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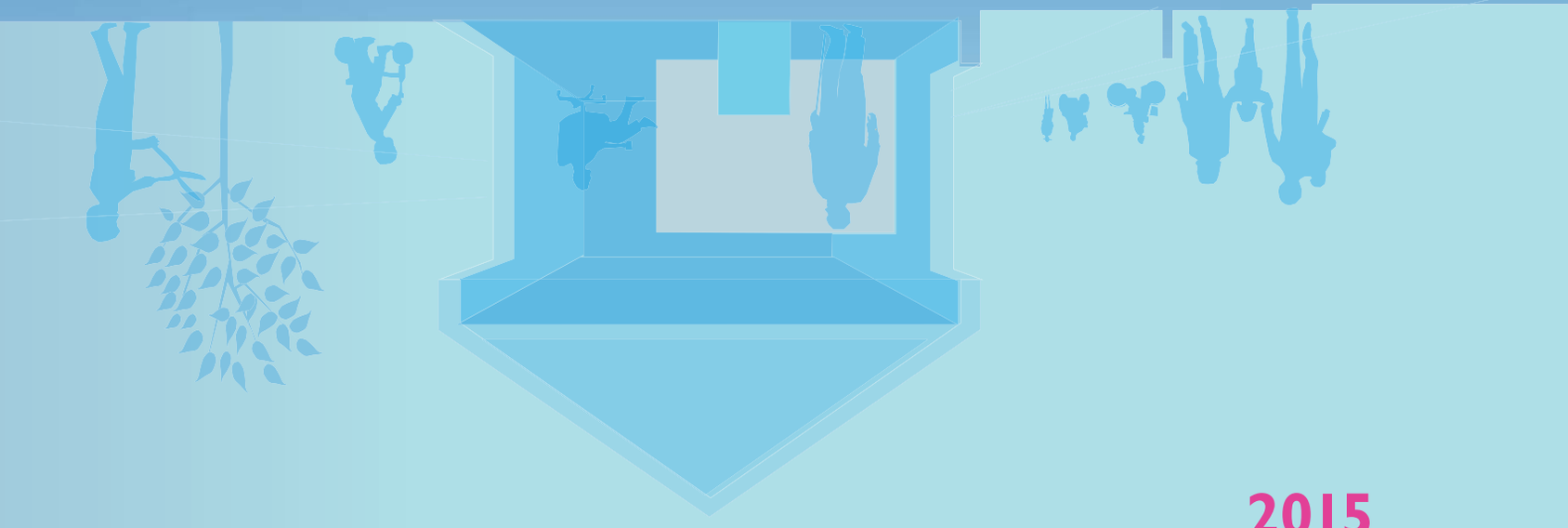
Universal Design Guidelines

Dementia Friendly Dwellings for People with Dementia, their Families and Carers

Centre for Excellence in Universal Design



2015

National Disability Authority
Údarás Náisiúnta Míchumais

Lárionad Foirfeachta
i nDearadh Uilíoch

Centre for Excellence
in Universal Design

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Dementia Friendly Dwellings for People with Dementia, their Families and Carers

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2015

Centre for Excellence in Universal Design

Creating an environment that can be used by all people, regardless of their age, size, disability or ability.

The National Disability Authority's Centre for Excellence in Universal Design has a statutory role to promote the achievement of excellence in universal design in:

- the design of the built and external environment
- product/service design
- information and communications technologies (ICT)
- the development and promotion of standards
- education and professional development
- raising awareness of universal design

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Contents

Universal Design Homes Principles

1. Integrated into the neighbourhood;

2. Easy to approach, enter and move about in;

3. Easy to understand, safe to use and manage;

4. Flexible, cost effective and adaptable over time.

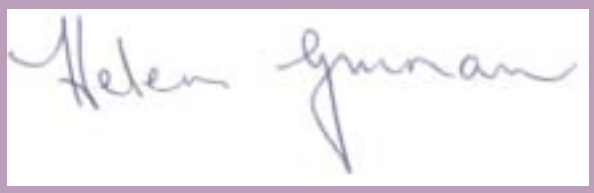
Helen Guinan - Foreword

The Centre for Excellence in Universal Design (CEUD) which is part of the National Disability Authority has produced these guidelines to inform policy and practice in relation to the design of dementia friendly dwellings.

Ireland is unique in having a statutory Centre for Excellence in Universal Design. Our work in raising awareness and informing policy is to enable people in Ireland to participate in a society that takes account of human difference and to interact with their environment to the best of their ability.

It is our aim that these guidelines will support the Universal Design Homes for Ireland Guidelines and will inform national policy and be used in practice by all stakeholders – those who commission, design, build, provide and occupy dwellings. If new dwellings or alterations to existing dwellings are built in line with a Universal Design dementia friendly approach, then they will help people to remain living at home and in their community independently and safely for as long as possible. This approach will also support family members and carers to sustain the caring relationship, particularly if these carers are older people or a person with a disability.

I would like to thank all the stakeholders for their engagement in this process and I would like to also thank the authors from TrinityHaus and the Living with Dementia (LiD) Programme, Trinity College Dublin for their work on this publication.



Ms Helen Guinan

Chairperson

National Disability Authority

Executive Summary

The purpose of these Guidelines

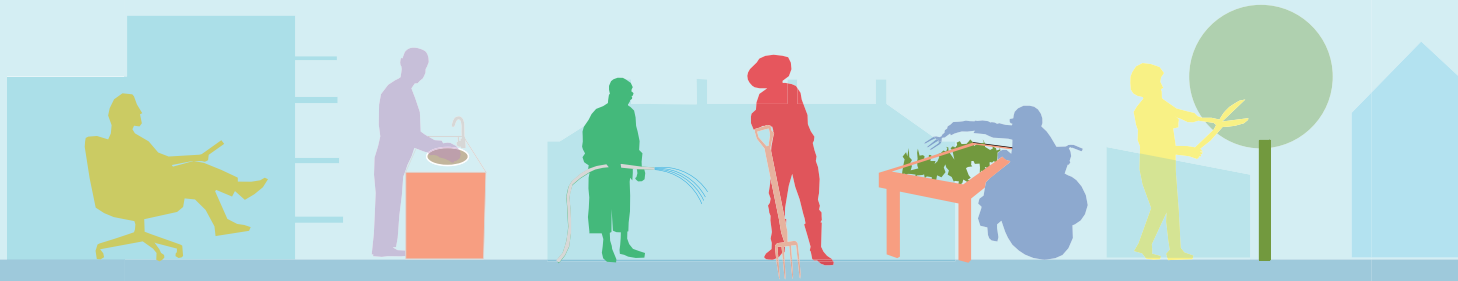
These **Guidelines for the Universal Design of Dementia Friendly Dwellings for People with Dementia, their Families and Carers** have been created to supplement the existing **Universal Design Homes for Ireland (UDHI) Guidelines.** They can be used for the design of new build and the retrofit of existing dwellings to ensure**:**

- That people living with dementia have the choice to live as long as possible in their own homes and in their own communities by creating dementia friendly dwellings that support the individual with dementia and also his or her family and carers.
- That practical guidelines are available for the design and delivery of Universally Designed Dementia Friendly Dwellings.

About the Guidelines

These Guidelines draw upon an in-depth literature review of national and international best practice in relation to dementia friendly design and Universal Design. This review was supported by an extensive consultation process with key stakeholders, and the examination of a number of national and international case studies.

To download the Research & Recommendations Report which contains this information please go to: **www.universaldesign.ie/housing/**

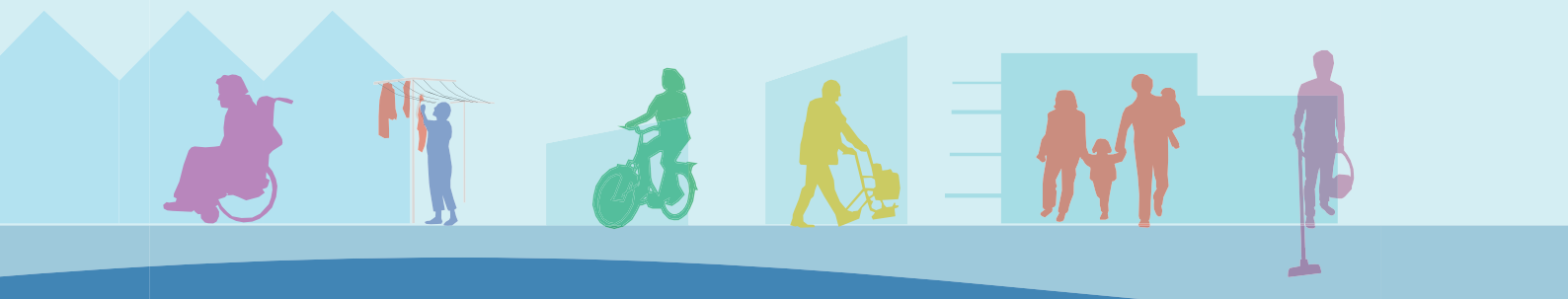


Across the world, it is estimated there are about 44 million people with dementia and this number is set to triple by 2050 to reach 135 million.
(Alzheimer's Disease International, 2013)

Overview of the Guidelines

The **UDHI Guidelines** provide overall Universal Design Homes guidelines while these current **Guidelines for the Universal Design of Dementia Friendly Dwellings for People with Dementia, their Families and Carers** outline dementia specific design considerations as part of the Universal Design (UD) approach. These guidelines follow the same format as the **UDHI Guidelines** to facilitate easy cross referencing between the two documents. When using these guidelines the reader should consider the following:

- The introduction section briefly describes the concept of UD Homes, the challenges of dementia, and its implications for the design of dwellings for people with dementia, their families and carers.
- These guidelines are applicable to both new build and existing dwellings, and refer to different scales of intervention; from low cost, low impact changes to major structural works.
- The UD process, including meaningful stakeholder engagement, is critical to a successful UD Dementia Friendly Dwelling. Pages 6 to 17 outline some key issues to be considered when designing dwellings for people with dementia, their families and carers.
- Specific design quality guidelines are provided in Sections 1-4. These move from location and public approach spaces, to circulation and internal living spaces, and finish with guidance relating to detailed issues such as finishes or technology.



It is projected that in Ireland the number of people living with dementia residing in the community is likely to double between 2011 and 2031, to reach approximately 60,000 by 2031. (Pierce, Cahill and O'Shea, 2014)

Introduction

These guidelines are informed by a complimentary research report and build upon the Universal Design Homes for Ireland (UDHI) Guidelines. These guidelines provide detailed guidance in relation to dementia specific design issues and the Universal Design of dementia friendly dwellings.

It is hoped that this guidance will raise awareness about designing for dementia and highlight the benefits of adopting a Universal Design (UD) approach to allow people to continue living at home and in their community for as long as possible.

This Introduction Section briefly outlines the concept of UD homes (for more detailed information refer back to the UDHI Guidelines) and the main issues around designing dwellings for people with dementia, their families and carers. Understanding the symptoms of dementia and age related difficulties is critical to the successful design of UD dementia friendly dwellings.

In this context, these design guidelines can be used for the design of new build and the retrofit of existing dwellings to ensure that:

- **Many people living with dementia can live as long as possible in their own home and in their own community by creating dementia friendly dwellings.**
- **Good home design supports families and carers as well as the person with dementia.**
- **Cost effective practical solutions will promote independence and address safety concerns.**
- **The well-being of the person with dementia and their families and carers will be enhanced.**

These guidelines can be used to inform design at various scales, whether this is a low cost, low impact intervention such as signage, major structural works, or a new build. Five scales of intervention have been identified to help in this regard and these design scales are detailed later in this section.

As stated in the UDHI Guidelines, Universal Design is simply good design.

Benefits of Universally Designed Homes for All

We all have changing needs at different stages in our life cycles – changes in family life, lifestyle, finances, or health circumstances. A UD Home can adapt and change with us by factoring in at the outset key design features that enhance quality of life for everyone at home. The application of UD thinking to these homes recognises our differences and accommodates them through the integration at the outset of the design and construction stages of a Universally Designed home with the following:

- Flexibility and ease of adaptability to meet peoples' changing needs over time in a cost effective way;
- Sustainable design to improve comfort and energy efficiency; and,
- Smart technologies to support independent living.

Living in a UD Home helps to avoid the need for re-location or costly building works as individual or family needs change over time. Integration of smart infrastructure and energy efficient systems at the outset of home design avoids costly re-fits and also benefits everyone in terms of comfort, efficiency and quality of services.

It is not about a 'one-size-fits-all' model – the UD Home environment enables the widest possible number of people to participate at home, in society, and to live independently. For a housing provider, builder or developer, a UD Home provides a competitive advantage as the home offers a more attractive market proposition for the widest range of potential residents.

UD Homes work well for everyone and look good. They are mainstream in aesthetics, not separate or distinct for those with special needs, and are designed according to 4 key Principles:

1. Integrated into the neighbourhood;

2. Easy to approach, enter and move about in;

3. Easy to understand, safe to use and manage;

4. Flexible, cost effective and adaptable over time.

Dementia and Age Related Difficulties
Understanding the issues to inform design

Designing or retrofitting for dementia friendly dwellings requires a good understanding of the symptoms and challenges dementia usually presents and an appreciation of the 'lived experiences' at home, of people with dementia, their families and carers.

Dementia is a syndrome caused by many different diseases, of which the most common are (i) Alzheimer's disease (ii) Mixed Dementia and (iii) Vascular Dementia. Dementia can affect a variety of cognitive abilities and different types of dementia can affect different parts of the brain. While no two people with dementia will have the same symptoms and experiences, the symptoms common to all types of dementia broadly include:

- **Impaired rational thinking, judgement, and problem-solving.**
- **Difficulty with memory (initially short-term but progressing over time to long-term memory difficulties).**
- **Problems learning new things.**
- **Increasing dependence on the senses.**
- **Fear anxiety and increased sensitivity to the built and psycho-social environment.**

While the difficulties experienced by people with dementia vary considerably, people with dementia will often have retained abilities and insight, which need to be supported to help the person maintain their selfhood and valued social persona.

In the early stages, difficulties experienced by people with dementia may be slight and go unnoticed but as the illness progresses they usually become more pronounced. For example, **activities of daily living** (ADLs), e.g. dressing, showering, eating, toileting, and **instrumental activities of daily living** (IADLs), e.g. food preparation, laundry, taking medication, using the telephone or shopping, may pose a real challenge to the individual. Damage to the parietal lobes may result in apraxia or the inability to organize in the correct sequence a variety of actions, such as setting the table, dressing oneself correctly, using money appropriately including checking change.

Many people with dementia will have other age-related health problems such as cardiovascular disease, Parkinson's disease and diabetes. They are also more likely to experience other age-related difficulties such as:

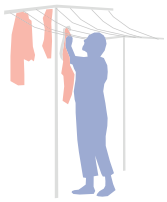
- **Mobility difficulties.**
- **Visual difficulties.**
- **Hearing difficulties.**

These health conditions and difficulties, which can significantly impact on the subjective experience of dementia, can be aggravated or improved by the built and psycho-social environment. Some health problems and diseases can lead to additional complications, such as vision and hearing loss, stroke and associated paralysis, incontinence, problems with drinking and eating, malnutrition, difficulty walking, falls, and injuries.

The interaction with dementia of these other diseases, health problems and sensory difficulties can lead to further complications if the person living with dementia can no longer communicate, or is unable to comprehend the value of using devices such as hearing aids or glasses. For people living with dementia, sensitivity to lighting and noise levels may be exacerbated by hearing and visual difficulties associated with ageing. It is therefore a real challenge to design the built environment to meet the complex, diverse and often varying needs and preferences of the individual with dementia and their families and carers. Built environment professionals need to keep in mind the health conditions and sensory difficulties people with dementia are likely to have and weigh up the benefits and drawbacks of introducing various design features for people with multiple health problems.

Designing for people with dementia, their family members and carers should always build on UD principles, which are beneficial for all. The physical environment has a salient role in promoting quality of life of people with dementia and quality of care delivered. The environment can influence and reduce the behavioural and affective symptoms associated with dementia and a person-centred approach should always be adopted. Due consideration should be afforded to the complex and unique needs of the individual with dementia and to families and carers. In line with this approach, and in the context of UD Dementia Friendly Dwellings the following goals should be kept in mind:

- **Recognise the important role played by formal carers visiting the home.**
- **Encourage social connections and meaningful engagement with family, friends and members of the local community.**
- **Reinforce familiarity and personal identity.**
- **Support meaningful activity.**
- **Promote positive risk taking.**
- **Promote autonomy and choice.**
- **Enhance self esteem and confidence.**
- **Ensure the ethical use of assistive technology, where relevant.**



Dementia Friendly Design Issues

The design of a dwelling that supports and enables all people regardless of age size, ability or disability and at the same time is accessible, usable and easily understood by people with dementia is a complex task.

Consider the following eight design issues as part of a UD approach for dementia friendly dwellings:

Encourage a participatory design approach where people with dementia, their family and carers can take part in the design process.

Use familiar design with the use of recognisable features consistent with user expectations.

Support personalisation of the environment to enhance continuity of self.

Provide an environment that is easy to interpret and calm, paying close attention to the reduction of acoustic and visual disturbances.

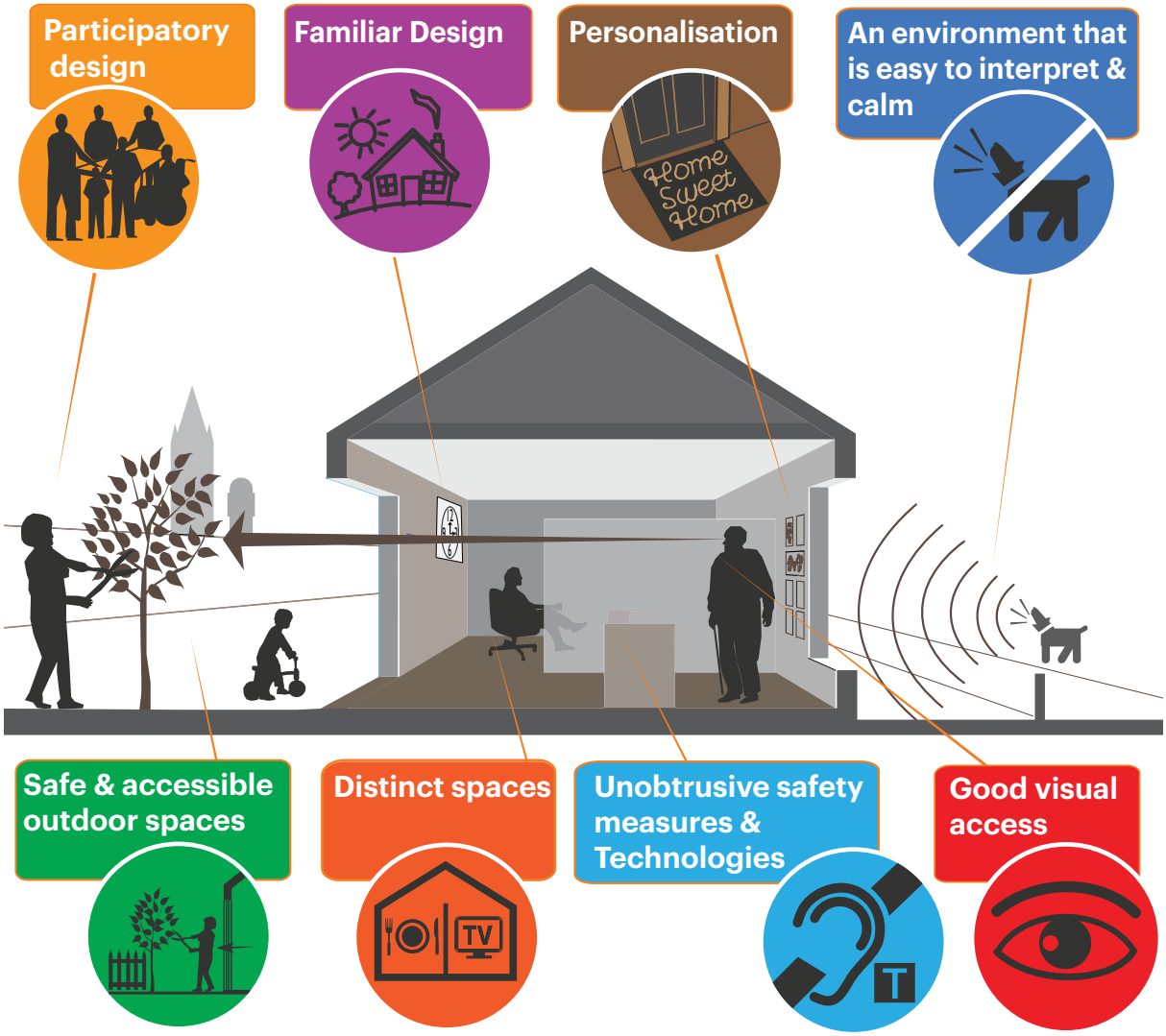
Provide good visual access to key areas of the dwelling or to important objects to remind and prompt the occupant when required.

Provide unobtrusive safety measures and appropriate technology such as Assistive Technology (AT), Ambient Assisted Living (AAL), Telecare or Telehealth to provide a safe and secure environment.

Create distinct spaces for different domestic activities so that the meaning and function of these spaces is legible and more memorable.

Provide safe and accessible outdoor spaces which are perceptible from the interior to encourage occupant use of these spaces.

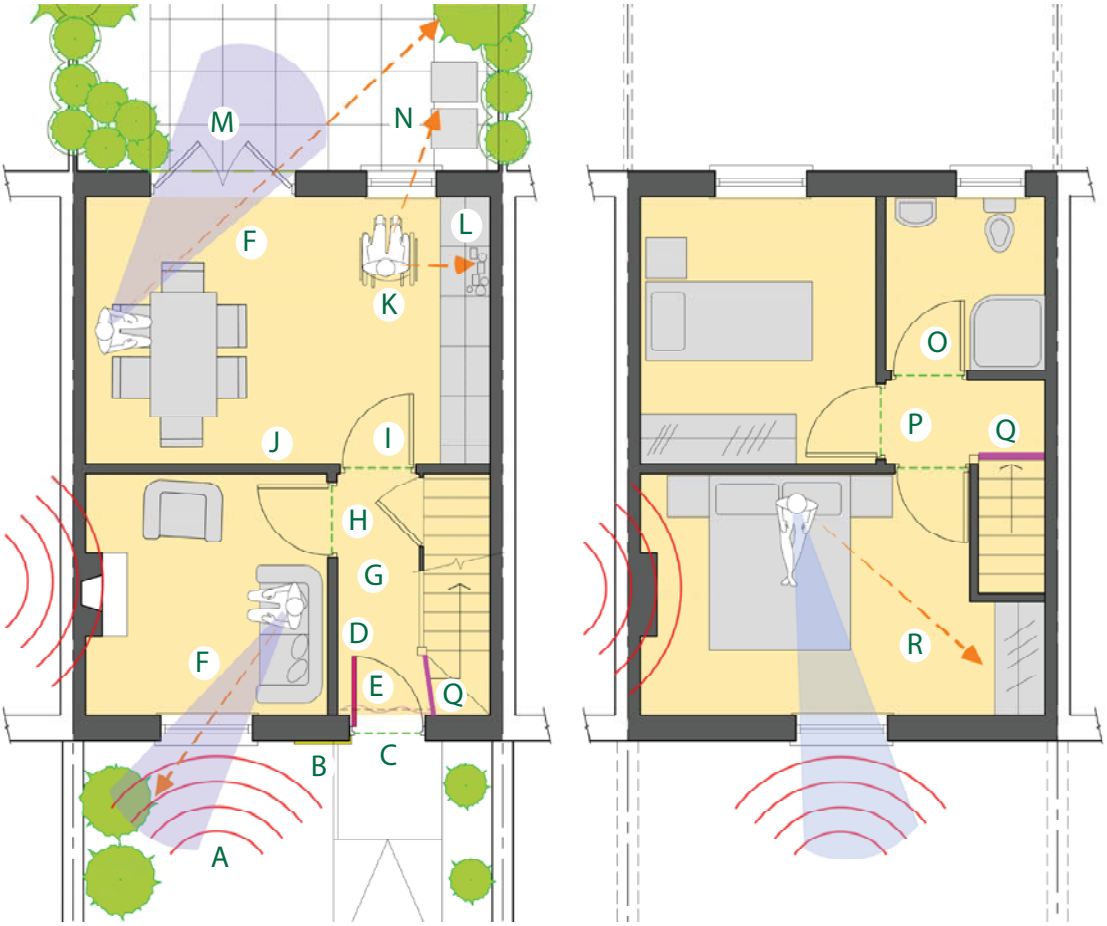
These issues must be carefully managed to ensure a balanced design approach for UD dementia friendly dwellings. Considering these issues within the framework of UD will ensure that the dwelling meets the specific needs of people with dementia while also supporting other occupants, family members, or carers.



At a Glance - Universal Design Dementia Friendly Dwellings

In following pages, floor plans are represented for three typical dwellings to illustrate some key design features in line with UD dementia friendly dwellings.

Two Storey Mid-Terrace Three Bedroom Townhouse



Ground Floor **First Floor**

Some typical UD Dementia Friendly features:

A. Ensure good acoustic conditions by orientating spaces away from sources of noise or by providing high levels of acoustic insulation such as triple glazing.

B. Create a distinct entrance by planting particular shrubs or by providing distinct colours to the entrance area or front gate.

C. Provide level entry front and back doors.

D. Provide a brightly painted front door to make it distinct and recognisable.

E. Consider fitting a curtain to disguise the inside of the door to discourage a person with dementia from leaving the house at unsuitable times if necessary.

F. Ensure window dressing, such as curtains or blinds, do not obscure natural light and that it provides maximum views to the outside, or key external features.

G. Avoid strong patterns for floor finishes and provide plain coloured, matt finishes which reduce glare or shine in brightly lit conditions.

H. Provide a continuous floor finish with as little change in material as possible. Where a change in material must occur, ensure there is minimum colour contrast, particularly at door thresholds.

I. Use a contrasting door colour to ensure that the door is easily distinguished from the surrounding walls.

J. Use contrasting colours on the skirting boards to provide a visual break between the walls and the floors to ensure greater visual contrast.

K. Ensure window location, window sill height and window dressing facilitate visual access to safe external areas or objects, such as a dustbin area or clothes line.

L. Consider using glazed kitchen units or cupboards to provide visual access to the contents.

M. Ensure easy, and where possible, level access to safe and accessible outdoor space to encourage a person to spend time outside or engage with outdoor activities.

N. Provide key objects such as recycling bins or clothes lines within view and easy reach to maximise independence and encourage typical daily household activities.

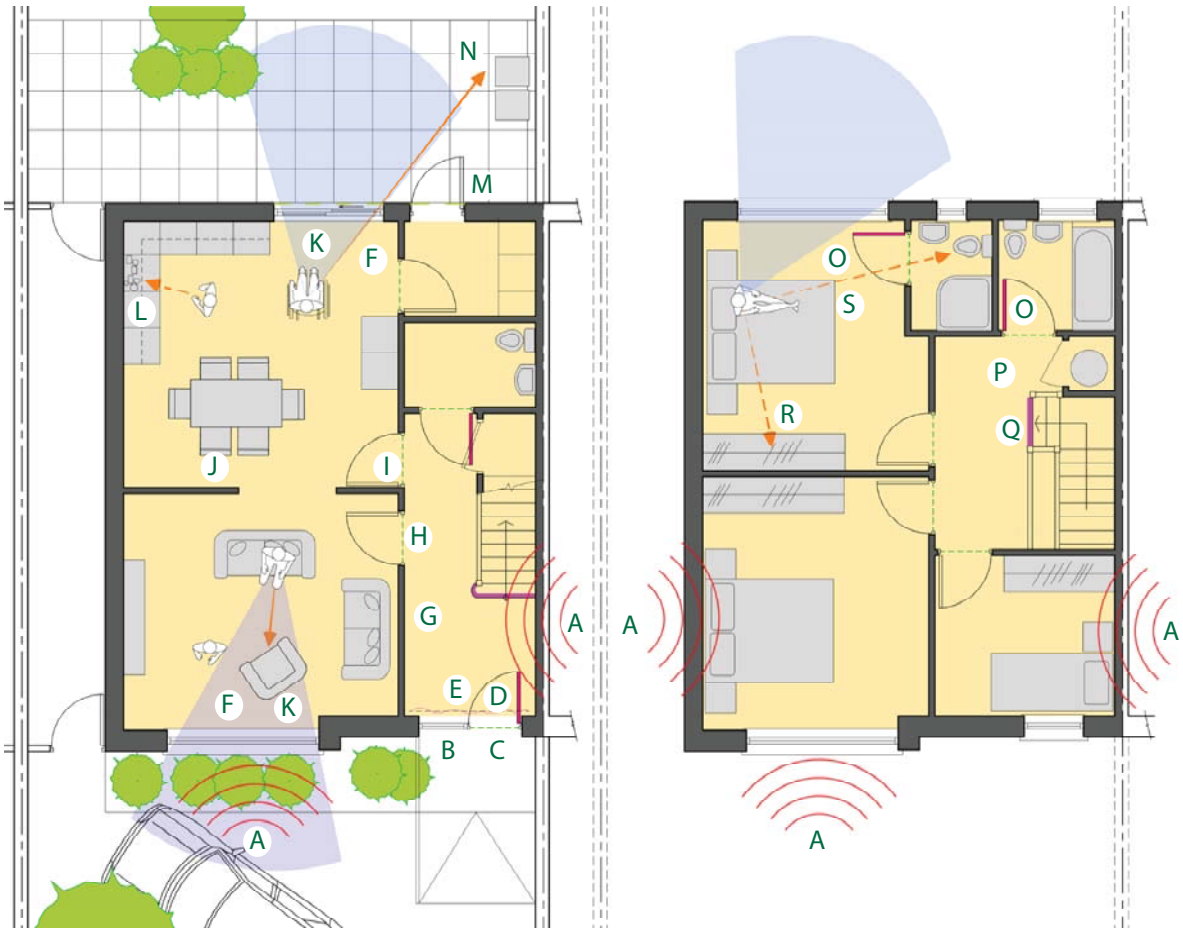
O. Provide a distinctive colour to the entry doors of key rooms such as the bathroom.

P. Ensure proper artificial lighting is provided in circulation areas, especially those leading to toilets and bathrooms that may be used at night.

Q. Provide colour contrast between the floor and the steps to highlight the presence of the stairs. Ensure that the handrail clearly stands out from the wall, for example by painting it a different colour.

R. Provide visual access to the wardrobe, and where appropriate consider a glazed section to the wardrobe to enable a person to see their clothes hanging inside to facilitate with dressing.

Two Storey Semi-detached Three Bedroom House



Ground Floor **First Floor**

Some typical UD Dementia Friendly features:

A. Ensure good acoustic conditions by orientating spaces away from sources of noise or by providing high levels of acoustic insulation such as triple glazing.

B. Create a contrasting entrance by planting particular shrubs or by providing distinct colours to the entrance area or front gate.

C. Provide a level entry at front and back doors.

D. Provide a brightly painted front door to make it distinct and recognisable.

E. Consider fitting a curtain to disguise the inside of the door to discourage a person with dementia from leaving the house at unsuitable times, if necessary.

F. Ensure window dressing, such as curtains or blinds, do not obscure natural light and that it provides maximum views to the outside, or key external features.

G. Avoid strong patterns for floor finishes and provide plain coloured, matt finishes which reduce glare or shine in brightly lit conditions.

H. Provide a continuous floor finish with as little change in material as possible. Where a change in material must occur, ensure there is minimum colour contrast, particularly at door thresholds.

I. Use a contrasting door colour to ensure that the door is easily distinguished from the surrounding walls.

J. Use contrasting colours on the skirting boards to provide a visual break between the walls and the floors to ensure greater visual contrast.

K. Ensure window location, window sill height and window dressing facilitate visual access to safe external areas or objects, such as a dustbin area or clothes line.

L. Consider using glazed kitchen units or cupboards to provide visual access to the contents.

M. Ensure easy, and where possible, level access to safe and accessible outdoor space to encourage a person to spend time outside or engage with outdoor activities.

N. Provide key objects such as recycling bins or clothes lines within view and easy reach to maximise independence and encourage typical daily household activities.

O. Provide a distinctive colour to the entry doors of key rooms such as the bathroom.

P. Ensure proper artificial lighting is provided in circulation areas, especially those leading to toilets and bathrooms that may be used at night.

Q. Provide colour contrast between the floor and the steps to highlight the presence of the stairs. Ensure that the handrail clearly stands out from the wall, for example by painting it a different colour.

R. Provide visual access to the wardrobe, and where appropriate consider a glazed section to the wardrobe to enable a person to see their clothes hanging inside to facilitate with dressing.

S. Similar to the above, provide a direct view to the WC from the bed to help provide a visual cue to prompt a person to use the toilet when required.

Two Bedroom Apartment

Some typical UD Dementia Friendly features:

A. Ensure good acoustic conditions by orientating spaces away from sources of noise or by providing high levels of acoustic insulation.

B. Provide good visual access to key areas and features, such as lifts or stairways within common circulation areas.

C. Create a distinctive entrance to the apartment by providing distinct colours to the entrance area or by using similar markers to identify the entrance from the others in the circulation area.

D. Provide a brightly painted front door to make it distinct and recognisable. Use this approach for other areas such as lifts or entrance doors to stairways.

E. Consider fitting a curtain to disguise the inside of the apartment door to discourage a person with dementia from leaving the house at unsuitable times, if necessary.

F. Provide a layout that gives good visual access throughout the dwelling.

G. Provide 'Cat and Kitten' doors for easy circulation and better visual access.

H. Provide a direct view to the WC from the bed to help provide a visual cue to prompt a person to use the toilet when required.

I. Ensure window dressing does not obscure natural light and that it provides maximum views to the outside, or key external features.

J. Ensure easy, and where possible, level access to safe and accessible outdoor space to encourage a person to go outdoors. In the case of many apartments this may include a balcony or a terrace area and in this situation, these spaces will need to be designed with due consideration for safety.

K. Consider using glazed kitchen units or cupboards to provide visual access to the contents.

It is estimated that there are approximately 48,000 people living with dementia in Ireland (Pierce et al., 2014).

Almost two-thirds of people with dementia in Ireland live at home in the community (Connolly et al., 2014).

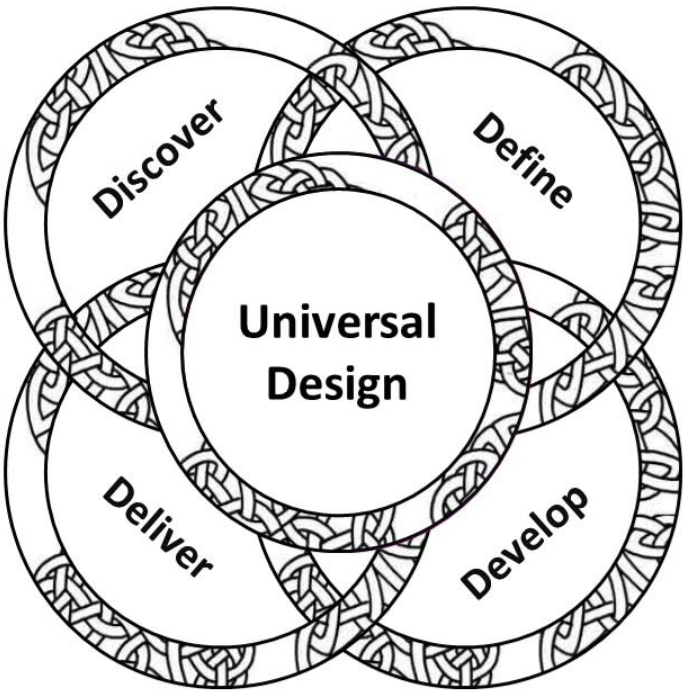
UD Approach for Dementia Friendly Dwellings Informing practice

Universal Design Process

These design guidelines are not meant to be overly prescriptive, but are intended to inform designers about some key dementia friendly design considerations and provide an overall guiding framework for the creative design process.

One of the key design considerations for a UD dementia friendly dwelling involves a participatory design approach. Other key design considerations include familiar design and personalisation, both of which will be greatly enhanced by direct engagement with the current or future residents of the dwelling. This will engender a more inclusive process where, depending on the stage of dementia, the voice of the individual with dementia can be heard and their needs and preferences understood.

It is in this context that the UD process, as illustrated below, of **'Discover, Define, Develop and Deliver'** and the inclusion of key stakeholders in the design process will help in the successful delivery of UD dementia friendly dwellings.



01 The Universal Design process as applied by the Centre for Excellence in Universal Design.

Suggested Key Stakeholders to be Consulted

It is very important to engage with key people during the design process to ensure that the design is in line with the client's or resident's requirements. Depending on the circumstances of each project, the designer should consider how they might engage with the following key stakeholders:

- **The person with dementia, if this is appropriate, and all other occupants of the dwelling such as a partner or spouse.**
- **Other family members who provide care or who are involved with the person with dementia on a regular basis.**
- **Relevant health professionals.**
- **Formal carers**

Where appropriate the designer may also consider speaking to the following individuals if they are involved with the person with dementia on a regular basis:

- **Neighbours.**
- **Friends.**

Things to Consider for the Construction Phase

Retrofitting of existing dwellings has the potential to cause confusion and anxiety for a person with dementia as they may not recognise the dwelling as their own if the changes are significant. Also, if the works are carried out while the person with dementia remains living in the house, the noise and disturbance may be stressful. With this in mind it is important to consider the following:

- **Is it appropriate for a person with dementia to remain at home while the building works are being carried out in order to experience the changes more gradually?**
- **Where the works are extensive and make it impossible to remain in place during the construction phase, should the person with dementia be brought back periodically to see the building work as it progresses?**
- **In either case, the building contractor and the tradespeople who will be on site must be aware of the circumstances and be sensitive to the needs of a person with dementia if this person is onsite.**

These issues are part of the design process and onsite implementation phases and should be considered as an integral part of the UD dementia friendly approach.

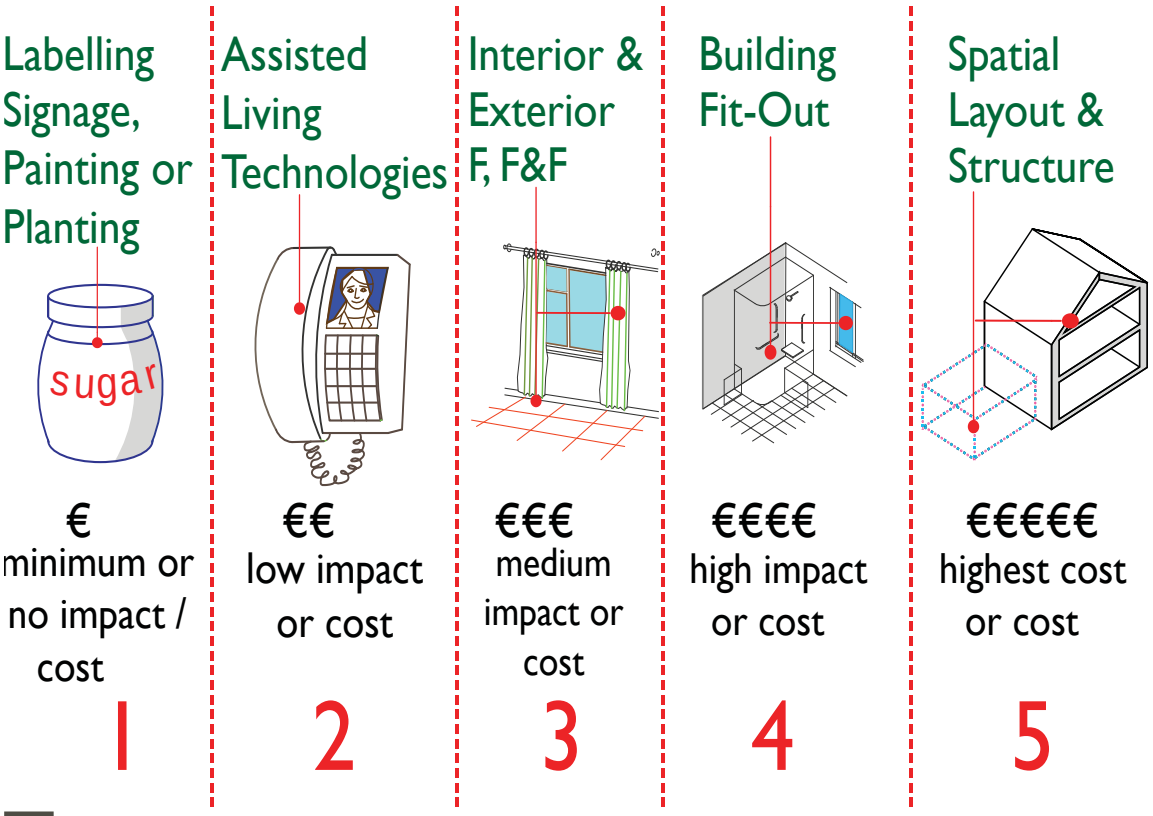
Design for New Build and Existing Dwellings:
Five scales of interventions, adaptations or design

These guidelines are applicable to both new build and existing dwellings. We have identified five different levels of intervention or design scales that can be applied as part of a Universal Design approach. These different design scales allow the user of these Design Guidelines to choose one or all of the design scales depending on the needs and constraints of the project; whether it is a new build or an existing dwelling, available budget, planning requirements, or other such determining factors.

The design scales are based primarily on the level of impact to the structure of the dwelling that would result from a design intervention at that scale. For instance, the introduction of labelling or signage may have no impact on the structure, while the addition of assistive technology, particularly if it is wireless, will have be a low impact intervention. Moving up the intervention scales involves greater impact on the building, culminating in Design Scale Number 5, which involves spatial layout changes, structural modifications, or new build.

The five design scales which are shown in Image 2 are as follows:

1. **Labelling, signage, painting or planting:** This is a low impact, low cost solution and can be considered in all scenarios, whether this involves a retrofit, or a new build project.
2. **Assisted living technologies such as Assistive Technology, Ambient Assisted Living, Telecare, or Telehealth**: Given the wide variety of technology available, including wireless technology, this could also represent a low impact option.
3. **Interior and exterior furniture, fixtures and fittings (F,F&F)**: This could involve replacing internal floor finishes or replacing window dressing.
4. **Building fit-out including external windows and doors**: This scale of intervention may involve fitting new windows to increase thermal or acoustic performance, or the fitting or a level access shower. It may also involve minor internal works such as fitting new doors or widening door openings.
5. **Spatial layout and structure including new build**: This applies to all new build or projects with major renovations. It involves spatial considerations such as room location, orientation or size, along with all associated structure and design elements such as windows, doors, etc.



02 *The five scales of design*

These five scales of design have been identified to outline how these Design Guidelines are applicable to both new and existing dwellings. They also illustrate that these guidelines can be used across a wide spectrum of issues; from minor low cost adaptations, to major works involving structural adaptations or new-build.

The reader should consider these design scales as part of the design process to help inform the decision making process in line with resident's needs, construction budget or the constraints of the project.

This Guidance document follows the same format as the UDHI Guidance and comprises the following:

- Four sections of design guidelines that flow from the outside of the dwelling, to the inside of different rooms within a dwelling, to specific elements and systems.
- Each section describes design considerations with photographs of existing buildings to communicate UD and dementia friendly features.
- Design quality guidelines with indicative floor plans and sketches of technical details are provided and can be applied to any new or existing dwelling type.
- The Design Guidelines apply to all five scales of design to ensure that the guidelines are applicable to both new and existing dwellings, and that they can be used for minor or major works. The design scales are identified as: **1. Labelling, Signage, Painting and Planting; 2. Assisted Living Technologies; 3. Interior and Exterior Furniture, Fixtures and Fittings; 4. Building Fit-out**, including external windows and doors; and, **5. Layout and structural changes including new-build**.
- **UD Dementia Friendly Dwellings** guidance and design tips are also provided to raise awareness and assist in person-centred design.
- Appendices include a glossary of key terms and list of key acronyms.

"If buildings and their carers relate to people living with dementia as individuals, reinforce their sense of well-being and provide opportunities for them to practise their remaining skills, then people living with dementia are helped to function at their greatest potential".
(Marshall, 1998)

At A Glance —
Universal Design Dementia Friendly Dwellings Quality Features

Section 1 – Home Location and Approach

- Dwellings integrated into the neighbourhood, with clear, safe routes from bike, car or public transport to the entrance of the home.
- Careful design of external lighting, street furniture, ramps and stairs, and access gates or similar, to make circulation safe and accessible to all people.
- Approach routes and entrances that are clearly visible and easily identifiable through the use of distinct colours, planting or personalised spaces.

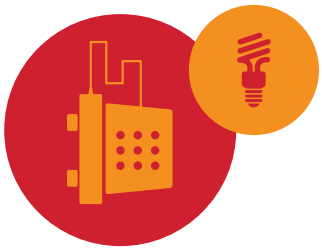
Section 2 – Entering and Moving About the Home

- Clearly visible entrance doors painted distinct colours to make them more recognisable.
- Clear and legible internal circulation routes that are well lit and use colour and tonal contrast to help with orientation, way-finding and safe circulation.
- Good visual access to key internal spaces to help with navigation and provide visual cues.
- Careful use of floor finishes to minimise glare or shine which are also desiged to avoid sudden changes in colour which may be perceived as a step.

Section 3 – Spaces for Living

- A balance between open plan layouts which enhance visual access and the creation of calm and distinct spaces which can help with legibility.
- Careful acoustic design to reduce noise and create calm and peaceful spaces.
- Reinforced walls and ceilings as 'hard-spots' around the toilet, shower, bath and stairs to support the easy installation of handrail and drop down supports as required.
- Flexible and adaptable space to cater to the changing needs of the residents.
- Bedroom layouts that provide direct access to ensuite bathrooms, and provide good visual access to bathrooms, wardrobes and exterior spaces such as gardens
- Safe, accessible and attractive outdoor space that is visible and easily accessed from the interior to promote outdoor activities.

Section 4 – Elements and Systems



- The use of safe and unobtrusive safety measures to support independent living.
- Details like lever door handles and taps that are familiar, easily understood and easily used by everyone.
- Easy control and use of heating or ventilation systems and the capability to integrate technologies such as Assistive Technology, Ambient Assisted Living or Telecare where appropriate.
- Choice of materials and colour, with fittings and finishes that are easy to use, maintain and create a calm and legible environment.
- Optimised use of natural light, ventilation and energy efficiency.

Centre for Excellence in Universal Design

Home Location and Approach 01

Universal Design Dementia Friendly Dwellings

Universally Designed Dementia Friendly Dwellings that are well integrated into the community and close to all public services and amenities will enable a person with dementia to go about their daily activities while providing easier access for family members and carers if required.

Cormac lives near the city centre and finds this convenient in terms of doing his shopping or visiting friends. He also enjoys simply strolling around the city or sitting somewhere with a book, or just watching the world go by.

However he finds that on busy days the footpaths are too narrow and can become very crowded while the lack of public toilets and seating can be a problem for him.

Location and Approach - Overall Design Issues

Helping a person with dementia to remain living in the familiar setting of their own home and community is important as it is a recognisable environment. This familiarity will support people who may retain long-term memories while at the same time experiencing short-term memory loss.

However, where a person is moving to a new home, or where future-proof dwellings are being designed, there are a number of important location, siting and approach issues that can be considered. This will of course depend on whether it is a rural or urban location.

People living with dementia may be restricted in terms of driving, using public transport or travelling any great distance from their home. Therefore a central location within walking distance of key services will help safe and independent travel within the community, and in turn maintain Instrumental Activities of Daily Living (IADLs) such as doing chores, visiting the doctor, or shopping. A central location will provide easier access for family, neighbours, carers, and other services that enable a person with dementia to live at home for longer.

In the context of location and approach consider these key **Design Issues:**

Participatory Design: involve all relevant stakeholders in the design process to ensure that the resident's needs and preferences regarding the location and on-site circulation routes are understood and included.

Familiar Design: will help to inform the location and design of circulation routes.

Personalisation: will make the dwellings more recognisable and thus aid orientation and navigation from adjacent public spaces and within the confines of the site.

Easy to Interpret and Calm: ensure that the relationship between the dwelling and local area will protect the house from excessive disturbance.

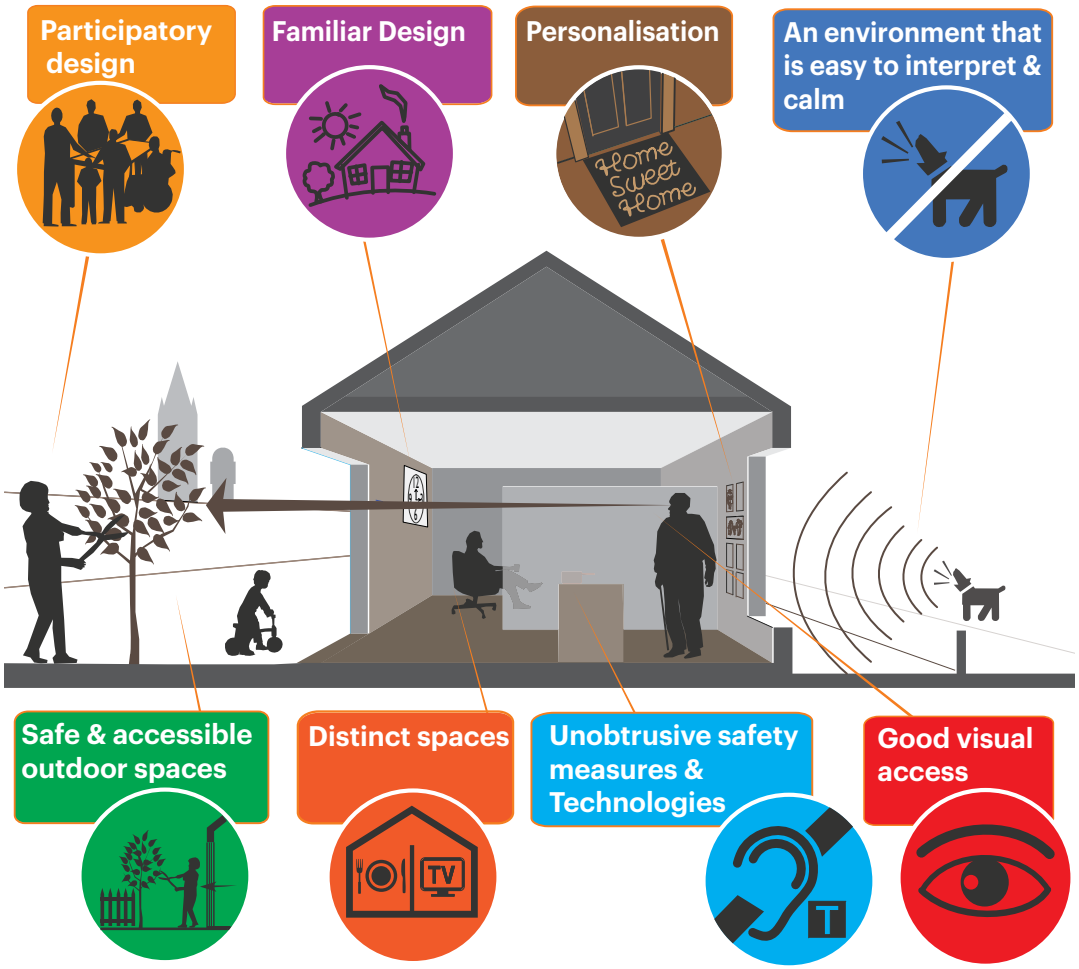
Good Visual Access: locate the dwelling and the approach to the dwelling to make sure it is clearly visible on approach from the community.

Unobtrusive Safety Measures and Assisted Living Technologies: the safety measures and technology that can be used to support a person's orientation and navigation when they are out in the community.

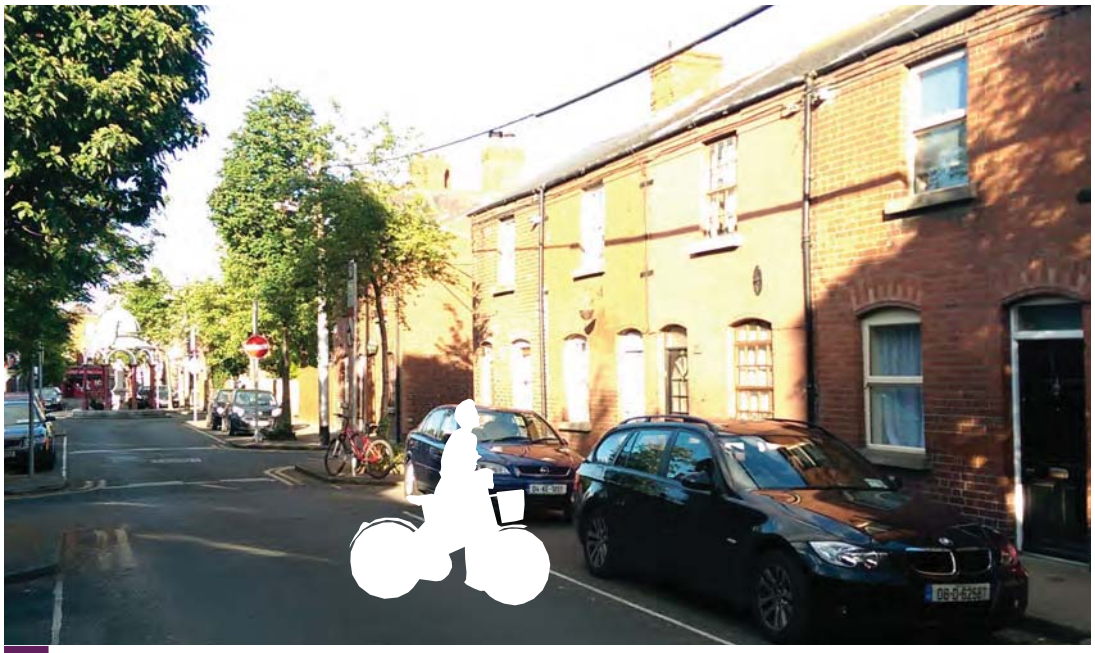
Distinct Spaces: in terms of planning and design of public space and approach routes consider how the creation of distinct spaces with clearly defined functions might help to inform and orientate a person with dementia.

Safe and Accessible Outdoor Spaces: whether in public, semi-public, or private areas, consider how these outdoor spaces can support people with dementia, their families and carers.

Please refer to the Introduction Section of this document for more detail on these design issues.



1.1 Location



01 Many traditional neighbourhoods in Irish villages, towns and cities provide dwellings that are well integrated into the community and close to key local services.

Photo Design Features

- Housing in a central location adjacent to key services and amenities.
- Traditional and familiar character to housing and external environment.
- Personalised front doors through the use of varying colours.
- Public realm well overlooked.

02 These dwellings, which are part of a senior citizen complex, are in close proximity to the city centre and the design balances social interaction with the creation of a calm environment.

The Location and Siting of Dwellings

Design Considerations and Awareness

A centrally located dwelling will be more conducive to allowing the resident to engage in local everyday activities while also facilitating easier access for their family and carers. In terms of siting, locating a dwelling in a prominent position within a development, or directly adjacent to the public road or street will enhance legibility and visual access to the dwelling from the community, and vice versa. This will also provide opportunities for the occupant to observe everyday life and for neighbours to keep a watchful eye on the dwelling as they pass by. Locating a new dwelling, or choosing an existing dwelling in close proximity to the public thoroughfare (as opposed to the end of a cul-de-sac) also reduces travel distances to the community and enhances passive security to individual dwellings and associated access routes.

Some people living with dementia may fear getting lost and feel insecure or anxious when out in public places. This may be compounded by concerns for personal safety, or fear of crime and therefore it is important to locate and site a dwelling where occupants will feel secure while in the dwelling, using the garden, or while walking or cycling to or from the dwelling, particularly at night. Design approaches such as **'Crime Prevention through Environmental Design**' (CPTED) promote design and management practices that create safer places for inhabitants by designing out opportunities for crime and more importantly reducing the fear of crime by eliminating spaces that make people feel vulnerable.

Please refer to Section 1.1 in the UDHI Guidelines for overall guidance.

03 A well lit public space in an urban location.

Photo Design Features

■ The space is well lit, uncluttered, provides generous space for pedestrians, and has enough activity to make a person feel safe when using it at night.

Photo Design Tip

▲ The provision of seating along this route would provide a resting place for a person with mobility difficulties, or simply a chance to stop and take things in.

UD Dementia Friendly Design Guidance

- Where possible choose a dwelling location close to local services, public transport and local amenity spaces.
- Whether the dwelling is in a new development, in an existing housing estate, or along a public road or street, ensure that the site minimises travel distances to nearby facilities and amenity spaces.
- Ensure that the siting of the dwelling maximises opportunities for informal social interaction and passive security while at the same time creating a calm environment.
- Avoid locating dwellings close to sources of excessive noise such as train lines or motorways as acoustic disturbance can be a major concern for some people with dementia.

Finally, in choosing a general location or a specific site within a location it is useful to discuss this with all relevant stakeholders and to involve the person with dementia at all stages. The more familiar or recognisable the setting the better it will be for the person living with dementia.

04 This recently redeveloped street provides traffic calming measures to reduce vehicle speed, plentiful seating and generous pedestrian areas.

Photo Design Features

■ Level access provided from pavement.

Photo Design Tip

▲ The patterned paving may cause difficulties for people with visual difficulties.

Roads, Streets and Pavements

Design Considerations and Awareness

The UD approach for roads, streets and pavements described in the UDHI Guidelines will provide a supportive environment for people living with dementia, their families, and carers. However there are a few specific dementia friendly design issues that could be considered as part of the UD approach.

Some people living with dementia may have orientation difficulties in the external environment resulting in confusion or disorientation. Clear signage in urban spaces will enhance way-finding, as will the provision of a clear circulation hierarchy composed of distinct and legible spaces and buildings. Good visual access to key urban spaces and facilities will provide visual cues in terms of orientation and will help remind or prompt people regarding their destination.

Where possible and appropriate, urban design can reflect traditional urban patterns such as the typical grid-like street and block patterns found in towns and cities around Ireland. This urban form is recognisable to most people, and if designed using the principles of legibility and distinctiveness, it will provide more coherent and easily understood urban spaces for all people.

Some people living with dementia may be fearful of their personal security

and safety when out in the community. Greater legibility and a clear circulation hierarchy will help but as referred to previously, other design approaches such as CPTED will also help to reduce opportunities for crime and reduce fear of crime (refer to Appendix 1 for further reading on CPTED).

Creating a calm urban environment which seeks to minimise visual clutter and excessive noise will be beneficial to people with dementia. Lower vehicle speed or design that creates lower traffic volume will also contribute to calmer urban spaces for all people.

Please refer to Section 1.1 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Increase spatial legibility by employing a grid-like urban structure composed of well-connected short streets with good visual access to key landmarks and spaces. Greater enclosure formed by clearly visible buildings and spaces with obvious functions and entrances will also aid legibility.
- Use landmark objects or buildings to create urban distinctiveness especially at junctions or important nodes. This will help to create more recognisable spaces and thus enhance way-finding.
- Consider how urban spaces can engender a sense of familiarity by the provision of human-scale, informal spaces inspired by traditional urban patterns, building design and features. This does not preclude innovative design but instead challenges the designer to employ recognisable spaces, features and functions which are consistent with users' expectations.
- Provide calm spaces that avoid excessive acoustic disturbance through design that reduces traffic volume and speed, and orientates noise generating activities away from dwellings and key amenity spaces.

"...loud noises often startle older people causing confusion and disorientation, especially for those with dementia. In addition, continuous noise, such as the drone of heavy traffic, affects their ability to hear" (Burton and Mitchell 2006).

05 Recently upgraded street in the centre of a large town.

Photo Design Features

- *This recently upgraded street provides wide footpaths, plentiful seating, traditional lighting, planting and familiar landmarks such as the street clock.* access provided from pavement.

Photo Design Tip

- Appropriate tactile material could be used to delineate the junction between the pedestrian footpath and the vehicular carriageway.
- The number and location of bollards may cause difficulties for many users, such as people with vision difficulties. The proper use of tactile paving could reduce the number of bollards.

Street Furniture and Lighting

Design Considerations and Awareness

In relation to the design and maintenance of street furniture and lighting, the UDHI recommends many features which contribute to a dementia friendly environment. However in the context of this document it may be worth emphasising issues around way-finding, lighting and safety, all of which are of course interconnected.

The urban form can contribute to increased legibility, distinctiveness and familiarity, which helps with orientation and navigation in the public realm. Street lighting and street furniture, such as signage, can reinforce and supplement these design

principles to ensure that the street environment is easily understood by people with dementia.

People with dementia, like most older people, will often need higher levels of lighting to compensate for vision difficulties, which may be related to both older age and dementia. The design of artificial light should seek to create even illumination, reduce the effects of glare and enhance task visibility.

Good signage and lighting will also help create a safer environment. Street lighting in particular can play an important role, not only in reducing opportunities for crime but also in reducing the fear of crime.

Please refer to Section 1.1 in the UDHI Guidelines for overall guidance

06 Public stop on on a main street in an urban area.

Photo Design Tip

- The provision of a properly designed bus shelter with adequate seating would provide a much safer and more comfortable waiting space for this older woman.
- The careful location of the dust bin should be considered to ensure it does not become an obstacle for a person with visual difficulties.

UD Dementia Friendly Design Guidance

- Provide minimal street signage, especially at junctions, which concentrates on key essential information in a legible and familiar format that will be recognisable to people with dementia.
- Ensure all signage uses non-reflective material, provides large easy-to-read graphics and characters and employs contrasting colours to increase legibility of information.
- Beyond signage, other cues such as sound, touch, or smell can be used to reinforce way-finding to help with orientation and navigation. For instance, plants with distinct smells (such as lavender) may trigger certain memories and may be used at the entrance to a park or public square to help communicate the function of the space.
- Provide comfortable seating with back and arm rests every 100m to 125m. Arm rests will help a person get in and out of a seat while back rests provide additional support and resting places to lean on as a person walks along a street.
- Provide seating and shelters at bus stops to provide greater comfort and safety for people using public transport.
- Ensure that artificial lighting provides even illumination along exterior paths while highlighting key areas such as building entrances, steps, and ramps. Pedestrian walkways should have an average maintained illuminance of 30 lux, while entrances, steps and ramps should have an illuminance of 100 lux.
- Ensure that any lighting does not produce a glare, or result in excessive reflection or shadows as this may cause confusion or disorientation for some people living with dementia.
- While lighting bollards may be useful for highlighting paths it is important that they do not emit light upwards as the resulting glare may cause difficulties for people with dementia.

1.2 Approaching the Home

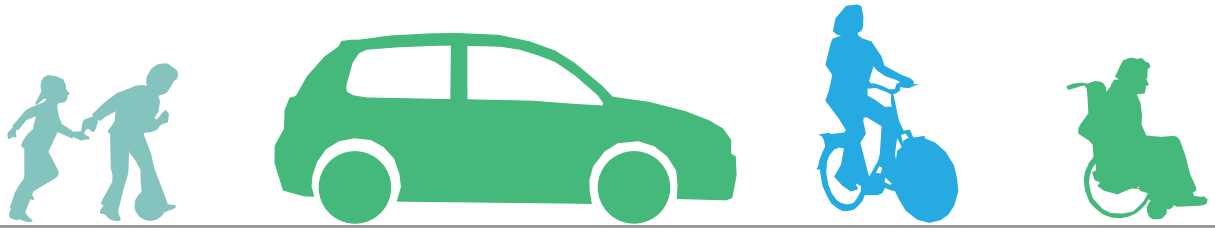
07 *The use of painted front doors to create distinctive and identifiable entrances.*

Photo Design Features

- Level access provided from pavement.
- Use of different coloured doors to distinguish different dwellings.
- Firm, non-slip, non-reflective surfaces.
- Planting and garden objects used to personalise entrance.
- A canopy is provided above each front door.

Photo Design Tip

▲ Plant boxes and pots could be placed on grass to remove trip hazards.



08 A well-landscaped courtyard in an urban residential development.

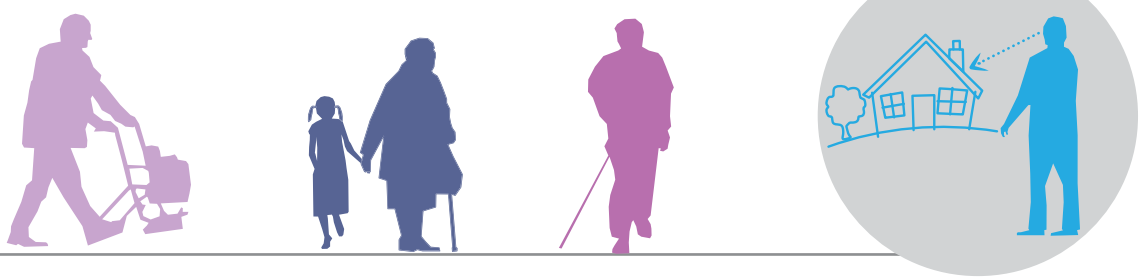
Appearance of the Home

Design Considerations and Awareness

The aim of this guidance is to use the UD approach to make all dwellings more dementia friendly. However in scenarios where one dwelling or a small selection of dwellings are being designed or adapted specifically for people living with dementia it is important that these are of a consistent quality with other dwellings and are integrated across the site to avoid stigmatization.

While dwellings should be of a consistent quality it is very important that they do not appear all the same. Design features such as varying door colours, distinct boundary treatments or porch canopy details, or individualised planting, can be used to identify individual dwellings. Design features which reinforce familiarity, personalisation and good visual access should be used to maximum effect to help orientate a person living with dementia and help them navigate to their own home.

Please refer to Section 1.2 in the UDHI Guidelines for overall guidance.



UD Dementia Friendly Design Guidance

- Use familiar design elements that are consistent with a user's expectations. Features such as entrance door canopies can communicate a certain function whether they are traditional or contemporary.
- Provide opportunities for people to personalise their home with planting or distinctive garden furniture which creates a unique identity for the dwelling.

Where possible consult with existing or future occupants to fully determine what would be 'familiar' or 'personal' to them in the context of the guidelines above.

Setting-down Points and Parking (including Underground Parking)

Design Considerations and Awareness

While the guidance contained in the UDHI Guidance supports a dementia friendly approach to parking and setting-down points, issues around underground carparking may need particular attention in the context of this guidance. While a person with dementia may not be driving themselves, they may travel with their partner or family carer and therefore the underground carpark environment will need to be carefully considered.

Please refer to Section 1.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Provide designated accessible parking bays close to the lifts or stairs serving the dwellings above which can be used by family carers who may have a person with dementia as a passenger.
- Provide good lighting, obvious signage and dedicated clearly delineated paths to guide a person to and from any underground parking facilities.

09 *Entrance gates from public street to townhouses.*

Photo Design Features

The gates in these images are in a logical location directly in front of the entrance door. The image to the right shows a distinct gate with a selection of bright colours which will make it easy to identify from the pavement.

Design Tip

▲ The gates shown in the image to the left should be easier to identify within the fencing. Use of patterned or coloured gates should have clear distinction from one house to another to avoid confusion.

Gates and Paths (Private and Communal)

Design Considerations and Awareness

The entrance gate to any dwelling or communal space should be located so that it is easily seen and identified from within the site when leaving, or from the street or road when entering.

The operation of the gate itself should be easily understood and it should be easily opened by all people. If the ironmongery on the gate is a different tone or colour from the gate itself it will stand out and provide greater visual access.

Care must be taken with keypad entry systems or intercoms to ensure they are intuitive and easy to use for everyone, and especially people with dementia.

As discussed earlier in relation to urban spaces, a clear circulation hierarchy composed of distinct and legible spaces will make it easier to navigate within a site. Good visual access to key paths and main entrance doors will help with orientation and prompt people about their destination.

Clear signage and good levels of even lighting will also enhance way-finding.

Please refer to Section 1.2 in the UDHI Guidelines for overall guidance.

10 Exterior circulation within an apartment courtyard.

Photo Design Features

- *Clear paths and signage providing orientation within an apartment courtyard.* Access routes to each apartment block are clearly visible and the light fittings or signage do not impede the pavement.

Photo Design Tip

- The change in surface finish and colour employed for the access routes to each block may be perceived as a change in level and may cause a person with dementia to alter their gait and lead to a fall.
- The surface water drainage should ensure that no ponding takes place as this could impede access or reflect light in a way that could be perceived by a person with dementia as a hole or step.

UD Dementia Friendly Design Guidance

- Locate the entrance gate in a logical location and ensure it is easily visible upon entering and exiting the site.
- Provide an entrance gate and associated gate furniture that is intuitive and simple to use and that is familiar to the extent that it is consistent with the occupant's expectations around appearance and function.
- Use colour and tone to make the entrance gate stand out from the background and distinguish it from adjacent surroundings.
- Allow opportunities to personalise the entrance path to make it more recognisable and familiar for people with dementia.
- Provide good lighting, obvious signage and dedicated clearly delineated paths which guide a person to and from their dwelling.

11 *Complicated ramp at the main entrance to a building that may be confusing.*

Photo Design Tip

▲ This ramp could be laid out in a more logical manner so it is easier to use and be understood for all users of the building. Handrails made of wood or plastic metal could help in cold weather.

Ramps, Steps and Landings

Design Considerations and Awareness

The UDHI Guidelines outline design features that support a dementia friendly approach to ramps, steps and landings. However, some people living with dementia may have difficulties perceiving certain 3-dimensional objects or may not fully understand certain functions and therefore a number of cues may be needed to make them aware of ramps, steps and landings. The logical location of external ramps and steps, achieving good visual contrast, providing multiple cues and adequate warnings, will all contribute to a dementia friendly external circulation.

Please refer to Section 1.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Provide ramps in locations that are obvious and convenient and which are clearly visible along the circulation route so they provide a usable and easily understood alternative to steps.

- Avoid convoluted ramp designs by ensuring that ramps are laid out in a logical manner where their use is intuitive and clearly understood. Ensure that entry and exit points are clearly visible and adjacent to the main circulation route.

12 *Steel handrails to exterior ramp.*

Photo Design Features

- Black handrails either side of this ramp act as a good way-finding device and provide an additional visual cue about the nature and function of the ramp.
- The black handrails also stand out clearly against the brick and concrete and thus provide good visual contrast.

Photo Design Tip

- Steel handrails are cold and uncomfortable to touch for many people. Specify timber or plastic-coated handrails to avoid this problem.
- The provision of low level lighting would enhance way-finding at night.
- The provision of a second lower handrail, with the upper surface positioned 600 to 750mm above the ramp and landing would benefit people of different heights.

Handrails

Design Considerations and Awareness

In the context of dementia, handrails can act as a way-finding device and provide an additional visual cue to remind people about where ramps or stairs are located or how they should be used. Providing a handrail that contrasts visually with the background, by using distinct colours or tones, will help a person see a handrail more clearly.

Please refer to Section 1.2 in the UDHI Guidelines for overall guidance.

13 *Metal guarding between carriageway and footpath.*

Photo Design Features

■ People will often use fixed objects to lean on or to help them navigate. This guarding acts as a good support and also as a way-finding device.

Photo Design Tip

▲ If the handrail was painted black or a distinct colour it would stand out better.

UD Dementia Friendly Design Guidance

- Use a handrail design that will be familiar to most people and will be consistent with their expectations.
- Use colour and tone so that the handrail stands out clearly from its background.
- Where possible, use some feature to clearly indicate where a handrail ends, as this will help provide a better signal to the user that the handrail is ending and thus give them a chance to adjust accordingly.
- Handrails should be provided on both sides of ramps and steps and should be continuous to the full length of the flight and around intermediate landings.
- Handrails should be positioned with the upper surface 900 to 1000mm above the ramp slope and 900 to 1100mm above landings.
- The provision of a second lower handrail, with the upper surface positioned 600 to 750mm above the ramp and landing surface is desirable and will benefit people of different heights.
- Handrails should extend 300mm beyond the top and bottom of a ramp or steps to provide support to people as they move from a level surface onto a slope and vice versa.

14 Access path with lighting bollard.

Photo Design Features

- The bollard lighting does not shine upwards and is set back so it does not obstruct the path.

Photo Design Tip

- Loose objects, such as the rock featured in the photo above, should be placed in a location where they do not present a trip hazard.

External Lighting

Design Considerations and Awareness

As described in Section 1.1, people with dementia, like most older people, often need higher levels of lighting. The design of artificial light should seek to create even illumination, reduce the effects of glare and enhance task visibility.

External lighting is not only important for usability, safety and security, it is also important in terms of perceived security and fear of crime. As discussed previously, some people with dementia may experience disorientation and anxiety when outside. Therefore lighting can be used to enhance a sense of security and to illuminate key routes or access points to help with navigation at night.

Please refer to Section 1.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

UD Provide dedicated lighting to key features such as paths and entrances to provide additional visual cues for way-finding.

UD Be careful with automatic lighting or sensor-activated lighting as this may startle or cause confusion if a person is unaware of the automatic function. In some cases, this may lead them to believe that another person has activated the light.

In scenarios involving known occupants, direct engagement with the occupants will allow the designer to understand the occupant's understanding or awareness with regard to automatic lighting.

15 *Planting and trees are traditionally used to signify entry points or focal areas.*

Photo Design Features

- The planting in these images helps to personalise and identify each entrance.

Photo Design Tip

- Planting should not visually obscure an entrance and regular pruning and maintenance is required to ensure entrances are not overgrown.
- Change of colour or tone (i.e. dark to light) in the paving can cause difficulties for some people with dementia as it may appear there is a step or change in level.

Planting

Design Considerations and Awareness

The UDHI Guidelines cover most of the important issues relating to planting and for dementia friendly dwellings. However, it may be worth reiterating some key features which take on additional significance in the context of this current guidance.

In terms of dementia friendly dwellings, planting can be used to make approach routes and entry points more recognisable, create opportunities for personalisation, and help mediate against external negative stimuli, such as glare and noise.

Planting can also be used to create multisensory cues providing visual, smell, and tactile experiences that can help with orientation and wayfinding. For instance, lavender planted by a front door may help draw an individual towards the aroma, or trigger memories of a similar arrangement from their past that may help them to remember or recognise their own door. **(See Section 3 for further information on planting)**

Please refer to Section 1.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Use planting familiar to the person with dementia to personalise entrances and pathways.
- Use colourful and distinctive planting in strategic locations and destinations to create visual landmarks to help with way-finding.
- In line with the creation of visual landmarks, use fragrant planting to reinforce way-finding by providing aromas in certain key locations such as entrances or junctions along approach paths.
- Ensure planting does not cause excessive shadows on the ground which may be perceived as a step or cause other difficulties for people with dementia.
- Avoid plants that irritate the skin or are toxic if ingested.
- Carefully locate trees that shed excessive fruit or leaves so that these do not cause slipping or tripping on paths. Maintain planting to keep pathways clear.

In scenarios involving known occupants, direct engagement with the occupants will inform the designer about what planting would be familiar to the occupant or that may help trigger memories.

16 *Shared* recycling facilities on residential site.

Photo Design Features

■ These recycling facilities are located in an obvious position on this residential site and can be clearly seen from the main entrance area.

Photo Design Tip

▲ Clearer signage and the use of colour would make the various bins stand out and help a person to distinguish one bin from the other.

Refuse Disposal and Recycling

Design Considerations and Awareness

The UDHI Guidelines outline a range of design considerations to ensure that refuse and recycling are accessible and usable by a wide variety of people.

In terms of dementia friendly design, dealing with refuse and recycling are daily activities that can be encouraged so that people maintain their independence and remain involved in everyday tasks. Ensuring that refuse and recycling facilities are in a convenient, easily accessed location, and is clearly visible from a key location, such as the kitchen or backdoor, will enable and prompt a person to continue with this activity for as long as possible.

Please refer to Section 1.2 in the UDHI Guidelines for overall guidance

UD Dementia Friendly Design Guidance

- Locate refuse disposal and recycling bins in close proximity to the dwelling and provide direct visual access from the kitchen window or back door where possible.
- Use colour, tone and signage to make bins visible and to clearly indicate their function.
- Where shared recycling facilities are provided, make sure these are located in an obvious position that can be clearly seen from the main circulation area.
- Provide high levels of natural or artificial lighting to refuse and recycling areas to make sure that the facilities are legible and easy to use for people with visual difficulties.
- Where refuse and recycling areas are located in an underground carpark, for example in an apartment building, make sure the access route to these facilities is legible, well lit, and provided with clear signage to help with way-finding.

Centre for Excellence in Universal Design

Entering, Exiting and Moving Around 02

Universal Design Dementia Friendly Dwellings

Entering, exiting and moving around the dwelling requires interaction with the built environment on a number of levels over all times of the day. For people with dementia, their families and carers, good access and circulation within the dwelling is critical to their independence, health and well-being.

Vera lives with her husband in a two storey terraced house on the edge of town. She manages quite well and can still go out and about independently because she lives close enough to the shops.

However, Vera is starting to find it harder to carry her shopping up the three steps to her front door. She's wondering if a ramp or even a handrail might help.

Entering, Exiting and Moving Around - Overall Design Issues

This section of the guidelines describes a number of issues, ranging from entrance doors to corridors, stairs and lifts. For people living with dementia and their family or carers, entering, exiting and moving around an apartment building or house is critical to their independence, well-being and safety. When designing or adapting a dwelling it is important to consider the complete circulation route as a continuum; oftentimes it takes only one design failure or barrier to prevent a person from reaching their destination.

The Universal Design (UD) measures presented in the UDHI Guidelines provide an overall framework for dementia friendly dwellings but there are a few additional key dementia friendly design issues that will enhance the UD approach and help provide clear, legible and easily understood circulation routes to support people living with dementia.

In the context of entering, exiting and moving around consider the following key **Design Issues:**

Participatory Design: will identify circulation features such as front doors, or internal door handles that suit the residents needs or are familiar to the person with dementia.

Familiar Design: in line with the above, will provide recognisable design features related to circulation. This may involve readily identifiable locks, handrails or similar that can be understood by the person with dementia.
Personalisation: provide opportunities for people to personalise key areas along circulation routes to make these spaces more familiar and recognisable.

Easy to Interpret and Calm: will make circulation routes easier to understand and reduce any distractions which may impinge on navigation and orientation.

Good Visual Access: ensuring that key parts of the dwelling can be seen clearly will help with orientation and prompt actions such as using the bathroom or going out into the garden at appropriate times.

Unobtrusive Safety Measures and Assisted Living Technologies: consider how this can be used as part of any circulation strategy. In some cases this may involve measures to prevent or discourage exiting at inappropriate times such as late at night.

Distinct Spaces: clearly defined spaces with dedicated uses will make circulation with the dwelling more legible and thus help with orientation.

Safe and Accessible Outdoor Spaces: circulation within the dwelling should promote easy access to these spaces and should positively encourage use by providing direct visual access from the inside, framing views, or capturing natural light, sounds, smells, or other external cues which would entice a person to go outside into a safe outdoor space.

Please refer to the Introduction Section of this document for more detail on these design issues.

2.1 Entering the Home

01 *Entrance doors to three storey townhouses.*

Photo Design Features

- Different types of planting at each entrance help to distinguish one dwelling from another.
- The projecting canopy provides a visual cue to help with orientation while also providing cover from the weather.
- A glazed panel to the side of the door will make the hallway inside brighter which will help with visibility inside the home.

Photo Design Tip

- The covered area by the front door could be increased by using a larger canopy which would give a person more shelter when entering the dwelling
- If each front door was painted a different colour it would help personalise the entrances and distinguish one dwelling from another.

02 *A entrance to a contemporary detached dwelling.*

Photo Design Features

- The projecting canopy provides a visual cue to help with orientation while also providing cover from the weather.
- Good levels of lighting illuminate the entrance, while an obvious door handle which clearly communicates its function is usable by people of various heights.

Photo Design Tip

- Colour contrast between the door and the adjacent solid panel would make the door itself more visible upon approach.

Entering and Exiting the Dwelling

Design Considerations and Awareness

Section 2.1 of the UDHI Guidelines provides detailed guidance that will improve access, usability and understanding of dwelling entrances for all residents including people with dementia. However some issues may be worth reiterating in the context of this current document.

In general, entering the home will be easier for people with dementia if the entrance door is located in a logical place that is consistent with a person's expectations, if it is clearly visible upon approaching the dwelling, and if it is easily distinguished from adjacent entrances.

Steps are considered to be one of the main obstacles for people with dementia, most of whom are older people, so there should be a level threshold; however, the colour or appearance of this threshold must ensure that it is not mistaken as a step.

Opening and closing the door should involve familiar actions, and where remote or automatic door opening systems are provided these should be simple and intuitive to use.

Some people with dementia may need higher levels of lighting and this should be taken into consideration at the entrance to ensure even illumination with enhanced task visibility where possible. Uneven natural lighting can also cause issues for people with dementia, so it is important that the entrance is designed to reduce excessive shadows or shaded areas to ensure safe transition and access.

Please refer to Section 2.1 in the UDHI Guidelines for overall guidance.

03 Entrance doors to housing for people with dementia which use a very contemporary design approach.

Photo Design Features

- Colour is used to distinguish one unit form the other.
- The projecting roof above the entrances provides cover from the weather as a person enters the dwelling and also provides a covered area in front of the dwellings for sitting out.

Photo Design Tip

- The use of colourful or fragrant planting in the grassed area to the front would create a more interesting and multisensory environment.

UD Dementia Friendly Design Guidance

- Locate the entrance in a logical location so that it is clearly visible on approach to the dwelling.
- Use an entrance canopy or similar to reinforce the location and function of the main entrance.
- Provide a front door and associated door furniture that is intuitive and simple to use and that is familiar to the extent that it is consistent with the occupant's expectations around appearance and function.
- Use colour and tone to make the entrance door stand out from the background and distinguish it from adjacent dwellings.
- Allow opportunities to personalise the entrance area and front door to make the entrance more recognisable for people with dementia.
- Use a level threshold, but ensure that there is not an excessive visual contrast between the threshold and the floor, otherwise this may be perceived incorrectly as a step.
- Use clear signage and graphics to identify dwellings and provide house numbers.

Where possible, direct engagement with the occupants or family members will inform the designer about the past experiences of the person with dementia and thus allow the use of design features, colours or objects that may be familiar to the occupant.

04 Entrance to a single storey dwelling.

Photo Design Features

- The projecting canopy provides a visual cue to help with orientation while also providing some cover from the weather.
- A seat beside the door offers a sheltered place to sit and watch the world go by.

Photo Design Tip

- The covered area by the front door could be increased by using a larger canopy which would give a person more shelter when entering the dwelling.

Exiting and Safety Issues

Design Considerations and Awareness

If a dwelling is provided with safe outdoor space then this will enable a person to exit the dwelling and remain within a safe and controlled environment. In this regard, it has been shown that the freedom to open a door and independently go outside may reduce agitation, frustration and wandering behaviour among people with dementia, as opposed to being simply confronted by a locked door. **(See section 3.8 for information on private outdoor space).**

Where the exit of the dwelling leads to a public space, such as a street or road, then this may cause concern. This may be of particular concern during inclement weather, or at night when the person with dementia could be in greater danger of getting lost or at risk from traffic. In this context it may be helpful if a person is disinclined from leaving the house and venturing into the community. To achieve

this consider the following:

- Avoid simply locking a door or adding more complex locking as this may just increase frustration and agitation.
- Consider painting the inside of the door the same colour as the adjacent walls to help disguise the door internally. However, this approach also disguises the door during the day, or at any time when a person needs to leave the house.
- A more flexible approach involves fitting a curtain or similar to the inside of the door which can be drawn across at appropriate times to camouflage the door and remove the visual cue that may prompt a person to leave the house in the first place. This curtain can also be located so that it conceals other items associated with leaving the house such as a coat rack, umbrellas, keys and similar.
- Technology such as a door alarm, or door sensors such as Exit Risk Messaging that can alert carers or family members via text message or similar that the door has been opened, may be useful in this regard. (See Section 4 for further information on technology).

UD Dementia Friendly Design Guidance

- Fix a curtain rail to the inside of the front door to allow a curtain to be drawn over the exit if required, and if necessary drawn over associated objects such as coat rack or umbrella stand. This will eliminate a direct view of the door and may help discourage a person with dementia to leave the dwelling.
- Devices that signal to a family member or carer when a door is opened can be used where required, but should always be used in an ethical manner and every effort should be made to find a balance between being overprotective and respecting individual autonomy.

Direct consultation with the occupants or family members may reveal certain behaviour patterns or preferences the occupant may have which may result in a more satisfactory design response.

05 *Entrance to a contemporary apartment block.*

Photo Design Features

- This building uses colour to highlight entry points and distinguish one entrance from another.

Photo Design Tip

- An entrance canopy or covered area would provide shelter and also create a more identifiable entrance on approach.
- Colour or tonal contrast would help highlight the door and distinguish it from the adjacent glazed screen.
- Permanent markings on the glazed entrance door and side panels would make the glass more visible and help prevent a person colliding with the glass.

Entrance Doors and Access Control to Apartment Buildings

Design Considerations and Awareness

For people with dementia, the main issues regarding entering an apartment building revolve around identifying the right entrance to the apartment block from the street or a courtyard, and then gaining access, whether as a resident or a visitor. Access to apartment buildings often involves the use of key pads or automatic doors and these need to be carefully designed so that they are simple and intuitive to use.

Please refer to Section 2.1 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Locate the entrance in a logical location so that it is clearly visible on approach to the apartment building from the street, courtyard or similar communal external space.
- Use an entrance canopy or similar to reinforce the location and function of the main entrance.
- Provide an entrance door and associated door furniture that is intuitive and simple to use and that is familiar to the extent that it is consistent with the occupants' expectations around appearance and function.
- Use colour and tone to make the entrance door stand out from the background and distinguish it from adjacent glazed screens or entrances to other residential or commercial units.
- Allow opportunities to personalise the entrance area and front door to make the entrance more recognisable for people with dementia.
- Use a level threshold but ensure that there is not an excessive visual contrast between the threshold and the floor so that it is not perceived incorrectly as a step.
- Use clear signage and graphics to identify block numbers and apartment block numbers.
- Intercoms should be located in an logical position adjacent to the door where their function and operation is obvious. They should be simple and intuitive to use for a person with dementia.
- Where possible provide a visual and audio intercom to provide multiple means of communicating the function of the intercom for both the resident and the caller.
- While fob entry or swipe card systems may provide assistance for many people, they may be confusing for a person with dementia. Where these are provided ensure that they are simple and intuitive to use.
- Ensure that the fob or card reader is in a logical location, can be easily seen on arrival at the door, and is finished in a colour or tone that makes it stand out visually from the background.

Where possible, direct engagement with the occupants or family members will inform the designer about the past experiences of the person with dementia and thus allow the use of design features, colours or objects that may be familiar to the occupant.

06 *The use of highly visible and bold signage.*

Photo Design Features

- While the image above relates to retail it nevertheless illustrates how strong graphics and clear signage can be used to assist with orientation.

Hallways, Lobbies and Corridors in Apartment Buildings

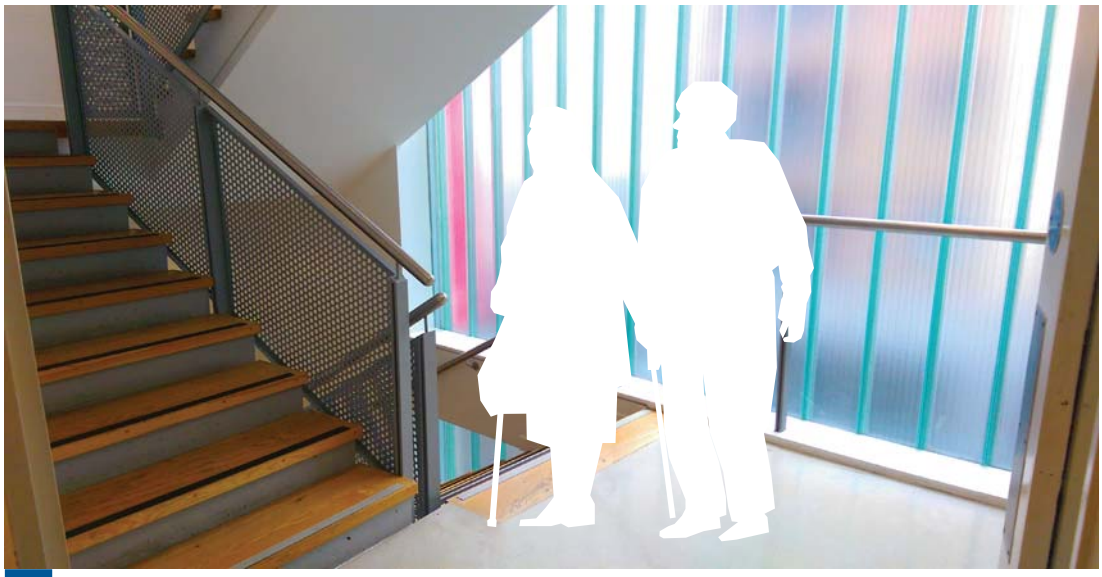
Design Considerations and Awareness

Many apartment buildings contain convoluted circulation areas to comply with fire regulations and this is compounded by long, artificially lit, double-loaded corridors where all the apartment entrance doors are identical. Situations like this may be very problematic for people with dementia, whether they are a resident or just visiting.

To deal with these issues and to create dementia friendly dwellings, circulation within an apartment block must be logical and legible upon entry. Good visual access to key spaces or to external landmarks will provide additional orientation cues. In addition to this, good levels of even lighting, signage and the personalisation of individual apartment entrances will all help.

For instance, Figure 08 on the next page shows a 'memory box' which is a device often used in long stay residential settings to help personalise the entrance to an individual's room and to provide items or images to help trigger memories or enhance a continuation of self. Such measures may be useful in an apartment corridor to help identify a person's dwelling where there are many identical doors opening off the same space.

Please refer to Section 2.1 in the UDHI Guidelines for overall guidance.



07 *A staircase in a mixed-use residential building*

Photo Design Features

- *A bright spacious staircase with plenty of natural light.*

Photo Design Tip

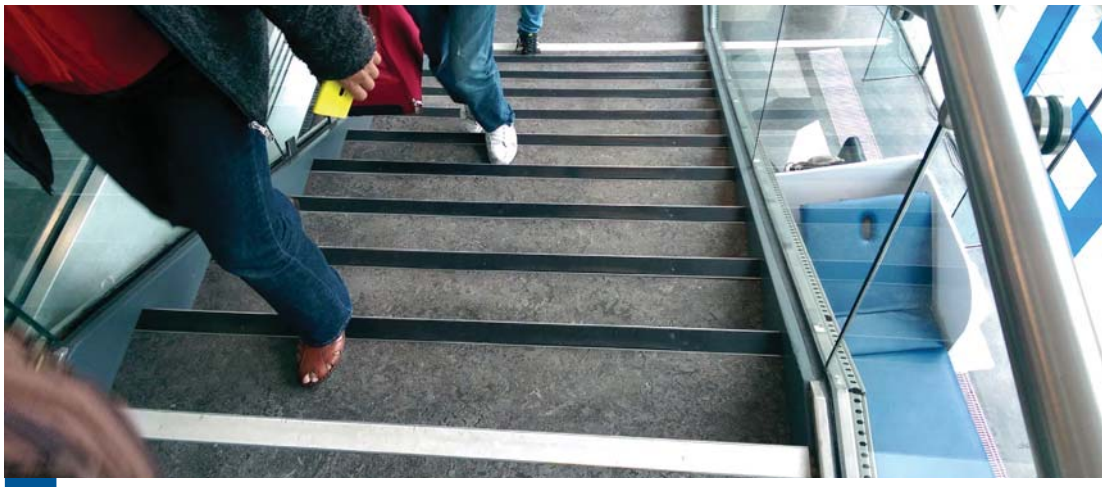
- If there was a clear glazed section in the external wall it would provide orientating views to the outside.
- Depending on the orientation of the external wall this space may need some solar control to avoid excessive glare within the staircase.

08 *The use of 'memory boxes' to personalise entrance doors.*

The memory box shown in Figure 08 could be used within an apartment corridor or other shared access area to help personalise and identify a dwelling. This would need to be agreed with the overall building owner or the management company who are typically responsible for these areas.

UD Dementia Friendly Design Guidance

- Provide legible and logical circulation within all common areas of the building to ensure ease of navigation from the main building entrance to the apartment entrance.
- Provide direct visual access along the circulation route to key spaces such as stairs or elevators.
- Provide external windows to circulation areas, and where possible, to provide natural light and views to external landmarks to help with orientation within the building. Be aware that an external window at the end of a corridor may cause glare and disorientation.
- Use colour and tone to make key doors along the circulation route stand out from the background.
- Use contrasting colours or tones to distinguish the floor from the walls. In a similar manner, use contrasting colour on the skirting boards to provide a visual break between the walls and the floors to ensure greater visual contrast.
- Provide a continuous floor finish with as little change in material as possible. Where there is a change in material make sure there is minimum colour contrast, particularly at door thresholds.
- Avoid strong patterns on floor finishes and provide plain coloured, matt finishes which will help reduce glare or shine in brightly lit conditions.
- Provide clear signage and bold graphics to enhance way-finding. These should be carefully located in obvious positions using non-reflective materials.
- Where required, handrails fixed to walls along circulation routes can be used for support while walking and also help with navigation. Use colour and tone so that the handrail stands out clearly from its background.
- Enure the structure of any walls where handrails may be required at a future date will allow secure fixing of handrails fittings.
- Ensure high levels of even, natural and artificial lighting within circulation areas to help those with visual difficulties.



09 *Stairs with contrast strips including clearly defined top and bottom steps.*

Photo Design Tip

▲ A material other than stainless steel for the handrails my provide greater visual contrast and may be not be as cold to touch.

Communal Stairs and Lifts in Apartment Buildings

Design Considerations and Awareness

In a dementia friendly apartment block the stairs and passenger lift should be in a logical location and should be clearly visible upon entering and moving about the building. Access doors or lift controls must be easy and intuitive to use while lighting and signage will make these entrances easy to locate and use.

Please refer to Section 2.1 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Access doors to stairs and lifts should be well lit and clearly distinguishable from their background by using a different colour or tone.
- Provide a continuous floor finish and colour from the corridor into the stairs or lift. Where there is a change in material make sure there is minimum colour contrast, particularly at door thresholds.
- For the stairs use a contrasting colour or tone so that the handrail stands out clearly from the background.
- Lift controls should be in a logical position adjacent to the lift where their function and operation is obvious. They should be simple and intuitive to use for a person with dementia.
- Consideration should be given to the use of mirrors within lifts as these may cause confusion. Similarly, care must be taken with lift announcements to ensure they do not startle or confuse a person with dementia.

2.2 Moving About The Home

This section relates to all dwellings, including apartments and houses. In line with the UDHI Guidelines, a dementia friendly dwelling should be designed logically and simply to create an environment that is instantly legible with a clear, easy and convenient circulation route for everyone to use.

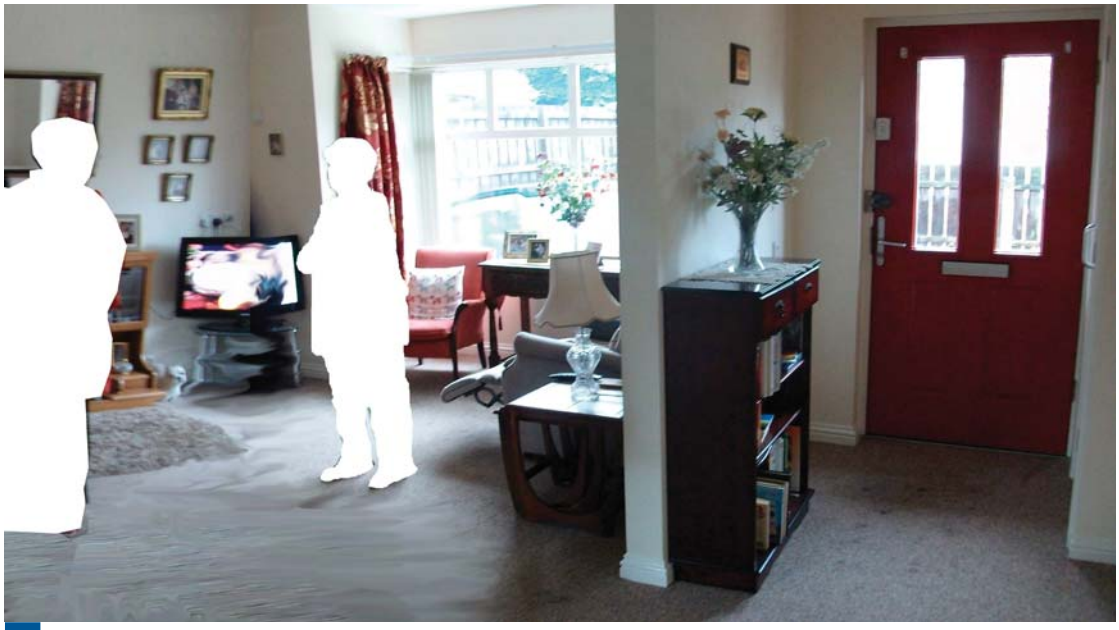
10 *Visual access upon entry and movement throughout a dwelling.*

Photo Design Features

- The circulation within the home provides good visual access and direct views to the exterior outside space to the rear which helps with orientation and may encourage a person to go outside.
- Large south facing rear windows provide good levels of natural light internally.
- The lack of saddle boards or any threshold makes it easy for everyone to move around between rooms.

Photo Design Tip

- The highly polished tiles may result in glare and cause problems for people with visual difficulties.
- In similar terms, the south facing rear windows may need some level of control to avoid excessive glare within the room which again may cause problems for some people who are sensitive to bright light.
- The doormat at the entrance should be recessed and its colour should match the colour of the paving to ensure that a person does not perceive it as a step.



11 *Open plan entrance and living area.*

Photo Design Features

- The layout provides an open arrangement where the circulation area is part of the living room. This provides good visual access and helps with orientation.

Entrance Hallway, Corridors and Doors

Design Considerations and Awareness

Similar to the kind of layout discussed in relation to the common areas of an apartment block, the circulation within a dwelling must also be logical and legible upon entering. Good visual access to key spaces within the house, supported by good levels of even natural and artificial lighting, will contribute to an easily understood and simply navigated internal environment.

The avoidance of strong patterns on floor or wall finishes coupled with the use of familiar design features, signage and opportunities for personalisation will also enhance the dementia friendly approach.

When considering the design of circulation within a dwelling, it is important to create a balance between an open plan approach, which gives maximum visual access, and the creation of a more traditional layout which has separate rooms providing clearly identifiable and distinct spaces. In this regard the needs and preferences of the residents, along with the past experiences of the person with dementia, will inform all design decisions. **(Balancing open plan and distinct spaces is also discussed in Section 3).**

Please refer to Section 2.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Provide legible and logical circulation to ensure ease of navigation from the entrance throughout the dwelling.
- Provide direct visual access from the entrance area and main circulation space to key living spaces, the bathroom or stairs.
- Provide external windows to circulation areas, and where possible, to provide natural light and views to external landmarks to help with orientation and encourage the use of safe external spaces.
- Use colour and tone to make key doors within the circulation area stand out from the background.
- Use contrasting colours or tones to distinguish the floor from the walls. In a similar manner, use contrasting colour on the skirting boards to provide a visual break between the walls and the floors to ensure greater visual contrast.
- Provide a continuous floor finish with as little change in material as possible. Where there is a change in material make sure there is minimum colour contrast, particularly at door thresholds.
- Avoid strong patterns on floor finishes and provide plain coloured, matt finishes which will help reduce glare or shine in brightly lit conditions.
- Provide clear signage and bold graphics to enhance way-finding. These should be carefully located in obvious positions using non-reflective materials.
- In some circumstances it might be useful to fit handrails to load bearing walls within circulation spaces for extra support while moving around the house. Use colour and tone so that the handrail stands out clearly from its background.
- Ensure high levels of even, natural and artificial lighting within circulation areas to help those with visual difficulties.
- When planning the dwelling, carefully consider the balance between an open plan which enhances visual access and a more traditional cellular plan which has the benefits of providing distinct and clearly identifiable spaces.

Direct engagement with the occupants or family members will inform the designer about the needs, preferences and past experiences of the person with dementia and thus allow the use of design features, colours or objects that may be familiar to the occupant.

Technical Sketch:

Indicative Floor Plan Showing General Circulation Layout

A. Ensure good acoustic conditions by orientating spaces away from sources of noise or by providing high levels of acoustic insulation such as triple glazing.

B. Create a distinct entrance by planting particular shrubs or by providing distinct colours to the entrance area or front gate.

C. Provide a level entry door.

D. Provide a brightly painted front door to make it distinct and recognisable.

E. Consider fitting a curtain to disguise the inside of the door at certain times in order to discourage a person leaving the house at unsuitable times, if necessary.

F. Ensure the layout provides maximum visual access to key parts of the dwelling.

G. Enure good views to exterior spaces.

Technical Sketch:
Open plan living, dining and kitchen area

A. Create distinct spaces using book shelves or room dividing screens.
B. Use distinct colours to define individual spaces.
C. Use distinctive furniture to define specific functions and spaces.

12 *Internal domestic stairs.*

Photo Design Features

- Contrast strips on the first and last steps at the landing.
- The floor colour, skirting boards and wall colour all serve to create visual contrast.
- The timber handrail is also visually distinct and stands out from the balustrade.

Photo Design Tip

- ▲ For added support an additional handrail could be fitted to wall. The stairs would have to be of a sufficient width to ensure that the additional handrail did not compromise the overall clearance of the stairs.
- ▲ Contrast strips could be added to all steps to provide greater contrast.

Stairs in the Home

Design Considerations and Awareness

Internal stairs may represent a physical barrier for people living with dementia, especially those with mobility difficulties. Contrasting colours between the steps of the stairs, the stringer and the walls can help a person with dementia to identify steps and changes in level or gradient, thereby simplifying the visual environment. This is also beneficial for older caregivers with age-related vision difficulties. Lighting is also very important on internal stairs so that they can be used safely at all times.

Please refer to Section 2.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Use colour or tonal contrast to help a person identify the stairs.
- Provide colour contrasting nosing strips to the top and bottom of the flight of stairs to highlight the changes in level.
- In addition to the above, providing colour contrasting nosing strips to all steps will provide greater legibility for the user.
- Use a handrail design that will be familiar to most people and will be consistent with their expectations.
- Use colour and tone so that the handrail stands out clearly from its background.
- Where possible, use some feature to clearly indicate where a handrail ends, as this will help provide a better signal to the user that the handrail is ending and thus give them a chance to adjust accordingly.
- Provide fixing grounds on the wall opposite to the handrail to allow future fixing of an additional handrail.
- Ensure high levels of even, natural and artificial lighting within circulation areas to help those with visual difficulties.

Direct engagement with the occupants or family members will inform the designer about the past experiences of the person with dementia and thus allow them to design the stairs around their specific needs.

Stair Lifts and Through-Floor Lifts

Design Considerations and Awareness

Guidance around through-floor lifts is provided in Section 2.2 of the UDHI Guidelines. It is recommended that much care should be taken with regard to any decisions regarding the installation and use of stair-lifts or through floor lifts for people with dementia, or indeed for others living in home.

The installation of a stair lift or through-floor lift may present a challenge to a person with dementia if they are not familiar with such pieces of technology. If the equipment is for the person with dementia then the controls should be simple and intuitive to use. If it is for another occupant then the controls may need to be disguised or left out of view when not in use.

It may be prudent to seek the advice of an Occupational Therapist or other relevant health professional before installing a stair lift or a through-floor lift in a dwelling where a person with dementia resides.

Please refer to Section 2.2 in the UDHI Guidelines for overall guidance.

Centre for Excellence in Universal Design

Spaces for Living 03

Universal Design Dementia Friendly Dwellings

Universally Designed Dementia Friendly Dwellings should provide high quality supportive environments that are easy to move around in and understand. They should be safe and easy to manage, flexible, cost effective and adaptable over time.

Breda lives with her husband in a bungalow in the country. She has always loved her garden and still grows some fruit and vegetables which are used in the house.

Recently, she is finding the garden harder to access and move around in, and sometimes gets a little disorientated. However, this won't stop her as her time in the garden is her favourite part of the day.

Spaces for Living - Overall Design Issues

The guidelines contained in this section refer to all key living areas of a typical dwelling including outdoor living space. While the design of these spaces greatly influences the quality of life for all people, it may have greater significance for a person with dementia as they may spend more time at home. The Universal Design Homes for Ireland (UDHI) Guidelines describe a Universal Design (UD) approach which helps to make living spaces more dementia friendly; however, there are a number of additional design issues which need to be fully explored when designing UD dementia friendly dwellings.

In the context of spaces for living consider the following key **Design Issues:**

Participatory Design: will identify the kind of living spaces, internally and externally, that will meet the needs of the residents. This may be important, for instance, in deciding on an open plan or a more traditional internal layout.

Familiar Design: will provide a recognisable layout for the person with dementia to ensure they can operate successfully.

Personalisation: allowing space for people with dementia to add their own touches will help create a more recognisable and familiar environment.

Easy to Interpret and Calm: this can be achieved in living spaces through good spatial planning, careful light and acoustic design, and the use of easily operated and understood fixtures and fittings.

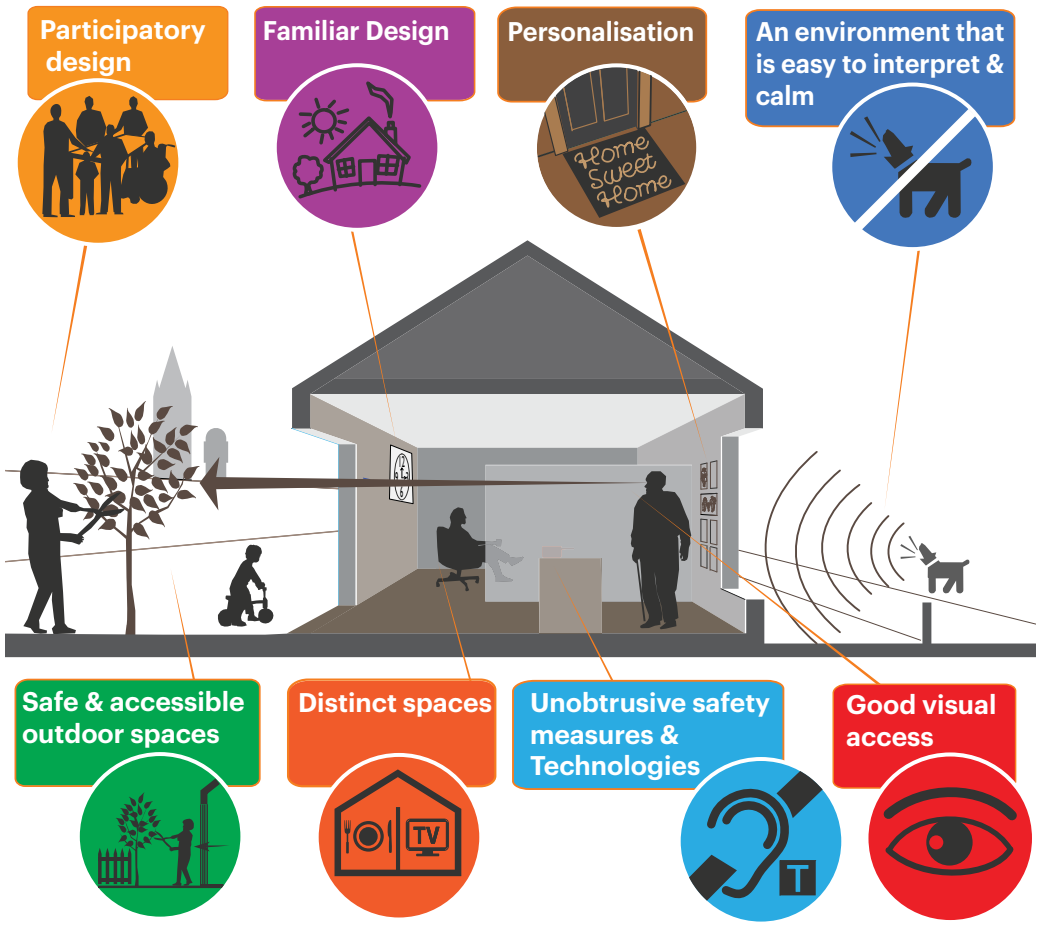
Good Visual Access: being able to see key internal and external spaces, or important objects will help remind and prompt an occupant to carry out certain tasks, engage in a particular activity, or venture outside to put out the rubbish or cut the lawn. This will also facilitate supervision which may help alleviate anxiety on the part of the person with dementia.

Unobtrusive Safety Measures and Assisted Living Technologies: will help a person with dementia to continue living at home by making everyday activities, such as cooking, cleaning or gardening, manageable and safe. Providing supports for Activities of Daily Living (ADLs), Instrumental Activities of Daily Living (IADLs), and leisure activities, not only aids independent living, but may also help a person's confidence and support remaining abilities.

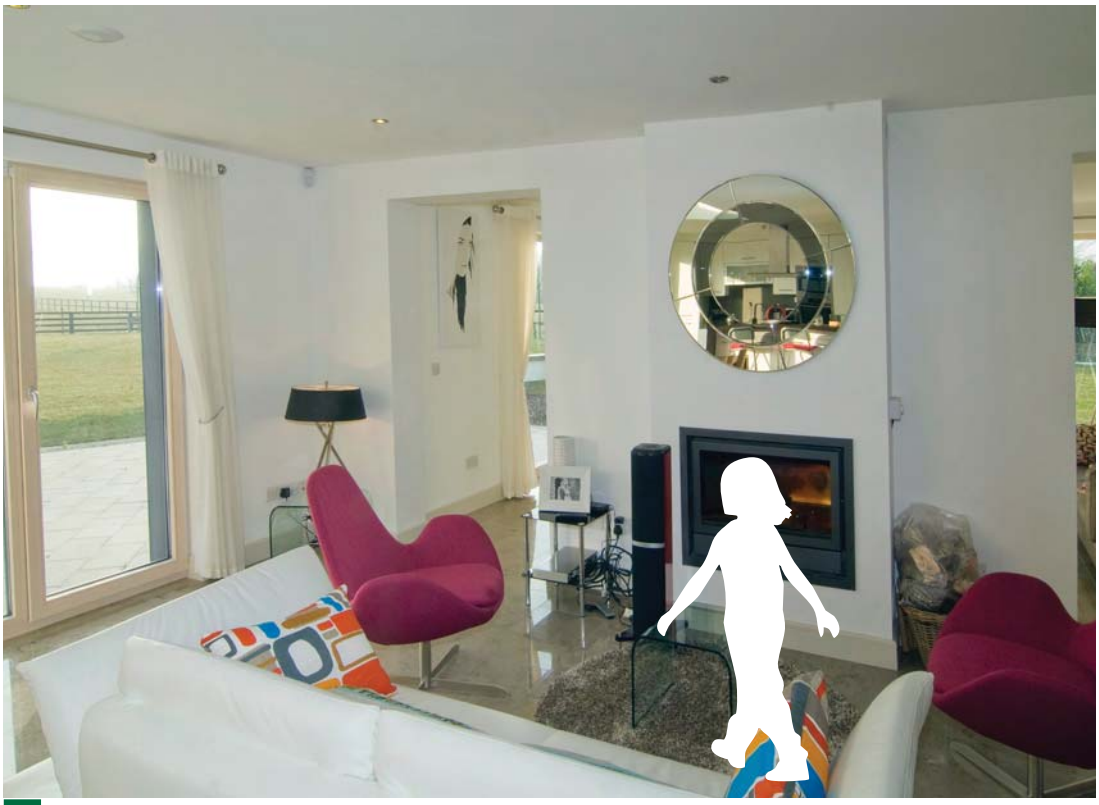
Distinct Spaces: separate rooms dedicated primarily to certain activities, such as dining or watching TV, will help reinforce the function of the space and provide further orientation cues. However, while open plan space may increase visual access, there is some debate as to whether the lack of defined or enclosed space may cause disorientation.

Safe and Accessible Outdoor Spaces: will allow people with dementia to spend more time outdoors, helping to regulate the body clock, promote exercise, and provide multisensory experiences.

Please refer to the Introduction Section of this document for more detail on these design issues.



3.1 Living Room



01 An open-plan living and dining area.

Photo Design Features

- Potential for a large clear turning space in the living area.
- Direct views to garden with no transoms or window sills obscuring view.

Photo Design Tip

- ▲ High gloss tiles may cause problems due to glare.
- ▲ The floor rug could be a trip hazard; as such it is important to be careful where floor rugs are positioned.
- ▲ Any refections in the mirror over the stove may cause difficulties for some people with dementia.

Design Considerations and Awareness

The living room is one of the most important places in the home, and as a person with dementia may spend a lot of time in the living room, the quality, safety and usability of the space is paramount. While the overall layout and design of the dwelling will determine the nature, form and location of the living room, there are a number of key issues in relation to the dementia friendly dwellings which need to be carefully considered.

Balancing an open plan arrangement to create maximum visual access, while also creating calm and distinct spaces is important. The use of furniture and materials to offer strong cues, appropriate lighting levels, certain finishes, colour and tone to provide greater legibility, and views to the outside, are all important dementia friendly issues that need to be incorporated as part of the UD approach.

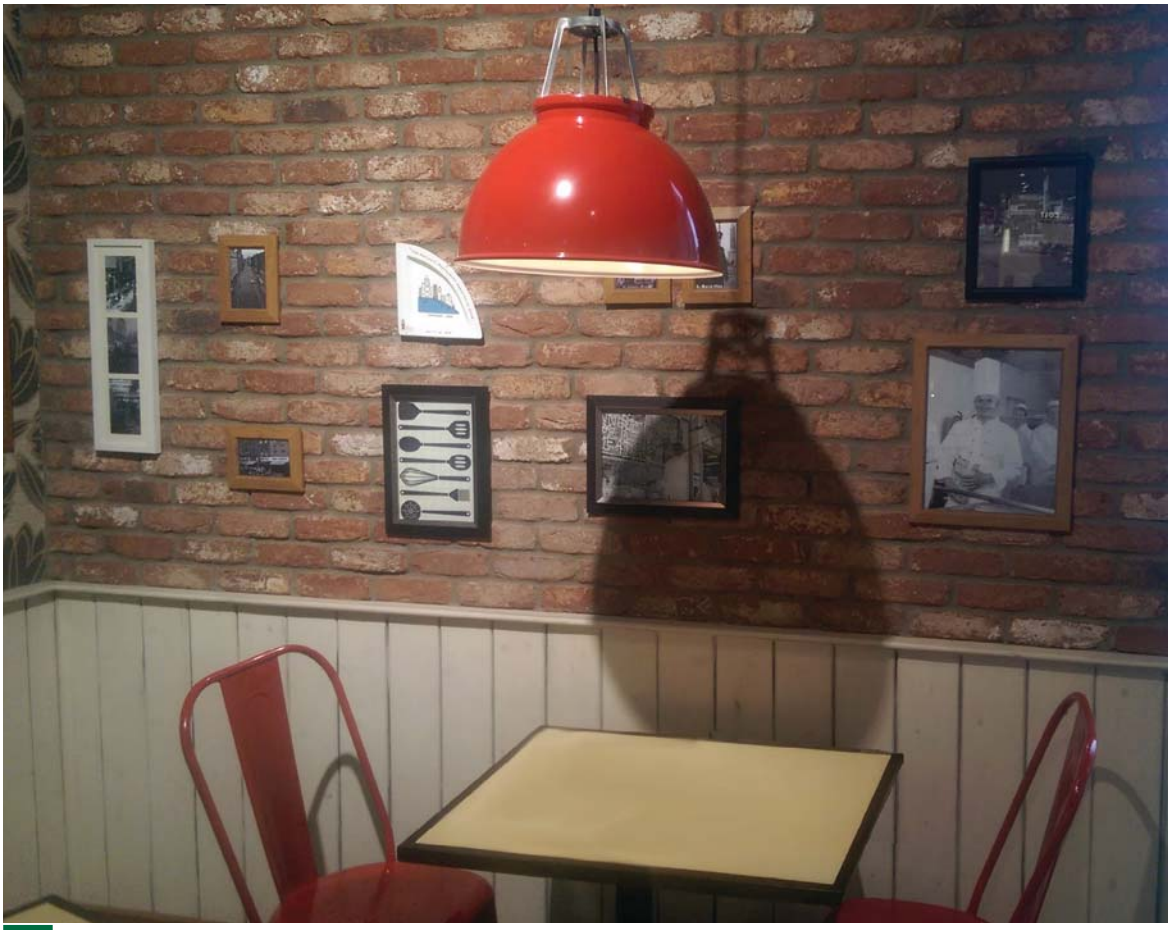
Please refer to Section 3.1 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Locate the living room away from sources of external and internal noise to create relaxing spaces that open out onto calm and safe external spaces receiving natural light.
- Ensure that internal and external walls, ceilings, floors, or windows have sufficient acoustic insulation to mitigate airborne and impact sounds from external and adjacent internal spaces.
- Whether the living area is open plan or not, every effort should be made to provide direct lines of vision to key spaces such as bathrooms, kitchens, or dining areas, to help with orientation and provide visual cues.
- Windows must be sized and located to provide daylighting and views to external spaces. Typically, a living room will benefit from a south and west orientation to capture midday and evening sun. Ensure that window transoms or window sill heights do not obstruct a seated person's view from the room.
- Where appropriate provide direct access from the living area to a safe and accessible outdoor space..
- Use colour and tone to provide contrast between the furniture and floor, and to make floors, walls, doors and other important features more legible.

Direct consultation with the occupants or family members may reveal certain preferences or design approaches that are most appropriate for the occupant.

3.2 Dining Rooms



02 *A dining area with feature lighting and cooking related decor.*

Photo Design Features

- Feature lighting to emphasise the dining table.
- Timber wainscotting fitted to the wall which is used as a design feature to reinforce the function of the space.
- Food related images and objects decorating the wall.
- Red chairs standing out from light coloured wainscotting in background.
- Section of the brick wall used to create a visual feature within the space.
- Dark brown rim around the table gives it more definition against background.

Photo Design Tip

▲ The strong patterns on the wall paper to the left may cause confusion for some people with dementia. If it is an existing wallpaper then it may help to keep it. Consult with the person with dementia and their family/carers for their feedback.

Design Considerations and Awareness

While the UDHI Guidelines outline a number of measures that will make a dining area more accessible and usable by all people, there are a number of subtle issues that can be examined to enhance the eating experience and to positively influence the eating habits of a person with dementia.

In many homes the dining area is part of the kitchen, or adjacent to the kitchen in an open plan arrangement. This may be used as an advantage where direct views to cooking activities and cooking smells from the kitchen stimulate appetite by providing visual and olfactory cues. Visual connection between a person with dementia and a family member, or carer, will help with caring while also allowing a person with dementia to see other people in the dwelling, thus reducing anxiety about being alone or isolated.

Using natural and artificial light, or lighting contrast to define the dining area will help to reinforce the meaning and function of the space, while food related images and other objects will help provide additional visual cues in relation to dining.

Please refer to Section 3.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Locate the dining area in close proximity to the kitchen so that cooking smells and views to food preparation are available.
- If the dining area is part of the kitchen, or part of an open plan arrangement, use lighting, finishes, colour, tonal contrast (on the wall), or decorative objects or images to create a distinct dining area with familiar elements.
- Ensure that the floor finish is continuous with adjacent spaces to eliminate anything that could be misconstrued as a step.
- Use overhead lighting to emphasise the dining table and to create good lighting thereby enhancing visual conditions.
- Use tables and chairs that visually contrast with the wall and floor. In this context avoid glossy surfaces that may cause a shine or glare, and use a table colour, or place mats that will contrast with crockery, glassware or cutlery.

Direct consultation will inform the design process and ensure that a design approach or objects that are best suited to the occupant can be used to engage with long-term memories.

3.3 Kitchens

03 *A bright modern accessible kitchen.*

Photo Design Features

- Dining table located within the kitchen area.
- Dark colour floor tiles and counter top provide good visual contrast.
- Adjustable sink unit allows it to be lowered or raised depending on needs.

Photo Design Tip

- Colour contrast between wall and kitchen units will make space more legible.

Design Considerations and Awareness

The design of the kitchen should aim at enhancing independence, social interaction, and nutrition. The kitchen is central to many ADLs, such as eating, and IADLs, for example cooking or washing clothes. While the kitchen should serve all occupants, it is critical in supporting people with dementia so that they can be assisted to continue as far as possible to prepare and cook food, set the table, clean up after the meal, do laundry, etc. In this regard accessibility, usability, and safety are paramount, not only for the person with dementia, but also for family members, or others providing care support.

The kitchen is often the heart of the home, and in many cases it is closely related to the living room, and it is in these two spaces that occupants will spend most of their time during the day. The UDHI Guidelines outline measures that will make a kitchen more usable by a person with dementia and to supplement these, there are a number of specific issues that should be considered:

- Locate the kitchen away from external disturbances and ensure that it receives plenty of daylight, and opens out onto a calm and safe external space.
- Locate the kitchen in a central location within the house to make it more accessible.
- Provide direct access between the dining room and the kitchen to help with the transmission of sensory cues, supervision, and comforting visual contact with others in the house.
- Direct visual and physical access to safe outdoor spaces will encourage and provide opportunities for a person with dementia to partake in outdoor activities such as putting out the rubbish, or hanging out clothes.
- Ensure good natural and artificial lighting for general visibility and for undertaking tasks. People with dementia will often need higher levels of lighting and therefore even, distributed lighting must be maximised. Use downlighters to highlight certain specific areas such as a sink or cooker.

04 Bright contemporary kitchen.

Photo Design Features

- Bright kitchen with plenty of daylight which is also provided with even artificial lighting from a number of ceiling mounted downlighters.

Photo Design Tip

- Better colour contrast between the kitchen units and the walls would provide better legibility within this space.

Sound absorbing materials, non-glossy finishes, and good visual contrast between the walls, floors, counters, kitchen units, and appliances will all contribute to a calm and easily legible environment. This approach will be reinforced by reducing clutter, ensuring that white goods such as fridges or washing machines are not placed behind kitchen unit doors, and by using more traditional appliances that may be more familiar to the occupant.

Making sure that certain objects and spaces are clearly visible, especially food, crockery, or cooking items, may serve as a reminder and may help with activities such as cooking and in turn nutrition. The use of clear glazed kitchen units which reveal their contents may help in this regard.

05 *Clear glazed wall-mounted kitchen units giving visual access to contents.*

The use of more familiar appliances and kitchen fittings may resonate with older personal memories and therefore enhance usability. For example, more traditional taps may be recognisable to older people, regardless of short term memory loss or the inability to learn new things.

06 *Typical kitchen tap in a modern home.*

Risk and safety are major concerns in a kitchen, but it is vital not to undermine a person's independence. As discussed in the introduction, 'positive risk taking' strikes a balance between safety, autonomy and wellbeing and this can be considered in the context of kitchen design. While bearing this in mind, it may still be necessary to provide safety measures, or in some cases to conceal certain hazards which pose a particular threat. Flexible and adaptable solutions should be considered to deal with any progressive decline in a persons cognitive abilities, or to ensure that these measures do not restrict other members of the household. (**See Section 4 for more information on assisted living technologies).**

Please refer to Section 3.3 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Locate the kitchen away from sources of external and internal noise and ensure where possible that it opens out onto calm and safe external spaces that receive plenty of daylight.
- Provide visual access to key adjacent spaces such as dining areas, the living room, bathrooms and to safe outdoor spaces.
- Provide direct access to safe outdoor spaces to facilitate activities that require movement between the kitchen and outdoor spaces for activities such as taking out rubbish, recycling, or doing the laundry.
- Windows must be sized and located to provide good daylighting and views to external spaces. Typically, a kitchen will benefit from an east and south orientation to capture morning and midday sun.
- Use colour and tone to provide contrast between furniture and the floor, and to make floors, walls, doors, light switches, plug socket plates and other important features more legible. Make sure these colours contribute to a bright room where lighter colours can be used to reflect light.
- Avoid glossy floor, counter or kitchen unit materials that may cause glare.
- Ensure a continuous floor finish with adjacent spaces to avoid changes in material that may be mistaken for a step.
- Avoid concealing white goods or other kitchen appliances behind kitchen unit doors to ensure maximum visibility.
- Use traditional or familiar fittings with simple controls to enhance usability.
- Use open shelves or wall mounted units with clear gazed panels for maximum visibility to regularly used foodstuff, crockery or cooking utensils.
- To avoid accidental misuse, remove potentially hazardous materials or appliances, or certain controls in a kitchen unit which are identical to adjacent units, or painted to match the background. Lockable units can also be used for this purpose, if necessary.
- Use labels, images, or photos on kitchen unit doors or appliances to remind the occupant about their use(s), or what each item contains.
- Consider safety devices such as automatic gas and water shut-off valves, or cooker and oven shut-down devices. Consult your plumber/electrician/specialist supplier for more information on these safety devices.

UD Dementia Friendly Design Guidance

- Smoke and heat sensors linked to an alarm system will enhance safety. These should not emit an excessively loud alarm sound as this could be very frightening and disorientating for a person with dementia. Where possible, consultation with the person with dementia and their families and carers would help in providing the right solution. In some cases it may be best to link these to a carer alert system, or an external monitoring service. (See Section 4 for more information on assisted living technologies).

Consultation with the occupants or family members may reveal certain preferences or design approaches that are most suited to occupant(s), or that provide higher levels of safety.

"I built the kitchen myself. I am very, very attached to it ... I am more or less happy with my kitchen. I have designed it for myself ... After 30 years in it, it becomes automatic" (man with dementia living in his own home).

3.4 Entry-Level Toilet

Design Considerations and Awareness

The UDHI Guidelines outline the requirements for an entry level toilet and discuss the benefits of making this toilet large enough and providing plumbing and drainage provisions so that it can accommodate a shower at some future date. This will allow an entry level room to be used as a bedroom and to be provided with adequate sanitary facilities. In the context of a typical two storey dwelling, this will also provide a downstairs shower adjacent to the main living areas.

Most of the relevant dementia friendly issues relating to toilets will be discussed in Section 3.6 Bathrooms.

Please refer to Section 3.4 in the UDHI Guidelines for overall guidance.

3.5 Bedrooms

07 Acessible bedroom with adjacent accessible ensuite toilet.

Photo Design Features

- The WC is clearly visible form the bed to provide a visual prompt to use the toilet when required.
- The wardrobe is visible from the bed to provide a prompt about getting dressed.

Photo Design Tip

- If the door to the ensuite was a distinct colour it would be more visible when closed.
- The sharp colour contrast between the bedroom floor and the hallway and ensuite may be seen as a step by some people with dementia.
- In the example above, there are objects behind the doors that prevent the doors from opening fully. Care must be taken with the arrangement of furniture to ensure doors can be fully opened for maximum visibility.

Design Considerations and Awareness

Sleep disturbance is common in some people with dementia. This often results in insomnia, nocturnal restlessness and wandering. In this regard, the bedroom must be designed to firstly help a person get a good nights sleep, and secondly to provide a safe environment at night when a person wakes up to use the toilet, or to move around in their room.

The bedroom is also central to ADLs such as dressing, walking and grooming. The design of the bedroom can provide supports for these activities by making sure that the room is properly lit, and that wardrobes or dressing tables and their contents are fully visible and usable.

In many dwellings the master bedroom will have an ensuite bathroom, and in this scenario the spatial relationship between the two rooms must be carefully considered. In other cases, such as older houses, or secondary bedrooms without an ensuite, proximity to a bathroom and the adjoining corridor must be fully considered to ensure a safe and supportive circulation between the rooms.

08 Bedroom with direct views to ensuite. Image 1 shows the door to the ensuite open while Image 2 shows it closed.

Photo Design Features

- The ensuite is easily accessible while the WC is clearly visible form the bed to provide a visual prompt to use the toilet when required.
- The use of the timber door to the ensuite provides a good colour contrast with the wall and therefore make it more visible from within the bedroom.

Photo Design Tip

- A plain floor finish within the ensuite, as opposed to the tile pattern, may cause less confusion for a person with visual difficulties.

In general, colour contrast between floor coverings and the visibility of the threshold should be minimised. Change of material to ensuite door would also make it more visible from a bedroom. Oftentimes, the bedroom may also serve as a retreat area, not only for the person with dementia, but for all others

in the dwelling. In this regard it must generally provide a calm and relaxing environment for resting, reading or just getting away.

Please refer to Section 3.5 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Locate the bedroom away from sources of external and internal noise to create a calm and relaxing space.
- Ensure that internal and external walls, ceilings, floors, or windows have sufficient acoustic insulation to mitigate airborne and impact sounds from external and adjacent internal spaces.
- Windows must be sized and located to provide good daylighting and views to external spaces. Typically, a bedroom will benefit from an east and south orientation to capture morning and midday sun. Ensure that window transoms or window cill heights do not obstruct a person's view of the outside when lying down or seated.
- Where the bedroom is not served with an ensuite ensure that a sufficiently sized room (See UDH Guidelines) is located adjacent to a bathroom providing ease of access, especially at night.
- In bedrooms served with an ensuite ensure that there is a direct unimpeded access route from the bed to the door of the ensuite.
- Ideally the WC should be visible from the bed to provide visual cues in relation to using the toilet. Ensure the doors are hung so they can open fully to reveal the WC when viewed from the bedroom.
- Use a distinct colour or tonal contrast to make the ensuite door more visible from the bedroom and recognisable as a bathroom.
- Minimise or eliminate, where possible, any threshold between the bedroom and the ensuite. While the ensuite floor will often be tiled or finished with linoleum (as opposed to timber or carpet in the bedroom), it is still important to minimise the colour and tonal contrast at the threshold to avoid the appearance of a step.
- Use colour and tone to provide contrast between furniture and the floor, and to make floors, walls, doors, light switches, plug socket plates and other features more legible. Make sure these colours contribute to a bright room where lighter colours can be used to reflect light.
- Wardrobes should be located so they are clearly visible from within the room, especially the bed. This will provide visual cues about getting dressed, particularly first thing in the morning.

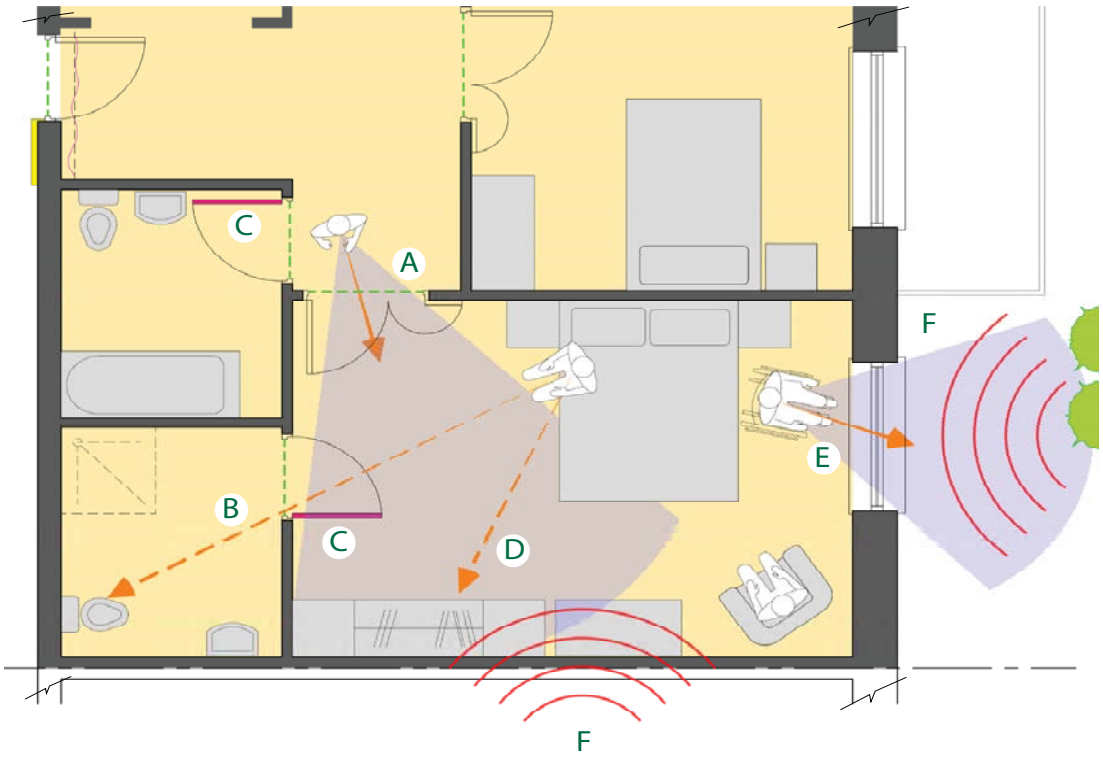
UD Dementia Friendly Design Guidance

- Consider using clear glazed panels in certain sections of the wardrobe doors to allow a person to see their clothing as a visual prompt to get dressed. In some cases it may help if a person's clothes for the day are left out in this section the night before.
- Use signage on ensuite doors, wardrobes, dressers and drawers, or on certain switches or controls, to make key spaces and objects legible.
- Ensure that the room is adequately lit by removing heavy curtains, blinds or pelmets that may reduce daylight. Replace existing light bulbs to achieve higher levels of artificial lighting in the room.
- Artificial lighting should be designed to provide high levels of even lighting with spot lights or similar feature lighting, such as down lighters, used to highlight specific areas or key objects associated with particular tasks.
- Assisted Living Technologies such as movement sensors or pressure mats that activate lighting once a person gets out of bed can be used to guide a person to the toilet at night. Telecare and ambient assisted living technologies should be considered in this context. **(See Section 4 for more information on Assisted Living Technologies).**

Direct consultation with the occupants or family members may reveal certain preferences or design approaches that are most suited to the occupant.

Technical Sketch:

UD Dementia Friendly bedroom and ensuite



A. Provide extra wide doors or 'cat and kitten' doors to provide maximum physical access and also good visual access.

B. Provide direct views to the WC from the bed to provide a visual prompt.

C. Provide a distinct colour door to ensuite bathroom to visually reinforce its location and function.

D. Provide direct views to the wardrobe and consider glazed doors to sections of wardrobe to provide views of the clothes hanging inside.

E. Ensure window location, window cill height and window dressings, such as blinds or curtains, facilitate visual access to the outside.

F. Ensure good acoustic conditions by orientating spaces away from sources of noise or by providing high levels of acoustic insulation such as triple glazing.

Technical Sketch:

3-Dimensional views to UD DFD bedroom and ensuite

A. Provide extra wide doors or 'cat and kitten' doors to provide maximum physical access and also good visual access.

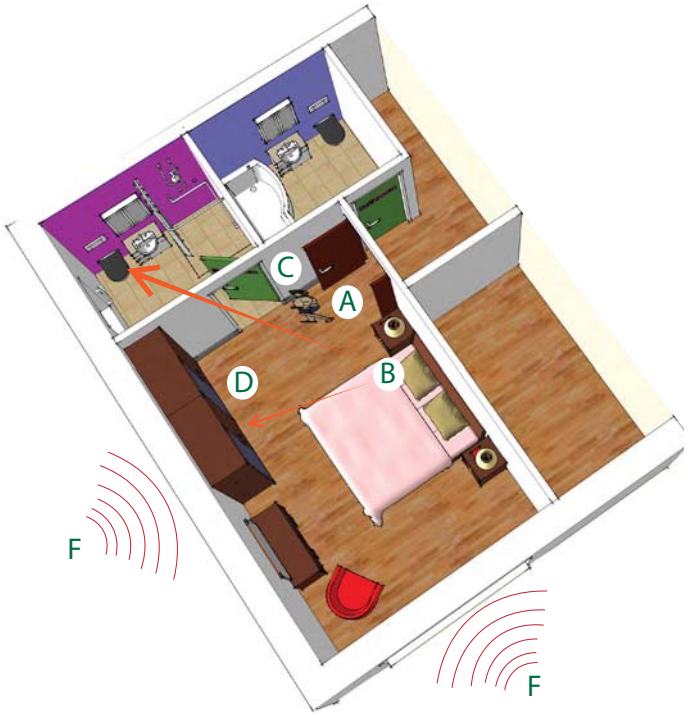
B. Provide direct views to the WC from the bed to provide a visual prompt.

C. Provide a distinct colour door to ensuite bathroom to visually reinforce its location and function.

D. Provide direct views to the wardrobe and consider glazed doors to sections of wardrobe to provide views of the clothes hanging inside.

E. Ensure window location, window sill height and window dressings, such as blinds or curtains, facilitate visual access to the outside.

F. Ensure good acoustic conditions by orientating spaces away from sources of noise or by providing high levels of acoustic insulation such as triple glazing.



3.6 Bathrooms

09 Two bathrooms with contemporary fittings.

Photo Design Features

- Image 1 shows a wall mounted sink which makes cleaning the floor easier and creates a more spacious feeling.
- Image 2 shows a wall mounted WC, which again is helpful in terms of cleaning and creating a greater sense of space.
- Image 2 also shows how colour is used to create visual contrast between the walls, floor and the WC.
- The bathroom in Image 2 is fitted with grab rails to assist people with mobility difficulties.

Photo Design Tip

- A greater colour contrast between the sanitary fittings and the walls shown in Image 1 would make this space more legible.
- The use of stainless steel grabrails in Image 2 may not be comfortable for some users.
- Try and make the bathroom look more homely rather than a medical space. Use off-the-shelf sanitary goods and place them as per the regulations in order to minimize an overly institutional feel.

Design Considerations and Awareness

The UDHI Guidelines details a range of measures which will make bathrooms more accessible, easily understood, and usable by people with dementia, while also creating a supportive environment for family carers or care workers. However, as the bathroom may be a difficult room for a person with dementia to interpret due to rapid advances in bathroom design over the years, several dementia specific issues should be reiterated as part of a UD dementia friendly approach to bathrooms.

Personal care, including toileting or showering are critical to a person's self confidence and independence and the bathroom must be carefully designed to support these activities. Similar to other spaces in the home, familiar design, a calm, easily interpreted space, good visual access, and the use of unobtrusive safety measures, will contribute to a secure and supportive space for people with dementia and carers alike.

Please refer to Section 3.6 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- The main bathroom (whether it is on the ground or the first floor) should be centrally located with ease of access from all parts of the dwelling.
- The bathroom windows should be large enough and located to provide maximum daylight for the bathroom. Typically, a bathroom will benefit from an east and south orientation to capture morning and midday sun.
- The bathroom door should be visually distinct through the use of colour or tone to make it clearly visible within the dwelling.
- Minimise or eliminate, where possible, any threshold between the bathroom floor and the hallway. While the bathroom floor may be tiled or finished with linoleum, in contrast to carpet or timber in the hallway, it is still important to minimise the colour and tonal contrast at the threshold to avoid the appearance of a step.
- Use signage on the bathroom door to make it easily recognisable.
- Artificial lighting should be designed to provide high levels of even lighting with spot lights or similar feature lighting, such as downlighters or concealed strip lights, used to highlight specific areas or key objects such as sinks or WCs.
- Provide adequate levels of mechanical ventilation to remove steam during bathing times.
- Ensure all mirrors can be easily moved, removed or covered over.

UD Dementia Friendly Design Guidance

- Where condensation on mirrors is causing problems for a person with dementia, consider fitting proprietary heating pads behind mirrors to keep them steam free.
- Install anti-scald taps to kitchen sinks or thermostatic mixing valves to bath taps or showers to prevent scalding during bathing times.
- Consider safety devices such as automatic water shut-off valves.
- Assisted living technologies such as movement sensors or emergency pull-chords can help in the case of a fall. Telecare and ambient assisted living (AAL) technologies should be considered in this context. **(See Section 4 for more information on assisted living technologies).**

Direct consultation with the occupants or family members may reveal certain preferences or design approaches that are most suited to the occupant.

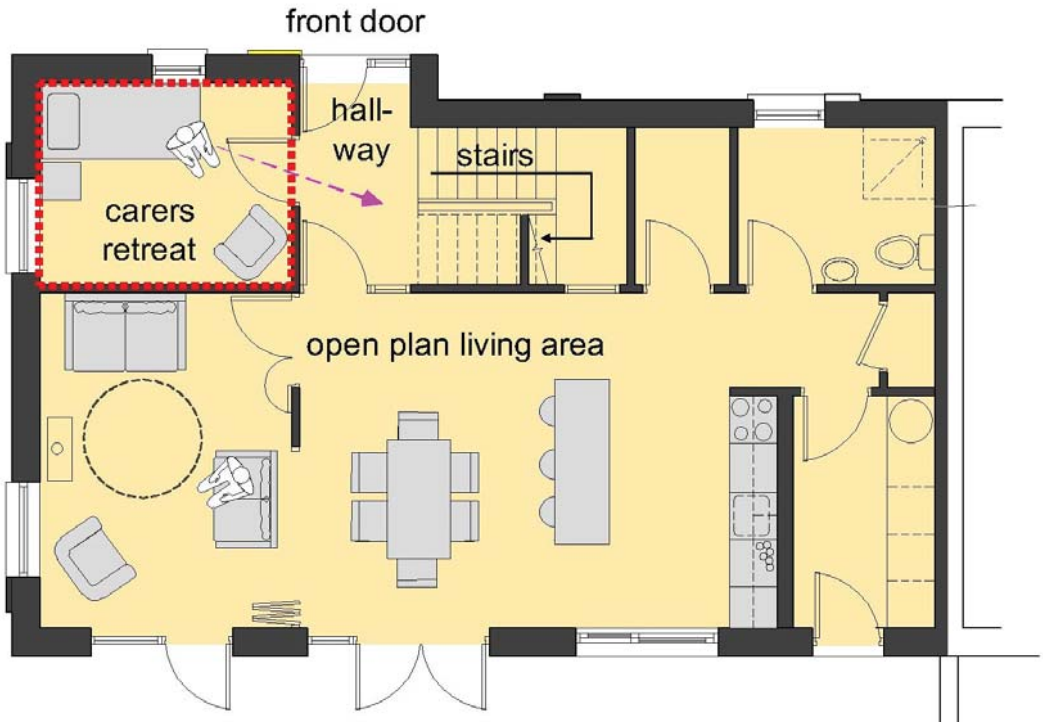
"The bathroom is awkward...to use the bathroom you have to go down...that is ok during the day...but at night-time negotiating the stairs" (Man with dementia living in his own home).

3.7 Multi-purpose rooms - Retreat Space for Carers

Design Considerations and Awareness

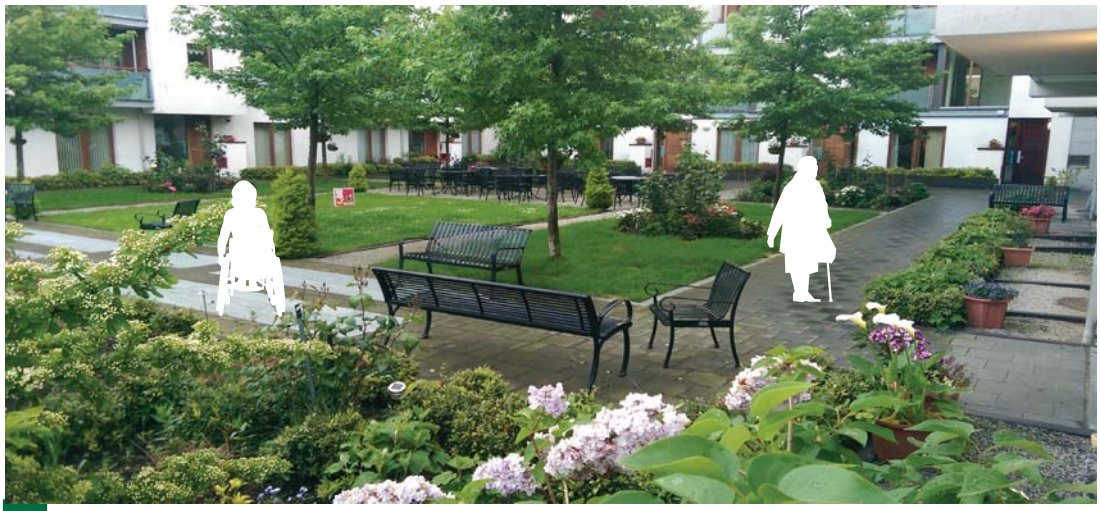
The UDHI Guidelines outline a range of issues concerning study rooms, and storage and utility spaces. These sufficiently cover issues regarding dementia friendly design. However, in the context of a dwelling that is designed to not only support the person with dementia, but also support family members and carers, it is worth discussing the provision of a retreat space for both people with dementia and carers. This retreat space may simply be a bedroom or a study that allows the person with dementia or carer to withdraw to a quiet space or carry out activities in privacy.

Please refer to Section 3.3 in the UDHI Guidelines for overall guidance.



09 *An example of a room that could provide a retreat space for a carer. The location of this room provides some level of privacy while allowing the carer visual access to key spaces such as the stairs and the front door.*

3.8 Private Outdoor Space



10 Courtyard in an apartment scheme for older people.

Photo Design Features

- Ground floor residential units have direct access to courtyard space.
- Various moveable seating types allow residents to exercise control over seating arrangements.
- Flat lawn space provided for sitting or lying out on the grass.
- Plants used to stimulate senses and create an attractive space.

Photo Design Tip

▲ The change of material on the walkway to the left could be misconstrued as a step or change in level by a person with dementia.

Overall Design Considerations and Awareness

Easy access to outdoor space is critical for people with dementia as access offers opportunities to carry out physical activities, get fresh air and exposure to daylight, which are all therapeutic for people with dementia. Gardens also provide multisensory experiences through contact with wildlife and plants, exposure to seasonal change, and information about the time of day, all of which help with orientation.

Private or semi-private outdoor space can take many forms, and can range from a small balcony to a large garden or courtyard. As long as the space provides an opportunity to be outside it will be beneficial for all occupants. However, depending on the nature and intended purpose of the outside space, an adequately sized area is important to allow a person who may have mobility difficulties to comfortably access, sit out or grow some plants or flowers in the space.

11 Covered terrace area outside ground floor apartment in modern apartment development.

Photo Design Features

- Ground floor residential units have direct access to covered terrace space.
- Terrace spaces open directly to common areas and extensive views.
- The projecting building and canopy provide a deep covered area for sitting out, eating, or growing flowers or plants.
- The covered area provides a transition space between outside and inside in terms of graduated natural light levels, shelter from the elements and a sense of enclosure and protection.

Photo Design Tip

▲ The change of material on the walkway to the left could be misconstrued as a step or change in level by a person with dementia.

Some kind of covered space between the interior and the exterior space, such as a veranda, pergola or covered terrace as shown above, will benefit people with dementia by providing a transition area between inside and outside. This transition space will help those who are sensitive to bright light or who have visual adaptation difficulties which may be exacerbated when moving from dimly lit interiors to brighter external daylight conditions. Such spaces will also provide shelter and shade in wet, windy or excessively sunny conditions.

When designing outdoor spaces consider how familiar planting, finishes, furniture or other fittings can be used to make these spaces more recognisable, trigger long-term memory and help with reminiscing for a person with dementia.

All of the above must be provided within a safe environment, so where required, care should be taken to provide secure boundaries that cannot be easily climbed. Secure garden gates that can be subtly disguised are also helpful.

12 *An example of a well designed garden.*

Private Gardens

Design Considerations and Awareness

Private gardens provide for a range of uses and activities and in the context of a UD dementia friendly dwelling it is important to consider the following:

- Provide space for socialising. This may be a bench or few garden chairs, or an outdoor eating space such as a patio with table and chairs.
- If areas for rubbish and recycling bins, fuel stores, garden sheds or clothes lines are within easy reach and in clear view, they may prompt a person to engage with domestic activities such as hanging out clothes or putting out the rubbish.

- A covered external space between the interior and the exterior will benefit people with dementia and others, by providing a transition area between inside and outside. In a private garden this might take the form of a veranda which would extend the living area and provide a space for a person to be outside without full exposure to the weather conditions.

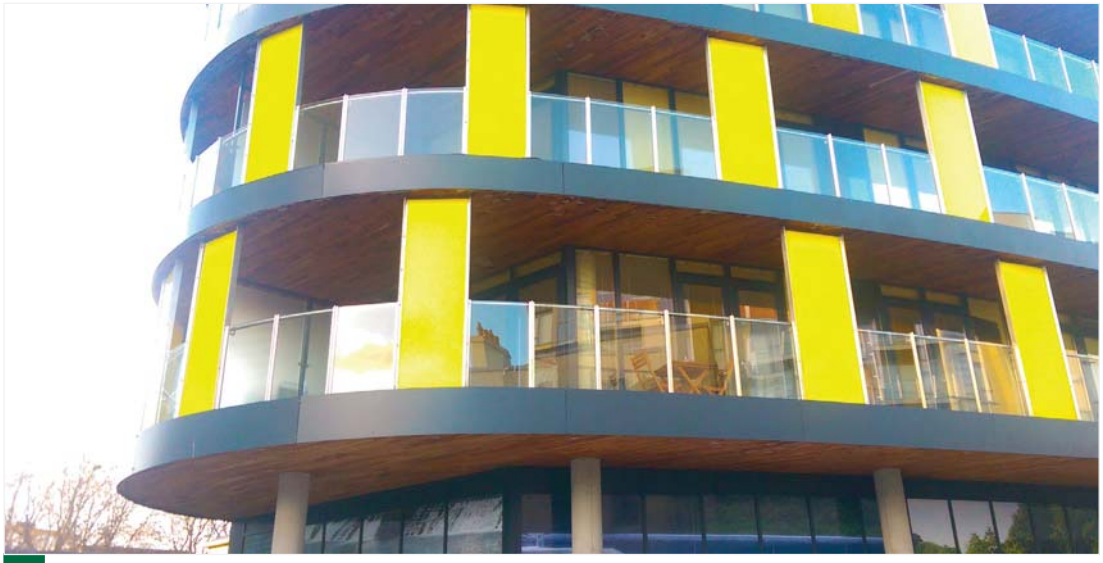
- Many gardens provide views to the community, or views to the surrounding landscape. Therefore, a balance must be struck between secure boundaries and visual and auditory contact with the adjacent environment.

Please refer to Section 3.8 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- The internal and external spaces of the dwelling must be designed together in an integrated manner in order to create a unified whole and to provide physical and visual access to the outdoors.
- Provide level access from the key internal living spaces such as the living room or the kitchen through an accessible and easily operated external door.
- Consider the use of a veranda, pergola or similar space to provide a shelter or shaded transitional outdoor space that can allow people to sit outside without full exposure to the weather conditions.
- Use solid, non-slip, non-reflective material for ground surfaces without strong patterns. Ensure the ground surfaces are suitable for wheelchairs or a person who may shuffle when walking.
- Avoid the use of garden structures or items which might cast slatted shadows on the ground which may be perceived as troughs or changes in level.
- Avoid abrupt changes in ground finishes or junctions between very different materials.
- Provide plants preferred by resident (e.g. roses or lilacs). Use planting that will also clearly illustrate the changing seasons.
- Provide multisensory experiences through the use of colourful planting or colourful materials for visual stimulation; fragrant planting for olfactory stimulation; textured objects and plants for tactility; or bubbling water features or similar for aural stimulation.
- Consider how the design of these spaces can provide for pets or other small animals such as rabbits. Consider growing vegetables, fruit, or herbs which can be picked and used – these activities may be therapeutic for people with dementia.
- Where safety is a major issue, provide an enclosure using trees, tall shrubs or bushes to screen walls or fences. This planting will also lessen the feeling of being overly contained.
- See Section 1.2 for specific guidance relating to paths, gateways, ramps, handrails, lighting, etc.

Direct consultation with the occupants or family members will provide information about garden layouts, garden furniture or planting that would be familiar or preferred by the person with dementia.



13 *Many recent apartment developments include large balconies and these can provide excellent private outdoor spaces.*

Photo Design Features

- Large balconies that wrap around the apartment giving direct access to the balcony from all rooms.
- Glazed balustrade providing maximum views to the surrounding landscape from the balcony and from within the apartment.

Photo Design Tip

- In terms of safety it may be appropriate to consider providing a higher balustrade or provisions for full height glazing similar to a wintergarden.

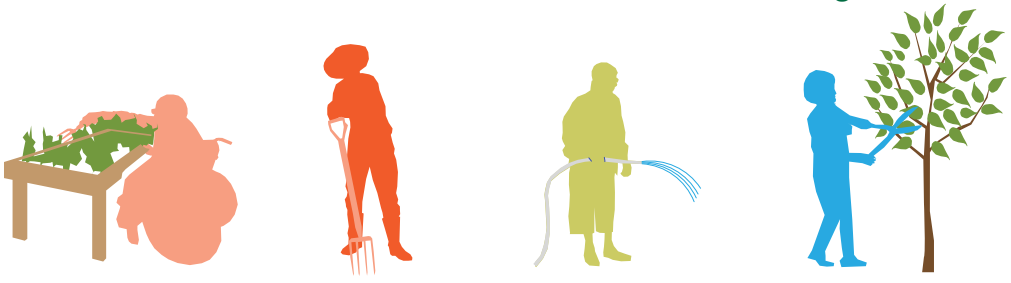
Balconies and Terraces

Design Considerations and Awareness

Well designed balconies and terraces can provide many of the same benefits that have been outlined in the previous section. Access to fresh air, daylight and views, or the opportunity to grow plants or food may be very enjoyable therapeutic for a person with dementia.

The key issues around providing good quality balconies or terrace space revolve around access, adequate space, and safety.

Please refer to Section 3.8 in the UDHI Guidelines for overall guidance.



14 Fully glazed balcony or 'Winter garden' in a recent apartment development. This also has a smaller open section with direct access from a bedroom.

Photo Design Tip

▲ If this balcony had a greater depth, it would provide a higher quality external space and allow the growing of plants or vegetables which can be a therapeutic and meaningful activity for a person with dementia, as well as allow the person to sit outside and enjoy the weather.

UD Dementia Friendly Design Guidance

- To ensure that a balcony or terrace is fully usable by a person with dementia it must be easily accessed and visually accessible from key internal spaces such a living, kitchen or bedroom.
- While a typical balcony with standard 1200mm high balustrade may be appropriate in most cases, it may also be worth considering the creation of a 'winter garden' style balcony which is fully enclosed.
- Where safety is a real concern provide 1800mm high safety glazing or similar balcony balustrade or full height screening.
- Providing a balcony with a minimum depth of 1500mm or 1800mm will ensure that it can function as an adequate outdoor space. This may be particularly important if a person spends much of their time at home.

Direct consultation with the occupants or family members may reveal certain preferences or design approaches that may help inform the design of balconies or terraces so they are suitable for people with dementia.

Centre for Excellence in Universal Design

Elements and Systems 04

Universal Design Dementia Friendly Dwellings

The building elements and systems should create a comfortable home that is easy to manage and understand, and affordable to run. The Universal Design Dementia Friendly Dwelling should promote well-being and good health, and anticipate the changing needs of not only the person with dementia, but all occupants including family members and carers.

Bridget and Paul live on the third floor of an apartment building in the suburbs and find the modest sized space with balcony very manageable.

Recently they renovated and find the new timber floors, light coloured painted walls and additional light fittings have made the apartment a lot brighter and more uplifting. Bridget finds it much easier to locate things which makes cooking much more manageable for her.

Elements and Systems - Overall Design Issues

Elements and Systems refer to a wide range of detailed issues such as finishes, ironmongery, signage, heating, lighting, or assisted living technologies. Careful detailing of a dwelling is critical to a Universal Design (UD) approach and while the Universal Design Homes for Ireland (UDHI) Guidelines provide much detail in this regard the following dementia friendly issues are important considerations in the treatment of Elements and Systems as part of a UD dementia friendly approach.

With regard to elements and systems consider these key **Design Issues:**

Participatory Design: this process will help select preferred finishes, colours, ironmongery, or technology that meet the needs of all users including the person with dementia.

Familiar Design: following on from the above, a dwelling's materials, finishes and fittings often represent the most identifiable items in the house. Ensuring that these are selected to align with the expectations and past experiences of the person with dementia is critical.

Personalisation: elements of the dwelling such as finishes and colours present a major opportunity for people to personalise their home.

Easy to Interpret and Calm: the detail encountered at this level of design will allow a focus on acoustic qualities, the specification of wall and floor finishes, artificial lighting design, or signage, all of which contribute to an easily understood and calming environment.

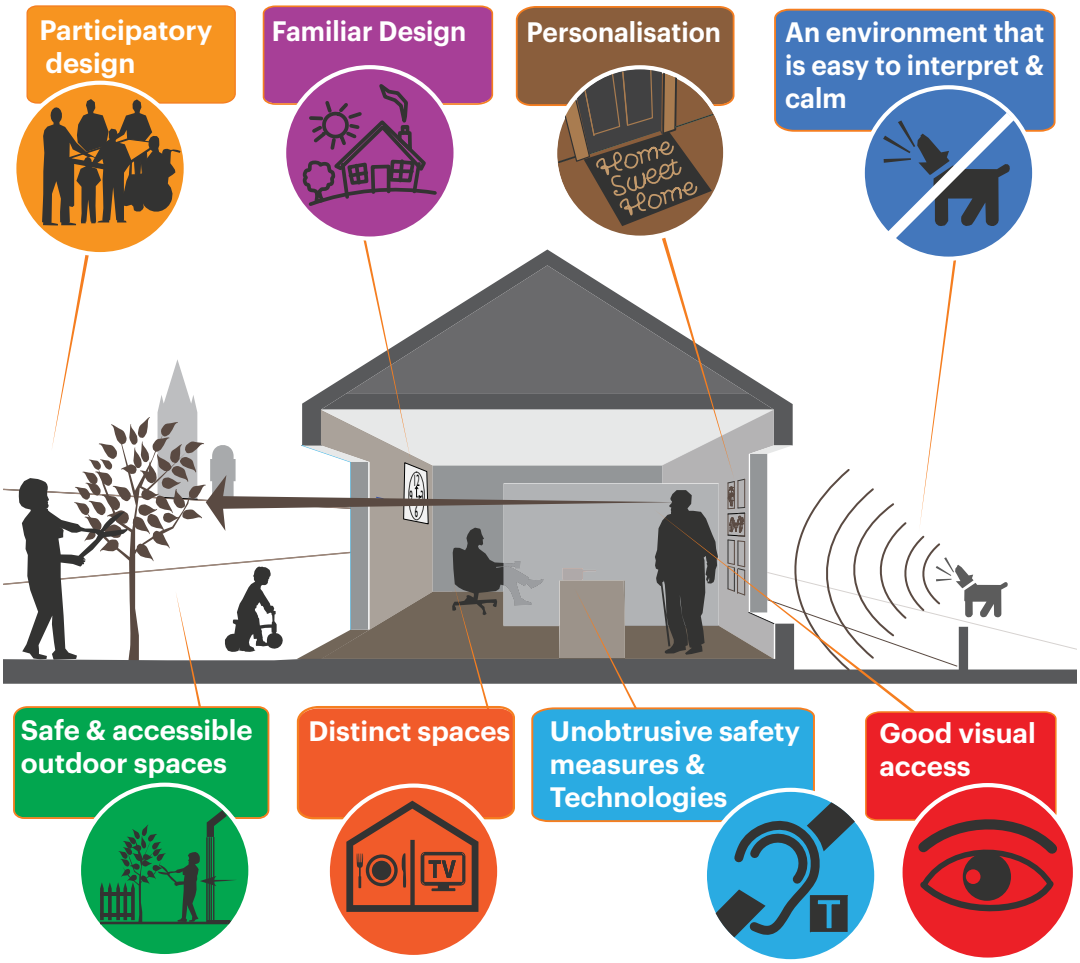
Good Visual Access: careful window and internal door design, coupled with good daylighting and artificial lighting, will enhance visibility within the dwelling.

Unobtrusive Safety Measures and Assisted Technologies: careful design of elements and systems will support independent living and a good quality of life. Taking a participatory design process ensures that the design response is appropriate and supports positive risk taking.

Distinct Spaces: materials, finishes, colours or specific lighting can be used to create distinct spaces to reinforce associated activities such as dining, bathing, or dressing.

Safe and Accessible Outdoor Spaces: the specification of certain elements and systems, such as materials, finishes, or artificial lighting, or the installation of assistive technologies, can be considered in relation to outdoor space to ensure that these spaces are accessible, usable, easily understood and safe.

Please refer to the Introduction Section of this document for more detail on these design issues.



4.1 Building Construction, Materials & Finishes

Considering the progressive nature of dementia, a dwelling will benefit from built-in flexibility and adaptability to allow modifications in line with changing needs. This will result in less disruption for the occupant should any modifications be required.

01 A strong load bearing structure will allow the future fitting of various forms of assistive technology ranging from ceiling hoists to grab rails or shower seats, as shown above.

Building Construction

Design Considerations and Awareness

The UDHI Guidelines discuss flexible and adaptable design and this is also a crucial approach in terms of UD dementia friendly dwellings.

Dementia is a progressive condition that affects people in very different ways, so providing adaptable and flexible solutions is critical to their ongoing support. The needs and abilities of family members and carers will also change so the dwelling will also have to be adapted in this regard.

The design of a dwelling should minimise the need for major changes as this will allow a person to remain at home during any modifications. This would eliminate the anxiety often provoked by a temporary move and alleviate the stress associated with major changes to a familiar environment.

Beyond the issues mentioned above, the design considerations covered in the UDHI Guidelines provide enough information to ensure that adaptability can be designed into a dwelling and therefore cater to the future needs of people with dementia, their families and carers.

Please refer to Section 4.1 in the UDHI Guidelines for overall guidance.

02 Front doors painted distinct colours to make them more recognisable.

Photo Design Features

- These doors are located opposite each other in the same corridor but the use of distinct colours creates a more recognisable entrance.
- Memory boxes are placed adjacent to the front doors to personalise the entrance and make it more identifiable. This would need to be agreed with the overall building owner or the management company who are typically responsible for communal areas in a residential building.
- Handrails provide support while a person is walking in the corridor and also as they open their front door.

Photo Design Tip

- If the apartment numbers were larger they would be more visible for all users.
- A light fitting above or adjacent to the door would provide higher levels of illumination which may be helpful when looking for keys or opening the door. It would also illuminate the door and make it more recognisable on approach.

Building Materials and Finishes

Design Considerations and Awareness

The UDHI Guidelines discuss the importance of building materials and finishes in terms of usability, health, safety and aesthetics. It also refers to the importance of legibility and comfort, and these are relevant for everyone including people with dementia.

Materials and finishes determine the interior visual quality of a dwelling through

colour, tone, reflectance, or the use of patterns. However, if they are well designed they can be used to compensate for visual, memory, or cognitive difficulties and help people living with dementia to remain living independently at home for as long as possible.

The following sections briefly discuss some of the key issues around building materials and finishes in the context of the UD dementia friendly dwelling.

Building Materials and Finishes: Colour, Tone and Contrast

Introducing colour and tonal contrast can be beneficial to people with both dementia and visual difficulties. Colour contrast can also help compensate for impaired reasoning. For example, contrasting colours or the use of sharply contrasting tones within the same colour, can help people to distinguish between different surfaces and between surfaces and objects. Contrasting colours can be used to distinguish doors from the surrounding walls and thus facilitate recognition of access points and make the environment easier to negotiate and understand.

03 Seating area with colourful contemporary furniture.

Photo Design Features

- While this is not a domestic space it illustrates how colour can be used to create distinct spaces.
- The dark sofas and the purple chairs stand out visually against the floor and walls.
- The yellow painted wall to the rear creates a distinct colour for this room and will help a person to identify this space as the living area.

When it comes to flooring, colour and tonal contrast may cause problems for people with depth perception difficulties as a sharp contrast in flooring can be perceived as a step or hole in the ground. For this reason, best practice is to choose one colour only and use this flooring throughout the home, including the kitchen, bathroom and living areas. The use of one material throughout a number of rooms on the same floor will eliminate the need for a door saddle or similar junction between materials at the door threshold.

Where door saddles or carpet bars are required, ensure that they are the same colour as the flooring at the threshold as this will reduce the risk of a person thinking that it is an object in their path that they must step over. In this case, since the saddle will not be visible, make sure it is not raised to the extent that it might form a trip hazard.

04 Door threshold between tiled hallway and tiled bathroom.

Photo Design Features

- While the tiles in the hallway and the bathroom are different, the colour similarity and elimination of a door saddle creates a seamless threshold

Photo Design Tip

- The polished tiled floors may create a glare and may cause difficulties for people with visual difficulties.
- The white painted door, skirting and architrave set against white walls and a pale coloured floor creates little visual contrast between these elements. If contrasting colours or tones were used it would help distinguish one element form another.

Some people with dementia can mistake one room for another. While this is less likely to be a problem for a person living in their existing house, it becomes a greater problem if major extensions or adaptations are carried out to the person's original dwelling. It has been suggested that way-finding can be improved if care is taken to make each room distinctive in its décor so that it is visibly different. Using particular colours for specific rooms or fittings may act as a simple cue to help with recognition. While colour-coding can be a highly individual and creative exercise, it is imperative that the information being communicated through colour is consistent throughout the home. Predictability and order can be achieved in the environment through consistent repetition of colour systems.

Building Materials and Finishes: Surface Reflectance

Reflections on glossy surfaces can interfere with visual perception and can cause visual discomfort arising from glare. In some cases surface reflection could be misinterpreted as a water spillage, and that a surface is wet or slippery. This might cause an individual to alter their gait when walking over it, or attempt to step over the perceived 'spillage', and this, in turn, may result in a fall. This also applies to any person with a visual difficulty.

Therefore, matt finishes are recommended to reduce these reflections and glare. Where glossy surfaces such as tiles are used, careful location of these surfaces adjacent to windows or light fixtures is required to avoid these light sources from producing reflections close to the line of sight.

Floor finishes can also make a difference to carers, informal and formal, who depending on their circumstances (age and mobility) may be prone to falls.

05 *Matt finish to timber floor.*

Photo Design Features

■ Even though this timber floor is adjacent to a south facing set of double doors the matt lacquered finish does not create excessive glare.

Photo Design Tip

▲ The colour contrast between the floor and the light colour of the aluminium threshold may be perceived as a step and every effort should be made to eliminate this.

Building Materials and Finishes: Surface Patterns

Research has found that patterned carpets or dark contrasting carpet borders may increase visual-spatial difficulties and present walking problems and falls for residents with dementia.

Patterns on floor coverings that represent real life objects can be problematic for some people with dementia. The use of plain and similar coloured floor tones is recommended; however, if a person has been living in a particular dwelling for a long period and the patterned carpet is familiar to them, then that person is less likely to have a problem. As mentioned earlier, carpeting can also hinder a carer assisting a person with a mobility aid to move about the home.

06 Floor finishes with strong patterns which may cause confusion. This image also shows how the junction of different flooring materials at door thresholds results in strong colour contrast that may be perceived as a step. White painted doors, white door frames and skirting boards set within white walls will make it harder to discern one item from another and therefore may cause problems for a person with dementia.

07 Plain floor finishes continued throughout all rooms will avoid any change in colour or tone at door thresholds. This image also shows a good colour contrast between the doors, walls, skirting boards and floor.

Bold and repetitive wall paper patterns and those with real life objects such as flowers can cause fear, restlessness, frustration, delusions and confusion for some people with dementia. It is widely recommended that walls are decorated with plain colours using muted or pastel shades - matt or satin finish paint is recommended as it reduces glare.

Please refer to Section 4.1 in the UDHI Guidelines for overall guidance.

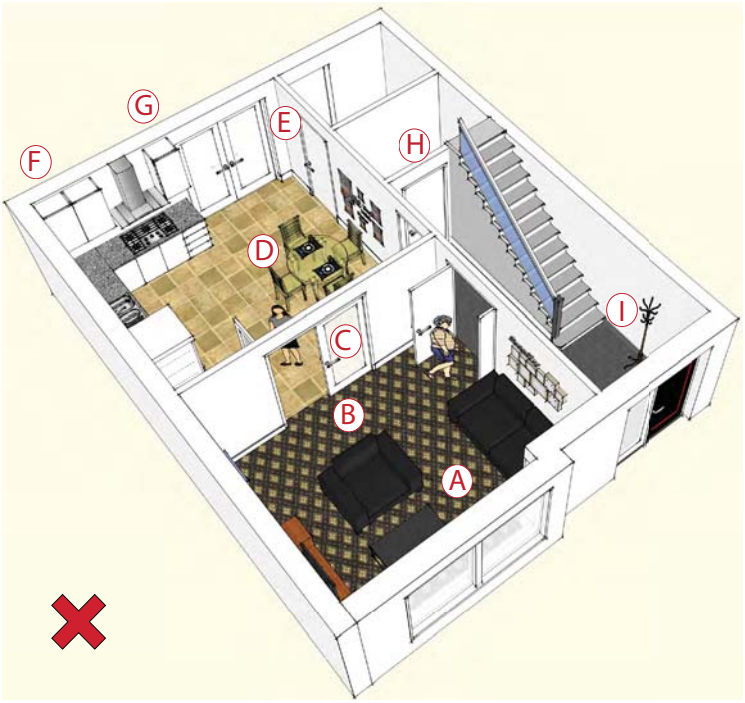
UD Dementia Friendly Design Guidance

- Where colour is needed for increased legibility consider colours in the blue and green area of the colour spectrum, as opposed yellow and red colours, as these colours may be harder to differentiate for people with dementia.
- Use colour and tonal contrast to distinguish one surface from another, or to make certain objects stand out against their background.
- In line with the above, paint skirting boards and door frames a contrasting colour to walls and ceilings to ensure a clear contrast is made between floor and wall finishes.
- Paint doors a contrasting colour to the wall to make it visually stand out from the background. Ensure the door handle and any locks or similar door furniture is finished in a colour that stands out from the door.
- Use colour or tonal contrast to highlight handrails, grab rails, light-switches, wall mounted fittings and other important objects that need to be visually prominent.
- Avoid sharp colour or tonal contrasts on floor finishes as these may be misinterpreted as an object on the floor or a step. Maintain a similar finish and colour on any one storey, and minimise or eliminate internal door saddles or carpet bars at door thresholds which may be misconstrued as a step.
- Use colour or decor to distinguish one room from another as part of a design strategy to create distinctive spaces.
- Avoid glossy finishes with excessive reflectance. Use material with matt finishes; when choosing paint consider low sheen paints such matt or satin finishes.
- Avoid strong patterns on both floor and wall finishes as these may cause confusion or disorientation.

Direct consultation with the person with dementia or family members may reveal certain materials or finishes that are familiar to the person with dementia and thus contribute to a recognisable environment.

Technical Sketch:

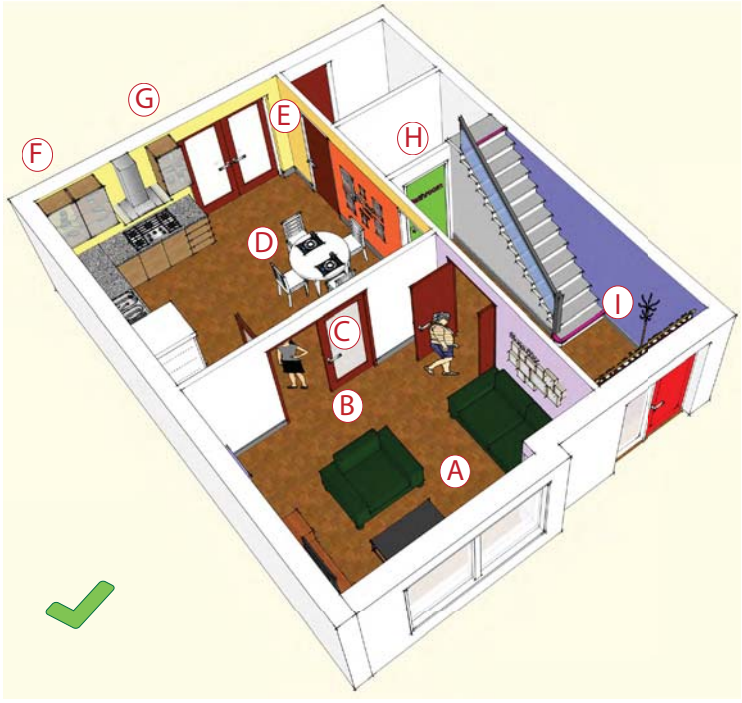
Typical Finishes and Colours which may cause difficulties



A. Patterned floor covering
B. Color contrast at door thresholds
C. Similar colour doors, walls and skirting boards
D. Furniture colour blending with background colours
E. Similar wall colours used throughout
F. Kitchen units blending into walls
G. Solid doors to kitchen units
H. Bathroom door blending into wall
I. No marking to first or last step on stairs

Technical Sketch:

Universal Design Dementia Friendly Finishes and Colour



A. Plain floor covering
B. No colour contrast at door thresholds
C. Colour contrast at doors, walls and skirting boards
D. Furniture colour in contrast to background colours
E. Wall colours to create distinct spaces
F. Kitchen units standing out from walls
G. Glazed front to kitchen units
H. Distinct colour to bathroom with signage
I. Marking to first and last step on stairs

4.2 Fit-Out Elements

It is through the fit-out elements of a dwelling, such as door handles or light switches, that occupants interface with the building. Fit-out elements include many objects that a person will engage with in a very hands-on manner, and therefore, well designed fit-out elements are critical to a UD dementia friendly dwelling.

Adaptable and flexible fit-out elements are important given the progressive nature of dementia. This will allow modifications that result in less disruption for the occupant should they be required.

07 Contemporary bathroom fittings in an accessible bathroom.

Photo Design Features

- The use of contemporary fittings helps create a bright and attractive bathroom.
- The plain colour, non-slip floor provides an easy to use floor surface while also creating a coloured contrast with the WC and the wash hand basin.

Photo Design Tip

- If the colour of the walls or tiled area to the rear contrasted with the colour of the WC and the wash hand basin it would make them easier to see for people with visual difficulties.
- If the toilet cover and toilet seat was a contrasting colour to the WC it would help make these elements more visible.

08 This matt finished stainless steel window handle is easily grasped and is visually distinct from the timber frame window behind.

Photo Design Tip

- The stainless steel handle may be cold to the touch and uncomfortable for some users and therefore plastic coated handles could be considered.
- Window should be easy to operate - some tilt and turn functions are complicated and difficult to use and this must be considered when specifying.

Windows, Doors and Ironmongery

Design Considerations and Awareness

The UDHI Guidelines cover most of the dementia friendly issues in relation to windows, doors and ironmongery. As stated throughout these current guidelines, familiarity and objects that are easy to interpret are critical for people with dementia. These design considerations are important to consider in relation to door or window handles locks, or other fittings.

Safety is an issue in all dwellings and UD can be used in designing dwellings to better protect people with dementia. Where necessary, unobtrusive and sensitively used environmental interventions such as a disguising exit points can be used to discourage a person with dementia from leaving the home but only where this would pose a risk. Devices that signal to a family member or carer when a door is opened can also be used where required, but should always be used in an ethical manner and every effort should be made to find a balance between being overprotective and respecting individual autonomy.

(See Section 2.1 for information about entering and exiting and Section 4.4 for information on entering and exiting technology)

Within the dwelling there may also be areas with potential hazards such as cupboards with cleaning products or service areas with electrical equipment. Where these present a risk to a person with dementia it may help to paint the access doors in a colour that matches the background to disguise these doors.

(See Section 4.4 for more information on safety and technology systems)

While safety is very important when considering windows, doors and ironmongery, this must be balanced with accessibility and visual access within the dwelling. As discussed in **Section 2.2,** good visual access to key spaces within the house will contribute to an easily understood and simply navigated internal environment. Careful design of internal doors will help to achieve this by ensuring that doors open back against adjoining walls or the use of extra-wide, or 'Cat and Kitten' type doors, as shown below.

09 'Cat and Kitten' internal doors as part of a spacious circulation area.

Photo Design Features

- The 'Cat and Kitten' style doors when opened fully create wider door openings and therefore provide enhanced accessibility and visual access.
- The timber floor provides a good colour contrast with the walls and doors which gives greater visual clarity to these elements.

Photo Design Tip

- If the door was painted a contrasting colour to the wall it would make the door more visible within the dwelling.
- Contrasting colour skirting boards, door frames and architraves will help create better visual definition and make it easier to distinguish between the elements.

The windows of a dwelling control much of the interaction between inside and outside, not only in terms of views and daylight, but also in terms of sound and thermal insulation. Providing a view to natural settings has therapeutic benefits for many people, while views to everyday public activities on the street has proven to be very attractive for people who are confined inside. Therefore, windows should provide maximum views to the outside, allow a person to experience positive stimuli such as a summer breeze, bird song, or external activities, while also protecting the occupants from disruptive external noise, solar glare or excessive solar heat gains, or conversely, internal heat loss.

(See Section 4.3 for information regarding the internal environment)

Please refer to Section 4.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Avoid the deliberate use of complicated door locks as way of preventing a person from exiting a dwelling as this may cause frustration and agitation. Instead consider disguising the door by painting it to match the background. However, this approach will also disguise a door at all times, including when it is safe or indeed beneficial for a person to go outside. It may also cause problems for family members or carers with visual difficulties.
- Instead, consider fixing a curtain rail to the inside of the front door to allow a curtain to be drawn over the exit, and if necessary drawn over associated objects such as coat rack or umbrella stand, to eliminate a direct view of the door and thus remove the inclination to leave.
- Internal doors should be hung so they open against an adjoining wall to allow maximum views to the room from adjacent spaces when the door is open. For non-fire rated doors consider using a door hold-open device to keep the door fully open to maintain visual access.
- Consider using extra wide doors or 'Cat and Kitten' doors to provide maximum physical access and also good visual access.
- Use internal door ironmongery that is intuitive and simple to use and that is familiar to the extent that it is consistent with the occupant's expectations around appearance and function.
- Paint doors a contrasting colour to the wall to make it visually stand out from the background. Ensure the door handle and any locks or similar door furniture is finished in a colour that stands out from the door.
- Ensure that window cill heights and window transoms do not obscure the view to the outside for a person when seated or lying on a bed.
- Provide window systems (including frames and glazing) that minimise glare and sound transmission while also balancing solar heat gains and internal heat losses.

Direct consultation with the person with dementia or family members may reveal certain approaches to the design of windows, doors and ironmongery that will help provide a balance between usability, comfort and safety.

10 Heating controls along with alarm and light switches beside

Photo Design Features

- The colour of these electrical fittings contrasts with the colour of the background.
- The large rocker-style switches are easy to operate as they require less strength.

Electrical Fittings

Design Considerations and Awareness

Many retrofit projects will include a level of electrical works and this may facilitate UD dementia friendly measures without too much impact on the dwelling. it is important that fittings are familiar, easy to use, and easily seen.

Electrical fittings, such as switch or socket plates, should be placed in logical locations where users would expect them to be. For instance, light switches or alarm key pads within entry hallways should be in a convenient location inside the front door that will not be obstructed by the door swing or furniture.

Please refer to Section 4.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Use electrical fittings such as light switches, socket plates, ventilation or heating controls, immersion controls or alarm panels that are familiar to a person with dementia and intuitive to use.
- Ensure that all switches or controls are placed in a logical location, are clearly visible from within the room and are finished in a colour that makes them stand out from the background.
- In some cases, electrical fittings, such as electrical distribution boards or cooker switches, may need to be disguised. If this is the case, place these fittings in concealed cupboards or use switch plates that merge with the background. These must still be usable by family members or carers.

Consultation with the person with dementia or family members may ascertain which electrical fittings are unproblematic to the person with dementia, their families and carer(s). It will also reveal potential risks and highlight certain electrical fittings that could be concealed or disguised.

11 *External signage giving directions to residential units.*

Photo Design Features

- The signage is at standing eye level where it is readable by people of small stature or people in a wheelchair. The white text on blue background makes the signage clearly legible.

Photo Design Tip

- The slightly glossy finish to the signage may cause light reflections that coud be problematic for people with visual difficulties.

Signage, Labelling and Other Written or Pictorial Information

Design Considerations and Awareness

As discussed in the introduction, short term memory loss associated with dementia can make it difficult to remember the layout of a physical environment, while cognitive difficulties can impair spatial processing resulting in disorientation and anxiety. In this regard clear and easily understood signage can help with way-finding in public spaces, on approach and entry to a building, and as part of the internal circulation.

12 Signage in a retail context using large, bold signage to provide directions and identify key spaces.

Photo Design Features

- While the signage above is in a retail context it shows how large, bold signage can be used to provide directions and identify key spaces such as stairs or a lift. Signage such as this could enhance way-finding and legibility in the communal areas of apartment blocks.

Photo Design Tip

- The location of the call button so close to the stairs makes it harder for certain people, such as a person in a wheelchair, to approach and use the call button. It may also cause conflict with people coming down the stairs.

Some people with dementia may also find it hard to distinguish one room from another or identify objects, appliances or equipment within rooms. Labelling of rooms or objects with simple text or images can increase legibility by helping a person identify the location and function of certain spaces. Examples include a label with a picture of a toilet outside the bathroom, a label showing an image of keys beside the front door, or images on kitchen cupboards to indicate what is inside (See Image 13).

13 *Written and pictorial signage on kitchen cupboards.*

Photo Design Features

- The signage and images shown above can help people identify the contents and may prompt them to carry out activities such as making a cup of tea.

Photo Design Tip

- If the doors to these kitchen units contained clear glazing allows a person to see the contents and may provide a more direct visual cue than the signage shown above.

Written and pictorial information regarding the month, date, or time can help to orientate people in relation to seasons and time of day. Image 14 on the next page shows an example of how this can be achieved by using a standard clock and some large format printed words. This could be maintained by a family member or carer and could be located in a few key rooms such as the kitchen or living area.

14 *Written and pictorial information about the time, date, or season.*

15 *A 'memory box' located adjacent to the front door of a dwelling accessed from a communal hallway.*

Photo Design Features

- The memory box, which contains a person's name and personal photographs, helps to personalise the dwelling and may assist a person with dementia to locate and identify their own door.
- The handrail provides physical support while the contrasting colour on the handrail and the door will enhance visual access.

While images, text and objects can improve way-finding and legibility, they can also reinforce identity. The placement of 'memory boxes' that contain family photographs or personal objects in strategic locations, such as beside a front door, will facilitate personalisation and help to identify dwellings, and maintain a sense of control. In an apartment building this would have to be agreed with the management company who are typically responsible for these areas.

As people with dementia may often have increased reliance on their senses, it is helpful to use multi-sensory cues, such as sounds, smells, or tactile surfaces, to reinforce way-finding and legibility. Aromatic or tactile planting, wind chimes, or water features that create a sound, or can be touched, or gently reflect light, should be considered along with words and images to provide multiple modes of communication to cater for a wide variety of sensory or cognitive conditions.

Signage and labelling are low cost measures that will cause minimal intrusion and can be undertaken as a stand alone measure or part of an overall retrofit. They should be considered from the start in new-build projects to ensure an integrated design is achieved where signage and labelling are optimised.

Please refer to Section 4.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Provide appropriate signage at all spatial scales, whether this is in a public space approaching a residential development, as part of external on-site circulation areas leading to a dwelling or apartment block, within the dwelling, or on specific objects to identify their function.
- Where possible, use multiple modes of communication, including both written and pictorial, and multi-sensory cues such as sound, touch and smell to reinforce way-finding and legibility.
- Ensure that the format and style used for any signage and labels would be familiar to people with dementia.
- Ensure all signage and labels use clear, large font and images where the font colour or image contrasts with the background colour. **(See the Signage section in Section 4.2 of UDHI for more details on signage).**
- Use matt or satin finishes for all signage and labelling to avoid glare. Ensure they are very well lit without causing excessive shine or reflection.
- Use 'memory boxes' or similar devices to create dedicated places for personalisation, and the installation of images or objects that will help a person identify their own home.

Direct consultation with the person with dementia or their family will help to identify problematic objects and spaces, and also identify the format of signage or labelling that might be familiar.

Mirrors and Other Highly Reflective Surfaces

Design Considerations and Awareness

For some people with dementia, mirrors may create confusion if, for example, the person does not realise that the image in the mirror is their own. This can generate fear and may cause adverse reactions. Therefore, it would be useful if the mirrors in the home can be easily moved, removed completely or covered over.

On the other hand, condensation covered mirrors from bathroom steam may also cause problems if a person is unable to see their reflection as expected in the mirror. To combat this, proprietary heated mirror pads, which are simply electrical elements fitted to the back of a mirror, can be installed to keep mirrors steam-free.

UD Dementia Friendly Design Guidance

- Ensure all mirrors can be easily moved, removed or covered over.
- Where condensation on mirrors is causing problems for a person with dementia consider fitting proprietary heated mirror pads to keep mirrors steam free.

Direct consultation with the person with dementia, family members or carers will help to see if this is an issue in the first place, and then to determine the best approach to mirrors in general.

4.3 Internal Environment

This current section looks at how lighting, ventilation, heating and sound affects people with dementia, their families or carers. People with dementia will often be more sensitive to environmental conditions and therefore the creation of a comfortable and supportive internal environment is crucial to their well-being.

16 *Kitchen, dining and living area in a contemporary dwelling.*

Photo Design Features

- Large, full-length, south-facing windows providing natural light, passive solar gain and views to external spaces.
- Dining table located adjacent to the kitchen.
- Colour contrast between the floor and the walls.

Photo Design Tip

- The highly polished tiled floors adjacent to south facing windows will create a glare and may cause difficulties for some people.

17 *Brightly lit dining area in refurbished 19th Century terrace dwelling.*

Photo Design Features

- Large, full-length windows and doors providing natural light, passive solar gain and views to external spaces.
- Dark brown window and door frames provide good contrast to the background.

Photo Design Tip

- The full length windows and doors would benefit from a frosted glass manifest or similar markings to prevent a person walking in to it by accident.

Natural and Artificial Light

Design Considerations and Awareness

Well designed natural and artificial lighting is important for people with dementia, for older people, and for people with visual difficulties. Good lighting can help with task visibility, place recognition, and raise awareness of hazards through increased visibility. Proper lighting design can also play a role in reducing sleep disturbances and thus reduce certain challenging behaviours, such as restlessness.

In terms of energy efficiency, automatic lighting controls (or the use of compact fluorescent lamps (CFLs) in place of traditional bulbs) will help reduce electrical energy consumption within common circulation areas or the home. However, careful consideration must be given to lighting controls that may not be familiar to a person with dementia, or controls that turn lights on or off automatically and thus confuse or frighten a person who is unaware of this function.

The following sections briefly discuss some of the key issues around natural and artificial lighting in the UD dementia friendly dwelling.

Natural and Artificial Light: Compensating for Deterioration in Vision

People with dementia and older people will often experience visual difficulties and therefore will benefit from higher levels of lighting.

Higher levels of natural light can be achieved through correct orientation, window location and window sizing. Careful design of curtains or blinds, along with reduced clutter on window sills, will maximise the available light entering through the window. **(See Section 3 for overall guidance in relation to natural light).**

Ensuring there are sufficient light fittings or simply changing existing light bulbs to a higher wattage will increase artificial light levels (Ensure that the bulb does not exceed the light fitting's ratings as set by manufacturer). The use of plug-in lamps can also be used to boost light levels within the dwelling.

18 *Kitchen, dining and living area in a contemporary semi-detached dwelling.*

Photo Design Features

- The simple, uncluttered window dressing allows maximum natural light into the room while also maintaining maximum views to the outside.
- The window design has eliminated the transom and therefore presents no visual barrier whether a person is seated or standing,.

Photo Design Tip

▲ The full length windows and doors would benefit from a frosted glass manifest or similar markings to prevent a person walking in to it by accident.

Natural and Artificial Light: Provide Evenly Distributed Illumination

Visual adaptation times from dark conditions to light, or from light to dark, increases with a person's age. Therefore, for older people, or people with dementia, uneven lighting can cause the following problems:

- Poorly lit rooms with a combination of brighter and darker areas can cause problems for people with light adaptation difficulties.
- Uneven light may create shadows and uncontrolled glare and reflections. This uneven lighting will impact on visual comfort, visual access and may create unsafe transition areas or act as hazards.

Therefore, evenly distributed illumination within a dwelling is important and in some cases it may be necessary to supplement daylight with artificial lighting to achieve the right conditions.

Any approach to uniform illumination must consider that the quality of light and how it is perceived is a very subtle and subjective issue which has many perceptual and psychological impacts. Overly uniform illumination minimises illuminance differences between surfaces and can reduce clues to the form of the room and hinder orientation. Indeed, a change in lighting levels can help residents to distinguish between various spaces. Light in itself attracts and people with cognitive difficulties are often drawn to light and thus light and shade can be used positively to attract people to certain spaces.

19 *Sunlight falling on a table beside a south facing window as an example of how light can be evocative and attract people towards certain spaces or objects.*

Photo Design Tip

▲ A darker or less glossy table would result in less reflectance and glare.

Natural and Artificial Light: Enhancing Task Visibility

While it is generally recommended that lighting levels should be uniform throughout the building, directed task lighting may be useful for people with dementia. For example, additional light sources in closets and cupboards will increase task visibility.

Extra and directional lighting may also be needed to view any cueing system, which may also include the use of coloured walls, objects or signage. It may also be used to accentuate stairs and handrails, so that people can move with confidence.

Dedicated lighting over counter tops in kitchens or in bathrooms will also help with activities in these areas. Good lighting will also make a difference to family members and carers who may also have some visual difficulties.

20 *Lighting fixtures fitted to underside of wall mounted kitchen units.*

Photo Design Features

- The under-cabinet lighting provides task lighting to the hob for cooking or to the adjacent counter-top for food preparation or similar.

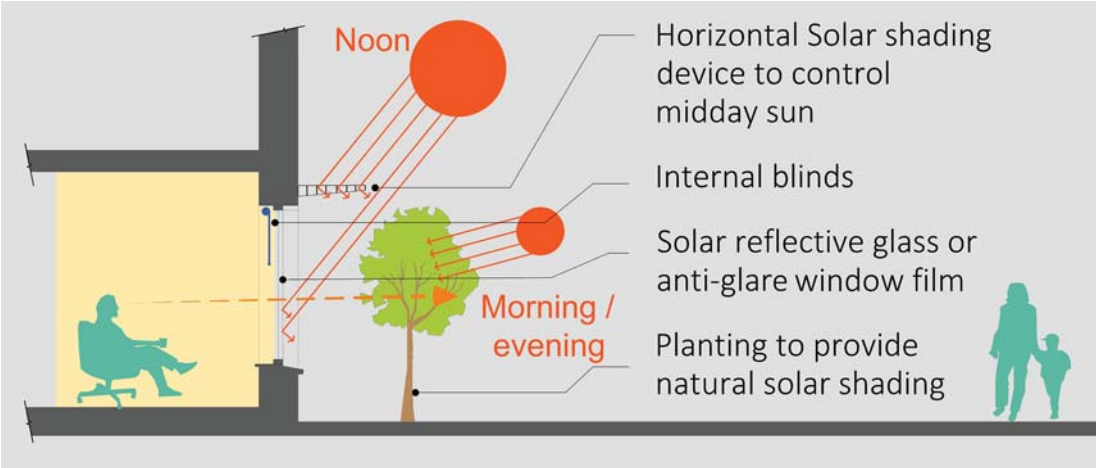
Photo Design Tip

- ▲ If the wall to the rear was a darker colour it would allow the kitchen units to visually stand out from the background.
- ▲ The stainless steel kitchen unit handles may be uncomfortable for some users.

Natural and Artificial Light: Reducing Effects of Glare

Direct natural light from windows or artificial light can cause glare, which tends to become more problematic with age. Glare can generally be divided into two types: (i) discomfort glare; and, (ii) disability glare. Discomfort glare results in an instinctive desire to look away from a bright light source. Disability glare makes it difficult to see an object or to carry out a task without causing discomfort.

Thus, windows should have a means of reducing excessive glare and excluding low-elevation sunlight such as blinds, curtains, awnings, solar reflective glass, or external solar shading devices.



21 Section through external wall showing different options for solar control.

The positioning of artificial lights should be given proper consideration. For instance, lights at eye level can cause glare and therefore indirect sources of light are recommended. Sources of direct light within a person's field of view should be of low luminance, while free reading lights can be used to great effect in a room, this should not contain anything brighter than a 40W light bulb.

Natural and Artificial Light: Reducing Sleep Disturbances and Providing a Therapeutic Environment

As light plays a role in controlling important biochemical processes and balancing circadian rhythms (i.e. the human body clock), the use of lighting appears to be a promising approach in attempts at re-balancing circadian rhythms. There is good evidence from research that increasing levels of lighting (beyond that considered as normal) in the environment where people with dementia live, can improve sleep patterns and can reduce challenging behaviours.

High intensity light with a blueish tint has been shown to improve circadian rhythms in older people; it may positively influence restless behaviour, delay cognitive decline and decrease feelings of depression. Other studies have

shown that improving lighting in the home can have wide-ranging effects including better appetite, improved health, and self-confidence, and a decrease in loneliness.

Please refer to Section 4.3 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Fit higher wattage bulbs in light fixtures to create higher levels of artificial light (e.g. if a light fitting currently has a 60W bulb and a person finds it hard to see in that room, replace the bulb with a 100W bulb). Do not exceed ratings as set by light fixture manufacturer.
- Ensure window dressings, ornaments or other objects are not blocking natural light coming through the window.
- Enure windows are orientated and sized correctly to maximise daylight and minimise excessive solar glare. Typically for bedrooms, bathrooms and kitchens, where many morning activities are carried out, an east and south orientation is beneficial to capture morning and evening light. Living areas will typically benefit from south and west orientation in order to capture midday and evening sun.
- Provide evenly distributed illumination throughout a dwelling to reduce visual adaptation difficulties, and minimise shadows or glare. This can be achieved through careful window design, the installation of sufficient ceiling mounted light fixtures, and the use of plug-in lamps where required.
- Notwithstanding the above, consider how carefully designed variation in light levels can be used to highlight certain features, or draw people towards certain spaces or an exit door leading to a safe garden area.
- Provide ceiling, wall-mounted, or under-cabinet spot lights or strip lights, or plug-in lamps to provide task lighting in areas such as bathrooms, kitchens or bedrooms.
- In line with the above, consider lighting within wardrobes or other storage areas to help draw a person's attention to these areas and help to identify and find various items.
- Consider how window dressing, such as blinds, external solar shading devices, solar reflectance glass or anti-glare window film, can help reduce glare within a dwelling.
- Ensure careful placement of light fixtures or plug-in lamps to avoid glare from artificial lighting.

Direct consultation with the person with dementia, family members or carers will help determine the key issues around natural and artificial lighting within the dwelling.

22 *Living area with a sealed stove and an air supply vent on the sealing.*

Photo Design Features

- The sealed wood burning stove minimises heat loss from the room and burns fuel more efficiently than a traditional open fire.
- The ceiling mounted air supply vent provides pre-warmed fresh air to the room and eliminates the need for external wall vents which can cause a draught and allow warm air to escape from the room.

Photo Design Tip

- ▲ There are more traditional sealed stoves available and these may be more familiar to a person with dementia and therefore easier to use.

Heating and Ventilation Systems

Design Considerations and Awareness

People with dementia can be more sensitive to environmental conditions. This may be caused by perceptual issues, where a person with dementia may have a different understanding of the temperature in the home, compared to other occupants. Furthermore, a person with dementia may not realise that the room is too hot or too cold, or damp, or that there is a draught coming in from under the door - they may simply feel uncomfortable. Sometimes this discomfort is expressed through behaviour such as: attempting to leave the room; becoming agitated; undressing; or alternatively, trying to put on inappropriate clothing.

Diminished understanding of environmental surroundings or the cognitive difficulties associated with dementia may have other implications for heating such as: difficulties in judging the temperature of hot radiators or hot water pipes; an inability to operate heating or ventilation controls; or a tendency to adjust controls when this may not be necessary.

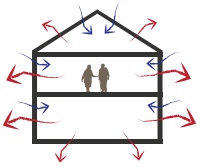
Efficient and responsive heating and ventilation systems are critical to a UD dementia friendly dwelling and these can be designed as part of an integrated approach. Some of the key elements of this approach are discussed further in the following sections and illustrated in the Technical Sketch on page 137.

Heating Systems

Maintaining healthy and comfortable room temperatures of between 18°C and 20°C is important for all people, but it is of particular importance for people with dementia, who may not be able to adapt their environment (i.e. put on clothing or close a window) or adjust the heating levels in order to remain comfortable.

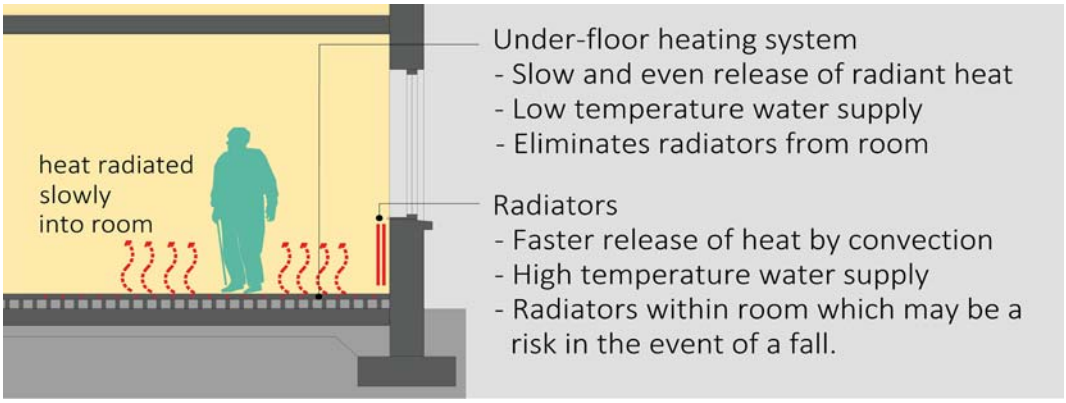
Maintaining this temperature range in an energy efficient manner, especially in winter conditions, can only be achieved through an integrated approach where:

- Key living areas are orientated towards the sun to maximise passive solar gain.
- An energy efficient building fabric (i.e. walls, floors, roofs etc.) that minimises heat loss through high levels of thermal insulation; minimises thermal bridging (i.e. a building component that bridges across an external wall, roof, or similar, and creates channel for heat loss); and, reduces air permeability (to prevent loss of warm air and air infiltration from outside).



When the building fabric is well designed the demand on the space heating system is reduced. Space heating is typically carried out by radiators or an under-floor heating (UFH) system. In the context of dementia UFH has some advantages over radiators such as:

- UFH provides stable and evenly distributed heating throughout the house, requires lower temperature water than radiators, and is therefore more energy efficient.
- Eliminates the need for radiators, which may be hazardous for a person in the event of a fall. If a radiator gets very hot it may cause burns if touched accidently, or by a person with cognitive difficulties who may be unaware of the danger.



23 Section comparing radiators and under-floor heating.

Using a building's thermal mass will help to maintain stable room temperatures. Thermal mass is a term applied to a building material's ability to absorb and store heat. A material with a high thermal mass, such as concrete, brick or stone will absorb large amounts of thermal energy and release it slowly when the air temperature starts to drop. In this way, thermal mass can be used to reduce excessive room temperature fluctuations by slowing down the heating and cooling process.

While thermostats are required for controlling heating and hot water temperature, they can be troublesome for some people living with dementia. One solution is to introduce thermostat systems that require far less intervention on the part of the resident and only function within optimal thermal comfort range. Another is to disguise thermostat controls by covering them or placing them out of sight. More advanced control systems will sometimes combine several functions in a centralised control panel, and link these to an external weather compensator, which all form part of a building management system (BMS).

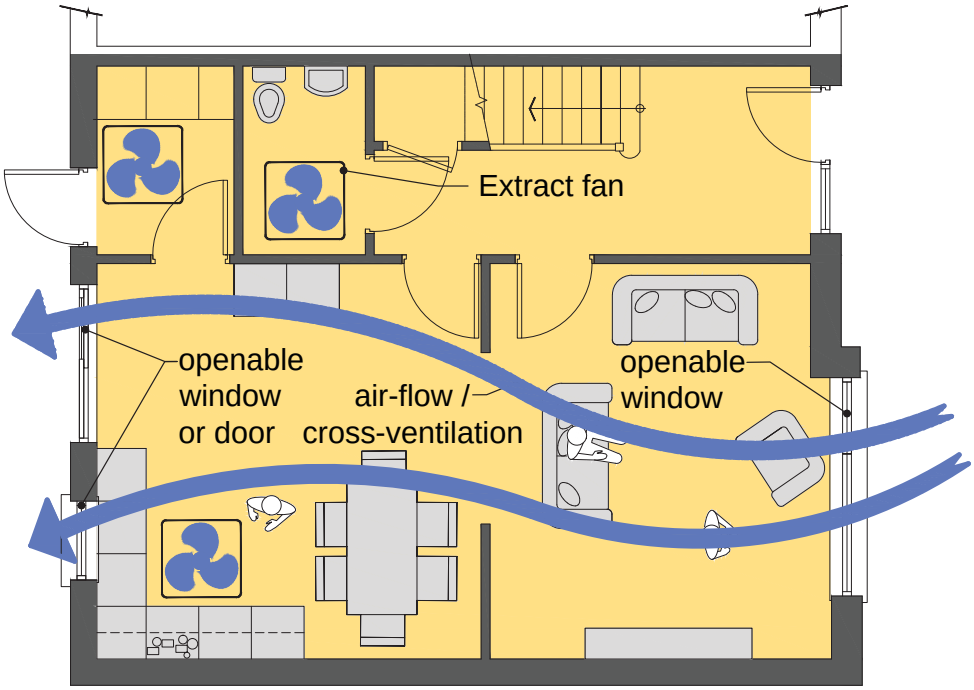
24 Example of an advanced space heating, water heating and ventilation control panel.

It is important that for both basic and advanced heating systems, controls should be designed in line with UD so that they are as simple and as familiar as possible and where the consequences for misuse are minimized.

Given the wide range of impairments and the progressive nature of dementia, it may sometimes be necessary to ensure that the occupant living with dementia cannot interfere with certain controls. As stated earlier, putting items, including the controls, in a location where they are not visible or accessible, or providing a cover over the control may be one solution.

Ventilation Systems

Ventilation is used for both cooling and for maintaining a healthy indoor climate. It introduces fresh air and removes pollutants and moisture. Natural ventilation provided by stack ventilation, or cross ventilation achieved by vents or openable windows (located at opposite sides of the building), can be used to create air movement to ventilate and cool.



25 *Cross ventilation in a dwelling achieved by an open plan arrangement to allow the cross flow of air and openable windows or doors on either side of the building. Rooms such as the utility, bathroom and kitchen will be supplied with extract fans.*

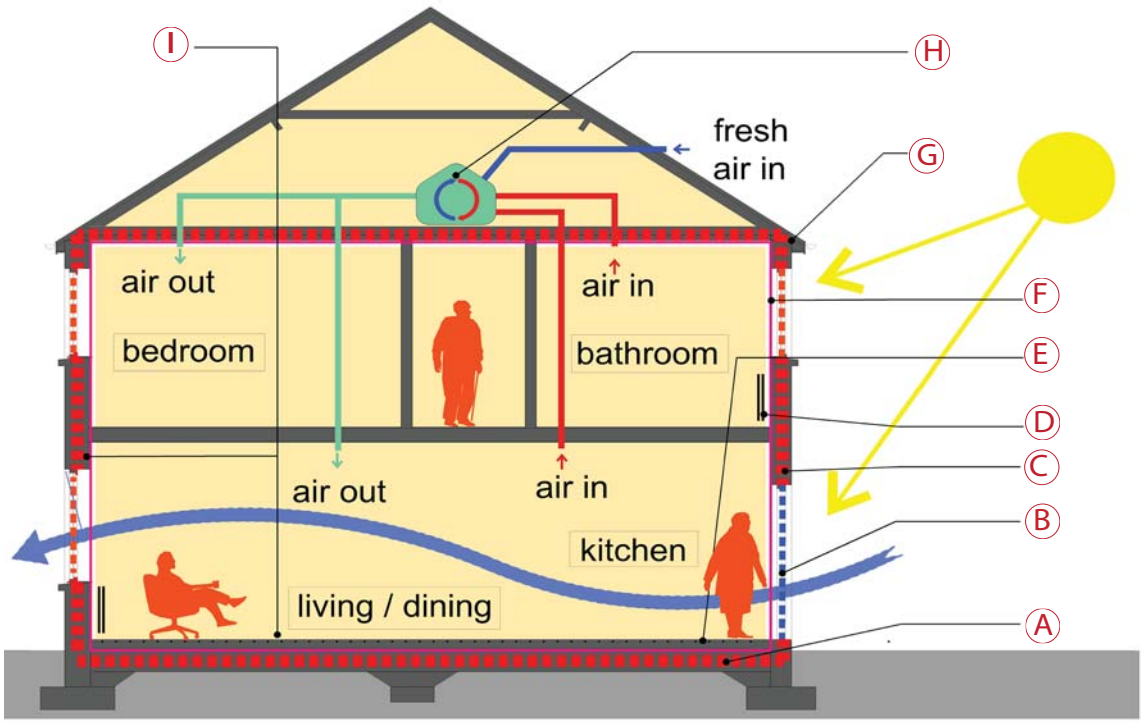
However, air movement can be a problem if it is perceived as an uncomfortable draught, or if is strong enough to cause curtains to move, or other light objects to move, which could be disconcerting if a person does not understand why. Mechanical ventilation is important in all bathrooms, and can be of great benefit to a person with dementia, their families and caregivers, as a steam-filled room can be stressful for a person with dementia.

Caution is needed though in relation to the use of noisy fans for ventilation as this can cause distress. Fans that are activated automatically when the light is switched on can be distressing and confusing for a person with dementia, as they may not understand how the fan was activated.

Mechanical ventilation, which can also be provided in ensuite bathrooms, utility areas and kitchens, can be linked to a mechanical heat recovery ventilation system (MHRV), which recycles waste heat from these areas and returns this heat to the house. However, MHRV systems typically require air supply vents in all habitable rooms and it has been reported that some of these can cause drafts, or can be noisy, especially at night. This would have to be carefully considered in the context of the UD of dementia friendly dwellings due to acoustic and environmental sensitivity and impact on sleep patterns.

In terms of sustainable design, energy efficient maintenance of comfortable internal temperatures is critical. In this respect, space heating, cooling and ventilation are interdependent and need to be carefully considered in the context of a UD dementia friendly dwelling.

Technical Sketch:
Key Heating and Ventilation Issues



A. Floor insulation to achieve a maximum average U-value of 0.21W/m2K for unheated floors and 0.15 W/m2K where underfloor heating is used.

B. Windows to achieve a maximum average U-value of 1.21W/m2K. Careful design of windows or vents should maximise cross ventilation within the dwelling.

C. Walls to be insulated to achieve a maximum average U-value of 0.21W/m2K.

D. Traditional wall-mounted radiators.

E. Under-floor heating system.

F. Airtight building fabric to eliminate air permeability.

G. Roof to be insulated to achieve a maximum average U-value of 0.16W/m2K.

H. Consider the use of mechanical heat recovery ventilation (MHRV) system to extract waste heat from kitchens, bathrooms etc., and use this waste heat to warm incoming fresh air which is supplied via ducts to all habitable rooms.

I. Use materials with a high thermal mass to maintain stable room temperatures within the dwelling.

Note: U-value refers to thermal transmittance and it measures the rate of heat that passes through a component or structure. It is expressed in units of Watts per square metre per degree of air temperature difference (W/m2K).

All U-Values referred to above refer to requirements for a new dwelling.
For further information and compliance issues see the Technical Guidance Documents Part L - Conservation of Fuel and Energy - Dwellings 2011.

Please refer to Section 4.3 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Create even temperatures within the overall dwelling by using consistent levels of thermal insulation on all parts of the building envelope, and by adopting appropriate window treatment to reduce overheating in summer or heat loss in winter.
- Utilise, or provide thermal mass within the building to reduce temperature fluctuations and maintain more consistent temperatures throughout the highs and lows of the winter and summer months
- Ensure high levels of building envelope airtightness to minimise draughts and the associated discomfort experienced by people with dementia.
- Consider the use of under-floor heating which can provide more uniform space heating and healthier radiated heat. This also eliminates the need for radiators which can be hazardous during a fall, or can cause burns when extremely hot. Under-floor heating also operates at a lower water temperature than radiators and thus can contribute to energy efficiency.

UD Dementia Friendly Design Guidance

- In terms of natural cooling and ventilation, consider how stack ventilation or cross ventilation can be incorporated into the dwelling. However, care must be taken not to create air movement that could be perceived as a draught or cause lightweight objects to move.
- Where mechanical heat recovery ventilation (MHRV) systems, or similar heating, ventilation and air conditioning (HVAC) systems are used, ensure that the fans associated with these systems do not create excessive noise or draughts. This can be a problem in the quiet of the night, and may compound any sleep disturbance issues.
- In new-build situations consider radiant slab cooling which provides a stable internal environment and reduces thermal discomfort by minimising vertical temperature differences and reducing draughts.
- Ensure high levels of ventilation and extraction from bathrooms where steam can be problematic for people with dementia. Care must be taken around automatic extractor fans in bathrooms or kitchens, where such operation may cause stress or disorientation for a person with dementia.
- Provide heating controls, both space heating and hot water controls, that are familiar to a person with dementia, and are intuitive and easy to use. Control panels should be placed in an accessible location where they are clearly visible. Ensure that any panel stands out from the background through the use of contrasting colours or tones.
- Consider using a more advanced heating system that requires less intervention from the occupant. Smart heating controls will often work in conjunction with internal and external temperature sensors and automatically control the heating based on a preset thermal comfort range.
- In some circumstances, where there is the risk that a person with dementia may interfere with heating controls to their own detriment, it may be necessary to conceal such controls, or provide ‘false’ controls that are disconnected from the heating system.

In many cases, direct consultation with the person with dementia or family members will help to identify space and water heating controls that are familiar to or understood by the person with dementia.

26 *Traffic noise on urban streets.*

Sound

Design Considerations and Awareness

Good acoustics are a key element when designing or retrofitting dwellings for people with dementia. The basic principle for creating good acoustic environments is to increase sound - help a person with dementia hear important things; and at the same time reduce noise. It is not only about blocking things out, it's also about ensuring that a person can hear pleasant and stimulating sounds.

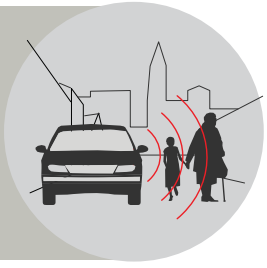
This issue of noise transmission between dwellings needs to be carefully treated in semi-detached, terraced or apartment buildings. Particular attention should be paid to sound insulation in separating walls, floors or staircases between dwellings. Dwellings close to sources of external environmental noise such as roads or railway lines must also be carefully designed.

Sources of internal noise generated by fans, water circulation pumps, or domestic appliances must also be addressed.

The importance of a good acoustic environment cannot be over emphasised in the UD of dementia friendly dwellings.

Please refer to Section 4.3 in the UDHI Guidelines for overall guidance.

"...noise to people with dementia is like stairs to people in wheelchairs" Judd (1998).



UD Dementia Friendly Design Guidance

- Create spaces that reflect a peaceful environment away from sources of external noise and closer to sources of pleasant sounds such as bird life in a garden. This is of particular importance for a bedroom where sleep disturbance may already be an issue.
- While the UDHI Guidance suggests that acoustic separation should exceed the current building regulations (Part E - Sound) by up to 5 decibels (dB), it may be appropriate to aim for a higher performance if noise is a real issue.
- Choose mechanical, electrical and plumbing systems, plant and internal equipment with low noise emissions.

Key sound transmission issues (see floor plans on next page)

A. Provide acoustic separation between dwellings to exceed the current building regulations (Technical Guidance Documents - Part E - Sound) by up to 5dBs.

B. Ensure windows facing onto public road provide good acoustic separation particularly in urban areas or adjacent to busy roads.

C. Carefully design party walls paying particular attention to areas adjacent to stairs, which can be problematic in terms of noise transmission between dwellings.

D. Use non-habitable rooms such as utility areas, bathrooms or circulation areas as a sound buffer to adjacent dwellings.

E. Ensure good acoustic conditions to all bedrooms to minimise any disruption to sleep.

F. Specify domestic appliances such as washing machines or electric showers with low noise emissions. Provide sound insulation to internal mechanical or electrical equipment such as water circulation pumps.

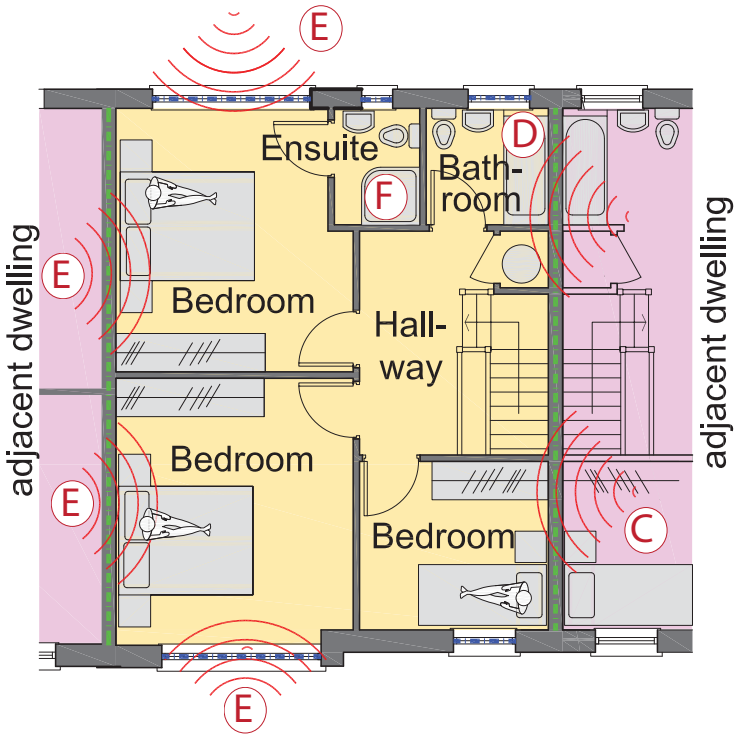
G. Use external planting or screens to reduce the transmission of noise from areas adjacent, such as roads, to the site.

Note: Decibels (dBs) are the units used to measure sound intensity.

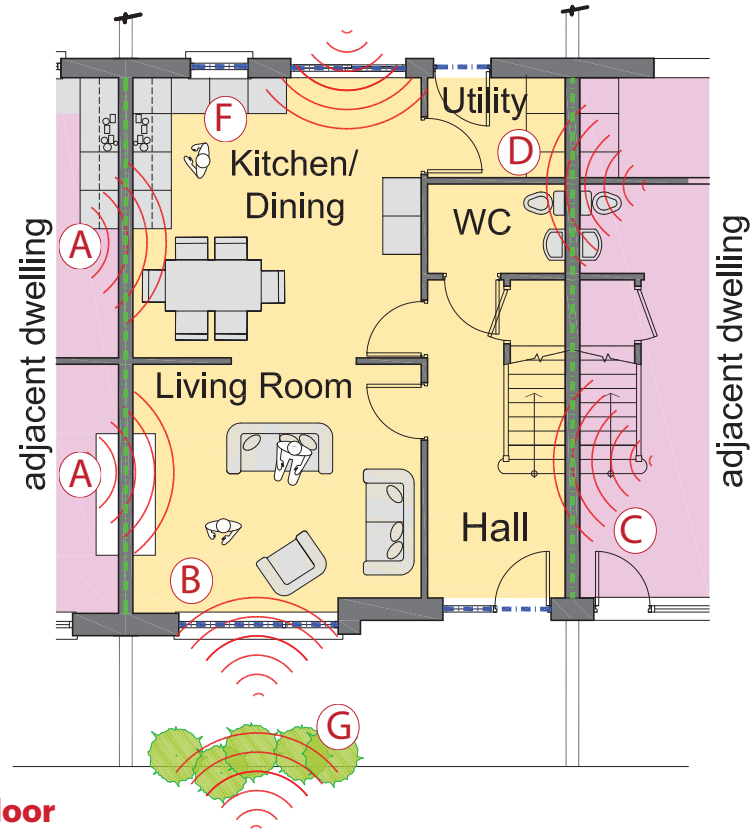
"People with dementia may have normal hearing, but they can lose the ability to interpret what they hear accurately. Underlying hearing disorders can also predispose a person to auditory hallucinations ... Excess noise can result in confusion, over stimulation, and difficulty communicating" (Bakker 2003).

Technical Sketch:

Floor plans of terraced house showing key sound transmission issues



First Floor



Ground Floor

4.4 Safety and Technology Systems

While technology can offer much support to people with dementia, their families and carers, it is important that if installed in the home, this is done ethically, and that the rights and preferences of people with dementia are respected. Technology should never be used as a substitute for human care, but rather should be used to complement personal care services.

Dementia is a progressive condition, therefore all safety and technology systems should have built-in flexibility and adaptability to allow modifications in line with changing needs. This will result in less disruption for the occupant should modifications be required.

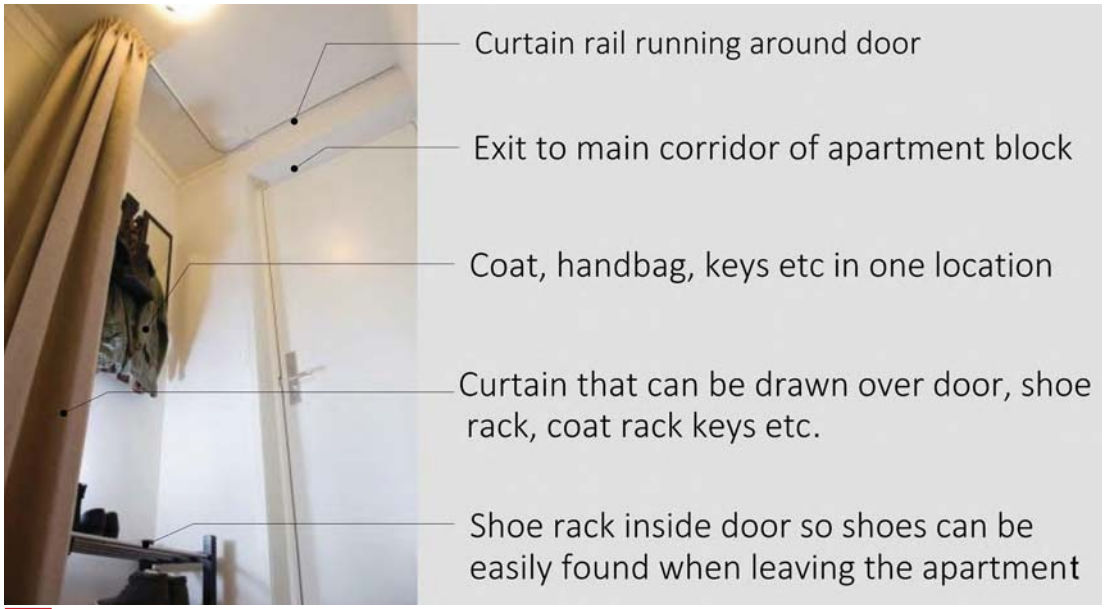
27 *Small service room outside an apartment, which is located in the common access corridor, adjacent to the entrance door to the dwelling.*

Photo Design Features

- The service room contains key electrical and other utility services that can be accessed independently of the apartment by utility companies, the management company, maintenance staff, or others, with the permission of the apartment residents.
- This reduces intrusion on the resident(s) and removes direct access to potential hazards from within the apartment.

Photo Design Tip

- If the front door was painted a distinct or contrasting colour it would make it more visible to people with visual difficulties.



28 *The inside of an exit door with a curtain that can be drawn over the inside of the door.*

Photo Design Features

- The curtain can be drawn over the inside of the door at certain times, and also across other items such as the coat and shoe rack, to remove the visual cues that might prompt a person to leave the dwelling.
- Locating the coat and shoe rack adjacent to the front door prompts a person to put on appropriate clothing and footwear when going outside.

Photo Design Tip

- If the inside of the front door was painted a distinct or contrasting colour it would make it more visible to people with visual difficulties during times when it is safe and appropriate to leave the dwelling.

Safety Features

Design Considerations and Awareness

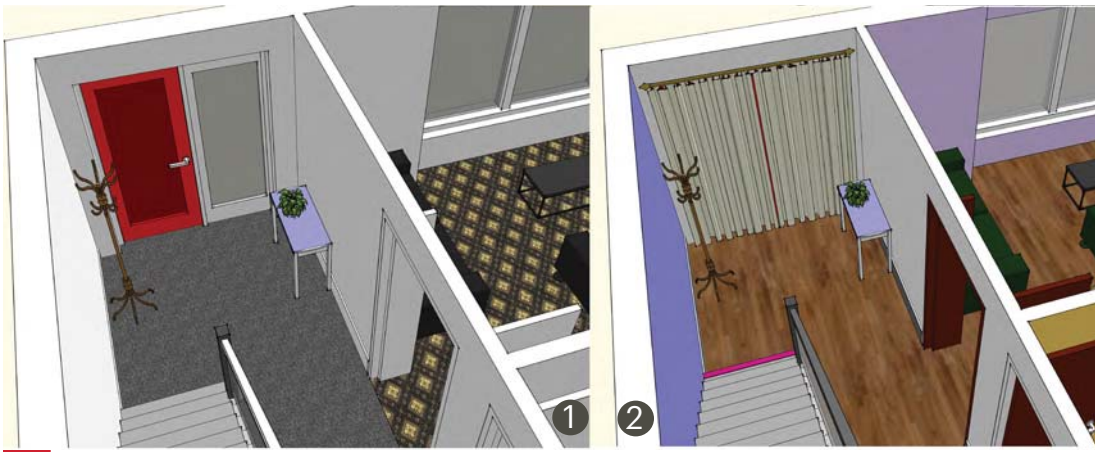
Safety is one of the main concerns families, carers and health professionals have when attempting to provide home care for a person with dementia. Poor design can pose risks, not only to people living with dementia, but also to family care givers or formal carers.

Wandering away from the home or getting lost, falling, being scalded and other domestic risks associated with, for example cooking, have been identified by families, carers and health service professionals as key concerns, especially when people with dementia live alone.

However, as reiterated throughout these guidelines, any safety features should be provided in an ethical and unobtrusive manner. Many health professional

and carers subscribe to an approach called 'positive risk taking' for people with dementia living at home. This is a way of balancing well-being and autonomy with safety.

Indeed, most of the design considerations discussed throughout these guidelines, (i.e. greater accessibility, increased legibility, enhanced visual access, mitigating visual-spatial difficulties by avoiding strong colour or tonal contrasts, or the provision of uniform lighting) will all contribute to the creation of a safer, more supportive environment.



29 *Image 1 shows a typical front door, while Image 2, shows a front door with a curtain drawn over the inside of the door to disguise the exit.*

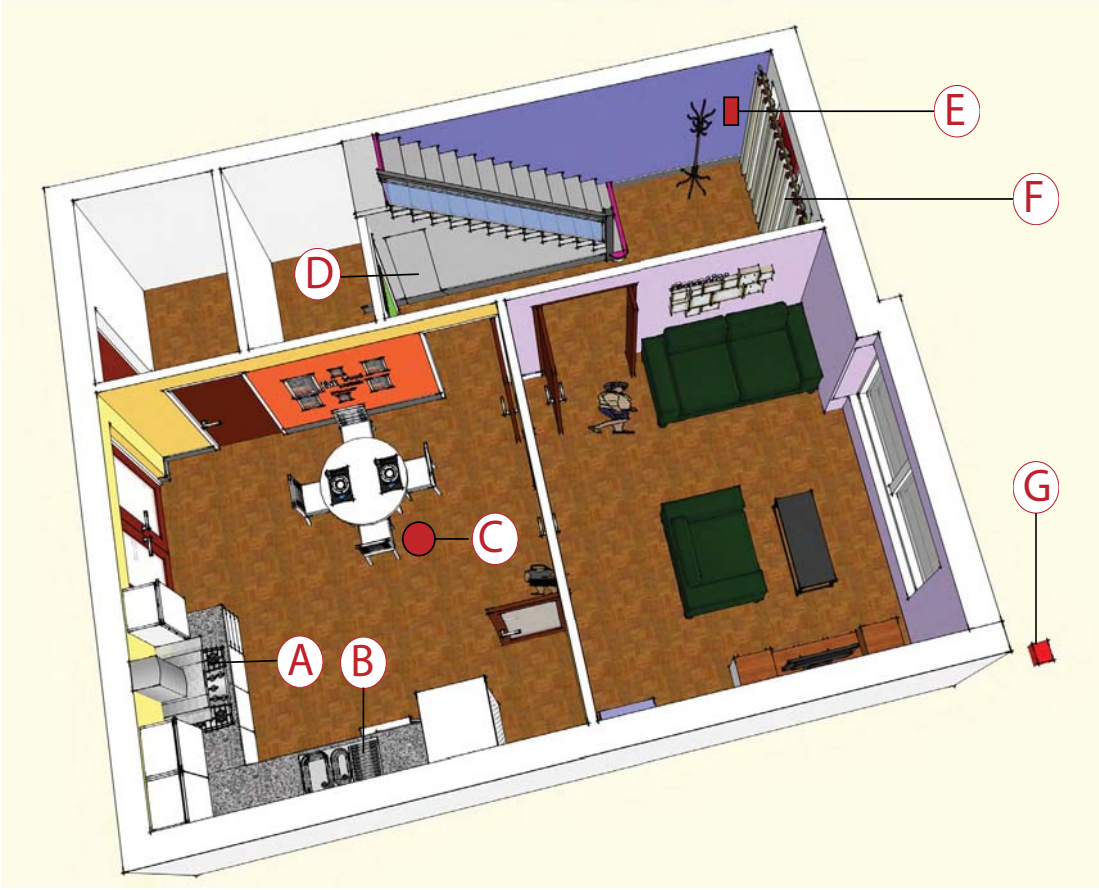
Specific safety measures will depend on the individual, the stage of dementia, and whether the person lives alone or not. In some cases there may be a need to limit access to certain hazards or provide assistive technology to protect the person. In this regard, consider the following:

- Disguising certain controls or exit points, if handled ethically and sensitively, will not be noticeable to a person with dementia, or will not cause frustration.
- Consider how a person with dementia may react to typical domestic safety or security systems, such as a loud fire or burglar alarm. This may be of particular concern if the person with dementia is unfamiliar with such systems (i.e. where they are retrofitted, or where the person moves into a newly-built dwelling).

Many of these issues have been discussed in previous sections of these guidelines. Additionally, Section 4.4. of the UDHI Guidelines outlines a range of UD issues around safety and security systems. However, given the importance of safety in the context of dementia, some of these key issues are reiterated below. Technology based safety measures are dealt with in the next section which discusses Assisted Living Technologies.

Technical Sketch:

Ground floor of semi-detached house showing key safety features



A. Automatic gas shut-off valves, or cooker and oven shut-down devices.

B. Automatic water shut-off valves.

C. Smoke and heat sensors linked to an alarm system.

D. Storage areas with potential hazards disguised by painting the door to match background

E. Exit risk messaging device.

F. Curtain to conceal front door from the inside.

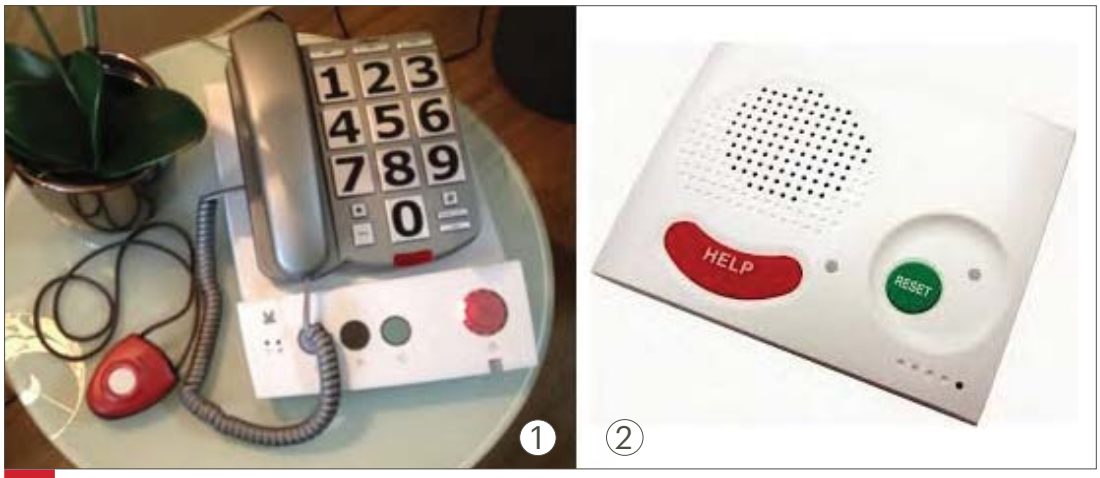
G. Code operated key safe fitted outside the home where keys can be retrieved by carer or family member if required.

Please refer to Section 4.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- Ideally, safe and accessible outdoor space should be provided to support the person with dementia to spend time outdoors in a multi-sensory garden or carefully adapted courtyard. In many cases a person with dementia may just want to go outside, and providing safe outdoor space may satisfy the desire and prevent them from travelling further afield if this presents a risk to their safety.
- In certain cases it may be beneficial to fix a curtain rail to the inside of the front door to allow a curtain to be drawn over the exit, and if necessary drawn over associated objects such as coat rack or umbrella stand, to eliminate a direct view of the door and thus remove the inclination to leave.
- Consider the installation of a exit risk messaging device or similar which can be programmed to alert a designated person if the front door is opened during certain predetermined times.
- Consider a code operated key safe fitted outside the home where keys can be placed. This can be accessed by designated people, such a family member or carer, if the person with dementia is unable to answer the door.
- Cupboards containing potential hazards such as cleaning products or dangerous implements, or service areas with electrical equipment, can be disguised by painting the access doors in a colour that matches the background. If these are also locked with discrete locking mechanisms they may not be noticed and therefore will not be a source of frustration.
- Controls for gas switches or cooker switches which may present a hazard can be disguised by blending them into the background, locating them out of view, or placing them in locked cabinets.
- Consider safety devices such as automatic gas and water shut-off valves, or cooker and oven shut-down devices.
- Consider the installation of anti-scald taps to kitchen sinks or thermostatic mixing valves to bath taps or showers to prevent scalding during bathing times.
- Smoke and heat sensors linked to an alarm system will enhance safety. These should not emit an excessively loud alarm sound as this could be very frightening and disorientating for a person with dementia. In some cases it may be best to link these to a carer alert system, or an external monitoring service.

Consultation with the occupants or family members may reveal certain preferences or design approaches that are familiar to the occupant, or that provide higher levels of safety.



30 *Image 1 shows a personal alarm and a large format button phone, while Image 2 shows an emergency call unit. These are examples of technology typically used by people with dementia.*

Assisted Living Technologies

Design Considerations and Awareness

Technology systems in domestic dwellings have become more commonplace and the role that these can play in relation to the internal environment of a home, or communication and entertainment, is discussed in the UDHI Guidelines, under the heading 'Assisted Living Technologies'.

Design for unobtrusive safety is a key concern for UD dementia friendly dwellings, and in this regard technology can play an important role.

There is much crossover between Assistive Technology, Ambient Assisted Living, Telecare, and Telehealth systems. However, in the context of UD dementia friendly dwellings it is worth looking at each to understand how they may be best deployed.

Maureen lives alone but her daughter and son live close by with their families and they call in frequently. Last year, following a few incidents, when a gas oven was left on and a hand basin flooded the bathroom, Maureen had a Telecare system installed. This monitors a few key potential hazards such as the gas cooker while also providing carbon monixide and temperature sensors. This has put Maureen and her family at greater ease and she is now living safely and comfortably at home.

Technologies: Assistive Technology

Assistive technology (AT) can be defined as products, equipment or systems aimed at supporting an older person or a person with a disability to undertake tasks they would otherwise find difficult or impossible. AT is also designed to help carers support a loved one or care recipient.

In the context of electronic equipment or systems, AT can range from a large button phone, or photo ID phone, to more complex whole-house technology, or smart home technology. In this regard there is much crossover between Ambient Assisted Living, Telecare, and Telehealth systems.

Where smart home technology is used as AT it can be designed as a comprehensive system that combines monitoring and automation and can be tailored to meet individual needs. Environmental Control Units (ECUs) are an example of smart technology used as AT in the home. ECUs can be used to control various items such as the lights or TV, and will help certain people to live with greater independence in their own home.

31 *This ECU uses a mobile phone or tablet interface to control a range of automated objects and devices within the dwelling.*

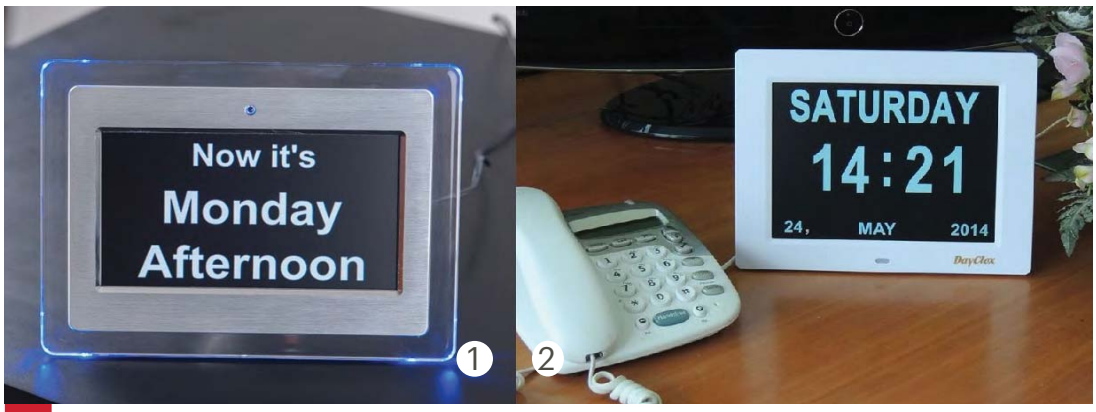
If required, ECUs can be linked to more complex home automation systems including automatic door, window, or curtain openers, and therefore enable a person who is frail or is living with mobility difficulties to independently control their environment.

If these technologies are carefully designed, and tailored to the needs and preferences of the person with dementia, they can be unobtrusive. (Smart home technology is closely related to Ambient Assisted Living as described next.)

Technologies: Ambient Assisted Living (AAL)

Ambient Assisted Living (AAL) centres on information and communication technology (ICT) enabling older people to live at home independently. AAL has a health and well-being focus and typically refers to embedded ICT to create more intelligent everyday environments to provide assistance, monitoring and care for everyday living for older people.

Digital day clocks are good example of simple and effective AAL technology which has been shown to be beneficial for people with the dementia. A day clock will help orient a person about the time of day, day of the week, or the month.



32 *Image 1 and Image 2 show examples of day clocks providing dates and times to help with temporal orientation.*

AAL is a rapidly developing area and will often encompass elements of both Telecare and Telehealth as outlined below.

Technologies: Telecare

Telecare uses various ICT to provide support and social care from a distance, supported by telecommunications, such as phone or video equipment.

Telecare packages can include pendant alarms, fall monitors, bed motion or bed occupancy sensors, and door entry/exit sensors. Other examples include sensors to record usual behaviour patterns and identify when deviations from the norm occur. Telecare can also include environmental hazard detectors including flood detector sensors to sense bath, sink or washing machine overflows, temperature sensors to monitor extreme temperatures and unusual changes in temperature, and natural gas detectors and smoke detectors.

These packages can also include bogus callers panic buttons, carbon monoxide detectors, fall and gas detectors.

33 *Image 1 to the left, shows an exit sensor that sends a message to a control point (family member, carer or care provider) when the door is opened. Image 2 on the right, shows an emergency call unit with a push button and a pull cord.*

Technologies: Telehealth

Telehealth refers to the electronic exchange of personal health data from a person at home to medical staff at a hospital or similar site to assist in diagnosis and ongoing monitoring of the person's health condition.

An Enuresis Sensor placed in a bed and connected to a telehealth service is a good example of how teleheath might be used to support a person with dementia who may be incontinent. An Enuresis Sensor detects moisture in the bed and alerts the telehealth service which in turn records these events and reports findings to the appropriate healthcare worker(s).

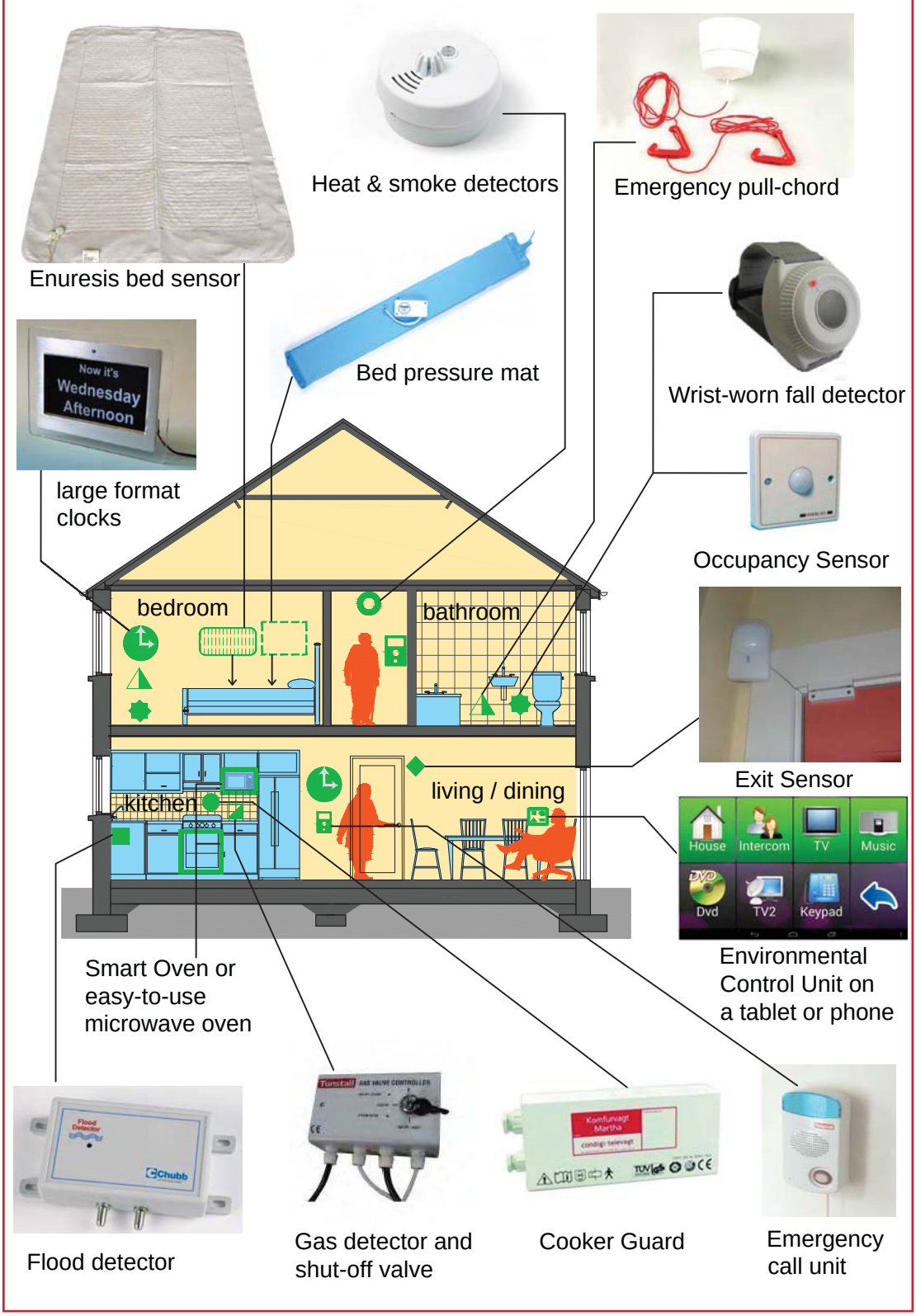
34 *Enuresis Sensor that can be connected to Telehealth system.*

The various assistive technologies described herein are some examples of a wide range of assistive technologies which are increasingly being used as part of an integrated approach to independent living for older people and people with dementia. In light of this, the guidelines below specify a range of measures drawn from all of the above and can be considered on an individual basis, or part of an overall package.

Patricia lives with her husband Seamus and they have recently refurbished their house. In the process they have had technology installed as part of an Ambient Assisted Living (AAL) service. They chose to do this as Patricia was diagnosed with Alzheimer's disease last year and has become increasingly confused. As part of this AAL they have digital day clocks to help with her orientation and exit monitors on the front and back door to alert the AAL centre if Patricia leaves the house between certain hours of the night, decided on by Patricia and Seamus.

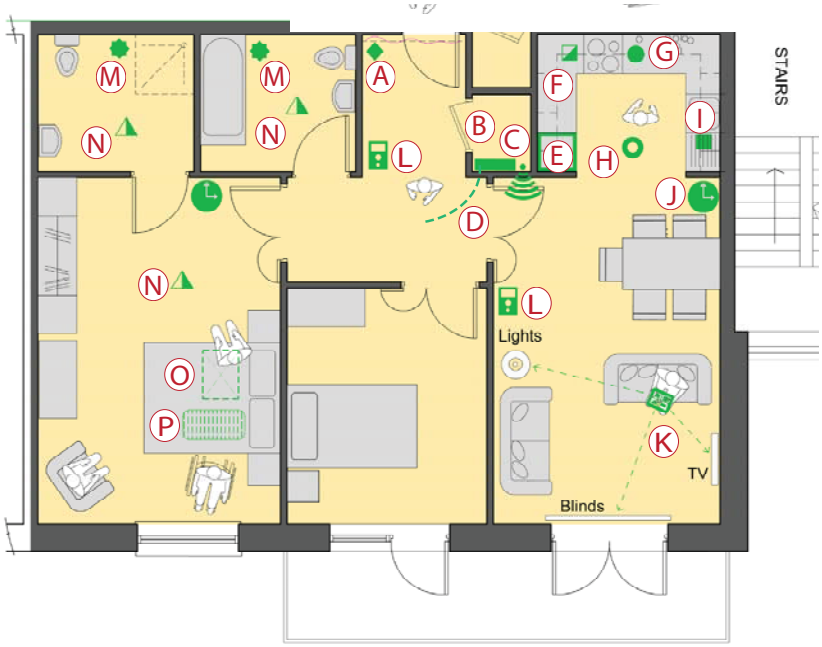
Technical Sketch:

Various Technologies combined to create an integrated approach



Technical Sketch:

Apartment Floor Plan Showing a Selection of Assistive Technologies



A. Exit alert sensor connected to a control point or an exit risk messaging service.
B. Accessible, ventilated cupboard as a hub for assisted living technologies.
C. Ensure hub location, structure and materials facilitate WiFi technologies.
D. CAT 6 data communication and power cabling to key areas within the apartment.
E. Providing an easy-to-use microwave oven or 'smart oven'.
F. Cooker minder system with sensors to turn off cooker when smoke is detected. Also consider induction hob, but remember that a person with dementia may not be aware that the cooker is on since there will be no visible sign of heat so an induction hob may not always be appropriate.
G. Gas detector and shut-off valve.
H. Flood detector and shut-off valve.
I. Heat and smoke detectors.
J. Consider large format clocks and calendars.
K. Environmental Control Unit linked to TV, lights and blinds.
L. Emergency call unit with push button and pull cord.
M. Pull-cord emergency call unit linked to Telecare or similar smart system.
N. Infrared fall detection devices linked to Telecare system.
O. Movement sensors or bed pressure mats that turn lights on automatically at night if a person needs to use that bathroom or move about.
P. Enuresis sensor or similar sensor linked to Telecare or Telehealth system.

Please refer to Section 4.2 in the UDHI Guidelines for overall guidance.

UD Dementia Friendly Design Guidance

- As specified in the UDHI Section 4.4 of the UDHI Guidelines, provide an accessible, ventilated cupboard to act as a hub for the above devices. However, in line with safety issues described earlier, ensure that this cupboard can be disguised, or locked.
- To ensure maximum flexibility for the future use of technologies install CAT6 data communication and power cabling to key areas within the house for future use if required (See UDHI Section 4.4 for further guidance).
- Ensure hub location, structure and materials facilitate WiFi technologies
- Consider the installation of an exit risk messaging device or similar which can be programmed to alert a designated person if the front door is opened during certain predetermined times.
- In kitchens consider the following technologies:
  - Induction hobs only generate heat where the pot or pan sits while the rest of the hob's surface remains cool. These induction hobs can also be programmed for automatic shut-off after specified times or if an object accidentally falls on the hob.
  - Smart ovens and smart microwaves, some of which can be used and monitored remotely.
  - Sensor and timer-based cooker turn-off devices.
  - Gas detector and shut-off valves.
  - Flood detector and water shut-off valves.
- In bathrooms consider the following technologies:
  - Automatic taps or automatic flood detector and water shut-off valves.
  - Infrared fall detection devices linked to Telecare system.
  - Pull-cord emergency call unit linked to Telecare or similar smart system.
- In bedrooms consider the following technologies:
  - Infrared fall detection devices linked to Telecare system.
  - Pull-cord emergency call unit linked to Telecare or similar smart system.
  - Movement sensors or bed pressure mats that turn lights on automatically at night if a person needs to use that bathroom or move about.
- Consider large format clocks and calenders to help temporal orientation.

Consultation with the occupants, family members or carers may reveal certain behavioural patterns, needs or preferences of the person with dementia to inform the best AT, AAL, Telecare, or Telehealth option.

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Appendix A: Stakeholder Consultation Process

Appendix A
Stakeholder Engagement Process

These Guidelines are underpinned by in-depth research and supported by an extensive engagement process with key stakeholders. This stakeholder engagement process is outlined in the Research & Recommendations Report titled - **Research for Dementia and Home Design in Ireland looking at New Build and Retro-Fit Homes from a Universal Design Approach.**

To download this report please go to; www.universaldesign.ie/housing/

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Appendix B: Bibliography and Acknowledgements

Lárionad Foirfeachta i nDearadh Uilíoch
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NDA
National Disability Authority
Údarás Náisiúnta Míchumais

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Appendix B Bibliography & Acknowledgements

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Please note that an extensive bibliography of relevant literature is available in the Research & Recommendations Report as referred to above.
(see www.universaldesign.ie/housing/)

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Image of couple on page 105, image of lady on phone on page 148, and couple on page 152, courtesy of Ambro at FreeDigitalPhotos.net

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Appendix C:
Key Terminology

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Appendix C Key Terminology

Accessible
With respect to buildings, or parts of buildings, means that people, regardless of age, size, ability or disability, are able to both access and use the building and its facilities.

Acoustics
Characteristics relating to sound.

Activities of Daily Living (ADL)
Typical domestic activities such as washing, dressing etc.

Alzheimer's disease
Alzheimer's disease- named after the Bavarian doctor who first described it (Alois Alzheimer), in a 51 year old woman, this is an organic illness that affects the brain. There are 48,000 people in Ireland with dementia and most of these people have Alzheimer's disease. During the course of the disease, proteins build up in the brain to form structures called 'plaques' and 'tangles'. This leads to the loss of connections between nerve cells, and eventually to the death of nerve cells and loss of brain tissue. People with Alzheimer's also have a shortage of some important chemicals in their brain.

Ambient Assisted Living (AAL)
Ambient Assisted Living (AAL) centres on information and communication technology (ICT) enabling older people to live at home independently

Apraxia
Apraxia is an acquired disorder of motor planning, despite intact motor coordination. It is not caused by incoordination, sensory loss, or failure to comprehend simple commands but rather by damage to specific areas of the cerebrum in the brain.

Assistive Technologies
technological devices (equipment or systems) that are used to increase, maintain, or improve functional capabilities of individuals.

Bathroom
A room comprising a bath, WC, washbasin, and associated accessories.

Building
A permanent or temporary structure of any size that accommodates facilities to which people have access. A building accommodating sanitary facilities may include a toilet block in a public park or shower facilities at a campsite. A temporary building may include portable toilet facilities such as those provided at outdoor events.

Cardiovascular
Cardiovascular disease includes ischemic heart disease (heart attacks) and blood vessel disease such as strokes. A heart attack occurs when the blood flow to part of the heart gets blocked and similarly a stroke occurs when the blood vessel that feeds the brain gets blocked.

CAT6
A data communication cable standard for Gigabit Ethernet cable.

Cat and Kitten Door
This door set comprises of two door leafs; one leave is a standard width door (the cat - usually between 700-800mm), while the other leaf is narrower (the kitten-usually 300-400mm). Therefore, when opened at the same time a wider door opening is created .

Circulation
External or internal spaces to allow a person move from one place to another (i.e. External pathways or internal corridors)

Challenging behaviours
Sometimes known as "behavioural and psychological symptoms" of dementia. A person with dementia may exhibit one or more of these challenging behaviours during the course of the illness. Challenging behaviours include agitation, aggression, wandering, sleep disturbance, inappropriate eating, inappropriate sexual behaviour, delusions, hallucinations, paranoia, depression, anxiety and misidentification.

Clear width
The width between hardrails.

Cognitive impairment
A cognitive decline greater than that expected for a person's age and education level.

Decibels
Decibels (dBs) are the units used to measure sound intensity

Dementia
Global or umbrella term used to describe a group of diseases that have common symptoms but different causes. Symptoms include impaired memory, language, ability to communicate, mood and personality. By far the most common type of dementia is Alzheimer's disease.

Designated car parking
Car parking spaces reserved for the use of car users with disabilities, whether as motorists or passengers.

Door ironmongery
A collective term for components including hinges, handles, locks and self-closing devices, which are used to facilitate the correct functioning of a door. May also be termed 'architectural ironmongery' or 'door furniture'.

Dropped kerbs
A lowered section of kerb between a pavement and carriageway forming a level or flush crossing point. Also referred to as dished kerbs.

Dwelling
A private home (privately owned or rented) that can take the form of a detached, semi-detached, terraced house or an apartment

Enuresis Sensor
Detects moisture typically associated with bedwetting.

Handrail
Component of stairs, steps or ramps that provides guidance and support at hand level.

Instrumental Activities of Daily (IADL)
Typical daily activities which involve a higher level of organisation than ADLs. These include shopping, paying bills, etc

Leading edge
The opening edge of a door adjacent to the handle.

Matwell
Entrance Door Matting Systems set into a frame in the floor.

Mixed dementia
Mixed dementia is a combination of Alzheimer's disease and Vascular dementia. The diagnosis of mixed dementia is on the increase probably as a result of more refined technologies now used in the detection of dementia sub-types

M^2
Metres Squared.

Nosing
An edge part of the step tread at the top of the riser beneath in a flight of stairs

Parietal Lobes
The brain comprises many different lobes (frontal, temporal, occipital and parietal) each with particular functions. The parietal lobes are found in the cortex of the brain and are where information such as taste, temperature and touch are integrated or processed. The parietal lobes enable us negotiate our way in the three dimensional world in which we live. Humans would not be able to to feel sensations of touch, if the parietal lobe was damaged.

Parkinson's disease
Parkinson's disease is a degenerative disorder of the central nervous system mainly affecting the motor system. The motor symptoms of Parkinson's disease result from the death of dopamine generating cells. Early in the course of the disease, the most obvious symptoms are movement related; these include shaking rigidity slowness of movement and difficulty with walking and gait. Later, thinking and behavioural problems may arise. Dementia is very common in the more advanced and severe stages of the disease. Parkinson's disease is more common in older people.

Passenger lift
A conventional motorised lift enclosed within a structural shaft and rising one or more storeys within a building. Lift and door movement is automatic.

Path
A pedestrian route that has no adjacent vehicle carriageway and includes paths in countryside locations as well as paths in urban and residential environments.

Pavement
A pavement is the part of a roadway used by pedestrians and is adjacent to the vehicle carriageway.

PIR
A Passive Infrared (PIR) sensor-activated light fitting.

Positive risk-taking
Positive Risk taking –refers to balancing the positive benefits gained from taking risks against the negative effects of attempting to avoid risk altogether. In dementia care, positive risk taking involves enabling the individual with dementia have some autonomy independence, dignity and choice whilst unobtrusively protecting that person from potentially hazardous situations.

Psycho-Social
Psycho-social environment refers to the culture, climate and ethos of the setting in which we live or where we work. The build environment in contrast refers to the actual architectural lay out of the setting. Examples of the psychosocial environment of a nursing home might include the ethos of care, respect for residents, quality of life, quality of care, and acknowledgement of employees' psychological well-being.

Ramp
An inclined plane 1:20 or steeper from the horizontal and intermediate landings that facilitate access from one level to another..

Retro-fit
Carrying out building works to an existing building.

Riser
The vertical portion between each tread on the stair.

Setting-down point
A designated area close to a building entrance or other facility where passengers can alight from a car or taxi.

Shower room
A room comprising a shower, WC, washbasin, and associated accessories, such as en-suite facilities in residential accommodation.

Soffit
The underside of any construction element, the underside of a flight of stairs.

Stairlift
A device mounted on a support rail that follows the incline of a stair and incorporates either a seat with footrest (chairlift) or standing platform and perch (perching stairlift). Stairlifts are designed for domestic use only. Also termed chair stairlift and domestic stairlift.

Step nosing
The leading edge of a step or landing.

Street furniture
Items located in street and other pedestrian environments such as lamp posts, litter bins, signs, benches, and post boxes.

Tactile paving surface
A profiled paving or textured surface that provides guidance or warning to pedestrians with visual difficulties.

Telehealth
A system that uses the electronic exchange of personal health data from a person at home to medical staff at a hospital or similar site to assist in diagnosis and ongoing monitoring of the person's health condition.

Telecare
The use of various ICT to provide support and social care from a distance, supported by telecommunications, such as phone or video equipment.

Through-floor lift
A simple one-person lifting car, suitable for someone standing or in a wheelchair, which can be easily installed in most homes. Travel distance is limited to between two floors only. It is usually self-supporting, motored by a free-standing vertical track, , and open above the car. The floor space on the upper level is closed by an infill lid attached to the lift car.

Transom
A horizontal crosspiece in a window frame usually dividing the window into a top and bottom section.

Tread
The part of the stairway that is stepped on.

Urban Form
The layout, shape, height and design details of the built environment, including streets, roads, public space, buildings etc. in an urban area.

U-Value
U-value refers to thermal transmittance and it is a measures the rate of heat that passes through a component or structure. It is expressed in units of Watts per square metre per degree of air temperature difference (W/m2K)

Vascular Dementia
Vascular dementia is caused by reduced blood supply to the brain due to diseased blood vessels and results in symptoms that can include memory loss and difficulties with thinking, problem-solving or language

Ventilation Strips
vents integrated into a window frame that are in the shape of a bar or strip, and that can be controlled by opening or closing the aperture within the vent to different extents.

Vision panel
A fixed, glazed panel set into a door that enables people to see through from one side of the door to the other. May also be termed 'viewing panel.'

Visual contrast
Colour and/or tonal contrast between surfaces and fixtures, designed to improve visual clarity.

Wainscoting
Panelling (usually timber) fixed to the lower part of an internal wall and usually carried up to approximately 1000m above finished floor level

Wayfinding
A collective term describing features in a building or environment that facilitate orientation and navigation.

Wet room
A shower room in which the floor and walls are all waterproof. The shower area can be accessed without crossing a threshold or stepping into a shower tray.

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Appendix D: Key Acronyms

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Appendix D Key Acronyms

AAL - Ambient Assisted Living

ADL - Activities of Daily Living

AT - Assistive Technology

BMS - Building Management System

CEUD - Centre for Excellence in Universal Design

CPTED - Crime Prevention through Environmental Design

ECU - Environmental Control Units

F,F&F - Furniture, Fixtures and Fittings

IADL - Instrumental Activities of Daily Living

ICT - Information and Communications Technologies

MHRV - Mechanical Heat Recovery Ventilation

NDA - National Disability Authority

UD - Universal Design

UDHI - Universal Design Homes for Ireland

UFH - Under Floor Heating

Notes

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