**21**
**Halifax Public Library, main entrance, Halifax, Nova Scotia. Schmidt Hammer Lassen with Fowler Bauld & Mitchell, 2014.**

new civic buildings in the region. **FIG 21** Its ambition and scale highlight a remarkable level of commitment and insight from the client, local community, and provincial government. Located on a prominent site in the city, the library provides an impressive range of spaces that accomodate not only books, but an auditorium, restaurants, study areas, and community meeting rooms. These spaces are housed within a series of large, fully glazed boxes that have been stacked high and stepped to provide cantilevered lookouts and landscaped terraces at a busy urban corner. The building offers sweeping views over the Citadel and Halifax Harbor and across the water to Dartmouth and the seascapes and forested horizon beyond. It assertively recalls contemporary landscapes of stacked shipping containers on waterfronts. Although such images are familiar in Atlantic Canada, the expressive gesture of big boxes, casual stacking, and demonstrative cantilevers now also characterizes a new international style in contemporary architecture.

An enthusiasm for the vernacular, clearly demonstrated by architects in the region, together with the projection of design into local communities by students and teachers, has stimulated a widening awareness and interest in architecture throughout Atlantic Canada. People there have become enthusiastic patrons of and advocates for contemporary design. Simultaneously, increasing flows of international capital into the region have prompted those patrons to seek out and commission both emerging and internationally established architects to design new buildings in the region. In contrast to the modesty of earlier projects, many of those buildings are substantial in size and flushed with ambition. Consequently, clients and architects, searching widely for inspiration, are now creating new buildings in Atlantic Canada that, responding to a seemingly insatiable appetite for striking imagery, are radically transforming the vernacular into spectacle.



# 12

## Arctic Architecture: Standards, Experiments, and Consensus

Lola Sheppard and Mason White



Architecture has played a subtle yet forceful role in transforming the Canadian Arctic, arguably becoming the most legible tool of "internal colonialism" during the region's dramatic modernization of the past century.[1] Prior to contact, movement and impermanence were ingrained in the culture and spatial practice of Indigenous people of the Arctic, producing architecture that was adapted to each season. This abruptly changed with the introduction of permanent structures, built using nonlocal materials and forms. But how did these imported buildings relate to the cultural, logistical, and environmental aspects of the North? And what are the possibilities for an authentic northern vernacular in terms of expression, siting, and programming?

From the 1890s to the 1940s, trading posts, mission buildings, and Royal Canadian Mounted Police military installations across the Arctic catalyzed rapid transformation.[2] These early structures served as colonial nodes of southern economic, cultural, and defense networks. The presence of trading, missionary, and military organizations spurred seasonal camps, which then gave rise to more permanent settlements. These developments imposed more permanent housing, which created shifts in domestic patterns on Indigenous people, profoundly changing the social life of inhabitants. Today, there remains considerable variety in urban form and architecture across the Arctic—from west to east, from coast

to inland, from urban capitals to remote hamlets. Subtle distinctions exist between the various northern peoples' land claim agreements and responses to cultural preservation and modernity. Furthermore, resource and infrastructure development as well as urbanization have occurred unevenly. And limited access to these communities by air, road, and water generates disparities in the capacity for delivering goods and building supplies. However, these challenges remain common among small, dispersed Arctic communities and have sometimes yielded Arctic-specific architecture, urban design, and infrastructure responses.

The radical transformations that have occurred in Arctic Canada over the past fifty years is remarkable. The evolution of the three territorial capital cities provides a useful barometer. Whitehorse, capital of Yukon, was incorporated in 1950 with a population of 2,500. It has grown tenfold to over 25,000 residents today. Yellowknife, capital of the Northwest Territories since 1967, was incorporated as a city in 1970 with roughly 6,000 people; it has also grown rapidly, to 19,600 today. Iqaluit, capital of Nunavut, was only recognized as a settlement in 1970, with a population of approximately 2,000; today it has 7,800 residents.[3] The modest size of communities in Arctic Canada becomes evident when comparing them to Russia's or Alaska's larger polar municipalities. However, the rapid rate of growth in Canadian territories has defied conventional methods of providing social, cultural, and mobility infrastructure.

This chapter observes three key phases in the evolution of Canada's Arctic architecture over the past fifty years: (1) the search for design standards, (2) an era of design experiments, and (3) the introduction of consensus-building. These phases are not sequential but rather overlap and coexist. Subsequent to the settlement period, from the 1950s and 1960s onward, government agencies deployed housing prototypes that represented a search for standardized design solutions, often without regard for climatic and cultural nuances. These standards were of little architectural value, though their legacy of efficiency and expediency remains evident in design and construction approaches today. During the 1960s and 1970s, a series of experiments produced novel technological responses to Arctic building challenges. Urban design approaches specifically calibrated to the climate of the region also began to emerge during this time. More recently, since the 1990s, there has been a shift toward consensus-based design that is more sensitively informed by Indigenous culture.

### The Search for Standards

Most housing prototypes introduced since the 1950s were grossly insensitive to the Arctic's unique social structures and harsh climate. They were poorly built and finished, without proper insulation, and were far too small to accommodate traditional extended families.[4] The earliest units, offered by the federal government, were prefabricated plywood dwellings under 300 square feet (28 square meters); they were nicknamed the "matchbox" because of their small size and simple shape. **FIG 1** Another unit type was named the "512" in reference



**1**
**Matchbox House 370A, Northwest Territories, c. 1960.**

to its square footage (47.6 square meters). Evidently, the intent was to provide only the minimum structure and space that might qualify as shelter. The matchbox and the 512 became a unit-by-unit colonial force that created significant social and cultural problems still evident today.

Despite the deployment of over twelve hundred units, only a few years after the loan program began, the houses were failing to fulfill the most basic promise of affordable home ownership for Inuit. They were "drafty, cramped, unsafe and totally unsuited" to life in the Arctic.[5] The 1960s saw a policy move toward rental housing, which started to address issues of affordability, although social and environmental needs remained neglected. As home ownership and rental availability increased within communities, planning tailored to context was overlooked, leaving urban form to be "designed on a pattern suited to southern Canadian suburbs."[6]

A turn toward more suitable housing came with the creation of the Northwest Territories Housing Corporation (NWTHC) in 1974, which also served the territory of Nunavut until its separation in 1999, and the Yukon Housing Corporation from the Housing Corporation Act of 1972. In its first six years, NWTHC constructed and deployed over thirteen hundred new rental units and implemented programs that encouraged families to build their own homes from local materials while offering assistance with such essentials as windows, doors, and hardware. One of these deployed units was the "Weber" house type, purchased from Weber Homes of Saskatchewan, which became the standard government-issued house by the late 1970s. **FIG 2** At 900 to 1,600 square feet (83.5 to 149 square meters), it was larger than the matchbox and began to address the needs of Inuit family structure. Another type, the "Woolfenden," developed specifically for the region by the Woolfenden Design Group in 1979, offered a multiunit configuration.

A few years later, NWTHC developed an improved Woolfenden model that sought to address "the pattern of extensive and long-term visiting between households, and storage requirements for bulk foods, storage and maintenance of hunting equipment, snowmobiles and the like."[7] Over the ensuing eight years, NWTHC worked iteratively through five types of units. In contrast with previous standardization efforts, there was an interest

**2**
**Weber House, Northwest Territories, c. 1974.**

in integrating technological innovations with social accommodations. In 1979, they introduced a two-bedroom duplex at 1,000 square feet (93 square meters), with an enclosed porch and an unheated storage room, observing that "a house must effectively represent the needs of the hunter."[8]

The practice of developing and deploying housing prototypes across the territory—often with little adaptation to context and shifts in culture—remains a legacy of government housing approaches in the Arctic. In the 2010s, the Nunavut Housing Corporation, established in the wake of Nunavut's 1999 separation from Northwest Territories, experimented with 10-, 24-, and 33-unit multiplex buildings. While they better addressed quantitative housing needs, these multiplexes revealed complex cultural issues as they pushed the limits of appropriate population density for a people for whom connection to the land is central to identity. Indigenous people tend to consider the land as home rather than a house as home, a concept evident in the greater continuity between inside and outside in traditional architecture—something the large multiplex with stacked units did not successfully provide.[9] Arguably, the five-plex house could be considered the most effective at balancing urgent housing shortages with cultural needs, land availability, and today's construction logistics.

Ongoing housing shortages in Nunavut, Nunatsiavut (northern Labrador), and Nunavik (northern Quebec) continue to create immense pressure to quickly supply cost-effective housing stock in large quantities. However, high transportation costs, tight construction timelines, and the risk of cost overruns render design experimentation challenging. This has resulted in a tendency to pursue standard, repeatable housing typologies.

### Rethinking the Domestic

In the past two decades, there has been an ongoing effort to redesign housing prototypes to better accommodate contemporary life and energy requirements, and to facilitate a more inclusive design process. In 2006, the Canada Mortgage and Housing Corporation (CMHC) initiated a study led by researcher William Semple to develop the Northern Sustainable House. Designs were produced through workshops with the Nunavut Housing Corporation in Arviat, the Tr'ondëk Hwëch'in First Nation in Dawson City, Yukon, and with the Northwest Territories Housing Corporation in Inuvik. Through this extensive community consultation, the project attempted to address technical challenges as well as cultural practices and comforts. Critical spatial elements—such as cold porches, sealift storage, large open rooms to hold family gatherings, and separate seasonal entrances—were all identified and incorporated. Cultural needs to host family feasts, prepare traditional country food, and sew skin clothing in a cool room (kept cooler than a living room or bedroom) were also integrated into the design.[10]

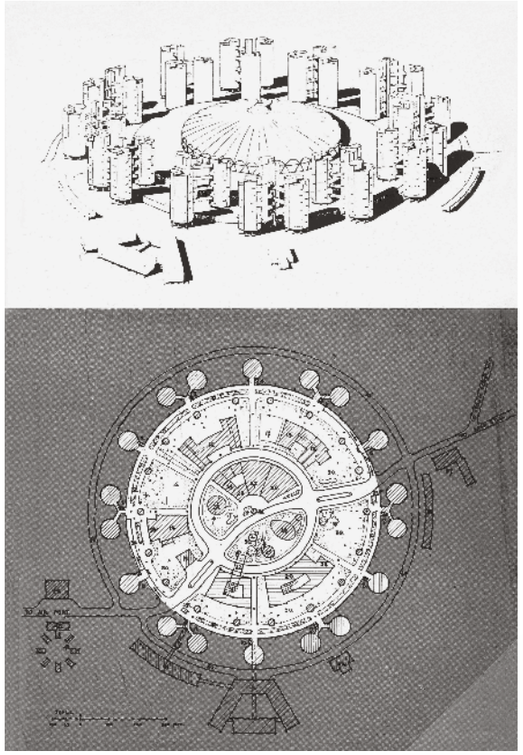
There have also been shifts in the design of multiunit housing in the North, notably in architect Gino Pin's housing in Behchoko for the Tlicho community, and in his McDonald Drive condominiums (2008) in Yellowknife's Old Town neighborhood. **FIG 3** The eight-unit McDonald complex uses the consistent thermal warmth of the site's rocky outcropping for energy benefits. In Whitehorse, Kobayashi Zedda Architects has been building small-scale condo units in the center of the city, such as the eight-unit Judy Condos (2009), offering an antisprawl alternative to the predominant oversized houses on large lots.[11]

Most houses in the territories are rentals that are financed, built, and maintained by the territorial housing corporations. The terms of rental housing limit spatial modifications by their occupants in response to cultural desires or entrepreneurial pursuits. Scholars such as Frank Tester have suggested that alternate ownership models, like cooperative housing, might provide greater flexibility in the housing continuum of Canada's northern territories.[12] Tester explains that one of the challenges of housing in the Arctic is "to develop a social housing policy that attempt[s] to treat housing as a social need and not a market commodity."[13] Housing must also be seen as a cultural need, reinforcing Indigenous community and family patterns, not resisting them. Although many recent initiatives by architects have considered these issues, there remains an unwillingness to fund this type of approach on a larger scale. The housing needs in the Arctic are dire, particularly in Nunavut, Nunavik, and Nunatsiavut—however, the solution cannot simply be more housing. Rather, what is needed is more culturally responsive housing and ownership models.

### Experiments I: Arctic "New Towns"

Parallel to the search for standards, several designers and government organizations took risks in the search for new Arctic typologies. In particular, the rapid growth of Frobisher Bay (renamed Iqaluit in 1987) presented an ideal context for imagining an Arctic-specific urbanism. The area's population has increased sharply since the 1950s due to an influx of government and military administrators as well as subsequent Inuit migration. Frobisher Bay transitioned from a military base to an administrative headquarters for the construction of the Distant Early Warning (DEW) Line from 1955 to 1957[14]; following this intense activity, it remained an informal collection of temporary structures, shacks, and hangars.

3
McDonald Drive condominiums, Yellowknife, Northwest Territories. Pin/Taylor Architects, 2008.



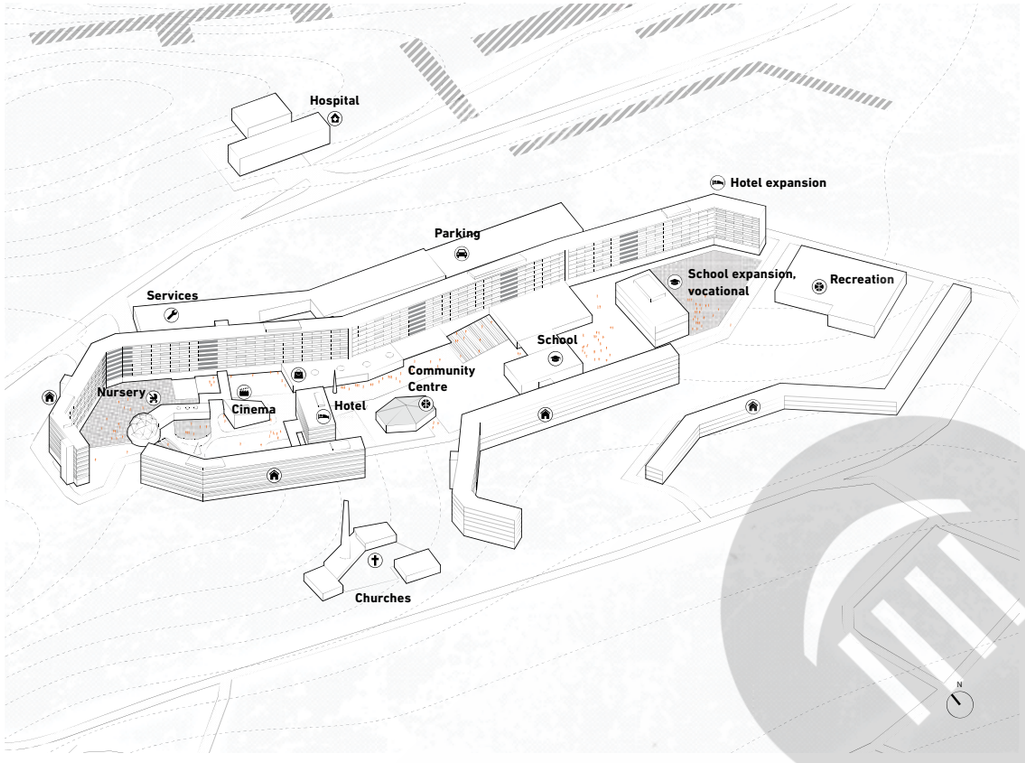
**4** left
**New Town I, overall sketch and plan, Frobisher Bay (now Iqaluit), Nunavut. E. A. Gardner, Chief Architect of the Department of Northern Affairs, 1958.**

**5** opposite
**New Town I, perspective.**

The Frobisher Development Group Committee was formed in 1958 to establish a civilian Arctic "New Town."

The first (unofficial) proposal for a town on Frobisher Bay was a futuristic plan by the federal chief architect's office to house one thousand people. **FIGS 4–5** New Town I was organized as a dozen clusters of twelve-story housing towers around a large central dome; the latter contained two schools, two churches, a community center, a fire hall, government offices, shops, restaurants, and a hotel, all within a massive atrium. In its ambition for total metabolic and programmatic self-sufficiency, New Town I included an atomic heating plant, a hydroponic vegetable garden, and a battery-powered internal monorail. The tower clusters were linked to the dome and to each other by a series of enclosed elevated walkways, providing an interior environment protected from the harsh climate.[15]

A second, more viable proposal was solicited in 1960 from Peter Dickinson Associates of Toronto, working with Rounthwaite & Fairfield. Three versions of the scheme tested high-, medium-, and low-rise apartment buildings. The low-rise scheme, composed of three slab buildings of six to eight stories, was deemed most feasible. It incorporated a cinema, hotel, nursery, and auditorium in an elevated plaza. The residences formed long wall-buildings that enclosed a courtyard, sheltering it from the strong Arctic winds.[16]




**6** opposite
**New Town II, re-drawn axonometric view, Frobisher Bay (now Iqaluit), Nunavut. Peter Dickinson Associates with Rounthwaite & Fairfield, 1960.**

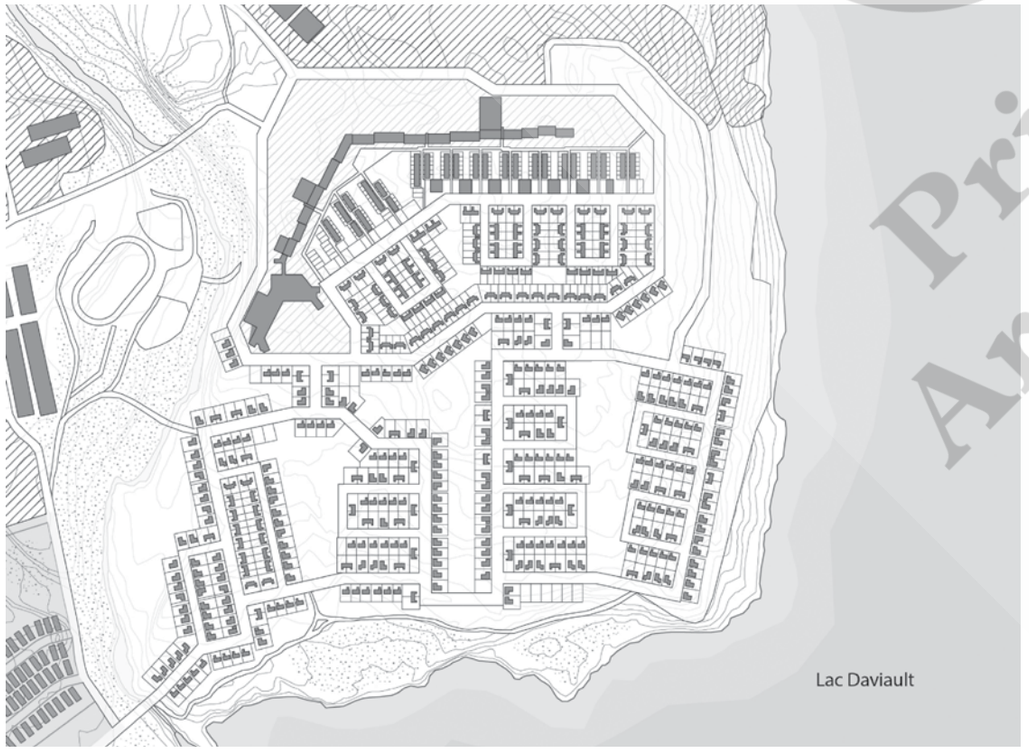
**7** right
**Resolute Bay project, perspective view, Resolute Bay, Nunavut. Ralph Erskine, c. 1976.**

Dickinson's New Town II (1960), though not built, informed the eventual realization of the Astro Hill Complex (1976), a modest aggregation of four buildings, including two residential slab towers set on bedrock, overlooking the bay. Today, the complex contains government offices, the headquarters of CBC North, a cinema, and a large hotel and multi-use complex. However diminished, the project retains the legacy of earlier ambitions for a building-complex-as-interior-city that is shielded from the elements. **FIG 6**

While the Frobisher Bay proposals offered a futuristic, high-modernist vision of Arctic urbanism in the mold of the International Style, another emergent strand of thinking called for an Arctic and subarctic urban vernacular. Swedish architect Ralph Erskine's work remains an important foray into this vein of large-scale urban design for the North. Erskine (1914–2005) drew international architectural attention in the early 1960s, in part through his cold-climate-responsive urban designs for the Swedish mining towns of Svappavaara and Kiruna. In 1970, the federal government hired him to develop a proposal for Resolute, the country's most northerly community and one of the coldest inhabited places in the world. The design scheme continued ideas initially developed in his siteless 1958 proposal for "An Ecological Arctic Town." The design brief for Resolute sought to integrate and consolidate the 140 Inuit—making up 32 households—who were forcibly relocated to the area in 1953 from farther south. This group was forced to settle within five miles (eight kilometers) of the fluctuating population of 250 to 600 administrative and military personnel who lived near the air base. The new town was intended to accommodate 1,200 residents in all, with provisions for a future population of 3,000. **FIG 7**

The initial relocation of Inuit families from the south to the desolated high Arctic in the 1950s as well as the town plan later proposed by Erskine are both instances of "social engineering," according to historian Alan Marcus. Indeed, many aspects of Erskine's design revealed the gaps between modernism and culturally-informed design.[17] The horseshoe-shaped perimeter building was to contain apartments for government personnel as well as a communal area with shops, a restaurant, and a library, with a swimming pool and an indoor botanical garden attached at the top.[18] These programs were to encircle a low-density fabric of individual homes for Inuit, a freestanding church, and a school—creating a contentious social organization in which *qallunaat,* or non-Inuit, would surround and look down upon Inuit.

Erskine's overall massing concept employs an urban "windscreen" to create a protected microclimate. However, the location and role of the windscreen perimeter wall conflicted with local practice. The town was sited on a hill—presumably for views to the bay, which




**8** opposite, top
**Fermont, Quebec, view with windscreen wall and civic buildings in foreground. Desnoyers Schoenauer, 1972; with subsequent work by Desnoyers, Mercure, Gagnon, Sheppard architectes in association with Laroche et Derry architectes.**

**9** opposite, bottom
**Fermont, Quebec, re-drawn plan showing original site strategy and the expansion of town since opening.**

**10** right
**Fermont, Quebec, view of windscreen wall with entrances and circulation cores marked by color.**

appealed to the *qallunaat* sensibility. Yet Inuit preferred to build their settlements near the shore for access to hunting and fishing sites. Furthermore, Erskine's focus on protection from the wind, which again appealed to a Euro-Canadian sensibility, overlooked the fact that wind plays an essential role in clearing snow, and an enclosure wall would encourage snowdrifts to pile up in the center—exactly where Inuit houses were to be located.[19] Construction began on a fragment of the perimeter building, but the project was abandoned in 1978 for economic reasons and left only partially realized. Despite the initiative's problems Erskine's Resolute experiment is notable for attempting to merge a comprehensive vision of the environment and social life with a direct response to climate. It was a search for an Arctic vernacular.

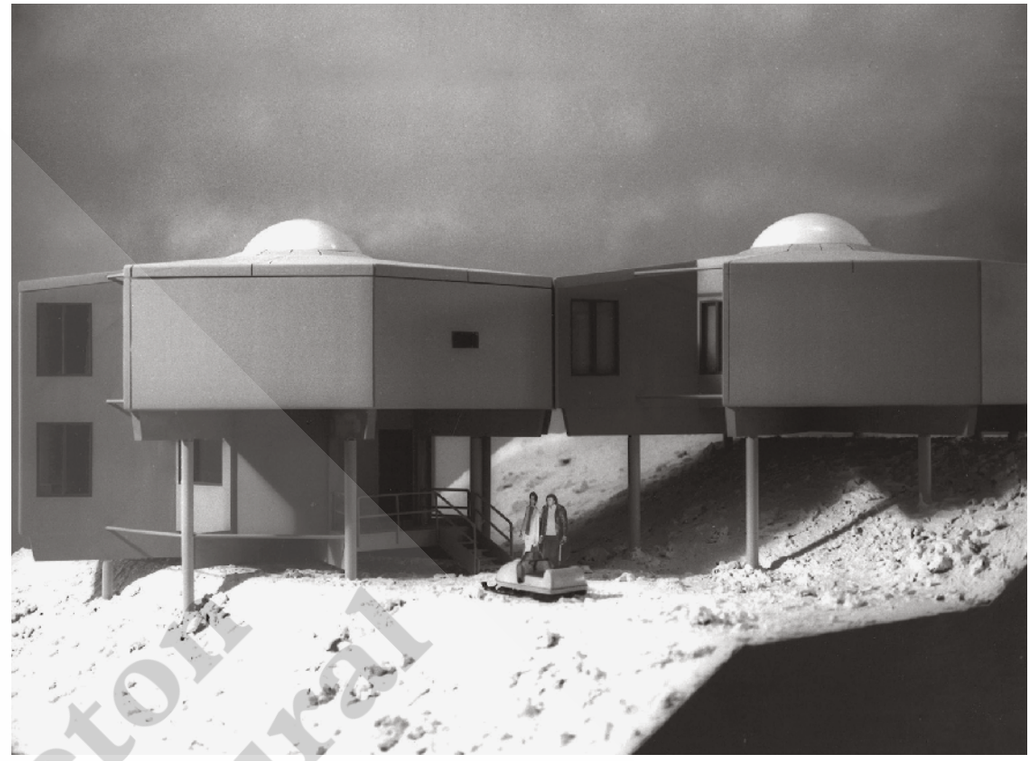
Subsequent town planning projects inspired by Resolute proved more successful, including the town plan of Fermont in northern Quebec, built as a company town in 1972 for Quebec Cartier Mining with its nearby iron ore mine. **FIGS 8–11** Located 745 miles (1,200 kilometers) northeast of Montreal, the town was to house 5,000 inhabitants, although its population mostly hovered closer to 3,500 and has declined to 2,500 in the past two decades.[20] The project, designed by Montreal-based firm Desnoyers Schoenauer,[21] embraced Erskine's concept of the windscreen wall to protect the area in the "shadow" of the screen from prevailing winter winds. The 0.8-mile-long (1.3-kilometer) windscreen building consolidated all the public functions and organized them along an interior street. According to architect Adrian Sheppard, the aim "was simple and unequivocal: to design a human settlement in the form of a physical setting which is conducive to good family and community life. In so doing, the planners had to address two main concerns: the physical conditions, and the other psychosocial realities."[22]

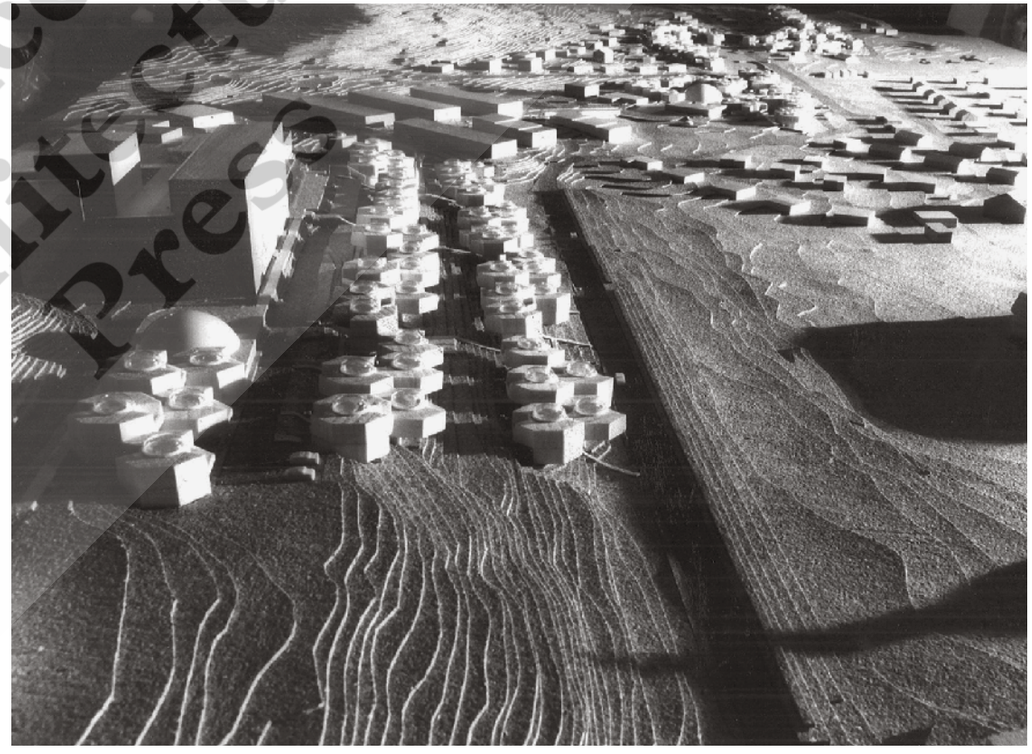
Norbert Schoenauer (1923–2001), a housing scholar and planner, identified four previous generations of subarctic settlement: temporary and periodic settlements inhabited by Indigenous people; haphazard and informal settlements built by the pioneers; "new towns" built by large mining companies modeled on typical suburban patterns; and towns modeled on the suburbs but with a more compact, commercial town center.[23] He describes Fermont as a fifth-generation subarctic town. It is organized around three climate-responsive design

**11** left
**Fermont, Quebec, view of interior street in windscreen wall. Desnoyers Schoenauer, 1972; with subsequent work by Desnoyers, Mercure, Gagnon, Sheppard architectes in association with Laroche et Derry architectes.**

**12** opposite, top
**Housing proposal for Frobisher Bay, unit study of prefabricated module, Iqaluit, Nunavut. Moshe Safdie and associates, architects and planners, 1974.**

**13** opposite, bottom
**Housing proposal for Frobisher Bay, site model showing aggregation pattern of prefabricated housing units on the site.**





premises: compact land use, the creation of microclimates through building massing, and the provision (through the interior street) of year-round climate-controlled access to communal facilities. These ideas were intimately linked to concerns for energy conservation, limiting the impact on the natural physical environment, and affording the inhabitants the greatest amount of physical comfort in the winter months.[24]

Located on the northwest boundary of Fermont, the windscreen building yields a protective microclimate for the lower-density residential buildings on the leeward side, but it causes more snow to accumulate. The encircling building contains all the necessary community facilities: commercial stores, town hall, fire station (now relocated), school, swimming pool, cinema, sports center, police station, hotel, and even three prison cells. Apartments are located on the upper floors. For reasons of wind flow, the central part of the building is five and a half stories high, while the extremities are three and a half stories. In order to maximize the protective effect of the screen, housing units are distributed with decreasing density the farther they are from the windscreen. A diversity of housing types was offered to accommodate various inhabitants. Townhouses are the closest to the windscreen; farther away are the semidetached units; and detached bungalows are at the outskirts. While the project creates a highly defined community in spatial and planning terms, it falls short of its full potential as a socially dynamic public realm. Nonetheless, it remains one of the most compelling site-specific and purpose-built modern experiments in urban form to be found in the subarctic and Arctic regions.

### Experiments II: Prefabrication

As comprehensive new towns were being envisioned, the 1970s also saw a higher degree of technological experimentation at the building scale. Canadian architects, such as Papineau Gérin-Lajoie Le Blanc architectes and Moshe Safdie (1938–), among others, offered new technological responses to building in the Arctic. Due to the extreme climate and difficult access, the challenges—including material performance, material transport, availability of

**14** left
**Gordon Robertson Education Centre, construction in progress, Iqaluit, Nunavut. Papineau Gérin-Lajoie Le Blanc architectes, 1973.**

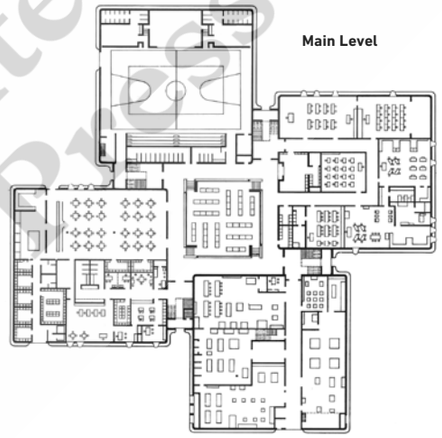
**15** opposite, top
**Gordon Robertson Education Center, exterior view.**

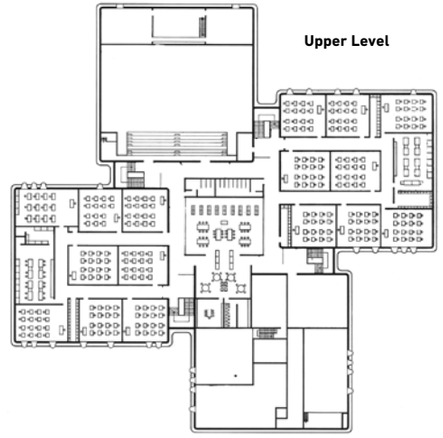
**16** opposite, bottom
**Gordon Robertson Education Center, plans.**

skilled labor, and, of course, the significant costs of all of these—are unmatched by those in design and construction anywhere else in Canada.

Following the success of the Habitat 67 experimental housing project in Montreal [see pages 46–47 and 162–163], in 1974 Moshe Safdie was invited by the government of the Northwest Territories to develop prototypes to replace government housing. **FIGS 12–13** One scheme he proposed was a series of modular, structurally independent octagonal units, which could be arranged in rows and terraced on a slope facing the bay. The modular strategy meant the units could be extended horizontally, vertically, or diagonally. The repetitive nature of this project raised the question of how many units one might cluster within a given neighborhood or community and still achieve a reasonable population density. They were to be made of stress-skinned panels covered with a fiberglass gelcoat, and they'd be built on piles, with only a cold room and a vestibule at grade. The elevated main level, based on an octagonal layout, had two wedges omitted from the plan to provide light and views. The remaining six wedges contained kitchen, dining area, and bedrooms, with a common living room and stair in the central space.

Safdie had difficulty relating the project to context, because the community was still transitioning from its former identity as a military camp. Reflecting on this dilemma, he



**17** above
**Nakasuk Elementary School, Iqaluit, Nunavut. Papineau Gérin-Lajoie Le Blanc architectes, 1973.**

**18** opposite
**Igloolik Research Centre under construction, Igloolik, Nunavut. Papinau Gérin-Lajoie Le Blanc architectes, 1975.**

noted that "contextualism was to recognize the extraordinary conditions that are unique to the place, but there wasn't an architectural heritage that one could identify with the region; one had to invent something new."[25] The project was to be built by a Japanese firm that was considering setting up in Canada. When the company withdrew, alternative construction methods rendered the prototype too expensive.[26]

Possibly the most successful experiments of this era were designed by Montreal firm Papineau Gérin-Lajoie Le Blanc architectes (PGL). Montreal had long been a vital connection to the eastern Arctic, because it possessed a strategic port for shipping materials and goods and offered access to prefabrication and resupply businesses. Over three decades, PGL developed designs that were both innovative for the time and acknowledged the specific logistical challenges of modern Arctic architecture.

In 1968, under the leadership of principal Guy Gérin-Lajoie (1928–2015), the firm began work in the Arctic with a small addition to the school in Pangnirtung, on Baffin Island. PGL's first stand-alone building in the North was the Gordon Robertson Educational Centre in Frobisher Bay, Iqaluit, completed in 1973. **FIGS 14–16** Along with six later projects by PGL, it employed what Gérin-Lajoie called a "composite total building" concept, which integrated a system of faceted, prefabricated panels made of glass fiber–reinforced

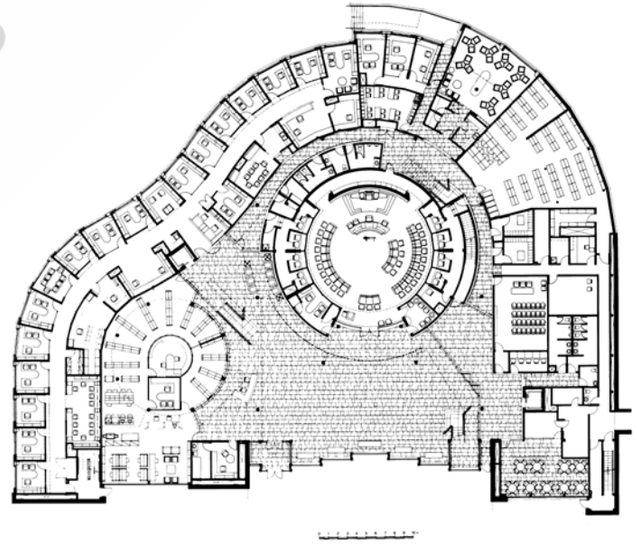
polyester resin with an internal layer of insulating foamed polyurethane. Gérin-Lajoie advocated for this system because of its speed and ease of construction and its potential to make use of local labor and skills. The building enclosures could be erected in thirty-five days by a team of four workers and one supervisor, and the panels were small enough to be lifted without heavy machinery. The quick build time allowed the frame and skin to be constructed during the short summer season and the interior to be finished afterward within a climate-controlled shell.[27] As historian Marie-Josée Therrien notes: "[Gérin-Lajoie] approached the challenges of the region with the enthusiasm of an inventor and the mindset of an industrial designer, at a time when the field of plastic manufacturing was making major strides."[28]

The 1973 Nakasuk Elementary School in Iqaluit is emblematic of many of PGL's buildings, which are notable for their unique shape, geometric cladding, and seemingly hermetic quality due to a scarcity of windows, reflecting a perception of the climate as inhospitable.[29] **FIG 17** In the Nakasuk School, modularity shapes the interior space as well as the exterior cladding, and provisions for an addition are also incorporated into the design. PGL completed five public projects in Iqaluit alone, and their use of prefabricated fiber-reinforced plastic began to define, at the time, a local vernacular suggestive of an Arctic approach to architecture. **FIG 18**

### Constructing Consensus

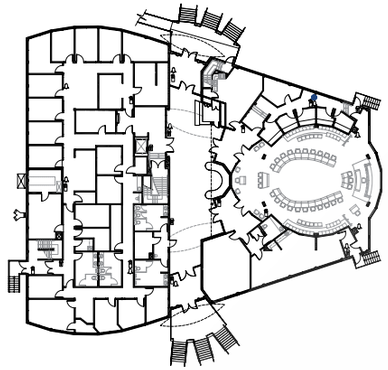
Many of these urban design, architectural, and technological experiments occurred in an era when decision-making in the Arctic was still overseen by federal authorities in Ottawa. In recent decades, communities have grown and the territories have gained political autonomy; in tandem, an increasing number of buildings have been designed that better accommodate culturally integrated programs and practices. This can be seen in firms such as Ferguson Simek Clark Engineers and Architects (now Stantec Architecture), Pin Matthews Architects (later Pin/Taylor Architects, now Taylor Architectural Group), EVOQ (formerly FGMDA, and led by Arctic-specialized principal Alain Fournier) and, more recently, Kobayashi Zedda Architects and Blouin Orzes Architectes. This contemporary Arctic vernacular is primarily seen across the territories in social and cultural projects, such as schools, cultural centers, and government facilities.

The Legislative Assembly of the Northwest Territories in Yellowknife, by Ferguson Simek Clark and Pin Matthews Architects, in association with Matsuzaki Wright Architects, provides a distinct example of a northern vernacular. Completed in 1993, it resulted from lengthy debate and discussions on an architectural identity for the Northwest Territories. **FIGS 19–20** The team chose a location on the southern edge of Frame Lake, where the building would nestle into rock outcroppings with minimal disturbance of the trees and ground. By facing the building to the lake rather than to the urban center of Yellowknife, the design intent was to connect the low-slung legislature to its natural



**19** above
**Legislative Assembly of the Northwest Territories, Yellowknife, Northwest Territories. Ferguson Simek Clark Engineers and Architects and Pin Matthews Architects in association with Matsuzaki Wright Architects, 1993.**

**20** right
**Legislative Assembly of the Northwest Territories, ground-floor plan.**



surroundings, encouraging government members to identify themselves within the landscape. A great hall serves as a community gathering space, and the legislature includes a one-story caucus as well as administrative offices that wrap around a drum-shaped chamber. The exterior is clad with a mix of sheet and cast panels made from zinc mined within the territory. The Legislative Assembly includes a comprehensive landscape design developed with landscape architect Cornelia Hahn Oberlander (1921–) of Vancouver. By embracing the principle of minimal intervention, the plan takes advantage of native plant species to conserve biological diversity. A subsequent collaboration between Pin and Oberlander, at the East Three Secondary School in Inuvik (2012), explores similar ambitions of integrating building and landscape.

A few years later, the Legislative Building of Nunavut (1999) in Iqaluit was completed by Montreal-based ARCOP Group with Keith Irving of Full Circle Architecture in Iqaluit, to house the territory's newly formed government. **FIGS 21–22** When Nunavut was established in 1999, government institutions were strategically decentralized and spread throughout the territory. This stemmed from a desire to distribute the wealth of administrative jobs, as well as from an attempt to imagine a less hierarchical political structure that brought government closer to residents.[30] As a result, the designers of the legislature were also asked to construct smaller, community-based government buildings and housing.[31] ARCOP's Norman Glouberman and Bruce Allan, the lead architects on the project, suggested constructing government housing in Iqaluit as a first step; the housing would be used as a training ground for local tradespeople, who would then work on the legislature building. In order to leverage the skills gained from housing construction, the legislature was designed as a heavy timber structure, an unusual move for a public building in Nunavut. The program was effective: 70 percent of the workforce was Inuit.[32] The ark-like profile of the building is shaped in response to wind and snow. The resulting legislature is one of the most striking buildings in Iqaluit, even though it is unceremoniously located in a downtown parking lot. The temporary nature of the facility may explain the perfunctory siting—it was designed to be leased by Nunavut Construction Company to the government for twenty years and then converted to offices once a permanent legislature is built.[33]

**21** opposite, left
**Nunavut Legislature Building, Iqaluit, Nunavut. ARCOP Group with Full Circle Architecture, 1999.**

**22** opposite, right
**Nunavut Legislature Building, first-floor plan.**

**23** above
**Keewatin Regional Education Centre, Rankin Inlet, Nunavut. Ferguson Simek Clark Engineers and Architects, 1986.**

**24** opposite
**Kiilinik High School, Cambridge Bay, Nunavut. Pin / Taylor Architects, 2002.**

**25** right
**Kiilinik High School, interior.**

The design of schools is perhaps the clearest record of architecture's evolving role in the Arctic region, and represents the political and cultural aspirations embedded within both federal and territorial governments.[34] In many Arctic communities, the school takes on a significant role—serving simultaneously as place of learning, performance space, and meeting and education space for community groups, among other functions. Yet the design of schools remains a difficult issue because of the profoundly troubling legacy of residential schools in Canada; for many Indigenous people forcibly removed from their homes as children, schools were places of physical and emotional abuse, and indeed of cultural genocide.[35]

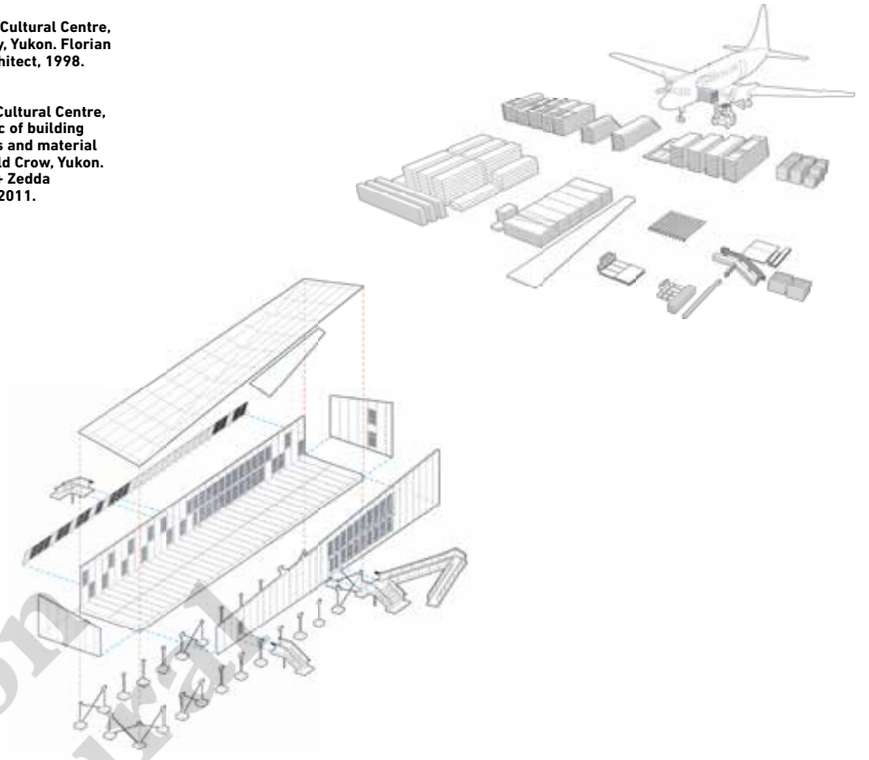
Since the 1980s, when most residential schools had closed, there have been several significant education buildings designed by architects such as Ferguson Simek Clark, Pin / Taylor, and Stantec. Community consultation is increasingly integrated into the early phases of the design process to better integrate Indigenous values and priorities. The Maani Ulujuk Elementary and Junior High School in Rankin Inlet (1982), by Clive Clark of Boigon and Armstrong Architects, exemplifies early efforts at taking a consultative approach, and dozens of additional schools and community centers followed in similar fashion.[36]

The Keewatin Regional Education Centre (1986), designed to house 108 students in double rooms, with two apartments for supervisors, innovated in its approach to massing and building envelope. **FIG 23** The protruding volumes were designed to enable easy expansion of the building at a future date. The red metal volumes adjacent to each window were adapted, with input from Gino Pin and Harold Strub, to enable a fresh-air vent in each room without permitting snow to enter. These seemingly simple innovations hint at new northern vernaculars.

Pin / Taylor Architects' many school designs include the Kiilinik High School (2002) in Cambridge Bay, Nunavut; the K'Alemi Dene School (2009) in N'Dilo near Yellowknife, Northwest Territories; and the East Three Secondary School (2012) in Inuvik. The Kiilinik High School is a low, saucer-like building with a rounded roof. **FIGS 24–25** The simplicity of the form is both modern and traditional. A cultural heritage center and public library are incorporated into the building; in small Arctic communities, modest populations and high construction costs require buildings to serve multiple functions. The rounded building turns its back to the wind: its geometry minimizes snow buildup on and around the building and uses natural wind-flow patterns to scour the perimeter of snow. Clerestory glazing and skylights extend the amount of light entering the school in winter, when daylight is limited, while reducing the amount of solar gain from the long summer sun. Like many of Pin's building, the Kiilinik School is clad in a simple material palette: its exterior is made primarily of relatively inexpensive corrugated steel, which is resistant to cold temperatures, wind, and freeze-thaw impacts.

Like Pin / Taylor Architects, Kobayashi + Zedda Architects (KZA), based out of Whitehorse, Yukon, have developed a body of work responding to the Arctic's unique climate and culture, as well as the logistical realities specific to Yukon. A formative early project for the Yukon firm was the 1998 Dänojà Zho Cultural Centre in Dawson City, Yukon, completed under the predecessor firm Florian Maurer Architect (of which Jack Kobayashi was copartner) [see pages 128–129]. **FIG 26** The building was originally conceived as the Han Cultural Centre—a place for the Han people, the original residents of the area, to tell their story. It is sited with a remarkable view to the Yukon River, activating the town's relationship to the water's edge. The center offers spaces to collect and display artifacts and to host cultural events from dance to storytelling. Inspired in part by the structural logic of Indigenous fish racks and traps, the building evokes this traditional construction both in its materials and building forms and sits in striking contrast to the Klondike-era Edwardian architecture of most of Dawson City. The delicate façade structure represents a significant challenge in the north, where volumes tend to be simple and monolithic in order to achieve stringent building performance.[37]

A more recent cultural centre by KZA, the John Tizya Centre, completed in 2011 in Old Crow, evolves the notions of a northern vernacular. The cultural center is the second building KZA has built in this remote Yukon community, and has no road and, very unusual for the north, no boat access. As a result, all building materials had to be sent by plane and were limited to 3.3 feet (one meter) in width, the dimension of the



**26** opposite
**Dänojà Zho Cultural Centre, Dawson City, Yukon. Florian Maurer Architect, 1998.**

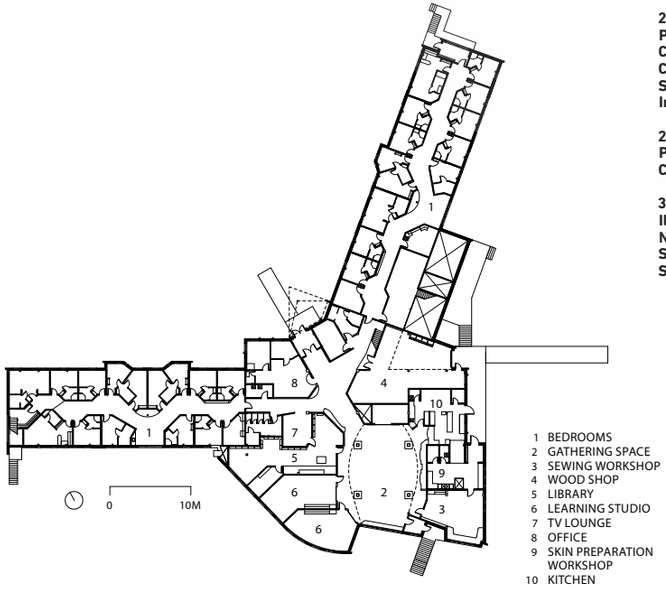
**27** right
**John Tizya Cultural Centre, axonometric of building components and material planning, Old Crow, Yukon. Kobayashi + Zedda Architects, 2011.**

plane aperture. **FIG 27** To this end, the building is constructed using Structural Insulated Panels (SIPs) to minimize on-site labor costs and material waste. As with many of their recent projects, building massing, use of color, and expressive use of technology begin to form a highly regionally specific architectural expression.[38]

Piqqusilirivvik is the Inuktitut name for the Inuit Cultural Learning Facility in Clyde River, Nunavut, by the Iqaluit office of Stantec Architecture with Fielding Nair Interna-tional. **FIGS 28–29** The project was opened in 2011 after a six-year process of collaborative integrated design. This entailed a two-year-long feasibility study involving workshops with elders and cultural advocates, in addition to research on folk schools and alternative education. Another year of elder consultation by the government of Nunavut included visits to many facilities around the territory to develop a working brief and proto-program. A three-year collaborative integrated design process followed, with workshops at all stages, both on-site in Clyde River and via virtual meetings.

The learning center represents a programmatic shift toward aligning public governance with local organizations and grassroots initiatives that strengthen and foreground cultural practices and learning methods. Rather than a static school or cultural center, it is active and constantly evolving—a laboratory for testing a curriculum that is taught and learned on the land, and which promotes the transfer of knowledge of traditional skills and crafts while reinforcing language skills. The building contains dedicated spaces for a sewing workshop, woodshop, library, skin preparation workshop, and large-capacity kitchen. These are arranged, according to one of the designers, "in a configuration that opens into and overlaps with flexible communal gathering and studio areas."[39] The building is a single story to support elders' needs and maintain a direct connection to the ground. In addition, Clyde River is known for some of the largest snowfalls and strongest winds in Nunavut; the building is therefore shaped and oriented to mitigate snow drift at its entries, clerestories, and mechanical intakes. One striking aspect of the project is its siting: it is somewhat removed from the town itself, since it was conceived as a territorial facility, as opposed to serving a single community.

More recent projects, such as the 2018 Illusuak Cultural Centre completed by Saunders Architecture with Stantec in Nain, Nunatsiavut, represent a new shift in priorities for cultural buildings in the North. **FIG 30** Here, a more global modernist sensibility, with expanded formal and material aspirations, is in evidence. The project is a multigenerational cultural center for the Labrador Inuit, and includes an exhibition space, auditorium, café, and offices for the Nunatsiavut government and Parks Canada. Located about 125 miles




**28** above
**Piqqusilirivvik Cultural Centre, exterior view, Clyde River, Nunavut. Stantec with Fielding Nair International, 2011.**

**29** left
**Piqqusilirivvik Cultural Centre, plan.**

**30** opposite
**Illusuak Cultural Centre, Nain, Nunatsiavut. Saunders Architecture and Stantec, 2018**

(200 kilometers) south of Torngat Mountains National Park, the Illusuak Cultural Centre is also envisioned as a beacon to promote cultural and ecological tourism in a region where the lack of intercommunity roads makes this challenging. Given the complex nature of building in the Arctic and subarctic, and the tendency toward cost efficiency, the formal ambition of Illusuak is notable.[40] More successfully than most Arctic buildings, it navigates between the existing fabric of the town and the natural geography of the water's edge (its proximity to the water demanded the construction of a raised ground). The project fuses a reinterpretation of fluid traditional forms with modern construction detailing, offering a new understanding of an Arctic vernacular.

## Conclusions, Projections

Historically, architecture in the Arctic was a colonialist tool imposed by newcomers, bringing about conformity via modernity. Historian Harold Kalman, in his 1994 *History of Canadian Architecture*, cites a northern architect of the time: "Many Northern designers have adopted an approach to design that is more pragmatic, and consequently less appealing…[producing] 'tight and well constructed buildings [that] strive to work in harmony

with the local climate and circumstance.'"[41] Such an argument, while true, might be taken as an excuse for architecture stripped of all quality. While not without failures, the technological and urban experiments of the 1970s were important in their quest for innovation and climatic responsiveness. Toward the end of the twentieth century, however, there emerged a generation of architects working across the Arctic that sought to identify a more culturally appropriate architecture.

In a region where all permanent buildings and settlements are less than seventy years old, what a truly Arctic architecture, landscape, and planning might look like is yet to be fully imagined. With an unfortunate amount of design being supplanted by concerns for expediency and efficiency, and curtailed by a fear of committing more mistakes, there is still not enough design risk-taking in Arctic architecture. New material assemblies, culturally informed programs, climatic-inclusive responses, co-designing methods, and approaches to logistics beckon the contemporary Arctic vernacular. Architecture and planning could potentially be effective tools of cultural empowerment—a means of making unique community patterns and family traditions spatially manifest.

Several new factors are emerging as the next challenges for architecture and planning in the Arctic. One of the limitations of recent work is a continued focus on singular buildings rather than the relationship among buildings and how they produce an urban realm. Another factor is the increasing relevance and role that an Arctic public realm might serve for its inhabitants. As Arctic communities continue to grow in population and in built footprint, how might mobility and seasonality shape urban thinking? A third factor is better responding to how most of the Arctic's Indigenous people (and many *qallunaat*) feel most content out on the land. The relationship of architecture to ground, landscape, and territory is an essential concept. A fourth factor is the increased need for Indigenous architects from the Arctic working in the Arctic—there is an urgent need for a design school in the northern territories. Architects have an enormous responsibility to design the Arctic's communities and the collective realm in a way that reflects its people, their values, their identity, and their sense of place today.



# Centers of Influence