wanderinginfamiliarspaces.com

Abigail Joshi - M.Arch (conversion) - 2008

Mackintosh School of Architecture, Glasgow School of Art

The Project

"What we need to question is bricks, concrete, glass, our table manners, our utensils, our tools, the way we spend our time, our rhythms, to question that which seems to have ceased forever to astonish us. We live, true, we breathe, true, we walk, we open doors, we go down staircases, we sit at a table in order to eat, we lie down on a bed in order to sleep, how? where? when? why?

Georges Perec, 1973

The 'Wandering In Familiar Spaces' website has been created as part of my masters project at the Mackintosh School of Architecture, Glasgow. The roots for this project stemmed from my dissertation titled 'The Architecture of Madness', in which I explored the relationship between architecture and its affect on the human psyche. I asked the question 'can architecture cure mental illness?' although the question posed was radical it sought to realise the connection between space and the psyche, and the ability of the architect to manipulate them, with either positive or negative effects.

This led me to reassess my personal understanding of disability and its place in developing inclusive environments. I began to recognise the current 'social model' of disability; **addressing environments that are debilitating rather than the people that use them**.

In order to understand the components of an inclusive environment I wanted to explore aspects of my everyday spaces with a fresh view of how someone with cognitive and sensory impairments might experience them. I was interested to examine these particular impairments, as many previous concepts of inclusive design seemed exclusively focused on physical attributes, even though the 1995 Disability Discrimination Act defines disability as a 'physical or mental impairment', therefore I wanted to challenge these previous assumptions and investigate the affects of mental impairments.

This brought me to question: **if the designer could attempt to perceive spaces from that of someone with such impairments, would it enhance their ability to achieve inclusive environments?**

I hope you find the contents of this website useful, any comments/contributions you may wish to provide are greatly appreciated, just visit wanderinginfamiliarspaces.blogspot.com and post a comment, or alternatively email me on abigailjoshi@wanderinginfamilirspaces.com

What are Cognitive / Sensory impairments?

"Happiness is a matter of one's most ordinary and everyday mode of consciousness being busy and lively and unconcerned with self."

Iris Murdoch

Cognitive impairments affect people across a wide spectrum of disabilities from severe to less severe, these include; dementia, autism, down syndrome, attention deficit disorder, dyslexia, dyscalculia. Clinical diagnosis alone offers little help when it comes to design, but when broken down into functional disabilities we begin to understand their impact. These functional disabilities may include problems with conceptualisation, memory, problem solving, reasoning, disorientation, judgment, attention, awareness, visual comprehension, reading/linguistic/verbal comprehension, and math comprehension.

I have also included sensory impairments; this is because many people who suffer cognitive impairments may also suffer from some sensory difficulties. It also takes into account our aging population and some of the difficulties they may encounter. It is worth noting that there are additional senses beyond the traditional five senses of sight, hearing, taste, smell and touch that are worth considering, these include, thermoception (heat/cold), equilibrioception (balance/gravity), proprioception and kinesthesia (joint motion and acceleration).

As discussed above the project covers a very wide subject, and for that reason I have chosen to predominately research dementia as an indicator for both cognitive and sensory impairments. Dementia is a disease that affects many of the cognitive functions in varying degrees of severity, whilst also targeting our ever-increasing aging population. All of the case studies (except for parts of Tor Nursing home) have been designed specifically for those with dementia, and highlight what I consider to be successful design considerations.

More detailed accounts of cognitive and sensory impairments will be discussed further in the PDF's available to download from each section or collectively from the *other information* section of this website.

How to use the Website

The aim of the website is to take you on a journey through public and private spaces, stopping along the way to question and highlight particular points which may be relevant to someone with a cognitive/sensory impairments. It is impossible to cover all aspects of these impairments, but hopefully it will enable insight into particular aspects of design.

The journey is illustrated as a narrative of images and sounds that represent my familiar spaces. However, I would encourage you to imagine your own spaces, as these will differ either slightly or more significantly with changes in climate and/or culture. The important point is that we take a fresh approach to our everyday spaces.

The format of using this website is as follows: choose the relevant public or private space, look at the associated image(s) and ask yourself the corresponding questions. These have been written to help you consider these spaces from the perspective of someone with cognitive/sensory impairment. Further to these questions you will find a PDF factsheet available to download on each section or collectively in the *other information* section.

Public Spaces

Public Spaces - Introduction

Our journey begins with a short photo-sequence animation of a journey I have taken many times, from my local post office to my home. This section seeks to highlight the many design implications found in the urban street environments (see ‘Inclusive Urban Design’ in *Referenc*es).

As you watch and listen to the movie ask yourself the following questions:

- Take a moment to consider the importance of being able to get outside. How does this affect your ability to feel independent and how does it add to your feelings of self-worth and everyday enjoyment.
- What types of services are available within a 500m-850m radius from your home?
- How would you describe the local character of your neighbourhood? Is it formal/informal, what are the distinct forms, styles, colours, materials, and scales?
- Are there distinctions in the area through small details, such as, colours of front doors, windows and gardens?
- How are the streets connected and laid out? Are they regular, irregular, grid system, cul-de-sacs etc?
- Do you experience a distinct hierarchy of street types, if so how are they defined?
- When you are in your local neighbourhood how easy is it to navigate your way around?
- Do you find yourself sticking to familiar routes, how confident would you feel to deviate from these routes?
- If you can imagine a particular route you have taken frequently can you associate areas of significance, perhaps landmarks either architectural or environmental?
- Consider decision points, such as junctions or where other visual information ends, what do you use to make your decision?
- How is information given? How is signage approached through use of font, symbol, colours etc Are they flat or perpendicular to the wall? Is there too much information?

- Are public and private spaces clearly defined? What components create these definitions?

- Are the buildings clear in their use and function? Is the entrance easily located and understood? Are the doors heavy to open?

- Is there a choice of steps or ramp with handrails in areas of incline?

- How wide and flat are the pathways? Are they well maintained? Are the materials in contrast with the walls? Are they wide enough to walk without fear of being bumped into?

- Are there frequent opportunities to sit down, how are these areas/furniture represented?

- Do you think there is adequate lighting? How does it respond with adjacent materials?

- What are the sounds like on your routes, are there areas of sudden loud noises, such as people shouting, heavy vehicles such as buses passing?

- Are pedestrians separated from bicycles and traffic either through trees, on-road parking etc?

- What are the ways in which people cross the roads? Are there clearly audible signals for safe crossing?

Public Spaces

The preliminary research undertaken for this project focused exclusively on design principles concerning internal spaces. It was upon discovering the book titled, *Inclusive Urban Design*: *Streets for Life*, by authors Lynne Mitchell and Elizabeth Burton that I began to question the wider environment.

Inspired by the book I decided to include a short journey to the project, from my local post office to my home. This journey was documented through an '8 step' series of photographs and converted into a photo sequence animation (found on the website).

It is with this journey that I have analysed six main topics discussed in the book, these include: familiarity, legibility, distinctiveness, accessibility, comfort and safety (specific definitions of these can be found in the glossary under other information). Below is a summary of the research found, all of which I believe to bare significance in illuminating issues surrounding design for those with cognitive and sensory impairments.

What types of services are available within a 500m-800m radius from your home?

According to the 'streets for life' principles primary services such as the doctor, post-office, food store etc should be no further than 500m from your home, with secondary services such as parks, library, dentist, places of worship etc no more than 800m away.

How would you describe the local character of your neighbourhood? Is it formal/informal, what are the distinct forms, styles, colours, materials, and scales?

'Distinctiveness is important to older people as it gives them a sense of knowing where they are, enhancing familiarity and making them feel at home in their surroundings'.

Are there distinctions in the area through small details, such as the colours of front doors, windows and gardens?

The fragments of our environment that create its distinctiveness come in small and large components. It

is important to understand what creates the character of our local environments to best understand its image to its inhabitants. Any changes to long established streets ‘should be small scale and incremental’, otherwise people who suffer from cognitive/sensory impairments may find themselves confused and agitated in unfamiliar surroundings. In new developments familiarity needs to be reinforced through ‘the use of local forms, styles and materials will help older people to become familiar with the new neighbourhood’.

- How are the streets connected and laid out? Are they regular, irregular, grid system, cul-de-sacs etc?

For those with cognitive impairments problems with conceptualisation, attention and memory can affect abilities to recognise where they are located. Irregular street layouts provide interesting places that are formed with smaller less formal blocks which emphasis distinctive character; regular grid systems (found throughout central Glasgow) tend to look identical, especially on street level, which can be confusing. Streets that are varied in length and width are distinctive and thus help to maintain concentration. Longer streets should, if possible, gently wind revealing emerging views.

- Do you experience a distinct hierarchy of street types, if so how are they defined?

‘Familiarity refers to the extent to which streets are recognisable to older people and easily understood by them. Familiar streets are hierarchical and long established with forms, open spaces, buildings and features in designs familiar to older people”.

There is a language that defines each of our local neighbourhoods; people understand their specific language as a series of urban forms, and hierarchies. In Glasgow there is a standard form of wide noisy main roads with mixed-use buildings, shops on ground floor. Then quieter secondary and tertiary streets lined with residential tenements.

- When you are in your local neighbourhood how easy is it to navigate your way around?

- Do you find yourself sticking to familiar routes, how confident would you feel to deviate from these routes?

- If you can imagine a particular route you have taken frequently can you associate areas of significance, perhaps landmarks either architectural or environmental?

Understanding the makeup of our external environments allows us to appreciate what is familiar which can be as equally influential as that familiarity explored in our private spaces. This can prove essential in encouraging navigation for those who can easily become disorientated.

Without the skills of mind mapping our routes we rely on our ability to distinguish landmarks and points of recognition. Identification of these points enables us to negotiate our environment. On my route I associated the park gates, grand park stairs, war memorial and the Church on the Hill as landmarks. Think about what landmarks you identify with in your local neighbourhood.

- Consider decision points, such as junctions or where other visual information ends, what do you use to make your decision?

Two kinds of cues can give orientation and assist in decision-making - landmarks and environmental/practical features. Landmarks, as previously discussed, can include 'buildings and structures, places of interest and activity, unusual places, buildings or usages'. Environmental features include aesthetic features: fountains, the Bowling Green etc, and practical features include street furniture, telephone boxes, bus shelters etc.

- How is information given? How is signage approached through use of font, symbol, colours etc? Is the signage flat or perpendicular to the wall? Is there too much information?

Too many unorganised signs can cause visual clutter, which can cause confusion and frustration as it can create excessive visual stimulation. Signage can provide useful way-finding information but there are several important points to consider for the best possible practice.

Lettering should be large and dark against a light background, red, orange and yellow are the easiest colours for the aging eye to distinguish (think of the inverse of the UK post office sign). Text should be simple and any images should be realistic and not abstract. Signs should be made from a non-reflective material to prevent glare. Ideally directional signs should be on post on a single pointer, and signs locating a place should be represented perpendicular to the wall to be given sight from further distances.

n Are the buildings clear in their use and function? Is the entrance easily located and understood? Are the doors heavy to open?

Many designers perceive inclusive design as being limiting in that traditional styles are the most important factor, however, ‘clarity of use and function appeared to be the overriding positive factor rather than style, whether traditional or modern’. Therefore, styles can be contemporary as long as the important components, such as the main entrance, are easily understood. Think for instance about a glass door, would someone know it was a door or maybe a window, how is opened? Can someone recognise the handles or way of entering.

- Are public and private spaces clearly defined? What components create these definitions?

Often people with cognitive impairments, such as dementia, struggle to ‘interpret the cues that signal the use of buildings, the location of entrances, the behaviour that is expected of them or the intensions of people around them’.

Think about how public and private cues are made, be it boundary walls, style of doors, signs etc, these cues aid those in understanding what is expected in each environment. It is worth noting that those with dementia prefer informal spaces to formal. This is because formal spaces can be perceived as intimidating, whereas areas that are lively, full of activity and vibrant are preferred, as they provide interest, a sense of freedom, and overall feel welcoming.

- Are there frequent opportunities to sit down, how are these areas/furniture represented?

It has been suggested that public seating should be provided every 100-125m, in styles that are easily recognisable at various heights to accommodate a wide range of people. The street furniture should be made from warm, non-conducting materials such as wood. Additionally, if there are several seats, they should be positioned perpendicular, to allow for maximum communication between those who may have visual/hearing impairments.

- Do you think there is adequate lighting? How does it respond with adjacent materials?

Adequate street lighting is essential in creating ample illumination for those with visual impairments. Light aids significantly in the understanding of the

environment. The most important issue with light and materials is that they contrast various environmental elements whilst preventing glare through the removal of reflective materials.

- How wide and flat are the pathways? Are they well maintained? Are the materials in contrast with the walls? Are they wide enough to walk without fear of being bumped into?

Pathways should ideally be 2m wide and well maintained to be flat and constructed from non-slip materials. Consideration should be made to encourage cyclists off the main footway, as many older people feel vulnerable and concerned that they may be knocked down.

- Is there a choice of steps or ramp with handrails in areas of incline?

When a level change is required it should be highlighted clearly with a choice of ramp and stairs where possible. Handrails should also be provided with particular attention to adequate lighting to provide even illumination.

- What are the sounds like on your routes, are there areas of sudden loud noises, such as people shouting, heavy vehicles such as buses passing?

- Are pedestrians separated from bicycles and traffic either through trees, on-road parking etc

Producing a buffer zone between the pedestrian and traffic can be an effective way of creating a safer, more enjoyable and comfortable environment for pedestrians. As mentioned above, people with impairments (especially those who are older) can feel vulnerable on the streets with fast movement and frightening loud noises. Therefore, a buffer zone on busy routes can be beneficial. Effective approaches include trees, grassy verge or even on street parked cars.

- What are the ways in which people cross roads? Are there clearly audible signals for safe crossing?

As a person ages the ability to detect higher pitched sounds decrease. Therefore, it is important to provide road crossings with audio signals in a lower pitch accompanied with visual signals.

All quotations in this document has been taken from:

Mitchell. L., Burton, E., (2006) *Inclusive Urban Design*: Streets for Life. Architectural Press - Elisevier

Private Spaces

PRIVATE SPACES - QUESTIONS

FRONT DOOR

Consider the front door.

- What are your first impressions?
- Is it easily distinguished from other doors?
- What might it remind you of?
- Do you know where it leads?
- What does it make you feel, relaxed and welcome?
- Do you know how to behave?
- Do you ring a bell, knock, or use your own set of keys?
- What happens when you express your intention?
- What is the expected response?
- Are you able to express your intention?
- Can you see/hear/touch the bell, knocker, or handle?
- Might it be a good place to sit, pause and get your bearings?

Front Door

Front doors are an apt place to begin this exploration of private spaces, as they indicate the access point of enclosed spaces. Represented in many forms, they signify our needs for privacy and security, whilst assisting in ventilation, admittance of light and barriers against unwanted environmental factors, such as noise.

The significance of the front door to many people with cognitive and sensory impairments predominately lies in its identity; it has to be recognisable with a clear understanding of the transition from one realm to another.

The information listed below discusses several factors that contribute to understanding thresholds from the perspective of those with cognitive and sensory impairments.

What are your first impressions?

Important doors create an impression of what lies beyond; therefore, as a significant cue it is valuable for the door to create a comprehensive first impression for someone with cognitive impairments. In order for a door to be an effective indicator it has to be identifiable, this may be through the use of a particular style (usually one that is distinctive or is familiar), familiar fittings or personal objects (plant by the door) or colour. The photo above was taken from the case study, Croftspar Place, here they use the colour yellow to signify the main threshold and staff block.

Think about the door to your house, how does it differ from others, name plate, colour, fittings, objects?

Is it easily distinguished from other doors?

As previously discussed, doors represent the transition from one place to another. In order to correctly identify which door represents personal space behind it has to have some features that are familiar to the individual.

The adjacent photo (Croftspar Place) illustrates how colour and contrast can distinguish between several doors. Individuals recognise that they live behind a certain colour. As the eye ages many people suffer from Colour Agnosia, a condition that reduces colour sensitivity principally caused by the yellowing of the lens. Strong colours in combinations of reds, oranges and yellows are the easiest, with blues, violets and greens the hardest. Strong colours are more successful over pastel or

muted colours on a background that contrasts the important elements, such as that shown in photograph above.

What might it remind you of?

The style of the door can indicate the nature of the threshold, whether formal or informal. What type of building do you think the adjacent photograph indicates? What contributes to your observations? If residential how is the atmosphere created?

A canopy or partition walls can help create a comfortable and sheltered entrance, as well as emphasising the primary entrance from a greater distance, helping in orientation. A canopy in a distinctive style (as shown adjacent) is memorable and creates an individual place. Familiar furniture in the form of a wooden bench and potted plants create a welcoming entrance whilst maintaining a sense of formality.

Do you know where it leads?

Additional cues that clarify where the door leads can be valuable, this might include the use of windows, either set as a panel within the door or adjacent. This allows the individual to recognise the space beyond before committing to entering.

How does it make you feel, relaxed and welcome?

The main entrance into a space can be daunting if you do not know where you are and what to expect, this vulnerability creates an opportune moment to establish a welcoming and comfortable atmosphere to set a non-threatening tone to the spaces beyond. Main entrances can be lively and active social spaces where people are coming and going, this creates an opportunity to welcome and interact with individuals. This can re-orientate individuals and introduce them to the layout of the building.

Do you know how to behave?

‘Thresholds are the “lines” or “realms” that distinguish one space and way of being/acting/behaving from another’.[i]
When these areas of transition are uncertain or vague the understanding of appropriate behaviour is also unclear. Ways of creating a distinctive architectural change of transition might include differences of ‘detail, material, scale, volume, light texture, rhythm or opacity’.[ii]

Do you ring a bell, knock, or use your own set of keys?

As memory can be significantly affected with a decline of cognitive functions it is important that support in accessing locked doors is made available to

reinforce maintaining skills. Suggestions in regulating access include; making one master key for all locks, use of a locked key holder accessed with pin number, multiple keys left with reliable neighbours/family, keys easily identifiable (giant key or keys attached to a large colour block) and kept in a regular location e.g. allocated key hook.

- What happens when you express your intention?

If the action to enter the building is via a bell or knocker it can be useful if there is a sound that alerts you that your request has been made, and that a response is quick and clear.

- What is the expected response?
- Are you able to express your intention?
- Can you see / hear / touch the bell, knocker, or handle?

As this project aims to focus primarily on cognitive/sensory impairments it is presumed that physical accessibility issues have been addressed. The importance of creating a space that is understood is the core focus; this can be difficult, as it will vary from person to person. It is therefore important for each designer to consider what styles of fittings and fixtures will be most easily understood, this includes items such as the doorbell, handle, knocker, all of which should be accessible and as easy to use as possible.

- Might it be a good place to sit, pause and get your bearings?

A common problem with diminishing visual acuity is the lens of the eyes ability to adjust to changes of light intensities, often experienced when moving from area to area such as outdoors to indoors. This transition can lead to a sense of disorientation and balance and can cause confusion.

Creating an opportunity to sit whilst this transition occurs can be greatly beneficial, as shown in photograph adjacent (Tor Nursing Home).

CIRCULATION SPACE

Consider the circulation spaces.

- What are your first impressions?
- Is there enough natural/artificial light for you to see clearly?
- Is the space formal/informal?
- Are the rooms off a central area or corridor?
- What can you hear?
- Do you understand what you are hearing?
- Does this space assist you in understanding the building?
- Do you know how to behave?
- How do you decide which direction to go?
- How can you tell what each door in the hall means?
- Do all the doors look the same or are some distinctive?
- Do you think you would feel more comfortable if you could see in a room before you enter?
- Is this a space where you could spend a lot of your time?
- Is it the heart of the home and the best place to see all the comings and goings?
- Is it a safe place to sit, would you get in the way?

Circulation

Those with cognitive impairments often experience deficits in areas such as disorientation, memory loss, problem solving, reasoning, judgement, attention, awareness and visual comprehension to mention a few. There are also sensory losses that result in difficulty interpreting what is seen, heard, felt, smelled and tasted. These are all important points to be aware of when considering the circulation spaces as they influence the individual's ability to navigate their environment, affecting one's autonomy, sense of security and privacy.

- What are your first impressions?
- Is the space formal/informal?

Cognitive impairments such as dementia can cause individuals to feel confused as to what the appropriate behaviour should be; this can be eased if the environment has clear indications through its design and atmosphere to make this understood. Creating clear cues in a comfortable and welcoming setting can promote and encourage decision making in a non-threatening calming environment.

- Is there enough natural/artificial light for you to see clearly?

It is important to maintain the correct balance of natural and artificial lighting in circulation areas. Too much direct natural light and artificial light can cause glare and cause agitation, however, with too little light many may struggle to navigate, as the aging eye needs an increased amount of light. Margaret Calkins books on the aging senses (bibliography) discuss the different lighting options in great depth.

- Are the rooms off a central area or corridor?

Whether the space is our own house, hotel or residential/nursing home, how the rooms are arranged in the space influences how we initially chose to navigate around the space. There are many possible layouts however there are two prominent categories, those where rooms are focused around a central area, and those off a corridor be it single or double loaded (rooms off both sides of a corridor).

It is widely accepted that the corridor option is not ideal, however with economical considerations this option is the most feasible. In this case it is important to attempt to design the corridors to be as short as possible, with good natural/artificial lighting and with recessed (seating/activity) areas to

break up the space. It is also advisable to create a circulation route that loops, or if this is not possible, use the ends to create a glazed sitting area.

Rooms that surround a main space are advantageous as they exploit the ability to directly view activity spaces creating direct cues, however, over stimulation may pose a problem.

- What can you hear?
- Do you understand what you are hearing?

Sensory cues can be significant especially when they trigger a familiar response or memory, these types of cues might include, a piece of music, sound of a bath running, smell of a favorite bubble bath or laundry powder, morning coffee or bread baking, all of which can help orientate a person to an anticipated place.

- Does the space assist you in understanding the building?

Meaningful and familiar cues are the most successful when used in a clear layout with visibility of selected components, and attention to appropriate scale all of which can help assist in understanding the building.

- Do you know how to behave?

A degenerative disease such as Alzheimer's (a disease which causes dementia) can result in an individuals cognitive abilities declining in stages of time. As the disabilities increase in severity, it may reach a point were access to all areas of the building is no longer a safe or secure option.
However, when a locked door is approached and not able to be opened (especially a glazed door), an obvious sense of frustration can be expected. In order to avoid such reactions areas can be camouflaged to work in reverse of a direct cue. Doors can be painted the same colour as the wall, handles can be made difficult to see, handrails and skirting's can be continued along door.

- How do you decide which direction to go?

It is important that the design of the environment promotes maximum exploitation of available skills in order to maintain them for as long as possible. This can be realised through the use of direct and indirect cues providing the environment does not become over stimulated.

A combination of direct and indirect cues are required to help make particular areas clear. Direct cues highlight places of focus and indirect emphasise a tool to guide the person to a place[iii].

Signage can be both direct and indirect, depending on where they are placed. This photograph above (Iris Murdoch Centre) illustrates how signage can be used around corners to add to its range of visibility. Ideally signage should combine word and symbolic association. It is important that the text is large, preferably with dark lettering on a light background, with realistic graphics as opposed to abstract. Additionally, signage should be well lit and positioned in a place which is most likely to be seen, this is often lower, as it has been noted that people with cognitive disabilities such as dementia tend to look mostly towards the floor, as they walk.

Handrails with grooves on the end to signal end, or entrance to a room can be another useful indirect cue for those who are visually impaired.

- How can you tell what each door in the hall means?

A way of highlighting a particular room (especially required when living in a home with multiple rooms) is to signal individual traits through the use of personalised doorways. Aids for personalisation might include the use of photographs of the person (age appropriate as different people recognise themselves more strongly at different times in their lives, it is worth working out what age the individual responds most strongly with). Additional cues might include; name plate, number, colour of door, or objects. An additional way to highlight a particular door is for it to be recessed; creating room for personal objects with appropriate levels of illumination to highlights selected cues.

- Do all the doors look the same or are some distinctive?

As a way of direct cueing it is suggested that significant doors such as bathrooms are highlighted with a particular style or colour. Bright yellow is an ideal choice (as shown here at the iris Murdoch centre) as Colour Agnosia that causes reduced colour sensitivity, exhibits reds, oranges and yellows as the easiest to distinguish. Areas such as the bathroom, W.C should be represented in an identical manner throughout a building, to keep the cue consistent.

- Do you think you would feel more comfortable if you could see in a room before you enter?

Being able to see into a space, be it through a window or a glazed panel in a door, can provide benefits for those with cognitive impairments such as dementia. As previously discussed, knowing how to behave in a particular situation can cause anxiety. Therefore, by enabling the individual the opportunity to see what is going on in a room, and decide whether to participate or not, allows the individual to feel autonomous and in control of their decisions.

The photo above shows the application of a window to provide views into a shared sitting area at Burnfield Care Home; alternative options might include opening particular areas, such as the dining room or activity room into the circulation space, whilst defining the areas with low walls, glazed walls etc It could be argued that this kind of direct visual connection maximizes way-finding, however, it could be equally said that it creates visual clutter and such spaces are not conducive in maintaining concentration.

- Is this a space where you could spend a lot of your time?
- Is it the heart of the home and the best place to see all the comings and goings?
- Is it a safe place to sit, would you get in the way?

Circulation spaces can provide a lively active area in which many people would enjoy spending time just observing. Recessed seating areas can help to break up long corridors whilst allowing a person to passively or actively participate in activity from a safe location.

KITCHEN, DINING, UTILITY

Consider the kitchen, dining and utility spaces.

- Where is the door leading in and out?
- Can you tell it is the kitchen, dining, and utility area from outside?
- Can you smell anything from this space?
- Does it feel like a domestic space?
- Do you know how to behave?
- How do you know what are in the cupboards?
- Can you reach?
- Do you know how to make a cup of tea?
- Is it possible to understand how the taps and cooker controls work?
- Do you boil water in a kettle or on the stove?
- Does the kettle look like a kettle?
- Is there somewhere to sit in the kitchen?
- Are the seats comfortable to use?
- How do you wash your dishes?
- Can you see the dishwasher?
- Do you know how to use the dishwasher?
- Can you understand the sounds from these spaces?
- Do you think you need to wash your clothes?
- Where do you wash and hang your clothes?
- Do you know how to operate these machines?

Kitchen, Dining, Utility

Kitchen, dining and utility have been grouped together as that is how they are grouped in my familiar environment, however, you should think about how these spaces are represented and linked in your familiar settings.

The kitchen, dining, utility have perhaps one of the strongest connotations to ‘home’ for many people, with many referring to them as the ‘heart of the home’. This is especially poignant for many women (esp. previous generations), as a place where food is prepared, meals eaten, families interact, as well as practical functions such as cleaning, sweeping, mopping, hanging out of clothes.

The therapeutic benefits of engaging participants in familiar homelike tasks include ‘ stimulation and challenge, ability maintenance and enhancing, casual opportunities for socialisation, connecting to fond and rewarding memories and an increased sense of productivity, value and belonging’. [iv]

One of the most important aspects of a kitchen, dining and utility for someone with cognitive/sensory impairments is that it can aid the maintenance of their skills whilst encouraging participation for as long as possible in a safe and secure environment.

How are thresholds defined?

One way of defining thresholds or functional boundaries is with a change in colour of floor coverings to signify change, similar tones are ideal.

Can you tell it is the kitchen, dining, and utility area from outside?

It is preferable to have visual contact in and out of spaces, to trigger visual cues.

Can you smell anything from this space?

The sights and smells of cooking and baking reinforce a sense of home and of self. Sensory cues such as the smell of coffee in the morning or dinner being

made in the evening can inform an individual of the time of day and location of the kitchen/dining room.

- Does it feel like a domestic space?

It is important that the style, layout and appliances are that of a domestic kitchen, dining and utility so that they are easily recognised for those whose memory is deteriorating, for example a freestanding cooker. This also applies when replacing appliances and kitchen units.

- How do you know what are in the cupboards?

It has been found to be advantageous to make objects found in the kitchen visible for easy location and use. This can be achieved in several ways; commonly used items such as tea and coffee can be placed on top of the kitchen worktop in containers that have transparent lids, signs can be put on the cupboard doors marking the contents, or cupboard doors can be glazed to give visibility to items, or open shelves.

- Can you reach?

It can be extremely unsafe for someone to struggle to reach a desired object, especially if they are elderly, therefore all immediate and regularly used items should be placed in a visible location on the worktop. Ironmongery should be easy to manipulate and large and contrasting enough to be seen.

- Do you know how to make a cup of tea?

Can you find your cup? It has been recorded that if an individuals cup is changed to a different style or colour then it may no longer be recognisable to that person, therefore it is appropriate to replace such objects, that have particularly familiar connotations, like for like.

- Is it possible to understand how the taps and cooker controls work?

As cognitive and sensory impairments affect the users ability to correctly interpret situations, controls have to be put in place where there is a potential danger. Temperature controls can be put on the taps to ensure that scolding does not occur, as well as clearly labeling hot and cold with identifiable colours. Timing controls on the cooker can cause it to be switched off after an estimated maximum cooking time.

- Do you boil water in a kettle or on the stove?
- Does the kettle look like a kettle?

Kitchen appliances that we accept as normal such as a kettle have to be regarded from the position of the person that uses them. For example a women born 60-80 years ago (or in many developing countries) may commonly associate boiling water with a steel kettle on a stove as opposed to an electric one. In such cases it is recommended not to place a plastic electric kettle adjacent to the stove in case such a user puts it on the stove.

- Is there somewhere to sit in the kitchen?

As an individuals cognitive and sensory abilities deteriorate and they are no longer able to participate in all of the daily activities, it is necessary to provide a comfortable place to sit so that they might continue to experience such a setting as others use the kitchen, to experience the smell and noises. In addition, they may even be able to participate from a seated position.

- Are the seats comfortable to use?

Whether the dining area is open plan to the kitchen or in a separate room it is important to have comfortable chairs, which offer minimum drag, particularly if used on floor covering such as carpet. This can be achieved with chairs that have wheeled fittings on the rear legs to assist in the pushing in and out of chairs at the table.

- Do you know how to use your crockery and cutlery?

The photograph adjacent (Iris Murdoch Centre) illustrates the use of different coloured crockery; some research suggests that reds and oranges may even stimulate appetite. A variety of cutlery and crockery can be purchased which is ergonomically designed for ease of use, this may benefit those with sensory losses, enabling the enjoyment of dining independently for longer.

- How do you wash your dishes?

- Can you see the dishwasher?
- Do you know how to use the dishwasher?

If the user is used to using a dishwasher then a sign on the dishwasher illustrating its use can be helpful. If the user is used to washing their dishes in the sink then it is important to maintain a sink and taps which are familiar, for example a Belfast sink with high pillar taps with capstan heads. On some occasions individuals begin to find familiar fittings such as turn taps difficult to use, to which lever handles may prove easier to use, however, its use has to be understood.

- Do you know how to operate these machines?

If an individual's ability allows them to use appliances such as the washing machine then all efforts should be made to make them able, including a simplification of objects that are required and made obvious beside the machine. If their use is not permitted then it may be required to put a latch on the door of the washing machine/dryer to prevent alien objects being misplaced, if this still fails then the appliance may need to switched off at the mains.

- Are there dangerous substance in the Kitchen/Utility?

When a persons cognitive impairments cause them to no longer correctly identify particular objects then it may be necessary to lock hazardous materials in a cupboard, in case they are misunderstood as food or drink. It is appropriate to use a lock that is discrete so as not to cause frustration.

- What is the Future of the Kitchen?

The ambient kitchen is a project through which the exploration of use of persuasive computing can be used for assisted living. It uses sensors and displays to store personal data and provide useful information. It effectively used the embedded sensors located throughout the kitchen become aware of how appliances, utensils etc are being used. Any changes in location of items can be monitored, and pressure sensitive floors can track people's movements. Projectors are integrated into the workbenches and they display contextual information, such as nutritional information or recipes on the kitchen work surface. Efforts are being made not to affect the aesthetics of the environment so as to maintain familiarity[v].

BATHROOM / W.C.

Consider the bathroom or W.C.

- How do you locate this room?
- Is there natural light or do you have to turn on a light?
- Do you know how to switch on the light?
- What is your first impression of this space?
- Is it familiar and relaxing?
- Do you prefer a bath or shower?
- Do you know how to take a bath or a shower?
- Can you access them?
- Can you operate the shower from a seated position?
- Is there a wet floor?
- Does the light reflect off of the materials?
- Is it a safe place?
- Do you struggle to locate the toilet seat?
- Can you get up and down easily?
- Do you know how to flush the toilet?
- Who left the mess in the toilet?
- Do you remember to wash your hands?
- Do you know how to turn on the taps?
- Do you see the soap?
- Do you recognise who you see in the mirror?
- Can the mirrors be removed?
- Is there shelving for your personal toiletries
- Can you see a toilet from your bedroom?

Bathroom / W.C.

For many people with cognitive and sensory impairments, bathrooms and W.C.'s can be places that cause 'potential psychological trauma as they may induce as abnormal, awkward, frightening and undignified'[vi] places. These reactions are often caused when an individual user needs assistance with personal tasks, often resulting in the introduction of unfamiliar bathing aids and rails. Therefore, the design of an assistive bathroom should be constructed in familiar styles and materials to create a supportive environment with 'homelike' qualities.

- How do you locate this room?

It is essential for rooms where a toilet is present to be made distinctive, so that they can be located easily and quickly for efficient use. Doors painted in a bright colour (red, orange yellow are ideal as they are the easiest to distinguish as the eye ages) and represented consistently are the most successful, as individuals may come to associate that colour with the toilet. Another suggestion is to put a canopy over the door; a projected cue can be visible from greater distances at more angles. Appropriate signage is also imperative that uses both pictures (realistic not abstract) and bold text (dark lettering on a light background) is preferable.

- Is there natural light or do you have to turn on a light?

If possible natural light in a bathroom/W.C. can create a pleasurable and warm atmosphere, preferably a balance between natural and controlled artificial light is favoured. Controlled artificial light enables maximum illumination in times of specific task activities whilst allowing for a dimmed light for a time of relaxation. Some people may also benefit from a constant low intensity light as a source of illumination at night, others may find this practice out of the ordinary.

- Do you know how to switch on the light?

Be careful to select light switches whose use is obvious to the user. Some people suggest automatic light sensors that turn the light on upon entrance to the room; however some people may be frightened by this practice.

- What is your first impression of this space?
- Is it familiar and relaxing?

- Do you prefer a bath or shower?
- Do you know how to take a bath or a shower?

Sanitary fittings and fixtures should be of a style that is practical and easily recognisable to the user. The bath should have non-slip mat/strips on the base, and should be clearly defined by contrasting tiles around its perimeter to highlight its boundaries. Ideally the bath or shower should be able to be accessed from 3 sides. Some people may find half shower curtains to be preferable as it prevents feeling of claustrophobia.

- Can you access them?

The bathroom should provide an area big enough to provide adequate space for a wheelchair circle or hoist maneuver with additional space for 2 people to assist with equipment. A level access shower is preferable.

- Can you operate the shower from a seated position?

It is important that whilst an individual may no longer be able to stand to have a shower, that they be given the opportunity to remain as independent as possible by being given the chance to control their environment, which maintains remaining skills.

- Is there a wet floor?
- Does the light reflect off of the materials?

Floor materials should be non-slip with matte wall and floor finishes. These are preferred over shiny materials as reflected light can cause glare as well as increased amplification of sounds. This can be reduced through the use of materials such as padded sheet vinyl flooring that has a high sound absorbency.

The photograph adjacent (Iris Murdoch Centre public toilets) illustrates bright bold contrasting surfaces with even illumination across matte surfaces.

Is it a safe place?

A comfortable room temperature should be maintained at all times. Heat lamps are an ideal way of maintaining a warm temperature whilst avoiding potential accidents on other hot surfaces. Another option is under floor heating which can be thermostatically controlled.

Hot water temperature controls should be put in place, via thermostatic mixing valves, in order to maintain a safe water temperature. Tap temperatures should be made distinctive through the use of bright red and blue markings.

Locks should be able to be disabled from the outside preventing any individual from getting locked in.

There should be no sharp corners in case of falls, and the toilet and sink should be positioned at a correct height that is easily adjustable.

Do you struggle to locate the toilet seat?

It is astonishing how many toilets in both private homes and public buildings fail to use contrasting toilet seats, a simple choice that greatly aids many people with cognitive and sensory impairments. A solid bright colour allows users confidence in where to sit. It has also been suggested that toilet water that has a dye through it can help men with their aim!

It is also beneficial to remove open wastepaper baskets as they can be mistaken and used as a toilet.

Can you get up and down easily?

As mentioned previously this project approaches accessibility as though all physical aspects have been addressed, so as to focus on cognitive and sensory impairments, however, appropriate handrails are essential in the bathroom/W.C and they are most beneficial when they can be located because they contrast significantly in the environment.

Do you know how to flush the toilet?

Who left the mess in the toilet?

Many contemporary toilets use a dual flush system, although the principle is good many people in older generations do not recognise this feature and as a result do not flush the toilet. This can cause frustration as people who have been vigilant in flushing the toilet throughout their lives can presume that someone else has been using their bathroom without their knowledge.

Do you remember to wash your hands?

Signage can be employed to remind the user the order in which they should use the W.C: toilet, toilet paper, flush, and wash hands.

- Do you know how to turn on the taps?

Age appropriate fittings are required, for example those with capstan heads, if however the twisting motion required by such fittings is no longer unachievable then alternative styles can be sampled to see what suits.

- Do you see the soap?

It is essential to implement good colour contrast throughout all aspects of the bathroom. Even toiletries such as soap can be overlooked if contrast is not made between itself and the sink (see adjacent photograph: Iris Murdoch). It is advised in the bath/shower area to create a soap recess, this benefits individuals should there be a fall.

- Do you recognise what you see in the mirror?
- Can the mirrors be removed?

Often those with cognitive impairments, such as dementia, become disorientated and confused with regards to time, place and sometimes even their own identity. On occasion particular individuals will be disturbed to see their reflection in a mirror, as they may no longer recognise it. Therefore, it is valuable to use mirrors that can be easily removed if necessary.

- Is there shelving for your personal toiletries

It Is important that people occupy their space with familiar objects, consequently shelves should be made available for personal items which are in easy reach.

BEDROOM

Consider your personal space.

- Has it been difficult to locate this space?
- Could you recognise it if you were unable to remember where it was?
- What are the things you remember about your personal space?
- Is it the décor, family photos, ornaments or pieces of furniture?
- How private is this space?
- Is this important to you?
- What are your first impressions of its purpose?
- Where is the bed positioned?
- Can you differentiate between the duvet and the bed sheets?
- Is the floor area/shape important?
- If you wanted could you change the positioning of the furniture?
- What can you hear?
- Is there a TV, radio etc?
- What can you see?
- How high are the window sills?
- Do the windows open?
- Do you know how to change your clothes?
- Can you see where your clothes are kept?
- Do you know what order to take them on and off?
- Can you get up at night safely?
- What is the flooring made from?
- Can you see a toilet?

Bedroom

Personal space is a place of sanctuary, a place where sleep and relaxation are encouraged, this is especially important for those with cognitive and sensory impairments. Warm temperature should be maintained in the bedroom and efforts should be made to make the environment as hazard free as possible. Furthermore, if the person suffering from the cognitive/sensory impairment can feel well rested then it will benefit the family and carers' in the long run.

- Has it been difficult to locate this space?

Both direct and indirect cues should be implemented to lead the individual to their personal space. The door should be highlighted with appropriate levels of illumination (see 'circulation' for more information).

- Could you recognise it if you were unable to remember where it was?

As mentioned previously the doorway to the bedroom is best highlighted with personal identification. This may be achieved through recessing the door and positioning a combination of personal objects and memorabilia such as familiar photographs with signage that includes both text and pictorial representation of the space.

- What are the things you remember about your personal space? Is it the décor, family photos, ornaments or pieces of furniture?

Orientation problems can affect perception of time, place or person, this can be a major source of anxiety and confusion, therefore it is essential that methods of way-finding do not compete, creating an over stimulated environment, which may lead to a navigation failure. A selection of personal objects such as quilts, photographs, pictures, ornaments etc. can make the decision making process easier and more achievable.

Furniture such as dresser with mirror and brush/comb may stimulate memories and encourage self-grooming. Decorating in warmer colours can

create a cosier atmosphere that stimulates a sense of security whilst providing maximum colour distinction should the individual develop Colour Agnosia.

- How private is this space?
- Is this important to you?

The bedroom is a personal space for private and intimate activity, 'sharing one's private space with another (by default not by choice) thoroughly undermines many of the conceptual notions of home, and is in complete opposition to many of the therapeutic goals of Assisted Living, and is therefore completely unacceptable'[vii].

- What are your first impressions of its purpose?
- Where is the bed positioned?

It is preferable to have a bedroom that enables several positions for the bed. It is pleasant to have the bed positioned in a way that receives views with space so that it can be accessed from both sides, should a hoist or wheelchair need to be implemented.

- Can you see a toilet from your bed?

If there is an en-suite to the bedroom it is advisable to distinguish the door in a vivid colour with clear signage and to layout the bedroom to have at least one bed position with a line of vision to the toilet. Often if a person can see a toilet they will use it, thus improving continence.

- Can you differentiate between the duvet and the bed sheets?

The colours of the bed cover and sheet should be carefully considered to contrast appropriately. This should be implemented through the use of bright strong colours.

Bed making skills may be encouraged with the use of step-by-step instructions located adjacent to the bed.

- Is the floor area/shape important?
- If you wanted could you change the positioning of the furniture?

The shape of the room will affect the possible layouts achievable. It is also important to create enough space for the use of a wheelchair and/or hoist, with the help of two people.

Furniture should contrast to the walls and floors and should be sturdy as illustrated in the photograph adjacent taken at the Iris Murdoch Centre, Stirling.

- What can you see?
- How high are the windowsills?

It is advisable to have the windowsills in the bedroom in higher than 600mm; this allows views from the position of the bed or chair.

- Do the windows open?

It is important for the user of the bedroom to feel in control of their environment, this includes ventilation, views, privacy and levels of light.

- Do you know how to change your clothes?
- Can you see where your clothes are kept?
- Do you know what order to take them on and off?

Furniture such as the wardrobe should be in a familiar style with handles that are easily seen and used, signage should reinforce identification of objects. When individuals have problems with memory, problem solving, attention and visual comprehension, it is important to make purpose obvious. This can be applied when it comes to the task of dressing. It is essential that an individuals skills are maintained and practiced as often as possible, to assist in dressing it can for some, be advantageous to have an open clothing rail for easy identification of clothes. Particular clothes could be laid out to assist the user, as too many choices may present over-stimulation. A dirty laundry basket labeled for identification would be useful.

- Can you get up at night safely?

Light at night may not always be conducive in creating calming environments for sleep. A soft night-light might be appropriate from some, whilst the use of automatic light sensors others may find them disturbing.

Sharp corners may need to be addressed with padding. Extra local lighting is also important in the bedroom as various tasks may be undertaken in this private space.

- What is the flooring made from?

All loose mats should be removed. A clear walking path should be made from the bed to the toilet, in case the individual gets up during the night.

LOUNGE

Now consider the lounge.

- What strikes you first?
- Is it the colour, the smell, the light, the proportions, the noise, or the furniture?
- Is there a focal point, a fireplace?
- How is the seating arranged?
- Is there an opportunity to re-arrange the furniture?
- What activities happen in this room?
- Can you find what you are looking for to participate in an activity?
- Is there enough light for specific activities?
- Where are the light switches?
- Do you know how to use them?
- Is the light coming from the window causing glare?
- What are the noise levels like?
- Would you be surprised to find a television in this space?
- Who decides what is on the television?
- What do you do if you want to find a quiet sitting space?
- When you touch the materials in this room, how do they feel?
- Are there objects in the room that interest you, are they familiar?
- Does any aspect of the décor confuse you?
- Are there any patterns/colours that make you feel disorientated.
- Is it warm enough, would you know what to do if you began to feel too hot or cold?
- What does the view from the window tell you about the place?
- Is it important to access the garden from this room?

Lounge

For most people the lounge creates on opportunity for individual or collective activities. Traditionally in British homes the lounge is an area where most people spend their time watching television, listen to music, read and entertain. It is also for many the place where meals are eaten, which demonstrates the versatility of such a room. There is much debate about whether separate or combined functions are beneficial to those with cognitive and sensory impairments such as dementia.

Has it been difficult to locate this space?

The living room door should be highlighted through the use of a widened door opening, with either glazed doors or glazed panels in the door, to enable views prior to committing themselves to entering the space.

What strikes you first?

It is important particularly in a room that is larger and of combined use, to be partitioned into smaller areas, either through half walls or folding partitions. This is because too much visual clutter can cause excess visual stimulation that can cause a lapse of concentration and agitation.

Is there a focal point, a fireplace?

A focal point like a fireplace can be effective in not only providing an alternative focus to the television but by creating an area of heat and movement to congregate around, which for older generations may trigger older memories, as well as a place to put familiar ornaments.

How is the seating arranged?

Seating should ideally be arranged in small groups in various styles of seating, to allow for a variation of seating heights to suit all.

Is there an opportunity to re-arrange the furniture?

Walkways should be made clear, with any sharp cornered furniture either removed or padded.

- What activities happen in this room?

Sitting rooms can be split into two groups, those that are combined with other activities (such as dining, craft, kitchenette) and those that are exclusively sitting rooms. Combined rooms benefit by being flexible and offer many social opportunities either through active participation or by just observing. Separate functioning rooms however offer a quiet space.

- Can you find what you are looking for to participate in an activity?
- Is there enough light for specific activities?

There should be a variety of lighting which can be controlled to produce suitable lighting for a range of activities, such as reading, writing, sitting and eating (if the dining space is included).

- Where are the light switches?
- Do you know how to use them?

Light fittings should be in a familiar style and they should contrast against the background.

- Is the light coming from the window causing glare?

As the eye ages there is overall blur to vision, this can cause sensitivity to intense light that can cause problems with glare. There are two types of glare, direct and indirect. Direct glare is caused from instances such as direct sunlight through a window or from an un-shielded light bulb. Indirect glare is caused from intense light reflecting of adjacent surfaces, such as that surrounding a window, or from a ceiling with reflective paint. Glare can cause much distress, agitation and disorientation; therefore to reduce this affect translucent materials should be used at windows, which allow views out whilst diffusing the light. Slatted blinds, particularly those in metal materials, should be avoided as they cause distinctive shadows that can be confusing. Glare can also be caused at night when light hits a window creating a mirror of reflected image; this can be distressing therefore it is important to cover windows with opaque coverings at night.

- What are the noise levels like?

Presbycosis is a condition that the aging ear may be affected by. It is the condition that decreases upper range hearing. This situation is found more

difficult when there is background noise, making participating in conversations more challenging. This can be supported through the use of sound absorbing materials, such as acoustics ceiling tiles or through carpets, furniture materials and window dressings.

- Would you be surprised to find a television in this space
- Who decides what is on the television?

The approach to television watching should be carefully considered. There can be a conflicting approach to the kind of atmosphere if televisions are left on without thought, the room is no longer a quiet space, and the noise of the television may cause agitation. Careful selection of television programs enables meaningful watching whilst respecting the need for a quiet space.

- What do you do if you want to find a quiet sitting space?

An interesting approach to quiet spaces can be found through the use of quiet sitting areas that are divided off the main sitting area. These areas can be small enough for just one or two people, creating a space where the individual can seek solace, particularly if they have become distressed in the public space.

- When you touch the materials in this room, how do they feel?

Tactile furnishings can create an interesting space with the use of various textures and colours, accessible from a range of locations.

- Are there objects in the room that interest you, are they familiar?

As disorientation of time, place and identity can occur with some cognitive impairments it is important to enforce identity through the reinforcement of self in familiar objects, these include ornaments, memorabilia and family photographs. Photographs of the particular individual are also important, both from the past and from present events.

- Does any aspect of the décor confuse you?

Clutter should be reduced to create a cohesive space, objects of particular interest should be made clearly visible and accessible, through either open shelving, glass fronted units or through cupboards which have signs.

- Are there any patterns/colours that make you feel disorientated.

Environments which are ambiguous or perceived as abstract, evoke negative responses from those who cannot interpret their meanings. Patterns can often be a source of confusion with those with visual depth perception deficits, especially when encountered on floor finishes. This does not however suggest that pattern should be altogether eliminated; on the contrary pattern can assist in creating a homelike warm atmosphere. Patterns should seek not to be abstract but of familiar interpretation. The colours should be soft with contrasting colours creating the background and foreground.

- What does the view from the window tell you about the place? Is it important to access the garden from this room?

As mentioned in the ‘garden’ section, access to the garden from the ground floor living area is preferable, as views out will cue individuals to use outdoor areas whilst allowing them to enjoy the activities within the garden. When the living area is located on a floor above, efforts should be made to provide a balcony, by which fresh air and opportunity to sit are made, with the necessary safety precautions.

GARDEN

Consider the garden.

- What does it remind you of if you were looking out onto it?
- How do you access the garden? What level?
- Does the garden seem familiar?
- What can you hear?
- What can you smell?
- What doe you see?

Go for a walk in the garden.

- Do you notice the boundaries of this space?
- How are the boundaries made?
- Do you feel confined?
- Do you see an exit?
- Is there an obvious path to take?
- Do you find yourself back at the door?
- What are the paths made from, is there any over-hanging planting?
- Do you feel safe?
- Does the garden offer protection from the wind, rain or sun?
- Do you recognise the furniture and various objects in the garden?
- What activities take place in the garden?
- Could you grow things, hang out your laundry, sit in the sun, work in a shed, observe a bird table, and put out your bins?
- Are there raised planting beds, so you don’t need to bend down?
- What kind of landscaping is there?
- Are the plants poisonous, edible, or spiky?
- Is there any lighting at night?

Garden

Gardens have the potential to provide an opportunity to enjoy the outdoor elements whilst being in a safe, interesting and accessible area. They are places that can encourage exploration; provide calming, pleasurable and social activities, and sensory stimulation. To feel the grass under your feet, smell the scent of flowers and the wind against your skin all inspire a sense of freedom in a world that might be seem otherwise confusing.

However, due to 'physical, psychological, and cognitive frailties, many people may not be able to enjoy the outdoors in an open or unprotected space'.[viii] These feelings are largely caused through feelings of physical frailties along with fears of being exploited by those with 'devious intentions' in an exposed position. Therefore, it is important, especially for those with cognitive impairments who may become disorientated, to define outdoor spaces. Definition is created through careful design that can significantly contribute to its success.

Consider the garden.

- What does it remind you of if you were looking out onto it?

Ideally residents should be able to see garden from their main living areas, with clear indication of how to access the garden and clear visual guides to pathways.

- How do you access the garden? What level?

For the garden to be accessed easily it should ideally be located off the main living spaces on the ground level. When the living space is not located on the ground floor, an alternative outdoor balcony can offer quick access to fresh air, seating and potted plants, however, access to the main garden should also be encouraged. The adjacent photograph (McKillop Gardens) illustrates the use of balconies; adequate safety precautions have been taken with bowed balustrades to prevent climbing, with a glazed overhang in the roof to allow maximum daylight whilst offering protection from the elements.

- Does the garden seem familiar?

Familiar layout and objects to the individual are essential in the space being fully utilised; this may include items such as a wooden benches, bird tables, shed, greenhouse etc.

What can you hear?

Sounds experienced in a garden include those either found in nature or those introduced and triggered. Sounds in nature include, birds singing, water trickling, wind rustling through leaves/grass etc. Those triggered include wind chimes, interaction with water and even sound sculptures.

Introducing sound elements into a garden can provide stimulating spaces, particularly for those who have poor hearing. Sound can be very therapeutic and calming, offering a variety of natural and triggered sound elements for different people with different abilities which will enable wider enjoyment of the garden.

What can you smell?

The obvious choice in accessing smells in a garden is through scented plants. Various plants produce different aromas and can be experienced in different ways, some you can smell from a distance (honeysuckle, varieties of rose), others you need to get in closer proximity to experience their delicate smells, and others you need to touch and crush the leaves (variety of herbs/fruits that can also be tasted). It is for this reason that it is imperative that gardens designed for those with cognitive and sensory impairments should not include any plants that are spiky or poisonous.

Other areas of the garden can produce interesting smells, such as bark and cut grass to name a few. It is worth noting how elements smell in different conditions such as when its wet or dry, hot and cold, and according to what season or time of the day it is. All of the above stimulate the senses and when adapted to suit individual needs create meaningful contributions to the garden.

What do you see?

Throughout the seasons of the year the garden can attract a spectrum of colours and shapes that create a change in mood and atmosphere. In nature there are a wide variety of plants that provide colour and shape (shape through leaves such as a sycamore) a selection of contrasting varieties should be considered to balance areas and create interest.

Man made objects can also create areas of visual curiosity; these include murals, brickwork, sculptures and mosaics. When used on the ground, in carefully selected areas of the garden, it can benefit many people with dementia as they often keep their eyes to the ground. The photo adjacent illustrates a sculpture that has been used by Landscape architect Anne Pollock at the Iris Murdoch centre in Stirling.

Go for a walk in the garden.

- Do you notice the boundaries of this space?
- Do you feel confined?

Gardens symbolise a place where you can escape and feel free from the constraints often experienced indoors. This is especially true for those with cognitive impairments such as dementia, as they are often very active people and can feel restricted in enclosed environments. This is true of the garden space, it is important for the garden to be a place of enjoyment and relaxation whether that is through active stimulation or through a calming place to rest. Therefore, it is beneficial to have a space which feels private and secure yet not confined and restrictive.

- How are the boundaries made?

To avoid a sense of confinement unobtrusive boundary treatments are needed. In order for users to be unaware of boundaries subtle barriers need to be made. This can be created through fencing that is painted green to merge into planting and a selection of soft and hard landscaping that creates distance from garden and fence. Low boundary walls should be avoided as some individuals may be tempted to climb over when visual contact is made beyond, therefore designing the garden to maintain concentration and interest within the safe and controlled perimeters will prevent potentially dangerous situations.

- Do you see an exit?

If it is unsafe for individuals to exit the garden unaccompanied, then exits from the garden should be camouflaged; doors might be painted to match the rest of the boundary treatment and paths created to avoid interception.

- Is there an obvious path to take?

A path in a garden creates an obvious cue for an individual to follow. As those with dementia may not know where the path leads, it is preferable to have a destination point which can been seen and recognised. Such a place might include a simple wooden bench (as seen adjacent at Burnfield Care Home), gazebo or pergola.

- Do you find yourself back at the door?

It is helpful for the door entering and exiting the garden to be located off the same route. Objects may be used as landmarks to signify the correct door, a person might not remember where the door is but they might remember it was the yellow one with the snail.

- What are the paths made from, is there any over-hanging planting?

Many people with cognitive impairments, such as dementia, experience kinesthetic problems (the relative position of neighbouring parts of the body). These problems require paths to be of a decent width, made from non-slip materials, evenly laid, and from using contrasting colours. It is important to keep pathways clear of any overhanging planting, but close enough to trees and planting to touch.

- Do you feel safe?

For those with poor vision, stair edges should be clearly marked and pathways kept clear. A combination of building layout and site design can enable spaces such as courtyards to be created; these are ideal as they offer privacy and security, allowing passive observation from others. Tor Nursing home, in the case study section of the website, illustrates a dynamic and overall successful application of a courtyard.

- Does the garden offer protection from the wind, rain or sun?

As sense of judgement, attention and awareness can be altered with cognitive and sensory impairments, it is important to provide areas in the garden that offer protection from rain, wind, snow and sun in various parts of the garden.

- Do you recognise the furniture and various objects in the garden?

Furniture should be in the style that is most familiar to the occupant. Historical objects can be introduced which may trigger memories from the past.

What activities take place in the garden?

'The creation of purposeful outdoor places provides opportunities for people to partake in familiar and therapeutic activity that stimulates the mind and body. Outdoor activity, particularly activities such as planting and tending a garden, help to orient people to time of day and year, and provide opportunities for socialisation and purposeful experience'.[ix]

Could you grow things, hang out your laundry, sit in the sun, work in a shed, observe a bird table, and put out your bins?

This photograph was taken at Croftspar Place (see case studies section); here the back garden is used for bin storage, with a clothes wheel and an individual grass area. These defined spaces allow for familiar domestic activities to take place.

Are there raised planting beds, so you don't need to bend down?

A garden should be a place that enables both passive and active activities. It can be a place where you can participate in gardening. By designing raised beds users can enjoying planting and caring for plants without having to bend down. The adjacent photograph (Tor Nursing Home) has enclosed the pond with raised beds within a wooden deck and topped low walls, this enables residents to sit beside plants and water at a comfortable height.

Is there any lighting at night?

For those who wish to explore the garden in the early evening, soft warm lighting should be installed, with particular attention given to areas of level changes to provide an even illumination.

Case Studies

CASE STUDIES - INTRODUCTION

Throughout this project the importance of exploring case studies has become increasingly evident. I have found that examining the successes and failures of such buildings has drawn me closer in understanding the complex relationship between the components involved in creating inclusive design.

The examples chosen here have been selected primarily on location and function. I was interested to explore the wide range of facilities locally which exhibit an emphasis on dementia/cognitive issues in very different ways. Secondly, I believed that each project is exemplary in one way or another, and as such deserved to be shared. Below is a summary of what I believe are the highlights of each project:

Burnfield Care Home

- Configuration of units
- Quiet sitting spaces off main sitting area
- Broken walls and windows creating greater transparency
- Mixed use activity space where the public can interact with the life of the home
- Well designed, safe and interesting garden

Croftspar Place

- Overall contemporary appearance with strong contrasting colours
- Memorable identity
- Configuration of interior and exterior parts of the building
- Enclosed garden and walking routes
- Individuality and emphasis on independent living

Tor Nursing Home

- Courtyard layout and style
- Ambience of café / shop
- Avairy and potting shed
- Extensive gardens

McKillop Gardens

- Broken double loaded corridors
- Layout of apartments
- Internal winter garden sitting room
- Cinema room
- Extensive enclosed garden

Iris Murdoch Building

- Use of signage
- Recessed windows
- Public toilets and bathroom
- Kitchen design
- Enclosed garden with an assortment of colours and textures
- Examples of colour contrast
- Use of natural light
- Memorable identity

Lastly, it is not the aim of this project to systematically audit each building, rather to highlight the achievements and at times, draw backs of each design. I hope that through this study, a dialogue will be established between designers around the world, as we all share our explorations of such buildings. If you are interested in sharing anything you may have experienced on the subject then please visit the ‘wandering spaces’ blog, found in the *other information* section of this website.

BURNFIELD CARE HOME

- Site: 32 Burnfield Road, Giffnock, Glasgow
- Classification Care Home Providing Nursing Care
- Number of stories: Three
- Number of bedrooms: 40 Single Occupancy
- Owner: Newark Care Development, Glasgow
- Status Charity
- Architect: Bercott Architects, Glasgow

Newly built in 2003 Burnfield residential home was developed by Newark Care Development, a Jewish charity founded in 1947. Having sold their previous premises in Pollokshields, Newark Care sought to develop a building which articulated a ‘person centred’ ethos, realising the individual needs of both the resident and care staff.

The main brief and aim by Ian Doherty, a then employee at Bercott architects, was to design a building which was ‘home’ for those who lived there. This can be seen in the deployment of three wings each acting as a small independent unit. This layout was made possible by additional funds raised and made available by Newark Care.

Particular successes are found in the mixed-use activity space that is used on a regular basis as a schul (synagogue) by the local Jewish community, as well as the snoozelum (light and sound) used for therapeutic activities. However, I believe the overall success lies in the layout of the units.

Each unit varies between eight, seven and five bedrooms; all adopt a similar layout, open plan kitchen, dining and living space, with individual bedrooms and bathrooms off these main spaces. This layout prohibits any use of corridors, thus maximising space and providing a private environment that echoes home. Although the layout is open plan, each area is clearly defined; the ceilings have been dropped to create a sense of change from the main adjoining spaces and the doors have clear indications of use, bedrooms have personalised signs and the bathroom/W.C. are always painted in a vivid yellow. The overall nature of the unit maximises privacy for the residents whilst creating a simple and easily understood space, which with clear visual links to common areas have resulted in greater levels of mobility and continence.

I also believe the garden to have been a success. The site has a substantial slope which brings the entrance from street level across a bridge, with the lower ground level becoming enclosed by the slope. This has created an

enclosed garden with planting and water features being built into the slope creating a passive boundary. The resident/visitor can enter the garden from the conservatory off the activity space, and walk around the garden under the bridge and through to the rear garden which forms a continuous route back. There are several areas of interest including a pergola, bird bath, various forms of planting and seating.

CROFTSPAR PLACE

- Site: 8 Croftspar Place, Springboig, Glasgow
- Classification Supported Housing providing personal care
- Number of stories: One
- Number of bedrooms: 8
- Owner: Cube Housing Association/Alzheimer Scot
- Status Housing Association
- Architect: Chris Stewart Architects

Croftspar Place was commissioned through Glasgow City Council Social Work to Cube Housing Association Ltd and Alzheimers Scotland, as a supported accommodation service for people with dementia. Completed in 2005 by Chris Stewart Architects, Croftspar place provides a space which encourages independent living with the support of 24 hour assistance when required.

The building is arranged in two separate single story blocks arranged around a south-facing courtyard. Each block contains 4 apartments (one attached to the staff accommodation) each with a covered walkway with an open colonnade, creating a continuous path which links all parts. Each block in rendered white and each apartment is characterised with a vivid door colour, which not only allows for easy individual association but creates a strong contrast between wall and door.

Inside the apartment visual connections are a significant design feature, with the living space, kitchen and bedroom flowing into each other. The kitchen becomes visible from both the living room and bedroom, with the bathroom placed off centre of the plan with access from both the bedroom and circulation space. The spaces have ample natural light and are spacious with high ceilings, reminiscent of the traditional tenement. But do not be mistaken, this project defies the opinion that the style should be of traditional aesthetic for easy association. The design is bright and contemporary which was intended by the architect, in an attempt to make the homes 'timeless and suited to people of any age group, generation and physical or mental ability'[1]. The style may be contemporary but the layout is traditional with a front and back door layout, with a formal front garden and an individual green space at the rear with a more private feel. Each apartment has individual bin storage and clothes dryer on their patch of grass, with optional seating, in unison

[1] www.glasgowarchitecture.co.uk

creating a semi private garden space that can be personalised to suit the individual.

Other facilities include a communal laundry room, designed to echo the traditional ‘steamie’, which is a tool to prevent accidental flooding (however, on the visit it was difficult to determine if this design feature was fully realised in reality). The front garden gives the residents an opportunity to socialise and observe the comings and goings, which in the summer can be utilised for outdoor activities.

TOR NURSING HOME

- Site: 30 Corstorphine Road, Edinburgh
- Classification Care Home providing Nursing Care
- Number of stories: Two
- Number of bedrooms: 50
- Owner: Tor Christian Nursing Home Ltd
- Status Private
- Architect: Unknown

Tor Nursing Home is located in an idyllic spot just off Corstorphine road in Edinburgh. Surrounded by Edwardian architecture the home sits high overlooking a magnificent mature garden. Tor is a Christian home which accommodates for up to 50 residents. A recent extension to the old building has created not only more rooms but a private and safe courtyard garden which can be accessed from the conservatory. The courtyard contains several areas of interest these include; a pond created with a wall which can be used for seating with a layer of planting to act as a passive barrier to direct water contact. The water reflects the surrounding plants and architecture whilst containing silver floating balls and water features which allow interaction. The highlight feature is small foot bridge which allows movement across the water, which contributes to a pleasant walking route. The courtyard also provides traditional age-appropriate fixtures and fittings, such as stylised wooden benches, a black lamppost and wall mounted light fittings.

Another area of interest is the café and shop located in the new glazed section of the extension, this allows an intermediary space between the private home and the public world. The space is flooded with natural light and warmth, and creates a place where the smell of coffee and ambience of chatting can be enjoyed by residents and visitors alike. The shop also provides an area for the community to interact with the home, providing an ever changing setting with the changing of seasons.

Tor also has additional features such as a potting shed and large aviary which become places where sensory experiences can be practised through the interaction of sound, sight and touch. The extended grounds provide a mature garden with large trees, ample planting, bird baths and seating in the form of benches and a small wooden snug, which provides privacy and shelter. All in all a garden to be enjoyed!

McKILLOP GARDENS

- Site: Parkhall Street, The Village, East Kilbride
- Classification Care Home Providing Personal Care
- Number of stories: Two
- Number of bedrooms: 40
- Owner: South Lanarkshire Council
- Status Local Authority
- Architect: Robert Potter & Partners

McKillop Gardens is a local authority care home run by South Lanarkshire Council which provides 24 hour residential care for older people, in both long and short term residency. It was built in 2004 as a part of South Lanarkshire Council's re-provisioning programme, the work was carried out by Robert Potter & Partners and specifically built with 'flexible accommodation and SMART technology to reflect the changing needs of frail elderly residents with increasing dementia'[2].The building comprises of five units each with approximately 8 private apartments.

Each unit comprises of a double loaded corridor broken in the centre by several communal areas. These areas include a sitting area with access to the garden/balcony on the street side, and an open plan dining/kitchen area facing the private enclosed garden. One end of the corridor creates a glazed sitting area with views out into the surrounding context with objects of interest on the walls, whilst the other links the unit with the additional building.

Each individual apartment is identified with a series of personal cues these include; their name on the door, a framed photograph adjacent to door, and in some cases a personal object such as ornament or toy placed at the edge of the door recess.

Within the apartment there can be found; an open plan sitting area with bay window, a kitchenette with small dining area, and a bedroom with en-suite shower facility adjacent. Each apartment can easily be personalised with individual ornaments and furniture which relate to the individual, with areas such as the bay window which not only permits maximum views and natural daylight, but is also reminiscent of traditional Glasgow tenement architecture. The kitchenette and small dining area allow the individual to prepare their own cup of tea or food when desired, with the bedroom and en-suite in close proximity. The en-suite facilities are spacious and well lit however contrasting colours would have been a benefit for those with poor sight and visual depth

[2] Robert Potter & Partners Website, www.rppweb.com

perception problems, both found commonly with those with dementia. The overall layout suggests independence and privacy, as facilities allow residents to choose between corporate or communal activities.

Out with each unit there are additional areas for residents, families and visitors to interact, these include; a cinema room on the ground floor, where films or other televised events can be screened and a very attractive warm winter garden on the second floor. In addition, one of the highlights at McKillop has to be the landscaped gardens, with continuous walking routes, clearly defined boundaries, planted beds at waist height and a gazebo in the centre as a focus point and place to sit and shelter.

IRIS MURDOCH BUILDING

- Site: University of Stirling, Stirling
- Classification Dementia Services Development Centre
- Number of stories: One-Two
- Number of bedrooms: N/A
- Owner: Stirling University / DSDC
- Status Education, Office, Residential
- Architect: Burnett Pollock Associates

Completed in March 2002 the Iris Murdoch building (named after the famous writer and philosopher who suffered from dementia towards the end of her life) is home to the Dementia Services Development Centre which seeks to demonstrate principles of design for dementia. The building was designed by Burnett Pollock Associates and sets out to 'minimise confusion, maximise transparency and aid orientation'[3].

The building occupies a glorious site as part of the Stirling University campus, which is situated approximately three miles from the centre of Stirling. The campus consists of 310 acres of countryside with views over the Ochil hills with Airthrey Loch as the focal point.

The Iris Murdoch building is constructed out of several forms each expressing a different function within. You are initially greeted with a sweeping white rendered wall which is punctured, at first with small aperture windows and then with a large hole which forms a gateway leading to the covered entrance, which is additionally marked by a grey aluminium clad drum.

On entering the drum space the different components of the building are revealed. The curved wall holds the main working part of the building, with an open plan office and library at the heart of the building to signify its importance. The small aperture windows are at three different levels, and are placed in a 600mm thick wall creating deep sills which can be used for placement of personal objects. They also allow generous daylight and are supplemented with roof lights which are diffused with blinds.

Adjacent to this part of the building is another wing which forms the main educational space. There is a wide gallery from which a large conference space is accessed. This space can be subdivided into three seminar rooms. Each space has separate access outside into the enclosed garden, which was

[3] www.burnettpollock.ac.uk

designed by Landscape Architect Annie Pollock. Outside of these doors memorable objects are positioned, such as a green watering jug, a blue frog and a yellow snail, these seek to illustrate memory associations and cues through objects.

In the centre of the plan is the two story part of the building, whilst the ground level accommodates cellular office space the first floor is home to a bedroom with en-suite and a living room with kitchen. Each of these spaces illustrates many design details which benefit those with dementia such as; glazed kitchen cupboards, traditional fixtures and fittings (taps and light switches etc), contrasting materials and colours on walls, furniture and floors, minimal use of patterns, with additional examples of contemporary technology and its benefits for both the resident and carer.

Other Information

Glossary

ACCESSIBILITY –*Inclusive Urban Design*: Streets for Life (see references)

Accessibility refers to the extent to which streets enable older people to reach, enter, use and walk around places they need or wish to visit, regardless of any physical, sensory or mental impairment. Accessible streets have local services and facilities, are connected to each other, have wide, flat footways and ground level signal-controlled pedestrian crossings.

ATTENTION – http://en.wikipedia.org/wiki/Attention

Attention is the cognitive process of selectively concentrating on one aspect of the environment while ignoring other things. Examples include listening carefully to what someone is saying while ignoring other conversations in a room. Sometimes attention shifts to matters unrelated to the external environment, a phenomenon referred to as mind-wandering or "spontaneous thought". Attention is one of the most intensely studied topics within psychology and cognitive neuroscience.

William James, in his monumental Principles of Psychology (1890), remarked:

"Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatterbrained state which in French is called distraction, and Zerstreutheit in German." [2]

AWARENESS – http://en.wikipedia.org/wiki/Awareness

In biological psychology, awareness comprises a human's or an animal's perception and cognitive reaction to a condition or event. Awareness does not necessarily imply understanding, just an ability to be conscious of, feel or perceive.

COMFORT –*Inclusive Urban Design*: Streets for Life (see references)

Comfort refers to the extent to which streets enable people to visit places of their choice without physical or mental discomposure and to enjoy being out of the house. Comfortable streets are calm, welcoming and pedestrian-friendly with the services and facilities required by older people and people experiencing temporary or permanent incapacity.

CONCEPTUALISATION - http://en.wikipedia.org/wiki/Conceptualisation

As the term is used in mainstream cognitive science and philosophy of mind, a concept or conception is an abstract idea or a mental symbol, typically associated with a corresponding representation in a language or symbology.

DISABILITY - http://en.wikipedia.org/wiki/Disability

Disability is a condition or function judged to be significantly impaired/distorted relative to the usual standard or spectrum of an individual of their group. The term is often used to refer to individual functioning, including physical impairment, sensory impairment, cognitive impairment, intellectual impairment, mental illness, and various types of chronic disease. This usage has been described by some disabled people as being associated with a medical model of disability.

DISORIENTATION – http://www.alzgmc.org/about_alz/glossary.htm - http://en.wikipedia.org/wiki/Disorientation

- A cognitive disability in which the senses of time, direction, and recognition become difficult to distinguish.
- Orientation is a function of the mind involving awareness of three dimensions: time, place and person. Problems with orientation lead to disorientation, and can be due to various conditions, from delirium to intoxication. Typically, disorientation is first in time, then in place and finally in person. Disorientation, the opposite, is a cognitive disability in which the senses of time, direction, and recognition become difficult to distinguish.

DISTINCTIVENESS –*Inclusive Urban Design*: Streets for Life (see references)

Distinctiveness relates to the extent to which streets give a clear image of where they are, what their uses are and where they lead. Distinctive streets reflect local character of the area and have a variety of uses, built form, features, colours, and materials that give the streets and buildings their own identity within the overall character of the neighbourhood.

DOMESTIC – Oxford English Dictionary

Of the home, household, or family affairs.

FAMILIAR – Oxford English Dictionary

- Often encountered or experienced,
- Well known,
- Knowing a thing well or in detail,
- Well acquainted, intimate,
- Excessively informal,
- Unceremonious.

FAMILIARITY –*Inclusive Urban Design*: Streets for Life (see references)

Familiarity refers to the extent to which streets are recognisable to older people and easily understood by them. Familiar streets are hierarchical and long established with forms, open spaces, buildings and features in designs familiar to older people

INCLUSIVE DESIGN - http://www.englishpartnerships.co.uk/inclusivedesign.htm

Inclusive Design is a way of designing products and environments so that they are usable and appealing to everyone regardless of age, ability or circumstance by working with users to remove barriers in the social, technical, political and economic processes underpinning building and design.

JUDGEMENT - http://en.wikipedia.org/wiki/Choice

Choice consists of the mental process of thinking involved with the process of judging the merits of multiple options and selecting one of them for action. Some simple examples include deciding whether to get up in the morning or go back to sleep, or selecting a given route for a journey. More complex examples (often decisions that affect what a person thinks or their core beliefs) include choosing a lifestyle, religious affiliation, or political position.

Most people regard having choices as a good thing, though a severely limited or artificially restricted choice can lead to discomfort with choosing and possibly, an unsatisfactory outcome. In contrast, unlimited choice may lead to confusion, regret of the alternatives not taken, and indifference in an unstructured existence; and the illusion that choosing an object or a course leads necessarily to control of that object or course can cause psychological problems

LANDMARK- Oxford English Dictionary

- A conspicuous object in a district
- An object marking the boundary of an estate, country etc
- An event, change

LEGIBILITY –*Inclusive Urban Design*: Streets for Life (see references)

Legibility refers to the extent to which streets help older people to understand where they are and to identify which way they need to go. Legible streets have an easy to understand network of routes and junctions with simple, explicit signs and visible, unambiguous features.

MATH COMPREHENSION - http://www.webaim.org/articles/cognitive/#maincontent

Mathematical expressions are not easy for everybody to understand. This does not mean that authors should avoid math entirely. For people who are comfortable reading equations and thinking mathematically, the best way to explain mathematical concepts is to use equations. On the other hand, often it is helpful to explain math conceptually, either with or without the formulas. Conceptual explanations help readers understand the reasoning behind the math.

MEMORY - http://www.alzgmc.org/about_alz/glossary.htm

The ability to process information that requires attention, storage, and retrieval.

PROBLEM SOLVING - http://en.wikipedia.org/wiki/Problem_solving

Problem solving forms part of thinking. Considered the most complex of all intellectual functions, problem solving has been defined as higher-order cognitive process that requires the modulation and control of more routine or fundamental skills (Goldstein & Levin, 1987). It occurs if an organism or an artificial intelligence system does not know how to proceed from a given state to a desired goal state. It is part of the larger problem process that includes problem finding and problem shaping.

REASONING - http://en.wikipedia.org/wiki/Reasoning

Reasoning is the mental (cognitive) process of looking for reasons for beliefs, conclusions, actions or feelings. Humans have the ability to engage in reasoning about their own reasoning using introspection. Different forms of such reflection on reasoning occur in different fields. In philosophy, the study of reasoning typically focuses on what makes reasoning efficient or inefficient, appropriate or inappropriate, good or bad. Philosophers do this by either examining the form or structure of the reasoning within arguments, or by considering the broader methods used to reach particular goals of reasoning. Psychologists and cognitive scientists, in contrast, tend

to study how people reason, which brain processes are engaged, and how the reasoning is influenced by the structure of the brain.

READING, LINGUISTIC, AND VERBAL COMPREHENSION - http://www.webaim.org/articles/cognitive/#maincontent

Some individuals have difficulties understanding text. These difficulties may be mild or severe, ranging from minor challenges to a complete inability to read any text. It would be unreasonable to expect web developers to accommodate the entire range of reading abilities. The difference between non-readers and genius readers is simply too vast. It *is* reasonable, however, to expect developers to write as simply and clearly as possible, taking into account the primary audience and including those who may have difficulty with some of the content. After all, an estimated 15-20% of the population has some sort of language or text comprehension difficulty.

Non-Literal Text

A problem for some readers is non-literal text, such as sarcasm, satire, parody, allegory, metaphor, slang, and colloquialisms. In some cases, readers will not realize that the words are not meant to be understood literally. A writer who says "I just love getting stuck in traffic when I'm already late for work" probably means the opposite of what this sentence actually says. Sarcasm such as this can be confusing to some readers. Similarly, someone who reads she must "get her ducks in a row" may not realize that the author is probably not referring to real ducks at all. The author is suggesting that the reader get organized or disciplined, using the comparison of a mother duck with her ducklings lined up behind her in order to illustrate the concept.

Non-Existent Text

The unstated assumptions and implied meaning of written content may seem obvious to the writer, but readers may not have the necessary background knowledge. Some readers may not have the skills to infer meaning from text without additional help.

SAFETY –*Inclusive Urban Design*: Streets for Life (see references)

Safety refers to the extent to which streets enable people to use, enjoy andmove around the outside environment without fear of tripping or falling, being run-over or being attacked. Safe streets have buildings facing onto them, separate bicycle lanes and wide, well-lit, plain, smooth footways.

SENSES - http://en.wikipedia.org/wiki/Senses

There is no firm agreement among neurologists as to the number of senses because of differing definitions of what constitutes a sense. One definition states that an exteroceptive sense is a faculty by which outside stimuli are perceived. The traditional five senses are sight, hearing, touch, smell, taste: a classification attributed to Aristotle. Humans also have at least six additional senses (a total of eleven including interoceptive senses) that include: nociception (pain), equilibrioception

(balance), proprioception & kinesthesia (joint motion and acceleration), sense of time, thermoception (temperature differences), and in some a weak magnetoception (direction)

SENSORY GARDEN - http://www.sensorytrust.org.uk

A self-contained area that concentrates a wide range of sensory experiences, such an area, if designed well, provides a valuable resource for a wide range of uses, from education to recreation.

VISUAL COMPREHENSION -
http://www.webaim.org/articles/cognitive/#maincontent

Some individuals have difficulties processing visual information. In many ways, this is the opposite of the problem experienced by people with reading and verbal processing difficulties. Individuals with visual comprehension difficulties may not recognize objects for what they are. They may recognize the fact that there are objects on a Web page, but may not be able to identify the objects. For example, they may not realize that a photograph of a person is a representation of a person, though they can plainly see the photograph itself (as an object) on the web page.

For these people, a moving, talking person in a video may be easier to identify and mentally process than a static image of a person in a photograph. Video and multimedia, accompanied with narration, may be the best way to communicate to these individuals.

VISUAL DEPTH PERCEPTION-

http://medical dictionary.thefreedictionary.com

The ability to perceive spatial relationships especially distances between objects, in three dimensions.

WAY-FINDING - *Creating Successful Dementia Care Settings:* Volume 2: Margret Calkins (see references)

The process by which the environment helps a person derive cues and information to aids in navigation from a point through space to a desired location.

References

BOOKS

Brummett, W. (1997). *The Essence of Home*: design solutions for assisted living housing. Van Nostrand Reinhold

Calkins, M. P. (2001) *Creating Successful Dementia Care Settings:* Volume 1: Understanding the Environment through Aging Senses, Volume 2: Maximizing Cognitive and Functional Abilities, Volume 3: Minimizing Disruptive Behaviours, Volume 4: Enhancing Identity and Sense of Home. The Maple Press Co.

Calkins, M. P. (1988) Design for Dementia, Planning Environments for the Elderly and the Confused, National Health Publishing

Cantley, C., Wilson, R.C. (2002) 'Put yourself in my place': Designing and managing care homes for people with dementia, The Policy Press in association with JRF

Cohen, U., & Weisman, G. (1991). *Holding onto Home*: Designing Environments for People with Dementia. Baltimore: John Hopkins University Press

Fleming. R., Forbes, I., Bennett. K., (2003). Adapting the Ward for People with Dementia. Sydney, The Hammond Group.

Hodges, L., Bridge, C., Chaudhary, K. (2006). The Home Modification Information Clearinghouse Project team; *Dementia Design Guidelines*: Home and Community Care Capotal Works Program. The University of Sydney (Faculties of health science and architecture)

Martin. F, (1992) '*Every House You'll Ever Need'*: A Design Guide for Barrier Free Housing. Published by Edinvar Housing Association Limited

Mitchell. L., Burton, E., (2006) *Inclusive Urban Design*: Streets for Life. Architectural Press - Elisevier

JOURNALS

Author Unknown. (2003). *A Matter of Preference*. Professional Social Work December 2003.

Grealy. J., Garbutt. Michael., (2006) Sensitive Design Meets Architecture Needs. H&H Aged Care, Dementia Design December 2005/January 2006

Mitchell. L., Burton, E., (2006) *Quality in Aging – Policy, practice and research*. Volume 7 Issue 1 March. Pavillion Publishing 2006

Mitchell. L., Burton, E., (2006) Neighbourhoods for Life: Designing Dementia Friendly Outdoor Environments. Quality in Ageing- policy, practice and research, Volume 7 Issue 1 March 2006, Pavilion Publishing

Pallister. M., (2003) *Architecture With Care*. Journal of Dementia Care. July/Aug 2003

Sarre. J., (2007) Dignity Through Design: *How Architecture Can Make A Difference*. Working With Older People June 2007 Volume 2 Issue 2. Pavilion Journals (Brighton) Ltd.

WEB PAGES

Alzheimer's Association Australia. (2000). *At Home with Dementia*: The environment and Dementia
http://www.alzheimers.org.au

Ambient Kitchen – Culture Lab, Newcastle University, Patrick Oliver
http://culturelab.ncl.ac.uk/ambientkitchen/

An Introduction to Inclusive Design, CEBE Special Interest Group in Inclusive Design
http://cebe.cf.ac.uk

Design Council - Inclusive Design by Rodger Coleman
http://www.designcouncil.org.uk

EDeaN European Design for all e-accessibility Network
http://www.education.edean.org

Olivier, P. (2007). *Ambient Kitchen – Home*, Culture Lab- Newcastle
http://culturelab.ncl.ac.uk/ambientkitchen/
Sensory Trust
http://www.sensorytrust.org.uk

The Helen Hamlyn Centre
http:// www.hhc.rca.ac.uk

Wherton, J., Monk, A (2006) *Designing Cognitive Supports for Dementia*
http://www.sigaccess.org/newsletter/sept06/Sept06_08.pdf

CASE STUDIES

EAC Housing Options for Older People
http://www.housingcare.org

Springboig Avenue, Supported Housing for People with Dementia
http://www.glasgowarchitecture.co.uk/springboig.htm

Collective Architecture
http://www.collectivearchitecture.com/

Alzheimers Scotland
http://www.alzscot.org

Care home Information
www.carehome.co.uk

Iris Murdoch Building Summary
http://www.burnettpollock.co.uk

Dementia Services Development Centre
http://www.dementia.stir.ac.uk

Robert Potter & Partners
http://www.rppweb.com

South Lanarkshire Council
http://southlanarkshire.gov.uk

SOUND SAMPLES

The Free Sound Project
http://freesound.iua.upf.edu

Door Knock	kemitix
Clock	cynical
Pouring Boiling Water	PercyDuke
Shuffling Cards	thereelfryboy
April 2004 Garden Birds	Jakeharries
Footsteps	WIM
Walk	CeraSea
Street Sound	BristolStories
Side Street	inchadney

Disclaimer

Whilst every effort has been taken to ensure the accuracy of the information within this website, I cannot guarantee its correctness and completeness and therefore do not accept responsibility for any loss, damage or expense resulting from the use of this information.

I wish to emphasis that the contents will not be reviewed regularly and therefore is subject to change as new research is unveiled and regulations updated. It is the responsibility of the user/reader to check the accuracy of relevant facts with the appropriate people before entering into any commitments based upon them.

Where links are provided to external websites they are for information only, and I therefore cannot be held responsible for opinions or accuracy of information held on those sites.

Acknowledgements

Many architectural students will appreciate that it is a great experience to finally produce something in the real world! So it is my pleasure to take this opportunity to thank those which have greatly contributed to the realisation of this project.

The project grew from a previous piece of work at the Mackintosh School of Architecture, titled *The Architecture of Madness,* for this I drew upon *'Tools for the Future'*, a document partially based on the knowledge and experience of my tutors Sally Stewart and Sandy Page, to them I thank.

My thanks also extends to those who gave me the opportunity to visit and document the featured case studies, these include;

- Majorie Creek, Director of Tor Nursing home.
- Malcolm Maddox, Chief Executive and Mary Mcquistin, Care Manager of Burnfield Care Home.
- Sharon Higgins, Service Manager of Croftspar Place.
- Charles Scholes, Charge Nurse at Bellsdyke hospital.
- Moiria Richardson, Manager of Mckillop Gardens, with the additional assistance of Evelyn Devlin from South Lanarkshire Council, as well as architect Jonathan Potter of Robert Potter and Partners.
- Finally Eileen Richardson at the Iris Murdoch Building who not only assisted with a tour of the building but gave additional support through the use of the library as part of the Dementia Services Development Centre at Stirling University.

Also a big shout out to Rosie Crerar and Alex Reece for advice and help regarding the making of the *'wandering in familiar spaces'* photo sequence, as well as all at GraphicalHouse, to you I am truly indebted.

I would also like to take this opportunity to thank Elizabeth Burton and Lynne Mitchell for the inspiration drawn from their work '*inclusive urban design, streets for life'*, from which I was greatly encouraged at the research being carried out in an otherwise unexamined subject.

I cannot end without thanking my wonderful husband Manish Joshi, and the rest of my clan for their endless support and patience, to you I dedicate this work.

Endnotes

[i] Brummett, W. *The Essence of Home*: design solutions for assisted living housing. p61

[ii] As above

[iii] Fleming, R., Forbes, I., Bennett, K. (2003)

[iv] [iv]Cohen, U., & Weisman, G. (1991). *Holding onto Home*

[v] Oliver, P. The Ambient Kitchen – Culture Lab, Newcastle University

[vi] Brummett, W. (1997). *The Essence of Home*: design solutions for assisted living housing. P86

[vii] Brummett, W. (1997). *The Essence of Home*: design solutions for assisted living housing. P61

[viii] Brummett, W. (1997). *The Essence of Home*: design solutions for assisted living housing. P64

[ix] Brummett, W. (1997). *The Essence of Home*: design solutions for assisted living housing. P89