Design for quality of life, sustainability, and resilience in long-term residential care settings for older people in Ireland

Universal Design Guidelines

Health Research Board

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- https://www.tcd.ie/trinityhaus/research-areas/healthy-and-inclusive-places/ltrc-planning-and-design-for-quality-of-life-and-resilience/

- https://residentiallongtermcaredesign.ie/

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- Newtownpark House, Blackrock, Co. Dublin
- St Brendan's Community Nursing Unit, Loughrea, Co. Galway
- The Village Residence, Drogheda, Co. Louth
- Haven Bay Care Centre, Kinsale, Co. Cork,
- CareBright, Bruff, Co. Limerick
- St Brendan's High Support Unit, Mulranny, Co. Mayo
- Ballyshannon Community Hospital, Ballyshannon, Co. Donegal

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Foreword

Despite the fact that one in three of us will spend some time in a nursing home before we die, there has been little attention to the quality of design of nursing homes until relatively recently. The heart-breaking suffering and increased mortality of nursing home residents during the COVID-19 pandemic further highlighted the need to design these settings in such a way that human flourishing and independence could be successfully aligned with the greatest possible support to protect against threats to well-being.

Fortunately, there have been developments in the international literature pointing to opportunities to rethink how we can shape nursing homes with the same standards of support, comfort and ease of use that we demand for our homes. These include the Greenhouse, Eden Alternative, and Teaghlach Model which recast nursing home settings more clearly into a series of smaller households with more empowering domestic-style format.

Allied to the key principles of Universal Design, this ground-breaking survey of national and international research, best practice and in-depth reviews of a representative sample of Irish nursing homes and their residents and staff can help to give a clearer direction to reconfiguration and renewal of best design principles in Irish nursing homes. The focus on broader issues such as planning and siting are as important as the interior design. It is abundantly clear that there is a profound synergy between optimising quality of life and quality of the lived experience through design and urban planning that serves residents and communities to the greatest extent possible.

These guidelines also arrive at an opportune time to inform the national guidelines on nursing home design which are in the course of preparation by the Irish Department of Health. It is important that our communities and society embrace this opportunity to enhance the broader spectrum of an Age-Friendly Ireland which promotes equal excellence in design and choice, whether in our own homes or in the setting of residential care.

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About These Guidelines

These guidelines have been developed as part of a **Health Research Board** (HRB) Investigator-Led Project (ILP) completed by TrinityHaus, School of Engineering, Trinity College Dublin (TCD); the Centre for Medical Gerontology in the School of Medicine (TCD); and Tallaght University Hospital (TUH), in collaboration with a range of Irish and international partners. This project explored **planning and design for quality of life and resilience in residential long-term care settings for older people in Ireland,** and was built on a number of previous related research projects including: **Universal Design Guidelines for Improving Quality of Life and Enhancing COVID-19 Infection Control in Existing Residential Care Settings for Older People** (Funded by CEUD; 2020-2022); and **Residential Long Term Care COVID-19: Role of the Built Environment** (Funded by SFI; 2020-2022).

The research report underpinning these guidelines outlines the research methodology, stakeholders engaged with, and key findings. This report can be found in the project page at: https://www.tcd.ie/trinityhaus/research-areas/healthy-and-inclusive-places/ltrc-planning-and-design-for-quality-of-life-and-resilience/

It is widely accepted that most people would prefer to continue living in their own home and community for as long as possible, as opposed to moving to long term residential care (LTRC). However, in many cases this is not possible due to the high level of care that some people require, or a lack of support at home. In other cases, a person may choose to move to a long term care setting for improved living conditions, to receive better care, or simply to have more company. For these people, it is essential to provide LTRC that support a high **quality of life**, and that provide inclusive and sustainable settings.

Continuing to live in your own home is a major part of '**ageing in place**', but research tells us that ageing in place is also about a continuity of community, staying close to family, friends, and local services, and remaining in familiar environments where a person has a strong sense of place. In this understanding of ageing in place, it becomes vital to carefully consider the location and community integration of LTRC settings so that people can move to a local setting and maintain their sense of place.

The diversity and changing nature of resident needs, health conditions, and dependencies, as well as the range of visitors and staff who typically occupy an LTRC setting, necessitate a welcoming and inclusive environment. The **Universal Design** (UD) approach presented in these guidelines provides the kind of accessible, safe, comfortable, and adaptable design required to support these diverse and evolving needs.

The COVID-19 pandemic disproportionately affected older persons, particularly those living in LTRC settings. While the primary impacts of COVID-19 were illness and death, the secondary impacts of isolation, loneliness, lack of physical activities and social interaction that resulted from infection control measures were also devastating to people living in these settings. The design of LTRC must therefore fully consider how a more **resilient built environment can enhance infection control, while also maintain quality of life during a pandemic.**

This resilience must also extend to the **impacts of climate change** including such hazards as storms, flooding, and heatwaves. Wider **sustainability** issues such as biodiversity are

also critical, along with the management and use of energy, not just in terms of climate change mitigation, but also in terms of adaptation and security of supply through economic or climate based disruptions.

These guidelines address the complex and interconnected issues and challenges described above through a **LTRC Planning and Design Framework** that consists of the following:

- **Core design values** including: Quality of life and Quality of Experience; Inclusion through Universal Design; and Sustainability and Resilience.
- **Evidence based design** across key spatial scales underpinned the research referenced earlier.
- **Key Design Considerations** including overall UD Principles; Key LTRC design issues, and a range of sustainability, climate adaptation and resilience topics.
- **Good practice exemplars and case studies** used to illustrate the design guidance.
- **Levels of Design** to illustrate how important features can range from minor to major interventions.
- **An Engagement and Co-creation Strategy** to bring these elements together and to facilitate a collaborative approach to planning and design.

The philosophy, approach and format of these guidelines align with other built environment and UD related guidance produced in Ireland over the last 10 years including UD guidelines for dementia friendly dwellings (see https://universaldesign.ie/built-environment/housing), UD guidelines for hospitals (see https://www.tcd.ie/trinityhaus/research-areas/healthy-and-inclusive-places/dementia-friendly-hospitals-from-a-ud-approach/), and as mentioned previously, UD guidelines focusing on quality of life and COVID-19 Infection control (see https://universaldesign.ie/built-environment/residential-long-term-care-settings-for-older-people). In line with these existing documents, these current guidelines are broken into:

- **Introduction** that sets out the wider context and policy landscape for LTRC settings in Ireland and describes the LTRC Planning and Design Framework outlined above.
- **At a Glance** that provides a brief overview of the key UD considerations and issues across a variety of typical LTRC settings.
- **Four Sections** of detailed guidance ranging from overall site location, approach and entry, down to detailed guidance around building components and technology.
- **Appendix Section** with a bibliography, glossary of terms, and links to useful information; detailed case studies; and, additional and supporting material related to the Engagement and Co-creation Strategy.

It is hoped that the framework included in this document will support an integrated and coherent approach to the planning, design, and adaptation of LTRC settings. Following this, it is intended that the guidelines in Section 1 to 4, which are not intended to be prescriptive, will provide a flexible approach to inform and inspire clients, designers, and setting operators, through good practice, design considerations and awareness, national and international exemplars, and UD guidance.

It is hoped that these guidelines will not only inform the design of attractive, accessible, usable and easily understood LTRC settings, but also play an important role in supporting key government policy aimed at providing high quality, inclusive and age-attuned, sustainable and resilient long term residential care in Ireland.

Introduction

01: Newtownpark House Nursing Home, Blackrock, Co. Dublin.

Long Term Residential Care as part of the housing and care continuum

Life expectancy in Ireland is one of the highest in the EU, something to be greatly celebrated. However, an ageing population does present challenges, especially in the domain of housing and residential care. In this regard, there is a broad consensus that ageing in place and ageing in your own home is the preferred option for most people when circumstances, health, capabilities, and levels of support allow this to happen. Progress has been made in relation to ageing in place, through Home Support Services, and initiatives such as the Housing Options for Our Ageing Population: Policy Statement. This policy statement also outlines a Housing-with-care continuum from mainstream housing to home care services, up to supportive housing, and also forms of residential long term care. So, while this policy emphasises the importance of ageing at home, promoted supported housing, it also acknowledged that '[l]ong-term residential care is often the most appropriate care option where an older person's needs are complex.' (p12).

Key Terms and Definitions

Long Term Care: As discussed above, for some people as they grow older their health and capabilities may decline. Many of these people may require help with daily activities, such as washing, dressing, and household activities such as cooking and cleaning tasks. Assistance with these tasks is often provided by long-term care (LTC).The global demand for LTC is expected to grow due to 'population ageing, changing family characteristics, projected shortages of formal and informal carers, and rising expectations of the availability, affordability and quality of LTC services' [1] (p. 9). The increasing prevalence of long-term

conditions such as dementia [2] is also a factor. Dementia is an umbrella term to describe a group of disorders caused by several diseases and conditions, with Alzheimer's disease and Vascular Dementia being the most common.

LTC is often provided informally, by family and friends, or formally by professional home carers, in the home of the older person. However, due to increased care needs or other causes, it can become impossible to provide this care at home. In these instances, care is provided in long-term residential settings.

Long Term Residential Care Settings: Residential care settings for older people are known by various names including "nursing homes," "long-term care facilities," or "care homes." [3]. In the Irish context, the terms 'nursing homes' and 'long-term residential care' facilities are effectively synonymous. These residential facilities cater for people who require access to 24/7 nursing care and often also therapist and specialist medical care.

Key policies and Initiatives in Ireland

The Health Information and Quality Authority (HIQA[1]) and the National Quality Standards for Residential Care Settings for Older People in Ireland: HIQA is an independent authority responsible for the inspection of residential centres for older people to ensure conformance with the Health Act 2007, regulations and the 'National Quality Standards for Residential Care Settings for Older People in Ireland' [4]. These HIQA standards comprise eight themes and 35 standards that cover issues ranging from health and quality of life, to staffing, governance and management. Across a number of these themes, there are standards related to the built environment and how design can support quality of life. For instance, Standard 2.6 'The residential service is homely and accessible and provides adequate physical space to meet each resident's assessed needs' sets out a number of features related to bedrooms, accessible indoor recreational areas, and safe, secure outdoor spaces. Standard 2.7 'The design and layout of the residential service is suitable for its stated purpose. All areas in the premises meet the privacy, dignity and wellbeing of each resident' sets out requirements for communal space (recreational and dining space) to provide a minimum of 4 square metres for each resident (excluding residents' private accommodation, corridors and entrance hall space). In all new builds and extensions, all single bedrooms have a minimum of 12.5M2 usable floor-space (excluding en-suite facilities) and that 80% of residents have single rooms.

See https://www.hiqa.ie/reports-and-publications/standard/national-standards-residential-care-settings-older-people-ireland

The Health Act 2007 (Care and Welfare of Residents in Designated Centres for Older People) (Amendment) Regulations 2016: These regulations specify certain design requirements for residential settings for older people. For instance, from January 2022, the regulations require bedrooms to have a minimum floor area of 7.4m2 per resident (including bed, chair, and personal storage space). The regulations state that if rooms are shared, they should not have more than 4 residents, other than in high-dependency rooms which will not have more than 6 residents, in that room. The regulations also provide requirements for sitting and recreational space.

See https://www.irishstatutebook.ie/eli/2016/si/293/made/en/print

[1] HIQA is also responsible for registration (licensing) of residential long-term care settings in Ireland.

Teaghlach Model: In response to international developments in marrying domestic scaled environments to the complex care needs of LTRC residents, such as the Green House and Eden Alternatives, the HSE commissioned an outline brief on adapting this format for future Irish LTRC setting development, that was named the Teaghlach model [5, 6]. The Teaghlach model aims to change the culture of care and promote a model of care that better resembles the older person's home life. This model follows a person-centred approach and the residential care facilities building design attempts to promote a more domestic lifestyle. One recommendation of this model is to divide the care facility into individual domestic-style units [6].

A 2016 HSE brief (see link below) describes the Teaghlach model of care supports as "a biopsychosocial approach which endeavours to better meet the older person's psychological and social needs without compromising on their physical care needs" [6]. The brief emphasises that the Teaghlach model is based on person-centred care rather than the institutional model, and while the physical environment is important there is also an emphasis on culture change in a model that supports older people to make decisions about their own lives.

02: CareBright, Bruff, Co. Limerick. A resident's private living space, decorated with an assortment of personal effects and family photographs.

The 2016 Health Services Executive (HSE) 'Design Brief: 10 Bed Dementia Specific Household - Residential Care Centre': This brief provides design criteria for dementia specific units as part of an LTRC setting. The brief states that the "10 bed dementia specific household core areas with single bedroom ensuites will have their own sitting/sunroom area, dining room and kitchenette at the centre or 'heart' of the home."

The brief is based on the 'Teaghlach', or 'household' model as described above and in Appendix 3 (p. 109 – 121) of the brief, which contains a document called 'Person Centred Care in Residential Services for Older People'. Appendix 3 sets out a vision for a small-scale and resident-centred living model where overall settings are divided into individual households that can cater to all residents, not only people living with dementia.

(Please note that the link below provides access to documents from 2016 and that the HSE should be consulted for current information).

See https://hdl.handle.net/10147/621465

The Housing Options for our Ageing Population: Policy Statement: This policy framework seeks to support Ireland's ageing population in a way that will increase the accommodation options available and give meaningful choice in how and where people choose to live as they age. It identifies a programme of 40 strategic actions to further progress housing options for older people including Action 4.12, which focuses on the issuing of planning guidelines for the development of residential care homes and primary care centres to ensure that they are appropriately designed and located in areas with access to transport and amenities.

See https://www.gov.ie/en/publication/ea33c1-housing-options-for-our-ageing-population-policy-statement/

Age Friendly Ireland's (AFI) 'Pre-planning Guidance for Residential Care Homes': This guidance highlights Section 247 of the Planning and Development Act 2000 which related to 'Consultations in relation to proposed development' [7]. Here, AFI guidance identifies the key issues which must be considered by stakeholders as part of any pre-planning and preliminary design process. [8]

See https://agefriendlyireland.ie/wp-content/uploads/2021/06/AFI-Pre-Plan-Guide-for-Residential-Care.pdf

With the exception of AFI's guidance, and the standard pre-planning consultation process, at present there is no specific or formal LTRC pre-planning consultation process involving statutory authorities such as HIQA or government agencies, i.e., HSE, in which location, integration with community, model of care, or general design of a proposed LTRC development could be appraised in the context of local need, available health and social care support, as well as overall housing mix within the area. A pre-planning process with a LTRC focus would ensure a more integrated approach to LTRC provision and provide valuable feedback to the setting developer at an early stage of the project.

HIQA -Fire Safety Handbook: A guide for providers and staff of designated centres (Version 1.2 — March 2025 and any subsequent updates): This HIQA handbook provides guidance for registered providers and staff of designated centres to develop, implement and sustain an effective fire safety programme, and to create a strong fire safety culture to drive quality improvement. The handbook also directs providers to relevant regulations and national standards, which should also be considered when developing a fire safety culture in a designated centre.

See https://www.hiqa.ie/reports-and-publications/guide/fire-safety-handbook-guide-registered-providers-and-staff

See also **Technical Guidance Document B 2024, Fire Safety – Volume 1, Buildings other than Dwelling Houses.**

Residential Long-Term Care settings: New-build, Retrofit and adaptation

03: Ballyshannon Community Hospital in Co. Donegal, which involves the adaptation and extensive new-build extension to the old Sheil Hospital.

New-build settings: The Economic and Social Research Institute (ESRI) projections estimate an increase in bed capacity requirements from 2022 to 2040; with short stay bed requirements increasing from 3,745 to between 6,431 beds (72% increase) and 7,265 beds (94% increase); and long stay bed requirements increasing from 29,579 beds to between 47,588 (61% increase) and 53,266 beds (80% increase) [9]. This represents a major supply challenge over the next 15 years or so, but with this amount of building and infrastructure to be provided, it is imperative that any new settings are carefully located, fully integrated into the community, and well designed.

Existing Settings: According to the 2023 'Overview Report: Monitoring and Regulation of Older Persons Services in 2022' there were 557 private, public, and voluntary nursing homes in Ireland that year. 77% of these settings were operated by private providers, 20% were operated by the HSE, while 3% of settings were delivered by HSE-funded centres [10]. In 2022, 26 settings had 20 beds or less, 151 had between 21 and 40 beds, 319 had between 41 and 99 beds, while 60 settings had 100 or more beds. The largest nursing home at the end of 2022 had 182 beds; the average number of beds per setting was 57.

While some of these settings are recently constructed, many more are older and will require minor adaptations (e.g., specific spaces, or elements in the setting); refurbishment (e.g., refurbishment of individual spaces such as bedrooms or whole-scale/large-scale refurbishment of the entire setting); or major retrofit or adaptation of setting (e.g. reconfiguration of the entire setting, major structural changes, or whole-scale reconstruction). In terms of future projects and existing settings, these current guidelines are designed for both new-build and adaptation or retrofit projects. The users of these guidelines can select appropriate guidance depending on the nature and extent of their project (See the Levels of Design section on page 24).

Pandemic Resilience: Balancing Infection Control with Quality of Life

LTRC settings around the world were hit hard by COVID-19, including Ireland, where 66% of all COVID-19 deaths were related to outbreaks in LTRC during the first waves of the pandemic [11]. While the primary impacts of COVID-19 were illness and death, the secondary impacts of isolation, loneliness, lack of physical activities and social interaction that resulted from infection control measures were also devastating to people living in these settings. Research identifies how the built environment can create or exacerbate the negative impacts of infection-related measures such as quarantine, constrained social interaction, or restricted visiting [12, 13]. These interventions are particularly difficult in terms of cognitive impairment (CI) or a person that walks with purpose, formerly called "wandering" [14].

COVID-19 Nursing Homes Expert Panel Examination of Measures to 2021: Following a recommendation from the National Public Health Emergency Team (NPHET) in 2020, an Expert Panel on Nursing Homes was established to examine the complex issues surrounding the management of COVID-19 in nursing homes. This resulting 'COVID-19 Nursing Homes Expert Panel Examination of Measures to 2021' included a number of built environment related recommendations related to internal circulation and spatial zoning; isolation facilities; social distancing facilities; infrastructural adaptations for visitors; ICT for resident/family communication; and a reconsideration of overall models including a move towards smaller settings.

Information on the COVID-19 Nursing Homes Expert Panel report: https://www.gov.ie/en/publication/3af5a-covid-19-nursing-homes-expert-panel-final-report/

Environmental Challenges: Sustainability, Climate, and Resilience

Energy efficiency, water conservation, waste prevention, and resilience are major issues for LTRC, not just in terms of the huge number of resources these settings use, but also in terms of associated costs, and the impact of environmental challenges on vulnerable older people in LTRC settings.

HSE Green Healthcare programme: While this programme applies to all healthcare buildings, there are certain aspects which are highly relevant for older people and the LTRC sector. For instance, LTRC settings are known to consume large amounts of energy and resources due to the high care needs and intensive environmental conditions required by many residents. In this regard, as part of the 'Green Healthcare' programme [15] guidance for 'Resource Efficiency for Community Nursing Units and Nursing Homes' was published which looked at water and energy conservation, waste prevention, and staff awareness [16].

Information on the HSE Green Healthcare programme: https://greenhealthcare.ie/

HSE Climate Action Strategy 2023 – 2050: This Strategy states that the health sector accounted for approximately 19% of public sector energy use in Ireland in 2019, and sets out targets to achieve net-zero public sector healthcare-related emissions by 2050 and provide healthcare that is environmentally and socially sustainable [17]. The HSE Climate

Action Strategy also identifies 'Adaptation and Resilience' as a priority area. Due to comorbidity and frailty, older people in LTRC are highly vulnerable to climate change. Considering the prevalence of cognitive impairment and disability in LTRC, it is important to note that climate change disproportionately affects people with dementia [18] and disabilities due to impairment, exacerbation of symptoms, difficulties with thermal regulation, and activity limitations [19]. A UK study examining indoor temperatures in care settings during a heatwave recorded daily temperatures >34.3 °C, much higher than the 26 °C threshold suggested by Public Health England [20].

In this context, the HSE Climate Action Strategy emphasises the need to "build resilience into its human resourcing, operations, and critical infrastructure to enable continuance of safe and effective healthcare delivery in the face of a changing climate"[17]. The plan points to ongoing vulnerability assessment of health infrastructure to severe weather (i.e. extreme heat, drought, high winds, extreme precipitation). In this context and, given the vulnerability of LTRC residents to an emergency or natural disaster, issues around climate adaptation and resilience are critical for LTRC design.

Information on the HSE's Climate change and health plan:
https://www.hse.ie/eng/about/who/climate-and-health/

Overall Benefits of Universal Design (UD)

04: Selection of relevant CEUD/NDA guidelines.

The Centre for Excellence in Universal Design (CEUD) at the National Disability Authority (NDA) refers to Universal Design as "the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of age, size, ability or disability". A Universal Design (UD) approach recognises that LTRC settings cater to a wide spectrum of people including residents, staff, visiting health and social care professionals, family members, friends, and various visitors.

Compared to previous decades, in recent years many people entering LTRC settings are at a more advanced age and therefore may experience greater levels of comorbidities, frailty, and cognitive impairment [21, 22]. A study looking at 6 European countries found that the mean age of residents at admission was 83.9 years, median length of stay was 73.4 weeks (just less than 1.5 years), and that 42% of residents died within 1 year of admission [23]. By comparison, the average length of stay in Irish LTRC settings is less than two years; furthermore, data from 9 public LTRC case studies across Dublin, Wicklow, and Meath found that 64% of residents had some form of cognitive impairment, 83% required staff

assistance when dressing, 97% required some form of assistance for bathing and showering, 56% for toileting, and 50% for eating [24]. In terms of cognitive impairment, many argue that there is under-detection; for instance, a Dublin-based study by Cahill et al [11] showed that 89% of residents surveyed were cognitively impaired (42% severely and 27% moderately impaired).

In this context, an inclusive setting must support a diversity of users with varying physical, sensory and cognitive capabilities, needs and preferences. To accommodate these demands, UD LTRC settings will integrate the following at the outset of the design and construction stages:

- Flexibility and ease of adaptability to meet users' changing needs over time in a cost-and-material effective way.
- Sustainable design to improve comfort and energy efficiency, reduce carbon emissions, and enhance resilience.
- Technologies to support health and social care, inclusion, and sustainability in settings.

As described above, UD contributes to sustainability through flexibility and adaptability. In broader terms, UD supports the United Nations (UN) 2030 Agenda for Sustainable Development and many of the associated **Sustainable Development Goals** (SDGs). In the context of LTRC and the built environment, SDG 3 'Ensure healthy lives and promote well-being for all at all ages' and SDG 11 'Sustainable Cities & Communities - Make cities and human settlements inclusive, safe, resilient and sustainable' are particularly relevant. SDG 11 is reinforced by the **UN New Urban Agenda**, which was adopted at the UN Conference on Housing and Sustainable Urban Development (Habitat III) in 2016. The New Urban Agenda sets global standards of achievement in sustainable urban development and rethinks the way we build, manage, and live in cities through cooperation with committed partners, relevant stakeholders, and urban actors at all levels of government as well as civil society and the private sector.

Information on the UN SDGs: https://www.undp.org/sustainable-development-goals
Information on the UN New Urban Agenda: http://habitat3.org/the-new-urban-agenda/

At a European level, the **New European Bauhaus** (NEB) is particularly relevant to UD and LTRC through its three core values of Sustainability, Beauty and Inclusiveness involving 'civil society and people of all ages and in all their diversity". This is reinforced by the NEB working principles which are multi-level from global to local, participatory and transdisciplinary.

Information on the NEB: https://new-european-bauhaus.europa.eu/index_en

UD is not about a 'one-size-fits-all' model – the UD environment enables the widest possible number of people to participate in society and to operate independently. A UD LTRC setting works well for everyone and supports care of a wide range of older people while providing an enabling environment for a diversity of staff, family members and visitors. It is mainstream in aesthetics, not separate or distinct for those with sensory, physical or cognitive difficulties. These current guidelines build on and are part of a suite of documents that include both dwellings and existing LTRC settings. Information on these related guidelines can be found at the links below:

- Improving Quality of Life and Enhancing COVID-19 Infection Control in Existing Residential Care Settings for Older People: https://universaldesign.ie/built-environment/residential-long-term-care-settings-for-older-people
- Universal Design Guidelines for Homes in Ireland: https://universaldesign.ie/built-environment/housing
- Universal Design Guidelines Dementia Friendly Dwellings for People with Dementia, their Families and Carers: https://universaldesign.ie/built-environment/housing

Information on UD in general: https://universaldesign.ie/

UD is a key part of the Overall Framework set out later in these guidelines and more in-depth discussion of UD in the context of LTRC settings is contained in page 18.

Participation and Engagement

05: Daily Clock exercise with residents and family members in Newtownpark House, Blackrock, Co. Dublin. The Daily Clock captures residents, family members, and staff experiences and perceptions of the built environment in LTRC settings.

The design and construction of an LTRC project will typically take place across a number of planning and design stages. This will depend on the nature and complexity of a LTRC project, or whether it is a new-build or a renovation to an existing setting. Moreover, the level of engagement and co-creation will vary greatly between each stage; however, in terms of transparency, collaboration, and trust-building, it is important that these stages are highlighted for stakeholders and that they are informed about the full process.

Participation and engagement is challenging, and older people can oftentimes be excluded from engaging in meaningful ways. In addition, stakeholder engagement is often limited by a number of factors including a limited amount of time to invest, lack of experience and expertise, or a lack of capacity to engage with complex projects. Many LTRC projects will play out over extended periods of time and will involve multiple stages from early project conception to delivery and setting management.

The design process must be led by the client, project owner or the design team leader as they are ultimately responsible for the delivery of the project within a certain timescale,

budget, and in compliance with relevant regulations and standards. However, key stakeholders such as the local community, current or prospective residents, family members, staff, or visiting healthcare professionals, should be encouraged and supported to get involved as early as possible.

Arnstein's ladder of participation, first published in 1969, offers an approach to explore and understand the power dynamics and relationships that underpin stakeholder engagement; furthermore, it positions participation within a spectrum, and advocates for engagement activities that move away from reinforcing tokenistic involvement of key stakeholders in projects that concern and potentially impact them, towards participation espousing a more collaborative and empowering approach that more accurately reflects and takes into account the 'stake' of key groups. The discourse around engagement and participation has certainly evolved since; nevertheless, the ladder can still be an important starting point for considering the degree and scope of participation at community level for a given project.

Each step up the ladder represents a deepening of the engagement and participation process thereby providing space and opportunities for older persons and other relevant stakeholders to shape the direction of and contribute to the project in ways that reflect their lived experiences, preferences and needs. This approach aligns with NEB principles; in particular, the NEB Compass [25] , demonstrates how communities can be involved in projects through three increasing participation ambition levels: (i) to consult, (ii) to co-develop, and (iii) to self-govern. Each NEB ambition strives for deeper, more collaborative forms of engagement.

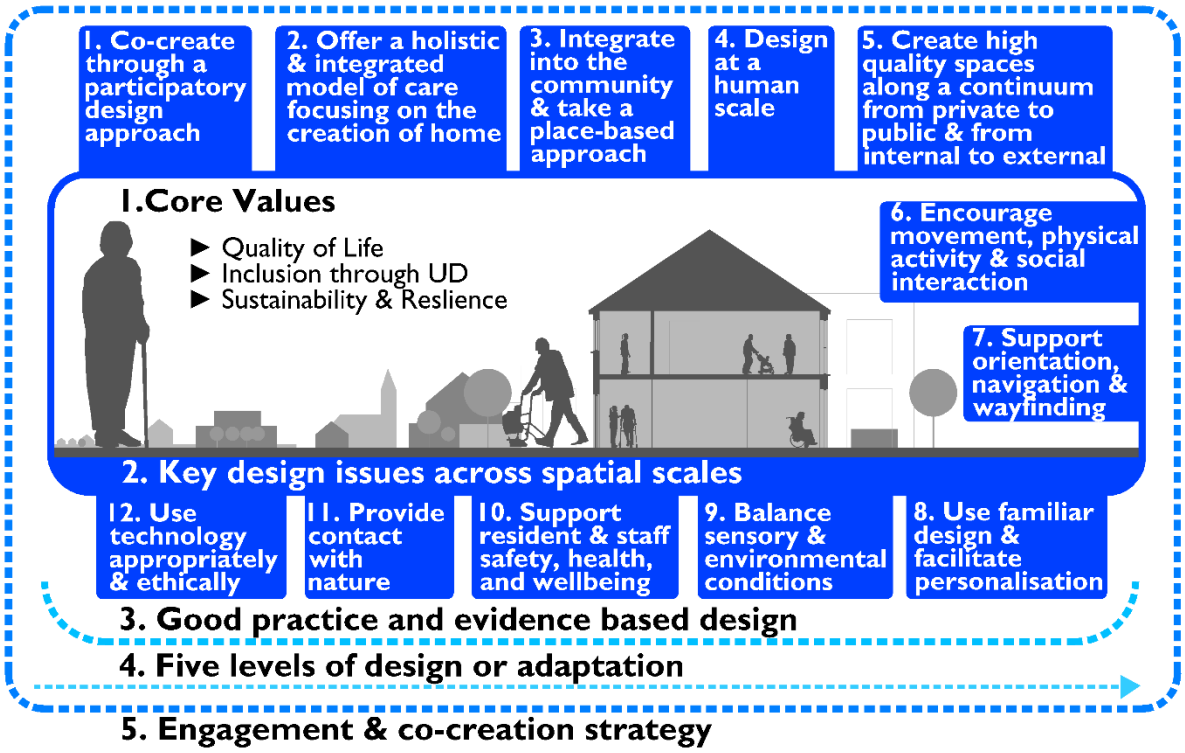
The engagement approach detailed in these guidelines takes this into consideration and is further detailed, starting on page 28.

Overall Planning and Design Framework

Introduction

This section builds on key issues and policy areas outlined in the introduction and sets out an **Overall Planning and Design Framework** to support an integrated approach to LTRC (see Fig. 01). The framework has five main components including:

1. **Core Values:** Quality of life, UD, and sustainability and resilience.
2. **Key Design Issues:** 12 design Issues specific to LTRC.
3. **Learning from Good Practice:** Using case studies and evidence based design.
4. **Levels of Design:** Different levels of design or adaptations for existing and new-build.
5. **Engagement and Co-creation:** Strategy that wraps around all other components.



06: The 5 main components of the Planning and Design Framework.

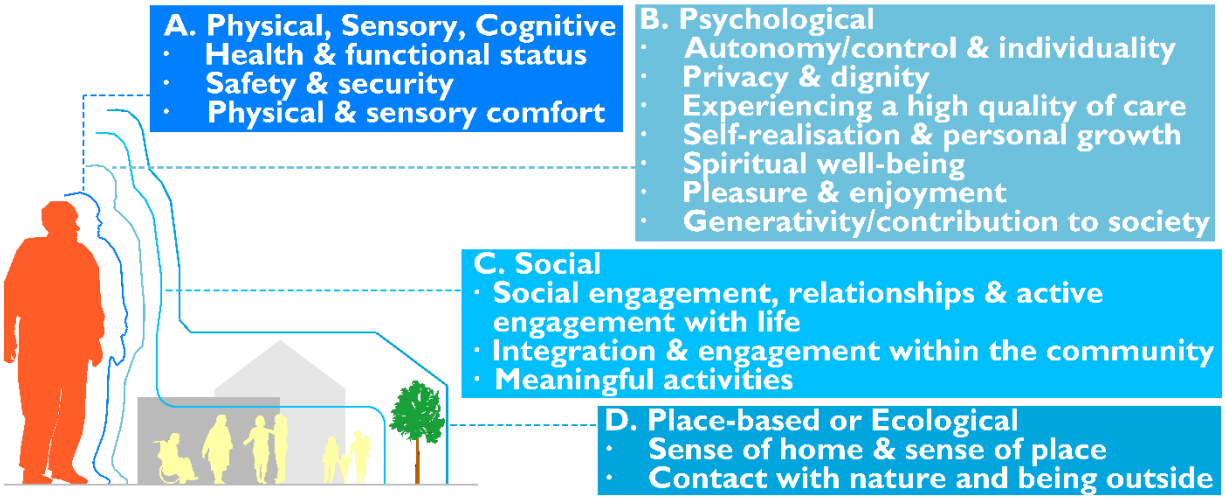
Core Values: Quality of Life, Universal Design and, Sustainability and Resilience

The Core Values of Quality of Life, UD, and Sustainability and Resilience, underpin the LTRC Framework. These core values are informed by evidence-based design, and are applicable across all key spatial scales, from location, to building design, and down to building elements and systems.

Quality of Life

Quality of life and quality of experience

Quality of life for all residents regardless of age, health, or illness is central to LTRC. These guidelines are based on a set of quality of life domains where residents have the support and freedom to live full and meaningful lives. These quality of life domains are broken into four areas with 15 key domains as outlined below in Figure 07.



07: Quality of life sectors and domains.

The first area focuses on physical, sensory, and cognitive issues including health, safety and security, and physical and sensory comfort. The second covers psychological domains that includes things like autonomy, experiencing a high quality of care, and generativity. The third area covers social domains and includes social engagement, integration with the community, and meaningful activities. The final area focusses on place-based concerns such as sense of home and sense of place, as well as ecological issues such as contact with nature.

These domains overlap to form an overall picture of the key issues around quality of life, wellbeing, and thriving for residents. This provides a structure to understand the role of the built environment in supporting quality of life for all residents. In this way, they also align with the NEB concept of '**Quality of experience**' which covers comfort, health, and safety for all users, regardless of age and ability [26].

Quality of life: Location, model of care, size, and configuration

Location: Some older persons advocate groups argue that some LTRC settings are in locations that sever connections between residents and their community, make inward and outward visiting harder, and make it difficult to integrate the setting with the community. "*The current practice of building nursing homes on green field sites outside villages and towns cuts residents off from community life and social interaction, and isolates those residing in them, thereby lessening their quality of life.*" [27].

Andersen et al. [28] argue that the social exclusion experienced by some LTRC residents can be mitigated by improved spatial integration of LTRC settings with the community: "*In this context, nursing home residents should have the possibility to be part of the social life of the cities, communities or neighbourhoods in which they live. Whether or not the nursing home is situated in the same area that the resident has lived in for years, remaining or becoming part of a neighbourhood and local community when moving to a nursing home is of great importance for individuals' quality of life.*" (p. 397 - 398).

In a similar manner, O'Shea and Walsh [29] argue that LTRC should be at the centre of communal activity and welcome people from outside, while Barney [30] goes further and states that direct community involvement and responsibility in the LTRC is important for improving standards. In this regard, a number of HIQA Standards promote community

integration, including Standard 1.3.9 - "Each resident has opportunities for recreation, travel and leisure outside of the designated centre, in line with the resident's will and preferences." While standard 1.4.2 requires that – "*Each resident is facilitated and encouraged to integrate into their community. The residential service is proactive in identifying and facilitating initiatives for participation in the wider community, developing friendships and involvement in local social, educational and professional networks.*" [4].

Moreover, according to Christie [31], a 'sense of connectedness' supports resilience in older people, particularly those living with dementia. This highlights the importance of location and connection to family, not only in terms of social interaction, but also in terms of a resident's resilience and their ability to adapt to adversity.

Model of care: The Teaghlach model and similar smaller and domestic scale settings were discussed earlier. The 'Green House' is another such model, that along with other small nursing home models such as the Teaghlach model, are considered 'non-traditional' due to their size (typically 10 to 12 residents), homely features, and the assignment of 'universal caregivers' to each household. In the 'Green House' model nursing assistants are assigned to the one small setting and have extra duties such as personal care, meal preparation and service, housekeeping, laundry, and other activities. This allows the staff and residents to get to know each other better and reduces the movement of staff in and out of the setting.

These smaller scale, household models have been linked to better resident satisfaction and improved quality of life [32, 33]. For instance, a study compared 15 nursing homes that adopted the Green House model to 223 traditional nursing homes found an improvement in rehospitalizations and certain nursing home quality measures, including a decline in bedfast and catheterised residents, and low risk residents with pressure ulcers [34].

Setting size and configuration: Smaller scale settings may also be perceived as less institutional, more homely in size, are often easier to relate to, and more comfortable in terms of scale [35-38]. However, as discussed previously, an appropriate scale and size may also be achieved by settings that are carefully broken down into smaller distinct units to provide less institutional and more homely environments.

Co-location and mixed-use: While many LTRC settings are standalone facilities, there are examples of settings that are co-located with complementary services, are integrated with other types of facilities, or enable other users to access and share their facilities. In Ireland, this approach is supported by Age Friendly Ireland's 'Pre-planning Guidance for Residential Care Homes' [8], which refers to '*Co-location with other facilities' and argues that "In order to ensure that residential care settings are at a heart of communities, sites should be proximate to existing community services, recreational spaces and other residential options (for example sheltered housing) thereby facilitating interaction with the wider community to the benefit of both residents and wider communities*." (p10).

In the UK there are settings that integrate LTRC with childcare, or various settings in a number of European countries (e.g. France, Switzerland) where LTRC is part of a mixed-use model that may contain intergenerational housing, healthcare, community facilities, or retail [39]. Greater integration of older people in society and intergenerational engagement are the objectives for many of these models. For others, such as the integration of 'Day care Guests' with LTRC as seen in some German settings [40], it is about a more integrative care

approach, but this also has the potential for generating more social interaction for both the residents and the community dwelling day care guests.

Finally, there are initiatives exploring the potential for supported housing and in some cases, LTRC, to act as community hubs and provide integrated social and healthcare facilities for the wider community [41]. It is argued that these models may help provide badly needed community services, while at the same time reduce social isolation in LTRC settings.

Pandemics and infection control: COVID-19 impacts on residents, families, and staff

The introduction discussed the primary impacts (illness and death) and secondary impacts (loneliness, distress, agitation etc) on LTRC sections from COVID-19. It also highlighted how the built environment can precipitate or exacerbate the negative impacts through settings with inadequate floor area, lack of private rooms, insufficient outdoor spaces, or poor ventilation, among other reasons.

According to the US Centre for Disease Control (CDC), respiratory viruses are mainly transmitted through contact, droplets, and airborne routes. Infection control strategies therefore must consider all transmission routes. However, there is good evidence that for COVID-19, contact transmission is generally lower risk and that the **principal modes of transmission involve respiratory droplets and airborne transmission**. [42]. Furthermore, research shows that the risk of transmission is reduced outdoors due to air movement removing and diluting COVID-19 virus particles and environmental conditions such as sunlight that may damage the virus particles and decrease transmission.

Based on these principal modes of transmission, design, retrofit, adaptation, or management measures within settings should primarily concentrate on:

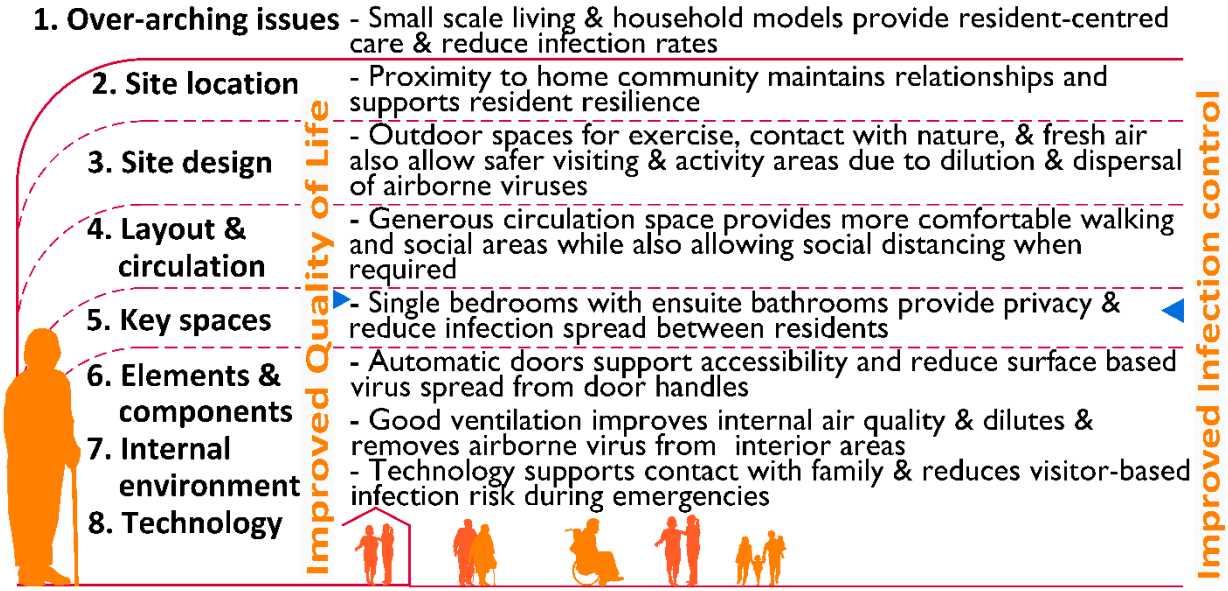
- Zoning or the creation of smaller 'households' with zone or household specific staff to reduce the risk of infection spread. The 'household' approach groups residents into smaller clusters (typically less than 12 people) of single bedrooms gathered around dedicated common areas. These households often have an independent 'front door,' direct access to a garden and are designed to create a homely setting (see section 2.1 for more detail on the household model).
- Circulation strategies and spaces used to reduce occupant density, create more comfortable walking areas, and maximise social distances.
- The provision of single rooms and ensuite bathrooms for protection or isolation.
- Optimising ventilation, providing air filtration, and improving and monitoring air quality.
- Taking advantage of reduced outdoor transmission and the increased use of outdoor spaces.

While these measures support infection control, they can also greatly improve quality of life by supporting a more homely setting; mobility and physical exercise; privacy and dignity; improved air quality; and greater access to the outdoors and nature.

As mentioned earlier, some infection control measures can have secondary impacts and can negatively affect residents, families, and staff. To mitigate these negative impacts, any design, retrofit, or adaptation measures should seek to balance infection control with quality of life through:

- Recognising that these settings are people's homes and that infection control measures cannot dominate the environment in terms of building layout and access, materials and finishes, and overall management of the setting.
- Creating and maintaining safe, attractive, homely, and comfortable interior and exterior spaces for mobility and social interaction with other residents, staff, and visitors.
- Providing and maintaining access to outdoor spaces and to nature for all residents on all floors of the setting.
- Using technology to enhance residents' communication with their family, to avail of telemedicine such as video consultations, or engage with therapeutic activities from listening to music to using augmented reality or virtual reality devices.

These guidelines highlight the role of the built environment in creating a balance between infection control measures and quality of life. In fact, **one of the key messages promoted in these guidelines is that across all key spatial scales there can be convergence between infection control measures and improved quality of life through good design.**



08: Convergence between infection control and improved quality of life.

Inclusion through a Universal Design Approach

Universal Design enabling and empowering a diversity of residents

UD is a "process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation" [43]. This definition brings health, inclusion, and agency into the heart of design and aligns with the quality of life domains described earlier.

UD creates accessible, easily understood, usable, and adaptable environments that support **human performance** and therefore address the **physical, sensory, and cognitive** quality life domains.

UD improves **health and wellness** through safe and comfortable environments, by providing accessible healthy activities, and supporting and empowering engagement and interaction, all of which are vital for the **psychological** aspects of quality of life.

Design for **Social participation** is central to UD and ranges from community integration (avoiding segregation), and access to resources, to the design of spaces that help with interpersonal interaction, thereby greatly supporting the **social** quality of life domains.

Understanding age-related difficulties and dementia

Given the ages, diversity of care needs, and range of health conditions that appear in LTRC, this UD approach is very important as it is likely that many residents will experience:

- Physical frailty
- General mobility difficulties leading to increased risks of falls
- Partial and severe sight loss
- Hearing loss
- Circadian rhythm difficulties resulting in sleep disturbance or disruption.

In relation to cognition, and considering the level of cognitive impairment within LTRC, adopting a dementia inclusive approach is vital. In the context of the physical environment, and in the interest of providing designers with a broad understanding of dementia, the following cognitive impairment symptoms are highlighted:

- **Cognitive impairment**: indicated by problems with memory (amnesia), speech or understanding of language (aphasia), a failure to carry out physical tasks despite having intact motor function (apraxia), and failure to recognise objects or people despite having knowledge of their characteristics (agnosia).
- **Reactive behaviour, formerly described as Behavioural and Psychological Symptoms of Dementia (BPSD)**: cognitive impairment may be accompanied by symptoms such as depression, delusions, hallucinations (visual and auditory) – and behaviours such as wandering, incessant walking or agitation. These are thought to represent responses to altered perception of environments and interactions, or reaction to unarticulated stress, pain, disorientation, or other discomforts.
- **Dysfunction in activities of daily living (ADL)**: In the early stages of dementia these can include difficulties with more complex tasks such as shopping, driving or handling money. In the later stages more basic tasks are affected such as dressing, eating, and bathing.

Supporting staff, family members, and visitors

The LTRC environment also needs to support staff, family members, and visitors as part of an overarching and participatory approach to care. Staff diversity in terms of age, size, physical strength, and other physical, sensory, and cognitive aspects; coupled with the diversity of roles and activities they undertake on a daily basis, means that the physical environment must be adaptable and flexible, and accommodate a wide range of staff characteristics and tasks. Family members and visitors will also present a range of needs, particularly older family members or friends, and these must be supported by the environment.

Universal Design supporting increasing complexity and care needs

Adopting a UD approach acknowledges the diversity of people who live, visit, or work in a LTRC setting, and the spectrum and evolution of needs that these settings must cater for, now and into the future.

Given the increasing complexity and care needs of residents, adequate floor area and overall space is required in terms of assisting residents; and using, manoeuvring and storing large wheelchairs and mobility devices, special furniture, medical equipment, and assistive technology. To enable this degree of care, these guidelines recommend a **UD Home +** level of provision (e.g. wider door openings, larger manoeuvring spaces, or turning circles) throughout the entire building to accommodate residents with a wide range of needs, including people using electric and manual wheelchairs. **UD Home +** is a step up from UD Home requirements, which support some people who use wheeled mobility devices, but do not aim to be fully wheelchair accessible.

For more information on UD Homes and UD Homes + refer to https://universaldesign.ie/built-environment/housing.

These two categories of UD provision will also be included in the forthcoming Irish Standard I.S.375 — Universal Design Dwellings — Requirements and recommendations.

UD and key spatial scales

A UD approach considers the built environment across all key spatial scales. In these guidelines, we adopt the following key principles for LTRC settings in Ireland:

- **Integrated into the neighbourhood** - highlights the relationship with the community and ensures the setting is close to local services and public transport and is well integrated into the community.
- **Easy to approach, enter, and move about in** – provides accessible and comfortable routes when approaching the setting from the community, when entering and moving around on the site, and when entering and exiting the building, including internal circulation within the setting (i.e., doors, corridors, stairs, lifts, and other circulation routes and issues).
- **Easy to understand, use and manage** - covers a wide spectrum of considerations across various scales; from the wider issues around circulation and wayfinding, to more specific issues such as the use of spaces within the setting (bedrooms, living room, etc.), to signage and technology.
- **Flexible, cost effective, safe, and adaptable over time** – ensures a setting is flexible and adaptable in use on a daily basis. This flexibility and adaptability will cater for changing health, social, and environmental circumstances, and help make the setting more economically sustainable over the long-term.

These principles were initially developed for private dwellings but are also appropriate for use in the context of LTRC settings, highlighting that these settings should be, first and foremost, a home.

Sustainability and Resilience

As outlined in the introduction, energy efficiency, water conservation, waste prevention, and resilience are major issues for LTRC because of the resource intense nature of these settings, and the associated environmental and economic costs of operation. In addition, due to the increasing age and care acuity in LTRC, the sensitivity of LTRC residents to environmental and climatic conditions is growing and requires careful consideration in terms of planning and design.

Sustainability and climate change mitigation

In 2019, the health sector in Ireland accounted for approximately 19% of public sector energy use, with LTRC as a major consumer. The guidance provided in 'Climate Action & Sustainability for Community Residential Healthcare' [16] primarily focusses on the operation of existing settings, but the principles also apply to new buildings. The guidance looks at Water Conservation, Waste Prevention, Energy Efficiency, and Other Sustainability Actions (e.g. Sustainable Purchasing, Pollinators, Sustainable Gardens). It recommends that a 'Green Action Plan' should be prepared to support the resourcing and implementation of any sustainability projects. The plan will include the following steps:

1. **Management Commitment:** Owner or management buy-in driven by social and environmental responsibility, cost savings, and legal obligations.
2. **Start a Green Team**: Involving a small group of employees who have influence on resources or have relevant skills, with representatives from care, maintenance, and kitchen staff, along with management. Residents and family members should also be involved (See the Co-creation and Engagement section).
3. **Review and Identify:** This is the assessment phase which helps create a 'baseline' of current resource use, develop internal indicators, compare against national benchmarks, and identify any potential opportunities. For new-build projects this might involve looking at similar existing settings as a proxy or simply using national benchmarks or ratings.
4. **Prepare your Green Action Plan:** From the potential opportunities identified, choose a number of actions to implement, create a timeframe, and assign tasks and responsibilities. Some actions will be more involved and costly than others (see the Levels of Design).
5. **Implement the plan:** Carry out the selected actions in collaboration with staff, management, residents, and family members.
6. **Review Progress:** Monitor progress, review what has worked and what has not, and feed this into future actions. Keep all stakeholders informed. For new-build projects this will apply to the design process, and ideally again once the setting is built and up and running.

Information on the Climate Action & Sustainability for Community Residential Healthcare: https://greenhealthcare.ie/wp-content/uploads/2023/08/Community-Hospitals-Booklet-2023.pdf

Climate change, adaptation and resilience

With vulnerable groups living in LTRC, and climate-related events becoming more frequent, planning and designing for climate adaptation and resilience is essential. According to Bene [44] resilience is much more than 'bouncing back' and instead has three dimensions: absorptive capacity, adaptive capacity and transformative capacity. Absorbing a shock is

about surviving and persisting, adaptation capacity is about responding through incremental adjustments, while transformative capacity involves altering the individual or community's primary structures and functions, including shifts in the very nature of the system. Some key building-related resilience issues include:

- **Avoiding Excessive Heat and Cold:** The EU Level(s) Indicator 4.2 [45] measures this by the percentage of the time out of range of defined maximum and minimum temperatures during the heating and cooling seasons. The NEB [46] evaluates the performance of the built environment through 1)Thermal performance of the building envelope, 2) Thermal zoning, 3) Radiant thermal comfort, 4) Humidity control, 5) Enhanced operable windows, and finally, 6) Outdoor thermal comfort.

- **Indoor air quality:** The NEB [46] rates indoor air quality through concentration limits of indoor CO2; Air pollutant concentration levels; and Ventilation rate.

- **Natural disasters and emergencies:** The NEB [46] breaks resilience into two parts including 'Hazard resilient design' and 'Consequence mitigation'.

  Hazard resilient design (i.e. building design to avoid or minimise impact) includes a range of measures including:
  - wind resisting design
  - flood resilience design
  - compliance with the national fire safety standards (and higher levels of safety provision required).

  Consequence mitigation (i.e. response in terms of survivability, response, and recovery) is independent of hazard type as the measures and metrics are relevant to all hazards. Some key measures are outlined below:
  - Staff & users have access to a warning system for relevant hazards
  - Emergency response plan in place that accounts for the characteristics of different hazards
  - Emergency training is provided to staff and regular evacuation drills are conducted to test emergency operation procedures
  - Fire and emergency alarm systems are regularly checked
  - Automatic shut-down systems in place for utilities/facilities mitigating the risk of cascading hazards (e.g. fire following storm)
  - Emergency lighting is available along escape/evacuation routes.

- **Maintaining a continuity of power:** In some jurisdictions around the world, it is mandatory to have a back-up power supply in residential settings for older people. In Ireland many LTRC settings will have a 'standby generator' that can be used for emergency power generation in the event of the loss of mains electricity supply due to: a planned electricity interruption by ESB Networks; a fault on the electricity network; a storm or third party damage to the electricity network [47].

- **General adaptability:** The fourth overall UD principle discussed earlier includes flexibility and adaptability. In a similar manner, the Level(s) indicator 2.3: Design for adaptability and renovation describes a building design that facilitates change to internal space distribution, buildings servicing, façade and structure, and to access requirements (e.g. ease of access to each residential unit) [45]. While these features will help cater to the changing needs of residents, they will also enhance the adaptive and transformative capacity required for real resilience.

Key Design Issues

This section sets out **12 LTRC specific Key Design Issues** drawn from the literature and stakeholder engagement. These design issues are also informed by and will support many of the National Standards for Residential Care Settings for Older People in Ireland [4]. Due to the high prevalence of dementia in LTRC, they refer to the principles contained in the Dignity Environmental Assessment Tool (Dignity-EAT) [48] and the features outlined by the HIQA Guidance on Dementia Care for Designated Centres for Older People [4]. With all this in mind, a people-centred and integrated approach to planning and design in LTRC will:

1. **Co-create through a participatory design approach:** Involve management, staff, residents, and family members in the design process to help create high quality, inclusive, sustainable, and place-based settings (This is expanded on in the Engagement and Co-creation section).
2. **Offer a holistic and integrated model of care which focusses on the creation of a home:** Care models such as the 'household' model or the 'Teaghlach' model seek to create smaller and more domestic scale settings that are person-centred, and that better resemble an older person's home life rather than an institution. This includes opportunities to get involved in (or at least experience the sights and sounds of domestic life such as normal daily activities (e.g., cooking or doing the laundry).
3. **Integrate into the community and take a place-based approach:** LTRC should be seen as part of the ageing in place continuum that involves standard dwellings, supported housing, and also LTRC settings. Locating settings close to residential areas, services, amenities, and public transport provide ease of access, and helps stitch LTRC into the community. In this regard, and where appropriate, LTRC can be part of a mixed-use development or can be co-located with other healthcare or community services, or alongside supported or multigenerational housing.

   Community integration supports and is strengthened by a place-based approach[2] to care, where an LTRC setting can become part of a community-led collaboration within a certain area that draws on local networks, assets, knowledge.
4. **Design at a human scale:** The setting size, scale, configuration and number of residents are important in terms of quality of life and infection control. The 'household' or the 'Teaghlach' model discussed above is part of this human scale approach. In many cases this can be achieved in a larger care centre by breaking up the setting into smaller households. However, the overall size should still be carefully considered to maintain an appropriate scale, avoid 'institutional creep', and allow settings to be well located and integrated into their community.
5. **Provide high quality external and internal spaces along a continuum from private to public**: A setting should contain a diversity of private, semi-private, and more public spaces to support a range of activities, social interaction, and needs. Given the increasing complexity and care requirements of residents, adequate floor area and

[2] In terms of health "Place-based approaches are collaborative, community-led and long-term approaches to building healthy, thriving communities in a defined geographic location. They recognize that coordinated action is required to enable systemic change, by bringing together community, government, private sector and academia to help address the root causes of disadvantage and simultaneously address multiple challenges. Approaches often have an anchor institution, a place-based entity rooted in the community and a backbone organization serving as a trusted third party convener." Place-based approaches also apply to planning and design where they refer to a community based approach within a certain area, including an understanding of context, sense-of place, vernacular design, local traditional knowledge, and other local and place-based factors.

storage is vital in terms of larger wheelchairs and mobility devices, furniture, care assistance, and appropriate technological supports. High quality internal and external environmental conditions are also critical.

This is also about providing easy access to high quality, safe and accessible outdoor space as part of a continuum that includes edge spaces, covered outdoor spaces adjacent to external walls, and external shelters or garden rooms.

6. **Encourage movement, physical exercise, activities of daily living, and social interaction:** Resident sedentary behaviour and physical inactivity are key concerns in LTRC and therefore the design of settings should encourage physical movement and activities of daily living (ADLs). It should also enable different levels of social interaction, from being alone, or with a small group, up to larger communal events or activities.
7. **Support orientation, navigation, wayfinding:** Many older people will have sensory issues, while a person with dementia will often experience difficulties in terms of orientation (spatial and temporal) and navigation. Therefore, the overall layout and building form, fittings and finishes, and technology should be carefully considered in terms of supporting legibility, orientation, navigation and wayfinding.
8. **Use familiar design and facilitate personalisation**: A person with dementia may have difficulties learning how to use or interact with unfamiliar or new types of objects or equipment. This can be disorientating and negatively impact on continuity of self. Familiar design with recognisable features that are consistent with user expectations will help avoid this issue.

   Personalisation of key individual spaces such as bedrooms help provide a more familiar environment and supports continuity of self.
9. **Provide balanced sensory & environmental conditions:** Excessive noise, heat, or light can be very challenging for many older people and especially for a person with dementia. In this regard calm and comfortable environmental conditions are essential. At the same time, positive sensory stimuli such as music, artwork, nature, and normal domestic sounds can provide a calming effect and support meaningful activity, orientation and wayfinding in a setting.
10. **Support resident and staff safety, health, and wellbeing**: LTRC residents are vulnerable to accidents such as falls, disruptive events, extreme weather conditions, and pathogens (i.e. COVID or flu virus). However, maintaining a good balance between activity and positive risk, and safety and health is vital. For instance, promoting physical movement while also providing handrails, or designing for enhanced infection control while also maintaining quality of life.
11. **Provide contact with nature:** Contact with nature is important for everyone, but research shows the added value it has for many older persons who may spend a lot of time inside. Contact with nature can vary from being outside, views to the outside, interacting with pets or other animals, or caring for plants.
12. **Use technology appropriately and ethically**: Technology is important in terms of resident safety, health, communication, therapy, and entertainment, but it must be deployed with great care to ensure it is ethical, appropriate, and unobtrusive.

Learning from good practice

The value of case studies within research and practice has been argued by many [49, 50], particularly in the context of architectural research [51]. A major part of the research that underpins these guidelines is based on Irish and international case studies. These were used as part of a contextual and place-based identification and investigation of good practice. A set of 11 Irish-based case studies underpin these guidelines and appear throughout as a way to illustrate good practice and associated design features.

In addition, 8 desk based case studies were conducted using the 12 key design issues as an analytical framework. The case studies were also analysed using five measures including:

1. Ratio of the perimeter of the building envelope to the building footprint (longer perimeter relative to the floor area indicating greater opportunities for visual connections to the external environment, natural light and ventilation)
2. Overall building grossing factor
3. Ratio of double to single loaded corridors
4. Green space per resident
5. Gross internal area per resident.

The desk based case studies are included in Appendix B along with the analysis methodology.

Five levels of design, interventions, or adaptations

These guidelines are applicable to both new build and existing settings. In this regard, we have identified five different levels of design and intervention that can be applied as part of a UD approach. These different levels allow the user of these design guidelines to choose one or all of the design levels depending on the needs and constraints of the project; whether it is a new build or an existing building, available budget, or other such determining factors.

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

The five design levels which are shown in Figure 09 are as follows:

1. Labelling, signage, painting, artwork or planting:

This level of intervention provides immediate assistance and benefit to those using the setting by improving information, softening the institutional environment and helping to make the buildings simpler and more intuitive. These can be low disturbance, low cost solutions and can be considered in all scenarios, whether this involves a retrofit, or a new build project.

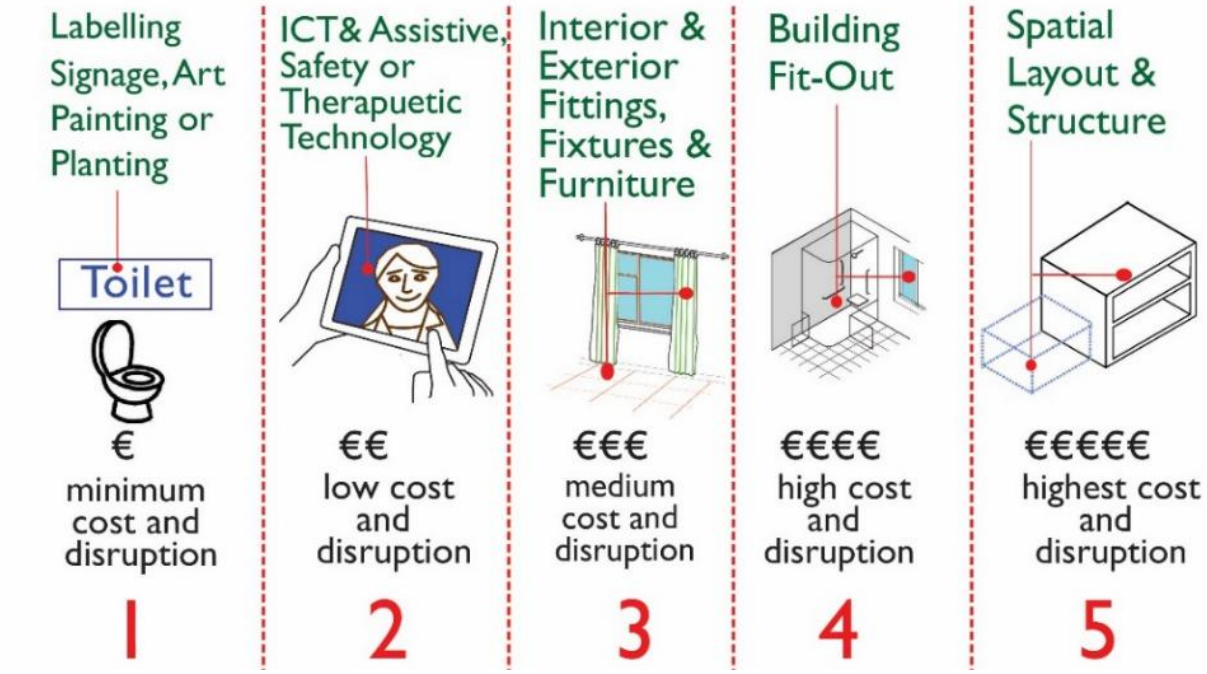
2. Assistive Technology, Ambient Assisted Living, Telecare, or Telehealth:

The use of technology plays an important role in the care process while also providing residents with communication and entertainment technology. Given the variety of technology available, including wireless, this could represent a low disruption option.

3. Interior and exterior furniture, fixtures and fittings (F, F&F):
This could involve replacing internal floor finishes, upgrading bathroom fittings, or providing new furniture. This level will allow UD to inform ongoing upgrades/maintenance and replacement programmes.

4. Building fit-out including external windows and doors:
This level of intervention may involve fitting new windows to increase thermal or acoustic performance, or the fitting of a level access shower. It may also involve minor internal works such as fitting new doors or widening door openings. This level will allow UD to inform fit-outs whether generated by the need to accommodate specific resident needs or as part of general building upgrades/maintenance and refurbishment i.e. fabric, services or upgrades to meet statutory regulations.

5. New Buildings and spatial/structural changes to existing building:
This applies to all new build or projects with major renovations. It involves spatial considerations such as room location, orientation or size, along with all associated structure and design elements such as windows, doors, etc. This level will allow UD to inform works including the building's spatial arrangement to provide the optimum layout for residents with dementia.



09: Five levels of design.

These five levels of design have been identified to outline how the guidelines are:

- Applicable to both new and existing buildings.
- Applicable across all spatial scales of a setting, from site design, to building components.
- Usable across a wide spectrum of issues; from minor low-cost adaptations to major works involving structural adaptations or new build.
- Usable by various stakeholders, whether this is a staff member who wants to implement minor changes, or the design team involved in new-build or refurbishment.

The reader should consider these design levels as part of the design process to help inform the decision-making process in line with resident needs and construction budget. It should also be noted that if a setting is sub-divided or the layout is reconfigured, there may be implications for staffing and overall management.

Engagement and co-creation with key stakeholders

Whether planning and designing new buildings or making changes to the built environment in existing LTRC settings, remember that UD is an inclusive, stakeholder-driven, people-centred approach. As such, it is important to engage with key stakeholders, whether they be residents, staff, family members, and/or visitors to ensure that the adaptation or retrofit of existing LTRC settings is in line with and reflects the needs of the individuals. All key stakeholders should be invited and supported to contribute in a meaningful way to ensure that their needs and preferences are incorporated into the design – whether it be a minor adaptation, a full-scale refurbishment, or a major retrofit of a LTRC setting.

As detailed in the introduction, and in line with the UD approach, engagement and co-creation with key stakeholders can be framed around the following kinds of engagement:

- **Informing:** sharing information on the overall project activities with the key stakeholders, and the broader community.
- **Consulting:** inviting stakeholders to share their concerns and reflections on the project, and integrating stakeholder and community input from engagement activities, into the design process.
- **Collaborating**: bringing in stakeholders as peers in the design process.
- **Empowering**: owning the project from the very start and having the decision-making power throughout the planning and design process, to ensure activities and solutions fully consider and reflect needs and experiences of stakeholders impacted by the project.

The guidelines have been developed in recognition of the diversity of people in LTRC settings – whether they be a resident, staff member, family member or visitor – and they have been framed by a UD approach to provide a more inclusive setting for a wide range of users.

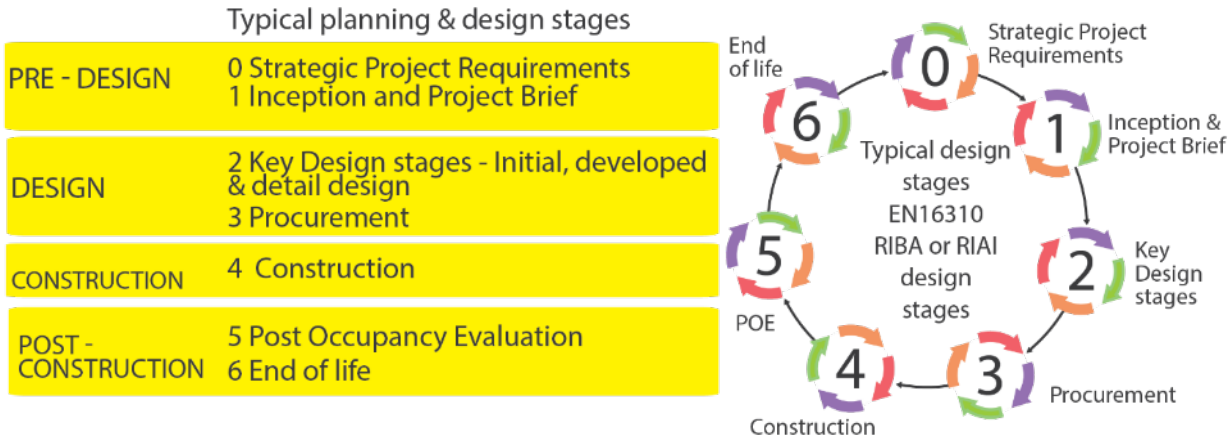
Acknowledging the complexity of LTRC planning, design, and delivery, a co-creation and engagement strategy has been developed. The strategy consists of three key aspects as follows:

- **An overall planning and design stage cycle that can guide the engagement and co-creation at various stages of a project** (i.e., from inception to the very end of the project, or at any stage during the project timeframe).
- **A four-step process for all or any one stage in the overall design process** that enables the design team to work with stakeholders to: plan and agree key objectives and activities at each stage (Plan & agree); conduct the activities and record outputs (Do and Record); provide feedback and reflect on key learnings (Feedback and Reflect); and agree/approve key deliverables at this stage and pass them on to the next stage (Validate and Transfer).
- **A toolkit with a suite of tried and tested tools and processes** that can be drawn upon to support the design process and the ability to co-create or adapt novel or context-specific co-creation tools as required.

Planning and design stage cycle

As outlined previously, the design and construction of an LTRC project will typically take place across a number of planning and design stages. This will depend on the nature and complexity of a LTRC project, or whether it is a new-build or a renovation to an existing setting. Moreover, the level of engagement and co-creation will vary greatly between each stage. For the sake of transparency and collaboration, it is important that these stages are highlighted for stakeholders and that they are informed about the full process.

The Architects Council of Europe describes four typical overall project stages that include **Pre-design**, **Design**, **Construction**, and **Post-construction**. There are a number of more detailed work stages within these overall stages that vary in description depending on various disciplines and organisations involved (i.e. RIAI, RIBA, etc), but these generally equate to the following: Predesign – 0) Strategic project requirements (decision to proceed or not); 1) Inception; Design – 2) Design stages (Initial design, developed design, detail design), 3) Procurement, 4) Construction, 5) Building use, 6) End-of life – retrofit or demolition. These are illustrated in Figure 10**.**



10: Typical Planning and Design Stages (0-6)

Four-step process

A four-step process and related canvas (Appendix C) has been created that can be used for all or any one stage in the overall design process that supports the design team to work with stakeholders. This process draws primarily on the RIBA Engagement Overlay, as well as the RIBA Inclusive Design Overlay (see Appendix C for links), both of which are designed to be used with the RIBA work stages, as mentioned above. This process involves the following steps:

4 -Step Engagement & co-creation process

A ▶ Plan & Agree				B ▶ Do & Record	C ▶ Feedback / reflect	D ▶ Validate/ transfer
Project team	Stake-holders	Engagement approach & inclusion plan	Co-design activities	Conduct activities & record results	Produce deliverable	Validate & transfer to next stage
					High-level learning	High-level learning transferred

11: Four-step process to support engagement across planning and design stages.

Each step is described below:

Step A: Plan and Agree

This step involves a number of activities that are aimed at setting the foundation for delivering the engagement activities (Step B). The activities are as follows:

A-1) Establishing the Core Design team: At the very beginning of the process (i.e. pre-design, stages 0 and 1) the design team is brought together. Bringing the team together may involve identifying a core design team that will be part of the overall project from the very start (Stage 0) all the way to the very end (Stage 6); in addition to the core design team, more members can be drawn in, and/or the composition of the team may vary according to the different design stages. For example, for an LTRC project it may be important to consider what healthcare or clinical expertise could be brought into the team to ensure that all key age-related issues are being addressed, at both pre-design and subsequent design stages as required.

A-2) Identifying and selecting stakeholder groups: This aspect involves completing a wider stakeholder mapping exercise to identify all the potential stakeholders that may be impacted by the project. Mapping the broader stakeholder ecosystem may also involve an initial exploration of how different stakeholders might potentially influence and/or be influenced by the project. Understanding the possible power dynamics and inter-relationships between different stakeholder groups can be used to inform the level of participation to be applied at each stage and frame the types of engagement activities to be selected and implemented across the various stages of design.

In-line with the mapping of stakeholders, one of the outputs from this sub-step involves identifying and selecting key stakeholders and creating a project stakeholder group (PSG) to work with the core design team across the next steps in the process. The PSG can support the core design team in identifying the levels and overall ambitions of engagement specific to each stage in the design process.

A-3) Engagement approach and inclusion plan: As outlined in the introduction, Arnstein's ladder of participation offers ways to frame the degree and scope of participation at community level for a given project. This in turn, is useful for understanding how public participation and citizen engagement work across the various planning and design stages; furthermore, building on the stakeholder mapping exercise (A-2) it can provide further insights into how power can be distributed between participants (i.e. who holds power) and how to work to distribute and share power in a more fair and equitable manner.

It is important at the very onset of the project (Stage 0) to **agree on the expected outcomes of participation and engagement,** as these will not only shape the level of participation to aim for, but also, help **to inform the initial engagement strategy, and inclusion plan**. These initial plans will provide guidance and support the core design team in considering **which stakeholders to involve, at what stage, and for how long**. In particular, the inclusion plan will also provide guidance on how best to target and engage key vulnerable and commonly excluded stakeholders (identified during the stakeholder mapping process) at each stage. Finally, an initial communication plan should be developed to enable the core design team (and PSG, as required) to communicate information, share

progress, manage expectations, and provide details on outputs and outcomes from each of the design stages.

The RIBA engagement overlay, as well as the New European Bauhaus (NEB) Compass are two key resources (see Appendix C for full list and links) that provide additional guidance related to facilitating meaningful engagement with community stakeholders. For example, the RIBA Engagement Overlay suggests reviewing the purpose, aims and objectives of the engagement strategy, as well as determining measures of its success. The NEB has developed an impact assessment that includes specific indicators for participation that can be used to measure the overall impact of the engagement approaches undertaken with community stakeholders.

Whatever the approach, it is critical that all parties have a clear understanding of expectations; engagement involves significant resources – both in terms of time commitment, and finances – to be undertaken effectively. Investing efforts to outline the overall approach will create a solid foundation for the next sub-step, which involves agreeing on the detailed engagement / co-creation activities to be selected and applied.

A-4) Detailed co-creation activities: This sub-step involves the selection of engagement activities to be delivered with the community stakeholders. Once selected, these activities will be agreed upon by the client, core design team, and the PSG. This agreement should involve detailed protocols for running the engagement activities with community stakeholder groups. As part of the overall co-creation strategy, a toolkit has been developed, with an initial set of co-creation and engagement activities. The toolkit is available from the TrinityHaus website.

Step B – Do and Record

Step B draws on all of the materials and outputs prepared in Step A to operationalize the delivery of the selected engagement activities, and record outputs. In addition to the material prepared in Step A, Step B will also take into consideration all the additional outputs prepared for that specific stage (as part of the overall planning and design process). In addition, depending on the level of participation the core design time (in collaboration with the PSG) may also decide to review and incorporate additional elements of the RIBA Engagement Overlay.

Based on the final agreed upon engagement strategy, and selected activities, protocols are developed, providing a step-by-step guide for implementing the activities.

Step C - Feedback and Reflect

Following the completion of all activities and the recording of outputs, Step C involves a set of reflections and feedback loops, across the following elements:

- **Design-Stage Outputs:** engagement outputs are fed back into key design stage outputs; for example, community inputs should be integrated into the business case study, or the feasibility study, among others to ensure community needs and impacts are adequately reflected and considered as part of the current and subsequent planning and design stages.

- **Process-related outputs specific to Engagement Approach**: at the end of the engagement activities, it is important to reflect on the overall process and consider what worked well, what didn't, what could be improved, and to feed that into an exercise intended to update the overall engagement strategy, inclusion plan, and communication plan as required, for future engagement activities. As part of this exercise, the core design team (and PSG) should undertake an assessment, linked with the measures for success identified in Step B, and aligned with the NEB assessment (participation indicators) to capture key learnings to facilitate revision of the engagement strategy (as well as inclusion and communication plans as required) in advance of the next design stage.

A key output from this step is a set of key deliverables (draft) to be validated and transferred to the next design stage, as part of Step D.

Step D – Validate and Transfer

The final step in this process involves bringing together the core design team, PSG to agree and approve the key deliverables that have been produced as part of the given design stage, and to pass these deliverables onto the next stage. As part of this process, high level learnings are also transferred, and are applied to inform the level participation, as well as revise the engagement/co-creation strategy, inclusion plan, and communication plan, as appropriate.

Co-creation toolkit

Throughout this process the design team and stakeholders can draw from an Engagement and Co-creation toolkit containing a suite of tried and tested tools and processes. These can be used to inform stakeholders and support the design process. Overarching elements of these co-creation and engagement activities include:

- **The centring of lived experiences of residents, family members and staff in LTRCs**, to underpin a person-centred approach, to ensure outputs reflect needs and preferences of key stakeholders impacted by the planning and design of LTRCs.
- **Specific to LTRC projects, community engagement outputs related to the values that frame the design, construction and maintenance of LTRC settings** (i.e. UD, Resilience, Quality of Life) as well Key Design Considerations overall, should be integrated to ensure person-centred approach, across the design stages.
- **The use of methods as part of a place-based approach to interrogate the built environment across various spatial scales**: Location and Connection to Community/Integration within the Neighbourhood; Spatial Design; Design Layout and Circulation; Key Internal and Outdoor Spaces; Furniture, Fittings; and, Thermal Comfort.
- **The application of arts-based methodologies as part of a broader consideration of connection and attachment to place and the meaning home**, for people living in LTRCs.

In Summary

A key part of the engagement/co-creation process is to provide the scaffolding to ensure a balanced approach between support and informed, independent input or feedback. With this in mind, it is important to design flexibility into the overall process; this means the overall

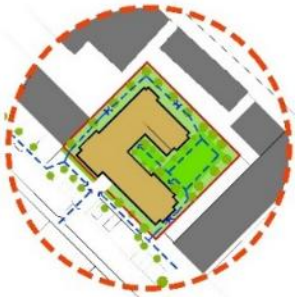
approach and associated engagement activities should reflect and, where possible adapt to peoples' needs and available resources (i.e. time to invest). For example, the engagement/co-creation process should include 'soft' entry and exit points into and out of the design process. In this way, the core design team and PSG will better facilitate the involvement of the right stakeholders, at the right time, and for the right length of time.

Mechanisms should be in place to maintain a degree of continuity to ensure that individuals who join at a later project design stage in the overall process are aware of the key outputs to date. The communication strategy will play a critical role in this and should be reviewed and updated at the beginning and end of each design stage, highlighting the key communication points for both the general community and engaged stakeholders.

Guidelines at a glance: Key Design Issues

These guidelines examine settings at four key spatial scales, ranging from the broad scale issue of location down to smaller scale issues such as building fit-out or materials. These spatial scales are outlined below along with some key design issues that should be considered at each spatial scale.

1. Site location and site design

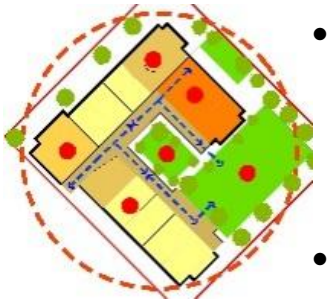


- **Locate settings centrally within the community:** This will enable people to continue to age in place, facilitate greater engagement and connection with the community, and provide access to local services, public transport, and day-to-day activities.
- **Site design and boundaries that create interactions and engagement with community:** Onsite spaces and boundaries that create visual connections and engagement between the setting and the local context.
- **Site layout and circulation:** High quality landscaping and accessible and attractive walking routes and outdoor seating areas throughout the site to support both socialisation and solitude, and contact with nature.

2. Overall building layout and circulation

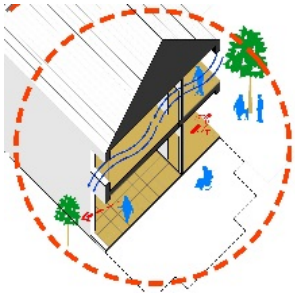
- **Overall scale and configuration:** Settings designed at a human-scale with a well-articulated overall form to minimise the institutional appearance and create distinct and easily recognisable spaces.
- **Households:** Setting broken down into households with dedicated entrance, living areas, kitchen, and outdoor space.
- **Circulation:** Wide, spacious, well-ventilated corridors with views to the exterior (avoid double-loaded corridors) to improve access, health, and quality of life. Treat circulation spaces as important social and common areas within the setting.
- **Building form providing outdoor space on upper floors:** Multi-storey settings can have many advantages, especially in urban areas, but it is essential that all floors have access to meaningful outdoor space. This can take the form of roof terraces, balconies, or deck access.

3. Key internal and external spaces

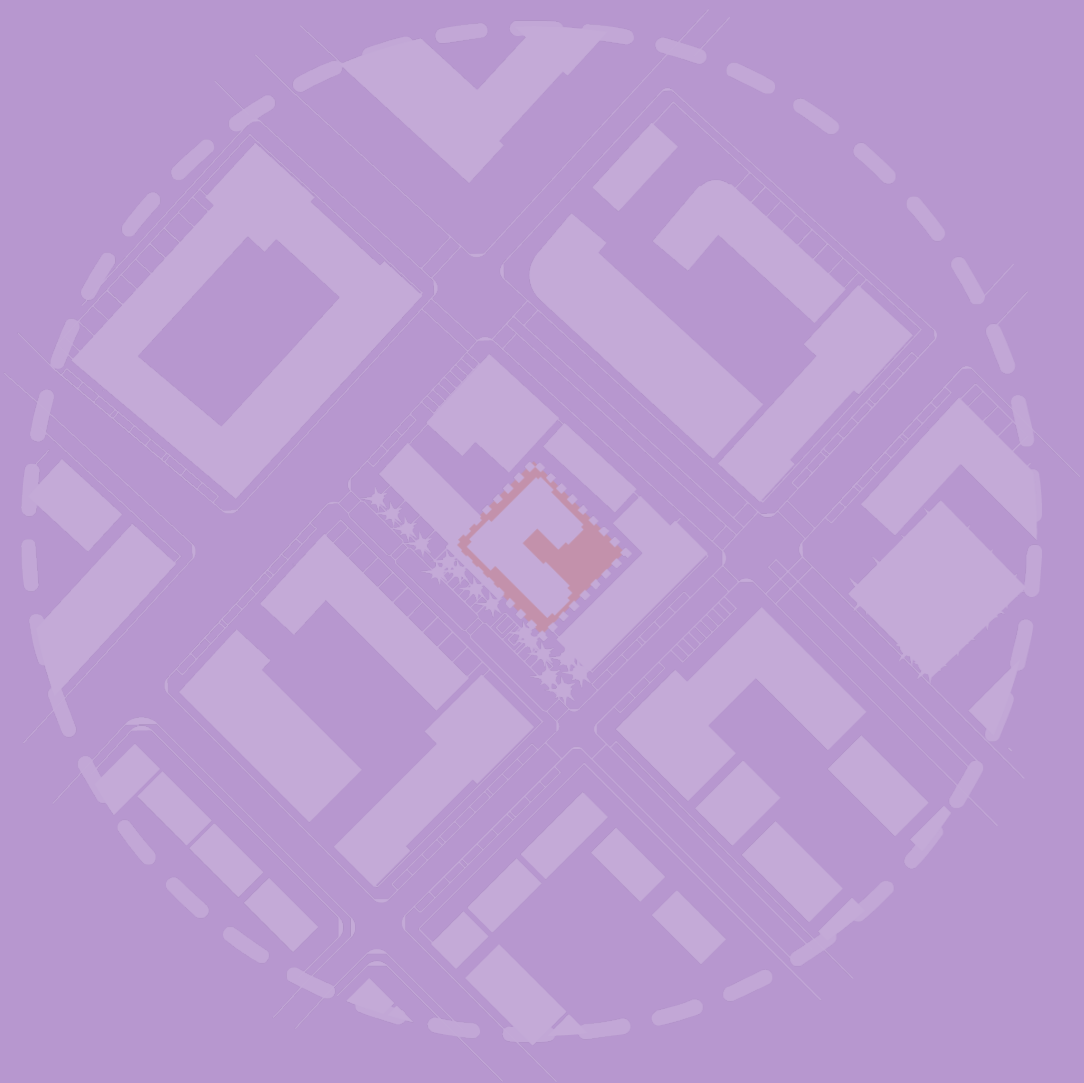


- **A range of high quality private and social spaces**: High quality spaces along a continuum from privacy to social interaction. Include a diversity of spaces with sufficient floor area, good views, and high quality environmental conditions such as heating, cooling, air quality, and natural and artificial light.
- **Homely living, kitchen, and dining areas as part of a household model**: Small-scale, homely living areas with adjacent domestic scale kitchen and dining spaces centrally located as part of a household. Where possible, these central social areas should link directly to an accessible, safe, and comfortable outdoor space.
- **Private bedrooms and ensuite bathrooms:** Spacious single rooms and private bathrooms. Ideally bedrooms should have direct access to an outdoor space.
- **Staff facilities:** Comfortable and accessible staff rooms, changing areas, and storage space.
- **High quality outdoor spaces threaded through the setting:** Accessible, comfortable, and attractive outdoor spaces throughout all floors including gardens, courtyards, roof terraces, balconies, and access decks. Where possible and appropriate, provide covered outdoor areas in the form of verandas, porches, or roof canopies.

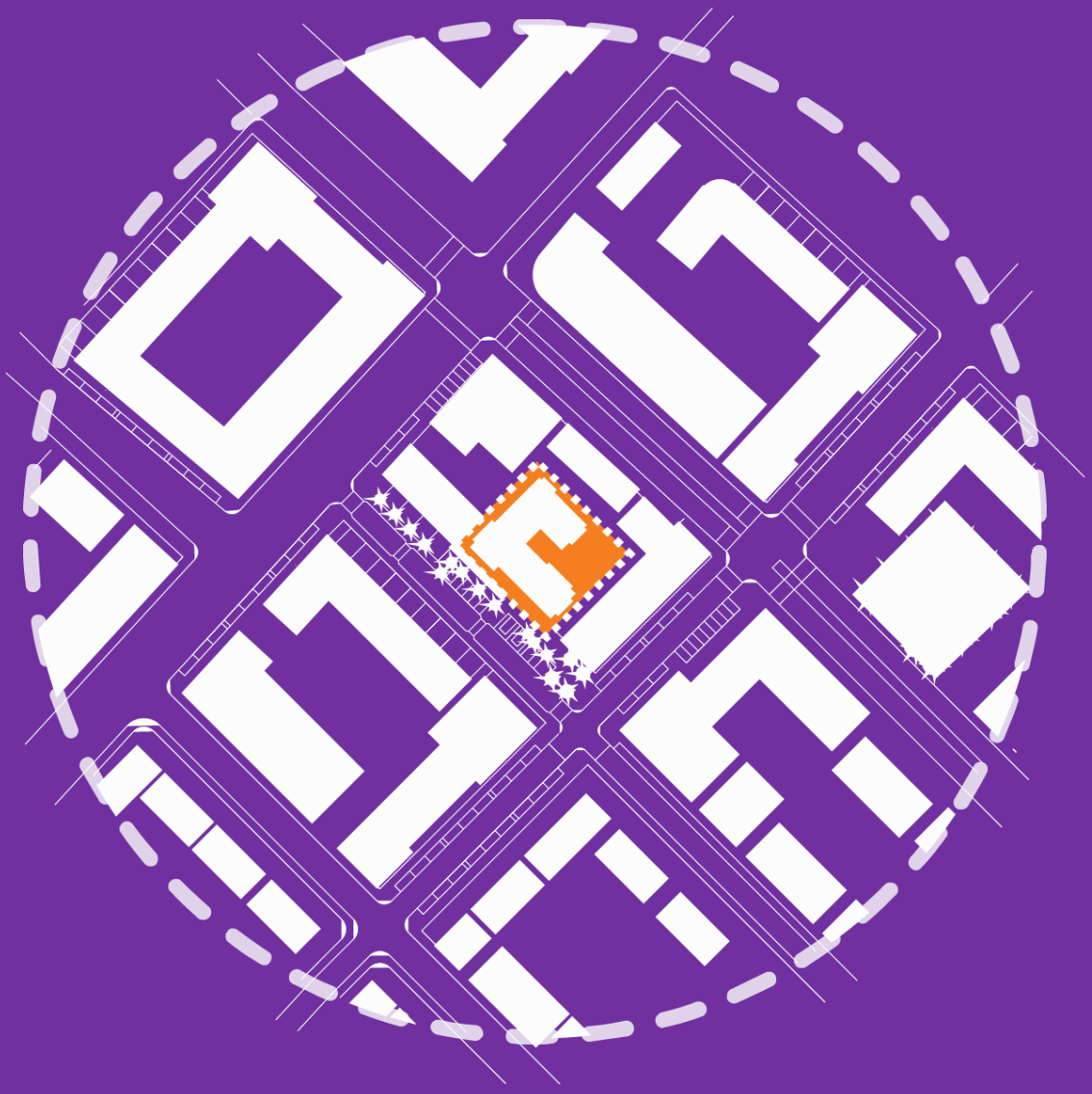
4. Elements and systems



- **Homely and domestic finishes and materials:** A balance between homely qualities and accessibility, safety, and infection control in terms of wall and floor finishes, ironmongery, and furnishings.
- **Air quality and ventilation**: Throughout all internal spaces, maximise natural and mechanical ventilation to maintain air-quality and dilute and flush out any airborne viruses. When required, use HEPA filters to clean the air, and use air quality monitors to check air quality on a regular basis.
- **Thermal comfort**: A balanced internal environment that avoids excessive cold or summer overheating, especially in the context of climate change.
- **Technology:** Optimise technology to enhance resident communication with families, avail of telemedicine such as video consultations, or use devices for therapeutic activities or social interests/hobbies.



01 Site Location and Site Design

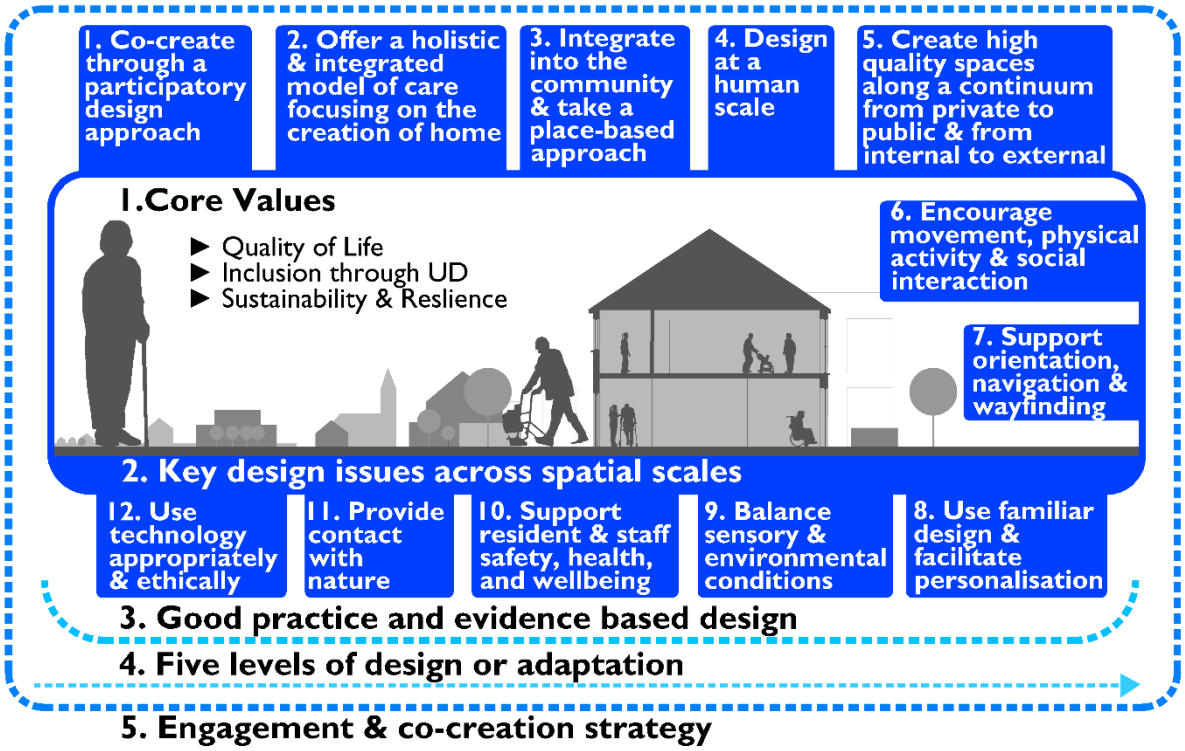


01: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Site Location and Site Design: Overall Design Issues

Where a LTRC setting is located in the community, how it is embedded in the community or connected to local services and amenities, the kind of site access and boundary treatment, and the overall site layout and associated open space and landscaping, are all critical to planning and design for quality of life, inclusion, and sustainability.

In this context, consider how the Overall Planning and Design Framework can be used to address key Site Location and Site Design challenges and opportunities. Think about: how the **Core Values** (quality of life, UD, and sustainability and resilience) and **Key Design Issues** (see more on this below) can be used to inform decisions around the site location and site design; what **Good Practice** or case studies can be referred to; how the **Levels of Design** can be incorporated into the site design of either new-build or adaptations to existing settings; and, finally, how the **Engagement and Co-creation** strategy can be used to include key stakeholders in the decision-making process at this spatial scale.



Considering how the **12 Key Design Issues** may relate to the different spatial scales, it is important to think about these issues in the context of site location and the site design:

1. **Co-create through a participatory design approach:** Have the relevant key stakeholders been involved in the location choice and the overall site layout?
2. **Offer a holistic and integrated model of care that focusses on the creation of home:** Is there a good relationship between the model of care and the chosen location and site design?
3. **Integrate into the community and take a place-based approach:** Does the location and site design help integrate the setting into the community in a really meaningful way? Does the development support multi-generational interactions in the community? Is there an opportunity to locate within a mixed-use development or co-locate with other services or other types of housing? Does the model of care and the design of the built environment reflect the local context and take advantage of local qualities and assets?
4. **Design at a human scale:** Do the site layout and location of buildings on the site help create a setting that has a human scale, is welcoming, and feels domestic as opposed to institutional?
5. **Create high quality spaces along a continuum from private to public, and from internal to external**: Do the site layout, access points, and onsite circulation contribute to a range of high quality public and private spaces, and help create a continuum of external to internal spaces?
6. **Encourage movement, physical exercise, activities of daily living, and social interaction:** Does the location encourage residents to go out and about in the local community? Do the site layout, access points, and boundaries promote physical activity and social interaction?
7. **Support orientation, navigation, wayfinding:** Is the setting visible and easily accessed from the community? Are there clear and legible access routes as you approach, enter, and move around the site?
8. **Use familiar design and facilitate personalisation**: Does the site design use familiar and domestic style features? Are there spaces that can be personalised for residents through furniture or planting?
9. **Provide balanced sensory & environmental conditions:** Do the location and site design help create calm and peaceful conditions, while also capturing positive stimuli such as wildlife, or pleasant sights and sounds from the community?
10. **Support resident and staff safety, health, and wellbeing**: Is the setting located away from sources of air pollution or excessive noise? Does the site create healthy conditions that encourage physical activity and social interaction?
11. **Provide contact with nature:** Do the location, site layout, open spaces, and landscaping create opportunities for contact with nature both inside and outside the setting?
12. **Use technology appropriately and ethically**: Is there a good relationship between the location and the technology used in the setting? For instance, can technology help residents to go out and about in the locality? Do the location and site layout facilitate independent or accompanied travel by residents using mobility devices (e.g. motorised wheelchairs), or through special or adapted bicycles such as trishaws?

1.1 Site location, inclusion, and relationship with the community

02: Older woman with a rollator walking along an urban street in Dublin.

Design Features:

- Pleasant and accessible environment supports residents to move about in the community.

Design considerations and awareness

LTRC settings will be in various location, from inner urban and suburban sites to those located in towns, villages, and in the rural countryside. Regardless of the area, the location of LTRC settings should be carefully considered to ensure that the setting is maximising its relationship with the community in terms of social interaction and inclusion in community life. Knowledge about the location and adjacent local community will also inform design and operational decisions around infection control and community interaction during a pandemic.

In urban (including towns and villages) or suburban areas, the public realm adjacent to the setting should be pleasant, safe, and accessible, with good walking and cycling routes, and easy access to public transport for residents, staff, and visitors.

Local air pollution from transport, home heating, or commercial activities is also a local environment issue that impacts quality of life. Older people are more vulnerable to both short-term and long-term air pollution.

Examining the wider location and the adjacent local environment will help inform decision-making related to new-build or adaptations to existing settings through:

- Understanding and incorporating the local context and the needs and preferences of local people living in the setting in terms of design and the built environment.
- Identifying services and amenities that may be used by the settings, or that may be required within the community and are incorporated in the setting if appropriate.
- Using knowledge of the adjacent built, natural, and cultural environment to inform the redesign or adaptation of the site and site boundaries (see Section 1.2 below).

While many of the issues mentioned above are outside the scope of a LTRC project, owners or managers should be aware of these issues and could liaise with the local authority to highlight these issues if required, and to request local improvements. In some circumstances, where a setting is located within a larger development, the setting may have greater influence over the design, management, and maintenance of the local public realm,

and should use this influence to improve the safety, accessibility, and attractiveness of the public spaces adjacent to the setting.

For more information on LTRC site location and site accessibility refer to Age Friendly Ireland's 2021 Pre-planning Guidance for Residential Care Homes.

For information on UD issues regarding location, and the public realm refer to the Building for Everyone – Booklet 1 (2014) and Universal Design Guidelines for Homes in Ireland - Section 1 (2015).

Universal Design Guidance

- Where possible, locate an LTRC setting centrally within a community and maximise its relationship with the community in terms of social interaction, inclusion, access to services, amenities, and public transport. Proximity to cycle lanes will be beneficial for staff and visitors and support residents to go out and about (in trishaws or similar). (See below for a discussion of mixed-models and co-location).
- Design projects should take account of the setting location, local context, and adjacent local environment, as part of the design process. Knowledge about the locality may help establish missing services in the community that could be potentially provided by the setting (See below for a discussion of mixed-models and co-location).
- Identify key local access routes, views, or landmarks to inform design decisions related to site access points, site boundaries, or site layout.
- If local environmental conditions are substandard, settings should liaise with the local authority to request local public realm upgrades and air quality improvement measures to provide a more supportive community for the setting.

1.2 Co-location and mixed-use

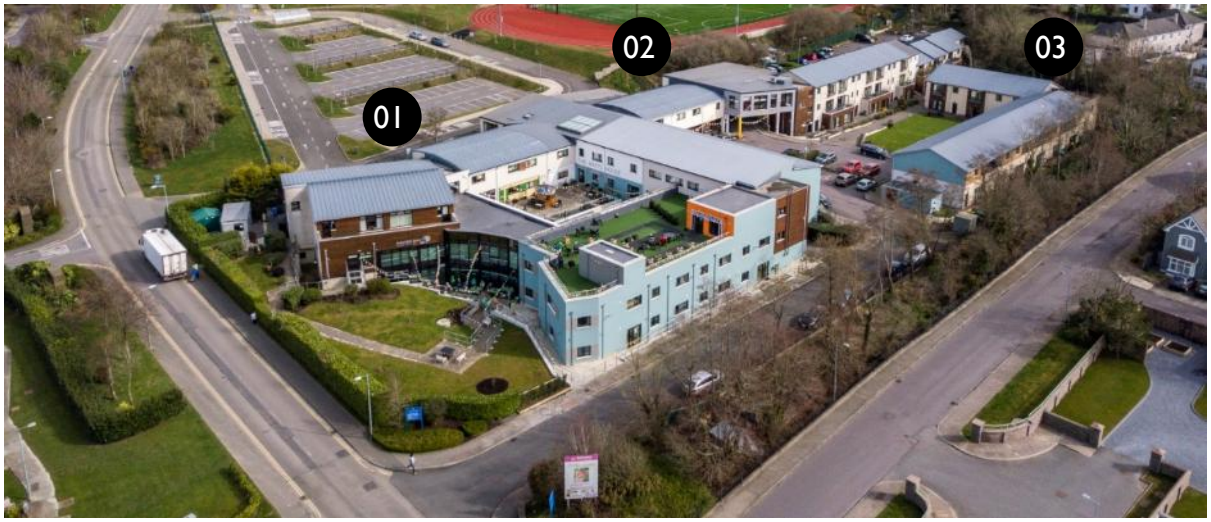
03: The Yarn Café in CareBright, Bruff, Co. Limerick.

Design features

- One of the main entrances to setting is through a popular local café, frequented by residents and their family members, as well as members living in the wider community.

Design considerations and awareness

Ensuring that a setting is well integrated into the community is important for LTRC. Depending on the type and size of the setting it may be beneficial to consider if the setting can be co-located with appropriate community services or facilities, such as healthcare, childcare, or a community centre. Co-location with other forms of housing such as supported housing, UD housing, or standard housing may also be an option. Including LTRC as part of a mixed-use development scheme may also be worth considering, particularly if it improves the integration of the setting into the community, provides the setting with additional facilities or amenities, or helps create a multigenerational environment.



04: Haven Bay Care Centre, Kinsale, Co. Cork.

Design features

- LTRC setting (01) co-located with General Practitioner surgery (02), and supported housing for older people (03).

For more information on LTRC co-location refer to Age Friendly Ireland's 2021 Pre-planning Guidance for Residential Care Homes.

Universal Design Guidance

- Consider if the setting can be part of mixed-use development or co-located with complementary community services, supported housing, or standard dwellings as part of a continuum of care and ageing-in-place, or as part of a multigenerational approach.
- If co-location or a mixed use development is being planned, explore the potential synergies between the proposed setting and the adjacent community to identify what facilities, amenities, or services can be provided or shared.
- Connection and engagement with the community also depends on how the setting is managed and operated. At all times resident autonomy should be respected, and any community engagement and interaction with co-located facilities or housing should be appropriate to the resident and a matter of resident choice.

1.3 Site approach

05: Green Park Nursing Home, Tuam, Co. Galway.

Design features

- Setting is well integrated into a residential area, adopts a domestic scale, faces directly onto the street, and is visually well-connected with the community.

Boundaries and positive interactions with the community

Design considerations and awareness

The 2009 'Urban Design Manual: A best practice guide' promotes visual connections between a development and the wider community [52]. The manual argues that views into the site can help create connections, reduce a sense of separateness or social division. Fleming and Bennett [36] observe that higher quality of life is associated with buildings that facilitate engagement with a variety of activities both inside and outside.

In line with these findings, it could be argued that greater visibility of the setting within the community, and more open, welcoming, and visually permeable boundaries may help foster connections and relationships with the community. The Urban Design Manual [52], as mentioned earlier, promotes visual connections across site boundaries, and argues that "[c]reating views out of the site will also help to give the new development a strong sense of local identity and place". In a similar vein, HAPPI [53] recommends that housing for older people should engage positively with the street, offer connections to the wider context, encourage interaction, and avoid an 'institutional feel'.

A site layout, boundary type, and building design that support residents to 'watch the world go by' from their bedrooms, sitting rooms, balconies, verandas, or from a garden can provide interest and stimulation for residents and help them connect with the community. Rowles [54] talks about 'Peggy's window' and one of his research participants, Peggy a 68-year old-women who due to health issues had become withdrawn and isolated in her home. However, her life was transformed with the installation of a large picture window that gave her a view of activity on the street and enabled engagement with the community.

In LTRC settings, this casual interaction with the community is often provided by way of balconies, porches, and verandas. Granger [55] refers to these as transitional spaces and argues that they provide visual stimulus through purposeful design, critical for physical and mental health: "Even in old age, there is joy, companionship, and spontaneity which, I would add, is facilitated by the material context – the places and porches – that enable the elderly to touch the world beyond."

According to Torrington and Tregenza these views of the community and everyday activities taking place outside are particularly important and attractive to those who are confined indoors [56].

06: Glenaulin Nursing Home, Chapelizod, Dublin 20, Dublin.

Design features

- Existing residential dwelling converted to an LTRC setting that is well integrated into a residential area and is visually well connected with the community.

While the boundary should create potential for interactions and engagement, it must also maintain privacy to protect residential amenity, and support the sense of security experienced by people in their homes. Where ground floor dwellings adjoin the public street, it is important that some kind of "defensible space" is created as a buffer between the building and the public realm (e.g., a planting strip). In these scenarios, the design of ground floor windows need to be carefully considered to ensure privacy [57].

For more information on LTRC and community interaction refer to Age Friendly Ireland's 2021 Pre-planning Guidance for Residential Care Homes.

Universal Design Guidance

- While privacy for certain areas or activities within the setting is important, consider how the site and building boundaries can be designed to create visual connections and engagement between the setting and the local context in a safe and secure manner. This may involve lowering hedges or walls, creating boundary wall openings or 'windows' or providing railings that enable views.
- Consider how certain parts of the setting such as the entrance, internal social areas or certain outdoor spaces can be visually connected to the community through visually permeable boundaries.
- Provide a site layout, boundary type, and building design that support residents to 'watch the world go by' from their bedroom, sitting rooms, or outdoor spaces.
- Consider how balconies, verandas, covered entrance areas, or garden spaces placed close to the boundary can provide views and opportunities for interaction with the local

community. This creates points of interest and stimulation, and help residents connect with the community. All of this can help alleviate loneliness and isolation for residents who have difficulties leaving the setting, or for those who may need to quarantine or shelter in place during a pandemic.

1.4 Site entry

07: CareBright, Bruff, Co. Limerick.

Design features

- Setting contains a main public pedestrian site entry point with vehicle set-down and clear and welcoming entrance area (01). It has a separate entry for onsite parking (02), and also a dedicated service entry (03).

Design considerations and awareness

An LTRC setting can take many forms ranging from a building that directly adjoins the street to being located on a larger site where the main building is set back from the boundary. In all cases the main site entry points should be easily identified, located, and accessed on approach. On a larger site, consider the need for more than one site entrance to ensure easy access for people arriving from different parts of the community. Where such sites are adjacent to public transport routes, locate site entrances as close to public transport stops as possible to reduce travel distances.

The site entry points should be clearly identified using simple, legible signage. For urban or suburban settings, the building and its main entrance will often be near the site entrance and so the site entrance will be easy to locate. In rural settings the site entrance, and particularly pedestrian entrances, may be harder to identify and will require clear signage and visual cues. The pedestrian path or bicycle route connecting the site entrance to the building entrance should be clearly legible, flat, even, and not broken by pedestrian railings or barriers.

Universal Design Guidance

- Create a visually distinct entrance that clearly identifies the main access to the site.
- On larger sites where there are options regarding site access location, select a point that minimises walking distances from key points such as public transport stops. To support older people and people with mobility impairments the walking distance to key destinations or public transport stops should ideally be within 500m.
- If possible, locate site access points to minimise travel distances from the site boundary to the LTRC building entrance.

- Choose a site entrance that will allow a level path through the site, or at least a route that minimises any gradient. Where the gradient is between 1:60 and 1:25, provide regular resting points. Provide resting points at maximum intervals of 19m where the gradient is 1:25 and maximum 25m intervals when the gradient is 1:33.
- Use landmarks, focal points, planting, or other features to reinforce the site access and create clearly visible and legible entrance points.
- Well-designed artificial lighting should be used to illuminate the site entrance and wayfinding signage during low light conditions.
- The pedestrian threshold to the site or footpath leading onto the site should be flat, even and sufficiently wide to facilitate the safe and comfortable passage of pedestrians using wheelchairs and other mobility devices.
- Place seating close to the site entrance to provide a resting and orientation point for people entering and leaving the site.

1.5 Site design

08: The Village Residence, Drogheda, Co. Louth.

Design features

- Good relationship with the wider campus through open boundaries (01), welcoming site entrance and vehicle set-down area (02), covered entrance walkway creating legible and sheltered building access (03), and accessible perimeter walkway with wide, flat, non-slip footpaths (04).

Design considerations and awareness

An LTRC setting can take many forms, ranging from a small standalone single-storey building sitting on its own site, to a large multi-storey setting directly adjoining the public street. It might be co-located with another healthcare facility or supported housing. Therefore, the site layout of the setting will vary greatly depending on its location and site circumstances.

For information regarding all aspects of UD site design covered in this section refer to the Building for Everyone – Booklet 1 (2014), and Universal Design Guidelines for Homes in Ireland - Section 1 (2015).

For information on UD dementia inclusive issues regarding site design

refer to the Universal Design Guidelines: Dementia Friendly Dwellings for People with Dementia, their Families, and Carers (2015).

Overall site layout and circulation

Design considerations and awareness

The overall site layout determines the positioning of buildings, the location and quality of outdoor spaces, parking, site access, and the type and quality of the site boundaries. The site layout should help the setting integrate and connect with the community while also creating a strong sense of place for the setting.

The site layout, particularly the main pedestrian access route, onsite external spaces, and any walking routes should support physical activity, social interaction, and multi-sensory experiences for people as they enter, exit and move about the site. A pleasant, homely, and accessible site design encourages residents to go out and about on the grounds (walking, sitting, reading etc.), and provides an accessible and welcoming environment for staff and visitors. These site amenities are of particular importance for residents who have difficulties leaving the setting or for those who have to shelter in place during a disruptive event (e.g. weather event) or pandemic.

Some residents may require safe and secure external spaces with an enclosed boundary in a location that is easily supervised by staff within the setting. Trees or tall shrubs can be used to screen and soften any walls or fences that enclose this space.

Creating a calm environment that minimises excessive vehicle activity and noise will be beneficial to people with dementia, while site design that lowers traffic volume and vehicle speed will contribute to calmer spaces for all residents. Where feasible the main vehicle access and service traffic should be kept away from outdoor amenity spaces, bedrooms and main living areas.

The site layout should ensure safe and comfortable access for people on bicycles, mobility devices such as electric mobility scooters, and trishaws.

Flexibility and adaptability of the site layout and key spaces is critical. For instance, during a pandemic it would be beneficial to have the flexibility for separate parking and circulation areas for staff and visitors, or outdoor loading and material delivery/collection spaces. (See Section 3 for more information on outdoor spaces).

Universal Design Guidance

- The site layout and design should create opportunities for physical exercise, daily activities (e.g. gardening, hanging clothes to dry), and social interaction within the site.
- The overall site design should have a legible layout supported by clear wayfinding that will orientate users and help them navigate within the site. All aspects of the site should be accessible, easily understood, and usable by all residents, visitors, and staff.
- Where the main entrance is located at a distance from the site entrance, ensure there is a clear and easily identified pedestrian route from the site entrance to the building entrance.

- On larger sites or where a setting is co-located with supported housing, healthcare, or another service, good site wayfinding will help people find their way around. This can be provided through clear, consistent, and easily read signage; supported by distinct paths or routes, and recognisable visual cues such as seating, building elements, artwork or planting. Provide simple and clear signage that communicates the relative positions of any other buildings on the site.
- All pedestrian routes should be flat, even and sufficiently wide to facilitate the safe and comfortable passage of pedestrians and people using wheelchairs and other mobility devices such as electric mobility scooters. All surfaces should have sufficient drainage, be non-slip, non-glare, and avoid strong patterns or sharp tonal or colour contrast.
- Provide safe, comfortable, well-lit, and accessible routes for bicycles, mobility devices such as electric mobility scooters, and trishaws.
- Provide high quality hard and soft landscaping to create a natural environment that supports diverse native plants and wildlife. Create calm, gently stimulating multi-sensory, restorative and healthful spaces for residents as they move through the site.
- Provide accessible and attractive walking routes and seating areas around the site to be enjoyed in normal times and to enable safe socialisation and exercise during a pandemic.
- Ensure that artificial lighting provides even illumination along exterior paths while highlighting key areas such as building entrances, steps, and ramps. Pedestrian walkways should have an average maintained illuminance of 30 lux, while entrances, steps and ramps should have an illuminance of 100 lux.
- Provide exterior social areas for occupants and visitors. These areas should have adequate outdoor accessible seating of an appropriate height and be fitted with backrests and armrests.
- Provide seating areas near the entrance where visits can take place without entering the building.
- Some residents may require safe and secure external spaces with enclosed boundaries. Ensure these are in locations that are easily supervised by staff within the setting. Trees or tall shrubs should be used to screen and soften any walls or fences that enclose these spaces.
- To facilitate enhanced infection control when required, consider how permanent and temporary site measures can be used to create site zoning to separate activities with high infection risk (e.g., removal of materials associated with infection cases) and other activities (e.g. resident movement, visitor access, etc.). It may be more appropriate that site flexibility can temporarily facilitate these measures only when required.

Set-down and parking

Design considerations and awareness

It is important to provide a generous set-down area near the main entrance where a resident, or a group of residents can safely and comfortably enter or exit a vehicle, whether this is a car or minibus. Consideration should be given to the high level of assistance that some residents may need when accessing a vehicle including those who may require a wheelchair lift or hoist.

09: Peamount Healthcare, Newcastle, Co. Dublin.

Design features

- Large, covered entrance providing clear, legible, and sheltered set-down area.

LTRC settings will require an adequate number of generously sized parking spaces near the entrance to support family members arriving or departing with residents, visitors, staff and those with deliveries. The number of spaces will depend on the size of the setting and local authority parking standards set out in local development plans. Considering the profile of LTRC residents and visitors, designated accessible parking spaces, or 'Age Friendly Parking' spaces should be provided close to the entrance.

All settings should make sure that there is good access and storage for staff and visitor bicycles. A minimum of 1 space per 20 bicycle spaces (or 5%) should be provided as accessible bicycle parking bays. This should take the form of an enlarged cycle parking space that is 1500 mm wide and allows a person to ride into and out of a cycle parking bay without the need for reversing, turning or lifting their bicycle.

Considerations should also be given to access and storage for mobility devices such as electric mobility scooters and to trishaws, where these are used in the setting.

While careful consideration must be given to the setting down area and travel distances from the car parking area to the entrance of the setting, this must be balanced with the creation of a safe, calm and welcoming entrance space that helps create a homely environment. This entrance space can also function as a social area for residents, and for families or visitors as they arrive or depart the setting. Large blocks of parking directly in front of the setting can also create an institutional feeling; options to locate any main parking areas away from the main entrance, or break parking up with planting and trees, should be examined to create a more domestic and welcome environment.

10: Maryfield Nursing Home, Chapelizod, Dublin 20.

Design features

- Car parking areas broken up with planting and-well integrated into the site.

For more information on Age Friendly parking refer to the National Age Friendly Parking Space Guide.

For information on electric vehicle charging refer to the Universal Design Guidelines for EV Charging Infrastructure (2024).

For information on trishaws and their use in LTRC settings refer to https://cyclingwithoutage.ie/.

Universal Design Guidance

- Provide a generous set-down area near the main entrance where residents can safely and comfortably enter or exit vehicles, include space for those who may require a wheelchair lift or hoist.
- A minimum of one designated accessible parking space or Age Friendly parking space should be provided; or a minimum of 5% of all parking spaces, whichever is greater.
- A minimum of 1 space per 20 bicycle spaces (or 5%) should be provided as accessible bicycle parking bays. This should be 1500 mm wide and allow a person to ride into and out of the parking space without the need for reversing, turning or lifting their bicycle.
- Ensure that the parking or set-down areas provided do not dominate the entrance area or diminish the quality of the space for residents, family, and visitors as they enter and leave the setting.
- Avoid placing large blocks of parking direct in front of the setting, and examine how parking areas can be broken up, or softened with planting and trees. All of these actions will help create a more domestic and welcoming environment.
- Ensure that artificial lighting provides even illumination to the set-down area. Pedestrian walkways should have an average maintained illuminance of 30 lux, while entrances, steps and ramps should have an illuminance of 100 lux.

Steps, ramps, landings and handrails

Design considerations and awareness

Some people living with dementia may have visual perception or cognitive difficulties that can make steps or ramps hard to use. Ideally, the access route and building entrance should avoid steps and ramps wherever possible. However, where a change of level occurs and

they are necessary, both steps and a ramp should be provided as a choice for users. The logical location of these ramps and steps, good visual contrast, the provision of multiple cues and adequate warnings, will all contribute to more accessible external circulation.

An older person may experience mobility and gait issues, and therefore ramps and steps should be as comfortable and easy to use as possible. Ramps should be wide enough to accommodate easy access and enable people to pass each other in comfort including people in wheelchairs or other mobility devices. Ramps should have a maximum gradient of 1:20 as steeper gradients cause difficulties for people with mobility difficulties or those using wheelchairs. If the rise of the ramp is 2000mm or greater, an alternative means of access such as a lift or platform lift will be required.

Similar consideration should be given to the design of external steps, where a maximum going and a minimum rise will benefit those with mobility and visual impairments.

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

For information regarding steps, steps, ramps, landings and handrails refer to the Building for Everyone – Booklet 1 (2014), and Universal Design Guidelines for Homes in Ireland - Section 1 (2015).

Universal Design Guidance

- Ramps should be at least the same width as the path they serve. This width will depend on the size of the setting but the clear width between handrails should be between 1500-2400mm.
- Ramps should be constructed with the shallowest gradient possible, so they are comfortable to use.
- External steps shall have a rise of between 150 to 170 mm and a going of between 300 to 450 mm.
- Steps should be at least the same width as the path they serve. This width will depend on the size of the setting, but steps that are 1500-2400mm wide will make it easier to access a setting during busy times.
- The minimum clear width between enclosing walls, strings, or upstands is 1200mm.
- For steps wider than 2000mm an additional central handrail will be required to divide the steps into channels.
- Where steps lead up to the main entrance, consideration should be given to a larger landing of between 1800-2400mm square (clear of any outward opening door swing).
- Handrails to be 900-1000mm above the pitch line and 1100mm above landings. The profile of this handrail should be 40-50mm in diameter if circular, or 50mm wide and 38mm deep if elliptical.
- Ensure handrails visually contrast with the background to make them more visible. Use handrail finishes such as timber or plastic which are comfortable to the touch. Avoid materials such as steel or metal which can be cold and uncomfortable to the touch.
- Artificial lighting should provide even illumination to entrances, steps and ramps, achieving an illuminance of 100 lux.

External lighting

Design considerations and awareness

Good levels of external lighting are crucial for LTRC settings as they operate as 24-hour care facilities with staff, family members, and visitors arriving and leaving at all hours. In addition, we need higher levels of light as we age and many older people will experience visual difficulties; therefore, high quality external lighting is very important. In particular, during the winter, external lighting is important for residents and visitors using external access routes or walking paths.

Lighting can also be used to illuminate key external features or trees when it is dark to create points of interest and help with orientation and navigation, both for residents inside and outside the setting's buildings.

Ensure that artificial lighting provides even illumination with an average maintained illuminance of 30 lux for approach, while entrances, steps and ramps should have an illuminance of 100 lux. The use of LED lighting should be carefully considered as the blue light emitted from LEDs may cause issues for some people with visual challenges. There is some evidence to suggest that the use of LED lighting may negatively affect sleep patterns or circadian rhythms.

While higher levels of light are required, glare can be problem for many people. Low level lighting, and lighting that is set into the ground directing light upwards should be avoided as the resulting glare can cause visual difficulties and discomfort for many people.

See Section 4 for more information on lighting.

Universal Design Guidance

- Use high quality external lighting to illuminate access routes.
- Use lighting to illuminate key external features to create points of interest and help with orientation and navigation, both for residents inside and outside the setting's buildings.
- Ensure that artificial lighting provides even illumination with an average maintained illuminance of 30 lux for approach, while entrances, steps and ramps should have an illuminance of 100 lux.
- Avoid low level lighting that directs light upwards as the resulting glare can also cause difficulties for people with visual impairments.
- The use of LED lighting should be carefully considered as the bluish quality of the light may cause difficulties for many people.

External landscaping

11. Bon Secours Care Village, Mount Desert, Cork.

Design Features

- Well-designed landscaping and planting provide attractive outdoor spaces and help to integrate the interior and exterior areas of the setting.

Design considerations and awareness

Given the importance of all external site areas and the need to think about these as part of a flow of spaces continuing into the building, the planting in a setting needs to be carefully considered as part of the overall UD approach.

Planting can be used to make approach routes and entry points more recognisable, create opportunities for personalisation, and help mediate against external negative stimuli, such as glare and noise. Planting can also be used to create multisensory cues providing visual, smell, and tactile experiences that can help with orientation and wayfinding. For instance, lavender planted by a front door may help draw an individual towards the aroma, or trigger memories of a similar arrangement from their past that may help them to remember or recognise their own door.

See Section 3 for more information on planting.

Universal Design Guidance

- Use native planting and planting commonly found in the area to create a familiar environment. Where possible use planting familiar to specific residents to personalise entrances, pathways, or private open spaces that they might frequently use.
- Use colourful and distinctive planting in strategic locations and destinations to create visual landmarks to help with wayfinding. Some of these can be illuminated to create points of interest or help with spatial orientation when it is dark.
- In line with the creation of visual landmarks, use fragrant planting to reinforce wayfinding by providing aromas in certain key locations such as entrances or junctions along approach paths.
- Ensure planting does not cause excessive shadows on the ground which may be perceived as a step or cause other difficulties for people with dementia.
- Avoid plants that irritate the skin or are toxic if ingested.

- Carefully locate trees that shed excessive fruit or leaves so that these do not cause slipping or tripping on paths. Maintain planting to keep pathways clear.

External storage for mobility devices and bicycles

Design considerations and awareness

Considering the high proportion of residents who experience mobility difficulties, frailty, or other health issues, there is often a high number of mobility devices used in LTRC settings. Furthermore, as larger electric wheelchairs and mobility scooters become more prevalent, the amount of storage required is increasing. In some cases, it is not necessary to bring these devices inside the building; in these situations, accessible and secure external storage near the main entrance can be useful.

In addition, where LTRC settings are using trishaws, access and storage needs to be factored into the design of any storage areas. For instance, a typical trishaw will be approximately 1060m wide and 2250 long (e.g. the Triobike Taxi).

Secure facilities should be provided for locking and storing bicycles belonging to staff, family members or visitors. Ideally a covered area would provide shelter and a space to remove or put on wet-gear before entering or leaving the setting. This could be provided as part of the storage or covered area near the building entrance. The 'Set-down and parking' section earlier described the width and manoeuvring space required for accessible bicycle parking bays; this should be considered in the context of bicycle storage.

External storage areas should be provided with sockets for charging electric bicycles, electric mobility scooters, and trishaws. Depending on circumstances, an outdoor rated socket may be required (e.g. IP65 Outdoor Socket). The height of these sockets should accommodate users with varying height requirements and be placed within easy reach.

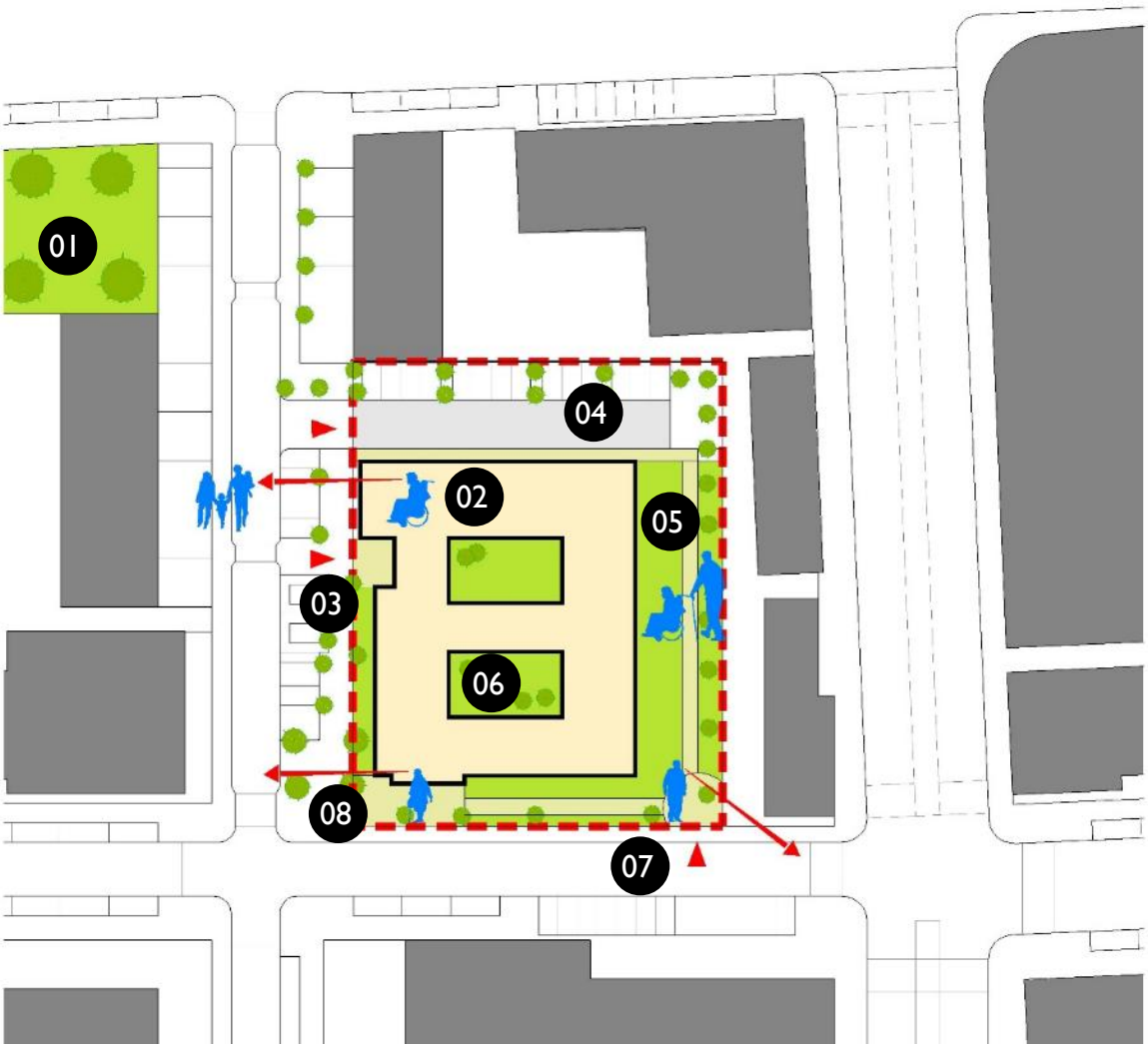
12. Cycling Without Age Ireland Trishaw carrying LTRC residents.

For information on trishaws and there use in LTRC settings refer to https://cyclingwithoutage.ie/.

Universal Design Guidance

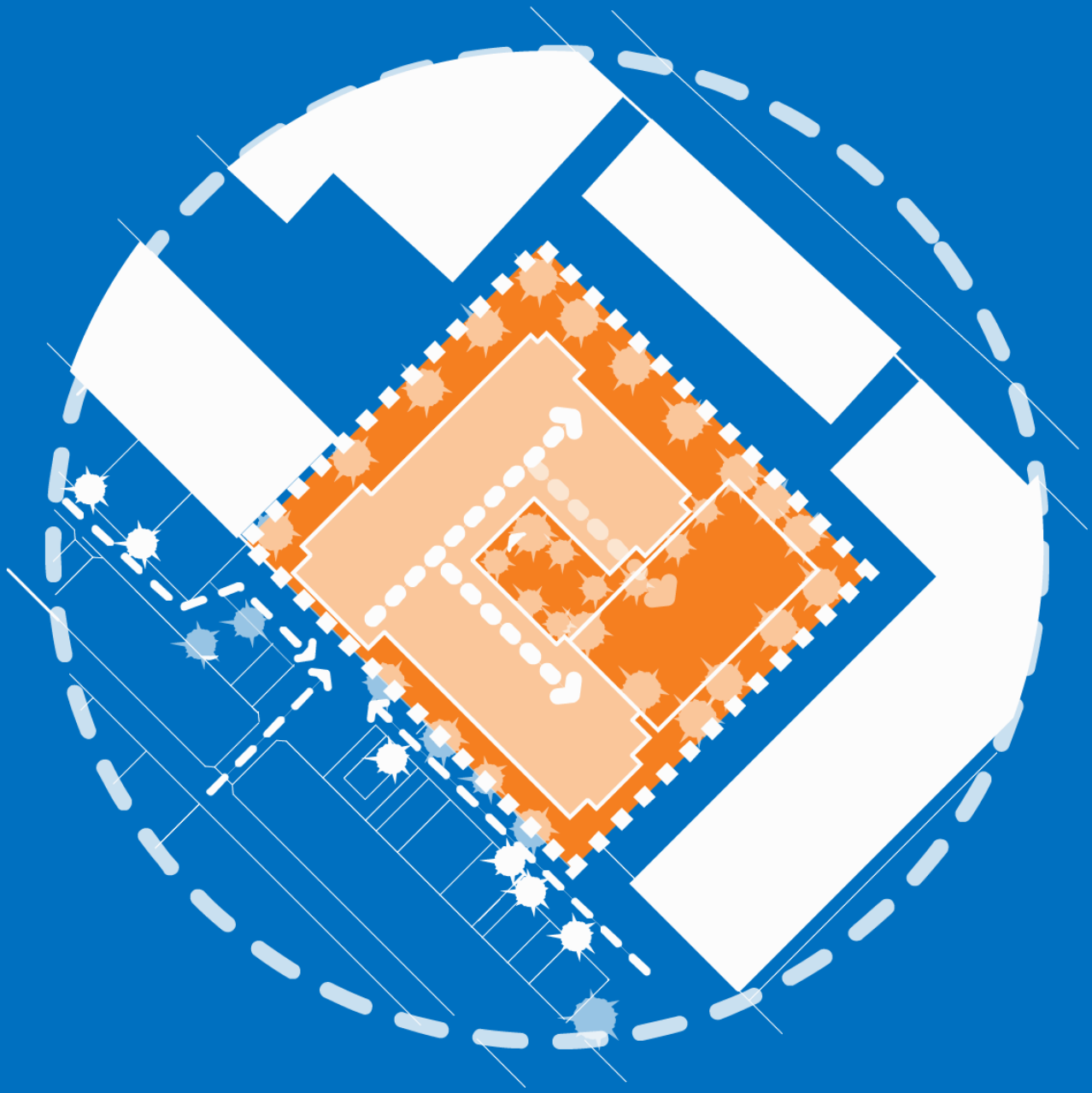
- Provide external bicycle and mobility device storage near the main entrance in a location where it is visible, easy to locate, accessible and easily used. This may form part of a main covered entrance area or may consist of a separate structure. Security measures such as lockable doors or gates, or the facility to lock bicycles or mobility devices in the storage shelter should be considered.
- Ground surfaces should be smooth, flat and even, using materials that are non-slip, non-glare, and avoid strong patterns or sharp tonal or colour contrast.
- Provide good levels of evenly distributed artificial lighting to ensure the storage is accessible and comfortable to use in low light.
- Provide sockets for charging electric bicycles, electric mobility scooters, and trishaws. An outdoor rated socket may be required (e.g. IP65 Outdoor Socket).

Technical sketch 01: Indicative site layout



1. Maximise connections with local amenities and services.
2. Consider how parts of the setting such as the entrance, internal social areas or certain outdoor spaces can be visually connected to the community through visually permeable boundaries.
3. Provide seating areas around the entrance where visits can take place without entering the building.
4. Lay out and break up any parking areas so they are tucked into the site rather than dominating the approach and entrance areas.
5. Provide high quality landscaping and accessible walking routes and seating areas around the site that can be enjoyed in normal times and to enable safe socialisation and exercise during a pandemic.
6. Provide safe and secure external spaces with enclosed boundaries in locations that are easily supervised by staff within the setting. Trees or tall shrubs should be used to screen and soften any walls or fences that enclose this space.
7. Consider if additional site entry points would support better access with the community, especially for those with mobility impairments.
8. Consider how the site and building boundaries can create visual connections and engagement between the setting and the local context in a safe, and secure manner.

02 Overall building layout and circulation

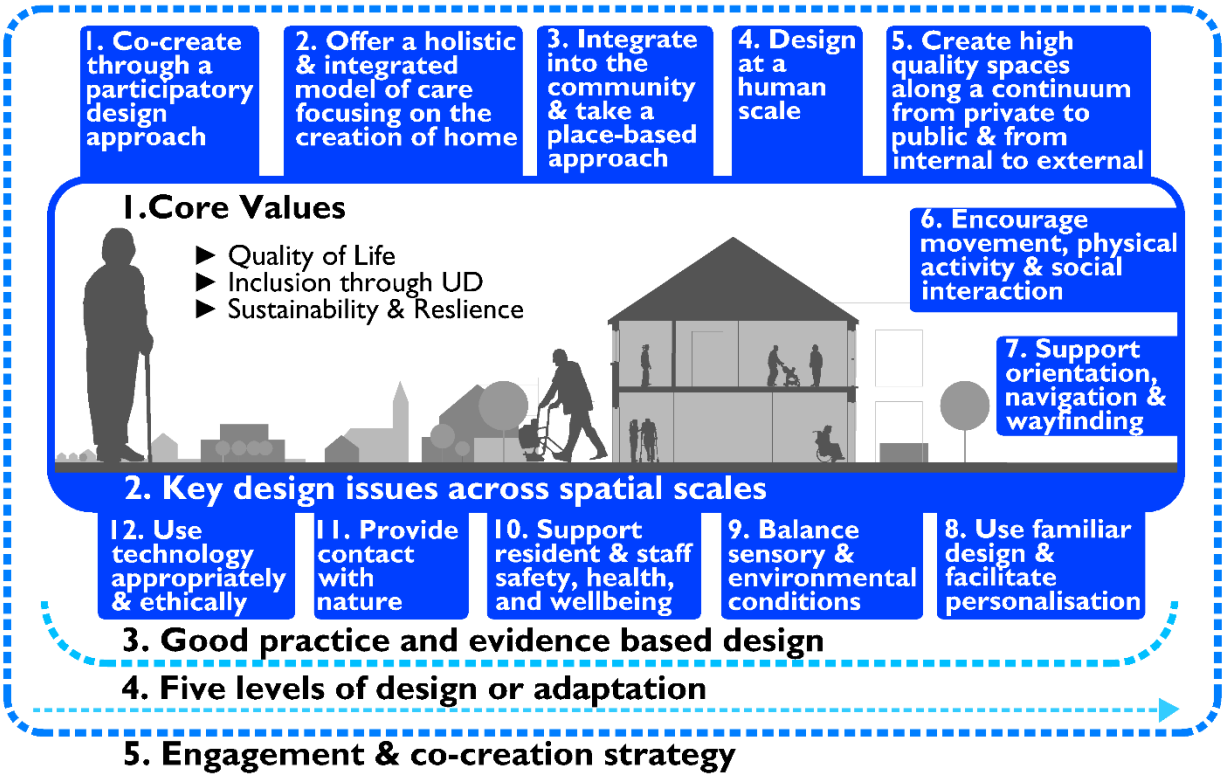


01: The Village Residence, Drogheda, Co. Louth.

Building layout and circulation: Overall Design Issues

The overall spatial layout and building form of the setting is shaped by the care model. If a household or Teaghlach model is adopted, this will influence the configuration of the overall building layout. In turn, the layout and building form determine human scale, legibility, and coherence. They also impact quality of experience by determining floor area, variety of spaces, access to outdoor space, views, natural light, and more. The layout also shapes the circulation strategy and how people enter, move around, and experience various spaces.

In this context, consider how the Overall Planning and Design Framework can be used to inform building layout and circulation. Think about: how the **Core Values** (quality of life, universal design, and sustainability and resilience) and **Key Design Issues** (see more on this below) can influence overall configuration and circulation decisions; what **Good Practice** or case studies can be referred to; how the **Levels of Design** can be incorporated into the layout and circulation design of either new-build or adaptations to existing settings; and, finally, how the **Engagement and Co-creation** strategy can be used to include key stakeholders in the decision process at this spatial scale.



Considering how the **12 Key Design Issues** relate to the different spatial scales, it is important to think about these issues in the context of building layout, form, and circulation:

1. **Co-create through a participatory design approach:** Have the relevant key stakeholders been involved in the design process?
2. **Offer a holistic and integrated model of care that focusses on the creation of home:** Is the model of care fully supported by the building layout, and does the building form and circulation create a people-centred and a homely environment?
3. **Integrate into the community and take a place-based approach:** Does the building layout and form integrate the setting into the community? Does the overall building design refer to the local context, capture views to adjacent landmarks, and refer to local building types and shapes?
4. **Design at a human scale:** Does the overall building layout and form help to create a setting that has a human scale, is easily understood, welcoming, and feels domestic as opposed to institutional?
5. **Create high quality spaces along a continuum from private to public, and from internal to external**: Do the building layout, entrances, and overall circulation help provide a range of high quality public and private spaces, and create a continuum of external to internal spaces? Is there adequate space for large wheelchairs and mobility devices, care assistance, and technological supports? Does the layout provide easy access to high quality outdoor spaces on all floor levels?
6. **Encourage movement, physical exercise, activities of daily living, and social interaction:** Do the building layout, arrangement of internal and external spaces, circulation, and access to outdoor spaces promote physical exercise, activities of daily living, and social interaction?
7. **Support orientation, navigation, wayfinding:** Does the overall layout and form create a legible and coherent whole? Does the circulation provide clear and legible routes as you approach, enter, and move around the building?
8. **Use familiar design and facilitate personalisation**: Is the overall building form familiar and domestic? Do key circulation spaces and focal points facilitate personalisation for residents through artwork, furniture or planting?
9. **Provide balanced sensory and environmental conditions:** Does the building layout and circulation help create calm and peaceful conditions? Do the circulation areas create a pleasant and comfortable experience, while also providing views, natural light, and capturing positive stimuli such as wildlife, or pleasant sights and sounds from outside?
10. **Support resident and staff safety, health, and wellbeing**: Does the building layout and form support natural ventilation and high quality natural light? Does the layout encourage physical exercise, activities of daily living, and social interaction?
11. **Provide contact with nature:** Do the layout, building form, and circulation provide opportunities to see or go outside on all floors? Are there opportunities for contact with nature both inside and outside the building?
12. **Use technology appropriately and ethically**: Is there a good use of technology that enables residents safely and independently move around the building and to access and use outdoor spaces?

2.1 Building layout and overall scale

02: Grangegorman Residential Care Neighbourhood, Dublin 7, Dublin.

Design features

- The careful layout and massing of the building, coupled with the use of courtyards and roof terraces all combine to create a human scale building.

Design considerations and awareness

Household model as a key building block: As outlined earlier, the overall spatial layout and building form of the setting is shaped by the care model. A household model approach will usually subdivide the setting into smaller units or 'households', with each household having approximately 12 residents (this number will vary depending on model and geographic location). These households are largely self-contained and typically will consist of single ensuite bedrooms, central living, dining, and kitchen areas, and a dedicated outdoor space. Households will have their own front door. This can also be accessed from a common area, sometimes shared with other adjacent households. They can exist as single storey detached units, or they can occupy different floors in a multi-level building. These households are typically supported by common spaces and shared facilities that directly adjoin the households or are independently located somewhere on the same site.

In the US, one of the most successful examples of this small-scale setting approach is the 'Green House' model. This is a trademarked model developed by the 'Green House Project' which seeks to create "…radically non-institutional elder care environments that empower the lives of people who live and work in them" (https://thegreenhouseproject.org). These settings contain 10-12 resident bedrooms gathered around a shared living, dining, and kitchen space. Nursing assistants or 'care partners' are assigned to the one small setting and have extra duties such as personal care, meal preparation and service, housekeeping, laundry, and other activities. This enables the staff and residents to get to know each other well and reduces the movement of staff in and out of the setting.

In terms of infection control, Scopetti et al.,[58] advocate for the division of settings into separate operating areas, with controlled movement between areas to reduce infection spread [58]. In a similar manner, Wang [59] advocates for dedicated environmental zones including clean (e.g., residential rooms), semi-clean (e.g., facility clinic), and contaminated zones that should be considered at the level of site planning. Each zone should have independent air-conditioning systems, dedicated circulation systems (e.g., entries and exits), and routes for waste collection. Physical separations, such as partitions, between these zones would be necessary in the time of pandemic, and spaces to store these partition materials for engineering separation should be included in planning.

The conditions that Scopetti et al. [58] and Wang [59] promote align with the household approach. There are also benefits for infection control due to fewer people living, working, visiting each household. Private bedrooms and ensuites have also been identified as beneficial in terms of infection control. These models may also support social distancing and isolation for infection control reasons due to design features including private bedrooms.

Regardless of the design of each specific household model, or how they are configured, the main thing is that these households become a key building block for the overall setting that can be repeated and organised in many different ways.

For more information on LTRC site location and site accessibility refer to Age Friendly Ireland's 2021 Pre-planning Guidance for Residential Care Home.

03: CareBright, Bruff, Co. Limerick.

Design features

- Domestic scale dining and kitchen area proving a homely atmosphere.
- Direct and unobstructed connection and clear views between the kitchen and the dining are providing good physical and visual access between these spaces.

Overall scale and number of residents:
Some of the primary drivers of the household model include creating smaller, more domestic style units, and reducing the number of residents as a way to create a person-centred approach. In this regard, Fleming and Bennett [35] discuss the importance of a 'human scale' in any setting for people with dementia. They present evidence relating to three key factors:

- Number of places (beds): fewer places/beds in settings linked to improved quality of life.
- Physical/spatial size: larger spaces have been connected to greater levels of disturbance, while more compact spaces have been shown to provide more comfort and to aid resident supervision and care. This involves a move away from a high number of beds, long corridors and more circulation space, towards smaller, more compact units.
- Social density: lower social density (i.e., more floor area or space provided per resident) connected to better care and social interaction outcomes.

An appropriate scale and size may also be achieved by subdividing larger settings into smaller distinct units to provide less institutional and more homely environments. However, there are challenges associated with larger settings that may not be resolved by simply breaking them down into smaller units. Small (e.g. <30) or medium (e.g. <60) sized settings may have some advantages in terms of the core values and key design issues outlined in these guidance. For instance, it is easier to find sites within communities for small or medium settings, and easier to achieve a more human scale environment.

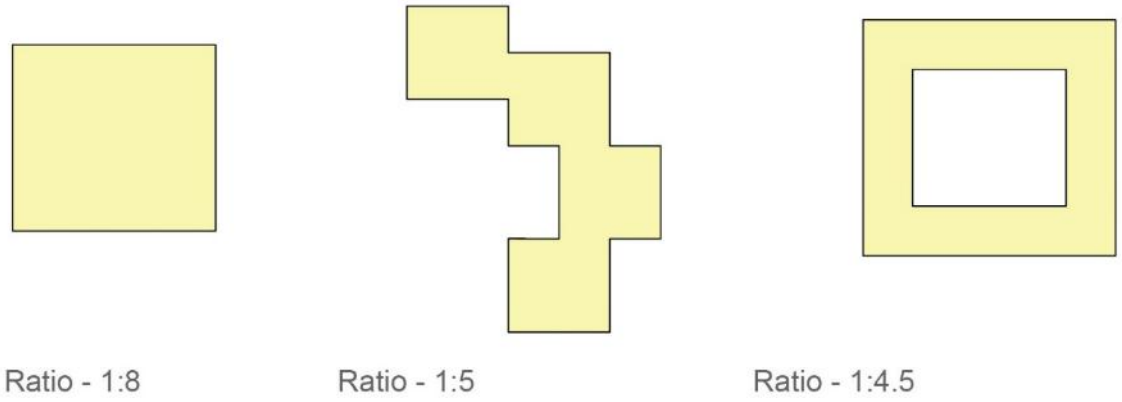
Furthermore, research looking at the characteristics of U.S. nursing homes that were affected by COVID-19, found that larger size settings (in these studies this was >150 beds) were more prone to infection than smaller settings [60, 61].

Building layout and overall form:
The building layout and building form determine the building's human scale, overall legibility, and quality of experience in terms of occupant density, natural light and ventilation, and multiple other aspects. The layout also frames the circulation strategy and determines how people enter, move around, and experience various spaces.

As discussed earlier, the household unit is a key building block of the overall setting layout. How these households are grouped and connected is crucial and requires careful consideration in terms of overall configuration (e.g. courtyard or linear layout) circulation type and length, single or double loaded corridors (i.e. accommodation on one side or two), or open or closed routes.

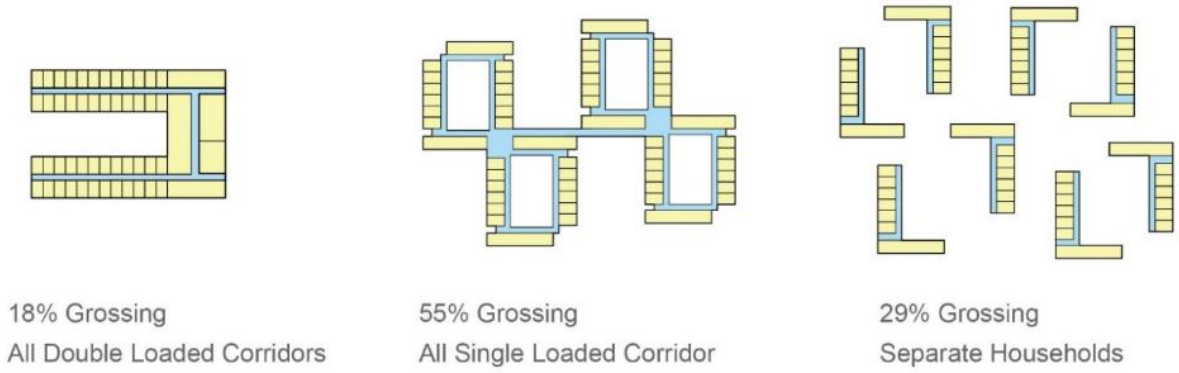
A few major layout and building form factors are briefly outlined below:

- **Perimeter of the building relative to the building footprint:** The perimeter of a building presents opportunities for visual connections to the external environment, natural light and ventilation. A shorter perimeter relative to the same floor area indicates a deep floor plan with embedded circulation which can be less legible and a less pleasant environment in general. The layouts in Figure 04 below have identical floor areas, but very different area-to-perimeter ratios, and demonstrate how different configurations might generate different quality spaces both within, and around buildings.



04. Various area to perimeter ratios

- **Generosity of circulation and informal areas:** The generosity of circulation and informal spaces provided in addition to the building's main habitable accommodation can impact the quality of experience. Wider circulation corridors and a larger proportion of single-loaded corridors are examples of this approach. This generosity of circulation / informal space is measured using the building's 'grossing factor' - calculated as the area of circulation/informal space expressed as a percentage of the net accommodation. The diagrams below in Figure 05 have an identical area of net accommodation; however, they have very different grossing factors. The diagrams in the centre and on the right have more opportunities for integrated landscape, meaningful views and discrete household arrangements as a result of the circulation strategy.

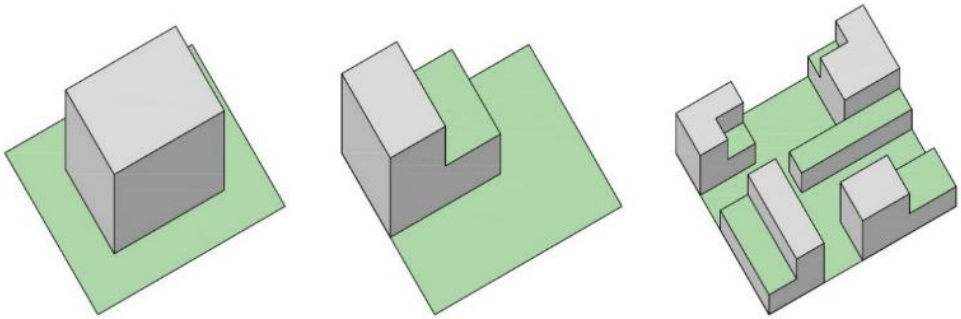


05: Various grossing factors associated with different building layouts

- **Single-loaded corridors:** Single-loaded corridors (i.e. corridors with accommodation to one side) are preferable to double-loaded corridors (i.e. corridors with accommodation on both sides) where possible as they allow visual connections to the outside, and natural light and ventilation into circulation spaces. This supports navigation within the building as well as general orientation. Whereas double-loaded corridors tend to create a 'warren like' appearance and are less legible. As demonstrated in the diagrams above, which illustrate the difference between single and double loaded circulation, there is a direct relationship between grossing factors, building footprint size, and single or double loading of corridors.
- **Gross internal floor area per resident**: The occupation density of a setting and the level of generosity of floor area for each resident are critical to quality of life, and major

parts of the household approach. This depends on the context of the building form and type; for example, settings comprised of a series of small blocks may require less internal circulation and have a lower floor area per resident yet may provide generous and high-quality design.

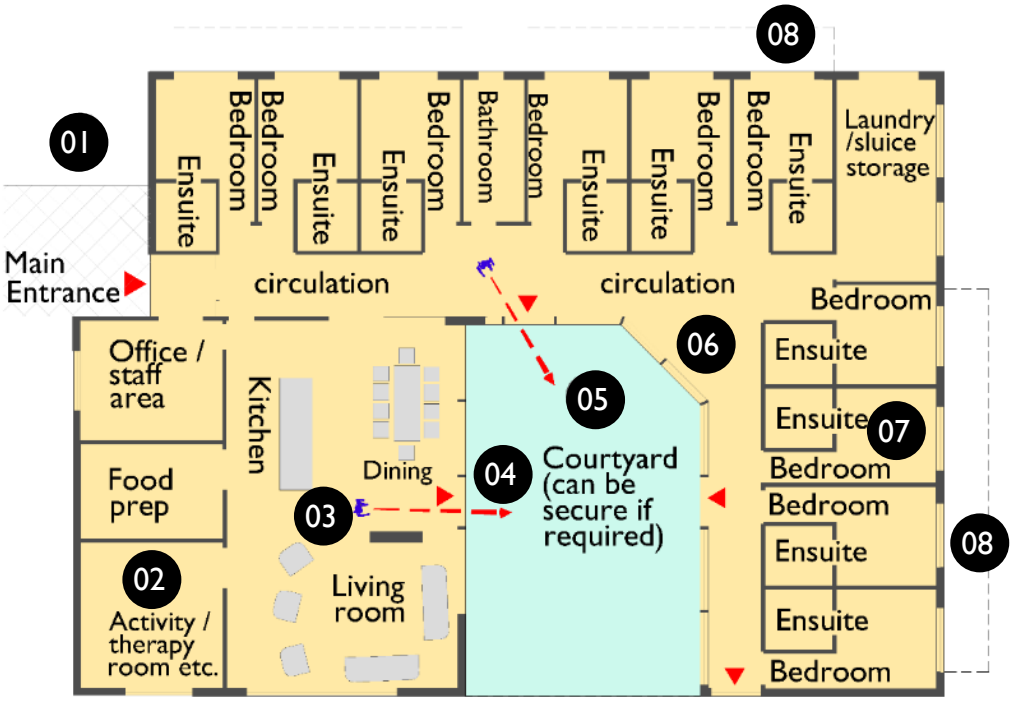
- **Area of integrated open and green space per resident:** In addition to the outdoor space provided on the overall site, outdoor and green areas integrated into the building layout and form can provide views and direct access to the outside, while also increasing contact with nature. Opportunities exist for integrating landscape both around, on and within buildings in the form of courtyards and roof gardens. The diagrams below in Figure 06 demonstrate that very different approaches are possible in relation to the integration of architecture and landscape and that roof gardens can be particularly effective for providing safe accessible landscape to residents of the upper levels of care homes.



06: Different approaches to the integration of architecture and landscape.

Appendix B provides 8 desk-based case studies that use these layout and building form factors to examine these settings. These case studies are also analysed according to the 12 key design issues set out in these guidelines.

Technical sketch 01: Generic and hypothetical ground floor plan of a household model showing a unit with 10 ensuite single rooms organised around a central communal area and courtyard.



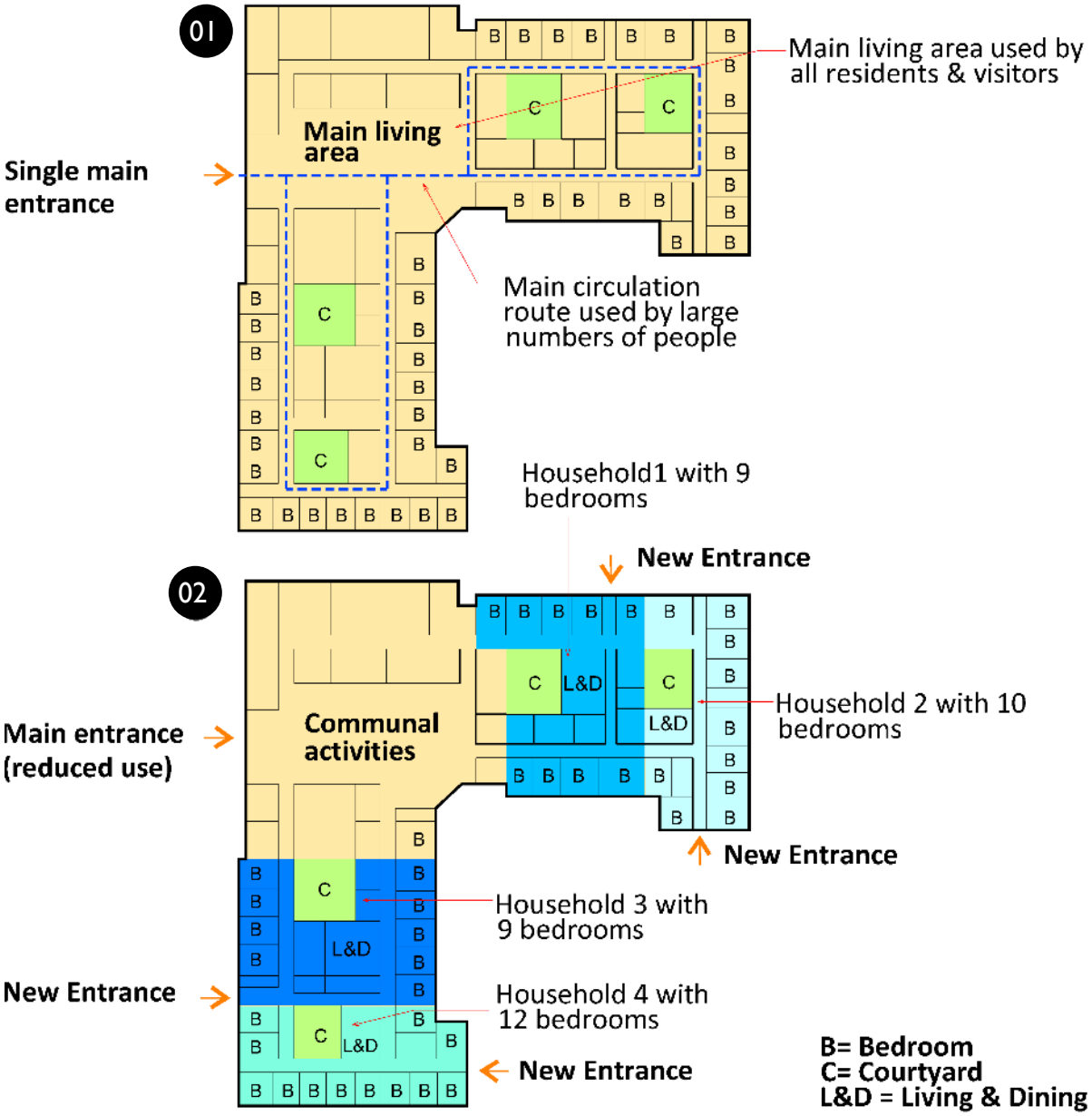
1. The household has a small number of residents (10). This reduces traffic from residents or visitors. The household also has a small number of fixed staff who primarily work in this household, which reduces traffic and potential cross contamination during a pandemic.
2. Activity room can be used as small visitor area.
3. Visual and physical access to the outside from the central social area.
4. Potential for multiple exterior doors to facilitate separate entrance/exit areas (i.e. one-way systems) or dedicated staff or visitor access points.
5. Easy access to outdoor areas and fresh air provides safer space for social interaction and exercise.
6. Circulation is primarily via single-loaded corridors
7. Single room with a private ensuite provides privacy and dignity, reduces risk of infection spread and makes isolation and socially distanced visits easier.
8. Depending on the context or floor level, a terrace or balconies can be considered.

For larger settings that are not divided into households or similar smaller units, the creation of separate zones should be possible during a pandemic. These should be capable of becoming independent operating areas with controlled movement between areas to reduce infection spread. In some cases, adjustable and flexible compartmentalisation within settings to enable isolation of individuals and small groups may be more appropriate.

Universal Design Guidance

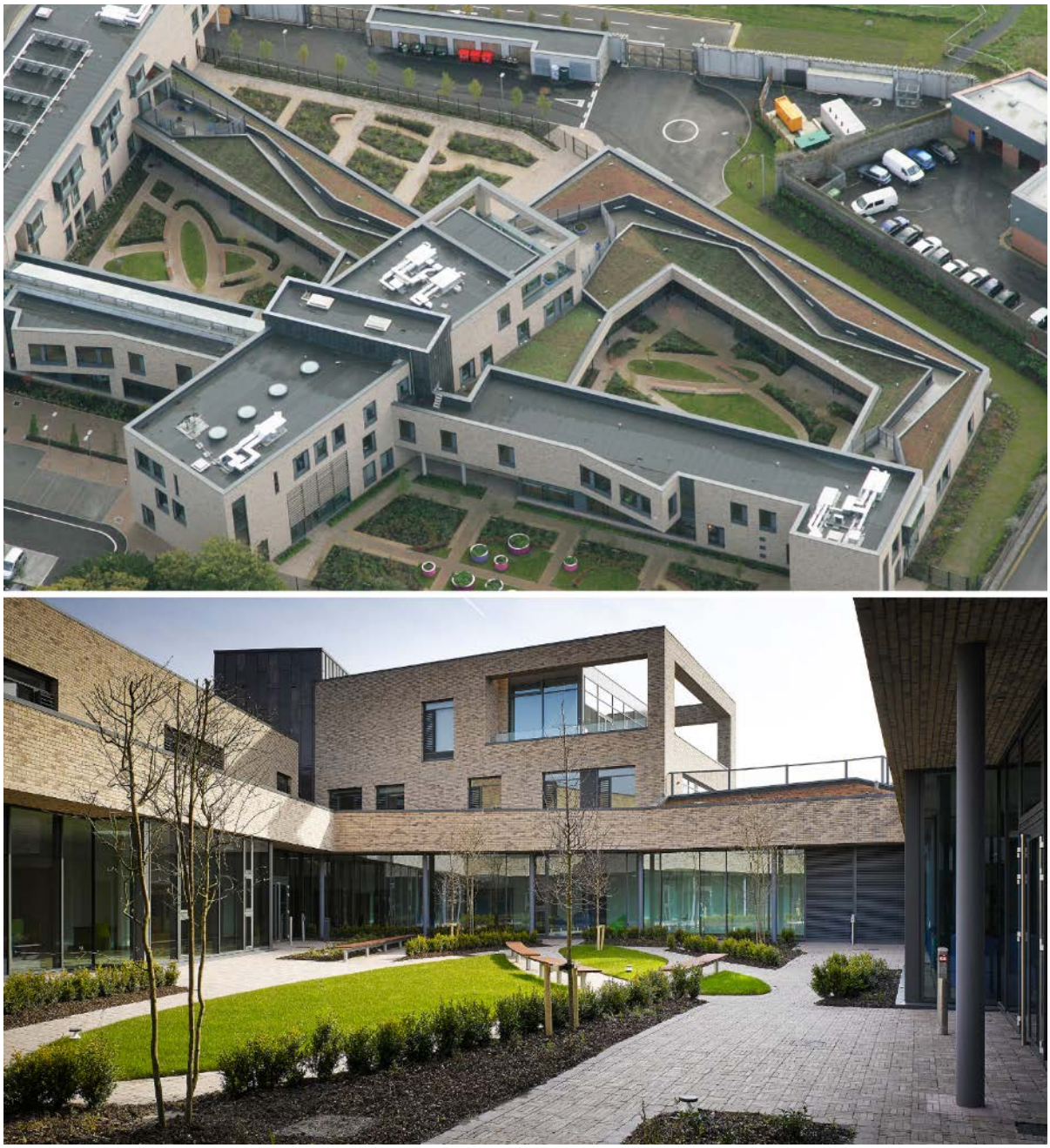
- Consider a household model approach to create smaller, homely, distinct, and more independent units with maximum of 12 residents per household.
- Where possible, reconfigure the layout of larger existing settings to create smaller, distinct, and more independent units. These may align with a 'household' or a 'Green House' approach where settings are sub-divided into 'household' units with maximum 8 to 12 private bedrooms with ensuite bathrooms in each household.
- For larger settings that are not divided into households or similar smaller units, the creation of separate and independent zones should be possible during a pandemic. However, given the benefits associated with a household approach, the permanent subdivision of larger existing settings into smaller units should be considered.
- The overall layout and building form of the settings should carefully consider the: perimeter to overall building footprint ratio in order to maximise opportunities for visual connections to the external environment, natural light and ventilation; generosity of circulation and informal areas; provision of single-loaded corridors; optimum gross internal floor area per resident; and, integration of open and green space into the building in the form of courtyards and roof terraces.

Technical sketch 02: Large conventional setting subdivided into households



1. Large conventional setting with single entrance, one main living area, and circulation area shared by the full setting.
2. Setting reconfigured to create smaller, distinct, and more independent units. These align with a 'household' approach where settings are sub-divided into 'household' units with maximum 8 to 12 private bedrooms with ensuite bathrooms in each household. Depending on the layout and internal space available, a bedroom may need to be used, or a building extension may need to be added to create an adequate living and dining space for each household.

2.2 Supporting quality of life in a multiple storey building



07: Phoenix Care Centre, Grangegorman, Dublin 7, Dublin.

Design features

- Residential setting using roof terraces and roof gardens to create access to outdoor space above ground level in a building with three floors (top image shows an aerial view of the building while the bottom image shows one of the ground floor courtyards).

Design considerations and awareness

Like all other forms of residential and healthcare buildings, multi-storey LTRC settings are common all over the world. These support a more efficient and sustainable use of land, facilitate the location of settings in compact urban sites where the vertical stacking of accommodation is necessary, allow LTRC settings to be placed above a street level plinth, or enable them to become part of a mixed-use development.

However, like other residential environments, LTRC placed on upper floors need to be carefully considered in order to avoid the social isolation and lack of access to outdoor space that can occur with this type of accommodation [62].

During the COVID-19 pandemic, multi-storey buildings presented a greater risk of isolation for residents on upper floors. For instance, for these residents, window visits or socialising in gardens or other outdoor areas was more difficult to achieve. Similarly, room visits by family members to residents on upper floors was more difficult in multi-storey buildings as visitors typically have to enter the main building and use stairs or lifts.

To mitigate these negative outcomes multi-storey LTRC settings should provide social areas and opportunities for meaningful interaction on all floors. Usable and meaningful outdoor space should also be provided on all levels, taking the form of roof terraces or balconies. Consideration should also be given to the circulation routes and access to upper floors and the open space on these upper levels. In particular, it is worth considering if access can be provided through spacious and well-ventilated routes, ideally without having to travel through key parts of the main building. In some cases, this could take the form of exterior walkways or balcony access.

08: Joe and Helen O'Toole Community Nursing Unit, Tuam, Co. Galway

Design features

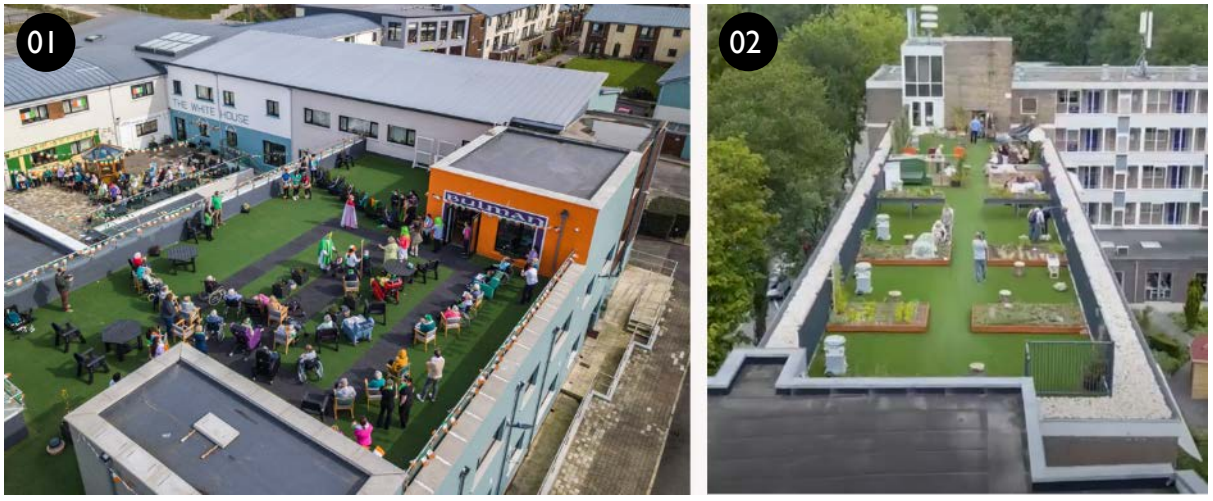
- The setting has a roof terrace at first floor level that provides access to outdoor space, fresh air, and nature to residents on this upper floor.
- The roof terrace provides raised planting beds and a rich diversity of vegetation.

09: Joe and Helen O'Toole Community Nursing Unit, Tuam, Co. Galway

Design features

- The roof terrace provides a variety of seating, and a choice of covered and open areas.

For existing multi-storey settings, examine how flat roof areas can be converted to roof terraces (See 02 in Figure 10 below), or how the rooms on upper floors. which do not access meaningful outdoor space, can be retrofitted with balconies or provided with access to a roof terrace. Where this is not possible consider how existing windows can be altered to provide at least 'Juliet balconies' that would give the resident better contact with the outside when desired.



10: Haven Bay Care Centre, Kinsale, Co. Cork (01); Pennemes, The Netherlands (02).

Design features

- Multi-storey settings where residents on upper floors have access to useable, high quality and meaningful outdoor spaces (i.e. roof terraces).

The household model has benefits for supporting quality of life on upper floors as these automatically provide the key social spaces and more natural level of interaction as part of the household. However, it is important that any households located on upper floors provide high quality outdoor space as part of the setting.

11: 3-D rendered image of the living areas in the proposed Grangegorman Care Neighbourhood, Dublin 7, Dublin[3]

Design features

- The setting adopts a multi-floor household model where households on all floors have access to outdoor terraces

Refer to Section 3 for more information on outdoor spaces.

Universal Design Guidance

- Residents on all floors should have access to usable and meaningful outdoor space. This can take the form of roof terraces or balconies.
- In existing multi-storey settings, consider how balconies or roof terraces can be retrofitted to provide residents with access to outdoor space on upper floors.
- Where this is not possible consider how existing windows can be altered to provide a 'Juliet balcony' or a 'balconet'. This is when a railing or balustrade is fitted to the outside of a full-length window or door on an upper floor, to take the form of a balcony.
- Access to upper floors for visitors should be facilitated through spacious and well-ventilated circulation routes, ideally without having to travel through parts of the main building frequently used by residents. This may involve an external stairs, or some form of balcony access.

[3] https://mcculloughmulvin.com/projects/grangegorman-residential-care-neighbourhodd; and https://www.toddarch.com/projects/grangegorman/

2.3 Entering and exiting the setting

12: Farnogue Residential Healthcare Unit, Wexford, Co Wexford.

Design features

- Entrance canopy and recessed entrance areas creates a clear, legible, sheltered, and welcoming entry to the setting.

Entrance area

Design considerations and awareness

Depending on the layout of the setting and its configuration in terms of household units, the setting may have one main central entrance, or a number of entrances serving clusters of households, or individual households. In all cases, each of these entrances is the main access point to that part of the setting and should be carefully considered in the context of this section.

The building entrance to the LTRC setting should be in a logical place that is consistent with a person's expectations as they approach the setting. The entrance should be legible, visible and recognisable from a distance, accessible, and create a sense of welcome for all users.

Depending on the site layout or building location, the entrance area may directly adjoin the public realm or may be set back from the boundary. Either way, the entrance area should be designed to create a strong sense of place and identity helping to integrate and connect the setting with the community.

In some settings, the area outside the main entrance will be an interesting and pleasant place for a resident to sit and watch the 'comings and goings'. The entrance area is often a key meeting point for residents, family members, visitors and staff as they enter and exit. Therefore, the entrance area should be treated as a social space and part of the LTRC extended environment that supports activity and social interaction (See 'Exiting and Safety Issues' at the end of this section).

A covered entrance area will provide shelter to people as they enter and leave the building. Entrance canopies and covered areas adjacent to the entrance will also make the entrance more visible and easier to identify.

All pedestrian paths leading to the entrance should be flat, even, well drained and sufficiently wide to account for people using wheelchairs and other mobility devices. Wayfinding signage should identify the entrance area on approach and clearly indicate the entrance door location. Good levels of evenly distributed artificial lighting should be provided at the entrance area, while consideration should be given to seating within this space (as part of or separate from the covered waiting area).

For information on UD entrance areas refer to the Building for Everyone – Booklet 2 (2014), and Universal Design Guidelines for Homes in Ireland - Section 2 (2015).

Universal Design Guidance

- The entrance is an important part of the setting and should be designed to create a welcoming space that helps create a strong relationship and connection with the community.
- Place the main entrance in a logical location that is clearly visible on arrival.
- Where possible, treat the entrance area as a social space that supports social interaction between residents, family members, visitors, and staff.
- Provide clear wayfinding signage to locate the entrance area and the main door.
- Provide good levels of evenly distributed artificial lighting to ensure the space is comfortable to use, and accessible in low light conditions.
- Provide seating with back and arm rests somewhere that is visible and easily reached.
- Install sufficient bicycle stands close to the entrance.

Entrance doors, access controls and thresholds

Design considerations and awareness

The main entrance door marks the threshold to the setting and is used every day by all users as they enter and leave the building. The clear opening must be wide enough to accommodate large, motorized wheelchairs and other mobility devices. The door itself must be accessible and easily operated by a person with sensory, physical or cognitive difficulties. Given the potential challenges involved when an older person is trying to open a door, or when someone is operating a wheelchair, consideration should be given to automatically operated doors that are linked to the intercom or security system.

The door should be highlighted using colour or tonal contrast so that it stands out from the background or from adjacent properties. All door furniture including door handles, or locks should be intuitive and easy to use. Push button access controls or intercoms should be easily located, within reach, and easily operated by all users.

Glazed door panels provide visibility and a good visual link between the interior and exterior. Where CCTV cameras are used, they should be discreet and not reduce accessibility.

13: St Joseph's Centre Shankill, Shankill, Dublin 18, Dublin.

Design features

- Entrance canopy and recessed entrance areas create a legible and sheltered entry.
- Level access threshold and automatic sliding doors create easy access for children's buggies and wheeled mobility devices.
- Sliding doors are a different colour to the overall doorframe to make them visually stand out and more legible.

For information on UD entrance doors refer to the Building for Everyone – Booklet 2 (2014), and Universal Design Guidelines for Homes in Ireland - Section 2 (2015).

Universal Design Guidance

- Provide a door with a clear opening width of at least 1000mm to accommodate large, motorised wheelchairs and other mobility devices, and to allow sufficient room for person who is being assisted as they walk through the door.
- In some cases, double door or cat-and-kitten door (door-and-a-half) will be beneficial. In these situations, the primary opening leaf should achieve a clear minimum opening width of 1000mm.
- The door must be accessible and easily operated by a person with sensory, physical or cognitive difficulties.
- Provide glazing panels within the door to facilitate a visual link between inside and outside.
- Use colour or tonal contrast (to the surrounding walls or window frames) on the door leaf to make it more visible and easily identified on arrival.
- Intercoms, keypad or card swipe controls should be easily located, within reach, and easily operated by all users.

- Provide a level threshold with a maximum upstand of 10mm. All threshold edges should be chamfered or pencil-rounded to ensure they do not catch on wheels or provide a trip hazard.
- Ensure there is not a significant colour or tonal contrast at the door threshold between the exterior and the interior as this may cause visual or spatial difficulties for some people who may have sensory, physical or cognitive difficulties.

Exiting and safety issues

Design considerations and awareness

If a setting is provided with safe outdoor space, then this will enable a resident to exit the setting and remain within a safe and controlled environment. In this regard, it has been shown that the freedom to open a door and independently go outside may reduce agitation, frustration and wandering behaviour among people with dementia, as opposed to being simply confronted by a locked door.

Where the exit of the setting leads to an open space or unsupervised space, such as the wider site or a street or road, then this may cause concern for certain residents and will have to be managed through supervision. Technology may help in this regard, including CCTV, door sensors that alert staff to a door being opened, or monitoring technology consisting of a resident bracelet to alert a staff member when certain people leave the setting (Section 4 for further information on technology).

2.4 Internal circulation

14: Anam Cara Housing with Care, Fold Housing, Glasnevin Dublin 11, Dublin.

Design features

- Spacious circulation with good natural light, views to outside, and comfortable seating.
- Good colour contrast between floors and walls, and clearly visible handrails for support.

Entrance lobbies, reception and waiting areas

15. Glenaulin Nursing Home, Chapelizod, Dublin 20, Dublin.

Design Features

- The character of the existing house has been preserved to create a warm and welcoming entrance lobby for residents, family members, and other visitors.

Design considerations and awareness

The provision and layout of entrance lobbies, receptions, and wating areas will depend on the model and size of the setting. In some cases, these areas will be housed as part of a central common area, while in others they may form part of a cluster of households. If provided, these areas should create a welcoming and homely environment and provide adequate space for people as they enter or leave the setting.

Some settings will need to provide a draught lobby for additional shelter and security. Such lobbies can be difficult to use due to the presence of two sets of doors, a difficulty that can be exacerbated when a person is using a wheelchair or being assisted by another person. To alleviate these difficulties, the draught lobby should be large enough to handle wheelchairs and other mobility devices. It should also be well lit to ensure safe and comfortable use.

16. Peamount Healthcare, Newcastle, Co. Dublin.

Design Features

- Two views of the main entrance draft showing a spacious and bright space.

The lobby and reception area should avoid flooring with strong patterns or abrupt colour/tonal changes as these can cause issues for people with sensory, physical or cognitive difficulties. Provide non-slip, plain coloured, matt floor finishes to reduce glare or shine in brightly lit conditions. Glazed doors and side panels to the lobby provide visibility and a good visual link between inside and outside and help with supervision and security.

If a reception desk is provided, this should be easily identifiable and facing the lobby or the entrance area and should be clearly visible upon entry. A lower section and a knee recess will provide accessibility for wheelchair users or people of smaller stature.

17. The Village Residence, Drogheda, Co. Louth.

Design Features

- Bright and welcoming lobby and reception with gentle lighting and a well-located reception desk.
- A lower desk section and a knee recess area provide accessibility for wheelchair users or people of smaller stature.

If waiting areas are provided, they should have ample comfortable seating with back and arm rests, while also allowing sufficient room for wheelchair users. An accessible toilet should be located close to the waiting area and should be clearly visible and identifiable for all users. Provide wayfinding signage where required.

For information on UD lobbies, reception, and waiting areas refer to the Building for Everyone – Booklet 2 (2014); and for specific guidance on reception desks and counters see Building for Everyone – Booklet 6 (2014).

Universal Design Guidance

- Where a lobby is essential for security or internal environment reasons (i.e. to prevent draughts or heat loss), then ensure it is sufficiently large enough for wheelchairs, other mobility devices, and assisted walking.

- Provide a spacious reception area to handle multiple wheelchairs, while also bearing in mind, other mobility aids, and assisted walking.
- Place the reception desk in a logical, visible, and easily accessible location.
- Provide a lower section to the reception desk with knee recess for wheelchair users.
- If the reception area is large enough provide seating with back and arm rests.
- Locate an accessible toilet within easy reach of the waiting area.
- Provide good levels of evenly distributed artificial lighting with the provision of task lighting to highlight certain areas such as the reception or toilet door.
- Use non-slip, non-glare materials that avoid strong patterns or sharp tonal or colour contrast.

Horizontal circulation

Design considerations and awareness

The overall circulation strategy has been discussed earlier in 'Building layout and overall form'. This section highlighted the household unit as a key building block and identified that the grouping and connection of these blocks, and the resulting overall configuration (e.g. courtyard or linear layout) has a major impact on the overall horizontal circulation for the entire setting.

For instance, a number of the desk-based case settings use outdoor routes as the primary circulation within the setting The Hogeweyk employs a combination of courtyard routes and elevated walkways at first floor level. Enclosed corridors are only used for secondary circulation within individual buildings or households. Practically all circulation in Eunice Seddon consists of covered walkways that connect all parts of the setting and these routes double as casual and incidental social and activity spaces (See Appendix B Case Studies for more information on these settings).

18. De Hogeweyk, Weesp, the Netherlands [63]https://hogeweyk.dementiavillage.com/).

Design Features

- Combination of courtyard routes (01) and elevated walkways at first floor level (02).

Separate to the main site or overall setting circulation, the household approach as described in these guidelines typically has its own entrance and independent circulation area that only serves a small number of residents. This configuration has benefits for both quality of life and infection control.

For all circulation it is important to provide calm, spacious, uncluttered routes. These routes must be wide enough to facilitate bed evacuations in the event of an emergency. The legibility of these routes will be enhanced by visual cues including identifiable spaces, features, connections to external spaces and views, artwork, planting, lighting, fittings, and furniture. This legibility will be supported by clear wayfinding using signage, colour coding, images, or other visual cues to help create an easily navigated setting.

Where possible, circular or looped circulation routes that pass through or run adjacent to key social areas may help provide continuous walking routes that return a person to their starting point. This arrangement also avoids dead-ends and any associated disorientation or anxiety.

For projects that involve the construction of new circulation areas or the adaptation of existing corridors, additional width for social distancing, increased natural ventilation through openable windows or increased mechanical ventilation should be considered as part of an infection control and resilience approach.

The length of circulation routes such as corridors should be kept to a minimum and double-loaded corridors (accommodation on both sides) should be avoided as much as possible as these can create a monotonous and institutional environment. Where long corridors or lengthy circulation distances already exist, accessible and comfortable seating should be provided at appropriate intervals. If there is sufficient space, these seating areas can become small social areas marked with a distinct colour, artwork, or planting.

Circulation routes on all levels should provide easy access to safe, comfortable and attractive outdoor areas. The circulation in these outdoor areas should employ the same level of accessibility, ease of understanding, and usability employed in the interior.

19: Ofalia House, Edenderry, Co. Offaly.

Design Features

- Corridor with direct views to garden and small social area with comfortable seating.
- Area is bright, spacious, uncluttered, and well-lit, with homely finishes, comfortable seating, and a clear view to the outside.

For information on UD horizontal circulation refer to the Building for Everyone – Booklet 2 (2014); and Universal Design Guidelines for Homes in Ireland - Section 2 (2015).

For information on UD dementia inclusive horizontal circulation refer to the Universal Design Guidelines: Dementia Friendly Dwellings for People with Dementia, their Families, and Carers – Section 2 (2015).

For information fire safety and horizontal circulation refer to HIQA -Fire Safety Handbook: A guide for providers and staff of designated centres (Version 1.2 — March 2025 and any subsequent updates).

Universal Design Guidance

- Provide calm, spacious, uncluttered circulation routes articulated by visual clues including identifiable spaces, features, connections to external spaces and views, artwork, planting, lighting, fittings, and furniture. These will be supported by clear wayfinding using signage, colour coding, images, or other visual cues to help create a more easily navigated setting.
- Ensure that the circulation routes are wide enough to facilitate bed evacuations in the event of an emergency.
- Where possible, a circular or looped circulation route, that passes through the common areas, may be appropriate as this provides continuous walking routes that return a person to their starting point. This arrangement also avoids dead-ends and any associated disorientation or anxiety.
- Wide, single-loaded corridors are beneficial in terms of access and allow for social distancing during periods of restriction.
- The ability to easily create one-way circulation systems is helpful in the context of infection control.
- Locating key spaces, i.e., storage rooms, administrative space/office, and living room, close together cuts down on walking time and enable better staff supervision.
- Provide spacious dedicated circulation systems for separation between clean, semi-clean, and contaminated zones where possible.
- Carefully consider the location and number of lifts and staircases as part of the overall layout and zoning to provide additional circulation capacity, and possibly separate routes for visitors or service personnel.
- Ensure circulation routes on all levels provide easy access to safe, comfortable and attractive outdoor areas.

Vertical circulation: Stairs

Design considerations and awareness

The safety of all users is paramount when locating and designing stairs in LTRC settings. However, many people will have used stairs on a daily basis, whether this is at home or out and about in the community, and they offer a familiar and easily understood way of travelling from one floor level to another for a mobile person. Walking up and down stairs also provides exercise, represents an activity of daily living, and may help preserve skills and strength.

20: Farnogue Community Nursing Unit, Wexford.

Design Features

- Well-lit main stairs in clearly visible location.
- Generous stairs width and half-landing area.

Conversely, stairs can also present a major safety hazard for many older people, particularly for people living with dementia, and should be designed and managed with caution. In many settings the stairwell and lift are adjacent and are accessed by shared secure doors openable only by swipe card or similar.

21: Newtownpark House, Blackrock, Co. Dublin.

Design Features

- Protective gate to the top of the stairs to prevent someone from falling down the stairs.

In terms of detailed design, the clear width of a stairs, which is measured between handrails, will depend on the location of the setting and the number of users. Ideally, the clear width should be a minimum of 1200mm. The total rise of a single flight should be no more than

1800mm and contain no more than 12 steps. Winders such as those in a spiral staircase or tapered steps are not suitable in an LTRC setting as they can create a sense of insecurity and confusion for many users.

Contrasting colours between the steps of the staircase and the staircase frame and walls can help a person with sensory, physical or cognitive challenges to identify steps and changes in level or gradient, thereby simplifying the visual environment, which is beneficial for people with vision difficulties. Lighting is very important on internal stairs so that they can be used safely.

For information on UD vertical circulation refer to the Building for Everyone – Booklet 2 (2014); and Universal Design Guidelines for Homes in Ireland - Section 2 (2015).

For information on UD dementia inclusive vertical circulation refer to the Universal Design Guidelines: Dementia Friendly Dwellings for People with Dementia, their Families, and Carers – Section 2 (2015).

For information on fire safety and vertical circulation refer to HIQA -Fire Safety Handbook: A guide for providers and staff of designated centres (Version 1.2 — March 2025 and any subsequent updates), and Technical Guidance Document B 2024, Fire Safety – Volume 1, Buildings other than Dwelling Houses.

Note: All of the above also apply to lifts as covered in the next section.

Universal Design Guidance

- The stairwell should be in an obvious location and clearly visible from main circulation area.
- The clear width of the stairs, which is measured between handrails, should be a minimum of 1200mm.
- The total rise of a single flight should be no more than 1800mm and contain no more than 12 steps.
- Steps should have a rise between 150-180mm (height) and a going (depth) between 300-450mm.
- Use colour contrast between the steps and the walls to highlight stairs.
- Be aware that certain hazard-warning surfaces may be disorientating for people with sensory, physical or cognitive difficulties and should therefore be given careful consideration.
- Provide colour contrasting nosing strips to the top and bottom of the flight of stairs to highlight the changes in level.
- In addition to the above, providing colour contrasting nosing strips to all steps will provide greater legibility for the user.
- Use a handrail design that will be familiar to most people and will be consistent with their expectations.
- Install an additional handrail between 600 – 750mm above the pitch line for children and people of smaller stature.

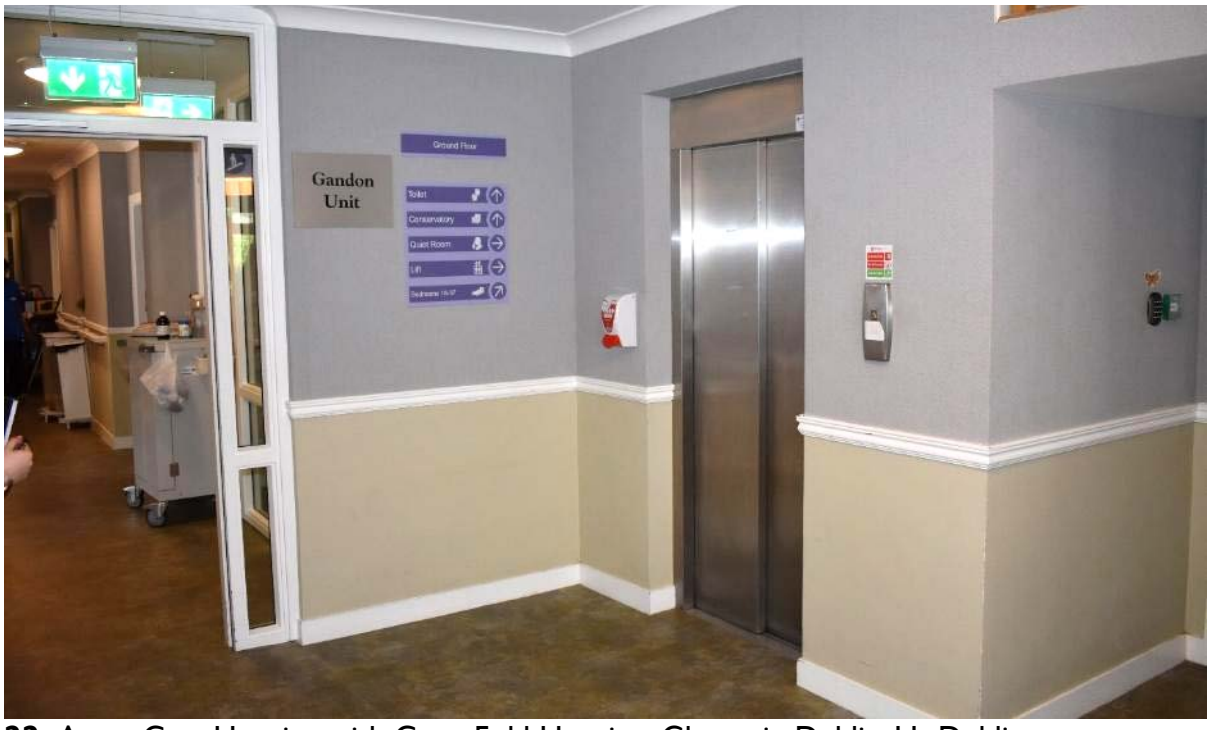
- Handrails should contrast in colour or tone to the background walls so that they are clearly visible and easily identified.
- Handrails must extend 300mm beyond the end of the stairs.
- Where possible, use some feature to clearly indicate where a handrail ends, as this will help provide a better signal to the user that the handrail is ending and thus give them a chance to adjust accordingly.
- Ensure high levels of even, natural and artificial lighting on the stairs to help those with visual difficulties.

Vertical circulation: Passenger lifts

Design considerations and awareness

The provision of passenger lifts in multi-storey LTRC settings is vital for all users of the building, including residents or visitors with mobility difficulties and those using wheeled mobility devices, staff carrying heavy loads, and people delivering equipment.

As discussed earlier, in many settings the stairwell and lift areas can only be accessed by secure doors openable by swipe card or similar. In other cases, the lift car can be freely accessed but the lift can only be operated through contactless smart cards, or similar. The use of lifts in The Hogeweyk provides an interesting example - large automatically operated lifts in addition to stairs are used to facilitate resident movement between the ground and first floor. With just the choice of two floors, the risk and implications for a resident with dementia choosing the wrong floor is minimal, and therefore most residents are capable of using the lift independently.



22: Anam Cara Housing with Care, Fold Housing, Glasnevin Dublin 11, Dublin.

Design Features

- Passenger lift in visible location accompanied by legible wayfinding signage

The provision of larger passenger lifts (e.g. 13 person lifts) should be considered given the need to facilitate large mobility devices, bulky care equipment, and beds. Standard passenger

lifts cannot be used in an emergency; however, the provision of evacuation lifts is becoming more common in LTRC due to the challenges of evacuating residents with high care needs and increasing requirements for bed evacuations (For more information on evacuation lifts see Technical Guidance Document B 2024, Fire Safety – Volume 1, Buildings other than Dwelling Houses).

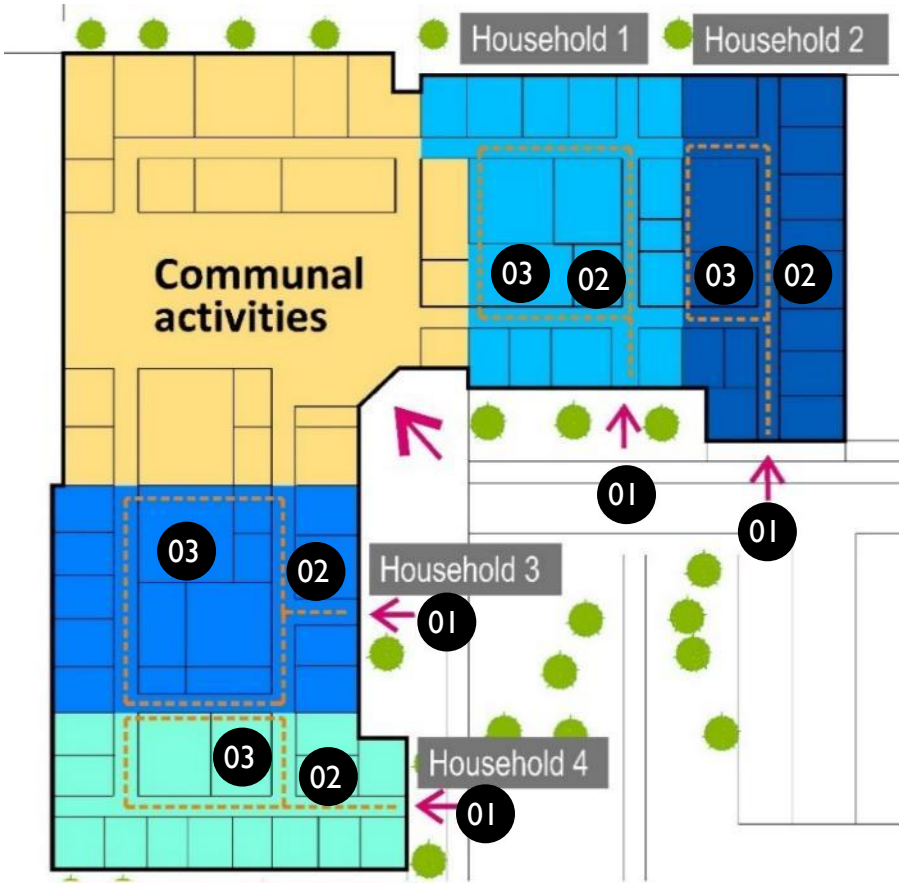
In terms of infection control, passenger lifts can present a challenge due to the confined space of a typical lift and the limited opportunities for ventilation. While there is very limited infection control research related to passenger lifts in LTRC settings, one hospital-based study [64] that examined ways to reduce aerosol transmission of COVID-19 in hospital elevators. recommended the following:

- Leaving elevator doors open for a longer period.
- Increasing the elevator's mechanical ventilation capacity. Current standards for the air change rate by mechanical ventilation in hospital elevators may vary between 6 and 20 air changes per hour. If we assume that aerosol particles will be continuously mixed with supply air, without considering particle deposition, resuspension, and stagnant flows, an air change rate of 10 times per hour implies a 100-fold reduction in aerosol particles in about 28 minutes. From the experiments, a 100-fold reduction in 24-30 minutes (cf. ACH = 10) with closed doors was found, 12-18 minutes during operation, and 3-5 minutes with open doors. The ventilation inside all studied elevators in idle position automatically shut off after 1-2 minutes; this can easily be prolonged by reprogramming the ventilation control software.
- Reversing the flow direction of the ventilator, and creating a unidirectional downflow of fresh (e.g., HEPA filtered) air from the ceiling towards the floor of the elevator cabin, is a measure that is standard in most operating rooms to create and maintain an airborne microbial free environment.

Universal Design Guidance

- Lifts should be positioned in a logical and visible location close to the main entrance.
- The lift carriage should be sized to facilitate wheelchairs, mobility devices and the bulky equipment that is needed in an LTRC setting along with equipment sometimes required for residents with physical, sensory, or cognitive difficulties. Larger lifts will be beneficial for staff carrying heavy loads, or outside contractors bringing in equipment or supplies.
- For multi-level buildings consider the provision of evacuation lifts.
- Lift controls should be in a logical location and visible upon approach, easily reached and easily used.
- The passenger car interior should avoid excessive mirrors or highly polished surfaces as these can be disorientating for people with visual and cognitive impairments.
- Floor finishes should be non-slip and avoid strong patterns or abrupt colour or tonal changes, particularly at the threshold to the lifts.
- Provide increased ventilation for lifts by leaving elevator doors open for a longer period, increasing the lift's mechanical ventilation capacity, reversing the flow direction of the ventilator, and creating a unidirectional downflow of fresh (e.g., HEPA filtered) air from the ceiling towards the floor of the elevator cabin.

Technical sketch 3: Indicative building layout showing access and circulation within a reconfigured setting



1. Households with independent entrances for visitors and staff. This indicative layout demonstrates how someone can enter a household without having to travel through a main entrance or circulation area. Residents may need to pass through sections of an adjacent household to get to the main common area, but during a pandemic they can stay within their own household or access the communal area by going outside and entering through the main front entrance. In these circumstances, consider covered external routes or sheltered walkways.
2. Dedicated circulation routes for each household mean that visitors and staff can restrict their movement to one household. (See note 1 above for outline of resident movement and access to the central communal area).
3. Depending on the layout and internal space available, a bedroom may need to be taken over or a building extension may need to be added to create an adequate living and dining space for each household.

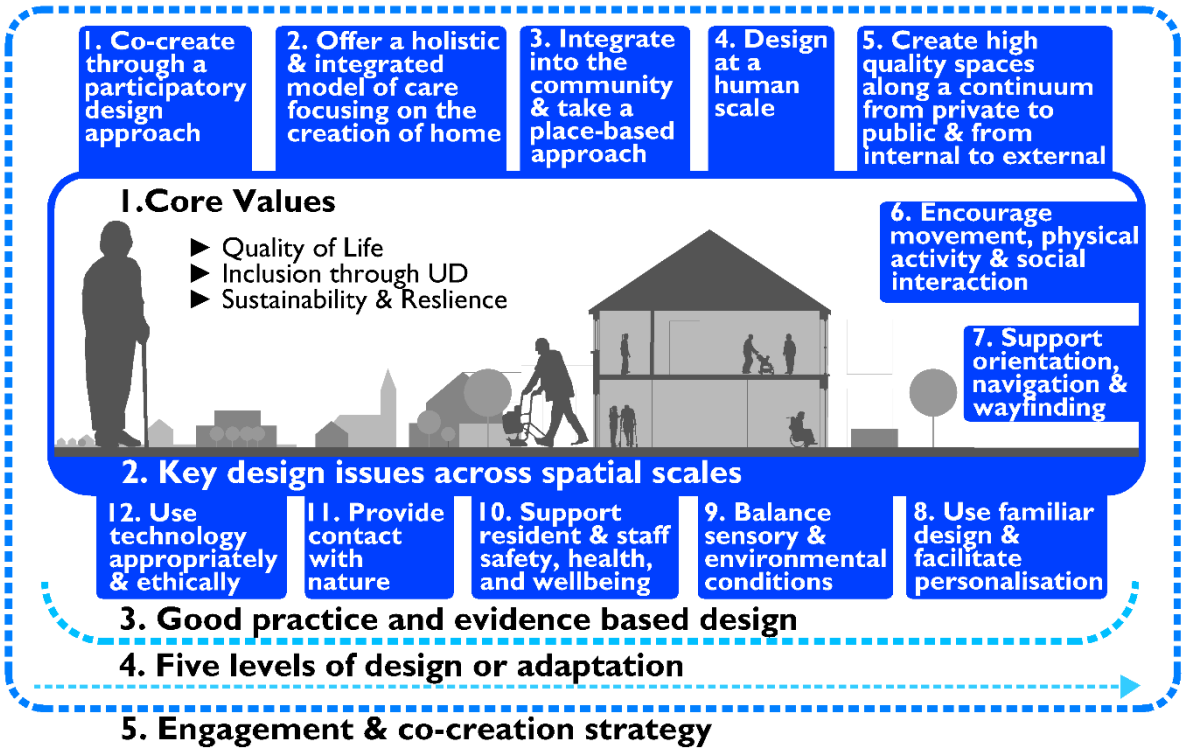
03 Key Internal and external spaces

01. The Village Residence, Drogheda, Co. Louth.

Key internal and external spaces: Overall Design Issues

The living rooms, dining areas, kitchen, bathrooms, gardens and other key internal and external spaces are where residents spend most of their time and where they live their lives. Therefore, the range, quality, and integration of these internal and external spaces is critical for quality of life and inclusion in LTRC. The design and operation of these spaces also determine the sustainability and resilience of these settings.

In this regard, consider how the Overall Planning and Design Framework can be used to underpin high quality design of key internal and external LTRC spaces. Consider: how the **Core Values** (quality of life, universal design, and sustainability and resilience) and **Key Design Issues** (see more on this below) can be used to inform decisions regarding these spaces; what **Good Practice** or case studies can be drawn on; how the **Levels of Design** can be incorporated into the design of either new-build or adaptations to existing internal and external spaces; and, finally, how the **Engagement and Co-creation** strategy can be used to include key stakeholders in the decision process at this spatial scale.



Considering how the **12 Key Design Issues** may relate to the different spatial scales, it is important to think about these issues in the context of key internal and external spaces:

1. **Co-create through a participatory design approach:** Have the relevant key stakeholders been involved in the design of the key internal and external spaces?
2. **Offer a holistic and integrated model of care that focusses on the creation of home:** Do these internal and external spaces fully support the care model and do they help create a home?
3. **Integrate into the community and take a place-based approach:** Do these spaces help integrate the setting into the community through the provision of welcoming facilities that can be shared with the community? Does the design of these spaces reflect the local context and take advantage of local qualities and traditional practices?
4. **Design at a human scale:** Do these internal and external spaces help create a setting that has a human scale, is welcoming, and feels domestic as opposed to institutional?
5. **Provide high quality spaces along a continuum from private to public, and from internal to external**: Do these spaces provide a range of high quality public and private areas, and help create a continuum of external and internal spaces? Is there adequate space for large wheelchairs and mobility devices, care assistance, and technological supports, especially in bedrooms, bathrooms, and internal and external living areas?
6. **Encourage movement, physical activity, and social interaction:** Does the layout, design, and management of these spaces promote physical movement, activities of daily living, and social interaction?
7. **Support orientation, navigation, wayfinding:** Are there clear and legible access routes as you approach, enter, and move through these spaces? Do these spaces enhance orientation to time and place?
8. **Use familiar design and facilitate personalisation**: Do these spaces use familiar and domestic style features? Can some of these spaces be easily personalised for residents through furniture, colour, artwork, or planting?
9. **Provide balanced sensory and environmental conditions:** Does these spaces help create calm and peaceful conditions, while also capturing positive stimuli such as wildlife, or pleasant sights and sounds from outside?
10. **Support resident and staff safety, health, and wellbeing**: Does the design of these spaces maintain good air quality, and avoid excessive noise and other sensory over-stimulation? Do these spaces create healthy conditions that encourage physical activity and social interaction?
11. **Provide contact with nature:** Do these spaces create opportunities for contact with nature both inside and outside the setting?
12. **Use technology appropriately and ethically**: Is there technology that enhances the performance of these spaces in terms of environmental conditions or therapeutic activities. Is technology carefully used to support comfort, safety and security, and independence, while also respecting dignity and privacy?

3.1 Key internal and external spaces: Overview

02: St. Mary's Residential Centre, Castleblaney, Co. Monaghan.

Design Features

- Bright living area with comfortable seating and fireplace create a homely environment.

Design considerations and awareness

A typical LTRC setting will contain a wide range of spaces including bedrooms, ensuite bathrooms, sitting rooms or living spaces, dining areas, kitchens, and shared/visitor toilets, along with specialised spaces such as therapy and treatment rooms. A setting may also include more public facing areas such as a café, community rooms, or similar. In addition, an LTRC will also consist of various external spaces in the form of surrounding green areas or entrance areas, and main resident gardens or courtyards. It may also contain smaller external areas such as dedicated household gardens, or individual external areas adjoining bedrooms such as terraces or balconies.

The household unit is discussed as a key building block throughout these guidelines, and it will have a number of the spaces mentioned above. These spaces are discussed in Section 3.2 - Household model, general layout and main features. The design considerations and guidance related to these spaces can be used when designing or adapting a household. However, they can also be used more generally for the design of spaces that are not specifically part of household, for instance in a more traditional model, or other alternative model beyond the household approach.

Many of the key spaces mentioned above are discussed in Section 3.2 and Sections 3.3. to 3.8.

For more information on UD design and range of common spaces that may be found in LTRC refer to Building for Everyone – Booklet 6 and 7 (2014).

3.2 Teaghlach model: The household general layout and main features

03: CareBright, Bruff, Co. Limerick.

Design Features

- An open and welcoming space with piano, décor, and house pet create an inviting space and homely atmosphere.

Design considerations and awareness

The household model has been discussed in the Introduction and Section 2; as part of this section, the 'Teaghlach' household model as developed by the HSE has also been outlined. This Teaghlach model is now described in this section in greater detail.

As per most household models the Teaghlach model subdivides the setting into smaller units or households, where each household is relatively self-contained, and houses a maximum of 12 residents (this number will vary depending on model and geographic location). Households typically contain single ensuite bedrooms, a central living, dining, and kitchen area, and a dedicated outdoor space. Households will often have their own front door. This can also be accessed from a common area, sometimes shared with other adjacent households. They could be single storey detached units or occupy different floors in a multi-level building.

Appendix 3 - The Teaghlach Model in the 2016 HSE Design Brief: 10 Bed Dementia Specific Household - Residential Care Centre, outlines this Teaghlach household approach in detail (See Text box 01 below).

Text box 01

Aim of the Teaghlach Model

The aim of the Teaghlach (household) Model is to facilitate resident-centred and ultimately resident-directed care supported by self-managed teams, in order to allow older people to receive ongoing care services as required in a setting which supports them to live to their fullest, enjoying multiple social, psychological and spiritual aspects of life and meaningful connections with others while receiving all the physical care they require.

Principles

- The Teaghlach (household) is each person's home.
- The people who live there direct their own lives individually and collectively.
- The people who live there are served by highly valued, decentralised, self-managed teams that have responsibility and authority.
- All systems, including treatments, exist to support and serve the older person within the context of their life pursuits.
- The physical building and all its amenities are designed to be a true home.

Places to flourish: a pattern based approach to foster change in residential care [65] is a resource that builds on the principles of the Teaghlach model and was designed to support organisations embarking on change programmes in LTRC (See Text box 02 below).

Text box 02

The Teaghlach Model

The kitchen/dining room becomes the central focus of the household. Every effort is made to include residents in the rituals of preparing and eating meals. For some this may include assisting in the preparation of meals, for others it may about the sensory and social experience associated with family mealtimes.

The nurses' station no longer exists as the change in culture requires a different approach to 'observation'; designated space for confidential work is provided in a less overt way. Residents make most choices about their daily routines, ranging from when to get up, what to wear, what activities to be involved in, and how they want to participate in managing their health care.

Each household has dedicated staff who work almost exclusively in a single household in order to develop and foster relationships between staff, residents and residents' families.

The household team is non-hierarchical and is accountable for all outcomes within the household. This team is supported by a mentoring group (Senior Managers e.g. Director of Nursing) who support the groups to develop skills such as team decision making, conflict resolution, delegation and other leadership competencies and provide support through the provision of resources.

The households are the living quarters of the residents and residents receive care services within the household to support them to live with dignity and optimal independence. Other services are accessed as they would be if the residents were living in houses in the community.

It should be noted Appendix 3 and the Places to flourish document mention a household size of between 6 and 16 residents. However, both these documents are from a few years back and it is now recommended that households should consist of a maximum of 12 residents.

The individual key spaces that make up the 'Teaghlach' household model are discussed in the following Sections 3.3. to 3.8.

3.3 Bedrooms

04: The Village Residence, Drogheda, Co. Louth.

Design Features

- Bright and spacious bedroom, with good manoeuvring space, and clear views to outside.
- Side window that can be opened to allow ventilation, while external louvres minimise glare and also provide safety and security.
- Ceiling mounted hoist to help transfer someone with limited mobility out of bed.

Design considerations and awareness

Research indicates that single bedrooms with ensuite bathrooms are preferred by residents and families [66]. These are linked to quality of life, and are a key part of the household model, helping to create a homely setting, enable privacy, dignity, personalisation, facilitate private visits from families and friends, and consultations with healthcare staff. It is also important to note that this level of privacy could become isolating for some residents without consideration of a model of care that prioritises social connection and meaningful activity at its core. LTRC residents may spend a lot of their time in their bedrooms, therefore the quality of these rooms is vital.

Easy access to the room and good manoeuvring space within the room are important, particularly for those using wheelchairs and other mobility devices. Extra wide doors (e.g. a clear effective door width of minimum 850 mm) or the installation of a door-and- half or a

'Cat and Kitten' type door will help with accessibility. A clear manoeuvring space/clear turning circle of a minimum 1800mm diameter, should be provided within the room. The bedroom is central to daily activities such as dressing, walking and grooming. The design of the bedroom can provide supports for these activities by making sure that the room is properly lit, and that wardrobes or dressing tables and their contents are fully visible and usable. Some people with dementia will experience sleep disturbance, resulting in insomnia and nocturnal restlessness. In this regard, the bedroom must be designed to firstly help a person get a good night's sleep, and secondly to provide a safe environment at night when a person wakes up to use the toilet, or to move around in their room.

Some household models provide greater freedom for residents in terms of bringing their own furniture, or rearranging furniture with the room. This supports 'personalisation' through personal possessions that remind people of their past, such as an old chair, or dresser from their home [67]. To enable this personalisation, Marshall [68] and others argue that bedrooms must be large enough to facilitate these personal belongings. For example, bedside lockers, dressers, or similar that display personal belongings will help with familiarity and personalisation.

Some settings provide a generous bedroom space with a flexible layout that can be reconfigured to create a separate seating area with some sense of separation from the bed. This helps with autonomy and independence and also helps create a better environment for the hosting of visitors.

05: CareBright, Bruff, Co. Limerick.

Design Features

- Spacious room size and moveable room divider facilitating different room configurations. Divider directly at the foot of the bed (01) or against the wall (02).

Single rooms improve infection control, and can be used to isolate confirmed or suspected cases of COVID-19. The advantages of single rooms with ensuite bathrooms is shown in a Canadian study by Brown et al. [69] who found that shared bedrooms and bathrooms in nursing homes are associated with larger and deadlier COVID-19 outbreaks.

Given the diversity of care needs, the progressively high levels of care required in many settings, and the aspiration to support individual residents as their care needs evolve, consideration should be given to the provision (or adaptability for future provision) of wall or ceiling mounted hoists to assist in the movement of residents from their bed and assist in transfer to the bathroom. In this regard, and to provide flexibility in terms of medical care, consideration should be given to the installation of an integrated gas supply system in the headwall of each bedroom to provide connections for various gases such as oxygen, if required.

06: St. Brendan's Community Nursing Unit, Loughrea, Co. Galway.

Design Features

- Well-lit room with good manoeuvring space to the side and front of the bed.
- No window frame or transom at eye-level, which provides an unobstructed view outside.
- Integrated gas supply system in the headwall provides connections for various gases such as oxygen.

The spatial relationship between main bedroom space and the ensuite should be carefully considered. Views to the toilet door, a short walking distance, handrails for support, good lighting (especially at night) and the use of ceiling mounted lifts and hoists, will all help in creating a more supportive environment.

If possible, access to a safe private outdoor space or balcony will greatly improve the experience for the resident, visitor, and staff. This space should have a level threshold and be clearly visible from the room.

07: CareBright, Bruff, County Limerick.

Design Features

- Each bedroom has direct access (01) to a small outdoor private area (02).

08: Peamount Healthcare, Newcastle, Co. Dublin.

Design Features

- Bedrooms on ground floor are provided with terraces, while bedrooms on the first floor have balconies

Finally, in line with the design of all LTRC spaces, colour and tonal contrast will help residents to distinguish walls from floors, and to highlight doors or objects where you want to attract attention. Floor finishes should be consistent and uniform in colour, while good levels of evenly distributed natural and artificial light will help those with visual difficulties.

Note: Given the increasing complexity and care requirements of residents, adequate floor area and storage is vital in terms of larger wheelchairs and mobility devices, furniture, care assistance, and appropriate technological supports.

For information regarding all aspects of UD bedroom design refer to the Universal Design Guidelines for Homes in Ireland - Section 3 (2015).

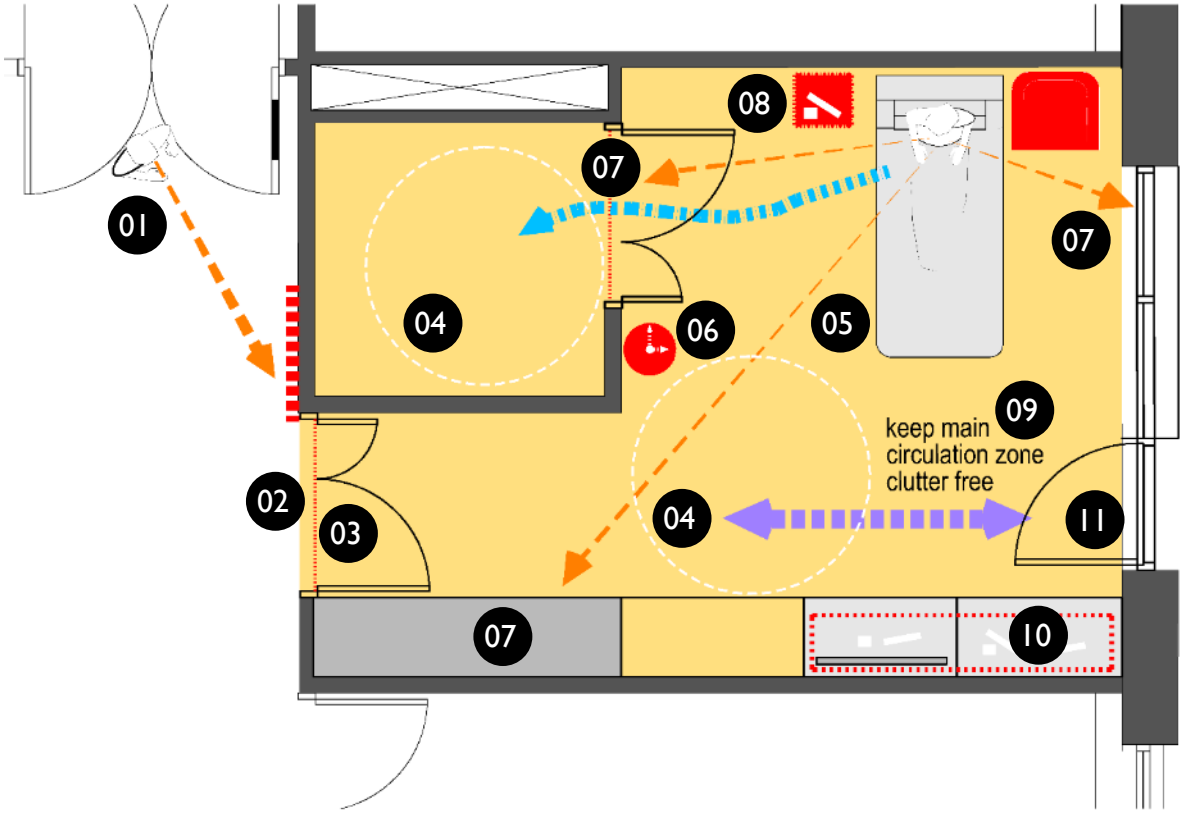
For information on UD dementia inclusive bedrooms refer to the Universal Design Guidelines: Dementia Friendly Dwellings for People with Dementia, their Families, and Carers (2015).

Universal Design Guidance

- Locate bedrooms away from sources of external and internal noise to create a calm and relaxing space.
- Ensure that internal and external walls, ceilings, floors, or windows have sufficient acoustic insulation to mitigate airborne and impact sounds from external and adjacent internal spaces.
- Provide spacious single bedrooms with a private ensuite bathroom/shower room for all residents.
- Rooms should be large enough to provide spaces for care services and spaces for staff disinfection and hand sanitation inside and outside these rooms and related equipment. These facilities should be provided in a discreet and non-institutional fashion in line with the household domestic design.
- Provide extra wide doors (e.g. a clear effective door width of minimum 850 mm) or install door-and-half / 'Cat and Kitten' type doors to provide accessibility for those using wheelchairs and other mobility devices.

- Provide a clear manoeuvring space/clear turning circle of a minimum 1800mm diameter within the room.
- In bedrooms served with an ensuite ensure that there is a direct unimpeded access route from the bed to the door of the ensuite.
- Ideally the WC, or at least the bathroom door, should be visible from the bed to provide visual cues in relation to using the toilet. Ensure the doors are hung so they can open fully to reveal the WC when viewed from the bedroom.
- Minimise or eliminate, where possible, any threshold between the bedroom and the ensuite. While the ensuite floor will often be tiled or finished with linoleum (as opposed to timber or carpet in the bedroom), it is still important to minimise the colour and tonal contrast at the threshold to avoid the appearance of a step.
- Ideally bedrooms should have a small sitting area that would support more autonomy, independence, and flexibility to support family members to spend time with residents and to facilitate the hosting of visitors.
- If space allows, consider providing a tea/coffee station with small fridge to facilitate hosting visitors.
- Wardrobes should be located so they are clearly visible from within the room, especially from the bed. This will provide visual cues about getting dressed, particularly first thing in the morning.
- Consider a locked medicine cabinet in each bedroom to facilitate individualised medications schedules (considered central to the Household model).
- Consider using clear glazed panels in certain sections of the wardrobe doors to support a person to see their clothing as a visual prompt to get dressed. In some cases it may help if a person's clothes for the day are left out in this section the night before.
- Bedrooms should be provided with large windows with good views to the outside. These windows should have a low-level sill to provide views outside when seated or in bed.
- Artificial lighting should be designed to provide high levels of even lighting with spotlights or similar feature lighting, such as down lighters, used to highlight specific areas (e.g. the access route to the bathroom).
- Ideally bedrooms should have direct access to a private outdoor space in the form of a terrace or balcony.
- Good ventilation is critical to reducing the transmission of COVID-19 in indoor spaces; therefore, all bedrooms and bathrooms should be well ventilated to help with infection control and improve air quality.
- Consider the provision of wall or ceiling mounted hoists to assist in the movement of residents from their bed and transfer to the bathroom.
- Consider the installation of an integrated gas supply system in the headwall of each bedroom to provide connections for various gases such as oxygen.
- Provide technology to enhance resident communication with families, to avail of telemedicine such as video consultations, and engage with various therapeutic activities from listening to music to using Virtual Reality or Augmented Reality devices.

Technical sketch 01: Indicative bedroom layout



Note:

1. Use large format signage, colour coding, or images to identify room entry on approach.
2. Use uniform colour flooring and avoid colour or tonal changes at thresholds.
3. Provide extra wide or Cat and Kitten doors.
4. Provide a clear manoeuvring space/clear turning circle of a minimum 1800mm diameter.
5. Provide clear width of minimum 1200 mm to at least one side of the bed (in this case between the bed and the bathroom) and a 900mm clear space on the other two sides.
6. Provide date and time clocks to improve temporal orientation.
7. Provide good views to key spaces such as toilets, wardrobes (ideally with clear glazed panels), and to the outdoors.
8. Provide space beside bed and in the room for personal belongings.
9. Provide uncluttered, safe and comfortable conditions for resident movement within the room. This will be enhanced by continuous handrails that are clearly visible to the resident.
10. Moveable furniture such as shelf units/room dividers can be used to change the room layout.
11. Ideally, each room should have access to an outdoor space such as a terrace or balcony.

3.4 Ensuite bathrooms

09: CareBright, Bruff, Co. Limerick.

Design Features

- Direct access from the bedroom (bedspace) to spacious ensuite bathroom.
- Cat and kitten (i.e. double doors) provide easy access for larger mobility devices or other equipment
- Wet room style bathroom avoids any steps or lips and creates an accessible space for wheeled devices.

An ensuite bathroom is a key resident private space and a major part of their bedroom. Ensuring that these areas are accessible, easily understood, and usable by residents is critical. The ensuite must also provide a supportive environment for family carers and staff. However, as the bathroom may be a difficult room for a person with dementia to interpret due to rapid advances in bathroom design over the years, several dementia specific issues should be reiterated as part of a UD dementia inclusive approach to bathrooms.

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

Easy access to the bathroom from the bedroom is important. In the pervious Section 3.3, the spatial relationship between the two rooms was discussed, including: views to the toilet door, and a short walking distance from the bed.

Extra wide doors (e.g. A clear effective door width of minimum 850 mm) or the installation of a door-and- half or a 'Cat and Kitten' type door will help with accessibility. Ideally the bathroom doors should open outwards so that if someone falls in the bathroom, they will

not block the door. However, double action doors that open both ways can alleviate this situation.
Adequate space within a bathroom for independent use by residents in wheelchairs and other mobility devices is crucial, along with adequate space for assisted showering and toileting by family members and staff. A clear manoeuvring space/clear turning circle of a minimum 1800 mm diameter should be provided within the room.

A level access shower with minimum lips or upstands, or wet room style shower will provide easy access, while vertical grabrails, horizontal grabrails, or drop-down rails will provide support.

Finally, colour and tonal contrast between the walls, floors, and bathroom fittings will help with visual orientation and make key objects like a handbasin or WC more visible. Floor finishes should be consistent and uniform in colour, while good levels of evenly distributed natural and artificial light will help those with visual difficulties.

10. The Village Residence, Drogheda, Co. Louth.

Design Features

- Simple and uncluttered bathroom with good colour contrast between floor and walls, and between the fixtures (e.g. handrails and toilet seat) and the background.

Note: Given the increasing complexity and care requirements of residents, adequate floor area and storage is vital in terms of larger wheelchairs and mobility devices, furniture, care assistance, and appropriate technological supports.

For information regarding all aspects of UD bathroom design refer to the Universal Design Guidelines for Homes in Ireland - Section 3 (2015).

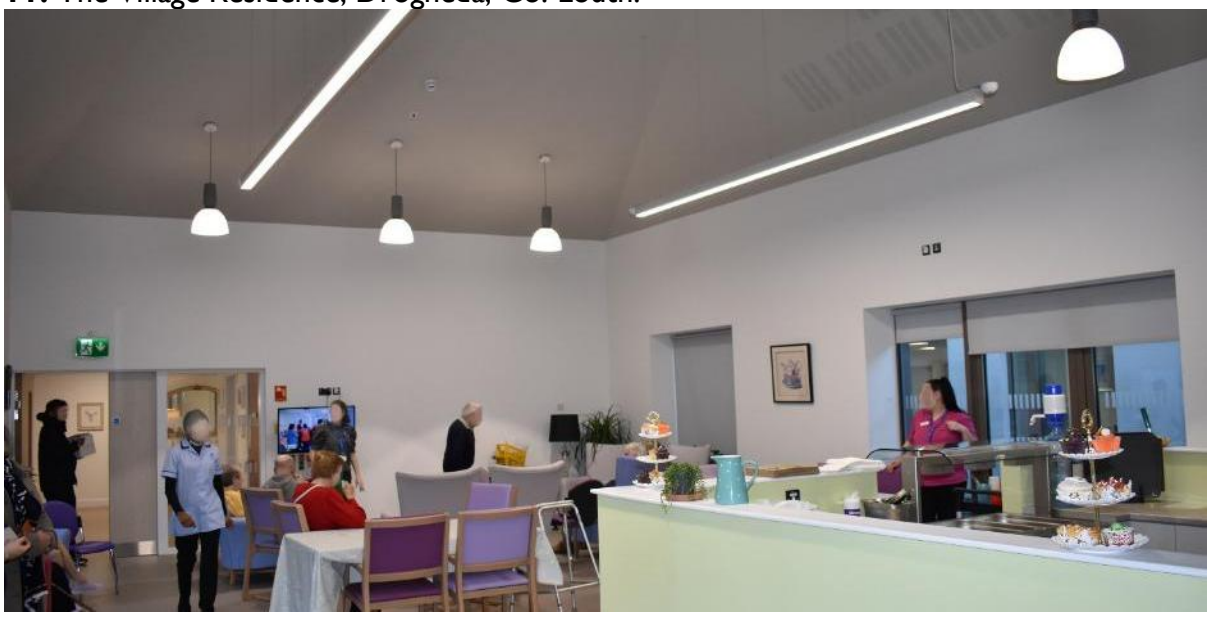
For information on UD dementia inclusive bathroom refer to the Universal Design Guidelines: Dementia Friendly Dwellings for People with Dementia, their Families, and Carers (2015).

Universal Design Guidance

- Locate the entrance to the ensuite bathroom within easy access from the bed area in the bedroom.
- Ideally the WC, or at least the bathroom door, should be visible from the bed to provide visual cues in relation to using the toilet. Ensure the doors are hung so they can open fully to reveal the WC when viewed from the bedroom.
- Provide extra wide doors (e.g. a clear effective door width of minimum 850 mm) or install door-and-half / 'Cat and Kitten' type doors to provide accessibility for those using wheelchairs and other mobility device.
- Provide adequate space within a bathroom for independent use by residents in wheelchairs and other mobility devices, along with adequate space for assisted showering and toileting by family members and staff.
- Provide a clear manoeuvring space/clear turning circle of a minimum 1800 mm diameter, within the room.
- Minimise or eliminate, where possible, any threshold between the bedroom and the ensuite. While the ensuite floor will often be tiled or finished with linoleum (as opposed to timber or carpet in the bedroom), it is still important to minimise the colour and tonal contrast at the threshold to avoid the appearance of a step.
- Provide a level access shower with minimum lips or upstands, or wet room style shower
- Provide vertical grabrails, horizontal grabrails, or drop-down rails for support.
- Artificial lighting should be designed to provide high levels of even lighting with spotlights or similar feature lighting, such as down lighters, used to highlight specific areas (e.g. handbasin).
- Use colour and tonal contrast between the walls, floors, and bathroom fittings to help with visual orientation and make key fittings more visible.
- Floor finishes should be consistent and uniform in colour, non-glare, and non-slip.
- Provide good levels of evenly distributed artificial light to help those with visual difficulties.
- Good ventilation is critical to reducing the transmission of COVID-19 in indoor spaces; therefore, all bathrooms should be well ventilated to help with infection control and improve air quality.

3.5 Common areas: Living rooms, kitchens & dining areas

11: The Village Residence, Drogheda, Co. Louth.



12: The Village Residence, Drogheda, Co. Louth.

Design Features:

- Open and airy space with kitchen and adjacent dining area.
- High ceilings with bright lighting create a sense of openness between these two spaces.
- Large windows allow for ample natural light to flood the space.

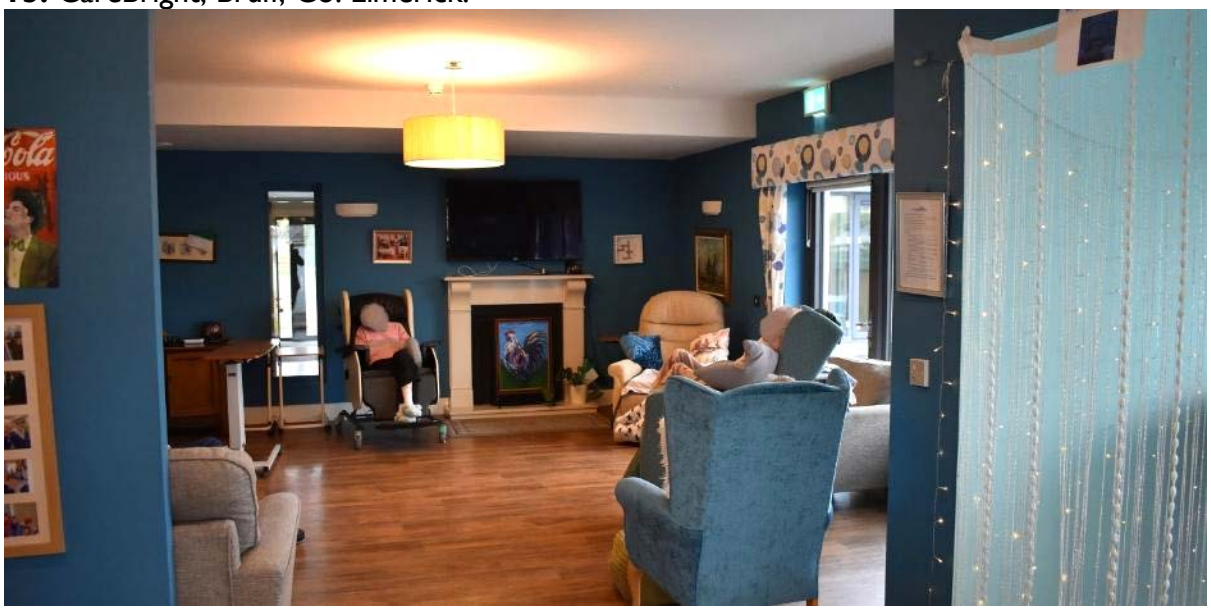
Overall layout and connected spaces

Design considerations and awareness

As mentioned earlier, the kitchen/dining areas are the central focus of the Teaghlach household. Similarly, the 'Green House' model emphasises a central, shared, domestic-scale communal area composed of a living area, and an open kitchen and dining area, collectively called a 'hearth'. Meals are prepared in the open kitchen by caregivers and shared at the common kitchen table. This shared area is typically connected to an enclosed external space

used for activities and socialising. The Teaghlach model and similar household-based settings often adopt the same approach, where an open plan arrangement combines a living room, dining area, kitchen, and dedicated outdoor space.

13: CareBright, Bruff, Co. Limerick.



14: CareBright, Bruff, Co. Limerick.

Design Features

- Image 13 shows a dining and kitchen area, while image 14 above shows a living room. These spaces form an integrated common social area at the heart of the household.

These common areas should be centrally located, easily accessed, and clearly visible from the main household circulation area. Easy access to these rooms and good manoeuvring space are important, particularly for those using wheelchairs and other mobility devices. Extra wide doors (e.g. clear effective door width of minimum 850 mm) or the installation of a door-and- half or a 'Cat and Kitten' type door will help with accessibility. A clear manoeuvring space/clear turning circle of a minimum 1800 mm diameter should be provided within these rooms.

These rooms should maximise views to the outside and daylight through generous windows with low level windowsills. At the same time glare and excessive heat gain should be avoided by internal blinds or similar window dressing, or external shading devices.

One of these spaces, possibly the living room, should lead directly to a safe and enclosed outdoor space that is accessible, easily understood, and usable. (See Section 3.8 for detailed guidance around outdoor space).

15: CareBright, Bruff, Co. Limerick.

Design Features

- Direct access from the common area to a covered outdoor area, which then leads to a larger garden space.

Colour and tonal contrast between walls and floors will help with visual legibility, while colour contrast between objects such and furniture and the background will make these objects more visible. Floor finishes should be consistent and uniform in colour, avoid strong patterns and any abrupt colour or tonal contrasts at thresholds. Good levels of evenly distributed natural and artificial light will help provide a comfortable, safe, and accessible living areas.

Note: Given the increasing complexity and care requirements of residents, adequate floor area and storage is vital in terms of larger wheelchairs and mobility devices, furniture, care assistance, and appropriate technological supports.

Universal Design Guidance

- Locate these areas so that they are centrally located, easily accessed, and clearly visible from the main household circulation area.
- These common areas should be large enough to support comfortable resting and social activities relative to the size of the household, also allowing for visitors, and staff

assistance. The rooms should provide ample area and manoeuvring space for large care home chairs, recliners, motorised wheelchairs and other mobility devices.

- Provide a clear manoeuvring space/clear turning circle of a minimum 1800mm diameter, within these rooms.
- Provide extra wide doors (e.g. a clear effective door width of minimum 850 mm) or install door-and-half / 'Cat and Kitten' type doors to provide accessibility for those using wheelchairs and other mobility devices
- Minimise or eliminate, where possible, any threshold differences between the rooms, or abrupt colour or tonal contrasts at the threshold to avoid the appearance of a step.
- Common areas should be provided with large windows with good views to the outside. These windows should have a low-level sill to provide views outside when seated.
- Artificial lighting should be designed to provide high levels of even lighting with spotlights or similar feature lighting, such as down lighters, used to highlight specific areas (e.g. reading or dining areas).
- The common area should have direct access to a safe, comfortable, and accessible outdoor space. This outdoor space should be clearly visible form inside.
- Good ventilation is critical to reducing the transmission of airborne pathogens in indoor spaces; therefore these common areas should be well ventilated to help with infection control and improve air quality.

Living rooms

Design considerations and awareness

The living area or sitting room may be a fully integrated part of the central common area or may be an adjoining space with some level of separation. Regardless of the layout, the living area should provide a homely and comfortable space. The living area is one of the most important places in the setting, and as a resident may spend a lot of time in the living room, the quality, safety and accessibility of the space is paramount.

Some settings provide non-functioning fireplaces, or electric appliances that give a fire effect to create a hearth in the living area. Many living areas will also have TVs; both the fireplace and TV can be used as a focal point around which seating or coffee tables can be organised to create a domestic environment.

16: St Joseph's Centre Shankill, Shankill, Dublin 18, Dublin.

Design Features:

- Large living room with separate configurations of space for different groups of residents to gather around, or to sit quietly on their own.
- Large window providing views to outside and allowing for high levels of natural light.

17: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Design Features

- Living area with TV and electric 'fire effect' fireplace as a focal point

In other settings the living rooms contain smaller seating nooks, or reading areas where a resident can sit alone, or with a family/staff member. In these situations careful lighting, comfortable seating, furniture and objects of interest, along with planting and framed views to the outside will all contribute to the creation of a sense of place.

18: The Village Residence, Drogheda, Co. Louth.

Design Features

- Intimate seating and reading area with comfortable chairs, reading light, good natural light, and unobstructed views to outside.

While the living area may contain the TV, fireplace, and other points of interest, it is also the space that a resident may often sit and look out the window. In this regard, it is important

that any windows providing a view outside should not have a window frame or transom at seated eye-level that would block the view of a seated person.

19: St. Brendan's CNU, Loughrea, Co. Galway.

Design Features

- Full length glazing and a clear window area at seated eye-level providing good external views.

Universal Design Guidance

In addition to the guidance for Common areas above, consider the following:

- Locate the living room so that it is easily accessed and clearly visible from the main household circulation area, while also integrating it, or adjoining it to the kitchen and dining area.
- The room area and layout should facilitate a range of potential furniture arrangements as part of creating a domestic and homely environment.
- Consider the provision of 'fire effect' appliance to create a fireplace and hearth within the living area.
- Carefully consider how the fireplace or a TV can act as a focal point with the room.
- Examine how the space can facilitate smaller seating nooks, or reading areas where a resident can sit alone, or with a family/staff member.
- For any windows providing a view outside ensure window frame design allows an unobstructed view outside for seated person (i.e. avoid a transom at seated eye-level).

Kitchens

Design considerations and awareness

It is worth reiterating that kitchens and dining areas, and the preparation and eating of food are at the heart of the Teaghlach and household model in general. The goal is to enable residents to experience the sights, smells, sounds, and social rhythms of everyday cooking, while ensuring that critical food safety controls are managed appropriately. A core element of the model is the introduction of domestic and family style routines that enable participation in food preparation and menu planning, more flexible mealtimes, and more spontaneity in relation to individual preference-based food choices. Therefore, the central location of a functioning and domestic style kitchen, alongside a comfortable dining area is really important. Ideally, and where feasible, this kitchen should include counters, kitchen sink, and some basic domestic appliances that residents and family members can use.

20: CareBright, Bruff, Co. Limerick.

Design Features

- Domestic style kitchen providing opportunities for residents (whether on their own or with help) to engage in daily household kitchen activities, including preparing and cooking food, washing dishes, and making a cup of tea.

In this regard, the design of the kitchen should aim at supporting autonomy and choice, activities of daily living and enhancing independence, social interaction, and nutrition. Ideally, and where feasible, this kitchen should include counters, kitchen sink, and some basic domestic appliances that residents and family members can use. The kitchen design should support residents, as far as possible and with the assistance of staff, to continue preparing and cooking food, setting the table, and cleaning up after the meal. Accessibility, usability, and safety are paramount, not only for the resident, but also for staff, family members, or others providing care and support.

There are many examples internationally that demonstrate how this can be done safety and in line with food and fire regulation. There are different models of food preparations depending on the unique circumstances of each facility, for example, whether it is co-located with other services or located on a stand-alone basis within a local community. In some

facilities meals are fully prepared and cooked within the household kitchen; in others they are partially prepared in a central production kitchen and finished within the household. Alternatively, some settings which have central kitchens prepare breakfasts and suppers in the household while retaining the main meal provision from that central kitchen.

Sound absorbing materials, non-glossy finishes, and good visual contrast between the walls, floors, counters, kitchen units, and appliances will all contribute to a calm and easily legible environment. This approach will be reinforced by reducing clutter and ensuring that certain objects and spaces are clearly visible, especially food, crockery, or cooking items, to serve as a reminder and help with activities such as cooking. The use of clear glazed kitchen units which reveal their contents may help in this regard.

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

Risk and safety are obviously major concerns in an LTRC kitchen that is accessible to residents. But it is vital not to undermine a person's independence or remaining skills. Positive risk taking is about striking a balance between safety, autonomy and wellbeing. While bearing this in mind, it will still be necessary to provide safety measures, or in some cases to conceal certain hazards which pose a particular threat. Flexible and adaptable solutions should be considered to deal with different levels of cognitive abilities, or to ensure that these measures do not restrict other members of the household.

Universal Design Guidance

In addition to the guidance for Common areas above, consider the following:

- Locate the kitchen so that it is easily accessed and clearly visible from the main household circulation area, while also integrating it, or adjoining it to the living and dining area.
- The kitchen should have direct access and unobstructed view to the dining area.
- The kitchen should have a minimum 1500mm diameter clear manoeuvring space between any walls or counters. A minimum 1800mm diameter clear manoeuvring space should be provided within the overall space.
- Consider the provision of adjustable height kitchen worktops for a person in a wheelchair. Even if this is only provided in one location it would enable a resident in a wheelchair to partake in at least some kitchen activities. Any adjustable worktops should be capable of providing a clear knee space of 700mm underneath and a height range of between 750mm and 1000mm.
- Use open shelves or wall mounted units with clear gazed panels for maximum visibility to regularly used foodstuff, crockery or cooking utensils.
- Avoid glossy floor, counter or kitchen unit materials that may cause glare.
- Use traditional or familiar fittings with simple controls to enhance usability.
- Install anti-scald taps to sink to prevent scalding.
- Provide easily understood and easily used taps that can be operated with a closed fist or elbow.

- Avoid concealing any of the white goods or other kitchen appliances that residents should have access to behind kitchen unit doors to ensure maximum visibility.
- To avoid accidental misuse, remove potentially hazardous materials or appliances. Lockable units can also be used for this purpose, if necessary.
- Use labels, images, or photos on kitchen unit doors or appliances to remind the residents about their use(s), or what each item contains.
- The kitchen should receive high levels of natural light for maximum visibility. Typically, kitchen windows will benefit from an east and south orientation to capture morning and midday sun.

Dining areas

21: Glenaulin Nursing Home, Chapelizod, Dublin 20, Dublin.

Design Features

- Dining area with large windows providing ample natural light and views to the outdoors.
- Stain-glass windows and painted wall murals preserve the historic nature of the setting.
- Tables provide opportunities for communal dining, while spacing between tables allows ample space for manoeuvring (i.e. wheelchair, rollator).

Design considerations and awareness

As described above the kitchen and dining areas are crucial in the household model. The dining area should be part of the kitchen, or directly adjacent to the kitchen in an open plan arrangement that offers direct access and good views between the spaces. This may be used as an advantage where direct views to cooking activities and cooking smells from the kitchen stimulate appetite by providing visual and olfactory cues. Furthermore, visual connection between a resident and a staff or family member in the kitchen, will help reassure the resident while also helping with supervision.

The dining area should be large enough to support comfortable dining for the number of residents in the household. The dining area should provide ample seating and manoeuvring

space for large care home chairs, recliners, motorised wheelchairs and other mobility devices. Enough space should also be provided for staff and family members to assist the residents during mealtimes.

Various dining table formats can be examined, while height adjustable tables that provide comfortable access for residents in larger or motorised wheelchairs will be important. In the Green House Model 'family style' dining is preferred whereby residents, visitors and perhaps staff eat together at one large table.

22: The Village Residence, Drogheda, Co. Louth.

Design Features

- Adjustable height 'Able Table' that provides additional support for residents

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

Universal Design Guidance

In addition to the guidance for Common areas above, consider the following:

- Locate the dining room so that it is easily accessed and clearly visible from the main household circulation area, while also integrating it, or adjoining it to the kitchen.
- The dining area should have direct access and unobstructed view to the kitchen.
- The dining area should provide ample seating and manoeuvring space for large care home dining chairs, recliners, motorised wheelchairs and other mobility devices. Enough space should be provided for staff and family members to assist the residents during mealtimes.
- Avoid glossy floor or dining table materials that may cause glare.
- Consider height adjustable tables that provide comfortable access for residents in larger or motorised wheelchairs.

- Use well placed light fittings above the dining table to provide adequate illumination and highlight the dining area.

3.6 Dedicated visitor spaces

23: St Joseph's Centre Shankill, Shankill, Dublin 18, Dublin.

Design Features

- Homely furnishings create a calm and soft environment.
- Large window provides views unobstructed views to the outside and allows for ample amount of light to flood the space.

Design considerations and awareness

While common areas are often ideal visiting spaces, the lack of privacy in these areas and the potential noisy nature of such shared spaces may not suit some residents and family members. And while residents may have their own bedroom, and visits can take place there, in some situations and in relation to certain visitors, this may feel like an invasion of a person's privacy.

Using outdoor spaces, particularly covered outdoor spaces such as verandas or garden shelters can also provide valuable visiting space, but the weather or the frailty of a resident may not always permit this.

One of the most challenging aspects of COVID-19 related restrictions in settings was the curtailing of visitors. This was compounded by settings that only had a single, centralised living area to host visitors. During a pandemic the use and sharing of these spaces among multiple visitors and residents was often not feasible. In response to COVID-19 some settings converted offices, storage areas, or other spaces to dedicated visiting rooms for small groups or single visits.

Overall, the COVID-19 pandemic has highlighted the need for more numerous and varied visitor spaces within settings to handle different kinds and numbers of visitors at different

levels of privacy. Again, as with all spaces, these visiting areas should be spacious enough for social distancing and well ventilated.

Universal Design Guidance

- Provide more varied visitor spaces within settings to handle different kinds and numbers of visitors at different levels of privacy. In existing setting, this may involve converting existing rooms, subdividing common areas, or building on new visitor spaces.
- All visitor areas should be spacious enough for social distancing and well ventilated.
- Provide a range of open and sheltered outdoor visiting areas in gardens or courtyards, or on balconies or roof terraces. Within these spaces provide a variety of open areas and seating and covered areas such as verandas or garden shelters (see outdoor space below).

3.7 Staff areas

Design considerations and awareness

The importance of separate staff spaces, break spaces, and changing areas with storage for personal belongings, a toilet, and shower facilities is often overlooked in LTRC settings. Moreover, the toll taken on staff during COVID-19 was exacerbated where settings did not have adequate staff areas. Therefore, settings should provide spacious, well ventilated, and comfortable staff rooms with adequate changing and hygiene facilities. These should have the flexibility to be segregated further as part of a pandemic preparedness approach.

Given the sometimes-demanding nature of LTRC, staff should ideally also have access to respite areas which include access to natural light and nature. These would be particularly important in the context of supporting mental health during a pandemic.

Universal Design Guidance

- Provide spacious, well ventilated, and comfortable staff rooms with adequate changing and hygiene facilities.
- Provide staff respite areas that include access to natural light and nature.

3.8 Outdoor space

24: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Design Features

- Residential setting with ample outdoor space that provides opportunities for residents to walk around, with planting and places to sit, to enjoy and experience the seasons.
- Outdoor space provides opportunities to admire the broader view and fosters a connection with the community.

Design considerations and awareness

In recent years the role of nature and access to outdoor spaces in LTRC settings has received greater attention [70], elsewhere, the role of biophilic design, which supports the innate connection between humans and nature [71], is being promoted as a critical part of aged care design [72].

Access to outdoor space and gardens is crucial to the health and wellbeing of all people, but particularly people with dementia due to the benefits related to socialising [73], therapy [74], as a restorative space [75], and as a break from the "dominant ambiance" of the internal setting [38].

While there are many benefits accruing from access to outdoor space and contact with nature, the following are just some of the main benefits in the LTRC context:

- Respite from the LTRC environment (change of scene) [38].
- Exposure to nature [76].
- Outdoor activities as a form of therapy and as restorative [75].
- A supportive space to engage with others [73].
- Outdoor activities as physical exercise [77].
- Views to the outside world
- Exposure to natural light and fresh air [78].
- Orientation to place and time.

A successful LTRC design will integrate landscape and outdoor spaces with the interior of the setting. Integrating courtyards and fingers of landscape will help to break down the mass of a large building. While integrating landscape in the form of courtyards allows for natural light and ventilation to penetrate deep into the building. Accessible outdoor spaces will provide safe places for residents and visitors to step outside and gain respite or carry out meaningful activities. These spaces can also help to provide meaningful views to the outside from a range of LTRC areas and greatly support orientation and navigation. All these factors work together to soften the LTRC setting and create a more human scale environment.

25: The Village Residence, Drogheda, Co. Louth.

Design features

- Attractive, colourful, and fragrant planting adjacent to the covered entrance walkway.

If the outdoor spaces are well-located, readily accessible, comfortable, and safe, it makes it easier for residents to go outdoors and use these spaces independently. Well-located and accessible outdoor spaces are also important to support staff or family members who are visiting or assisting residents.

Gardens, roof terraces, and balconies: Outdoor space in LTRC can take a number of forms including ground level gardens and courtyards and roof terraces. Providing outdoor

space at the upper levels of multi-storey settings was discussed in Section 2.2. It is important to afford those living above the ground level the same opportunities to access outdoor space as those living on the ground floor.

Covered outdoor areas, verandas and edge spaces: A range of covered outdoor spaces are an important consideration in LTRC. For many older people and people with dementia, outdoor conditions such as wind, rain or strong sunshine can prove challenging. Sometimes the idea or threat of these conditions can act as a disincentive to going outside. Additionally, as we get older our eyes take longer to adjust to sudden changes in light levels, and therefore going from lower internal light levels to intense sunlight can be uncomfortable and disorienting for many people. Finally, the direct movement from inside to outside, or from a quiet internal environment to an active external environment, where for instance, a group activity is taking place, can prove disconcerting for some people and may prevent someone from using the garden.

The construction of covered outdoor space adjacent to the building, or a veranda can alleviate some of these challenges. These edge spaces mediate the relationship between inside and outside, and temper the environmental conditions of natural light, wind, rain, and sound, thereby softening the transition experience between the two spaces. The mediating influence of edge spaces can be harnessed and tuned to the sensory, physical and cognitive needs of a person with dementia. Edge spaces and sheltered external in-between spaces can enable a person to 'preview' the external weather conditions or social activity that may be taking place outside before committing to going outside. These transition spaces also allow a person's eye to adjust to outside lighting levels [79] [80] [81, 82].

Beyond the role of a transition space, these covered outdoor spaces provide a sheltered and shaded seating or social area protected from inclement conditions. Given the mild climate in Ireland these spaces could be used for much of the year if they were designed correctly and if residents or visitors are dressed appropriately.

26: St. Clares Nursing home, Dublin.

Design features

- Residential setting with well-designed outdoor space that provides a combination of large and small social areas, and covered seating area with direct access to the main living room.

Edge spaces can often create areas of interest and interaction, not only between people, but also between people and nature. These qualities of transition or edge spaces can be exploited to draw people outside and help them benefit from being outside and in contact with nature and natural processes.

Outdoor space, health, and infection control: As outlined earlier, outdoor spaces provide significantly safer environments in terms of COVID-19 transmission and are therefore vital for contact with nature, outdoor amenities, and visiting. As discussed previously, Wang [59] advocates for outdoor spaces for physical activities (e.g., walking routes) to promote resident wellbeing. He argues that with good natural ventilation, the outdoor environments may be developed into safe common areas with lower risk of infection.

Ickert et al. [83] highlighted the role of outdoor visits during COVID-19, but noted that these visits require a safe, comfortable physical location where a resident can be brought to meet with family, while maintaining physical distance from others outdoors. From their study, several of the settings had purchased outdoor tents to help facilitate outdoor visits while keeping residents from sun or rain exposure. However, they point out that staff must be facilitated to remain nearby during outdoor visits in the event that residents have difficulty and need to end the visit early or require other assistance from staff.

27: St Joseph's Centre Shankill, Shankill, Dublin 18, Dublin.

Design features

- Sheltered outdoor space, installed during the COVID-19 pandemic, providing opportunities for residents and family members to meet together, while maintaining distance from others who may be using the space.

For information on UD issues regarding outdoor spaces refer to the Building for Everyone – Booklet 7 (2014), and Universal Design Guidelines for Homes in Ireland - Section 3 (2015).

For information on UD dementia inclusive outdoor spaces refer to the Universal Design Guidelines: Dementia Friendly Dwellings for People with Dementia, their Families, and Carers (2015).

Gardens, courtyards and other key outdoor spaces

28: Glenaulin Nursing Home, Chapelizod, Dublin 20, Dublin.

Design Features

- Outdoor space with seating and a view of the river, and other natural surroundings.
- Wheelchair-accessible, with enough space to manoeuvre and move about, supporting social activities and connection to nature.

Design considerations and awareness

As outlined above, outdoor space and landscape can be integrated into the LTRC setting in a number of ways. This section focuses on gardens and courtyards that are typically accessed directly from the main LTRC circulation area, or through common areas at the centre of household units. While these outdoor spaces may be dedicated to different users or have varying levels of public or semi-private access, the design considerations and issues outlined below are largely applicable to most circumstances [84].

Location, approach and entry and exit: The key outdoor space must be located in close proximity to its intended users, adjacent to the household common areas, or within easy access of the main circulation area. The wayfinding strategy should provide clear directions to the garden, and it should be clearly visible as you approach from common areas or circulation. The entrance should be identifiable and highlighted using signage, colour, graphics, or images. There should be a level threshold with no sudden colour or tonal changes, and access doors should be accessible, easily operated and understood. If possible, a single-entry/exit door should be provided as this acts as landmark to make returning indoors easier.

Garden layout and circulation: Overall, the layout of the garden should be legible and easily navigated. A circular or looped path will provide a continuous walking route that returns a person to their starting point. This arrangement also avoids a dead-end and the exit-seeking behaviour or confusion that a dead-end can sometimes instil. Where feasible, the whole garden should be visible from inside for observation and safety purposes. The provision of handrails, lean-rails, and seating in strategic locations throughout the garden will provide support and wayfinding. The materials and finishes to the paths and patio areas should provide safe and comfortable walking surfaces.

Where an enclosed garden is required for security or safety reasons, it is important that

the boundary is unobtrusive and well screened with planting. Areas where you want residents or visitors to go should be clearly highlighted to attract attention. Emergency exits or service gates or doors should be disguised through planting, or by blending these elements into the background using colour or materials.

Social, activity, and resting areas: Raised flower beds, accessible planters, potting tables and clotheslines will enable activities for people with physical, sensory or cognitive impairments. Level, open areas constructed of nonslip and non-reflective surfaces will provide opportunities for one-to-one and group activities. Ideally, the garden should provide a range of seating areas and seating types to accommodate the needs of a diversity of people in the garden. A variety of sheltered and more open seating areas will offer a choice of experiences and exposure to the elements, depending on the weather conditions.

Planting and garden objects: Planting should be chosen to provide multi-sensory experiences and opportunities to reminisce. Colourful and fragrant planting can be used as part of wayfinding by providing distinct visual landmarks and aromas. Planting can also be used to reinforce spatial and temporal orientation by including local and native species that strengthen the sense of place and offer cues as to the time of year through seasonal flowers or foliage. It is also important to avoid toxic plants or those that might present a slip or trip hazard through the shedding of leaves or fruit.

Lighting: Illuminating routes within the garden, along with key features and trees, will make the space more accessible and usable in the evenings. It will also allow it to be viewed from inside when it is dark.

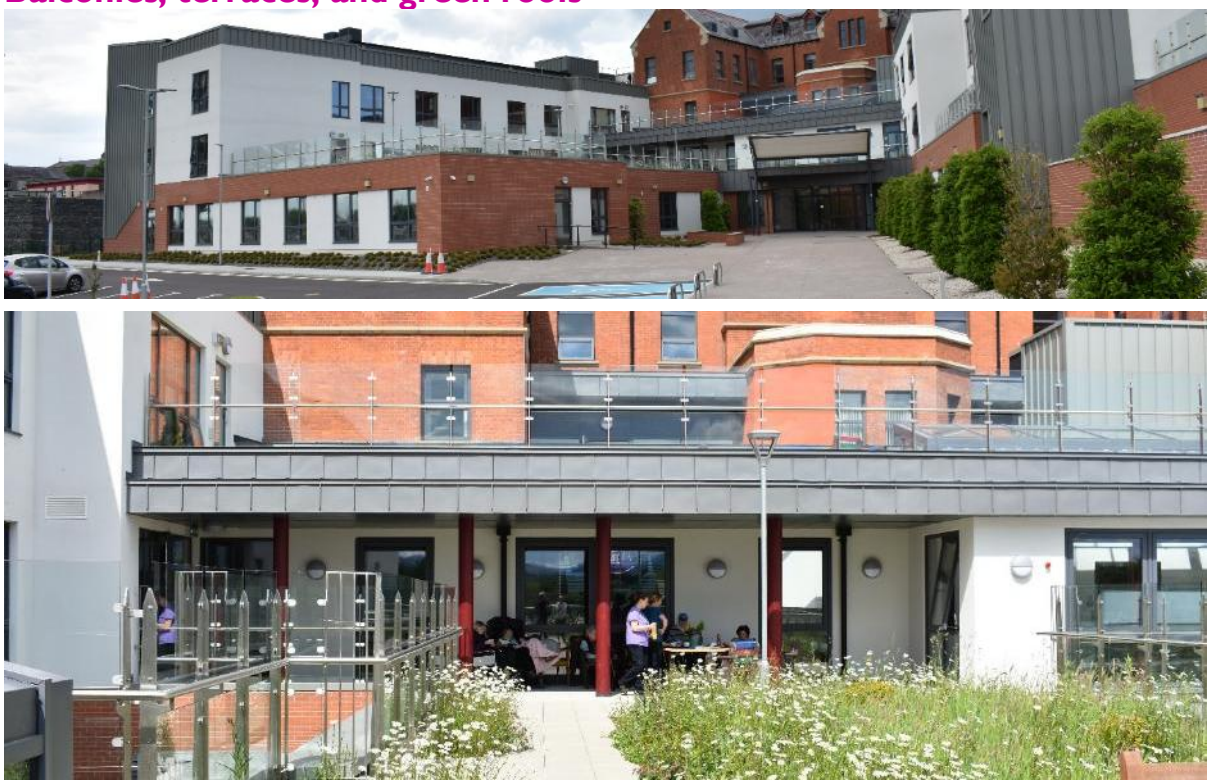
Covered outdoor areas, verandas and edge spaces: The rationale for covered outdoor spaces has been discussed earlier. These cover areas will provide valuable thresholds, important activity and social areas in the garden.

Universal Design Guidance

- The internal and external spaces of the setting must be designed together in an integrated manner in order to create a unified whole and to provide physical and visual access to the outdoor spaces.
- The key outdoor space should be located in close proximity to its intended users, adjacent to the household common areas, or within easy access of main circulation area.
- The entrance should be identifiable and highlighted using signage, colour, or graphics.
- Provide level access from the key internal spaces such as the household common areas or main circulation space through an accessible and easily operated external door.
- Consider the use of a veranda, pergola or similar space to provide a shelter or shaded transitional outdoor space that can enable people to sit outside without full exposure to the weather conditions.
- The layout of the garden should be legible and easily navigated. Ideally, a circular or looped path should provide a continuous walking route that returns a person to their starting point.
- Provide comfortable seating with back and arm rests at regular and short intervals
- Use solid, non-slip, non-reflective material for ground surfaces without strong patterns. Ensure the ground surfaces are suitable for wheelchairs or a person who may shuffle when walking.

- Avoid abrupt changes in ground finishes or junctions between very different materials.
- Provide plants preferred by residents (e.g. roses or lilacs). Use planting that will also clearly illustrate the changing seasons.
- Provide multi-sensory experiences through the use of colourful planting or colourful materials for visual stimulation; fragrant planting for olfactory stimulation; textured objects and plants for tactility; or bubbling water features or similar for aural stimulation.
- Where safety is a major issue, provide an enclosure using trees, tall shrubs or bushes to screen walls or fences. This planting will also lessen the feeling of being overly contained.

Balconies, terraces, and green roofs



29: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Design features

- The top and bottom images show a first-floor roof terrace that provides a combination of large and small social areas, and covered seating area with direct access to the main living room area.

Design considerations and awareness

Balconies and Terraces: Well-designed roof terraces and balconies can provide many of the same benefits that have been outlined in the previous section. Access to fresh air, daylight and views, and contact with nature are very therapeutic for LTRC residents. These spaces become even more important if a resident who is located on an upper floor is unable to travel to or access a ground level garden due to illness, frailty, delirium or infection control (See Section 2.2, Supporting quality of life in a multiple storey building).

While many of the same design issues that apply to ground level outdoor areas are relevant to terraces and balconies, there are a few additional considerations mainly around access, adequate space to carry out meaningful activities, and safety due to height concerns.

30: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Design features

- Roof terrace with extra high glazed balustrades for safety.
- Provides views to the broader community and fosters connection and sense of place.

31: Joe and Helen O'Toole Community Nursing Unit, Tuam, Co. Galway

Design features

- The roof terrace uses full height glazed wall (01) to help shelter the outdoor area

Green roofs: In the context of views and access to nature it is also important to consider ways to green the built environment, especially for those living on upper levels of a building. The creation of green or planted flat roofs may provide an attractive and therapeutic view for residents and visitors on upper floors overlooking the roof. While these roofs will not be physically accessible for residents, they will provide a natural scene and also introduce biodiversity and wildlife close to the building.

32: North West Cancer Centre, Altnagelvin Hospital, Co. Derry, Northern Ireland

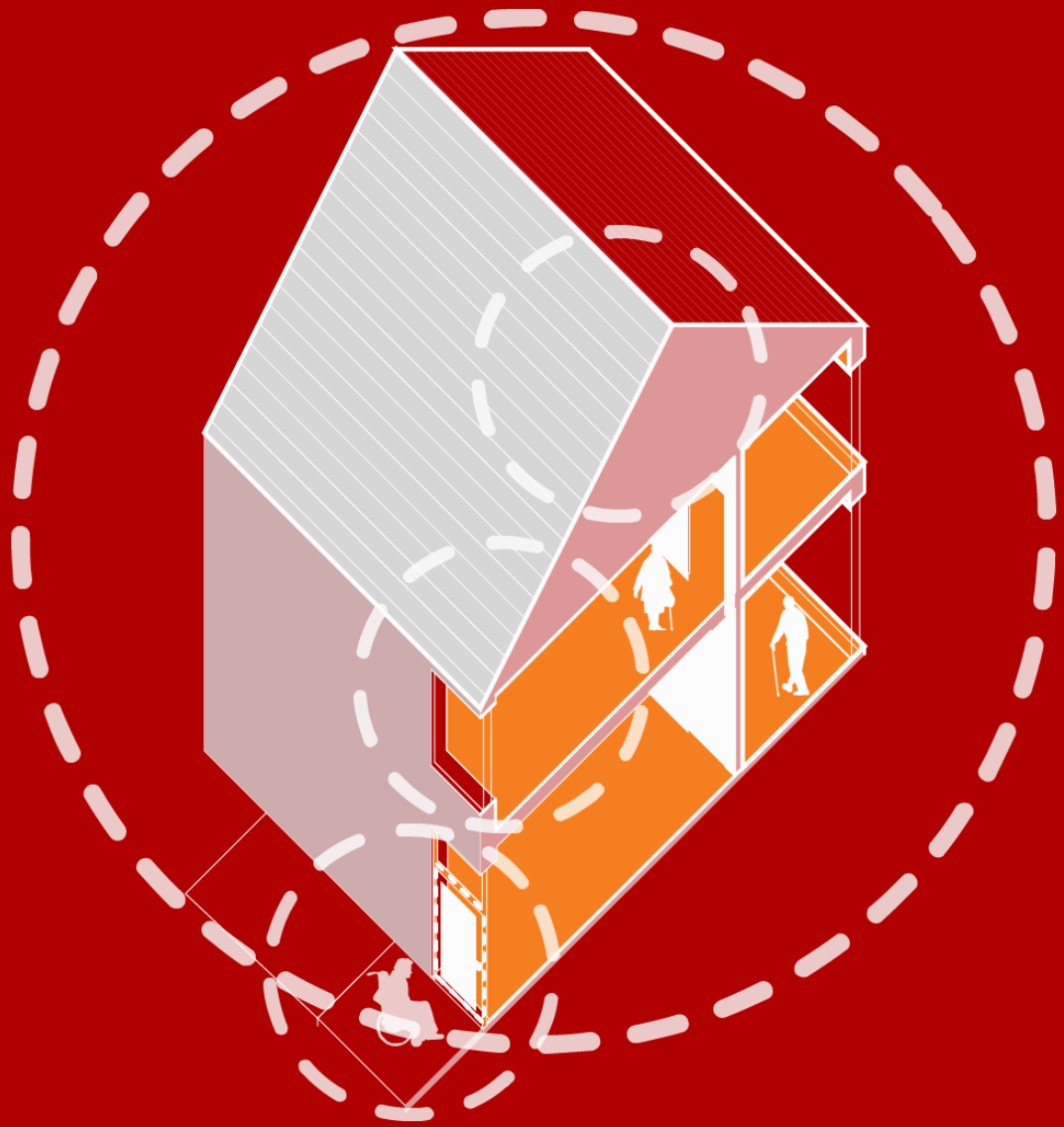
Design features

- The green roof to the building in the background (01) creates pleasant views from any of the rooms that overlook this area.

Universal Design Guidance

- To ensure that a balcony or terrace is fully usable by a resident it must be easily reached and visually accessible from the key internal spaces on the floors that it serves.
- The balcony or terrace should have a level access.
- Balustrades / guardings should have a height of 1100mm and comply with the Building Regulations TGD Part K. Where a risk of residents trying to scale a balustrade is identified, a risk assessment should be completed; if there is a risk of residents standing on a chair or other object, a balustrade height of 1500mm should be considered. In exceptional circumstances, a risk assessment may determine a higher balustrade than 1500mm. Tall balustrades should be designed to avoid appearing as containment screens to residents.
- Consider how flat roof areas that are overlooked by residents (but not necessarily used as roof terraces) can be greened to improve views and contact with nature
- Providing a balcony or terrace with a minimum depth of 1800mm will ensure that it can function as an adequate outdoor space.

04 Internal Environment, Elements and Systems

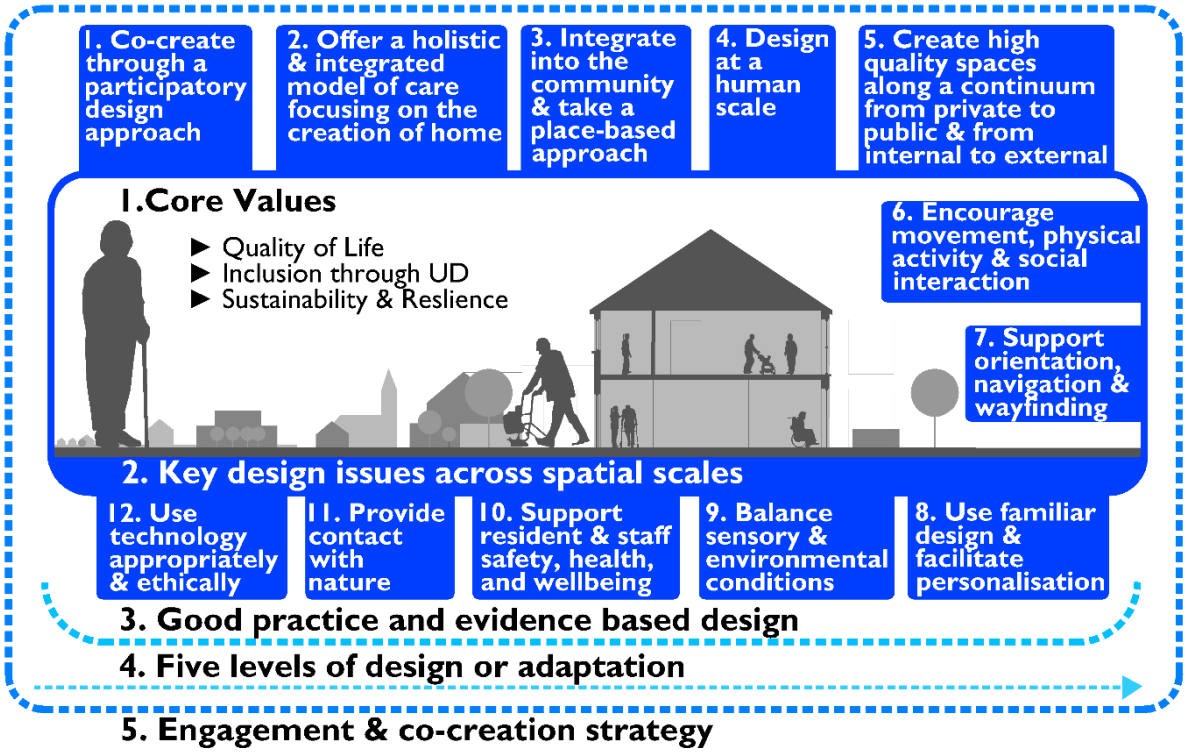


01: Haven Bay Care Centre, Kinsale, Co. Cork.

Internal Environment, Elements & Systems: Overall Design Issues

The internal environment, elements and systems all contribute to a pleasant and homely experience for residents, staff, and visitors to the LTRC setting. Therefore, the range, quality, and integration of these components are critical for quality of life and inclusion in LTRC. The design and operation of elements and systems will also contribute to overall sustainability and resilience of these settings.

In this regard, consider how the Overall Planning and Design Framework can be used to underpin high quality internal environment, elements and systems. Consider: how the **Core Values** (quality of life, UD, and sustainability and resilience) and **Key Design Issues** (see more on this below) can be used to inform decisions regarding the internal environment, elements and systems; what **Good Practice** or case studies can be drawn upon; how the **Levels of Design** can be incorporated into the design of either new-build or adaptations to existing internal environment components, elements and systems; and, finally, how the **Engagement and Co-creation** strategy can be used to include key stakeholders in the decision process at this spatial scale.



Considering how the **12 Key Design Issues** may relate to the different spatial scales, it is important to think about these issues in the context of internal environment, elements and systems:

1. **Co-create through a participatory design approach:** Have the relevant key stakeholders been involved in the design of the internal environment components, elements, and systems?
2. **Offer a holistic and integrated model of care that focusses on the creation of home:** Do these elements and systems fully support the care model and do they help create a home?
3. **Integrate into the community and take a place-based approach:** Do the internal environment, elements and systems help integrate with the community? Does the design of elements and systems reflect the local context and take advantage of local qualities and traditional practices?
4. **Design at a human scale:** Do the internal environment, elements and systems help create a setting that has a human scale, is welcoming, and feels domestic as opposed to institutional?
5. **Create high quality spaces along a continuum from private to public, and from internal to external**: Do internal environment, elements, and systems support or contribute to a range of high quality public and private areas, and help create a continuum of external and internal spaces?
6. **Encourage movement, physical activity, and social interaction:** Do the internal environment, elements, and systems promote physical movement, activities of daily living, and social interaction?
7. **Support orientation, navigation, wayfinding:** Do the internal environment, elements and systems contribute to clear and legible access routes as you approach, enter, and move through the setting? Do these enhance orientation to time and place?
8. **Use familiar design and facilitate personalisation**: Do the elements and systems use familiar and domestic style features? Can some of these elements and systems be easily personalised for residents through furniture, colour, artwork, or planting?
9. **Provide balanced sensory and environmental conditions:** Do the internal environment, elements and systems help create calm and peaceful conditions, while also capturing positive stimuli such as wildlife, or pleasant sights and sounds from outside?
10. **Support resident and staff safety, health, and wellbeing**: Do the internal environment, elements, and systems maintain good air quality, avoid excessive noise and other sensory over stimulation? Do the internal environment, elements, and systems create healthy conditions that encourage physical activity and social interaction?
11. **Provide contact with nature:** Do the internal environment, elements and systems create opportunities for contact with nature both inside and outside the setting?
12. **Use technology appropriately and ethically**: Is there technology that enhances the performance of LTRC settings in terms of environmental conditions or therapeutic activities? Is technology carefully used to support comfort, safety and security, and independence, while also respecting dignity and privacy?

4.1 Internal environment

02: Newtownpark House, Blackrock, Co. Dublin

Design Features

- Homely furnishings create a soft and welcoming environment.
- Natural light shines into the setting from two large windows.

Design considerations and awareness

Considering the amount of time that LTRC residents spend indoors, and their potential sensitivity to environmental conditions, then the internal environment and related issues such as ventilation and air quality, room temperature, and humidity are all crucial for quality of life, health and resilience.

Ventilation and air quality

Design considerations and awareness

Ventilation and air quality are critical to the wellbeing of older people in nursing homes [85]. Openable windows should be used to provide natural ventilation, and fresh air can improve well-being. The overall building and the design of the windows should be carefully considered where high noise level, pollution or dust levels may be a potential problem [86].

03: The Village Residence, Drogheda, Co. Louth.

Design features

- Window side panel that can be fully opened for ventilation while safety/ security is maintained.

As discussed throughout this document, airborne transmission is one of the main infection routes for COVID-19, therefore air quality and ventilation are crucial. Allen and Marr [87] and Wang (59) highlight the importance of ventilation in terms of infection control and set out a number of recommendations. Drawing on these and in consultation with Irish experts[4] in the area, the following prevention strategy for COVID-19 Risks in Nursing Homes is recommended:

- Purge ventilation at intervals to disperse the virus with regular 'airing out' of rooms. Purge ventilation is the introduction of intermittent, rapid ventilation into a habitable room, usually via an openable window or external door, to maintain or restore a pleasant living environment.
- Improve background ventilation to dilute the virus and keep air moving (windows slightly open, doors open for cross ventilation etc.). Wall vents must not be blocked and hit/miss vents kept open.
- Increase humidity with humidifiers and/or bowls of water for evaporation.
- Monitor poor ventilation and low humidity with CO2 (carbon dioxide monitors) to keep CO2 below 600ppm. CO2 build up is a proxy for inadequate ventilation.
- Use portable high-efficiency particulate air (HEPA) filters will help to remove infected aerosols from the air.

[4] This included an interview and correspondence with Orla Hegarty, Assistant Professor, UCD, who we would like to thank for her contribution.

04: Portable HEPA filter.

Universal Design Guidance

- Increase natural ventilation to dilute the virus in the air and help extract it outside. For existing settings this may simply involve opening windows or making sure passive wall vents are open. It may also involve retrofitting openable window sections or installing new passive wall vents.
- Perform purge ventilation at regular intervals to air out the rooms by opening windows and doors to replace any stale air in the room with fresh air. Ensure windows are capable of being easily operated and fully opened when required (while considering safety and security). Ensure window design provides good views to the outside from both a seated and standing position.
- Where existing settings have mechanical ventilation systems, make sure they are fully serviced and operating at optimum capacity. Ensure fresh air is being drawn in from outside; a system that recirculates air from one place to the next may not be safe and may need to be adapted to use fresh air.
- Existing mechanical ventilation systems should be adjusted to extend the operating times to before and after people use the spaces; they should also be reprogrammed to maximise fresh air intake.
- Where possible, fit high-efficiency particulate air (HEPA) filters in the mechanical ventilation system.

- Monitor poor ventilation and low humidity with CO2 (carbon dioxide) monitors to keep CO2 below 600ppm. These are reasonably priced and readily available and can be placed in each room or carried from room to room as part of intermittent monitoring.
- Use portable HEPA (high-efficiency particulate air) filter in the bedrooms of residents with COVID-19 to help remove aerosols from the air. Many domestic type filters are equipped with H13 HEPA filters capable of filtering 99.97% of particles at a clean air delivery rate of 467 m3 per hour on the highest fan speed setting. These portable filters are small-scale freestanding units that can be easily removed when not required.

Room temperature and humidity

Design considerations and awareness

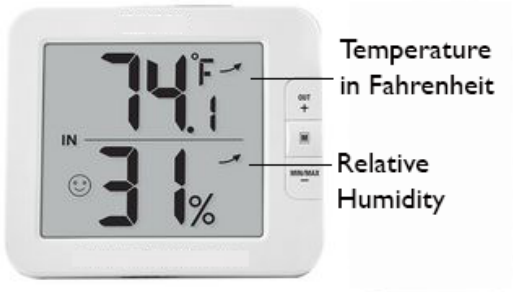
Comfortable temperatures have been shown to be associated with good quality of life amongst LTRC residents. Specifically, high temperatures in the resident's bedroom were associated with lower quality of life [35] [88]

05: The Village Residence, Drogheda, Co. Louth (01) and St Joseph's Centre Shankill, Shankill, Dublin 18, Dublin (02).

Design Features

- Solar blinds to help control excessive solar gain and glare.
- External planting and planted pergolas can help provide shade to external and internal spaces.

Furthermore, studies have found that the spread of pathogens and viruses can be facilitated in cold and dry conditions. An indoor relative humidity between 50 and 60% is suggested to reduce the risk of spreading airborne-infectious diseases.



06: Portable Hygro-Thermometer to measure temperature and humidity.

Universal Design Guidance

- Cold and excessively dry conditions may be problematic in terms of COVID-19; therefore, it is advisable to have warm indoor temperatures (e.g. 18-21 degrees Celsius, depending on the room and the occupant's preference/health) and an indoor relative

humidity at approximately 50%. Relative humidity can be monitored using readily available and economical air quality meters.

- Where humidity is too low it can be increased with portable vaporisers or humidifiers, or by simply bringing bowls of water into the room for evaporation.
- Introducing leafy plants (e.g., Spider or Jade Plants) to a room can also increase humidity through evaporation and evapotranspiration from the plant leaves.
- Increased natural or mechanical ventilation, or portable dehumidifiers, can be used where humidity levels are too high.

See Section 4.6 regarding back-up power for essential services & technology

4.2 Finishes, materials, and fittings

06: St. Mary's Hospital, Castleblayney, Co. Monaghan.

Design Features

- High quality finishes creating a bright, calm and uncluttered environment.

Design considerations and awareness

The colour, tone, reflectance, or surfaces patterns of materials and finishes determine the interior visual quality of the LTRC setting. Through these qualities, materials and finishes affect the visual field and perception of people with dementia. Furthermore, due to symptoms such as agnosia, a person with dementia may experience visual spatial cognition difficulties that lead to problems with depth perception, disorientation, anxiety or discomfort; therefore, the selection of materials and finishes is critical.

Carefully selected materials and finishes will not only ameliorate these difficulties, but can also be used to compensate for visual, memory, or cognitive difficulties. This will help people living with dementia to have a more positive experience in LTRC settings.

Colour of materials and finishes: Despite the great interest that many people have in colour, there is still scant evidence regarding how we perceive colour, or how it affects us on a psychological level. And while it has been established that as people age their vision and

perception of colour changes, there is little research regarding dementia and colour perception. Nevertheless, some studies show that people with Alzheimer's find it more difficult to distinguish between hues in certain parts of the colour spectrum such as blue and green, compared to hues such as yellow and red. It has also been reported that colour schemes that mix hues from opposite sides of the colour wheel, such as the combination of red and green, or yellow and blue, can cause difficulties for people with dementia as these colours can appear mixed or muddy.

It is also worth considering that age-related changes to the eye can cause colours to be perceived with a yellow tint. Therefore, pastel colours may be difficult to distinguish while stronger more vibrant colours may stand out better. In this regard objects or spaces to be highlighted should use bold or accent colours.

07: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Design Features:

- Vibrant and colourful photograph of a natural landscape with a combination of green and orange creates a warm and restful sense/feeling in the circulation space.
- Photograph provides a distinctive landmark making it a destination/wayfinding point for a resident walking in the setting.

Notwithstanding the lack of research data, some established ageing and dementia experts cautiously suggest the following colour implications:

- Blue: a cool colour that is believed to be restful and calming, and that decreases perceived room temperatures and increases the perceived size of a room.
- Green: a cool colour that is believed to be very restful, and as above increases the perceived size of a room. It is also strongly associated with nature.
- Red: a warm colour that is believed to be a stimulating colour that increases perceived room temperatures and decreases the perceived size of a room (the opposite to blue).
- Violet is a colour with no clear psychological implications.
- Orange as a warm colour, that along with green, is strongly associated with nature.
- Yellow as highly visible colour has strong communication qualities. It is believed to be a restful colour that increases perceived room size.

It must be strongly reiterated that the lack of evidence regarding the impact of colour means that the application of colour should be undertaken with caution. It is probably more accurate to say that colour is very subjective, and will be perceived differently depending on a person's age, gender, or culture, and also contextual influences such as fashion, lighting conditions, time of day, and season.

Tonal contrast of materials and finishes: While the impact of colour is debatable, the use of colour and tonal contrast has more defined outcomes. Introducing colour and tonal contrast can be beneficial to people with both dementia and visual difficulties. Colour and tonal contrast can also help compensate for cognitive or spatial perception difficulties. For example, contrasting colours or the use of sharply contrasting tones within the same colour, can help people to distinguish between different surfaces and between surfaces and objects. Contrasting colours can be used to distinguish doors from the surrounding walls and thus facilitate recognition of access points and make the environment easier to negotiate and understand.

08: Newtownpark House, Blackrock, Co. Dublin.

Design Features:

- Subtle use of tonal contrast between the floor, walls and the seating.
- Domestic style flooring with not strong patterns.
- Muted colour, comfortable, and domestic style furniture.

Colour contrast is based on Light Reflectance Value (LRV), which is a measure of the amount of light a colour reflects into the environment and therefore determines the brightness or darkness of a colour. LRV is measured between 0 and 100, where a high LRV results in a bright colour, while a low LRV results in a darker colour. To achieve good LRV contrast between two materials, there should be at least 30 points of a difference on the LRV scale.

When it comes to flooring, colour and tonal contrast may cause problems for people with depth perception difficulties as a sharp contrast in flooring can be perceived as a step or hole in the ground. Similarly, blocks of contrasting colour tone or high contrasting floor patterns may be perceived as objects on the floor; this can cause a person to step over, sidestep, or veer off course, and may result in a fall. In other cases, it has been shown that significant floor colour changes will deter some residents from entering that space. For this reason, best practice is to choose a uniform colour only and use this flooring throughout the setting.

Some people with dementia can mistake one room for another, and in this regard, wayfinding can be improved if rooms are distinctive in their décor. Using distinct colours for specific rooms or fittings may act as a simple visual cue to help with recognition and orientation. While colour-coding can be effective, it is imperative that the information being communicated through colour is consistent throughout the setting. Predictability and order can be achieved in the environment through consistent repetition of colour systems.

Surface reflectance of materials and finishes: Reflections on glossy surfaces can interfere with visual perception and can cause visual discomfort arising from glare. Surface reflection can also be misinterpreted as water spillage, and that a surface is wet or slippery. This might cause an individual to alter their gait when walking over it, or attempt to step over the perceived 'spillage', and this, in turn, may result in a fall. This also applies to any person with a visual difficulty. Therefore, matt finishes are recommended to reduce these reflections and glare. Where glossy surfaces such as tiles are used, careful location of these surfaces adjacent to windows or light fixtures is required to avoid these light sources from producing reflections close to the line of sight.

09: The Village Residence, Drogheda, Co. Louth.

Design Features:

- Matt finishes and a relaxing colour scheme helps creates a calm and restful space.
- Simple finishes that avoid strong patterns.

Floor finishes can also make a difference to visitors, accompanying persons, or staff, who depending on their age or mobility, may be prone to falls.

Surface patterns: Research has found that patterned floor finishes or dark contrasting borders may increase visual-spatial difficulties and present walking problems and falls for

people with dementia. Patterns on floor coverings that represent real life objects can be problematic for some people with dementia and therefore the use of uniform colour is recommended. Bold and repetitive wallpaper patterns and those with real life objects such as flowers can cause fear, restlessness, frustration, delusions and confusion for some people with dementia. It is widely recommended that walls are decorated with plain colours using muted or pastel shades - matt or satin finish paint is recommended as it reduces glare.

Mirrors and highly reflective surfaces: For some people with dementia, mirrors may create confusion if, for example, the person does not realise that the image in the mirror is their own. This can generate fear and may cause adverse reactions. Therefore, it would be useful if the mirrors in certain parts of the setting, can be easily moved, removed completely or covered over. On the other hand, condensation covered mirrors from bathroom steam may also cause problems if a person is unable to see their reflection as expected in the mirror. To combat this, proprietary heated mirror pads, which are simply electrical elements fitted to the back of a mirror, can be installed to keep mirrors steam-free.

Infection control: As discussed in the introduction, the transmission of COVID-19 through surface contact is now considered to be lower risk. Therefore, self-disinfecting surfaces, fittings or furnishings containing materials with antimicrobial properties are not a priority in these guidelines.

Nevertheless, frequent cleaning and disinfection of surfaces may help reduce secondary airborne transmission as well as prevent the spread of other infections. Technological infection controls such as UV germicidal irradiation, and the cleaning of surfaces using vacuums with HEPA filtration should also be considered.

Furthermore, while the benefit of automatic sensor taps, automatic opening doors, and other 'no touch' features may be marginal in terms of COVID-19 infection control, these features have benefits in terms of accessibility for a wide range of setting users.

Finally, finishes, materials, and fittings should strike a balance between being homely, accessible, easily cleaned and easily disinfected. The use of finishes and colour is a critical part of LTRC design in terms of creating a domestic environment and also supporting orientation and wayfinding.

Universal Design Guidance

- Finishes, materials, and fittings should strike a balance between being homely, accessible, easily cleaned and easily disinfected.
- Where colour is needed for increased legibility consider colours in the blue and green area of the colour spectrum, as opposed to yellow and red colours, as these colours may be harder to differentiate for people with dementia.
- Use selective colour and tonal contrast to distinguish one surface from another, or to make certain objects stand out against their background.
- In line with the above, paint skirting boards and door frames a contrasting colour to walls and ceilings to ensure a clear contrast is made between floor and wall finishes.
- Paint doors a contrasting colour to the wall to make them visually stand out from the background. Ensure the door handle and any locks or similar door furniture is finished in a colour that stands out from the door.
- Use selective colour or tonal contrast to highlight handrails, grab rails, light switches, wall mounted fittings and other important objects that need to be visually prominent.

- Avoid sharp colour or tonal contrasts on floor finishes as these may be misinterpreted as an object on the floor or a step. Maintain a similar finish and colour on any one storey, and minimise or eliminate internal door saddles or carpet bars at door thresholds which may be misconstrued as a step.
- Use colour or décor to distinguish one room from another as part of a design strategy to create distinctive spaces.
- Avoid glossy finishes with excessive reflectance. Use material with matt finishes; when choosing paint consider low sheen paints such matt or satin finishes.
- Avoid strong patterns on both floor and wall finishes as these may cause confusion or disorientation.
- Ensure all mirrors can be easily moved, removed or covered over.
- Where condensation on mirrors is causing problems for a person with dementia consider fitting proprietary heated mirror pads to keep mirrors steam free.

4.3 Fit-Out Elements

10: CareBright, Bruff, Co. Limerick.

Design Features

- Cat and Kitten doors to create wider clear openings when required.
- Large pull handle and push plate for easy operation.
- Door hold-open devices keeps fire door open for accessibility but releases them when the fire alarm is triggered.

Doors and windows

Design considerations and awareness

Fit-out elements such as doors, door handles and windows are parts of the setting that a resident will interact with in a very hands-on manner. From using the main entrance front door, down to entering a toilet, or opening a wardrobe or a window, the accessibility, ease of understanding and usability of these elements across all spatial scales of the setting is critical for people with dementia.

11: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Design Features

- Colour contrasting automatic entrance door for ease of access.

While wide door openings, or double doors are common in the more public parts of LTRC settings, these should be considered for more private areas such as bedrooms to maximise accessibility. In some locations the installation of a door-and- half or a 'Cat and Kitten' type door will help in this regard.

12: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Design Features

- Cat and Kitten doors to create wider clear openings when required (01).
- Vision panels with adjustable louvres that can be opened or closed (02).

The windows in the setting control much of the interaction between inside and outside,

not only in terms of views and daylight, but also in terms of sound and thermal insulation. Windows should provide maximum views to the outside, to give a person opportunities to experience positive stimuli such as a summer breeze, bird song, or external activities, while also protecting the occupants from disruptive external noise, solar glare or excessive solar heat gains, or conversely, heat loss. Window sills and transoms should not obscure the view to outside when a person is seated or laying on a bed. Windows should be easily opened by a resident, with appropriate restrictors ensuring their safety.

13: The Village Residence, Drogheda, Co. Louth.

Design Features

- Window sill heights providing good views outside, while an opening side section with external louvres allows residents to open the window without safety or security concerns.

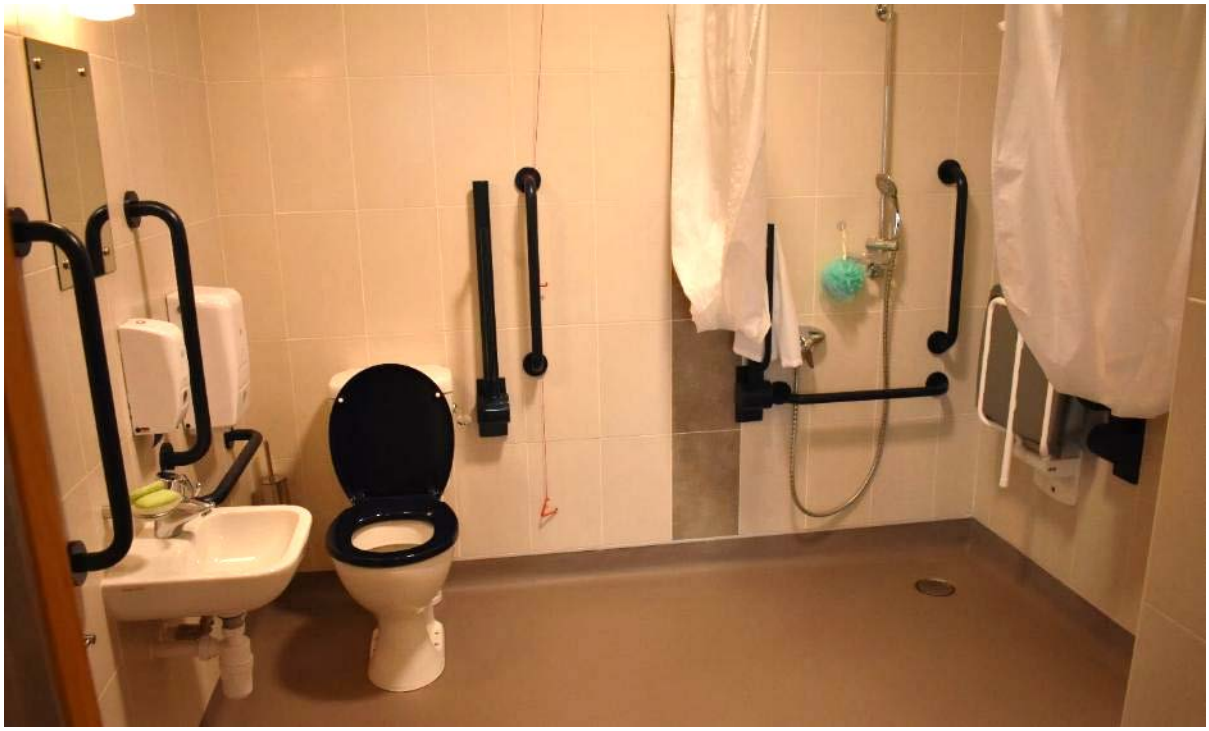
Universal Design Guidance

- Internal doors should be hung so they open against an adjoining wall to allow maximum views to the room from adjacent spaces when the door is open. For non-fire rated doors consider using a door hold-open device to keep the door fully open to maintain visual access.
- Consider using extra wide doors or door-and-a-half (Cat and Kitten doors) to provide maximum physical access and also good visual access.
- Use internal door ironmongery that is intuitive and simple to use and that is familiar to the extent that it is consistent with the resident's expectations around appearance and function.
- Manually operated doors shall have handles which are operable by a closed fist or elbow
- Paint doors a contrasting colour to the wall to make them visually stand out from the background. Ensure the door handle and any locks or similar door furniture is finished in a colour that stands out from the door.
- Ensure that window sill heights and window transoms do not obscure the view to the outside for a person when seated or laying on a bed.
- Provide window systems (including frames and glazing) that minimise glare and sound transmission while also balancing solar heat gains and internal heat losses.

Sanitary fittings

Design considerations and awareness

Bathrooms have been discussed earlier in Section 3. In terms of toilet and bathroom fittings, these should be as non-institutional looking as possible and use recognisable features, and colour contrast effectively. Colour and tonal contrast can be used to distinguish and highlight the objects where you want to draw attention. Fully accessible toilets with a range of supports for people with mobility impairments (i.e. hoists, changing benches, space for carers etc) will be required in certain locations and these should take on board the design considerations outlined above.



14: CareBright, Bruff, Co. Limerick.

Design Features

- Bathroom well provisioned with handrails, grabrails, drop-down shower seat.
- Good colour contrast between all fittings and the background.
- Wet room style shower avoids any steps or lips.

Universal Design Guidance

- Provide a level access shower with minimum lips or upstands, or wet room style shower.
- Provide vertical grabrails, horizontal grabrails, or drop-down rails for support.
- Artificial lighting should be designed to provide high levels of even lighting with spotlights or similar feature lighting, such as down lighters, used to highlight specific areas (e.g. handbasin).
- Use colour and tonal contrast between the walls, floors, and bathroom fittings to help with visual orientation and make key fittings more visible.
- Install anti-scald taps to handbasin to prevent scalding.
- Provide easily understood and easily used taps that can be operated with a closed fist or elbow.

Electrical fittings

Design considerations and awareness

While some LTRC residents may have difficulties with controlling lighting and electrical appliances, supporting somebody to interact with and use such controls can help maintain existing skills, foster/reinforce independence and engage in meaningful activities.

Universal Design Guidance

- Use electrical fittings such as light switches, socket plates, or ventilation controls that are familiar to a person with dementia and intuitive to use.
- Ensure that all switches or controls are placed in a logical location, are clearly visible from within the room, and are finished in a colour that makes them stand out from the background.

Handrails and grab rails

Design considerations and awareness

Providing space and supports for resident mobilisation and activities, including safe and stimulating walking or circulation routes, is critical to quality of life and inclusion. Handrails and grab rails are important to this mobility, and not only provide physical support, but increase confidence and help with wayfinding.

Handrails must be clearly visible; this can be reinforced by using contrasting colours so they visually stand out from the background. High levels of natural and artificial light should optimise the visibility of the handrails.

In addition to corridors and bathrooms, the judicious placement of handrails and grab rails in other locations such as cafes, or garden areas, may be an inexpensive way to increase comfort and safety, and reduce the risk of falls.

15: Mercer's Institute for Successful Ageing (MISA) St James's Hospital, Dublin 8

Design Features

- Good colour contrast between handrail and wall, timber finish, which is more comfortable to the touch.

In retrofit projects where existing handrails do not visually contrast with the background and where it is too expensive to replace them, it may be possible to paint these, or fit them with a coloured cover to achieve the visual contrast required.

Universal Design Guidance

- Use a handrail design that will be familiar to most people and will be consistent with their expectations.
- Use colour and tone so that the handrail stands out clearly from its background.
- Where possible, use some feature to clearly indicate where a handrail ends, as this will help provide a better signal to the user that the handrail is ending and thus give them a chance to adjust accordingly.
- Handrails should be provided on both sides of ramps and steps and should be continuous along the full length of the flight and at intermediate landings.
- Handrails should be positioned with the upper surface 900 to 1000mm above the ramp slope and 900 to 1100mm above landings.

Wardrobes and cupboards

Design considerations and awareness

Ensuring that a person continues engaging in activities of daily living is an important part of maintaining resident skills and health. Providing wardrobes, lockers, storage areas, and cupboards that are accessible, easy to understand and use, will help in this regard. For instance, making sure that certain objects and spaces are clearly visible, especially food, crockery, or cooking items, may serve as a reminder and may help with activities such as cooking and, in turn, improve nutrition. The use of clear glazed kitchen units that reveal their contents may help in this regard. This also applies to wardrobes that enable a person to see their clothes, which might provide a visual cue or prompt to dress themselves.

16: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Design Features

- Kitchenette area with clear glazed cupboards to make things visible, and good colour contrast between the counter tap and background.
- Easily operated kitchen sink tap.

Universal Design Guidance

- Use open shelves or wall mounted units with clear glazed panels for maximum visibility to foodstuff, crockery or cooking utensils.
- Consider using clear glazed panels in certain sections of the wardrobe doors to enable a person to see their clothing as a visual prompt to get dressed. In some cases it may help if a person's clothes for the day are left out in this section the night before.
- Use labels, images, or photos on kitchen unit doors or appliances to remind the occupant about their use(s), or what each item contains.

4.4 Wayfinding, signage and graphics

17: Anam Cara Housing with Care, Fold Housing, Glasnevin Dublin 11, Dublin.

Design Features:

- Consistent style of wayfinding signage used throughout the setting helps make it more recognisable for residents and visitors.
- Clear use of text, symbols and directional arrows to help with navigation.

Short term memory loss associated with dementia can make it difficult to remember the layout of a physical environment, while cognitive difficulties can impair spatial processing resulting in disorientation and anxiety. Consequently, wayfinding is a major part of LTRC design, particularly in the context of increasing resident needs, and must be carefully considered across all spatial scales within the setting [81].

In the context of signage, it is worth bearing in mind that some people with dementia may also find it hard to distinguish one room from another or identify objects, appliances or equipment within rooms. Labelling of rooms or objects with simple text or images can increase legibility by helping a person identify the location and function of certain spaces. Examples include a label with a picture of a toilet outside the bathroom, labels and images on family rooms or dining rooms, or images on kitchen cupboards to indicate what is inside.

Signage location and positioning: The overall locations of the signage must be well considered in terms of aligning with LTRC resident routes and direction of movement. Ageing results in a decline in visual acuity and restricts the upward gaze and therefore signage at too far a distance, or at an excessive height will make it difficult to read certain

signage. In addition to normal ageing impairments, visual difficulties are more prominent among people with dementia. To compound this the perceptual disturbances associated with dementia can affect visual processing and therefore impinge on a person's ability to read and comprehend signage.

Therefore, signage should be in a logical location (consistent with a person's expectations), at a height not too far above eye level, and situated in an uncluttered location with minimum adjacent distractions or clutter (e.g. other non-wayfinding signage, information leaflets). Signage should face the direction of approach to ensure it is clearly visible when required.

Signage Colour, Contrast and Surface Finish: Consistent visuals for each and all categories of signage is the first issue to be considered in terms of signage colour. As discussed previously, research shows that people with Alzheimer's find it more difficult to distinguish between certain parts of the colour spectrum such as blue and green, compared to hues such as yellow and red. It has also been reported that colour schemes that mix hues from opposite sides of the colour wheel, such as the combination of red and green, or yellow and blue, can cause difficulties for people with dementia as these appear muddy, and therefore these combinations should be used with caution.

It is also critical to consider that the contrast between the signboard and the colour of the text is determined by the LRV of each colour. As described earlier, LRV is measured between 0 and 100, where a high LRV results in a bright colour, while a low LRV results in a darker colour. For signage to be legible there must be an LRV contrast of at least 70% between the text and the background colour (e.g. there is an 88% LRV differential between a white background and royal blue text).

Symbols: The use of simple easily understood language and terminology will be reinforced by clearly associated symbols or icons. This provides another navigation cue that strengthens the overall wayfinding approach.

Note: All signage designed in accordance with the HSE Signage Manual are suitable for the visually impaired. In some facilities, it may be necessary and useful to provide signs in Braille and tactile format; these can be provided as separate signs or incorporated in the designs of the standard signs. The latter is recommended as it reduces the number of signs and avoids visual clutter.

Universal Design Guidance

- Where possible, use multiple modes of communication, including both written and pictorial, and multi-sensory cues such as sound, touch and smell to reinforce wayfinding and legibility.
- Ensure that the format and style used for any signage and labels would be familiar to residents including people with dementia.
- Ensure all signage and labels use clear and large font, and images where the font colour or image contrasts with the background colour.
- Use matt or satin finishes for all signage and labelling to avoid glare. Ensure they are very well lit without causing excessive shine or reflection.
- Capitalize the first letter of names and locations with all other letters lowercase.

4.5 Technology

Technology for communication

18: Older woman using a tablet, with support from a family member.

Technology can assist in social networking that enables residents to communicate with friends and family who are not able to visit on a regular basis. Furthermore, considering that the secondary impacts of COVID-19 include isolation, loneliness, stress, and lack of engagement with family and friends, information, and communications technology (ICT) has been promoted as a way to mitigate at least some of these impacts. That said, it is important to acknowledge the shortfalls of ICT when this is the only means of communication / interaction for residents, and their family and friends (i.e. the value and importance of in-person meetings and gatherings).

19: Ballyshannon Community Hospital, Ballyshannon, Co. Donegal.

Design Features

- Large button telephone with quick dial buttons to key people (these buttons are fitted with photos of these key people).

Universal Design Guidance

- Ensure building structure and materials facilitate Wi-Fi technologies.
- Use technology such as silent staff call systems to reduce noise within settings.

- Ensure technology is accessible and usable by all residents including those with physical, sensory, or cognitive disabilities.
- Where possible, encourage residents to use their own technologies (such as smart phones and tablets) that they are familiar with.

Technology for healthcare

Design considerations and awareness

Technology can help residents access healthcare that may not be otherwise available during isolation or quarantine. Furthermore, the use of technology, in particular platforms that support remote audio and video assessment of residents can reduce infection risk by reducing foot fall into the setting.

Universal Design Guidance

- Ensure desktop computers, laptops, tablets, or smartphones are available to support remote audio and video assessment of residents by healthcare professionals. Consider which device is the most appropriate to use depending on the resident's needs and preferences.
- While Wi-Fi may be suitable for many technologies, the provision of CAT 6 ethernet cables will ensure a stronger and more reliable connection, which may be vital during important health assessments, as well as during periods of high demand (e.g., during pandemic lockdowns when residents can only engage through technology).

Technology for safety and security

Design considerations and awareness

Technology for residents' safety involves a range of assistive technology systems including: ambient assisted living; infrared fall detection devices; pull-cord emergency call unit; monitoring equipment (i.e. bracelets to alert a staff member when designated resident leaves the setting); movement sensors or bed pressure mats that can automatically turn lights on at night when a person gets up and needs to see where they are going.

Universal Design Guidance

- Ensure building structure and materials facilitate adequate Wi-Fi technologies.
- For resident beds consider the following technologies: infrared fall detection devices; pull-cord emergency call unit; movement sensors or bed pressure mats that can turn lights on automatically at night if a person needs to use the bathroom or move about.

Therapeutic technology

20: Newtownpark House, Blackrock, Co. Dublin

Design Features

- Use of lightbox to create a calm environment and provide visual images of nature.

Design considerations and awareness

The 'Snoezelen' room concept provides an example of how technology can provide therapeutic spaces in LTRC. This is a room where multi-sensory stimulation is achieved through visual effects using water columns, fibre-optic cables, mirror balls, screen projectors, video, interactive projection systems; sound effects through musical selections; tactile stimulation using vibrating water beds, and olfactory stimulation using aromatherapy equipment. Research shows multi-sensory stimulation to be an appropriate and effective therapy for people with dementia. Such therapeutic spaces may also prove beneficial during stressful and isolating events such as a pandemic.

Augmented reality (AR) is a digitally enhanced version of the real-world that is achieved through the overlay of digital elements (e.g., visual images or sound), typically delivered via an AR headset. Users can see images that blend both real-world elements and virtual elements that have been introduced by the headset. Using an AR headset could provide relaxing experiences within the resident's own environment.

Virtual reality (VR) is a computer interface that allows a user to become immersed in a computer-generated environment in a naturalistic fashion, typically using a VR headset. A VR headset could provide the resident with immersive experiences, ranging from connecting with loved ones in a common simulated space to visiting environments not otherwise accessible (e.g., a music concert or a nature expedition that could include interaction with virtual animals).

The provision of these technology-based amenities and digitally enabled social contacts for older residents isolated in settings during an emergency may potentially decrease their sense of loneliness, and increase their self-perceived health. However, careful consideration should be given to the use of such technologies by people with cognitive or sensory impairments as an immersive experience could potentially be disorientating or distressing.

Universal Design Guidance

- Ensure building structure and materials facilitate adequate Wi-Fi technologies.
- Provide facilities to give residents the choice to listen to music or the radio.
- Consider augmented reality (AR) and virtual reality (VR) technologies where appropriate and desired by the resident, bearing in mind that such technologies may be disorientating for some residents with cognitive or sensory impairments.

4.6 Back-up power for essential services and technology

In the introduction section where 'Climate change, adaptation and resilience' are discussed, the vulnerability of LTRC settings to disruptive climate events and electrical power loss is highlighted. It is important to consider the provision of 'standby generators' or temporary onsite power supply in the event of the loss of mains electricity supply due to: a planned electricity interruption by ESB Networks; a fault on the electricity network; a storm; or third party damage to the electricity network.

Universal Design Guidance

- Provide an onsite back-up / standby generator that can be used for emergency power generation in the event of mains electricity loss.
- In smaller settings that do not have a standard full size generator, consider how a mobile generator can be used when required.
- In addition to the above, consider how an onsite emergency battery power back-up system can be used until a mobile generator kicks-in, or until power is restored.

Appendices

Appendix A: References, Links, and Terminology

References

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Links to further resources and research

Universal Design for Improving Quality of Life and Enhancing COVID-19 Infection Control in Existing Residential Care Settings for Older People: Research Report: https://universaldesign.ie/built-environment/residential-long-term-care-settings-for-older-people-/

Residential Long-Term care and COVID-19: Role of the built environment in balancing infection control and quality of life Key Findings and Recommendations 2022: https://www.tcd.ie/trinityhaus/research-areas/healthy-and-inclusive-places/rltc-and-covid-19/

Universal Design Guidelines: Dementia Friendly Dwellings for People with Dementia, their Families and Carers: https://universaldesign.ie/built-environment/housing/dementia-friendly-dwellings/

Research on Dementia and Home Design in Ireland: https://universaldesign.ie/built-environment/housing/housing-research/

Age-Friendly Homes: https://agefriendlyhomes.ie/

New European Bauhaus (NEB): https://new-european-bauhaus.europa.eu/index_en

Links to organizations

Age Action: https://www.ageaction.ie

Age Friendly Ireland: https://agefriendlyireland.ie

All Ireland Gerontological Nurses Association (AIGNA): https://www.aigna.ie

Care Champions: https://www.facebook.com/carechampionsireland/

Centre for Excellence in Universal Design at the National Disability Authority: https://universaldesign.ie

Global Observatory of Long-Term Care (GOLTC): https://goltc.org/

Health Services Executive (HSE): https://www.hse.ie

Irish Association of Directors of Nursing and Midwifery (IADNAM): https://iadnam.ie

Nursing Homes Ireland: https://nhi.ie

O'Connell Mahon Architects: https://www.oconnellmahon.ie/

Sage Advocacy: https://www.sageadvocacy.ie

Tallaght University Hospital: https://www.tuh.ie

Photographs

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Thank you to Newtownpark House, Blackrock, Co. Dublin for Image 01 – Introduction, image 02 – Section 4.1, and Image 08 – Section 4.2.

Thank you to Haven Bay Care Centre, Kinsale, Co. Cork for Image 02 – Section 1.2.

Thank you to CareBright, Bruff, Co. Limerick for Image 07 – Section 1.4.

Thank you to The Village Residence, Drogheda, Co. Louth for image 08 – Section 1.5, Image 01 – Section 2, Image 1 – Section 3.

Thank you to Bon Secours Care Villag for Image 11 – Section 1.5.

Thank you to Cycling without Age Ireland for Image 12 – Section 1.5.

Thank you to McCullough Mulvin Architects and TODD Architects for Image 09 – Section 2.2.

Thank you to Farnogue Community Nursing Unit, Wexford for Image 18 – Section 2.4.

Thank you to St. Mary's Residential Centre, Castleblaney for Image 02 – Section 3.1, Image 06 – Section 4.2.

Terminology

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

Acoustics
Characteristics relating to sound.

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

Ageing in Place
Ageing in place is not only about continuing to live in your own home, but also the desire to continue living in your community. This is an important consideration for long term care and the location and connection to and with the community of LTRC settings forms an important part of ageing in place for residents in these settings. As such, ageing in place requires a continuum of care with an integrated approach to LTRC settings that are embedded in the community and well connected to the housing spectrum and community-based health and social care services.

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

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

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

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

Atrium
Large internal open space extending through all floors of the building.

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

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

Campus
A site or grounds with a collection of mostly detached buildings which share a common purpose.

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

CAT6
A data communication cable standard for Gigabit Ethernet cable.

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

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

Clear width
The clear width between handrails or doorframe.

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

COVID-19 Pandemic
The coronavirus disease 2019 (COVID-19) pandemic was a global outbreak of coronavirus – an infectious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

Common Living Area
Typically found in a household and is made up of a central and shared living room / dining / kitchen area.

Concourse
A large open space, within or outside a building, that provides a social/gathering space or circulation space, for large numbers of people.

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

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

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

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

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

En-suite bathroom types/location:
- **Inboard -** Where the en-suite is located between the room and the internal circulation areas (i.e. corridor).
- **Interstitial -** Located between 2 rooms, preserving the internal and external walls for glazing, but can result in extended circulation areas.
- **Outboard** Where the en-suite is located along the external wall; this reduces the amount of glazing but increases observation glazing from the circulation.

Enuresis sensor
Detects moisture typically associated with bedwetting.

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

Heating, Ventilation and Air Conditioning (HVAC)
Heating, Ventilation and Air Conditioning systems in a setting

Hoist (Ceiling or Wall-mounted)
A hoist is a specialised device used to safely and efficiently transfer someone with limited mobility.

Household model
A household model approach will usually subdivide the setting into smaller units or 'households', with each household having approximately 12 residents (this number will vary depending on model and geographic location). These households are largely self-contained and typically will consist of single ensuite bedrooms, central living, dining, and kitchen area, and a dedicated outdoor space. See below - Teaghlach model.

Information and Communications Technology (ICT)
This includes a wide range of technologies such as computers, telecommunications, etc.

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

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

Long-Term Care
As people grow older and their health deteriorates, they are more likely to require help with daily activities, such as washing, dressing, and household activities such as cooking and cleaning tasks that they once had no problem completing. Assistance with these tasks is often provided by long-term care.

Long-Term Residential Care Setting (LTRC)
These are residential facilities cater for people who require access to 24/7 nursing care and often also therapist and specialist medical care. In the Irish context, the terms 'nursing homes' and 'long-term residential care' facilities are effectively synonymous.

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

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

M2
Metres Squared.

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

Nursing home
See Long-Term Residential Care Setting (LTRC)

Pandemic
A widespread occurrence of an infectious disease over a whole country or the world at a particular time

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

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

Participation and collaboration
Where all key stakeholders (see below) are part of the planning and design process, in a structured and meaningful manner, to ensure their expert knowledge, experience or needs are factored into the process.

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

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

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

Person-centred care
Person-centred care ensures the resident/client is at the centre of everything you do with and for them. This means that you need to take account of their individual wishes and needs; their life circumstances and health choices.

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

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

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

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

Resilience
Resilience has three dimensions: absorptive capacity, adaptive capacity and transformative capacity. Absorbing a shock is about surviving and persisting, adaptation capacity is about responding through incremental adjustments, while transformative capacity involves altering the individual or community's primary structures and functions, including shifts in the very nature of the system.

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

Riser
The vertical portion between each tread on the stair.

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

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

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

Staff Stations
Areas where desks are located (i.e., distributed in a subtle manner and integrated throughout the setting) to provide a space for staff to complete day-to-day work tasks.

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

Stakeholders
Any person or organisation that can affect or can be affected by the development of a new residential long-term care setting, or the extension or refurbishment of an existing RLTC setting.

Strategic planning
A strategic Plan assesses the current situation of an organisation, determines a vision or strategy for the future, identifies how this strategy will be implemented, and sets targets and goals for achieving the strategy.

Step nosing
The leading edge of a step or landing.

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

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

Teaghlach model
Teaghlach model is a household model that subdivides the setting into smaller units or households, with each household is relatively self-contained, houses a maximum of 12 residents (this number will vary depending on model and geographic location). Households typically contain single ensuite bedrooms, a central living, dining, and kitchen area, and a dedicated outdoor space. Households will often have their own front door. This can also be accessed from a common area, sometimes shared with other adjacent households. They could be single storey detached units or occupy different floors in a setting.

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

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

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

Tread
The part of the stairway that is stepped on.

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

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

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

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

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

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

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

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

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

Appendix B: Case Studies

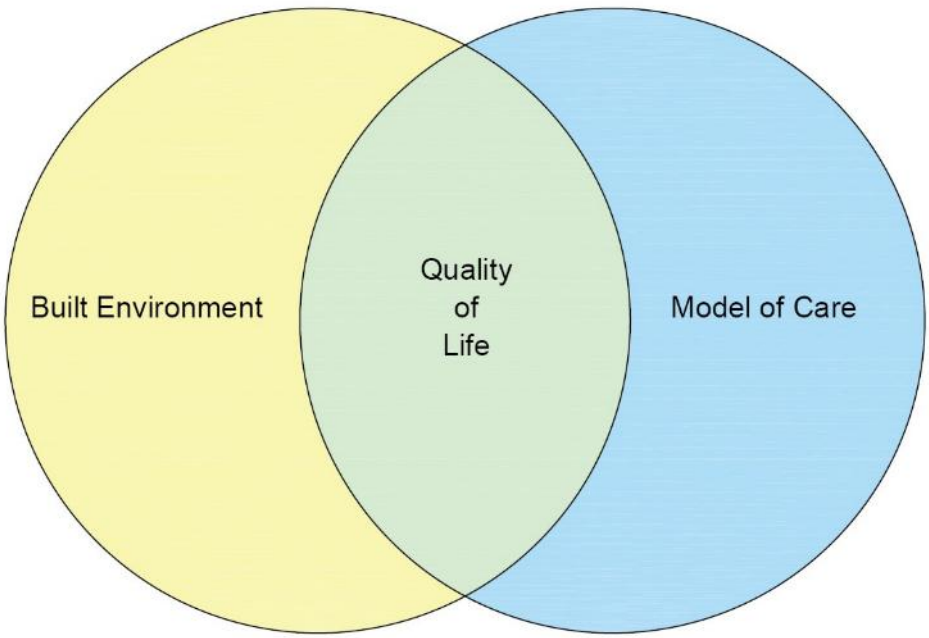
Introduction and analysis methodology

This appendix outlines eight desk-based case studies where the design of the built environment is a critical part of how each setting seeks to support a high quality of life. The text below sets out the analysis methodology used in these case studies. This is followed by the case studies, where each setting is described and analysed over three pages.

Building Anatomy and Analysis - Explaining Essential Concepts and Vocabulary:

It is immensely challenging to conduct an empirical cross-comparison of buildings, as a building is by definition a bespoke artifact. This holds true even for buildings which appear to have the same brief and function, and even for today's modern methods of construction which can, to some extent, mass-produce modular buildings. No two buildings are the same as all structures must still be reconciled with the peculiarities of site and must take account of variables such as climate and orientation.

The purpose of this study is to assess a series of successful Long Term Residential Care Settings against a series of agreed design issues. A part of this will involve a review of architectural information - plans, sections and 3d images - alongside photographs of the building. A large amount can be deduced from this information, but it remains to some extent in the realm of opinion. To further support these considered, professional opinions, we have sought to extract certain measured data from each building in an effort to identify core ingredients which are fundamental to positive care home environments regardless of architectural style, global location, climate and culture. Where these core ingredients are combined with the right model of care, we believe that it contributes significantly to the quality of life of residents.



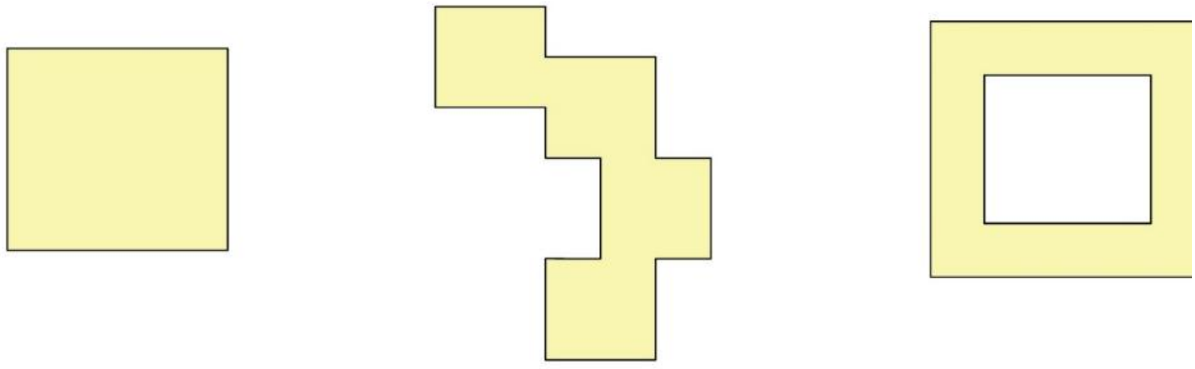
Each case study building has been measured to determine the total building area per resident as well as the common and private area per resident. Other key information has

been recorded about building circulation and corridor design, as well as landscape and external space. The key terms and approach to measurement are explained in greater detail below. This process has not managed to reveal any secret formula or single solution to the challenge of providing safe, meaningful and high-quality homes. Rather it has generated amorphous set of data from which there is a lot to learn, but which must be approached and understood on a case-by-case basis. All of the case studies were selected for their high quality, but the data and analysis demonstrate that there is no one way that quality can or should be achieved. There are huge differences across the exemplars in terms of scale, cost and approach to layout and circulation, and each building should be understood in context, from the geographic to the cultural.

Certain essential lessons are, however, clear. For the successful design of long-term care homes, the experience of living must be weighed as equally important to the process of caring; the careful consideration of in-between spaces, such as corridors, is fundamental, and careful design can make the difference between living in your home or living in an institution. Where cost is a constraint, the case studies demonstrate that high quality space can be provided simply, and in a cost-effective manner. Much can be achieved with the careful arrangement of smaller blocks, making something of value out of the space between things, or the adaptive reuse of existing buildings can provide sustainable and cost-effective solutions which are knitted into existing communities.

1. Perimeter of the Building Envelope relative to the building Footprint (ratio):

This measures the length of the perimeter of the building and expresses it as a ratio relative to the floor area. A longer perimeter relative to the same floor area would indicate greater opportunities for visual connections to the external environment, natural light and ventilation. A shorter perimeter relative to the same floor area indicates a deep floor plan with embedded circulation which can be less legible and a less pleasant environment in general. The diagrams below have identical areas but immediately demonstrate how different configurations might generate different quality spaces both within, and around buildings.

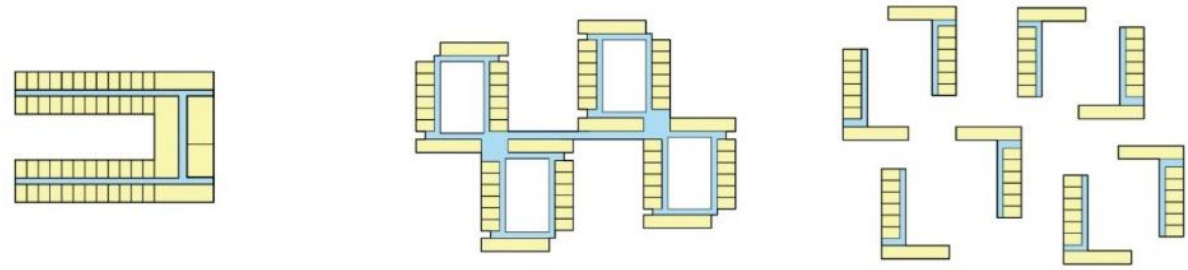


Ratio - 1:8 Ratio - 1:5 Ratio - 1:4.5

2. Overall Building Grossing Factor:

The building's grossing factor is a way to measure the generosity of circulation and informal spaces extra to the building's habitable accommodation. This is calculated as the area of circulation space expressed as a percentage of the net accommodation. Buildings with a higher grossing factor may have more informal break-out areas, wider circulation corridors and a larger proportion of single-loaded corridors as a result of this generosity. It should be noted that where a care setting is provided as a series of separate households, this

calculation will not be as relevant, and the grossing factors may be low despite a high level of generosity in the design. The diagrams below have an identical area of net accommodation; however, they have very different grossing factors. The diagrams in the centre and on the right have more opportunities for integrated landscape, meaningful views and discrete household arrangements as a result of the circulation strategy.



8% Grossing
ıll Double Loaded Corridors

55% Grossing
All Single Loaded Corridor

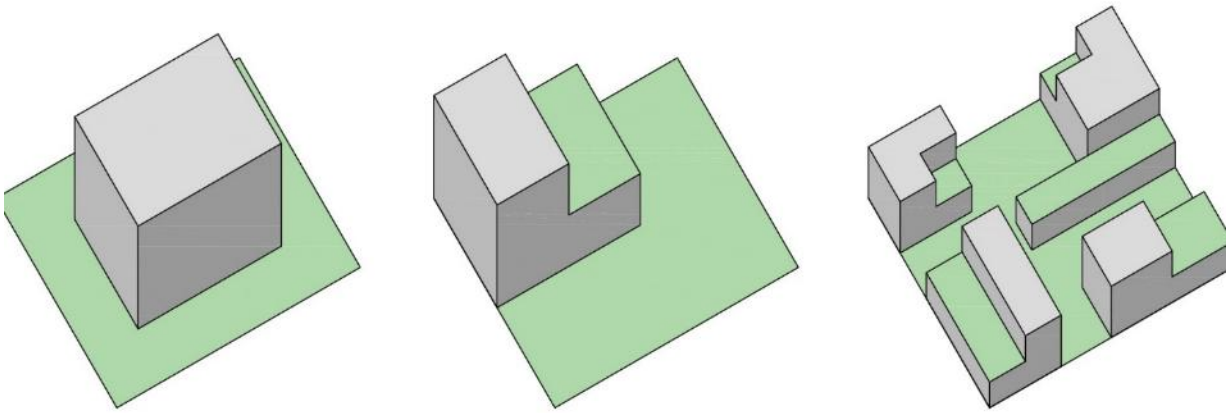
29% Grossing
Separate Households

3. Ratio of double to single loaded corridors:

This ratio measures the length of general circulation which has accommodation on both sides, relative to corridors which have accommodation along one side only. This allows us to gain an understanding of the quality and legibility of the building's circulation spaces. Single loaded corridors are preferable where possible as they allow visual connections to the outside, and natural light and ventilation into circulation spaces. This supports navigation with the building as well as general orientation whereas double loaded corridors tend to create a 'warren like' appearance and are less legible. As demonstrated in the diagrams above, which illustrate the difference between single and double loaded circulation, there is a direct relationship between grossing factors, building footprint size, and single or double loading of corridors.

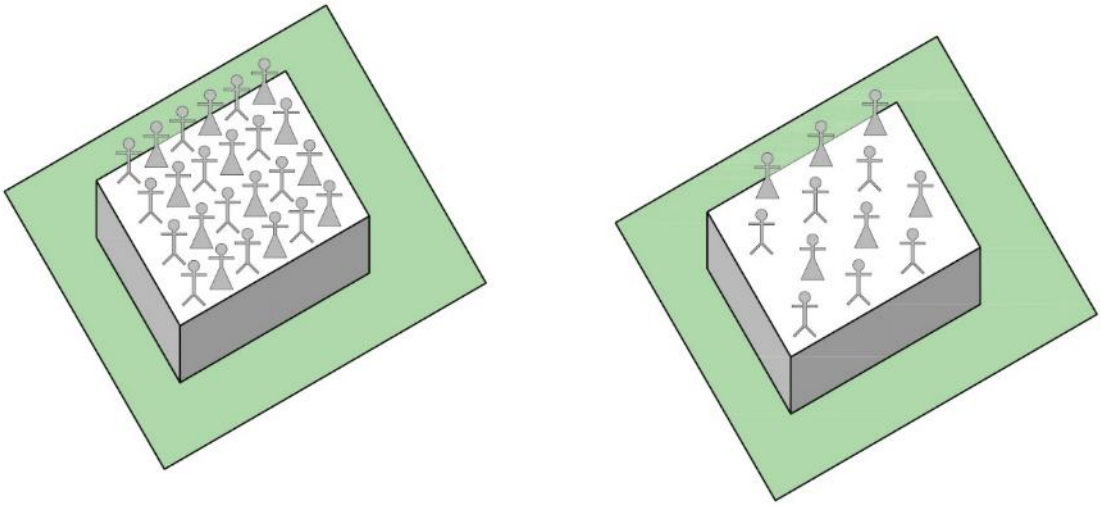
4. Green Space per Resident:

This is a calculation of the total area of high-quality landscaped external space relative to the total number of residents. It should be noted that opportunities exist for integrating landscape both around, on and within buildings in the form of courtyards and roof gardens. The diagrams below demonstrate that very different approaches are possible in relation to the integration of architecture and landscape and that roof gardens can be particularly effective for providing safe accessible landscape to residents of the upper levels of care homes.



5. Gross Internal area per Resident:

This figure is a high-level assessment of how much space is provided per resident - the gross internal floor area divided by the total number of residents. This will help to give a high-level understanding of the density of the scheme and the level of generosity of space built-in for each resident. This information must be understood in the context of the building form and type, for example schemes comprised of a series of small blocks may require less internal circulation and have a lower area per resident despite providing generous, high-quality design.



Eight case studies

The following pages outline the eight case studies in alphabetical order. The architects involved in each case study are listed below, along with their websites, where available.

1. De Hogeweyk, Weesp, The Netherlands - Architects: BuroKade - https://www.burokade.nl
2. Eunice Seddon, Dandenong, Melbourne, Australia - Architects: Allen Kong Architects - https://www.allenkongarchitect.com.au/projects
3. Grangegorman Residential Care Neighbourhood, Dublin, Ireland - Architects: McCullough Mulvin Architects - https://mcculloughmulvin.com and TODD Architects - https://www.toddarch.com
4. Huis Perrekes, Geel, Belgium – Architects: NU architectuuratelier - https://www.nuarchitectuuratelier.com/en/home
5. Humana Sodra, Gävle, Sweden - Architects: White Arkitekter - https://whitearkitekter.com
6. Jewish Senior Life, Rochester, New York, USA - Architects: Perkins Eastman - https://www.perkinseastman.com
7. Il Paese Ritrovato, Monza, Italy - Architects: Studio Giovanni Ingrao
8. Pennemes, Zaandam, The Netherlands- Architects (involved in the more recent interventions FKG Architecting https://fkgarchitecten.nl

1 De Hogeweyk - Weesp, The Netherlands

Architect: BuroKade

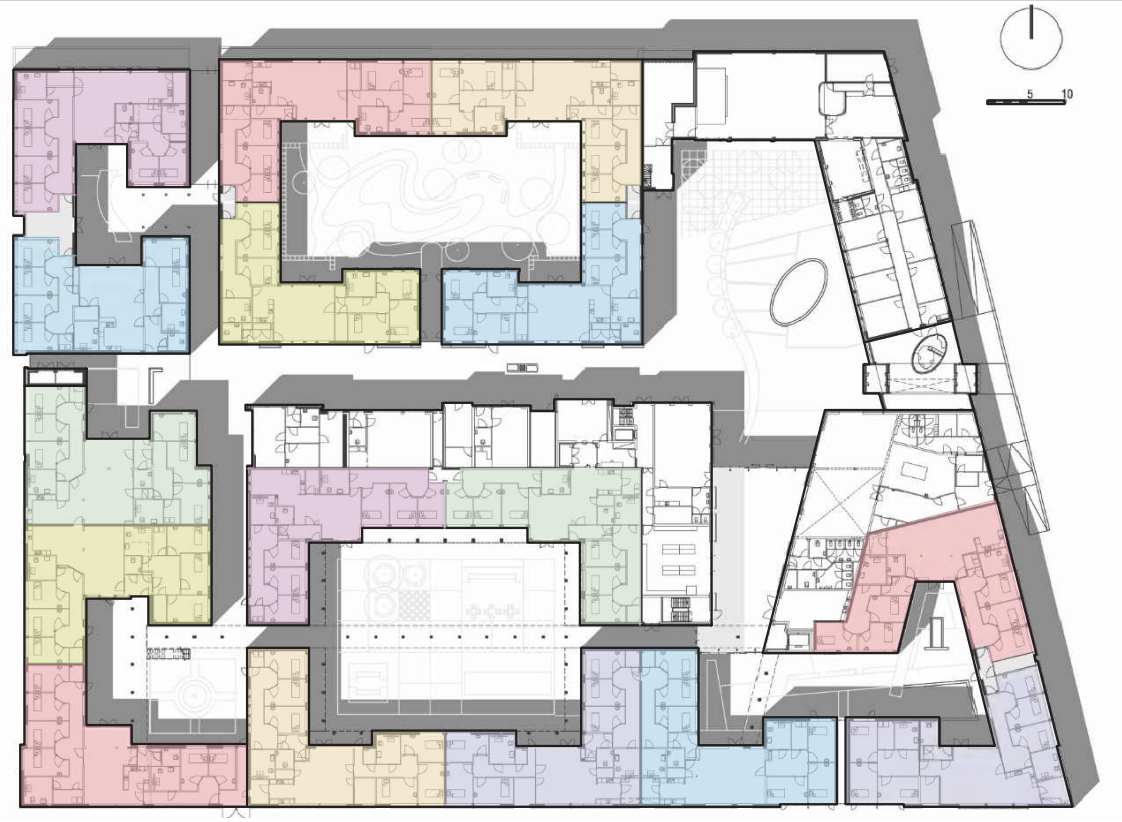
Project Facts:	
Model of Care	Household model
No. of Residents	Approximately 135
No. of Homes	23

De Hogeweyk synthesises the familiar, vernacular of the village, with the household model of care to create an innovative, supportive and highly successful environment for people living with dementia. Households of 6 and 7 residents are arranged within a legible landscape of pedestrian streets and lively, planted squares which create distinct identity spaces, supporting navigation and wayfinding.

Overarching Universal Design Principles	YES	PART	NO	N/A
1. Integrated into the Neighbourhood		●		
2. Easy to Approach, Enter and Move About In	●			
3. Easy to Understand, Safe to Use and Manage	●			
4. Flexible, Cost-Effective, Adaptable over Time	●			

The organic and programmed activities of the care village encourage participation in the activities of daily life, while the built environment supports participation and movement. Residents are supervised in a safe and unrestricted environment with the intention that they can continue with life in as normal and dignified a manner as possible.

The village format not only provides a familiar design, but completely de-institutionalises the care setting, eliminating excessive and disorientating internal circulation and ensuring contact with nature and the external elements.



The Building:

De Hogeweyk encloses a series of outdoor streets and external spaces of varying scales through the arrangement of separate household blocks, each with own-door access. This simple mechanism works to generate high quality space along a continuum from public to private while the architecture of a village is the definition of communal life at a human scale.

The care village is place-based and community integrated to the extent that the design is centred on place-making with spaces that inspire and promote social interaction and exchange. The care village functions as a multifaceted community rather than a monolithic institution on the level of its architecture as well as its model of care, albeit enclosed within a secure boundary.

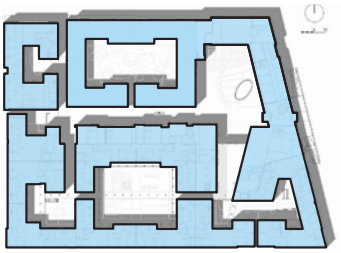
There is an extensive building perimeter allowed relative to the overall building footprint (ratio 1:5) generated by the meandering streetscape and language of separate blocks and households.

Internal circulation and double loading of corridors is significantly curtailed by the arrangement of households with own-door access while high quality landscape is integrated throughout the scheme.

BUILDING FOOTPRINT / SITE AREA

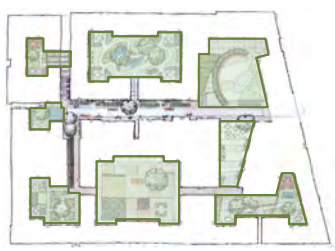
Building footprint 7,604 sqm
Site area 15,310 sqm

BUILDING ENVELOPE/ BUILDING FOOTPRINT

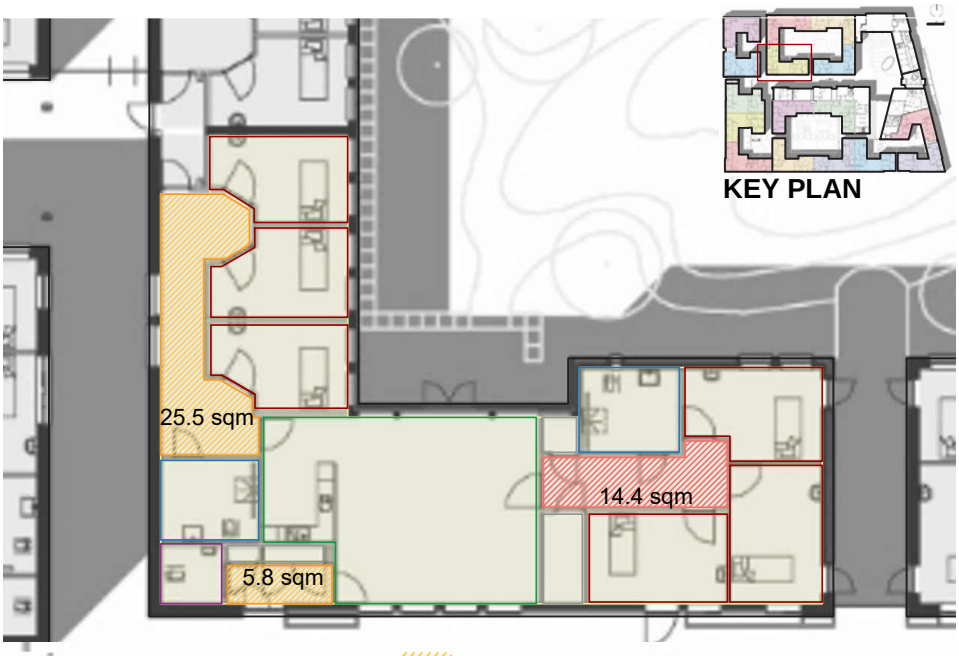


Building perimeter 1,492 m
Building footprint 7,604 sqm

GREEN AREAS/ PER RESIDENT



Green areas 3,853 sqm
Number of residents 152



6 or 7 people household
1 Kitchen/ living room
2 Bathrooms

Single loaded corridor - 31.3 sqm

Double loaded corridor - 14.4 sqm

The Household Unit:

The core concept of the household unit is fundamental to the success of De Hogeweyk and is central to generating its architectural form. Households of 6 or 7 residents are comprised of private bedrooms and shared communal living areas. Each household has direct access from the outside and functions as a discrete unit within the scheme. This means that the grossing factor of households, and data on single and double-loaded carridors are less relevant as the human scale of the houshold limits the need for significant circulation area.

The assembly of a series of smaller volumes, and the elimination of long corridors creates greater opportunity for meaningful views to landscape and nature, natural ventilation and penetration of daylight into all spaces. This supports familiarity, and orientation and navigation in internal spaces in the same way that the series of small streets and village squares enhances wayfinding externally.

As such the development performs very strongly in relation to measurable architectural data - implying a robust and supportive built environment which, when combined with the right model of care and positive management of the facility, should ensure significant benefits for quality of life.

Schedule of Architectural Data:

Total Building Area Per Resident	Building Perimeter: Building Footprint	Building Grossing	Building Footprint relative to Site
71 sqm	1:5	22% (household)	49.6%
Common Area	Double Loaded: Single Loaded Corridors	Green Space per Resident	Private Space per Resident
14 sqm	1:2	25sqm	16.6sqm

2 Eunice Seddon, Dandenong, Melbourne, Australia

Architect: Allen Kong Architects

Project Facts:	
Model of Care	Household model
No. of Residents	Up to 82
No. of Homes	77

The success of Eunice Seddon as a building for long term care can potentially be attributed to the fact that it is not in fact a building, but a landscape in which residents' private rooms are arranged and then bound together by a unifying roofscape. This means that landscape and movement, in the form of an external meandering boardwalk, define the residents' experiences and offer great opportunities for informal interaction and personalisation of space.

This approach crates a natural hierarchy of scale between the small private units and larger communal buildings which are legible as separate structures, while benches and seating along the boardwalk integrate familiar design at a human scale.

Overarching Universal Design Principles	YES	PART	NO	N/A
1. Integrated into the Neighbourhood	●			
2. Easy to Approach, Enter and Move About In	●			
3. Easy to Understand, Safe to Use and Manage	●			
4. Flexible, Cost-Effective, Adaptable over Time	●			

While Eunice Seddon is economical in its approach to materials and finishes, the space created by the arrangement of buildings is of a high quality and demonstrates what can be achieved simply, with creativity and careful consideration of the in-between places. While the external circulation provides contact with nature, the extensive roof allows for control and management of environmental conditions.

Individual standard bedroom (Eunice) Individual bedroom (Wallara)

72 Bedroom + **5** double bedroom= up to **82** residents

The Building:

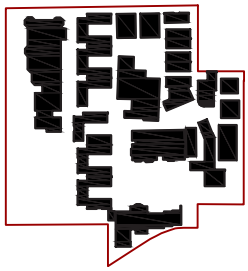
A variety of different buildings are brought together under one roof with the defining unit being the rectangular 2-bedroom blocks which are arranged to form informal external rooms and gardens.

A larger, multi-purpose communal building and carpark define the Eastern boundary of the site while 2 other larger structures form a central focal point, providing communal dining and lounge facilities. This arrangement produces a recognisable variety of buildings at different scales which are reflected in larger and smaller courtyard and garden spaces.

The seemingly informal arrangement of buildings in the landscape should encourage residents to engage with others, while the larger shared building and cafe straddle the boundary between the home and the broader community, hopefully fostering integration, connection and a sense of place.

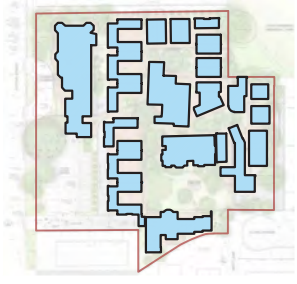
The boundary of the home is nonetheless well defined and the living units are orientated inwards with potential for passive security and safe, enclosed internal spaces.

BUILDIND FOOTPRINT / SITE AREA



Building footprint 3,119 sqm
Site area 8,648 sqm

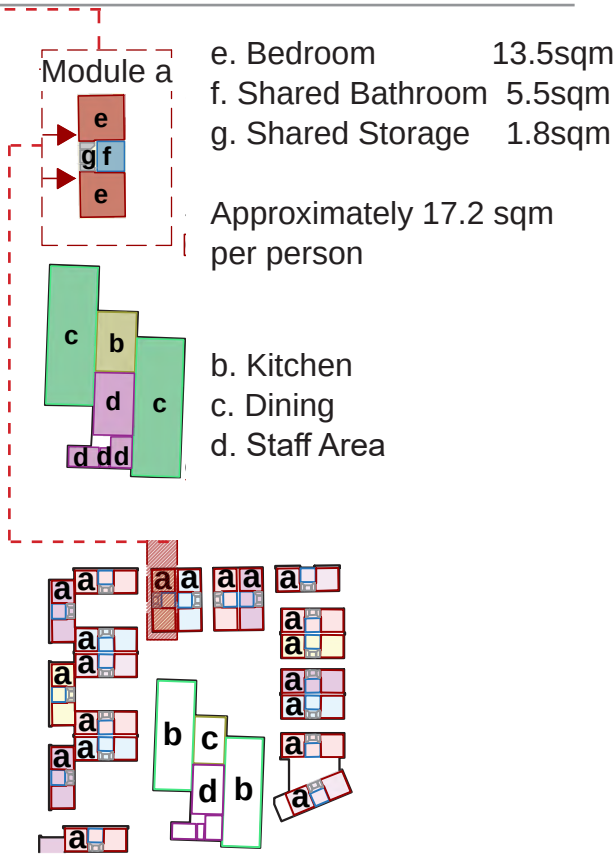
BUILDING ENVELOPE / BUILDING FOOTPRINT



Building perimeter 1,281 m
Building footprint 3,119 sqm

GREEN AREAS / PER RESIDENT

Green areas 1,233 sqm
Number of residents 82



Individual Living Units and Clusters:

Eunice Seddon manages to strike an uplifting balance between identity and individuality on one hand, and community and the collective on the other. This is an outcome of the home's core philosophy and model of care, but it is also joyfully reflected in the built environment and connecting landscape.

While the 2 room living units are economically planned at 13.5 square meters per room with shared washroom and storage, opportunities are created by how these blocks are arranged and great generosity exists in the informal, in-between spaces. The blocks are planned in clusters of 2's and 3's and this creates micro-communities within the broader landscape as residents take ownership of, and personalise the spaces formed between their blocks. The approach to colour and individualised details like front doors enhances the individual identity of these spaces, creating landmarks along the external walkway and supporting orientation, navigation and way-finding.

The decision to substantially eliminate internal corridors is the defining element of Eunice Seddon's architecture once the surface treatments of materials and colour are pared away. This has multiple positive outcomes, allowing profound emphasis on landscape and biophilic design, and ensuring residents are exposed to the positive sensory stimuli of nature and the outdoors.

Schedule of Architectural Data:

Total Building Area Per Resident	Building Perimeter: Building Footprint	Building Grossing	Building Footprint relative to Site
38 sqm	1:2	n/a external circulation	36%
Common Area Per Resident	Double Loaded: Single Loaded Corri-	Green Space per Resident	Private Space per Resident
7 sqm	n/a - external circulation	15sqm	17.2sqm

3 Grangegorman Residential Care Neighbourhood, Dublin, Ireland

Architect: McCullough Mulvin Architects and TODD Architects

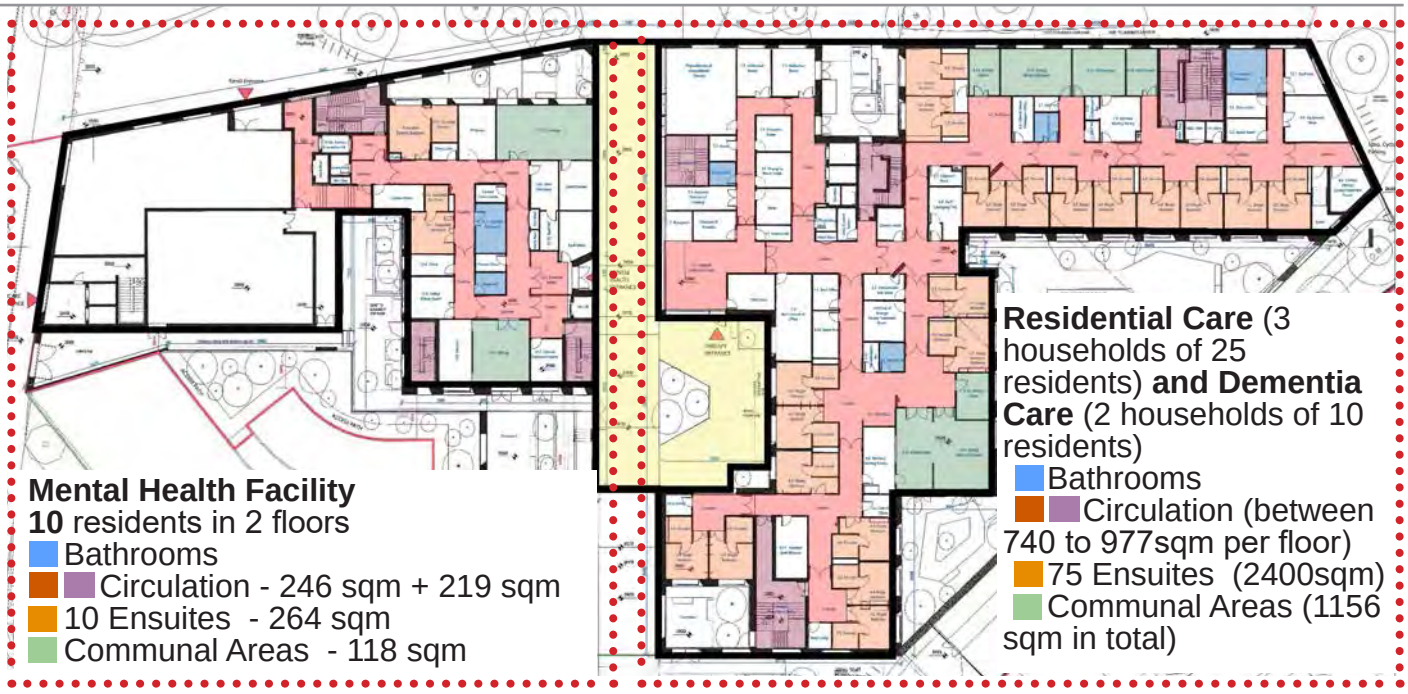
Project Facts:	
Model of Care	Households
No. of Residents	95 (in Care Home)
No. of Homes	5 Households

Grangegorman Residential Care home is a well-considered and beautifully designed long term residential care home planned for Dublin 7. It combines both elderly residential care and residential mental health facilities in 2 discrete blocks which are wrapped in a unifying external envelope.

For the purposes of the case study analysis, this report will look at the elderly residential care facilities only.

Overarching Universal Design Principles	YES	PART	NO	N/A
1. Integrated into the Neighbourhood	●			
2. Easy to Approach, Enter and Move About In	●			
3. Easy to Understand, Safe to Use and Manage	●			
4. Flexible, Cost-Effective, Adaptable over Time		●		

The elderly care element of the residential neighborhood incorporates 5 households - 3 households of 25 residents and 2 dementia households of 10 people each. The building is situated close to Dublin City Centre on the newly developed Grangegorman Campus of TUD. The chosen site for the home ensures that there is potential for multilateral connections with both the educational campus and its landscape, and the existing residential community of Dublin 7.



Ground Floor

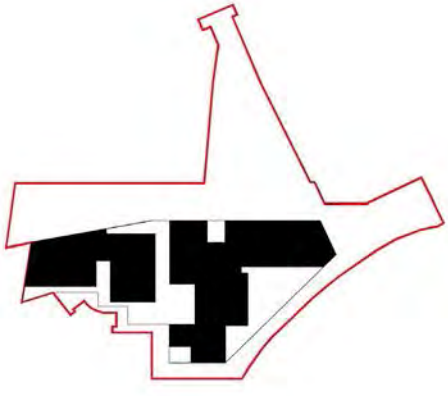
The Building:

At over 12,000 square meters of internal floor area, Grangegorman Residential Care Neighbourhood is one of the larger case study buildings. Despite this, Grangegorman RCN has fewer residents than other smaller schemes and a higher square meter area per resident. These measurements are largely driven by the multistorey building form and the area allocated to internal corridors.

While care has been taken to break the larger 25 bed households down into smaller clusters of rooms through articulations of the floor plan, these households are large and some of the clusters may feel disconnected or isolated for elderly residents. This is a function of the briefed household size rather than an architectural approach. Households are accessed via a single main entrance connected to the buildings shared circulation cores and corridors.

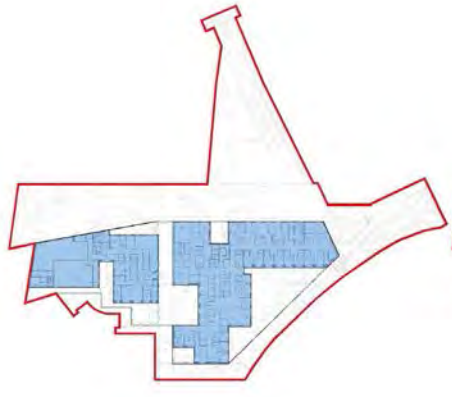
The building facade steps in an out, ensuring that there is an elongated perimeter and allowing for natural light and ventilation into all the residents rooms as well as along a reasonable percentage of single-loaded corridors.

BUILDIND FOOTPRINT / SITE AREA



Building footprint 3.542 sqm
Site Area 11.566 sqm

BUILDING ENVELOPE / BUILDING FOOTPRINT



Building perimeter 350 m
Building footprint 3.542 sqm

GREEN AREAS / PER RESIDENT

Green areas 2.326 sqm
Number of residents 105 people

First Floor

Second Floor

Bathrooms
Circulation
Rooms Ensuite
Communal Living

The Household:

As previously noted, the elderly residential care element of the Grangegorman Neighbourhood is comprised of three 25-bed households and 2 dementia-specific households of 10 residents. While the 10-person households may be appropriate for residents with dementia, it is more difficult to justify the 25-bed household size. It is likely that many of the residents within larger households will also have some degree of dementia, and it is believed that the smaller household sizes have better outcomes in terms of infection control and quality of life for all.

Each household is arranged with access to external landscaped areas as well as communal living and dining spaces. Within the larger households it is inevitable that some rooms may end up at a significant distance from certain communal spaces.

Despite the thoughtfully designed spaces, stepped facade and landscaped courtyards, the larger household numbers generate a more institutional living arrangement which is home-like rather than a home.

Schedule of Architectural Data:

Total Building Area Per Resident	Building Perimeter: Building Footprint	Building Grossing	Building Footprint relative to Site
115 sqm	1:10.1	28%	30%
Common Area	Double Loaded:	Green Space per Resident	Private Space
12.15 sqm	5:1	29.8 sqm	24 sqm

4 Huis Perrekes, Geel, Belgium

Architect: NU architectuuratelier

Project Facts:	
Model of Care	House
No. of Residents	15
No. of Homes	1

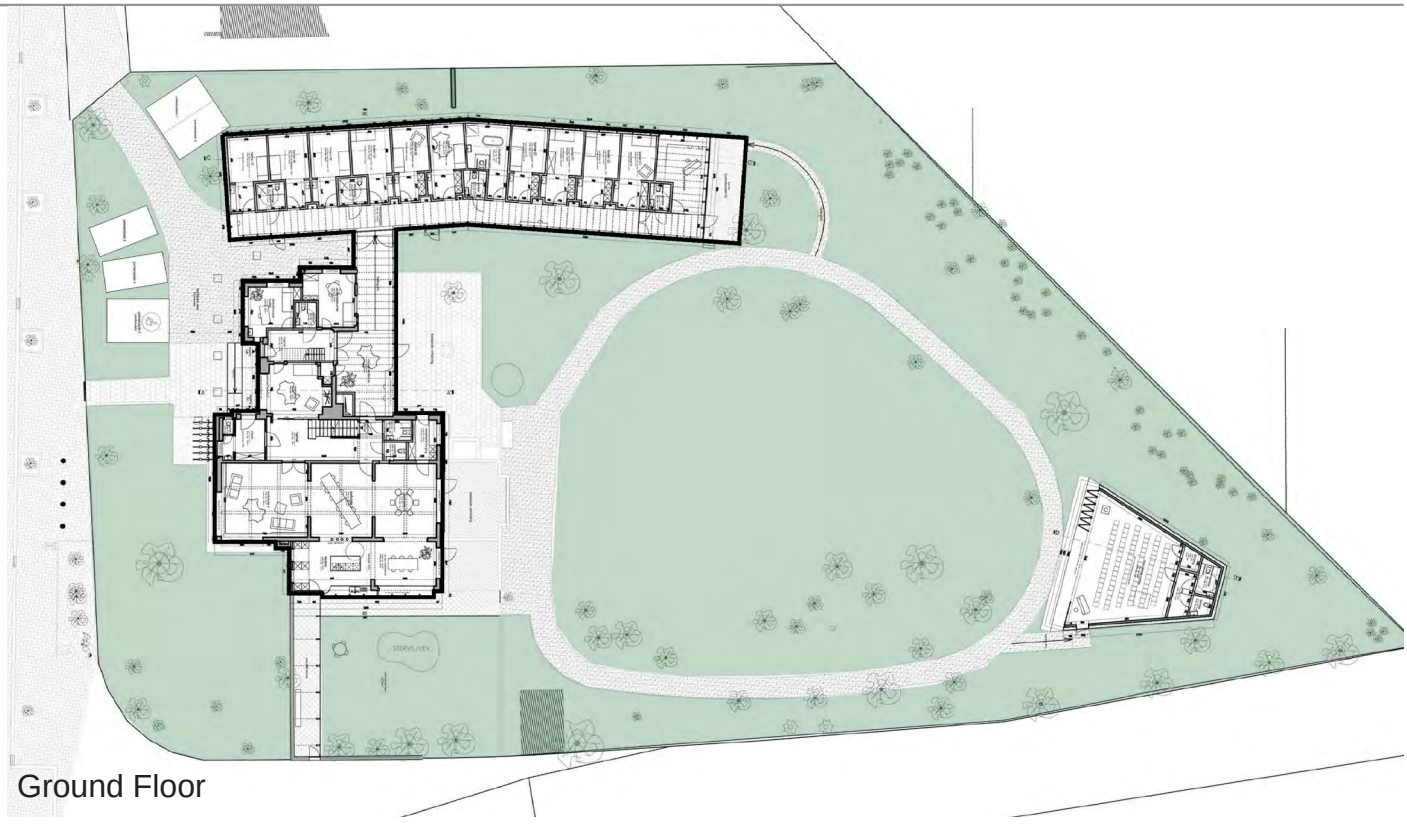
Huis Perrekes describe themselves as a ‘house’ which protects and supports, inviting residents to take on a meaningful role in life for as long as possible. In fact, Huis Perrekes is an assortment of buildings, knitted into the existing fabric of the village of Geel, Belgium and this arrangement ensures that residents’ homes are place-based, and community integrated in the most authentic sense.

Overarching Universal Design Principles	YES	PART	NO	N/A
1. Integrated into the Neighbourhood	●			
2. Easy to Approach, Enter and Move About In	●			
3. Easy to Understand, Safe to Use and Manage	●			
4. Flexible, Cost-Effective, Adaptable over Time	●			

This study examines one of these homes which, as an adapted family house is familiar in terms of its design, and is naturally easy to approach, enter and move about in.

Occupying existing buildings in a village ensures that the ‘home’ is integrated into the neighbourhood and that the transition from public to private space is not a contrivance, but a familiar state as residents continue to inhabit buildings at the most human of scales - quite literally the ‘house’.

Huis Perrekes, Belgium



Ground Floor

The Building:

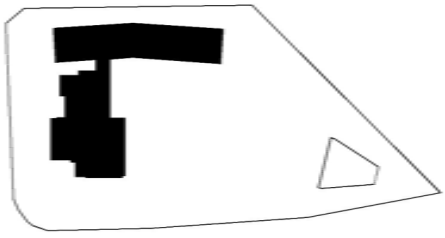
Huis Perrekes is an example of successful adaptive reuse - an existing house has been modified by the addition of a dormitory wing which expands the residence by 10 bedrooms, including bathroom facilities and living space.

The core spaces of the home remain located in the original structure and are familiar and easy to navigate, while the dormitory wing is sensitively designed, overlooking the garden and uses natural timber finishes, ensuring balanced sensory conditions, natural light and meaningful views.

While the dormitory corridor may seem long, with the last bedroom having the potential to feel isolated, the scale of this care home is very small compared to many institutional settings.

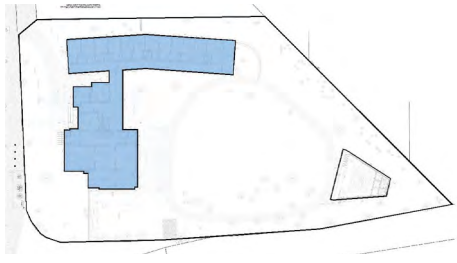
The beautifully detailed corridor becomes a habitable space in its own right and encourages movement like a cloistered walkway with strong connections to nature and landscape. The main 'house' is clearly visible along this route, and this ensures that residents can intuitively orientate themselves within the scheme.

BUILDIND FOOTPRINT / SITE AREA



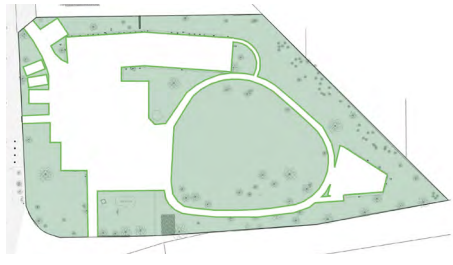
Building footprint 615 sqm
Site Area 3.800 sqm

BUILDING ENVELOPE / BUILDING FOOTPRINT



Building perimeter 174 m
Building footprint 615 sqm

GREEN AREAS / PER RESIDENT



Green areas 2.469 sqm
Number of residents 15 people

Ground Floor

First Floor

15 people household
1 Kitchen
7 Living Areas
12 Bathrooms
Circulation (137 sqm)
Single Loaded Corridor (68 sqm)
Toilet/Bathroom (66 sqm)
Bedrooms (169 sqm)
Communal Living Areas (223sqm)
Flats (68 sqm)

The Household:

Huis Perrekes is, in many regards, just a house and as such, the idea of households within a larger institutional setting does not apply. The home can accommodate 13 to 15 residents and there are a range of room types, but these are not subdivided into separate clusters or pods.

There are 3 rooms located at First Floor Level, 2 of which are larger 'apartments' which could accommodate couples or could be available to residents with a spectrum of particular needs, whether they are more independent and mobile, or require end-of-life care. This arrangement allows for some flexibility and variety within the house although it is difficult to determine exactly how these spaces are used within the constraints of this study. The remaining 10 rooms are arranged along the dormitory corridor which is itself a unique space within the home.

The success of the Huis Perrekes approach flows easily from the adaptive reuse of an existing home. The scale and setting are familiar, there is no need to develop repeating clusters of rooms which may be disorientating and institutional, and in this manner, a very simple solution has proven to be both exemplary and innovative.

Schedule of Architectural Data:

Total Building Area Per Resident	Building Perimeter: Building Footprint	Building Grossing	Building Footprint relative to Site
59 sqm	1:3.5	34.5%	16.18%
Common Area Per Resident	Double Loaded: Single Loaded Corri-	Green Space per Resident	Private Space per Resident
14.8 sqm	1:2	164.6 sqm	15.8 sqm

5 Humana Sodra, Gävle, Sweden

Architect: White Arkitekter

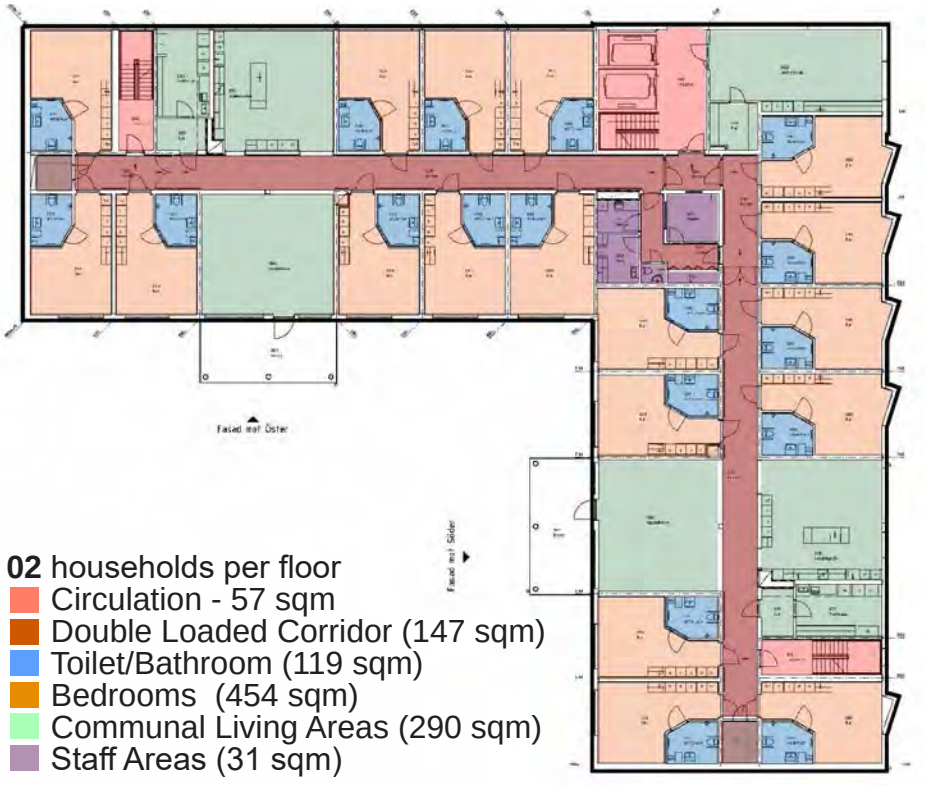
Project Facts:	
Model of Care	Households
No. of Residents	88
No. of Homes	Approximately 10

Humana Sodra is a home which cares for up to 88 long term elderly residents in the city of Gavle, Sweden.

The home is an example of an urban long term residential setting, located in a higher density architectural typology, akin to a block of apartments. In this way the design is both familiar and exists at a human scale, particularly to those who previously lived in flats or high-rise residential buildings. Similarly, the full kitchens and their relationship to the living space echoes one of the most common configurations of rooms to be found in homes - whether they be houses or apartments.

Overarching Universal Design Principles	YES	PART	NO	N/A
1. Integrated into the Neighbourhood				●
2. Easy to Approach, Enter and Move About In	●			
3. Easy to Understand, Safe to Use and Manage	●			
4. Flexible, Cost-Effective, Adaptable over Time				●

The higher rise nature of the block means that residents must rely on shared vertical circulation and internal corridors to access households, however this has balanced against small household sizes and generous personal space as noted below.



02 households per floor
- Circulation - 57 sqm
- Double Loaded Corridor (147 sqm)
- Toilet/Bathroom (119 sqm)
- Bedrooms (454 sqm)
- Communal Living Areas (290 sqm)
- Staff Areas (31 sqm)

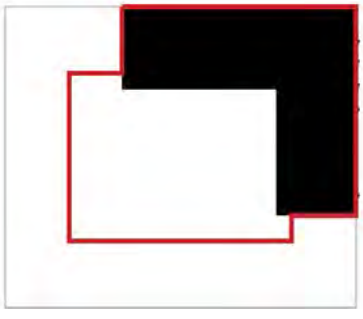
The Building:

The building is a six storey L-shaped block which fits seamlessly into the urban streetscape, surrounded by a range of multistorey residential developments. Setbacks on the uppermost floor create a sheltered roof terrace and the block's central courtyard also provides access to protected garden areas.

There are no balconies or terraces to the street, however, large balconies are provided off each household's communal area which overlooks the central courtyard. These glazed, semi-enclosed spaces provide meaningful views across the city's roofs as well as helping residents to orientate themselves to time and seasonal change.

The relatively dense, multistorey arrangement of the building is offset by generous, high quality private space with residents rooms en suite measuring 31 square meters on average. Spacious rooms with high quality finishes use familiar design at a recognisable human scale to counteract and minimise the institutional atmosphere which can arise in larger care homes.

BUILDIND FOOTPRINT / SITE AREA

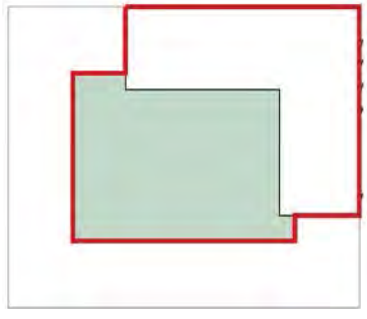


Building footprint 1.286 sqm
Site Area 2.707 sqm

BUILDING ENVELOPE / BUILDING FOOTPRINT

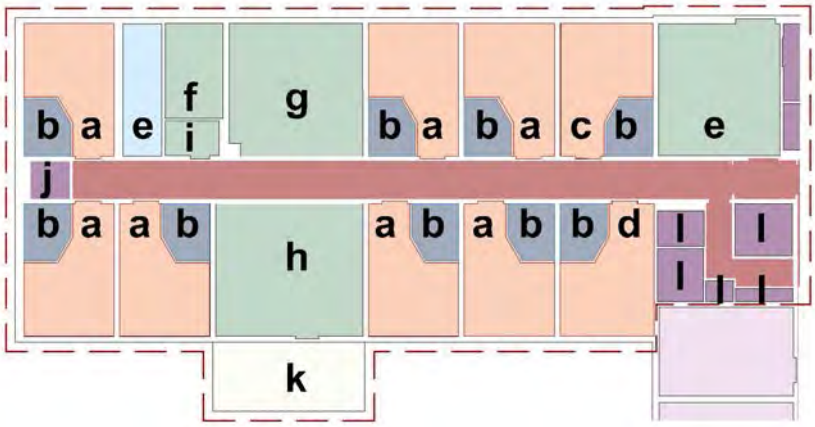
Building perimeter 188 m
Building footprint 1.286 sqm

GREEN AREAS / PER RESIDENT



Green areas 1.423 sqm
Number of residents 88

The Household Area:



a Bedroom type 1: 25sqm (each)
b Bathroom: 606 sqm (each)
c Bedroom type 2: 25.8 sqm
d Bedroom type 3: 26.4 sqm
e Circulation core: 57.1sqm (total)
f Laundry: 14.7 sqm
g Kitchen: 47.2 sqm
h Common room: 74.5 sqm
i Hall: 5.2sqm
j Storage: 4sqm
k Balcony: 28.1sqm
l Staff area: 22.7sqm

The Household:

Households consist of 9 private rooms with en suite bathrooms, supported by a shared kitchen, common room and balcony as well as ancillary facilities such as a laundry room.

The central household spine is a double-loaded corridor with accommodation arranged to either side. Any negative impact of this internal circulation space is, however, softened by the position of the kitchen and living room to either side approximately half way along its length. The living room is open to the corridor and provides views to the balcony and beyond from the depth of the plan. This is helps to mitigate the sometimes disorientating impact of fully internal corridors.
The households, and the building in general, are densely planned with a building grossing factor of approximately 17%. This spatially efficient approach is offset by the small household size of 9 residents, and amongst the larger personal room sizes which has been reviewed as part of this study, measuring between 25 and 26.5 square meters.

This highlights an interesting outcome of this study, which is that it is possible to find successful, high-quality care homes with smaller residents' bedrooms when this is offset by a generous approach to circulation and communal space.

By contrast, it may be valid to reconcile a tighter approach to circulation and break-out space with a more generous area allocated to residents' private rooms.

Schedule of Architectural Data:

Total Building Area Per Resident	Building Perimeter: Building Footprint	Building Grossing	Building Footprint relative to Site
80.3 sqm	1:6.8	16.9%	47.5%
Common Area Per Resident	Double Loaded: Single Loaded Corridors	Green Space per Resident	Private Space per Resident
13.2 sqm per household	All Double	16.17 sqm	31 sqm (bedroom + bathroom)

6 Jewish Senior Life, Rochester, New York, USA

Architect: Perkins Eastman

Project Facts:	
Model of Care	Green House care model
No. of Residents	108 (36 per cottage)
No. of Homes	3 cottages

Jewish Senior Life Retirement Community is a residential care campus in Rochester, New York where different building types, which deliver different levels of care, are set in a unifying landscape. This study looks at the 3 greenhouse 'cottages' which are arranged to the east of the campus. For the purposes of analysis, an area local to these buildings has been defined as their particular 'site' - this is identified in the diagrams below.

Rather than being integrated into an existing community, the cottages are located in a purpose-built campus setting. Their form and massing are clear and legible, with buildings easy to approach via vehicular and pedestrian routes. While this landscaped setting offers high quality outdoor spaces, in some respects it may been isolated from community life as a self-contained community surrounded by a significant road network.

Overarching Universal Design Principles	YES	PART	NO	N/A
1. Integrated into the Neighbourhood				●
2. Easy to Approach, Enter and Move About In	●			
3. Easy to Understand, Safe to Use and Manage	●			
4. Flexible, Cost-Effective, Adaptable over Time				●

KEY PLAN

Greenhouse cottages Building excluded from study Area considered as site area

The Building:

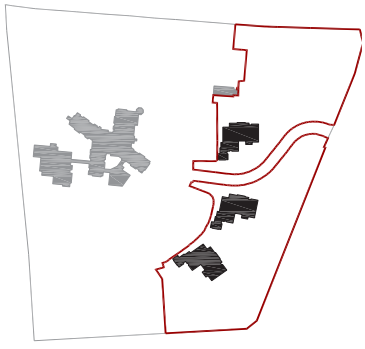
Each ‘cottage’ is designed in the style of a large vernacular house with pitched roof and familiar domestic facade details. While each of the cottages is a building of significant scale housing 36 residents, the massing is broken down into a series of volumes, rendering the design familiar, and easily understood.

The main entrance of each building is easy to intuitively identify though the use of a canopy and the smaller volume used to define the entrance lobby.

Each ‘cottage’ has access to secure garden areas within the broader campus, with landscaped walking routes. In this way there is direct access to residents to safe outdoor areas, while internal spaces benefit from broader views to the campus beyond.

Each of the 3 cottages benefits from a generous community room which is accessed off the main entrance which may foster participation and interaction in the life of the home.

BUILDIND FOOTPRINT / SITE AREA



Building footprint 2.985 sqm
Site Area 34.833 sqm

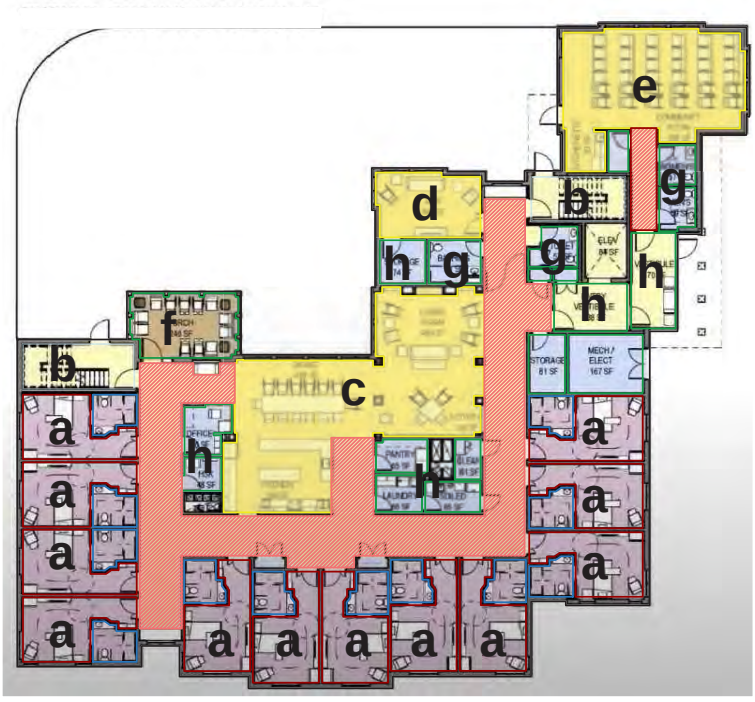
BUILDING ENVELOPE / BUILDING FOOTPRINT

Building perimeter 537m total
Building footprint 2.985 sqm

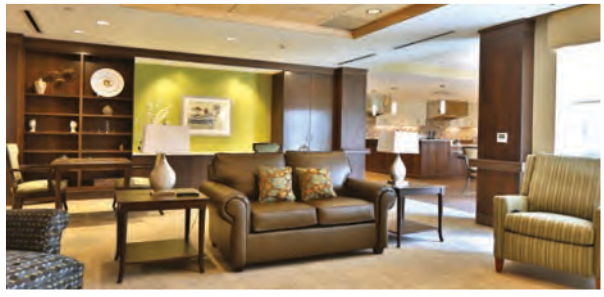
GREEN AREAS / PER RESIDENT

Green areas 31.848 sqm
Number of residents 108

The Household Area:



KEY PLAN



a Private module with:
1 individual bedroom
1 individual bathroom
b Staircase core
c Kitchen/ Living
d Living
e Community room
f Terrace
g Bathrooms
h Common areas

The Household:

While the accommodation is arranged economically and efficiently, with the circulation provided as internal, double-loaded corridors, the household size of 12 residents per floor ensures that the setting does not become overly institutional.

The arrangement of permeable, open-plan communal areas at the core of each floor plan acts as an ordering mechanism and aids orientation and navigation within the home.

Views from many points along the internal corridors are available through these porous zones to the outside, mitigating the negative and sometimes disorientating impact of long, windowless corridors.

This arrangement also ensures that the clusters of 3-5 bedrooms in each household have direct access to the communal areas and the risk of residents feeling isolated or cut off at the end of long corridors is greatly reduced.

The residents' private rooms are arranged in a horseshoe around the building perimeter, providing natural light, ventilation and views to all, while inboard private ensuites create a buffer between private and potentially noisy communal areas.

Schedule of Architectural Data:

Total Building Area Per Resident	Building Perimeter: Building Footprint	Building Grossing	Building Footprint relative to Site
82.9 sqm	1:5.5	18.8%	8.56%
Common Area Per Resident	**Double Loaded: Single Loaded Corridors**	**Green Space per Resident**	**Private Space per Resident**
17.33 sqm per household	All Double	294 sqm	24.55 sqm (bedroom + bathroom)

7 Il Paese Ritrovato, Monza, Italy

Architect: Studio Giovanni Ingrao

Project Facts:	
Model of Care	Alzheimer Village
No. of Residents	64
No. of Homes	8

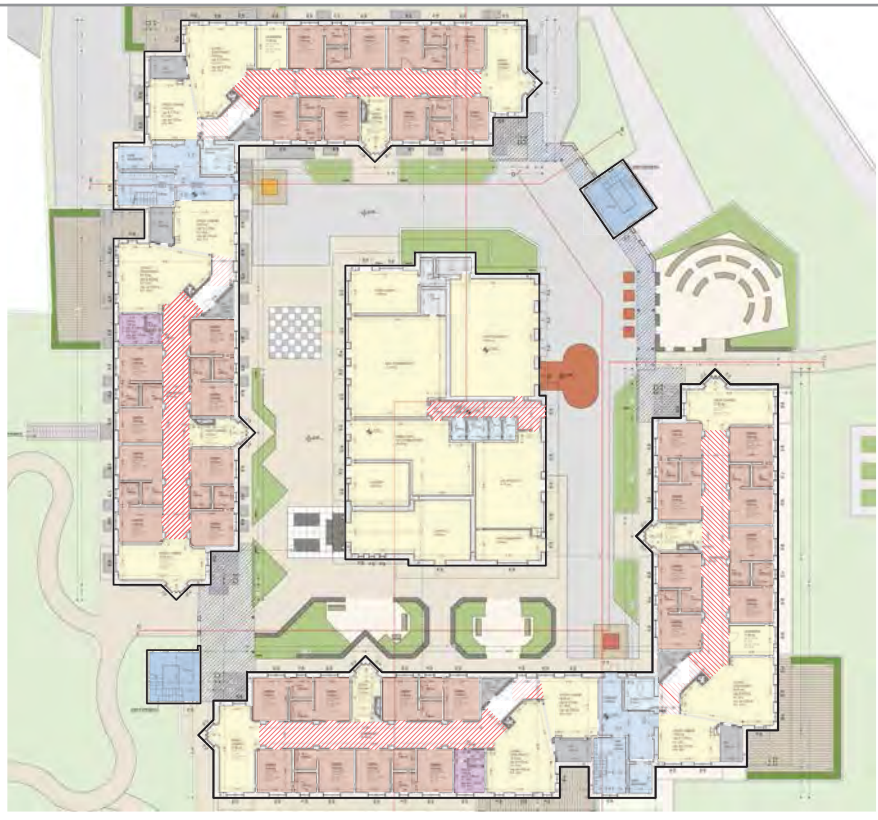
Pease Ritrovato describe themselves as an Alzheimer Village where the gentle care model allows residents to participate and exercise choice and autonomy in their lifestyle and activities, maintaining natural social relationships and lifelong habits.

This approach is also embedded in, and facilitated by the built environment of the care setting. At a glance, the village atmosphere is apparent in the variety of spaces, both internal and external, which are created by the overall massing and arrangement of residential and amenity buildings.

The entire home is enclosed within a secure perimeter, creating an internal community where residents may wander, visiting the shops and bar. Interaction with the surrounding community happens at scheduled events, while residents can take trips with family to external events, as well as participating in organised day trips.

The overall design is intended to recreate 'ordinary life' where residents live in an apartment and are free to go to the bar, to the theatre, to church, to the garden, to the hairdresser. This approach, and its architectural execution has ensured that the care home is familiar and non-institutional while supporting the safety, health and well-being of residents.

Overarching Universal Design Principles	YES	PART	NO	N/A
1. Integrated into the Neighbourhood				●
2. Easy to Approach, Enter and Move About In	●			
3. Easy to Understand, Safe to Use and Manage	●			
4. Flexible, Cost-Effective, Adaptable over Time				●



KEY PLAN

Individual bedroom | Common area | Circulation core | Staff area

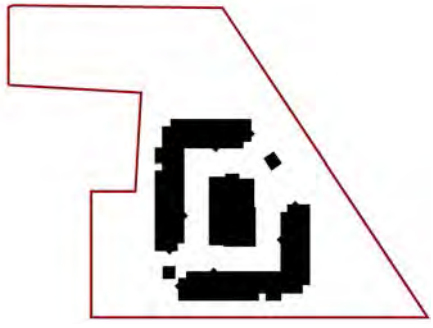
The Building:

Paese Ritrovato is arranged as 2 distinct but connected L-shaped blocks with establish a secure perimeter and form and central courtyard area which is the public realm of the village.

A central, single storey block is positioned to further break down this courtyard space, providing a range of communal amenities within while generating a variety of external public spaces around its perimeter. Within this block, certain key spaces are picked out and articulated as landmarks - like the chapel with its increased height, pitched roof and bell-tower. In this manner, a variety of recognisable, high-quality spaces are arranged along a continuum from public to private, offering diverse experiences and choice to residents.

Each of the L-shaped blocks contains 4 apartments of 8 residents each which are arranged over 2 storeys. This increased height to the perimeter creates a sense of looking inwards to the public square, encouraging participation while supporting orientation and navigation throughout the scheme.

BUILDIND FOOTPRINT / SITE AREA



Building footprint 2.360 sqm
Site Area 12.158 sqm

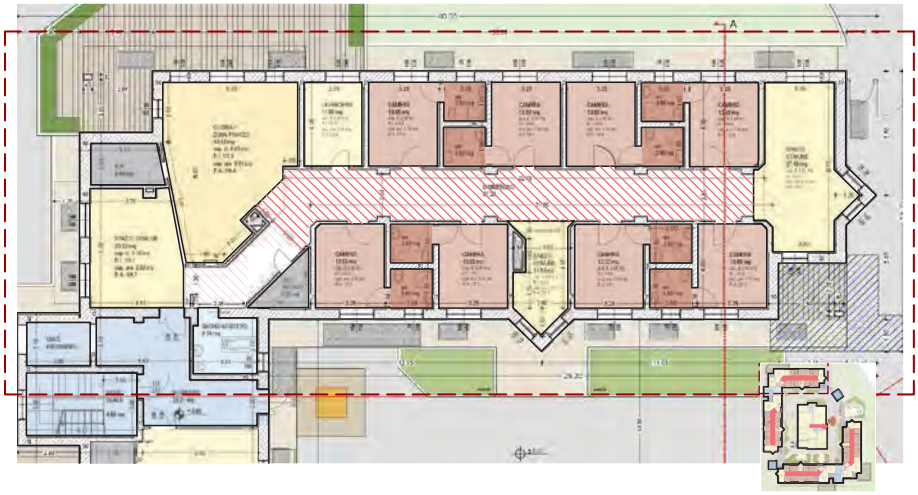
BUILDING ENVELOPE / BUILDING FOOTPRINT

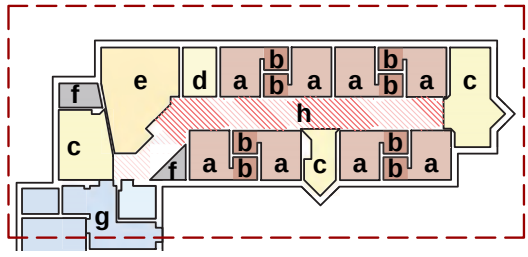
Building perimeter 529 m
Building footprint 2.360sqm

GREEN AREAS / PER RESIDENT

Green areas 4.468 sqm
Number of residents **64**

The Household Area:





a Bedroom
b Bathroom
c Common areas
d Laundry room
e Kitchen
f Common spaces
g Staircase core
h Corridor

KEY PLAN

The Household:

Each floor of Paese Ritrovato's perimeter blocks contains 2 households of 8 residents each. These households are connected by a shared circulation core which is shown in blue in the diagram above.

Rooms are arranged off a central corridor which is fully internal and double loaded. The small size of the household and the arrangement of communal spaces at either end, as well as half-way along the corridor, help with orientation and wayfinding and ensure views through these spaces to the outside.

Residents' rooms are arranged to either side of the block, meaning that 4 per household look inwards, overlooking the activity and life of the courtyard or 'village square' while the remaining 4 are on the quieter external perimeter and look outwards to landscape beyond the home. The residents' private space measures approximately 16.8 square meters and is complimented by generous communal areas within the apartment.

The design intent fosters a lifestyle where residents do not live in their bedrooms, but participate in the community of the home, both at the scale of the apartment, and at the scale of the Alzheimer village overall.

Schedule of Architectural Data:

Total Building Area Per Resident	Building Perimeter: Building Footprint	Building Grossing	Building Footprint relative to Site
64.69 sqm	1:4.46	18.87%	19.4%
Common Area Per Resident	Double Loaded: Single Loaded Corridors	Green Space per Resident	Private Space per Resident
15.75 sqm	All Double	69.80 sqm	16.80 sqm (bedroom + bathroom)

8 Pennemes, Zaandam, The Netherlands

Architect: (involved in the more recent interventions): FKG Architecting

Project Facts:	
Model of Care	Nursing home / Dementia care
No. of Residents	200

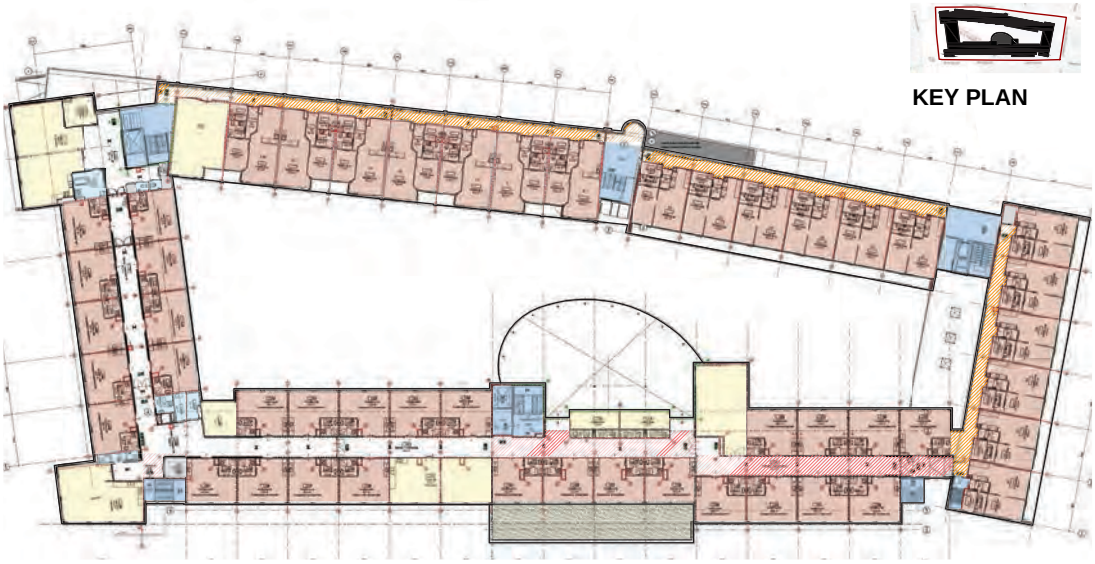
Overarching Universal Design Principles	YES	PART	NO	N/A
1. Integrated into the Neighbourhood	●			
2. Easy to Approach, Enter and Move About In	●			
3. Easy to Understand, Safe to Use and Manage	●			
4. Flexible, Cost-Effective, Adaptable over Time	●			

Pennemes is located in the centre of Zaandam, a city to the north of Amsterdam, and benefits from this central location. The majority of residents may participate in community life, particularly though shared facilities such as the community centre which allows free movement of the locals in and out of Pennemes and gives residents an opportunity to interact with them and involve themselves in broader society.

For those residents with dementia, rooms in a secure block are either garden facing or look onto the street, providing contact with nature and the ability to people-watch and observe the life of the city.

This large urban setting accommodates 200 residents and occupies an entire block, however the scale is broken down by increments into separate units and households, with individuals who have dementia living in familiar groups of 8. The overall size of the home also has the added benefit of creating a secure perimeter for internal courtyard gardens, while roof terraces can be accessed at the upper levels.

The building's central location ensures that it is integrated with community as well as easy to access, approach and enter. For residents who have spent their lives living in the neighbourhoods of this city, the design is a familiar typology and easy to understand.



KEY PLAN

Individual bedroom | Common area | Circulation core

Double loaded corridor | Single loaded corridor

The Building:

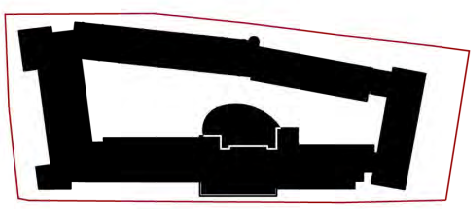
The building layout forms the perimeter of an entire urban block, yet its relatively shallow plan encloses a generous central courtyard-garden which is fundamental to the home's ambiance and ethos.

This form generates a long, thin building with a reasonably generous perimeter relative to the floor area despite the fact that the building's grossing factor is low and half of the internal corridors are double loaded. This means that while the building is economically planned, habitable spaces all benefit from good quality natural light, ventilation and views to the internal gardens or surrounding streetscape.

A series of vertical circulation cores break down the continuous urban form and are expressed as projections which break the building line, ensuring that the various points of entry can be clearly identified upon approach and entry. At the upper levels, these cores punctuate the overall plan and define access to the households which breaks down the overall building into more human-scale living units.

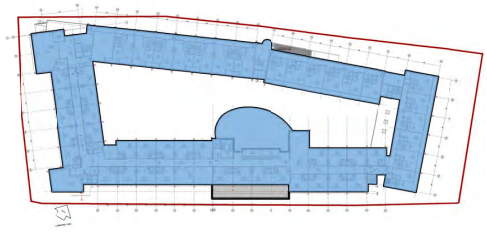
The design makes use of the internal courtyard as well as roof gardens to provide residents with access to open accessible space which incorporates seating and planted zones.

BUILDIND FOOTPRINT / SITE AREA



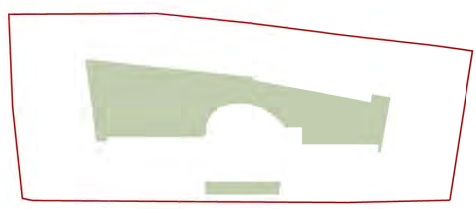
Building footprint 4.388sqm
Site Area 9.170sqm

BUILDING ENVELOPE / BUILDING FOOTPRINT



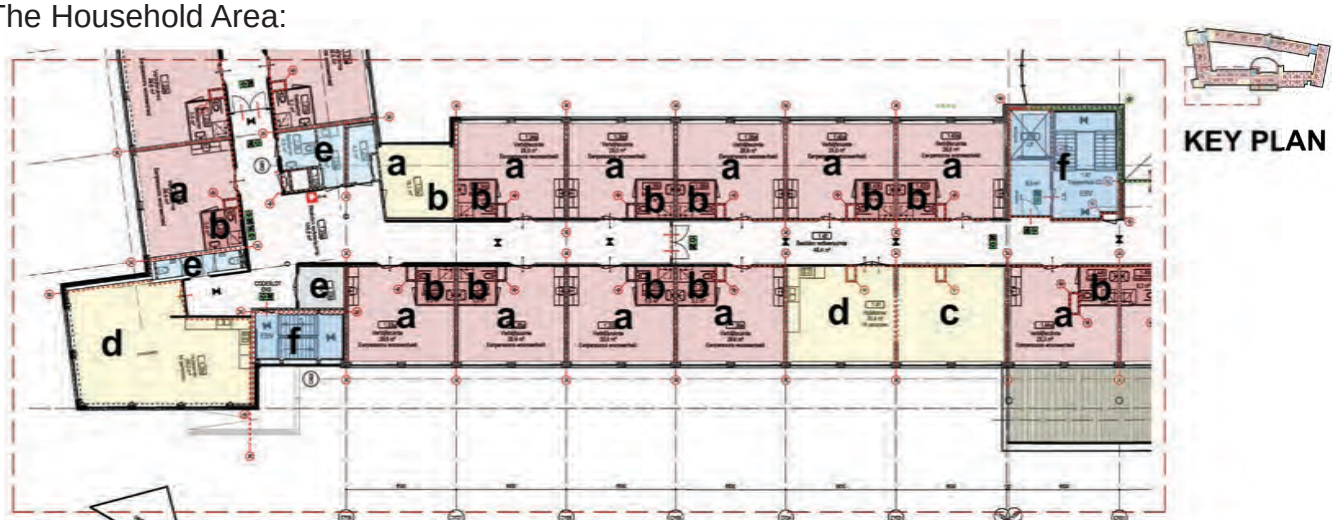
Building perimeter 681m
Building footprint 4.388sqm

GREEN AREAS / PER RESIDENT



Green areas 2.008sqm
Number of residents **200**

The Household Area:



a Bedroom
b Bathroom
c Common areas
d Kitchen
e Common spaces
f Staircase core
g Corridor

The Household:

There are various household arrangements within the Pennemase setting in order to cater for residents with different needs. Only residents with dementia are restricted in their ability to come and go from the building which also contains a large element of mainstream senior housing.

Rooms for residents with dementia take the form of 'studio' apartments which are ensuite and have a small kitchenette to the corridor side. Groupings of 8 such rooms also share communal living areas and a large kitchen. These communal rooms are arranged at intervals along the internal corridor and help to mitigate the institutional nature of otherwise double-loaded internal circulation. It appears that it is possible to look though these spaces to the outside, allowing the communal areas to act as landmarks within the household, and assisting with orientation and navigation.

More independent residents in the senior housing areas of Pennemese live in 2-bedroom apartments which are fully equipped with cooking facilities. This variety within the one setting makes Pennemese an attractive location for independent residents who may later look to move laterally within the home - allowing them to age-in-place and their need for support increases.

Schedule of Architectural Data:

Total Building Area Per Resident	Building Perimeter: Building Footprint	Building Grossing	Building Footprint relative to Site Grossing
not available	1:6	19.48%	47.85%
Common Area Per Resident	Double Loaded:	Green Space per Resident	Private Space
32.6sqm per cluster	1:1	10.04 sqm	34.6sqm (bedroom + bathroom)

Appendix C: Engagement and Co-Creation

Overview

The design and construction of an LTRC project will typically take place across a number of planning and design stages. This will depend on the nature and complexity of a LTRC project, or whether it is a new-build or a renovation to an existing setting. Moreover, the level of engagement and co-creation will vary greatly between each stage, however in terms of transparency and collaboration, it is important that these stages are highlighted for stakeholders and that they are informed about the full process.

These guidelines have been developed in recognition of the diversity of people in LTRC settings – whether they are a resident, staff member, family member or visitor – and they have been framed by a UD approach to provide a more inclusive setting for a wide range of users.

Stakeholder engagement and Public-Patient Involvement (PPI)

The guidelines are underpinned by in-depth research supported by an extensive engagement process with key stakeholders, of which Public and Patient Involvement (PPI) formed a critical component. As noted by the Health Research Board, PPI in research establishes a mechanism through which members of the public and patients are actively engaged, with researchers, in decision-making processes across the various stages of the research cycle. PPI represents an active partnership between members of the public and patients and researchers in the decision making about research.

Specific to the research underpinning these guidelines, PPI largely refers to the general public, residents, family members and carers (including staff). While the project and research team recognizes and acknowledges the diverse care needs of residents who live in LTRC settings, the term 'patient' is not an accurate representation or reflection; it is important to note that, in the context of LTRC and the role of the built environment in supporting health and well-being, these settings are homes in which individuals reside, and as such, the most appropriate term in this instance is 'residents'.

Some of the key highlights of the stakeholder engagement and PPI process include:

- Case studies involving 11 LTRC settings in Ireland; as part of the on-site building analysis, Older Person Council representatives (in collaboration with Age-Friendly Ireland) conducted, analysed the results and prepared the findings reports for the walkability audits.
- Extensive review of international literature and best practice.
- 2 Stakeholder Workshops (70 participants in total); 3 PPI Workshops (involving our PPI Co-Applicants Age Action and Age-Friendly Ireland; and our PPI Collaborators Care Champions, and other healthy ageing advocates.
- Piloting of arts-based / place-based approaches to explore and deepen our understanding and meaning of home and connection and relationship to broader community and overall neighbourhood (Glenaulin Nursing Home).

The stakeholder engagement and PPI process is outlined in the "Key Findings and Recommendations report (2026)"; as well as a stand-alone research report on "Engagement and Co-Creation to support person-centred and place-based approaches with key stakeholder groups (2026)".

Key stakeholders

As detailed in the introductory section of these guidelines, stakeholder engagement is often limited by a number of factors including a limited amount of time to invest, lack of experience and expertise, or a lack of capacity to engage with complex projects. Many LTRC projects will play out over extended periods of time and will involve multiple stages from early project conception to delivery and setting management.

The process must be led by the client, project owner or the design team leader as they are ultimately responsible for the delivery of the project within a certain timescale, budget, and in compliance with relevant regulations and standards. However, key stakeholders such as the local community, current or prospective residents, family members, staff, or visiting healthcare professionals, should be encouraged and supported to get involved as early as possible.

Depending on the circumstances of each project, the design team should consider engaging with key stakeholders, some of whom may include:

- Residents living in the LTRC setting
- Family members, carers, and friends of residents
- LTRC setting staff (Directors of Nursing, and other clinical staff; nursing and care staff; consultants; catering; building management and facilities)
- Owners and Managers
- Allied health professionals
- Others associated with the setting (i.e. staff / volunteers involved in supporting daily activities and overall health and well-being of residents, such as clergy members, hair salon staff).
- Architects, Engineers, Planners, and other built environment professionals
- Local Authority planning department
- HIQA
- Financial Experts

Depending on the extent of the work, it may also be necessary to consult:

- GPs
- Members from the community (i.e. prospective LTRC residents, their family members, carers, and friends)
- Representatives from community-level institutions (i.e. schools, churches, GAA, art centres, libraries, etc)
- Age-Friendly Ireland (via the local authority AFI coordinators)
- Older Persons Councils

Co-Creation and engagement canvas

As detailed in the introduction to the guidelines, a four-step process and related canvas has been created that can be used for all or any one stage in the overall design process that supports the design team to work with stakeholders. The canvas template is provided below and is followed by a set of 'Things to Consider'.

LTRC Planning & Design for quality of life & resilience

Remember the following:

A. 3 core values

- Quality of Life
- Resilience
- Universal Design

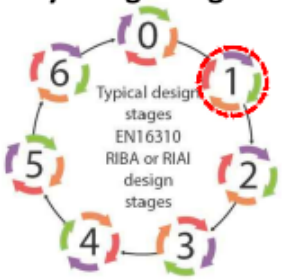
B. Evidence-based design across key spatial scales

C. Key design considerations

- 4 Universal Design Principles
- 12 Key LTRC design issues
- 4 Environmental sustainability, climate adaptation and resilience issues

D. Good practice examples and case studies

Key design stages



Engagement and co-creation canvas - Project name: Project stage: Date:

A - Plan & Agree ▶				B - Do & Record ▶	C - Feedback / reflect ▶	D - Validate / transfer ▶
Project team (for this stage)	Stakeholders (e.g. residents & family, staff, visiting healthcare professionals, local community)	Engagement approach & project-specific inclusion plan (including who and how much involvement at this stage, engagement tools, etc)	Select activities, tools & processes to use (see examples below)	Conduct activities &record results	Produce project stage deliverables	Transfer project specific information to next stage
					High-level learning outcomes (e.g. what activities or tools worked well, etc)	Higher-level learnings transferred to client, design team or other stakeholders

Potential engagment and co-creation tools

- **Collaborative mapping**
- **Focus groups / workshops**
- **Walking workshops**
- **Daily clocks**
- **Diaries**
- **Interviews**
- **Surveys/ questionnaires**
- **Design persona excercises**
- **Walkability audits**
- **Arts based approaches**

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Things to consider across the 4-step process

Step A – Plan and Agree

- **Ensure design process and associated engagement strategy and activities are transparent and accountable**. Communities have reference points of previous experiences where they are not engaged with. Transparency can foster a greater sense of ownership, providing means for local stakeholders to feel part of the process – to reduce the risk that community stakeholders will perceive it as something else in disguise.
- **Ensure the stakeholder strategy fosters an intergenerational approach** such that it captures stakeholder needs for 'today, tomorrow, and the future'. In addition, an intergenerational approach can help to address potential barriers that hinder stakeholder participation in design process (i.e. ageism) and foster a more collaborative, empathetic approach across the various design stages. This can be further reinforced through the use of personas and scenarios (see separate deliverable for more information regarding the use of personas and scenarios as a design tool).
- **Identify and agree (with the community and key stakeholder groups) what constitutes a 'successful' engagement approach**. Building on the shared goals identified at the onset of the engagement activities, conduct a parallel exercise to establish the indicators of success.
- **Refer to the detailed stakeholder mapping exercise** (with associated assessment of power dynamics) to **identify what aspects and interactions within the wider stakeholder group need to be considered to facilitate and promote peoples' contributions** to the greatest extent possible.
- **Manage stakeholder expectations** in terms of both engagement (degree and level) and the proposed outputs that will be delivered at the end of each design stage. With this in mind, the communication strategy should be reviewed and updated as required, to ensure it reflects the engagement outputs, and stakeholder expectations over time.
- **Consider how** (i.e. within the overall engagement approach, inclusion plan, and communication strategy**) to de-risk the engagement / co-creation process**.

Step B – Do and Record

- Engagement activities should reinforce and align with **the identification of shared goals**.
- **Select engagement activities that support a collaborative and inclusive approach** (i.e. not perceived as tokenistic, a box-ticking exercise by participants, or extractive), in order to build trust over time.
- **Establish 'soft' entry and exit points in the design process** to support participant engagement in a way that recognizes and values their time, effort, and available resources. Organize activities during a time that is convenient for

participants (e.g. outside office hours, and/or on weekends) to facilitate more meaningful engagement.

- **Establish mechanisms that provide all stakeholders with an opportunity to contribute** (i.e. some people are more comfortable speaking in a group, while others feel more comfortable speaking in smaller groups, or one-on-one settings). Linked to this point, while it is important to ensure everyone has space to speak, it also important to **design inclusive engagement processes to 'give time to listening'**. Communication should be done in a respectful manner.
- **Ensure activities are delivered, as much as is possible, in place**, to foster deeper connection to setting, and its relationship to community and neighbourhood scale.

Step C – Feedback and Reflect

- **Establish and embed mechanisms to record learnings** – to further enhance the quality of engagement (long-term), and to help frame future design and planning processes with community stakeholders.
- **Conduct an assessment** (of the agreed upon engagement strategy) **and identify areas for (a) improvement / refinement; and (b) good practices to be carried forward** into the next design stage and/or other projects.

Step D – Validate and Transfer

- **Bring the detailed brief back to the community; include a detailed design model to help the community and broader stakeholder groups visualize the design** and better understand the next stages in the process, including the degree and timescale of their involvement.
- **Create dissemination channels to communicate the key outputs from each design stage.** As part of this, ensure the dissemination activities provide space for the participants themselves to share their experience, showcase the newly generated knowledge, and reinforce a sense of ownership of outputs.

Relevant Links

New European Bauhaus - https://new-european-bauhaus.europa.eu/index_en

RIBA – Plan of Work - https://www.riba.org/work/insights-and-resources/riba-plan-of-work/

TCD PPI Ignite- https://www.tcd.ie/tcaid/ignite/index.php

Approaches to Attaining Societal Participation - https://nda.ie/participation-in-society/approaches-to-attaining-societal-participation

Further information on this research can be found at:

- **https://www.tcd.ie/trinityhaus/research-areas/healthy-and-inclusive-places/ltrc-planning-and-design-for- quality-of-life-and-resilience/**

- **https://residentiallongtermcaredesign.ie/**

HRB Health Research Board

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