Designing person-centred robust Specialist Disability Accommodation

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VICTORIA State Government

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Summary

Background and methods

Under the National Disability Insurance Scheme (NDIS), Specialist Disability Accommodation (SDA) is for people who need specialist housing solutions. This includes housing that caters for extreme functional impairment or very high support needs.

The NDIS robust SDA design category aims to 'incorporate a reasonable level of physical access provision and be very resilient, reducing the likelihood of reactive maintenance and reducing the risk' to the resident, service providers and the community.[1] The National Disability Insurance Agency has published general design standards for robust SDA. But the guiding principles that focus on leading-edge and person-centred good-practice design in the robust category are not available. Residents' preferences for robust SDA design have not been well explored.

The Department of Families, Fairness and Housing is Victoria's primary supplier of robust SDA. To guide development of future robust SDA builds, the department commissioned ORIMA Research to:

- pinpoint good practice approaches
- develop a set of design principles.

The research project involved three stages:

- **literature scan** – gathering relevant literature and a 'deep dive' review of eight academic articles, reports and policy papers
- **initial interviews** – one-on-one in-depth interviews and a group in-depth interview with **four experts**[2]
- **core qualitative research** – one-on-one in-depth interviews, group in-depth interviews and mini focus groups with **29 people**. This included 23 stakeholders, two people with a disability and four family/carers of people entitled to robust SDA.

Throughout the research, we refined the design principles with:

- stakeholders
- family members/carers
- residents.

Insights from the literature review informed the principles.

Resident needs, experiences and perceptions of robust SDA

Stakeholders said that **robust SDA** gives homes to a **diverse group of people**. This group has a wide range of disability types and sensory and environmental needs (more so than NDIS participants living in other SDA design categories). This includes a distinct group of NDIS participants who showed behaviours of concern.

The robust SDA group includes residents with a range of the following:

- **Disabilities.** This includes intellectual disability, autism, acquired brain injury, pica and Prader-Willi syndrome. Some residents have co-occurring disabilities or conditions such as an intellectual disability and co-existing diagnosed mental illness.
- **Sensory needs** that need to be addressed in a robust SDA. This includes internal temperature or humidity, lighting, the use of certain colours and noise.

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1 National Disability Insurance Agency 2019, *NDIS Specialist Disability Accommodation: Design Standard,* Edition 1.1, National Disability Insurance Agency, Canberra.
2 Stakeholders included SDA providers, Supported Independent Living providers and other experts in the field of disability (academics, advocacy organisations, peak bodies) as well as representatives from the former Victorian Department of Health and Human Services and the NDIA.

- **Behaviours of concern.** This includes self-harming behaviours; aggressive or violent behaviours that may cause harm to others; and destructive or obsessive behaviours that may result in property damage.
- **Environmental needs.** These are other factors that could trigger behaviours of concern in the home. These include a lack of personal space, behaviours of other residents', past trauma-associated triggers (e.g. 'institutionalised' design features) and items of fixation.

The research found an **important link between the built environment** (building location, features and design) and **resident outcomes**. Well-designed robust SDA plays an important role in improving resident outcomes. It does this by having specific and unique environmental features that support independence and reduce behaviours of concern.

Research respondents raised other issues with robust SDA including:

- the nature and quality of current robust SDA offerings (which was not considered 'ideal' practice)
- NDIS SDA robust design funding constraints
- challenges in meeting residents' choices in shared living spaces.

Stakeholders and family members felt there was a clear need for improvements to robust SDA. The research found a lack of guidance and standards in good-practice robust SDA design.

Design principles

To improve robust SDA design, we developed **seven good-practice design principles**. The need for a **person-centred co-design approach** underpins the principles. To tailor homes to individual residents' needs, spaces should be co-designed with:

- residents
- families/carers
- broader support networks (including family members/carers and support staff).

The good-practice design principles are to:

- enable a **person-centred co-design approach**
- create a **homelike space** that is not institutional in design
- maximise **independence** and **freedom**, minimising restrictive practices
- maximise **safety and comfort** of residents, staff, visitors and neighbours
- support resident **choice and options for interaction** with others when desired, as well as privacy and personal space
- enable (but not replace) **effective supports**
- maximise the **adaptability and flexibility** of the **building design**.

The research found specific design elements that support these principles (detailed in Part C of this report). In a person-centred approach, consider these design elements with specific residents in mind. Some, but not all, of these elements could be adopted.

Introduction

Background

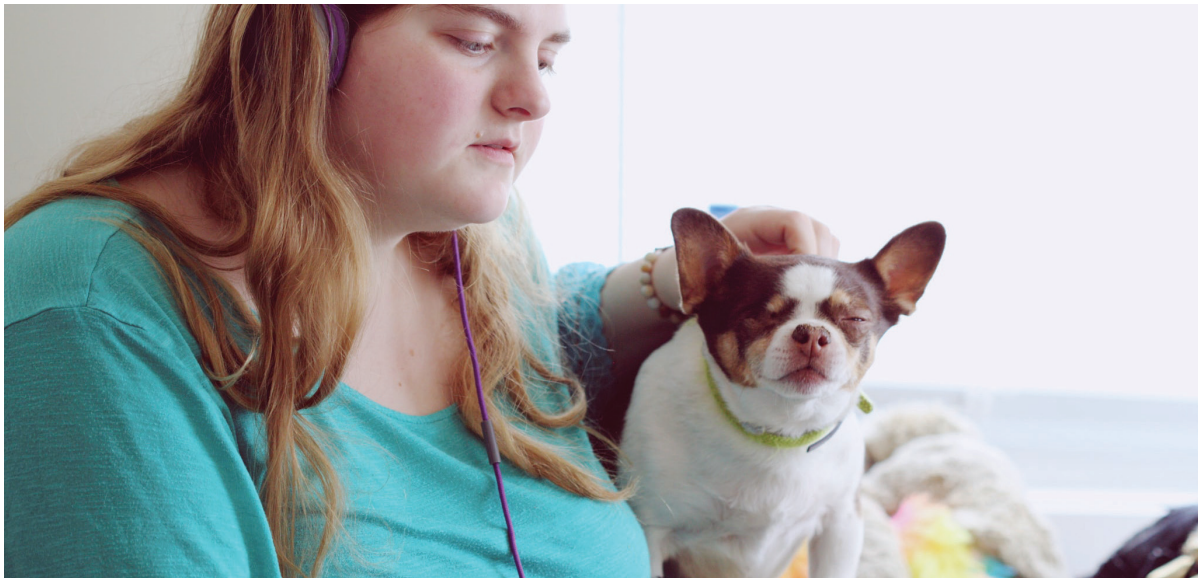
Specialist Disability Accommodation (SDA) is for people who need specialist housing solutions. This includes housing that caters for residents' extreme functional impairment or very high support needs. Under the National Disability Insurance Scheme (NDIS), the 'bricks and mortar' of SDA and the supports offered in homes (Supported Independent Living or 'SIL') are separated. SDA includes four building design categories:

- improved liveability
- robust
- fully accessible
- high physical support.

Robust SDA is 'housing that has been designed to incorporate a reasonable level of physical access provision and be very resilient, reducing the likelihood of reactive maintenance and reducing the risk' to the resident, service providers and the community.[3] The National Disability Insurance Agency (NDIA) has published general design standards for robust SDA. But guiding principles that focus on leading-edge and person-centred good-practice design in the robust category are not available. Residents' preferences for robust SDA have not been well explored.

The Department of Families, Fairness and Housing is Victoria's primary supplier of robust SDA. The department commissioned ORIMA Research to develop principles to guide future robust SDA design and construction.

3 National Disability Insurance Agency 2019, *NDIS Specialist Disability Accommodation: Design Standard,* Edition 1.1, National Disability Insurance Agency, Canberra.



Project aims

The primary aim of the research was to **develop guiding good-practice principles**. These principles would inform construction of **leading-edge, robust SDA**. The research also aimed to:

- understand the design features, preferences and experiences of people who need robust SDA
- pinpoint design trends, both here and overseas, that relate to robust SDA
- develop design principles for robust SDA informed by a range of experts with knowledge on the topic
- find experts in robust SDA
- document tested or trial design, environmental and construction features that build on the NDIS SDA Design Standard guidance.

Research method

The research project involved three stages:

- **literature scan** – a scan and cataloguing of the available literature on the topic and a 'deep dive' review of eight key academic articles, organisational reports and policy papers
- **initial interviews** – one-on-one interviews and a group in-depth interview with **four experts**
- **core qualitative research** – one-on-one in-depth interviews, group in-depth interviews and mini focus groups with **29 people**. This included 23 stakeholders, two people with a disability and four family/carers of people entitled to robust SDA.

Literature scan

A literature scan catalogued trends, approaches, guiding principles and good practice in robust SDA. The purpose of the scan was twofold:

- produce a list of resources to use when developing guidelines for good-practice robust SDA design
- decide the relevance and value of conducting a full literature review.

The scan looked to find:

- trends in disability housing design, universal design and accessibility
- guidelines, principles and factors in building robust housing for people with complex needs
- subject matter experts
- examples of good-practice disability housing design and construction.

The literature scan found 44 local and overseas research papers and journals. The researchers decided that a full literature review was not necessary. Still, they chose eight studies for a 'deep dive' literature review. This deep dive:

- helped develop guiding design principles and features
- gave background to the qualitative research findings.

We have included relevant findings from the deep dive in this report. Refer to Appendix 1 for the reference list.

Initial interviews

Initial stakeholder[4] interviews:

- gave first insights into the key issues and considerations about robust SDA
- helped refine research instruments
- found key stakeholder participants for the rest of the qualitative research.

Four research participants took part in this stage of the research through two one-on-one in-depth interviews and one group in-depth interview.

Core qualitative research

The core qualitative research included 23 people via:

- three online mini focus groups
- 11 one-on-one in-depth interviews
- two group in-depth interviews.

Fieldwork took place between 22 October 2020 and 26 January 2021. Researchers conducted almost all interviews online to protect health and safety during the coronavirus (COVID-19) pandemic.

The target audiences for this research included the following:

- **Stakeholders.** This included SDA providers, SIL providers and other disability experts (academics, advocacy organisations, peak bodies). There were also staff from the then Victorian Department of Health and Human Services and the NDIA. This audience included **10 SDA providers**, **nine SIL providers** and **eight other experts**.
- **Residents entitled to robust SDA.** This included people whose current robust SDA was not meeting their housing needs.
- **Family members and carers of people entitled to robust SDA.** This included people living in robust SDA and those fit for robust SDA looking for this type of housing.

Most participants were from Victoria given the department's scope. We also spoke with experts from other states and territories.

4 Stakeholders in this phase of the research included peak bodies, advocacy organisations and representatives from the former Victorian Department of Health and Human Services.

Table 1 shows the qualitative research design.

Table 1: Qualitative research design

Initial interviews with	2 × OIDI 1 × GIDI *n* = 4
Stakeholders	2 × OMFG 8 × OIDI 2 × GIDI *n* = 23
Residents of robust SDA	1 × OIDI 1 × FIDI[5] *n* = 2
Family/carers of people entitled to robust SDA	1 × OMFG 1 × IDI *n* = 4
Totals	3 × OMFG 12 × OIDI 1 × FIDI 3 × GIDI *n* = 33 participants

Online mini focus group (OMFG); group in-depth interview (GIDI); online in-depth interview (OIDI); face-to-face in-depth interview (FIDI)

The following methods helped find participants for the research:

- **Homes Victoria, the Department of Families, Fairness and Housing and ORIMA Research's Disability Research Services Division** used their industry experience and desk research to find initial interview participants.
- ORIMA used **snowball sampling** in the first interviews. Participants recommended SIL providers, SDA providers and developers and other experts in the field. The department sent these participants a primary approach letter to invite them to take part in the research. ORIMA then contacted them to schedule an interview or to include them in a mini focus group.
- We found a **disability design academic** during the literature scan. ORIMA invited the academic to take part in the research.
- ORIMA asked VALID, a **disability advocacy body**, to recruit resident and family/carer participants.

Resident and family/carer participants received an **$80** payment (or gift voucher). This was to recognise their contribution and cover the costs of taking part.

Appendix 2 lists the people and organisations that took part in the stakeholder part of the research. ORIMA and Homes Victoria thanks all participants for their time and valuable contribution.

5 One resident preferred a face-to-face interview. This took place outside the Victorian COVID-19 lockdown period and followed government health and safety guidelines.

Research challenges and limitations

At the start, we planned to include more people with robust housing needs in the research. Yet, the timing of the research (during a COVID-19 lockdown period) and the communication preferences of people with robust housing needs made recruitment hard. We took a flexible approach (offering face-to-face talks after lockdown) and extended the fieldwork period. Still, fewer residents took part in the research than would have been ideal. We acknowledge the importance of giving people with lived experience direct input into the research.

Findings from people with lived experience of robust housing (residents and family members/ non-paid carers of residents) were consistent with other stakeholders. This confirmed the research findings. But take caution when generalising the research findings to the broader population of people entitled to robust SDA. This is due to the small sample size of lived experience participants and the diverse range of needs among this group.

Presentation of findings

The research was qualitative and so we have presented the results and findings in a qualitative way.

The following terms used in the report estimate the size of the target audience who held certain views:

- **Most** refers to findings that relate to more than three-quarters of the research participants.
- **Many** refers to findings that relate to more than half of the research participants.
- **Some** refers to findings that relate to around a third of the research participants.
- **A few** refers to findings that relate to less than a quarter of research participants.

The most common findings are reported except in certain situations where only a minority has raised certain issues. Still, these are important and may have wide-ranging effects or uses.

How to read this report

This report is divided into three sections:

Part A

Part A: Background provides an explanation of the research findings, an overview of robust SDA and how to consider the design principles and elements.

Part B

Part B: Good-practice design principles explains the good-practice design principles developed through the research.

Part C

Part C: Design elements and features to support good-practice design details specific design elements and features to support good-practice design and resident outcomes. It includes case studies of good practice.

Quotes from research participants feature throughout the report. These support the main results or findings discussed.

The **following terms** appear throughout this report:

- **Stakeholders** refers to people involved in the research – (SIL) providers, SDA providers, government representatives and other industry experts. Industry experts include peak bodies, advocacy bodies and academics.
- **Residents** refers to people with disability who need robust SDA. They may or may not live in SDA.
- **Family members** refers to family members and carers of people with disability who need robust SDA.
- **Participant** refers to research participants (the above three groups).
- **Behaviours of concern** refers to behaviours that place the person or others at risk of harm.[6]

Quality assurance

Researchers carried out the project in line with the international quality standard ISO 20252 and the Australian Privacy Principles contained in the *Privacy Act 1988*. ORIMA Research also adheres to the *Privacy (Market and Social Research) Code 2014*.

6 NDIS Quality and Safeguards Commission 2019, *Positive behaviour support capability framework*, Canberra.

Part A:

Background

Resident needs

This section gives background to help understand the needs of residents in robust SDA. It outlines the link between the built environment and resident outcomes. It then discusses the range of resident disability types, behaviours and environmental triggers that need to be considered in robust SDA.

Link between the built environment and resident outcomes

The research found a natural and important link between the built environment (building location, features and design) and resident outcomes. Outcomes include health, wellbeing, emotional control, behaviours of concern and forensic behaviours. Academic literature on the topic highlights the link between building design and residents' physical, mental and psychosocial wellbeing (Mobley, Leigh & Malinin 2017; Wright, Zeeman & Whitty 2016; Zeeman, Wright & Hellyer 2016). Golembiewski (2015) noted that even minor changes or improvements to building design can create strong and long-lasting improvements in residents' behaviours.

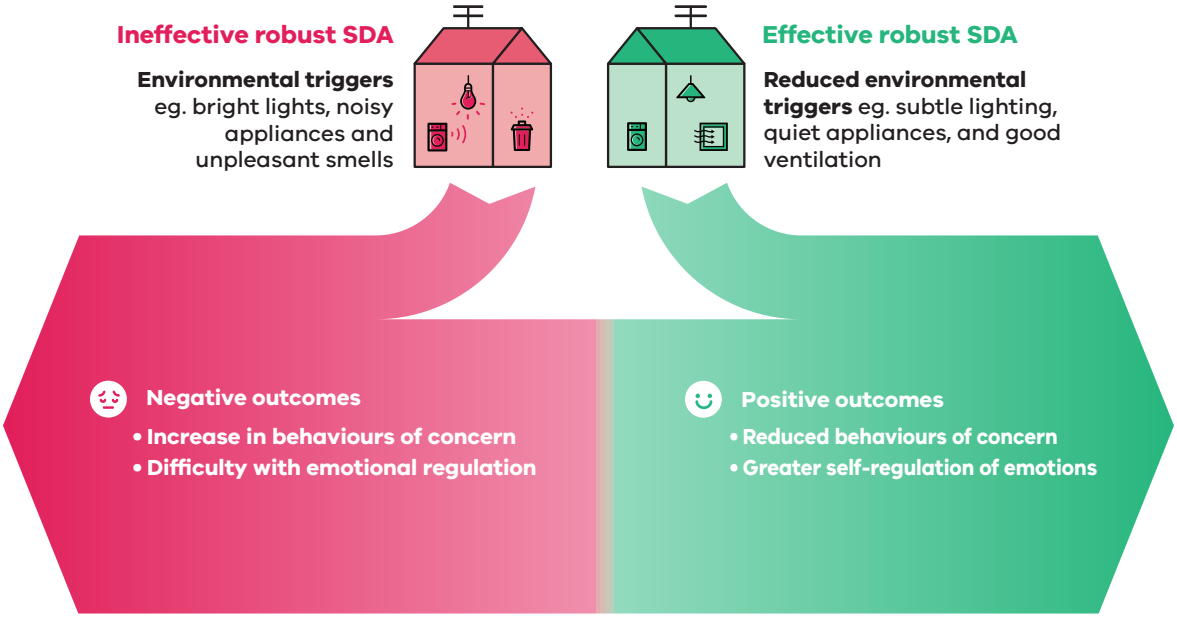
> *'The impact of the design is massive … it can have a really positive effect on people and their behaviours, but if it's inadequately designed it can have the reverse effect where people's behaviours remain or get worse.' – Stakeholder*

Stakeholders felt that robust SDA could improve resident outcomes by offering the unique environmental features needed for specific sensory needs and reduce environmental triggers. The literature found that good-practice design can reduce behaviours of concern. This reduces agitation, aggressive behaviours and the rate of self-injury (Bridge & Vasilakopoulou 2019; Sax Institute 2020).

> *'Good design reduces the incidence of poor behaviour, behaviours of concern like self-harm, damage to property, injuring other people … as a result that improves the life of residents, their co-residents and the people that work with them.' – Stakeholder*

Figure 1 shows the link between building design and resident outcomes.

Figure 1: Effects of robust SDA on resident outcomes



Stakeholders also said that effective robust SDA design could improve safety for SIL staff and other residents. It could deliver SIL support in line with residents' support preferences. For example, it could offer:

- more ways for residents to increase their independence
- less obtrusive observation of residents by SIL staff
- reduced staff-to-resident ratios.

Range of people needing robust SDA

Stakeholders told us that robust SDA gave homes to a **diverse group of people**. These people have a broad range of sensory and environmental needs, disabilities and behaviours of concern (more so than other SDA categories). These included the following:

- **Sensory needs.** Stakeholders said that residents had specific sensory needs to cater for in building design to reduce triggers (discussed in the next section).

> *'The people who are likely to be eligible for robust [housing] are also likely to have a sensory processing disorder … they might be over-sensitive or under-sensitive to particular sensory inputs.' – Stakeholder*

- **Disabilities.** These included intellectual disability, autism, acquired brain injury, pica and Prader-Willi syndrome.
  - Some residents had co-occurring disabilities or impairments and co-morbidities (e.g. epilepsy, mental health disorders). These must be considered when designing homes.

> *'You see a real mix of disabilities in this cohort … the people who are eligible for robust [SDA] often have a range of different diagnoses that are multiple and overlapping.' – Stakeholder*

- **Behaviours of concern.** These included:
  - self-harming behaviours (e.g. banging one's head against a wall)
  - aggressive or violent behaviours that may harm others (e.g. physical aggression or throwing furniture)

- destructive behaviours that may cause property damage (e.g. throwing large pieces of furniture or breaking fixtures and fittings)
- obsessive behaviours (e.g. 'picking' at loose carpet or floorboards)
- improper sexualised behaviours
- leaving the home without support (where residents need support to access the community)
- constant hunger because of Prader-Willi syndrome.

> *'To get into the robust category you generally have some pretty extreme behaviours of concern … the vast majority of those in robust will have these challenging behaviours.' – Stakeholder*

The research found that residents had unique housing needs. These needs require tailored building design and fit-out solutions.

Environmental features that can trigger behaviours of concern

The research found a range of environmental features that could:

- trigger or increase behaviours of concern for residents
- lower quality of life and reduce resident outcomes.

These were specific to each resident. But stakeholders and the literature (Ahrentzen & Steele 2009; Bridge & Vasilakopoulou 2019; Tuckett, Marchant & Jones 2004) mentioned the following common environmental triggers:

- **Sensory triggers.** These are sensory features of the space that cause residents' discomfort:
  - **noise** – loud sounds, noises made by non-verbal residents, high-frequency noises or noises given off by appliances such as refrigerators, lights and exhaust fans
  - **light** – glare, rooms that are too bright or too dim and flickering lights (e.g. dim lighting can have a negative effect on the mood of patients with dementia; glare and bright reflections can trigger visions; Bridge & Vasilakopoulou 2019)
  - **strong smells** – food smells, cleaning products or perfume/deodorant worn by staff.

'When [my son] is escalated, the smell of food makes him sick and drives him nuts.' – Family/carer of resident

- **Temperatures and humidity levels** that do not suit residents' personal preferences. The literature also suggests that poor airflow and lack of fresh air can agitate residents (Bridge & Vasilakopoulou 2019).
- **Certain colours** and textures trigger behaviours of concern for some residents.
- **Under-stimulation.** While too much in the environment (e.g. bright lights, loud noises) can trigger residents, stakeholders warned that under-stimulating spaces (those with limited sensory stimulation – e.g. without colour, artwork on walls or tactile stimulation) could also trigger residents' behaviours of concern.

'When you look at the cause of challenging behaviours, it often comes from a sensory need … for some people it's touch, and you can't use certain textures in the home. For other people it's light or sound.' – Stakeholder

- **Trauma-related triggers** include fixtures, fittings or other design aspects that remind residents of negative or traumatic experiences. Stakeholders said that some design elements could remind residents of places they experienced trauma. This could cause distress, triggering behaviours of concern. Stakeholders said this can be specific to a person and setting. But they also said that 'institutional' designs or parts of the home used to seclude residents were common triggers.

'The abuse that [my son] has experienced in care was tremendous. Psychological, physical, sexual abuse … when there are things in his home now that remind him of the place where that happened, it's a trigger for him.' – Family/carer of resident

- **Features triggering obsessive behaviours.** Stakeholders said that certain features in the home could become items of fixation for some residents. This could lead to damage or pose risks to residents' health and safety. These included:
  - easy access to electrical wire or circuit boards and exposed screws, which some residents would play with or unscrew
  - 'pickable' fixtures and products (e.g. floor coverings, plaster board and light switches). Stakeholders said that some residents would pick at these fixtures until they came loose. For example, they would pick until the carpet unravelled or large sections of paint/plaster came away from the wall.

'There's people with obsessive behaviours. They might obsessively eat, or pick at paint, or unscrew screws … if there's something like light switches, they can flick or things they can get their fingers around to pick, they'll go for it.' – Stakeholder

- Triggers related to **other residents** include:
  - **behaviour that triggers unwanted responses** – stakeholders said that behaviours of concern (e.g. screaming) could be a trigger for others in the home
  - **SDA layout that offers little personal space** – a lack of personal space or a sense of crowding by other residents can be triggering for some.

'The triggers often come from the other people that someone is forced to share a space with. If you don't have a place where you can get away from other people and the triggers to self-soothe, the behaviour will keep escalating.' – Stakeholder

Perceptions, experiences and challenges in delivering robust SDA

This section discusses perceptions and experiences of existing robust SDA building design. It also covers challenges that stakeholders mentioned.

Two case studies show residents' experiences of robust SDA. This helps to frame the findings from this section. They show how home design and environment can affect an individual.

Thoughts about the robust SDA design category

Stakeholders felt there were big issues with existing robust SDA building design and features. They said that most robust SDA does not deliver the best possible outcomes for residents. (Refer to the next section for specific issues.) In the literature, Zeeman et al. (2016) argue that good-practice person-centred housing for people with complex needs (such as robust SDA) is a big area of unmet need in Australia.

> *'Most things are currently not well catered for in the robust category. Not enough is being built, and most of what's been built in the past is totally inadequate and more like a jail cell in the community.' – Stakeholder*

As discussed in the previous section, 'Resident needs', robust SDA caters to people with a diverse range of disabilities, sensory needs and behaviours. Most stakeholders said that the diversity of resident needs made it more difficult to pinpoint and apply standard design guidelines to build robust SDA in comparison with other SDA design categories. As such, some stakeholders felt that a range of subcategories for robust SDA (with different design standards) would be better. This would better reflect the diversity of residents' housing needs.

> *'In the other design categories there are commonalities in people's needs, but the robust group is very diverse. It's very hard to talk about commonality with this group … it's inevitable that you'll end up with designs that don't suit each individual.' – Stakeholder*

In relation to the design standards that were available for robust SDA, many stakeholders said that the NDIS category design standards:

- focus too much on building 'unbreakable' homes (to minimise property damage) and staff safety

- do not consider how to maximise outcomes for residents in life satisfaction and behaviour.

> *'Robust has the connotation of being hard, almost prison-like … the category is about making buildings that will withstand behaviours, rather than buildings that will minimise the triggering of the behaviours.' – Stakeholder*

Also, many stakeholders saw a general lack of knowledge and expertise among SDA developers in what was needed to deliver good-practice robust SDA design beyond the NDIS guidelines.

Zeeman et al. (2016) and Bridge and Vasilakopoulou (2019) also found a lack of local research to give an evidence base for developing good-practice robust SDA. The literature highlights knowledge gaps in the housing needs of:

- people who injure themselves on purpose
- subgroups such as First Nations people, people from culturally diverse backgrounds and the LGBTIQ community (Bridge & Vasilakopoulou 2019; Sax Institute 2020).

> *'[Current robust housing] is inadequate because nobody understands the architecture or how it can support people's neurological needs.' – Stakeholder*

The research found strong support among stakeholders and in the literature (Zeeman et al. 2016) for guidelines for building robust SDA to sit beside the NDIS standards.

Issues with existing robust SDA

Stakeholders found a range of problems with existing robust SDA homes that should be used to improve builds. The following points summarise the problems.

- **Not thinking enough about individual needs.** Stakeholders felt that existing robust SDA does not cater well enough to individual triggers and needs. These stakeholders felt that a more person-centred approach was needed to maximise positive behavioural outcomes for residents. Academic literature also noted limited prospects for a person-centred approach to robust SDA homes. This hinders residents' choice in their living arrangements (Zeeman et al. 2016).

> *'A real problem with the current approach to robust is the assumption that people in this category, or who have the same clinical profile, are going to have the same needs, and that just isn't the case.' – Stakeholder*

- **The number of residents per home is too high.** This meant that some residents were triggered or disrupted by others

they lived with or did not have enough personal space. Also, stakeholders suggested that the usual 'group home' model does not give the option for single-person homes. This type of SDA robust build is often needed to meet an NDIS participant's assessed needs and choices.

> *'When you have all these people living together with challenging and aggressive behaviours, you will have problems. The approach with robust is often to buy a small block of land and fit as many people as they can on it. That approach just never works.' – Stakeholder*

  - A few stakeholders warned that too many single-person homes could 'force' some residents who benefit from interaction with others to become isolated.

- **Property sizes are not large enough.** In some cases, stakeholders felt that homes were too small to offer all the rooms residents need (e.g. ensuites, many living areas) plus a spacious outdoor area.

> *'The blocks are small and particular people with neurological and sensory needs, need a larger space. The funding's inadequate to fund the floor area that these people need.' – Stakeholder*

  - A few stakeholders also said there were no standards about minimum room sizes for shared spaces and breakout rooms. They felt this was an issue because it is important for residents to have enough private space.

- **Safety not maximised.** Some stakeholders felt that the design and layout of some robust homes did not maximise the safety of residents, staff, and visitors. For example, they do not have multiple points to exit in case of a fire.
- Some homes do not have a **homely, welcoming space**. They often use 'institutional'-looking materials or have features that limit access (e.g. high security fences or locked kitchens). This increases behaviours of concern for some residents who have had negative or traumatic experiences in un-homely settings. Like everyone, stakeholders felt that all residents have the right to a house that feels like a 'home' and where they feel comfortable.

> *'At one stage my son was living in what felt like a prison. There was automatic locking doors and bars on the window; he was confined to one area of the house and couldn't move around freely. It was like 'One Flew Over the Cuckoo's Nest".' – Stakeholder*

- **Limited choice of who to live with.** Stakeholders felt that residents are not given enough choice about other members of their household. This leads to having residents whose behaviours, needs and housing choices are not similar (e.g. residents whose behaviours of concern are likely to trigger each other). Also, some stakeholders said the current system assumes that residents who qualify for robust SDA would choose to live with other robust SDA residents. These stakeholders said there is a need to allow more residents to live with family members, friends, or housemates, or to live alone in a single-person home.

> *'Most people with disabilities don't have a choice in who they live with, and that is absolutely crucial … every person needs to have choice and control over their lives, and someone who's forced to live in a group home with people they don't know doesn't have that.' – Family/carer of resident*

- Some homes are **not fully accessible**. This means people needing robust SDA with a physical disability cannot live there.
- **Building materials** are **not durable enough** and are often damaged. This causes high upkeep costs and risks in the home that could threaten residents' health and safety. Also, some features (e.g. televisions) are not protected well enough so are damaged.

> *'From what we've seen of existing robust SDA, the homes are being destroyed. They're not meeting that robust requirement. It's not purpose built, it's refurbished existing stock and they end up looking like derelict hostels.' – Stakeholder*

Despite these issues and challenges, stakeholders felt that the robust SDA category gives good support to residents. They mentioned several examples of good practice in the design and delivery of robust SDA. Part C includes some examples as case studies.

Bigger challenges in delivering effective robust SDA

Developing good-practice design principles for robust SDA is important to improve the category. Yet, many stakeholders said there are bigger challenges to delivering effective, good-practice robust SDA. These were often about funding. One stakeholder noted that the current funding for SDA is fixed until the next full price review in 2023. So, there is limited scope for any changes to address these financial challenges until the end of this period.

Through SDA market analysis, the Summer Foundation found trends in the type of SDA design categories being built. They noted that only 6.6 per cent of planned SDA homes cater to the 'robust' category. In contrast, 66.5 per cent of homes cater to the 'high physical support' category.[7] In addition, some stakeholders said that investors/developers saw residents needing robust SDA as a 'business risk'. So, there are few willing to build robust SDA.

Stakeholders also mentioned specific **funding challenges**:

- Factors that lead to added costs for building person-centred SDA homes include the following:
  - Single-person housing options. Some stakeholders felt that the cost of the property and the SIL support needed would be higher for this housing type.

7 Summer Foundation 2021, *Specialist Disability Accommodation: supply in Australia*, 3rd edn, The Housing Hub, Blackburn.

> *'We end up having multiple people living together because that allows people to share support staff, which is the biggest cost. Support for one person in a house alone is hard to pay for.' – Stakeholder*

  - Well-located and larger-sized homes. Some stakeholders said that the budget available for robust SDA was not enough to fund suitable land in good locations. These might be in inner suburbs, with enough space for suitable outdoor features and space and access to community facilities.
  - Unique features and design needs to deliver the most effective robust SDA for a person's needs.
    - For example, one stakeholder said they received requests to include pools in robust SDA. This is because water therapy can be beneficial for many residents in this category. The stakeholder found it too expensive to include via the NDIS SDA payment available.
  - The need to use more expensive non-standard building materials to minimise upkeep costs resulting from resident damage.
  - Assistive technology and home automation. This could include lights that turn on and off softly at the beginning and end of the day to help control residents' sleep–wake cycles.
- Balancing the need for unique features (and their high cost) with the ability to ensure a property can be reused for future residents with different needs or resold.

> *'You can have residents in a home who move on or pass away, and you have to find new people to take their spot. So the home and its features do need to be adaptable and flexible to allow for that.' – Stakeholder*

Stakeholders noted challenges associated with supporting **residents' choice and control** and **best outcomes** in **shared living arrangements** including:

- giving enough choice for residents in who they live with – including the ability to live with other NDIS participants or friends/family
- achieving suitable matching of specific needs (e.g. catering to a mix of unique sensory profiles) in the same property.

Opportunities in delivering robust SDA

A few stakeholders suggested supporting models that allow for multiple single-person homes on the same property with communal spaces to support social interaction.

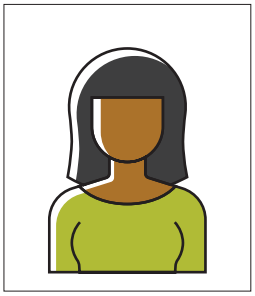
> *'A model that we are working towards is having a cluster of single-person homes on one block … the residents can have independent homes with independent space but with room to meet with and socialise with others if they choose.' – Stakeholder*

Many stakeholders also felt that having better designed robust SDA could achieve positive behavioural outcomes for residents. This, in turn, has the potential for positive cost benefits. Stakeholders felt that good-practice robust SDA could result in lower SIL costs in NDIS plans if behaviours of concern were reduced. Property damage and the cost of repairs would also reduce.

> *'The cost over the years of constant repairs, and of needing more and more staff to deal with escalating behaviours in the home, far surpasses the initial costs of putting more time and effort into the design of a better home at the beginning.' – Stakeholder*

Case study 1: Tara – wants to live on her own

Case Study



Name (made up): Tara

Disability type: Intellectual

Current living situation: Robust SDA not working well due to conflict with other residents in the home

Rating: ★★☆☆☆

Ideal living situation: A modern, single-person home with space to have friends and family visit

Tara lives in a robust SDA home with one other resident, Christine. Tara and Christine do not get on well. Also, their **behaviours of concern can be triggering for each other**. To reduce their contact, Tara's **home was divided in two**. She has a private bedroom, bathroom and living area. But the kitchen and backyard (one of the places Tara goes to calm down and self-soothe) are shared. Therefore, she still has to see Christine regularly, which upsets her.

Tara would like to live in her own single-person home. She does not want to live with someone else who has a disability. Although Tara likes to spend time alone, she **also likes having her friends over**. She would like an **open plan living area where she can entertain the people she loves**.

> *'I'd like to live with people without a disability because I like to have my space and I don't like having my behaviours around … but I didn't have a choice.'*

Aspects of home working well

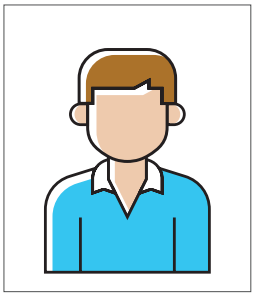
- Ability to decorate the home and choose the furniture so the space feels more homelike and her own
- Open plan living/dining space to entertain family and friends
- Outdoor swing-chair that Tara finds calming and can use for self-soothing
- Own bathroom to give privacy and personal space
- Subdivided home to offer private living areas, but Tara would prefer to live by herself or without others with a disability
- Mini-fridge in the living room with access to cold drinks and snacks.

Aspects of home not working well

- Only having internet access in the staff office. This means Tara cannot easily stream music to self-soothe
- The location, which is several hours from the beach (the beach is calming for Tara, and staff drive for hours each day to take her there)
- Furniture cannot withstand Tara's behaviours of concern. Tara does not have a dining table because it was damaged when her behaviours of concern were triggered
- No visibility and access to the kitchen. This means Tara cannot access food and drink when she wants and limits her ability to learn how to cook
- Not having a home with a modern, 'clean' look (e.g. white walls and modern fixtures and furnishings), which Tara prefers

Case study 2: Steve – balanced living

Case Study



Name (made up): Steve

Disability type: Prader-Willi syndrome

Current living situation: Robust SDA working effectively

Rating: ★★★★★

Ideal living situation: Similar to current home

Steve lives in a robust SDA home with **four other housemates**. They all get on well. Steve likes to chat to his housemates or watch movies with them. It is important to him to live with people he knows and likes. But **he also likes to have alone time to help him self-regulate his emotions**. Steve's house has two living rooms, one for watching movies and one for 'quiet time'. This gives him another place to go when he needs peace and quiet. Most of the time, this gives Steve a good balance between spending time alone and with others. **Sometimes Steve has to wait for a space in the quieter loungeroom or backyard when a few different residents want alone time at once**. Because of this, he spends more time in his bedroom than he would like.

> *'We have two loungerooms … one is for relaxation and one is for playing on the computer and Netflix.'*

Aspects of home working well

- Multiple living areas zoned for social activities or quiet, alone time
- A large bedroom for his hobbies, including space for a TV, computer to play video games, shelves to store his belongings and a large bed
- A large outdoor area to allow more than one resident to spend time outside at once
- A group of residents who are well matched and enjoy spending social time with each other

Aspects of home not working well

- Not having enough space for all residents to have alone time at once without spending large amounts of time in their bedroom. Steve would like a personal space outside his room where he can go for quiet time whenever he needs
- Not having internet access in his bedroom
- Not having enough space to entertain visitors away from other residents. This means most of Steve's visitors take him out rather than visiting him at home

Part B:

Good practice design principles

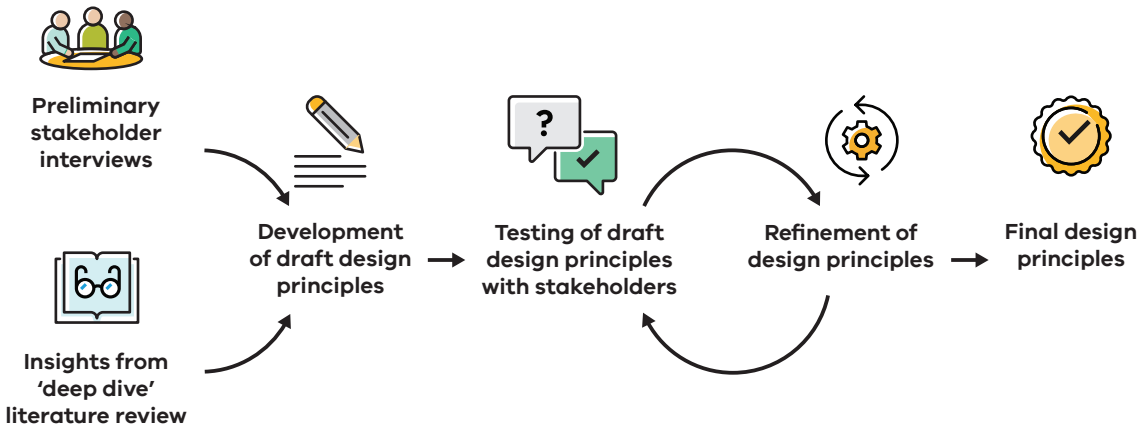
Principles to support good-practice robust SDA

This section presents the seven design principles to support good-practice robust SDA found in the research. We give an overview of how we developed the principles and the intended outcomes and effects of each.

Developing the design principles

We developed the design principles with stakeholders and family members over the course of the research. Insights from the 'deep dive' literature review informed this process (Figure 2). The research found that literature and resident interviews supported the suggested design principles.

Figure 2: Development of design principles



Overview of design principles and their intention

The research identified seven overarching principles to guide good practice robust SDA design, with the overarching aim of **maximising the quality of life for residents living in robust SDA**.

As outlined in Figure 3, the seven principles identified in the research were to:

- Facilitate a **person-centred co-design approach**;
- Create a **homelike environment** that is not institutional in design;
- Maximise **independence** and **freedom,** and minimise / mitigate restrictive practices;
- Maximise **safety and comfort** of residents, staff, visitors and neighbours;
- Support resident **choice and options for interaction** with others when desired, as well as privacy and personal space;
- Facilitate (but not replace) **effective supports;** and
- Maximise the **adaptability and flexibility** of the **building design**.

Figure 3: Good-practice design principles for robust SDA

Stakeholders felt that well-designed robust SDA based on the above principles would have a positive impact on resident outcomes and housing sustainability. This was based on their experience in the disability sector and knowledge of relevant research studies. Specifically, this could be achieved in the following ways:

- **Increase residents' independence** and **participation in daily activities.** They would be living in an environment specifically tailored to support their everyday activities.
- **Reduce environmental triggers.** Tailor the space to meet residents' specific sensory needs and choices.
- **Reduce behaviours of concern.** Environments were less likely to trigger residents. Stakeholders suggested that good-practice robust SDA may reduce:
  - property damage
  - the risk to residents, staff and others
  - the need for restrictive practices.
- **Improve the quality and adaptability of homes.** Stakeholders felt this would increase the resale value of properties and allow them to be adapted to residents' changing needs. They could also be remodelled for future residents.

These principles guide development of good-practice robust SDA housing solutions for individuals. Discussed below are the rationale and key considerations for each principle. Part C of this report gives more specific findings about design features to support these principles.

Enable a person-centred co-design approach

Stakeholders and the literature both said it was important to **involve residents in decisions about the design of their home** (Mobley et al. 2017; Zeeman et al. 2016). This would ensure the design is best tailored to their needs and choices. This would mean taking a person-centred co-design approach and including:

- expertise given by family members, carers or support staff
- information from residents' behaviour support plans in relation to their environmental and sensory needs.

As well as asking those who know the resident, the literature calls for a multidisciplinary co-design approach to robust SDA. This would involve the expertise of:

- architects
- interior designers
- access consultants
- environmental psychologists
- constriction engineers
- staff from non-government organisations as needed (Wright et al. 2016; Zeeman et al. 2016).

> *'The person and their supports and their families should be involved in the design from the start … involved in identifying triggers and identifying what their enjoyable places are, working with the architects to form the design and materials brief. You've got to start with that kind of co-design.' – Stakeholder*

The research found that a person-centred co-design approach was important to achieve the following:

- **Allow residents to self-regulate and reduce behaviours of concern.** Stakeholders and the literature both said that homes tailored to each resident would help to minimise triggers and maximise positive resident outcomes (Ahrentzen & Steele 2009).

> *'Part of it is about meeting people's needs so that they don't behave in unsafe ways. They need to be able to do what they need to do in their home to calm themselves down so that they don't get into a full steam in the first place.' – Stakeholder*

- **Give residents choice.** Stakeholders said it was important to give residents the chance to state their needs and preferences and have meaningful input into the design of their home. Stakeholder and family participants said this approach would give residents a sense of 'ownership' of their space. This would encourage positive emotions and minimise behaviours of concern.

> *'We try to fully involve our daughter if we're changing something in the house so that she gets to design it … it's painted in the colours she wants and she has a garden with plants she's picked that she looks after.' – Family/carer of resident*

- **Ensure homes are tailored to people of different cultural backgrounds** (e.g. Aboriginal residents). A few stakeholders said this (refer to Part C for a case study showing how robust SDA can cater to residents' cultural needs).

A homelike space

The research found it is **important to recognise that robust SDA is a person's home**, rather than a care facility. Stakeholders said residents have a right to live in a place that looks and feels like a home. It is important for residents to feel their home is a meaningful and safe space. The literature also noted the importance of a homelike space (Bridge & Vasilakopoulou 2019; Scalzo in Sax Institute 2020; Wright et al. 2016; Zeeman et al. 2016).

> *'It's our daughter's home, and it's important to us that it's treated as such. We need it to look and feel like a home to her, and that's what it should be built around.' – Family/carer of resident*

Stakeholders and family members said that this principle was important to achieve the following:

- **Discourage using 'institutional' fixtures and products** (e.g. fluorescent lighting, barred windows, 'hospital-style' linoleum flooring). These are not homelike and could trigger residents who had negative or traumatic experiences in institutions. Golembiewski (2015) said that homes without institutional features could reduce violence, rowdy behaviours and negative interactions with staff.
- **Reduce behaviours of concern and destructive behaviours.** Stakeholders said some residents are more motivated to respect and care for somewhere they see as a 'home'. They are therefore less likely to cause property damage. The academic literature also said that a homelike space was likely to reduce violent and aggressive behaviour (Bridge & Vasilakopoulou 2019; Golembiewski 2015).

> *'My son loves ripping things off the walls, but when we put up his own paintings, he never rips them down … we got him to choose his own furniture and he's never smashed or broken it because they're things that he chose himself.' – Family/carer of resident*

- **Support positive emotions.** Spaces that are meaningful for residents are more likely to support positive emotions and improve wellbeing.
- **Increase the flexibility of the property for future use.** Homelike robust SDA would produce more attractive homes. This would increase opportunities for new residents to move in (including 'non-robust' residents) and resale value.

The literature also said that homelike spaces increase residents' independence, participation in daily activities and sleep quality. The studies did not outline the reasons for these improvements (Bridge & Vasilakopoulou 2019; Mobley et al. 2017).

Maximise independence and freedom

Stakeholders said that effective robust SDA should maximise residents' independence. This would offer freedom and independence while reducing the need for restrictive practices. The research found it was important for the following reasons:

- **Give greater independence.** Stakeholders and the literature both noted that giving residents the ability to self-regulate and have choice and control over their space (e.g. lighting, temperature) and the activities they do within the home is helpful. It gives them greater independence and freedom and could reduce behaviours of concern (Bridge & Vasilakopoulou 2019).

> *'You want to create an environment that best supports them to be independent, that lets them move about their own home as they wish and do the things that they enjoy.' – Stakeholder*

- **Address environmental features that trigger of behaviours of concern.** Stakeholders and the literature both said that good-practice design that minimises known environmental triggers could offer more prospects for self-regulation. It could also reduce aggressive and violent or self-harming behaviours of concern, which reduces the need for restrictive practices (Bridge & Vasilakopoulou 2019; Mobley et al. 2017; Sax Institute 2020; Tuckett et al. 2004). The literature explained that by reducing environmental triggers, good-practice design can make the sensory space easier for residents to get around. This reduces overwhelming feelings and confusion that can present as behaviours of concern (Bridge & Vasilakopoulou 2019).

> *'Our goal is ultimately to reduce restrictive practices … behaviours of concern come from environments of concern, and if you have someone in the right environment you can see those behaviours and the need for restrictive practices reduce massively.' – Stakeholder*

- **Encourage less intrusive monitoring and restrictive practices.** These include indirect supervision and technologies that allow restrictive practices to only be used for residents who need them. Also, a high level of supervision is a trigger for some residents who do not want to feel they are under constant watch.

Maximise safety and comfort

A well-designed space can reduce the incidence of behaviours of concern. Yet, stakeholders said it was still **essential to have safety principles and precautions in place in case of emergencies and events that may trigger behaviours of concern**. Ahrentzen and Steele (2009) also said that some residents, particularly people with autism, may be less aware of dangers in the home. As such, the research found it was important to maximise the safety and comfort of residents, staff, visitors and neighbours.

Stakeholders and family members said this was important in achieving the following outcomes:

- **Ensure all parties feel safe and comfortable** in the home. This protects their health and wellbeing.
- **Encourage visitors to visit the home.** This would help residents' relationships with their family, friends and support networks (including both family members/carers and support staff).

> *'It used to be when I visited my son, I was always fixing things, patching things up, cleaning things up … he can escalate quickly so you had to be watchful. Now I can sit down in the lounge room with him and have a cup of coffee. We can enjoy the simple things with him now.' – Family/carer of resident*

- **Enable staff to give good-quality care.** Reducing the time and effort spent protecting themselves and residents from dangers in the home could help achieve this.

> *'If staff safety is a priority, then they can better support tenants and their needs … if you can't look after staff, then they can't look after residents.' – Stakeholder*

- **Reduce staff turnover.** Staff feel safer and more comfortable at work.
- **Give comfort and peace of mind to residents.** One family member said that for her child, knowing there were measures in place to protect staff from their behaviours of concern was comforting. Their child did not want anyone hurt.

Support choice and options for interaction

The research found it was important to support residents' choice and options in interaction **with others when wanted, as well as privacy and personal space**. The choice in where and how people interact also needs to allow residents to **avoid or exit situations where others may trigger their behaviours of concern**.

> *'Good design requires the capacity for both people being together some of the time and people being separate some of the time … so people have the ability to withdraw or the ability to engage with others.' – Stakeholder*

Enable effective support delivery

With the important role played by SIL staff and other therapeutic services in improving resident outcomes in mind, stakeholders said it was **important for robust SDA buildings to enable, but not replace, effective supports**. Stakeholders said this was important for the following reasons:

- **Enable the long-term provision and adaptation of supports.** Consider how design features could best allow support services to remain efficient and effective as residents' needs change over time.

> *'There needs to be a lot more done in terms of what can be incorporated into the home design to facilitate the support that's given... the right building can enhance the provision of effective support.' – Stakeholder*

- **Meet residents' needs in the most effective way.** Stakeholders felt it was important to actively assess whether residents' needs could be best addressed through design or support services in the design phase. This was to ensure design solutions were not replacing the need for more effective behavioural or other supports. To this end, it is critical that all residents have a suitable behaviour support plan.

Adaptable and flexible design

Stakeholders felt that good-practice robust SDA should maximise the flexibility of the building design **to support the changing needs and abilities of residents and broaden the appeal of properties for future use/sale**. This is important for the following reasons:

- **Support residents well throughout their life.** Stakeholders said that adaptable robust SDA would better support people throughout their lifetime. This would allow for 'ageing in place' if desired and cater to supports that scale up or down based on resident needs.

> *'We need to be able to adapt a home to people's needs ... people's lives change, their needs change and their home should change with them.' – Family/carer of resident*

- **Increase the economic viability of the home for investors/developers.** Flexible designs are easier to adapt to the needs of future residents only if we consider these costs at the start.

A few stakeholders also stressed ensuring residents have the option to move house at a later stage if they want, despite these long-term investments.

> *'You also don't want to be packing people into a house for life. They should have the option to move if they want to, just like any other adult.' – Stakeholder*

Part C:

Design elements and features to support good-practice design

Overview of design elements and features

This section of the report presents specific good-practice design elements and features found in the research. Aligned to the design principles, these elements support good-practice robust SDA.

Design elements and features

The suggested design elements and features were found through the stakeholder consultation, 'deep dive' literature review and research with residents of robust SDA and their family members. They have been categorised into five outcomes that the research found were key to improving quality of life for residents:[8]

- **maximise the safety** of residents, staff and neighbours
- **minimise environmental features that trigger behaviours of concern**
- **maximise** residents' **independence**
- **support** residents' **choice in interactions**
- other key outcomes such as **preventing property damage** and **minimising neighbourhood fatigue**.

Applying design elements and features

Consider the design elements outlined in the following sections with a specific resident in mind. This will result in a person-centred approach. Some, but not all of these elements might be adopted. This will depend on the resident's needs and preferences. Other inventive design elements would be adopted where appropriate, as this list is not complete.

> *'It needs to be person-centred. We have to look at the individual and give them choices and control about their life. We need to listen and we need to follow those choices.' – Family/carer of resident*

Note that some design elements or features are repeated across sections if they can help achieve several outcomes.

8 The following authors' works informed the list of design elements and features that follow: Ahrentzen & Steele 2009; Bridge & Vasilakopoulou 2019; Golembiewski 2015; Mobley et al. 2017; Sax Institute 2020; Tuckett et al. 2004; Wright et al. 2016; and Zeeman et al. 2016. A full reference list is at Appendix 1.

Safety

Maximising residents' safety

The following design elements and features would maximise the **safety of residents**, including reducing risk of **injury**:

- Reduce the risk of residents burning themselves by:
  - **installing induction stoves**, rather than gas stoves – these are not hot to touch even when in use
  - setting a maximum temperature for hot water taps (e.g. 42° C)
  - offering a **safe way for residents to light cigarettes** such as having an igniter like a car lighter in an outdoor area.
- Select **fixtures and furnishings with round edges** (e.g. for kitchen benches) to reduce the risk of injury if residents walk into these or fall.

> *'You shouldn't have sharp corners. They can hurt people if someone runs or falls, and they just get more damaged.' – Stakeholder*

- **Recess or hide fittings** such as light switches, electrical wires and appliances to prevent 'picking' or other obsessive behaviours that could lead to electrocution.
- Ensure residents **cannot reach ceiling fans**. Residents could injure themselves by touching fans while in use.
- Locate manholes or air-conditioning return vents away from resident areas to prevent entry to these spaces.
- Give **a good line of sight** throughout the house to make supervision easier.

> *'What's unique to robust is the need to have a line of sight. [Where residents need] 24/7 supervision, it can be very imposing on them so a smart design would allow a good line of sight that isn't overly intrusive.' – Stakeholder*

- Use **non-slip flooring materials** to stop residents falling over, particularly in bathrooms.
- Install **outdoor lighting** to give better visibility to residents when moving around outside at night.
- Use **accessible fire alarm systems** (e.g. alarms with visual guides that explain the risk or talking alarms that explain the reason for the alarm).
- Use **remote controls to raise and lower blinds** if cords are a danger to residents (cords can strangle).
- Use **soft edges** (e.g. rubberised) on **doors and doorways** to stop fingers from jamming.
- **Avoid hard flooring** (e.g. concrete slabs, carpet over concrete slabs without enough padding, tiles) for residents with epilepsy or who are prone to falls. Rubberised tiles might be better for these residents.

> *'Both of my sons have had hospital admissions for head injuries from falling on the hard floor. They need an underlay or softer flooring that they can fall on safely.' – Family/carer of resident*

- For appliances that could be a risk to residents (e.g. hot kitchen appliances), **use an automatic shut-off feature** so they switch off after a period without use.
- Equip sinks and toilets with **intake alarms that shut the water off** if a leak or overflow occurs.
- Consider and **avoid potential hanging points** (to prevent self-harm).

The following design elements **reduce risks to residents' health**:

- Plant **non-poisonous plants** in case residents try to eat them.
- Use **building materials that are hygienic** and easy to clean. This can be important if residents are likely to vomit or go to the toilet in living spaces.

> *'You do need things that can be easily cleaned, particularly if residents have issues with incontinence. Carpet generally doesn't work well in those situations; it's not hygienic.' – Stakeholder*

- Use **hypoallergenic materials** (e.g. marmoleum flooring) for residents with allergies.

The following design elements may reduce the risk of residents who need extra support leaving the home:

- Use **high fences** with a **design that is in line with the streetscape** and looks appealing. This will minimise residents' ability to climb fences while keeping the homelike nature of the home.
- **Avoid** having homes near **main or busy roads**. This will reduce the risk of traffic accidents if a resident is outside the home alone.
- Install **sensors on doors and windows** to let staff know when residents leave the home and need support.
- Use **windows that have a limited opening** (cannot open all the way).

Maximising staff safety

The following design elements **maximise the safety of staff**:

- Use **island benches in the kitchen** to allow staff to move freely and offer several exit routes from the room.
- Give **secure access to staffrooms** to ensure staff are safe in these areas. Stakeholders mentioned solid doors, extra-secure screen doors or 'barn doors' where staff can open the top half to interact with residents but not give access to the room.

> *'It's important for the workers to have a secure area that they can retreat to if they need' – Family/carer of resident*

- Use **modern keyless locking** systems to increase the ease and speed of locking/unlocking areas of the home. This will reduce the 'key and owner' feel of a property. Stakeholders mentioned access via PIN pads, fingerprints, swipe cards or other automated systems.

Maximising the safety of all

The research found design elements and features that would **maximise the safety of everyone in the home**, **visitors and neighbours**.

To **maximise the safety of neighbours**, stakeholders said it was important to consider how close **the property was to other vulnerable members of the community**. This might include nearby schools or childcare centres if residents have behaviours of concern that may be a risk to these groups. Also, if residents have behaviours of concern that involve lighting fires, stakeholders suggested avoiding bushfire-prone areas.

The following design elements **reduce the risk of injury to self or others**:

- Use **fixed or special furniture** (e.g. heavy furniture) that is not easy for residents to throw. Remove small, hard or breakable objects that residents could throw.

'You can have built-in furniture that's nicely designed, like bench seats built into the wall with cushions on them. It means that people can't throw or swing furniture around.' – Stakeholder

- Avoid the dangers of broken windows or other smashed glass by:
  - **having windows that finish above the floor** (e.g. 500–1,000 mm) or **highlight windows** above eye level so windows cannot be kicked or hit
  - using non-shatter or toughened glass.
- Include **gas and electricity override switches** to allow staff to turn these off in an emergency.
- Allow residents/staff to **see who is at the front door** (e.g. through a peep hole, side glass panel next to the door or intercom system) so residents are not surprised by visitors.
- **Avoid rock gardens or pebbles** in outdoor spaces (rock/stones can be thrown at others).
- Install **emergency call buttons** in each room and/or have a **staff alert system** to allow residents and staff to tell others about emergency situations.
- **Hang pictures/photos high on walls** so they cannot be thrown. High ceilings may be needed for this.

The following design elements **increase the safety of moving around the home**:

- Have **several points of entry/exit** to the home and staffrooms in case a dangerous situation occurs in the home. Some stakeholders said this was important where residents might light fires. Residents/staff may become trapped in a burning home without an exit.

'Every room in [my son's] house except for his ensuite has two doorways, so you have two ways to enter and exit each room. If he's at one entry and he's coming at you, you don't want to be trapped.' – Family/carer of resident

- Use **wide hallways** (minimum 1,100 mm) to allow two people to pass each other without getting in each other's personal space. This may be triggering for some residents.
- **Avoid trip hazards** (e.g. uneven flooring, carpet with a strong weave or pile) and set up level access to all areas of the home. Suggested flooring included bamboo, wood, tile, natural linoleum and marmoleum.

Environmental triggers

Sight and light

The research found that **some types of light and confronting sights** could be a trigger for residents. The following design elements reduce these triggers:

- Give **mostly natural light**. This is least likely to be triggering for residents and helps improve residents' sleep patterns. Stakeholders suggested that extra natural light could come from highlight windows or skylights.

> *'Good natural lighting is recommended. We use skylights to get that light into the house.' – Stakeholder*

- Use lighting that residents prefer such as:
  - lighting that fades on and off to avoid sudden bright light or darkness
  - dual-tone lights (white and off-white) if residents prefer these
  - lights that residents can control in different areas of the home
  - non-fluorescent lighting.
- **Minimise reflection and glare** throughout the home (e.g. by avoiding white shiny surfaces). This can be triggering for some residents.
- **Tailor colours** within the home to avoid triggering residents. While preferred colours varied, stakeholders suggested using **neutral or muted tones** as a starting point.

> *'It's an individual thing as to what the preferred colours are. Pale, natural colours tend to be a bit more relaxing than the harsher colours.' – Stakeholder*

- Include **artworks and wall coverings chosen or created by residents**. This will increase the sense of ownership with this decor. It should also reduce property damage and self-injuries (e.g. banging one's head against the wall).
- Offer **views to the outdoors from indoor areas** to give residents a sense of calm and connection to the outdoors.
- **Avoid building materials** that look **'institutional' or commercial** (e.g. 'hospital-style' linoleum flooring, fluorescent lights). These are less homelike and can be triggering to residents with past trauma or abuse in these settings.
- Design homes to **look appealing from the front and fences that blend into the street** (e.g. similar style homes, fences with trees planted in front of them). This increases the homelike nature of the home and increases community approval.
- Use **remotes, smart technology or less accessible switches** for residents who like to flick switches on and off. This can annoy others in the home.

Noise

Loud or unpleasant noises can be a trigger for residents. The following **good-practice materials, fixtures and fittings** reduce these triggers:

- **soundproof materials** such as laminated glass/windows, solid doors, reinforced walls, good insulation, acoustic batts and wooden materials

> *'Good soundproofing is important if you've got residents who make a lot of noise. You can use things like acoustic batts in the walls to minimise the sound.' – Stakeholder*

- **quiet appliances** such as LED lighting or other lights that do not make sounds, and quiet air conditioners and fans.

In designing the **layout of the home and choosing the property location** consider:

- **separating quiet and noisy 'zones'** to allow residents to choose how much noise they would like around them

> *'My son's house has zones, which I really like … if somebody is being loud in one part of the house, everyone else can stick to a quiet part of the house.' – Family/carer of resident*

- **reducing noise from neighbours or nearby roads** by:
  - planting hedges or using high fences to block out sound
  - having bedrooms away from noisy areas of neighbours' properties (e.g. driveways)
  - choosing properties that do not have many direct neighbours.

Temperature, humidity and odours

Temperatures or humidity levels that are too high or too low can be triggers for residents. Strong or unpleasant smells can also be triggers.

The following design elements reduce these triggers.

- Use **double-glazed windows** for good insulation and to reduce heat and cold extremes inside the home.
- **Place windows thoughtfully** throughout the house to **capture cross-breezes** (a natural way to cool the home). Use building materials and layouts **suited to the climate**.
- **Set up individual controls to adjust the temperature and humidity** in different zones of the house (e.g. bedrooms, lounge rooms). Stakeholders also suggested using technology better for automated temperature/humidity control tailored to people's likes.

- **Have good airflow** to allow strong or unpleasant smells to disappear quickly (e.g. windows to maximise natural airflow and good kitchen exhaust fans).
- Consider installing **heating, ventilation and air-conditioning (HVAC) systems** to better circulate fresh air to residents. Consider these for all rooms but mainly break rooms or individual spaces.

> *'We use HVAC systems in our homes, which circulates air and controls the climate all year round. It's under the floor, so nothing can get broken.' – Stakeholder*

- Avoid paints that send out **volatile organic compounds (VOC) emissions**. These can be triggering for some residents.

Space and crowding

Having limited space or feeling crowded can be a trigger for residents. The following design elements reduce these triggers.

- **Design homes for a smaller number of residents per property.** This will prevent overcrowding and offer more ways for residents to spend time alone. Stakeholders said the preferred maximum number of residents is three per property for robust builds. Robust SDA needs smaller numbers than other categories due to complex residents' needs.

> *'Someone in a standard group home will be sharing with three or four other people, which often isn't successful … we tend to see people flourishing more in a home with less people, where there's more room to breathe and less snowballing of behaviours.' – Stakeholder*

- Use the **layout and floorplan** and design of the home to **create a sense of space** including by having:
  - **high ceilings** to give a greater sense of space within each room
  - a property with a **land size large enough to build a spacious house** that has large bedrooms; several living or retreat areas; and a large outdoor space. Stakeholders said it was important for residents to have large bedrooms to offer space for them to do leisure activities alone (e.g. watching TV). Having several living spaces allows residents to choose when and how often they interact with others.

> *'In a robust home you really need to make sure that everyone has enough room to move around each other, and to get away from each other if they need to. That goes for both the residents and the workers.' – Stakeholder*

  - **individual bathrooms/ensuites** for privacy and personal space while using this space. This reduces stress from waiting to use the bathroom and reduces violence and aggression between residents as a result of sharing a confined space.
- Use **seating layouts** in common areas that **create personal space**, such as one- or two-seater chairs/couches where residents can sit by themselves. This is better than larger couches that may force them to sit too close to others.
- **Avoid cluttered homes with 'busy' interior decoration.** This may cause residents to become over-stimulated. Offer enough room to store household items out of sight to reduce clutter.

Comfort and sense of calm

The following design elements maximise residents' comfort and sense of calm.

- Optimise outdoor areas and activities by having:
  - **large outdoor spaces** to support outdoor activities and self-soothing. Stakeholders said outdoor areas are great for tending veggie patches, using sensory gardens, exercise equipment or art projects

> *'It's really nice for people to be able to be out in the garden, or to have a barbecue area and be able to eat and spend time outdoors.' – Stakeholder*

  - **greenery and water features** to create a calming space
  - **well-designed paths-of-travel between the car and home** with suitable sensory input and safety features. This transition can be stressful for residents and a peak time for behaviours of concern to occur
  - a property **located near walking tracks** to minimise the need for vehicle travel. Regular exercise is calming
  - **elements of the outdoors and nature into indoor areas** to give a sense of calm. Achieve this through indoor flowers and plants, views to outside from indoors, and artwork depicting nature.
- Use curved features within the home including:
  - curved **walls** to reduce sharp corners and dead ends where residents may get 'stuck' and not know how to get out
  - curved **outdoor pathways** without abrupt ends, which encourages calmer travel between spaces and helps with self-soothing.
- Have **'quiet' areas in the home** to allow residents to choose to spend time in calm spaces for self-regulation.
- Use **open-plan design and avoid locking areas of the home** so residents are aware of what is happening in each room. This helps develop a sense of control over their home.

Under stimulation

It is important to minimise features that trigger residents to become over-stimulated. Yet, the literature also said it was important for a state of 'sensoristasis' or sensory balance to prevent residents becoming under-stimulated (Bridge & Vasilakopoulou 2019). Bridge and Vasilakopoulou note that under-stimulation can cause residents to self-stimulate through self-injury or aggressive behaviour. To address this, stakeholders and the literature both suggest using **sensory or 'Snoezelen' rooms** to give residents positive sensory stimulation.

Maximise independence and minimise restrictive practices

Supporting orientation and getting around

The following design elements help residents to **access their local community and navigate their home** on their own.

- Choose a **property location that offers easy and safe access to community facilities and amenities** such as:
  - medical facilities
  - local shops
  - community centres
  - **public transport**.

This helps residents to connect with and travel in their local community without support.

> *'It's great if people can be somewhere where they can walk and do their own shopping, go to their own appointments if possible; those sorts of things where they can become more independent.' – Stakeholder*

- Install **sensor lights in outdoor areas** to improve sight at night. Stakeholders felt it was important for these lights to stay on for a long time after switching on. This way, residents can sit outside in the evenings.
- Ensure the home is **accessible for all residents** (e.g. even, smooth flooring or wheelchair accessible). This gives residents a sense of independence and autonomy.
- Use a **simple, predictable and easy-to-navigate floorplan** (e.g. avoid dead ends) to increase the ease of 'wayfinding' within the home.

- Use **different colours in different spaces** to increase residents' awareness of where they are in the home. This also helps with daily care routines, with a visual reminder of the purpose of each room.
- **Set up a good line of sight between spaces** (e.g. by using half-walls or walls with sections cut out). This allows residents to see who is in or what is happening in another room before entering. Residents can make informed decisions about where they want to go and not be surprised or triggered by others in the home.

> *'I saw a house that had little windows strategically built into the walls so that you could see if people are in the other spaces without having to expose yourself. I think that's really important for people with autism.' – Stakeholder*

- **Only use one type of floor covering** (only floorboards or only carpet) to allow ease of movement between rooms. Changes in surface could be unsettling for some residents.

Communication and interactions

The following design elements help residents and staff to communicate and interact better.

- **Support a range of communication technologies** within the home to suit a variety of resident needs. This might include internet access, tablets, telehealth facilities and satellite phones and radio communication in remote areas. Stakeholders said it was important to:
  - have **internet access throughout the house, including in each bedroom** to allow residents to use technology on their own and for self-soothing (e.g. streaming music online)
  - **allow communication** between residents and staff **in different rooms** (e.g. through internet-enabled devices or other technologies built into the home). This reduces the need for constant supervision.

> *'A lot of people in robust houses don't use verbal communication, so you've got to give them other ways of managing their environment, like being able to alert staff that they want them to come into the room.' – Stakeholder*

- **Place extra light switches** or other visual alerts on the **outside of bedrooms** so staff can let residents know they are entering. This is particularly useful for residents with a sensory impairment.

Daily activities

The following design elements help residents to **complete daily activities** on their own.

- Set up **kitchen facilities** in living spaces for ready access to basic food and drink preparation (e.g. coffee, tea, toast). This lets residents access this at will without needing to enter the main kitchen, which may be busy or not accessible.
- Give residents the **chance to take part in daily activities** through access to washing machines and clothes lines that are at the right height and are easy to access. Offer outdoor activities (e.g. a vegetable garden) and kitchen-bench set-ups that let them help prepare meals (e.g. large island benches).

> *'We'd love to have an area outside where he can hang out his own clothes … so he can be involved in running his own house just like anybody else.' – Family/carer of resident*

'An island kitchen bench is really important. A place where they can sit on one side with team members on the other side where they can help chop veggies and prepare the meal.' – Family/carer of resident

- **Modernise daily activity boards** with digital screens in hallways, bedrooms or common areas, or through tablets, to give residents more control. Use automated prompting systems to encourage residents to perform daily activities on their own.
- Have light switches in similar places and at similar heights in each room to help residents find them.
- Set up **covered outdoor areas** to allow residents to use outdoor spaces in poor weather.
- Offer a **smoking area** that residents can access on their own whenever they like.

Less restrictive practices

The following design elements reduce the use of restrictive and intrusive practices.

- **Minimise intrusive supervision** so residents feel less like they are always being 'watched' including through:
  - using **technology to allow more unsupervised time**. Door/window sensors can alert if residents leave and sensors in residents' beds can alert if they get up in the night. Sensor maps show how residents are using the spaces in the home

'Something like a sensor in a resident's room that alerts a staff member if they've gotten out of bed is much less intrusive than having a staff member sitting in the room with that person to watch them every night.' – Stakeholder

  - ensuring **clear lines of sight** throughout the house to allow staff to support residents in a less intrusive way
  - **separating residential areas** so staff can remove themselves from a resident's space when suitable
  - using a **pager system** or having an **emergency call microphone** connected to the staff office so staff are called only when needed. This allows the ratio of 'floating' staff supervising residents to remain low (where suitable).
- Use **technology to target restrictive practices** to only the residents who need them. For example, attach a finger or facial recognition device to the fridge so access is only restricted for some residents.

'Technology can have the potential to reduce restrictive practices, like a lock on the fridge that would open the door for one resident's face but not another, so that person can have a bit more independence.' – Stakeholder

- **Maximise independent kitchen access** through features such as lockable cupboards, a butler's pantry and/or two fridges (one locked and one giving free access). This way, only the necessary areas/items are secured. Change access based on residents' risk at a given time.

Support choice in interactions

Interacting with other residents

The following notes about **home size and type** help residents' **choices in their contacts with other residents**.

- Design **homes that cater to fewer residents**, with a **maximum of three residents** per property. This gives each resident more scope to choose when they do or do not want to be around others.

> *'I think ideally three people is the most you would want in one home. Any more than that and people are living on top of each other.' – Stakeholder*

- Design homes **that cater for non-robust/non-SDA housemates** (e.g. family members or friends) to give residents greater choice in who they live with.
- Offer options **for single-person homes** to give residents the option to live alone. Some stakeholders suggested building a small number of multiple single-person homes/villas on one property. The homes could include common outdoor and indoor areas to offer residents privacy and community, or by locating properties not far from each other.

> *'My son has been really flourishing living by himself, [but] there's a real lack of accommodation for people who need to live alone … it's something that really needs to be catered for because it's a massive unmet need.' – Family/carer of resident*

> *'Having homes close to other SDA houses makes the provision of the supports more efficient.' – Stakeholder*

We also found the following design elements for **home layout** in the research.

- Set up **several spacious living** areas to offer residents social interaction or to spend time alone as they like.
- Design **flexible living spaces** (e.g. using movable walls) to offer different levels of social interaction or privacy based on residents' needs.
- **Define the boundaries between shared and private spaces**. This shows residents where they can spend time with others and where they can spend time alone (or should leave others alone).
- Use seating in shared areas to:
  - **support personal space** such as by having several smaller chairs/lounges rather than one large, shared couch
  - **allow residents to partially engage with others** such as by having seating around the edge of the room. This allows residents to watch an activity happening in the room without fully taking part.

Interacting with family and the community

The following considerations about **property location** support residents' **choices in their interactions with the community**.

- Choose properties that offer **easy and safe access to community facilities, amenities and public transport**. This allows residents to more easily interact with the community when they choose.
- Give residents **options in property location** (e.g. choice between busy and quiet areas, metro and rural locations). They can then find a home that best suits their needs and likes.

> *'Living in urban or rural areas is a matter of personal preference … some people will want to live in a less urban area and some people want to live in the middle of the city. They should have the choice of where they end up.' – Stakeholder*

- Choose a property location that gives residents **access to existing support structures** so they can keep using these supports when they move. These might include family or familiar medical services.
- Set up a **spare bedroom** to allow visitors to stay overnight.

Consider the following design elements **inside the home**.

- Offer **space to entertain guests/visitors** (e.g. large living spaces, a dining table that can fit many guests around it).
  - In multi-person homes, offer spaces that allow **residents to host visitors away from other residents**. This way, residents can spend time with family and friends in a quiet, private space.

> *'There should be a separate space, maybe at the front of the house, where people can have their family visit that isn't in the shared living space where the other residents also have to be.' – Stakeholder*

- **Ensure design is accessible** to cater for residents, staff or visitors who have a physical disability.
- Allow residents to **see who is at the front door** (e.g. through a peep hole, side glass panel next to the door or intercom system). This will allow them to make an informed choice about who can enter their home.

Spending time alone

The following design elements support residents' **choice to spend time alone**.

- Design **large bedrooms** to allow residents to spend time alone and do leisure activities in this room (e.g. watching TV).
- Set up **private outdoor spaces** for each resident (e.g. patios).
- **Offer 'nooks'** in common areas or bedrooms to allow residents to spend time alone without completely isolating themselves from the activity of the home. Stakeholders said some residents may find comfort in having a small, semi-enclosed space to spend time in.

Other design elements and features

Preventing damage

The following good-practice **building materials reduce property damage**:

- materials that are **easy to clean and maintain** (e.g. epoxy paint) to prevent rapid wear and tear

> *'Using things like epoxy paint on the walls means that it can withstand a lot of scrubbing and cleaning, which you're going to need to do in a robust house.' – Stakeholder*

- **durable materials** that resist wear and tear such as:
  - magnesium oxide board for wall cladding
  - Dacron for soft furnishings
  - Silestone, Corian, granite or concrete for kitchens and bathrooms (avoid laminate or tiled countertops because these are easily damaged)
- **materials that absorb impact**, which reduces property damage as well as being less harmful if 'crashed into' by residents (e.g. walls insulated with hay bales)
- materials that are **difficult to remove if** 'picked' at by residents, and that minimise the gaps between different panels of the material (e.g. steel corrugated roofing instead of roof tiles, tongue-and-groove wood for interior walls).

> *'We've started using tongue-and-groove panels on the walls. Because they fit together so closely, the residents can't get their fingers in there to pull them off.' – Stakeholder*

The following good-practice **fittings, fixtures and furnishings prevent property damage**:

- **windows that finish a distance off the floor** (e.g. 500–1,100 mm) to prevent being kicked in, and **highlight windows above eye level** to prevent hitting or smashing
- **recessed fittings and fixtures** (e.g. lights, light switches, appliances and electrical wiring) to prevent tampering

> *'Light fittings all need to be recessed into the ceiling. Anything low-hanging doesn't last very long.' – Family/carer of resident*

- **durable window coverings** that are less prone to damage such as blinds with heavy duty brackets, good-quality curtains, external shutters and blinds, or blinds protected between two glass panels (external blinds and shutters should be homelike in appearance)
- **soft-close drawers**, which prevent damage and sudden loud noises caused when drawers slam shut
- **retractable fire sprinklers** so they are not visible or accessible to residents (also avoids the institutional look of the home)
- **underfloor heating and cooling** – this removes the need to have heating and cooling units on walls or ceilings where they are easily accessible and damaged by residents
- **fixed or customised furniture** (e.g. sectional furniture or heavy furniture) that is not easy for residents to throw and cause property damage
- **doors with several hinges** (up to five) to prevent residents removing them.

Minimising neighbour fatigue

Stakeholders recommended building links with neighbours and the local community during the design stage to build acceptance of the home and residents.

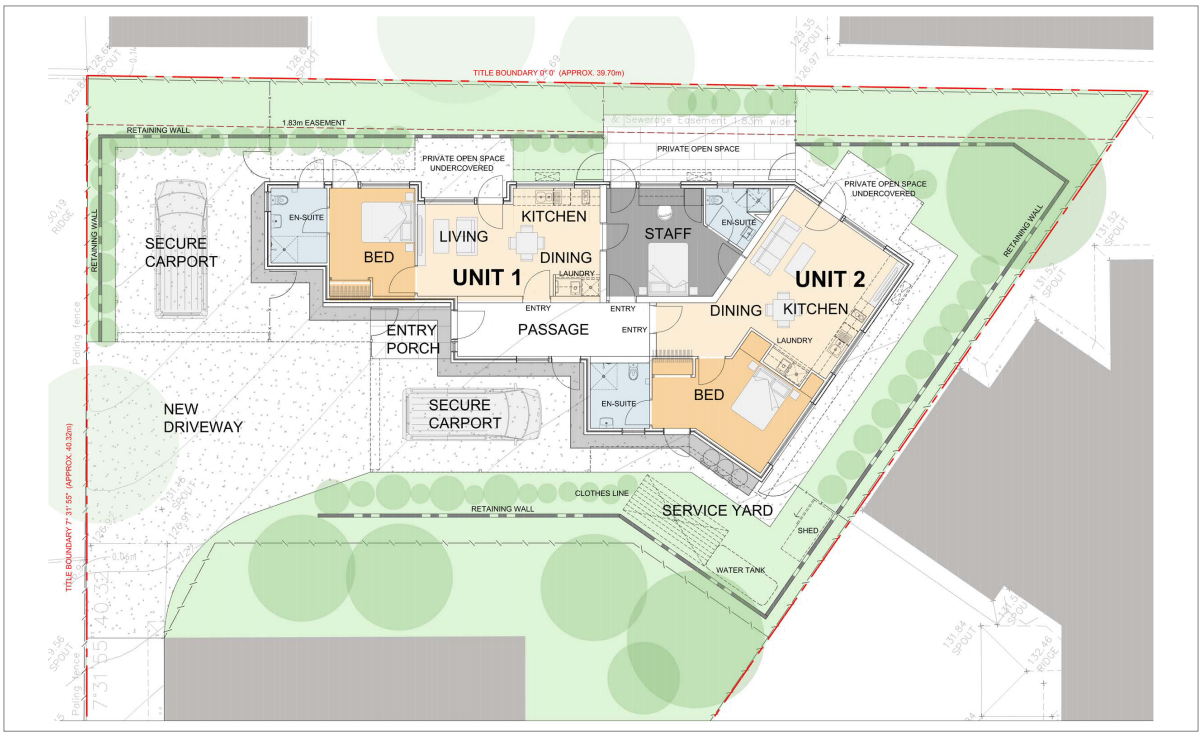
Neighbour fatigue is discomfort experienced by, and complaints from, neighbours. The following design elements **minimise neighbour fatigue** by reducing noise and other disturbances and increasing privacy.

- Choose **properties with fewer residential boundaries** and/or enough distance from neighbours.

> *'If you can have a property in a less built-up location or with more distance away from the neighbours, then you can avoid [neighbour fatigue] becoming a problem.' – Stakeholder*

- Use building materials that reduce noise such as:
  - laminated glass
  - solid doors
  - reinforced walls
  - insulation
  - acoustic batts
  - soundproofing screens at the perimeter of the property.
- **Plant hedges** to give privacy to both residents and neighbours.
- **Consider surrounding properties** in designing room layout (e.g. avoid placing noisy areas of the house near neighbours' bedrooms).

> *'We had a resident in one house who would scream all through the night, and his room was right up against the fence near the neighbours' windows. If you can take things like that into consideration when designing a house's layout you could prevent issues like that.' – Stakeholder*



Examples of good practice and innovation using the design principles and features

This section presents good-practice examples across a range of robust SDA design and development aspects that stakeholders shared in the research. We give examples to do with:

- building and design for an individual's needs
- creating flexibility
- using outdoor spaces for productive activities
- catering to cultural needs
- balancing needs for privacy and social interaction
- reducing restrictive practices and supporting independence through technology.

Building and design for an individual's needs

One SDA developer said that a holistic understanding of the individual needs of their future residents underpinned their approach to developing robust SDA. To enable this, they got direct input from residents, their key support networks (e.g. family members and carers) and their SIL provider. This included reviewing individual behaviour support plans and including design features that would complement the plan.

Designing robust SDA for an individual's needs from the beginning is best practice. Yet, one stakeholder gave an example of adjusting existing housing to minimise a resident's individual triggers and behaviours, and the importance of knowing these. This stakeholder worked with a resident who was in accessible public housing and met the needs for robust SDA.

This resident's main behaviour of concern was property damage due to banging her head against the wall. (This also put the resident at risk of injury, as well as damaging the property.) Robust design standards suggest that this resident needed stronger walls to prevent property damage. But this stakeholder understood the resident's behaviour and saw that reinforcing the walls would place her at risk of further brain damage. Instead, the stakeholder used other solutions to offer a safer space. This included reducing environmental triggers and working with the resident to choose some of her own artworks and wall coverings to display. Decorating the walls with imagery that the resident liked reduced behaviours that may damage the property (and injure the resident).

Creating flexibility

One SDA developer includes design features of several SDA categories (e.g. robust, fully accessible and improved liveability) as a standard practice in all their SDA developments. This achieves greater flexibility in the future use and repurposing of SDA developments. The developer incorporates robust materials in SDA builds, even when not needed under the particular category they are building for.

Using outdoor spaces for productive activities

One stakeholder explained the value of having spaces and facilities for exercise and creative activities of choice in robust SDA for young men with autism. The stakeholder saw this as an effective way to support self-regulation and the pursuit of productive activities and hobbies for residents. This is particularly important for residents with autism. Engaging in such activities in a community setting can often be stressful and uncomfortable for this group.

This stakeholder worked with a man with autism who enjoyed spray painting and woodwork. The stakeholder set up a shed into the resident's backyard to use for these activities. Another example included converting garages into spaces for gym equipment to offer ways for the body to understand its ability to sense its location, movements, and actions. This stakeholder said that these measures increased residents' ability to self-regulate and their quality of life.

'This type of at-home hobby is mostly overlooked; however, it is a very normalised way of enabling someone to engage in their own self-regulation and productive pursuits.'

Catering to cultural needs

One stakeholder shared the example of a robust SDA designed for First Nations residents. The design addressed cultural needs through a co-design process with the resident's community. This reduced the need for restrictive practices and the use of PRN medications (medications administered as needed) among residents.

The home design was a collaboration between an Aboriginal and a non-Aboriginal architect. Talks with Elders and the community about traditional housing structures to lessen behaviours of concern influenced the design.

Key features included:

- a housing design that **used traditional First Nations design** but was built with modern materials

- **acknowledgment and use of First Nations belief systems** into the housing structure and design – for example, curved walls to avoid sharp corners because sharp corners are where 'bad spirits' are found, to increase psychological safety
- **outdoor features** that **reminded residents of home country** used in the landscape of the garden (e.g. gum trees).

Balancing needs for privacy and social interaction

One SDA developer felt it could be useful to have 'cluster' style properties with around five single-person homes on a larger block of land. The block would have shared indoor and outdoor spaces for residents. Although this stakeholder had not yet built such a property, they felt this layout could give residents an ideal balance between having a private space and greater independence. It would also offer ways for connecting with other residents on the property when chosen.

They also felt that this would help to avoid residents triggering each other because a resident could easily choose to leave a social situation.

Using this model, less invasive staff supervision could also occur by giving a good line of sightbetween indoor and outdoor areas. This would allow residents to spend time alone in their home while staff watch the area as needed.

Reducing restrictive practices and supporting independence through technology

One stakeholder shared an example of an SDA build that uses leading-edge technology. In collaboration with telecommunications and technology corporations, using the technology reduced restrictive practices. Design-phase meetings with residents' family members and support workers led to permission to use these new technologies in the home.

Key features of the home included the following:

- **Facial recognition to unlock the fridge.** Restrictive locking practices did not have to be in place for residents where this was not needed. The health and safety of other residents who needed it was still protected.
- **RFID (radio frequency identification) tags in residents' clothing to help people to access the front gate.** This technology allowed one resident to safely unlock the door and check the mail without the risk of other residents leaving the property without support. For this resident, being able to check the post was important.

Not knowing when the mail arrived caused anxiety. Including this feature reduced anxiety, behaviours of concern and the need for PRN medications.

- **Light automation.** Lights came on at 6.00 am and slowly brightened over time to help residents wake up naturally at the beginning of the day. A similar feature that allowed blinds to lower on their own at the end of the day was also used.
- **Google system reminders** (e.g. through Google Home). These were set up to remind residents of certain daily care tasks, enabling greater independence. For example, a resident may receive a reminder to 'remember to brush your teeth' when they enter the bathroom.

Conclusions

Robust SDA **plays a vital role in offering suitable housing for a diverse group of people**. This group has a wide range of sensory and environmental needs, disabilities and behaviours of concern. The research found that good-practice robust SDA tailored to each resident's specific needs has potential to **improve quality of life and resident outcomes while reducing behaviours of concern**. This link between the suitability and quality of the built space and resident outcomes highlights the importance of effective robust SDA design. It also points to more effective design in other SDA categories more broadly.

Yet, the research found **several issues currently facing robust SDA** including:

- the nature and quality of current robust SDA offerings (not considered good or 'ideal' practice)
- funding limits
- challenges supporting resident choice and best outcomes in shared living arrangements.

Stakeholders and family members felt there was a **clear need for changes and improvements to robust SDA offerings** and the systems that support it. The research found a **lack of guidance in good-practice robust SDA**. This highlights the need for a **clear set of good-practice design principles**. These principles would guide development of more effective housing solutions and support improvements in available robust SDA.

We developed seven good-practice design principles through the research. The need for a person-centred co-design approach with residents, their families/carers and broader support networks would ensure each home is tailored to individual residents' needs.

These design principles also **apply across other SDA categories**. Using or adapting these more broadly could be considered in the future.

The research found a set of design elements and features to support these principles. Part C of the report outlines these.

Adopting the design principles found through this research will contribute to better quality outcomes for residents of robust SDA. But it is important to note that they only form part of the solution. Broader policy changes would need to address some existing barriers to creating effective homes for this group, such as funding constraints.

APPENDIX 1:

Reference list for 'deep dive' literature review

The following sources were consulted and reviewed as part of the deep dive literature review:

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APPENDIX 2:

List of participating organisations

The following is a list of organisations and people who took part in this research:

- Advanced Rehab Centre – Jo-Anne Bennett
- DHHS Disability Justice and Complex Clients Section – Mark Stevenson
- DHHS Disability Justice Coordination Team – Carolyn Husenovic
- DHHS Professional Practice Team – Daniel Rose and Hellen Tzanakis
- DPN Casa Capace – Ian Maynard
- Enabling Spaces – Shelly Dival
- Good Housing – Antony Annise, Samuel Graiche and Lily Nehme
- Greenlight Human Capital – Julie Yule
- Home@Scope
- Owen Jourdian, Managing Director Illowra Projects; Deputy Chair, SDA Alliance
- Live Better – Nommie Douglas
- National Disability Insurance Agency
- Northcott Disability Services
- Purposed Housing – Anna Fleming
- SDA Alliance – Melanie Southwell
- SDA Services – Greg Barry
- Summer Housing – Queenie Tran
- Supported Independent Living Co-operative – Steve Antony
- Synapse
- University of New South Wales – Professor Catherine Bridge
- Victorian Advocacy League for Individuals with Disability
- Zenitas – Samuel Crinall

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