Autoclaved Aerated Concrete (AAC)

Autoclaved aerated concrete (AAC) is a mineral-based building material made from sand, water, limestone, cement, and aluminum powder. The mixture is then hardened in an autoclave (pressurized steam chamber). It is a lightweight form of concrete best used as cladding to provide a protective exterior for new and existing buildings. AAC can also be used for low to mid-rise load-bearing walls.

Although AAC has many benefits as a climate-resilient, pest-resistant material, limited supply options and specialised training requirements have constrained its use in British Columbia.

Hazard Resilience

Wildfire

Fire-resistant, with a high hourly fire rating (> 4 hours)

Rain and Floods

Breathability of the material prevents mould.

Windy

Wind resistant with reinforcements

Extreme temperatures

Low/moderate temperature regulation but an excellent insulator.

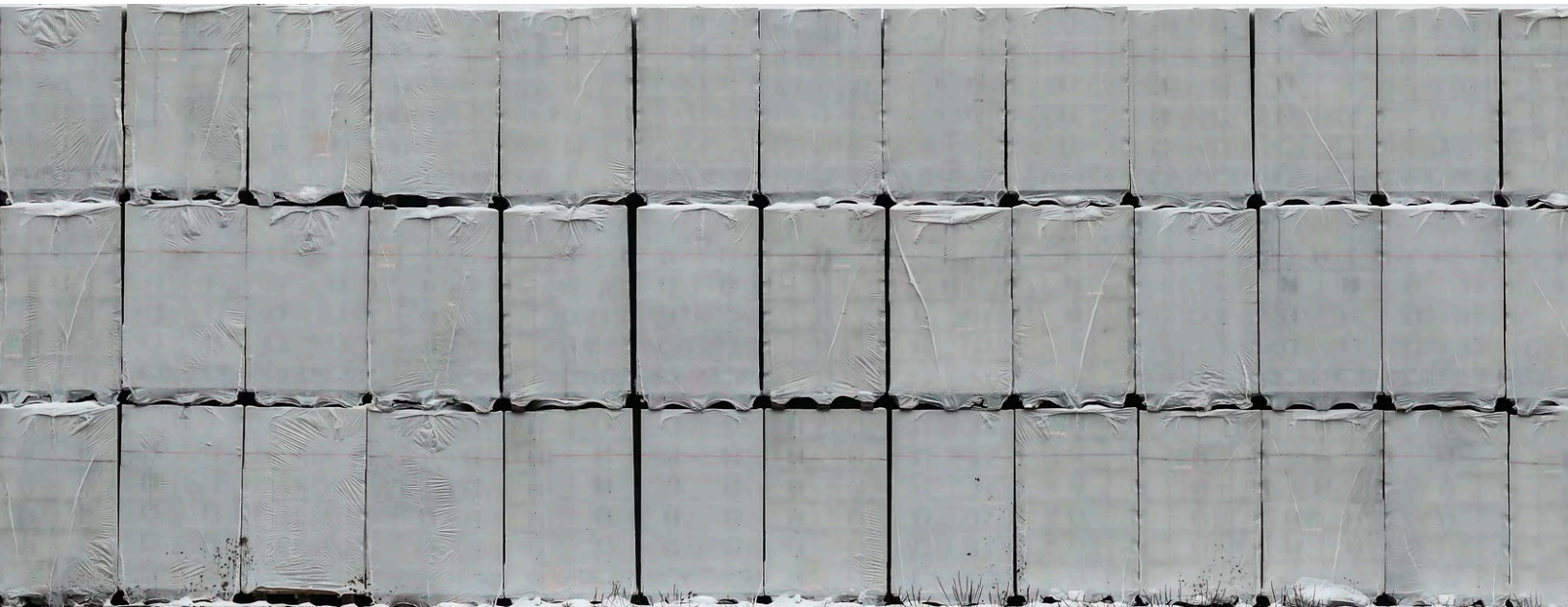
Seismic

Relatively high compressive strength and light weight contributes to seismic resilience.

As of 2025, recent and credible public estimates of costs were not available. Estimates may be available through local suppliers. The upfront cost of AAC may be higher than conventional concrete but its lightweight nature makes it more affordable to construct with.

Climate Resilience

Component	AAC
Fire	✅ High hourly fire rating, which means AAC can withstand fire for a long period (~4+ hours) before damage.
Floods	✅ Can absorb moisture and then dry out without lasting damage when surface treatments are used. An exterior waterproofing or dampproofing layer may be appropriate in flood-prone conditions.
Moisture	✅ Does not have interconnected porosity, which means moisture cannot pull very deeply into the material and only affects surfaces in direct contact with water. Inorganic - does not decay when exposed to moisture and provides no food for mold or mildew.
Extreme Temperatures	✅Excellent insulation. ⚠️However, freeze-thaw resistance requires an exterior coating, which could interfere with the breathability of the material. A waterproof but vapor permeable coating that allows for dissipation of moisture is recommended.
Wind	⚠️ Needs reinforcements for wind resistance, such as reinforced vertical, grout-filled cores and bond beams.
Seismic	✅The relatively high compressive strength and light weight of AAC blocks contributes to seismic resilience.



Benefits & Risks

Aspect	Benefit of AAC	Risk of AAC
Environmental	Non-toxic materials. Reduced weight of aerated concrete means less materials used and reduced waste. Pest-resistant.	Limited supply options may mean materials need to be transported long distances, which increases emissions. The high temperature kiln required for construction also increases associated emissions.
Durability		An exterior coating is required for durability. Using AAC in roofing is not recommended, as unreinforced AAC panels exposed to rain and snow can lead to water ingression and roof collapse.
Energy Efficiency	Excellent insulation contributes to thermal efficiency.	
Economic		There are limited supply options, which may increase transportation costs. Domestic AAC production has the potential to provide both economic and environmental opportunities.
Regulation & Codes		AAC was historically part of the National Building Code but currently, its use needs to be approved by a structural engineer.

Technical Feasibility & Construction

Materials:
Typical material requirements include sand, water, limestone, cement, and aluminum powder.

There are currently a limited number of suppliers of AAC blocks in Canada.

Maintenance and Lifespan: When used in a load-bearing capacity, AAC is reinforced with steel (RAAC, reinforced aerated autoclaved concrete). The lifespan of RAAC is estimated at 30 years.

Building Codes: AAC was historically part of the National Building Code but currently, its use needs to be approved by a structural engineer.

Construction
Specialised training is required to work with AAC. A high-temperature kiln is required for construction. AAC should not be used for roofing. Unreinforced AAC panels exposed to rain and snow risk water ingression and roof collapse.

Construction time is lower compared to regular concrete. AAC is easier to cut, shape, and shave due to its lightweight and cellular properties. Rocksolid Building Products, a company looking to open a AAC manufacturing plant in Canada, estimates that using AAC for load-bearing blocks speeds up wall installation by up to 50%. They further note that AAC is lightweight and easy to install as cladding.

AAC may be used for:

- Exterior finishes and replacement
- As infill (contributing to thermal performance)
- Multi-story buildings, provided panels are used with connectors and confined frames.

Mechanical anchors and connections aid in seismic resilience.

Example: Historic AAC Block House (Radium Hot Springs, BC)

This home was originally constructed between 1963-1968 by a stonemason using AAC blocks for the load-bearing walls. Even without an exterior finish on the walls, the AAC walls have only experienced surface weathering over six decades. There is no rot and no risk of structural failure. The AAC block house demonstrates the resilience of this material to wind, fire, and other tough climactic conditions.

More information about the house can be found on the RockSolid Building Products building feature.

Note Space: *Community & Personal Knowledge*

Photo credit: Rocksolid Building Products.