

DESIGN GUIDELINES OF DWELLINGS FOR THE AGEING SOCIETY: JAPANESE APPROACH TOWARD UNIVERSAL DESIGN

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ABSTRACT

Rapid ageing of the population necessitates the preparation of dwellings that are suited to ones' later years. Since dwellings last for decades, it is often the case that people rarely care about the outcome of choosing poor quality dwellings. Safety, accessibility, and usability are thought to be met as-a-matter-of-factly, which actually are not.

To overcome such problems, we have developed our dwelling design guidelines for the ageing society through extensive research and succeeded in publishing them as recommendations from the government (Ministry of Construction). We have gone much further: The government subsidized housing mortgages now require the essential conditions to be eligible for preferential interest rates. The condition was the choice among the three, for durability, for energy conscious design, or for design for ageing, when the scheme was first revised in 1996. After two years, the mortgage now requires either energy conscious design or design for ageing. Within a few years, we further expect the integration of the two essential requirements, so that we will have a brighter future.

The paper will explain the development processes and arguments we have overcome through years.

KEYWORDS:

Design for ageing, dwellings, housing policy, universal design.

INTRODUCTION

Japan is expected to be one of the most aged society in the world in 2000, and estimation is that more than a quarter of the whole population in Japan will be 65 and over in 2015. It means that previous assumptions of care of the aged by their family members, or care in special institutions for the aged will cease to be valid. Minimum barrier-free physical environments will be needed to avoid inconveniences during daily living. To solve problems related to the trend, the Ministry of Construction started a five-year research and development project on design for the aged society in 1987. The author took the leading role in defining the aim of the project, and put "design for all ages" as the key concept, discarding the traditional idea of special design for the aged. In Japan in June 1994, "Act on Accessible and Usable Buildings by the Aged and Physically Disabled Persons" was made, and in June 1995, "Design Guidelines of Dwellings for the Ageing Society" were issued. These are similar to ADA and FHAA Guidelines in the States, and these Japanese Act and the Guidelines, put together, will allow ageing residents to go out and move around in the community. It is a clear departure from age segregation that has been the idea of sheltered housing scheme. It assumes that residents will age in place, and that the dwellings should be able to respond to the changing needs of residents. Comparison of housing policies for the aged persons in different countries (including Japan) can be found in Brink (1998).

DESIGN FOR ALL AGES: UNIVERSAL DESIGN CONCEPT

During the development stages, the author tried to integrate existing knowledge with new ideas derived from experiments, etc. Results of such experiments, etc., are reported elsewhere (Kose et al.,

1991; Kose, 1992; Kose, et al., 1992a,b,c; Kose, 1994). Basic concepts for dwellings the author finally adopted are:

- 1) The dwellings should be livable 30 years after they are built.
- 2) Safety, comfort, and usability must be ensured for all residents.
- 3) Required level should not be too high to be universal.
- 4) Dwellings should be adaptable to meet new requirements in response to the changing needs.
- 5) Design and facilities should be given choice depending on the needs of the residents.

In order to put the above concepts in practice, the following points were thought to be necessary:

- 1) Safety of the residents (no tripping risk on floors, etc.).
- 2) Physical support for negotiation (such as handrails).
- 3) Potential for single floor living (as opposed to stair use).
- 4) Circulation for assisted wheelchair (negotiable width for corridors and doors).

The above can be interpreted as follows in terms of design:

- 1) Basically flat floor. No door sills, no step differences, unless vitally necessary.
- 2) Handrail installation at critical places, such as stairs, bathroom, toilet, and entrances.
- 3) Wider corridors and doors.
- 4) Gentler stairs.
- 5) Adoption of negotiable design features, such as door handles, water controls, electrical outlets, etc.
- 6) Preparedness for emergencies.

Some of the details have been modified since the author published a previous paper (Kose, 1997), but the basic ideas remain the same.

ISSUED DESIGN GUIDELINES

The Design Guidelines were issued in June 1995 as two separate documents, one being issued by the Director-General of the Housing Bureau of the Ministry of Construction, the other by the Director of the Housing Construction and Improvement Division, the latter giving more of the details (see Appendix for the former). The final Guidelines are based on the discussions of effectiveness, design and economic feasibility, climatic conditions, and cultural tradition. It has been the case in most countries to give due consideration to feasibility, climatic and cultural tradition when accessibility requirements were introduced, and Japan took the similar route as it was assumed to be more effective than otherwise.

IMPLEMENTATION OF GUIDELINES

Just to issue guidelines does not ensure them put into practice. In that sense, there is a strong mechanism in Japan for implementation. Japan has long had the Japan Housing Loan Corporation, a government organization. It has given the prospective clients lower interest rates for housing loans, and has been a driving force of Japan's economic growth. The Corporation now took a decisive step to ask barrier-free or energy conscious design to be eligible for lowest interest rates, starting fiscal 1996. The move is coupled with a similar scheme from the National Pension Housing Fund, a Ministry of Health and Welfare organization. Along with the issuance of Guidelines, consumer education is also done through various measures. These new moves are expected to promote construction of barrier-free dwellings, and majority of newer dwellings will be basically barrier-free in the long run (for more discussion from the viewpoint of housing policy, see Kose, 1996). The following photos show how the recommendations of the guidelines are implemented in real settings. At the time of its design (autumn 1996), not all are incorporated into the standard practice of design of a housing manufacturer as you will notice from the comments in the picture captions.



Photo 1. Entrance to the house. A handrail was installed afterwards to negotiate steps.



Photo 2. Entrance hall where shoes are taken off. There is a handgrip.



Photo 3. Floors are basically without raised door sills.



Photo 4. Raised *tatami* floor, where the residents directly sit on.

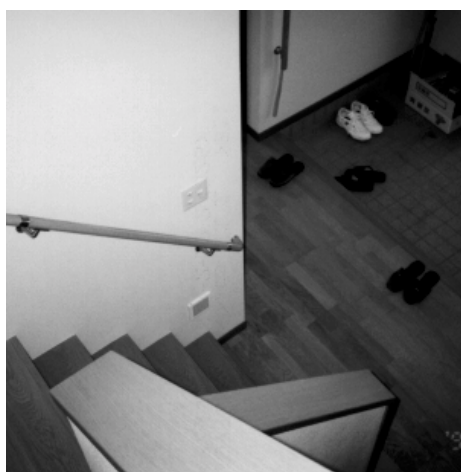


Photo 5. Stairwell with a handrail.



Photo 6. Entrance to the bathroom is flat.



Photo 7. Close-up of flat doorsill.



Photo 8. Bathtub with grab bars.



Photo 9. Grab bar for going in/out of a bathtub.



Photo 10. Toilet with L-shaped handrail.



Photo 11. Toilet with a small wash basin.



Photo 12. Door lock is rather awkward to use.



Photo 13. Bathroom controller is clearly visible.



Photo 14 This door handle is large enough.



Photo 15. Door locking levers are too small again.

We also have enough evidence that newer dwelling design is well accepted by the residents in general terms (Kose & Tanaka, 1998) as well as in comparison of older models versus newer ones (Kose, et. al, 1999), it can be said that the introduction of the guidelines was a great success.

CONCLUSION

Existing dwellings are worse in terms of barrier-free design compared to newer ones. In addition, aged persons who are more vulnerable and experiencing difficulties in their daily living tend to live in sub-standard dwellings that are full of barriers. To solve the problem, intervention at an earlier stage is desirable. Currently, there are few schemes that allow dwelling remodelling before residents develop difficulties or experience accidents during their daily activities. It is however necessary, from the viewpoint of ensuring QOL for aged persons, to introduce a new scheme of financial assistance for remodelling. All we have now is loan from Japan Housing Loan Corporation or of similar kind, but unfortunately such loan schemes lack economic incentives for the aged residents. It is however certain that Japan will experience troubles unless it succeeds to upgrade quality of existing dwellings in a more effective way.

As of autumn 2000, there are two potentials for change: One is the introduction of the scheme of Care of the Aged Insurance by the Ministry of Health and Welfare, and the other is Housing Performance Indication System by the Ministry of Construction. Unfortunately, the former denied enough amount of expense to improve poor quality dwellings where the frail aged person lives (less than a month's cost is allowed for home remodelling! Rather, expenses for human resources are covered, which are consumed and leave nothing afterwards). The latter is to be applicable only to new construction, but will be expanded to existing ones in due course. It is not obligatory, and because of that, the market will decide. Our expectation is that performance on design for ageing will gain acceptance by the general public.

A much newer move is the government's decision to prepare around 40% of all dwellings to be suitable for aged persons to live in 2015. It is because at that time almost 40% of all households are expected to have at least one family member who is 65 years or older. Not only new construction but also existing dwellings will be definitely directed towards design for the ageing society.

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Appendix Design Guidelines for Dwellings in the Ageing Society (Government Circular)

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To Governors of Prefectures

From: Director-General, Housing Bureau, Ministry of Construction

RE: Design Guidelines for Dwellings in the Ageing Society

As we go into the 21st century, it is important to make it possible to continue to live safely in the community where the aged persons have lived so far. To accomplish the goal, new housing construction shall be designed and made from the beginning to allow for the residents to continue to live their daily life, should they develop physical and functional deterioration or disabilities due to ageing, etc.

From the social welfare policy viewpoint, more extensive care-giving at home is the critical issues, and it is most important for dwelling design to give due consideration for their fulfilment.

To attain the goal, and to promote public education based on the concept of the Law on Building Accessible and Usable Buildings by Aged and Disabled Persons (No. 44/1994), the following design guidelines of dwellings for the ageing society (DG) have been finally established. I hereby send the DG as my duty.

I strongly suggest that you will understand the purpose and ideas of DG. I also ask you to try to do within your capacity to enforce the DG in the dwelling design for PORH, RH/PH by your Local Housing Associations, etc. I also urge you to send the DG to transmit to Local Governments, Housing Associations, Association of Regional Architects, etc.

1. General:

1-1 Purpose

The Guidelines intend to give guidance on how to design dwellings that will allow residents to continue to live in the same dwelling even if they develop problems of functional capability deterioration or disability, thereby promoting constructing dwellings suited to the aged society.

1-2 Scope (Coverage)

(1) The guidelines mainly apply to new construction, including replacement of old dwellings.

(2) The guidelines refer to general ideas of dwelling design only. If one intends to give individual considerations to residents who already developed physical and functional deterioration or disabilities, it will be necessary, in some cases, to take into account of other ideas in addition to those described here.

(3) The guidelines will be revised as social context changes and technical developments come up.

2 Design Guidelines of Respective Dwellings (or dwelling units for multifamily dwellings)

2-1 General (Common) Requirements

(1) Layout of spaces

- (a) The following rooms/spaces are to be on the same floor level if possible: Entrance, toilet, washroom, bathroom, dressing room, living room, dining room, and aged person's (AP) bedroom.
- (b) Toilet, washroom, living room and dining room shall be closely located with AP bedroom, if possible.
- (c) In the DG, the AP bedroom means a room that is normally expected to be used as such in the future.
- (d) If there will be multiple rooms/spaces in a dwelling, at least one of each shall follow the DG.

2-1-2 Level differences

Internal floors shall be level, without step differences, door sills, etc. However, main entrance, and level differences for taking off shoes area, entrance to bathroom area, and entrance to outside balconies can have thresholds.

2-1-3 Handrails

- (a) Stairs and bathroom shall have handrails.
- (b) Entrance, toilet, washroom, dressing room, living room and dining room, aged person's bedroom, and corridor, etc., shall have handrails, either from the beginning or with later installation.
- (c) Handrails shall be of usable shape and materials, and shall be installed at appropriate locations and height.

2-1-4 Width of corridor and doors

Width of corridors and doors shall be made to allow for smooth passage of walking-aids and assisted wheelchairs.

2-1-5 Floor/wall finishes

Finishes of internal floors and walls shall be safe against slipping, collision, and falls.

2-1-6 Doors/sliding partitions, etc. (openings)

Openings shall be safe and easily usable. The operating devices (grips, handles, locking devices) shall be usable and be properly located.

2-1-7 Building appliances

- (a) Water and hot water supply, electrical appliances, and gas appliances shall be safe and easily operable.
- (b) Lighting appliances be properly located for safety, and sufficient lighting shall be provided.
- (c) Fire alarms and emergency reporting systems shall be provided, or shall be prepared for later installation.

2-1-8 Thermal environment

Environmental design (insulation and ventilation) shall be such that temperature difference between rooms/spaces be minimized. It is expected that heating/cooling equipment be installable, to maintain proper temperature all year round.

2-1-9 Storage

Storage space for daily use shall be properly provided. It shall be easily usable without requiring difficult posture.

2-2 Internal spaces

2-2-1 Main entrance

- (a) Level difference at the main entrance shall be safe.
- (b) Space for entrance shall be wide enough to have a seat available.

(c) Level difference between shod and unshod areas shall be easily manageable height, with intermediate steps where needed.

2-2-2 Stairs

Stair pitch and shape shall be safe for ascent and descent.

2-2-3 Toilet

- (a) Toilet shall be provided with enough floor area for care-giving, if possible.
- (b) Entrance to toilet shall be made not to hinder emergency assistance (including unlocking).
- (c) Toilet shall be of sitting type (not be of squatting type).

2-2-4 Washroom/Dressing room

- (a) Washroom shall be designed for the ease of handwashing, etc.
- (b) Dressing room shall be designed for the safety of clothing/unclothing.

2-2-5 Bathroom

- (a) Bathroom shall have enough space for care-giving, if possible.
- (b) Should there be level differences between bathroom and dressing room, it shall be safely designed, and handrails shall be provided.
- (c) Doors of the bathroom entrance shall be safely designed, as well as designed for emergency assistance (including helping someone out).
- (d) Bathtub shall be of such shape and dimension designed for safety.

2-2-6 Aged person's bedroom

Aged person's bedroom shall be wide enough to allow for potential care-giving. It shall be designed with sound insulation and emergency evacuation in mind.

2-2-7 Balconies, etc.

Level differences at the balconies shall be designed to give due consideration to safety.

3 Design guide for external space for multi-family dwellings

3-1 Approaches, etc.

- (a) Main circulation within the housing blocks and main entrance to a building block shall be designed with safety and usability of walking-aids and wheelchairs.
- (b) Entrance of the block shall be accessible by cars, and parking space shall be provided if possible.

3-2 Public stairs

Public stairs shall be designed with safety in mind, in particular for pitch and shape.

3-3 Public corridor/circulation

Public corridor shall be provided with enough width for wheelchair maneuvering, where possible, and no level differences shall be allowed.

3-4 Floor finishes and handrail provisions

- (a) Floor finishes of approaches, entrance to the building block, stairs, ramps and corridors shall be designed with safety against slipping and tripping in mind.
- (b) Stairs, ramps, and corridors shall be provided with handrails.
- (c) Handrails shall be of usable shape and materials, and shall be installed at appropriate locations.

3-5 Elevators

- (a) Block of dwelling units with six stories and higher shall have elevators. Blocks with three to five stories shall have elevators if possible.

(b) Circulation and the block entrance to elevator hall, and elevator hall, and elevator cage shall be designed to allow for wheelchair accessibility (shape, and dimension).

3-6 Lighting appliances

Lighting for external approaches and common spaces shall be properly done with safety in mind.

4 Design guide for external space of detached houses

4-1 Approaches, etc.

(a) Approach circulation shall be designed to accommodate for walking-aids and wheelchair use (shape and dimension).

(b) External stairs shall be designed with safety in mind, in particular for pitch and shape.

(c) Enough external lighting level shall be provided with safety in mind.