



LOOKS THAT LAST

Planning for a **Better Built Form** in Alberta



Alberta
Masonry
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LOOKS THAT LAST

Planning for Alberta's Future Built Environment

Buildings in Alberta have changed a great deal over the years, and they're continuing to change. Now more than ever, in the face of both natural and man-made problems – from storms and fires to envelope failure and dilapidation – the province and its communities need long-lasting, well-designed buildings that stand the test of time.

Many of Alberta's longest-standing heritage structures were built with brick and stone. The legacy of Alberta's masonry industry shows through in countless historic streets throughout the province, in communities along historic railroad routes and in city centres built in the earliest days of Canadian settlement. However, since the World Wars, the boom-and-bust nature of Alberta's economy led to a change in building quality. Today, many homes, neighbourhoods and businesses are built with cheaper building materials in order to rapidly meet surges in demand.

The consequences of this short-term thinking can be seen as these quick-and-dirty structures age. Homes built primarily with low-quality exteriors prove vulnerable to envelope failure within a couple of decades, requiring costly repairs to rehabilitate. Structures framed in flammable or weather-vulnerable materials prove unable to withstand worsening weather and more frequent natural disasters, from wildfires to windstorms to pounding hail.

What we can see is clear: When buildings are built with low-quality, low-durability materials, they're not built to last. The solution is to build well, and build to last.

Considering up-front cost alone isn't enough. Both inside and outside a building, durable materials are needed. In an age of wildfires and worsening precipitation events, buildings need a strong, fireproof structure that can withstand the worst nature can throw at them. Those buildings will need exterior walls that hold their aesthetics over time, enabling homeowners to build value and save on insurance premiums.

Brick, stone and block deliver not just looks, but performance that lasts. The durability, longevity and beauty of masonry products are what make so many Alberta heritage buildings iconic. But these materials aren't just heritage classics – they're in use today and form integral parts of modern architecture and design, with benefits inside and outside of buildings.

Municipal policymakers have the tools to improve the quality of Alberta's building stock. Through clear, concise policies, communities can raise the bar on the built form and help build neighbourhoods, businesses and institutions that both look great and last a lifetime and beyond.



BREAKING BOOM-AND-BUST

Building for Permanence in Today's Alberta

Alberta's built environment – the materials and character of houses, businesses and institutional buildings – has been shaped by the boom-and-bust cycles of the province's economy. But this hasn't always been the case.

In the first decades of Alberta's history, Albertans learned the wisdom of building durable, long-lasting communities. In fact, when a fire torched downtown Calgary in the 1880s, the City passed ordinances requiring that large downtown buildings be built with sandstone. The city became known as the Sandstone City for its impressive Paskapoo sandstone landmarks, many of which still stand today. In Edmonton, at least three brickyards operated, and in other communities throughout the province, builders used local clay and stone to lay the foundations of city centres and neighbourhoods.

What changed for Alberta? The World Wars. In the years after the wars, with so many Alberta men gone off to war and many not returning, builders turned to other materials. In the ensuing years, the boom-and-bust cycle of the economy has driven a pattern of stop-and-start building. When times are good, builders build fast and with low-quality materials, then leave them to sit when times are bad. Much of Alberta's growth has taken place over the past 50 years, leaving these short-term booms and busts to have outsized influence in how our neighbourhoods look and feel.

The Alberta of today is built on this double legacy, creating a significant divide between historic Alberta and modern. The heritage landmarks of past decades coexists with newer neighbourhoods built

on short-term thinking, subject to problems like envelope failure brought on by giving little weight to notions like durability and longevity. But as Alberta faces new challenges in the form of worsening weather and a need to diversify the economy, it's vital that planners and builders look to the successful methods of planners past to inform how we build the future.

As planners, builders and homeowners consider the next wave of construction, whether it's the revitalization of former boom neighbourhoods or the construction of new ones, it's important to keep performance top-of-mind. What will tomorrow's buildings look like in Alberta? Will tomorrow's homes stand up to increasingly frequent hail and wind events? Will tomorrow's businesses suffer from envelope failure within ten or fifteen years of being built? Will tomorrow's institutional buildings survive to serve future generations, delivering the best possible value for money?

Municipalities have the opportunity to give their answers through policy. Planners and citizens alike can use levers like design guidelines and land use bylaws to have input into matters of design. Building officials and procurement officers can plan buildings with long-term principles that prioritize durability and lowest total cost of ownership. At the root of all these ideas are durable, natural building materials that stand the test of time.

Masonry is an important part of Alberta's heritage. Now more than ever, it should be a key building block of Alberta's future.



BRICK AND STONE

Part of Alberta's Heritage

The history of Alberta shows through in the many heritage buildings still standing from the early days of Canadian settlement of the Prairies. In towns and cities across the West, heritage brick and stone downtowns and classic homes and businesses still stand, a testament to the historic structures built by Canadian pioneers.

Many of Alberta's surviving heritage buildings are built with masonry. Across the West, communities turned to local brick and stone to build long-lasting and fireproof communities. Communities often have unique characters to their brick and stone: In Edmonton, for instance, many older buildings were built with brick from as many as three historic brickyards, while in Calgary, heritage buildings are often built with sandstone.

The importance of masonry is reflected in the history of Calgary in particular. In November 1886, a large fire destroyed eighteen buildings, severely damaging what was then a city built primarily with wood. City officials sought to reduce the potential for future fires by making a new law, requiring that all large downtown buildings be constructed with sandstone – a resource readily available nearby in the form of Paskapoo sandstone. Calgary went on to become known as the Sandstone City: Fifteen quarries operating in the area supplied an enormous quantity of sandstone and brick, much

of which still forms Calgary's streetscapes today. Buildings like the old Customs Building, Calgary City Hall and the Lougheed House stand as prime examples of the city's sandstone era.

In the 1970s, Alberta Research conducted an extensive study of clay and shale deposits in Alberta and found the province to be abundant in the grade

of clay used to make brick. Much of Alberta's high-quality brick clay is found in southeastern Alberta, on the flanks of the Cypress Hills, drawn from what is called the Whitemud Formation – “the most important source of clays in Western Canada.”

The former I-XL brick plant in Medicine Hat, the last brick-producing facility to operate in the province, may still be visited today. The plant opened in 1886 as the Medicine Hat Brick and Tile Factory - a factory believed to be the oldest industrial site in all of Alberta.

By 1913, I-XL Industries was shipping brick out of Redcliff, eventually growing to acquire the Medicine Hat brick plant in 1929. The company steadily expanded over the years, shipping brick throughout western Can-

ada. The I-XL brick plant operated until 2010, when a river flood forced the plant to close - but the land remains a Provincial Heritage Resource.

Today, Alberta still produces other types of local



The Alberta Legislature was built with Paskapoo sandstone, a type of 65-million-year-old rock quarried at what is now Glenbow Ranch Provincial Park near Cochrane.

masonry, including natural stone. Stone products like Rundle Rock are quarried at the Thunderstone and Kamenka quarries near Canmore, along with other types of stone throughout the province.

Alberta masonry producers also manufacture high-quality architectural block. Firms such as Expocrete and H.O. Concrete have manufacturing plants throughout the province, producing a wide variety of colours and styles of architectural concrete block for building exteriors as well as utility block well suited for interior uses such as fireproof retaining walls, sound attenuation and durability.

The legacy of Alberta's brick and stone history can be seen in countless brick and stone downtowns across the province. They encompass cities like Medicine Hat, Lethbridge and Red Deer as well as communities like, Banff, Canmore, Lacombe, Nanton, Fort McLeod and Wetaskiwin. The province's brick and stone history can be seen as well in downtown heritage buildings in smaller towns along the rail lines that drove Alberta's growth. Much of Alberta's urban history, in communities large and small, is built on a brick and stone foundation.



Brick and stone are well suited to both traditional and modern designs.



DISASTER-PROOF COMMUNITIES

Building to Withstand Natural Disasters and Hazards

Alberta is no stranger to natural disasters. In fact, three of the four most expensive natural disasters in Canadian history took place in Alberta – all of them since 2013.

No natural disaster had a biggest cost impact on Canada than the Fort McMurray wildfires of 2016. According to the Insurance Bureau of Canada, the disaster resulted in \$4 billion in insurance payouts. But Alberta also faced the third and fourth most costly disasters in Canada: The floods of 2014 cost \$1.8 billion in payouts, while the hail-storm of 2020 incurred costs of \$1.2 billion.

Those costs were driven by the decimation of more than 70,000 homes, including serious damage to the exterior cladding on many houses across Calgary. The intensity of the storm severely damaged homes clad in vinyl siding and stucco. The cost of replacing that siding at the time was estimated to be as high as \$16,000 per home, and up to \$27,000 if the home was clad in cement board.

Those replacement costs could have been avoided with the use of more durable exterior materials – namely stone and brick. The widespread siding damage in the storm of 2020 serves as a warning: Cutting costs on a home's exterior cladding today will leave homeowners vulnerable to damage and spiking maintenance costs tomorrow, especially with extreme storms expected to get worse. The Canadian government anticipates that once-in-ten-years precipitation events could increase by as much as 20% in the coming years, putting more pressure on infrastructure to withstand heavy rain, hail and snow.

The picture is clear: Weather in Alberta is getting worse, and it's causing enormous damage to vulnerable homes and businesses.



Hail can seriously damage low-durability wall cladding materials such as stucco and vinyl siding.

Durability has advantages that go beyond mitigating the need for maintenance. Building for durability can save homeowners money on their insurance.

Insurers evaluate the risks involved in homes when they determine what premiums you'll pay. In general, the stronger the building material, the lower the risk and the better the rate. Masonry buildings tend to be considered less of a risk than those clad and built with combustible materials. Even better rates are possible for buildings that go beyond the cladding and build

structural elements from non-combustible materials like concrete block.

Some communities have recognized the importance of durable materials and set standards for weather-resistant and winterized design to help promote durability. This approach can work particularly well for institutional and employment structures, especially for vital services that will need to operate well in the event of a natural disaster. Municipalities should prioritize durability when constructing new public buildings. Structures like schools, emergency service stations, transit buildings, community centres and other buildings that provide public services should be built to withstand extreme weather impacts, prioritizing durable building envelopes and sturdy structures that can shrug off severe precipitation and keep operating during a natural disaster.

ENVELOPE FAILURE

Cheap Materials, Expensive Problems

Building envelope failure is a well-documented problem in Alberta.

In 2008, the Provincial Government conducted a broad-spanning Building Envelope Survey in response to an increasing number of complaints about failures in the exterior cladding of residential buildings. These complaints focused specifically on stucco and EIFS and the damage caused to structures by moisture that had infiltrated behind the cladding.

The Ministry of Municipal Affairs found that “all sites observed demonstrated incomplete and deficient construction” that fell below Building Code standard. They singled out EIFS – acrylic stucco – as a particularly serious offender. Issues at play included poor construction and inadequate stucco depth to prevent damage and infiltration.

This damage cost not just homeowners, but governments. For homeowners, costs ran as high as \$50,000 per wall face on an average home to remove and replace stucco and remediate the mould damage. On the municipal side, the City of Calgary reported that many of their inspectors spent half their time in court or involved in other legal proceedings stemming from lawsuits by homeowners and disputes with builders and warranty programs.

The government observed:

The survey team’s observations demonstrate a need for government, municipal and residential construction industry representatives to take steps that will safeguard the quality and integrity of new home construction in Alberta as it relates to the building envelope.

With record years for insurance spending becoming more and more frequent, Alberta will not be immune to severe weather that can both damage facades from the outside and infiltrate it and destroy them from the inside. The best solution is to build for durability. Choosing robust, sturdy building materials will prevent issues like moisture infiltration, saving homeowners money in the long run.

The benchmark for sustainable housing affordability is 30% or less of household income going to housing. A key part of achieving this benchmark is to pay attention to exterior design and prioritizing durability. It is not affordable when homeowners keep having to pay for unexpected repairs to home exteriors that only last a few years. The sticker price of cheap building materials is heavily undercut by the cost of repairing and replacing the building envelope.



South Red Deer
Less than 20 years old



Red Deer
10 to 15 years old

WHY MASONRY?

Durable, Sustainable and Appealing, Inside and Out

Masonry refers to three materials: Brick, stone, and both structural and architectural concrete block. Masonry can be used not just for the internal structure of a building, but for the building's exterior. Whether used internally or externally, or as the main exterior material or as an accent, masonry has a wide range of advantageous properties.

For the exterior of buildings...

- **Masonry is long-lasting.** Brick and stone can last 100 years or more; other materials, like stucco, may begin to decay within a decade or two and will require replacement throughout their lives.
- **Masonry is durable.** Brick and stone have the resilience to withstand extreme weather events like hail, wind and snow without being damaged or blown off the sides of homes or businesses. This helps avoid costly repairs and insurance premiums during natural disasters.
- **Masonry is timeless.** Many of Alberta's oldest surviving heritage buildings are built with masonry. Brick and stone are among the world's oldest and most classic building materials, and they convey a strong sense of permanence.
- **Masonry is fireproof.** While materials like siding are highly flammable, brick and stone do not combust. In the event of a fire, a masonry building is more likely to survive.
- **Masonry is low-maintenance.** Materials with shorter lifespans may need to be replaced every couple of decades and are vulnerable to various forms of envelope failure. Masonry can last more than a century and isn't prone to damage by fire, hail, wind, termites, moisture infiltration and other threats that can destroy siding and stucco.
- **Masonry is sustainable.** Brick is made from clay and shale, among the most abundant materials on Earth. Its carbon footprint is entirely up front, at the manufacturing phase. From then on, it's environmentally inert, gives off no more emissions and pays down its carbon debt over the course of its life. It can even be ground down for road beds and recycled in the future.
- **Masonry can increase your home's resale value.** Masonry holds its value better than other building materials, enabling a great return in the event you sell your home and move elsewhere.



For the interior of buildings...

- **Masonry is safe.** History is full of examples of wood-frame buildings becoming fire traps. Structural masonry is the opposite. Masonry interior walls can slow or even prevent the spread of fire from unit to unit.
- **Masonry is survivable.** Structural masonry will outlast other structural materials because it is invulnerable to many common hazards. Masonry is unaffected by issues like rotting, moisture infiltration, termites, mould and fire, ensuring your building survives to serve for years to come.
- **Masonry delivers the lowest total cost of ownership.** Masonry buildings incur much lower maintenance than less durable types of building materials, while also having the longest lifespan. Investing in structural masonry now

delivers savings for generations.

- **Masonry is adaptable.** Many heritage buildings, built with masonry, are prime candidates for adaptive reuse. Buildings can be repurposed decades down the line and put to new use. This saves the carbon impact of building a new structure. For sustainability purposes, the best building is one that is already built, and masonry delivers on that principle.
- **Masonry reduces waste.** Block is modular, allowing builders to use just as much block as needed in order to finish the job. Any unused material can be repurposed or recycled.

Whether as an exterior accent, a primary exterior cladding material or as a structural material, masonry delivers both a timeless look and an enduring life cycle performance that continues to appreciate in value over time.



POLICY BASIS FOR EXTERIOR DESIGN

Building Looks That Last Within Alberta Planning Law

Municipalities, both in Alberta and throughout Canada, often use non-statutory design guidelines to outline their preferences for community and exterior design. These policy tools can be placed alongside statutory options to allow communities a say in how neighbourhoods and districts are designed.

Programs such as Area Structure Plans and Urban Design Guidelines are being used in some communities as a means for local planners and citizens to state preferences for exterior design. The bulk of these approaches, while useful in encouraging developers to account for a community's stated vision, are non-statutory. They can be useful when dealing with principled builders with a respect for the community's sense of what kind of neighbourhood they want to live in. However, more proscriptive approaches may be useful in the event a community wishes to place stronger safeguards on community character and sustainability.

Authority for strong design guidelines exists within Alberta's Municipal Government Act. Through robust land use bylaws, communities can take a step beyond non-statutory design guidelines and implement urban design standards as an element of approval at the zoning phase. The legislation specifies the following under Section 640 (1.1):

640(1). Every municipality must pass a land use bylaw.

(1.1) A land use bylaw may prohibit or regulate and control the use and development of land and buildings in a municipality, including,

without limitation, by

A. Imposing design standards,

...

C. Regulating the development of buildings,

The ability to "impose design standards" at the land use bylaw phase allows the implementation of progressive and streamlined planning practices common in the United States, including pattern language and form-based codes. These types of policies can be utilized to establish broad areas of architectural character based on key characteristics, such as common materials in a given area. Developments meeting these clear form-based standards would then proceed as-of-right.

BUILDING ON THE POLICY BASIS

Municipalities can utilize form and pattern-based language in their land use bylaws to outline appropriate standards for built form.

One relatively easy-to-implement approach is to integrate elements of Urban Design Guidelines at the land use bylaw stage, or to add language to the land use bylaw stating that Council-approved design guidelines shall be utilized in the assessment and approval of new development proposals. The best way to implement this type of language is to enact it with clear, determinative statements, laying out obvious and simple objectives for developers to meet.



It is not sufficient, for instance, to require that developers produce “good design” or “beautiful buildings.” This is ambiguous language that creates room for dispute between planners and builders as to what constitutes beauty. Better policy calls for specific, easy-to-interpret benchmarks.

For instance, a land use bylaw could govern infill in a key neighbourhood by mandating a certain percentage of the façade consist of specific building materials that are common in that neighbourhood. This is particularly valuable in areas where the municipality may wish to protect a heritage district, such as areas of Alberta with legacy brick and stone structures.

Pattern zoning and form-based codes represent further evolution of these principles. Pattern zoning identifies a key infill area and bases approved infill on a series of pre-approved “pattern” building plans, while form-based codes organize zoning areas based primarily on the form of buildings. These types of zoning can be particularly useful when managing intensification.

Form-based codes in particular have seen uptake in a number of jurisdictions in the United States, and have begun to be implemented in Canada. The first full form-based code was implemented in Laval, Québec. However, elements of form-based codes are employed by a number of communities throughout Canada.

These approaches can go beyond protecting established neighbourhoods. Design guidelines and pattern or form-based zoning can be utilized at the new subdivision level, providing standards by which new neighbourhoods should be built. Designs which meet these standards would then proceed as-of-right, allowing quality to be guaranteed while still speeding along the development process.

Urban design is a vital part of community planning. The neighbourhoods we live in have a profound effect on our lives, and the character of those neighbourhoods is determined by beautiful, high-quality building envelopes. The use of materials like brick and stone, whether as accents to other wall facings or as a primary facing material, can add beauty and an enduring sense of place to structures, helping to both maintain property value and establish an attractive community look and feel.



POLICY CLARITY

Clear Expectations, Faster Results

In general, clear design guidelines are more useful when setting policy than ambiguous ones.

When a community sets guidelines that call for a “high quality of design,” it sets the stage for questions because the guideline is so broad as to be nearly meaningless. It invites a dispute: What constitutes high-quality design? These disputes can create delays in the approval process, which can make it more costly for builders to build.

On the other hand, having no policy whatsoever creates a burden of low expectations and places the cost of it squarely on the community. Municipalities are the only forever stakeholders in new buildings. A builder’s share ends when the building is sold, while a resident or tenant may only occupy the structure for a fraction of its lifespan. The building, however, will remain where it is so long as it is structurally sound. It becomes part of the fabric of the community and contributes to the overall character of the neighbourhood. If the building is poorly-built and subject to envelope failure, or if it is simply a badly-designed eyesore or a structure

whose value declines with time, it alters the character of the neighbourhood around it negatively.

The best way to cut across these problems is to be specific and clear when setting exterior design policy. Rather than general statements, communities should prioritize specific, targeted language that gives builders a clear and easy-to-interpret set of “boxes” to “check off” as they go into planning a development.

For instance, some communities in Alberta have used policies like Area Structure Plans to set percentage thresholds for certain facing materials – e.g. utilizing brick or stone for 15% of the building exterior. Specific policies like this are useful in that they set explicit and achievable benchmarks without stifling creativity. Particularly for greenfield developments, it can be useful to establish a series of key and specific goals, such as overall massing and preferred and discouraged exterior cladding, while leaving style and configuration to the creativity of the builder.



AMC'S RECOMMENDATIONS

Putting Looks That Last Into Practice

For the building exterior...

- Use durable, natural materials such as brick, stone and block as preferred exterior building materials for the construction of new institutional buildings. Low-durability materials, such as stucco, should be used as accent materials or in combination with the preferred materials.
- For new residential dwellings, encourage builders to meet a minimum threshold of 15% of the exterior building material being masonry.
- In established and heritage regions, new development should utilize brick and stone masonry consistent with the heritage character of the existing built environment – e.g. sandstone in downtown Calgary, brick in Edmonton or Medicine Hat, et cetera.
- Prioritize the use of fireproof exterior cladding materials such as masonry in areas where wildfire activity is likely.
- Recommend brick and stone as suitable exterior cladding materials in sustainable design and weatherproof design qualities, recognizing their durability and life cycle carbon performance.

For the building interior...

- Prioritize structural concrete block for construction of institutional and public buildings, including schools. Specify a preference for structural concrete block at the procurement phase of a project and require successful proponents to deliver specifications utilizing masonry for the structure's interior.
- For multi-unit structures, such as schools or multi-residential buildings, construct dividing walls with concrete block to act as breaks on the spread of fire.
- Procure new public buildings with an emphasis on the lowest total cost of ownership, utilizing life cycle cost assessment rather than sticker-cost-alone pricing. Prefer the use of durable, long-lifespan materials for structural elements.
- Construct new institutional buildings to be future candidates for adaptive reuse.

