Moving from Theory to Practice in Inclusive Design

Rita Newton, Marcus Ormerod, Andy Lewis and Erika Leho
SURFACE (Salford University Research Focus on Accessible Environments)
Bridgewater Building, Meadow Road Salford M7 1NU, United Kingdom
Tel. +44 (0) 161 2955405, Fax +44 (0) 161 2955011
http://www.inclusive-design.it
r.newton@salford.ac.uk, m.ormerod@salford.ac.uk

Abstract
The aim of this paper is to provide an overview of the work of SURFACE and to summarise the main findings from the different research methodologies adopted in their research. The work of SURFACE has been in seeking to bridge the gap between theory and practice in inclusive design. Throughout the research the SURFACE team used a variety of research techniques to obtain information from designers, building owners, access groups and voluntary organisations to investigate how inclusive design approaches could be incorporated into the architectural design process. The results of the research demonstrate that designers are keen to incorporate inclusive design principles but there is a knowledge gap particularly when designers are dealing with complex design problems; that users want to be involved in the design process but feel they have a limited amount to contribute due also to a knowledge gap; that there are a number of concerns relating to the implementation of the Disability Discrimination Act in October 2004 and in particular, what is ‘reasonable’ provision remains uncertain. The authors propose that further consideration needs to be given to how designers and professionals can achieve innovation in inclusive design solutions in the built environment, and for the need to have an integrative approach to inclusive design.

Keywords: accessibility, disability discrimination act, inclusive design

1. Introduction
SURFACE (Salford University Research Focus on Accessible Environments) is a centre of excellence with the Research Institute of Built and Human Environment at the University of Salford. SURFACE was originally supported by the EPSRC (Engineering and Physical Sciences Research Council) through a feasibility study into creating accessible environments within the briefing process of design (£40k). This grant built on previous work by Professor Peter Barrett investigating the process of briefing. This feasibility work led into a larger project again funded by EPSRC under EQUAL that looked at bridging the gap between theory and implementation in accessibility – a best practice approach (£230k). The output from the research has been published design notes, a legal and procedural guide, a better practice design guide, a national framework on inclusive design education, development of a Masters programme in Accessibility and Inclusive Design, and networking activities. Also a practice updating service will be launched shortly.

2. Context
2.1 An inclusive approach in undertaking research
It has been accepted for some time, not only in England and Wales but also in other countries, that accessibility of the built environment is critical in order to create a socially inclusive society. Buildings facilitate social inclusion for people with disabilities and older people. If people are excluded from buildings that provide education, employment, leisure, entertainment, services and amenities then not only does discrimination occur but also opportunities for integration are lost. The social model of disability, which was a basic
premise of this research, identifies that it is the barriers that society creates that are the disabling factor, rather than a person’s impairment (Oliver 1996).

This aspect is taken up by universal design (Ostroff & Presier 2001) in trying to create environments that the majority of people can use. Imrie goes on to suggest that inclusive design takes universal design further by broadening it to:

challenge the social and institutional, as well as technical, relations of design and building processes. Inclusion in the design and development of the built environment is not a disability issue per se; it is an equity and quality (of life) issue for everyone. (Imrie & Hall 2001)

In Europe the term “design for all” is used to replace earlier terms such as barrier-free design and non-handicapping. Whilst this may all seem to be purely semantics, the use of labels to categorise people in the past has led to a dehumanising of issues and divisions in society that have left disabled people either marginalized or completely excluded from the decision making processes. The work of SURFACE uses an inclusive design approach and the social model of disability as the basis for the research, together with emancipatory research methods (Finkelstein (1985), Oliver (1992), Barnes & Mercer (1997)) to work with disabled people at the centre of the research activities.

2.2 Current UK guidance and legislation

In accordance with Part III of the Disability Discrimination Act\(^1\), from October 2004, service providers will have to make reasonable adjustments in relation to the physical features of their premises to overcome physical barriers to access. Part III of the DDA deals with the provision of goods and services to the public in the UK. Education is not covered in the DDA but this is redressed in England and Wales by the Special Educational Needs and Disability Act (2001) [SENDA], where physical adjustment duties come into force in 2005.

Section 21 (2) in Part III of the DDA provides that ‘Where a physical feature (for example, one arising from the design or construction of a building or the approach or access to premises) makes it impossible or unreasonably difficult for disabled persons to make use of such a service, it is the duty of the provider of that service to take such steps as it is reasonable, in all the circumstances of the case, for him/her to have to take in order to-

(a) remove the feature;
(b) alter it so that it no longer has that effect;
(c) provide a reasonable means of avoiding the feature; or
(d) provide a reasonable alternative method of making the service in question available to disabled persons.’\(^2\)

It is the service providers who owe the duty to make ‘reasonable’ adjustments. However, both the DDA and SENDA impact on the built environment as the majority of public services, service transactions, employment and education are carried out in buildings or their surroundings. Within the DDA there is no definition of what is ‘reasonable’ or how this is determined and approached. There has been much consideration of this. In February 2002, for example, the revised DDA Code of Practice was published. This deals with the October

---


\(^2\) On 1 October 2004 duties (a) to (c) (referred to in this paper as ‘the October 2004 Part III duties’) come into force. The fourth duty, (d), has been in force since 1 October 1999.
2004 Part III duties and, as stated by the Disability Rights Commission, this Code “provides detailed advice on the way the law should work…”

In England and Wales currently the Building Regulations Part M – Access and facilities for disabled people and its accompanying Approved Document provide minimum guidance on accessibility. This only covers new developments and does not apply to alterations or changes to existing buildings. The guidance is based on a 20 year old British Standard BS 5810:1979 which has now been superseded by BS 8300: 2001 Design of buildings and their approaches to meet the needs of disabled people – Code of Practice. A consultation exercise on proposals for amending Part M is currently being undertaken by the Office of the Deputy Prime Minister on behalf of the UK Government (27 August to 29 November 2002). The proposal for Part M is that it will take on board a considerable amount of the guidance contained within BS 8300 thus making this compulsory for service providers. The revised Part M will not however include management issues related to buildings (currently included in BS 8300) since this will be difficult to control through the building regulation process. The situation in Scotland and Northern Ireland differs from England and Wales. In Scotland, the information from their former equivalent Building Regulation Part T is now dispersed into each of the relevant parts of the Scottish Deemed to Satisfy Provisions. Also unlike Part M the dispersal of access regulations in the Scottish approach means that it already applies to existing buildings. In Northern Ireland Part R of the Building Regulations closely mirrors that of Part M (England and Wales), however different terminology, illustrations and anti-discrimination legislation are used.

2.3 Issues
A preparatory stage of the research has been an exploration of the issues. This exploration was undertaken informally by talking and discussing the context of inclusive design with a wide range of people, and from a content analysis of structured interviews (from a different research project), and from a literature review.

![Figure 1: Exploration of issues relevant to accessibility](image)

3. Assessing Practice in Inclusive Design
3.1 Questioning designers
Over a 3 month period questions were developed, tested and piloted to 100 architecturally related people and these responses were used to shape a final questionnaire. The questionnaire comprised 27 separate questions containing 105 variables. A variety of questions were used to give both closed and open responses. Definitions were provided for key terms and information was provided in a form to be readily understood by building designers. Cross-checking questions were used to establish consistency of respondent answers. The length of the questionnaire was kept to 4 sides of A4. Whilst a more comprehensive questionnaire may
have yielded more data, it was felt that the response rate would fall dramatically. The questionnaire was divided into sections that established the profile of the respondent; their design practice; extent of consideration of access issues; knowledge of current and future legislation; and level and nature of training on accessibility.

A sample provided by the RIBA of UK architectural practices was used for distribution that represented 23% of the architectural and building design practices in the UK, a total of 2017 questionnaires being distributed initially and 1327 in the follow-up. The first round yielded 690 responses and the second 478, a total of 1168 (58%). The useable questionnaires from this were 961 (48%). The response to each question was analysed and cross tabulations were made using SPSS version 9.0. The significance of this analysis was then assessed, and the conclusions that could be drawn from this and the subsequent case studies are given in figure 5.

3.2 Using case studies of the design process
Seven case studies were successfully undertaken and for each case study a copy of the brief and outline drawings was obtained, a structured interview was undertaken with the architect (or their representative) and a representative from the client team. Cross case comparisons were then made (Yin 1994), and the results from this were fed into the overall analysis of results (figure 5). It was found that there is consistency between the literature and practice in how designers assimilate and operationalise their knowledge base on accessibility. It can be concluded that the model of effective briefing for accessibility from the analysis of questionnaires (see previous) is equally applicable throughout the whole design and construction process. Additionally, it was found that:

• Everyday environments are disabling, even to non-disabled people, and designers produce disabling environments for everyone (Reason 1990, Norman 1998)
• There is a need for good design, effective communication and human-technology interactions,
• Designers predominantly use their own personal experience of disability, if they have it, and they build on Part M in applying this; if designers have little or no experience, they are reliant solely on Part M
• There is limited capacity to absorb new knowledge and make use of it
• Little emphasis is placed on accessibility because designers see it as only one of many priorities
• Designers find difficulty in handling the wealth of design information available to them

3.3 Maximising expert opinion through user participation
A range of expert opinion has been sought on a wide variety of inclusive design issues following a Delphi (Dalkey & Helmer 1969), Linstone & Turoff 1976) methodology approach. The study was split into two expert panels, one comprising representatives from national charities with an interest in accessibility of the built environment (although they did not necessarily have the resources or expertise to influence this), and a second panel of members of Access Groups.3 Each panel member was sent a questionnaire on a range of issues that was subsequently analysed by the research team. This analysis was fed back to the panel members in a second round questionnaire to see if members changed their views in the light of feedback, and to add in new emerging issues that may have been introduced by a panel member. A third round followed the same format, and the fourth round was a workshop to bring together the participants and to present the findings. There is always a difficulty is

---

3 Access Groups are voluntary organisations, typically comprising disabled people with an interest in the promotion of disability and of access issues. Access groups tend to focus on their local area and have limited experience of larger building projects.
ensuring that panel members remain committed to the process, and a key part of the methodology and analysis was ensuring that results did not become affected by participant drop-out. The level of involvement of the participants is illustrated in the table below.

<table>
<thead>
<tr>
<th>Panel</th>
<th>Round</th>
<th>No of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Charities</td>
<td>One</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Two</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Three</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Four</td>
<td>11</td>
</tr>
<tr>
<td>Access Groups</td>
<td>One</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Two</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Three</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Four</td>
<td>5</td>
</tr>
</tbody>
</table>

| Figure 2: Illustration of level of participation from Delphi participants |

From this process emerged both key advances in the understanding and application of the Delphi methodology (particularly strengths and weaknesses), and advances in our understanding of reasonableness and consensus in accessibility. Particular emerging themes were those of professional practice, education and user involvement. This latter theme became particularly prominent in that everyone felt that user involvement was fundamental yet there appeared to be a significant knowledge gap amongst users and user organisations.

3.4 Action Research
The SURFACE team worked with designers on projects at pre-tender stage, including a sports centre, internet café, library, cinema and IT resource centre. The designs of these projects were followed from the initial briefing process, through concept and detailed design, to tender by contractors for construction. The work is currently on-site and a review will be undertaken with the design team on handover and a final review of the inclusiveness of the buildings will be conducted two years after opening. This will allow time for the users and client to work through the practicalities of the buildings. Additionally, this will be after Part III of the DDA (1995) has come into force and the potential for claims of discrimination exist, whilst the SENDA (2001) will not become applicable for a further year, allowing opportunity for adjustments to take place on this project.

Through the outcomes from the Delphi process panels, professional interviews and this action research, the importance of design guides to help architects develop accessible buildings became apparent. As Barrett indicated, those in industry often want best practice guidance to tell them what to do in the form of short, punchy “how to do it” guides and that:

Best practice advice, although seemingly attractive, is almost certain to be superficial with a rationalistic emphasis. This is understandable as it is rather more complicated and unseemly to make proposals that fully reflect the messy, human reality of organisational life. (Barrett 2001)

The approach taken in the action research phase was to develop design notes that created ‘a technology transfer process in which the industry partners are active agents in assimilating and adapting the ideas to their particular context.’ (Barrett 2001). A series of 30 design notes covering major features involved in the design of the specific projects were created as detailed below:
### Figure 3: Range of Design Notes

The design notes were created from a social model approach to disability, to allow the architects and specialists creative freedom and at the same time infuse inclusive design principles within their approaches. The original view of the design team had been that the Part M Approved Document of the Building Regulations was adequate, however, on reflection at the end of the design process the architects involved had found better practice solutions and were keen to apply the design notes to future projects. Also, as was confirmed from the questionnaire and case study research, the earlier an inclusive design approach can be implemented the easier it is for all those involved to design inclusively. Ideally this needs to occur at the initial briefing stage between client and designers.

#### 3.6 Learning lessons from others

A literature review and initial semi-structured interviews with a small number of experts was undertaken for the area of fire safety for comparison, since both fire safety and inclusive design have primary legislation (eg Fire Precautions Act and DDA 1995) as well as Building Regulations and Approved Documents, Codes of Practice and British Standards. Fire legislation was found to be more voluminous and more fragmented than inclusive design legislation and in the past changes have been made to address areas that have become outdated, or need clarification or to take on board European Directives, which already seems to be happening with the DDA. Also, there are valuable lessons to be learnt from the way changes in fire safety legislation and procedures have been handled. For example, since the early 1990’s, following a government commissioned report by Bickerdike Allen and Partners, which reviewed fire and building regulation, there has been comprehensive national guidance to support fire safety legislation and procedures. Additionally, changes in fire safety legislation and technology have been supported by design guidance material (eg Approved Documents, British Standards). As with inclusive design there are many different ways of achieving an adequate standard of fire safety since there are many design variables.

<table>
<thead>
<tr>
<th>External</th>
<th>Internal</th>
<th>Communication</th>
<th>Emergency Evacuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking</td>
<td>Circulation</td>
<td>Signage</td>
<td>PEEP’s</td>
</tr>
<tr>
<td>Pedestrian / vehicle routes</td>
<td>Doors</td>
<td>Sound enhancement systems</td>
<td>Electronic door closers</td>
</tr>
<tr>
<td>Street furniture</td>
<td>Lifts</td>
<td>Wayfinding systems</td>
<td>Evacuation stairs</td>
</tr>
<tr>
<td>Changes in level</td>
<td>Stairs</td>
<td>Colour / tonal contrast</td>
<td>Refuges</td>
</tr>
<tr>
<td>External steps</td>
<td>Office environments</td>
<td>Lighting levels</td>
<td></td>
</tr>
<tr>
<td>Ramps</td>
<td>Reception desks and counters</td>
<td>Natural light</td>
<td></td>
</tr>
<tr>
<td>External surfaces</td>
<td>Seating and waiting areas</td>
<td>Visitor information provision</td>
<td></td>
</tr>
<tr>
<td>Toilets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changing facilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor finishes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of glass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acoustics</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The comprehensive analysis (further literature review and semi-structured interviews) concludes that there should be two guides similar to those recommended by Bickerdike Allen and Partners in 1990, namely (1) a national guide to the legislation and procedures and (2) a comprehensive inclusive design guide capable of forming a basic educational resource for professionals in the field. The first for example, would explain the relationship between the building regulations (Part M and Approved Document), the DDA Part III and the new BS8300. The second guide would reflect the better practice guidance resulting from the research.

The analysis also demonstrated the need for a National Framework on Inclusive Design Education as well as a network of educational establishments offering courses in the same. For fire safety, both of these emerged in the UK in the early 1990’s and by 1997 UK vocational fire education enjoyed “a position of international leadership and a reputation as the finest and most progressive worldwide”. (Brian Booth, V.C., University of Central Lancashire).

4.0 Implementing Better Practice
As a result of the research, SURFACE has introduced a variety of approaches to encourage the take up and implementation of better practice. These are summarised in the table below:

<table>
<thead>
<tr>
<th>Implementing Better Practice</th>
<th>Voluntary Orgs</th>
<th>Access Group</th>
<th>Design Profession</th>
<th>Research Community</th>
<th>Policy Makers</th>
<th>Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design notes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Updating service</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal and procedural guide</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better practice design guide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National framework on Inclusive Design education</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of Inclusive Design courses</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Networking activities</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4: Implementing better practice in inclusive design

4.1 Design Notes
In the action research phase the design notes were further refined and it was established that this material should be augmented with an information and support (updating) service to clarify issues and investigate more complex problems. A sample design note (16 Changing Facilities) is included at the end of this paper.

4.2 Information and Support (Updating) Service
The aim of this service is to provide an easily accessible information and support service on inclusive design. The objectives (adapted from Fairclough 2002) would be to:
1. assist service users to keep in the forefront internationally and learn from other industries and overseas, and document and demonstrate the benefits of inclusive design
2. assist service users to learn from the best by providing a variety of ‘how to’ guidance

The service would provide a constant review of legislation and advice as it is published. Additionally a mechanism to identify research opportunities and seek out specific solutions to complicated accessibility problems could be offered through this.

4.3 Legislative and Procedural Guide
Although the 2001 Regulations explain the interaction of the Approved Document to Part M of the Building Regulations and the DDA, and the 2002 Code of Practice also attempts to explain this interaction, there is a need for one separate procedural guide setting out the interaction between the building regulations, the British Standard and the legislation. This guide describes how the various documents relate to each other and provides guidance on the issue of reasonableness.

4.4 Better Practice Inclusive Design Guide
The format for the design guide is similar to that being prepared by the Fire Safety Engineering Task Group in relation to fire safety engineering, namely guidance at various levels that will be of value to a wide range of construction professionals. As with fire safety engineering, inclusive design tends to be in the hands of a few, and guidance should aim to enhance the connectivity between all the guidance documentation available at the various levels. The guidance will similarly enable a mix of design criteria ‘to be more logically established to deliver better performance and increased value’. It includes selection of the most appropriate materials, use of simple techniques such as an effective stepping stone towards a more sophisticated approach, consideration of the value of adopting a more performance based approach against a more prescribed codified approach, and broad considerations that will affect the ease with which disabled people are able to use a building. Further to the BRE Best Practice Guides: Structural Fire Engineers section, it is considered appropriate for the inclusive design guidance to similarly be supported by a detailed description of the background theory used and a number of worked examples.

4.5 National Framework on Inclusive Design Education
In the long term the key is held in education, as identified by the Council of Europe and the European Commission who are both currently seeking consultation on design for all curriculum development. SURFACE is currently involved in both these processes and is working with North Carolina State University USA, Buffalo University USA, Global Universal Educator’s Educator’s Network to deliver the Universal Design Education Online web site to enable educators to interact with each other on inclusive and universal design issues. SURFACE is also involved in the LTSN CEBE special interest group on this issue.

4.6 Development of an Accessibility and Inclusive Design Post-graduate Programme
As part of the national framework on education referred to above, it is important that appropriate training and courses are provided to assist practitioners to keep up to date and to further develop their skills in better practice. Currently there is demand for such courses and SURFACE have developed an internet distance taught programme in accessibility and inclusive design. It is likely that as inclusive design education becomes more mainstream at undergraduate level that demand for programmes at post-graduate level will diminish.
4.7 Networking

As previously discussed, there is a considerable amount that we can learn from the fire safety industry. Since 1990 a network of universities and colleges offering fire courses has emerged and this has been extremely successful in putting the UK on the map as a world leader in fire safety education. In contrast, at present there are only a limited number of institutions offering courses in accessibility and inclusive design and the level of networking between course providers has not reached the levels seen in the fire sector. The UK is near the top but is not yet seen as a world leader in accessible design. However, with the development of the idea of inclusive design, if like the fire industry the UK is able to network its courses and link academic institutions with industry and user participants, then there is theoretically no reason why they should not become world leaders. This is just one of example of the possible benefits of networking, others can be seen for example from the success of the EQUAL (www.equal.ac.uk) network and Accessibuilt (www.jiscmail.ac.uk/lists/accessibuilt).

5.0 Future Directions

5.1 Can built environment professionals be innovative in inclusive design?

People have a very varied view of what innovation is and even what it means, for example, what is innovation in one company is standard practice over a number of years in another company. According to Flanagan (1999) invention, innovation and research & development are often confused but he considers that ‘innovation can be defined as the transformation of an idea into a product or service that is marketable’ and he supports this by citing the Department of Trade and Industry who describes innovation as ‘the successful exploitation of new ideas’.

Construction in the UK is one of the leading economic sectors and as such there is strive for constant improvement to its processes and product. The problem is not that there is no innovation but that the rate of innovation and subsequent change lags behind other industries and appears to be falling further behind (Winch 1998). Recent studies of innovation in the UK construction industry have indicated poor performance in the generation and adoption of technological (product and / or process) (Nan & Tatum 1997, Ove Arup 2000) innovation (Latham 1994, Egan 1998). Additionally Gann (cited in Winch 1998) argues that ‘innovation efforts in the industry are disproportionately orientated towards product enhancement rather than process improvement’. Also recent studies (Cripps 2002) suggest that many of the perceived barriers relate to frustration with the built-in culture and nature of the construction industry. It is felt to be risk adverse and overly conservative. The way in which projects are set up and run does not support innovation, especially in terms of time and resources for creative thinking. The tradition of tension between the different players in the project team is also a problem, with a lack of understanding and respect for others being a part of this problem.

However, construction innovation offers potential for significant company, industry, and societal benefits (Slaughter 2000) and the industry needs to be better at demonstrating this. The benefits arising from an individual innovation may be relatively small, but when several are realised together their cumulative impact can be considerable (EPSRC 1999). An example of successful innovation in inclusive design is achieved in product design by the Helen Hamlyn research centre. An example of a recent award for good inclusive design in the built environment was recently given by the Adapt Trust that honours excellence in access provisions to arts and heritage buildings. The award was made to Malcolm Fraser Architects for their work on Dance Base, a dance studio in Edinburgh, about which the judges commented:
‘The project presented the architects with a site in the Old Town, Edinburgh, not renowned for its accessibility. The result has proved that access issues do not preclude the aesthetics of good design and what impressed most was the way facilities for disabled people have been seamlessly incorporated throughout the building …. Basic physical access has been provided to all levels, but it is the design detail that has made this building special. Particular attention has been given to colour effects, signage and hearing assistive systems making it a joy for people with sensory impairments to use’.

The disappointment was that the prize was offered separate to the major Stirling Prize when innovation in inclusive design could have been an integral element of the judging process. Despite this, the ability to demonstrate the validation of innovation techniques is essential, as new ideas generally have to be proven to offer significant advantage before they are adopted. Projects that are identified as innovative and leading edge in inclusive design provide an opportunity for stakeholders in the construction industry to rise to the challenge of designing environments for everyone to use and environments that ultimately improve quality of life.

6.0 Conclusion
It is proposed that a way forward for achieving inclusive design of public buildings is to be bolder and more innovative in how we seek to achieve this, and this will form the basis of further SURFACE research. Ove Arup (2002) have recently demonstrated that in order to become and remain truly innovative we continually strive to learn from others with fundamentally different ways of thinking. However, we can only seek to do this if the foundations are laid with which to achieve this.

The research to date has shown that the key would seem to be effective legislation underpinned by practical guidance in the form of design notes, information service, legislative and procedural guide, better practice inclusive design guide or similar. In order for these to have impact and to be adopted by designers there needs to be appropriate network, and a national framework for inclusive design education.

References
Linstone, H. & Turoff, M. *The Delphi method: techniques and applications.* Addison-Wesley
Ove Arup and Partners (2000). *The contribution that technological change could make to meeting the objectives of rethinking construction: assessment in relation to product.* CRISP
SURFACE (Salford University Research Focus on Accessible Environments) sourced at [www.surface.uk.co](http://www.surface.uk.co)
**Figure 5: Summary of findings from case studies and questionnaires**

<table>
<thead>
<tr>
<th>ACCESSIBILITY ISSUE</th>
<th>WHO</th>
<th>WHAT</th>
<th>WHEN</th>
<th>IMPROVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Defining disability</strong></td>
<td>- Personal experience of disability has influenced the way some architects design</td>
<td>- the social model of disability is not a strong influence on design</td>
<td></td>
<td>- Adopt a more holistic approach to design i.e. cater for a wider range of peoples needs</td>
</tr>
<tr>
<td>[social/architectural model is more enlightened, religious/medical model is more restricting on design]</td>
<td>- Only one case study brief defined disability</td>
<td>- design caters predominantly for wheelchair users (parking, level approaches, toilets) over other access features (acoustics, colour, braille) that would assist people with sensory impairments</td>
<td></td>
<td>✓ holistic approach</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACCESSIBILITY ISSUE</th>
<th>WHO</th>
<th>WHAT</th>
<th>WHEN</th>
<th>IMPROVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Defining access</strong></td>
<td>- most architects feel it is their responsibility to ensure that access is considered at briefing</td>
<td>- some (1/4) architects have received access training, typically for ½ day</td>
<td></td>
<td>- architects should ensure that they are trained in access issues</td>
</tr>
<tr>
<td>[predominance of wheelchair design]</td>
<td>- consultation is generally undertaken with end users via drawings or meetings, but this only sometimes includes disabled people</td>
<td>- if cutbacks are to be made, most architects consider that accessibility should not be compromised</td>
<td></td>
<td>✓ knowledgeable architect</td>
</tr>
<tr>
<td></td>
<td>- most architects agreed that they could learn from including disabled people</td>
<td>- clients are unaware of the need for access to be addressed at the briefing stage</td>
<td></td>
<td>✓ architects should ensure clients understand their responsibilities</td>
</tr>
<tr>
<td></td>
<td>- access issues are constantly changing yet few architects have received recent training</td>
<td></td>
<td></td>
<td>✓ empowered client</td>
</tr>
</tbody>
</table>
| | | - access issues may not be mentioned in the brief but they can develop in the briefs indirectly over time (e.g. colour contrasts when deciding paint schedule) | | ✓ Architect should encourage the client to be more explicit during
addressed more thoroughly where Access Officers are involved

- clients assume disabled people will only be visiting the building

<table>
<thead>
<tr>
<th>ACCESSIBILITY ISSUE</th>
<th>WHO</th>
<th>WHAT</th>
<th>WHEN</th>
<th>IMPROVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Brief and the process of briefing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[access is considered too late, generally on occupation]</td>
<td>most architects (3/4) think that they consider access issues on all projects</td>
<td>most architects (2/3) do not use any form of checklist for preparation of the brief</td>
<td>overwhelming consensus that access issues should be considered early on in the design process, preferably RIBA Plan of Work Stages A and B</td>
<td>the brief needs a commitment from the client to provide full access</td>
</tr>
<tr>
<td>[remedial work is expensive]</td>
<td>clients are actively involved in briefing but they rely on the architect to meet access requirements</td>
<td>architects consider enough detail is included in the brief to ensure effective access</td>
<td></td>
<td>✓ holistic approach</td>
</tr>
<tr>
<td></td>
<td></td>
<td>some (1/3) architects do not make reference to guidelines or standards in designing for accessibility</td>
<td></td>
<td>✓ empowered client</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reference to access in briefs is quite limited in terms of how it is addressed – typically just reference to Part M</td>
<td></td>
<td>✓ knowledgeable architect or specialist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>when access is not considered until construction is started it leads to compromises on access issues and increased</td>
<td></td>
<td>Clients should consider engaging specialists (as in other areas of design) to assist with access issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>evidence from all case studies that the brief has changed over time to take account of site restrictions, changes in requirements, cost implications etc, but no evidence of changes in access provision</td>
<td>✓ knowledgeable architect or specialist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓ empowered client</td>
</tr>
<tr>
<td>Guidelines and Legislation</td>
<td>costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Part M been around a long time] [Part M is not scientifically based] [impact of changing technology, hearing loops and cochlea implants] [Part M recently reviewed for housing] [Part M falls significantly short of peoples needs] [DDA – need to make reasonable provision]</td>
<td>clients seemed informed of the existence of Part M but were not familiar with the practical implications of this architects were either knowledgeable on the implications of the Disability Discrimination Act, or, unaware of the implications (there was no middle ground)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>architects predominantly use Part M as the standard for achieving accessibility some architects do design beyond Part M, and when they do, they tend to rely on personal experience to inform the change</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>meeting Part M of the Building Regulations in the future may be inadequate, given the scope of the DDA – clients need to know their legal liabilities ✓ empowered client ✓ legislation or guidelines</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Note 16  Changing Facilities

General Principles

A designated unisex changing and / or shower facility for disabled athletes will ensure privacy for the user and also allow for assistance from a helper of the opposite sex when required. In exceptional circumstances, where space is at a premium, it may be appropriate to use a curtain rather than a door on the cubicle. This is far from the ideal solution and is not recommended on new build projects.

Transfer and use

Disabled people will use the shower facility in ways that suit their individual capabilities however the basic solution is a layout which enables the wheelchair user to transfer to a seat in the ‘wet area’ and to keep the wheelchair dry and within reach for the reverse transfer.

The wet area

Water must be contained in the wet area without the introduction of complex falls that will make standing or moving a chair difficult. Even the smallest up stand can render a shower facility unusable. Shower curtains should be used to provide privacy and prevent splashing.

The dry area

A dry changing area should be provided to ensure a properly self-contained facility. The basic design considerations are identified below.

Changing Cubicles

Main points to consider

Designated unisex accessible changing cubicles should be large enough to allow for assistance where required.

The door should have a minimum clear opening of 1000mm to accommodate the wider type sport chair. This should follow through on the routes where the people using sports chairs will travel.

The door should be fitted with a kick plate and grab bar to enable it to be pushed open or shut. The door furniture should be large and easy to grip. The door should be fitted with an easy turn lock and an emergency release facility.

A changing bench, full length of the room and a minimum width of 700mm should be provided. The bench should be padded, waterproof, non-slip and ideally be capable of moving up and down, either electrically operated or manually. If this option is not taken then a permanent bench should be fixed at a fixed height 500mm from the floor.

A full-length mirror should be provided in the room.

A shelf is useful for placing belongings on so as not to restrict circulation space.
A hook should be placed at a height of 750mm above the floor.

A panic alarm cord should be provided and this should be red so it can clearly be distinguished from a light pull cord.

If the guidance for dimensions of the cubicle below is followed it may be possible to incorporate a suitable shower in this type of room. However, there are other issues like ventilation that will need further consideration.

**Critical dimensions for a unisex accessible changing cubicle**

- Compartment dimension should be a minimum of 2000mm x 2000mm
- Privacy should be ensured by using a door with a minimum clear opening of 1000mm.
- A full length mirror should be provided
- A horizontal grab rail adjacent to the seat fixed at 700-750mm from the floor.
- A shelf for belongings should be provided fixed at 500mm from the floor
- There should be a clear unobstructed area outside the cubicle of 1500mm

**Critical dimensions for cubicle for disabled person not requiring assistance**

- Compartment dimension should be 1600m x 1400mm
- A tip down seat fixed 450-475mm from ground.
- Privacy should be ensured by using a door with a minimum clear opening of 1000mm.
- A full length mirror should be provided
- A horizontal grab rail adjacent to the seat fixed at 700mm from the floor.
- A shelf for belongings should be provided fixed at 500mm from the floor.
- There should be a clear unobstructed area outside the cubicle of 1500mm

**Shower cubicles**

**Main points to consider**

A satisfactory shower facility will allow a wheelchair user to transfer to a seat for the duration of the shower and back to the wheelchair with ease. A wall mounted tip down seat or a shower chair in the cubicle will assist with this function. Consideration should be given to making sure that grab rails and tip down seats can be fixed to solid walls.

It is important that it is possible to transfer onto the shower seat from the side, front or at an angle.

Access to the compartment must not be impeded by any up stand and it is recommended that in order to maintain the water in the cubicle floor channelling and flush drainage gratings are used.

The floor surface should be slip resistant, even when wet, to ensure a safe transfer can be completed.
The shower controls must be carefully positioned. The exact position will depend on the size of the cubicle provided. Ideally, in a cubicle of the size recommended below, the shower controls should be placed on the flank wall to the seat to avoid over-reaching.

The shower controls must incorporate a thermostatic mixing valve with anti scald setting. Ideally there should be a separate control for water temperature and volume. The shower controls should convey tactile information indicating on / off and hot / cold. This principle should be adopted in all showers.

The showerhead should be height adjustable and have a long enough flexible hose for those who wish to hold the showerhead.

The tip up seat provided should be fixed firmly to the wall at a height of 475mm.

Any soap dispensers provided should be reachable from the seat and close to the shower controls.

Grab rails should be provided and care should be taken to make sure that they are not slippery when wet. Grab rails and all fittings should contrast with their surroundings. Details on colour contrast issues will be dealt with later.

A panic alarm cord should be provided and this should be red so it can clearly be distinguished from a light pull cord.

If providing a separate designated showering facility ('wet area') it is essential that it is located adjacent to the ‘dry’ changing area and that all drying areas are well heated in order to avoid uncomfortable changes in temperature between wet and dry areas.

**Critical dimensions for an accessible shower cubicle**

- Compartment dimension should be a minimum of 1500mm x 1500mm
- Privacy should be ensured by using a full width cubicle curtain
- Horizontal grab rail fixed 700-750mm from ground. Vertical grab rail positioned between 900mm and 1400mm.
- Tip down seat fixed 450-475mm from ground.
- Shower controls located between 900mm and 1200mm.
- Showerhead should be capable of being moved between 1200mm and 2200mm from the floor with a detachable head on flexible hose.
- There should be a clear unobstructed area outside the cubicle of 1500mm

Consideration should be given to the size and type of lockers being provided in the changing rooms. They should be sufficiently large enough to accommodate prosthetic limbs.

Consideration should be given to the provision of a first aid room within close proximity to the changing area.

**Sources**