Architectural Accessibility in North Carolina — The Quest for Barrier Free Design

by Ronald L. Mace

In 1983, my architectural firm designed an apartment project for disabled people for Western North Carolina Housing, Inc., a non-profit organization in Asheville. Since the project will be built with money from the U.S. Department of Housing and Urban Development (HUD), we designed it to comply with HUD's design standards for accessibility. Upon review, HUD rejected the plans and told us to redesign the bathrooms to meet a different set of requirements, the 1980 American National Standards Institute's (ANSI) Standard for Accessibility. HUD did this because ANSI had recently approved a major revision of its 1961 standard. The 1961 ANSI Standard had been the basis for HUD's original specifications.

To meet the request of the HUD examiners, i.e., to adapt our design to the new ANSI Standard, we had to change the placement of bathtub controls, grab bars, mirrors, and light switches. We submitted the revised plans, but HUD rejected them too. This time the examiner said the placement of the grab bars did not comply with the Handicapped Section of the N.C. State Building Code, which is different from both the HUD and the new ANSI Standard. So we revised the plans again and submitted our third bathroom design, which was finally accepted. In this final design, the bathroom did not meet the exact specifications of any of the standards—HUD, ANSI (1980), or the N.C. Building Code.

The process we followed for the Asheville project is not uncommon. The lack of uniformity in specifications for barrier free design causes inefficiency, unnecessary costs, and confusion among the architectural and construction communities. I use a wheelchair myself and my company works to promote barrier free design for handicapped people, but even I was exasperated by the Asheville experience. The process is even more frustrating for those architects or builders who "bring to the design process all the able-bodied attitudes and assumptions that have shaped design concepts in Western culture," as Gerben DeJong and Raymond Lifchez recently put it in a major review of "Physical Disability and Public Policy" for *Scientific American*.[1]

Accessibility for handicapped people who

Ronald L. Mace, an architect, heads an architectural firm, Mace and Associate, Architects, in Raleigh, and is president of Barrier Free Environments, Inc., which specializes in design for people with disabilities. In 1974, Mace and his partner, Betsy Laslett, developed the Illustrated Handbook of the Handicapped Section of the North Carolina State Building Code *and assisted the state in establishing the Special Office for the Handicapped. Mace, a member of the N.C. Building Code Council, is recognized throughout the country as an expert in barrier free design.*

are looking for an apartment, shopping for groceries, seeking employment in an office building, or visiting an art museum depends upon: 1) the adoption of effective, uniform design standards at the federal and state level; and 2) the implementation of these standards by architects and builders. Both of these issues concern public policymakers and the private sector in North Carolina. In 1973, North Carolina adopted a new Handicapped Section of the N.C. Building Code and began a program of technical assistance to implement it. This code has been used as a model by federal agencies and other states, but now it needs to be updated to meet new national standards and bring the advantages of uniformity to North Carolina.

Although implementation of North Carolina's design standards has been relatively smooth, handicapped people often do not enjoy barrier free living. Two disabled people who joined our staff last year could not find accessible apartments which were large enough for them and their families or attendants. Despite North Carolina's progress, very real physical barriers still exist in the day-to-day world of disabled people, particularly in finding housing.

How can North Carolina fine tune its building code to take advantage of improved national standards and new technological advances? Why is uniformity in standards desirable? How can the state's administrative system improve accessibility for disabled people? To answer these questions, we must first understand the development of the N.C. Building Code and the accomplishments of the system responsible for its implementation.

Handicapped Section of the N.C. Code Becomes a National Model

The development of the current Handicapped Section of the North Carolina State Building Code began in 1970 when Gov. Robert Scott (1969-73) established the Governor's Study Committee on Architectural Barriers. That committee, chaired by then state Rep. Howard Twiggs (D-Wake), found that the existing handicapped section was largely ignored by the building industry. The handicapped section consisted only of minimal recommendations, which because of their non-mandatory language could not be enforced. Hence, in September 1972, the committee recommended that the Handicapped Section of the N.C. Building Code "... be revised to provide more enforceable and comprehensive standards of accessibility."[2]

Gov. James E. Holshouser Jr. (1973-77) then extended the life of the committee. After another year of negotiation and compromise with the building industry and with handicapped advocates, the committee, in conjunction with a task force set up by the Building Code Council, completed a revision of the Handicapped Section of the N.C. Building Code. The Building Code Council adopted the new and more comprehensive handicapped section with *mandatory provisions*, effective September 1, 1973.[3] Adoption by this council gave the new code requirements the force of law. For the first time, North Carolina had a broad set of specific, mandatory construction standards which provided accessibility for people with all types of disabilities in all new construction and in existing buildings when they are being extensively remodeled or when they change type of occupancy (for example, a house which becomes a restaurant must comply).

At the time of this revision, the only design guidelines available were the 1961 ANSI *Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped.* North Carolina's new code went far beyond this national standard. The new N.C. Code included more comprehensive and more stringent architectural specifications than did the ANSI design standards. More significantly, perhaps, it provided that these standards must be implemented *in all new and extensively remodeled buildings.* The ANSI Standard addresses design specifications only; it does not say where the requirements should be used. Consequently, the new Handicapped Section of the N.C. Building Code became a model for many states and national agencies, in *both its technical and policy aspects.*

The national reputation of the N.C. Code became clear as early as 1975 when the U.S. House of Representatives Committee on Public Works and Transportation sponsored review hearings on the effectiveness of the federal Architectural Barriers Act of 1968. In his testimony before the panel, General Services Administration (GSA) official Walter Meisen singled out North Carolina's code as a national model, calling it "the most stringent [in the nation]" and "a very good code."[4]

For a handicapped code to have any impact, however, a good system for administration is needed. The code requirements have to find their way into the day-to-day lives of architects, builders, and building inspectors. The vehicles for administering the N.C. Building Code are the Building Code Council and the Engineering Division of the N.C. Department of Insurance.

The Building Code Council, established by state law, is a 12-member body appointed by the governor.[5] The council has the authority to propose, adopt, and amend the building code. The requirements of the code are mandatory statewide for all buildings, both publicly and privately owned. The Engineering Division of

the Department of Insurance provides staff assistance to the council. Initial responsibility for administration and enforcement of the code rests with local inspection officials. Thus, each county or municipality which has a local building inspector or inspection department is responsible for enforcing the code through a system of building permits, inspections, occupancy permits, and condemnation proceedings.[6]

Anyone who questions the decision of a local building inspector may appeal that decision to the Department of Insurance. The Engineering Division reviews these appeals and makes a decision, which in turn can be appealed to the Building Code Council or to the state courts. The council meets quarterly to hear these appeals and to review requests for amendments to the state code which, again, anyone can request. If the council overrules the Engineering Division's decision on an appeal, it usually amends the code to clarify the issue. Thus, any council decision on an appeal sets a precedent which usually creates a permanent change in the code. Since the adoption of the new handicapped section in 1973, relatively few requests for amendments have been made to the council. An important reason for this record has been the technical assistance provided to the construction industry, explaining the code requirements and suggesting simple, inexpensive methods for meeting them.

This technical assistance began soon after the new handicapped section was adopted. In written form, the new code requirements were difficult for those unfamiliar with the needs of disabled people to understand. Gov. Holshouser authorized discretionary funds for the production of *An Illlustrated Handbook of the Handicapped Section of the North Carolina State Building Code.* This book, released in 1974, contains illustrations of the code requirements. It shows the ways disabled people use certain building features and suggests alternative ways of designing some of these features. With it, all those involved in design and construction of buildings can see quickly and clearly what the code requirements mean. In 1974, the Building Code Council adopted the *Illustrated Handbook* as the official Handicapped Section of the Building Code. The first of its kind in the United States, the *Illustrated Handbook* became a popular model for many other states and organizations. GSA Assistant Commissioner Meisen, for example, told the 1975 Congressional review panel that the GSA hoped to "incorporate some of the drawings and diagrams of the North Carolina Code" in developing a better standard.[7]

Recognizing the need for continued technical assistance on the code, Commissioner of Insurance John Ingram in 1975 established the Special Office for the Handicapped within the Engineering Division. That office, headed by architect Theresa Rosenberg, began conducting training seminars for architects and building inspectors, developing public awareness campaigns, and serving as a resource for information on the handicapped code requirements. The Special Office for the Handicapped has repeatedly received praise as a solution to a common problem, most recently in *Scientific American:* "What is needed is a technical assistance body that can offer creative solutions meeting both the letter and the spirit of existing standards and codes ... [and] a decision-making body that can render these creative solutions and compromises legally binding. One model of technical assistance is the Special Office for the Handicapped in the N.C. Department of Insurance."

After the successful 1974 *Illustrated Handbook,* the special office published two more guidelines.* Responding to several state and federal policies and laws (including the Governor's Study Committee on Architectural Barriers and Section 504 of the Rehabilitation Act of 1973), the legislature appropriated funds to begin modifying university facilities and other state-owned buildings for accessibility to handicapped people. However, modifying an existing structure produces a new set of problems requiring an even greater understanding of accessibility. A new illustrated manual, *Accessibility Modifications* (1976), provided advice on setting priorities for modifications and implementing them without undue expense. In 1980 the federal Office for Civil Rights, U.S Department of Education, distributed thousands of copies of *Accessibility Modifications* as part of a technical assistance program for implementing Section 504 of the Rehabilitation Act of 1973.

By 1979 it was apparent that the homebuilders and some building inspectors were having difficulty determining exactly what the handicapped section required in housing. The housing requirements were scattered throughout the code and were difficult to find. To solve this problem, the Special Office for the Handicapped published a third illustrated manual, *Accessible Housing,* which pulled all housing requirements

**Editor's Note: Barrier Free Environments, Inc., the firm headed by Mace, produced all three of these books under contract with the state. Theresa Rosenberg, director of the Special Office for the Handicapped, emphasizes the value of Mace's contribution. "He is a pioneer in developing materials for technical assistance for accessibility for disabled people," says Rosenberg. "His contribution has been invaluable to the citizens of North Carolina and, indeed, throughout the country."*

together. In 1980, the Building Code Council adopted *Accessible Housing* as the official handicapped code for housing.

Uniformity—An Elusive Goal

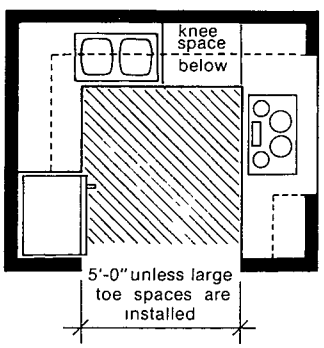
The Special Office for the Handicapped and the handicapped section of the code itself established high standards within the state and indeed in many parts of the country. In the late 70s and into the 80s, the N.C. Code proved all the more important as federal and state laws requiring accessibility were enacted and began to be implemented. These same laws, however, together with a widening presumption of accessibility among the general public, also highlighted the limitations of the N.C. Code, and all other design standards throughout the country.

Several laws call specifically for architectural accessibility for handicapped people. The 1968 Architectural Barriers Act (PL 90-480), for example, requires that buildings constructed or leased with any federal money meet federal accessibility standards. Other statutes which do not explicitly require architectural changes often make changes necessary to provide access to federally funded programs. Section 504 of the Rehabilitation Act of 1973, for example, requires any program receiving federal funds to be accessible to disabled people (see article on page 82). Similarly, the federal Education for All Handicapped Children Act (PL 94-142) and the N.C. "Creech Bill" (NCGS 115C-106 *et. seq.)* require that all handicapped children receive an education along with non-disabled children in the "least restrictive environment." Implementation of the education statutes and Section 504 often requires architectural modifications to existing facilities. State law (NCGS 168-1 to 168-8) establishes the right of disabled citizens to full and free use of all facilities, both publicly and privately owned, which serve the public. While this statute does not specifically require architectural modifications, it does imply that all North Carolinians have the right of access.

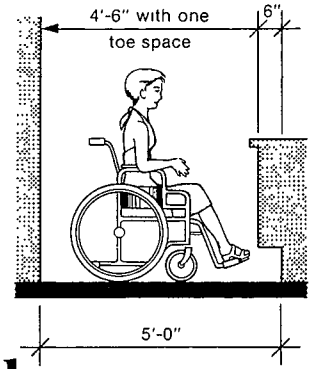
All these laws have improved accessibility and have increased opportunities for disabled people nationwide. However, removal and

From *Accessible Housing*, produced by Barrier Free Environments, Inc. This and other illustrated guides for handicapped accessibility are available at minimal cost. For an order form, write to the Engineering Division, N. C. Department of Insurance, P. O. Box 26387, Raleigh, N. C. 27611.

5.2 Kitchens



a. Clear floor space



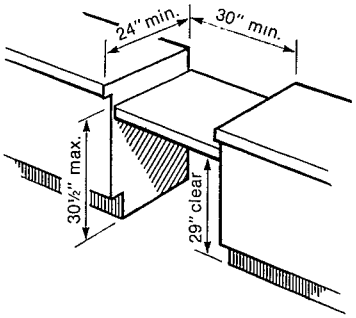
b. Cabinet toe space

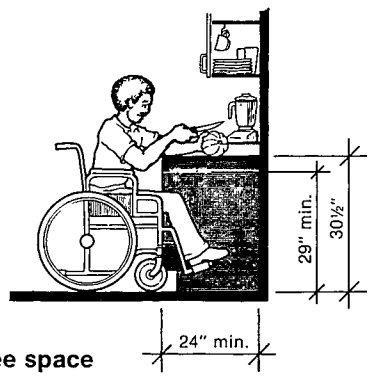
a. There must be a minimum 5'-0" x 5'-0" clear floor space in the kitchen of accessible units to permit a person using a wheelchair to make a 360° turn.

b. Cabinets may overlap the 5' x 5' clear floor space by 6" if a toe space at least 6" deep x 8¾" high is provided.

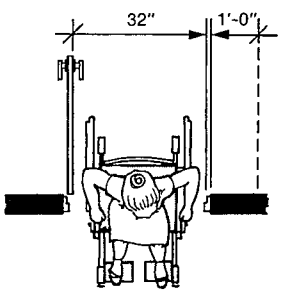
c. A knee space for seated work at least 30" wide, 29" high, and 24" deep must be provided. The top of the counter must be at least 30" wide, 24" deep and no more than 30½" above floor to the top.

d. Doors must have a 32" clear opening and swing out or slide. However, doors may swing in if they do not overlap the 5'-0" x 5'-0" clear floor space. See example on page 24.





c. Lowered work surface with knee space



d. Doors

prevention of architectural barriers under these laws have been impeded by the lack of uniformity in the construction standards set by each law.

Virtually every state code for accessibility, including North Carolina's, has been based upon the 1961 ANSI Standard. Many states considered adopting this early national standard, but both construction and disability communities found it inadequate. Often a state would assemble a working group to write its own handicapped code. Consequently, many states' requirements were based partly on the 1961 ANSI Standard and partly on local preferences and personal opinions.

Meanwhile, the same patchwork approach was taking place at the federal level. Federal accessibility and civil rights laws passed during the 1960s and 1970s instructed federal agencies either to use the 1961 ANSI Standard or to write their own. During the 1970s, several federal agencies adopted the North Carolina Code as an interim standard. Other agencies wrote new standards. By the late 1970s, there were over 50 codes and standards for accessibility being used in the country. Proliferation of differing standards produced chaos for the construction industry and less accessibility for disabled people. Construction projects using federal money in North Carolina fell under the accessibility requirements of at least three, and sometimes four, different standards: 1) the agency providing the construction funds; 2) the agency responsible for the program (which sometimes differed from the source of the federal funds); 3) the 1961 ANSI Standard; and 4) the N.C. Building Code.

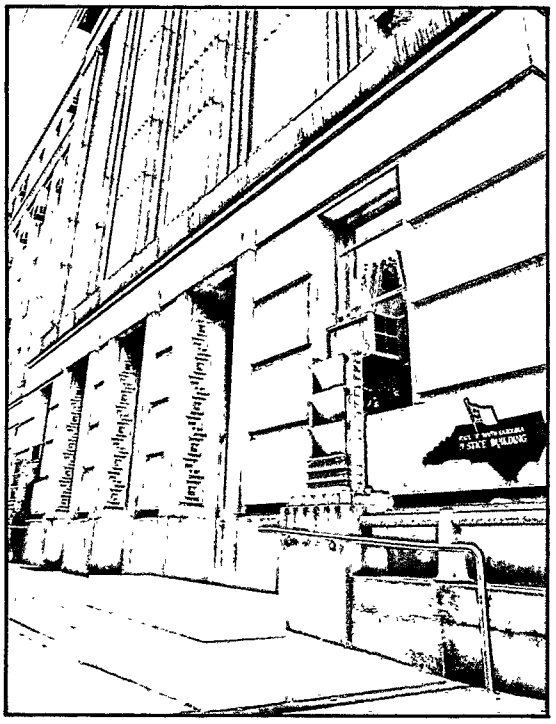
All of these standards might differ, for example, about the type and placement of acceptable water coolers. For the architect, builder, or manufacturer, which standard took precedence? The answers were never clear. The architect would generally meet the one most likely to be enforced, or pick and choose specifications from each in a time-consuming attempt to meet the essence of all. The manufacturers would produce different models or options so the product could be sold in every state. Lack of uniformity in technical specifications increased costs, slowed the planning process, and fostered negative attitudes toward accessibility in general.

In the last three years, however, significant progress has taken place towards long-needed uniformity in design standards for accessibility. In 1974, the American National Standards Institute launched a review of its 1961 Standard. Released in 1980, the newly revised ANSI Standard is broader than the original and its technical specifications address all types of disabilities and cover most building elements.[8] Most industries have endorsed the new ANSI Standard, and it has been adopted in whole or in part by 20 states and model codes (see chart, page 45). South Carolina, for example, recently adopted the 1980 ANSI Standard in its entirety.

Meanwhile, a change in federal law required the federal Architectural and Transportation Barriers Compliance Board to issue guidelines which all federal agencies must use to develop their standards for accessible design. The Compliance Board's *Minimum Guidelines and Requirements for Accessible Design,* published in 1982, adopted most of the 1980 ANSI Standard and became effective in January 1983.[9] Since then, the major federal construction agencies—HUD, Department of Defense, Postal Service, and GSA—have jointly published proposed new *Uniform Federal Accessibility Standards.*[10] The adoption by the Compliance Board of the 1980 ANSI technical specifications in its *Minimum Guidelines*, and the subsequent adoption by the major federal agencies involved in construction of the *Minimum Guidelines* into their *Uniform Federal Standards* have created new uniformity at the national level.

Now all federal agencies will, for the first time ever, use the same technical specifications for building elements such as water fountains, toilet stalls, and ramps in their regulations. States which have adopted the new ANSI or federal standards now have the same specifica-

At the Justice Building in downtown Raleigh, builders constructed a ramp to the front door while maintaining the architectural integrity of the building.



Michael Marros

tions. Designers, builders, manufacturers, owners, and taxpayers in those states will benefit from increased efficiency and cost savings. Disabled people will benefit from the increased implementation of more adequate design features in projects constructed within these jurisdictions. Ironically, *North Carolina is not one of these states* even though it was a forerunner to the new standards. The North Carolina code broke new ground for the country. But now the country has caught up—and surpassed—North Carolina.

Basis of Technical Criteria in State Access Requirements, April 1983

Two points need to be emphasized about the lists below. First, this is the technical *basis,* not the exact technical *requirements* of the various states' requirements. North Carolina, for example, is listed under the American National Standard Institute 1961 Standard. When North Carolina adopted its handicapped code in 1973, the 1961 ANSI Standard was the *basis* for the code. But the 1973 code went much further in some technical requirements than did the 1961 ANSI Standard. Moreover, various technical items in the Handicapped Section of the N.C. Building Code have been updated since 1973. Thus, inclusion in a certain column below does not indicate that the technical requirements of a particular state are exactly the same as the model code at the top of the column.

The second point of emphasis is the word "technical." No model code serves as a *policy* basis for a state. Each state works out its own approach to how the technical requirements should apply within the state. Hence, a state like North Carolina may have a much more far-reaching policy section to its code than does another state in the same column below.

States Using ANSI† 1961 Standard (revised 1971)

Alabama
Arizona
*Colorado
*Connecticut
*Florida
Georgia
*Hawaii
Indiana
*Maryland
*Michigan
Minnesota
Mississippi
Missouri
Nebraska
New Jersey
North Carolina
*North Dakota
Oklahoma
Oregon
Pennsylvania
Tennessee
Washington
West Virginia
Wisconsin

States Using ANSI† 1980 Standard

Alaska
*Colorado
*Delaware
*Florida
*Hawaii
Idaho
Illinois
Iowa
Kansas
Kentucky
Louisiana
Maine
New Mexico
New York
*Ohio
Rhode Island
South Carolina
*South Dakota
Vermont
*Virginia

States Using ATBCB† Minimum Guidelines and Requirements for Accessible Design

Arkansas
*Delaware
*Maryland
*Nevada

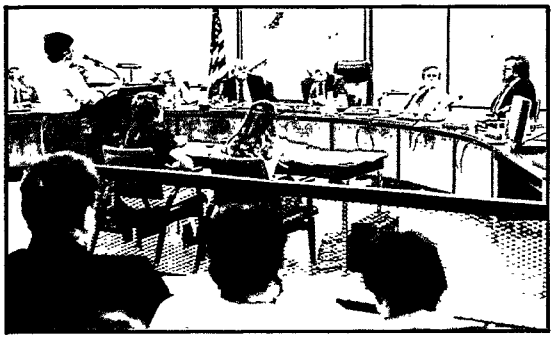
States Using Other Criteria

California
District of Columbia
*Maryland
Massachusetts
*Michigan
Montana
*Nevada
New Hampshire
*Ohio
Utah

*Designates states which have more than one code or states which use more than one standard as a technical basis. These states may appear in more than one category.

†ANSI: American National Standards Institute
ATBCB: Architectural and Transportation Barriers Compliance Board

Source: National Center for a Barrier Free Environment
1015 Fifteenth St., N.W., Suite 700, Washington, D.C. 20005



Michael Matros

N.C. Building Code Council Chairman Ray Moore (third from right) consults with council member (and author of this story) Ron Mace (far right) during a recent presentation by Theresa Rosenberg regarding wheelchair "turn around" space in bathrooms.

Housing - The Barriers Remain

While the state's handicapped code and the technical assistance provided by the Special Office for the Handicapped have received well-deserved praise, North Carolina has some work to do in housing. Both technical and policy issues need to be examined. Current code requirements for housing specify that 5 percent of all apartment units in complexes having more than 10 units must be accessible or adaptable according to the technical specifications in the N.C. Building Code.[11] In theory, over the years a supply of accessible housing would accumulate so that disabled people might have a chance of finding appropriate housing in their communities.

After builders complained that these minimums were expensive or unnecessary, the Building Code Council attempted to make the builders' jobs easier. When builders found that some non-disabled tenants did not want grab bars and other accessibility features in their apartments, the council pointed out to builders that the required units could be "adaptable," not fully accessible. Hence, the builder or owner could add a grab bar or adjust a cabinet to provide space for wheelchairs *when needed.* Although other built-in accessibility requirements such as wide doors and extra floor space must still be provided, an adaptable apartment has no visible accessibility features and looks like any other apartment, yet it meets or can easily be adjusted to meet the needs of disabled people. The building community also received an additional inducement to provide these "adaptable" units. Under 1974 tax laws,[12] builders can receive a $550 North Carolina tax credit for each required unit they build which complies with the handicapped code.

Despite the five-percent minimum, the code provisions for adaptability, and the tax incentive, the actual probability of a disabled person finding an accessible apartment is extremely low. These units are not required to be held open for disabled tenants, and the code does not specify what types of units (one bedroom, two bedroom, etc.) should be made accessible. Most are occupied at any given time by a non-disabled person, and the majority seem to be one bedroom units, which preclude disabled people with families or live-in attendants from living in them. The solution is to continue building accessible or adaptable apartment units and to guarantee that a reasonable distribution of one, two, and three bedroom units are constructed so that a stock of such units is built up across the state.

An alternate proposal might be to adopt a 1983 New York state law, which requires *all* apartments to be adaptable. The new national, uniform standards are beginning to filter down into the product design departments of major manufacturers and into common architectural practice. If an architect makes *all bathrooms* accessible, the design and construction expenses might be less than modifying plans so that only certain apartments have accessibility features. In order to test this cost efficiency proposition, observers will have to follow closely the New York experience in the new few years.

In the short run, the Special Office for the Handicapped could do more to distribute a listing of apartment complexes with accessibility features. The state law providing a tax credit to builders requires this office to maintain a copy of occupancy permits for complying units built since January 1, 1979. The office gets such information through a form letter sent to local building officials. It reads, in part: "This [record] enables us to keep a listing of accessible apartments throughout North Carolina, which is critical to disabled citizens seeking housing." But few handicapped people in the state are aware of this service. The Special Office, other agencies serving disabled people, and handicapped advocacy organizations must publicize and distribute this information.

The Challenge Ahead

When North Carolina's handicapped code requirements were written and adopted ten years ago, they represented the best available thinking on the subject. However, recent research and experience have taught us more about design for disabled people. Meanwhile, new national standards have been adopted in the private sector and—for the first time—in the federal bureaucracy. North Carolina needs to keep abreast of changing technology and the progress at the national level. Therefore, the Building Code Council, the Special Office for the Handicapped, builder groups, and handicapped advocacy organizations should consider the following recommendations.

1. **The N.C. Building Code Council should amend the technical specifications of the handicapped code to conform to the 1980 ANSI Standard and the new *Uniform Federal Standard.*** These changes would affect only items of a technical nature, such as the width of a parking space, the height of a water fountain, the slope of a ramp, or the clear space needed to turn a wheelchair. These amendments should not change any policies such as which types of buildings are required to comply. Adopting the new specifications would allow the building industry and the disabled community in North Carolina to take advantage of the quality and cost benefits that uniformity can provide.

Manufacturers are now producing accessible elevator control panels, bathtubs and showers, water coolers, telephone enclosures, alarm systems, signs, cabinets, and toilet room equipment designed to meet the new uniform standards. When architects and builders can buy such products directly rather than having to custom design or modify similar equipment, they save time and money. Manufactured standard products, consistently and accurately produced, can eliminate construction errors and minimize potential liability for owners and architects. At this time, because of minor differences between the North Carolina handicapped code and the uniform national and federal standards, many new products may not be acceptable in North Carolina.

2. **The technical assistance program within the Department of Insurance should be expanded.** Currently in North Carolina, no systematic training exists on accessibility in a general sense, or on the building code requirements specifically, for persons entering the building industry—architects, builders, building inspectors, and building agency officials. Expanding the educational function of the Special Office for the Handicapped could help meet this training need. In addition, changes in the technology of design for disabled persons and updating the code will increase the need for information and assistance from this office.

3. **The Special Office for the Handicapped should publish a booklet identifying the apartment complexes throughout the state where accessible units exist.** The office currently has this information but does not make it available to the public on any regular basis.

4. **The Building Code Council should require builders to make accessible five percent of each type of unit in an apartment complex—one bedroom, two bedroom, etc.** At present, builders generally construct only one bedroom apartments accessible, which limits the type of family that can use the apartment.

5. **After the recommended code amendments are completed (see item number 1), the Special Office should publish a listing of architectural products which meet the state requirements for accessibility.** Many innovative and cost-saving products have come on the market since the ANSI Standard was revised in 1980. This information is difficult for the building industry to assemble, and its availability will be a service to both the construction and disabled communities.

Conclusion

The Handicapped Section of the Building Code remains one of the better codes in the country in its policy and scope of applications—that is, the code requires that all buildings be made accessible with only single family residences and some heavy industrial facilities exempted. Other states now have similar policies, and North Carolina should retain this important coverage.

We are moving into the second and perhaps third generation of design specifications for disabled people—specifications based on facts and long-term experience. With the new standards, perhaps we can reach nationwide uniformity so that a toilet stall for disabled people in North Carolina is the same as one in California and the same as one required by HUD or the General Services Administration or IBM Corporation. When this happens, designers and builders will no longer have to look at a code to see what to do. They will become familiar with these details just as they are with thousands of others, and these requirements will become part of the common knowledge of the industry. □

FOOTNOTES

[1]Gerben DeJong and Raymond Lifchez, "Physical Disability and Public Policy," *Scientific American.* (Vol. 248, No. 6), June 1983, p. 47.

[2]*Final Report—The Governor's Study Committee on Architectural Barriers*, September 1, 1972.

[3]Section 11X, N.C. Building Code.

[4]*The Effectiveness of the Architectural Barriers Act of 1968 (Public Law 90-480)*, Hearings before the Subcommittee on Investigations and Review of the Committee on Public Works and Transportation, House of Representatives, 94th Congress, 1st Session, October 7 and 20, 1975. p. 75.

[5]NCGS 143-136. For an overview of how the state's building regulation system functions, see "North Carolina's Comprehensive Building Regulation System" by Philip P. Green Jr., *Popular Government*, spring 1980, pp. 26ff.

[6]By July 1, 1985, all counties and municipalities are required to have inspection departments. See NCGS 153A-31 and 160A-411.

[7]*The Effectiveness . . .*, p. 80.

[8]*Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped (1980)*, the American National Standard Institute, number A117.1 (the same title and number of the 1961 standards).

[9]36 CFR 1190 (1982).

[10]Federal Register, Vol. 47, p. 33862, April 29, 1983.

[11]Sections (11X) 5.2 and (11X) 5.3.

[12]NCGS 105-130.22 and 105-151.1.