The Environmental Modifications Tool:
A Guide to Housing Design for Adults with Intellectual and Developmental Disabilities who Exhibit Behaviours that Challenge

CONTEXT

The physical environment is a fundamental part of successful supported housing for people with intellectual and developmental disabilities (IDD) who exhibit behaviours that challenge (BTC). These behaviours include aggression and destruction of the environment that can be detrimental to quality of life in supported housing. Since BTC frequently result from an interaction between a person and their environment, the treatment of BTC should address underlying discomforts, whether it is related to health, the environment, or lived experience before relying on chemical or physical restraints. As behavioural patterns can be influenced by characteristics of the physical environment, this tool presents strategies to architecturally modify houses to better meet the unique and complex behavioural needs of this population.

END USERS

This tool is intended for both those caring for adults with IDD who exhibit BTC and those designing and caring for the buildings in which they live, this includes: frontline support workers, administrators, therapist, family members, facility managers, building maintenance staff, contractors and architects.

The design strategies recommended here are based on current research, including a literature review, case studies and key informant interviews. Staff and residents in supported housing often find discrete but useful solutions to modify their homes to minimize/mitigate/prevent BTC, without sharing successful modifications with their peers or communicating these needs to the construction industry. This tool aims to summarize existing solutions and promote further communication and development of effective modifications

STRUCTURE

The modifications to the physical environment are summarized first as a list of design strategies as responses to behavioural needs and then in a complete list as organized by rooms.

Design Considerations

Architectural Scale
It is important to consider building design at many scales to ensure the house as a whole has been appropriately modified.

Community Scale shows density of the area surrounding building (urban, suburban, rural) and the access to public resources (transit, emergency services, day programs).

Building Scale shows the overall layout of the building, the size and orientations of rooms and their function, entrances and circulation and the use of indoor and outdoor space.

Detail Scale shows materiality and method/quality of construction.

Behaviour-Environment Relationship
Physical modifications should be tailored to avoid or minimize environmental discomfort that can lead to BTC.

Self-Injury can modified for by removing dangerous materials and products and using building layouts that reduce frequency or impact of this behaviour.

Aggression towards Others can modified for by designing a house with adequate balance of private and communal spaces, and with the movements of both residents and support staff in mind.

Destruction of the Physical Environment can modified for by constructing houses that are durable, high quality, easy to maintain.

Level of Intervention
A given behavioral issues requiring physical modification can likely be met in a variety of ways, each with associated time, cost and skill required.

Quick Fix refers to modifications relatively little investment of time or money. These can likely be taken on by residents, support staff and family members, without construction training.

Renovation refers to construction in an existing building. These require a combination of building maintenance staff, contractors, architects, and residents, support staff and family members to collaborate.

Purpose-built refers to construction of a new building. These require a combination of building maintenance staff, contractors, architects, and residents, support staff and family members to collaborate.

Design Principles

Building Layout and **Spatial Organization** refers to the layout and spatial functioning of a house, this includes configurations of hallways and rooms, as well as how users enter and circulate throughout a residence.

The building location and layout reflects the daily needs and rhythms of the residents as their home and support staff as their workplace.

Density of the surrounding area and the access to public resources should be considered in selecting housing site

Single story houses or generous ground floor area to promote accessibility

Specify resident units with personal bedroom, living area and bathroom

Specify a variety of room size and configuration to meet different preferences and needs

Safety and **Durability** refers to a robust environment, including safe and controlled access to risky areas, environments designed for ease of maintenance and with a tolerance for unintended uses (Lowe et. al, 2014).

Durable materials and robust products are used in behaviour-prone or high wear areas.

Flimsy, fragile objects are avoided, removed or enclosed.

Potentially dangerous housing areas and elements are restricted

High quality products and construction methods are used to improve durability and lessen the impact of behaviours

Sensory Experience and **Stimulation** refers to adjusting qualities of the physical environment to better suit individual perception and avoiding barren, unstimulating environment (Mostafa, 2008; Lowe et al., 2014).

Provide access to a variety of sensory experience

Passive building techniques and high quality mechanical systems are used to ensure adequate light, ventilation and a pleasant climate.

Building materials and furnishings provide a variety of sensory experiences.

Digital media/Wifi/Internet are installed and controlled to meet the needs of residents and support staff.

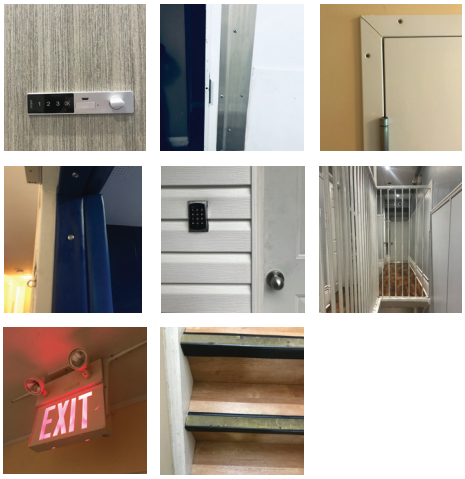
Homelikeness refers to the perception of built environment as similar to typical familial or individual homes and apartments compared to institutional congregate living (Thompson et al., 1996).

Individual preferences are reflected in physical surroundings of resident homes

Resident units with personal bedroom, living area and bathroom

Specify a variety of sizes/configuration of to meet different preferences and needs

Design Modifications



Entrances + Circulation

Use locking mechanisms (keys, code, magnetic locks) to appropriately meet resident and program needs

Use a single key or a single code for locking mechanisms

Locate staff areas close to / at entrances or areas requiring supervision

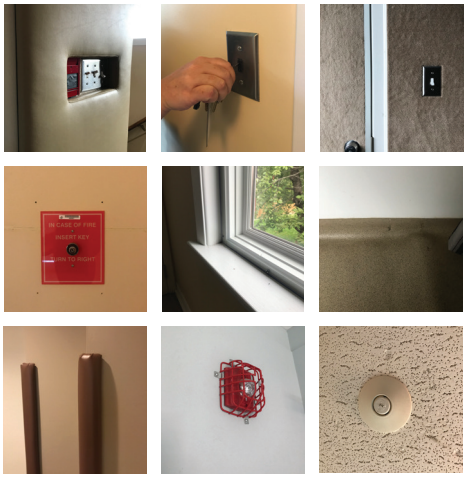
Specify wide corridors and entrances to allow accessible, easy passage

Install anti-slip/textured stair tread

Install door bells/alarms that ring upon entry and exit of a room

Install locks on entrances/storage cabinets to hazardous areas

Consider large lockable closets as storage



Fixtures and Finishes

Install hardened walls to resist damage

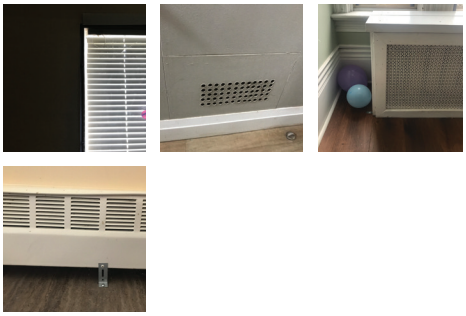
Install padded, or carpeted walls to reduce impact self-injury

Install durable flooring, consider cove baseboards

Minimize seams in wall and flooring material to address the impulse to pick at or pull apart building materials

Remove typical curtains and blinds, replace with blinds installed behind a plexi-glass cover or blinds between panes of glass

Consider frosted glass to bring diffuse, natural light into private areas



Building Systems

Install heat recovery unit to help with building/energy efficiency

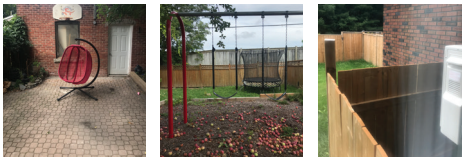
Organize heating and cooling units to service zones of the house to provides variety to meet a range of needs and as backup in event of failure

Recess, cover or relocate necessary sprinklers, fire alarm pulls, and exit signs

Install ventilation high up on walls or ceilings out of reach

Specify seamless vent covers

Enclose existing radiators behind a built-in cover



Outdoor Areas

Install fences to secure areas or divide outdoor areas

Provide both larger communal outdoor areas and quieter individual outdoor areas

Design Modifications






Living Areas

Provide space for staff to meet, perform administrative task and store equipment

Employ surveillance considering resident independence and staff/resident safety

Use water, tear resistant fabrics on upholstery or cover absorbent materials in with liquid protection layer

Use built in furniture securely fastened to the wall for larger cabinets / storage units

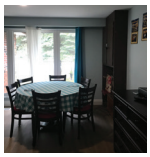
Specify heavy sofas, armchairs and tables made of solid material to withstand wear and reduce the possibility of flipping, picking up or moving

Consider light-weight furniture to allow residents to safely individuals their space

Enclose televisions and speakers behind plexiglass cover

Specify room/closet with a closing door to store computer

Fastened digital computer/tablets to the wall


Kitchens

Specify a locking kitchen door

Specify some locking kitchen cabinets for sharp or dangerous implements

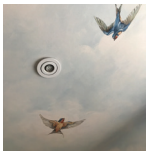
Specify large, durable appliances to serve larger groups

Specify adequate preparation space for larger meals, consider the maximum amount of people in the house for a meal (extra support staff, family, administrative staff, therapeutic staff etc.)

Provide two entrances to kitchen to allow for one-way circulation

Consider a secondary kitchen with a simplified equipment to be used as a training/test kitchen




Bedrooms

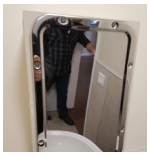
Specify durable plastic wrapped mattresses with minimal seams

Specify durable beds: built from solid material, with a box structure rather than legs

Remove or screw down picture frames

Consider painting artwork directly on the wall as a mural, in place of typical hung pictures









Bathrooms

Plan extra drainage to avoid flooding

Locate bathrooms on the ground floor to minimize flooding damage

Install a barrier free shower

Specify hidden plumbing elements and toilet cisterns, with inspection chambers in case of un-blocking (zipt-tie cistern, wooden cistern cover, hidden cistern, steel toilet)

Remove handles from plumbing elements at risk of flooding

Specify water shut-off/controls accessible from outside the bathroom

Specify overall temperature control on hot water