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Better Buildings

Issue 4

OPERATING • MANAGING • REPAIR • RETROFIT • RENOVATION

Envelope and Accessibility Retrofits

Bashaw Senior's Lodge

Overview

In 1995, extensive improvements were made to the Bashaw Valley Lodge, a 38-unit, one-storey wood-frame structure in Bashaw, Alberta. A major portion of the work involved the retrofit of the exterior walls. A sprayed-in-place polyurethane foam insulation was applied over the existing cladding to improve the thermal performance of the wall as well as creating an air barrier and vapour retarder. The repairs also addressed building code violations, improvements to life safety features for residents, increased accessibility for persons with disabilities, and improvements to the Lodge's overall efficiency. The desired end product was a safer and more comfortable building.

The final construction cost was \$353,844.

A key concern for the owners and residents was to restrict disruption to the occupants. Only one resident suite was vacant, therefore work had to be scheduled around the day-to-day operations of the Lodge. The contractor had to manage his resources so that window replacement and door retrofits to allowed the residents to occupy their suites by evening.

The Assessment

Existing conditions:

No major renovations had been made to the 1,428 m² building since its construction in 1966. A

mechanical and fire alarm upgrade took place in 1988, and minor changes in 1987. These included improvements to the north-west wall and the addition of a covered entrance for ambulances to the north-east entrance. Generally the building was well maintained and repairs were done as needed.

The architects performed an exhaustive condition survey in 1994. The following problems were noted:

The Site:

1. The ramps providing access to the building were not in compliance with the Alberta Building Code. The slope was too steep and the guardrails too low.
2. Main entry was not barrier free.

Bashway Valley Lodge (after renovation)



North-West corner (before renovation)



Building envelope:

1. There were complaints of cold exterior walls and drafts. The owners had already strapped, insulated and added a stucco finish on the north-west wall in 1987 to alleviate a local problem, but complaints persisted in other areas. Test holes were made in the exterior walls to determine insulation type, vapour barrier type, and whether there were condensation or other moisture problems. The existing wall had 3" batt insulation, poly vapour barrier and no evidence of moisture problems.
2. All windows except those by the main entrance were single-glazed double-hung wood windows with removable storm/screen sashes. Most were in good condition, but the double-hung windows were not weather tight and required a substantial amount of maintenance.
3. The exterior doors were painted solid core wood in wood frames. The weather-stripping was worn and the doors required regular painting and refinishing.
4. There were complaints that some rooms were cold.
5. Although the roof was in good condition, there were a few minor repairs to be made.

Building interior:

1. Suite doors did not conform to the Alberta Building Code.
2. The suite entrance doors could not be opened when the bi-fold bathroom doors were open. This could lead to serious consequences, if a resident collapsed and blocked the open bathroom door.
3. No suites were fully accessible to persons with disabilities, and barrier-free access was not provided in the main entrance, in the main public washroom, or the bath areas.
4. The walls were repainted and the vinyl wall coverings were replaced.

Mechanical:

1. The main water service needed to be replaced and there was no backflow prevention device.
2. There were complaints of discomfort due to cold in the main vestibule and the bath areas.
3. There was no mechanical ventilation in the crawl space.
4. The kitchen exhaust fan did not conform with fire regulations.
5. There were reports of poor exhaust in the laundry room.

Electrical:

A general paging system connected to a central location was needed.

The Work
Exterior walls

A two-component spray-in-place polyurethane insulation, 75mm thick was applied to the existing walls. This continuous insulation system provides an air barrier and vapour retarder because it flows into cracks and gaps and around protrusions and is completely seamless. No caulking was involved and other trades were not disrupted.

Main entrance from parking lot (before renovation)



The exterior wall was strapped with 38 mm x 38 mm wood strapping at 400 mm horizontally and 38 mm deep “Z” bars at 400 mm vertically to minimize thermal bridging. Plywood sheathing (9 mm), building paper, a metal lath and a new stucco finish were applied. This increased the thermal resistance of the wall from 1.93 RSI (R-11) to 5.28 RSI (R-30).

The polyurethane foam could not be applied during inclement weather, and had to be applied to a surface that was free of frost, dew and water. In addition, wind can cause a problem with overspray on the building and surroundings. Therefore, the application of the system was scheduled for the spring. This had no impact on the schedule



because the windows were replaced systematically and the strapping was applied when weather permitted.

Other improvements:

Barrier-free access was provided throughout the building. New PVC sealed low-E windows were installed. The exterior doors were replaced with prefinished, pressed steel, insu-

lated, weather-stripped doors. Suite doors were replaced with fire-rated doors, and the bi-fold doors in the washrooms were replaced with folding accordion doors.

The main water service was replaced. Heating was provided in the main vestibule and the bath areas. Mechanical ventilation was added in the crawl space. The exhaust systems were upgraded. A general paging system connected to a central location was provided.



The Schedule:

Scheduling was complicated by the need to keep residents safe and comfortable in the middle of winter. Since one suite was vacant, it was possible to move residents while the suites for persons with disabilities were being renovated. The schedule of window replacement was managed so that residents only had to vacate their rooms for the day; the room was ready to be occupied again by the evening. Disruption to the food service was minimal while work was taking place in the kitchen; catered food was brought in once or twice when the kitchen was inoperable. The Town of Bashaw provided temporary water with a connection to the fire hydrant during the replacement of the water main.

Main entrance from street (after renovation)



The Costs:

The final construction cost was \$353,844. The cost breakdown is as follows:

General requirements	\$35,323	\$929.55/suite	9.9%
Site work	\$9,895	\$6.93/m ²	2.8%
Architectural	\$224,232	\$157.03/m ²	63.4%
Mechanical	\$48,594	\$34.09/m ²	13.7%
Electrical	\$30,800	\$21.57/m ²	8.7%
Allowance	\$5,000	\$3.50/m ²	1.5%

The largest proportion of the work was the refurbishment of the exterior wall. These costs are as follows:

Exterior insulation	\$23.71/m ²	\$16,500
Stucco	\$61.21/m ²	\$42,600
Residential windows	\$40.83/m ²	\$28,420
		\$87,520

The Government of Alberta funded the project. The general contractor was required to supply a 50% performance bond and a 50% labour and material bond.

Results:

The objectives of the work were to increase access, safety and comfort for the residents. Barrier-free access was increased by providing a ramp and new entry doors with an electronic opener, and by renovating the public washroom and two of the resident suites so they would be suitable for wheelchair use.

Safety was increased with the provision of fire-rated doors to the resident suites, and comfort was increased with new windows and added insulation.

The owners report that complaints regarding cold drafts have stopped and that the residents are much more comfortable. It was hoped that the Low-E windows would control over-heating in summer. While conditions are somewhat improved, overheating is still a problem. An air-conditioning system is being considered.

Contacts

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For more information about building envelope solutions and best practices, visit the Canada Mortgage and Housing (CMHC) web site at www.cmhc-schl.gc.ca and visit the Highrise and Multiples site at www.cmhc-schl.gc.ca/research/highrise/