Unsettling Ground: Arctic Urbanism on Fluid Geology
Instabilité du sol : Urbanisme dans l’Arctique sur une géologie fluide

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Building and Dwelling in Inuit Nunangat

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Article abstract

Ground is the transition across the surface and subsurface of the land, mediating environmental change and the stability of geological time. In the Canadian Arctic, dramatic seasonal cycles and warming trends are reshaping increasingly unstable ground. Inuit in communities such as Arviat, in southern Nunavut, have always dealt with geological instability using their traditional knowledge of climate and territory. However, the North has been aggressively shaped by systematic spatial interventions of resource-based economies, militarization, and administration. Federal building programs across the Territory have imposed visions of efficiency and modernity, transforming the land inhabited by Inuit into a settled ground. To “unsettle ground” is understood here as strategies to address gaps between the imposed stability and singularity of modernist, Northern master planning and housing and the richness and fluidity of the Indigenous landscape. Two trips to Arviat and extensive meetings with community members and housing advocates revealed numerous instabilities, including geological changes, adaptation of the Community Plan, and uncertain economics of public housing. Housing has failed to engage the land on a perfunctory technical level, in its ability to create a communal “social ground”, and on a larger scale the ongoing failure of community planning disregards community relationships to landscape. Conversations on the ground revealed community-centered building practices reclaiming spaces imposed by the strictures of modern colonial architecture and planning. Our research thus examines the multiple identities of ground and posits the possibility for new, respectful ways for architecture to inhabit the land in Nunavut while unsettling ground.

Cite this article

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ABSTRACT

Ground is the transition across the surface and subsurface of the land, mediating environmental change and the stability of geological time. In the Canadian Arctic, dramatic seasonal cycles and warming trends are reshaping increasingly unstable ground. Inuit in communities such as Arviat, in southern Nunavut, have always dealt with geological instability using their traditional knowledge of climate and territory. However, the North has been aggressively shaped by systematic spatial interventions of resource-based economies, militarization, and administration. Federal building programs across the Territory have imposed visions of efficiency and modernity, transforming the land inhabited by Inuit into a settled ground. To “unsettle ground” is understood here as strategies to address gaps between the imposed stability and singularity of modernist, Northern master planning and housing and the richness and fluidity of the Indigenous landscape. Two trips to Arviat and extensive meetings with community members and housing advocates revealed numerous instabilities, including geological changes, adaptation of the Community Plan, and uncertain economics of public housing. Housing has failed to engage the land on a perfunctory technical level, in its ability to create a communal “social ground”, and on a larger scale the ongoing failure of community planning disregards community relationships to landscape. Conversations on the ground revealed community-centered building practices reclaiming spaces imposed by the strictures of modern colonial architecture and planning. Our research thus examines the multiple identities of ground and posits the possibility for new, respectful ways for architecture to inhabit the land in Nunavut while unsettling ground.

KEYWORDS

Nunavut, architecture, community planning, geology, land

RÉSUMÉ

Instabilité du sol: Urbanisme dans l’Arctique sur une géologie fluide

Le sol est la transition entre la surface et le sous-sol de la terre, les changements environnementaux et la stabilité des temps géologiques. Dans l’archipel arctique canadien, les cycles saisonniers d’une extrême dissemblance ainsi que les tendances croissantes du réchauffement climatique rendent le sol de plus en plus instable. Les communautés Inuit, telles que les Arviammiut vivant dans le sud du
Nunavut, ont toujours su composer avec les sols instables de leur région grâce à leurs connaissances traditionnelles du climat et du territoire. Toutefois, le Nord fût radicalement transformé par l’imposition d’une économie basée sur les ressources naturelles, la militarisation et l’administration. Les programmes fédéraux à travers le Nord du Canada ont imposé des visions basées sur l’efficacité et la modernité qui ont transformé le territoire traditionnel jusqu’alors habité par les Inuit en un territoire colonisé. La « décolonisation » du territoire est une stratégie visant à combler les divergences imposées par le modernisme nordique afin de redonner au paysage autochtone sa richesse et sa fluidité. À la suite de deux voyages à Arviat ainsi que plusieurs rencontres avec les membres de la communauté et de la protection du logement, plusieurs irrégularités furent soulevées : les changements géologiques du sol issus des changements climatiques, l’adaptation des espaces et l’usage du Plan Communautaire, et finalement, l’insécurité financière des logements sociaux offerts dans la communauté. À l’échelle domestique, le marché résidentiel n’a pas réussi à utiliser les ressources de la terre autant sur le plan technique que social. D’ailleurs, l’échec répété de la planification communautaire continue d’omettre les relations existantes entre les communautés autochtones et leur territoire. Les observations et les échanges sur le terrain ont révélé la nécessité d’une nouvelle approche de planification afin que les communautés Inuit puissent retrouver l’identité et la richesse architecturale qui leur est propre. La recherche explore les diverses identités territoriales et propose de nouvelles possibilités afin d’offrir une architecture qui respecte l’unicité des cultures du Nunavut et l’imprévisibilité de son sol.

**MOTS-CLÉS**

Nunavut, architecture, planification sociale, géologie, territoire

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As life is treasured, so must the land be treasured. Just as family units knew and protected each other well, the land they occupied was as familiar as members of a family unit.

— Mark Kalluak, Elder

We examined architecture and planning’s relationship to ground in the community of Arviat, in the Kivalliq region of Nunavut (Kalluak 2017, 56). As the third largest and among the fastest growing communities in Nunavut, Arviat is the object of a significant proposed master-planned expansion designed to address the challenges of community growth. Unfortunately, the planned expansion and the first buildings constructed during the course of research for this piece reveal discrepancies between the planned construction of the Nunavut Housing Corporation and the concerns of a unique, community-centred building culture.
The notion of *unsettling ground*—the subject of this research—refers to a series of questions and observations around planned development in the community, imposing new grounds (social, economic and thermal) that transform the stability of a landscape subjected to unprecedented fluidity. Ground refers here to the physical processes and cultural perspectives that shape the landscape over time, and how Indigenous inhabitation challenges simple classifications of natural and developed landscapes (Tsing 2005, 175). Northern ground is shaped by environmental processes—climate, weather and geology—and the practices of design and construction—mapping, planning and building—that force the semblance of stability and fixity desired by colonial developers and administrators for sovereign territory or resource hinterland. Stable *ground (n.*) is the transition from the surface to the subsurface of the earth, mediating fast rates of environmental change from the soils and rock. The term can also be understood as the imposition of cartographic, planning, and architectural structures used to *ground (v.*) political, economic, or cultural power. Lastly, *ground (adj.*) describes the process of physical or cultural friction over time, eroding what appears to be stable and solid: ground can thus be gained, contested, and broken1.

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The community of Arviat was first founded in 1921 as Eskimo Point, a Hudson’s Bay Company trading post that connected the Arctic fur trade from Churchill to inland Inuit camps. Later, an RCMP station, a federal day school, and various church missions established the narrow point stretching out into Hudson’s Bay as an administrative and economic centre between Inuit and the Canadian State (Tester 2017, 22–23). While the Federal government’s policy of dispersal sought to keep the Inuit out on the land, the collapse of the Arctic fur trade following the Second World War brought migrations and evacuations from the interior, in the 1950s and 1960s, to coastal trading posts such as Arviat (Eskimo Point) and Tikirarjuaq (Whale Cove) (Damas 2002). Traditional camp life was so disrupted by the economies, policies, and interventions imposed by the RCMP that Inuit began migrating from traditional territories to informal settlements of shacks and snow houses for economic opportunity and support around the Qallunaat institutions in the town centre (ibid.). The informal settlement was overcrowded, living conditions were horrendous, and a brutal tuberculosis outbreak in 1962 finally resulted in the first Federal houses being constructed to address the urgent public health crisis facing the community (Tester, McNicoll, and Tran 2012, 168). The shacks and tents were quickly replaced by new wood-framed houses along gravel streets that followed the low glacial esker and stone beach at the edge of Hudson’s Bay.

The current Community Plan (accepted in 2010), responding to housing programs and a growing population of over 2800 people, extends the grid of property and streets set during the first response of Federal administrators in the 1960s across undeveloped stretches of saline and ice-rich permafrost by introducing static, wood-framed 5-Plex housing onto a landscape of seasonal and climatic instability (Forbes et al. 2013). Government housing programs have thus fashioned an idea of permanence built on profound cultural concepts that shape identity and the built environment in southern Canadian towns: the house as the seat of social stability, private property as economic prosperity, and the separation of the town from the surrounding hinterlands. In the North, conflicting priorities of housing as public welfare, on one hand, and as a market commodity, on the other hand, have confused the responsibilities of the Federal welfare State with efforts to assimilate Inuit into Canadian society and economies (Stern 2005, 72–74).

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The reality is that the ground in and around Arviat is continuously being shaped by dramatic seasonal cycles of the environment, development pressures, and deep geological processes of glaciation and retreat, causing the foundations of the modern-built environment (governed by State planning and mapping practices), to literally fall apart. Houses and spaces constructed on the shifting and melting ground have failed in Arviat on a perfunctory technical level while causing dramatic social upheaval in the Inuit peoples who inhabit these spaces. Moreover, Government housing programs have been unable to keep pace with the growth of most Nunavut communities who struggle to maintain overcrowded houses that are falling apart in the harsh Arctic environment. The proposed expansion of the Community Plan in Arviat will nearly double the size of the town, bulldozing the land and repeating the same ineffective design practices from forty years ago.

4. In conversation with members of the Arviat Housing Association, the local administrators of public housing, they estimated a need for over 300 new housing units to accommodate community members today, notwithstanding future growth in the town. The maintenance department of the AHA renovates and repairs damaged units, but also retrofits units to meet updated building codes and technologies that have been introduced since the 1960s.
ago. In response to the dire need for more housing, the planned Residential zoning and lots continue to perpetuate an urban form that maintains static relationships to increasingly unstable ground.

Figure 3. Arviat housing profile and present shortfall (author's drawing).
Friction between external assumptions made by designers of the territory and the richness and complexity of Inuit land is revealing what decolonial theorist and feminist anthropologist Anna Tsing (2005, 175) calls “gaps” between unstable and negotiated ground conditions. Gaps occur between the multiple rates of change in Northern ground and the static architecture that has been built in its communities. Planning and architecture practices across the North were instrumental in the brutal imposition of development projects on Inuit land and its people to fulfill national narratives of progress and sovereignty central to Canada’s ‘Northern Vision’ (Farish and Lackenbauer 2009, 523–524). The modern Arctic environment has thus been constructed by imported representational and material practices that have imposed a socio-spatial identity on the North while historicizing and suppressing Indigenous knowledge of the land. Today, the political myth of a resource hinterland and sovereign territory in the ‘Northern Vision’ is changing through continued Inuit activism and negotiations that first led to the Nunavut Land Claims Agreement (NLCA). Furthermore, there is growing recognition that the often-distant relationships between communities and the designers who shape constructed spaces need to be challenged to support the collective values and concerns of communities in Inuit Nunangat. However, observations on the ground continue to show persistent failures of housing projects to address instability as a condition of collective life for Arviamiut and as a technical condition of building on the land.

This project was carried out as a series of studies conducted remotely at the University of Waterloo and through two community visits to Arviat in May and August of 2018 to document instability between the land and buildings. Our findings reveal the impact of changing seasons on the ground and the daily life of the people of this community, belying the seemingly static space described in the proposed Community Plan. Different understandings of the ground are informed by the perspectives shared by community members, housing advocates, the Arviat Housing Association, and local Hamlet Government during informal conversations and meetings. Interviews and on-the-ground photographic studies of constructed and inhabited landscape document a unique design practice of a community grounded in a constantly changing landscape. Arviamiut are in fact building responses to problematic development practices and the shifting ground underfoot. As a local and informal architectural practice, these projects offer

5. The ‘Northern Vision’ was first created by John Diefenbaker during his election campaign as a national project and was later invoked by Stephen Harper as he too saw the land and water as a strategic and economic resource in the 21st century. Early planned Northern towns, such as Inuvik, were anchored in the territory by military airfields, radar stations, and bases.

6. The community visits occurred between April 29–May 10 and August 17–September 1, 2018.
a unique set of lessons to outside designers who continue to shape much of the Northern built environment. Three conditions of instability emerged from our research: *ground as fluid geology, as constructed terrain, and as home.* Beginning with the land itself, each ground condition unpacks the layered relationships between various rates of change in the land and how these shape State housing projects and Inuit building practices in Arviat.

**Figure 4.** The frontier of fill being expanded for future development (author’s photograph).

**Three shifting grounds in Arviat**

Euro-Canadian perspectives continue to exert authority over how the ground is interpreted as a building site without local readings of accelerating rates of change that occur in Arctic ground. For example, Inuk filmmaker Zacharias Kunuk and anthropologist Ian Mauro produced *Inuit Knowledge and Climate Change* in 2011 to record the most dramatic effects of anthropogenic climate change on the planet, as observed by Inuit across the high Arctic (Kunuk and Mauro 2010). Despite the fact that their conclusions were identical, the scientific community disregarded Inuit observations and concerns regarding a changing relationship between the fluctuating climate and their readings...
of the land. Scientists and policy makers considered their understanding to be more viable than that of Inuit.

The conflicting epistemologies and authority over who can best interpret the changing environment is also documented in artist and researcher Susan Schuppli’s video installation, *Can the Sun Lie*\(^7\). While the elders and hunters observed change through their multi-generational understanding of the environment, modern climate modelling questioned the accuracy and causality of Inuit observation, ultimately casting doubt on the perceptions of such dramatic climatic changes within a human lifetime. This epistemic divide between developers, scientists, and Inuit is not necessarily one of competing knowledges but rather a difference in how uncertainty and instability are given meaning. For the hunters observing the changes on the land, the strange and unfamiliar movement of the sun was indicative of a profound and disturbing imbalance in the environment, and a new challenge to their ability to follow the sun and stars across the land\(^8\).

Conditions of instability are multiple in contemporary Inuit communities across Nunavut. Instability is latent to the Arctic environment, but has also been constructed through colonization—and is now being amplified by the warming climate. Arviamiut have always known the land and water to be fluid, with seasonal change as a driver of adaptations to their traditional buildings and migrations across vast territories. On the other hand, planning and building projects by the Canadian State, which sought to establish control over the North, wrought social, economic, and cultural upheaval on communities such as Arviat. Today, instability is negotiated in the community through complex architectural responses to both environmental and social change.

**Ground as fluid geology**

In Arviat, the AHA has been undertaking a multi-year retrofit project on foundations for nearly all of the town’s housing units. Much of the housing built up to the early 2000s was bearing on foundation piles driven into the permafrost, which it was assumed were anchored deep in the frozen landscape. However, the virtual line drawn across the geological section, demarcating stable, frozen permafrost from the changing environment in the Arctic, is continuously shifting, and is better described in the North as an extended transition from deep geological cycles of glaciation to the seasonal fluidity of snow and ice. The foundation piles embedded in this fluid geology could not provide the designed stability for the houses above; as a result, heaving and jacking piles were physically tearing apart the town’s already overstretched housing resources.

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7. Schuppli 2014.
8. Ibid. 2014, 9:30 of the video.
The geology of the Hudson’s Bay basin that underlies Arviat was formed through cycles of glaciation and retreat. As the Laurentide ice sheet retreated west across the Hudson Bay lowlands, outwash streams deposited the long eskers of loose gravel and sand that striate the land. The sea that followed the glacial retreat deposited layers of salt-rich sediment, creating saline permafrost that responds acutely to the seasonal cycles of freeze and thaw (Forbes et al. 2013, 189). Following the retreat of the last glaciers, the land itself is rebounding from the weight of the kilometres-thick ice sheet. Isostatic rebound, or the rising of the earth’s crust, is therefore causing the exposed land to rise and new coastline to emerge from the water, changing the topography of shoreline and the bathymetry of the seabed. These millennia-long geological processes are thus overlayed by dramatic seasonal cycles that transform the surface of the permafrost and Hudson’s Bay from fluid to frozen states.

The cyclical change from ice to water, upon which the community relies, reshapes the permafrost year after year, patterning the surface of the ground. However, the cycles known by Arvamiut are unsettled where the warming climate colludes with long geological processes in the depths of permafrost formations: layers of soils and peat, frozen around buried formations of ice, are subjected to increasing warming trends, accelerating the melting and shifting of ground beneath the town. The Arctic is experiencing warming trends so intense that increasingly fluid permafrost is perceptible in the spaces of the town. Arviat is already experiencing a 2-degree temperature rise9, with the warming air differentially impacting the geology of this town. Areas of saline- and ice-rich wetlands that were buried to build the town soften around narrow eskers that offer relative stability compared to the water and land that surround the community.

This unsettling new condition between climate and ground has doubled the stresses on inherited buildings already unsuited to the permafrost. Residents and local housing authorities are facing a challenging project to adapt the structures themselves to the environment, but are also building knowledge on the accelerating geological conditions beneath the town. The need to adapt buildings to the speed of climatic and geological change is made more difficult for local housing authorities by the growth of the community and the current planned development for this growth, which continues to impose an urban form that does not recognize the changing ground.

**Constructed territory**

Arviamiut have inherited an urban form and architecture conceived at odds with both the inherent fluidity of the permafrost and the social and economic reality of life in this community. Development continues to project fundamental Euro-Canadian relationships of building as a means of establishing control and stability over territory. The streets in Arviat are aligned to the shoreline and arrayed from the coastal esker onto the muskeg further inland. The rectangular geometry of the plan is inscribed with standardized lots and infrastructures to be expanded as the community grows, yet no consideration for the ground conditions.

![Figure 5. Current Community Plan and planned expansion over the ground (author's drawing).](image)

The planned development outlined in the current Community Plan continues to project a stable relationship between the ground beneath and the new housing above. The fundamental relationship of Canadian urbanism is rooted in the foundational work, in western geological sciences of geologists James Hutton and Charles Lyell, who first separated the human world from the imperceptible histories of deep time. For Hutton and Lyell, the meaning of geology was the natural record of both organic and tectonic changes that had altered the physical surface and structure of the earth (Hutton 1795; Lyell 1872, 1). The forces shaping the rock and soils were understood within epochs and eras and separated from social and cultural histories of communities (ibid., 3). Geology, seen then as stable ground relative to human projects, could be considered as an unchanging surface on which dwelling unfolded.
The stable reading of geology was created by new global mapping technologies, as the Canadian Arctic was first being colonized by European powers and then by Canada. Developed by the United States Army Corps of Engineers in 1947, the Universal Transverse Mercator grid was the first system of mathematically rationalized global space (Dracup 2006). Prior to this, the first Mercator projection of global space was developed in 1569 by the Flemish cartographer Gerardus Mercator as a system of representation that translated land claimed by European colonial powers, from the observations of explorers, into a two-dimensional geography, the contents of which could be navigated without the sea or the stars (Israel 2003). Abstract spatial systems, such as military Mercator mapping, but more importantly the National Topographic System, which structures how resource exploration leases are divided, operated at scales and by means that erased all readings of complexity in the land. In less than a generation, geographic and architectural projects at the scale of the Territory erased the freezing and thawing of the land by subdividing and developing what the State saw as stable ground to be settled (Scott 1998, 2; Freeman 1976, 62). Planners, cartographers, and nation-builders therefore rationalize the ground through the abstract mathematical perspective of the Mercator grid, which continues to enable planners to deploy streets, urban infrastructure, and development with little regard for or response to the subtle but complex realities on the ground.

As a result, the architecture of early Northern housing programs was embedded in a brutal project of shifting Inuit life in camps and on tralines into the domestic spaces of modern (and southern) Canadian towns. Driven by public health crises and a desire to assimilate Indigenous peoples into Euro-Canadian society, the new wood-framed structures fragmented the social-natural relationships between dwelling and building on the land in favour of separate frames of political and economic reference for the State. In parallel with the period of intense colonization following the Second World War, traditional life on the land was aggressively transformed by an architecture of housing that supported systematic and spatial interventions, including forced relocations of Inuit, military monitoring, and building programs to position the governing agenda of colonization, resource extraction, and militarization of the Arctic.

The house, as a western building type, shapes domestic life by imposing economic and social structures and ideas of property. Circumscribed by lot lines in town plans, property is valuable because of its stability. For Northern administrators, the public housing unit has become the driving element of economic and social stability, as public housing now makes up nearly 80 percent of all housing in Arviat (Nunavut Housing Corporation 2016, 7). Within the existing gridded plan, the detached houses and multiplex units help to address economic instability for families. The number of families...
Figure 6. Typical residential block of 5-plex housing and streets in Arviat (author's drawing)
'housed' or the number of housing units constructed has become the primary metric through which the success or failure of housing programs are being measured. The NHC's and community planners' design for social and structural stability—an architectural and urban form imported from southern Canada—continues to pervasively produce conditions of instability for the community.

The building types are shaped by from the standard size of plywood sheets, minimum areas required by building codes, and necessary fire separations between buildings to create an efficient built fabric that fragments many of the social and ecological relationships in the community. The 5-plex, a 5-unit row house, has proliferated in communities throughout the Nunavut. A hybrid of townhouses and military barracks, the 5-plex design is characterized by rapid and efficient construction, shared utility services, and the least surface area of building envelope possible. Up to 2018, when this research was conducted, every 5-plex housing unit in Arviat had the same 2-bedroom layout, flooding the community with housing units neither large enough for most families, nor small enough for the many singles and couples in the young community (Statistics Canada 2016). Once again, the architecture norm of the Canadian nuclear family was imposed, largely failing the multigenerational Inuit families and their extended kinships, and breaking networks of child-care and sharing economies when family members are allocated housing10.

Historically, family and kinships were formed within the camps and across the land, and relationships were maintained through the seasonal migrations for hunting and trading (Damas 2002, 14–17). Seasonal cycles were not considered when Northern administrators began constructing the first permanent settlements (Stern 2003, 153). Today, these highly constrained lots limit the space for outbuildings, parking, and storage, which are necessities of the seasonal life lived by Arviamiut. Clusters of 5-plex housing on the outskirts of town limit the agency of residents to construct storage buildings, park different vehicles, or expand their dwellings to meet the needs of growing families. Throughout the town, local and informal building attests that a house is not enough for life in the North. Indeed, the harsh environment and traditional territories have introduced routines, economies, and programs that are not accommodated in how outside designers understand Northern domestic space.

10. In response to the housing shortage in Arviat, the Arviat Housing Association has necessarily developed a system of allocation to efficiently fill available spaces, alleviate overcrowding, and vacate damaged houses that require repair. From a private conversation with the Arviat Housing Association, August 2018.
Ground as home

Inuit, who have inhabited the North for generations, have a complex understanding of the changing land. *Nuna* is the Inuktitut word that describes the lively terrain upon which all things are related (Kalluak 2016, 56). Nuna is social, ecological, and spiritual; Rocks, muskeg, ice, and other species are understood as alive and are thus accorded the respect due to all living things. This idea of land transcends scales, from that of the Inuk hunter and outpost camp to trails that extend hundreds of kilometres across the land. The subtle changes of the landscape through seasons and history are closely observed by individuals on the ground. The intimate knowledge of place is then collectively mapped into oral records of inhabited landscapes through complex toponyms and itineraries, describing camp sites, hunting grounds, and kinships in the rhythm of seasonal changes (Aporta 2009, 135). Nuna is constructed and continuously nurtured through the lived experience of the landscape, adapting to environmental changes, kinships, and technologies.

Traditional dwelling on the changing ground has been maintained by adapting building practices based on generations of shared knowledge. Inuit *Quajimajatuqangit*, or IQ, describes the deep body of ancestral knowledge passed down through generations, rooted in understanding, and respecting
the uniqueness of weather, climate, and living with other species (Kalluak 2016, 43). IQ frames a world view around Nuna by four maligarjuat (translated literally as ‘big things that must be followed’): maintaining harmony in communities and in the mind; working for the common good; being respectful of all living things; and continuously planning for the future in the changing environment (Karetak and Tester 2017, 9–15). For Inuit, these ethical principles are the foundations for living together and collective adaptation.

Figure 8. Hunter returning to Arviat by snowmobile from the caribou herd in May 2018 (author’s photo).

Today, generational and seasonal cycles still drive the social and economic relationships of collective spaces. The principle of aajiiqatigiiingniq, or collective work to address challenges, is the principle used by Inuit to adapt as a community to their environment. Elder Rhoda Karetak describes the principle as an important part of healing the brutal legacy of colonization by all who work and research in Inuit Nunangat (Karetak 2017, 200–201). Readily visible in Arviat is a local building practice that works between the fluid geology and constructed stability of housing to weave together new connections between the buildings of the town and the inhabited terrain of
the community. Faced with the accelerating impacts of climate change and the inherited instability of this form of public housing, the unique architecture informed by the principles of IQ addresses the complex rates of change in the environment. Inuit are themselves negotiating the dislocation and trauma of living between two worlds: that of the modern Canadian town and traditional life on the land (Collignon 2006, 207). The many residents of Arviat I spoke with did not consider their local building practices as a form of climate adaptation, but rather as building in “a good way”, namely, attuned to their community needs and the shifting land.

This new design practice by the community addresses the climatic, social, and structural instability by reconfiguring the designed relationships in the Community Plan to incorporate local knowledge and practices. The intuitive knowledge of thermal gradients in the community is used within the existing planned town as well as on the land. Cabins and camps outside of the town boundary are carefully sited in response to geological formations, prevailing wind patterns, and topography. Inhabitation, renovation, and construction are all undertaken by the community in collective spaces to accommodate specific rates of change in the environment. For example,

Figure 9. Informal structures and paths between the houses cross surveyed lots and rights-of-way (author’s photo).
many community buildings, such as the John Ollie Recreation Centre at the edge of town or the new Youth Centre next to the high school, are critical social infrastructures that are generic spaces that have been adapted simply by community occupation. Open ground in the town between lot setbacks or areas of ‘open space’ in the Community Plan thus takes on a dynamic character through seasonal change to become a network of trails, impromptu snowmobile race tracks, and gathering spaces. In the gap between planned ground and the land, the agency of the community to define and build space questions the stable categories of public and private, residential and commercial, and town and hinterland that define the design of community spaces.

**Building with Instability**

The challenges of dwelling on unstable grounds are multiple in Arviat, and what is clear in this community is that the provision of housing by the territorial government is made to work by layers of architectural interventions by local housing authorities and residents in response to the multiple changes unfolding in the environment. Building has thus become a proactive tool for Arviamiut to reconnect the landscape to the individual dwelling, with architectural responses that are informed by local knowledge of the land. These interventions, aggregated across scales and over time, offer a comprehensive and local vision of how to unsettle the relationships between housing and ground that are deeply rooted in the brutal legacy of colonization.

Between the houses and fluid geology, the Arviat Housing Association has been cutting the foundation piles of all the houses in town and floating them above the landscape on timber block and wedge foundations that are then leveled each year to keep houses and structures stable. The urgency of the AHA’s foundation retrofit is an example of the technical adaptation of an entirely static architecture to the increasingly unstable ground. In response to the Community Plan, the Hamlet Government has developed a multi-year process of filling the landscape with excavated gravel from the eskers that surround the community (Figure 10). As the AHA foundation retrofit mediates the stability of structures to the surface of the ground, the one metre of gravel helps to insulate the ground from the warming summers as well as preserve its bearing strength for the houses being constructed above. At the architectural scale, the proliferation of outbuildings and additions (when allowed by zoning regulations) are constructed by residents to address programmatic gaps in the houses and to create collective spaces for living on the land and water. Mobile tent frames for ice fishing and cabins towed out onto the land therefore expand the domestic spaces of the houses across hundreds of kilometres of traditional territories. Despite the fact that
community organizers and government institutions have conducted research around more culturally attuned housing (Canadian Mortgage and Housing Corporation 2006; Lanz 2004), this locally led research and unique building practice are not recognized within the Community Plan and are therefore limited to the marginal spaces of the town.

The capacity of the community to take ownership over the construction of housing and the shaping of collective ground is not without precedent. Indeed, the self-built houses of the Homeownership Assistance Program (a program running from the 1970s until 1992 that provided a forgivable loan covering a house design, materials, and other construction costs) were built by the community and remain some of the few privately owned houses in the community (Robson, 1995, 15). Although the HAP program had only two generic types, local modifications made by owners to layer additions and porches have produced examples of multigenerational housing that accommodates both the needs of life on the land and the immediate climate of its sites.
The collective building projects unfolding now offer a counter-map to the past visions for the North while imaging a future driven by Inuit spaces and land-based values. Despite the changing attitude of designers toward their responsibilities in communities such as Arviat, the elements of the Community Plan (land use, property, and housing) neither recognize the informal structures built by the communities nor the changing environment for which these projects are a supposed response.

Architects have long been fascinated by building in the remote, frozen landscapes of the Canadian Arctic as a landscape for speculation, where housing prototypes, new town plans, and utopian visions have abstracted place, geography, and culture. The process of *unsettling ground* is necessarily difficult because it directly challenges existing architecture and planning practices to engage these specificities.

To close the distance between the cultural assumptions that shaped the Northern Vision of the 1950s and 1960s, with the legal and ethical obligations laid out in the Nunavut Land Claims Agreement, Inuit authority must not only be considered but welcomed within a new legacy of buildings and policies impacting the Arctic ground. The discourse around architectural practice on Indigenous land is indeed changing within Canada, despite the abstract, larger-scale planning conventions, housing programs, and land ownership of Euro-Canadian culture that continue to shape housing across Nunavut. Indigenous designers, such as Harriet Burdett-Moulton in Iqaluit, are among many who are re-centering design practices to incorporate as well as negotiate traditional and contemporary architecture and community building (Shaw-Collinge 2018). To continue this process, it is imperative that contemporary architectural practices in Canada reconsider the theoretical grounding with which they engage with territory, community, and land in the North. Sustained and committed participation of designers, community members, and policy makers is crucial to constructing a built environment that embodies the needs and visions of Northern communities.

Designers must acknowledge the disciplinary limits of our current design approaches and tools, which often negate the concerns and desires of Northern communities. *Unplanning*, decoding, and upending our default practices must therefore be ongoing. Responding to climate change and the housing crisis cannot be solely an exercise in building science but must be a process undertaken with—and for—Northern communities to balance the urgent technical design work with the authority of communities over the land and spaces they inhabit. Awareness of the land will need to respect Inuit conceptions of space to enable community perspectives to better support Indigenous self-determination.
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