First Nation Mold Remediation Case Study

Tsartlip First Nation

Canada Mortgage and Housing Corporation (CMHC) has a number of mold remediation and repair case studies that draw on the experiences of First Nations from across Canada to assist First Nation communities in managing moisture and mold problems in housing.

The case studies highlight current housing operations and the key milestones, decisions, changes and experiences that have led to effective solutions to mold problems. They were prepared based on interviews with key members of the community, including housing department staff, councillors and mold remediation contractors.

Many First Nations across Canada have important decisions to make regarding the way mold issues are addressed in their communities, and may find these case studies to be useful in preparing mold remediation and prevention strategies for their own purposes.

The Community

The Tsartlip First Nation has a total population of 900 and about 450 live in 165 homes on-reserve. Tsartlip is a Coast Salish village on the Saanich Inlet, 20 kilometres north of Victoria, British Columbia, and it is located next to the village of Brentwood Bay. Tsartlip has a school, an adult education centre and a health centre. The community is 15 minutes away from both an international airport and the British Columbia Ferries terminal to Vancouver. It has easy access to the University of Victoria, Royal Roads University and Camosun College.

The community has similar weather to the city of Victoria—coastal mild weather without the amount of rainfall experienced by the west side of the island or the lower mainland.

Housing Overview

Housing in the community consists of units built in the 1960s and 1970s with financial assistance from Aboriginal Affairs and Northern Development Canada (AANDC) and units built during the early 1990s with the assistance of CMHC. Between 2003 and 2007, 39 new units were

Figure 1 Tsartlip First Nation's office

built, and at least 30 of those are multi-family rental units, including duplexes or fourplexes, and flats for elders. The housing mix also includes a few mobile homes purchased privately and set up on family land.

One of the strengths of Tsartlip's housing stock is the different types of housing units to meet the different needs of community members (figures 3 and 4). The Tsartlip leadership believes that high quality affordable rental housing is an important first step for young families—families who would become the homeowners of the future. Recently, several young families (with the support of Tsartlip) have entered into loan agreements to build their own homes.

However, the biggest challenge the community faces is how to manage the rental housing units. There is not enough money generated from these units to hire a housing manager, so the housing administrator also acts as a housing manager.

Mold Issues

In the late 1990s, Tsartlip's Housing Department suspected that houses in the community had mold problems. Housing Department staff began teaching home occupants how to identify mold in their houses and the community's health representative posted mold-related information in the Tsartlip newsletter, which brought more attention to the matter. Community members became concerned once they realized there could be health risks associated with mold. Home occupants became good at sensing dampness and detecting mold by smell and by sight. With this increase in education and awareness, the Chief and Council, the Housing Department and home occupants came to realize that the community had a larger mold problem than originally suspected.

Tsartlip First Nation sought and received financial assistance for mold remediation and repair from AANDC and, with that funding, they undertook an investigation of every house with occupant-reported mold problems. The results revealed that at least a third of the houses in the community were moldy, and some had large mold problems. This led to a tremendous movement to fix the situation. By the time the mold remediation and repair project was finished, Tsartlip had torn down and replaced ten homes and renovated more than forty.

Figure 2 View across Brentwood Bay

Figure 3 and 4 Street view of a mold remediated house with a new apartment on the second floor

Throughout the process, moisture issues that resulted in mold were identified and documented. In many cases, poor construction practices such as a lack of insulation (or poorly installed insulation) created cold interior wall surfaces and condensation that provided ideal conditions for mold growth. In addition, problems associated with a lack of regular house maintenance, poor site drainage, and faulty window and door installations allowed moisture penetration into the homes that resulted in problems with mold growth. Missing or inadequately operating kitchen and bathroom fans also contributed to moisture accumulation indoors. Other common problems observed in many of the houses included damage under bathroom and kitchen sinks caused by plumbing leaks, and water penetration through roofs, causing wet attics eventually resulting in moldy ceilings. According to the community, these mold issues could have been avoided if the water and moisture issues were understood, identified and dealt with sooner.

In summary, moisture-related factors leading to mold in the community included:

- poor site water management that did not keep rain and snowmelt water away from foundations;
- cracked foundations that allowed water to enter basements, which remained wet;
- roof leaks that caused wet attics, eventually resulting in moldy ceilings;
- plumbing leaks that allowed water to seep and accumulate, damaging surfaces;
- poor window and door installation that allowed water infiltration, which damaged the surrounding wood framing;
- lack of insulation that led to cold surfaces on interior walls and condensation issues;
- wet basements that caused stored items to become moldy;
- laundry rooms with no exterior venting for the clothes dryer that caused high humidity levels and condensation problems;
- missing, broken or poorly operating exhaust fans in kitchens and bathrooms that were ineffective at removing moisture created during daily activities; and
- bathroom walls with constant exposure to high humidity conditions, which caused them to become moldy.

Community's Approach to Solving Mold Problems

Tsartlip leadership supported the mold remediation and repair work, and staff were hired to take care of the problem. It took several years to complete the process and this created some disruption in the community. The average cost of the renovations was in the range of $40,000-$45,000 per unit. One of the issues was that, at that time, dealing with mold was a new field and house investigations and mold remediation activities were expensive and costly for the community. Tsartlip negotiated with several contractors and in the end decided to build capacity within the community in the areas of home investigation, mold remediation and construction of better homes. The Chief and Council supported training for community members in order to save money and create local employment opportunities.

As a result of the community's decision to focus on capacity development, one of the most important parts of this project included the formation of a construction crew (approximately 20 workers) that could take on the mold remediation work. Tsartlip hired an external project manager for the job for a period of three months initially and he ended up working with the First Nation for several years. The project manager identified several best practices that were key to the success of the mold remediation work.

The process they followed included a number of key steps. First, Tsartlip developed a contract document that was signed by all members of the construction crew. The project manager was given authority to ensure that the conditions of the contract were honoured by every worker. The contract clearly laid out expectations—when to arrive for work, lunch and coffee times, workplace safety rules, respect for others, and the expected quality of the work to be done. The contract also gave the project manager the authority needed to lead the crew. The project manager got along well with the crew supervisor who was from Tsartlip and knew how to work with the different personalities on the crew. This relationship and knowledge about the crew proved to be very important over the course of the project.

In addition, a very specific and detailed scope of work for every mold remediation task was laid out in advance and the crew was required to follow it. Initially, workers

received the same general training. With time, it became clear that each individual had certain skills; this knowledge was then used to organize the workers into specific and more effective crews. Teams were established—roofers, drywallers, painters, plumbers, carpenters, and soon, by the end of the project the workers excelled at their trade. They also learned how to estimate their time and materials, which was probably the most important skill they learned as several of the crew members went on to contracting jobs both on-and off-reserve. The project manager encouraged good construction practices and demanded high-quality workmanship from all working crews. In the end, the remediation crews not only cleaned up or removed the mold found in the homes but went on to identify and fix moisture problems that created the mold in the first place.

Eventually, the project got large enough that Tsartlip had to hire First Nation workers from neighbouring communities. There was a tremendous sense of pride in the community that came from doing its own work. Men and women who wanted to work could have a job on the crews. Because the mold remediation project was such a community-wide effort, the community developed increased awareness about house construction and renovation methods. There was also a growth in awareness about what it means to have a house, how a house works (or doesn't) and the role of the home occupant in keeping a house in good physical condition.

A number of home occupants had to be relocated during the course of the mold renovation work and this was not easy for families with children. It was difficult for many families to find proper accommodation during this time. However, the project funding meant most people did not have to pay for the mold remediation work. When occupants returned home, each family was given customized mold information and regular information from the Health Department's newsletter. Some, but not all community members made changes to their lifestyle or how they looked after their house after the mold renovation project based on the training they received. And, most people in the community are now aware of their responsibilities when it comes to housing and mold.

The mold remediation and repair project was funded by the government but even when the funding ended, the community continued to be aware of and address maintenance and moisture issues that could result in future mold problems. Ten years after the project was completed, the people of Tsartlip are still aware of moisture and mold issues and know what it takes to maintain a mold-free home.

What This Meant for New Housing

The mold remediation project was an important step for the future of Tsartlip's housing. It raised awareness of house construction issues, showed what could be done in the community by the community, demonstrated the importance of house maintenance and occupant behaviour and allowed for employment and training of many community members.

The building of new projects now demonstrates the knowledge and experience gained by the community through the mold remediation process. Several years after the mold project was completed, 39 homes were constructed almost exclusively by these same Tsartlip skilled workers. (figures 5, 6, 7 and 8) They organized themselves into specialized trade crews and now know about site safety, quality assurance inspections and work protocols. As a result, they build houses to a much higher standard than before. The community takes pride in having its own people and tradespeople build and work on its houses.

Figure 5 Newly constructed back-to-back fourplexes in Tsartlip

Figure 6 Newly constructed flat for senior community members

Figure 7 Mold remediated house showcasing locally made kitchen cabinets and varnished plywood floor

Figure 8 A series of new semi-detached homes in Tsartlip

Dealing with mold in existing housing provided the Tsartlip Housing Department with insights on how to make the new homes more mold-resistant. For example, some of the changes to house construction practices included:

- slab-on-grade construction instead of basements and crawl spaces;
- mandatory staff training on the installation of polyethylene vapour barriers, insulation and house wraps for moisture protection;
- attention to window and door installation and weatherproofing details to meet British Columbia Building Code requirements to eliminate water penetration;
- better drainage and grading around houses to manage surface water;
- thorough building inspections to pick up and correct defects and deficiencies at early stages for completeness, quality assurance and code compliance; and
- installation of higher quality kitchen and bathroom fans to better manage moisture from showers, baths, cooking and washing.

Outcomes and Lessons Learned

An important outcome from this experience was that most of the mold remediation and repair funding remained within the community. The funds were used to train and build capacity and skills among community workers to remediate existing homes and build better homes in the future. The workers and community members now have an understanding of moisture management that will help prevent mold from occurring in new and existing houses.

Tsartlip has the following key messages for other communities:

1. Get everyone in the community involved in preventing and dealing with mold.
2. Get upfront commitment by Chief and Council for support in the fight against mold.
3. Build capacity in the community to deal with the mold problem and remediation.
4. Educate and raise awareness among community workers and home occupants by providing training opportunities.

5. Follow up initial training with maintenance programs for home occupants.
6. Make sure roles and responsibilities are clear to all members of the community at the start of mold remediation activities.
7. Learn when to seek outside professional help for mold clean-up activities and how to improve housing construction standards.
8. Impress upon all members of the community, from the Chief and Council to home occupants, the importance of construction and housing quality.

Conclusion

All new houses in Tsartlip are now being built to higher construction standards to prevent and avoid moisture problems and mold. As a result of the mold remediation and repair project, the community now has a local and skilled construction crew that can take on mold remediation and repair work. This investment in education and training has become an asset for the community and is reflected in the quality of newly built and renovated housing units. Community members in general have benefited as well, given the improved housing, employment and skills development opportunities. A whole-community approach to understanding and preventing mold, education and remediation is what worked for Tsartlip.

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