DESIGNING HOMES FOR ALL

An inclusive design guide to support people living with cognitive and sensory impairment

Housing Executive

Department of Health
www.health-ni.gov.uk

Department for Communities
www.communities-ni.gov.uk

GLOBAL BRAIN HEALTH INSTITUTE

DDS Dementia Design Specialist Architects

Foundations

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Foreword

Department for Communities/ Department of Health

Well-designed homes are a key element of promoting health, well-being, safety, independence and quality of life for everyone, including those living with disabilities. It is widely recognised that poorly designed non-inclusive environments can be confusing, disabling and even dangerous.

This is especially the case for many people living with cognitive and sensory impairment (CSI), whose disability may not be immediately evident in terms of their presentation. However, the impact of hidden disabilities can be just as disabling as a physical disability, with the built environment often a major contributor to a person's challenges.

Whilst the design of enabling and inclusive environments for new projects and planned upgrades does not necessarily add cost, it does require knowledge and informed choice. 'Designing Homes for All' aims to guide and support people, through home design, to remain independent and live with dignity and autonomy for longer.

This guidance seeks to go beyond statutory requirements to build truly inclusive environments and communities which align with our responsibilities as outlined in Articles 9 and 19 of the UN Convention on the Rights of Persons with Disabilities (2006) in relation to accessibility and living independently.

The Departments recognise that well-designed and healthy homes are a major contributor to:

- Greater life chances, independent living and care
- Improved health, well-being and comfort
- Better educational attainment and workplace productivity
- Lower costs to our health service and ultimately a healthier population

This document aligns with a key Department of Health (DoH) strategy for addressing health inequalities, "Live Better", which aims to ensure that the right care is provided in the right place, which for the majority of our population is home. It also aligns with the vision set out in the DfC Housing Supply Strategy 2024-2039 where "Everybody has access to a good quality, affordable and sustainable home that is appropriate for their needs and is located within a thriving and inclusive community."

We actively encourage stakeholders involved in housing design for people living with disabilities to examine the guidance contained within the document when considering their approach to property adaptation and new build across tenure.

Signed:

Minister
Department of Health (DoH)

Signed:

Minister
Department for Communities (DfC)

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He was one of the authors of the Interdepartmental Housing Adaptations Design Toolkit which provides a consistent and standardised approach to design principles, space standards and methods of communication in the delivery of housing adaptations across tenure.

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Mark is a qualified architect who works for the Department of Finance's Housing Advisory Unit; a professionally qualified team who carry out technical inspections and provide technical advice to the Department for Communities' Housing Division on a wide range of subjects such as design standards, cost management and procurement policy.

Post qualification he worked in the private sector before taking up his current Government role in social housing over 10 years ago. In this time, he has advised on and developed a keen interest in, adaptable and accessible housing; including areas such as Space Standards, Lifetime Homes, Wheelchair Housing and Homes for Older People.

Document Structure

Section 1: Introduction and Background

Section 2.1: Key Design Foundations:

Research in the field of design for people living with cognitive and sensory impairments has shown that there are three primary design foundations which are beneficial to all regardless of the disease, symptoms or diagnosis.

- **2.1.1 Optimise Sensory Load**
- **2.1.2 Reduce Design Complexity**
- **2.1.3 Provide Access to Nature**

Section 2.2: Inclusive Design Principles:

The Inclusive Design principles, which have evolved through practice and research, are intended to help guide stakeholders towards a design solution which supports a person's health and well-being, but without dictating how it should be achieved. Using overarching design principles means there is potentially a variety of suitable design solutions and therefore can allow for a tailored response to each person's individual needs and preferences. The 12 principles are:

- **Provide a safe environment**
- **Promote privacy, dignity and independence**
- **Provide optimum levels of stimuli**
- **Provide optimum levels of light and contrast**
- **Provide a non-institutional and human-scale environment**
- **Support orientation**
- **Support wayfinding and navigation**
- **Provide good visibility and visual access**
- **Provide access to nature and outdoors**
- **Promote engagement with family and community**
- **Promote physical and meaningful activities**
- **Support healthy nutrition and hydration**

Section 3: Design Considerations and Applying Principles in Practice:

Design considerations identify possible solutions for achieving the desired inclusive design principles in Section 2.2. Though more detailed than the principles, they should be considered as general descriptions of what could potentially be incorporated in the design rather than mandatory, detailed technical specifications. The design considerations are intended to guide and inspire, but do not represent a complete list of all possible solutions to achieve the design principles. This means there is flexibility and choice for designers to choose the optimum solution from a variety of options.

- **3.1 Home Location and Surrounding Environment**
- **3.2 External Access - Approach and Entrance**
- **3.3 Internal Access and Circulation**
- **3.4 Fixtures, Fittings and Decor**

Section 4: Room Layout Design:

The focus of this section is to expand on guidance provided in Section 3 (Design considerations: Applying Principles in Practice), by providing enhanced detail for inclusive design features in the following rooms:

- **4.1 Living areas**
- **4.2 Kitchen and dining areas**
- **4.3 WC and bathrooms**
- **4.4 Bedrooms**

Appendices and References

SECTION 1

Introduction and Background

Introduction and Background

1.1 What is Inclusive Design?

"Our home is not just a dwelling place. It should be a place of comfort, shelter, safety and warmth. It is the main setting for our health throughout our lives"

(UK Health Security Agency 2015)

Inclusive design is the design of an environment so that it can be accessed and used by as many people as possible, regardless of age, gender, ethnicity, religion, background and disability. It recognises and supports the different ways people use the home environment and aims to provide dignified and equitable use by everyone, supporting people across all abilities, from childhood to later life.

People of all ages and abilities prefer to remain in familiar surroundings and stay active, engaged and valued members of their communities while participating fully in all aspects of life for as long as possible. Much of our focus in Northern Ireland, to this point, has been on accessible design for people with mobility or physical impairment. Our shared environment has been improved and adapted to support people with physical impairments to access places and services on an equal basis. That knowledge and expertise has now expanded to include design and improved access for people living with Cognitive and Sensory Impairments (CSI).

'Designing Homes for All' embraces the ethos of inclusive design by aiming to create better barrier-free environments for people with disabilities. It seeks to inform and encourage the design process to go beyond meeting minimum standards or only achieving legislative requirements, and to avoid solely routine reliance on checklists. In doing so it seeks to change mindsets and embed inclusivity as an essential component of good design.

1.2 Aims and Objectives

For the most part the guidance in this document is not regulatory. It neither does nor can cover every element of design relevant to people with disabilities, particularly those living with CSI.

The guidance aspires to:

- Ensure that the home environment is designed to promote the safety, comfort, independence, and general well-being of all the occupants.
- Provide a reference for anyone involved in the home design process to a range of considerations to improve the accessibility and ultimately the usability of the home for people of all ages and abilities.
- Change attitudes towards inclusivity in how we build or adapt our homes.
- Promote a 'Designing Homes for all' approach to the building and adaptation of homes across Northern Ireland.

- Raise awareness of what good housing design for all looks like.
- Encourage those involved in housing design and construction to consider the principles that underpin the document.
- Support people with cognitive and sensory impairments, along with their families and carers, to make informed decisions regarding the design of their home to enhance their quality of life.
- Influence the development of future amendments to building standards and regulations in Northern Ireland.

It is extremely important to highlight that, whilst the guide seeks to achieve these aspirations, it is essential that **personalisation** is central to the design process. People with disabilities and their carers must have a say in the design of their homes if we are to be truly inclusive in our approach. Those with the lived experience of disability and their family and carers are very often best placed to identify those areas in their home which are impeding their ability to function to their full potential.

The guidance has been compiled using a wide range of existing evidence-based guidance, building legislation and internationally recognised best practice regarding inclusive design standards, which are included in the extensive reference section. It seeks to bring together in a more accessible format those design principles and considerations that best reflect the needs of people with CSI.

As best practice in the field of inclusive design is ever evolving, this guidance will also require regular review and may need to be updated over time.

Every effort has been made to ensure that the language used in this guidance is correct at the time of publication.

Target audience

Whilst the guidance is primarily a technical document it is aimed at a wide range of stakeholders involved in developing, designing, constructing, advising and setting policy for inclusive design as well as those who will ultimately live in the homes. This includes but is not exclusive to:

- **Architects and Designers** who develop design proposals
- **Interior designers** providing advice on interior finishes and decor
- **Builders/contractors** completing the work required
- **Occupational therapists** involved in establishing the housing needs of people with disabilities
- **Social Workers** in sensory support teams
- **Special Educational Needs staff**
- **Northern Ireland Housing Executive Technical staff** involved in design proposals for adaptations in both social and private sector
- **Housing Associations** designing and providing social housing
- **Department of Health, Department for Communities and Department for Infrastructure** Policy teams with a responsibility for accessible homes and neighbourhoods
- **People with disabilities and their families** considering making changes to their home

Furthermore, the guidance is intended to apply across tenures and to a wide range of dwelling types, old and new.

This includes:

- Existing dwellings
- Existing dwellings when being extended or adapted
- New build dwellings
- Purpose built dwellings for people with disabilities

The guide provides a set of design principles that will enhance home design for everyone regardless of age or medical condition. It is not a check list of dos and do nots, as such an approach can limit the opportunity to respond to individual needs or circumstances.

It does not aim to address processes, systems or funding arrangements in Northern Ireland but argues that incorporating the principles early in the design stage would have minimal impact on budgets.

The aim is best described by the Cedar Foundation as follows:

> ***"A well-designed living space can significantly reduce barriers to daily activities, providing individuals with the opportunity to live more autonomously and safely. This is especially important for those with cognitive impairments, such as brain injury or learning disabilities, who may have difficulty with orientation, memory, or decision-making. Similarly, people with sensory impairments, such as vision or hearing loss, may require specific adaptations to navigate spaces effectively and comfortably.***
>
> ***The guide will not only promote safety but also offer design solutions that foster a sense of dignity, autonomy, and inclusion. It can provide practical recommendations for creating environments that are easily understood, navigated, and enjoyed by people with a range of needs. From visual cues to lighting and colour contrast, to acoustics and tactile markers, the right design can make a meaningful difference in the lives of individuals with sensory and cognitive challenges".***

Although the guide is focused primarily on the home, the underlying principles can equally be applied in supported living environments, public buildings and other residential/care settings.

1.3 How do we define disability?

In the context of this guide the definition of disability as outlined in the Disability Discrimination Act 1995 is applied which defines disability as *"A physical or mental impairment which has a substantial and long-term adverse effect on a person's ability to carry out normal day-to-day activities."*

Disability is not the same for everyone. It can be physical, cognitive or sensory, with symptoms and severity that can vary from individual to individual and over time. Some disabilities are congenital and some are acquired later in life. Some are progressive; some are non-visible; and some people have more than one type of disability. Disabilities are not one-size-fits-all.

In addition, people's experience of disability can depend on their circumstances: their economic background, their support network and on their access to education, healthcare and social services. It can also depend on the design of their home. We know that poorly designed homes can be the disabling factor for some people by preventing or reducing their ability to perform normal day-to-day activities. Therefore, the focus of this document is to provide design guidance that can improve accessibility, user comfort, health and well-being for people of all ages and abilities.

Diagnoses and designations are avoided in this guidance, as it is not possible to provide a comprehensive list. Further guidance on the interpretation of these terms is outlined in the Equality Commission for Northern Ireland's Definition of Disability guidance (revised 2007).

1.4 Key types of disability and their impact

Medical conditions and impairments are dynamic and might change over time. Consequently, the interactions with the home environment can vary from person to person and can affect people in several different ways. For this document, disabilities are considered in three key groups; cognitive, sensory and physical. Each present with different challenges in terms of accessing and managing within the home environment.

Cognitive Impairment

Impaired cognitive ability can affect memory, reasoning, judgement, planning, focus, and decision making. This can lead to a person experiencing difficulties in finding their way around or engaging with their home environment and the people within it. The result can be a reduced ability to cope, negotiate and navigate in unfamiliar settings. Even familiar settings can be challenging.

Being aware of the challenges that cognitive impairment poses for people allows us to design to better support their needs and reduce the stress and anxiety they experience in poorly designed (non-inclusive) home environments. For example, cues, prompts and signage can be provided to support memory and wayfinding, which in turn can reduce isolation and promote social inclusion.

People living with CSI and neurodevelopment conditions can present with behaviours that challenge. Those behaviours can be a response to the design of the environment if it is not planned or adapted to support their needs. It is therefore important to consider their specific needs when designing the home environment to help with the management of such behaviours.

Very often this will require a multi-disciplinary/multi-agency approach with Health and Social Care (HSC) Trust occupational therapy services, behavioural psychologists, social services, medical teams, housing providers, architects and designers.

Non-inclusive design can accelerate both functional (ability to cope with everyday living) and cognitive decline, therefore negatively affecting a person's independence, dignity and autonomy.

We can support cognitive function through good design. We can do this by designing intuitive, predictable, legible and familiar environments.

Sensory Impairment

Sensory impairment can reduce the ability to see, hear, taste, smell and touch. This affects how a person experiences and interacts with their environment. The general perception is that a person engages with the home environment through sight, but this underestimates the input we rely on from our other senses to interpret our surroundings. Through inclusive design features, all the senses can be aided and supported to enhance our understanding of the home environment.

Blind and partially sighted people rely on their remaining senses - hearing, touch, smell, and taste - to compensate for their visual impairments to make sense of the world and to help navigate it. They use aids such as canes and guide dogs to extend their cognition. 80% of visually impaired people can use their remaining sight to help interpret spaces if they are designed to support greater visual clarity and understanding. For example, the use of tonal contrast to highlight key items and the use of contrasting surfaces to support increased 3D depth perception. Design interventions using light, colour, contrast, texture and signage can help compensate for lost abilities and support people to better understand and read their home environment.

People with cognitive and sensory impairments can also find it difficult to understand and filter multiple simultaneous sensory stimuli and become confused and overwhelmed. This is especially the case for people who may experience sensory sensitivities, which includes both hypersensitivity and hyposensitivity.

From a sensory perspective we should design in such a way that relevant information can be delivered without creating sensory overload, which will confuse, distract and ultimately lead to frustration and withdrawal. In doing so we should edit out what is irrelevant and emphasise what is important to support a person's understanding and their remaining abilities.

Physical Impairment

People living with physical impairment can experience reduced mobility and difficulties with balance or performing tasks, including those needing manual dexterity. Day-to-day activities such as walking, standing and sitting can all be impacted.

The barriers to inclusion for people living with physical impairments are generally understood and we can design to support their needs, such as by providing wider doors, ramps and accessible toilets. These features are now frequently included in our built environment. It is a statutory requirement that accessible facilities are built as a minimum to meet current building regulations, otherwise the very people we are looking to support and enable may be excluded.

We can design our environment to support people with physical impairments to access places and services on an equal basis.

With the aim of creating inclusive home environments and communities; and with accessibility as the foundation, every home should be designed to support the needs of people living with cognitive, sensory and physical impairments. This will also benefit their carers (both paid and unpaid) to provide the care and support that people living with disability may require. By integrating cognitive and sensory needs with accessibility we can design better homes for all.

Inclusive Design benefits everyone

If home environments are designed well to support the most vulnerable members of our community, they are designed well for everyone.

1.5 Need for Inclusive Design

Our relationship with the built environment, including the home, is not passive. At some time, everyone has experienced feeling uncomfortable when they enter a room, or a building; or when they walk down a street or through an exterior space. This can be due to several reasons such as excessive noise, lighting that is too bright or too dark, or unpleasant odours.

We rarely stop to think about why we feel uncomfortable within a space or analyse the reasons why; we just react. Generally, people engage with the spaces in which they feel comfortable, and withdraw, when possible, from the spaces which make them feel uneasy or uncomfortable.

A poorly designed built environment can impact everyone in some way, but for people living with CSI, who are very sensitive to their general surroundings, these feelings are more debilitating. They can become disorientated or lost and feel agitated or stressed in an environment that does not compensate for their additional needs. This can result in exclusion, withdrawal and isolation. They can lose confidence and their ability to cope because of the effects of a non-inclusive environment.

The number of people living with disabilities who have most to gain from inclusive design is growing. Demographic changes indicate that the number of people living with disability is increasing, particularly those living with Cognitive and Sensory Impairments (CSI), partly because people are living longer.

People with disabilities - Demographics and Statistics for Northern Ireland

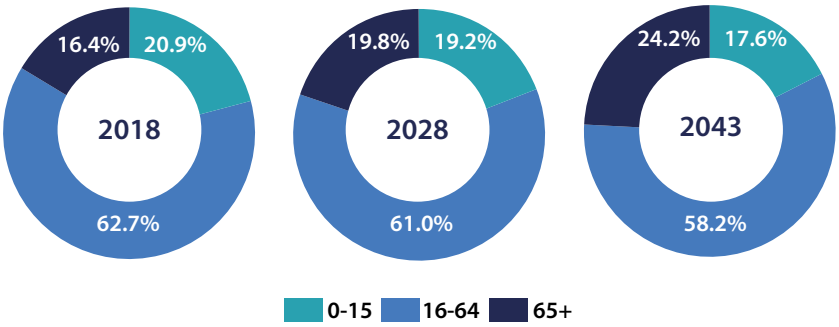
1 in 4

Almost **1 in 4** people in Northern Ireland are living with a confirmed disability, with the 2021 Census figures recording that "one person in four (24.3%) or 463,000 people had a life limiting long-term health problem or disability."

13,283

Breaking that down more specifically for people with CSI, figures from the Northern Ireland Statistics Research Agency (NISRA) (2022) indicate that there are currently **13,283 people with a dementia diagnosis** in Northern Ireland, with figures expected to rise. These figures do not take account of those with mild difficulties who are awaiting assessment and are often not known to statutory services. The Alzheimer's Society (2022) estimate the figure to be **over 20,000** and indicate that people with dementia in Northern Ireland are more likely to get a diagnosis than anywhere else in the UK.

Northern Ireland's growing elderly population reflects the global trend. In 2021, 17.2% of the population of Northern Ireland was aged 65 or over, representing 326,500 people. That growth is forecast to continue with NISRA (2017) estimating that the older population **(over 65) will be 24.2%** of the population in 2043.



Projected percentage of NI population aged 65+ in 2018, 2028 and 2043

The fact that people are living longer is very welcome, but the prevalence of chronic disease, long-term conditions and disability increases with age. It is therefore increasingly important that our homes are designed to meet future needs.

There are approximately **16,000 children and adults with learning disabilities** living in Northern Ireland and known to statutory services. (Taggart 2014). This is a higher proportion of our population than other regions in the UK (McConkey et al., 2003). There are also a substantial number of people with borderline/mild intellectual disabilities who do not use statutory services and are therefore not identified within these statistics.

Figures also indicate an increasing number of people with an autism diagnosis. The 2020/21 Northern Ireland School Census shows that **13,401 school aged children have been diagnosed with autism**. This represents an estimated autism prevalence rate of 4.5% within the school aged population.

1 in 5

57,500

Currently across Northern Ireland, there are **57,500 people with sight loss**, with this figure expected to rise by over 25 per cent by 2032 and with the Royal National Institute for the Blind (RNIB) indicating that **1 in 5 people** will experience sight loss in their lifetime.

109,500

The NI Census 2021 estimates that **109,500 people in Northern Ireland have hearing loss** which constitutes 5.8% of the population. It is estimated that at least **40% of the general population are living with CSI** when you include the range of neurodevelopmental conditions, though **many of this population may not have a confirmed disability.**

In addition to the increasing need within the population, the field of inclusive design has evolved greatly over the past 40 years. Through this time, we have witnessed a change in the culture surrounding the care of people living with CSI which has moved towards a more person-centred approach and a move away from institutional care. Inclusive design is now seen as a non-pharmacological supportive intervention for people with CSI and this means any setting occupied by people should be optimised to support their additional needs.

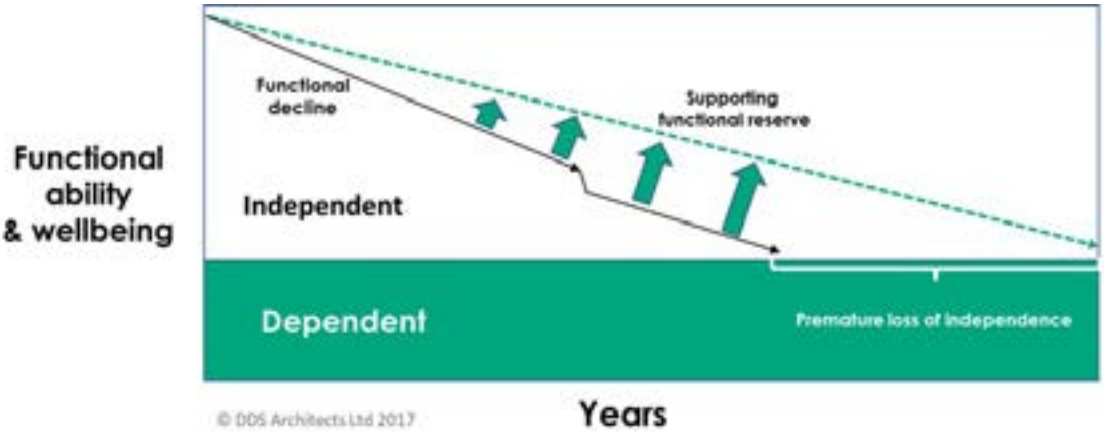
Therefore, the population figures and the change in approach to supporting for people with CSI suggests that inclusive design and applying the principles embedded in this guide is increasingly important in meeting the future needs of our changing population.

This guide intends to help address this need by focusing on the home design interventions that can promote function and enhance the lives of people living with CSI.

1.6 Benefits of Inclusive Design

Designing inclusive home environments benefits everyone

It is widely acknowledged that, because inclusive design strives to create places that are intuitive and usable by all, regardless of age, ability and circumstance, everyone in society benefits. Inclusive design and informed management of facilities can create places where people can thrive and have equitable opportunities to live, work and stay actively engaged in their community. But for the large number of people of all ages living with cognitive, sensory and physical impairments, and for their families and their carers, the impact can be profound; inclusive design can have life-changing benefits. For example, the design of an environment can have a major impact on functional decline. The figure below shows the relationship between environmental design and functional decline, demonstrating that non-inclusive design can accelerate both functional (ability to cope with everyday living) and cognitive decline, whereas inclusive design can support functional reserve and help avoid premature loss of independence.



Graph showing functional decline and premature loss of independence

There is an increasing amount of research evidence, including a number of in-depth and critical studies with promising outcomes and findings, which supports the positive impact of inclusive design features. Much of the research and guidance literature relates to people living with dementia or has been carried out in residential homes (nursing, care, assisted living) and hospital settings. However, there is no reason to think that design features have a different degree of importance or impact depending on the setting. Therefore, these studies and others have provided us with research-based findings to inform our approach to designing environments for people living with CSI.

Ultimately the overarching benefit of inclusive design is to society. The goal is an inclusive and resilient society free from disabling barriers where all individuals are equal and there is greater support, exchange and knowledge between diverse ranges of people. An inclusively designed built environment, in particular the home and the community, is the foundation of an inclusive society.

1.7 Barriers to inclusion and adoption of CSI design principles

In general there is a lack of awareness and understanding of CSI issues within the design professions and the general population. Furthermore, the scale of the need is not fully appreciated. Therefore, we need to increase our understanding of CSI issues, develop better guidance, adapt our approach to design, and normalise our adoption of CSI design practices in order to improve the lives of people with CSI and so reap the benefits that inclusive design can bring.

Common misconceptions preventing adoption of inclusive design principles

1. Inclusive design implies additional cost

For new buildings or planned refurbishments, this is not the case. If the expertise is included from inception of the project, sensory and cognitively inclusive home environments can be constructed at no extra expense.

2. Inclusive design adversely affects the aesthetics

If skilled and knowledgeable designers are engaged, the aesthetic will not be adversely affected. All supporting interventions can and should be invisible to the untrained eye. A skilled and informed designer can incorporate inclusive elements and design interventions that work seamlessly into the design without compromise.

3. Inclusive design requires different solutions for different disabilities

The fundamental foundations of providing access to nature, reducing design complexity and optimising sensory load are common requirements across the CSI communities whilst at the same time benefiting the wider population.

4. Inclusive buildings are more suited to occupants with CSI

It is established that ‘neurotypical’ and non-CSI individuals share a preference for more peaceful, less complex buildings with fewer stimuli. Inclusive design works well for everyone.

5. Inclusive design is only for wheelchair users and/or elderly people

Disability can take many different forms and therefore true inclusive design needs to create places that are useable and enjoyable by everyone regardless of age or ability, and, although wheelchair accessibility is essential, should not focus solely on one type of disability. In addition, inclusive design seeks to not just meet current needs, but also to meet people’s needs throughout their lives as their circumstances change due to accident, illness or ageing.

6. Inclusive design is comprehensively covered by Building Regulations

It is important to recognise that building regulations are the minimum requirement, and in terms of disability, generally only cover physical accessibility and sensory impairment. By adopting a change in attitude and by following best practice, inclusive design goes beyond minimum compliance to try to create the best designs possible for a much wider range of people, particularly those with disabilities such as CSI.

7. Inclusive design is already common practice within society

Despite many improvements to the built environment over recent years, particularly in relation to physical access, there remains significant shortcomings with achieving inclusive design, which includes design for CSI. There is no room for complacency; there is still much that needs to be done to make inclusivity integral for good design.

8. Inclusive design is best left to specialists

In terms of the design and construction of homes, housing and communities, inclusive design is the responsibility of everyone who is involved in the process, not just professionally qualified people. In particular, the experts in disability are normally those with the disability, as well as their families and their carers. Including them in the design process can be invaluable in creating the best solution to suit their needs.

Common Misconceptions Preventing Adoption of Inclusive Design Principles

1.8 Integrating Inclusive Design in Project Delivery

Inclusive access can only be achieved if a systematic inclusive design approach is included for design, construction and refurbishment projects from inception through to completion and beyond. A summary of the inclusive design aspects to consider at each work stage, based on the RIBA's Inclusive Design Overlay for their Plan of Work, is shown in the table below.

Inclusive design aspects to consider at each work stage

	RIBA Work Stage	Actions to consider at each stage:
0	**Strategic Definition** 	• Define commitment to inclusive design. Ideally an inclusive design strategy should be developed. • Identify an Inclusive Design Lead (or Champion). • Ensure a dedicated project budget is allocated for inclusive design.
1	**Preparation & Briefing** 	• Seek to understand the users of the built environment by engaging with current and/or future occupants, and the local community, where possible. • In refurbishment projects, undertake an inclusive design audit of the building. • Ensure the project brief makes explicit reference and commitment to inclusive design over the life of the project. • Confirm the project teams' technical expertise and competence in relation to inclusive design.

2	**Concept Design** 	• Agree an inclusive design review and feedback process. • Set up a user group for engagement sessions to test designs and capture feedback. • Commit to identifying and applying best practice inclusive design, standards and guidance as relevant. The aim should be to go beyond minimum regulations. • Consider future-proofing measures within the design.
3	**Spacial Coordination** 	• Undertake an inclusive design review pre-planning submission, in consultation with the user group. • Ensure inclusive design best practice is applied and regulations adhered to.
4	**Technical Design** 	• Carry out regular inclusive design reviews in consultation with the user group. • Identify risks to accessibility and inclusion. • Ensure inclusive design is embedded within the procurement strategy, such as ensuring competency within a prequalification questionnaire (or similar). • Ensure contract documentation includes all aspects of inclusive design within drawings, documents and specifications.
5	**Manufacturing & Construction** 	• Ensure the Inclusive Design strategy is communicated to, and understood by, the construction team. • Ensure the construction team have considered inclusion needs for construction site-staff, as well as the impact on the public of temporary works such as closing a pathway. • Carry out inclusive design audits in consultation with the user group mid-build, and pre-completion. • Prepare tenant handbook/building user guides and consider alternative communication formats as required.
6	**Handover** 	• Undertake a site visit with the user group for testing and feedback, to identify and address any potential accessibility barriers for people to use the building. • Provide occupants with inclusive and easy to understand tenant handbook/building user guides. • Where required, provide occupants with inclusive and easy to understand training on any inclusive design features or technology of their home. • Ensure the asset management team are provided with information and training on all relevant accessible features and technology. • Documentation for use by occupants and asset management should be made available in alternative formats, such as easy read and braille, as required.
7	**In-Use** 	• Initiate Post-Occupancy Evaluation (POE) to understand how the design has performed for all. • Ensure that any building(s) and external public realm (hard or soft landscaping) is managed to ensure inclusive design is maintained.

Explanatory Notes:

1. The above is based on the Inclusive Design Overlay to the RIBA plan of work. *https://www.architecture.com/knowledge-and-resources/knowledge-landing-page/riba-inclusive-design-overlay*

2. As projects will vary in size and complexity, ranging from new bathrooms or small extensions to one-off new build houses or large blocks of apartments, specific points may not be relevant to every project. However, the general principles of embedding inclusive design from start to finish of projects, and throughout each team; of going beyond the minimum requirements, and constantly reviewing, adapting and learning, are universal.

3. A user group can be formed from established community groups, charity and advocacy organisations, tenant forums and future tenants. User groups should aim to include a diverse demographic.

4. An inclusion champion from within the client organisation and/or the design team, would be responsible for raising standards, monitoring, and advising on equality, accessibility and inclusion on the project.

It is important to note that there are circumstances where certain types of conditions and associated behaviours require a specific individualised bespoke approach to design. Such cases often require a multi-disciplinary interagency approach in determining requirements. This guide does not seek to cover every type of scenario but is aimed at providing general advice that will support the needs of the majority, thereby setting a base line from which we can build and develop custom solutions for individual needs.

1.9 Importance of Home

A well-designed home is one of the most important non-medical supports we can give a person living with CSI.

Our homes are the foundation of our lives and are crucial to our health and well-being. Everyone, regardless of age or medical condition, requires a home environment that is a place of safety and security, and which offers comfort, privacy, dignity and independence. These are key quality of life measures. For those with a disability, although their abilities may be impaired, they remain a unique and valued individual, and a home that is well-designed and maintained can support them to make the most of their abilities and live as fully and independently as possible.

For everyone, their home environment needs to be enabling rather than disabling and this 'Designing Homes for All' guide aims to help everyone achieve this. We all experience, observe and interact with our surroundings differently as our cognitive and sensory abilities and tolerances are unique and individual. Therefore, this guide provides a set of design principles that can be applied to help enhance home design so that it becomes enabling.

For anyone living with CSI, it is important and reassuring to know how their home can be tastefully designed and adapted to support their individual needs. A person's home design may need to be modified to meet current, and future needs as requirements change. This will help enable greater independence and, for some, delay or mitigate the need for home care assistance or long-term residential care. Well-designed homes can support everyone to live as fully and independently as possible.

Inherent in providing a supportive home environment is ensuring optimum levels of sensory stimulation. As cognitive and sensory impairments can reduce the ability to filter sensory stimuli and to focus on those that are important, we should reduce and edit unnecessary physical, auditory and visual clutter in our surroundings. This will include optimum lighting levels and ensuring good contrast between elements as this can make it easier for us to read and understand our surroundings.

Helping people understand and read their surroundings can involve the inclusion of cues, prompts and reminders in appropriate locations. These can also aid in providing a structure to engage in physical and meaningful activities, thereby adding purpose and pleasure to a person's life.

The ability to understand and navigate around the home and neighbourhood is vitally important. For example, an ability to easily access local facilities can increase opportunities for social interaction and engagement. This supports a sense of belonging, identity and autonomy, which are all beneficial to a person's sense of self-worth. Access to nature also gives potential for social interaction, as well as providing restorative and therapeutic benefits. Being outside in nature has been proven to have a positive impact on health and well-being.

If the home environment is well designed and managed it can significantly improve a person's quality of life and allow them to remain in their own community despite having a disability, which is something that most people desire.

Small inexpensive adaptations can help a person to be independent, as well as lowering stress and anxiety levels and thereby potentially reducing the amount of care and support to be provided. Should someone need a more detailed assessment of their housing needs, the local occupational therapy service can advise on the type of works which may be helpful.

It is with the aspiration of providing genuinely inclusive 'Housing for All' that three Key Design Foundations have been identified as recommended for the home.

These are:

1. Optimise Sensory Load **2. Reduce Design Complexity** **3. Provide Access to Nature**

Each of the three Key Design Foundations are described in Section 2.1. These are underpinned by twelve carefully considered Inclusive Design Principles, as described in Section 2.2, which can be applied to any home. Designing a supportive environment does not require expensive changes but does require having the knowledge to make informed choices, as well as understanding how a person with cognitive, sensory or physical impairments can be helped to use their surroundings to the best of their abilities. Studying, understanding and where appropriate, applying the Inclusive Design Principles should be the basis for providing a genuinely supportive environment.

SECTION 2

Key design foundations and principles of inclusive design

Key design foundations and principles of inclusive design

2.1 Key Design Foundations

Whilst individuals may live with their own unique challenges, there are three key inclusive design foundations that are known to benefit people living with CSI. Research has shown that design with optimum sensory stimuli, reduced spatial complexity and with exposure to nature as a principal amenity are desirable and beneficial features for people living with CSI. They are also features preferred by the general population. These Key Design Foundations are the basis for the subsequent Design Principles and Design Considerations.

2.1.1 Optimise Sensory Load

A primary goal should be to deliver relevant information without overloading the senses. A person can be assisted to read and interpret their surroundings, without being overwhelmed with sensory input, by reducing or eliminating sensory clutter which can confuse and distract and ultimately lead to frustration or withdrawal.

People with CSI find it difficult to understand and filter multiple simultaneous sensory stimuli and may become confused or overwhelmed. Editing out the irrelevant and simplifying the design of the home supports people's understanding and their remaining abilities. It can reduce or prevent sensory overload.

Using design interventions including light, colour, contrast, texture, and acoustic design can compensate for lost or impaired abilities and support a person to better understand and read their environment - freeing up cognitive and sensory capacity to focus on the task in hand and on activities of daily living.

All the senses should be considered and supported to achieve optimum occupant satisfaction, well-being, comfort, access and use. Some basic considerations include:

- **Vision:** enhance visual clarity and reduce visual clutter.
- **Hearing:** create an optimum acoustic environment, support communication and reduce background noise.
- **Olfactory:** optimise air quality; provide pleasing olfactory cues and eliminate unpleasant smells.
- **Thermal:** control temperature and optimise air movement.
- **Tactile:** optimise tactile stimulation to aid understanding and reduce unnecessary texture change.

Our brains are continually processing sensory information to understand and interpret our surroundings. For those living with CSI, managing this cognitive and sensory input can be more difficult. Therefore, the less a person needs to process at any one time, the easier and less taxing it will be. Designing familiar and uncluttered spaces enables a person to have more capacity to enjoy their surroundings and the people within it.

Enhanced visual clarity and reduced visual clutter are fundamental requirements in supportive home environments. For example, flooring can often be misinterpreted and add to the visual complexity of an environment. Patterned finishes, changes in materials, threshold strips, polished surfaces, and floor mats all need to be capable of being easily recognised and interpreted.

The acoustic tolerance threshold for someone with CSI can be greatly reduced and therefore a busy environment may be uncomfortable and disabling. Our goal in acoustic scenarios is to design environments that support social interaction and clear communication. Reducing or eliminating unnecessary noise will free up cognitive and sensory capacity and allow a person to focus without unnecessary distractions or discomfort.

Everyone has at some time experienced an environment in which they feel uncomfortable, overwhelmed or even anxious or scared. We must recognise that for some the threshold of tolerance for non-inclusive spaces may be higher than that of a person living with CSI. Some can compensate and adapt while others are hypersensitive to their surroundings, and the cognitive and sensory input required to navigate a space might overload their capacity and abilities.

We can use good design to help support people who often find homes and the public realm confusing and overwhelming. Homes and environments that are designed to be inclusive aim to enable everyone to stay actively engaged and mobile in their community, which helps build resilient communities.

2.1.2 Reduce Design Complexity

Direct visual access and spatial proximity are fundamental requirements for people living with CSI. Optimal visibility, or visual access, allows people to easily identify where they are, where they came from, and potential destinations. When key areas like the lounge room, dining room, bedroom, kitchen, and outdoor space are visible, people can make informed choices and navigate more effectively. Ensuring small scale, clear and legible plan

arrangements with direct visual access to key facilities is therefore preferred. If we design to support self-care and dignity, we enable occupants to maintain independence.

Designers can provide cues, prompts and signage to support memory, orientation and wayfinding - but the preferred solution would be to have optimised the spatial layout at the initial design stage of a project, so occupants have direct visual access to facilities in the building which they use on a regular basis. Direct visual access is always preferable to signage, which is an additional element that needs to be identified and decoded.

We must consider that a person living with CSI may not have the capacity to retain new information, for example remembering the location of a toilet or their own bedroom. They may struggle to build familiarity with a new setting, so that every journey becomes a further challenge.

We should design intuitive, predictable, legible and familiar environments, with the aim to reduce overall design complexity and layout.

2.1.3 Provide Access to Nature

The restorative and therapeutic benefits of access to nature have been widely recognised and studied. Being outdoors encourages movement and physical activity as well as providing opportunities for socialisation and connection with others. Also, exposure to natural light helps regulate our circadian rhythms which promotes healthy sleep patterns, while sunlight exposure stimulates the production of vitamin D, which is essential for maintaining healthy bones, regulating calcium levels and supporting the immune system.

Spending time in natural environments can reduce stress, anxiety, and depression, while promoting feelings of calmness and relaxation. The sights, sounds, and smells of nature have a soothing effect on our senses and can help restore our attention and focus.

Being outside and in nature offers numerous health benefits that encompass both physical and mental well-being.

2.2 Inclusive Design Principles

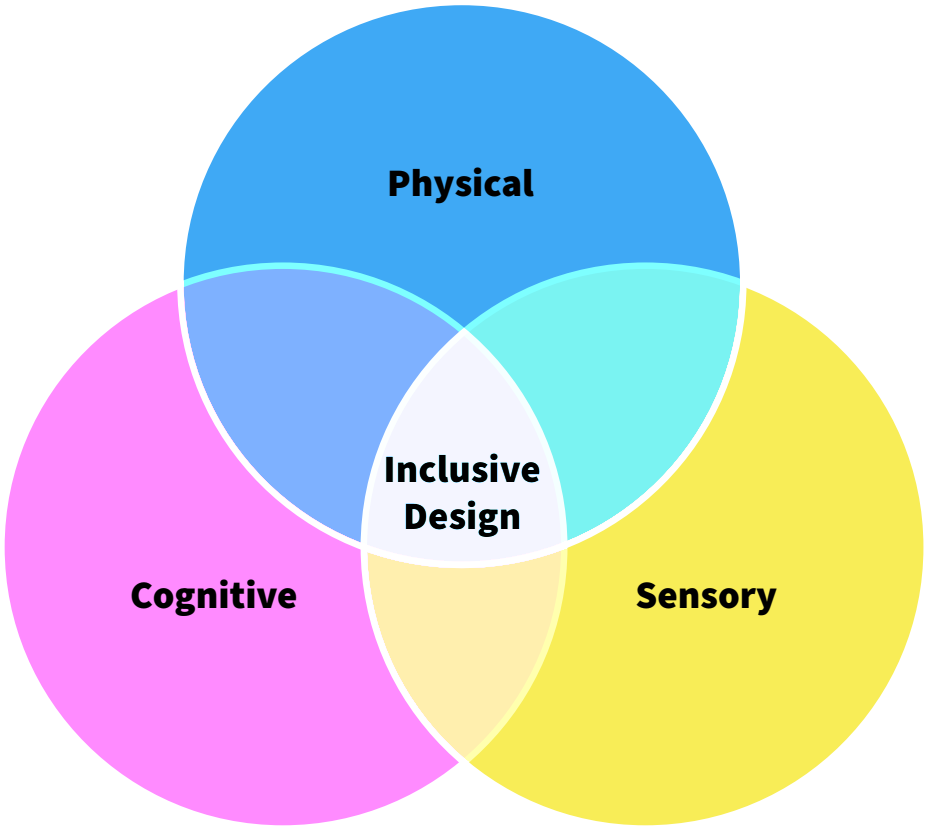
The three key foundations in Section 2.1 are underpinned by twelve Inclusive Design Principles. An understanding of these will put everyone in a better place to interpret their surroundings and provide insight into the role the home environment can have on people's health, well-being, functional abilities, and capacity to manage daily tasks.

Dignity, Independence and Autonomy should always be at the forefront when designing to meet individual needs. The changes can be subtle, tasteful and not at all obtrusive. Think back to the key principles and work from there.

The twelve Inclusive Design Principles are:

1. Provide a safe environment
2. Promote privacy, dignity and independence
3. Provide optimum levels of stimuli
4. Provide optimum levels of light and contrast
5. Provide a non-institutional and human-scale environment
6. Support orientation
7. Support wayfinding and navigation
8. Provide good visibility and visual access
9. Provide access to nature and the outdoors
10. Promote engagement with family and community
11. Promote physical and meaningful activities
12. Support healthy nutrition and hydration

Applying these principles will help to ensure that home designs do not impede the occupants' ability to lead fulfilling lives. In other words, in line with the social model of disability, the environment does not become the disabling factor.



Inclusive Design Principles

Design principles are given to guide a design solution and outcome. They do not specify or prescribe the way a design is to be realised, which allows for a variety of design solutions. The use of principles allows a design to better respond to an individual's needs whilst considering site conditions and budget constraints.

Those living with a disability need to be at the heart of the design process. Where possible, user choice and personalisation of a design solution should be a guiding consideration, as this supports genuinely inclusive design. Those living with CSI, their families and their carers are experts in disability and their input and insights are invaluable.

Principle 1: Provide a safe environment

We should design to reduce potential risks in unobtrusive ways. We need to provide both internal and external environments that are safe and accessible so that people can maximise their abilities. **Where safety measures are agreed to be appropriate**, design them to be as unobtrusive as possible. Creating a safe and healthy setting may require managing entry and exit from a location as well as minimising potential safety hazards.

Ensure:

- Good visual access is provided, if possible, for people to see and to be seen. This can be achieved by providing views both from inside to outside and from circulation spaces into communal spaces. Providing vision panels in doors and glazed screens between rooms may be of benefit.
- Exit and entry points can be controlled or monitored unobtrusively. Screening, de-emphasising the exit with low contrast strategies or introducing other points of interest nearby can reduce the urge to leave or help negate the frustration of continually being confronted by a locked door.
- Windows with unrestricted openings are risk assessed as these can present both egress and falls risks.
- Access to kitchens and other potentially hazardous areas, as well as appliances, utensils and products within them, are risk assessed for individual circumstances.
- Water from the hot tap and the surface temperature of heating equipment and water pipes are temperature controlled.
- Floor finishes are slip-resistant as required and graded in wet areas to prevent ponding. Ensure any changes in surface are appropriately highlighted and occupants are advised of cleaning requirements to maintain surface safety integrity.
- External areas are safe and that the boundary treatment is secure, blends with the landscaping and does not enable climbing.
- The design and placement of latches should be considered to ensure the area is secure.

Avoid:

- Open plan kitchens with unrestricted access to appliances and utensils. Lockable cupboards and drawers and isolating power switches should be considered.
- Internal steps or changes in level.
- Unnecessary changes in floor finishes.
- External features which could be used as a foothold to climb, such as fences or gates with horizontal members, planting near a fence, or decorative elements.

Design and furnish with safety in mind

Principle 2: Promote privacy, dignity and independence

We should design to ensure people can maintain privacy, dignity and independence for as long as possible. These are key quality of life measures. Although a cognitive or sensory impairment may affect a person's abilities, mood and behaviour, they remain a unique and valued individual that deserves to be treated with respect and be supported to maintain their autonomy.

Use familiar and intuitive layouts and design details. If our environment is easy to navigate and understand it supports independence and self-care. Feeling independent can be just as important as actual independence.

Ensure:

- An environment that embodies the values of self-care and independence, supporting opportunities to engage in the ordinary activities of daily living. This requires a person to have access to all the normal household facilities and encouragement to function to their full potential.
- Interventions that are homelike and do not draw attention to or stigmatise the occupant.

Avoid:

- Institutional design and detailing that will highlight a person's disability.

Design to promote independence

Principle 3: Provide optimum levels of stimuli

Cognitive and sensory impairments can reduce the ability to filter simultaneous stimuli and to attend to only those that are important. We should reduce and filter out unnecessary sensory stimuli within the environment and optimise helpful sensory input.

We should recognise that sensory deprivation can also have a negative impact on a person's well-being and ability to feel comfortable with their surroundings.

Ensure:

- Environments are designed to consider the full range of senses; enhance positive stimulation and allow an individual to use their abilities to interpret their surroundings and the people within it.
- Environments enable a person to see, touch, hear and smell things that will give cues as to where they are and what they can do.
- The structure is located and designed to minimise sound transfer and disturbance from the exterior environment to the interior and between adjoining properties.
- Mechanical equipment is designed and placed to minimise noise disturbance to occupants.
- The environment is used and managed to ensure background noise and reverberated sounds are kept to a minimum or to a manageable level.
- Occupancy satisfaction and user comfort are a guiding consideration.

Avoid:

- Unnecessary exposure to stimuli that are unhelpful or distracting, such as patterned walls and floors, noisy appliances, clutter, and noise from televisions and radios.
- Potential for false engagement with murals or photographic images which lead to confusion and or disorientation. Life size and realistic images can be misleading and can be misinterpreted.
- Sharp contrast between adjoining floor finishes and threshold strips.

Ensure a calm interior

Avoid unnecessary stimuli

Principle 4: Provide optimum levels of light and contrast

Light, both natural and artificial, supports vision, health and well-being. People who do not have regular exposure to natural day light can suffer from sleep disorders and their circadian rhythms can be adversely affected. Good lighting is also a key element in the design of safe environments.

Contrast, when used correctly helps to support our vision and understanding of our environment. We should ensure we optimise visual understanding with the correct use of contrast and good natural and artificial lighting design.

Visual impairment does not just reduce visual acuity but can cause the following:

- Decreased contrast sensitivity which affects depth perception.
- Decline in sensitivity and range of visual field.
- Reduced colour vision; colours become less bright and contrast between colours becomes less noticeable.
- Reduced ability to adapt to the transition between bright light and darkness.
- Inability to tolerate glare.

Ensure:

- Access to day light and optimised penetration of sunlight into interior spaces to support circadian rhythm and enhanced sleep.
- Optimum levels of light to guarantee adequate illumination in all main areas to help create safer environments and support daily activities and self-care.
- Uniformity of light coverage to reduce light and dark zones and shadows.
- Adequate contrast between elements to support visual access.

Avoid:

- Glare from light fittings and from polished and reflective surfaces.
- Glare from light fittings that are directly above beds or sitting areas by carefully placing light fittings, concealing light sources, or by using diffusers or shades.
- Exposure to light at night that will disrupt sleep patterns and circadian rhythm.
- Patterned or geometric floor finishes.
- Sharp contrast in tone and texture between adjoining floor finishes.

Colour choice is important to everyone but especially those with cognitive and sensory impairment. It can significantly contribute to how people access, use and enjoy a space. Consequently, colour and tone are very important when considering good inclusive design. It affects how successfully a person navigates a property thereby promoting independence.

Optimise natural and artificial lighting

Principle 5: Provide a non-institutional and human-scale environment

People do not wish to live in institutional environments. We should design to provide homely and familiar settings that will reassure a person and make them feel comfortable and at ease. Home environments also need to be designed to be therapeutic and supportive. We should not introduce institutional designs and features into people's homes.

The overall scale of an environment can sometimes be overwhelming. Factors which define the scale of an environment are:

- The number of people a person will encounter
- The overall size of a building
- The size of the individual building elements for example doors, room dimensions and corridor width and length.

Ensure:

- Small scale, welcoming, familiar and domestic spaces rather than commercial or institutional settings.
- The design and layout of a home allows for personalisation of private spaces.
- Communal or shared facilities in supported living environments present a scale that enables a person to feel in control and not intimidated by the size, number of encounters or choices they are confronted with.

Avoid:

- Building or room layouts and sizes that can result in crowding in certain areas, which can lead to a person being overwhelmed due to sensory overstimulation.
- The use of commercial or institutional furniture and fittings. Their use may lead to confusion and disorientation.

Design familiar domestic spaces

Principle 6: Support orientation

People with cognitive and sensory impairments can experience issues with orientating themselves in relation to the people around them, location, time and also their own self awareness. Who, Where, When and Why can all become difficult to understand resulting in anxiety and confusion.

Ensure:

- Internal landmarks and views are provided which help people identify location, time, date and season.
- Good visual access that supports orientation in space and time. Good visibility, or visual access, allows people to easily identify where they are, where they came from, and their potential destinations.
- Scope for personalisation of private areas.
- Views and access to the external environment support orientation in time and place.

Avoid:

- Interior finishes, furniture and fittings that can cause confusion regarding the location or use of a space.

Good Visibility Between Rooms to Support Orientation.

Principle 7: Support wayfinding and navigation

A reduced ability to independently find their way around can severely impact a person's confidence, sense of autonomy and quality of life. Impaired spatial orientation is common among people living with cognitive and sensory deficits. We should design with ease of wayfinding in mind.

Ensure:

- Layouts are small in scale and simple to understand, thus reducing the need for decision making based on memory or inference.
- Direct visual access is provided to locations and key functions to support a clear understanding of a setting.
- Spatial proximity of related functions such as kitchen, dining and lounge, as well as a bedroom with associated en-suite.
- Well defined circulation routes.
- Potential for personalisation to identify personal and private spaces.
- Use of appropriate signage as required to support wayfinding

Avoid:

- Large scale, repetitive environments with uniform architecture.
- Changes of direction or decision points on circulation routes, where possible.

Use recognised inclusive signage: Courtesy of StudioLR

Principle 8: Provide good visibility and visual access

Good visual access gives a person confidence to explore their environment, which in turn allows opportunities for engagement, socialisation and physical activity. An environment that allows a person to see their destination will help to minimise confusion. It also supports passive observation which supports independence.

The simplest and most visually accessible environment is one in which a person can see everywhere they may want to go from where they are.

Ensure:

- Optimum contrast to support visual clarity.
- Good lighting, both natural and artificial, to provide bright and even coverage.
- Clear and legible plan arrangements/layouts.
- The use of glazed doors and vision panels where appropriate.

Avoid:

- Cluttered environments which can over stimulate and result in cognitive and sensory overload.

Good visibility and visual access of rooms

Principle 9: Provide access to nature and the outdoors

There is a growing recognition of the therapeutic benefits of access to nature and the outdoors, both physical access and the ability to view from indoors. Exposure to natural light supports and aids health by helping the body's production of vitamin D and maintaining circadian rhythm. Access to the outdoors also offers the opportunity for physical exercise which can result in benefits such as reduced stress, anxiety, obesity, and heart disease.

Ensure:

- Physical and visual access to nature and the outdoors to support mental and physical health and well-being, in addition to helping orientation with respect to time of the day and season.
- The design and placement of latches is considered in order to keep gardens secure.

For gardens and external environments ensure:

- Level and safe access to external environments that can be supervised easily.
- Well defined circulation routes with pathways that are free of obstacles and complex decision points, provide passing points of interest and give opportunities to engage in activities and social interaction.
- Appropriate contrast between the path, furniture and planting to support visual understanding.
- Accessible seating is provided, as well as sheltered rest areas that provide cover from the elements.
- Sensory experiences are provided to enhance and stimulate the different senses.

Avoid:

- Paths or routes which lead to a dead end.
- Toxic planting.
- Fences or gates with horizontal members, planting near a fence or decorative elements which could be used as a foot hold to climb.
- The design and placement of latches should be considered in order to keep gardens secure.

Direct access to nature

Principle 10: Promote engagement with family and community

Remaining actively engaged with family and community for as long as possible helps reduce loneliness and social isolation. It allows people to age in place and supports a sense of belonging and identity.

Ensure:

- Home design blends with the surrounding architecture and does not stand out as 'special'. Stigmatisation remains a problem for people living with cognitive, sensory and physical impairments.
- A variety of spaces are provided that allow a person to choose whether to spend time on their own or with others.
- Internal and external environments are provided that are comfortable and inviting and which encourage visitors to spend time and engage in meaningful activities and social interaction with occupants.
- Environments allow social interaction whilst protecting an occupant's privacy and dignity.

Avoid:

- Segregated accommodation or access arrangements.

Design to promote engagement
(Courtesy of: PRP Architects, Pilgrim Gardens, Evington. - Image ©Tim Crocker)

Principle 11: Promote physical and meaningful activities

Meaningful and physical activities add structure, purpose and pleasure to a person's life. These can include a range of things from the usual activities of daily living, such as, cooking, cleaning, gardening, and self-care. They provide opportunities for social interaction and engagement which support a sense of belonging, identity, and autonomy.

Ensure:

- Internal and external environments are suitable for physical and meaningful activities.
- The environment is designed and furnished to ensure an occupant can engage in meaningful activities for as long as possible in their lives. Their need for support may vary over time and this should be considered at the initial design stage.
- A variety of spaces are provided that allow a person to choose to spend time on their own or time with others, including areas suitable for person-centred activities or group activities.

Avoid:

- Environments with auditory and visual clutter which can distract and overwhelm.

Design to promote meaningful activities in the home

Principle 12: Promote healthy nutrition and hydration

A person's general health and well-being is dependent on good nutrition and hydration. We should design to stimulate appetite; enable a person to access food and drink as required and provide a suitable supportive environment for it to be consumed.

Ensure:

- Visible cues, prompts and sensory stimuli, such as food smells to stimulate appetite.
- Adequate lighting and contrast to support enhanced visual access to the food, beverages and tableware.
- Dining room furniture and layout suits the occupants' access requirements and personal preferences.
- Access to meaningful engagement in food preparation and cleaning.

Avoid:

- Auditory, visual and olfactory distraction in the dining environment.

Design to promote healthy nutrition.

SECTION 3

Design considerations: Applying principles in practice

Design considerations: Applying principles in practice

In the context of this document, design considerations are thoughts and suggestions as to how the key design foundations and principles can be achieved. They are not prescriptive but are a commentary on what could be considered to achieve a successful design outcome.

Section 3 focuses on the application of the design foundations and principles in practice. The section is subdivided as follows:

Subsection 3.1: Home Location and Surrounding Environment
Subsection 3.2: External Access, Approach and Entrance
Subsection 3.3: Internal Access and Circulation
Subsection 3.4: Fixtures, Fittings and Decor

3.1 Home Location and Surrounding Environment

The therapeutic benefits of a safe, attractive and carefully planned external living environment are well recognised.

3.1.1 Home Location

Location for a dwelling: Location is a fundamental consideration as it can influence independence, security, social inclusion and a sense of belonging.

Key design considerations for location of a dwelling:

a) Homes should have convenient access to local services, amenities and public transport to help maintain independence and encourage social interaction that can help reduce the risk of isolation.[1] A neighbourhood that provides an inclusive environment will also help to provide opportunities for exercise.

b) Where possible, housing for people with disabilities should be integrated with general needs housing but designed to be visually indistinguishable. This can help avoid segregation. Neighbourhoods should also provide a range of housing for people to live in at all stages of their lives.

c) Avoid locating homes where excessive noise may cause nuisance and anxiety. Potential external sources of noise include busy roads, railway lines, services areas and children's play areas.

d) Homes should engage positively with the street, providing active frontages and good visual contact between the home, communal areas and the public realm, while ensuring sufficient privacy.

e) The design should provide an opportunity to customise the approach and entrance so it can be easily recognised and identified.

f) If rehousing is a consideration, placement in a person's place of origin, or place where they have previously lived, can be an advantage as it limits the amount of new learning and can help maintain access to existing social supports.

g) It is important that, where appropriate, the design of a building's windows and doors encourage social relationships. Windows should also provide attractive views out from the main living area that allow seated people to have connection with nature, time of day, seasons, weather and with activity outside.[2]

h) New build housing schemes should aim to create people-friendly streets that prioritise sense of place, character and social interaction rather than traffic movement. They should be high quality places that are accessible to all and take into consideration the needs of people with a range of disabilities.

i) There is increasing evidence, particularly following the COVID pandemic, that access to safe and well-designed outdoor spaces has therapeutic benefits. Such access enables people with disabilities to maintain an active lifestyle which supports their physical and

emotional well-being. Added to this is the potential for exposure to sunlight to assist the body's manufacture of vitamin D is of particular importance in older people.[3]
(See also Section 3.1.9 'Communal Gardens')

j) Good design should consider the surrounding landscape and topography, the local climate, the pattern of buildings, streets and open spaces. Early engagement with a representative and diverse range of local people is actively encouraged; proportionate to the scale of development.

Homes located close to outdoor space

3.1.2 Legibility and wayfinding

Our built environment should be designed and managed to include and support the needs of people living with cognitive and/or sensory impairments. A person with CSI requires an environment that is safe, secure and easy to move around, so they can make the most of their abilities.

We should aim to design and build environments that are easy to navigate and to understand. When people find an environment too challenging to navigate, they will withdraw. Unnecessary visual clutter, complexity and the fear of getting lost can be overwhelming for a person living with CSI, resulting in loss of independence and autonomy. Not being able to navigate through a space because elements are not clearly visible, or can be misinterpreted, due to lack of contrast or visual clarity can prevent independent and dignified use. Familiarity and predictability support understanding and wayfinding, as do intuitive layouts for our footpaths and roads.

Key design considerations for legibility and wayfinding:

a) **Visual clutter** results in our eyes constantly scanning, moving and taking in everything in our surroundings. For some people with cognitive and sensory conditions, this can cause a sense of chaos, stress, anxiety and disharmony. Their eyes and mind are unable to relax and they can have difficulty focusing on the relevant and filtering out the irrelevant. It can be challenging to decode and decipher elements in such an environment. Visual clutter should be minimised in public external environments as it detracts from the overall clarity of the environment. The careful placement, management and visibility of essential items and elements in our built environment can help to support legibility and understanding.

b) **Visual contrast** between elements in our environment is key to visual clarity. Contrast, if used correctly, can support inclusion and access. If visual contrast is not present, or is used incorrectly, it can lead to exclusion and result in facilities being inaccessible.

c) Streetscapes, which includes both roads and footpaths, should be designed to provide a **clear legible framework**, with unobstructed lines of sight and be **free of physical obstacles and visual clutter.**

d) **Orientation and wayfinding** in our built environment should be supported by using inclusive signage and landmarks. (See section 4.9 'Signage' for further guidance).

3.1.3 Footpaths

Wayfinding and legibility must be supported by the physical environment, and our footpaths and roads must be safe and secure for all users. We must understand that small details that we may take for granted, or may consider irrelevant, can present real challenges for people with CSI. By considering the details, we can eliminate many of the barriers and reduce the levels of stress and anxiety experienced by people when navigating our external environment.

When designing and planning pedestrian urban areas it is important we understand the impact that contrasting paving patterns can have as they can add to the visual complexity of an environment. Contrast is required, but it should be used to highlight changes in level, edges or physical obstructions. We must carefully consider the overall visual effect. If footpaths are not kept in good repair, they are a risk to all in the community. A fear of falling can be intense and debilitating and consequently can have a major impact on a person's confidence. If they do not feel safe and confident using the pedestrian routes they will stop visiting and using the services provided. This will ultimately result in loneliness and social isolation for individuals who are excluded. A well designed and maintained environment offers a sense of security and safety, and this is what we need to offer those people who find their built environment challenging.

Key design considerations for footpaths:

a) Footways and footpaths must be safe, clear, legible and unobstructed.

b) Pedestrian footpaths should have a sound, firm, slip resistant and reasonably smooth surface. Unbonded loose gravel should not be used.

Public spaces should be easy to navigate (Courtesy of: PRP Architects, New Lodge, York. - Image © Robert Greshoff Photography)

c) The width of footways and footpaths should be as wide as is practicable[4] The overall footpath width should ensure an accessible clear width can be maintained that allows for street furniture.

d) Paths should be free of physical obstructions (discussed in detail in section 3.1.5, Street Furniture).

e) For people living with cognitive and sensory impairments, visual clutter created by surface decoration on paved surfaces can be equally as debilitating as physical obstacles. Changes in surface colour or texture can be misinterpreted as changes in levels/steps. Dark surfaces can be misinterpreted as holes, whereas light surface areas on dark backgrounds can be viewed as physical objects obstructing the path. When used on paved surfaces, contrasting surface patterns and changes in materials should be carefully considered wherever possible.

f) Surface treatment of steps that give the illusion of a continuous surface, can be hazardous to people who are partially sighted and wheelchair users viewing from a lower level.

g) When utility companies or others open a trench or hole in a paved surface, they must replace the surface with a sound and matching replacement surface.

h) Pedestrian footpaths should have detectable edge which can be followed by people with CSI. For example, a wall, building line, kerb edge or well delineated grass verge. Visual contrast should also be provided where possible. This can be provided by a visually contrasting kerb, or path edge, or even a clear, regular and straight vegetation line.

i) Dished/open-top drainage channels should not be used on footpaths as they increase the risk of trips and falls.

j) Litter is another element in the environment that needs to be interpreted/identified. It is unpredictable and can distract from the task in hand. Therefore, litter control is an important aspect in the management of the visual environment. Sufficient dog waste bins and litter bins should be provided, and these should be well managed and maintained.

k) Tree pits adjacent to or on footpaths should not have exposed loose soil or gravel. A bonded permeable surface is recommended at the base of trees to prevent soil or gravel causing a slip risk if kicked onto the footpath. Tree grilles should not be used as an alternative as these can be problematic for people using sticks or canes.

l) Trees and soft landscaping enhance an urban environment and can help assist with wayfinding by providing landmark and reference points. However, roots or branches should not obstruct the pedestrian route. A height of 2500mm must be clear of overhanging branches, and lower vegetation should be cut back behind the path line. The edge of grass verges that border footpaths should be kept to a clearly defined line and expose the contrasting edge of the path, where one exists. Moss growth and fallen leaves are a slip hazard and they should be routinely removed.

m) Standing water on pedestrian footpaths is a hazard, and therefore footpaths should drain freely so water does not pond or puddle. Standing water in certain light can be reflective and cause glare. People can change their gait or leave the safety of the path when faced with uncertainty.

Clear and unobstructed footpath.
(Courtesy of: Gareth O'Kane Photography)

Clear and unobstructed footpath.
(Courtesy of: DDS Architects)

3.1.4 Dropped Kerbs and Tactile Warning Surfaces

Following extensive research, the UK Department of Transport and the Scottish Executive jointly published guidance on the use of tactile paving surfaces in December 2021.[5] The following paragraphs are a summary of the guidance given in that document.

Dropped kerbs are provided to assist wheelchair users at pedestrian crossing points. The addition of a blister surface is to provide a warning to visually impaired people who would otherwise, in the absence of a kerb upstand over 25mm high, find it difficult to differentiate between where the footpath ends, and the carriageway begins. The blister surface is therefore an essential safety feature at pedestrian crossing points where the footway is flush with the carriageway to assist wheelchair users to cross unimpeded.

Dropped kerbs and/or blister surfaces are essential for safe access and use of the external environment for people with cognitive, sensory and physical impairments. If not provided, or they are installed or not maintained to comply with guidance, they can increase the risk of accidents and prevent independent and inclusive use and access.

Key design considerations for dropped kerbs and tactile warning surfaces:

a) In all cases where the kerb is dropped at pedestrian crossing points there should be no vertical upstand between the road surface and the kerb. Even a minimal vertical upstand can be a hazard to wheelchair users.

b) The kerb directly in front of the blister surface adjoining the road should be painted white to improve visible access.

c) Dropped kerbs should be provided in safe locations only. There should be clear lines of sight for both the pedestrian and approaching driver.

d) The layout and design should be cognisant of the fact that the pedestrian may not have visual access to the opposite side of the road but is anticipating a reciprocal dropped kerb and accessible footway. A dropped kerb should never be provided in isolation and should have a dropped kerb opposite with adequate space to allow access to the footpath, as well as space to manoeuvre to travel in the desired direction.

e) If a blister surface is provided it should be installed to comply with best practice guidance and be maintained in good order. This is critical for safe use.

f) At controlled crossings the blister surface should be red (the colour that has been established for this application since 1981) to indicate to partially sighted people that the crossing is controlled. At uncontrolled crossings, the blister surface is usually buff, but any colour (other than red) can be used so long as it achieves effective colour or tone contrast with the surroundings.

g) Tactile warning surfaces must be designed to avoid constituting a trip hazard or a slip risk. They must also avoid causing undue discomfort to people with painful conditions such as arthritis, or to wheelchair and mobility scooter users.

Dropped kerbing and tactile paving helps with safe navigation of outdoor spaces (Courtesy of: Marshalls Landscaping UK)

3.1.5 Street Furniture

The placement and design of street furniture is a key consideration when assessing accessibility. Street furniture can refer to items which normally contribute positively to the streetscape such as seats, planters, and identifying, directional or informative signage. However, street furniture also includes items that are usually less appealing such as litter bins, bollards, post boxes, service outlets, utility cabinets and advertising material, including A-boards. Street furniture, regardless of their use, should be placed in a clear delineated zone, in line with each other along the length of a pedestrian route. This creates a clear and predictable layout for all users. For an external environment to be inclusive and provide for the needs of people living with CSI, pedestrian routes that are clear, legible and unobstructed are essential.

Obstacles in a pedestrian environment can make access difficult and may cause stress to users. We should design our environment to eliminate as many unnecessary obstructions as possible. If we can manage the environment to provide a clear and legible pedestrian route it will be more inclusive, less challenging and both more inviting and welcoming.

Key design considerations for street furniture:

a) There needs to be a clear management policy to maintain unobstructed routes. Service providers and occupants need to understand the impact that obstructing the footpaths can have on accessibility for people living with impairments.

b) All street furniture, including bins, bollards, bicycle stands, posts and utility cabinets, should contrast visually against the background in which they sit. Wet and dry conditions must be considered when determining visual contrast.

c) Street furniture should not reduce the clear width of an accessible route to less than 1500mm, except where a passing bay is within direct sight or within 25 meters, in which case the width can be reduced to 1200mm. Over hanging items should be kept above 2500mm. [6]

d) Materials used for street furniture should not have highly reflective finishes.

e) Each route/footpath should have at least one side with a continuous detectable physical edge, for example a wall, building line, kerb edge or delineated grass verge edge, for people with cognitive and/or visual impairment to follow.

f) **Raised planters** add to the visual environment and can help clearly demark street furniture zones. They should contrast visually with the background against which they are viewed. They should not taper downwards as this will not give a true indication of the size if detected at ground level with a cane.

g) **Free standing posts, signposts or lampposts** should have a band at a height of 1200mm and 1500mm above finished ground level[7] that contrasts with the post.

h) **Waste bins** should be a minimum height of 1000m[8] above finished ground level, with the bin opening at 1000mm from ground level. If provided, they must be well maintained.

i) **Low level bollards** should be a minimum height of 1000mm and have a contrasting strip at the top.

j) **Bicycle stands** should be provided in convenient locations so that signposts, handrails etc. are not used to secure bicycles and therefore creating obstructions. The design of a stand should not present a trip hazard.

k) **Utility cabinets** should have a minimum height of 1000mm and should have a consistent depth through their height.[9] Duplication of utility 'furniture' should be avoided where possible. Provision needs to be coordinated to ensure facilities are fully utilised, transferred and shared wherever physically possible.

Clear unobstructed footpaths ease navigation Courtesy of: PRP Architects, Farrow Court, Ashford. – Image © Richard Chivers)

Example of a clear zone for street furniture resulting in an unobstructed town centre footpath. (Courtesy of: Getty images)

Unfixed furniture on footpaths should be avoided. Courtesy of: DDS Architects)

3.1.6 Public Seating

Seating provides somewhere to stop and rest and is therefore an essential amenity for those who are frail and can only walk a limited distance before needing to sit. However, there is generally a lack of sufficient seating provided in the both the private and public realm, and if accessible seating is not provided it excludes the very people who require it most to access our public spaces and services.

In addition to being somewhere to rest, seating provides an opportunity for social interaction and engagement. Seating provided in an environment that is welcoming and inviting will encourage people to gather and spend time socialising.

Key design considerations for public seating:

a) Seating should be approached on a level and even surface, and with no visual contrast or level change between the path and the platform on which the seating is provided. An accessible space should be provided for a wheelchair user to be accommodated in the general seating area.

b) Seating should contrast visually with the background against which it is seen.

c) Where only one bench is provided in an area the seat height should be between 450 mm and 480 mm.[10]

d) Back support and arm rests should be provided, as this will aid those people who require both for safe and independent use.

e) Seating should have designs that are recognisable and familiar to people with CSI so that their purpose is obvious and unambiguous.

f) Seating should be comfortable to sit on and use materials that feel warm to touch.

g) Seats should be located in safe, clearly visible and well-lit areas. Care should be taken when positioning seating to ensure a comfortable sensory environment.

h) In regularly used pedestrian areas, seating should be provided at 25-50m intervals and at the top and bottom of an incline on a route. Where possible, such as in newly created public spaces, the aim should be to provide seating at shorter intervals of 10-20m.[11]

Outdoor seating with level access, back support and arms (Courtesy of: Streetmaster Products)

3.1.7 Manhole, Utility Access and Drainage Covers

Access covers should present neither a physical nor visual barrier to inclusive use. If incorrectly positioned, installed or maintained they can be a hazard, and are particularly problematic for people with CSI. Uneven and broken surfaces create a perceived or real risk of falling which can have a major impact on a persons confidence.

Service covers add to the visual complexity. (Courtesy of: DDS Architects)

Service cover is concealed reducing visual clutter. (Courtesy of: DDS Architects)

Key design considerations for manhole, utility access and drainage covers:

a) Visually, manhole, utility access and drainage covers can be misinterpreted as holes or objects on the footpath. The change in surface finish/ material and the textured surface can be disorientating for people, as well as posing a slip risk when wet. They add to the visual clutter and increase the complexity of decoding and understanding an environment.

b) Whenever possible, service covers should not be installed on an access route. However, where this is unavoidable, manholes and utility access covers on footpaths should have recessed covers finished in a material to match the surrounding footpath surface. They should be also slip-resistant with similar characteristics to the surrounding surface. It is imperative service covers are level and flush with the surrounding surfaces.

c) Service covers should be regularly checked and repaired to avoid accidents. It is particularly important that covers are correctly repositioned and secured after maintenance. [12] Repairs should be in material to match the adjoining paving surface and be level and flush with the surrounding footpath surface.

3.1.8 Signage

A fundamental principle of inclusion is to be able to find your way around without assistance. Good signage is beneficial to all who live in the community and to people visiting an area, but people with CSI can find wayfinding particularly challenging and can have a fear of getting lost, even in familiar environments. Asking for and following directions can be a challenge and without inclusive signage, people living with CSI find it difficult to identify and find essential services or desired destinations. This can result in a loss of confidence and withdrawal from the community.

Therefore, wayfinding and orientation should be supported where possible with inclusive and recognisable signage.

A systematic and consistent approach to signage is required. Good signage design for people living with cognitive and sensory impairments requires knowledge and understanding of current best practice in inclusive signage and is a specialism that has advanced in understanding in recent times.

Key design considerations for signage:

a) Signage should be part of an integrated wayfinding strategy. Within specific areas signage should have a consistent style and design.

b) The font, colour, size, position, height, frequency, and contrast with its surroundings are all key to a successful signage scheme design.

c) Directional signage should be provided at all decision points and changes of direction.

d) Advertising signage should be managed in an environment and should not create or contribute to visual clutter.

Not Recommended:

e) Signage should not be placed within the pedestrian route where it might cause an obstruction but should be placed adjacent to the pedestrian flow and allow people to stop and study without blocking the route.

f) Signage should not be placed in positions where it may be missed or obscured, for example on low level walls, in shrubbery or where it may be covered by vehicles.

g) Unnecessary signage that provides irrelevant information should be avoided where possible, as it can be overly distracting for people with CSI. All signage should be assessed and considered carefully for its usefulness to people with CSI.

3.1.9 Communal Gardens

Access to the outdoors and contact with nature, has proven beneficial effects on our health and well-being. Parks and communal gardens offer people of all ages the opportunity to relax, enjoy nature and stay active.

In addition, providing accessible public spaces provides an opportunity for people to meet and gather; therefore, increasing social interaction and engagement that can help reduce loneliness and social isolation. Communal gardens can also be ideal locations for multigenerational gatherings and, if well designed, can provide a wide range of sensory experiences.

For gardens and public spaces there are some key features that should be provided to improve inclusive enjoyment and accessibility.

Key design considerations for communal gardens:

a) Visual access to nature is as important as physical access. Communal gardens should be considered an extension of the internal environment. Clear and direct visual access from within the home supports independent access and use of the external environment.

b) Communal gardens must provide a safe and secure environment that has level, obstacle-free access.

c) Consider providing a variety of routes within a garden which can include, where applicable, circular routes and short cuts.

d) Provide ample, well-designed, comfortable, and familiar seating and resting points (See section 3.1.6 'Public Seating').

e) Paths should have a minimum clear width of 1200mm, with suitable passing bays provided.

f) Unbonded gravel should not be used as a surface material.

g) Path edges should provide visual contrast with the surface, in order to give guidance for people with cognitive and sensory impairments.

h) Signage, street furniture and public seating should comply with guidance given in Sections 3.1.5 'Street Furniture' and 3.1.6 'Public Seating'.

i) Shade and shelter should be provided where possible. Consider pergolas, climbing plants and trees to create a degree of shade that will encourage greater use in warm summer months. Providing an open covered area will also provide shelter from the rain, wind and sun. This will encourage and enable year-round use.

j) Shared gardens should not only allow people access to nature, but they should also encourage and facilitate purposeful activities within the area, such as by providing raised beds to grow fruit or vegetables.

Communal gardens can help to encourage purposeful activity and social interaction

3.1.10 Private Gardens, Balconies and Terraces

Access to private or semi-private outdoor space adjacent to the home, which can range from a small balcony to a large garden, can be very beneficial for the health and well-being of occupants. They can provide easy access to the outside in order to get fresh air and exposure to daylight, as well as being a place to sit and relax, or to grow plants, or to enjoy spending time outside with family and friends. Gardens can provide contact with nature, as well as helping some people living with disabilities avoid feelings of confinement. Outdoor space can also appeal to the senses through contact with plants and wildlife, and exposure to the changing seasons and time of day.

Key design considerations for private gardens, balconies and terraces:

a) Provide level access from a main living space, such as the living room or the kitchen, through an accessible and easily operated external door.

b) Outdoor paths and patios must have suitable ground surfaces. These should be firm, even, slip-resistant, smooth enough to be wheeled over, and should not be covered with loose or bonded gravel.

c) Hard surfaces must be level or gently sloping[13] with no slope greater than 1:20 and have even drainage falls.

d) Paths should have a minimum clear width of 1200mm, but with space to turn a wheelchair at the ends of paths and also at gates. The ground and adjacent path should be level to avoid a trip hazard, and all edgings laid flush.

e) Ideally, gardens and balconies should be sheltered, and with a sunny aspect.

f) Provide a reasonably sized proportion of suitable hard surfacing with a minimum width of 1800mm for sitting out, socialising, accessing planters, or for play. Ensure there is space for a bench or a few garden chairs but preferably provide outdoor eating space with table and chairs that can seat all occupants.

g) Provide visual connection to the garden from the kitchen/dining or living room. It is often helpful to consider the garden as an extension of the internal spaces.

h) Gardens should aim to create interest, promote interaction and provide for sensory stimulation through sound, smell, sight and touch. Consider the use of a variety of plants that give colour, texture and fragrant smells, and which attract wildlife, throughout the changing seasons. Additions such as bubbling water features or wind chimes can also be beneficial, particularly where gardens are next to sources of unwanted noise.

i) Consider the ease of managing and maintaining a garden. For some occupants, a small garden or patio with some areas of planting, space for a table and chairs, and somewhere to store a few tools, is all that may be required.

j) Ensure balconies or terrace spaces are accessible, have adequate space to be useable, and are safe for all. The design of the balustrading, and the handrail, must maintain safety while maximising views for people when seated.

k) Consider providing raised beds, with leg space below, which will help make the plants more accessible to wheelchair users and those who have difficulty bending.

Key design considerations for private gardens, balconies and terraces (continued):

l) Consider how outdoor spaces can be used in all weathers. Where possible, provide a place to sit that gives protection from wind, rain or sun.

m) The use of certain plants, materials, and garden furniture can be used to make garden spaces feel familiar, memorable and reassuring, as well as triggering memories in people with dementia.

n) An abrupt transition from a dimly lit interior to a bright garden, or vice-versa, can cause difficulties for people with certain visual conditions. The use of a covered space, such as a porch or veranda can help with the transition as well as providing shade and shelter. [14]

o) Aim to provide colour contrast environment in the garden design. For example, there should be colour contrast between paving, garden furniture and planting.

p) In larger gardens consider providing a looped path and large, interesting features to help those with CSI navigate around. For example, trees, sculptures, bird tables, water features and large pots can provide markers, as well as bringing enjoyment through the seasons.

q) Ensure gardens are safe and enjoyable for all. For example, prune low-hanging branches; and avoid using poisonous or thorny plants where they can be easily reached. In addition, private gardens need to feel safe and secure and therefore should be enclosed by walls or fencing, but without creating feelings of confinement. The use of planting can soften the impact of walls and fences, as well as provide screening.

A private balcony can offer access to the benefits of being outdoors and having access to nature. (Courtesy of: PRP Architects, St Bede's, Bedford. - Image © Tim Crocker 2014)

3.2 External Access Approach and Entrance

Gardenmore Green Social Housing Scheme. (Courtesy of: Hall Black Douglas Architects)

3.2.1 Approach to dwelling

Consideration needs to be given to the journey from any parking area, drop-off point or site boundary to private and communal dwelling entrances, to ensure that all aspects of the approach route need to be barrier free, accessible and usable by all. It should be recognised that level changes can be difficult for many people to negotiate and there is a risk of injury to people, particularly individuals with impaired sight, when approaching and walking around the outside of a building under all lighting conditions.

Key design considerations for approaches to dwellings:

a) Locate dwellings, and design finished floor levels so that, where possible, level or gently sloping access can be achieved to all entrances to individual houses or blocks of flats from the street, and from all parking spaces or setting-down points serving the dwellings.

b) Provide an approach with a surface and landings that is firm, even, durable, easy to maintain and slip-resistant to allow for rain and other environmental factors. It is important that paving is laid with flush joints and is not subject to settlement. Loose gravel, cobbles and setts should be avoided. Fixtures such as access chamber covers, and drainage gratings, must be flush with the surrounding surface.

c) Occupants with CSI will be helped if there are permanently detectable and noticeably recognizable physical features to provide familiar waymarks when moving along access routes around their homes.

d) Design the approach, which may include a ramp where unavoidable (see 3.2.3), to be an integral part of the landscaping and building.

Well-designed level approach with car parking at Apex Housing, Newtownards. (Courtesy of: Gareth O'Kane photography)

3.2.2 Car parking

Car parking should be provided that is convenient, generous and flexible. It should enable from the outset, or by cost effective adaptation for everyone including, people with CSI, people with reduced mobility, someone unloading shopping from a car, and those with children, to enter and exit a vehicle as easily as possible.

As people with different needs move in and out of a neighbourhood, it is important that the parking arrangements are sufficiently flexible to allow the provision to vary over time.

Key design considerations for car parking for dwellings:

a) Where someone has a disability, aim to provide a car parking space within their dwelling curtilage wherever possible.

b) Where parking is not located within the curtilage of the dwelling, it should be located as close as practicable to the principal accessible entrance.

c) Provide wider parking spaces where possible from the outset, or design for future widening.[15] This will allow everyone, but especially disabled and/or older people, who may or may not have a blue disability badge, to get in and out of a car from both sides with relative ease. Specific accessible parking should be designed to comply with British Standards, however for general parking a 3m width of parking space should be considered where possible.[16] Also allow for ease of access to the rear of the vehicle.

d) Where communal car parking is provided, i.e. for apartment blocks or for individual homes without in curtilage parking, provide designated accessible parking bays.

e) For someone who experiences mobility difficulties or CSI, transferring into and out of a vehicle, whether assisted or unassisted, can be time consuming and it is important that they are able to stay dry. Consider providing dwellings with their own covered car space

such as a carport or canopy to provide weather protection whilst getting in/out of a car. Alternatively allow for a carport to be erected in future if not provided at the outset.

f) Ensure parking bays have a suitable ground surface that is firm, level, even and smooth enough to be wheeled over. It should not be covered in any loose laid materials such as gravel.

g) Where a driveway provides the whole or part of the approach, it should comply with the requirements for a level approach or a ramped approach.

h) Consider also providing weather protection on the route from accessible parking to the dwelling entrance. The cover should be in keeping with the overall design of the development or dwelling.

i) Ensure communal carparking for dwellings is well lit, easy to find, and has clearly marked parking areas and safe walking areas.

Car parking provides a level approach to the property (Courtesy of: PRP Architects, Durrants Village, Faygate. - Image © Richard Chivers)

3.2.3 Ramps and steps on access routes

Ramps and external steps on approaches to entrances should be avoided wherever possible. However, when required, they should be designed to be as easy as possible to use by all, including people with mobility problems, visual impairments and people manoeuvring prams

Key design considerations for ramped and stepped approaches to dwellings:

a) Locate dwellings and design finished floor levels to avoid the need for steps or ramps on approaches to entrances.

b) Where steps are required, design external steps with a uniform rise and going. Steps must also be slip-resistant and as level as possible whilst having sufficient fall to avoid pooling of water.

c) To help people with a visual impairment appreciate the extent of the stair and identify individual treads, ensure steps are clearly defined by permanently contrasting continuous stair nosing with an LRV differentiation of 60 points.[17] (Note: Thomas Pocklington Trust recommend an LRV differentiation of 60 points). Step nosings must extend for the full width of the stair on both the tread and the riser.

d) People with cognitive and /or sensory impairments may not anticipate steps and risk tripping or falling when they encounter them. Provide tactile paving (corduroy surface) at the head and foot of flights of steps to give advanced warning of approaching changes in level. The design of tactile paving, however, must avoid constituting a trip hazard or creating a risk of slipping (see section 3.1.4).

e) Ensure that steps and landings are lit adequately to 150 lux, [18] so that they can be used safely at night.

f) Where step provision is unavoidable, technical specifications are included in the Housing Adaptations Design Toolkit. If ramp provision is unavoidable, the ramp gradient should be a shallow as possible, the location should be obvious and convenient, and the ramp should be laid out in a logical manner where its use is intuitive and clearly understood.

g) Steps should be provided in addition to a ramp where the level change is 300 mm or greater.[19]

h) Any ramp(s) on the approach should look attractive and blend in with the design of the dwelling.

i) Ramps must also have 100mm visually contrasting safety edges to both sides and infill panels where there is a danger of children falling from a height.

j) Where ramp provision is unavoidable, refer to building regulations and technical specifications included in the Adaptations Toolkit.

Not recommended:

k) Avoid single steps where possible as they can create a trip hazard or cause confusion.

l) Do not use tapered treads or open risers. Tapered treads can be dangerous, while open risers can be disconcerting and confusing for many people.

m) Steps must not have protruding nosings as these hamper the manoeuvring of prams and may cause people who drag their feet to trip when ascending. Also, steps should avoid overlapping the one below.

n) Avoid locating manhole covers and similar services access covers on ramps.

Well-designed and easily identifiable ramped and stepped approach to a communal entrance. (Courtesy of: PRP Architects, Windmill Court, Chingford. - Image © Tim Crocker 2016)

A clearly defined and level approach pathway (Courtesy of: PRP Architects, Durrants Village, Faygate. - Image © Richard Chivers)

3.2.4 Handrails

Handrails to steps, ramps or paths provide support for everyone but are particularly important for those who are older or have disabilities.

Handrails can also act as a guide and as a wayfinding device for those living with CSI. In addition, they can provide an extra visual cue to remind people about where ramps or stairs are located or how they should be used.

Key design considerations for handrails to dwellings:

a) Provide a handrail on each side of a ramp or flight of steps along its full length, including on intermediate landings. The double handrail assists people who may not have equal strength on both sides and must use a particular arm or hand and may require additional support on one side.

b) Ensure handrails are fitted in continuous runs.

c) Use a handrail design that will be familiar to most people and will be consistent with their expectations.

d) Ensure handrails are easy to grasp, tactile and comfortable to touch, with raised, and contrasting, studs marking where they end. People who need to grasp a handrail firmly will find a cold rail uncomfortable or even painful. Therefore, the choice of material for the handrail should be comfortable for all, for example by using timber or plastic-coated steel.

e) A handrail should extend 300mm in the horizontal plane beyond the top and bottom of a flight of steps.[20] This allows an individual to steady or to brace themselves before ascending or descending of a ramp or flight of steps. The change in slope also signals the start or finish of a flight to a person who is blind or partially sighted.

f) Handrails should be installed with a positive end, curving downwards or against the wall so that someone who has visual difficulties will know that the end of the stair has been reached, and also to reduce the risk of clothing being caught.

g) Ensure handrails contrast visually with the background against which it is seen by using distinct colours or tones, but without being highly reflective.

h) Additional technical specifications are included in the Adaptations Toolkit.

Consider handrails for safety and wayfinding

3.2.5 Entrance Area

Good lighting, weather protection and the appropriate provision of easy-to-use locks and control systems can all help in facilitating quick and easy access into a building, and enhancing the feeling of safety, comfort and security.

A person's personal identity can often be expressed by a 'threshold' area immediately outside their private space. This area can also act as a transition zone between private and public areas; a place for expression of self by the use of personal objects, and a safe place of one's own in which to sit and observe, meet and greet.

Key design considerations for dwelling entrance areas:

a) Place entrances in logical locations and ensure they are clearly visible, readily identifiable and accessible.

b) The front door marks the threshold of the home and therefore must be designed to be easily identifiable from the street and look welcoming. Where there are many houses or apartment buildings of similar design it is especially important to make it easy for everyone to locate a particular entrance, for example by using distinctive elements such as colours, boundary treatments, planting, and detail design features such as canopies. Colour coded doors and/or door frames that contrast strongly with the front of the building are more easily spotted from a distance, draw attention to the doorway and can help people to identify their front doors.

c) Select signage that is suitable for those with cognitive and sensory impairment. All house numbers and other signage should be large, in a clear typeface and set against a background of contrasting colour and tone.

d) An entrance door to an individual house or a block of flats should be sheltered by a canopy, porch or recess to provide protection from inclement weather while a person is unlocking the door or waiting for the door to be opened for them.[21] This is particularly important for those who are less agile and may take time in opening the door. In addition, canopies over the entrance area provide a helpful indication of the point of entry, which aids wayfinding, and also provides a sheltered area from which someone can view into the building on arrival before entering, and to view the routes outside before leaving, which reduces anxiety. Where there is a level threshold the protection of a canopy or porch also helps avoid water penetration from wind driven rain.

e) A suitably located bay or corner window [22] that allows a good view of the dwelling entrance area from a habitable room can provide additional convenience and security. This may not be possible in apartments and therefore a doorbell camera could be considered. Door viewers should also be provided, but the height should take account of people who are wheelchair users as well as those who are standing.

f) Consider providing a fixed semi-private/external seat outside the private entrance to a dwelling. This will encourage chatting to neighbours, provide somewhere to rest before entering the dwelling, or simply allow someone to sit and observe.

g) Provision of a shelf, or a seat, at the front door can provide a place to rest heavy objects before opening the door.

h) Consider recessing the front door to:

- Provide a semi-private, defensible space at the entrance to the dwelling.
- Help create domestic accents along linear corridors.
- Provide a feature wall for a dwelling number and wall lighting.
- Allow space for personalisation without blocking shared passageways (where relevant).
- Provide space or features such as a shelf[23] that can be personalised with pictures, plants or occupants' names, subject to fire regulations.
- Assist with wayfinding.
- Provide shelter from the weather if external.
- Provide space to grow plants if external.
- Provide space for a seat or bench.

A sheltered entrance door with space to customise. Graham Gardens, Lisburn (Courtesy of: Clanmil Housing)

3.2.6 Entrance Door

It is essential that everyone, whether occupants, family, carer, friends, and visitors can access and egress the home with ease and safety. People need to be able to find and operate locks, doorbells or other entry control equipment, open and close doors, manoeuvre through doorways easily, and feel safe and comfortable while doing so.

Key design considerations for entrance doorways to dwellings:

a) Ensure entrance doors have a suitable clear opening width for a wide range of individuals, including walking frame users and wheelchair users, or those pushing a pram, or carrying suitcases or shopping, to enter with ease and without damaging the door or frame.

b) Provide level thresholds at all entrance doors. Upstands and gradients impede access, and small variations from any point taken as level can make a threshold inaccessible and potentially dangerous. Care needs to be taken when fitting replacement doors to maintain accessible thresholds.

c) Ensure there is a 300mm nib (or clear space) to the leading edge on the pull side of all entrance doors; communal or private.[24]

d) Door closers will often be needed for security or fire safety reasons at communal entrances or within circulation spaces. However, these can make doors difficult to open for frail individuals or wheelchair users. A means to reduce or overcome door force should be considered, such as the use of power operated doors, or swing-free and door-holding devices that only operate when the fire alarm is activated. Regular inspection and maintenance of these devices is essential to ensure they continue to operate properly.

e) The use of power operated doors will allow easy use by a greater diversity of people. These can either have manual operation, such as by using a push pad or remote control, or have automatic operation activated by sensor. Ensure the door type is suitable for people with sight loss who have a guide dog.

f) Some occupants may need electrically operated door opening devices now or in the future, either because they lack the dexterity to operate the door handle and lock and/or because it is more convenient for them to deal with callers without travelling to the door. Therefore, consider providing a remote entrance door opening facility which can be controlled from the living room, kitchen and main bedroom. Where not required from the outset, an electrical spur suitable for the future fitting of a remote-control door opening devices such as magnetic locks, or a powered door opener, should be provided on the hinge side of the door.

g) A ‘spy hole viewer’ positioned at appropriate height, or safety glass vision panel in door, should be considered to allow the occupants to identify a visitor without opening the door.

h) Subject to the needs of security, safety and/or privacy, consider providing a vision panel to create a clear view through the door, or adjacent to the door, for people at all eye levels. The vision panel should provide a zone of visibility between 400mm and 1600mm above floor level that is at least 150mm wide and positioned no more than 200mm from the leading edge of the door.[25] Frosted or one-way glass may need to be considered where clear glass would make occupants feel vulnerable.

3.2.7 Access Control

Provision of easy-to-use locks and control systems can all help in facilitating quick and easy access into a building, and in enhancing feelings of safety, comfort and security. Secure entry systems that provide audio and/or visual communication, or remote opening, can also help everyone manage the home more easily.

Key design considerations for selecting access control to dwellings:

a) Install the door lock, letterbox, door viewer, doorbell and any access control system at an accessible height so everyone can use them, including people standing and those in wheelchairs.

b) Locate the access control devices close enough to the door to allow a person to position themselves where they can easily use the controls and have sufficient time to enter the building once the door is activated.[26] Some access systems such as video systems, require the user to position themselves immediately in front of the access control device.

c) Where video entry is included, position the camera appropriately to ensure a good view of all callers.

d) Ensure call and activation controls can be easily identified by visitors with CSI. They should be illuminated and tactile, and with good visual contrast with the background.

e) Select door entry controls with call buttons that are easy to operate by a person with reduced dexterity and strength.

f) Provision should also be made for callers who are deaf or hearing impaired by using a visual or vibrating signalling doorbell system, as well as visual and audible signals where entry phones are installed. The means of indicating that the call is acknowledged and that the lock has been released should be both audible and visible.

g) Also, for deaf or hearing-impaired occupants provide a flashing light on the inside of an internal door to alert the resident inside their room to someone ringing the doorbell or consider providing doorbells that are linked to the lights of the house so that when the doorbell is pressed connected internal lights flash.[27]

h) In noisy environments, an entry system with an inductive coupler and two-way integrated camera and video screen would assist hearing aid/cochlear implant users, sign language users and people without speech.[28]

i) Consider provision of a door entry phone with remote release facility in the main living space and in the principal bedroom.

Easy to use access control systems for safety, comfort and security.

3.2.8 Ironmongery

Door hardware must be accessible and usable by all potential users.

Key design considerations for entrance doorways to dwellings:

a) Provide robust and well-designed ironmongery that contrasts in tone or colour with the background surface to help people with impaired sight.

b) The front door should have an appropriate multi-locking system that is safe, easy to grip and operate and positioned well clear of the door jamb to allow space for less dextrous fingers. Consider a thumb latch which is easy to push down. Locking systems that require the use of both hands simultaneously can be a barrier to access and therefore doors should be secured by a single-handed locking system.

c) For behaviours of concern, additional safety control measures may need to be considered.

d) Guidance on suitable door opening and locking hardware is provided in BS 8300-2:2018.

Colour contrasting door ironmongery with clear numbering (Courtesy of: PRP Architects, Windmill Court, Chingford. - Image © Tim Crocker 2016)

3.2.9 External lighting

On the approach to a dwelling sufficient external lighting is required so that:

- Occupants/visitors can identify the front door and house number from a distance.
- People can identify features and potential obstacles and so manoeuvre safely from the road to the entrance door.

At the entrance door, sufficient external lighting to an individual house or an apartment block, is needed so that:

- Occupants/visitors can find the lock or locate the entry system and operate locks and doors.
- Lip reading is facilitated, either directly or on screen, by people with hearing difficulties.
- Callers can be easily identified (e.g. through the entrance door, or by use of a video control system)

Key design considerations for entrance doorways to dwellings:

a) Provide artificial lighting that gives even illumination along exterior paths while highlighting key areas such as building entrances, steps, and ramps. Paths should have an average maintained illuminance of 50 lux,[29] while entrances, steps and ramps should also have an illuminance of 100 lux,[30] and locks/access controls should have 100-200lux.[31]

b) Consider lighting which is activated by a dusk to dawn timer and by detecting motion, so that it automatically illuminates the doorway or entrance when approached. This will aid occupants returning home and act as a safety feature when strangers or visitors approach the house. Where used, ensure PIR motion sensors are set with the correct sensitivity, so it is not activated by animals or by cars on the road. With sensor lighting installations for outside spaces, the lights should gradually increase and decrease when entering/leaving the area, rather than providing sudden light or darkness.

c) In areas with low ambient lighting levels, glare can be very obtrusive and extra care should be taken when positioning light fittings to avoid causing too much glare for someone walking towards the house. To keep glare to a minimum, use fully diffused luminaries and ensure that the main beam angle of all lights directed towards any potential observer is not more than 70 degrees.[32] Higher mounting heights allow lower main beam angles, which can assist in reducing glare.

d) Some people 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 CSI, so it is important that the entrance is designed to reduce excessive shadows or shaded areas to ensure safe transition and access.

e) Lighting should also be considered where level changes exist external to the property.

Good external lighting with clearly visible access (Courtesy of: *Hall Black Douglas Architects*)

3.3 Internal Access And Circulation

3.3.1 Entrance Hall

First impressions when entering a dwelling are important. Entrance halls, as the area immediately inside the main entrance door, should be as welcoming, uncluttered and as spacious as possible for occupants and visitors.

Key design considerations for entrance halls:

a) Entrance halls should be free of clutter with easy navigation routes to habitable rooms.

b) Entrance halls should be adequately lit to assist with navigation and wayfinding. Lux levels of 300 are recommended.[33]

c) The function of rooms accessible directly from the entrance hall should be clearly identifiable and visible.

Entrance hall free of clutter with good visual access to rooms (Courtesy of: Getty Images)

3.3.2 Horizontal Circulation: Hallways and Corridors

Circulation areas, such as private hallways and communal corridors are critical to facilitating easy access around apartment buildings and within individual dwellings. They should be naturally lit, generously sized, free from obstruction and easy to navigate, as well as being interesting spaces that encourage social interaction, where appropriate.

Key design considerations for hallways and corridors:

a) Ensure hallways and corridors are adequately lit and ventilated. Provide high levels of even natural light, wherever possible, along with good artificial lighting.

b) Aim to design hallways and corridors to a minimum of **1200mm wide**[34] and free from fixed obstructions.

c) Design communal circulation areas as interesting, shared spaces which support interdependence and encourage interaction where appropriate.

d) Recess radiators where possible to maintain width and avoid positioning directly opposite doors.

e) Provide legible and logical circulation to ensure ease of wayfinding from the communal entrance to the dwelling, and within the home from entrance door to key living spaces, the bathroom or stairs. (See Section 3.3.5).

f) Provide views to the outside to help people orientate themselves within the home or within the overall apartment building.

g) Provide direct visual access along the circulation route to key spaces such as stairs or lifts.

h) Design communal corridors with a domestic scale to avoid an ‘institutional feel’ or over-stimulation.

i) Ensure sufficient colour and tonal contrast between adjoining surfaces and between surfaces, switches and sockets (See Section 3.4).

j) In private hallways consider storage space for generic items such as keys and umbrellas as well as for mobility aids.

Not recommended:

k) Avoid long, dull, monotonous, dead-end, internal corridors with no natural light or visual connection to the outside.

l) Avoid external windows at corridor ends where it may cause glare and disorientation.

m) Avoid the use of patterned flooring, or flooring with a high gloss or shiny finish.

n) Avoid storing mobility items in private hallways or communal areas where they will cause an obstruction or present a fire evacuation hazard.

3.3.3 Stairs

Stairs can be one of the biggest accessibility barriers within a dwelling, impacting on people's safety, independence and ability to access all habitable rooms in the property.

Key design considerations for stairs:

a) Design stairs within a dwelling with a recommended minimum clear width of 900mm between handrails.[35] This width can help facilitate a stairlift to be fitted in future if appropriate.

b) Aim for as shallow a pitch on the stairs as possible within regulatory guidelines.

c) Provide handrails on both sides for support.[36]

d) Use colour and tonal contrast so that the stair rail stands out clearly from its background.

e) Straight flights of stairs with landings are preferred.[37] Tapered treads or winders are not recommended due to increased risk of falls for people who have impaired mobilities or are visually impaired.

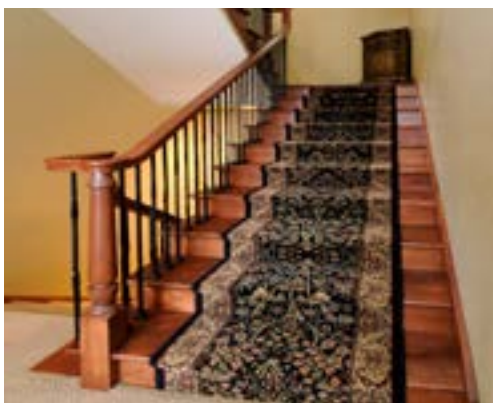
f) Contrasting colours between the steps of the stairs, the stringer and the walls can help to identify steps and changes in level or gradient.

g) Ensure stairways are adequately lit with high levels of even natural and artificial lighting along its length and on landings.

Not recommended:

h) Avoid patterned carpets on stairs. Consider evenly coloured options.

i) Avoid open risers and protruding nosings (as per Steps Section 3.2.3).



Avoid patterned flooring on stairs. (Courtesy of: Getty Images)

Good width on stairs with contrasting rail. (Courtesy of: Getty Images)

3.3.4 Internal Doors

The positioning and location of doors is critical to the accessibility of a dwelling. It is important to consider the relationship between corridors and doors in any design to enable smooth transition from room to room.

Key design considerations for doors:

a) Ensure doors have a suitable clear opening width for a wide range of individuals. (Further information for door widths is included in the Adaptations Toolkit).

b) Door handles, locks, latches and catches should be easy to grip and use. Lever type handles are recommended with a return at the end to improve hand grip.

c) Door handles should colour contrast with the door to help people with CSI to locate the handle. A 15 LRV point difference is recommended as a minimum.

d) Handles should be fitted clear of the door frame to enable easier grasp for individuals with impaired dexterity. They should be of a design that is recognisable.

e) Doors should be fitted to enable opening beyond 90 degrees.[38]

f) Where possible, bathroom doors should open outwards[39] to maximise space, enable easy access in the event of emergency and to facilitate ease of opening/closing. This may not be possible in situations where corridor/landing space and safety may be impacted.

g) Doors opening off opposite sides of a corridor should be directly opposite each other where possible to help with navigation and wayfinding. Where privacy is paramount, it may be better to off-set doors.

h) Where space is limited, sliding doors or pocket/cassette doors can be a consideration in good accessible design to maximise space in rooms, particularly for people with mobility impairment. Models with self-close and soft-close features are recommended. Be aware that pocket/cassette doors may have finger pull ironmongery which may not be suitable for those with impaired dexterity.

i) Doors should be hung with hinges adjacent to the corner of the room into which they open to maximise circulation space within the room.

j) Door saddles and thresholds bars should be avoided between rooms where possible.

3.3.5 Wayfinding

It is extremely important to design for good visual access ensuring when an individual enters a property that they can easily navigate, transition and find their way to habitable rooms.

Level threshold and consistent flooring

Rooms such as the living room, dining room and kitchen should be near a WC, which should be easily located and accessible for both day and night-time use. Bedrooms should be in close proximity to a WC for use during the night-time.

Use recognised inclusive signage: Courtesy of StudioLR

Key design considerations for wayfinding:

a) Enhance visual features by introducing colours, for example on flooring, walls and doors, that allow for easier recognisability and wayfinding of different activities, spaces and sensory areas.

b) Use signage that is easy to interpret, incorporates symbols and contrasts in colour against the surface on which it is mounted.

c) For those with sight loss the symbol or text can be of a raised design or in Braille.

d) Consider means of escape for people in the event of a fire or other emergency and ensure each person understands and recognises the fire alarms fitted in the building.

e) For occupants who are deaf or hard of hearing consider smoke and fire alarms with combined audible and visual signals. It is advisable to install strobe alarms as they flash more brightly, or use vibrating alarm systems in areas where someone with hearing loss may sleep.

f) Where concerns exist about escape it may be advisable to contact the local Fire and Rescue Service[40] for assistance in preparing a Personal Emergency Evacuation Plan (PEEP).

g) Consider the use of rounded or chamfered corners on building facades, which can improve sightlines and soften a buildings appearance.

Not recommended for wayfinding:

h) Avoid signage with too many different colours which can overload the senses.[41]

3.4 Fixtures, Fittings and Decor

3.4 Inside the Home: Fixtures, Fittings, and Decor

As a general principle it is important that fixtures, fittings and decor within the home are familiar in style and function, intuitive to use, and clearly visible.

3.4.1 Colour and Interior Finishes

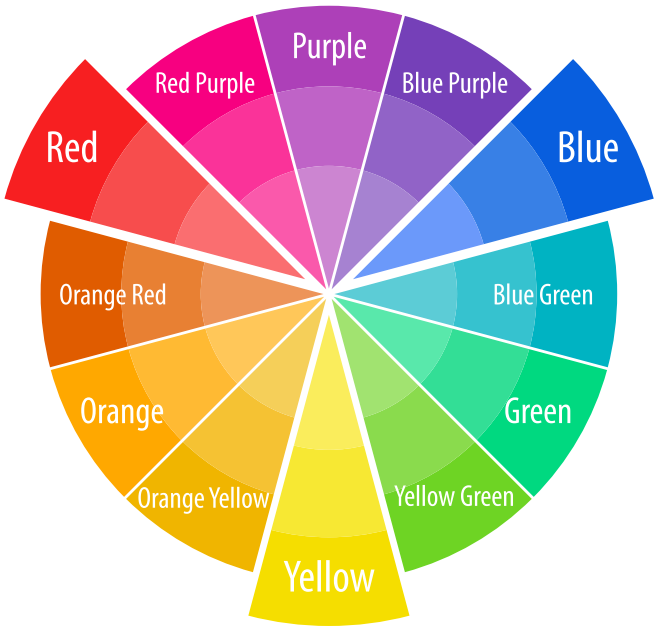
Colour as seen by the eye is tri dimensional. When discussing colour, we must consider the hue, tone and chroma which are terms used to describe aspects of colour, but they refer to different characteristics.

Hue refers to the attribute of colour that distinguishes one colour from another on the colour wheel. It represents the basic colour family, such as red, orange, yellow, green, blue, and purple. Hue is often referred to as the "pure" colour without any variations or additions. The choice of hues will determine a colour scheme.

Chroma refers to the amount of colour saturation/intensity, i.e. strength of colour. Measured up to 1000 steps, a higher number indicates a more intense colour. Generally muted or less saturated softer colours are thought to be more calming and can help to reduce cognitive and sensory overload.

Tone refers to the lightness or darkness of a colour. It is the variant of a hue and chroma achieved by adding black and white to it, resulting in darker or lighter shades of the same colour. Tone determines the overall brightness or darkness of a colour. Inclusive design requires the use of tonal variation to enhance the visual clarity and legibility of a space.

The interior surface finishes can be selected to support and enhance understanding. The tonal difference, measured in light reflective value (LRV), between surfaces can support people to read and interpret the size and scale of a room and identify objects within it.



Courtesy of: Getty Images

There are two key points to note:

- Tonal contrast is critical for materials to be seen against each other.
- Contrasting tonal variations between surfaces can help to enhance the 3D properties and visual clarity of a space.

How does tonal variation relate to light reflective value?

In colour theory, tone refers to the lightness or darkness of a colour. Tone determines the amount of light a surface reflects and absorbs. Light Reflectance Value, LRV, is a measure of the total quantity of visible light reflected by a surface at all wavelengths and directions when illuminated by a light source. It is a universal value used to assist with determining relative visual contrast. LRV refers to the percentage of light a surface or colour reflects and represents a relative darkness to lightness value rather than referencing a particular colour.

Our visual environment is created by physical elements and the light that is reflected off them. To predict how light or dark a colour will appear relative to another colour we can use their light reflectance values as a comparison.

LRV is measured on a scale from 0%, which is absolute black and does not reflect any light, to 100%, which is pure perfectly reflective white and reflects 100% light. An absolute black or perfectly reflecting white does not exist in our everyday terms. Approximately speaking, the average blackest black has an LRV of 5% and the whitest white 94%.

The relationship between tone and light reflective value is that lighter tones reflect more light, while darker tones absorb more light. For example, a light grey colour has a higher light reflective value than a dark grey colour. This concept is important and understanding the light reflective value of surfaces and finishes is essential for creating enhanced and supportive visual environments.

BS 8300 recommends a difference of 30 points of LRV between features that need to be seen to help support visual understanding. It states the critical elements as being floors, walls, ceilings and doors (BS 8300:2-2018) must be clearly identifiable relative to each other.

It is commonly thought that a difference of 30 points or more will provide good contrast definition between materials, though a scale difference of around 20 points might still be acceptable, provided the illumination on the surface is 200 lux or more. It is not an absolute science but aiming for a 30 point difference should be the goal, though it may not be achievable in all cases. Below 10 points the contrast will not be clearly identified by all. For door furniture the three-dimensional (3D) form of handles etc. create light and shade and it is therefore considered that a 15 point contrast difference is acceptable.

The RNIB, Royal National Institute of Blind People, recommends tonal contrast as the best way to visually accentuate building features to help a person living with visual impairment. They suggest highlighting columns, handrails, doors, light switches and other key elements. The RNIB also emphasises that a tonally contrasting skirting can help someone navigate as it can serves as a navigational aid. It is especially helpful for someone with only side vision, offering help in maintaining a line of travel along a corridor.

Disabling environment - due to lack of visual contrast and clarity. (Courtesy of: DDS Architects)

Enabling environment - due to enhanced contrast and visual clarity. (Courtesy of: DDS Architects)

By careful and informed use of contrasting light reflective values, you can enhance the perception of volume, depth, and spatial relationships within an interior space. It creates greater visual clarity by reducing the cognitive and sensory loads imposed to interpret and understand the environment. In the disabling environment image above the boundaries between the surfaces are blurred and difficult to differentiate. In the enabling environment image above the junctions between the major elements are clearly defined and easier to identify.

Use of light reflective values of surfaces to emphasise the visual clarity of an interior space

Emphasising the 3D volume and highlighting key elements within an interior space using varying light reflective values involves manipulating and using tonal differences to create a sense of depth and scale.

Key design considerations for using tonal contrast:

a) **Use a Range of Tones:** Create a hierarchy of light reflective values by using a range of tones. This tonal variation helps define the different critical planes, surfaces and elements, contributing to the perception of depth, 3D volume and relative placement of elements within a space.

b) **Observe Surfaces, Consider Texture and Materiality:** Take note of the different surfaces within the space, such as walls, floors, furniture, and decorative elements. Each surface may have different reflective properties based on materials and finishes. Different materials and textures react differently to light. Reflective surfaces, such as polished metals or glass, will have more pronounced highlights, while matt surfaces will produce softer highlights. Adjust the approach based on the reflective properties of the materials. It should be noted that polished and highly reflective surfaces are not recommended as both the glare and reflections can be problematic for some people.

c) **Highlight Key Elements:** Identify key architectural or design elements within the space that are required to be emphasised. Use contrasting light reflective values on these elements to draw attention to them and to ensure they contrast with the background against which they will be viewed. This could include focal points like exit doors, furniture or architectural features.

d) **Light Sources:** Determine the primary light sources within the interior space. Consider both natural and artificial lighting. Understanding where the light is coming from will help predict how it will interact with various surfaces.

e) **Use ambient or indirect lighting to fill in shadows** and provide overall even illumination. This helps create a more balanced and realistic representation of the interior space. Be mindful that shadows can be misinterpreted. Therefore, using tonal contrast rather than shadows is preferred when the aim is to support enhanced 3D depth perception and visual clarity between elements.

f) **Maintain Consistency**: Ensure consistency in the application of light reflective values throughout the home. This will help create a cohesive and unified visual experience, reinforcing the perception of a 3D environment.

Inclusive colour schemes, supporting contrast between critical elements.
(Courtesy of: DDS Architects)

Sourcing LRV information for different materials.

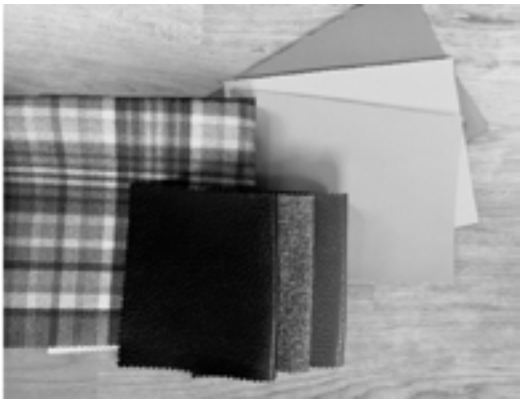
Light reflective values for interior finishes are typically measured using devices called spectrophotometers or colorimeters. These instruments quantify the amount of light reflected by a surface at different wavelengths across the visible spectrum.

Many manufacturers now provide light reflective values (LRV) for their interior finishes and materials. They are often included in their product specifications, colour charts, or technical data sheets. If you are looking for LRV information for a specific product, you can check the manufacturer's documentation, website, or contact their customer support for the most accurate and up-to-date information.

If it is not possible to source a LRV for an interior finish or material it can be approximated by using a colour swatch with known LRV ratings. The nearest colour match from the swatch can be assumed to be the LRV of the material of interest. Please note this will be an approximate measurement only.

When considering contrast, a black and white photograph of an environment or selection of materials can be used to assess if contrast is present. Most mobile phone cameras have the option to view images in black and white. This is a useful tool and starting point when looking at interior finishes and relative tonal/visual contrast.

Contrast between elements and finishes supports visual clarity. (Courtesy of: DDS Architects)



Black and white image shows the clear contrast definition between critical elements and finishes. (Courtesy of: DDS Architects)

Using Colour Contrast to Support Enhanced Visual Access - Worked Examples

Designing inclusive environments will involve many different scenarios from new builds, refurbishments and extensions to existing properties. Every project will need to have design solutions to meet the brief and client requirements. In the following example we will look at how you might achieve the contrast requirements discussed in section 3.4.1 above taking a step-by-step approach. There is no one-design-fits-all solution and each project will have its own unique conditions.

This is not a prescriptive solution but an example of the steps that may be involved in achieving an enabling design solution and outcome.

Example 1: Typical bedroom, living spaces or habitable rooms

Step by step process for achieving colour contrast:

Keynote 1: Where possible, work with the occupant or carers to ensure you understand and consider their unique requirements and preferences.

Keynote 2: Relative tonal/visual contrast is critical for materials to be seen against each other. A 30-point LRV contrast between critical surfaces is desired but is not an absolute value. The guidance should be read in conjunction with Section 3.4.1.

- *It is advisable to have an initial colour scheme and theme in mind.*

1. The starting point is to select a primary design element and establish its LRV rating. This could be the floor covering, feature wall colour, main wall colour or a principal furniture item. This key element will set a base line LRV from which to build from.

    - *For some projects you will have a free rein, but for others you will need to take into consideration existing elements which will be retained. For example, the flooring material in adjoining rooms should be referenced as it is advisable to have a uniform floor tone within linked spaces. A maximum 10 point difference is recommended for adjoining floor finishes.*

2. Once the base line element and its LRV point value has been established, aim to have a 30 point LRV differential between main planes which adjoin each other, such as wall and floor, wall and ceiling, and wall and doors.

- *The contrast of a feature wall against a lighter-toned wall means that the corner of the room is accented. This use of a 'feature wall' is helpful in exaggerating the appearance of 3D space, which is a visual function that is sometimes lost.*

- *See sample selections in the table below showing two alternatives where the flooring is used as a base line LRV and the colour schemes are worked from this as a primary design element reference point.*

- *Doors can be highlighted (LRV 30 point contrast) if in regular use, or they can be camouflaged if it is desired to detract attention from them. If the door and architrave are painted to match the wall within which they sit, the door is less likely to be noticed or be the focus of attention.*

3. After the major elements' colours are chosen, then the fixtures and fittings can be selected to contrast against the background against which they will be viewed, such as a seat pad and arms of a chair contrasting against the floor, or chair back contrasting against a wall.

- *It is not always possible to achieve 30 points of contrast between walls, ceilings, floors and skirting. When this is the case, it is essential that optimum contrast is achieved between the two critical planes: the floor and wall. If skirting and architraves can have a good contrast with the wall and floor this is also recommended but is not always possible.*

4. A black and white photo of the selected materials can be used to test the contrast.

- *Patterned walls and floors are not recommended as these add to the cognitive and sensory load of the environment. However, pattern can be introduced on accessories with care. It is recommended that pattern is applied on elements that can be easily removed if they become an iss*ue.

Sample LRV values for design elements as used in the illustrations below.
NOTE: These options are based on starting with the flooring as the baseline LRV (or Primary Design Element)

	Element colour's LRV	
Design Element	**Option 1**	**Option 2**
Floor *Primary Design Element*	**12-17**	**23-24**
Wall	74	66
Feature wall	44	83
Door *(highlighted)*	44	38
Skirtings & architraves *(White)*	94	94
Ceiling *(White)*	94	94

Option 1: Courtesy of: Bill Bannister and DDS Architects

Option 2: Courtesy of: Bill Bannister and DDS Architects

Example 2: Sanitary facilities

Step by step process for achieving colour contrast:

A typical ensuite with standard WC and accessibility kit:

- *The colours should be chosen to highlight the fixtures and fittings and to sup¬port understanding and depth perception.*
- *The primary design elements in a bathroom or en-suite will be the sanitary ware fittings and grab rails if required.*
- *At this time, manufacturers do not generally publish LRVs for sanitary ware, but this will be a requirement going forward if we are to design inclusive environments. (Note: the LRV for sample white sanitary fittings was checked and values of 73-75 LRV will be used for this example). Values for the fitting to be installed should be requested if the required contrast requirements are to be met.*
- *The steps above in Example 1 apply.*

1. Starting with the sanitary fittings' LRV, select floor and wall colour that offer a 30-point contrast difference.
2. Select grab rails that contrast clearly against the background against which they are viewed.
3. Select a toilet seat which contrasts against the toilet bowl and the floor. This helps with identifying the toilet clearly.
4. Take a black and white photo of materials to test the contrast.

- *Consider using a sink countertop as an option. This gives greater flexibility to contrast with wall colour choices.*
- *Tiles and/or wall finishes should have a low sheen or matt finish. Gloss surfaces will produce glare and reflections, which are not desired.*
- *Coved skirting may be required in wet environments. A contrasting cove skirting is recommended. If the floor finish is wrapped up the wall it can distort the perception of the junction between the wall and floor. If a contrasting cove is not achievable a maximum upturn of 100mm is recommended.*

The table below gives sample LRV reference values for the illustration below. These values will also work for white grab rails. Note the 30 point contrast is not achievable between all elements but it has been provided for the critical elements.

A typical ensuite with a standard WC and accessibility kit:

Start, standard non-inclusive solution.
(Courtesy of: Armitage Shanks)

Finished with enhanced contrast between critical elements.
(Courtesy of: Armitage Shanks)

B & W Photo test showing clear contrast between critical elements.
(Courtesy of: Armitage Shanks)

Sample LRV values used in the illustrations above.

Design Element	**Element Colour's LRV**
Sanitary fittings *Primary Design Element 1*	**73-75**
Grab rails *Primary Design Element 2*	**87 (White) or 5 (Charcoal)**
Floor	**0-15**
Wall	**35 - 55**
Door (highlighted)	**97**
Ceiling	**97**

3.4.2 Windows

Window design, including placement, size, orientation and ease of operation, is crucial for a wide range of aspects of the home. Good window design can optimise natural light; it can provide attractive views out as well as connection with the world outside; it can allow for supervision of children in a garden; it can also allow for rapid ventilation and help with security by providing passive surveillance. However poor window design can lead to unwanted solar gain, glare and noise, as well as impact on privacy and safety.

Key design considerations for windows:

a) The position and orientation of windows may result in glare and unwanted solar gain. Window treatments should be considered to mitigate undesired effects.

b) Windows may produce reflections that could be misinterpreted and they may vary depending on the time of day. This should be considered when selecting and managing window treatments.

c) Consider toughened safety glass or non-sharding Perspex in windows and for viewing panels in doors where behaviours create a safety risk to the health and safety of the user, their carers or other family members.

d) Ventilation is required for both cooling and for maintaining a healthy indoor climate, and natural ventilation is normally provided by opening windows. Window handles and locks should be reachable by all, easily grasped and operated for people with limited hand dexterity, and visually distinct from the frame.

e) Childproof type locks can be used to limit the opening of a window and allow natural ventilation without the possibility of egress or injury. It is important to ensure that such provision does not compromise escape in the event of an emergency.

f) If background noise is potentially problematic, such as from a main road, an airport flight path or a nearby industrial area, consideration should be given to triple glazing and other noise suppressing measures.

g) If the risk of climbing exists, windows should be flush with the internal face of the wall, or internal sill boards should be chamfered or bevelled (approx. 45º).

h) Consider the use of automatic window openers/closers and automated curtains/blinds, as an occupant may have difficulty responding to environmental changes, such as by opening windows if a room gets too warm, or closing curtains and turning on lights as natural light falls in the evening. However individual assessment and identification of suitable products is advisable.

i) Dual aspect should be considered as it allows better daylight as well as differing views, access to a quiet side of the building, and cross ventilation as well as being more adaptable.

Reflections can add to the visual complexity and may be misinterpreted. (Courtesy of: Getty images)

Glare should be minimised where possible (Courtesy of: Getty images)

3.4.3 Lighting

The visual environment is created by its physical elements and the light that illuminates them. Lighting should be designed to allow people to adequately perceive and interpret their surroundings. People need to clearly see their environment to make sense of it and to optimise their independence and abilities. Applying key recommendations and using these approaches will make homes safer for mobility and carrying out daily tasks, as well as more secure and easier to live in. There should ideally be a high and even level of ambient light throughout the home to allow people to move around safely, and sufficient light for specific tasks. Effective lighting boosts confidence and supports independence. Lighting design should consider both daylight and electric lighting, as each supports visual conditions in terms of visual function and amenity. Good lighting design benefits and is appreciated by most of the population, whether they have sight loss, other sensory loss, neuro-developmental condition or dementia.

Key design considerations for lighting:

a) The aim should be to create a visual environment that maximises useful sight. Lighting should be sufficient for tasks, orientation and movement. A minimum level of light, from natural and/or artificial sources, should be provided for ambient and task-specific purposes.

b) A person's needs should be assessed and an appropriate lighting response found to create a visual environment that supports the person's chosen ambience and activities. Lighting installations should be adjustable, to allow flexibility to meet individual needs. The use of switching, dimming and varying different lighting elements will help accommodate varying needs, for tasks or ambience, of all those who live in or visit the home.

c) Lighting levels should be as even as possible across different areas and should minimise glare. Deep shadows or sharp changes in light levels from one room to another, or within rooms, should be avoided. Evenly distributed lighting reduces the need to readjust significantly to different light levels; an ability that can reduces with age. Shadows can be misinterpreted and add complexity to the visual environment.

d) To minimise glare, the bright areas of light sources should not be directly visible from normal directions of view. Diffusers can be used to reduce glare and these should be made of a shatterproof material.

e) Interior finishes with gloss or polished finishes are not recommended as they reflect light, creating glare.

f) Use 'domestic and familiar style' fittings to help promote a recognition of 'place'.

g) It is recommended to maximise use of available natural light, but with the use of simple measures such as curtain tie backs and blinds to control light direction and glare.

h) Use lighting lamps (bulbs) with good colour rendition. A Colour Rendering Index (CRI) of 80 or above, will best represent colour as seen in daylight.

i) Exposure to the 24-hour cycle of light and dark supports our natural human circadian rhythms. The warmth/colour of light, which is ranked on a Kelvin scale (K), is important in this regard as it can impact on this circadian rhythm. Warm light assists us to wind down for the day and get ready for sleep while cool lighting helps us be alert and energetic for performing tasks. Consequently, cool lighting in our evening spaces may interfere with our internal clock and sleeping patterns. Generally, warm light is produced at 1000 to 3300K while cold or cool light typically sits around 4000K.

j) Ideally installations should be able to be altered to respond to changing needs, new occupants and lighting innovations.

k) Bedrooms should be shielded from light during the night to reduce sleep disturbance. This could be achieved by using blackout curtains or blinds.

l) Fluorescent lighting is not recommended and should be replaced if existing due to possible flickering of the light source and the low-level audible hum, which can be emitted.

m) Coloured lighting can be used to produce a calming effect in some cases. This could be achieved by using special lighting systems that are now available which can change colour by using a remote control.

n) Movement detection lighting systems should be considered. Particularly in bathrooms, hallways and stairwells.

o) Movement detection and daylight compensation should be considered for common stairs to ensure that they are always well lit.

Suggested illuminance (LUX) for different tasks

The tables below offer guidelines for lighting levels for different tasks and rooms (and a maximum level of difference within or between rooms). They offer a starting point to consider how much illuminance is needed but, because people's needs are varied, should be treated with caution and with attention to the positioning of lamps. The lower figure given is the minimum recommended for someone who is blind or partially sighted; the upper figure is the level recommended for someone with both cognitive and visual impairment.

Task definition	Examples of activity	Suggested LUX
Routine	Showering/bathing	100 – 300
	Brushing teeth	200 – 300
	Washing (in bathroom)	100 – 300
	Finding keys	100 – 300
Time consuming	Reading/writing	200 – 1000
	Washing up	200 – 500
	Having a meal	200 – 500
Short, detailed	Selecting clothes (wardrobe/ drawer)	100 – 200
	Using the telephone	100 – 400
	Putting on shoes	100 – 300
Requiring concentration and with risk	Making a cup of tea	200 – 1000
	Cooking in the kitchen	200 – 1000
	Shaving	200 – 1000

Lux levels by activity. Source: Thomas Pocklington Trust, (2014), (online). Homes and living spaces for people with sight loss: A guide for interior designers.

Suggested illuminances (LUX) on the floors of each room

The lighting level in a room should not be more than twice the level in an adjoining room. Illuminance levels are measured using a light (illuminance) meter.

Rooms in the home	Suggested LUX	Minimum LUX for someone with visual impairment and dementia
Hallway	100 – 300	300
Lounge /Dining	100 – 300	300
Kitchen	200 – 300	600
Bathroom	100 – 300	300
Bedroom	100 – 300	200
Stairs (on treads)	100 – 200	150

Source: Thomas Pocklington Trust, (2014), (online). Homes and living spaces for people with sight loss: A guide for interior designers.

Light sources

Lighting from only one source, such as a single pendent light, may be insufficient. The use of more than one light source should be considered. See figures below.

Illustration showing the narrow area that is lit when one central ceiling light with a lamp shade is used to light a room. Two people are in the room, one sitting at a table on the left and the other reading in an armchair on the right. A triangle of light is cast in the room from the central light fitting, with only half of the table being fully lit.

Illustration of the same room as in Figure above. This time with three light sources: a wall light above the table, a round central ceiling lamp and a desk lamp beside the person reading. The table is fully lit and the rest of the room has improved lighting

3.4.4 Switches/Sockets

Key design considerations for switches and sockets:

a) Switches should be positioned to facilitate the user and not more than 1100 mm above finished floor level as per current NI Building Regulations. Ensure that all switches or controls are placed in a logical location; they are clearly visible from within the room, and that they contrast against the background against which they are viewed.

b) All switches and controls should be capable of being operated one handed and without the need for gripping/ twisting.

c) It is important that there is a minimum of 2 way switching to lights in all halls, stairways and landings. Consideration should be given to 3-way switches to bedrooms or living rooms so that the lights can be operated from the bed or wherever the person would normally be seated in a room, if the natural light starts to fade.

d) Light switches should contrast with the colour of the wall or have a coloured backing plate or surround to provide the necessary contrast. However bright glaring colours should be avoided. The use of soft natural colours such as white, off white, ivory or soft pastel shades is preferred but this is dependent on the wall colour against which they will be viewed. The colours used should be consistent throughout the dwelling to help the user to identify its functionality and avoid confusion with other controls/switches.

e) Consideration must be given to the type of switch fitted. Toggle switches, rocker switches or push-button type switches may be preferable to other types, which require them to be gripped and turned.

f) Consider fitting switches outside the door leading into a room in order that the user is entering a lighted area, therefore removing the transition from light to dark and to light again.

g) Consideration should be given to leaving switches at familiar heights and locations for people with dementia to minimise disruption and disorientation in their own homes. This will support familiar and intuitive use.

h) Visual fascination with light can lead to continually switching lights on and off. Where this occurs switch guards can be fitted, or the switch placed outside the room to be operated by a carer.

i) Additional sockets should be provided for task lighting (see artificial light table 6 below) and for any additional necessary equipment such as a charging point for a powered wheelchair etc.

j) Rooms should be provided with a sufficient number of 13-amp socket outlets. The recommended minimum number of sockets is shown below:

Socket outlets by room:

Room	No. of socket outlets
Living Room:	8 outlets
Dining area	4 outlets
Single bedroom	6 outlets
Double/Twin bedroom	8 outlets
Kitchens (above worktop)	8 outlets
Halls/landings	4 outlets

Source: DfC Housing Association Guide

k) Sockets should be positioned to prevent trailing leads where possible.

l) Sockets and switches should be mounted at a height to facilitate ease of use (see table below as a guide).

Positioning of sockets and switches

Switches	Switches should be between **900mm and 1000mm** above floor level and a minimum of **300mm** (measured horizontally) from an inside corner of a room For wheelchair dwellings switches should be a minimum of **700mm** from an inside corner.
Socket outlets	Switches should be between **450mm and 700mm** above floor level and a minimum of **300mm** (measured horizontally) from an inside corner of a room. For wheelchair dwellings switches should be no lower than 700mm and a minimum of **700mm** from an inside corner.
Controls (E.g., Immersion Switch or heating controls).	Controls should be between **900mm and 1000mm** above floor level.
Consumer Units	Consumer Units should be no higher than **1350mm to 1450mm** above floor level.
Kitchen Sockets and Fixed Switches above worktops.	Kitchen wall sockets/switches to be **100mm** above fixed worktop height. Where a person's reach is restricted, consider a separate bank of control/isolator switches in an accessible location.

(Source: RIBA Inclusive Design).

m) Additional sockets or power supplies may be required for specialist equipment in kitchens and bathrooms such as rise and fall worktops, wash/dry toilets and hoists.

n) Physical cues, such as an indicator light on a switch, are useful to show whether the switch is on or off.

o) Equipment for use by a person with severe hearing loss should provide visual or tactile feedback to inform the user as to its condition. Specialist equipment should be considered where appropriate, such as a kettle that lights up when in use but goes out when the water is boiled, or a piece of equipment that vibrates when it is turned on or off, such as a smart phone.

Contrasting switched sockets (Courtesy of: Varilight UK)

Contrasting switch (Courtesy of: Varilight UK)

3.4.5 Flooring

The specification of flooring is a key safety consideration in all areas. Flooring should be chosen to suit the needs and activities of the household. There are a number of design features to be considered.

Key design considerations for flooring:

a) Adjoining flooring should be tonally similar to reduce the risk of falls. Floor LRV values should be within 8 points of each other (less is better) and no more than 10 points difference is recommended.

b) Where it is possible to abut flooring without a transitional strip, this is preferred. This will reduce the number of interfaces to be coordinated. However, always ensure the flooring is level, as floor covering thicknesses can vary.

c) Transition strips when used should match the tones of both surfaces with an ideal difference of no more than 3-point LRV difference with each adjoining surface. Polished finished strips are not recommended.

d) Floor coverings should be plain coloured with a matt surface finish. Avoid defined patterns, speckles or highly polished surfaces. Patterned floors add to the cognitive and sensory load of the environment and are not recommended. Sparkly floors or flecked floors may be perceived as something to pick up.

e) Slip resistant flooring is necessary for washrooms, bathrooms, shower rooms, kitchens and other areas where the floors may become wet. These should have a minimum slip resistance value. The Health and Safety Executive (HSE) provide useful advice on flooring (See: https://www.hse.gov.uk/slips/manufactfloor.htm)

f) The use of dark coloured mats or rugs should be avoided as these can be perceived as holes in the floor. They can also be a trip hazard.

g) Where the user is noise sensitive and there is an issue with sound being transmitted through the fabric of the dwelling, consideration can be given to provision of sound suppressing materials, such as floor coverings.

h) In kitchens or utility rooms which may have vibrating equipment such as washing machines or tumble driers, the floors may require soundproofing.

i) Logos or branded insets may be perceived as an obstacle and adds complexity.

j) Flooring with a high gloss or shiny finish may be perceived as being wet or slippery and may produce glare and reflections that can be misinterpreted. Matt finishes are therefore preferred.

k) Highly contrasting, aluminium and brass reflective trims, transition strips or threshold strips could cause high-stepping as they may be perceived as a step or change in level.

l) Lighting solutions should aim to give an evenly distributed light, in order to reduce shadows at floor level. Shadows can be misinterpreted.

m) Skirtings must give a clear indication where the floor ends and the wall begins. A contrasting skirting is recommended by the RNIB as it offers an additional visual cue to follow. Architraves if painted to match the skirting also help identify the location of the door.

n) Coved skirtings may be required for maintenance and cleaning, but it should be recognised that these can distort the perceived location of the junction between the floor and the wall, if not in a contrasting colour. A maximum upturn of 100mm is recommended if non-contrasting coved skirting is used.

Floor samples selections with low tonal contrast and matching threshold strip. All within recommended LRV variation range. (Courtesy of: DDS Architects)

3.4.6 Heating/Ventilation

People living with CSI may be more sensitive to environmental conditions and temperature regulation. It is therefore important to create a comfortable internal environment to improve their health and well-being.

Key design considerations for heating and ventilation:

a) Maintaining a healthy and comfortable room temperature of between 18°C and 21°C is recommended for general health and well-being. This is of particular importance for people with disabilities.

b) It is important to maintain this temperature range in an energy efficient manner, whilst being mindful of the risk of overheating.

c) Maximise useful solar gain in winter by orientating the main habitable rooms towards the sun but consider shading for summer months.

d) Optimise the thermal performance of the dwelling by increasing fabric insulation and airtightness and reducing thermal bridging where possible so that heat loss and energy usage are minimised. Ensure increased energy efficiency is matched with adequate ventilation.

e) With regards the method of heating, consider the use of under floor heating as it can help to provide more stable and evenly distributed heating throughout the home. It also eliminates the need for conventional radiators which can impact on circulation space within rooms, as well as being hazardous in the event of a fall, or if touched accidently by someone with cognitive and/or sensory impairment.

f) If conventional radiators are in use, the surface temperature should not exceed 43 degrees Celsius.

g) Control systems and thermostats should be selected that are easy to use and familiar to users.

h) Where safety measures are agreed to be appropriate, it may be necessary to ensure that controls cannot be interfered with and located where they are not readily accessible or visible.

3.4.7 Sanitary fixtures and fittings

Their ability to undertake activities of self-care, including washing and using the toilet, are critical for self-confidence and for maintaining independence for as long as possible. Bathrooms and the fixtures and fittings must be carefully designed to support these activities. Their design should be familiar, calm and intuitive and with provision for safety measures without feeling institutional.

Key design considerations for sanitary fixtures and fittings:

a) Wall and floor finishes in sanitary facilities should have a matt finish to help reduce glare and reflections.

b) Floors should be slip resistant and comply with current guidance for slip resistance in wet areas.

c) The room should be well lit with even light distribution to reduce shadows. The lights should operate independently from the extractor fan so that they can be left on at night for both background light and to assist with finding the toilet, without the fan running constantly and the noise disturbing sleep.

d) Consider anti-flood detectors and isolator mechanism on sink and baths.

e) A mirror should be provided to help with personal care but be mindful that for a person living with dementia it may be necessary to cover or remove the mirror if the reflection is an issue.

Taps

f) Separate hot and cold taps controls are easier for some to operate and less confusing than single lever mixer taps. A familiar style and design should be considered, such as crosshead taps, which are easy to use and familiar to most people.[42]

g) Taps controls should be clearly marked ‘hot’ and ‘cold.’ Concealed anti-scald thermostatic controls should be provided.

h) Regulating temperature and pressure at hand basins, showers and baths taps may be necessary.

Sanitary ware

i) Install sanitary ware that has a familiar style and design.

j) Contrast the toilet seat with the toilet bowl and the floor against which it will be viewed. The use of red for toilet seats and grab rails to colour contrast with sanitary ware should be avoided as it has an institutional feel.

k) Consider lever handled flush handles as they are familiar, intuitive, and easily identifiable. Push flush plates may not be as familiar and easily identifiable.

l) The sink top should have space for toiletries to be placed and displayed. It is important to ensure the top is not cluttered but there is ample space to display necessary items for personal care.

m) Storage is recommended to keep the environment clear of clutter and distractions.

n) Wet rooms or low-profile shower trays are recommended as stepping into or out of a shower may present a trip or fall hazard.

Grab rails

o) Grab rails should contrast with the background against which they will be viewed.

p) They should be made of a slip resistant material in both wet and dry conditions.

Accessible WC with clear contrast definition. (Courtesy of: Armitage Shanks)

Accessible shower with clear contrast definition. (Courtesy of: Armitage Shanks)

Traditional and familiar style mono mixer tap with hot and cold crossheads. (Courtesy of: Milano Elizabeth.)

3.4.8 Acoustics

Acoustics can be a very important consideration in home and garden design. Unwanted noise can have considerable impact on wellbeing and comfort, as well as affecting concentration on tasks and hindering clear communication. This is true for everyone but it especially impacts on individuals with sensory processing difficulties such as hypersensitivity where noise can be a significant factor in their ability to manage in certain environments. Conversely, pleasant sounds from nature such as birdsong or flowing water can have calming and therapeutic effects.

The home environment needs to be designed to minimise unwanted noise. At design stage this can be by considering location and layout of the dwelling and potential sources of noise; either external sources such neighbouring properties or busy roads, or internal sources such as lifts, domestic appliances or mechanical ventilation equipment. Particular attention should also be given to ensuring that internal and external walls, ceilings, floors, or windows provide high levels of sound insulation.

The acoustic design of interiors should seek to minimise background noise, echo and reverberation using acoustic panelling, soft surfaces and furnishings. These can help to reduce reverberation and make speech easier to understand. Providing quiet spaces within a dwelling can also be considered where necessary.

There may be circumstances where specialist advice is required but excellent guidance is already available in Section 10 of PAS 6463:2022 Design for the mind – Neurodiversity and the built environment.

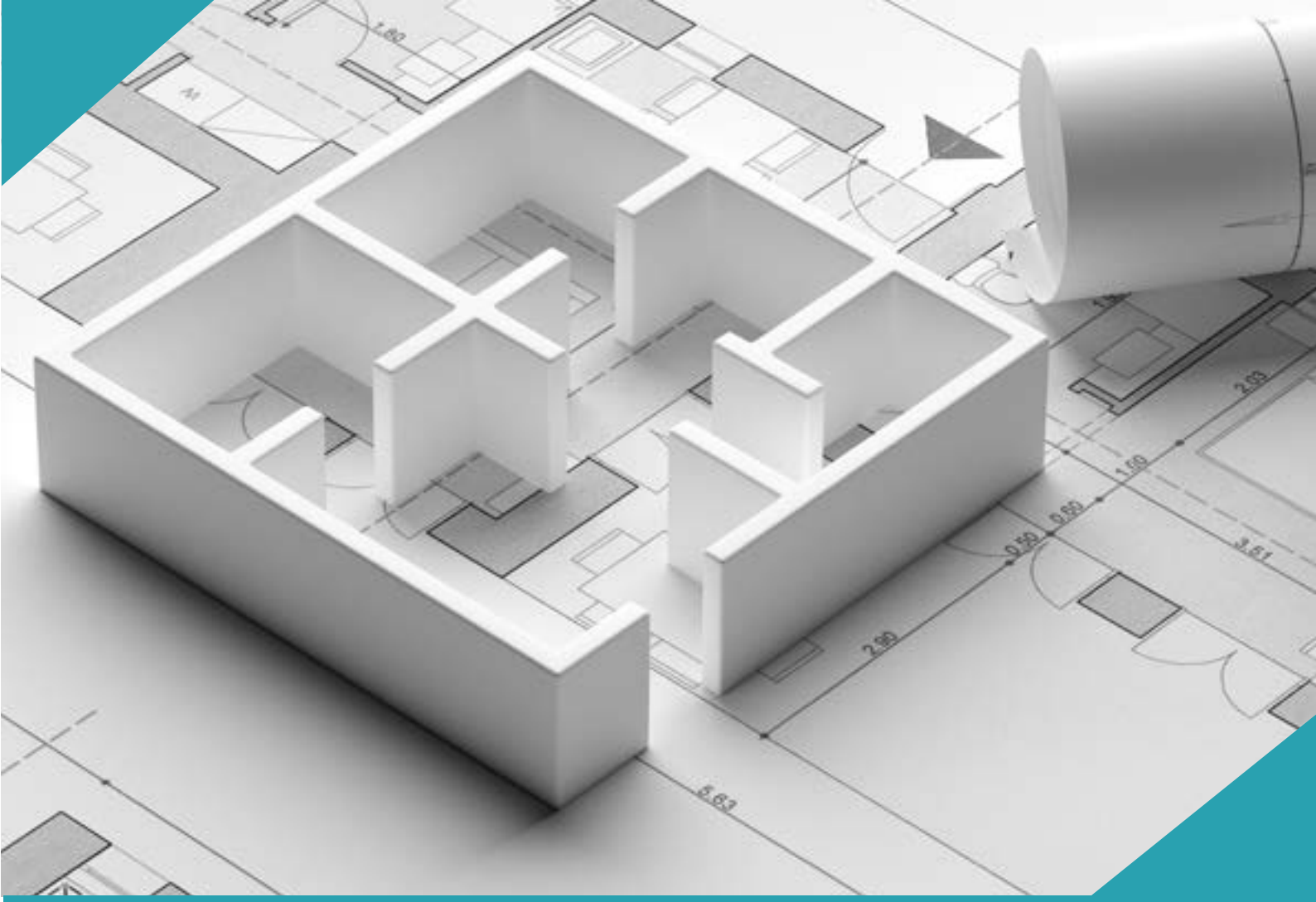
3.4.9 Electronic Assistive Technology

Technology is constantly evolving but can be confusing for people with cognitive and sensory impairment. Its use must add value and improve the individual's ability to function within their environment. It is therefore important to match any technology with the needs of the individual. Taking account of its operability, user/carer preference and their ability to understand and retain instructions. The location, useability and visibility of electrical sockets may also be a consideration to enable the installation of appropriate technology.

Telecare or telemonitoring systems can be installed to provide security and support, although they should not be viewed as a replacement to care. It is important to take account of ethical considerations and ensure appropriate consents are obtained. There are also a range of devices sometimes referred to as environmental control systems, which can assist with the operating of certain functions within the home, such as opening/closing doors and turning on/off lights. Many of these devices are now widely available.

Environmental control systems can be an effective way to control functions within the home.
(Courtesy of: Getty images)

It is recommended to undertake individual assessments involving the appropriate health professionals, such as occupational therapists and the product suppliers making sure to involve the person living with a disability and/or their family/carer.



SECTION 4

Room Layout Design

Room Layout Design

Our homes are the environment that we engage with most. It's where we live, sleep, cook, eat, relax, play, carry out self-care, entertain friends, and perhaps bring up a family, or even work. Therefore, it is important that it provides an environment that is comfortable, safe and secure and that supports health and well-being. These qualities become even more important as we age or have a disability and therefore may be inclined to spend more time at home. A dwelling, and the individual rooms within, that is well-designed can support those with a disability to live as independently as possible and be able to navigate and move around freely; and to locate, reach and use all fixtures, fittings and controls with ease, in addition to carrying out normal daily activities.

Providing sufficient space is a key consideration for all homes but can be particularly important for those with a disability. As well as allowing for the necessary furniture, circulation and occupancy, adequate space makes it easier to manoeuvre a pram or wheelchair; it can allow for children to play, to have somewhere private to retreat to, space to prepare food conveniently, space to work from home or for children to do their homework, it can provide space to entertain friends and family, pursue hobbies, to store personal possessions, household necessities, and materials for recycling. Space can also mean a home is more flexible and adaptable to meet differing abilities and changing needs of occupants over its lifetime.

Though the overall dwelling floor area is important, the layout of the rooms in relation to each other and to the outside; how the space is used, and the quality, practicality and efficiency of that space also must be carefully considered. Therefore, in addition to space, the design of the homes and the individual rooms needs to consider a range of aspects such as character, location, views, daylight, artificial lighting, accessibility, connection, storage, finishes and services

The main rooms in the home are those that are used frequently by occupants to carry out the day-to-day tasks associated with independent living and therefore the design of these spaces greatly influences the quality of life for people. In the following pages, room layouts for living rooms, kitchens, bedrooms and bathrooms are presented to illustrate some of the key design considerations for the main rooms.

The focus of this section is to build on guidance provided in section 3 of how to apply principles in practice by providing enhanced detail for inclusive design features in the following rooms:

4.1 Living areas
4.2 Kitchen/dining area
4.3 WC/bathroom
4.4 Bedrooms

NOTE: Sample exemplar floor plans for housing design of 3-Person, 2-Bedroom, Single Storey properties and 5-Person, 3-Bedroom 2-Storey properties are included in Appendix 4 to the following standards:

- Lifetime Homes
- Independent Wheelchair User
- Assisted wheelchair User

Disclaimer: The room layout drawings in Section 4 are for illustration purposes only and are not intended to be prescriptive or definitive in showing how the guidance in this document, or other standards referenced therein, can be achieved. Use of these drawings for any other purpose, such as Planning and Building Control applications, or for construction, is entirely at the user's own risk.

4.1 Living Areas

The design of the living area is extremely important as occupants will spend the majority of their time there. Design should seek to ensure that the area is a well-proportioned and attractive space. They should be large enough to allow for multiple functions such as socialising, relaxing, watching TV and studying as well as factoring in the needs of people with disabilities who may require specialist equipment.

Key design considerations for Living Rooms:

1. Character

The living area should be a bright, generous, well-proportioned, attractive, calm and flexible space.

2. Location

Living Rooms should be located on the entrance level of every dwelling to help accommodate those with mobility issues and/or visitors; orientated to maximise natural lighting and take advantage of attractive views out; and positioned away from sources of external and internal noise

3. Space

Living Rooms should be of sufficient size to accommodate the household and visitors and all the necessary furniture. They should be sized to allow for socialising, relaxing, work/study; and have adequate space for accessing furniture and using mobility equipment.

4. Views out

Living room windows should be positioned to take advantage of views of natural or interesting features and over outdoor spaces where there is human activity. The windows should also have transoms or sill heights that do not obstruct a seated person's view. Patio doors can often create both an accessible entrance/exit and enhance views of nature

5. Daylight/Sunlight

Living Room windows should be sized and located to optimise natural light/sunlight while balanced against privacy and heat gain/loss. The quality and quantity of natural light has a positive impact on mental health and circadian rhythms, and it also helps with light/colour definition, which supports carrying out daily tasks and reducing the risk of accidents.

6. Connection

The design of the living area should endeavour to provide visual connection to key spaces such as kitchens, dining areas, bathrooms and outdoors, to help with orientation and provide visual cues. Open plan can be a good option, particularly for those with cognitive or mobility issues, but a means to divide the spaces may benefit those with cognitive or sensory impairments who require or desire quiet, private time.

7. Storage

Adequate storage for items in regular use will help reduce clutter and should be designed to allow independent access by everyone. Open access shelves allow the items to be seen and can often be more functional, but it may be preferable to have closed storage to reduce the cognitive and sensory load.

4.1 Living Areas (Continued)

1. Character
Ensure a bright, generous, well-proportioned, calm and flexible Living area

2. Location
Locate where it will have convenient access for all, good daylight and views out.

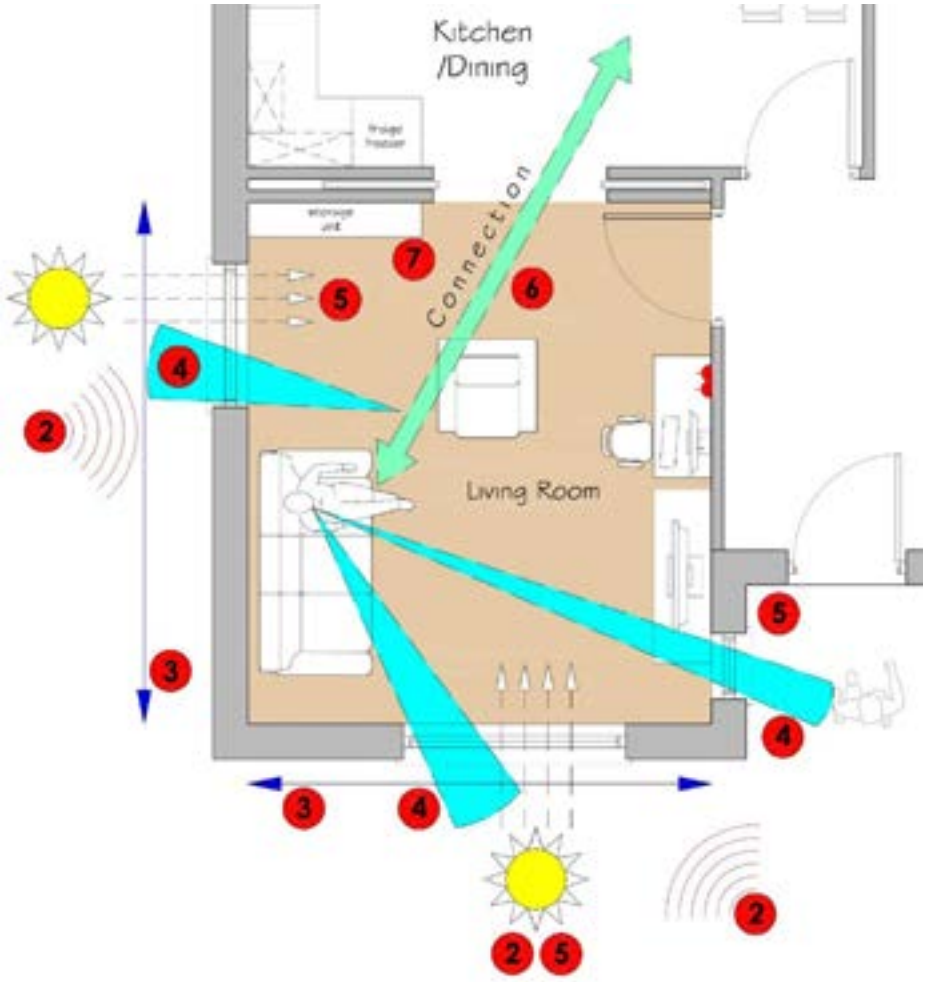
3. Space
Provide space for occupants and visitors, for all furniture and for various activities.

4. Views Out
Ensure a view out for seated persons of natural features and/or activity.

5. Daylight/Sunlight
Ensure good levels of natural light to help mood, vision and reduce accidents.

6. Connection
Provide good visual and physical connection between adjoining spaces.

7. Storage
Provide adequate, easily accessible storage to reduce clutter.



4.1 Living Areas (Continued)

Key design considerations for Living Rooms:

8. Flexibility

Living Rooms should be flexible to accommodate changing circumstances and different furniture layouts. If there are no bedrooms on the entrance level, living rooms should be able to accommodate a temporary bed space. In two storey dwellings consider an appropriate location for a future through-floor lift, which if unable to be accommodated in a circulation area, will often be in a Living Room.

9. Accessibility

Living Rooms should allow for ease of movement for everyone, but particularly for those using a wheelchair. There should be sufficient space for circulation and turning circles, and for approaching furniture, transferring to chairs, opening doors and operating windows.

10. Artificial Lighting

Electric lighting should provide a good overall level of ambient lighting. It should minimise dark corners and shadows and provide an even and consistent level of light to make moving from room to room easier and safer. Task lighting is essential for focused activities. A combination of general (ambient) and task lighting should be considered to provide depth and warmth and help the room feel homely.

11. Finishes

There should be contrast in colour and tone between floors, walls, and doors to aid definition and legibility. Floor Finishes in adjoining rooms should be similar in hue and tone with LRV ratings +/- 10 points variation, to avoid the visual impression of a step. Finishes should also mitigate airborne and impact sounds from adjacent external and internal spaces. Floor coverings should be chosen to facilitate ease of circulation.

12. Furniture

Furniture should be positioned to ensure a clear route into the room and should contrast tonally with walls and floors against which they will be viewed. The position of the TV should be considered to ensure someone with low vision can use suitable seating in a good ergonomic position to watch TV.

13. Electric Sockets

Sufficient electrical sockets should be provided to enable portable task lighting to be used, avoid the need for trailing flexes/cables/wires that may cause an obstruction, and support the use of assistive equipment, which should be easily accessible (for anyone with limited reach, strength). Switches and sockets should be visually contrasting with the wall or surface they are mounted on.

4.1 Living Areas (Continued)

8. Flexibility
Design for differing layouts, potentially including a bed, and for future adaptations.

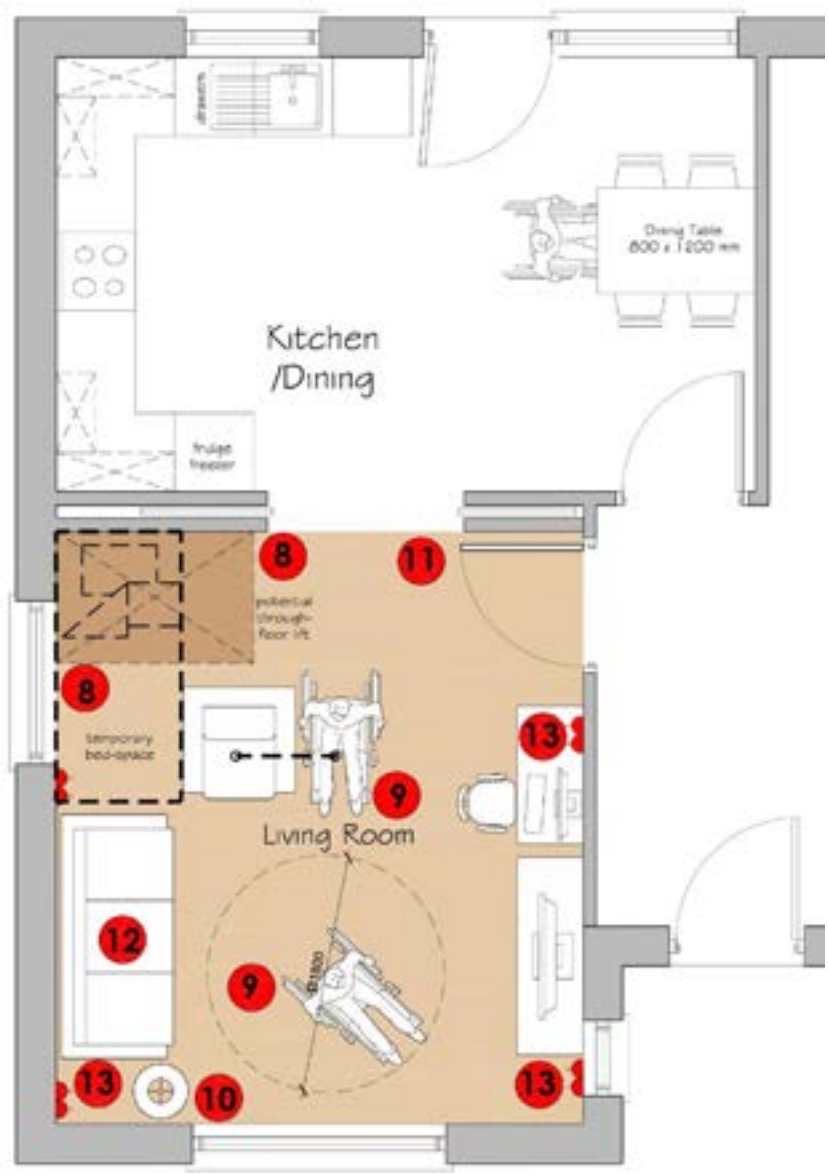
9. Accessibility
Ensure sufficient space for a person using a mobility aid/ wheelchair.

10. Artificial lighting
Provide sufficient artificial lighting. Combining ambient and task lighting works best.

11. Finishes
Ensure sufficient contrast in colour and tone between floors, walls, doors.

12. Furniture
Consider contrast with surfaces and position for easy circulation.

13. Electric Sockets
Ensure sockets/switches are clearly visible, easy to reach, and simple to use.



4.2 Kitchen and Dining Areas

The kitchen and dining area is an increasingly important space in the home, which is often viewed as the hub for meal preparation, family time and socialisation with visitors. It is therefore important to design for a range of functions.

Key design considerations for Kitchen and Dining Areas:

1. Character

Aim to create a calm, legible environment that is practical and easy to use, as well as being aesthetically pleasing. If possible separate utility facilities from the kitchen/dining area to reduce noise and enhance communication.

2. Location

Locate the kitchen in close proximity to a dining area, living space, and where it will receive plenty of daylight. Ideally it should also be located adjacent to a calm and safe garden area, and convenient to amenity areas (bins, washing line, etc.)

3. Space

Ensure the kitchen is large enough to allow for storage, preparation, cooking and serving of food, as well as the usual tasks of cleaning, washing up, laundry and waste disposal, both safely and conveniently. Sufficient space should also be available for a wheelchair user to turn and manoeuvre between appliances and units.

4. Views out

Aim to provide kitchens with a pleasant view out, typically into a garden area, which will also allow for supervising children.

5. Daylight

Ensure a good level of natural lighting for general visibility and for undertaking tasks. Where appropriate, consider an open plan kitchen/ lounge, as it can bring increased daylight into the kitchen area.

6. Connection

Locate the dining table in the kitchen, or close by, so people can see and smell cooking activities, which can stimulate appetite by providing visual and olfactory cues. Visual and physical connection to safe outdoor areas can encourage and facilitate a person with CSI to engage with outdoor activities such as recycling or hanging out clothes. Visual connection between rooms will allow a person with CSI to see other people in the dwelling, thus reducing anxiety about being alone or isolated.

7. Storage

Provide adequate storage space to reduce clutter. Consider a mix of open shelving, glass fronted or labelled cupboards so that regularly used items and foodstuffs are easy to find, and cooking and good nutrition is encouraged. Consider providing wall units that are shallow and supplied with pull- down shelving to make the contents more accessible for all. For low cupboard units, deep ‘pot drawers’ can make access easier where otherwise the rear of the cupboard could be difficult to reach.

4.2 Kitchen and Dining Areas (continued)

1. Character
Ensure a calm, legible, attractive and practical kitchen.

2. Location
Consider the kitchen's proximity to living spaces, and outdoor areas.

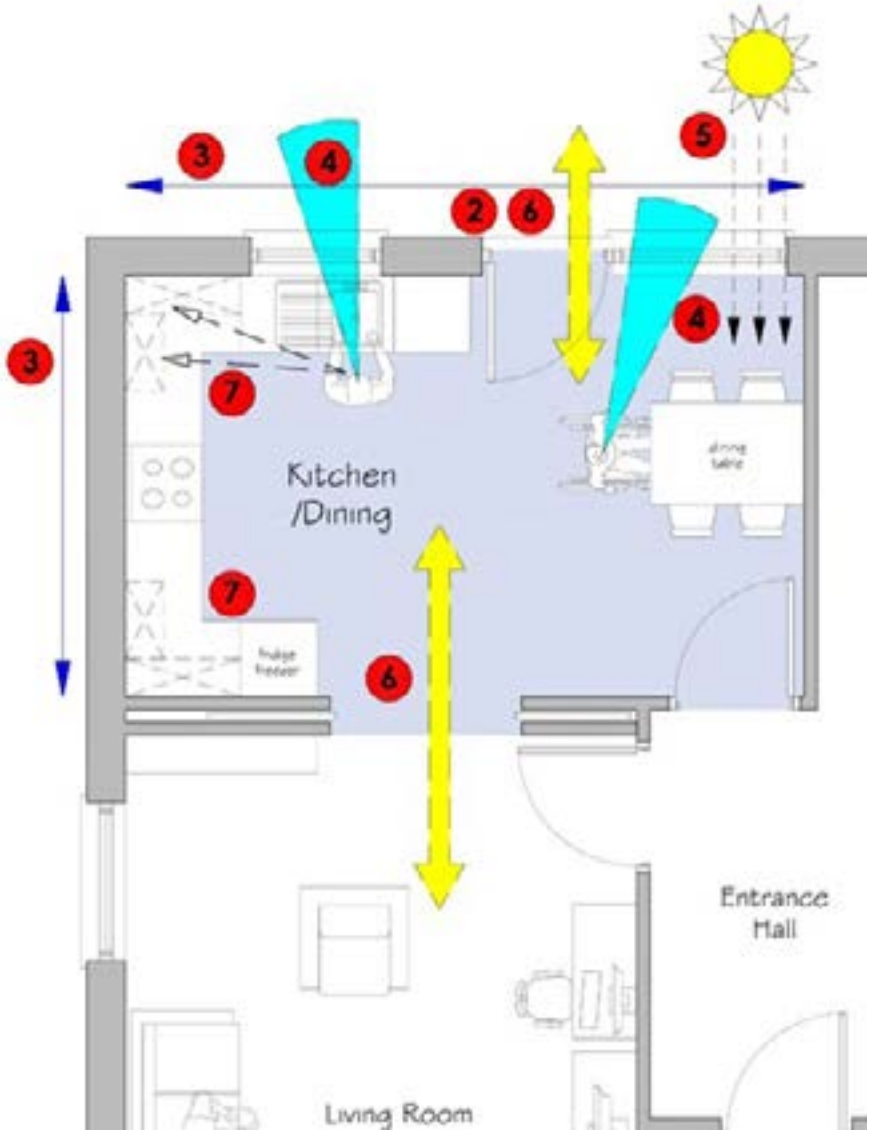
3. Space
Provide adequate space for mobility, and practical, social activities.

4. Views out
Seek to provide a pleasant view out.

5. Daylight
Ensure good levels of natural light.

6. Connection
Provide good visual and physical connection between adjoining spaces.

7. Storage
Provide adequate, easily accessible storage to reduce clutter.



4.2 Kitchen and Dining Areas (continued)

Key design considerations for kitchen and dining areas (Continued):

8. Layout

Design a kitchen arrangement that is convenient, safe, logical and uncluttered, with easy access to all units and appliances. The fridge, sink and hob should be positioned in a logical sequence (e.g. a 'work triangle') to enable easy movement for food preparation, cooking and serving. The oven, hob, sink and for food preparation space should be on a continuous straight, L-shaped or U-shaped run of worktop to create a safe and useable working area.

9. Accessibility

Ensure sufficient space in a kitchen to enable a wheelchair user or person using mobility equipment to manoeuvre freely and safely. A clear turning circle of 1500 - 1800mm should be possible. Provide at least 1200mm clear space in front of appliances/ drawers/ cupboards. Handles to drawers and cupboards should be easy to grip and contrast with surfaces. Consider a height adjustable worktop and ease of access to appliances and to cupboards.

10. Artificial lighting

People with CSI often require higher levels of lighting, which means artificial lighting for general visibility and for undertaking tasks must be maximised. Lighting should be evenly distributed throughout the room with no areas of deep shadow and consider using down-lighters to highlight certain specific areas such as a sink or cooker. Ensure that glare and reflection from lighting are avoided.

11. Finishes

Ensure sufficient contrast in colour and tone between floors, walls, doors and furniture to aid definition and legibility. For the benefit of people with visual or cognitive difficulties, highly reflective surfaces should be avoided. Select floor coverings that are slip-resistant and easy to clean and ensure the LRV of flooring in adjacent rooms is as close as possible, to avoid giving the appearance of a step at the join.

12. Electric Sockets

Ensure outlets, switches and controls are clearly visible, easy to reach, simple to operate and consistent in design. Locate sockets for easy access such as on an angled plinth, mounted on the face board of the work surface, or even in a socket tower. Switches and sockets should be visually contrasting with the wall or surface they are mounted on.

13. Flexibility

Design kitchens for flexibility and adaptability to enable use by people with cognitive, sensory or physical impairment, now and in the future.

4.2 Kitchen and Dining Areas (continued)

8. Layout
Provide a convenient, safe, logical and uncluttered kitchen layout.

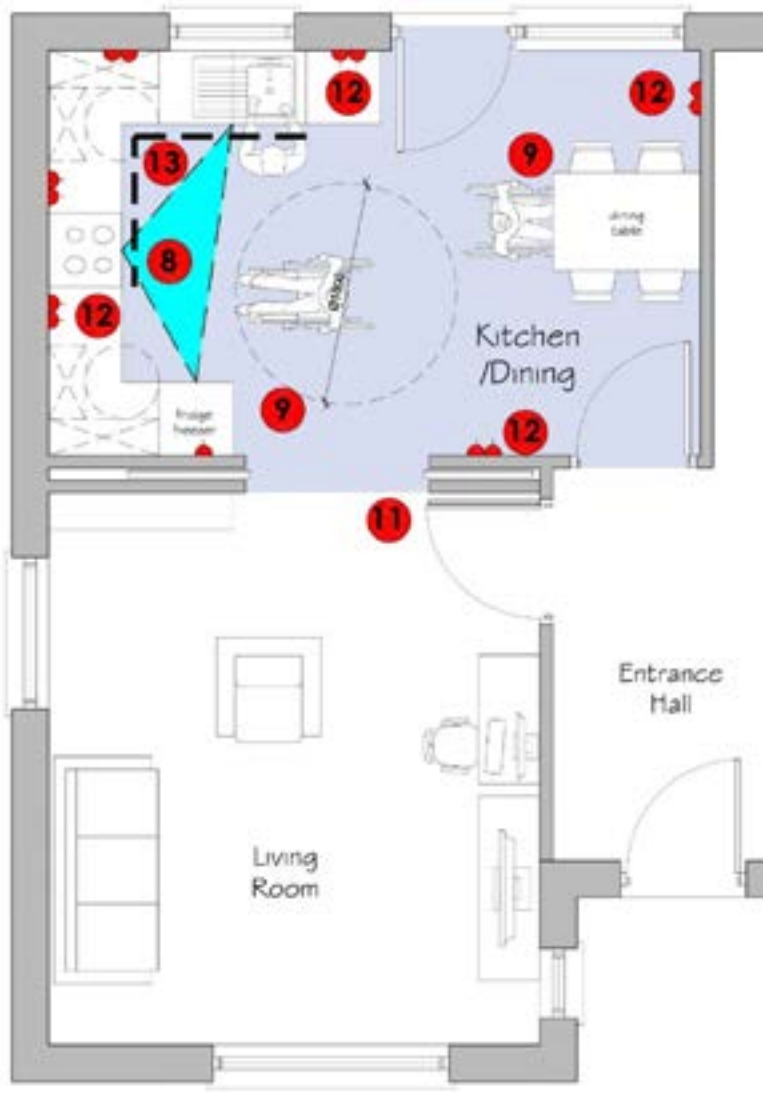
9. Accessibility
Ensure sufficient space for a person using a mobility aid/ wheelchair.

10. Artificial Lighting
Provide sufficient artificial lighting throughout.

11. Finishes
Ensure sufficient contrast in colour and tone between floors, walls, doors.

12. Electric Sockets
Ensure sockets/switches are clearly visible, easy to reach, and simple to use.

13. Flexibility
Design flexible and adaptable kitchens.



4.3 WC and Bathrooms

The design of WC and bathrooms is critical in ensuring the safety, independence, privacy and dignity of all occupants. It is important to ensure that the design allows for flexibility to accommodate changing needs and is not clinical in nature. Well sourced fixtures and fittings should help to normalise design at no extra cost.

Technical specifications for Shower Rooms are included in the Adaptations Toolkit.

Key design considerations for WC and Bathrooms:

1. Character

Personal care, including washing and using the toilet, are critical for self-confidence and independence. Bathrooms must be carefully designed to support these activities, as well as feeling familiar, calm and legible, with provision for safety measures without ever feeling institutional.

2. Location

There should be a toilet on the entrance level of every home. It is also useful if this room is large enough to be adapted into a shower room should this be needed in the future, for example if someone is unable to use the stairs. The location of the bathroom, in relation to the main bedroom should be considered to allow for a connecting door and/or hoist. Ensuite facilities should be considered for those with complex needs.

3. Space

The bathroom should provide space for a number of different activities and allow for changing needs, such as washing small children, assisting an older person, enabling independent access by a wheelchair user and cleaning pets. It should also allow space for either a bath or a shower, storage, access to a window and for use by a person in a wheelchair. An outward opening door will ensure internal space is not compromised by the door swing.

4. Daylight

Bathrooms should have natural light and ventilation where possible. Window controls should be within easy reach and therefore windows should not be located above baths if possible.

5. Connection

It is also useful to have the bathroom immediately adjacent to the main bedroom and provide a connecting door between them to allow use as an ensuite. This is particularly important for those with complex needs. If a connecting door is not provided at the outset allow for future installation of full height door by providing 'soft spot' between them.

6. Fittings

WC should be located to allow for positioning of grab rails, and use of mobile commodes and toilet surrounds. The flush control, preferably a spatula type, should be located on the transfer side of the WC. Clear access zones shall be provided to the toilet, wash hand basin, shower and/or bath.

4.3 WC and Bathrooms(continued)

Key design considerations for WC and Bathrooms:

1. Character
Ensure a familiar feel, without feeling institutional.

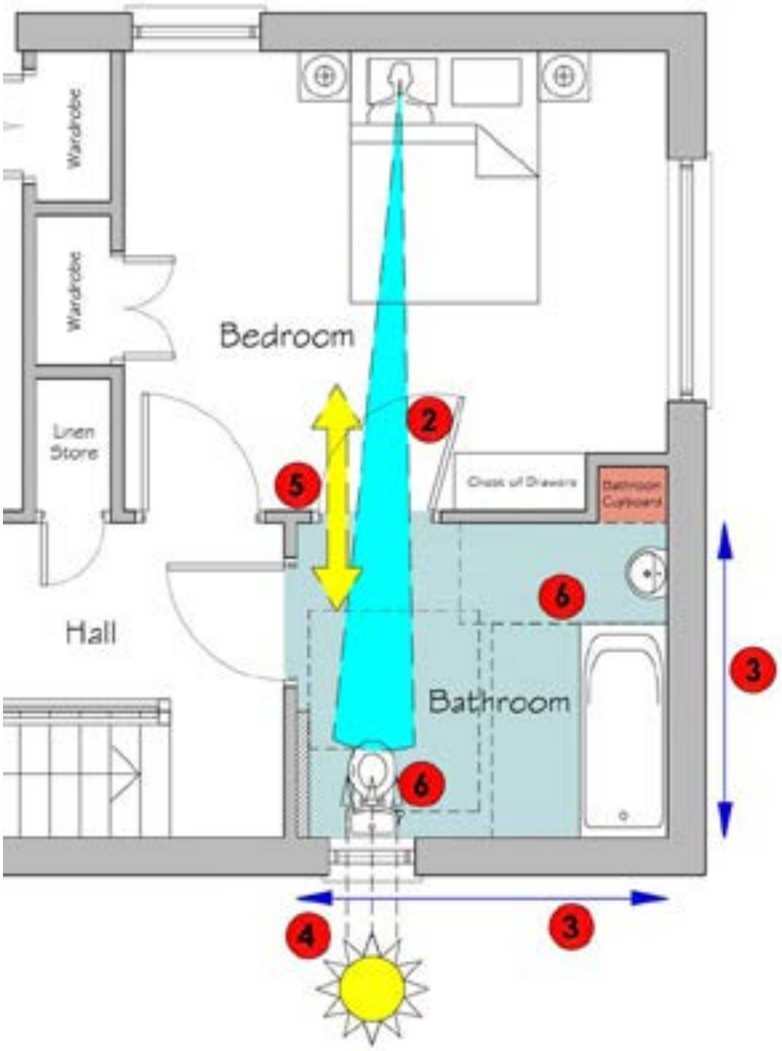
2. Location
Provide an accessible bathroom/WC on every level.

3. Space
Provide adequate space for different activities and for wheelchair use.

4. Daylight
Provide natural light and ventilation where possible.

5. Connection
Consider direct access to main bedroom.

6. Fittings
Ensure fittings are suitably designed and located for ease of use for everyone.



Key design considerations for WC and Bathrooms (continued):

7. Storage

Bathrooms can get very cluttered with toiletries, so it is important to provide accessible storage space in order to help keep surfaces clear and make the bathroom easier to manage.

8. Layout

Some people will need to use a ceiling mounted hoist to transfer them to the bath and/or WC from a bed. The plan of the dwelling, the probable position of a bed and layout of the bathroom should be arranged to allow for this. The preferred position of the toilet is opposite the door opening. Shower areas should not be used as an approach route to access other bathroom facilities. Consider ease of handing the WC position to provide both left and right handed transfer.

9. Accessibility

A wheelchair turning circle of minimum 1500 - 1800mm diameter should be provided. The structure above the main bedroom and bathroom ceilings should be suitable for a hoist-track to be installed as this will assist someone get into and out of a bath, or transfer from a wheelchair. The bathroom door should be outward opening to allow more space in the room, or for access in an emergency if a person should collapse against it. The lock should be capable of being opened from outside the room.

10. Artificial Lighting

Artificial lighting should be designed to provide high levels of even lighting. With spotlights or similar feature lighting (moisture resistant, low glare task lighting) such as down-lighters or concealed strip lights, used to highlight specific areas or key objects such as sinks or WCs. Lighting should avoid glare and shadows, which can be an issue in bathrooms due to shiny surfaces and numerous objects. Light circuits should be separate from the extractor fan circuit to prevent the sudden noise that can be produced when the light is switched on.

11. Finishes

Colour contrast between sanitary ware, wall, floor finishes and door can make a bathroom more legible for everyone. Bathrooms that combine white wall and floor finishes with white fixtures and fittings should be avoided. Flooring should be water-tight, plain, slip resistant and non-reflective. Minimise the colour and tonal contrast between floor finishes at the threshold to avoid the appearance of a step.

12. Flexibility

The walls in bathrooms and WC compartments should be capable of firm fixing and support for installation of well-placed grab rails, to assist getting into the shower or bath, or getting up from the toilet. The provision of a capped outlet for future installation of a floor drain and tanking of walls and floors in bathrooms at ground floor level will allow for adaptation to a 'wet' bathroom for a disabled person.

4.3 WC and Bathrooms (continued)

7. Storage
Provide adequate, easily accessible storage to reduce clutter.

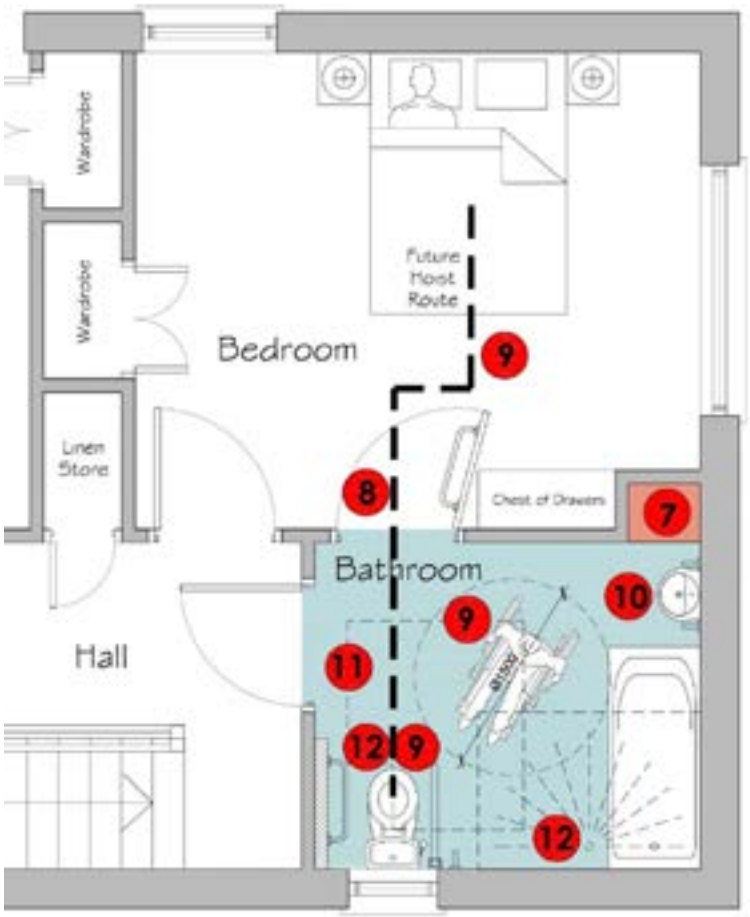
8. Layout
Provide a legible, convenient and connected layout.

9. Accessibility
Provide adequate space for each activity and for easy wheelchair use.

10. Artificial Lighting
Combine high levels of even lighting with some feature lighting, such as at WHBs.

11. Finishes
Ensure colour contrast between sanitary ware, wall, door and floor finishes.

12. Flexibility
Ensure fittings are suitably designed and located for ease of use for everyone.



4.4 Bedrooms

Bedroom design is often overlooked as it can be viewed as merely a room to sleep in. However, for people with disabilities it may be a room that it is necessary to spend more time in. It is therefore important to consider the layout and design to ensure it is a warm, comforting space conducive to relaxation whilst taking account of the necessary functional tasks that need to be carried out, for example dressing and personal care.

Key design considerations for designing Bedrooms:

1. Character

Bedrooms provide a range of functions, including study and self-care activities, but primarily need to allow a person to get a good night's sleep. They should aim to provide a calm and relaxing environment for all.

2. Location

Bedrooms ideally should face east to aid sleep patterns and they should also be positioned away from sources of external and internal noise.

3. Space

Bedrooms need to provide space for all, including those using wheelchairs or mobility aids, to enter, move and turn around freely, use the furniture, get in and out of bed easily, operate windows and use controls. There also needs to be space for other activities besides sleep, such as work/study, dressing and grooming and storing belongings. Children will need space for play, hobbies and entertaining friends. The needs of carers should also be considered.

4. Views out

Position the bed and design the window so that window transoms or cill heights allow an unobstructed view out of the window for someone when seated, sitting up in bed or lying down. Some people may be confined to bed over long periods so the aspect from the bedroom window is especially important.

5. Daylight

Bedroom windows should be sized and located to optimise natural light. Good daylighting has a positive impact on mood and circadian rhythms, which regulate bodily functions such as sleep. Shading devices should be used to reduce glare, which tends to be more problematic with age.

6. Connection

There should be visual connection and easy access between a bedroom and bathroom. Ideally the WC should be visible from the bed to provide visual cues in relation to using the toilet. In certain house types, visual connection and easy access between a bedroom and living room will benefit those confined to bed.

7. Storage

Wardrobes should be located so they are clearly visible from within the room, especially the bed, and consider glazed doors to sections of wardrobe to provide views of the clothes hanging inside. This will provide visual cues about getting dressed, particularly first thing in the morning.

4.4 Bedrooms (continued)

1. Character
Provide a calm, relaxing environment for all

2. Location
Orient facing east to aid sleep patterns, and locate away from noise sources

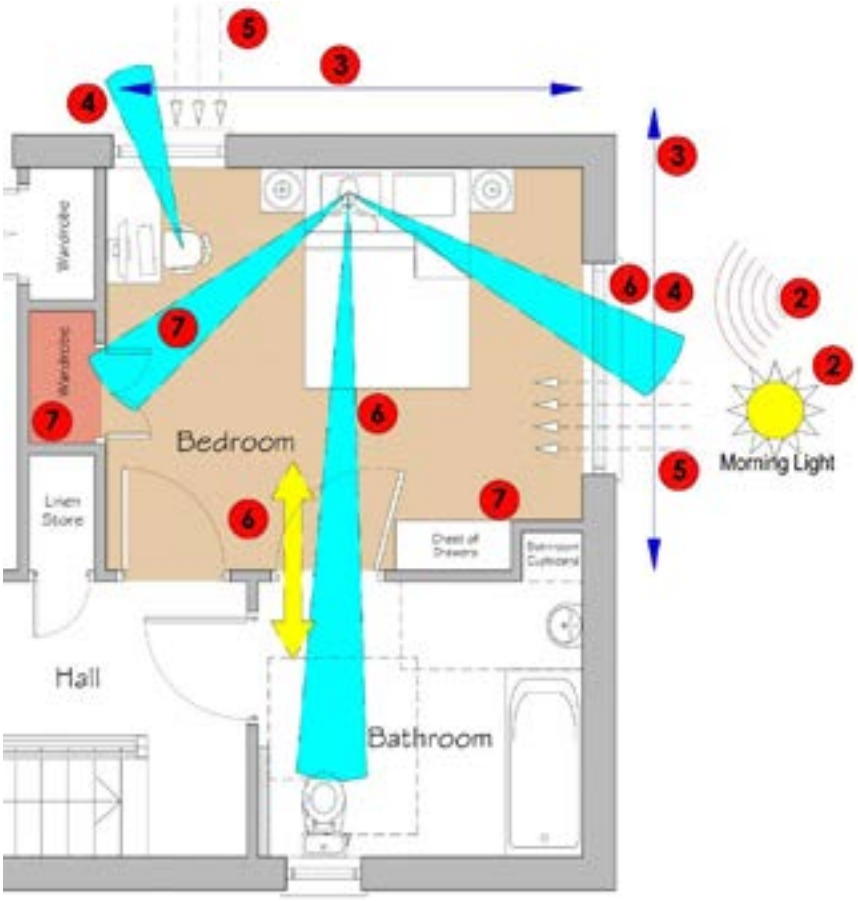
3. Space
Provide adequate space for different activities and for wheelchair use.

4. Views out
Ensure a view out for a person in bed of natural features and/or activity.

5. Daylight
Ensure good levels of natural light to help mood and circadian rhythms.

6. Connection
Consider direct access to (ensuite) bathroom.

7. Storage
Consider wardrobes that are easily seen from the bed and have glazed doors.



4.4 Bedrooms (continued)

Key design considerations for Bedrooms:

8. Flexibility

Where not provided from the outset, bedrooms should allow for the future installation of a through-floor lift from the entrance level, allow for creating a connecting door between a bedroom and adjacent bathroom, and provide a ceiling structure suitable for the future installation of a ceiling mounted hoist.

9. Accessibility

Bedrooms should allow for ease of movement for everyone, but particularly for those using a wheelchair. There should be sufficient space for circulation and turning circles, and for approaching furniture, transferring to the bed, opening doors and operating windows.

10. Artificial Lighting

Electric lighting should be dimmable and well-distributed throughout the room with no areas of deep shadow. Provide sufficient electrical sockets to allow portable task lighting to be used. These should be positioned to minimise the need for trailing leads.

11. Finishes

There should be contrast in colour and tone between floors, walls, and doors to aid definition and legibility. Floor Finishes in adjoining rooms should match LRV to avoid the visual impression of a step. Finishes should also mitigate airborne and impact sounds from external and adjacent internal spaces. Floor coverings should be chosen to facilitate ease of circulation.

12. Switches & Sockets

Sufficient electrical and phone sockets should be provided for bedside lights, TVs, and telephones. Additional sockets and switches in suitable positions should be considered for assistive equipment such as call systems, pressure relieving mattress, nebulizer, oxygen, and door access phones. Provide two-way centre light switches allow control of lights from the bed. Switches and sockets should be visually contrasting with the wall or surface they are mounted on.

13. Safety and privacy

There should be visual connection and easy access between a bedroom and bathroom. Ideally the WC should be visible from the bed to provide visual cues in relation to using the toilet. In certain house types, visual connection and easy access between a bedroom and living room will benefit those confined to bed.

4.4 Bedrooms (continued)

8. Flexibility
Allow for future Through Floor Lift installation

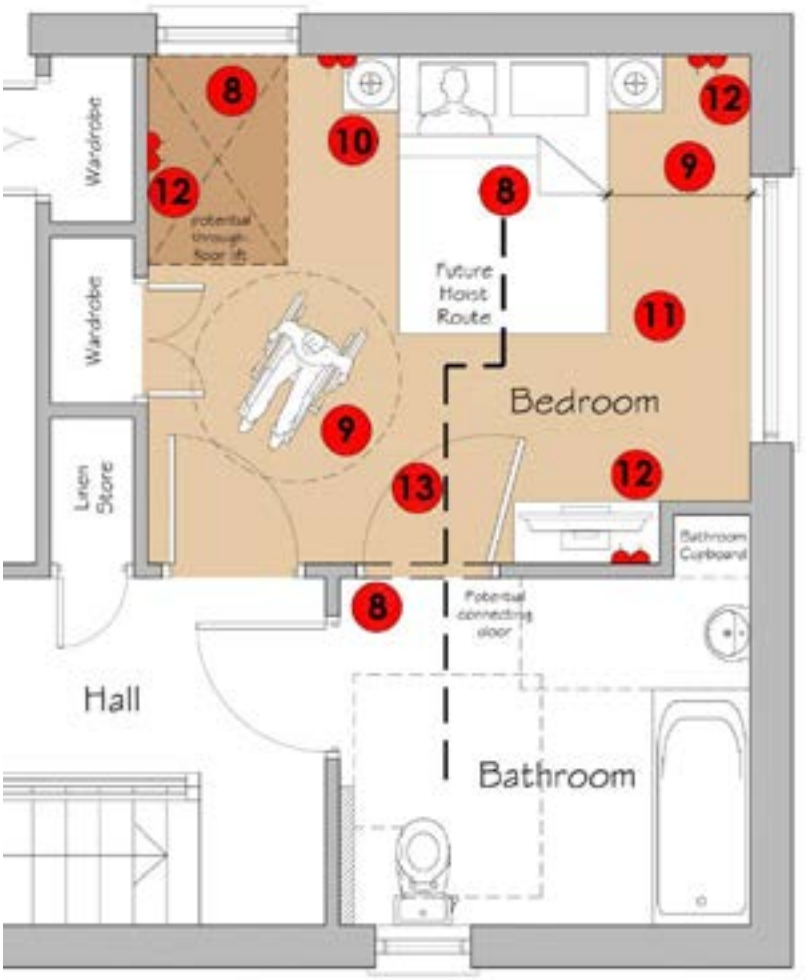
9. Accessibility
Provide adequate space for each activity and for easy wheelchair use.

10. Artificial Lighting
Provide sufficient artificial lighting throughout. Allow for dimmable lighting.

11. Finishes
Ensure sufficient contrast in colour and tone between floors, walls, doors.

12. Switches & Sockets
Provide sufficient sockets for normal use and for assistive equipment.

13. Safety and privacy
Consider direct access to (ensuite) bathroom.



Appendices

Appendix 1

Key Acronyms

ADHD Attention Deficit Hyperactivity Disorder

ASD Autism Spectrum Disorder

AT Assistive Technology

BS British Standard

CRI Colour Rendering Index

CSI Cognitive and Sensory Impairment

HSC Health and Social Care in Northern Ireland

HSE Health and Safety Executive

K Kelvin (Colour Temperature)

LRV Light Reflective Value

LTH Lifetime Homes

NHF National Housing Federation

NIHE Northern Ireland Housing Executive

OT Occupational Therapist

PBW Pure Brilliant White

PDE Primary Design Element

PEEP Personal Emergency Evacuation Plan

PIR Passive Infrared

PTSD Post-traumatic stress disorder

RNIB Royal National Institute of Blind People

WC Water Closet (Toilet)

WHB Wash Hand Basin

Appendix 2

Northern Ireland Housing Processes and Relevant Technical Specifications

New Build Private Sector

Currently designers, contractors and developers in the private sector must comply with the building regulations outlined in Technical Booklet R - Access to and use of buildings, Sections 7 to 11 (October 2012). The regulations aim to ensure properties are visitable for people with disabilities. Key features include:

- Access to and into a dwelling
- Circulation within a dwelling
- Access to sanitary convenience at entrance level
- Heights of sockets, switches etc.

Local council planners may also consider the introduction of accessibility requirements into their local development plans.

New Build Social Sector – Housing Associations

As well as complying with the building regulations, housing associations incorporate Lifetime Homes Standards (LTH) which are designed to ensure that the home is flexible, adaptable and accessible throughout a person's lifetime. In doing so the standards aim to encompass **liveability** for all occupants and **adaptability** for changing needs if required. Key features include:

- Parking and level approach to entrances
- Wider internal doorways and hallways
- Circulation space
- Stairs and potential fitting of lifts etc.

There is also a target in place to build 10% of new housing to wheelchair standards which promotes a universal approach to design and seeks to achieve homes that are inclusive for a wide range of wheelchair users, and which takes account of a variety of other disabilities where possible. (For example: dexterity, cognitive function, and hearing or sight impairments)

Wheelchair housing | Department for Communities (communities-ni.gov.uk)

Adaptation Provision

In Northern Ireland the Interdepartmental Housing Adaptations Design Toolkit sets out agreed space standards, technical specifications and communication processes between health and housing across tenure.

This guide has been developed as a companion document to the Toolkit to provide enhanced guidance regarding the overall design of properties for people with disabilities.

Technical Specifications

- Northern Ireland Housing Adaptations Design Toolkit
  Adaptations Design Communications toolkit (nihe.gov.uk)
- Technical Booklet R- Access to and use of Buildings October 2012
  Technical-booklet-R-Access-to-and-use-of-buildings-October-2012 (finance-ni.gov.uk)
- Northern Ireland Wheelchair Housing Design Standards
  Annex A - Specific Wheelchair Housing Design Standards (communities-ni.gov.uk)
- Lifetime Homes Standards
  Lifetime Homes - Centre for Accessible Environments (CAE)
- Universal Design Guidelines for Homes in Ireland
  Universal Design Guidelines For Homes in Ireland - Introduction
- Design of Accessible and Adaptable General Needs Housing –
  Code of Practice BS 9266:2013
  BS9266.pdf (housinglin.org.uk)

Appendix 3 - Legislation and Policy

Legislation/Policy	Relevant sections
The Health and Personal Social Services (Northern Ireland) Order 1972 Health and Personal Social Services (Northern Ireland) Order 1972 (legislation.gov.uk)	Article 2 – provides a definition of what constitutes a person in need which can help to determine who may be eligible for services. Article 15 – outlines the duty to make arrangements for advice and provision of ***facilities**** including accommodation.
The Chronically Sick and Disabled Persons (Northern Ireland) Act 1978 Chronically Sick and Disabled Persons (Northern Ireland) Act 1978 (legislation.gov.uk)	Section 2(a) – outlines the duty to provide practical assistance for a disabled person in their home. Section 2 (e) – sets out the duty to provide assistance to people with disabilities in arranging for the carrying out of any works of adaptation in their home or providing additional facilities* to secure their greater safety, comfort or convenience.
The Disabled Persons (Northern Ireland) Act 1989 Disabled Persons (Northern Ireland) Act 1989 (legislation.gov.uk)	Section 3 - Disabled person or authorised representatives to make representation regarding assessment for, or provision of, services. Section 4 – outlines the duty to consider needs of disabled persons in relation to any services in accordance with section 2 of the Chronically Sick and Disabled Persons Act as above. Section 8 – highlights the duty to consider the abilities of carers where care is substantial and informal.
The Manual Handling Operations Regulations (NI) 1992 The Manual Handling Operations Regulations (Northern Ireland) 1992 (legislation.gov.uk)	Article 4 - tasks employers with seeking to avoid the need for employees to undertake any manual handling operations at work which involve a risk of their being injured and (ii) taking appropriate steps to reduce the risk. Schedule 1 – sets out the factors to which the employer must have regard and questions they must consider when making an assessment of manual handling operations.
The Children Order (Northern Ireland) 1995 The Children (Northern Ireland) Order 1995 (legislation.gov.uk)	Assessment of children's needs, which, as defined in Article 17 includes children living with disabilities. Schedule 2 (7) – includes the duty to minimise effects on disabled children of their disabilities and give children the opportunity to lead lives which are as normal as possible.

Legislation/Policy	Relevant sections
The Housing (Northern Ireland) Order 2003 The Housing (Northern Ireland) Order 2003 (legislation.gov.uk)	Article 50 - sets out the legislation in relation to the Disabled Facilities Grant Article 51 - defines what is meant by a disabled occupant Article 54 - paragraphs (a) to (l) set out the full list of purposes for which the grant is provided.
The Health and Social Care (Reform) Act (Northern Ireland) 2009 Health and Social Care (Reform) Act (Northern Ireland) 2009 (legislation.gov.uk)	Section 2 of the 2009 Act sets out the duty of the Department to promote in Northern Ireland a health and social care system designed to secure improvement in: the physical and mental health of people in Northern Ireland; the prevention, diagnosis and treatment of illness; and the social well-being of people in Northern Ireland. In meeting that statutory duty, the Department must allocate financial resources, having regard to the need to use such resources in the most economic, efficient and effective way. It must secure the commissioning and development of programmes and initiatives conducive to the improvement of health and social well-being of people in Northern Ireland.
The Health and Social Care Trusts (Establishment) (Amendment) Order (Northern Ireland) 2022 The Health and Social Care Trusts (Establishment) (Amendment) Order (Northern Ireland) 2022 (legislation.gov.uk)	The Health and Social Care Act (NI) 2022 dissolved the Regional Health and Social Care Board (S. 1) and transferred a number of its functions to Health and Social Care Trusts (S 2). Both these sections came into effect on 1 April 2022 by virtue of the Health and Social Care (2022 Act) (Commencement) Order (NI) 2022. Article 2 - removes the definition of "relevant functions" from the relevant establishment orders and updates the functions of the Trusts and the Department's power, by direction, to provide for specified functions be to be undertaken by Trusts on behalf of the Department. These functions include duties outlined as above in: • Health and Personal Social Services (Northern Ireland) Order 1972 • Chronically Sick and Disabled Persons (Northern Ireland) Act 1978 • The Disabled Persons (Northern Ireland) Act 1989 • The Children Order (Northern Ireland) 1995 • Carers and Direct Payment Act (Northern Ireland) 2002

Legislation/Policy	Relevant sections
Department of Health: Systems not Structures Changing Health and Social Care 2016 Systems, not structures - Changing health and social care - Full Report (health-ni.gov.uk)	The Report highlighted that the health and social care system is currently unable to meet the needs of people in a responsive way. Maintaining the current configuration of services is tying up resources in the acute sector, which would have a greater impact if they were invested in primary and social care. The report highlighted that new approaches and service delivery models need to be found that will deliver more responsive, efficient, and effective care, whilst maintaining safe and good quality services. Inclusive and well-designed homes will help to enable the delivery of primary and social care.
Department of Health: Health and Well-being 2026: Delivering Together health-and-well-being-2026-delivering-together (health-ni.gov.uk)	'Health and Well-being 2026: Delivering Together' sets out an *"overarching ambition"* of enabling *"every one of us to lead long, healthy and active lives."* Suitable accessible environments inclusively designed will play a key role in meeting that aspiration.
Interdepartmental Housing Adaptations Design Toolkit 2014 (updated 2022) Interdepartmental Housing Adaptations Design Toolkit	The Toolkit sets out a consistent and standardised approach to design principles, space standards and methods of communication in the delivery of housing adaptations across tenure. This 'Designing Homes for All' Inclusive Design Guide will be used as a companion document to further enhance the design approach for a wider range of disability.
UN Convention on the Rights of persons with Disabilities (ratified by the UK in 2009) Convention on the Rights of Persons with Disabilities | OHCHR	**Article 9** Places responsibility on the state to enable persons with disabilities to live independently and participate fully in all aspects of life by taking appropriate measures to ensure to people with disabilities have access, on an equal basis with others, to the physical environment including housing. **Article 19** Recognises the equal right of all people with disabilities to live in the community and the right to choose where they live.

Appendix 4: Exemplar floor plan layouts

Disclaimer: The room layout drawings in Section 4 are for illustration purposes only and are not intended to be prescriptive or definitive in showing how the guidance in this document, or other standards referenced therein, can be achieved. Use of these drawings for any other purpose, such as Planning and Building Control applications, or for construction, is entirely at the user's own risk.

1. Floor Plan – 3P2B Single Storey (Lifetime Homes)

Key

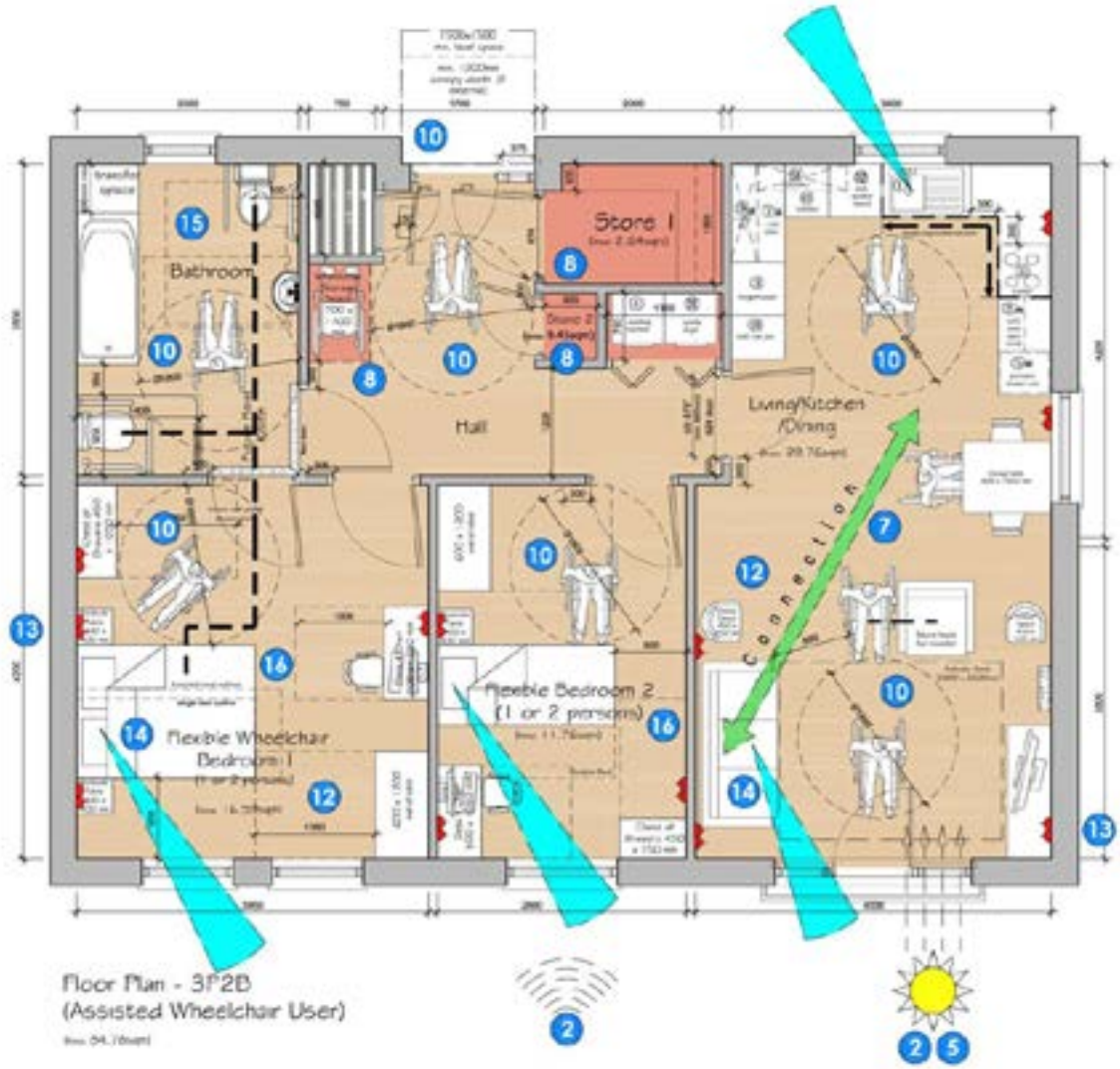
1. Character	**2. Location**	**3. Space**	**4. Layout**
5. Daylight	**6. Views Out**	**7. Connection**	**8. Storage**
9. Flexibility	**10. Accessibility**	**11. Artificial Light**	**12. Finishes**
13. Switches & Sockets	**14. Furniture**	**15. Fittings**	**16. Safety**

2. Floor Plan -3P2B Single Storey (Independent Wheelchair User)

Key

1. Character	**2. Location**	**3. Space**	**4. Layout**
5. Daylight	**6. Views Out**	**7. Connection**	**8. Storage**
9. Flexibility	**10. Accessibility**	**11. Artificial Light**	**12. Finishes**
13. Switches & Sockets	**14. Furniture**	**15. Fittings**	**16. Safety**

3. Floor Plan – 3P2B Single Storey (Assisted Wheelchair User)



Key

1. Character	**2. Location**	**3. Space**	**4. Layout**
5. Daylight	**6. Views Out**	**7. Connection**	**8. Storage**
9. Flexibility	**10. Accessibility**	**11. Artificial Light**	**12. Finishes**
13. Switches & Sockets	**14. Furniture**	**15. Fittings**	**16. Safety**

4. Floor Plans – 5P3B Two Storey (Lifetime Homes) Ground floor plan

Key

1. Character
2. Location
3. Space
4. Layout
5. Daylight
6. Views Out
7. Connection
8. Storage
9. Flexibility
10. Accessibility
11. Artificial Light
12. Finishes
13. Switches & Sockets
14. Furniture
15. Fittings
16. Safety

5. Floor Plans – 5P3B Two Storey (Lifetime Homes) First floor plan

First Floor Plan
5P3B
(Lifetime Homes)
(Area 47.4 sqm)

Key

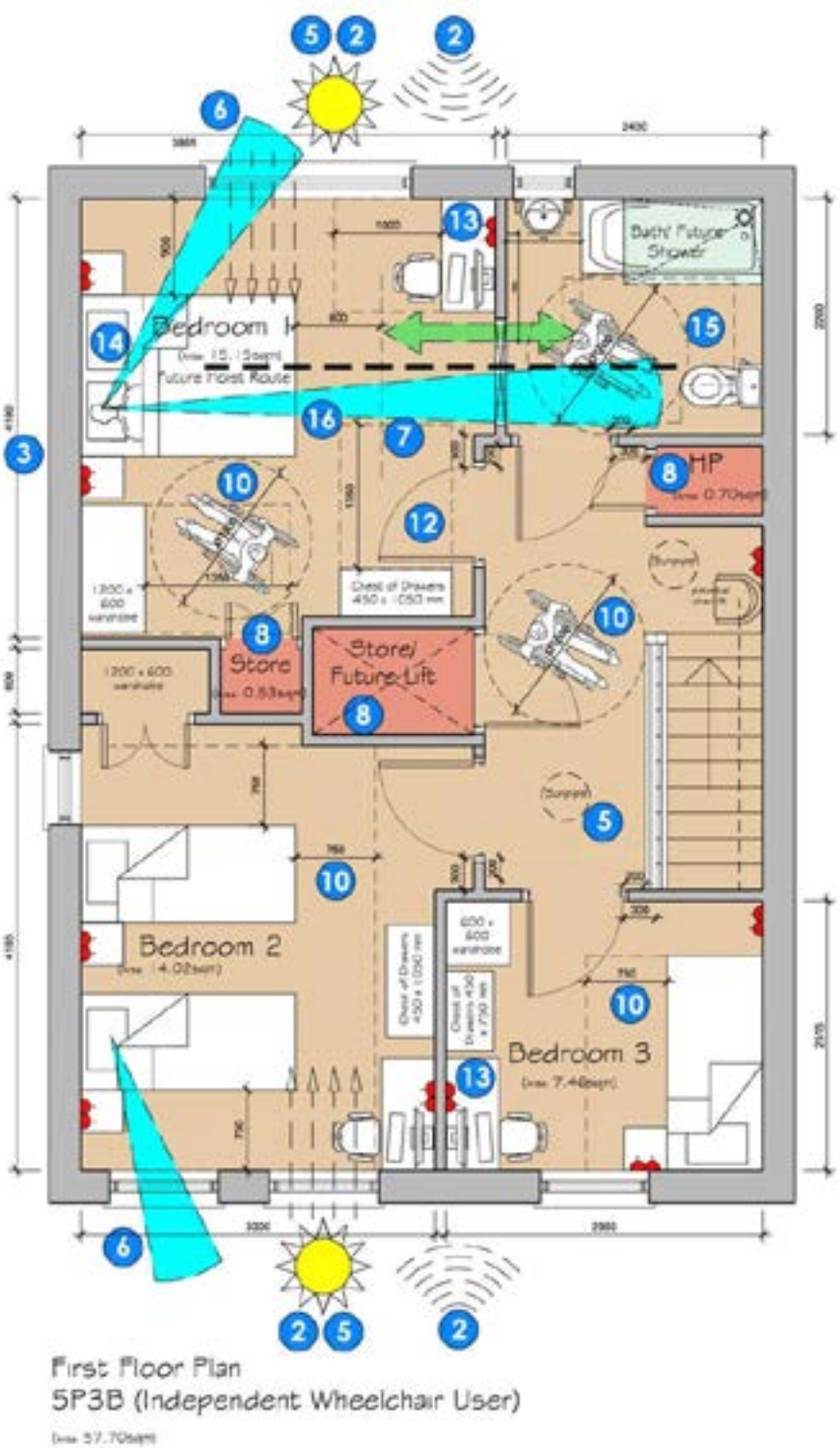
1. Character
2. Location
3. Space
4. Layout
5. Daylight
6. Views Out
7. Connection
8. Storage
9. Flexibility
10. Accessibility
11. Artificial Light
12. Finishes
13. Switches & Sockets
14. Furniture
15. Fittings
16. Safety

6. Floor Plans – 5P3B Two Storey (Independent Wheelchair User) - Ground floor plan

Key

1. Character
2. Location
3. Space
4. Layout
5. Daylight
6. Views Out
7. Connection
8. Storage
9. Flexibility
10. Accessibility
11. Artificial Light
12. Finishes
13. Switches & Sockets
14. Furniture
15. Fittings
16. Safety

7. Floor Plans – 5P3B Two Storey (Independent Wheelchair User) – First floor plan



Key

1. Character
2. Location
3. Space
4. Layout
5. Daylight
6. Views Out
7. Connection
8. Storage
9. Flexibility
10. Accessibility
11. Artificial Light
12. Finishes
13. Switches & Sockets
14. Furniture
15. Fittings
16. Safety

8. Floor Plans – 5P3B Two Storey (Assisted Wheelchair User) - Ground floor plan

Key

1. Character
2. Location
3. Space
4. Layout
5. Daylight
6. Views Out
7. Connection
8. Storage
9. Flexibility
10. Accessibility
11. Artificial Light
12. Finishes
13. Switches & Sockets
14. Furniture
15. Fittings
16. Safety

9. Floor Plans – 5P3B Two Storey (Assisted Wheelchair User) – First floor plan

First Floor Plan
5P3B
(Assisted
Wheelchair User)

Key

1. Character
2. Location
3. Space
4. Layout
5. Daylight
6. Views Out
7. Connection
8. Storage
9. Flexibility
10. Accessibility
11. Artificial Light
12. Finishes
13. Switches & Sockets
14. Furniture
15. Fittings
16. Safety

References

Housing for Older People

Generally, the majority of older people live in general needs housing and wish to continue living independently in their own homes and communities as they age. Therefore, high quality homes should be provided that are suitable for older people from the outset or which are designed to be easily adapted to meet the changing needs of people as they grow older.

The following references and websites provide additional good practice guidance and resources for the design of housing for older people.

References and Websites

Age Friendly Ireland, (online).
Available at: https://agefriendlyireland.ie/ (Accessed Oct 2025)

Age Friendly Ireland, (online). *Housing for Older People: Future Perspectives.* Available at: https://www.dublincity.ie/sites/default/files/media/file-uploads/2018-07/Housing-for-Older-People_-Executive-Summary.pdf (Accessed Oct 2025).

Age Friendly Ireland and the Centre for Excellence in Universal Design at the National Disability Authority, (2015) (online). *How Walkable is Your Town?* Available at: https://agefriendlyireland.ie/wp-content/uploads/2021/10/How-Walkable-Is-Your-Town.pdf. (Accessed Oct 2025).

Centre for Excellence in Universal Design (2017) (online). *Homes for Smart Aging Universal Design Challenge. The Rebuilding Ireland Homes for Smart Aging Universal Design Challenge.* Available at: https://universaldesign.ie/about-universal-design/awards/homes-for-smart-ageing-universal-design-challenge (Accessed August 2024).

Clúid Housing Association, (2021) (online). *Clúid Housing's Design Guide 2021-2025.* Available at: https://www.cluid.ie/wp-content/uploads/2021/07/Cluid-Design-Guide.pdf. (Accessed Oct 2025).

Department for Communities. *Annex B1 - Housing for Older People - Design Standards (draft proposals).* Available at: https://www.communities-ni.gov.uk/sites/default/files/publications/communities/hagds-annexb1-housing-for-older-people-design-standards-draft-proposals.pdf (Accessed Oct 2025).

Department of Housing, Planning and Local Government, Department of Health, (2019). *Housing Options for Our Aging Population, Policy Statement, Government of Ireland.* Available at: https://assets.gov.ie/9398/ca553fa753b64f14b20e4a8dcf9a46ab.pdf (Accessed Oct 2025).

Department of the Environment, Heritage and Local Government, (2007) (online). *Quality Housing for Sustainable Communities, Best Practice Guidelines for Delivering Homes Sustaining Communities.* Available at: https://www.gov.ie/en/publication/24d9e-quality-housing-for-sustainable-communities-design-guidelines/. (Accessed Oct 2025.

Directory of DH Funded Extra Care Schemes (UK).

DWELL Project (online). Available at: https://dwell.sites.sheffield.ac.uk/home (Accessed August 2024).

Feddersen, E. and Lüdtk, I. (2018). *Living for the Elderly: A Design Manual.* 2nd Edition. Birkhäuser.

Fox, S. and Kenny, L. (2015) (online). *A Home for Life, the housing and supports needs of Clúid's Older Tenants.* Clúid Housing. Available at: https://www.cluid.ie/wp-content/uploads/2020/05/A-HOME-FOR-LIFE-FINAL-28-10-15.pdf (Accessed May 2024).

Habinteg Housing Association, (2011). Lifetime Homes Design Guide. IHS BRE Press.

HAPPI, (2009), (online). *Housing our Aging Population Panel for Innovation.* GOV. UK. Available at: https://www.housinglin.org.uk/Topics/browse/Design-building/HAPPI/ (Accessed May 2024).

Housing LIN, Case study 152, (2019). Designing inclusive Later Living communities for HAPPI occupants. Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/Practice_examples/Housing_LIN_case_studies/HLIN_CaseStudy_152_ProctorMatthews.pdf (Accessed May 2024).

Housing LIN, (2013), (online). *Landscape Design Principles for Dementia Care (2nd edition), Factsheet No. 26.* Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Factsheets/HLIN_Factsheet35_Landscape.pdf. (Accessed May 2024).

Housing LIN, (online). *Strategic Housing for Older People: Planning, designing and delivering housing that older people want; A resource pack*. Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/SHOP/SHOPResourcePack.pdf. (Accessed May 2024).

Housing LIN, (2015), (online). *Extra care housing what is it?* Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/Housing_advice/Extra_Care_Housing_What_is_it.pdf (Accessed May 2024).

Housing LIN Resources Library, (online). Available at: https://www.housinglin.org.uk/Topics/type/ (Accessed May 2024).

Irish Wheelchair Association, (online) Available at: https://www.iwa.ie/ (Accessed May 2024).

Lewis, A. (2015). *Daylighting in older people's housing, A guide for housing providers, architects and associated professionals involved in housing design and development.* Pocklington for Professionals no. 3. Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/OtherOrganisation/Daylighting-Guide-PDF.pdf. (Accessed May 2024).

Lyons, R., Sirr, L. and Innovation Delivery, (2016), (online). *Housing for Older People – Thinking Ahead.* Ireland Smart Aging Exchange and Housing Agency. Available at: https://www.housingagency.ie/sites/default/files/publications/35.%20Final-Report-Housing-for-Older-People-Dec-2016.pdf (Accessed May 2024).

Molloy, R. and Costello, A. (2014-2015) (online). *Age Friendly Towns, A Guide.* Age Friendly Ireland. Available at: https://agefriendlyireland.ie/wp-content/uploads/2021/10/Age-Friendly-Towns-Toolkit.pdf (Accessed May 2024).

Porteus, J. and Park, J. (2018). Age-friendly Housing: Future design for older People. RIBA Publishing.

Royal College of Occupational Therapists, Housing LIN (2019) *Adaptations without delay: A guide to planning and delivering home adaptations differently.* Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Other_reports_and_guidance/Adaptations-Without-Delay.pdf (Accessed May 2024)

Royal Institute of Architects in Ireland, Research Report, (2018). Designing Homes for an Ageing Population. Available at: https://agefriendlyhomes.ie/wp-content/uploads/2021/05/Housing_Research_Document.pdf (Accessed May 2024)

Studio Weave in collaboration with the Royal Institute of British Architects, (Jun 2018). *Living Closer: The Many Faces of Co-housing.* RIBA. Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/OtherOrganisation/LivingCloser_StudioWeave.pdf (Accessed May 2024).

Universal Design Guidelines for Homes in Ireland, (online). Provides guidance on the design of new homes that will generally meet the needs of an aging population. Available at: Available at https://universaldesign.ie/built-environment/housing (Accessed August 2018).

Walsh, Dr K. (2018), (online). *Evaluation of Phase 1 of the Dublin City Age Friendly Housing with Support Model in Inchicore.* Dublin City Council and the Housing Agency. Available at: https://www.housingagency.ie/sites/default/files/48.%20Housing-with-Support-MODEL-Web.pdf (Accessed May 2024).

Wel_hops (Welfare Housing Policies for Senior Citizens) (2007) (Online). *Older Persons' Housing Design: A European Good Practice Guide.* Available at: https://www.brighton-hove.gov.uk/sites/default/files/migrated/article/inline/00%20-%20Design%20Guide%20(full)%20-%20Copy.pdf (Accessed Nov 24)

Designing for People Living with Dementia

Most people living with dementia would rather stay at home, with few opting for supported accommodation through personal choice. The aspiration therefore is that people with dementia will be enabled to remain living at home and in their community independently and safely for as long as possible.

The following references and websites provide additional good practice guidance and resources for the design of housing for people living with dementia.

References and Websites

Alzheimer's Society in Northern Ireland (online). Available at: https://www.alzheimers.org.uk/about-us/who-we-are/alzheimers-society-northern-ireland (Accessed May 2024).

Department of Health (2015) (Online), *Health Building Note 08-02 Dementia-friendly Health and Social Care Environments.* Available at: *https://www.england.nhs.uk/wp-content/uploads/2021/05/HBN_08-02-1.pdf* (Accessed May 2024).

Grey, T., Pierce, M., Cahill, S. and Dyer, M. (2015) (online). *Universal Design Guidelines Dementia Friendly Dwellings for People with Dementia, their Families and Carers.* Centre for Excellence in Universal Design, National Disability Authority. Available at: *https://universaldesign.ie/uploads/publications/UD_Guidelines-Dementia_Friendly_Dwellings-2015-Introduction_2023-11-10-092702_qovq-3_2024-10-01-123310_yyxl.pdf* (Accessed May 2024).

Housing LIN, (2013), (online). *Landscape Design Principles for Dementia Care (2nd edition), Factsheet No. 26.* Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Factsheets/HLIN_Factsheet35_Landscape.pdf. (Accessed Oct 2025).

National Housing Federation (2013) (online). Dementia: Finding housing solutions. Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/OtherOrganisation/Dementia_-_Finding_housing_solutions.pdf (Accessed Oct 2025).

Royal Town Planning Institute, (2020) (online). *Dementia and Town Planning: Creating better environments for people living with dementia.* Available at: https://www.rtpi.org.uk/practice-rtpi/2020/september/dementia-and-town-planning/ (Accessed Oct 2025).

The King's Fund, (2013) (online). *Developing Supportive Design for People with Dementia.* Available at: https://www.kingsfund.org.uk/insight-and-analysis/reports/developing-supportive-design-people-dementia (Accessed Nov 2024).

The King's Fund, (2013) (online). *Improving Environments for Care at End of Life.* Available at: https://assets.kingsfund.org.uk/f/256914/x/4c97a97707/improving_environments_care_end_of_life_2008.pdf (Accessed Nov 2024).

Thomas Pocklington Trust, (2010), (online). *Design Guidance for People with Dementia and for People with Sight Loss.* Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Other_reports_and_guidance/RF35_dementia_and_sight_loss_design.pdf (Accessed Oct 2025).

Designing for People Living with Sensory Disabilities

The home environment can be designed, constructed or adapted for people with sensory impairments, such as sight or hearing loss, to help support their safety, comfort, independence, and general well-being.

The following references and websites provide additional good practice guidance and resources for the design of housing for people living with sensory disabilities.

References and Websites

Bauman, H. (online). *Deafspace.* Gallaudet University. Available at: https://gallaudet.edu/campus-design-facilities/campus-design-and-planning/deafspace/ (Accessed Oct 2025).

Chime, (Online). Available at: https://www.chime.ie/ (Accessed Oct 2025)

Housing LIN, (2008), (online). *Housing for People with Sight Loss, Factsheet No. 26.* Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Factsheets/Factsheet26.pdf. (Accessed Oct 2025).

National Institute of Building Sciences, (May 2015). *Design Guidelines for the Visual Environment.* Available at: *https://nibs.org/wp-content/uploads/2025/04/NIBS_LVDP_Guidelines_2015.pdf* (Accessed Oct 2025).

Royal National Institute of Blind People (RNIB), (online). Available at: https://www.rnib.org.uk/. (Accessed Oct 2025).

Thomas Pocklington Trust, (2010), (online). *Design Guidance for People with Dementia and for People with Sight Loss.* Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Other_reports_and_guidance/RF35_dementia_and_sight_loss_design.pdf (Accessed Oct 2025).

Thomas Pocklington Trust, (2015), (online). *Good Housing Design – Lighting: Housing for People with Sight Loss – A practical guide to improving lighting in existing homes.* Available at: https://www.housinglin.org.uk/_assets/Resources/Housing/OtherOrganisation/A-practical-guide-to-improving-lighting-in-existing-homes.pdf (Accessed Oct 2025).

Thomas Pocklington Trust, (2021), (online). *Lighting in and around the home: A guide to better lighting for blind and partially sighted people.* Available at: https://www.pocklington.org.uk/wp-content/uploads/2021/10/Lighting-Guide-2021-FINAL.pdf (Accessed Nov 2024).

Vision Ireland, (online). Available at: https://vi.ie/ (Accessed Oct 2025).

Designing for Mental Health

Our relationship with the built environment is not passive. The design of homes and communities and can have an impact on people's mental health.

The following references and websites provide additional good practice guidance and resources for the design of housing for people living with mental health issues.

References and Websites

Design Council, UK, (online). *Designing good mental health into cities: the next frontier for urban design.* Available at: https://www.designcouncil.org.uk/our-resources/archive/articles/designing-good-mental-health-cities-next-frontier-urban-design/ (Accessed Oct 2025).

Housing Agency, Health Services Executive. *Design for Mental Health: Housing Design Guidelines.* Available at: https://www.housingagency.ie/sites/default/files/publications/36.%20Design%20for%20Mental%20Health%20Housing-Design-Guidance-MAY-2017.pdf (Accessed Oct 2025).

Designing for Autism Spectrum Disorder

The design of homes needs to support the needs and aspirations of people with autism and help support their independence, health and well-being.

The following references and websites provide additional good practice guidance and resources for the design of housing for people with autism.

References and Websites

Architecture for Autism, (online). *The Autism ASPECTSS Design Index*. Available at: https://www.autism.archi/ (Accessed August 2024).

Brand, A. (online). *Living in the Community, Housing Design for Adults with Autism.* Available at: https://rca-media2.rca.ac.uk/documents/117.Living_in_the_Community2010.pdf (Accessed Oct 2025).

Gaines, K., Bourne, A., Pearson, M. and Kleibrink, M. (2016). *Designing for Autism Spectrum Disorders.* Routledge,

Information Analysis Directorate (2021) (online). *Prevalence of Autism (including Asperger Syndrome) in School Age Children in Northern Ireland: Annual Report 2021.* Available at: https://www.health-ni.gov.uk/sites/default/files/publications/health/asd-children-ni-2021.pdf (Accessed Oct 2025).

Steele, Ki. and Ahrentzen, S. (2015). *At Home with Autism: Designing Housing for the Spectrum*. Policy Press.

Housing for Mobility Impairment

Current policy in Northern Ireland is that Building Regulations only require new dwellings to be designed to be accessible or 'visitable' by a person who uses a wheelchair. Policy neither requires dwellings to be adaptable, nor fully accessible or useable for someone in a wheelchair. However, where dwellings are not purpose built for someone with mobility issues, they should be designed that are responsive and future proofed for a wide range of people's needs over their lifetime. Consideration should be given to specific space and access requirements for various users which may include ambulant disabled, independent wheelchair users or assisted wheelchair users.

Available best practice guidance in the design of wheelchair accessible dwellings should be consulted and applied.

References and Websites

Department for Communities. *Annex A – Specific Wheelchair Housing Design Standards.* Available at: https://www.communities-ni.gov.uk/sites/default/files/publications/communities/hagds-annex-a-specific-wheelchair-housing-design-standards.pdf (Accessed Oct 2025).

Habinteg Housing Association and the Royal College of Occupational Therapists Specialist Section – Housing. *Wheelchair Housing Design Guide.* 3rd Edition, RIBA.

Irish Wheelchair Association, (2014), (online). *Best Practice Access Guidelines: Designing Accessible Environments. 4th Edition.* Available at: https://www.iwa.ie/access-guidelines/best-practice-access-guidelines-4/ (Accessed Oct 2025).

Irish Wheelchair Association, (online) Available at: https://www.iwa.ie/ (Accessed Oct 2025).

Mayor of London, (2007) (online). *Wheelchair accessible housing, Designing homes that can be easily adapted for who are wheelchair users, Best Practice Guide.* GLA. Available at: https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/archives/bpg-wheelchair-acc-housing.pdf (Accessed Oct 2025).

Northern Ireland Housing Executive, Department for Communities and Department of Health (2022), *Housing Adaptations Design Toolkit.* Available at: https://www.nihe.gov.uk/getattachment/b0653b86-7bd0-4dd8-b983-7c5215e4eca7/Housing-Adaptations-Design-Toolkit.pdf (Accessed Oct 2025).

Sport Eireann, Irish Wheelchair Association (2018), *The Great Outdoors: A guide for Accessibility.* Available at: https://www.sportireland.ie/sites/default/files/2019-10/great-outdoors-a-guide-for-accessibility.pdf (Accessed Oct 2025).

Designing for General Disability

The following references and websites provide additional good practice guidance and resources for the design of housing for people with disabilities.

References and Websites

All Party Parliamentary Group for Healthy Homes and Buildings (2017), (online). *Building Our Future: Laying the Foundations for Healthy homes and Buildings.* Available at: *https://www.housinglin.org.uk/_assets/Resources/Housing/OtherOrganisation/APPG_HHB_paper-Reply-by-30-Sept-20171.pdf* (Accessed May 2024).

Association of Occupational Therapists of Ireland (AOTI) (2019). *Housing Design Guidelines for Occupational Therapists.*

British Standards Institution (BSI), (2018). *BS 8300-1:2018 Design of accessible and inclusive built environment - Part 1: External Environment – Code of practice*

British Standards Institution (BSI), (2018). *BS 8300-2:2018 Design of accessible and inclusive built environment - Part 2: Buildings – Code of practice*

British Standards Institution (BSI), (2013) (Online). *BS 9266:2013 Design of accessible and adaptable general needs housing – Code of practice https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Other_reports_and_guidance/Design_of_Accessible_Housing_BS9266.pdf* (Accessed May 2024).

British Standards Institution (BSI), (2022) (Online). *PAS 6463:2022 Design for the mind – Neurodiversity and the built environment - Guide* https://www.housinglin.org.uk/_assets/Resources/Housing/OtherOrganisation/Design-for-the-mind-Neurodiversity-and-the-built-environment-Guide.pdf (Accessed May 2024).

Centre for Excellence in Universal Design, National Disability Authority, (2012) (online). *Buildings for Everyone: A Universal Design Approach*. Available at: https://universaldesign.ie/Built-Environment/Building-for-Everyone/. (Accessed May 2024).

Centre for Excellence in Universal Design, National Disability Authority, (2015) (online). *Universal Guidelines for Homes in Ireland.* Available at: https://universaldesign.ie/Built-Environment/Housing (Accessed May 2024).

Department of Children and Youth Affairs, Centre for Excellence in Universal Design, Early childhood Ireland, TrinityHaus, Mary Immaculate College, (2019). *Universal Design guidelines for Early learning and Healthcare Settings.*

Department of Finance (2012) (Online), *Technical Booklet R: Access to and use of buildings.* Available at: https://www.finance-ni.gov.uk/publications/technical-booklet-r (Accessed May 2024).

Department of Finance (2012) (Online), *Technical Booklet E: Fire Safety.* Available at: https://www.finance-ni.gov.uk/publications/technical-booklet-e (Accessed May 2024).

Department for Transport (2021) (online) *Guidance on the Use of Tactile Paving Surfaces. Available at: https://assets.publishing.service.gov.uk/media/61df0c91e90e07037794fe90/guidance-on-the-use-of-tactile-paving-surfaces.pdf* (Accessed Aug 2024).

Disability Equality Specialist Support Agency, (online). *Play for all; providing play facilities for children with disabilities.* Available at: https://www.dessa.ie/wp-content/uploads/2021/03/Play-for-All.pdf. (Accessed May 2024).

Disabled Facilities Grant. (Online). Available at: https://www.nihe.gov.uk/housing-help/grants/types-of-grants-available/disabled-facilities-grant (accessed May 2024)

Equality Commission for Northern Ireland: *Definition of Disability* (revised 2007) Available at: Definition of Disability (Accessed January 2025)

ETendersNI, (online). Available at: https://etendersni.gov.uk/epps/home.do (Accessed May 2024)

Forbo Flooring Systems (2020). Design for the mind: Neurodiversity in the built environment: Whitepaper. Available at: https://forbo.blob.core.windows.net/forbodocuments/792349/Forbo%20Design%20for%20the%20Mind%20Whitepaper%20UK%20April%202020.pdf (Accessed May 2024)

Grey, T., Siddal, E. and O'Shea, E. (2012) (online). *Shared Space, Shared Surfaces and Home Zones from a Universal Design Approach for the Urban Environment in Ireland, National Disability Authority.* TrinityHaus. Available at: https://universaldesign.ie/uploads/publications/Shared-Space-Full-Report.pdf (Accessed May 2024).

Housing Agency (2019) *Designing Housing to Meet the Needs of All.* Available at: https://www.housingagency.ie/sites/default/files/2019-07/Designing-Housing-to-meet-the-needs-of-all.pdf (Accessed May 2024).

Independent Living Ireland, (online). Available at: https://independentlivingireland.ie/ (Accessed May 2024).

Information Analysis Directorate (2022) (online). *Raw Disease Prevalence in Northern Ireland 2021/22.* Available at: https://www.health-ni.gov.uk/sites/default/files/publications/health/rdp-ni-2022.pdf (Accessed May 2024).

Northern Ireland Housing Executive (NIHE) (2022), *Interdepartmental Housing Adaptations Design Toolkit.* Available at: https://www.nihe.gov.uk/my-housing-executive/adaptations/adaptations-design-communications-toolkit (Accessed May 2024).

Pickles, P. (1998) (Online) *Housing for Varying Needs: A Design Guide.* Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20131205115152uo_/http://www.archive2.official-documents.co.uk/document/deps/cs/HousingOutput/start.htm

Royal Institute of British Architects (RIBA), (2024) (online). *Inclusive Design Overlay to the RIBA Plan of Work.* Available at: https://www.architecture.com/knowledge-and-resources/resources-landing-page/inclusive-design-overlay-to-riba-plan-of-work (Accessed May 2024)

Royal Institute of British Architects (RIBA), (online). Available at: https://www.architecture.com/ (Accessed October 2025).

Royal Institution of Chartered Surveyors (RICS) (online). Available at: https://www.rics.org/ (Accessed May 2024).

Royal Institute of the Architects of Ireland (RIAI), (online). Available at: https://www.riai.ie/. (Accessed May 2024).

Royal Society Ulster Architects (RSUA), (online). Available at: https://rsua.org.uk/ (Accessed Oct 2025).

Taggart, L. and Cousins, W. (2014-15) *People with intellectual Disabilities: Promoting Health, Addressing Inequality,* Northern Ireland Assembly. Available at: https://www.niassembly.gov.uk/globalassets/documents/raise/knowledge_exchange/briefing_papers/series3/people-with-intellectual-disabilities-briefing.pdf (Accessed Oct 2025).

The Association of Occupational Therapists of Ireland, AOTI, (online). Available at: https://www.aoti.ie/ (Accessed Oct 2025).

The Health and Safety Executive for Northern Ireland (HSENI). (Online) https://www.hseni.gov.uk/ (Accessed Oct 2025)

The National Disability Authority, (online) Available at: http://nda.ie/ (Accessed Oct 2025).

Society of Chartered Surveyors Ireland, (online) Available at: https://scsi.ie/. (Accessed Oct 2025).

Endnotes

[1] https://assets.publishing.service.gov.uk/media/5a79d58e40f0b66d161ae79b/2044122.pdf

[2] https://www.communities-ni.gov.uk/sites/default/files/publications/communities/hagds-annexb1-housing-for-older-people-design-standards-draft-proposals.pdf

[3] https://www.wishnetwork.org/news/blog/why-dementia-friendly-gardens-are-more-important-than-ever

[4] **Department of Transport** (2021) (online), *Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*

[5] https://assets.publishing.service.gov.uk/media/61df0c91e90e07037794fe90/guidance-on-the-use-of-tactile-paving-surfaces.pdf

[6] **British Standards Institution (BSI), (2018).** *BS 8300-1:2018 Design of accessible and inclusive built environment - Part 1: External Environment – Code of practice*

[7] **British Standards Institution (BSI), (2018).** *BS 8300-1:2018 Design of accessible and inclusive built environment - Part 1: External Environment – Code of practice*

[8] **British Standards Institution (BSI), (2018).** *BS 8300-1:2018 Design of accessible and inclusive built environment - Part 1: External Environment – Code of practice*

[9] **British Standards Institution (BSI), (2018).** *BS 8300-1:2018 Design of accessible and inclusive built environment - Part 1: External Environment – Code of practice*

[10] **British Standards Institution (BSI), (2018).** *BS 8300-1:2018 Design of accessible and inclusive built environment - Part 1: External Environment – Code of practice*

[11] **RIBA, Habinteg and CAE,** (2024). *The Inclusive Housing Design Guide. RIBA publishing, p.37.*

[12] **British Standards Institution (BSI), (2018).** *BS 8300-1:2018 Design of accessible and inclusive built environment - Part 1: External Environment – Code of practice*

[13] **British Standards Institution (BSI), (2013) (Online).** *BS 9266:2013 Design of accessible and adaptable general needs housing – Code of practice*

[14] **Grey, T., Pierce, M., Cahill, S. and Dyer, M. (2015) (online).** *Universal Design Guidelines Dementia Friendly Dwellings for People with Dementia, their Families and Carers.* Centre for Excellence in Universal Design, National Disability Authority.

[15] **Habinteg Housing Association, (2011).** *Lifetime Homes Design Guide. IHS BRE Press*

[16] **Pickles, P. (1998) (Online)** *Housing for Varying Needs: A Design Guide.* (Accessed October 2025).

[17] **Thomas Pocklington Trust, (2014), (online).** *Homes and living spaces for people with sight loss: A guide for interior designers*

[18] **Centre for Excellence in Universal Design, (2015) (online).** *Universal Design Guidelines for Homes in Ireland.*

[19] **RIBA, Habinteg and CAE,** (2024). *The Inclusive Housing Design Guide. RIBA publishing.*

[20] **Habinteg Housing Association, (2011).** *Lifetime Homes Design Guide. IHS BRE Press*

[21] **Habinteg Housing Association, (2011).** *Lifetime Homes Design Guide. IHS BRE Press.*

[21] **Habinteg Housing Association, (2011).** *Lifetime Homes Design Guide. IHS BRE Press.*

[22] **Pickles, P. (1998) (Online)** *Housing for Varying Needs: A Design Guide.*

[23] **Pickles, P. (1998) (Online)** *Housing for Varying Needs: A Design Guide.*

[24] **Habinteg Housing Association, (2011).** *Lifetime Homes Design Guide. IHS BRE Press.*

[25] **Centre for Excellence in Universal Design, (2015) (online).** *Universal Design Guidelines for Homes in Ireland.*

[26] **British Standards Institution (BSI), (2013) (Online).** *BS 9266:2013 Design of accessible and adaptable general needs housing – Code of practice.*

[27] **Association of Occupational Therapists of Ireland (2019).** *Housing Design Guidelines for Occupational Therapists*

[28] **British Standards Institution (BSI), (2013) (Online).** *BS 9266:2013 Design of accessible and adaptable general needs housing – Code of practice*

[29] **British Standards Institution (BSI), (2013) (Online).** *BS 9266:2013 Design of accessible and adaptable general needs housing – Code of practice*

[30] **Grey, T., Pierce, M., Cahill, S. and Dyer, M. (2015) (online).** *Universal Design Guidelines Dementia Friendly Dwellings for People with Dementia, their Families and Carers.* Centre for Excellence in Universal Design, National Disability Authority.

[31] **British Standards Institution (BSI), (2013) (Online).** *BS 9266:2013 Design of accessible and adaptable general needs housing – Code of practice*

[32] **Thomas Pocklington Trust, (2021), (online).** *Lighting in and around the home: A guide to better lighting for blind and partially sighted people*

[33] **Thomas Pocklington Trust, (2021), (online).** *Lighting in and around the home: A guide to better lighting for blind and partially sighted people*

[34] **RIBA, Habinteg and CAE, (2024).** *The Inclusive Housing Design Guide. RIBA publishing.*

[35] **British Standards Institution (BSI), (2013) (Online).** *BS 9266:2013 Design of accessible and adaptable general needs housing – Code of practice*

[36] **Centre for Excellence in Universal Design, (2015) (online).** *Universal Design Guidelines for Homes in Ireland.*

[37] **RIBA, Habinteg and CAE, (2024).** *The Inclusive Housing Design Guide. RIBA publishing, p83*

[38] **British Standards Institution (BSI), (2013) (Online).** BS 9266:2013 Design of accessible and adaptable general needs housing – Code of practice

[39] **RIBA, Habinteg and CAE, (2024).** *The Inclusive Housing Design Guide. RIBA publishing.*

[40] **Northern Ireland Fire and Rescue Service**· https://www.nifrs.org/

[41] **British Standards Institution (BSI), (2022) (Online).** *PAS 6463:2022 Design for the mind – Neurodiversity and the built environment - Guide*

[42] **Centre for Excellence in Universal Design, (2015) (online).** *Dementia Friendly Dwellings for People with Dementia, their Families and Carers, National Disability Authority*

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