Research & Development Highlights

97408 Technical Series

EVALUATION OF PHYSICAL ADAPTATIONS AND HOME AUTOMATION FEATURES IN FOUR HOUSING UNITS LOCATED IN VILLE SAINT-LAURENT, QUEBEC

Introduction

This study was carried out jointly by the ministère de l'Industrie, du Commerce et de la Technologie du Quebec, the Société d'habitation du Qu6bec and Canada Mortgage and Housing Corporation.

Through observations and surveys of 10 residents in a low-rental housing project, this study evaluated the level of use and the suitability of physical adaptations and home automation features.

Architectural accessibility features were integrated into the interior and exterior common areas of the building. In addition, 4 of the 48 units in the building were adapted to meet the specific needs of persons with disabilities. One of these four units was equipped with a home automation system and other specialized equipment allowing for a better control of the environment. This home automation system was combined with a universal infrared remote control. This housing unit, located on the ground floor, is occupied by a quadriplegic person.

Six other residents also took part in the study. These persons are seniors, some of whom have mobility problems, and they live in traditional units.

Main Architectural Accessibility Features in the Common Areas of the Building

- Parking space reserved for persons with disabilities
- Clear passage between the parking space and the access ramp
- Access ramp
- Accessible main entrance: turning space on the landings and absence of thresholds
- Electromechanical door opener on the front entrance doors to the building
- Clear interior passage
- Elevator
- Special toilets for men and women
- Electromechanical door opener on the toilet doors
- Electromechanical door opener on the garbage chute door (ground floor)
- Electromechanical door opener on the laundry room door
- Electromechanical door opener on the common room door
- Centralized communication system in the common room
- Electromechanical door opener on the exterior door of the common room
- Access ramp in the back yard
- Clear passage from the back yard to the front entrance
- Handrails in the corridors
- Emergency alarm activated by the opening of exit doors
- Signs

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Specific Architectural Accessibility Features in Adapted Units

Entrance

- Unit entrance with no threshold, and entrance door with a lever handle, an independent lock, a double peephole and an electromechanical door opener activated by a key and a push button.
- Turning space in the entrance hall
- Identification of visitors on a television screen, with the image being transmitted by the camera located in the building entrance
- Lowered electrical controls (switches, thermostat, etc.); raised electrical outlets
- Wall intercom with telephone receiver
- Central communication system for the building

Kitchen

- Turning space in the kitchen
- Lowered kitchen counter
- Lowered kitchen cabinets
- Cook top and microwave/convection oven
- Clearance under the sink and cook top
- Service hatch between the kitchen and dining area
- Lever faucets
- Light switch, ventilation hood control and electrical outlets on the front of the counter
- Lazy Susan
- Window-opening device equipped with a humidity detector

Bathroom

- Turning space in the bathroom
- Clearance under the wash basin
- Lever faucets
- Full-length mirror
- Nailing strips for grab bars by the toilet and bathtub
- Lowered medicine cabinet
- Clearance along the entire bathtub
- Lever faucets in the bathtub, with sliding hand-held shower
- Slip-proof finish in the bathtub

Bedroom

- Lowered clothes-closet rod Living Room

- Roller-mounted sliding window
- Electromechanical door opener on the balcony door, activated by a push-button
- Turning space on the balcony

Additional Equipment Integrated into the Automated Unit

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- Telephone remote alarm system that can be forwarded to external telephone numbers and that transmits a digital voice message in case of accident, fire, theft or flooding.
- Burglar-proof alarm system equipped with a presence sunulator, activated by motion detectors in each room and break-in detectors on the doors and windows.
- Automatic switching on and off of the lighting, activated by motion detectors in each room.
- Ambient temperature control, operated by detectors in each room; temperature programming in each room, based on the living habits of the household.
- Predetermined scenarios, that is, programming of the different features controlled by the home automation system based on representative sketches of the living habits of the occupants; for example, the “Rising" scenario raises the temperature in the bedroom and the bathroom, then opens the bedroom curtains and turns on the coffee maker.
- Telephone remote control of all home automation system functions.
- Heat and smoke detectors placed at a central location in the housing unit, activating the remote alarm in case of emergency.

Fabco Électronique Interface

- Control of the appliances plugged into the numerous X-1O outlets in the unit.
- Network of infrared transmission relays allowing for the transmission of remote

control orders from one room to another.
- Universal infrared remote control allowing for the direct control of all the equipment, from anywhere in the unit.
- Interface with the Secant system for this system to be able to receive the information from the universal remote control commands and update its status log on all the equipment that it controls (e.g. curtains opened or closed).
- Emergency call stations, activated by pull cords or pendants, in the bedroom, bathroom and living room; activating an emergency call automatically opens the electric lock in the unit entrance door, sounds an emergency horn, turns on a warning light in the corridor and sends out an external telephone remote alarm.

Other Specialized Equipment

- Hands-free intercom located in the unit entrance and the bedroom; the intercom may also be activated by the universal remote control.
- Safety timer that automatically turns off the cook top elements after a programmed lapse of time.
- Range ventilation hood equipped with an automatic extinguisher.
- Humidity detector under the sink that sets off a telephone remote alarm in case of flooding.
- Electromechanical curtain openers that open, close and pivot the vertical blinds in the bedroom and living room.
- Electromechanical door opener on the unit entrance door, activated by remote control.
- Treated wood platform that raises the balcony, thereby eliminating the exterior threshold.
- Special bi-fold doors requiring a reduced opening radius, for access to the bedroom and bathroom.
- Electric bed, activated by the universal remote control.

Objectives

Verify the compliance of the adaptations and home automation features with the needs of the tenants.
Identify the nature and level of training to be provided to users before and during their use of the adaptations and home automation features.

Determine the type and frequency of adjustments required by the home automation and mechanical equipment during its use.

Determine the suitability of the accessibility and home automation features in relation to their costs.

Methodology and Results

All the persons with disabilities who participated in the study received some training on the use of the different adaptations and home automation features incorporated in the building and their respective units.

An occupational therapist guided each of the persons with disabilities in order to maximize their use of the equipment, in relation to their respective disabilities.

Certain adjustments were made to the equipment to facilitate its use by the tenants.

During the six-month observation and survey period, meetings were organized with the tenants on several occasions to record the extent to which they used the various accessibility features in the building and their units and the difficulties that they encountered.

Six residents with no disabilities were also asked about their perceptions of the architectural accessibility features integrated into the interior and exterior common areas of the building

A meeting was also held with the occupational therapist caregiver to obtain this person’s views on the difficulties encountered by the seniors.

Conclusions and Repercussions for the Housing Sector

Due to the very limited number of participants, the conclusions of this study cannot be generalized.

Even though the building and the adapted units integrate a good number of architectural accessibility principles, some improvements are required, especially with regard to access, circulation and fire protection.

The seniors with declining mobility expressed comments that resembled those formulated by the persons with disabilities. There is consequently a certain similarity between their needs.

The tenant in the adapted and automated unit used some of the features made available to him. He did this based on his values, needs and habits. He thus became our benchmark. Based on this benchmark, that is, a quadriplegic person with limited use of his upper body members, it can be assumed the greater the disability of the user, the more suitable the home automation system becomes.

As well, home automation presents definite advantages for most users, whether they have disabilities or not, and also for landlords. It is in this context that the decision to install home automation equipment in all housing units should be made.

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Research Report: Evaluation of Physical Adaptations and Home Automation Features in Four Housing Units Located in Ville Saint-Laurent

Consultant: Société d'habitations communautaires Logique inc.

A full report on this research project is available from the Canadian Housing Information Centre at the address below.

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