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Buildings and Handicapped Citizens

by R. F. Legget

UDC 721.011

One Canadian in every seven has a permanent physical disability or an infirmity associated with advancing age; and at least half a million suffer some serious physical handicap that impairs normal movement. As a result of modern treatment and rehabilitation methods this large segment of the population is being steadily integrated into almost all phases of ordinary living. Handicapped citizens are therefore using public and private buildings to a steadily increasing degree, and it is imperative that as many buildings as possible in Canada should be so designed that they can easily be used by them. The mere thought of negotiating a wheel chair up the monumental flights of steps that appear to have been almost a prestige symbol for some types of Victorian public building will show how needs have changed and how public thinking has advanced in this vital area of public convenience.

Canada is doing something about the matter. It is the purpose of this Digest to show how this aspect of building design is advancing just as are the more technical features dealt with in preceding issues. All designers, architects and engineers should be familiar with the information that is now available to assist in ensuring that buildings will be convenient for use by those who do not enjoy full use of bodily movements.

If such features are incorporated in original building designs, the extra cost involved is almost negligible when compared with the to-

tal cost of a structure. The added convenience will benefit not only handicapped citizens but all who use the building, since no impediments are added and only inconvenient features eliminated. Some changes can be made to existing buildings for the same purpose, often with little effort or excessive cost, but there is a point beyond which changes become clearly impracticable. It is desirable, therefore, that there should be some means of identifying on the outside those buildings that are designed in such a way that citizens who are handicapped can use them. There is now available, and coming into increasing use, a clear sign for this purpose. It appears at the end of this Digest, where its use is further explained.

"Supplement No. 7"

This is the rather mundane title of the document now available for the guidance of Canadian designers in showing how buildings can be made convenient for the use of the handicapped. It is one of the technical supplements to the National Building Code of Canada, published with it but not part of the Code itself. When, therefore, the Code is adopted for legal use by any municipality, the supplements do not thereupon obtain legal significance. They are conveniently available, however, for use with the Code. By voluntary adoption they can become effective instruments in the control of design in the public interest. Many organizations throughout Canada are working to promote the widespread use of Supplement No. 7 in their own

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municipalities. Copies of the document are available in all major cities. Gradually, therefore, awareness of its significance is becoming more general, so that with the cooperation of building owners and designers impediments to the use of large buildings by those who suffer from disabilities should steadily decrease throughout this country.

The Supplement is a slim pamphlet of twenty pages, available in both French and English. It contains detailed provisions for design requirements for buildings and associated site development. Provisions for residential design will be included at a later date since here, too, omissions in design sometimes interfere with normal living for those who are handicapped. Larger buildings, however, present the major initial problems and it is in this field that a start has been made.

Sources of Information

The technical content of the document is based upon careful anthropometric studies — statistical average measurements of the dimensions of the human body, standing, walking, seated, and in a wheel chair. Dimensions of wheel chairs are now generally standardized so that the amount of space necessary for moving them can readily be calculated. Correspondingly, the space necessary for convenient movement by those who use such aids as crutches has also been accurately determined. When these basic dimensions are considered in connection with the detailed design of buildings, the necessary changes in what might be called “conventional” design features can be determined. Supplement No. 7 presents in convenient form, ready for use, the results of such applications.

Only rarely will reference have to be made to more than the basic anthropometric dimensions included in Supplement No. 7. For those who wish to have more detailed figures there is available a most convenient guide published by the Royal Institute of British Architects in 1963, *Designing for the Disabled* by Selwyn Goldsmith, a book of 236 pages available from the R.I.B.A. at 66 Portland Place, London W. 1, England, at a price of fifty shillings. It is believed to be the “first information manual prepared for the architect which covers all

aspects of building design from the point of view of the disabled user.” It is based on information assembled from eight countries, including Great Britain and Canada.

It is surprising that only very recently has public attention been directed to this problem of building design. In consequence, there is no large supporting body of literature to which the reader of this Digest can be directed for further information. DBR/NRC has issued a bibliography of the information that is most conveniently available but even this is a list of only thirty items: DBR Bibliography No. 26; April 1964; available free from the Division.

Design Requirements — Site Development

Proper site development can be a most effective means of resolving the problem of access to buildings for the handicapped without in any way interfering with general convenience or the aesthetic aspects of landscaping. Walks, or walkways, should, for example, never be less than 5 feet wide and should never have a gradient more than one in twenty. Quite naturally, the layout of walks should not include any abrupt changes in level, such as the single low steps that are so often seen and which can be so dangerous even for everyday use. Another obvious requirement, non-slip surfaces, can readily be provided by roughly finished concrete.

Not yet frequently seen, but a most desirable feature of walkway arrangement, is the blending to a common level of walks that cross, and the corresponding cutting out of curbs where walks cross them, the walks being then sloped to street level. This does add to the problem of planning but adds little to final cost. The writer has seen even the main street of a small city in Texas completely constructed in this way. It looked right; it was convenient for general walking; and it was a vivid demonstration of local regard for the needs of the disabled.

The word “ramp” is suggested for general use when any outside passageway has to be graded at more than one in twenty. For ramps the maximum gradient should never exceed one in twelve, and a handrail must always be

provided, at least on one side, to assist those who have difficulty in walking. The provision in parking lots of one or two stalls convenient for those with wheel chairs is yet another of the planning provisions so obvious when stated but all too seldom seen. The use of end stalls as reserved spaces for handicapped motorists is a convenient solution.

Design Requirements — Buildings

Provisions within buildings are rather more obvious than those required in site planning. One primary entrance of every building, for example, must be wide enough and so located that it can easily be used by those in wheel chairs. The minimum opening to give this requirement is 2 ft 6 in. clear of all protruding hardware when the door is open; the corresponding minimum width of door itself is 2 ft 8 in. Door closers, when required, should be of a type that will permit the opening of the door with little effort and should be slow closing to allow uninterrupted passage of a wheel chair. Lever door handles are clearly preferable to facilitate their use by those with impaired grip. And when revolving doors are used, as is now so frequently done, an auxiliary side-hung door must be provided for the use of those in chairs.

These details of design, elaborated in Supplement No. 7, are here given as examples of the type of simple requirement that can make all the difference between convenience for the handicapped and, in the extreme case, the impossibility of their entering buildings. All the features mentioned are naturally supplementary to the exit requirements of the National Building Code itself, but they do not conflict with them. As may be seen, they can be incorporated into entrance designs without any apparent departure from regular requirements.

Within a building there are similar needs with regard to ease of movement. Where there must be small changes in level between floors ramps should always be provided in addition to, or in place of, the usual sets of a few stairs. These are an accustomed sight in hospitals; they should soon be as familiar in ordinary public buildings where circumstances make such changes in floor level unavoidable.

Ramps within buildings should never be less than 3 feet wide and should always have a level area measuring at least 5 feet by 5 feet at the top if they lead to doorways. Long ramps should have a 4-foot level platform at intervals of not more than 30 feet and at all turning points. There should always be a straight approach of at least 6 feet at the bottom of every ramp.

Stairs must naturally be provided for all but the smallest changes in level, and for access between floors. Here, too, there are recommendations as to stair dimensions and profiles that facilitate their use by the disabled. Somewhat naturally, open risers are not recommended, despite their current aesthetic attraction. If such open stairways have to be used, then an alternative solid set of stairs should always be available for the handicapped. For mechanical vertical transportation, standard elevator designs are quite satisfactory as long as the necessary door openings are provided, as they usually are in modern elevator design.

It is clearly desirable that all floors should have non-slip surfaces, not only for the benefit of the handicapped but for the safety of all who use a building. Highly polished floor finishes are therefore to be avoided. Particular attention should be given to the finish of floors in vestibules and in entrance hallways since these may become dangerous when wet. A minimum of wax should be used for maintenance, and non-slip waxes such as are now generally available are recommended.

Finally, there are some equally "obvious" but most desirable features in connection with the equipment of buildings, especially in toilets that are available for public use. These must be so laid out as to permit the easy entry of wheel chairs. At least one toilet stall in each toilet room should have a minimum width of 3 feet and a minimum depth of 4 ft 8 in., with a door that swings outwards, a grab bar to facilitate movement of the occupant, and a toilet properly located. If included in original designs, these provisions cause no difficulty at all. Even the changing of one stall in existing well-designed toilets should not prove to be

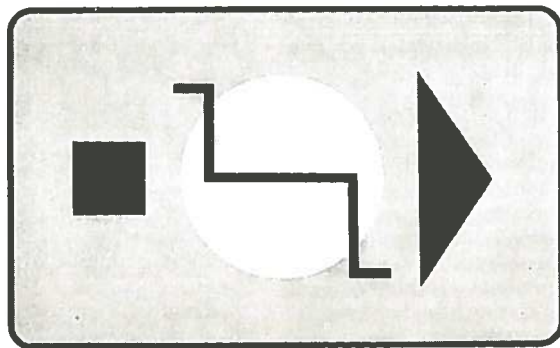
too troublesome or costly. Wash-basins, drinking fountains and telephones are other common features of public buildings at least one or two of which should be located for easy use by the handicapped, especially by those confined to wheel chairs. Dimensions and design requirements for these features are contained in the Supplement.

Conclusion

It will now be apparent that it is desirable to be able to indicate clearly those buildings that contain in their design features such as those described. It was for this reason that the representative national committee responsible for the preparation of Supplement No. 7 developed a distinctive sign for display on the outside of all buildings that can be used by handicapped citizens. This is shown below, necessarily in black and white, although the

actual sign is black on a bright yellow. As may be seen, it can be displayed in any one of three ways in order to indicate the location of the entrance it is intended to designate. It is a privilege to add that the main building of the Building Research Centre in Ottawa now displays this sign; the original design for research purposes was found to coincide almost exactly with the requirements for handicapped citizens herein summarized, only a few minor interior modifications being necessary.

If copies of Supplement No. 7 cannot be obtained from the office of your local rehabilitation or allied society, application should be made to The Secretary, Associate Committee on the National Building Code, National Research Council, Ottawa, mentioning Supplement No. 7, or NRC No. 8333; individual copies may be ordered at 25¢ per copy.



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