Living in the Community

Housing Design for Adults with Autism

Andrew Brand

The Kingwood Trust

A registered charity since November 1994, Kingwood has worked steadily to provide a new approach to support for people with autism and Aspergers. In ordinary houses, close to local shops and services, individuals and small groups of people are helped to take control of their lives and to develop interests and skills through which they may begin to reduce the most disabling aspects of their condition. Kingwood's goal is to provide a full life within the community for people with autism and Asperger's.
www.kingwood.org.uk

RCA Helen Hamlyn Centre

The Helen Hamlyn Centre provides a focus for people-centred design research and innovation at the Royal College of Art, London. Originally founded in 1991 to explore the design implications of an ageing society, the centre now works to advance a socially inclusive approach to design through practical research and projects with industry. Its Research Associates programme teams new RCA graduate with business and voluntary sector partners.
www.hhc.rca.ac.uk

BEING

BEING was commissioned by The Kingwood Trust to shape and manage this ground breaking project with the Helen Hamlyn Centre to deliver this publication. BEING is a specialist business consultancy that helps organisations in the public, private or charitable sectors achieve their goals through the effective application and management of design.
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Foreword

Lady Hornby, Chair, The Kingwood Trust

The importance that design can play in improving the living environment for people with autism has until now gone largely unrecognised. At Kingwood we were convinced that the impact of housing design sensitive to the particular needs of people with autism would be significant, with the potential to improve their quality of life immeasurably. We therefore commissioned Professor Jeremy Myerson and his team at the Helen Hamlyn Centre at the Royal College of Art to carry out this study.

The Helen Hamlyn Centre is one of the world's leading postgraduate centre for art and design. It looks at design from a people-centred, socially inclusive perspective, an approach that is at the heart of our own philosophy and the work we undertake in supporting people with autism. At Kingwood we believe that although autism is a serious condition, given the right support it need not prevent people from enjoying a full and active life in the community.

This study represents the first stage of our investigation into a subject that has been little researched. Its findings include a number of recommendations formulated by experts in design and based on the experience, observations and insights of people with autism, their families and a wide group of professionals. Amongst some of the findings we anticipated there were some real surprises, including the importance of relating activity to space, the need for the creation of safe spaces or dens to help reduce anxiety and the role of transitional spaces such as corridors.

Whilst the study found answers to many of our questions and proved beyond doubt that design does matter in the living environment for people with autism, it also threw up many more questions. We have therefore commissioned two further studies starting in October 2010, one looking in more depth at the design of specific spaces and the other focusing on sensory space.

The Autism Bill, passed in 2009, has led to increased attention being paid to autism. Housing authorities now recognise their responsibility to respond to the needs of people with autism in their planning, design and allocation policies. We hope that the new information in this study will help these authorities to make better and more informed decisions about housing provision for the half a million people in the UK with autism and their families.

We should like to thank Professor Myerson, Andrew Brand, the Kingwood research associate, and all the team at the Helen Hamlyn Centre, members of the Expert Reference Group and Colum Lowe at Being together with staff at Kingwood, people we support and their families. They have all contributed most generously of their time and expertise to create a greater understanding of how housing design can help people with autism to enjoy a better quality of life.

Expert Reference Group

The role of the Expert Reference Group was to provide guidance and support for the project, broaden its perspective and assess its findings and results. In addition to informal meetings and consultation with individual members of the group, formal meetings were held at the Royal College of Art in London in March and July 2010.

Name	Role	Organisation
Sue Osborn	Chief Executive	The Kingwood Trust - UK
Kevin Charras	Scientific advisor	ARTZ, Artists for Alzheimer's - France
Monica Cornforth	Media Relations Consultant Parent of adult with autism	Independent - UK
Valerie Fletcher	Executive Director	Institute for Human Centered Design - USA
Matthew Goodwin	Director of Clinical Research	MIT Media Lab | Autism & Communication Technology - USA
Derek Hooper	Inclusive Design Advisor	Commission for Architecture and the Built Environment (CABE) - UK
Richard Mazuch	Director of Design Research and Innovation	Nightingale Associates - UK
Marc Sansom	Director	International Academy of Design & Health - UK
Richard Seymour	Director	Seymour Powell - UK
Frances Sorrell	Chair	Sorrell Foundation - UK
Teresa Tavassoli	Doctoral Scientist	Autism Research Centre, University of Cambridge - UK
John Zeisel	President	Hearthstone Alzheimer Care - USA

Introduction

The environment in which an adult with autism lives can have a profound impact on their health and wellbeing. Providing the right setting can help to enhance motivation, confidence and self-esteem.

This project brought together the autism charity The Kingwood Trust and the Royal College of Art Helen Hamlyn Centre in a research partnership to explore how design could improve living environments for adults with autism, support their specific needs and improve quality of life. The key findings from the study are published here for wide readership with particular focus on housing providers, architects and designers involved in the design, refurbishment and development of residential accommodation for adults with autism.

Autism is characterised by difficulties with social functioning, which can seriously affect a person's ability to live independently. Adults with autism therefore often need support in managing daily tasks in their homes. Historically, this has been provided in residential institutions but the emphasis has shifted to community-focused models of support that take place in people's own homes. In the UK, up to half of adults with autism receive support in the homes of their foster families or parents[1]. With an increasing number of people being diagnosed with autism and parents of autistic adults getting older and less able to provide care, many are seeking opportunities to live outside traditional institutions or their parental home and want to find alternative housing or accommodation.

For the 350,000 adults with autism in the UK, there are no more than 3,000 places in specialist or autism appropriate services[2] so choices in where to live can be extremely limited.

Recognising the increasing urgency to meet the housing and support needs of this population, the UK Government published its Autism Strategy in March 2010, directing councils to take into account the needs of adults with autism in the planning, design and allocation of local housing. So whilst more housing opportunities are set to become available, there is a distinct lack of documented design guidance and therefore a risk of placing people in buildings that do not meet their needs or aspirations. The consequences of not providing appropriate accommodation can lead to family dependence, stress, incidences of aggression and social isolation.

This publication summarises a one-year design research study, the first project focusing on autism to be undertaken by the Helen Hamlyn Centre. The work looks at autism from a design point of view rather than taking a behavioural or sociological perspective. It recognises that there is a great deal more research to be completed in understanding how design may benefit people with autism, their families and the people who support them.

The study has looked at the needs and aspirations of adults with autism, particularly at the assistance they require with personal care, emotional support and domestic tasks. In most cases, the people who contributed during the research phases of the project were described as having a marked learning difficulty or learning disability and high support needs. Additionally, the study was concerned about the design of ordinary residential buildings in the community and the guidelines and concepts presented in this publication reflect this focus. This does not preclude these recommendations being used for other building types or for the design of accommodation for people who require less support.

The aims of the study were to:

- Understand how the built environment and housing design in particular affects the health and wellbeing of people with autism
- Look at how housing design impacts the effective delivery of care and support for adults with autism
- Develop recommendations and concepts that show good practice in the design of residential accommodation for people with autism
- Publish key findings and recommendations as a reference for planners, architects and other key decision makers in the development of residential accommodation for people with autism

The study took a people-centred design approach to research, first engaging people in their own homes as well as completing secondary research and interviewing experts in the field of autism. An understanding of people's needs, constraints and aspirations was built from observations and their stories. Key insights and patterns of behaviour were extracted from the data leading to the development of four design themes.

The design themes are expressed in terms of qualities rather than physical variables and can be used as a framework for generating concepts and making decisions about all the different considerations involved in planning a building, from its location and orientation to details such as wall finishes.

Recommendations and concepts relating directly to building elements are also presented. These are based on existing research, observations from site visits, insights from the Expert Reference Group as well as other professionals who work within autism.

Together they represent a collection of recom-mendations that should be considered when commissioning or refurbishing residential accommodation but are not written to be mandatory or prescriptive. Many of the ideas are drawn from the evidence of working schemes that are currently in existence, whilst others are potential solutions that have yet to be validated.

An abridged version of the design guide shown on pages 20-29 can be freely downloaded for use in design briefs from The Kingwood Trust's website, www.kingwood.org.uk

Terminology

The term autism is used throughout this publication to refer to all autistic spectrum conditions including Asperger's syndrome. The report refers specifically to people with Asperger's, when referring to individuals who have this diagnosis.

Context

About Autism

This section provides an introduction to some characteristics of autism and outlines challenges that might be experienced by adults with autism. All have consequences for the design of residential buildings. It does not aim to be a comprehensive description of autism. Further information is available from the National Autistic Society[3].

Autism is a lifelong neurological and complex condition that affects the way a person perceives and interacts with other people and the world around them. It is a spectrum condition, which means that whilst all people with autism share certain difficulties, they will be affected by them in different ways. Some may lead relatively independent lives while others require dedicated support every day.

There is currently no real consensus on whether autism is one condition or a range of similar and inter-related neurodevelopment conditions with separate sub-groups, such as Kanner or classic autism, Asperger's syndrome and high functioning autism. For a comprehensive description of the diagnostic criteria, refer to the Diagnostic and Statistical Manual of Mental Disorders[4].

As a spectrum condition, autism manifests itself in many different ways. Some people with autism have accompanying learning disabilities, whilst others may possess high levels of intellectual ability. However, everyone living with the condition shares a difficulty in making sense of the world and exhibits difficulties in three main areas:

Social interaction
This includes difficulty with social relationships, appearing aloof, showing compromised ability and little desire to live in communal situations, trouble in understanding social rules and prioritising their own needs over those of other people.

Communication
There can be difficulty in interpreting verbal and non-verbal communication such as understanding the meaning of common gestures, facial expressions or tone of voice. In some cases, people might have limited or no ability to talk.

Restricted repetitive behaviours
There can be difficulty in managing transitions and dealing with changes in routine. Repetitive behaviours, such as pacing, hand flapping or rocking and persistent preoccupation with certain subjects and objects are typical.

People with autism may also display some or all of the following characteristics, which can present themselves as either challenges or strengths, but all of which have implications for the design of their home environments:

- Sensory abnormalities such as unusual reactions to stimulation or difficulty in making sense of stimulation. Certain visual details, colours, sounds, smells, tastes or textures can cause both distress and enjoyment
- A need for more personal space and dislike of physical contact
- Poor awareness of danger
- An inability to generalise concepts, which means skills learnt in one situation may not be transferred and employed in a similar situation
- Poor coordination and balance
- Seizures or periods of loss of consciousness may be experienced
- Special interests and sometimes high levels of ability in music, mathematics, technology or art
- Vulnerability to mental health problems such as anxiety and depression

Facts

There is no single register of people with autism in the UK. Rates of prevalence are extrapolated from smaller studies and therefore vary from one report to another. In 2007, it was estimated that autism affected 1% of the adult population in England[5]. This figure corroborates earlier studies focusing on children in the South Thames region, which estimated a minimum occurrence rate of 116 in 10,000 (1.16%)[6].

Autism affects men and women of all racial, ethnic and socio-economic backgrounds although the ratio for men to women is significantly different. Studies have found sex ratios of between 2:1[7] and 4:1[8]. Estimates of the proportion of people with autism who have cognitive disability vary considerably and it is not possible to give an accurate figure. It is likely that over 50% of those with autism have an IQ in the average to high range, and a proportion of these will be very able intellectually [9]. For some individuals, cognitive ability cannot be evaluated using traditional methods because of their communication impairments. Figures 1 and 2 show data from a survey by the National Autistic Society in England and Wales, in which parents rated the cognitive capability of their adult sons or daughters[10].

Figure 1: Cognitive capability

- 24% Low Functioning
- 30% Medium Functioning
- 34% High Functioning
- 7% Very High Functioning
- 5% No Response

Figure 2: Living arrangements

- 3% Independently
- 8% Independently with regular professional or family support.
- 49% In parental home
- 32% In a residential setting
- 5% No Response
- 3% Other

The terms shown in Figure 1 are the same as those used in the original report.

In the same survey, half of respondents declared they were living with their parents, see Figure 2. Overall, only 3% of respondents were living independently and a further 8% were living independently with regular professional or family support[11].

Context

Adult Services

People with autism may require help to live in their own homes whether as tenants or owner-occupiers, alone or with others or in specialist autism residential accommodation.

Depending on individual needs, support ranges from 24 hour cover, assistance with personal care and all house-related tasks including meal preparation, grocery shopping and cleaning to simply a few hours a week to provide emotional support or help with managing finances. Most of the people who contributed to this study were described as having high support needs, defined as receiving more than 15 hours per week. In some cases people needed constant support.

As recently as 40 years ago, there was no specialist accommodation or support for adults with autism in the UK. Many lived in mainstream services for people with learning disabilities or in the parental home. Newer autism specific services have been largely the initiative of voluntary organisations, parent-led groups through local autism societies and the National Autistic Society[12]. A fragmented approach to the development of adult services exists and has lead to various programmes of support.

All aim to increase independence and choice.

The quality of support services is often determined by the dedication of their front-line staff. Support workers adopt many roles, as one explained:

"You wear about fifty different hats; one minute you are a cook, then cleaner, then swinging from trees; you're helping the psychologist to make the right diagnosis, you're calming someone down after an outburst; you have to have so many skills."

Residential building type

Large institutional residences are not appropriate for most people with autism. They can be over-stimulating environments, occupied by large numbers of people for whom daily routines are determined by staff rather than residents. In response to these older types of services, there has been a shift towards providing residential accommodation in domestic-sized buildings in the community, not apart from it.

Smaller living units such as group homes or self-contained flats in a single building have been shown to lessen the incidences of challenging behaviour, with individuals benefiting from more variety and stimulation from their living environment and inclusion in a community[13]. Whilst these new types of residential building form the focus of this study, it is recognised that they may not be suitable for all people with autism. Different models of accommodation and support exist in the form of clustered housing in one locality, sometimes referred to as villages or farmsteads.

Research
Methods

When designing for people with autism, it is essential to have an understanding of how they might experience the environment and perceive people and objects in it.

Autism cannot be simulated with empathy tools such as age suits[14] or low vision goggles. The way people with autism perceive the world is on the edge of our typical experiences. To build a better understanding, published works on the nature and complexities of sensory processing, behavioural and architectural research on the built environment and its effect on people with autism were reviewed. Biographical works by people with autism were also considered. They provided insightful and lyrical accounts that complemented pathological descriptions of autism.

A selection of references is shown on pages 46-47.

Interviews were conducted with adults with autism as well as professionals who work with them such as support workers, psychologists and architects. Additionally, an expert reference group was established, see page 3.

The third element of the research study included visits to supported living residences. Seven homes for autistic adults were visited on a number of occasions. The purpose of conducting studies *in situ* was to observe firsthand how residents use and respond to their living environments, see how support workers interact with them and carry out contextual interviews. Short stories about four contributors are told on pages 12 and 13. These individuals have difficulties with communication and various stimulation sensitivities, but also a desire for independency.

Insights were drawn from the stories and observations to develop universal themes and a design guide. Throughout the project, contributors were invited to comment on the work. To get feedback on specific issues, illustrated concepts were reviewed in workshops with autistics adults. An outline of the process is shown below.

SCOPE
- Interview autism experts
- Review literature
- Initial pilot interviews with support workers

EXPLORE
- Observe and listen
- Interview in context
- Shadow support workers

DEFINE
- Define work themes
- Workshops
- Test early ideas

DEVELOP
- Design concepts
- Expert feedback
- Develop recommendations

Photographs taken from visits to existing supportive living residences in the UK

Lucy

Lucy is 29 years old. Seven years ago, she moved into a three-bedroom house acquired through a housing association's shared ownership scheme. The house was selected because it had three bedrooms, one to accommodate guests, one for staff, and a bedroom for Lucy. It also had a straight staircase for her physical disability. The location was perfect for Lucy, providing proximity to shops, a pub she likes, a local railway centre and plenty of space.

Every day Lucy writes down what she would like to do as she does not want to have a set activity plan. Lucy is a talented filmmaker. Using a computer for video editing, she made a film about her moving house, which was shown at her service provider's AGM and the Valuing People[15] conference in London.

"I've got lots of colours in my house, and my stuff and all my lights, a notice board and a picture of Thomas the Tank Engine. This place makes me happiest."

Lucy likes to go out and is interested in railways. She has model trains and railway illustrations in her room. She is very sensitive to sound and has perfect pitch. She may decide to wait outside a shop if it is noisy. Car engines left running and fans are a source of stress but she can manage her own vacuum cleaner and uses this daily to clean the house.

Paul

Paul is 23 and lives in a first storey flat with another adult with autism and complex needs. Paul and his flatmate each have a dedicated support worker from 7.30 am to 10.30 pm every day and sleep-in support for the remainder of the time.

Paul is a very quiet man and likes his own company. He understands verbal communication but has difficulties in understanding everything that is being said or asked of him. Paul has limited speech. He knows some Makaton[16], but rarely uses it to communicate with his support workers or visitors.

Paul likes a structured day and to know what activity is happening next. He enjoys walking round the local area and neighbouring village and will happily go out in all weather conditions. Paul enjoys going to the pub with his dad for a pint of beer and chocolate fudge cake.

Paul is particularly fond of his spinning toys. Spinning can emotionally arouse Paul to the point where he is unable to control himself and so his spinning toys are locked away with his consent. Paul is encouraged only to play with three toys of his choice two or three time a day for half an hour at a time.

Robyn

Robyn is a 24 year old woman with Asperger's syndrome. Her achievements are impressive, having spoken about autism at various conferences in the UK and America, appeared on BBC radio and CNN and regularly performing songs she has written at London venues. Robyn's talents can belie her difficulties. She describes her condition as

"... sitting behind a frosted glass wall, being able to see the world but unable to get into it."

Robyn has broken down parts of this wall with the help of verbal communication, art and music.

Until recently, Robyn shared a rented property with three other people. She needed support in managing her money and understanding some the subtleties of other people's behaviour. Robyn also experiences various sensory sensitivities, finding house-related tasks such as cooking to be stressful. Like many adults with a diagnosis of Asperger's, Robyn has found it difficult to get help with housing and support from local authorities, as her needs do not align with the existing service definitions, and she has relied on the support of her housemate, network of friends and parents.

Robyn now lives alone in a rented property, receiving support from her local autism society for a few hours per week. She is excited about having more control over her living environment and finishing it to her own preferences.

Lee

Lee is 32 and lived with a foster family for most of his life. His foster parents became adult placement carers when Lee turned 18 enabling him to remain in the family. As they entered their 70s, Lee's foster parents became concerned for his future welfare and sought alternative accommodation and support services. In 2008, Lee took on his own tenancy and moved into an individual flat in a new supported-living residence.

The transition to Lee's new home was managed carefully. Discussions about what Lee was going to take with him and what colours and furnishings he would like were started several months before the move. Closer to the move, Lee visited the new development with members of the support team. Together they agreed a care plan and enjoyed planning for the future.

Lee makes sure that his support workers take him out for food, especially lasagne. He enjoys going to the local pubs and watching football with his foster dad.

Lee experienced periods of anxiety, leading to challenging behaviour at times. In his new home, Lee is now relaxed and settled and has shown a growing independence. He regularly attends a local horticultural group, taking pride in ensuring the plants are watered, and has recently opened a bank account.

Design Themes
Key Findings

Material gathered during the research phase was used to uncover patterns, decipher common themes and define a structure for understanding how the design of built environments can affect people with autism. From an analysis of what had been observed and recorded, key project findings and insights were defined.

The design of residential buildings can profoundly impact on the health, wellbeing and behaviour of adults with autism. To enhance the confidence and independence of people with autism and complex needs, a holistic approach must be taken that aligns the building design and level of personal support with individual preferences and aspirations.

The abilities and sensitivities of individuals on the autistic spectrum vary greatly so reactions to the environment can differ. Unique groupings of behaviour have started to emerge from the research, but further study is required to prove their universality.

Service staff, prospective residents and their families are rarely consulted in the writing of design briefs and are typically not involved in the preparation and initial stages of building projects. Post Occupancy Evaluations are more common though not universally performed and whilst their findings may inform the next project, it can be difficult and expensive to modify the building being evaluated, which may have several shortcomings. Architects and designers should involve end users throughout the design and build process.

There has been a shift from institutional care to community-focused, social models of support, which advocate personal planning rather than regulated schedules as fixed by staff. Emphasis is rightly placed on the individual needs and wishes of residents. However, in aiming to provide normal home like environments, the requirements of staff have been overlooked and this affects their ability to provide appropriate levels of care and support. It should be noted that residential buildings are people's homes, but they are also places of work.

Homes are more likely to be successful when the compatibility of residents has been assessed and people are cohabitating alongside those with similar needs, routines and lifestage.

These findings were distilled into four design themes that were used to drive the next stages of the project. They are expressed in terms of the qualities and performance criteria that are critical to improving housing for adults with autism. Some of the qualities are specific to people with autism whilst others may benefit wider groups of people. They are written in a manner that tries to help architects and designers ask the right sort of questions at the briefing stage. The aim is to inspire creative responses to these qualities rather than provide prescriptive rules or regulations.

Design responses to these themes are expressed as guidance and concepts in this publication to practically show how they might be used and applied in real spaces.

The four design themes were summarised as follows:

Growth and development:

Enhance the motivation, confidence and self-esteem of residents by encouraging exploration of their environment and providing spaces for developing interests and skills

Triggers:

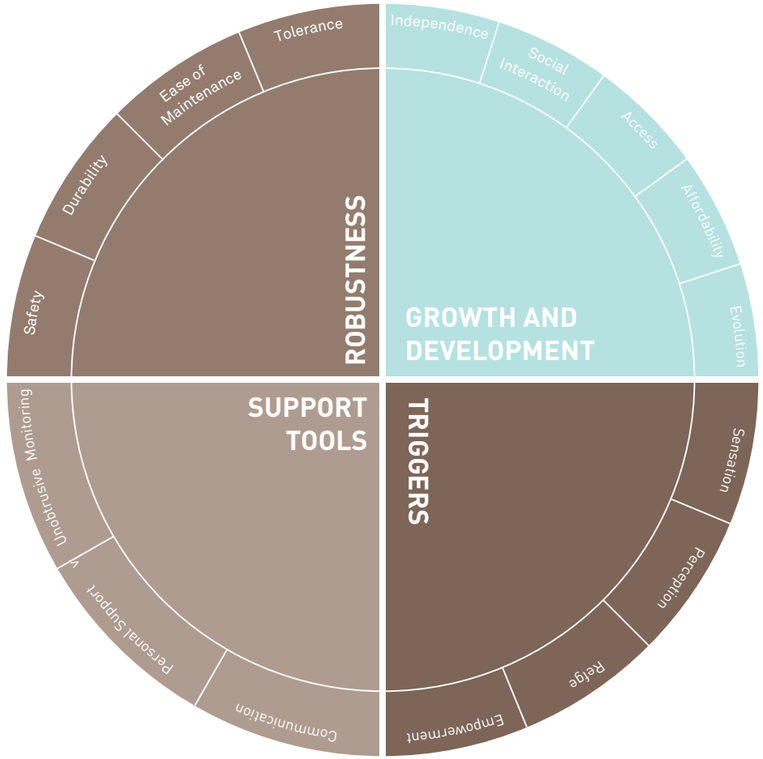
Reduce the triggers of agitation and anxiety, by providing comprehensible, coherent spaces that meet the sensory needs of individuals

Robustness:

Keep residents and staff safe in a robust environment that is tolerant of unintended use

Support tools:

Give staff the tools to deliver people-centred care and support



Design Themes
Growth and Development

To improve the quality of life for adults with autism, there must be opportunities for them to make free choices and be independent. Simple activities like answering the front door and choosing who they invite in enhances their sense of ownership and engagement with the home environment. Similarly, enabling residents to make informed choices and take on responsibilities such as preparing food, cleaning and doing laundry can add meaning and purpose to everyday life. However, increased autonomy and multiple options present ambiguities, which people with autism may find difficult to process and this can lead to agitation or increase anxiety. The challenge therefore is to design environments with what appear to be limited options whilst at the same time building in systems that allow them to be adapted to the changing needs of residents.

Providing environments in which residents' strengths and special interests can be harnessed will also enhance motivation and confidence. Critical to the personal growth and development of adults with autism is residential accommodation that feels like their home and helps them discover the lives they want to lead.

"We need people who understand his behavioural problems... All this in a small homely safe environment, but where he is encouraged to grow up and take control of his life" [17]

Enhancing the following qualities through design can enhance health, wellbeing and quality of life:

Independence

- Giving residents choice in how they live and who they share their home with is empowering
- Enabling residents to do things by themselves increases self-esteem

Social interaction

- Providing a variety of spaces allows residents to engage in social activities on their own terms
- Enabling residents to adjust their home environments to the desired level of social engagement or privacy can result in increased levels of social interaction

Access

- Allowing access to the whole building, especially outdoor spaces, creates a sense of ownership and freedom
- Offering good access to the local neighbourhood, can provide residents with purposeful activity

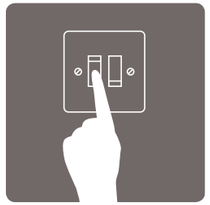
Affordability

- Offering a variety of affordable housing options with graduated levels of support can help residents progress from needing significant support to living semi-independently

Evolution

- Providing home environments that respond to the changing interests and aspirations of residents can further their self-development
- Using features that can be deactivated or removed makes it easier to disable stimulation, which may lead to focused interests and inhibit progress

Design Themes
Triggers



People with autism can be prone to acute and disabling anxiety, resulting in unusual reactions and complex behaviour. They can become easily overwhelmed or even fearful of ordinary daily experiences and activities. This can be compounded by communication issues and sensory abnormalities that affect the ways people with autism process and interpret stimuli in the environment. Through careful selection of design elements, triggers that lead to agitation or increase anxiety can be reduced.

Residents may demonstrate under-developed or over-developed sensitivities to stimulation, resulting in adverse reactions to the presence or absence of certain visual details, colours, textures, noises or aromas. These triggers vary from one individual to another and so home environments may have to provide ranges of stimulation.

People with autism can be particularly sensitive about the amount of personal space they occupy in group situations and may feel threatened if distances are insufficient. When overwhelmed, they may need to retreat to a private space.

"The school bell sounded like eleven alarm bells all sounding at once"

Enhancing the following qualities through design can reduce triggers that cause agitation:

Sensation

- Designing consistent, low arousal environments with appropriate lighting, acoustics, ventilation and use of colour and material can minimise sensory overload
- Providing stimulation for residents with under-developed sensory sensitivities can reduce complex behaviour. In particular environments may need to accommodate vestibular[18] and proprioceptive[19] activities

Perception

- Designing navigable environments can help residents orientate themselves both physically and socially
- Providing clear sensory cues as to the function of specific spaces can help residents understand what is expected of them
- Designing permeable interiors that increase predictability and legibility can help residents assess potential social interactions

Refuge

- Offering private spaces that can be personalised by residents as well as withdrawal spaces peripheral to communal areas allows residents to retreat from group situations when overwhelmed

Empowerment

- Designing environments in which stimulation can be calibrated by residents provides a sense of control and empowerment

Design Themes
Robustness

People with autism can make unexpected, spontaneous movements or lack an appropriate fear of danger. They can also show an under-developed sensitivity to temperature or pain. These characteristics mean there can be significant risk to residents and staff and preventative actions many need to be taken to protect them from injury. Overtly protective features such as wall guards can look institutional and create a sense of containment or become the targets of challenging behaviour. The specification of safe, durable environments needs to be balanced with the aim of providing aesthetically pleasing, homelike accommodation.

People with autism can lose confidence quickly. If their home environment and the objects within are designed to withstand heavy or unintended use, both the physical and emotional impact on residents can be lessened and they will be more likely to engage in household activities. Residents can be further helped to complete tasks necessary for daily living by designing environments that are easy to clean and repair. This has the added benefit of giving staff more time to support residents in these activities and in developing skills for independent living.

"We understand how the limits of a human environment can provide security and be very comforting, but at worst it could reflect confinement"

Enhancing the following qualities through design can reduce risks and lessen the impact of heavy or unintended use:

Safety

- Controlling access to areas of risk and using safety materials and technologies can protect residents and staff from injury

Durability

- Using durable materials can reduce the impact of heavy or self-injurious behaviour such as jumping, banging, running and fiddling

Ease of maintenance

- Designing environments so they can be easily maintained helps staff to spend more time supporting residents
- If home environments are easy to maintain, residents are more likely get involved with household tasks like cleaning

Tolerance

- Designing environments that can withstand unintended use can lessen the physical and emotional impact for residents when they make mistakes

Design Themes
Support Tools

Whilst supported-living residences are people's homes, they are also places of work. The design of these buildings affects the quality of service and contributes to staff morale. People with autism have difficulties in conveying their wishes and feelings and in understanding verbal and gestural communications, which impacts on the relationship between them and support workers. By embedding non-verbal communication systems in home environments, interactions between staff and residents can be rendered more meaningful and purposeful.

Designing environments and the objects within such that residents can better understand how their actions relate to outcomes can motivate residents and make daily activities more manageable. Employing Norman's design principles of feedback and natural mapping[20] may have particular benefit for people with autism.

If sufficient space is provided for staff to give one-to-one support then residents are more likely to carry out household tasks rather than staff simply doing the work for them. Embedding buildings with sensor technologies and clear sightlines can help staff to monitor residents from a distance without making them feel like they are constantly being watched. For residents who physically need more personal space, this may help to reduce their anxiety.

"He might be screaming because he wants a biscuit or he is in pain. We just don't know"

Enhancing the following qualities through design can increase levels of purposeful communication and reduce frustration:

Communication

- Using visual prompts to impart information, warnings and reinforce orientation within home environments can help residents understand what is expected of them
- Providing tools for spontaneous non-verbal communication between residents and between residents and staff can increase interaction and enhance confidence
- Embedding information in the environment about how it should be used can motivate residents to take on household tasks

Personal Support

- Providing appropriate environments for one-to-one life-skill training and assisting with personal hygiene care can help staff deliver quality support
- Providing facilities for staff to record observations and capture what residents like, enjoy and respond to can improve continuity of support

Unobtrusive Monitoring

- Embedding strategies and assistive technologies in the home environment allows staff to safely monitor residents from a distance

Design Guide
Building Layers

This section offers basic instruction and ideas for actions and modifications that may be used to make residential buildings more autism-friendly.

In combination with the previous sections, it aims to provide basic information for planners, service providers, architects and designers to engage with the subject. However it is not intended to be prescriptive, nor is it necessarily exhaustive. Recommendations are based on existing studies, findings from this project's research activities and responses to the four design themes introduced on pages 14-19. Many of the recommendations are drawn from experience or post occupancy evaluations rather than hypothesised, objective testing.

The design guide is divided into five layers that constitute a build project:

1. Planning deals with identifying the location and defining the right type of building for prospective residents.

2. Massing and layout covers the size, orientation, structure and internal organisation of the building.

3. Mechanical and electrical outlines technologies and utility services.

4. Furniture, fabric and finishes introduces ideas about interior design and decoration.

5. Fixtures and fittings covers items that are installed in a building in such a way they may be considered part of the building.

People with autism can be resistant to changes in their environment so decorating or renewing furniture may bring about negative reactions. Changing fixtures and fittings or the services infrastructure in an occupied building can cause disruption to residents.

If improvements are needed in an occupied building, measures need to be taken to prepare residents for the changes and reduce the impact of noises, clutter, smells and the number of visitors that result from building work.

Building contractors or trades people may require help to understand how their actions can affect residents. Ideally all design actions and modifications should be made before residents move into a building.

Design Guide
1. Planning

DO

Get to know who you are designing for and understand their individual preferences.

Give prospective residents a choice in where they live and who they share their home with.

Specify or select the type of buildings that will best suit prospective residents and facilitate the level of support they need[21].

Group together residents with similar needs, routines and lifestage. In addition to age, gender and mobility needs, people with autism will have learning differences and extreme variation in personal preference. For example, people sensitive to certain noises and impulsive behaviour may not be able to live with those who respond positively to such stimulation.

Locate residential buildings close to:

- Established and stable neighbourhoods[22]
- Access to public transport
- Shops and cafes
- Health services
- Education and leisure facilities
- Places of employment
- Pedestrian and cycle friendly routes

CONSIDER

Budgeting for contingencies. Late or post-occupancy changes may be required to meet residents' needs, which were not identified at the briefing stage.

What is the appropriate number of residents within the context of the site and space available. The research suggests that more than eight residents living together can negatively impact their quality of life.

Harmonising the scale and style of the building with neighbouring buildings to increase integration with the community.

Specifying detached buildings to minimise transmission of externally generated noise and maximise personal space.

Specifying single-storey buildings to negate the transmission of footfall noise from above and risks associated with staircases.

Locating residential accommodation in areas with good access to nature, such as public parks; especially if on-site outdoor space is constrained.

How car parking will be provided for staff, visiting health professionals and family.

BEWARE OF

Having more than eight people sharing a single residence.

Locating residential buildings near:

- Roadways with high volumes of traffic, railways, airports or busy commercial sites
- Other buildings that allow residents to be constantly overlooked by neighbours or allow residents to peer into neighbouring households
- Areas that may be affected by adverse environmental events such as flooding, which could force residents to be displaced
- Areas that may be impacted by long term town planning directives

2. Massing and Layout

DO

Refer to the Care Homes for Younger Adults and Adults Placements National Minimum Standards[23] and Lifetime Homes Standards[24] for guidance on room sizes and fit-out.

Specify generous room sizes but of domestic scale and proportion. Larger spaces may be required as people with autism can be sensitive about the amount of personal space they occupy in group situations. There can also be as many support staff as there are residents using a space.

Organise the building layout to help establish routines and aid understanding by specifying spaces according to their primary function. This reinforces that a kitchen is for food preparation, a dining room for eating and bedroom for sleeping. A simple layout can minimise confusion[25].

Provide clear visual access throughout the building. Residents are more likely to enter a space if they can see who is occupying it and assess the potential social interactions[26]. Clear sightlines also help staff monitor residents in an unobtrusive way.

Separate high stimulus areas such as communal activity spaces from low stimulus areas to minimise transmission of noise.

Provide more than one exit from communal spaces to give residents choice and help staff to manage challenging behaviour.

Provide smooth transitions spaces between areas of activity to allow for sensory recalibration[27], especially at entrances to the building or between high stimulus areas.

Specify wide circulation spaces with passing bays or incidental spaces in corridors[28] so residents may pass one another without conflict and staff can walk alongside residents.

Minimise blind corners so that residents can avoid unplanned social encounters.

Co-locate activity spaces to reduce travel distances and distractions and to mimic typical domestic adjacencies. For example, locate the kitchen next to the dining area, with an exit and view to outdoor areas and the main living space.

Position rooms to maximise natural daylight with bedrooms and breakfast spaces towards the east, activity spaces towards the south and increase views of natural features like gardens and trees to enhance alertness and improve mood.

Locate laundry facilities so that soiled articles and clothing do not have to be carried through dining or food preparation and storage areas.

Provide good access to outdoor spaces and sheltered outdoor spaces.

Specify larger bathrooms to facilitate one-to-one assistance with personal hygiene.

Provide sufficient space for staff to write, file and store records and a private space away from residents for them to rest and focus on tasks that need concentration.

CONSIDER

Specifying large communal rooms with high ceilings to allow for large movements such as jumping and pacing and providing smaller enclosed spaces to which residents can withdraw when needed[29].

Using form, material, light or colour to differentiate communal spaces from private spaces. This can aid understanding of the boundaries of ownership.

How colour, the position of furniture or lighting can be used to create comprehensible boundaries within a larger room rather than specifying multiple smaller rooms.

Using curved walls along circulation spaces or avoiding corridors altogether by designing short connecting spaces so the building interior does not look institutional.

Locating physical activity spaces in centrally visible locations in the building, to help increase awareness and use of these spaces.

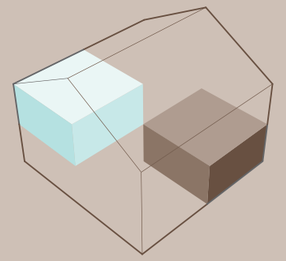
Employing features in circulation spaces that provide activities around which informal social exchange may take place. For example, adding a centrally located mailbox[30].

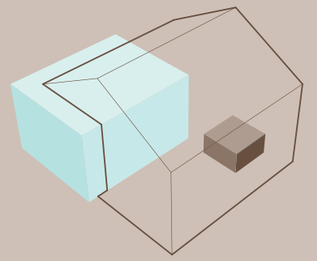
Separating toilets from bathrooms to aid understanding of these spaces and avoid misuse.

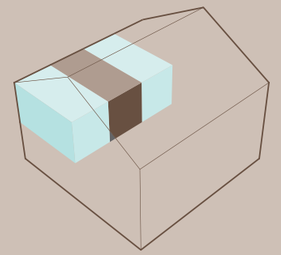
Building in systems that allow the interior to be adjusted to the changing needs of residents, such as residents wishing to cohabitate with a partner, or losing mobility as they get older.

BEWARE OF

Focusing on trying to get every detail of the building plan and layout correct, as stipulated by various guidelines including the recommendations here, at the expense of creating a coherent and comfortable homelike environment







Design Guide

3. Mechanical and Electrical

DO

Fit individual electrical circuit breakers for mains power supply in each room including bedrooms as well as for individual kitchen appliances such as the oven and refrigerator.

Fit integrated fire alarm and emergency lighting installations that have a domestic rather than institutional appearance.

Specify ample plug sockets in all rooms to reduce the length of trailing power cables.

Future-proof the building by incorporating new technologies such as alarm systems, digital or fibre optic communication systems even if the front end of these technologies is not installed at the time of build.

Conceal all pipework and toilet cisterns and fit an inspection chamber behind the toilet to make unblocking easier.

Specify space heating systems that respond and settle quickly to the desired temperature.

Regulate the temperature of water discharged at hand basins, bath and shower outlets in accordance with care home regulations[31].

CONSIDER

Using a whole-house mechanical ventilation system to augment passive systems, specifying central ventilation systems and acoustic insulation to minimise fan noise within the building.

Installing zonal heating systems to allow residents and staff greater control of the temperature in their immediate environment.

Positioning space heating controls out of reach of residents as access can result in fixation and inappropriate behaviour.

Fitting a pumped return system on the domestic hot water so that water is discharged immediately at the desired temperature[31].

Fitting some plug sockets close to ceilings in bedrooms and activity spaces to minimise cable lengths to wall mounted equipment.

Installing sensors and assistive technologies to reduce the need for physical monitoring, such as door sensors, water sensors in wet areas, fall sensors, bed occupancy sensors, motion sensors or enuresis sensors for detecting moisture in beds. Consider the ethics of using these technologies.

BEWARE OF

Using interfaces with winking lights or beeping noises, which may lead to excessive focused interests.

Using traditional radiators or leaving hot water pipes exposed as residents may burn themselves on them. Instead use alternative space heating devices such as low-surface temperature radiators, under-floor heating, or ceiling-mounted radiant panels.

Using plastic faceplates for light switches and plug sockets as they can be more easily damaged than metal ones. Use aluminium or brushed stainless steel faceplates to conceal screw heads.

Design Guide

4. Furniture, Fabric and Finishes

DO

Use muted, matt and harmonious colour schemes in communal areas and consult residents on their colour preferences for private spaces.

Assess the visual and colour sensitivities of residents and add or remove colour accordingly using decorative objects, pictures and textiles.

Use domestic, comfortable furnishings that are free of toxins and off-gassing chemicals.

Use non-reflective materials, minimal detail, and continuous and smooth surface transitions to minimise distraction.

Arrange furniture so movement is not obstructed and thoroughfares are obvious. Provide some seating against partitions or walls as people with autism can have a fear of being approached from behind.

Provide places to affix and integrate visual information such as pin boards or magnetic dry erase boards.

Decorate kitchens, dining rooms, living rooms and activity spaces to clearly differentiate the spaces and indicate the appropriate activities for each room.

CONSIDER

Specifying normal home furnishings rather than special needs catalogue furniture, which can look institutional. Where risks to residents and staff are probable, specify sturdy furniture with rounded edges and bite resistant, moisture-proof fabrics.

Using security hangers for pictures and Plexiglas instead of glass.

Specifying some furniture that is easy to move, such as rolling shelving units, so residents can adjust their environment.

Using colour contrast to highlight functional features.

Using wall and ceiling fabric hangings or acoustic panels to reduce noise.

Marking paths with light or colour, giving spaces a clear visual identity and placing feature objects as landmarks to help residents orientate themselves.

BEWARE OF

Using geometric or repeating patterns on surfaces as these can provoke excessive focused interest or new routines. Organic, non-repeating patterns such as natural wood grain can be preferable.

Removing all stimulation from the environment. Think creatively about how stimulation can be increased or reduced in the same space and provide a subtle degree of stimulation by thinking about materiality, light and shadow, acoustic effects and spatial experience.

5. Fixtures and Fittings

Assess the health, safety and welfare risks for residents and specify fixtures and fittings accordingly. It may be necessary to specify anti-ligature and durable fixtures and fittings that will wear well and withstand deliberate damage and unintended use. However, the need for robustness should be balanced with the appeal of materials. It is important to select building elements that look and feel more homely.

INTERNAL DOORS

Install outward opening doors on communal use WCs and bathrooms with door-locking mechanisms that can be opened from outside in case of emergency. Double action pivot doors may need to be fitted to residents' private rooms where there is risk of seizure or challenging behaviour.

Fit lever door handles rather than door knobs and specify bolt through connections. For private spaces, ensure fixings on the private side of the door are concealed.

Specify door closers that have stand open mechanisms where permitted by Fire Officers to create more open spaces. Use closers that can be automatically released by the fire alarm system. Swing-free door closers may be required on high use thresholds. Concealed door closers should be used where there is risk of residents swinging or trapping their fingers in the exposed bars of standard closers.

Consider fitting doors with integral vision panels in communal spaces so residents and staff can see people on the other side. Fit spy-hole viewers in the front doors to residents' private spaces so they can see who is outside their room.

For buildings in which residents are likely to wrench on doors, reinforced door frame fixings and heavy-duty hinges may be required. To reduce damage in demanding environments, protective door strips and edge trim may be required.

LIGHTING

Maximise natural light through use of light shafts, skylights and clerestory windows. Use multiple, directional light sources with overlapping light beams to create a soft and bright effect and indirect lighting where surfaces may create glare and reflection. Consider using coloured light or filtering elements where residents have colour sensitivities.

Provide independent control of lighting so residents and staff can adjust levels of light. If dimmer light switches are specified, ensure they do not emit noise, which may cause distraction and discomfort.

Fit non-flickering lighting such as electronic ballast fluorescent lamps, which flicker at an imperceptible frequency and are less likely to aggravate light-sensitive residents.

For more demanding environments, install light fittings with bezels that sit flush with the mounting wall or ceiling to prevent people pulling on the fixture.

Recess down-light fittings to provide an unobtrusive appearance on the ceiling.

WINDOWS

Use laminated or toughened safety glass for both inner and outer panels of windows and glazed doors. Specify smaller sizes of glass in combination with strong glazing bars to increase resistance to impact and reduce repair costs should a pane be damaged or broken. Acoustic glass may be required for road facing windows to reduce transmission of traffic noise.

Consider using internal sandwiched glazing blinds (also known as integrated or interstitial blinds) to control privacy and the amount of natural light coming into the building if residents are likely to find curtains or shutters over stimulating or target them when agitated.

In spaces where residents are likely to misuse or target the pull chords, wands or handles that operate these blinds, using electronic remote controls or removable magnetic keys can lessen damage.

Install operable windows with constrained opening and locking features and robust window furniture.

5. Fixtures and Fittings

WALLS

Use traditional brick construction for internal walls, clad with impact-resistant plasterboard and skimmed with plaster. Damage to thin plaster is less noticeable and can be easily repaired. Fix partition walls to floor and ceiling joists to make them more resistant to impact.

Consider enhancing the acoustic performance of the building by separating floors and walls, using suspended ceilings, sound absorption materials, cavities, sound resistant plasterboard or acoustic tiles. People with autism can be over-sensitive to sound and the acoustic performance of the building may need to exceed existing Building Regulation requirements.

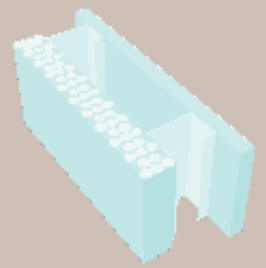
Use half walls and cut-outs to increase visibility and awareness of what is happening in adjacent spaces. Screen partitions or portable dividers can be used to make temporary spaces for dining and other activities.

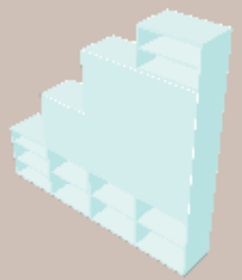
Use durable paints and wall coverings that can be easily cleaned. For more demanding environments, install wainscoting or tall skirting boards, corner guards, and chair rails

STORAGE

Provide plenty of accessible, fixed storage to keep the building free of clutter. People with autism may lose focus and concentration when there is a large amount of detail or disorder in their environment. Ensure there is storage in bathrooms and shared spaces. Provide lockable storage for hazardous materials and medication.

Consider building storage into architectural features such as under stair spaces or using it to divide a room. Fixed units can be less obtrusive. Fit doors to storage units to help maintain a visually low-arousal environment.





FLOOR COVERINGS

Choose floor coverings that are suitable for the function of the space as well as aesthetically appropriate. Be mindful that the acoustical properties of floor coverings have significant impact on noise levels and that the colour of finishes will impact on the lightness or darkness of a space.

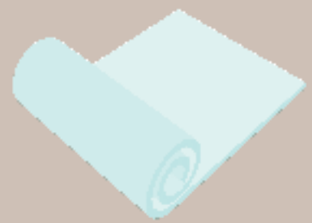
Fit durable and waterproof floor coverings that require low maintenance and can be easily cleaned in communal areas such as activity spaces and kitchens. Install waterproof, slip resistant floor coverings with sealed coving between the floor and the walls in WCs and bathrooms and hard wearing floor coverings in circulation spaces. Use darker floor colours in areas where there are likely to be spillages.

Assess if more resistant floor coverings are required in bedrooms of individuals who may experience incontinence.

Minimise visual barriers such as colour or pattern transitions on floor surfaces. Use carpet tiles rather than rolled carpet, as tiles can be more easily replaced if damaged. If using rolled carpet, use single width carpet rolls to span rooms so that carpet joins are hidden. Where carpet joins are unavoidable, consider aligning rolls with fixed features such as door thresholds and fit protective strips to cover the join.

Consider using linoleum, cork or plastic derived systems such as Flotex floors in communal areas. These materials are abrasion resistant and easy to maintain, and also resilient which makes them more comfortable on the feet and more forgiving than wooden boards or tiles should someone slip and fall.

Install noise-reducing underlay material beneath floor surfaces to help reduce the sound of footfall and lessen noise transmission, especially between different floor levels. Slip resistant rugs can be used to dampen noise and highlight functional spaces.



Design Concepts

Concept Residence

A concept residence is shown in this section to illustrate some of the guidance provided on pages 20-29. The concept is indicative only and is not presented as a universal design of housing for adults with autism. Meaningful design solutions can best be achieved by responding to the context of the building site and specific requirements of residents.

For a new development, the overall look and feel should be considered in relation to neighbouring buildings and the local area. The external appearance of this concept is plain since it has been conceived without topographical context.

There is space for four residents. The building has one self-contained flat with a private garden that could be used to house a semi-independent individual or someone with greater support needs for whom communal living is not suitable. The remaining three residents share a kitchen and living spaces.

Ground floor

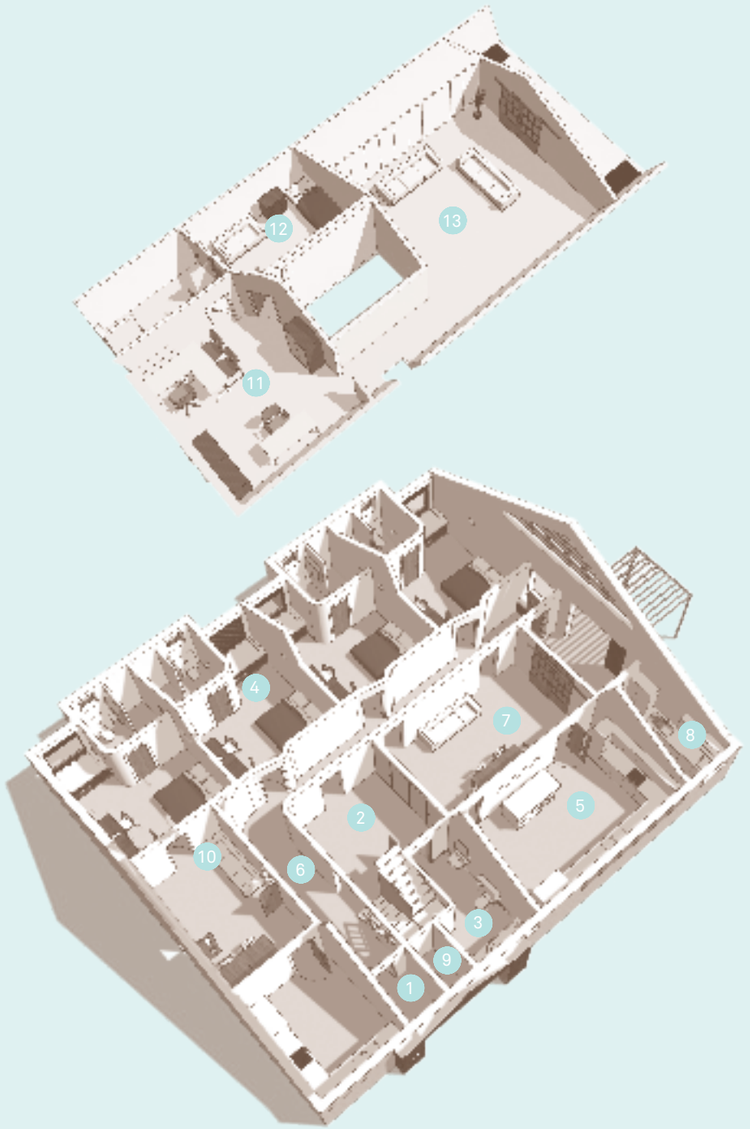
1. Front entrance space
2. Communal space for physical movement like jumping, pacing, bouncing.
3. Accessible bathroom and wc (communal use) located next to main living space
4. Bedroom with en suite for residents
5. Kitchen
6. Circulation space
7. Dining space
8. Laundry
9. Plant room
10. Self-contained flat with separa living space, kitchen and bedro

First floor

11. Staff office
12. Staff bedroom with en-suite shower and wc
13. Quiet space for residents

First floor layout

Ground floor layout



Design Concepts

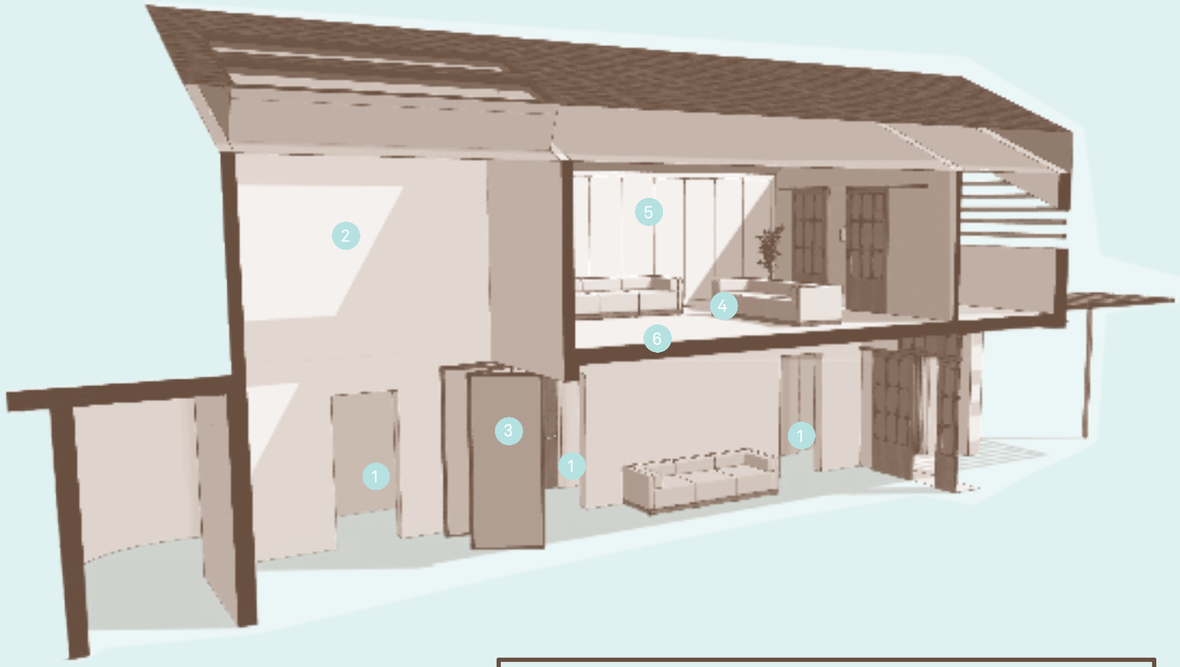
Communal spaces

Not all activities can be specified or foreseen at the time of design so general design strategies need to be employed. This concept has large communal activity space for dining, relaxing, recreational activities or physical exercise.

The space has relatively uninterrupted detail lines providing a continuous space that can be divided by a folding partition. The communal spaces are located centrally so they are visible and accessible from circulation routes, increasing awareness and encouraging participation in informal activities. A quiet space is located on the first floor.

1. Because communal spaces can be socially demanding for people with autism, multiple exits are provided to allow residents to separate themselves from others and engage in social activities on their own terms
2. Light towers flood the communal spaces with natural light and provide areas with double height ceilings, encouraging freedom of movement
3. Folding partition to divide communal room into dining space and high activity space
4. Quiet living area for residents
5. Ample storage for educational, recreational and arts and crafts materials
6. Additional sound absorption material fitted under the floor
7. A wall cut-out allows people in tl activity space to see if the kitche is occupied and vice versa, whils maintaining a degree of privacy
8. WC closely located to communal spaces

"If you are sharing an open space with different activity areas, alongside each other, there is no sense of anyone intruding on anyone else or being stuck in small space so conversation can be more relaxed and natural"



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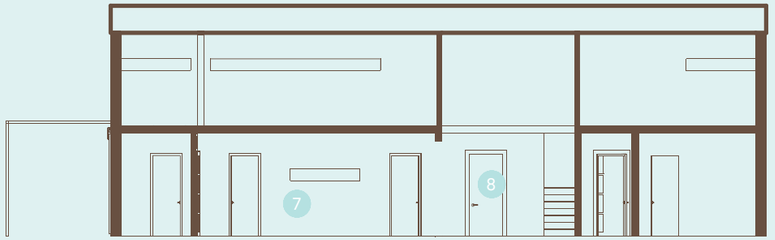


Reverse Section

Design Concepts

Kitchen

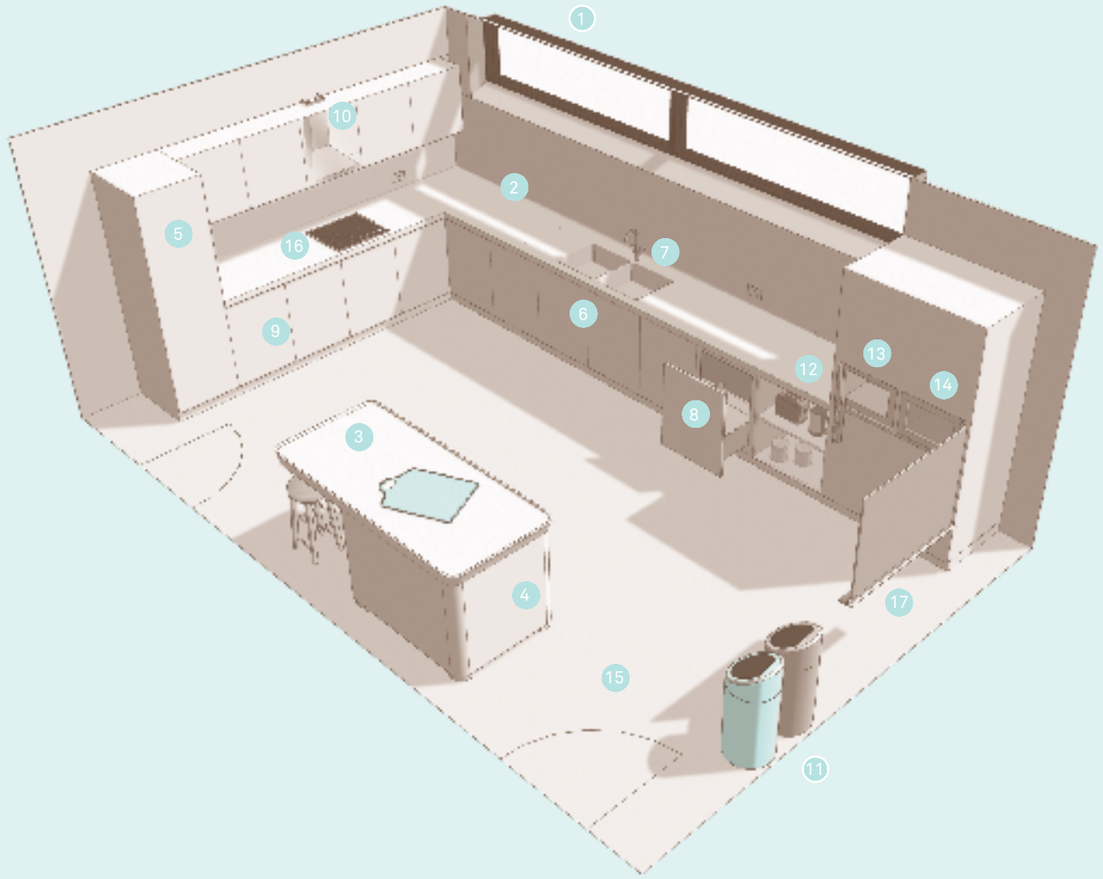
A kitchen performs many roles. It is a space for storing, preparing and cooking food as well as snacking, dining and entertaining visitors. Because of its many uses and the sensory stimulation associated with cooking, kitchens can be stressful and uninviting places for people with autism.

To help contain the sights, sounds and smells emanating from the kitchen, this concept kitchen is separate from rather than part of the main activity space. The kitchen is adjacent to the activity and dining spaces as in a typical domestic house.

Kitchens can become contested areas therefore generous floor space, multiple work stations and ample countertops are provided to allow people to work simultaneously

1. Clerestory windows provide natural light whilst minimising distraction from outside
2. Fire and heat-resistant counter-top with integral splash back
3. Island bench with cantilever work-top to allow people to sit and prepare food or eat snacks. A lipped edge catches spillages
4. Unrestricted access to a small refrigerator integrated into island unit for storing snacks and items to be consumed on that day
5. Restricted access to large refrigerator and freezer. Food items can be decanted from large to small refrigerator daily
6. Restricted access to under sink units, used for storing potentially hazardous products such as bleaches and cleaning products
7. Double sink with captive plugs (heads of threaded fasteners covered)
8. Kitchen units fitted with drawers rather than shelves so contents can be easily seen and accessed
9. Wall mounted cabinet doors are attached with piano hinges for durability
10. Extractor fan disguised in wall mounted cabinet
11. Dedicated location and visual instruction for waste disposal, composting and recycling
1. Cool-touch small appliances to minimise risk of being burnt with under counter storage position
13. Separate oven from hob so different people can access appliances at the same time. Integrated oven unit has side opening door and is mounted at counter top height to ease access
14. Integrated microwave
15. Linoleum flooring
16. Gas-to-glass hob with front controls to avoid reaching over hot surface
17. Chalk board for writing messages, lists and menu options

"I mostly use the microwave. I don't like the oven and find the microwave much easier. I mainly heat things up"



Design Concepts

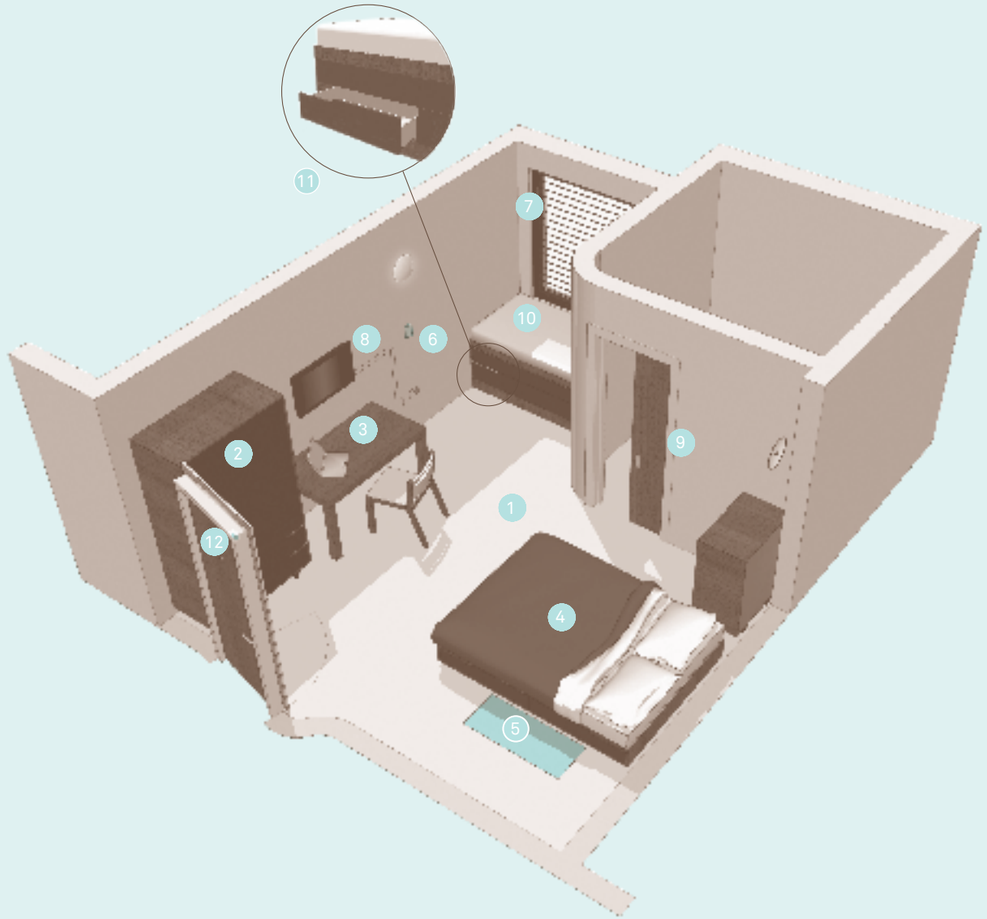
Bedroom

The familiarity, predictability and sense of ownership of personal space can have a very positive effect on a person with autism.

Residents should be encouraged to choose the colour scheme, objects and furniture for their bedrooms. This concept shows a good-sized bedroom with en-suite facilities and a snug that provides views of the garden.

1. Carpeted floor for comfort
2. Movable storage affixed to wall once in preferred position
3. Wireless internet connection
4. Bed positioned away from windows, radiators and entrances. Direct view from bed to WC door
5. Mat with pressure sensor switches on low level lighting at night
6. Invisible, contactless light switch with dimmer function
7. Window with integrated blind
8. Media centre and TV screen recessed into wall, connected with concealed flat wire
9. Space saving pocket door to en-suite washroom and WC
10. Window seat with view of garden giving continuous awareness of the weather and time of day and year
11. Built in storage. Drawers opened with cut-out feature negating potential issues with handles and fixings
12. Door sensor

"if you've got autism, in my experience, you're likely to spend a lot of time in your bedroom because that's where you feel safest, so what's in your bedroom and what you can see through the window is your world"



Design Concepts

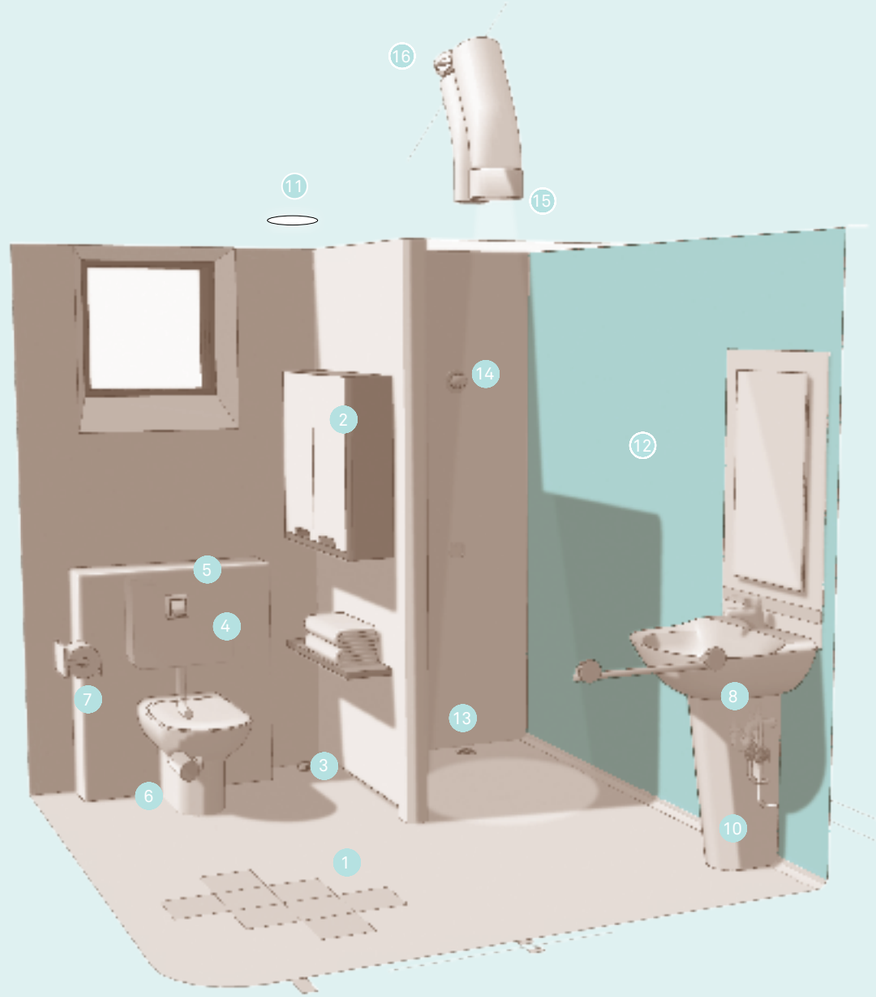
Bathroom and WC

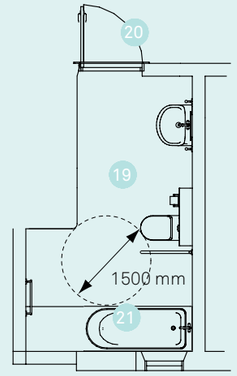
To increase privacy and reduce anxiety, residents should be able to access a toilet at any time. In this concept, en-suite washrooms and toilets are provided for each resident.

Combined facilities can cause confusion for people with autism. To aid understanding in this room, the toilet is positioned in line with the door and the hand basin and shower are located against the far side wall. In addition, a separate communal WC and bathroom are provided and located close to the main activity space for residents who have continence concerns. People with autism can have a fascination with water and spend significant time bathing. If they become over-stimulated, water can get thrown around the room. It is therefore important to ensure the floor is sealed and waterproof and standing water can be managed by staff.

1. Fully tiled wet room with level access shower tray. Nonslip tile flooring
2. Fixed storage for towels, toiletries and gloves and wipes
3. Anti-flood detector and isolator mechanism on sink and bath outlets
4. Concealed toilet cistern to control access
5. Push panel flush system
6. Large bore toilet waste pipe with inspection chamber behind toilet pan for easy removal of blocked items.
7. Toilet roll holder and bath rail grouted into wall for durability
8. Captive sink plug
9. Regulated temperature and pressure at hand basin, shower and bath outlets. Control valves located in adjacent room with restricted access
10. Fully concealed pipe work and services
11. Emergency lighting
12. Wash facilities located on same side of room with colour high-lighted wall
13. Floor drain with inaccessible fastener heads
14. Anti-ligature fixtures including shower head and towel rail
15. Light pipe to illuminate showering space
16. Remotely located extractor fan to minimise noise

17. Layout of the accessible WC and bathroom
18. Bath or shower room
19. Ample space for staff to stand beside the person they are assisting
20. Outward opening door that can be unlocked from outside for quick access in emergency
21. Rapid drain bath made from heavy gauge porcelain or steel





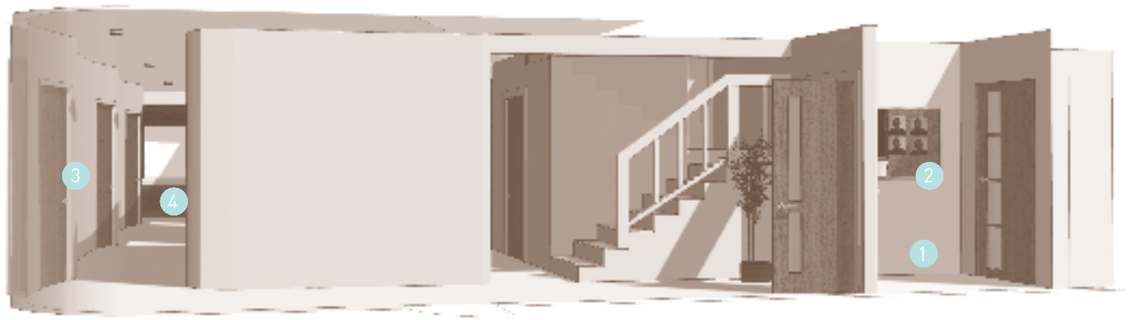
Layout of accessible WC and bathroom

Design Concepts
Circulation Space

In this concept a wide circulation space links the front entrance with the rest of the building. Residents are able to access their bedroom without having to pass through communal areas.

This design separates communal activity spaces and bedrooms, providing physical and cognitive transition between public and private spaces. The multiple entrances and exits between the living and circulation spaces allow residents to see what is going on without committing to participating. They also provide incidental spaces that allow residents to pass in different directions without impinging on one another and prevent congestion. The circulation space has only one corner, which is curved to soften its visual impact and lead people through the space. The bedroom walls are curvilinear to make the space look less institutional. Each bedroom door is angled into the circulation space, presenting itself to residents and providing some shielding from the view of people standing further along the space.

1. Large front entrance space
2. Daily schedule showing who is in the building
3. Bedroom doors
4. Window seat and view to garden

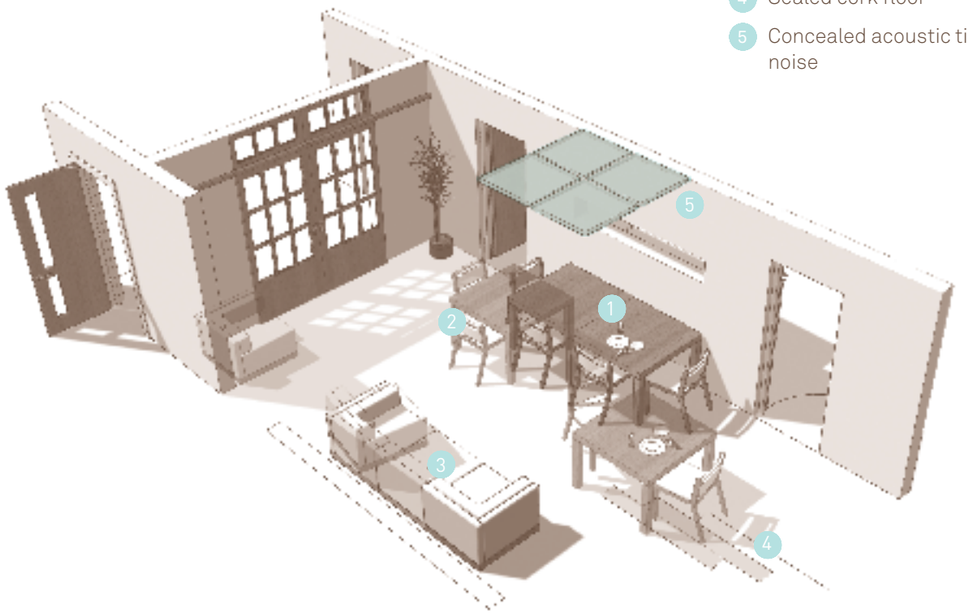


Design Concepts
Dining Space

A sense of community can be generated around eating together. However, people with autism may find communal dining and the act of eating itself stressful.

The sensation of food textures and tastes may be overwhelming so other sensory stimulation should be modulated in dining spaces. For example, sound absorbing materials, acoustic panels and room dividers or screens can be employed to minimise the clatter of cutlery and transmission of people talking. Similarly, lighting should be controllable. Multiple spaces should be provided for dining, especially for residents who are guarded about their personal space.

1. Two smaller tables placed together for communal dining. Tables can be separated for residents who need more personal space. Matt finishes to minimise glare
2. Sturdy furniture with domestic look
3. Sofa can be separated to provide individual seats
4. Sealed cork floor
5. Concealed acoustic tiles to reduce noise



Design Concepts
Laundry and Staff Space

In this concept, the work areas of the building are located to maximise comfort for residents. Both the laundry and staff office are designed to be accessible to residents.

Laundry

The laundry room is located next to an external exit so there is direct access to outdoor drying facilities. It can also be accessed directly from bedrooms via the main circulation space so there is no need to carry soiled linen through dining or food preparation areas.

1. Two washing machines, one with sluice capabilities
2. Macerator for disposing of incontinence pads
3. Storage for towels and bed linen
4. Sufficient space for drying, folding and ironing
5. Mechanical ventilation to prevent build up of odours

Staff Space

In this concept, the staff office is located on the first floor away from the main living space in order to make the building feel less institutional. There is space for writing and filing records, making confidential calls and holding meetings.

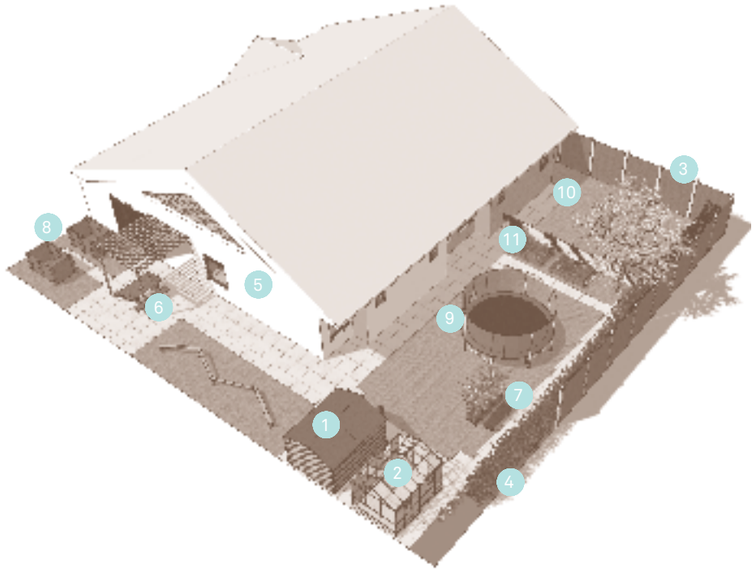
1. Open office
2. WC and en-suite shower
3. Bedroom for sleep-in support workers

Design Concepts
Outdoor Spaces

A connection to and use of outdoor spaces is essential for most people with autism. A variety of different types of space should be provided, including sheltered or covered seating, recreational space and sensory spaces.

In this concept, a mix low-maintenance landscape of open spaces, walkways, raised planters and vegetable patches is provided to give residents onsite recreational opportunities. An outdoor space within the footprint of the main building provides shelter so that residents can go outside in inclement weather.

1. Garden shed for outdoor storage
2. Greenhouse
3. Secure high fence
4. Series of tall and medium planting is located in front of the perimeter fence to make it less obvious
5. External lighting activated by timers rather than motion detectors
6. Social seating near to house
7. Individual seating
8. Vegetable planters, accessible raised beds
9. Exercise or high activity area
10. Individual garden for the flat
11. Sensory garden



Conclusions

The main contribution of this study is a set of design themes that can be used as a framework for generating concepts and making planning decisions for residential buildings for adults with autism.

Design guidance has also been developed and is intended for use by planners, housing providers, architects and designers. The guide is not intended to be mandatory or prescriptive. Many of the ideas are drawn from the evidence of working schemes that are currently in existence, whilst others are potential solutions that have yet to be validated.

As with most of the literature on autism and the built environment, this study has attributed observed patterns of behaviour to certain design decisions. In many cases, links between design elements and improvements in behaviour such as enhanced levels of confidence or social interaction, have been interpreted rather than measured. Recommendations presented in this publication are expected to bring benefit. However to validate their impact and quantify how the design of individual design elements affect adults with autism, baseline or intervention studies are required.

A large number of unmet design challenges emerged from this study, particularly how communication, sensory integration, and control of environments in domestic settings might be improved. More research needs to be done to understand ways in which people with autism perceive spatial relationships and connect contextual information with detail information. This work might inform future studies that investigate how architectural principles and elements, such as colour and texture or embedded technologies, could be used to help adults with autism improve perception and understanding of their domestic environments and the objects within.

The next phase of this project, taking place between October 2010 and September 2011 will focus on the detailed design of different spaces within residential buildings. Prototypes will be developed and tested to evaluate some of the ideas produced in this study.

The design of residential buildings clearly makes a difference to the quality of life of adults with autism, but should not be considered in isolation. A holistic approach should be taken that includes the design of people-centred support plans, models for financing accommodation, inclusion in the community as well as meaningful employment and help developing friendships, relationships and interests that bring meaning and purpose to everyday life.

The UK Government has formalised its policies for adults with autism that mandate provision of housing and support, but has not described what these services should look like. Further multidisciplinary research and practice is needed to define new models for social housing and financing support for adults with autism

No singular model of housing or support will meet all the needs of this population. Planners and design professionals are encouraged to stay up-to-date on literature in the field and consult adults with autism, their families and service providers to meet their individual condition and circumstances.

Footnotes

[1] Barnard J et al (2001)

[2] Harker M, King N (2004)

[3] The National Autistic Society, www.autism.org.uk

[4] Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. American Psychiatric Association, Washington DC, World Health Organization (1993)

[5] Brugha T et al (2009)

[6] Baird G et al (2006)

[7] Wing, L (1981).

[8] Ehlers S, Gillberg C (1993).

[9] The National Autistic Society, Statistics: how many people have autistic spectrum disorders? www.autism.org.uk (Aug 2010)

[10] Barnard J et al (2001)

[11] Barnard J et al (2001)

[12] Harker M, King N (2004)

[13] Heller T, Miller AB & Factor A (1998)

[14] An age suit recreates physical aspects of old age including: restricted joint movement; restricted neck movement; impaired vision and reduced dexterity of the hands and sensitivity of the fingertips.

[15] Valuing People: a new strategy for learning disability in the 21st century. Department of Health (2001)

[16] Makaton is a method of communication using signs and symbols, incorporating picture cards and ties in facial expressions with words to produce more content in the shortest form, www.signedlanguage.co.uk/makaton.html

[17] Barnard J et al (2001)

[18] The vestibular system is stimulated by movement of the head and input from other senses. It influences the development of balance, equilibrium, postural control and muscle tone

[19] The proprioceptive system is stimulated by contracting and stretching of muscles as well as the pulling and compression of joints between bones

[20] Norman (1989)

[21] For residential building types, refer to page 9

[22] Opening Doors, Arizona State University (2009)

[23] Department of Health, Health Technical Memorandum (HTM) 04-01, National Resource for Infection Control www.nric.org.uk

[24] www.lifetimehomes.org.uk

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[27] Opening Doors, Arizona State University (2009)

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The environment in which an adult with autism lives can have a profound impact on their health and wellbeing. Providing the right setting can help enhance motivation, confidence and self-esteem. This study explored how design could improve living environments for adults with autism, supporting their specific needs and resulting in a better quality of life. Key findings are published for wide readership with particular focus on housing providers, architects and designers involved in the design, refurbishment and development of residential accommodation for adults with autism.