

Aboriginal Housing Assessment: Community Design Needs & Preferences and Application of Local Materials



Prepared for:



Canada Mortgage and Housing Corporation

Prepared by:



The Centre for Indigenous Environmental Resources

The Canada Mortgage and Housing Corporation (CMHC) provided funding for the Centre for Indigenous Environmental Resources (CIER) and Tall Grass Development to talk to and visit Aboriginal communities to learn about housing. Four communities have shared their experience using local materials for housing construction. 14 Aboriginal communities shared their ideas about alternative designs.

This document provides the results of the research report “Aboriginal Housing Assessment: Community Design Needs and Preferences and Application of Local Materials” and may be useful for your own community’s housing plans and decisions. The Aboriginal communities who participated in this research have agreed to share their stories so that other communities can benefit from their successes and learn from the challenges they have faced. This document would not be possible without the assistance of these communities. Verbal consent was received from all participants regarding the use of the information, including any photographs, they shared with the research team for the express purposes of this report.

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What is the right approach for your community's housing needs?

Are more culturally appropriate housing designs something you have considered?

Is your community thinking about using a local resource to build houses?

Would your community like to have more input in the design of houses?

Some Aboriginal communities in Canada are already using local materials. Local materials may offer possibilities for your community.

Houses that are designed according to cultural, climate and community needs and preferences are a common need within Aboriginal communities in Canada.

INTRODUCTION

When indigenous peoples around the world first built structures, they designed them in a way that respected culture, climate and place. The structures, including dwellings, were designed for the cultural needs of the inhabitants, stood up to the demands of the local climate and were constructed with materials local to the place. Today, the majority of the houses in Aboriginal communities are dwellings designed for an urban non-Aboriginal culture, constructed with conventional materials often transported from a far distance away.

This report summarises a study that responds to two concerns of Aboriginal communities: that the design of their housing is not appropriate for their culture and that building materials are too often imported from far away even when local resources could be made available.

Several First Nation demonstration projects have involved innovative housing designs and materials. These have already been documented and are not the subject of the study. In contrast, the study looked at “home-grown” use of local materials and, initially, looked for housing design of local origin. Although suitable communities were found for studies of materials, no communities were found where there were examples of local designs and where the communities were interested in discussing them. Accordingly, the study focus on housing design was changed to needs and preferences of a selection of communities from 7 major cultural areas in Canada (Arctic, Eastern Sub-Arctic, Western Sub-Arctic, Northeastern Woodlands, Plains, Northwest Coast, and Plateau).

The study documented the experiences of selected Aboriginal communities in the use of local materials for housing and the housing design needs and preferences expressed by community members and housing administrators.

There are 2 main sections to this document.

Section 1 includes information on the use of local materials for housing. Three types of local materials were studied – logs, straw bales and bricks. The research team visited four Aboriginal communities and learned from other communities, business and organizations through literature review and telephone calls.

Section 2 includes information on community preferences for housing designs. 14 communities participated in the research on alternative design. The housing design suggestions provided by these communities are presented in this section.

SECTION 1

LOGS

There are many Aboriginal communities using local trees to build houses – some use the trees to create lumber and other build log homes.

Almost every building in Nibinamik First Nation in northwestern Ontario is built with local logs. The community has been building log homes since the late 1960s. The Boreal Forest surrounds Nibinamik and spruce trees were used to build houses. In March 2002, when this research took place, Nibinamik was not a designated reserve.



Nibinamik First Nation

For houses that are built by the Nibinamik government, local crews of 1 to 5 people are hired for a 3-week period to cut the trees using their own chain saws. The work involves tree cutting, bark peeling and cutting the trees to an appropriate size (depending on the type of log home being built). Harvesting takes place in the winter months from March to April, and can continue into the summer when it becomes easier to prepare the logs.

On average, crews of three people harvest the spruce trees used for log homes. A foreman marks suitable trees (e.g. 18 cm diameter and straight) and two people cut the trees using chain saws. Log homes do not require the use of a sawmill and, depending on the design,

logs can be used whole, or cut to the required length.

Because only some trees are straight and uniform, cutting trees for log homes requires a selective cutting approach. Green logs twist and settle as they dry which creates cracks and shifting after construction therefore logs are allowed to dry. After being cut down, the trees are debarked and left standing for approximately two months. Local people are hired to transport the logs from the forest using their own vehicles or boats.

Log house building skills exist in Nibinamik, passed on by people who used logs to build their own homes and trappers' cabins for many years. Other people learned construction skills when the Ontario government funded the construction of the local school and health centre. These skills are being passed on to the young people in the community as they work in crews with more experienced log builders.



A log home in Nibinamik First Nation

Nibinamik has also received funding to train younger members in log building through Aboriginal Human Resource Development Agreements, run by Human Resources Development Canada (HRDC – now the Department of Human Resources and Skills Development Canada) and channelled through a local group, Mamo-Wichi-Hetiwin Employment and Training. Nibinamik has had successful Residential Housing Construction Training proposals in the past using local trainers to provide training to five to six people per session.

Tree harvesting and house construction occurred on a regular basis since the mid 1970s with four to five houses being built each year, until very recently. The majority of the community housing consists of log homes, some of which are over 25 years old. The last log house was built in 1999. In recent years private individuals have continued to build their own homes out of logs.

The community's ability to build log homes with local trees changed when a devastating forest fire swept through the area in 1992. Approximately 50,000 hectares of forest were burnt. The community now has to travel approximately 15 kilometres now for suitable logs. This is considered too far and has increased the cost of building with local materials. This, in combination with the decision of a past Chief to commit the community to purchasing prefabricated building materials, has resulted in few new log homes being built since the early 1990s.



Outhouse, Nibinamik First Nation

Nibinamik First Nation now purchases lumber from an external supplier to build houses. Some homes are built of rough lumber from local material that is run through the local portable sawmill. Most of the homes, however, are now wood-frame with plywood siding, constructed with cut lumber flown into the community. The Chief noted that these wood-frame houses are more expensive than log houses primarily because of the cost of the materials and shipping.



One Style of Log Home Design, Nibinamki First Nation

“Nibinamik First Nation is one of a kind, [the log houses are] culturally appropriate and tie in with nature...it demonstrates who we are, as Aboriginal people, and we are keeping our identity”

– Band Councillor

Eagle's Nest Log Industries is a 100% First Nation industry and is a joint venture between Cooks Ferry, Coldwater, Siska and Nooaitch First Nations. The company was created to meet the need for community housing and a community desire for log homes. The company also provides local employment and believes using local people and materials has environmental, economic, spiritual and cultural benefits.

“our log homes are built to reflect the traditional values of our people using local resources and providing us with a healthy living environment”

www.eaglesnestloghomes.com

Local trees, primarily fir trees that are straight and uniform in shape are used to build houses. Trees that are not suitable for a log house can still be used for lumber and other paper products. Eagle's Nest has a “tree agreement” with Weyerhaeuser Canada and Tolko Industries and can exchange trees harvested on the reserves for premium house-building logs.

The First Nations of Eagle's Nest have planned 24 new subdivisions for their members, with many new log homes.

Many other Aboriginal communities have buildings made from logs. To ensure that the residents get the full benefits of a log home some training is necessary. Organizations such as Manitoba Keewatinowi Okimakanak (MKO) and the International Association of Log Builders have training programs. Although complete training in house construction can take up to 4 years, a beginner can become a capable craftsman and work on houses after approximately 4 to 6 months of training.

Benefits According to the Community:

- Properly built log houses perform well and last a long time. Log homes provided excellent insulation and breathe well, resulting in more efficient heating and cooling of the house and a healthy interior air.
- Different designs of log-building are available, allowing for more variety in tree suitability.
- Log home building does not require expensive or technical equipment. Trees can be cut down and to size with a chain saw. Local trees can also be used to create lumber if a local sawmill is available.
- Building log houses can create more employment than building houses using pre-fabricated building materials. In the case of Nibinamik First Nation, more people in the community were employed during log home construction than when prefabricated building materials were used. This also helps to keep revenue within the community.
- Local materials cost less than building materials shipped by air or transported to the community by winter road.
- Minimal transportation of materials reduces pollution caused by transportation.
- There is pride and cultural benefits associated with the use of local, natural materials.



Housing in Nibinamik First Nation

Challenges According to the Community:

- Without properly trained supervisors and builders, log homes can have problems with drafts and cracks, and may not perform optimally. The ability of the house to protect residents from the cold, and handle snow loads, depends on the skill and training of the building supervisor.
- The economic advantages of local materials decreases as outside labour must be hired. Without adequate capacity (or training opportunities) within the community the benefits to the community of using local materials may not be very high.
- Supply is dependent upon a sustainable source of trees, this may require sustainable management practices, including sustainable harvesting plans, replanting, fire management.
- Many homes in First Nation communities use open wood stoves or open fuel drums for heating, which create dust and results in respiratory problems – especially in houses with cathedral ceilings. Drop ceilings are being used and log stoves are encouraged for log homes.
- Building codes do not address log construction.

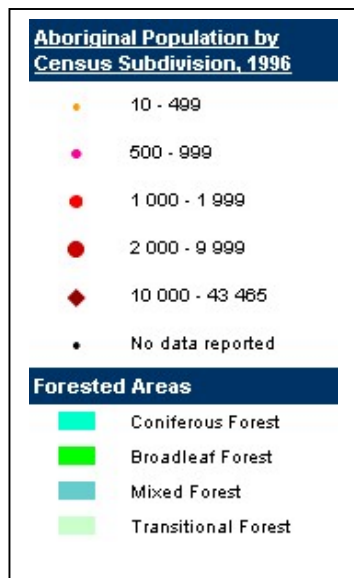
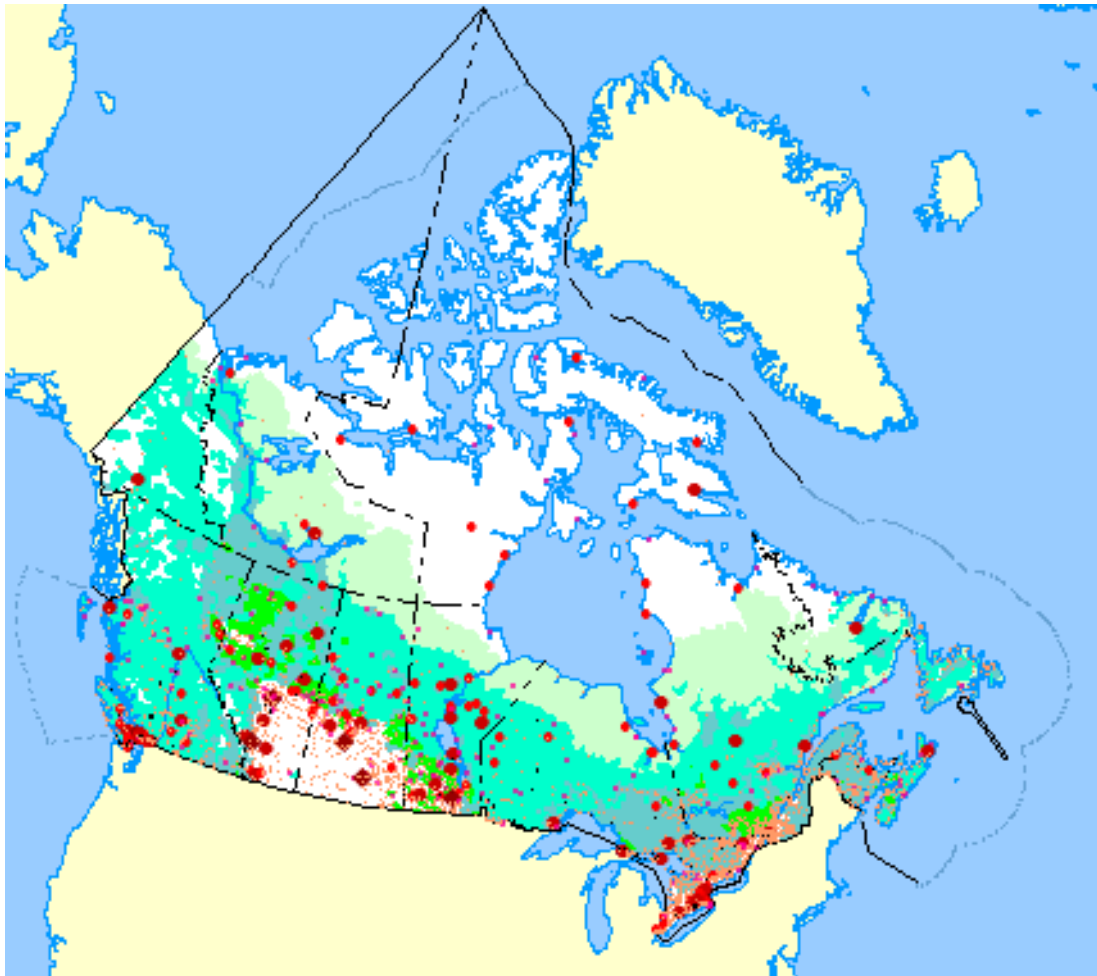
Application to Other Communities

Logs can be a viable source of housing material given the right combination of access to suitable trees over the long-term, building skills and knowledge within the community, favourable environmental conditions and political and community support.

To ensure the sustainability of the log building process, a community must have a plentiful supply of logs that are relatively near the community. Many Aboriginal communities in Canada are situated in areas with substantial timber resources, although access to the timber is another matter.

The community also needs the knowledge and skills required for general house building (as per conventional construction) and the specific requirements for log building. Development of this capacity could provide economic opportunities for the members and both keep revenue within the community and reduce the cost of hiring non-local labour.

- Specific log building techniques and an understanding of general house construction (windows, roofs, foundations etc.) is required to ensure the long-term success of the house. Training is an essential component of a housing initiative to ensure the long-term success of local building.
- As is the case in Nibinamik, local timber sources may be less expensive for the community than pre-fabricated materials transported from outside the community. Local materials require minimal transportation (and therefore create a minimum of pollution via transport).
- If managed correctly (i.e. not over-harvested) trees may provide a sustainable source of building materials.
- Training of local people provides local economic opportunities for the community that could be expanded to provide services off the reserve as well, as demonstrated by Eagle's Nest Log Industries.
- Environmental damage can create significant reduction in tree resources, as was experienced by Nibinamik First Nation.



Aboriginal Populations in Forested Areas in Canada.
 Source: Atlas of Canada, Natural Resources Canada

STRAW BALE

Many Aboriginal communities live near agricultural areas where straw bales are readily available. To date, however, few communities have used straw bales for housing construction to any significant degree. The Kanata 2000 demonstration home, in Kahnawake Mohawk Nation successfully used straw bales for insulation. In 2000, there were an estimated 1000 straw bale houses in Canada, both in urban and rural areas.

Many Indian reservations in the northern plains of the U.S.A. are also close to agricultural areas. Since 1998, the construction of straw bale homes in Aboriginal communities has been most active in southern Montana. The successes and lessons learned on the Northern Cheyenne Reservation and Crow Reservation were included in this research. Four straw bales buildings were studied: a private home; the Northern Cheyenne Literacy Centre; the Muddy Hall Community Centre; and the Crow Study Hall.



Private home, Northern Cheyenne Reservation



Interior of private home,
Northern Cheyenne Reservation

The non-profit organization, Red Feather Development Group, and the University of Washington created the American Indian Sustainable Housing Initiative (AISHI). The AISHI promotes and provides technical (and sometimes financial) support for straw bale construction where there is interest in Indigenous communities. For the private residence and the Community Centre the decision to use straw bales was made by the community, who approached the AISHI for support. In some cases the AISHI approaches communities where there is a need and may be interested. For 2 of the buildings, the use of straw bales was suggested by the AISHI and finalized by the communities.



“Truth Window”, Private Home,
Northern Cheyenne Reservation

Between 200 and 300 bales were used for buildings, which range in size from 140 to 150 square metres (1500 to 1600 square feet). Each bale is approximately 40 kilograms (90lbs) with dimensions of 17x24x44/46 inches. Modifications of the bales before construction is not necessary apart from cutting them to fit certain locations in the design (e.g. windows). Lumber was required for interior partitions, and wood trusses for the roof. The straw bales bear the weight of the roof directly so wall framing is not required. Three layers of stucco are applied to the exterior and interior walls.

The design and layout of the buildings was developed with ongoing community input. This allowed for buildings that meet the peoples' needs and are properly constructed. The result is low-cost, energy efficient, "natural feeling" buildings.

Previous research published by CMHC (1998, 1997, 1986) on the use of straw bales for housing construction has illustrated some of the concerns around this building material (e.g. water infiltration). As with all housing construction there are particular details that require technical expertise and attention to detail (e.g. around windows and doors), however, in the case of straw much of the labour can be completed by relatively unskilled participants. In the cases presented in this research, the partnership between the communities and the AISHI provided the expertise required to ensure the straw bale buildings were well constructed.

According to the community participants and AISHI, straw bales provided an economically viable, energy efficient housing material for these buildings. Building techniques are relatively simple, allowing for resident, community, and volunteer participation during construction. This contributed to the economic and socio-cultural benefits of the buildings. The volunteers that worked on these buildings were from both within and outside the community. Red Feather organized these other volunteers.

Technical specifications were available from Red Feather. For example, detailing is important and keeping the straw dry is essential. Straw bale for housing construction has applications for Aboriginal communities in Canada. Many communities have, or are close to, agricultural areas where straw is an abundant waste product from grain crop production. Straw is a natural product and can be grown and renewed quickly. According to the participants, houses are healthy and cost-efficient. Construction can be completed with a combination of skilled and unskilled labour due to the relatively "low-tech" requirements of straw bale buildings. Participation in the

construction by interested participants provides socio-cultural benefits, and potentially economic benefits, if volunteer labour is used.



Crow Agency Study Hall, Crow Reservation

Benefits According to the Community

- Straw is a natural and annually renewable material.
- Straw is abundant; it is available anywhere agricultural grain crops are grown.
- Straw bale building is a low-tech construction method, which allows homeowners and community members with no previous construction experience to participate in the construction process.
- Because unskilled labour can be used to construct significant components of a straw bale home, there are opportunities to reduce labour costs associated with building a home.
- Straw bale walls have a high insulation value: from R-40 to R-50.
- Straw bale homes keep the warmth in during the winter and remain cool inside during the summer.
- Straw bale homes are less expensive to heat than modular or poorly constructed wood-frame homes.
- A straw bale house can be enclosed in 7 days with the right number of builders (10-15); 2 days to erect the straw bale walls: 2 days to build the roof and three days to apply the stucco on the exterior and interior sides of the straw bales walls.

Challenges According to the Community

- For the case studies visited during this research project, square three-string straw bales were not available locally. This increased the cost of transporting the bales to the building site and increased the environmental impact through burning of fossil fuels for the transportation.
- Must take extra precaution to ensure that bales do not get wet before or during construction.
- Straw bale building is not a widely accepted building practice. This may cause some challenges with building codes.
- If the home is built with a team of volunteers during a two- or three-week “blitz build” it is important to have the foundation poured and the site ready for the volunteers to start building the straw bale walls when they arrive.
- It is good to have some experienced people on hand to demonstrate for the rest of the crew. Also important to have someone at the site experienced with straw bale to manage the process.

“Because of the abundant supply of straw on the Northern Plains and the volunteer friendly construction process, straw bale construction presents an opportunity for tribal members to help each other build comfortable, durable, energy-efficient housing.”

– David R. Riley (2003)
– Pennsylvania State University

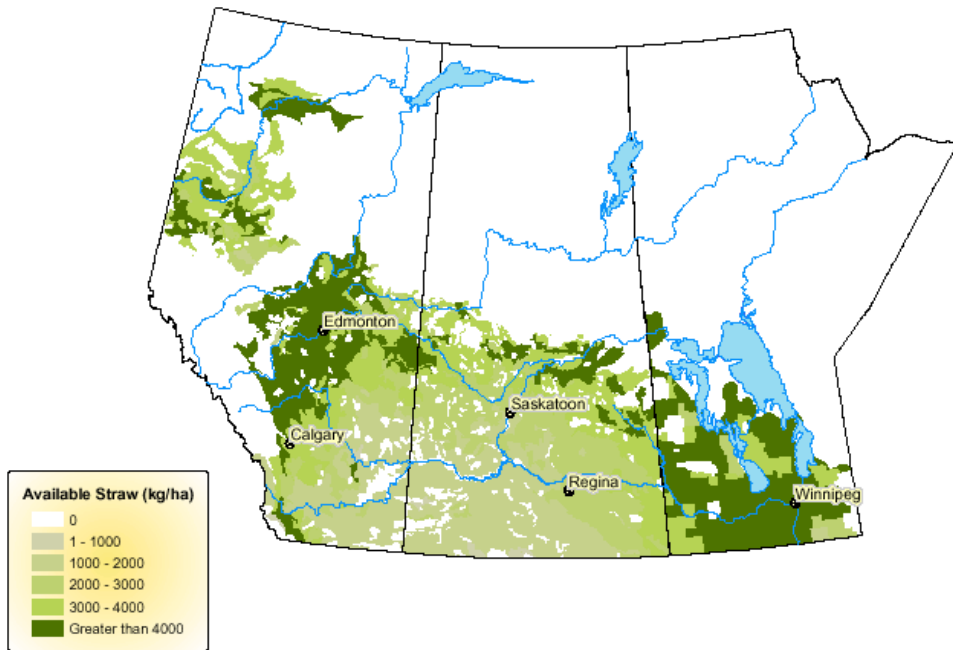
Applicability to Other Communities

- Straw is an abundant waste product from the production of agricultural grain crops and could be readily available.
- Plant fibres mature much quicker (about six months) compared to tree fibres (six to ten years). Therefore using straw bales to construct houses can be more easily sustained over the long-term by the natural environment than other renewable resources.
- There is a large social sustainability component to building with straw bales. This is because the exterior structure of the home can be built with a combination of skilled and unskilled labour.
- The most efficient design for a straw bale home is a single story structure with a minimalist utility core surrounded by the straw bale shell. The utilities (primarily water and wastewater lines for the kitchen, bathroom and laundry) are placed in the centre of the floor plan.
- Detailed construction drawings, illustrative hand-out materials, and a tight construction schedule can help if there is limited time to build the home.
- Because straw bale building is not readily accepted and there are important technical details involved in achieving the benefits of using straw, it is important to have expertise involved (e.g. partnerships).

“If they are willing to commit volunteer labour to help each other, it [building homes with straw bales] is better.”

– Homeowner; Northern Cheyenne Reservation, Montana

Total Available Straw



Canada

Total available straw (AB, SK, MB)
 Source: Agriculture and Agri-Food Canada

Region	Area (Mha)						
	Total Land	FarmLand ²	Crop Land ³	Summerfallow	Tame Pasture ⁴	Natural Pasture	All Other ⁵
NL	41	0.04	0.01	0.001	0.003	0.007	0.02
PE	1	0.3	0.2	0.001	0.01	0.001	0.06
NS	6	0.4	0.1	0.001	0.02	0.03	0.2
NB	7	0.4	0.1	0.001	0.02	0.03	0.2
QC	154	3.4	1.8	0.01	0.2	0.2	1.2
ON	108	5.5	3.7	0.01	0.3	0.5	1.0
MB	65	7.6	4.7	0.3	0.4	1.6	0.7
SK	65	26.2	15.4	3.1	1.4	5.1	1.2
AB	66	21.1	9.7	1.2	2.2	6.7	1.2
BC	94	2.6	0.6	0.04	0.2	1.2	0.5
YT	48						
NT	135						
NU	209						
Canada	998	67.5	36.4	4.7	4.8	15.4	6.2

¹Data source, Statistics Canada, Census of Agriculture, 2001

²Includes all farms reporting income from agricultural production.

³Includes all crops except Christmas tree production.

⁴Includes all tame and seeded pasture lands.

⁵Includes Christmas tree production.

Land Area in Manitoba, Saskatchewan and Alberta where straw can be sustainably harvested annually.

CLAY BRICK

Sumas First Nation in southern British Columbia has clay resources and a clay brick plant on reserve. The plant, Sumas Clay Products, is owned in trust by the Band Council and employs residents of the community.

In the past, political differences resulted in a minimal use of bricks in the homes. Bricks were used for some foundations, chimneys and garages but generally not for an entire home.

This is slowly changing because the Chief and Council is now in support of bricks. The Chief and the manager of Sumas Clay Products would like to see every house in Sumas First Nation built with brick.



Local brick used in houses
Sumas First Nation

"I would like to see all the houses built with brick "

Sumas Clay Products Plant
Manager

The community recently lost its longhouse to a fire. Volunteers built a new community centre, made entirely of bricks. Sumas Clay Products donated a foreman's time and the bricks.

The Community Centre currently provides space for Halqemelyn (local) language classes, Christmas dinner and cultural activities until a new – *brick* - longhouse is built.



New Community Centre made from local brick,
Sumas First Nation

The community currently has 4 trained bricklayers. There are hopes to partner with a Vancouver institution that offers bricklayer training to use Sumas First Nation and Sumas Clay Products for on-site training. This would help encourage more people to enrol in a formal course and help begin the process of building brick homes in the community.

With more people trained in bricklaying, this knowledge could be passed onto to other community members. Off reserve, a bricklayer's labour is expensive and this is one of the reasons brick homes can be expensive. With local labour and local bricks, the cost to build a brick house on reserve could be manageable.

Homes built with local brick and local labour also have the advantage of keeping housing money in the community. As well, this approach to housing would contribute to a local sense of pride.

Sumas Clay Products has the only beehive kilns in Canada. This allows the plant to make specialty brick products, as well as conventional bricks and chimney-flue liners. The brick is a unique colour and is exported internationally to the United States and Japan.



Sumas Clay Products

Clay is harvested from the mine by blasting and drilling work done by community members. Claybourn Industries, located nearby, crushes large clay pieces that the Sumas crusher cannot. Smaller pieces and secondary crushing is done by Sumas as is the rest of the brick manufacturing process.



Stacking bricks in the kiln

The brick plant's production has dwindled since the late 1980s due to decreased demand for brick and changes in buyers' sources of bricks. The brick plant has the capacity to burn over 100 kilns a year and could easily provide bricks for the Sumas First Nation and surrounding communities.

In addition to plans for brick houses, there are also plans for a shopping mall, a convention centre with a casino and possibly a hotel on reserve land. These could all be made with local Sumas bricks.

“...it can strengthen people spiritually by using and building with our own brick and with our own hands”.
Chief Silver

Benefits According to the Community

- Brick homes:
 - have better thermal capacity (cooler in the summer and warmer in the winter);
 - perform well over the long term and have very low maintenance costs;
 - are healthier and have not experienced mould problems as have other wood frame houses;
- Using a local resource results in virtually zero transportation costs and pollution;
- Using First Nation owned materials reduces the cost of building a house;
- There are local employment opportunities;
- Expanded production and marketing could provide bricks to neighbouring reserves;
- Using local materials provides a sense of pride to the community and a connection with land; and
- Cultural benefits include “strengthening people spiritually by using and building our own materials and with our own hands” (Chief Silver).

Challenges According to the Community

- Clay is a non-renewable resource.
- Creating bricks from clay requires technical capabilities and energy input (crushing clay, firing bricks etc.);
- Negative environmental impacts are a result of the brick plant (air pollution, depending on heat source, dust, water use etc.); and
- The economic viability of the brick plant could decrease if future demand decreases, eliminating the source of bricks for the community.
- Even when you have a local resource, other factors may complicate implementation of ideas (politics, funding, skills).

Application to Other Communities

The Sumas First Nation is in a unique position with access to local clay and brick processing facilities.

- Access to clay resources for bricks is not common in Aboriginal communities in Canada.
- Access to processing facilities is not common in Aboriginal communities in Canada.
- External bricklayers fees can be high and local skills can decrease the cost of building brick houses and help to keep revenues in the community. Training is an essential components of a local materials housing initiative to ensure the long-term success of local building



Inside the Community Centre, Sumas First Nation

Why promote local materials?

- In the case of the participating communities, using local materials for housing construction brought environmental, economic, social and cultural benefits to the participants and the community as a whole.
- Increased pride in the houses creates social and cultural benefits.
- Increased pride in the houses can result in better care and maintenance.
- Communities believe they are cheaper.
- Offer local employment. Using both local materials and local labour helps keep money in the community.
- Communities believe that local materials are more environmentally friendly.
- Reduced transportation distances save money and reduce environmental impacts.
- Local materials represent the local environment and culture and tend to support cultural identity.

Challenges for Local Materials:

- Local materials must be harvested in a sustainable manner for local resources to become a viable option for housing materials.
- Local labour must be properly trained; especially when funding for housing relies on houses meeting building codes. Housing construction with local materials such as logs and straw bales require some training and apprenticeship opportunities.
- Housing building codes do not exist for all local materials (e.g. straw, logs), which can make using local materials and obtaining funding for their use difficult. Adjustments to standards could be considered to some on-reserve housing (e.g. log).
- Local political challenges may complicate the use of local materials; community support is important.
- Funding requirements (governments, banks) may complicate the use of local materials because they are different from the norm (e.g. brick as a luxury material); adjustments to the requirements could be considered in some situations (e.g. when brick is locally available).
- An economic analysis of the feasibility of using local materials and the potential benefits of local materials has not been done, therefore the true benefits of using local materials is not yet understood.

SECTION 2

14 Communities participated in this research and shared their ideas about needs and preferences for housing design:

Arctic:

Hamlet of Gjoa Haven (NU)
Teltit Gwich'in First Nation (YT)

Eastern Sub-Arctic:

York Factory First Nation (MB)
Kawawachikamach First Nation (QC)

Western Sub-Arctic:

Liidlii Koe First Nation (NT)
Fort Simpson Metis Nation (NT)

Northeastern Woodlands:

Mebertou First Nation (NS)
Six Nations of the Grand River (ON)

Plains:

Piapot First Nation (SK)
Pasqua First Nation (SK)

Northwest Coast:

Tsawout First Nation (BC)
Kitsumkalum First Nation (BC)

Plateau:

Westbank First Nation (BC)
Okanagan First Nation (BC)

ALTERNATIVE HOUSING DESIGN

In general, current housing designs in Aboriginal communities do not meet the needs or preferences of the residents.

One very important difference between Aboriginal and non-Aboriginal housing is the length of time that people reside in their houses. In Aboriginal communities people tend to live in one house for their lifetime – it can become a family home. In non-Aboriginal communities people often move from one house to others over their lifetime.

This has many implications. For example, a non-Aboriginal family, or family off-reserve would likely move to a larger home as the size of their family increases. This is not an option in an Aboriginal community. Usually, as non-Aboriginal people age and their housing needs change many would adapt their homes (e.g. add railings on stairways) or move into single-story homes or apartments. Aboriginal elderly people have few options. While there are programs on reserve to adapt housing, this was still a common complaint of the research participants. The challenges associated with ensuring homes are adequate in size for the occupants were raised in every community.

Houses in Aboriginal communities are generally provided to suit the current needs of the applicant. One person noted that when he reviews a housing application for a young couple with a new baby for example, he knows that their family will grow but he cannot allocate housing to suit these future needs. Many of the housing concerns of the communities that participated in this research relate to the fact that people cannot adapt their living space to meet the needs of a growing family.



New Housing, Liidlii Kue First Nation

Analysis: Pattern of Common Elements

The people who participated in this research had many housing complaints and ideas for solutions that relate to design. These comments suggest more appropriate housing design processes and physical structures. Some of the design needs are cultural in nature, while others are more general.

Cultural Design Needs

Many of the design needs of communities relate to larger family size and the family orientation of Aboriginal culture and lifestyle. Most participants in this research had more than two children and had households made up of more than their immediate family (e.g. adult children, elderly parents, two families living together in one house, relatives visiting for long periods of time). Virtually all of the houses were unable to accommodate such large numbers of people, resulting in cramped living conditions, and occasionally, feelings of inadequacy and distress at the inability to provide for family and friends.

More space

Most houses in Aboriginal communities are built for four people, but most participants were living with more than four people in their homes. Generally, there are not enough bedrooms for each person to have their own space. In some cases additional bedrooms have been created by altering floor plans but without increasing the overall size of the house. People would like to live in houses that are larger, include more bedrooms and have more than one washroom.



Hallways considered by some to be a waste of space; Kitsumkalum First Nation

Basements are often used to provide additional living space. However, most basements are not finished and not well insulated or heated. Many basements have mould problems. Some people would like to eliminate basements completely and opt for only a crawl space (while not losing living space). Some people suggested raised houses (“split-level houses”) as a way to provide extra living space without using the basement. Other participants would like to include the basement as a viable living space.



Raised house, Kitsumkalum First Nation

Additional storage and cupboard space as well as space to accommodate a deep freeze is needed in many communities. In particular, people who hunt, fish, gather berries, and preserve foods need more space for storage. Food is also often given to other people in the community who are in need and is supplied during community gatherings. Housing designs need to consider storage of large quantities of frozen and preserved foods.



Storage area, Kitsumkalum First Nation

The needs of children

The overall need for more space results in a lack of space for children to play, study and socialize away from their parents. In addition, the small number and size of bedrooms in the homes that requires children to share rooms was seen as a problem, especially for families with children of opposite sexes, and as children aged. People would like to have homes that include indoor and outdoor places for children.

Flexible space

The need for interior space that is flexible was mentioned in many of the interviews. The standard floor plans that divide a house into small rooms and hallways does not allow for comfortable family gatherings and in many cases creates rooms that are not large enough to allow the members of the household to eat together. People would like the option of houses that use a more open concept floor plan. For example, the kitchen, living room and eating area could be within one large room. Such a large room could also be used for feasts, ceremonies, crafts, and other cultural activities.

Back-up heat source

Communities in northern Canada and remote communities are concerned with the reliability of their heat source. Residents without a second source of heat would like to have this in their houses. Many people who have a fireplace or a woodstove are very pleased to have this back-up source of heat.



Woodstove as back-up heat source

Outdoor space and outbuildings

For many communities, cultural activities occur out of the house. Many people expressed a desire for outdoor space associated with their house, or for outbuildings, such as sheds and smokehouses.

Outdoor more areas are needed to set up poles to pound and dry animal skin, to dry fish, to accommodate a large table (that may be partially covered) for cleaning fish, preparing berries, etc. In addition to sheds and smokehouses some communities would like to have a workroom that is heated and attached to the house.



Outbuildings, Kitsumkalum First Nation



Outdoor space, Kitsumkalum First Nation

Closed porches and mudrooms

People would like to have an entrance to the house that is separate from the main door. This is a concern for communities that experience cold and / or wet weather. A closed porch or mudroom protects the living space (e.g. from wind gusting into the house) and helps to improve the energy efficiency of the house. It also provides space for people to enter the house, clean up after working outside, and remove outdoor clothes and shoes. This helps to keep the house free of mud, dust and the chemicals that adhere to these particles.



Old Porch, York Factory First Nation



The need for an enclosed entrance,
Liidlii Kue First Nation

Fire exits

Several communities are concerned about the potential safety of their homes and their ability to escape during a fire. In some cases foundations and houses have shifted and windows and doors are difficult to open or don't open at all. People would like to be confident that there are adequate fire exits in their homes.

The needs of the elderly

Elderly Aboriginal people who are living in single-family homes experience the same challenges as all elderly people. Steep stairs to enter the house, steep and occasionally winding stairs to the basement and/or second floor (where one exists), narrow hallways and doors, small washrooms, and storage areas that are out of reach all create difficulties for elderly people, many of whom have walking aids.

In some communities elder / senior citizen facilities have been built that provide group housing, home care or community living options. Some of the people interviewed for this research agreed with this approach to living while others did not.



Entrance ramp, Naskapi Nation,
Kawawachikamach

Housing options for single people

In many Aboriginal communities people are on waiting lists for housing and can remain on the list for several years before receiving a house. Generally these houses are given to families and not to single people. In some cases single people do not qualify for the waiting list. This results in young people leaving the community or increases crowding problems as they continue living with family or relatives so they can remain in the community.

Some communities have started to build multiplex housing units to provide apartment-type living situations for single people. Many people interviewed stressed the need to design houses that meet the needs of single people in their communities.

General Design Needs

According to interview participant, there is almost no choice in the type and design of the houses they are to occupy, including cosmetic details. In some cases this related to health and mould associated with carpet. People would like to be involved in the choices of colours, flooring and other finishing materials.

Better housing material quality and construction

According to the interview participants many of the houses require significant repairs soon after they are built. Many people were concerned that the materials that were used to build their homes were not of sufficiently high quality. Some people also believe that their houses are not structurally sound. There is also a feeling in many communities that the houses are not properly built or inspected according to the building code.

Consideration of climate

For communities in northern climates, efficient heating systems and triple pane windows would improve the efficiency of the house. Construction that minimizes the potential for shifting and cracking of walls and foundations would prevent the need for some housing maintenance and repairs. The location of doors and windows should also consider the climate and be situated to maximize the energy efficiency of the house. In some communities, for example, the doors and windows are on the north side of the house, indirectly in line with the north wind, and out of line with the sun, respectively. People would like to have efficient and effective housing designs that suit the local climate.



Housing at Six Nations of the Grand River