FERMONT: THE MAKING OF A NEW TOWN IN THE CANADIAN SUB-ARCTIC[1]

Adrian Sheppard, FRAIC
Emeritus Professor of Architecture
McGill University, Montreal
Canada

NOTE: This paper is based on a lecture delivered on July 11, 2007
at the Ion Mincu School of Architecture and Urbanism, in Bucharest, Romania
The text was revised in march 2012

ABSTRACT

A significant number of new towns were built in the Canadian north since the turn of the century, most of them after 1950. The vast majority are one-industry towns created to service mining companies, government agencies, or utility corporations. Without exception, these new settlements were conceived as straightforward and pragmatic solutions to a housing need for workers and their families. Essential planning issues were bypassed in the interest of speed of construction, savings in costs, and matter-of-fact attitudes about company workers. The concern for the actual buildings (architecture) always mattered more than the design of the town (urbanism). Planners as well as their clients neglected to address important climactic, social, and aesthetic realities related to conditions of the North.

The author's former office was commissioned in the early 1970's by Quebec Cartier Mining Corporation (QCM) to design the new town of Fermont. The town was to house 5,000 to 6,000 people and include all the essential facilities for normal northern living. QCM was a wholly owned subsidiary of US Steel Corporation, which at that time was the world's largest steel company.[2] The vast majority of the residents of the new town were employees of the Corporation. Fermont was the first new town in Canada specifically designed to respond to the realities of the harsh climactic conditions of the sub-arctic and to address the problem to living in isolation.

Since Fermont was built specifically to replace the mining town of Gagnon, near Lac Jeannine, and since a substantial segment of its population expressed the desire to be relocated to the new town, a significant number of Fermont's future inhabitants were known. This situation afforded

[11] This paper was written a few years after the town was completed. Since then, the situation of Fermont has changed radically and the Client, US Steel, is no longer in existence.

[2] Fermont was the name of the first iron works in Canada built in 1736 near Trois-Rivières. The name of the new town was selected by the *Commission géographique du Québec,* and not by QCM.

the planners an opportunity to involve these people in a participatory design process. It was a unique opportunity to learn about the specific needs and aspirations of workers and their families who were veterans of northern living.

WHY A NEW TOWN?

The largest and richest North American iron ore deposits lay in northern Quebec in an area known as the Labrador Trough, and which runs up from Gagnon through Wabush and Labrador City, to Schefferville and on to Ungava. Today, most American steel industries import their ore from that region, but smelting of the iron concentrate is done in their blast furnaces in the USA. By the 1960's, most large American mines were either depleted or yielded iron ore that was not rich enough to be economical. As such, the American steel industry turned to Quebec for their future supplies, as the newer-type blast furnaces required the higher-grade ore that was plentiful in Labrador, but absent in the United States.

US Steel, through its Canadian subsidiary, had already built two towns in Quebec since the Second World War: Gagnon, near Lac Jeanine and Port Cartier on the Saint Lawrence River. The two towns were linked by their privately owned rail line which carried the iron ore south. Gagnon was built specifically to house and service the mine's personnel, while Port-Cartier was created as a transhipment from the trains to the ships. From Port-Cartier, the ore was transported by giant carriers up the Saint Lawrence River, through the Great Lakes to the American Mid-West, where the steel mills are located.

At the time of construction of Gagnon, the ore deposit at Lac Jeannine was US Steel's largest reserve, and it was assumed that it would last about 100 years. However, because of greatly improved ore extraction methods, this deposit was virtually depleted by the late 1960's. US Steel sought other deposits and eventually found and gained control of a very large deposit at Mount Wright[3]. This find became the *raison d'être* of Fermont.

The Mount Wright development included three major component parts: the extensions of the rail line from Gagnon to Mount Wright, the construction of an ore concentrator in the vicinity of the new mine, and the construction of the town of Fermont. The total budget for the three projects at the time was about half a billion dollars,[4] (1970 dollars) of which about 25% was designated for the town.[5]

THE CONSULTANTS' SELECTION PROCESS

[3] In actuality, Mount Wright is a mountain of solid iron ore rising 1,000 feet above Lake Hesse at its base. It is about 4 miles long and 4,000 feet wide at its base.

[4] All costs are quoted in US currency

[5] This amount corresponds to about 8 to 10 billion dollars in today's currency.

The construction of any new town, especially one conceived for the sub-arctic, is an important and daunting task. Fermont was to be QCM's third new town in the Province of Quebec. Few Corporations had ever built so many towns in the same region in Canada. The Corporation was well aware of planning flaws and design shortcomings of Gagnon and Port-Cartier, and was prepared to do their utmost to avoid repeating the errors of the past.

As it happens for many mega projects of this sort, QCM proceeded by inviting large Canadian and American engineering firms to submit proposals. They sought, what is commonly called in North America, a Turnkey Proposal, which involves the submission of a complete "package" consisting of a design concept, a construction proposal, and financing tender of the project. Each bidder was invited to form a consortium that was to include the various disciplines required to undertake the entire task. These included all the professionals and the general contractors. The professional teams encompassed town planners, architects, engineers, landscape consultants, land surveyors, and other professionals. The proposals called specifically for an attainable preliminary plan for the town, a design of all the buildings, a schedule of design and construction work, as well as a cost estimate and a financial *pro-forma* of the entire project. The winning proposal was to be chosen following the two most relevant criteria: the cost of the project and the merit of the design of the town and the buildings. The consultants were given a few months to constitute a complete team and to prepare a proposal. [6]

THE SPECIAL CONSULTANT

The consortium engaged the services of the well-known Anglo-Swedish architect Ralph Erskine. Erskine was the world's leading authority on northern architecture and had built extensively in Lapland and other parts of Sweden, as well as in Resolute Bay in northern Quebec. His best known projects at the time were the new copper mining towns of Kiruna and Svappavaara located north of the Arctic Circle in Lapland and where the climactic conditions are not unlike those of Labrador. The most distinguishing feature of these two projects is the application of the windscreen-buildings principle to help improve the microclimatic environment. It should be noted that Erskine had developed the notion of windscreen building years before Fermont was conceived. As the name implies, a windscreen is a means to protect areas of the town against the dominant winter winds in order to make the outdoor environment more bearable during inclement weather. The idea is simple, and constitutes an effective and low-cost solution to the specific climactic conditions of the north. The Client was easily convinced of the merits of the proposal. The concept of a long windscreen building, though new to Canada, made sense. Today, the windscreen building is the dominant feature of Fermont.

---

[6] The winning consortium, of which the author was a member, was a joint-venture composed of four groups: **SNC Inc.** was responsible for the design services and the field supervisory duties; The mandate of **Pentagon Construction** included the administration and construction of all the buildings and structures on site, including that of the construction camp; **H.J. O'Connell Ltd.,** task was to design and construct the infrastructures of the town; and **Les Entreprises Desourdy Inc**. were responsible for the construction of the prefabricated housing units. The town planners and architects were **Desnoyers Schoenauer**, a wholly owned division of **DMLG Architects.** The School (*Le Centre éducatif de Fermont*) constituted the second phase of the project and was designed by **Desnoyers, Mercure, Gagnon, Sheppard, Architects** in association with **Laroche et Derry, Architectes**.

Ralph Erskine's mandate as consultant to the consortium ended once the group won the commission to prepare the final plans and specifications for the project. Subsequently, Erskine became special consultant to QCM during the early stages of the design development.

THE GEOGRAPHIC CONTEXT

Mount Wright is situated about 1,200 km. northeast of Montreal, and 120 km. north of Gagnon. Together with Labrador City and Schefferville, the three communities constitute a small conurbation of human settlements in an otherwise uninhabited region of the continent. One can drive to Mount Wright and Fermont by way of a partially paved road, or hitch a train ride on one of the QCM ore carriers. The only comfortable reasonable way to reach the town is by plane. The road is virtually deserted for hundreds of kilometres and there no signs of human life or services are encountered for long periods of time. During the winter months it can be quite forbidding.

Labrador is an area of Quebec measuring 270,000 sq. km., roughly the size of New Zeeland or somewhat larger than Romania. Its population is barely 30.000 people[7]. Most of the land is without any distinguishable features or much variety. Near Fermont, the trees are small, mostly black spruce that attains maturity after about one hundred years. A typical tree will measure about 7 or 8 meters in height and have a 15-centimeter trunk. Winter lasts for about 8 months and summer only three. The average annual snowfall is 500 centimetres, and mid-winter temperatures may fall to 50 or 60 degrees below zero Fahrenheit. Lakes and rivers remain frozen for half the year. The climate during the summer is mild and pleasant but black flies and mosquitoes make the outdoors unbearable for many. For those who like fishing and hunting, Labrador is a true paradise.

THE HUMAN ENVIRONMENT IN AN ISOLATED MINING TOWN

The romance for the great northern forest of Canada has long past, especially in the context of isolated mining towns. Nature is mostly seen as an adversary. Mining is a hard, remorseless and very macho occupation where "bosses" are bosses and where workers fight hard for top working conditions. Even though today the mining work is fully mechanized and relatively safe, it is hard, lonely, taxing, and repetitive. The climate is harsh, the summers short, the social activities are relatively few, and the cultural life is nearly non-existent.

Because of its distant location from the inhabited parts of Canada, the cost of all consumer goods is twice to three times what it is in the "south". Salaries are relatively high, yet most families cannot find ways to save money, even after many years of relatively frugal living. Ironically, many new residents are attracted to these mining towns believing that by earning large salaries

[7] The population at the time of the writing of this article was approximately 30.000. Since then it has increased to 40.000, a 30% growth.

they will accumulate enough savings to have a better life in the future once they return to their hometown.
Life in a mining community is remarkably homogeneous and habitual. Living in Fermont is living in a society of uniformity, regularity, and conformity. The mining community is one where unemployment or underemployment is unknown, where few residents are old or sick, where salaries of nearly everyone are known, and where one employer dictates the condition of life during work and after hours. One resident of Fermont once famously said: "the Company controls even my freedom". In such conditions, the turnover of workers is large. Only 25% of the employees stay on for more than 2 years. The "survival" rate in the town is particularly low for unmarried men and women who as a rule seek more entertainment and pleasures.

It is difficult for new residents to develop a sense of identity with their physical and social environment. The sentiment, at first, is often akin to living in a camp rather than in a town. Even those who enjoy this life of isolation and hard work, consider their town as a transitory place. They look forward to the day they will return to their place of origin. During the citizens' participation in the design process, future residents were asked about which facilities ought to be incorporated in their new town. They listed the usual amenities: schools, churches, recreational centres, medical clinics, hotels, and sports facilities. When the question of a cemetery was raised, not only did no one call for one, but the consensus was that none be built there. No one wanted to die in Fermont. They were adamant in their sentiment[8]. The sense of isolation, luckily, is somewhat relieved by the fact that Fermont, Wabush, and Labrador City are within about one half hour's drive of each other and together they form an urban agglomeration of about 50,000 people.

CITIZEN PARTICIPATION IN THE DESIGN PROCESS

It was a rare opportunity to design an entirely new town for which half its population was known beforehand. About a third of the 9,000 people living in Gagnon had expressed a desire to be relocated to Fermont. These people were veterans of northern living and had been long-time employees of the mining company. Inevitably, they would set the tone and initiate many of the routines in the new community. As such, they were most helpful in advising the planners and architects about future needs and aspirations. Their contribution helped formulate the parameters of the new town. When QCM was first presented with this suggestion of a participatory design process, they readily accepted the idea, and the consultants were asked to manage the participation process. Meetings were held with the citizens' representatives every month to discuss the design and the evolution of the concept.

Unfortunately, the participatory process was limited to housing. The nature and the form of the town were excluded from the debates, partly because the Clients feared that the discussions might become too theoretical, and partly because the participants themselves expressed little interest in the ideas concerning the configuration of town plan. Aside from listing the facilities

[8] The initial sentiment of living in a "temporary" settlement is waning and the citizens are identifying with the new town in a positive way. Recently it was announced that the city administration will consider the construction of a cemetery. The idea was well received by the community at large.

they wished for, the discussions centred around housing typologies, the size of the houses, garages, layouts, materials, etc.

FERMONT: A FIFTH GENERATION OF SUB-ARCTIC SETTLEMENT

Norbert Schoenauer identified five generations of sub-arctic settlements built in Canada over the years[9]. The **First Generation** of settlements were those that were temporary and periodic and built and inhabited by indigenous people. These were created primarily for hunting and food gathering reasons. These settlements were small, compact and in total harmony with nature. Energy conservation was the intrinsic facet of the lives of these early inhabitants.

The **Second Generation** of settlements were those built by the early pioneers seeking the natural resources of the place. They were built haphazardly as makeshift places for living and were generally in total disharmony with nature. They represent the start of energy waste in the sub-arctic settlements, and although their ecological impact was minimal because of their size, they initiated the culture of environmental desecration in the North.

Once the large mining companies began to seriously exploit the resources in the sub-arctic, they created the so-called **Third Generation** settlements, which were actually conceived as "new towns" and modelled on suburban developments of the South. These towns continued the tradition of the loose land-use patterns and were insensitive to local climate and nature. As the waste of resources and energy became more apparent to planners, a new consciousness began to develop.

This led to the **Fourth Generation** settlements, which were not unlike the Third Generation settlements, except that they were planned with dense town centres, often as a form of multi-use complex, or as compact agglomeration of buildings. Finally, the **Fifth generation** of settlements, to which Fermont belongs, is based on planning concepts entailing energy conservation in all its forms, the use of passive solar energy, and ecological common sense. Unfortunately, Fermont is still the only example in Canada.

THE PROBLEM DEFINED AND THE PREMISE OF THE PLAN

QCM acknowledged that their previous experiences in building a new town in the North had not been very successful. The citizens of the two new towns were unhappy about many aspects of their physical environment. Moreover, the administration of these towns had been sometimes difficult and costly. Henceforth, the mining company was willing to support new ideas concerning the planning of Fermont, and not simply repeat the old models. QCM had both the desire and the means to move ahead.

[9] This classification was first mentioned in SHAPE AND ORIENTATION OF NEW BUILDINGS DESIGN FOR ENERGY CONSERVATION IN THE SUC-ARCTIC WITH SPECIAL REFERENCE TO FERMONT, Norbert Schoenauer, *Economic Commission for Europe, Committee on Housing, Building and Planning, Ministry of Municipal Affairs, Canada.*

The basis of the North American towns has always been the subdivision of land into separate building lots. It is a concept that faithfully reflects the prevailing notion of private property and individualism. In the case of Fermont, where the power was centralized in one corporation[10], it provided an opportunity to implement a broader vision without being subjected to the usual political complications encountered in traditional town building.

The objective was clear from the very start. It 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, it had to address two main concerns: the physical conditions of the place, and the psychosocial realities of the community. The former meant (a) seeking out ways to ameliorate the impact of harsh climactic conditions, (b) provide optimum community facilities for the citizens, and (c) provide optimum housing to respond to the various needs of the citizens. The latter meant responding to the psychological circumstances of living in isolation and in a very homogeneous community, and providing ways to help and encourage harmonious and voluntary human inter-actions.

Once the conceptual objectives and the design intent were set, the organization of the town plan was defined according to three fundamental premises: (a) using a compact land-use throughout the town, (b) implementing the windscreen building principle, and (c) providing for maximum climate-controlled access to the communal facilities. In point of fact, these premises were intimately related to the concern for energy conservation, to limiting the impact on the natural physical environment, and to afford the inhabitants the greatest amount of physical comfort, especially in the winter months.

COMPACT LAND-USE

In the vast forested environment of Labrador where nature is omnipresent, it is more congenial and comforting to inhabit a milieu that provides a sharp contrast to the immensity of that inhospitable landscape. The drama of a duality between the man-made and the natural is emphasized and clarified by way of this fierce contrast. The “hard-edges” of the city underscores this drama by allowing the virgin nature to be near and visible from all parts of the town. The notion of a hard-edge also means eliminating the “pseudo-suburban” belt created around most settlements in the North.

A compact town is less costly to build and maintain since the extent of the infrastructure is reduced considerably. The distances between the communal facilities and the housing units (as well as between the units themselves) are reduced and make human interaction more comfortable, especially in winter. The concept of green spaces in the form of parks in northern communities has a very different connotation than in the South. In the North, parks are hard to maintain, are less frequently used, and are less needed than in traditional urban settings. This is

[10] Since QCM built and paid for the construction of the town, they were the *de facto* owners of the land and the buildings at the start of the project and during its early life. Once the town became incorporated, and the housing units sold to the residents, Fermont operated as any other normal town and QCM lost its monopolistic power.

not to say that the existence of a traditional city park in the middle of the town would not have been a positive addition to Fermont.

Because of the density of the town, the savings in the infrastructural costs was estimated at $8 million[11]. The following table illustrates this savings, using a neighbouring town as the basis for the comparison. The conclusion shows that increase in density inevitably reduces the linear footage of public right-of-ways from 19.7 to 7.5 feet per person. This corresponds to a 60% reduction in length of the network.

The savings in costs relates to the capital investment in right-of-ways, namely paving of roadways, construction of curbs and sidewalks, installation of sewers, storm sewers, water mains, fire hydrants, street lighting, and power distribution. Further considerable savings accrues from servicing shorter lengths of right-of-ways, including road maintenance, snow clearing, policing, lighting, etc.

CITY	**Town "X"**	**Fermont**
POPULATION	3,600 people	5,000 people
AREA OF THE TOWN	300 acres	190 acres
DENSITY	11.6 persons/acre	26.3 persons/acre
AREA OF RIGHT OF WAY [12]	75 acres	47.5 acres
RIGHT OF WAY PER PERSON	19.7 feet	7.5 feet

THE PRINCIPLE OF A WINDSCREEN BUILDING

The principle of a windscreen, as the name implies, is a method of shaping and locating buildings in such a way as to protect the area from the dominant winter winds. It is a means of creating a favourable microclimate by shaping the morphology of the built mass. The first planner/architect to develop and apply this principle in the North was Ralph Erskine. Erskine was the author of two cities in Lapland, Kiruna and Svappaavara, where he configured the larger buildings in such way as to provide the town with some protection from the dominant winds. He named these buildings "windscreens". In both towns, Erskine placed numerous such windscreens buildings rather than one large one, in order to reduce the opacity of the "screen". He was concerned about an overbearing presence of a longer unique structure. In Fermont, on the other

[11] This is the equivalent of $30 to $35 million in 2007 currency.

[12] One must assume that on the average, the area of the Right of Way for municipal services consume about 25% of the built-up area of such a town

hand, there is a single windscreen building which measures 1.3 km. in length. It is located on the northwest boundary of the town from whence the dominant winter winds come.

Seen either from inside the town, or from the rear, the Windscreen is a formidable wall. As one approaches Fermont by way of its only access road from the north, the "wall" marks the sense of arrival, much like the urban fortifications of medieval European towns, except that in the case of Fermont, the fortifications are protecting the town from the weather, not from invaders.

For aerodynamic reasons, the central part of the building is five and a half storeys high while the extremities are only three and half. The wind tests demonstrated that the Windscreen protects about 300 houses in an effectual way and another 300 partially. This means that the wind shadow has a beneficial effect on an area of the town in which reside about two thirds of the residents. [13] It is an aerodynamic fact that snow accumulation on the leeward side of the windbreak increases substantially. It is the most negative aspect of any windscreen. Fortunately in Fermont, the protected area subjected to additional snow accumulation has a south-easterly exposure and as such the sun's radiation and the improved microclimatic environment will contribute to the melting and evaporation of the snow.

The Windscreen literally constitutes the town centre of Fermont. It contains all the community facilities such as the commercial centre, the town hall, the fire station, the school, the swimming pool, the cinema, the sports centre, the police station, the hotel, and even a three-cell prison. All these facilities are at the ground floor of the building and are interconnected by the public mall and a series of passages. The 330 apartments and visitors' rooms within the Windscreen are located on the upper floors. The school is the only communal facility which occupies three full floors. It is located at the extreme west end of the Windscreen.

A CLIMATE CONTROLLED ENVIRONMENT

The notion of making an all-indoor city, as once proposed by Buckminster Fuller and other early modernist utopians, was never considered as a viable option. Living entirely in an indoor environment is ruthless and unacceptable. No matter how harsh the climate is and how long the winters last in the sub-arctic regions, people need continuous and prolonged access to the outdoors. Communion with nature is necessary for the physical and mental well being of everyone. In addition the inhabitants of the North tolerate cold and snow a great deal more than those living in the South. Fresh air, natural light, sunshine, wind, and awareness of the changes in weather are fundamental needs.

In the case of Fermont, the "indoor city" is primarily a network of inter-connected communal facilities. The various housing areas of the town, as well as all the dwelling units in the Windscreen operate as they do in any conventional setting. The only difference is that many of the dwelling units in the Windscreen have their accesses by way of the public mall.

[13] Norbert Schoenauer, the principal planner of Fermont, explains the climactic advantages of the windscreen building principle in FERMONT AND WINDSCREENS published in the October 1971 issue of *The Canadian Architect.*

THE NETWORK OF ROADS AND STREEETS

The design parameters and the final configuration of the road network in Fermont addresses the issues of way-finding, traffic speed, security, width, snow accumulation, sidewalks, lighting, etc. The network comprises four categories of roads: the access road, the primary distributor roads, the collector streets and the local streets, in addition to a sub-system of pedestrian pathways that coincides with the street system. By avoiding cross intersection of streets and using only T-shaped junctions, potential collision points are reduced from 16 to 6. Street runs are purposely short to discourage speeding.

The major town promenade follows the south side of the Windscreen and connects all the significant facilities of the town. In good weather, this one and a half kilometre walk is as popular and practical as the indoor mall. Sidewalks are always located on either the north or the east side of the streets. This is done so that snow dumping is done on the south and west sides, where the sun contributes much of the melting.

HOUSING CONCEPT

At the basis of the housing concept was a desire to provide Fermont with the largest reasonable variety of housing typologies. What's more, good planning practice stipulates that better and more identifiable neighbourhoods are created when there is relative homogeneity in housing forms. Considerable effort was made to locate the maximum number of housing units in the wind shadow of the windscreen. For that reason the housing units are distributed in descending order of density with respect to the windscreen. The town houses are set at the foot of the Windscreen, further down are the semi-detached units, and the detached bungalows are some distance away.

The debate over the wisdom of constructing detached bungalows in the context of Labrador was a difficult one. On the one hand, the detached house is without a doubt a questionable typology from an environmental point of view. On the other hand, QCM were concerned that a significant number of workers would refuse to relocate from Gagnon to Fermont without the incentive of being provided with a new self-contained detached house. It was a reality that could not be dismissed lightly. To a large number of the future inhabitants of Fermont, especially those coming from small southern communities in the province, an urban housing prototype was simply unacceptable. One powerful incentive for immigration to the new town was to be given the opportunity to acquire a low-cost single-family detached house. Each detached and semi-detached house is provided with an unheated garage and a large vestibule (a mudroom) located between the garage and the house proper. The size of the vestibule was created in response to the need for storage of large and bulky winter gear before entering the house.

As a matter of principle, all of the houses and most of the dwelling units in the windscreen have a double exposure to allow for cross-ventilation. The town is built on the north of the lake, and

most of the houses have a lakefront view, either because they are oriented that way, or because they benefit from the topography.

MODULAR PREFABRICATION OF HOUSES

All the detached, semi-detached and town houses in Fermont were prefabricated using a system of pre-engineered wood modules. The wood modular system of prefabrication had the advantage of being of superior quality, more solid, and faster to erect than conventional wood construction methods. Since 90% of the housing units were assembled inside a factory under ideal environmental conditions, their quality was better than any *in situ* construction could provide. Outside construction was inevitably affected by weather conditions, lack of daylight, and general discomfort of the workers. Pre-fabricated modular construction is particularly advantageous when applied in remote regions, such as Labrador where the climactic conditions are hard, the building season short, and skilled local craftspeople were nearly impossible to find. Since the housing units must be designed to withstand transportation shocks, lifting, and rough manipulation, modular housing units are stronger than conventional *in situ* built units.

Because of government-set transport limits, no modules wider than 14 feet, or longer than 51 feet could be transported on a Quebec road. This meant that none of the rooms in any dwelling unit could be wider then 13 feet (the net internal dimension of the modules). This restriction imposed a major planning constraint, though a great effort was made to create wider spaces by opening walls between two adjacent modules.

All housing units were made up of two, three, or four modules, either stacked or contiguous. The modules were constructed in a factory in Saint-Jean-sur-Richelieu and then shipped by truck to the port of Montreal where they were set on a barge and floated down the Saint Lawrence River to Port-Cartier. At Port-Cartier the modules were tans-shipped on a train to Fermont. The last leg of the journey, from the rail line to the building site, was done by truck. Finally the modules were lifted from flatbeds and set on their foundations using mobile cranes.

All the electrical services and the plumbing system were installed in the factory, as were the kitchens, the windows, the outside cladding and most of the interior finishes. The on-site tasks consisted mainly of building the foundation wall, setting the housing modules on the foundations, joining the modules together, completing the interior and exterior finishes and implementing the landscape of the individual lots. The process was fast and efficient. It took barely a few days and with relatively few workers to complete each house once foundations had been poured. The construction of the foundations, however, was difficult and expensive. Because of the depth of frost penetration in the soil, the underside of the footings had to be a minimum of 12 feet below finished grade.

THE LESSON OF FERMONT

Like all big projects, the design and the construction of Fermont was a long, difficult, and non-linear process. Reaching a consensus among the myriad actors who participated in the making of

the town was often difficult and time-consuming. Diverse and often conflicting interests implied compromises on all sides. Unforeseen situations sprang up at all times. Shortages of labour, labour strikes, technical problems, extreme adverse climactic conditions, sudden changes in program and scheduling, all contributed to making the course of action thorny and difficult.

Issues, which were considered invariables or absolutes at the start of the project often became impossible to sustain as the design or the construction, progressed. Yet, because all objectives were met and all design ideas carried out as anticipated, Fermont can be considered a social and environmental success story. After the normal period of growing pains and some adjustments, one can discern a pride of place, and a willingness on the part of the community to contribute to the life of the town. What began as a large construction camp created to implement a new vision for an urban settlement has become a true community, with families living a normal life, pursuing reasonable social objectives, and finding an equitable balance between nature and their man-made environment. With years, a sense of identity with the town has become discernible and an acceptance of a life-style that addresses the specific environmental and climactic circumstances of the North has entered the public consciousness.

It has been pointed out, correctly, that the architecture of Fermont is somewhat predictable and "safe", and that a new town was a unique occasion to push the proverbial architectural envelope further. In point of fact, the formal conservatism in the design of Fermont was one of the stated design intent. Settling permanently in a subarctic land is a difficult and wrenching experience, even for the most adventurous persons. The desire to live in a town "like in the South" was a primordial concern of the future citizens. During the public hearings the voice of the future residents was loud and clear. They wanted to live in an environment that was familiar. They feared being stigmatized, or being treated as guinea pigs inhabiting a new radically different environment. One cannot hold public consultations, and then reject the aspirations of the participants. It took greater courage to follow conventional architectural design cannons than to be radical.

Some minor mistakes were made in the planning of Fermont. Both the client and the urban planners made a number of erroneous assumptions about life in the North. Inexorably, pioneers commit errors in their search for better or unproven solutions. Fermont was conceived with a definite idealism and with a conscious aspiration to create a physical environment that was more suitable to subarctic living than other Quebec precedents.

BIBLIOGRAPHY

NORTHERN CITYSCAPE: LINKING DESIGN TO CLIMATE, Editor: Norman Pressman Publisher: Winter Cities Association, Yellowknife, NT, 1995

WINTERSTADTE: PLANNING FUR DEN WINTER IN KANADISCHEN GROSSTADTEN, Barbara Hahn, Publisher: A.V. Verlag, Augsburg, Germany, 1992

DOCUMENTATION ON NEW TOWN DEVELOPMENT, Selected from presentations at the International Making Cities Liveable Conference, Publisher: IMCL Council, Carmel, CA, USA, 1990
1890-1990 UN SIECLE A BATIR 1990-2090, Pierre-Richard Bisson et Raymonde Gauthier, *Illustration of the Fermont Project,* Publisher: Corporation Architecture 1990, Ministère des affaires culturelles du Québec, 1990

THE CANADIAN ENCYCLOPEDIA, Second Edition, Vol. IV, p. 2229, Entry in *Urban and Regional Planning,* Publisher: Hurtig Publishers Ltd., Edmonton, AL, 1988

CITIES DESIGNED FOR WINTER, Edited by Jarma Manty and N. Pressman, Publisher: Building Books Ltd., Helsinki, Finland, 1988

CITIES DESIGNED FOR WINTER, Publisher: Tampere University of Technology, Department of Architecture, Tampere, Finland, 1988

NEW COMMUNITIES IN CANADA: EXPLORING PLANNED ENVIRONMENTS
Norman Pressman, *A New Version of the Company Town,* 1987

PLANNING CANADIAN COMMUNITIES: AN INTRODUCTION TO THE PRINCIPLES, PRACTICE AND PARTICIPANTS, Gerald Hodge, Publisher: Methuen, Toronto, New York, London, Sydney and Auckland, 1986
HABITAT, Vol. 27, No. 4, Norman Pressman, *Reshaping Winter Cities: Concepts Strategies and Trends,* Publisher: Canada Mortgage and Housing Corporation, Ottawa, ON, 1984

NEW TOWNS IN THE NORTH: NEW COMMUNITIES IN CANADA, (Special Issue), University of Waterloo, Publisher: Faculty of Environmental Studies, Waterloo, ON, 1978

THE SHAPE AND ORIENTATION OF NEW BUILDINGS, *Design for Energy Conservation in the Sub-Arctic with Special Reference to Fermont,* Publisher: The Economic Commission of Europe, Planning and Development of Human Settlements, Ottawa, ON, 1977

L'ACTALITE, Vol.2, No. 8, Danielle Simpson, *Si tu savais... à Fermont, la compagnie c'est ta mère,* Publisher: MacLean-Hunter Limited, Montréal, QC, August 1977

BUILDING IN THE NORTH: EXPERIENCE AND PROJECTS, Vol. 2, Blanche Lemco van Ginkel, Publisher: van Ginkel Associated Limited, Toronto, ON, 1976

LAND USE DEVELOPMENT/DEVELOPMENT ET AMENAGEMENT DU TERRITOIRE
Georges Le Pape, Editor, Publisher: Canadian Federal Publication Service, Ottawa, ON, 1976

THE CANADIAN SETTLEMENT SAMPLER, (Published as part of Canada's Contribution to the United Nations Habitat Conference), Publisher: Community Planning Press, Ottawa, ON, 1976

BATIMENT, Marc Castro, *Comment on crée une ville nouvelle,* Publisher: Maclean-Hunter Ltée.

Montreal, QC, November 1972

THE CANADIAN ARCHITECT, *Fermont and the Windscreen,* Publisher: Southam Magazine Group, Don Mills, ON, October 1971

Adrian Sheppard, FRAIC
Montreal, Canada
November 2011