BARRIER FREE DESIGN FOR DISABLED PERSONS- EVALUATION FRAMEWORK FOR ASSESSING THE QUALITY OF ACCESSIBILITY IN PUBLIC BUILDINGS

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ABSTRACT

This paper proposes a framework for evaluating accessibility features that have been incorporated in new buildings or retrofitted in existing ones. The guidelines are based on detailed observations and evaluations of accessibility provided within recent years in public buildings owned and operated by the federal Canadian government.

The evaluation objectives focus not only on safety, functional ease and technical accuracy, but also on the operational requirements, the attitudes that are reflected by the solutions provided and the visual impact they have. Many of the accessibility provisions observed todate are far from satisfactory in view of the proposed evaluation guide.

Therefore the conclusions reached are that if these issues are to be addressed appropriately, much greater comprehension must be developed on the part of the designers regarding the intent of barrier free standards, their degreee of implementation, and how they affect and relate to disabled and able-bodied users.

INTRODUCTION

The objective of this paper is to present criteria considered essential in evaluating the quality and usefulness of handicap-accessible features in public buildings, criteria which go beyond the purely technical assessment of building accessibility to focus equally on its psychological, social and visual aspects. The development of these criteria was based upon detailed observations of accessible provisions, carried out in twenty-two old and new buildings that are under the jurisdiction of Public Works Canada.

This federal ministry, responsible for over 3000 buildings across Canada (buildings serving the public and office buildings)is in the process of implementing a recent policy to make the majority of the buildings accessible within a five year period. The ministry has developed their own Barrier Free Design guidelines (Public Works Canada, 1980) and since then have begun the modification program in earnest. (New construction built after 1975 already respected the Canadian National Building Code requirements for accessibility.)

As part of this initiative, in the summer of 1981 they contracted me to evaluate some of the recent projects carried out Montreal and Ottawa, and based on my findings, to propose an evaluation framework which they could apply to subsequent work. My approach was not to study plans and specifications, nor fill out long checklists about what did or did not exist, but simply to observe and use the accessible features, to question administrators and users of the building, and to sense and perceive my reactions to it all.

I had been particularly selected to do the study because I have both personal and professional experience in the field, and therefore I would like to present my credentials for it:
I have been an architect for 17 years -- designing, consulting, criticizing, learning, observing;
for 13 of those years, I have been in a wheelchair -- learning new ways, experiencing barriers and frustrations, dealing with misunderstanding and segregation;
for 8 of these past years I have specialized in policies, programs and solutions related to accessibility of the built environment;
and for the last 5 years I have also been a professor of architecture -- transmitting to students not only the notions of good design but also the full human context in which architecture should be conceived.

Therefore, my approach to the evaluation process includes various viewpoints, which I would like to elaborate as the following:

1 - The practical view

My own needs for accessibility are immediate, and I continually judge how they are satisfied on the basis of two primary characteristics: functionality and safety. These are essential qualities to which I react instinctively, because they directly affect my ability to circulate and manouever around and within a building with independence, ease and security. Not only are these requirements primary to the satisfactory use of any environment, but the physical autonomy they bring is one of the prerequisites for liberating emotional and intellectual strength. For instance:

a) do I have to use my energy being patient rather than efficient?
b) do I have to go long distances when others travel a direct path?
c) do I get held up between doors and get angry?
d) am I at the back when all the action takes place up at the front?

2 - The technical view

I check all features against my knowledge of the many codes, guidelines and design criteria that exist in North America (Mace, 1974, Lifchez, 1979, National Research Council, 1980, etc.) as well as those in Europe (Goldsmith, 1976). I am aware of the values, reasons and research which underly these codes and guidelines, but I am equally aware of the many assumptions that have been made in this process (many unfounded) and of the intellectual and rational thinking that has often been substituted for real, pragmatic experimentation. Through my own experience, I realize that many assumptions have been rarely tested or proven, or that others have been valid in the past but should be re-evaluated at present, since life-styles and life-values are in constant change.

Furthermore, I am continually surprised that design solutions to the same problem are handled differently in every situation. This poses questions such as:

a) are there too many codes, each one different?
b) does no one really understand them or apply them?
c) are technical people so uncomfortable with the subject that they cannot treat it properly?
d) faced with the requirement of "standards for the handicapped", do people lose their ability for logical thought?

At the same time, I am troubled by the reality that many important design criteria have still not been incorporated into the technical literature, which is predominantely oriented to the wheelchair user, and does not provide adequately for the needs of visually- or hearing-impaired persons, elderly persons, those with ambulatory or coordination limitation, and others. This brings up questions such as:

a) is there specific knowledge that can be used to expand these codes?
b) can the requirements be stated in a way that they can be interpreted easily and correctly?
c) can any concensus be reached on these subjects?

3 - The user view

As a disabled persons, I am inevitably conscious about how other persons perceive me in any situation or setting, and how they react to my effort to be as independent and appear as integrated as possible. This implies that in the process of using facilities that may or may not be accessible, or are partially so, I am continually verifying my emotions and reactions:

a) do I feel stigmatized?
b) do other people go out of their way to help me?
c) do I feel uncomfortable or insecure with the special features that have been provided for my particular use?
d) do I wish it had been done differently?

Inevitably these considerations intertwine with the practical and technical viewpoints, but in quite unpredictable ways. It is not always the most expensive solution (mechanical or "special use") that is the most useful, appropriate or appreciated, and design overkill in an accessible feature (very commonly observed) is often undesirable and unproductive. Though disabled, I am still a human, not a robot, and I prefer to use facilities (somewhat adapted, if necessary) that others use. Am I allowed to do that? (Lifchez and Winslow, 1982)

4 - The professional view

As an architect, I evaluate the design solution to the accessibility problem in terms of the attitudes and hidden messages that it implies, not only to me, but to users who may be less, or not at all disabled. This judgement is oriented toward considerations such as:

a) is it a logical solution?
b) does it make sense in the given context?
c)is it visually integrated?
d) how does it affect the esthetics of the rest of the setting?

Furthermore, I do not judge the accessibility situation only in relation to my own handicap, but as a professional with knowledge of many other handicapping situations, I simulate other disabled persons'reactions to the environment, to how safely and comfortably they could function within it. These include:

a) could they find their way in a particular architectural layout (horizontal and vertical circulation)?
b) would the decorative treatment (lighting, textures, colour contrasts) help or hinder them?
c) would they profit or suffer from the special equipment?
d) what specific aids would they need?

The preceeding viewpoints begin to introduce the complex task of judging if, how, and for whom any built environment, with its endless variations of type, size and equipment, has been made accessible. How can the many persons with physical and sensory impairements, each with different limitations and abilities, having differing requirements as well as individual means of coping, be adequately accommodated? What are the specific environmental objectives we need to fulfill? What criteria can and should we apply? What does barrier free design truly imply?

THE MEANING OF ACCESSIBILITY - FUNCTIONALITY - SAFETY

The concept of barrier free design is a relatively new one, having emerged within the past ten years as an expansion of "design for the handicapped", which mainly addressed the mobility problems of wheelchair users. The enlarged view of the accessibility problem, though still strongly oriented towards the needs of disabled persons, has come to realize that many other users, generally considered able-bodied, suffer from the existance of a variety of often un-intentional man-made barriers, the result of lack of consciousness and knowledge . . .

In the best of all possible worlds, the aim would be to create a totally barrier free environment, one where no orientational, functional, visual, auditory, spatial or manouevering barrier would exist for any user of an environment . . . whether old, young, encumbered by packages, pregnancies, strollers, maintenance wagons, moving equipment . . . or whether they are among the many individuals who have a medically identifiable impairement that becomes a handicap when they are carrying out their daily activities. In such a world, many persons whom we consider able-bodied would worldlessly appreciate and take advantage of design features that facilitate the use of the environment and for everyone provide greater ease, safety and functionality.

However, to be realistic, at this stage of the accessibility evolution process, we -- architects, technicians, site planners, industrial designers and specialists -- do not even know which performance standards are valid and which design solutions to advocate. Nevertheless, having made some significant strides towards a basic accessibility, we have to face another reality: that is, that disabled persons as such (those with a medically identifiable impairement) will in different ways (special to them) always be somewhat different, and may require some help, despite their and society's efforts to achieve independence and autonomy. I do not view this as a negative fact, only as a practical one. Therefore, before embarking on specific aspects that should be evaluated, I wish to elaborate on the various kinds of help disabled people may need or ask for (these two are not identical, depending upon the individual in question). I have classified these in three categories:

1 - Help that comes naturally during a normal activity

Such help is not discriminatory to the person receiving it, nor hazardous to the person offering it; it is help that is naturally acceptable and generally polite: e.g., a door held open in a situation where people are continually walking in and out; a push up a ramp if it seems to cause strain; passing a paper towel in a busy washroom . . .

2 - Help that is offered without hazard

Though no hazard is involved, this type of help obliges the helper to make a special effort to accommodate the disabled person, which consequently makes the person helped feel uncomfortable: e.g., having someone open a locked door or operate an elevating device; having to use a

private phone because the public one is inaccessible; asking for permission of any kind . . .

3 - Help that is hazardous to one or both persons involved

Some type of help does present a danger to the person(s) helping and/or to the person being helped: e.g., hoisting up/down a curb, steps or staircase; pushing/pulling a wheelchair up/down a steep ramp; transferring someone to an inaccessible toilet . . .

In other words, the fact that one has to ask for any special kind of privilege, as in the second and third situations, focuses on "procedures" that must be taken. This in turn emphasizes the lack of "integration and equal participation" that still exists, and that denies disabled persons their rights as first-class citizens. Therefore, accessibility design solutions must respond not only to the prescribed standards, but must take into consideration their effect on disabled users as well as their able-bodied counterparts.

EVALUATION FRAMEWORK

The standard procedures for evaluating accessibility - usually in the form of checklists - tend to enumerate and define technically the accessible features that are provided in any one facility. (Access for All, 1977) That, of course, is the nature of checklists: the simplify and reduce elements to common denominators that can be quantified, but they do not provide a procedure that is broad and complex enough for assessing environmental performance. (Konecny (Falta), 1973)

Checklists view accessibility features as elements dissociated from the architecture and equipment found in and around a building; they do not qualify them in terms of operational, psychological, social or esthetic impact. However, if we are ever to achieve something resembling a barrier free environment for all, we will have to replace this narrow approach regarding "special features for the handicapped" (responding to the code but no more)by the broader concept that simple, integrated, visually and environmentally appropriate solutions do exist, and must be integrated into our design vocabulary for the benefit of all users.

Based on the foregoing reflections, the proposed evaluation guidelines incorporate a broad range of design considerations, including qualitative as well as logistic aspects:

1 - respect for design standards;
2 - respect for the context the building presents;
3 - flexibility in relation to design solution;
4 - user-related qualities as opposed to simple technical characteristics.

Many of the buildings evaluated were retrofitted for accessibility (mainly wheelchair use) and do not even pretend to rectify the many environmantal problems that are the scope of barrier free design. Furthermore, the constraints found in existing buildings present much greater difficulties than would similar accessibility requirements in new buildings.

It was educational, as well as interesting to note, however, that in both old and new buildings many incongruities were observed that were not specifically related to existing size or location restraints. Many of the solutions proved inadequate, many inappropriate , some overdesigned, and in general they seemed to be illogical efforts to accommodate the "unknown, disabled being".

Based on this experience, one which kindled many reflections of attitudinal barriers and practical uncertainties, the evaluation framework was conceived to focus attention on the integration of functional, operational and esthetic qualities inherent to any effort to improve the practical characteristics of our environment. Since many criteria interact in the evaluation framework, the questions posed include the following:

1 - What kind of facility is it?

Does it provide a service to the public? (e.g., post office, employment office) or does it provide long-term employment? (e.g., mail sorting facility, customs offices). In some situations, these two functions overlap (e.g., National Film Board, Department of Revenue) and in others hardly at all (e.g., forestry department). In each situation, one must judge to which level accessibility requirements should respond: which areas must be totally and readily accessible; which areas require a lesser degree of accessibility? Can we honestly make a distinction? On what grounds?

2 - How are the accessibility features integrated with the non-accessible situations?

Do disabled persons have to use completely separate facilities, elsewhere, altogether away from the normal circulation and from other users? Are they obliged to find the one "accessible" toilet or entrance, or can they use the same one that others do, and still find it accessible? Are the accessible features located in an easily accessible place? (This may sound like a silly question, but it is truly unbelievable how often facilities such as 'handicap toilets' and lower telephones are located in completely inaccessible settings.)

3 - How essentially useful is the accessible facility that has been provided?

Is the facility effective for the disabled user as well as the non-disabled user? In this consideration, cost-effectiveness is an important factor. The more users (of all types) that can really benefit from an accessibility features (e.g., cafeteria staff using service carts on a ramp; elderly, blind or uncoordinated persons using a handrail for support or guidance), the more that feature has an economic and functional value that reaches beyond the confines of "design for the disabled". Cost-effectiveness increases rapidly when it becomes a valuable and useable part of the built environment.

4 - How safe is the feature, and for whom?

What risk does it harbour for disabled persons (e.g., a uni-sex toilet where a disabled person is alone behind locked doors?) and for other users (e.g., a wall-hung, protruding fountain accessible to wheelchair users but hazardeous to blind persons?) What about a short but steep ramp that may project a wheelchair too abruptly into a circulation path that may be at right angles to the ramp? This is a danger for passers-by and is very serious if it leads into vehicular circulation. In addition, the short, steep ramp may often be unstable and slippery for all users.

5 - Does it conform to standards, and to which ones?

Does the solution show an understanding of the intent of the standards? (e.g., why accessible unisex toilets in a workplace where a severely disabled person requiring a helper would normally choose one of the same sex? therefore why send autonomous disabled persons into a separate unisex toilet where they feel segregated from their co-workers?) Have the persons that interpreted the standards responded by applying too broad or too limited a range? (e.g., why provide special electric doors for the 'handicapped entrance', particularly in new installations where space is not a problem, when the design standard only requires a lightweight door closer and sufficient flat landing space on both sides of the door? why supply the special, expensive, hospital-type wheelchair basin when the standard only specifies accessibility under the basin and lever or cross-type faucets?) Is it a logical solution, a safe one, or over-kill?

6 - What is the perception of and the reaction to the accessibility features by disabled and non-disabled users?

Is the reaction negative when it appears too special (e.g., the hospital wheelchair basin), too ugly (why does it have to be ugly?), too out of the ordinary (why should that happen?) Is the reaction positive because it is equally useful to other users (e.g., a lowered telephone for children or short parsons; a ramp for baby strollers or bicycles)? This consideration is important, since consciously or unconsciously it affects the attitudes of able-bodied persons toward disabled individuals: negative reactions tend to focus attention on the disability itself, and thereby reflect unfavourably on disabled persons in general.

7 - What are the operational problems inherent in the accessibility solution?

Here again cost-effectiveness plays an important role in making the chosen solution viable. Does someone have to unlock locked doors to make the barrier free feature accessible? Does the disabled person have to have permission, a special key, or call ahead? Is there unnecessary mechanical/electrical equipment that is liable to break down? Is the accessible feature difficult to find? Must one have knowledgeable information before reaching or using it? Must one be accompanied? Does someone else have to operate the equipment? Does it necessitate exceptional maintenance? Is it as easy to use in winter (with ice and snow) as it is in summer? Is there a simpler solution to the problem that has to be resolved?

8 - How esthetically pleasing is the accessible feature?

Is the feature visually integrated with the architecture and the decor? This is a far from superficial consideration, since it too can have an impact on the acceptance of disabled persons as equal citizens in our social and physical environment. In addition, many accessibility requirements such as ramps, textures, handrails, colour contrasts and height differentials offer the creative potential to incorporate them in ways that expand the design vocabulary while enhancing its functional character. Far from being distracting, the careful integration of useful features can profitably enrich the visual quality of both exteriors and interiors of buildings.

9 - Is the signage appropriate, adequate and well located?

Is there uniformity in the symbol and combination of symbols used to transmit the same message? Is there complete and correct signage pointing to the location of non-evident accessible features? Is information provided in a central area giving the location of all accessible exits, toilets, telephones, special elevators etc. so that noone has to hunt for them? Is there a coloured and brailled map locating the circulation, service facilities and all public spaces? Are the signs lisible to visually impaired users? Are the messages understandable? One short note: the international symbol of accessibility should be used with care. It is not necessary that an obvious accessible feature be identified once it has been reached; the symbol should not be overused in a way that increases visual confusion and affects decor consistency. Are hearing-impaired people shown facilities for them? Is raised lettering used where it can be reached? Are all potential users considered?

CONCLUSION

The foregoing evaluation criteria review many aspects that have to be considered not only when evaluating but also when creating a barrier free environment. They raise questions of principle, not of specific situations and solutions, and certainly not of technical details. These have been dealt with in detail in the report to Public Works Canada (Falta, 1982). Given the variety of criteria be integrated in any one solution, it is evident that each situation must be judged independently within the given context. That is a main reason why check-lists are simply inadequate.

The evaluation framework emerged as I tried to judge and classify the accessibility features I observed. If the truth be said, any comprehensive evaluation was impossible. I could not even contemplate the "barrier free" concept, because only wheelchair accessibility had been improved. And not always in the best fashion, either. I sensed self-conscious, uncertain design gestures, reflecting a lack of both comprehension and acceptance on the part of the designer. (It is fair to say that for each of the buildings,a different architect was employed, though several worked under one supervising PWC architect.)

It was surprising to note (if not altogether shocking) the lack of coherehce in the standards applied (and certainly no adherence to the PWC Design manual), and there were wide discrepancies in the ways that basic accessibility had been provided. Here I am not speaking only of retrofit, but also of new installations. Each ramp, each door, handrail, toilet, washbasin, even sign, was treated differently, and none of them could be ascribed to any code that I could identify. Why is this? Even within the same building, different solutions (some better and some worse) were used for the same functional situation.

If I apply my evaluation criteria to the various features, new and retrofit, in the nine categories they would rate variably as good, bad or medium. Few of them would get top marks. How can that be? Designers pride themselves on the ability to create good design solutions while respecting technical codes and specifications. Some of my findings did not support those claims. Certainly I respect a designer's freedom to propose individual, interesting solutions, and I applaud the good ones. On the other hand, many solutions showed little consideration for the objectives underlying the technical requirements, with the result that they were functionaly and operationaly unsatisfactory (if not dangerous) and visually drab.

Furthermore, there were rather broad interpretations of design standards, and both extremes were observed: some very careless applications and some very obvious overdesign, some designs responding to things,rather than to people.

At the same time, there were excellent solutions, ones where accessibility was incorporated into both the functional and visual setting, attractive and unobtrusive. There were also solutions that, despite evident concern and effort, did not adequately solve the problem. I comiserated with their creators . . .

Where does the problem lie?

Appropriate accessible building design -- barrier free for all users -- starts with the conviction that such design is functionaly useful, necessary, visually interesting, serves not only a small portion of the population but is valuable to all users. This positive, common-sense attitude is the basis towards a progressively barrier free design approach. Without it, we will continue to have poor accessibility solutions. It is not a simple question of closer adherence to the standards, but more essential is understanding the issues which those standards address. We have to fill an information void regarding the intent of accessibility standards and their possible interpretations. Through education we can start to eliminate the negative attitudes that form a barrier, and open the way to good accessibility for all.

In order to speed the education process, we need the active participation of the persons for whom design modifications were originally intended. All the evaluation guidelines available, even the most enlightened and comprehensive ones, result in professional evaluations which, for better or worse, remain an exercise carried out in a vacuum. Meaningful evaluation can only come about when disabled people, with their many types and levels of disabilities, use a building and facility frequently, and provide individual feedback on how each accessibility feature serves or hinders them. Every disabled person has different needs, different methods of coping in various circumstances, and different reactions to the quality of what has been provided.

Despite the best efforts of any team to check equipment, simulate its use, compare it to standards and make educated extrapolations about the needs of other disability groups, the only valid evaluation will come when disabled users/consumers will be able to render their verdict "en bloc". We must welcome these people into the buildings to seek services, information and work.

Only users can really tell us what is missing and what works. It is a user evaluation that will give the final answer.

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