Manic 5 at Expo 67:
Territorial Megastructure or the Connection of Three Spaces

Marie-France Daigneault Bouchard

A Thesis
in
The Department
of
Art History

Presented in partial Fulfillment of the Requirements
for the Degree of Masters of Arts (Art History) at
Concordia University
Montréal, Québec, Canada

January 2013

CONCORDIA UNIVERSITY
School of Graduate Studies

This is to certify that the thesis prepared

By: Marie-France Daigneault Bouchard

Entitled: Manic 5 at Expo 67: Territorial Megastructure or the Connection of Three Spaces

and submitted in partial fulfillment of the requirements for the degree of

Master of Arts

complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the final examining committee:

_____ Chair

_____ Examiner
Dr Catherine MacKenzie

_____ Examiner
Dr Johanne Sloan

_____ Supervisor
Dr Cynthia Hammond

Approved by _____
Dr Johanne Sloan, Graduate Program Director

_____
Catherine Wild, Dean of Faculty of Fine Arts

Date _____

ABSTRACT

Manic 5 at Expo 67: Territorial Megastructure or the Connection of Three Spaces

Marie-France Daigneault Bouchard

Manic 5 is the largest multiple-arch and buttress dam in the world. It is part of the Manicouagan-Outardes Complex that marked the emergence of a Québécois expertise in hydroelectric production and transportation. Begun in 1959 and completed in 1968, the iconic dam is located on the Manicouagan River in the Côte-Nord region. In the summer of 1967, during the last stages of Manic 5's construction, three cameras captured the daily activity of construction, from 10am to 10pm. The live footage was edited, transmitted and projected in full color in the Québec Industries pavilion on the grounds of Expo 67, Montréal's world's fair celebrating the centennial of Canada.

Drawing on multiple archival resources such as printed and filmic promotional documents of the dam, photographs, architectural drawings of the pavilion, and newspaper articles, this research departs from a photomontage representing the spectacle of Manic 5 at Expo 67 and aims to uncover its history while contextualizing it into the history of twentieth-century architecture. I consider this event and its underlying material presence as a "territorial megastructure," based on the architectural concept of the megastructure developed during the 1960s and in which Montréal had a prominent role, mainly through its hosting of Expo 67. Manic 5, a space of production, and Expo 67, a space of consumption, can each be considered a megastructure in and of itself, although they will here be analysed in relation to their physical and virtual connection over a territory covering more than 800 kilometres, the space of transmission.

ACKNOWLEDGEMENTS

This thesis benefited from the continuous support of many persons. First, I want to thank my thesis supervisor, Dr. Cynthia Hammond for encouraging the emergence of my personal voice as a scholar. Her intellectual guidance and humanity was of invaluable help in moments of doubt and with her, I understood how theory is also about experience on the field and one's own creativity. I thank Dr. Johanne Sloan for her insightful comments and suggestions upon reading my work, allowing for more clarity, rigor, and consistency. I am indebted to Dr. Alessandra Ponte for initiating my intellectual interest towards technology and media in relation with architecture, the decade of the 1960s, and, of course, the northern landscapes of Québec characterised by hydroelectric networks. I also thank Dr. Jean Bélisle for introducing me to the artist Lili Réthi's drawings of Manic 5 and for sharing with me his unique scholarly experience. I could never be thankful enough to my friend Radisson Labelle, my great road trip partner who enthusiastically accompanied me on an unconventional trip to Manic 5. For the support, the shared experience, and the extensive conversations, I want to thank my colleagues and friends, especially, Anne-Marie Proulx, Stephan Kowal, Mathieu Bouchard, and Lola Hakimian. Finally, I am grateful to all my friends and my family for their support and patience while listening to my relentless obsession about Manic 5. Altogether, these persons showed me that it is not necessary to be alone to be a scholar; each conversation counts; each experience nourishes the reflection. This is how one builds a great project… and it doesn't need to be a territorial megastructure.

TABLE OF CONTENTS

LIST OF FIGURES

"The ultimate frustration is that no book, film, lecture, animated analysis
devised so far can reproduce the real characteristics of space.
The true effect of noise, dampness, mustiness, decadence,
squeaky-cleanliness, dumbness of the place itself.
No means exists to replace the instinctive will
to stroke, tap, poke, pick at a wall or a panel."

Peter Cook, architect of Plug-In City
The City, Seen as a Garden of Ideas, 7, 2003.

"Once the historian selects texts, objects, photographs, films,
and other documents to form a series and links these in an argument,
he or she has begun to create a narrative."

David E. Nye
Narratives and Spaces, 7, 1997.

Introduction: Manic 5 at Expo 67

> *Montrealers who had never seen Manic 5 – except possibly via a spectacular closed-circuit colour television hookup linking the project with Expo 67 – were now using electricity made deep in the north country. And, as usual, most would never give it a thought. Few would think of the thousands of men who had labored against the freezing winds of the Manicouagan gorge, blasting through the granite rock, risking their lives high on the dam, to make sure that light glowed brightly at the flick of the switch.*[1]

Manic 5, or what is today known as the Daniel-Johnson Dam, is the largest multiple-arch and buttress dam in the world.[2] Constructed on the Manicouagan River by the national hydroelectricity corporation of Québec, Hydro-Québec, between 1959 and 1968, the massive project was, despite its remote location, familiar to Québec residents across the province because of the mass circulation of images of the project's construction. Such visual familiarity intensified when Hydro-Québec made Manic 5 the focal point in its multi-media display at Expo 67, the world's fair held in Montréal, Québec, from April 28 to October 29, 1967.[3] Hundreds of thousands of visitors from around the world, Canada, and Québec visited the Québec Industries pavilion, where a closed-circuit television system linking Montréal and the Manicouagan River made the construction of the unfinished dam visible to viewers hundreds of miles away. The

---

[1] Lili Rhéti and William W. Jacobus, Jr., *Manic 5: the Building of the Daniel Johnson Dam* (New York: Doubleday and Company, 1971), 163.

[2] The Manic 5 dam is known today as the Daniel-Johnson dam in homage to Québec's Premier Daniel Johnson (1915-1968) who died of a heart attack on site the night before the official inauguration on September 26, 1968. For questions of clarity and because it was still known as Manic 5 at Expo 67, I will use "Manic 5" to designate the dam.

[3] "Montreal was officially a *exposition universelle*, but we use the term 'world's fair' … to adhere to the anglophone scholarly convention." As mentioned in note 1 of "Introduction: Dusting Off the Souvenir,"in *Expo 67: Not Just a Souvenir*, eds. Rhona Richman Kenneally and Johanne Sloan (Toronto: University of Toronto Press, 2011), 20.

technological feat of transmitting and projecting live images on a theatre-size screen had been made possible only recently by the time of Expo 67.

The black and white image most frequently employed to depict the "spectacular closed-circuit colour television hookup" linking the Manic 5 hydroelectric dam with Expo 67[4] is peculiar and intriguing despite the simplicity of its caption: "From Expo 67, the visitors can follow, in real time, the evolution of the building of Manic 5."[5] (Fig. 1) Why choose a hydroelectric dam, still under construction, to represent the wide range of Hydro-Québec's work across the province? As part of the Manicouagan-Outardes complex, Manic 5 underscored Québec's developing leadership in hydroelectric production and transportation at a moment in Canadian cultural and political history when the question of Québec's sovereignty was increasingly at stake. Thus the dam participated visually as well as financially and politically in the articulation of a modern, Québécois, francophone national identity.[6] (Fig. 2)

The dam's distance from Expo 67 was part of the spectacular nature of the display found in the Hydro-Québec pavilion. Located on the Manicouagan River in the Côte-Nord region, Manic 5 is a three-hour drive north of the city of Baie-Comeau and more

---

[4] The image was published in a book about the history of hydroelectricity in Québec (see note 5), in magazines (*Montréal*, July 1967), and more recently on a few personal websites documenting Expo 67 and its material artefacts ("The Quebec Industries Pavilion," *Expo Lounge* blog).

[5] Clarence Hogue, André Bolduc and Daniel Larouche, *Québec, un siècle d'électricité* (Montréal: Éditions Libre Expression, 1979), 305. "De l'Expo '67, les visiteurs peuvent suivre, en direct, l'évolution des travaux à Manic 5" (trans. Marie-France Daigneault Bouchard).

[6] There are two recent scholarly texts analyzing the instrumental and symbolic aspects surrounding the history of Hydro-Québec in relation with identity issues in Québec with sections that address more particularly the role of the Manic 5 hydroelectric dam. See Stéphane Savard, "Retour sur un projet du siècle: Hydro-Québec comme vecteur des représentations symboliques et identitaires du Québec, 1944 à 2005," (Ph.D. thesis, Université Laval, 2010); Dominique Perron, *Le nouveau roman de l'énergie nationale : analyse des discours promotionnels d'Hydro-Québec de 1964 à 1997* (Calgary : University of Calgary Press, 2006).

than 800 kilometres north-east of the city of Montréal. (Fig. 3) In the summer of 1967, during the last stages of Manic 5's construction, three cameras captured the daily activity of construction, 10am to 10pm. This live footage was edited, transmitted and projected in full colour in the Québec Industries pavilion on the grounds of Expo 67, providing visitors with a powerful demonstration of the range and especially the scale of hydroelectric industrial production in real time.

The visual representation of this daily event is pivotal for the thesis that follows. It shows a theatre screen, framed by a shimmering structure, with rows of spectators in the lower foreground. (See fig. 1) These spectators observe a frontal, symmetrical view of the huge concrete structure gradually being built. Under closer examination, however, the image reveals that it is actually a *photomontage*, a fact confirmed by the film negative I located in the archives of Hydro-Québec in 2011. (Fig. 4) The photomontage found in the archives offers a broad view inside the pavilion's projection room,[7] showing how the angled metallic frame creates a strongly perspectival effect in relation to the flatness of the projection screen. It serves another purpose: to physically impose a distance between the moving images and the seated audience, suggesting perhaps the vast distance between the site of work and this space of observation. The floor, visible at the back of the room where the photograph was taken, imposes a similar distance between the observer and the subject of the image. This setback emphasizes the effect of the frame on the projected image of the dam on the screen, suggesting a window opening onto an industrial space.

[7] According to architectural drawings of the projection room in the archives of the City of Montréal, Rodney Y. Hatanaka, from the design firm Gagnon/Valkus Inc., designed the interior architecture of this space.

This photomontage turned out to be a crucial document in my research on Manic 5's representation at Expo 67, not only because it brought me to consider the event it represents, but also because it reflects, in a sense, the construction of this topic. The original photograph was overexposed in order to make visible the darkened interior of the room and the seated audience, leaving the screen almost totally white. Some unknown hand replaced that washed-out screen with a correctly exposed and clearer image of Manic 5, taken from a central point of view that accentuates the perspectival effect of the frame.[8] The final collation gives the illusion of a single picture, but of course it is now clear that two separate photographic spaces were juxtaposed to form one. This small act of photographic illusion and editing is an excellent expression of the way that the display at Expo 67 similarly compressed space and time, bringing two distant and apparently incongruous locations together in a single, mediated gesture. In this way, Manic 5 was virtually present in Montréal for Expo's visitors, so they might experience the dam's construction "through image and sound"[9] without leaving the city. I was first tempted to define this event as a "spatial montage" or collage. Further research helped me to discover how the relationship between these two events, Manic 5 under construction and the world's fair of 1967, engages with issues extending beyond the scope of their pictorial meeting. Their relation needs to be understood in the context of their *spatial* encounter, or connection, in order to read this photomontage, and consequently the event it represents, with more insight.

---

[8] While I identified the original picture, in which the screen had been replaced (See fig. 56), I was not able to verify the source of the image used to replace the screen. The image of Manic 5 was likely taken from a direct shot of the dam.

[9] "À l'Expo, Manic 5 par l'image et le son," *Entre-Nous* (novembre 14, 1966): 5. "par l'image et le son" (trans. Marie-France Daigneault Bouchard).

While this photomontage is useful for understanding how the Hydro-Québec display was meant to function, it also summons, for me, another well-known image of the era: the photograph used to depict *The Society of the Spectacle* by Guy Debord.[10] (Fig. 5) In a strategy of *détournement*, which consist of employing expressions of the capitalist system and its media culture in a context that subverts their meaning,[11] the picture of a mesmerized audience is intended to denounce the system that produced it. This is very unlike the intentions behind Hydro-Québec's use of their photomontage, which was meant to promote, through spectacle, industrial and technical progress. Debord's influential text, published for the first time in the same year that Expo 67 opened in Montréal, is an "apocalyptic account of passive consumption and alienation [related in part to the proliferation of images], even if his own practice as a Situationist activist/artist insisted that the strategic repositioning of images could be a form of resistance."[12] In Debord's image we only see passive spectators wearing 3D glasses, not the theatre screen they are looking at. In contrast, the photomontage of Manic 5 shown at Expo 67 insists on the subject shown on the screen, the construction of a dam that symbolizes the becoming-modern of a nation. Leaving aside the intentions behind each, these images could almost be different viewpoints on the same event; in fact, pictures of the audience in the Québec Industries pavilion, similar to Debord's image, do exist. (Fig. 6)

---

[10] The image appeared as the back cover of an unauthorized English translation from 1970, see Guy Debord, *Society of the Spectacle* (Detroit: Black and Red, 1970). Photographer J.R. Eyerman originally took this photograph in 1952 for the Life magazine at the opening screening of *Bwana Devil*, the first full-length colour 3D motion picture, at the Paramount Theater in Oakland, California. This original image was cropped and flipped to illustrate *Society of the Spectacle*. For complete information on the original image, see the Getty Images website, object number TLP129471.

[11] The French group *Internationale Situationniste* (Situationist International), of which Debord was a cofounder in 1957, largely developed this practice along with ideas based in Marxism.

[12] Johanne Sloan, "Postcards and the Chromophilic Visual Culture of Expo 67," in *Expo 67: Not Just a Souvenir*, 180.

This uncanny echo between the image of *The Society of the Spectacle* and the presentation of the construction of Manic 5 as a spectacle, leads me directly to Debord's description of his own times, when "[e]verything that was directly lived [had] moved away into a representation."[13] Expo 67 would likely itself constitute a spectacular event for Debord, given what art historian Johanne Sloan calls "the veritable assault of imagery, information, and entertainment which confronted the … visitor."[14] For Debord, "[t]he spectacle is not a collection of images; it is a social relation between people that is mediated by images."[15] In a sense, Hydro-Québec wished to offer to Expo's visitors a worker's experience through the presentation of live images that resulted in a traditional theatrical experience of entertainment. The company oversimplified the process by which a complex experience of labour in a remote location was visually mediated and translated into a narrative of success, serving a national ideology based on progress and modern technology. Debord's interpretation of spectacle serves to critically situate in history the projection of Manic 5 at Expo 67, a spectacular event that I will analyse in more depth to uncover its underlying complexity.

In order to understand Manic 5's representation at Expo 67, I researched, developed and defined the spatial and material negotiation between two distant yet visually superimposed places: an urban centre at a moment of international exposure and a remote industrial site under construction. The unique form of this association brought me to consider the architectural concept of the "megastructure" and to define this association

---

[13] Guy Debord, *Society of the Spectacle* (Detroit: Black and Red, 1970), paragraph 1.

[14] Sloan, "Postcards and the Chromophilic Visual Culture of Expo 67," 180.

[15] Debord, *Society of the Spectacle*, paragraph 4.

more specifically as a *territorial megastructure*.[16] In his influential 1976 text, *Megastructure: Urban Future of the Recent Past*, architectural critic and historian Reyner Banham examines the widespread development in the 1960s of the megastructure, a term coined in 1964.[17] Apart from considerations of scale, which the prefix *mega-* suggests, Banham identifies the megastructure as architecture that is usually:

> **1** constructed of modular units; **2** capable of great or even "unlimited" extension; **3** a structural framework into which smaller structural units (for example, rooms, houses, or small buildings of other sorts) can be built – or even "plugged-in" or "clipped-on" after having been prefabricated elsewhere; **4** a structural framework expected to have a useful life much longer than that of the smaller units which it might support.[18]

A multifunctional program combining "all the functions of a city or part of a city,"[19] such as work, residential and leisure spaces, was also a key component of the megastructure. Communication technologies were developing with promising results and extensively integrated as well.[20] Projects dealing with all these aspects at once were often utopian and futuristic, remaining in the realm of ideas and in the form of drawings, collages and

---

[16] It is interesting to note that a member of the group Situationist International, Constant Nieuwenhuis (1920-2005), imagined *New Babylon* (1959-1974), a social, utopian urban project considered key in the megastructure movement as well as of the Situationist group's "period of active investigation of future architectural and urban forms." Tom McDonough, "Metastructure: Experimental Utopia and Traumatic Memory in Constant's *New Babylon*," in *Megastructure Reloaded*, eds. Sabrina van der Ley and Markus Richter (Berlin: Hatje Cantz, 2008), 108.

[17] Banham identifies the Japanese architect Fumihiko Maki as the first to use the term in an essay titled "Mega-Structure" in *Investigations in Collective Form* (1964). Here, Maki defined the megastructure as "a large frame in which all the functions of a city or part of a city are housed. It has been made possible by present day technology. In a sense it is a man-made feature of the landscape. It is like the great hill on which Italian towns were built." Quoted in Reyner Banham, *Megastructure: Urban Future of the Recent Past* (London: Thames and Hudson, 1976), 8.

[18] Ralph Wilcoxon quoted in Banham, *Megastructure*, 8. Banham avoids developing his own definition of the term megastructure by bringing in the definitions by Maki (see note 16) and Wilcoxon. (van der Ley and Richter, *Megastructure Reloaded*, 28) Wilcoxon, a planning librarian at the College of Environmental design at Berkeley, is particularly efficient in enunciating precise constructive principles of this type of architecture although it does not address the social ideas behind the development of the megastructure.

[19] Maki quoted in Banham, *Megastructure*, 8.

[20] Banham, *Megastructure*, 9.

models.[21] Banham nonetheless addresses a number of completed projects as part of the megastructure movement, even when they did not meet all of the above criteria, and even when they only "*looked like* a megastructure."[22] One well known example, the apartment complex Habitat 67, was built for Expo 67.[23] (Fig. 7)

Banham also dedicated a whole chapter to Montréal titled "Megacity Montreal". In connection with Montréal's downtown, he considered the Expo site to be what he called a "megaform", consisting of two manufactured islands and Cité-du-Havre (where Habitat 67 was located), a "spit of land extending outwards from the bank of the St Lawrence."[24]

> All were joined by bridges above water and Metro tunnels below ground, so that the whole site could be seen as a megaform in the Metabolist sense. Again, the major claimant to the title of megastructure in downtown was downtown itself, unified by a subterranean network of shopping malls, pedestrian tunnels, Metro stations and parking silos, like eight kilometres of an underground root system of which the office towers and hotels above ground were mere outgrowths. And since the Metro was an active ingredient in both downtown and Expo, it could be seen, if you had so intellectualizing a turn of mind, as the meta-form behind the megaforms.[25]

Just as Banham qualified the metro as "meta-form behind the megaforms," so too would I argue that the electric network, partly powered by the Manic-Outardes complex,

---

[21] Some of the most notorious megastructure projects are from the British group Archigram, notably *Plug-In City* (1964), the architect Yona Friedman's *Spatial City* (1958-1962), and *New Babylon* (1959-1974) by Constant Nieuwenhuys. They shared a belief that technology could liberate society from the labor of work and permit different nomadic lifestyles.

[22] Banham, *Megastructure*, 13, emphasis in original.

[23] Designed by architect Moshe Safdie (1938-), Habitat 67 is located only steps away from the former site of the Québec Industries pavilion. Although Habitat 67 was constructed with multiple units prefabricated on site, these were not identical and needed to be individually calculated to "survive the … asymmetrical loadings" created by their random assembling. Moreover, what especially removes Habitat 67 from any but an aesthetic category of the megastructure is the fact that the overall building lacks flexibility for future extension and its substructure is not independent of its units. (Banham, 107)

[24] Banham, *Megastructure*, 105.

[25] Banham, *Megastructure*, 105-106.

participated in this meta-form, allowing the megaform of Expo 67 as well as the city to change and grow.

Banham was not alone in considering Montréal an highlight of megastructuralist practice; more recently, architectural historian Inderbir Singh Riar has offered an overview of this moment, circa 1967, assembling a detailed literature on the topic and revisiting different aspects of the megastructure in Montréal, from Expo's thematic pavilion Man the Producer to the social consequences of this movement in the city, as will be explored below.[26] This thesis is the first scholarly attempt to identify and analyse the conjoined sites of Manic 5 and Expo 67 in relation to the architectural megastructure. Their scale, multifunctional program – work, residential, leisure – and embedded communication network encourages this reading.[27] Thus, the interpretation I am arguing for in this thesis relies on the connection between two distant places, each megastructure in and of itself.

Instead of using the term "megastructure" to describe an urban and inhabited architectural object,[28] I aim to draw upon its definition in relation to notions of expansion,

---

[26] Inderbir Singh Riar, "Montreal and the Megastructure, ca 1967," in *Expo 67: Not Just a Souvenir*, 193-210.

[27] Sylvain Simard, "Les télécommunications," *Manicouta* (July 31, 1966): 3-6. This article explains how Manic-Outardes' communication network operated.

[28] Architects of megastructuralist projects developed during the 1960s widely and positively considered them as material solutions to problems of architecture, urbanization, and infrastructure in a developing society of information. See Dominique Rouillard, *Superarchitecture. Le futur de l'architecture 1950-1970*, (Paris: Éditions de la Villette, 2004), 14. Moreover, several projects took the form of linear, continuous cities housed in homogeneous structures expanding on territorial scales. For example, the project *Continuous City* by Alan Boutwell developed an elevated horizontal bar completely crossing the United States from east to west. See Cornelia Escher, "Alan Boutwell: From the Modular Housing System to the *Continuous City*," in *Megastructure Reloaded*, 158-168. *Continuous Monument* (1969) by Superstudio and *No-Stop City* (1969) by Archizoom are relevant, although they were intended to be dystopic responses to the enthusiasm for the megastructure movement. (Rouillard, 15)

modularity, but especially to connectivity, in order to articulate how Manic 5 and Expo 67 together formed a *territorial* megastructure. The idea of an underlying, often continuous, framework inherent to the megastructure and its integration of communication technologies underscores the material and virtual connections between two places separated by 800 kilometres. This irreducible distance partly justifies the addition of the term "territorial" to this particular megastructure. But it is important to understand that the physical distance between Manic 5 and Expo 67 was both the spatial challenge to overcome and the continuous backdrop to their connection during the relatively brief run of the world's fair.

During a winter trip to northern Québec to visit today's largest hydroelectric complex in the province, the James Bay project located several hundred kilometres northwest of Manic 5, architectural historian Alessandra Ponte observed that "the concept of 'landscape' [didn't] seem applicable" under conditions of "excessive distance and … extreme weather."[29] She believes that the term "territory" describes this vast space better than "landscape." "Landscape," she continues, "speaks of central perspective, of the

---

[29] Alessandra Ponte, "Journey to the North of Quebec: Understanding (McLuhan's) Media," in *Traversées/Crossings*, ed. Catherine Mosbach (Paris: ICI Interface, 2010), 11. See also McGill University's podcast website for Alessandra Ponte's lecture, "Journey to the North of Quebec: Understanding (McLuhan's) Media," *Winter 2012 lecture series from McGill's School of Architecture*, Montréal, January 23, 2012.

After working on the American desert for many years, Alessandra Ponte has shifted her attention to the ice "desert" of northern Québec. In 2009, while working as a research assistant at Université de Montréal, I had the occasion to assist Ponte in her research on hydroelectricity in northern Québec. I also assisted Ponte in her selection of images for the *Traversées/Crossings* article mentioned above, which Ponte illustrated with photographs from her trip to the James Bay region. I owe much to the experience of working with Ponte; her research greatly inspired me and set me on my own path with regard to the distant hydroelectric installations on which so many aspects of modern life rely but are absent from daily awareness. Another important step towards the present thesis was Dr Johanne Sloan's graduate seminar, *Landscape as Visual Material and Culture* (Department of Art History, Concordia University, Fall 2010). There, I began to explore Manic 5's visual representation in my major research paper.

singular point of view, of a painterly practice of framing, capturing, labeling, and packaging an experience, usually reduced to its optical dimension, into a neat and reassuring series of images."[30] Thus "landscape" as a concept is unequal to the realities of the James Bay region that she encountered. Just as Ponte travelled to the James Bay region in 2009, so too did I travel to the Manicouagan region in 2011, taking many pictures that accompanied my written observations along the way. Just as Ponte sees the term "landscape" as too limited to truly encompass the kind of space produced by the James Bay project, I too believe that characterizing the space between Montréal and Manicouagan as "territorial" opens up more powerful analytical possibilities. This territory encompasses many different landscapes; further, it is impossible to synthesize or represent this enormous distance, and its many landscapes, into one image.

In 2012, Ponte organized a seminar on the theme of "Territorial Infrastructures." There, she explained that "geographically inclined architects"[31] are imagining, increasingly, architectural projects "expressed in form of cartographical representations, mapping in time and space the transformations of topographical features as well as fluxes of matter, goods, energy, people and information."[32] Such architects tend to "think in terms of environments and territories" instead of focusing on the traditional, isolated architectural object. Ponte also suggests that new readings of contemporary infrastructures should address their "growing visibility and ubiquity" and thus devoted a

---

[30] Alessandra Ponte, "Journey to the North of Quebec," 11.

[31] Ponte identifies this "emerging group" as interested in geography's theories and concepts as well as in the "discipline's representational tools," such as mapping, made easily accessible via a "digital revolution" that produced tools like Google Earth. (See fig. 3)

[32] Alessandra Ponte, "Territorial Infrastructures," *Phyllis Lambert Seminar* (École d'architecture de l'Université de Montréal, Winter 2012), accessed July 18, 2012, http://www.arc.umontreal.ca/docs/pdf/evenements/2011-2012/InfrastructuresTerritorialesProgramme.pdf.

colloquium "to the question of infrastructure in an 'expanded' sense and at a territorial scale."[33] This thesis takes up Ponte's invitation to further explore the idea of the territorial infrastructure, by offering the argument that what might be considered a territorial *infrastructure* can make an important contribution to architectural history if explored as a territorial *megastructure*.

With regard to Ponte's above definition of landscape, the Manic 5 site was made into a landscape, an experience packaged into a "reassuring series of images,"[34] due to its constant filming during Expo 67. More specifically, it was an industrial landscape in process. Cultural theorist W.J.T. Mitchell has developed the thesis that a landscape can also be understood as a medium in itself, exceeding its historical definition as a pictorial genre.[35] He argues that "[b]efore … secondary representations, … landscape is itself a physical and multisensory medium (earth, stone, vegetation, water, sky, sound and silence, light and darkness, etc.) in which cultural meanings and values are encoded."[36] In that sense, Manic 5 and its transformed surroundings were already a physical landscape, but this landscape required a "secondary representation," its live projection at Expo 67, in order for its meaning to be accessible to a broader group. Although Mitchell considers that "a working country is hardly ever a landscape,"[37] the case of Manic 5 is particular in that it is precisely the human and machine work necessary to build a massive dam in a

---

[33] Alessandra Ponte, "Territorial Infrastructures."

[34] Alessandra Ponte, "Journey to the North of Quebec," 11.

[35] W.J.T. Mitchell, "Imperial Landscape," in *Landscape and Power*, 2nd ed., ed. W.J.T. Mitchell (Chicago: University of Chicago Press, 2002), 5.

[36] Mitchell, "Imperial Landscape," 14.

[37] Raymond Williams, *The Country and the City* (London, 1973), 120, quoted in Mitchell, "Imperial Landscape," 15.

natural setting that rendered this landscape (in process) significant to the spectators in the Québec Industries pavilion, especially the Québécois francophone ones.

In the preface to the second edition of *Power and Landscape*, Mitchell, acknowledging the influence of sociologist Henri Lefebvre,[38] also suggests that the topic of landscape should be considered as a triangulation or "dialectical triad" including space, place, and landscape, where none of the three concepts is dominant.[39] I believe that an important triangulation does occur in the relation between Manic 5, Expo 67, and the space and technology connecting them. For instance, Manic 5 and Expo undoubtedly correspond to specific locations (places) and architectural designs, but these sites have become landscapes with the passage of time. Instead of focusing on the three terms as a "conceptual totality,"[40] I was interested in the potential to, in Mitchell's words, "triangulate the whole topic, and … resist the temptation to binarism."[41] This perspective of triangulation in landscape has helped me to articulate my understanding of the spatial interaction between Manic 5 and Expo 67. I thus identify three interconnected spaces programmatically giving shape to the territorial megastructure: a *space of production* corresponding to Manic 5 and its surroundings; a *space of consumption* corresponding to the projection room, extending to the wider site of Expo 67, and even to the broader context of the city of Montréal; and finally a *space of transmission* that includes the territorial dimension and technological networks necessary to physically and virtually

---

[38] In the *Production of Space* (1974), Lefebvre established a three-part dialectic between a perceived, a conceived, and a lived space that, he argues, all participate in the social production of space.

[39] W.J.T. Mitchell, "Preface to the second edition of *Landscape and Power*: Space, Place and Landscape," in *Landscape and Power*, ix.

[40] Mitchell, "Space, Place and Landscape," viii.

[41] Mitchell, "Space, Place and Landscape," x.

connect Manic 5 and Expo 67. This observation might appear anachronistic, but it is not; a 1967 article about Manic 5's presentation in the Québec Industries pavilion was illustrated in precisely this tripartite manner.[42] The series of photographs showed two cameras on the site of Manic 5 (space of production); two antennas installed in two different locations along the distance between Manic 5 and Montréal (space of transmission), and the model of the Québec Industries pavilion followed by the interior of the projection room (space of consumption). (Fig. 8) This evidence encouraged me to develop my analysis, which builds upon and departs from existing scholarship about megastructures, Expo 67, and hydroelectrical installations in Québec, by reinforcing the idea of a territorial megastructure with the tripartite articulation occurring between spaces of production, consumption, and transmission.

[42] "Manic 5 à l'Expo," *Manicouta* (April 30, 1967): 4.

Historical and Geographical Context, Methodology

Historical and Geographical Context

The 1960s were, for the province of Québec, the era known as the Quiet Revolution (1960-1966).[43] Many social transformations took place in a society aiming to define itself as modern and self-sufficient, and which equated technological progress with higher living standards. Compared to its neighbours, the province of Ontario and the United States, Québec lagged behind in industrial development; its newly acquired faith in technocracy resulted in the creation of a new, principally francophone middle class.[44] Among the many social, cultural, economic and political changes undertaken, the complete nationalization of hydroelectric resources in 1962 was key.[45] They were put under the management of Hydro-Québec, the public supplier of (hydro)electricity in the province.[46] Since the end of World War II there was, in Québec, a growing interest in the province's natural resources in its northern reaches.[47] The government used nationalist and economic discourses of conquest in their approach, to justify the opening of mines

---

[43] For more information on the Quiet Revolution in Québec, see Marcel Fournier, "Une société en mouvement. La révolution tranquille ou la montée des classes moyennes," in *Les années soixante: Montréal voit grand*, ed. André Lortie (Montréal/Vancouer and Toronto: Centre canadien d'architecture/Douglas& McIntyre, 2004), 31-51; Paul-André Linteau et al., *Histoire du Québec contemporain*. Tome II. *Le Québec depuis 1930* (Montréal: Boréal, 1989), 419-803.

[44] Fournier, "Une société en mouvement," 32.

[45] Linteau et al., *Le Québec depuis 1930*, 422. The nationalization aimed to regularize access to a service previously controlled by a few private companies. A first partial nationalization of hydroelectric resources took place in 1944 affecting the region of Montréal, but it was only completed to include the rest of the province in 1962 under the newly elected liberal government of Jean Lesage. For a general history of electricity in the province of Québec, see: Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*; for a brief history focused on Hydro-Québec, see: "Chapitre 1. De la 'commission hydroélectorale' au 'navire amiral': brève histoire d'Hydro-Québec," in Savard, "Retour sur un projet du siècle," 34-64.

[46] Recently, part of the electricity produced by Hydro-Québec is exported to the United States. See "Developing Outside Markets," on the *Quebec Hydropower: Energy for the Future* website.

[47] Linteau et al., *Le Québec depuis 1930*, 244-246.

and the development of hydraulic resources considered unused and waiting to be exploited. One 1967 Hydro-Québec brochure proclaimed, "For thousands and thousands of years, the power of these two great rivers … had been wasting in foam and swirls."[48] This is a typical example of how the Manicouagan and aux Outardes Rivers were viewed before their harnessing.

Neither the Québec government nor Hydro-Québec considered the rights or quality of life of the first inhabitants of this territory, the Innu, in the wake of the north's technological colonization.[49] The Innus' attachment to the land they lived on, which they know as *Nitassinan* (our land),[50] was not recognized by the government, which chose to ignore the evidence of nomadic patterns of habitation, and to privilege western norms of static and permanent settlement in their assessment of whether or not the land was "inhabited".[51] Moreover, a majority of the Innu had already been forcibly settled in federal reserves established by the 1960s. The relationship between First Nations, Québec nationalism, and hydroelectricity is beyond the scope of this thesis, thus I refer the reader to others' work regarding the history and ongoing struggle between Hydro-Québec and

---

[48] Paul Paradis, *735kV, Manicouagan-Montréal* (Montréal: Public Relations Department of Hydro-Québec, [ca 1967]) [2].

[49] The government only provided very few minor jobs to members of the Innu community. See Stéphane Savard, "Les communautés autochtones du Québec et le développement hydroélectrique: un rapport de force avec l'État, de 1944 à aujourd'hui," *Recherches amérindiennes au Québec* 39, nos.1-2 (2009): 49. For an analysis on the technological colonization of nature by Hydro-Québec, see Perron, *Le nouveau roman de l'énergie nationale*, 68-71.

[50] For more information on the Innu's historical and contemporary relation to the land, see Jean-Paul Lacasse, *Les Innus et le territoire: Innu tipenitamun* (Montréal: Éditions du Septentrion, 2004); "Le territoire dans l'univers innu d'aujourd'hui," *Cahiers de géographie du Québec* 40, no. 110 (1996): 185-204.

[51] The only traces acknowledging Innu's cultural erasure due to hydroelectric projects that I could find in documents of the 1960s were in two movies by director Arthur Lamothe (1928-), the short documentary *De Montréal à Manicouagan* (1963) and the narrative film, *La neige a fondu sur la Manicouagan* (1965). Both mention that an Innu cemetery was flooded by the water reservoir created by the Manic 5 dam.

the Innu community, particularly the former's exploitation of the latter's territory. Among others, anthropologist Paul Charest and documentary film-maker Arthur Lamothe are essential reading and viewing on this subject.[52]

Far away from these struggles, in the southern end of the province, Expo 67 was a landmark event of the 1960s. It took place on two manufactured islands, Ste. Hélène and Notre-Dame, and Cité-du Havre, which was the site's official entrance. (Fig. 9) Expo celebrated Canada's centennial as a united nation under the theme *Man and his World*. Many thematic pavilions, such as Man the Producer, Man and his Health, and Man in his Community, provided a universal yet multifaceted image of human conditions.[53] Moreover, sixty-two countries participated by presenting their culture and *savoir-faire* to the rest of the world in individual pavilions.[54]

---

[52] Paul Charest, "More Dams for Nitassinan: New Business Partnerships between Hydro-Quebec and Innu Communities," in *Power Struggles: Hydro Development and First Nations in Manitoba and Quebec*, eds. Thibault Martin and Steven M. Hoffman (Winnipeg: University of Manitoba Press, 2008), 255-279; "Les barrages hydro-électriques en territoire montagnais et leurs effets sur les communautés amérindiennes," *Recherches amérindiennes au Québec* 9, no. 4 (1980): 323-337. The director Arthur Lamothe has dedicated the major part of his work at documenting the Innu culture principally in the 1970s and 80s, among which *La conquête de l'Amérique* (1992), in two parts, addresses the Innu's struggle to recover their rights on the natural resources of their territory. The films are available online at the National Film Board website. See also note 49.

[53] It is worth noting that the First Nations of Canada had, for the first time, the occasion to participate in the representation of their cultures and realities on their own terms with the Indian pavilion, a participation that caused controversy. See Myra Rutherdale and Jim Miller, "'It's Our Country": First Nations' Participation in the Indian Pavilion at Expo 67," *Journal of the Canadian Historical Association / Revue de la Société historique du Canada* 17, no. 2 (2006): 148-173.

[54] For more information on the history of Expo 67, see Yves Jasmin, *La petite histoire de l'Expo 67: l'Expo 67 comme vous ne l'avez jamais vue* (Montréal: Québec/Amérique, 1997); Pierre Dupuy, *Expo 67 ou la découverte de la fierté* (Montréal: Éditions La Presse, 1972); Compagnie Canadienne de l'Exposition Universelle de 1967, *Rapport général sur l'Exposition universelle de 1967*, (Ottawa: Imprimeur de la Reine, 1969); Compagnie Canadienne de l'Exposition Universelle de 1967, *Expo 67: guide officiel* (Montréal: Maclean-Hunter Limitée, 1967).

Screen technologies were omnipresent in a variety of settings at Expo 67.[55] This communication tool adopted many forms; Bill Bantey, a reporter for *The Gazette* and editor for *Montréal* (a monthly magazine published by the city under Mayor Jean Drapeau in preparation for Expo 67), covered the event from its early stages.[56] He writes:

> The majority of the 100-odd pavilions … have motion pictures and audio-visual devices to convey their messages. They range from standard, single-screen projections and continuous box-screen loops to massive, multi-screen setups of unprecedented imagination and complexity. The commanding Labyrinth tops them all.[57]

This type of comment was widespread and the Labyrinth pavilion, with its innovative, multiscreen spectacle, was recognized as one of the most popular of Expo 67.[58]

Close to the Labyrinth, on Cité-du-Havre, the Québec Industries pavilion, where live coverage of the construction of Manic 5 took place, was located between the International Trade Centre and the Rest Garden.[59] (Figs. 10-11) The idea of an industrial pavilion came from the Québec Ministry of Industry and Commerce. Over one hundred and fifty participating Québec industries financed the venture. Under the theme *The St. Lawrence Industrial Valley*, the pavilion's purpose was "to stimulate the demand for

---

[55] Ben Highmore, "Into the Labyrinth: Phantasmagoria at Expo 67," in *Expo 67: Not Just a Souvenir*, 125.

[56] Alan Hustak, "Montreal reporter considered Expo the highlight of his career," *The Globe and Mail* December 3, 2010.

[57] [Bill Bantey], "The Wonderful World of Film," *Montréal* (June 1967): 4.

[58] Highmore, "Into the Labyrinth," 127.

[59] The International Trade Centre, designed by the Montréal firm of architects D'Astous and Pothier, was built for the exclusive use of businessmen visiting Expo. The general public was not allowed inside. The Rest Garden consisted of a turfed surface planted with a few small trees, lacking urban furniture of any kind. *Expo 67: Official Guide*, *April 28-October 27* (Montréal: Maclean-Hunter Publishing Company, 1967), 172.

Quebec products and to encourage new industries to set up in Quebec."[60] Jean Grondin (1926-2006), a Québec architect, designed the pavilion and imagined a grid of regular hexagonal cells arranged in an asymmetrical C-shape forming an interior courtyard.[61] (Fig. 12) The Québec Industries pavilion was officially inaugurated on May 8, 1967 in the presence of the province's Premier Daniel Johnson.[62] (Fig. 13)

As major events in the province of Québec's modern history, both Manic 5 and Expo 67 participate in the collective memory that shapes and supports Québécois identity.[63] As such, they are the subject of much scholarly analysis and the focus of a great deal of visual culture.[64] However, in the history of representation of each site, the direct overlap between the two, namely the virtual presence of Manic 5 in one of Expo's pavilions, has been overlooked. My thesis addresses this gap by documenting and

---

[60] "An engineers guide to Expo 67," *Product Design and Value Engineering*, Special issue, vol. 12, no. 4 (April 1967): 19.

[61] In a special edition of *La Presse* (April 15, 1967) consisting of a guide to Expo, the pavilion was described in these words: "On a horseshoe-shaped floor, representing the majestic Canadian river, the visitor has the impression of going downstream. Along the way, he sees numerous industries that have established themselves on its shores. Appropriate light effects animate the elements in the exhibit." (19). "Sur un plancher en forme de fer à cheval, et qui représente le majestueux fleuve canadien, le visiteur a l'impression de descendre le fleuve. Tout le long du parcours, il voit les nombreuses entreprises industrielles établies sur les rives. Des jeux de lumière appropriés animent les éléments de l'exposition." (trans. Marie-France Daigneault Bouchard).

[62] "Inauguration au Pavillon des Industries du Québec," *Entre-Nous* (May 29, 1967): 2.

[63] Stéphane Savard, "*Lieu-de-mémoiriser* Hydro-Québec comme symbole des représentations de la nature et de la technologie: esquisses de réponse et piste de réflexion," *Conserveries mémorielles* 2, no. 4 (2007): 46-64. Brigitte Schroeder-Gudehus, "Progrès et fierté: les expositions universelles," *Bulletin d'histoire politique* 17, no. 1 (2008): 15-24.

[64] It would be a complex task to retrace all the promotional documents and books that were published at the time to visually document Expo 67 and Manic 5. But one confirmation of their equal importance in the history of representations of Québec can be found in Linteau et al., *Le Québec depuis 1930*, where images of Expo 67 and Manic 5 are reproduced, side by side. See 424-425. Recent scholarly treatments of Expo 67 include: Kenneally and Sloan, *Expo 67: Not Just a Souvenir*; Robert Comeau, ed., "Premier dossier thématique. L'Expo 67, 40 ans plus tard," *Bulletin d'histoire politique* 17, no. 1 (2008): 13-173; several master's and doctoral theses also closely look at specific events at Expo 67, see Pauline Curien, "L'identité nationale exposée. Représentations du Québec à l'Exposition universelle de Montréal 1967 (Expo 67)," (Ph.D. thesis, Université Laval, 2003). See also note 6 for recent scholarly treatments of Hydro-Québec and Manic 5.

analysing the spatial relation between both, expressed as a spectacle, but presented here through the lens of the megastructure concept and the reconstitution of three connected spaces of production, consumption, and transmission. Extensive archival research and careful coverage of primary sources available in French and English expanded my knowledge about and aided in my understanding of this event.

Methodology

A first step was to collect information on the subject of the projection itself, the construction of the hydroelectric dam, an industrial process that lasted almost ten years. Hydro-Québec published various promotional, printed documents about the dam during the 1960s.[65] They were filled with photographs recording the construction process of Manic 5 and also lengthy descriptions that featured numbing enumerations of statistics, whose purpose was to convey the project's enormous scale.[66] With so few people having the means to experience the dam's actual physical surroundings, photographs and words were important tools in the work of rendering the project as vividly as possible.[67] Hydro-

---

[65]The principal promotional documents that I consulted for my research on Manic 5's construction were David Peace, *Manicouagan* (Montréal: Hydro-Québec, 1964); Paul Paradis, *735kV, Manicouagan-Montréal* (Montréal: Hydro-Québec, [ca 1967]); Paul Paradis, *Manic-Outardes* (Montréal: Hydro-Québec, [ca 1967]); Ian McNaughton, *Manic 5, comment a été construit le plus grand barrage à voûtes multiples du monde* (Montréal: Hydro-Québec, 1968).

[66] Historian David E. Nye theorized the idea of the technological sublime in his history of the United States based on technological progress. Manic 5 clearly corresponds with Nye's concept, particularly its strong bond with nationalist discourse. Nye developed different types of technological sublime, such as the mathematical sublime, which expresses technological performance through abstraction with numbers. This idea helps to understand Hydro-Québec's rather relentless use of statistical information in its documents about Manic 5. See *American Technological Sublime* (Cambridge: The MIT Press, 1994).

[67] A fascinating source of information for my research was a 1971 book, *Manic 5: The Building of the Daniel Johnson Dam*, describing in precise detail the dam's history and illustrated with a profusion of sketches by the artist Lili Réthi (1894-1971). Focusing on the onsite procedures, the book covers the building project from land prospecting in 1955 to the launch of hydroelectric production in 1970.

Québec also produced short films about the dam's construction at various stages, although the live projection at Expo 67 epitomized the virtual, spatial experience of Manic 5's construction, an experience that is marked, of course, by the absence of an actual visit to the site.[68] In a sense, the virtual visit offered at Expo 67 had begun years before with the diffusion of printed and filmic documents about Manic 5.[69] Postcards of the dam, from the very beginning of its construction until its completion, were also – and are still being – produced. This corpus of documents is both representative and not: these images often represent spaces that no longer exist; today they are filled with tons of concrete, submerged under millions of cubic-yards of water, or simply integrated in the completed dam.

Art historian Johanne Sloan remarks that "the exaggerated colouristic effects" to postcards illustrating various pavilions of Expo 67 "present the world's fair as a site of possibility and fantasy, where the material world has an unanticipated plasticity," which participated in the "utopian promise" of the event.[70] These Expo 67 postcards stand in stark contrast with the postcards and pictures of the dam under construction. The latter depict the human capacity to destroy and recreate a landscape for industrial purposes, and thus make ambiguous the question of whether we see activities of destruction or creation. (Figs. 14-15) The symbolic meaning, based on ideas of progress and nationalism, accorded to the project was strong enough to overcome the lack of plasticity of its

---

[68] The compilation "L'épopée de la Manic" (2010) edited by Hydro-Québec reunites four original films on dvd: *Manicouagan-5* (1964) and *Du béton et des hommes* (1965) by Fernand Rivard; *Manic 2* (1967) by Rivard and Aram Goudsouzian; and *Le complexe Manic-Outardes* (1968) by Goudsouzian.

[69] Savard suggests that the promotional corpus produced by Hydro-Québec served to define the company as a *lieu de mémoire* for the Québécois society, a concept that he previously developed as related to collective memory. (Savard, "*Lieu-de-mémoiriser,*" 53)

[70] Sloan, "Postcards and the Chromophilic Visual Culture of Expo 67," 177.

representations and become a spectacle, especially at Expo 67.

In the Hydro-Québec archives, I consulted two papers published bi-monthly by the company and retraced, through articles, an approximate chronology of the participation of Hydro-Québec in Expo 67. The first paper, *Entre-Nous*, was intended to inform all Hydro-Québec employees across the province about the accomplishments of and activities related to Hydro-Québec.[71] The second paper was a supplement locally distributed in the Manicouagan-Outardes region, from which its name, *Manicouta*, was taken. *Manicouta* was created to inform the inhabitants of the construction sites about local activities. It was published during the most active construction period, from 1964 to 1969. These papers were my principal source for technical descriptions of the closed-circuit television system and the team who operated it, enabling the live projection in the Québec Industries pavilion.

The Hydro-Québec's photographic fonds contain thousands of images, a large number of which are unpublished. Among many subjects, this archive illustrates the camera installations at Manic 5 and the Québec Industries pavilion at different stages of its construction. These archival pictures were an essential source of information supplementing my understanding of the spectacle and its projection space beyond what is actually visible in the photomontage. Photographs of the projection room's construction helped me to understand its design and spatiality, while others showed it in operation during Expo with different types of audiences. Nearly at the end of my process I succeeded in locating plans of the pavilion and the projection room in the City of

---

[71] In January 1971, *Entre-Nous* became *Hydro-Presse*. (Hogue, Bolduc and Larouche, 331)

Montréal archives, which helped to inform my understanding of this exhibition space. Given the fragmented nature of the traces left behind by this unique event at Expo 67, a variety of visual material provided valuable information for this thesis, aiding in a (de/re)construction of spaces that have today disappeared or radically changed from their original state over forty years ago. My overall coverage of primary sources about the projection of Manic 5 at Expo 67 and its inclusion in this thesis make the present work the first scholarly effort to bring together two major historical events in Québec.

As I was exploring, through archival sources, the visual event that linked Manic 5 and Expo 67, I realized it would be crucial to personally experience both the site of the dam and the site once occupied by the Québec Industries pavilion on Cité-du-Havre. Fortunately, the Manic 5 dam still stands, an impenetrable wall retaining a huge reservoir of water, open to the public during the summer. In contrast, the Québec Industries pavilion was completely dismantled soon after the world's fair ended and its site remains vacant.[72] Only vestiges of the past remain, such as broken lamp-posts and cracked asphalt paths slowly being infiltrated by grass. The land is now privately-owned terrain.[73] (Figs. 16-17)

---

[72] The demolition occurred between 1968 and 1970 according to a recent patrimonial report on Notre-Dame island and Cité-du-Havre sponsored by the City of Montréal. A thematic park called *Terre des Hommes* was opened on Ste. Hélène and Notre-Dame islands during the summer from 1968 to 1972 and until 1981 on Ste. Hélène island only; Cité-du-Havre was not part of the project and although a number of permanent pavilions subsist, the temporary ones were quickly removed. Réjean Legault, "Étude patrimoniale sur les témoins matériels de l'Exposition universelle et internationale de Montréal de 1967 sur l'île Notre-Dame et la Cité du Havre," (Laboratoire de recherche sur l'architecture moderne et le design, École de design de l'Université du Québec à Montréal, April 27, 2007): 21. The report is available on the City of Montréal website.

[73] Canada Mortgage and Housing Corporation owned the terrain until 2002 and it is now the property of a numbered company. A sign located at the site's entrance on Pierre-Dupuy Avenue indicates that Trustcan, a property management company specializing in seniors' residences, now manages the site.

At the end of summer 2011, I undertook the thirteen-hour drive from Montréal to the Manicouagan region. Having in mind the photographs and films documenting the construction process of the dam at different stages, I was confronted with a static experience of the engineered monument completed over forty years ago. (Fig. 18) Due to security issues, a visit to Manic 5 today only permits limited access to the ridge, the base, and the interior of the dam – stretches of concrete corridors[74] – and the neighbouring powerhouse through a one-hour guided tour.[75] The complex construction of this seemingly homogenous structure is imperceptible on site except for a small photographic exhibition at the information centre.

Most importantly, the experience of travelling to Manic 5 included the physical journey I made between the two sites. This journey was key to my understanding of my subject. I came to see the significance of this distance, the underlying and, at Expo 67, invisible space which connected Manic 5 and Expo 67. The landscapes between Expo 67 and Manic 5 are punctuated with the material presence of cables, pylons, and antennas. (Fig. 19) My spatial experience of Manic 5, of Cité-du-Havre, and of the road in between thus problematized, complemented, and confirmed some of the insights I gained through archival, historical, and theoretical research. Experiencing places that I first encountered

---

[74] Unfortunately, at the time of my visit on August 29, 2011, maintenance works were underway and the interior was inaccessible to the public. I could only imagine these confined corridors with the recollection of images of their construction. I later came across a short video where it is possible to briefly "visit" these corridors. See the "Manic 5, au cœur du courant" capsule on the *Urbania* website, accessed September 24, 2012, http://urbania.ca/canaux/quebec12/914/manic-5-au-coeur-du-courant.

[75] In 2005, a journalist and a cameraman from the state television station, Radio-Canada, were able to enter Manic 5 without encountering security agents or secured entrances. It raised controversy about the lack of security in the hydroelectric complex. Their report was broadcasted on February 15, 2005, see the February 2005 archives of the *Le Téléjournal/Le point* programs on the Radio-Canada website.

through images of their past lives was enlightening as it made more vivid my previous observations about the action of time on space or the modification of space over time.

The three spaces of production, consumption and transmission that I argue constitute a territorial megastructure are still discernable today, if connected in a less acute manner since the historical period of their creation has ended. Through my site visits and analysis, it became evident that both were transformed by the passage of time, which induced a change in their use; their connection appears more diffuse. It would be difficult to argue convincingly for a territorial megastructure between Montréal and Manicouagan today. With time, they became places whose landscapes blur the limits between the natural and the cultural. Given this blurring, this difficulty of looking back, it seems all the more essential to return to the event that temporarily but spectacularly connected northern and southern Québec, an event that was and could never be repeated. The goal of this thesis is to make visible these connections between the spaces of production, consumption and transmission again, for the purposes of arguing that a territorial megastructure operated during Expo 67 and is illustrated in one image, the photomontage with which I introduced this thesis.

Section 1: Territorial Megastructure

> *"If you want to unite men, said Saint-Exupéry, give them a tower to build." The dam that we have in front of our eyes is a brilliant illustration of the spirit prevailing last year at Expo 67 and continuing to animate this Mecca of universal fraternity. The hinterland we used to call* Terre de Caïn *[Land of Cain] has become a* Terre des Hommes *[Land of Men] [sic]. And much better than a tower, we constructed together Manic 5, this pyramid of a new age, this huge citadel that will henceforth keep the entrance of our largest reserve of energy.* [76]

Manic 5 and Expo 67 can both be understood as individual megastructures in their own right. As they stand virtually superimposed in the photomontage representing their direct connection, it is precisely the latter, their connection, which makes them a whole, part of a territorial megastructure. In order to argue for the presence of such a structure in the historical and physical landscapes of the province of Québec, it is essential to first define the narrative that I have uncovered from a selection of documents from my research.

The demand for electricity sharply increased in the province of Québec after the end of World War II. According to the August 1965 issue of *Montreal* magazine, "Montréal [was] the world's biggest consumer of electricity per capita."[77] Towards the end of the 1950s, Hydro-Québec was conducting studies on the hydroelectric potential of the Manicouagan and aux Outardes Rivers, on which seven dams in total would soon be

---

[76] An excerpt from the *Allocution de M. Daniel Johnson Premier ministre du Québec, Cérémonie de la dernière coulée de béton au barrage Manicouagan 5* (26 septembre 1968). The integral speech is quoted and thoroughly analyzed in Perron, *Le nouveau roman de l'énergie nationale*, 173-177.

"'Si vous voulez unir les hommes, disait Saint-Exupéry, donnez-leur une tour à construire.' Le barrage que nous avons devant nous est une illustration éclatante de l'esprit qui régnait l'an dernier à l'Expo 67 et qui continue d'animer ce haut-lieu de la fraternité universelle. Cet arrière-pays qu'on appelait jadis la Terre de Caïn est devenu véritablement une Terre des Hommes. Et beaucoup mieux qu'une tour, nous avons construit ensemble Manic 5, cette pyramide d'un âge nouveau, cette citadelle colossale qui gardera désormais l'entrée de notre plus grande réserve d'énergie." (trans. Marie-France Daigneault Bouchard)

[77] "More Power for Montreal," *Montréal* (August 1965): 14.

constructed, along their parallel courses, to provide more power to the cities of Québec and Montréal and the industrial zone in between. These dams became the Manicouagan-Outardes complex, or Manic-Outardes. In fall 1959, the first teams of workers arrived in the Manicouagan region to prepare in various ways for the future energy production of this hydroelectric complex. Expanding over a considerable area (Fig. 20), workers' settlements, landing lanes, access roads, and transport lines for the eventual electricity all required space in the middle of the north-eastern forest. The first pour of concrete for the Manic 5 dam took place on September 22, 1962. Concrete works would last six years. At the peak of construction, up to 3,500 persons at a time were working on the site of Manic 5.[78]

The 1,292,000 kilowatts eventually produced by Manic-Outardes would need to travel hundreds of kilometres to be distributed to the south of the province.[79] The problem, however, was how to distribute this massive volume of electricity. The technology available at the time would have meant twenty power lines running side by side through the forests, fields, and cities that separated Manicouagan and Montréal.[80] For this reason, Hydro-Québec developed the 735 kilovolt line, a high-tension cable used in power transportation over long distances, which considerably reduced the number of cables necessary and, consequently, the physical imprint on the territory. The world's

---

[78] McNaughton, *Manic 5, comment a été construit le plus grand barrage*, 43. That number increased to 4,700 people if the family members of the workers living on the site of Manic 5 are included in the calculation.

[79] Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*, 305.

[80] Paradis, *735kV*, [6].

first 735 kilovolt power line to ever function linked Manic 2 with Lévis on September 21, 1965 and then, in November of that year, with Montréal. [81]

The Manic 5 dam was finished in 1968 and its power station became operational in 1970. [82] "[T]he most spectacular and most important element"[83] of the Manic-Outardes complex was not only the most impressive in terms of its final dimensions: 214 metres high and 1 314 metres wide.[84] Even before completion, the thirteen massive arches and fourteen soaring buttresses of the hydroelectric dam had gained powerful symbolic currency. The dam was visual and physical evidence of Québec's power and ability to dominate a reluctant nature, and technologically colonize the northern territory of the province.[85] And so, early in 1966, when Hydro-Québec was invited to represent itself via the form of its choice in the Québec Industries pavilion at the upcoming world's fair,[86]

---

[81] Paradis, *735kV*, [10]; Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*, 316.

[82] Manic 2 started to generate electricity in 1965; Manic 1, in 1966; Outardes 3 and 4, in 1969; Manic 5 in 1970 and finally Manic 3 in 1975. (Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*, 307)

[83] McNaughton, *Manic 5, comment a été construit le plus grand barrage*, 3.

[84] McNaughton, *Manic 5, comment a été construit le plus grand barrage*, 3. "… towering 703 feet above bedrock at its central arch and reaching 4,310 feet across the Manicouagan River valley at its crest."

[85] Dominique Perron's analysis of Hydro-Québec's promotional strategies includes the only section that I could find about Manic 5's architectural significance. Perron questions the widespread idea that the dam was a pure masterpiece of engineering. (Perron, 66-70)

[86] The participation of Hydro-Québec in Expo 67 began earlier, with a sponsorship in the Man the Producer thematic pavilion, with Ontario Hydro, for the "Resources for Man" section of the exhibition. Hydro-Québec did not have direct responsibility for exhibition content, which included the harnessing of rivers and the construction of electric power stations. Nor did it control the design of the display. Nonetheless, the company was constantly concerned about the quality of its identification as the sponsor of the exhibition space. A brief article described the "Resources for Man" exhibition in which the identification of Hydro-Québec at the entrance is judged discreet. "L'Hydro-Québec au pavillon 'L'Homme à l'œuvre': Le niveau de vie dépend de la quantité d'énergie disponible." *Entre-Nous* (June 12, 1967): 11. In addition to the Québec Industries proposition, Hydro-Québec was studying the possibility of representing the theme of water as a source of energy and transportation in the Québec pavilion. At that stage, the Québec artist, Charles Gagnon (1934-2003) was participating in the discussions as an aesthetic consultant (*esthéticien-conseil*) from the design firm Gagnon/Valkus. "L'Hydro-Québec présente à Expo 67," *Entre-Nous* (February 14, 1966): 1. Charles Gagnon is mostly known as a multidisciplinary artist and conceived a controversial film and installation for the Christian pavilion at Expo. See Monika Kin-Gagnon, "The Christian Pavilion at Expo 67: Notes from Charles Gagnon's Archive," in *Expo 67: Not Just a Souvenir*,

this was the occasion to imagine a spectacle at the scale of the ambitions of the young state. Unsurprisingly, Hydro-Québec chose Manic 5 to accomplish its goal.

In March 1966, Hydro-Québec officially announced its decision to present the live construction of Manic 5 on a 30 by 18' screen in the Québec Industries pavilion through a closed-circuit television network linking Manicouagan and Montréal.[87] Modifications were made to the micro-wave communication system already in use, in order to permit video reception of Manic 5's images in Montréal and permanently improve Hydro-Québec's communication system. The company argued that it ensured a better protection of the 735 kilovolt power lines while also augmenting the telephone link capacities between the recently built head office in Montréal and the principal production and distribution centres throughout the province.[88] Hydro-Québec was responsible for the interior design of the spaces it occupied; it entrusted this task to Gagnon/Valkus Inc., the design firm that had created the famous company's logo in 1964: a capital Q with a lightning bolt for the tail, which still adorns the top of the head office building.[89] (Fig. 21) The design firm proposed the funnel-shaped device to frame the screen and, as mentioned in an *Entre-Nous* article, give it "a new dimension."[90]

143-162.

[87] Oswald Mamo, "Manic 5 à 'Terre des hommes,'" *Entre-Nous* (March 14, 1966): 1.

[88] Mamo, "Manic 5 à 'Terre des hommes,'" 3.

[89] Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*, 331.
Unfortunately, I was not able to locate the firm's archive and no trace of their interior design for the Québec Industries pavilion was found in Hydro-Québec archives. It was in the City of Montréal archives that I finally discovered the drawings showing the design of the projection room by designer Rodney Y. Hatanaka.

[90] "À l'Expo, Manic 5 par l'image et le son," 5. "une nouvelle dimension" (trans. Marie-France Daigneault Bouchard).

Megastructurality

One of the ideas behind the megastructure was the desire to attain a social ideal in which any inhabitant could be described as *homo ludens*,[91] an individual liberated through technological progress from the obligation of work, and thus free to pursue creative desires.[92] This aspiration is not dissimilar to the idea of an improved life through better access to electricity and its technologies, a goal pursued and promoted in Québec by the government and ultimately Hydro-Québec. Even if the public development of hydroelectricity seems motivated by genuine intent to improve quality of life, it had, like the megastructuralist ideal, many flaws, some of which will be explored below. With his book *Megastructure*, Banham "bulldozed megastructures into history, characterizing the architectural forms he had once endorsed with such aplomb as 'Dinosaurs of the Modern Movement.'"[93] That the principal historian and critic of the megastructure historicized in 1976 an architectural phenomenon that had started perhaps a decade earlier reinforces the idea that the spectacular visual connection between Manic 5 and Expo was temporary. This type of spectacle did not survive as an efficient and accurate way to ideologically represent the successive industrial endeavours affecting and transforming wilderness territories. In the case of hydroelectricity in Québec, "[t]his euphoric era of 'almost-connivance' between an informed public and a 'transparent' Hydro-Québec [would] fade

---

[91] Banham, *Megastructure*, 26. The concept comes from Dutch philosopher Johan Huizinga, whose text *Homo Ludens* (1938) argues for the role of an element of play in the evolution of culture and society.

[92] Such individuals often illustrate the nomadic inhabitants of Constant's *New Babylon*, but also of Archigram's various city projects. Hence, the reason why Banham describes the *homo ludens* as the "inhabitant of the megastructure." (Banham, *Megastructure*, 81)

[93] van des Ley and Richter, *Megastructure Reloaded*, 28. The title of *Megastructure*'s first chapter is "Introduction: Dinosaurs of the Modern Movement."

in the wave of the protest movements of the 1970s."[94] This shift in attitude is especially true with the James Bay project in the 1970s, which had to deal with protests related to the rising ecological consciousness and the claims made by the Cree nation for its rights on its ancestral land.[95]

In a more tangible way, Manic 5 shares many formal characteristics with the megastructure concept. As mentioned above, it starts with questions of scale: the recently built Place Ville-Marie (1962) in downtown Montréal – the largest building in the Commonwealth at the time – was shown standing in the dam's central arch in one of the promotional short films. In addition, an instant and temporary village of workers was installed at the base of the evolving dam. (Fig. 22) After a few years, Lac Louise village, a "suburb" of over 350 trailers – "true mobile homes"[96] – was established a little to the west of the dam to house the workers living with their family.[97] (Fig. 23) Essential services were available to the inhabitants of Manic 5, such as "a police station and jail, firehouse, school, mess hall, bank, post office, hospital, and church … there was also a tavern, a movie house, a bowling alley, a billiard hall, a big sports arena, and a kind of restaurant-general store."[98] The site was thus a multifunctional, almost urban complex in the middle of the forest. In fact, during its construction years, Manic 5 shared the most

---

[94] Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*, 331. "Cette ère euphorique de 'quasi-connivence' entre un public renseigné et une Hydro-Québec 'transparente' s'estompera dans la vague des mouvements de contestations des années '70" (trans. Marie-France Daigneault Bouchard).

[95] See Perron; Savard, "Retour sur un projet du siècle."

[96] Paradis, *Manic-Outardes*, [7].

[97] In some ways, these worker villages recall projects like *Instant City* (1969), developed by the British group Archigram, who played with ideas of temporary, light, and mobile installations appearing on a site overnight, although these were imagined to have much more spectacular and festive functions than Manic 5's work camp.

[98] Réthi and Jacobus, 56.

similarities with a megastructure due to the dynamism of its activities requiring that temporary installations covered the landscape. This aspect of Manic 5 is unlike the *Veladiga* dam project (1965) by architect Paolo Soleri (1919-) who instead imagined "a mighty dam as the support for a skin of human habitations."[99] But Manic 5 shares a formal resemblance with *Veladiga* nonetheless, due to their mutually arched structures. (Fig. 24) After 1968, when Manic 5 was complete, the temporary buildings were dismantled: the houses, the concrete factory, and everything that was no longer necessary for the decreasing population and activities. Many of these same workers then moved further north to Hydro-Québec's next hydroelectric projects, Churchill Falls or James Bay,[100] ironically becoming in their own way rather like nomadic workers, if not quite *homo ludens*, the imagined, utopian inhabitant of the megastructure. Recall that the government had denied precisely this right of mobile inhabitation to the Innu.[101]

While power lines were visible along the way from Manicouagan to Montréal, the cables, pylons, and posts disappeared completely on the Expo site. Indeed, at the time of its construction, Hydro-Québec had decided to build simultaneously two electric

---

[99] Banham, *Megastructure*, 201. The Veladiga project appears in Paolo Soleri, *Arcology: The City in the Image of Man* (Cambridge, Mass.: The MIT Press, 1969). Soleri imagined an ecological utopia, for which none of the intended gigantic structures were constructed. On a lesser scale, the Arcosanti village, an experiment in urban design following Soleri's principles of "arcology" (architecture and ecology), has been under construction in Arizona since 1970.

[100] Many such workers had already participated in previous Hydro-Québec projects such as Bersimis (1953-1959), a hydroelectric project located 60 kilometres southwest of Baie-Comeau.

[101] Photographer Thomas Kneubühler made this observation regarding the James Bay region with the presentation of his project *Under Currents* (2011) at the Québec Triennial 2011 at the Musée d'art contemporain de Montréal. His project "looks at the hydroelectric installations in Northern Quebec and their impact on the people and the land. Northern Quebec is traditionally a nomad's land, home to the native Inuit and Cree. Ironically, in the course of the development, it is the workers from the south that become nomadic: they are flown in for their work shifts and housed in temporary work camps, whereas the native population, displaced by the installation's progress, are settled in subdivisions." See "Under Currents" for the project's details and images on Thomas Kneubühler's official website.

networks for efficiency reasons. The first was above ground and temporary; it only served during the construction years of the site and was completely dismantled right before the opening of Expo.[102] The second network, underground and permanent, aimed at satisfying the high demand for electricity to supply the lighting, air conditioning and technological spectacles presented in many of the pavilions, as well as public services such as the monorail.[103]

Of course, this merging of the mechanics into the topography of the recently manufactured islands structurally accentuated the site's artificiality, from which architecturally heterogeneous, and often megastructural, pavilions seemed to have sprung. This idea concurs with how Banham, in his chapter about Montréal, interprets the city as composed of many architectural elements defined as urban and "accidental" megastructures linked together through the metro and the underground pedestrian network.[104] As such, the underground electrical network on the site of Expo 67 also acted as another kind of connective framework between the different pavilions and services.

The Québec Industries pavilion was one of the numerous "smaller structural units" "plugged-in" to the underground, electric "structural framework" wiring Expo 67's site.

---

[102] "'Drave' à l'Expo," *Entre-Nous* (May 15, 1967): 14.

[103] The underground network was built in less than a year. For more details on the steps followed by Hydro-Québec to electrify Expo's site, see Gaston Mathieu, "On a travaillé d'arrache-pied pour électrifier les îles," *Entre-Nous* (April 24, 1967): 6-7.

[104] By "accidental" megastructures, Banham means constructions that were not intended as megastructures that nonetheless share some formal, structural or functional characteristics. He includes the "rails; artificial islands; harbour; grain elevators; towers of downtown; underground circulations" of Montréal in this group. (Banham, 106)

To accommodate its temporary nature on the site of Expo,[105] architect Jean Grondin imagined a modular structure composed of standard steel columns and fir-laminated beams covered with prefabricated white fibreglass panels, which were an innovative material developed especially for this project.[106] Multiple stepped roofs covered the hexagonal cells of 12 feet per side, composing a white geometric topography with downtown Montréal as a backdrop. (Figs. 25-26) Twenty-four of the identical cells were devoted to the presentation of the industrial face of Québec through conventional electronic and mechanical displays.[107] (Figs. 27-28) The temporary, modular, and prefabricated design of the Québec Industries pavilion played with the constructive principles of the megastructure movement.

My in-person exploration of lot 2300 – the pavilion's official identification in Expo's site documents[108] – certainly confirmed that an architectural unit had once been connected to the site. Grass now completely covers the lot circled by what were then newly-spread asphalt paths, walkways that once guided visitors between pavilions. Today, plants grow through numerous cracks, forming an irregular pattern on the ground. Traces of the connection between the pavilion and the site can be read in a row of lamp-

---

[105] According to a short article in *Manicouta*, after the end of Expo, the Québec Industries pavilion was to be bought by a group of businessmen and converted into a motel in Rivière-du-Loup or Rimouski in the Bas Saint-Laurent region. I have not been able to confirm this information elsewhere. The article also vaguely announced that the projection room was destined to become a cinema. "600 000 personnes l'ont visité: y êtes-vous allés?" *Manicouta* (October 30, 1967): 3.

[106] Jacques Varry, "L'exposition universelle de 1967 en chantier," *Architecture Bâtiment Construction* 21, no. 248 (décembre 1966): 21; Department of Industry and Trade and Commerce, *Expo '67, Building Materials, Systems and Techniques*, prepared by I. Kalin (Ottawa: The Queen's Printer, 1969), 97-99.

[107] Claude Aubry, "La Cité du Havre à l'Expo," *Montréal* (July 1967): 11.

[108] Compagnie canadienne de l'Exposition universelle de 1967, "Pavillon des Industries du Québec," in *Rapport général sur l'Exposition universelle de 1967*, Tome I (Montréal: Compagnie canadienne de l'Exposition universelle de 1967, 1969), 498.

posts, or rather, their surviving lower halves that,[109] with a lone water hydrant, are the sole occupants of what is now a rather mysterious *terrain vague*. (Figs. 29-30) These relics testify to an active past but now are dormant, waiting for a future use. Most likely, one day some new building will appear and reconnect with the existing underground infrastructures, as was the case further east. On the terrain separating the former from Habitat 67, two residential towers (Tropiques Nord and Profil-O) were built on the site of the former Man and the Community pavilion and the Olympic House.

Territoriality

The electricity used at Expo 67, issuing directly from the Manic-Outardes complex, connected to the urban site via the first of three 735 kilovolt power lines. This system of transportation starts with two collector stations, Micoua and Manicouagan, which increase the tension received from the seven nearby dams. These stations are dense technical hubs of posts and pylons from which a large number of cables emanate. (Figs. 31-32) Then,

> [t]he two lines leaving the Manicouagan station follow the north bank of the St. Lawrence River to the Isle of Orleans, where they cross the river to reach the Lévis station …. From there they follow the south bank of the river to the Boucherville station near Montreal. … As to the third line, it [is] built entirely on the north bank of the river over a distance of 375 miles.[110]

The description of the routes followed by these power lines appears in a booklet published by Hydro-Québec – *735kV, Manicouagan-Montréal* – and they are

---

[109] In fact, a light projector was located in this fiberglass cylinder while higher metallic posts carried adjustable circular fiberglass panels on which light was reflected; they were placed on a triangular concrete basis. For more details on the urban furniture at Expo 67 and its material traces on the site, see Legault, "Étude patrimoniale sur les témoins matériels."

[110] Paradis, *735kV,* [11-12].

conceptually illustrated with bold black lines on a map.[111] This representation is crucial for my argument. It suggests, better than any photographic image, the presence of the territorial "infra–" or, as I argue, "mega–" structure. (Fig. 33) The two, close-set black lines materialize a cleared corridor of more than 150 metres (535 feet) wide, occupied by a linear and regular arrangement of electric lines and pylons.[112] (Fig. 34) Paul Paradis, the author of the Hydro-Québec booklet in which this image is found, expresses, unapologetically, the visual impact of such massive planning and infrastructure initiatives in his opening paragraph:

> Passengers of an airplane flying over the North Shore on a beautiful sunny day can see an unusual track of land that stretches out of sight in the distance. It looks as if a giant lawn-mower had rolled its way through the woods of Quebec. This wide avenue is the clearing for two of the three 735,000-volt line that will carry the electricity generated on the Manicouagan and aux Outardes Rivers all the way to Quebec and Montreal.[113]

Along this electric road down to Montréal, several stations responsible for the maintenance and control of the power lines were built. The construction of a new transformation station, Marie-Victorin Station, was particularly necessary in Longueuil to distribute the electricity needed on the site of Expo 67.[114]

Power was delivered through 200,000 feet of underground cables of 12,000 volts to provide the 50,000 kilowatts of power that Expo 67 required.[115] Although this section of

---

[111] This representation gives the impression that they are linear cities across the territory. Continuous, massive, linear cities were an architectural form developed in the megastructure movement. See note 28.

[112] This information comes from a crossection of the 735 kilovolt line found in printed documents about audiovisual production in the Hydro-Québec Archives. H1/1503-02/3286.

[113] Paradis, *735kV,* [3].

[114] Charles Bourgeois, "Le poste Marie-Victorin," *Entre-Nous* (April 25, 1966): 3.

[115] This power was equivalent to the needs of a city, such as Hull or Trois-Rivières. "L'électricité coûte moins cher au Québec qu'au Etats-Unis," *Entre-Nous* (April 1, 1966): 16.

the electric system was buried, to clear the ground of the usual wires and posts, the connective path of electricity is omnipresent and clearly illustrated in a map accompanying an article of April 1967 that explains how the islands were electrified.[116] (Fig. 35) Here, as was the case for the 735 kilovolt lines, the graphics do not perfectly represent the physical presence of the electric installations; they testify, rather, to a new sort of technological structure, merging with features of the landscape, from which a new topography emerges.

I wish to emphasize that in the expression, territorial megastructure, "territorial" holds a double meaning. On one hand, it exceeds the great scale already implied by the megastructure it qualifies. On the other hand, the word "territorial' inevitably invokes themes of ownership and/or occupancy of a delimited space. To insist upon territoriality aids, I believe, in defining and understanding the nature of the megastructure formed by the connection between Manic 5 and Expo 67. This descriptor does not only refer to a structure that must claim, by virtue of its immensity, a geographical scale; it is also a way to reference the territorial gains that Hydro-Québec – and consequently the government of Québec – was making, politically and neocolonially, in the name of the modernization and autonomy of Québec society. From Montréal to Manicouagan, the power lines' continuous presence crossed cities, villages, fields, rivers, and forests; these various spaces were thus literally connected together and symbolically included in a new nationalism based, on a large part, on technocracy.

---

[116] Mathieu, "On a travaillé d'arrache-pied," 6.

The geographical imprint of hydroelectricity on the territory was even more evident with the construction of the Manic 5 dam, where that imprint took a geological turn by diverting the river temporarily through tunnels carved directly in the bedrock; replacing the alluvium in the deep gorge underneath the river with concrete, and building many underground components in the dam's surroundings.[117] These earthworks contributed to permanent change in the landscape and geography of the region, as did the artificial islands of Expo 67 further south.[118] The construction of this massive concrete wall created an artificial water reservoir of 2,100 square kilometres and approximately 35 billion cubic meters.[119] This massive gathering of water led to the birth of an equally massive island – more than 2,000 square kilometres.[120]

The name, "Manicouagan" has origins in the Innu language. "Manikuagan," meaning "the spring where thirst is quenched,"[121] testifies to the Innu's knowledge of the region and their active use of the river. They did not consider the territory and its natural resources as their possessions, but rather as a way of living, as the place of their culture.[122] In contrast, Québécois society felt the need to illustrate its territorial possession through a

---

[117] All these different operations and more are illustrated and described in details in *Manic 5: the Building of the Daniel Johnson Dam* by Réthi and Jacobus.

[118] This flooding, submerging of large tracts of land took place along the route of the St. Lawrence river as well, such as during the construction of the St. Lawrence Seaway in the 1950s, which saw the flooding of many villages, commonly known as the "lost villages." See Louis Helbig, "The Lost Villages," *On Site* 27 (Spring 2012): 23-27. I want to thank Cynthia Hammond for bringing this article to my attention.

[119] Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*, 307.

[120] The geological depression causing this new "island", Île René-Levasseur, to appear with the rising waters of the reservoir is the result of the impact of a meteorite millions of years ago.

[121] Réthi and Jacobus, *Building of the Daniel Johnson Dam*, 2.

[122] Lacasse, "Le territoire dans l'univers innu," 194.

functional monument that affected and controlled natural resources. At the time, Hydro-Québec ignored the First Nations' deep ancestral bond with the land.[123]

As stated in the introduction to this thesis, it is not my aim to analyse the nationalistic links between Manic 5 and Québécois francophone society's emancipation, nor that society's impact on the Innu's cultural practices and quality of life. However, it cannot be denied that political motivation, fuelled by the potential of territorial conquest, led to the exploitation of natural resources, resources deeply embedded in the Innu's traditions. These motivations were echoed in the scale and ambition of the endeavours behind Manic 5. Similar motivations fostered the will to literally create the grounds of Expo 67, in a way conquering the waters of the St. Lawrence River. During the Quiet Revolution in Québec, an almost uncritical faith in progress concealed some social and environmental issues that are only beginning to be questioned and criticized today.

In that sense, and without directly pointing to the Quiet Revolution, Banham recognized that the particular atmosphere of Montréal had an undeniable impact on the development of the megastructure:

> [I]t is helpful to be able to see Mega-Montreal of the mid-sixties as a complete historical phenomenon, inclusive enough in its ramifications to cover, among other things, architectural education at McGill University; the topography of downtown; the atmosphere of optimism induced by the onset of Expo preparations; the mysterious power of the local money establishment to promote major property adventures; a bilingual culture with unexpected world linkages; the land use policy of Canadian National Railways; and yet stranger affairs, including the personality of Mayor Drapeau. In the end, however, this historical phenomenon must be defined by its products; however diverse in detail, *les mégas de Montréal* were

[123] Savard, "Les communautés autochtones."

> perceived as a comprehensible grouping of architecture united by ambition, ingenuity and the ground on which they stood.[124]

By affirming that "this historical phenomenon must be defined by its products," Banham would seem to concur with one aspect of what I am attempting to achieve with this thesis: to define the tangible reality behind a "much less well recorded" event that contributed to the "historical phenomenon" of Mega-Montréal, namely the connection between Manic 5 and Expo 67. To introduce the aspect of territoriality thus expands upon Banham's view of Montréal as the ground of a "megacity," by highlighting the physical and virtual connection with Manic 5, the supplier of its energy. It also includes aspects that are not always perceived as the material "products" of the megastructure. Just as the Innu's ancestral land was irrevocably transformed without their consent by the construction of Manic 5, many Montrealers, especially the less fortunate among them, were deeply affected by *les mégas de Montréal* (Montréal's megas) and the destructive urban renovation they implied.[125] Architectural historian, Inderbir Singh Riar notes that citizens started to contest the decisions that were taken to transform their built environment:

> The legacy of massive infrastructural undertakings that had come to define Montreal, such as the construction of highways and their arterial links to the core (constructions seen by Banham and others in tandem with the megastructural effects of Expo 67), would force a reconsideration of (if not outright lament for) what may have disappeared in their wake.[126]

The phenomenon by which enormous earthworks were undertaken in the province of Québec at that period thus linked the North and South or the urban and the wilderness

---

[124] Banham, *Megastructure*, 105.

[125] André Lortie, "Montréal 1960; les singularités d'un archétype métropolitain," in *Les années 60: Montréal voit grand*, ed. André Lortie (Montréal/Vancouver and Toronto: Centre canadien d'architecture/Douglas& McIntyre, 2004), 107-111.

[126] Singh Riar, "Montréal and the Megastructure," 205.

together in "the optimism of large-scale thinking of the 1960s."[127] Many large-scale urban projects were under construction during the 1960s in the city of Montréal – the Expo 67 islands and pavilions, bridges, the Louis-Hippolyte-LaFontaine tunnel, the metro, highways and several skyscrapers such as Place Ville-Marie. (Figs. 36-37) Throughout the province, the population witnessed the construction of dams, the openings of mines and the development of industrial and other infrastructure projects. The monumental landworks necessary to the realization all of these projects participated in relating them both to the megastructure and to territoriality. In a sense, they were "accidental megastructures" as well as the fruit of political intentions. In the context of the Quiet Revolution, to "take possession" of the territory through huge land manipulations was synonymous with the idea of progress.

This rhetoric was particularly identifiable in the Québec pavilion at Expo 67, where the province was illustrated under three themes: challenge, struggle, and drive. As the magazine *Montréal* stated in September 1965, "These representations [were intended to highlight] the dynamism of a people at work, men and women's tireless activity. Québec [was] thus depicted as a vast construction site [*chantier*]."[128] For Expo 67, the majority of large-scale urban projects were completed in order to demonstrate the city's newness and modernity to the international, visiting crowd that summer.[129] The televised presentation

---

[127] Singh Riar, "Montréal and the Megastructure," 205.

[128] "Un aspect du Québec de l'an 2000 à l'expo 67," *Montréal* (September 1965): 21. "[c]es représentations [voulaient mettre] en relief le dynamisme d'un peuple au travail, l'activité inlassable des hommes et des femmes. Le Québec [était] donc représenté comme un vaste chantier" (trans. Marie-France Daigneault Bouchard). For a complete analysis of Québec identity's representations at Expo 67, see Pauline Curien, "L'identité nationale exposée." See especially chapter 5, "Le pavillon du Québec à Expo 67," 185-215.

[129] George-Hébert Germain, *Le génie québécois: histoire d'une conquête* (Montréal: Libre Expression/Ordre des ingénieurs du Québec, 1996), 126.

of Manic 5's *chantier* acted, in turn, as a reflection or a reminder, at the other end of the territorial megastructure, of the immediate past state of the city. As if the urban upheavals experienced by Montrealers only a few months prior were forgotten, even more dramatic works in Manicouagan were represented via live projection, but kept at a safe distance through the heavily framed screen in the Québec Industries pavilion. The process of human transformation of the environment was put forth with pride, while the images of Manic 5 under construction were presented as exemplary, desirable … virtually aesthetic. (Fig. 38)

Section 2: The Connection of Three Spaces

> *- The spectacle you see here is transmitted live from Manic 5 through the longest closed-circuit colour television system in the world, on this Thursday May 25th, at 2:48pm.*
> - View of the dam.
> *- 15,000 tons of concrete are cast everyday.*
> - Change camera, colours are not clear.
> *- They will open the sluices.*
> - Widen the image. Music![130]

The preceding dialogue aims to reproduce a narrator's interventions, alternating with a co-director's inaudible instructions, during a projection presented by Hydro-Québec in the Québec Industries pavilion. The narration that accompanied the televised images of Manic 5 changed daily, as did the projected images. This written trace reveals perhaps more than what an average spectator in the projection room may have taken in, as it exposes the simultaneity of the spectacle's behind-the-scenes production. This excerpt also provides a brief example of the live commentary of the narrator. Since I was not able to locate archived footage of any of the thousands of original reports on Manic 5's construction presented that summer, nor any record of an actual session in the projection room, this section of the thesis links together various visual and textual sources that serve to describe and characterize the average spectator's experience.[131]

---

[130] "Au 14e étage du siège social: Une salle de contrôle entre Manic et les terrains de l'Expo," *Entre-Nous* (June 12, 1967): 11.
"*Le spectacle que vous voyez en ce moment est transmis en direct de Manic 5 par le plus long circuit fermé de télévision en couleur au monde, ce jeudi 25 mai, à 14h48*.
- Vue du barrage.
- *15 000 tonnes de béton sont coulées chaque jours* [sic].
- Change de caméra, les couleurs ne sont pas claires.
- *On va ouvrir les pertuis*.
- Élargissez l'image. Musique!" (trans. Marie-France Daigneault Bouchard)

[131] Regularly, the technical team recorded up to date segments in order to project them if a technical problem occurred with the closed-circuit television system. (Mamo, "Manic 5 à 'Terre des hommes,'" 3.)

The Québec Industries pavilion was accessible in two ways: visitors could either take a guided tour of the exhibition, passing by the participating industries' displays before reaching the projection room, or enter directly from a nearby entrance.[132] The audience entered under a large, blue-mirrored, rippled surface covered with hundreds of light bulbs and adorned with the "bright yellow fluorescent" logo of Hydro-Québec.[133] (Fig. 39) A hostess greeted the spectators as they entered the room, where images on the screen ran continuously. Some people arrived and others exited as the final/opening all-embracing view of the dam came into view – certainly similar to the one visible in the photomontage – and was accompanied by a recorded chorus of men singing, the only moment when music was heard.[134] (Fig. 40)

Once in their seats, the spectators attended a twelve to fifteen minute presentation of the construction site through the sounds and images captured live by three onsite cameras; they contemplated the performance of an industrial landscape in production. The co-directors chose the footage by following an outlined shooting script; they were allowed to digress from it depending on the events and conditions of the moment as well as on the cameramen's personal initiative to provide them with original images.[135] Although the technical team was expected to present a unique spectacle each time, typical sequences for the beginning, middle, and ending of the presentation were more or less expected, so as to permit some of the prepared comments as announced by one of the

---

[132] Aubry, "La Cité du Havre à l'Expo," 11.

[133] *Pavillon des Industries du Québec, Expo 67*. Microfilm reel 26, frame 1-113, drawing 2-37-10-3. Collection de la compagnie de l'Exposition universelle de 1967 (P67). Montréal City Archives, Montréal. The details of the material were specified on the technical drawings of the project.

[134] "Avant-première du spectacle télévisé, son et image," *Entre-Nous* (April 24, 1967): 1.

[135] "Au 14^{e} étage du siège social," 11.

narrators. These narrators sat in a closed mezzanine at the back of the room, really a technical space hidden from public view, where a technical team also ensured the proper functioning of the Eidophor projector.[136] The lights would progressively raise to indicate the end of the presentation and invite the spectators to depart, allowing for a new cycle to begin. Their experience as "tourists" to Manic 5 ended and they were back in the projection room dominated by "dark blue, red, and black" where the "only light notes" were, as *Entre-Nous* described the scene in April 1967, "the funnel of gleaming tubes framing the screen and the orange seats." Tellingly, the anonymous author of the same piece concludes without any intentional Debordian reference that the design of this projection room was a "very modern *décor* constituting another *spectacle* in itself."[137] (Fig. 41)

Space of production

As a space of production, Manic 5 became one of the greatest suppliers of hydroelectricity in the province.[138] Not only was it a producer of electric power but one of symbolic power too; Manic 5 symbolized a new nationalism that had emerged from the Quiet Revolution.[139] A brand of cigarettes and a car even bore the name, *Manic* and popular songs and a novel were written in reference to it.[140] The spectacle of human

---

[136] "Au 14e étage du siège social," 11.

[137] "Avant-première du spectacle télévisé," 1. "le bleu nuit, le rouge et le noir;" "seules notes claires : l'entonnoir en tubes chromés qui encadre l'écran géant et les fauteuils orangés;" "Un décor très moderne qui constitue en soi un autre spectacle." (trans. Marie-France Daigneault Bouchard), my emphasis.

[138] With a production of 1,292,000 kilowatts, it was the most powerful production station of the Manic-Outardes complex. (Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*, 305)

[139] Linteau et al., *Le Québec depuis 1930*, 425.

[140] Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*, 300. Singer Georges Dor composed the popular song *La complainte de la Manic* (1966); Gilles Vigneault originally wrote the song *Mon pays*

capacity to tame natural forces for industrial purposes presented at Expo 67 was a metaphor for Québec's modernization and newly gained autonomy. A 1967 article in *Entre-Nous* stated that "[the spectators] understood better than with a lengthy speech, the scale of the works undertaken so far in a country of coldness."[141] In order to have these strong images about the production of an industrial landscape continuously projected on a screen at Expo 67, a whole team was working twelve hours a day to produce them on the site of Manic 5, a smaller-scale echo of the manpower required to actually build the dam itself.

On Mont Cantin, on the west bank or to the left of the dam from a downstream view, the first camera was situated near a temporary studio in which the images were selected by a co-director.[142] The camera was protected by a shed on an elevated concrete structure. (Fig. 42) From a bird's eye view, it captured the reservoir, the workers in action, the back of the dam, the settlement at its base, and a panoramic view of the natural setting, which contrasted with the area affected by the works. (Figs. 43-44) In July of 1967, the water level in the reservoir was increasing at a rate of about 8 inches a week and was still several meters below the rising ridge.[143] This situation allowed viewers to observe the flip side of the front façade and partially grasp the formal complexity of this huge, arched retaining wall.

(1964) for the movie *La neige a fondu sur la Manicouagan* by Arthur Lamothe; French author Henri Vernes wrote a youth novel, *Terreur à la Manicouagan* (Paris: Lefrancq, 1995 (1965)), where his character Bob Morane has to save Manic 5 from destruction.

[141] "Avant-première du spectacle télévisé," 1. "[les spectateurs] ont saisi mieux que ne l'aurait fait un long discours, l'ampleur des travaux entrepris si loin dans un pays de froidure." (trans. Marie-France Daigneault Bouchard)

[142] "Manic 5 à l'Expo," *Manicouta* (April 30, 1967): 4-7. It is in this article that I found the most elaborate description of the onsite installations necessary to produce the images that were sent to Montréal.

[143] Réthi and Jacobus, *Building of the Daniel Johnson Dam*, 141.

The second camera was located on a former helicopter landing field. It captured the complete view of the dam's official face, which served as the final/opening scene of the projection and remains the only visible part today.[144] The continuous back and forth movement of the three buckets on the aerial cableways above the dam also appeared in the image's framing. (Fig. 45) With the help of powerful zooms this camera could film the power station and the settlement at the base of the dam.[145] Camera number three moved around the site on a small truck and could take night shots with the help of a light system.[146] (Fig. 46) The truck was allowed to go on the loading dock and on the east part of the dam which was already completed; this camera took closer views and details of the workers in action.[147] A large proportion of the editing was done directly at Manic 5 by an onsite co-editor. The images provided by the three cameras were distributed on seven screens in the studio and the selection was immediately sent to Montréal via the transmission system.[148] All cameras were equipped with telephoto lenses, fitted with directional microphones, to capture close-ups and high quality sound that was heard through the combination of central and corner speakers in the projection room at Expo.[149]

The space of (electricity) production, Manic 5, was re-produced on the Québec Industries pavilion's screen, which acted as the visible point, or more correctly the surface of junction between Manic 5 and Expo 67. The space and team of (image)

---

[144] "Manic 5 à l'Expo," 5.

[145] "Manic 5 à l'Expo," 6.

[146] "Manic 5 à l'Expo," 6.

[147] "Manic 5 à l'Expo," 6.

[148] "Au 14^{e} étage du siège social," 11.

[149] "Manic 5 à l'Expo," 7.

production was invisible to the spectators as was the space in between Manic 5 and Expo 67, only briefly mentioned by the narrator as "the longest closed-circuit television system in the world", a superlative adding to the spectacularity of the subject, or product, seen through real time images.

Space of consumption

On the manufactured islands of Expo 67, every visitor was a tourist. Of course, many people from across the world travelled to Montréal to visit Expo 67, but Montrealers too became tourists as soon as they crossed the entrance gate on Cité-du-Havre to enter a utopian world composed of national and thematic pavilions. In the Hydro-Québec projection room, for fifteen minutes, their position was in a sense doubled by their real-time experience of Manic 5. The simultaneity of the workers' actions and of the dam's evolution as they were comfortably sitting in the room and watching the screen made them witnesses of a unique moment taking place before their eyes. Unlike the spectators watching films in other pavilions, visitors to the Québec Industries pavilion did not see carefully edited scenes recorded months in advance, often projected in much more visually and architecturally phenomenal settings, such as in the Labyrinth.[150] In the case of the Manic 5 projection, the images were dependant on the reality of what was happening every day on the construction site. Fernand Rivard, head of the Cinéma-Photo department at Hydro-Québec and the main director responsible for the cinematographic

[150] In the Labyrinth pavilion, for example, the "viewers [were] elevated to a ramp 40 feet above the floor where they [viewed] images on a 60-foot screen in front of them and simultaneously a projection on an equally vast screen below." Bill Bantey, *Montréal* (January 1967): 5, quoted in Highmore, "Into the Labyrinth," 127. The author also summarizes some of the most popular and spectacular multiple screen displays at Expo 67.

aspects of the Expo 67 projection of Manic 5,[151] explained that "[e]ach show … [was] actually a true happening developing as circumstances dictate[d] it. … each show [was] different from the previous one and … better from day to day." [152] The spectacle was thus part happening, part narrative, and part documentary.[153]

In November 1966, an article in *Entre-Nous* stipulated that the one and only goal of the presentation was to "allow visitors a true understanding of life at the construction site of Manicouagan 5 where hundreds of men [were] erecting the largest multiple-arch dam in the world."[154] During the 1960s, the Manicouagan region frequently hosted political, cultural, artistic, and scientific personalities who had the privilege of guided tours of the various construction sites giving them a taste of life there.[155] Apart from these visits, carefully supervised by Hydro-Québec, it was difficult for casual tourists to access the site by their own means and observe the dam-in-progress, in contrast with historical dams like the Hoover Dam (1931-36) or those part of the Tennessee Valley Authority (1933-

---

[151] He also directed films produced by Hydro-Québec. See note 68.

[152] "Au 14^{e} étage du siège social," 11. "[c]haque émission … est en fait un vrai happening qui se développe au gré des circonstances. … chaque émission est différente de la précédente et… meilleure de jour en jour" (trans. Marie-France Daigneault Bouchard).

[153] The team of cameramen and co-directors at Manic 5 were young and some of them had experience in cinema; one even worked with the famous *Nouvelle Vague* director Jean-Luc Godard. They were also working on a collective filmic project in their spare time. See Sylvain Simard, "Une équipe nouvelle vague à Manic 5," *Entre-Nous* (August 28, 1967): 5; Bernard Gagnon, "Un essai sur le rêve et l'évasion," *Manicouta* (July 31, 1967): 4-6.

[154] "À l'Expo, Manic 5 par l'image et le son," 5. "permettre aux visiteurs de prendre réellement conscience de la vie sur le chantier de Manicouagan 5 où des centaines d'hommes [érigeaient] le plus grand barrage à voûtes multiples au monde." (trans. Marie-France Daigneault Bouchard)

[155] Among many similar examples: the cartoonist Hergé (Hogue, Bolduc and Larouche, *Québec, un siècle d'électricité*, 299); the singer George Dor ("Rencontre avec George Dor à la Manicouagan," *Manicouta* [April 30, 1967]: 6); Prince Albert de Liège and Princess Paola ("Visiteurs princiers à Manic," *Entre-Nous* 47 [May 29, 1967]: 12); journalists from the literature journal *Liberté* that dedicated a special number to Manic 5 in 1964; *Entre-Nous* and *Manicouta* regularly mentioned in their pages when various groups of engineers from around the world were visiting the dam.

43) in the United States.[156] The number of in-person visits at Manic 5 was very low compared to the 5000 individuals who "visited" Manic 5 daily through its projection at Expo 67.[157] This number, further, was much higher than the real site could have accommodated given security issues, apart from the near-inaccessibility of the site itself. Even today, only 15,000 visitors tour Manic 5 during the guided-visit season between June 24 and August 31.[158] Yet according to an article in *Manicouta*, 600,000 people entered the Manic 5 projection during, and via, Expo 67.[159]

With its live projection, Hydro-Québec wished to invite Expo 67's visitors to experience, for a few minutes, "Manic 5's exciting life,"[160] but no matter how "real" the images shown on the screen were, an actual visit to Manic 5 could not be replaced. The visitors were like disembodied tourists at Manic 5 and passive consumers of an experience based on the work of many other people: a workforce was truly in action in a technological landscape and their actions transformed into spectacle by means of moving images. In that line of thought, Banham considered that the spaces and spectacles of Expo 67 did little to avoid passivity in the visitors, except in the Man the Producer pavilion, a huge steel structure "based on the manipulation of a truncated tetrahedral cell" offering

---

[156] For more details on the Tennessee Valley Authority's dams, see Christine Macy and Sarah Bonnemaison, "Chapter 3: Putting Nature to Work with the Tennessee Valley Authority, 1933," in *Architecture and Nature: Creating the American Landscape* (London and New York: Routledge, 2003), 137-221. For more details on the Hoover Dam's construction, see Nye, *American Technological Sublime*, 137-142.

[157] "Photos/Actualité," *Entre-Nous* (July 17, 1967): 12.

[158] Information provided by a guide during my visit to the site of Manic 5 on August 29, 2011.

[159] "600 000 personnes l'ont visité," 3 (trans. Marie-France Daigneault Bouchard). In the case of the Hoover Dam, David Nye remarks that: "[a]s soon as its construction began, in 1931, thousands of tourists came to see it rise …. In 1934-35 there were 750,000 visitors, making the dam as popular as the Grand Canyon." (Nye, *American Technological Sublime*, 138)

[160] "À l'Expo, Manic 5 par l'image et le son," 5. "la vie trépidante de Manic 5" (trans. Marie-France Daigneault Bouchard).

open spaces for a maximum of flexibility.[161] While the visitors of the Man the Producer pavilion were confronted by "nothing but alternative routes, to be selected at conscious will or simply at random" in other pavilions, no matter how "sophisticated, … apparently aware of the 'media revolution' they were … all processed the visitor as the more or less passive consumer of a prescribed linear experience without conspicuous alternative routes."[162] In other words, as Singh Riar points out, Banham "reimagined the pavilion [Man the Producer] as participating in an entirely different spectacle than that fixed by Expo"[163] and this was mainly due to the open architecture of the pavilion that did little to dictate the visitors' response to the exhibitions on display.[164] That considered, in the Québec Industries pavilion, even if the product, namely the projected activity of Manic 5, was inscribed in ideas of uniqueness, simultaneity, and verisimilitude of the moment through sound and image, viewers were not challenged in their passive role of simple observers.

The Québec Industries pavilion received negative criticisms for its repetition of the provincial pavilion's industrial focus.[165] The third printing of *Expo Inside Out!*, which described itself as "a 48-page critical, selective (and unauthorized) guide to Montreal's Expo 67,"[166] was completely dismissive of the Québec Industries pavilion, granting it a

---

[161] Singh Riar, "Montreal and the Megastructure," 196.

[162] Banham, *Megastructure*, 116.

[163] Singh Riar, "Montreal and the Megastructure," 198.

[164] Singh Riar analyzes Banham's understanding of the Man the Producer pavilion in relations, among other things, with the ideas of the Situationist International. (Singh Riar, 196-199)

[165] Pauline Curien, "L'identité nationale exposée. Représentations du Québec à l'Exposition universelle de Montréal 1967 (Expo 67)," (Ph.D. thesis, Université Laval, 2003), 194-212.

[166] *Expo Inside Out!* (Montréal: Omniscope Limited, 1967): 1.

zero score corresponding to "waste of time and/or money." The guide described the pavilion as follows:

> As if the province's own pavilion weren't enough, her captains of industry have come through with an even duller one, an incredibly banal display which presents Quebec as an enormous collection of dump trucks, factory chimneys, and small-time operators in snow shoes. Fifteen at a time we are ushered through the Quebec Industries pavilion, and lectured on the usefulness of local shovels, sheets and soft drinks, as we gaze at pictures of factories and factory presidents.[167]

This description stands in contrast with the account found in the magazine *Montréal*, for example.[168] In the July issue, a journalist mentioned that the pavilion "dear to the Québécois" housed the "most important private circuit of colour television in the world" and that this "exceptional realization … [was] a feat commensurate with the technical prodigies necessary to control the Manicouagan and Outardes Rivers."[169] The *Expo Inside Out!* guide did not mention the projection, suggesting that their criticism may have addressed the more conventional part of the exhibit. The exhibition spaces effectively appear as dark and windowless while the colourful displays look static and didactic, especially in comparison with the modern sophistication of the projection room's interior design. (See figs. 28-29, 41)

In January 1966, a fifteen-minute excerpt from the Hydro-Québec colour film *Du béton et des hommes* (1965) began a Canadian and American tour of theatre screens

---

[167] *Expo Inside Out!*, 37.

[168] First published in 1964, the articles appearing in this magazine were both in French and English although they often differed in their approach to the same subject, making it appear as if the two editors, Bill Bantey and Michel Roy, wrote them separately instead of one being translated. This is not information that I could confirm thoroughly since the authors are not always mentioned.

[169] Aubry, "La Cité du Havre à l'Expo," 11. "un bâtiment cher au Québécois"; "plus important circuit privé de télévision au mondée"; "Cette réalisation exceptionnelle … est un exploit à la mesure des prodiges techniques qu'il a fallu pour asservir les rivières Manicouagan et Outardes." (trans. Marie-France Daigneault Bouchard)

starting in Montréal.[170] The film partly documents the construction site of Manic 5 some years before Expo 67 in a dramatic and lyrical way, focusing on the domination of "man" over nature.[171] This touring film is interesting in its suggestion of a precedent for the live projection at Expo 67. Perhaps this tour influenced the decision to repeat a conventional cinematic presentation setting in the Québec Industries pavilion, although the room – occupying eight hexagonal cells, totalizing around 200 square meters[172] – was carefully designed to participate in the projection's spatial experience. (Fig. 47) An interior wooden skin softened the rough shape of the interior space, created by the pavilion's exterior shell, as it is visible on the room's section. (Fig. 48) The interior cladding was composed of two layers of lath, or evenly-spaced wood straps. The rear straps were set at a 10˚ angle to those at the front, creating a *moiré* effect, which recalled the gleam of the metallic screen frame.[173] (Fig. 49) Many lights and mirrors were integrated into the space between the two layers of lath to accentuate the texture of the walls and ceiling.[174] The interior volume of the room took the shape of two funnels joined by their larger opening, which created a threshold between the space of the room and the space of the screen, once again maintaining a marked distance between the viewers and the "view."

---

[170] The celebrated songwriter and singer Félix Leclerc (1914-1988) composed new songs for the occasion. "Un film de l'Hydro-Québec sur tous les écrans d'Amérique," *Entre-Nous* (January, 1966): 5.

[171] Directed by Fernand Rivard, this filmic document is similar to and I believe provides an approximate idea of the type of spectacle presented in the Québec Industries pavilion.

[172] The projection room is 15 meters deep and more or less 13 meters wide due to the irregularity of the shape.

[173] *Pavillon des Industries du Québec, Expo 67*. Microfilm reel 26, frame 1-113, drawing 2-37-10-3. Collection de la compagnie de l'Exposition universelle de 1967 (P67), City of Montréal Archives.

[174] *Pavillon des Industries du Québec, Expo 67*. Microfilm reel 26, frame 1-113, drawing 2-37-10-6. Collection de la compagnie de l'Exposition universelle de 1967 (P67), City of Montréal Archives.

Space of transmission

The spectacle was thus produced and consumed at the respective ends of the megastructure and was transmitted along the territory just as electricity still is today. This space was part of the transformation of human labour into spectacle, and served to dematerialize and mediatize a massive industrial monument as information travelling almost invisibly via microwaves over the territory in between. The closed-circuit system required the installation of a transmitting device at Manic 5 in addition to seventeen transmitter-receivers between the dam and the city of Joliette.[175] From a newly installed antenna in Joliette, the signal reached Montréal, where two antennas, one receiving and one transmitting, had been installed on the roof of the 27-storey Hydro-Québec building on Dorchester Boulevard (today René-Lévesque Boulevard).[176] The signal of Manic 5's images travelled one last time towards the antenna installed outside the projection room of the Québec Industries pavilion on Cité-du-Havre, to finally be reassembled, projected and virtually rematerialized on the screen.[177]

The staff at the Québec Industries pavilion – technicians in charge of the projection, and narrators – projected these images and simultaneously worked to align the short commentary and final soundtrack with them. Between the emitting station at Manic 5 and the receiving base in the pavilion, a third station oversaw the whole process and intervened if necessary. This last station could be found on the fourteenth floor of the

---

[175] The city of Joliette is located a little less than 800 kilometres to the south of Manic 5, only 70 kilometres to the north of Montréal.

[176] "À l'Expo, Manic 5 par l'image et le son," 5.

[177] "Le réseau de télévision en couleur est prêt pour les premiers essais," *Entre-Nous* 47 (February 13, 1967): 3.

Hydro-Québec head office in Montréal. The production of each twelve-minute segment was thus under the supervision of three separate stations, which were connected together via private telephone lines.[178] One of the principal directors, Fernand Rivard or Roger Boisvert, was usually present in the intermediary station and kept an eye on the images shown in the Québec Industries pavilion through a television screen. He could communicate by telephone with all parties in case adjustments had to be made and the two other stations could also report to him in case some major decision had to be taken.[179]

In addition, on five places along the transmission network, there were colour monitors in order to rapidly localize any failure in the transmission.[180] The latter were located in the telecommunication rooms of stations already part of the electric transmission network grouping different apparatus and integrating:

> a building which … house[d] the relay room, telecommunications room, a shop, and an office for the operating personnel. … The control room [was] the nerve centre of each station. That [was] where the operator control[ed] the energizing and de-energizing of the lines and transformers. Nearby [were] the protection relays which, through the current transformers, supervise[d] the operation of the lines and apparatus.[181]

The telecommunication and electricity networks were functioning in parallel and met punctually along the distance they crossed in small technical hubs connected to the overall system, thus reinforcing the image of the territorial megastructure linking these smaller units through different infrastructures.

---

[178] "Au 14^{e} étage du siège social," 11.

[179] "Au 14^{e} étage du siège social," 11.

[180] "Le réseau de télévision en couleur," 3.

[181] Paradis, *735kV*, [34].

The white antenna standing high beside the projection room of the Québec Industries pavilion was one of the very few, if not the only, visible indicator of the information being transmitted through the Hydro-Québec's hertzian network on the Expo 67 site.[182] (Fig. 50) The microwaves arriving from the rooftop of the head office in downtown Montréal were of course visually imperceptible, but drawings indicating the exact positions of the two antennas made their connection appear as a tangible pulsating link with the use of a bold dashed line. (Fig. 51) This representation echoes the one made of the 735 kilovolt line over the province's territory and of the underground electric system of Expo 67. (See figs. 34, 36) Although these are all similar representations of connectivity, they did not assume the same form in space. The 735 kilovolt lines are highly material and continuously visible; the electric system of Expo 67 is material although concealed from view in the underground, while the microwave system is for the most part immaterial and invisible, except for antennas that provide fragmented clues of its presence.

Another aspect concerning the transmission space also contributes to the argument I am making here about the territorial megastructure. Hydro-Québec's head office, "located in the heart of the city it serves, … stands over a huge subterranean sub-station sixty feet below street level which supplies the business area of Montréal, … the world's largest underground transformer station [in 1965]."[183] (See fig. 21) During Expo 67, this high-rise also accommodated the *Salon des employés*, a space on the eleventh floor

---

[182] The microwave system of transmission was also known as a hertzian system (hertzian waves), both describing wireless communication.

[183] "More Power for Montreal," 15.

reserved to the employees, working and retired, of the company visiting the metropolis because of the world's fair.[184] From its rooftop, antennas relayed microwaves received from the north up to their final destination on the screen of the Québec Industries pavilion; its volume housed work spaces as well as the intermediary technical room participating in the projection's production on the fourteenth floor. The building also connects to the underground spaces of Montréal and its metro system. This multifunctional tower participated both in the space of transmission and thus was part of the territorial megastructure, as were the distribution and transformation stations located in remote locations along the hydroelectric route from Manic 5 to Expo 67.

On April 11, 1967, just a few weeks before the grand opening of Expo 67, the directors of Hydro-Québec were invited to attend a preview, to sample the televised presentation.[185] An unexpected snowstorm occurred the night before at Manicouagan and made the conditions very difficult for the team of onsite cameramen. Manic 5 was covered with snow and low temperatures impeded the mobile unit's efforts to capture images.[186] Only a privileged few in Montréal were able to see these live images of Manic 5 paralysed by cold and snow. Yet, despite a proximity rendered possible through technology, their respective, usually disconnected, physical environments – affected, in this case, by drastically different weather conditions – testified to a distance that would not let itself be erased completely. Temporary disconnections between the two places, usually the result of technological malfunction, would remain a constant threat to the

---

[184] "Avant-première du spectacle télévisé," 2.

[185] "Avant-première du spectacle télévisé," 1.

[186] "Avant-première du spectacle télévisé," 1. With a temperature of 0˚F (-18˚C), the mobile equipment was freezing.

transmission of images, and thus to the spectacle's presentation. Therefore, the built imprint of the information and electricity transmission systems – antennas, pylons, cables, and stations – maintained, through their materiality, a tangible connection in transmissive space.

Two other broadcast systems at Expo 67 shared similarities and differences with the closed-circuit television system managed by Hydro-Québec. With the help of three mobile radio units and five mobile TV units present on the site of Expo, the International Broadcasting Centre (IBC) functioned as a central observation organ producing television and radio information programs which were diffused at a large scale. On the other hand, the Operations Control Centre (OCC) functioned as a surveillance and security centre connected visually to the site with many fixed cameras; communicating with each pavilion through teletype machines; or sending out messages to the public via eleven large-scale electronic boards.[187] The Hydro-Québec closed-circuit system positioned itself somewhere in between the two media instances in terms of the connected spatiality it engendered. On a few occasions, Hydro-Québec collaborated with the IBC in order to broadcast its spectacle internationally, thus reaching to a global and dispersed audience.[188]

---

[187] André Jansson, "Communication Clinics: Expo 67 and the Symbolic Power of Fixing Flows," in *Strange Spaces: Explorations Into Mediated Obsurity*, eds. André Jansson and Amanda Lagerkvist (Farnham, England: Ashgate Publishing Ltd, 2009), 273.

[188] "Grâce à l'Oiseau matinal: Manic 5 à la TV britannique," *Entre-Nous* (June 26, 1967): 3; "Une première Canada-France," *Manicouta* (October 30, 1967): 2. On May 25, the satellite Early Bird transmitted one of the live television programs on Manic 5's construction, in England on the BBC. Approximately ten million British spectators saw the show on that occasion, a large number compared to the 70,000 Expo visitors who sat in the projection room in the Québec Industries pavilion during the whole month of May. Later that summer, French television transmitted a live colour show from Manic 5 through satellite communication. Several million viewers watched it. The IBC's greatest achievement was to have previously colour-broadcasted the opening ceremony of Expo 67; it was estimated that more than one billion people watched it around the world. (Jansson, "Communication Clinics," 265)

Usually, however, it operated as a closed-circuit system, like the OCC's surveillance centre, although on a much greater scale.

The line between spectacle and surveillance was thin, however, as the following demonstrates. On April 25, in an information session about the projection, presented to the executives of Manic 5, Fernand Rivard had to explain why his fifteen-member staff was situated around the dam with three scrutinizing cameras.[189] After they watched an example recorded in the afternoon of the images that would be presented at Expo 67, Rivard insisted that the true actors were the onsite workers who might appear at any time on the screen and that they should be told that "the three cameras that [followed] them from 10am to 10pm, seven days a week, [were] not there to make TV surveillance, but [had the] mission to produce a spectacle showing to the visitors at Expo the Québec man at work on his rivers."[190]

The Hydro-Québec closed-circuit system functioned like a reporting or documenting device, using near-constant onsite observation of the activity at Manic 5. While the monitoring process was part of the exhibit in the IBC pavilion and to a certain extent made visible in the OCC pavilion,[191] it was hidden from the public in the Québec Industries pavilion, where only the final spectacle onscreen was offered to the public view. Almost the entirety of the editing process and monitoring took place in different locations along the electric and communication territorial network, starting in Manic 5

---

[189] "Séance d'information au personnel des cadres," *Manicouta* (April 30, 1967): 1.

[190] Ibid. "les trois appareils qui les [suivaient] de 10h du matin à 10h du soir, sept jours par semaine, n'[avaient] pas pour but d'effectuer une télésurveillance, mais pour mission de produire un spectacle montrant aux visiteurs de l'Expo l'homme du Québec au travail sur ses rivières." (trans. Marie-France Daigneault Bouchard)

[191] Jansson, "Communication Clinics," 265.

itself. The scale of this process of gathering, assembling, and communicating a moving image explains, in some way, why certain aspects were not visibly evident at Expo.[192] Yet, there is one room that I have yet to discuss fully, one that was crucial in the transmission process.

The final projection relied on the small technological space in the enclosed mezzanine at the back of the theatre room, perceivable only through discreet windows on the rear wall, ensuring that the staff could check the spectacle and that the commentator could adapt his pace and content to the images displayed on the screen. (Fig. 52) Only a restricted, spiral staircase gave access to this area. (Figs. 53-54) By its nature, this hidden room was part of the space of transmission. It did not share the spectacular and public characteristics of the consumption space, but it integrated its volume; in a sense, this insertion strengthened their connection, just as the transmission process started on the Manic 5 site. The device that would achieve the final step in making the live images appear on the screen, the Eidophor, was located in this very space. (Fig. 55)

Two and a half months before the opening of Expo 67, the technical equipment was installed in the projection room and mezzanine of the Québec Industries pavilion and the Cinéma-Photo team could begin testing it. What seems easy to achieve now in the age of digital technology, live projection over great distances on a theatre size screen, had only

---

[192] These steps in the transmission of images were not kept completely hidden from the public, as evidenced by the fact that I was able to retrace them with the help of articles in *Manicouta* and *Entre-Nous*. These journals were, however, almost exclusively distributed among the Hydro-Québec's community of employees at the time of their publication. I have not extensively researched newspapers to verify if the same type of articles could be found in popular print media, but it is most likely that they were not, as the Québec Industries pavilion and its exhibit were usually only very briefly mentioned, if at all, in more popular articles about Expo 67. See Aubry, "La Cité du Havre à l'Expo"; "Voici la Terre des hommes," *La Presse*, April 15, 1967, 19.

recently become possible at the time of Expo 67. The Eidophor projector used in the Québec Industries pavilion had encountered many difficulties since its first development in the late 1930s.[193] The spectacle at Expo 67 suggests a union between two media: television, in terms of live streaming, and cinema, in terms of the large screen and the architectural experience of entering a public theatre room. The intentions at the origin of the development of the Eidophor – also known as the "theatre TV project"[194] – are, in a sense, quite telling about the concept and ambition underlying the projection of Manic 5. The Eidophor had been promoted in a way that referred to a series of myths, namely total cinema, "reinforcing man's mastery of time and space (embodied in the principles of instantaneity and ubiquity attached to the television medium)."[195] What would it do exactly? Its original goal was to transmit colour images, simultaneously and instantaneously, "to hundreds of theatres to be projected on large screens with remarkable clarity and definition."[196] Although it never happened this way, by 1967, Eidophor technology could achieve a fragment of its goal on a private television closed-circuit system by connecting in real time Manicouagan to Montréal.

---

[193] The Eidophor was first invented in Switzerland by Professor Fritz Fischer (1898-1947). It was 20th Century Fox who took up the challenge to support its research and development until the late 1950s. Despite enthusiastic announcements made in the mid 50s about its imminent commercialization, which only occurred in the 1960s on a lesser scale than originally foreseen, the company never reached its ultimate goal of "revolutionizing both film distribution in cinema theatres and television as a theatrical format." (49) Several obstacles, mainly technological ones, were impediments to the device becoming the radical new medium of entertainment, combining cinema and television at a time when cinema was losing terrain to the newer television medium. Kira Kitsopanidou, "The Widescreen Revolution and 20th Century-Fox's Eidophor in the 1950s," *Film History* 15, no. 1 (2003): 32-56.

[194] Kitsopanidou, "The Widescreen Revolution," 46.

[195] Kitsopanidou, "The Widescreen Revolution," 42.

[196] Kitsopanidou, "The Widescreen Revolution," 42.

The main role of the interior architecture aimed at emphasizing the images that would be projected, by means of the Eidophor, twelve hours a day on the 540 square-foot screen.[197] The sound and light was also described as playing a role in the creation of "the suitable atmosphere for the reception of the message transmitted by the cameras."[198] These last words seem to refer directly to Canadian media theorist Marshall McLuhan's immensely popular book, especially at Expo 67, *The Medium is the Message* (1964).[199] However, this quote argues the exact opposite of what McLuhan was developing in his influential text. Indeed, he would have rather designated all the technological endeavours required to materialize the live images to actually be the message; in other words, physical distance had virtually disappeared. For McLuhan, technologies, or media were synonymous with extensions of the human body.[200] As such, communications media had developed in a way that allowed the viewer to "be" in another place than the physical viewing location, in an attempt to eradicate time and space. The distance instantly and virtually crossed by the spectator was in fact crossed by the material medium of transmission – McLuhan's "medium is the message" – which blended with territory, creating new landscapes from Manic 5 to Expo 67, and everywhere in between, leading

---

[197] It is usually described as a 600 square-foot screen in the articles I consulted, although a 30 by 18' screen is a 540 square-foot screen.

[198] "À l'Expo, Manic 5 par l'image et le son," 5. "l'atmosphère propice à la réception du message transmis par les caméras." (trans. Marie-France Daigneault Bouchard)

[199] "Expo 67 became McLuhan's fair, a fact openly acknowledged by the extent to which the theme pavilions of 'Man and His World,' whose designs blended Canadian history and culture, were based on McLuhan's writings, which were liberally quoted on plaques throughout the pavilions." Donald Theall, *The Virtual Marshall McLuhan* (Kingston, Ontario: McGill-Queen's University Press, 2001), 126, quoted in Richard Cavell, *McLuhan in Space: A Cultural Geography* (Toronto: University of Toronto Press, 2002), 296n46.

[200] Marshall McLuhan, *Understanding Media: The Extensions of Man* (Cambridge, Mass.: MIT Press, 1994. (1964)), 182.

us to Mitchell's idea that "[l]andscape is a medium."[201] The three connected spaces of production, consumption, and transmission thus become a form of medium, a series of landscapes that mediate the cultural and the natural,[202] embedded in what I argue to be a territorial megastructure.

[201] Mitchell, "Imperial Landscape," 14.

[202] Mitchell, "Imperial Landscape," 15.

Conclusion

> *It seemed a shame that Manic 5's spectacular beauty, every bit impressive as the tallest skyscraper or longest suspension bridge, had to be lost to the lonesome desolation of the bush country.*[203]

At the beginning of this thesis, I proposed that the photomontage depicting the live projection of the construction of Manic 5 at Expo 67 needed closer attention in order to reveal itself beyond the image of a theatrical projection or spectacle. (See figs. 1,4) The information unveiled by my research around this event allows an examination of this fascinating cultural moment far beyond what one can actually see in the picture. Having assessed the rich archival evidence surrounding this event, it is possible to understand the screen seen in the photomontage as a space of production, the spectators as sitting in a space of consumption, and finally the frame as a space of transmission – a visual metaphor for the contracted distance that stands between Manic 5 and Expo 67. I analysed the structure supporting this event as a territorial megastructure by taking into account its enormous material presence, from Manic 5 to Expo 67, including the 735 kilovolt power lines and transmission apparatus. I contextualized this structure into the history of twentieth-century architecture, particularly the development of the megastructure, in which Montréal had a prominent role through, among other things, its hosting in 1967 of the world's fair, Expo 67. The photomontage with which I opened this thesis can thus be read as part of the visual culture and discourse specific to this movement in architecture as well as part of the nationalistic, neo-colonial relationship between Hydro-Québec, Expo 67, and the natural resources of Québec.

---

[203] Réthi and Jacobus, *Building of the Daniel-Johnson Dam*,143.

My research brought me to travel not only from Montréal to Manicouagan, but physically and virtually through many archives. The resulting thesis has made an original contribution in several ways. It has documented an overlooked event at Expo 67 by providing an analysis of the 1967 world's fair relation with another remarkable achievement in Québec's recent history, the project of the Manic 5 hydroelectric dam, often used to symbolize the emancipation of Québec's francophone society. I wished to introduce an architectural reflection on subjects such as hydroelectricity, Hydro-Québec, and Manic 5, that more often than not are linked to national politics and identity issues in the province of Québec. Hydroelectricity production and transmission produce built environments, landscapes, and visual material that should be analysed, I believe, more closely in relation to recent art, architectural, and landscape histories of Québec. I therefore chose to look at the participation of Hydro-Québec not through its role as a "vector of symbolic and identity representations in Québec,"[204] but by calling on its participation in the visual and built landscapes characterizing urban, rural and natural environments on the territory. In turn, they themselves become carriers of identity as the places of the people's daily activities, a reflection that I would like to pursue further in future research.

My road trip from Montréal to Manic 5 in August 2011 permitted me to observe clues from the past and follow what I have argued to be the territorial megastructure that articulates these disparate places, together. For all its size, Manic 5 stands as a quiet

[204] From Savard's doctoral thesis title "Retour sur un projet du siècle: Hydro-Québec comme vecteur des représentations symboliques et identitaires du Québec, 1944 à 2005," my translation.

monument "to the lonesome desolation of the bush country;"[205] traces of the rows of houses that occupied its west side during a number of active years are still visible while surrounding vegetation has slowly grown back where it could. Signs of the implantation of the Québec Industries pavilion are also visible on Cité-du-Havre, forlorn traces among other concrete leftovers from the celebrations of Expo 67. In contrast to the realities of that era, electric and communication networks have since expanded exponentially, while virtual connections between distant places are made easier, and thus less notable, every day. Hence, it appears all the more significant to have documented and analyzed an event that historically stands as an unrepeated, technological and spectacular experiment in the realm of industrial landscape representation which characterized an era of uncritical optimism towards technical progress.

Another contrast with the norms and values reified at Expo 67 comes in the form of perceptions about the harvesting of natural resources; these undoubtedly have greatly changed. Instead of seeing the greatness of humanity conquering a reluctant wilderness in the name of progress, contemporary and critical gazes upon these actions denounce the ongoing colonization of natural territories and their resources as exploitation. The First Nations too are still struggling for their land claims to be heard and their rights recognized.

A celebratory representation of industrial processes of construction around natural resources, such as the Manic 5 dam, would thus not be possible today. Even if the projection of Manic 5 at Expo 67 was received as a triumphant endeavour to connect the

---

[205] Réthi and Jacobus, *Building of the Daniel-Johnson Dam*,143.

productive north to the consuming south, its ghosts raise many questions about today's relationships between these two realities. It is in this sense that I hope the concept of the territorial megastructure may be useful to other architectural historians and scholars of landscape, as a metaphor for and lens through which to consider the technological relationships between north and south, remote and urban. The territorial megastructure that I have described was a tool for creating a spectacular immediacy, erasing time and space at once, and transformed hard, physical human labour into a consumable spectacle of images. Perhaps in some way this immediacy and consumption could be understood as transparency. As I have demonstrated with this thesis, however, the space of transmission is intricate and remains almost invisible to the spectator.

My goal with this thesis has been, in large part, to document the projection of Manic 5 at Expo 67. As soon as I started my research, it became clear that it would be worthwhile to ascribe to this event the significance it deserves in the already well-furnished histories of Manic 5 and Expo 67. In the process, I discovered a multitude of details, each part of which could, I believe, unfold through further research into other illuminating and entwined narratives about Québec, the 1960s, hydroelectric power, and architecture. And thus at the end of this thesis, I must return to my opening image, the photomontage or "detail" from which my research interest arose and unfolded, and introduce the original photograph used to produce the photomontage. This image shows a man walking away from the projection, towards the camera, in the left-hand aisle. (Fig. 56) This same figure was completely erased in the ensuing photomontage, which would become the official representation of Manic 5's presentation at Expo 67. The manipulated image crops, tightly frames, and thus focuses our attention on the object of the audience's

gaze. (See fig. 1) The photomontage is thus, itself, eloquent and concise proof of how the spectacle was as much about erasure as it was about visibility. In this way, the excised figure points out to how the official representation – in all senses – would leave a great deal out of its frame. Equally, the choice to edit the representation of the (also edited) projection enhanced its spectacular visual result. But it must not be forgotten that large-scale erasures and "edits" were engendered through the creation of the sites of Manic 5 and Expo 67 and the territorial space of transmission in between. Such edits in and of the land had a significantly more intense impact on people's lives; the built and natural environments contain lived realities that a sole image cannot express. As this thesis has shown in the case of Manic 5's representation at Expo 67, a carefully constructed image – indeed, an entire territorial megastructure – is not only a creative work; it can also be a complex representation of erasure.

BIBLIOGRAPHY

Primary Sources:

Archives:

Archive photographique. Fonds Hydro-Québec, H1/700964 (1966-1967). Hydro-Québec Archives, Montréal.

Dossiers de productions audiovisuelles. Fonds Hydro-Québec, H1/1503-02/3286. Hydro-Québec Archives, Montréal.

Entre-Nous. January 1966-December 1967. Montréal: Service des Relations Internes de la direction des Relations publiques, Hydro-Québec. Hydro-Québec Archive, Montréal.

Manicouta. January 1966-December 1967. Hauterive: Service des Relations Internes de la direction des Relations publiques, Hydro-Québec. Hydro-Québec Archive, Montréal.

Pavillon des Industries du Québec, Expo 67. Microfilm reel 26, frame 1-113, drawings 2-37. Collection de la compagnie de l'Exposition universelle de 1967, P67. Montréal City Archives, Montréal.

Promotional documents:

Grands ouvrages / Major Projects. Montréal: Hydro-Québec (Relations publiques), [ca 1966].

McNaughton, Ian. *Manicouagan*. Montréal: Hydro-Québec (Relations publiques), 1964.

Paradis, Paul. *735kV, Manicouagan-Montréal*. Montréal: Hydro-Québec (Relations publiques), [ca 1967].

Paradis, Paul. *Manic-Outardes*. Montréal: Hydro-Québec (Relations publiques), [ca 1967].

Peace, David. *Manic 5, comment a été construit le plus grand barrage à voûtes multiples du monde*. Montréal: Hydro-Québec (Relations publiques), 1968.

Articles:

“600 000 personnes l’ont visité: y êtes-vous allés?” *Manicouta* (October 30, 1967): 3.

"À l'Expo, Manic 5 par l'image et le son." *Entre-Nous* (November 14, 1966): 5.

"An engineers guide to Expo 67," *Product Design and Value Engineering*, Special issue, vol. 12, no. 4 (April 1967): 19.

"Au 14^{e} étage du siège social: Une salle de contrôle entre Manic et les terrains de l'Expo." *Entre-Nous* (June 12, 1967): 11.

Aubry, Claude. "La Cité du Havre à l'Expo." *Montréal* (July 1967): 9-13.

"Avant-première du spectacle télévisé, son et image." *Entre-Nous* (April 24, 1967): 1-2.

[Bill Bantey], "The Wonderful World of Film," *Montréal* (June 1967): 4-6.

Bourgeois, Charles. "Le poste Marie-Victorin." *Entre-Nous* (April 25, 1966): 3.

"'Drave' à l'Expo," *Entre-Nous* (May 15, 1967): 14.

Gagnon, Bernard. "Un essai sur le rêve et l'évasion." *Manicouta* (July 31, 1967): 4-6.

"Grâce à l'Oiseau matinal: Manic 5 à la TV britannique." *Entre-Nous* (June 26, 1967): 3.

Hustak, Alan. "Montreal reporter considered Expo the highlight of his career." *The Globe and Mail* December 3, 2010.

"Inauguration au Pavillon des Industries du Québec." *Entre-Nous* (May 29, 1967): 2.

"La technologie et la terre des hommes." *Entre-Nous* (April 24, 1967): 6-7.

"L'électricité coûte moins cher au Québec qu'au Etats-Unis." *Entre-Nous* (October 9, 1967): 4.

"Le réseau de télévision en couleur est prêt pour les premiers essais." *Entre-Nous* (February 13, 1967): 3.

"L'Hydro-Québec au pavillon 'L'Homme à l'œuvre': Le niveau de vie dépend de la quantité d'énergie disponible." *Entre-Nous* (June 12, 1967): 11.

"L'Hydro-Québec présente à Expo 67." *Entre-Nous* (February 14, 1966): 1.

Mamo, Oswald. "Manic 5 à 'Terre des hommes.'" *Entre-Nous* (March 14, 1966): 1,3.

"Manic 5 à l'Expo." *Manicouta* (April 30, 1967): 4-5,7.

Mathieu, Gaston. "On a travaillé d'arrache-pied pour électrifier les îles." *Entre-Nous* (April 24, 1967): 6-7.

-----. "Visite à travers le monde de l'électricité." *Entre-Nous* (June 12, 1967): 12-13.

"More Power for Montreal." *Montréal* (August 1965): 14-15.

"Photos/Actualité." *Entre-Nous* (July 17, 1967): 12.

"Rencontre avec George Dor à la Manicouagan." *Manicouta* (April 30, 1967): 6.

"Séance d'information au personnel des cadres." *Manicouta* (April 30, 1967): 1.

Simard, Sylvain. "Les télécommunications." *Manicouta* (July 31, 1966): 3-6.

-----."Une équipe nouvelle vague à Manic 5." *Entre-Nous* (August 28, 1967): 5.

"Tout est prêt: pour la transmission en direct des travaux de Manic 5 à l'Expo 67." *Manicouta* (March 13, 1967): 1.

"Un aspect du Québec de l'an 2000 à l'expo 67." *Montréal* (September 1965): 21.

"Une première Canada-France." *Manicouta* (October 30, 1967): 2.

"Un film de l'Hydro-Québec sur tous les écrans d'Amérique." *Entre-Nous* (January, 1966): 5.

Varry, Jacques. "L'exposition universelle de 1967 en chantier." *Architecture Bâtiment Construction* 21, no. 248 (December 1966): 21-43.

"Visites à l'Expo." *Entre-Nous* (June 26, 1967): 12.

"Visiteurs princiers à Manic." *Entre-Nous* (May 29, 1967): 12.

"Voici la Terre des hommes," *La Presse*, April 15, 1967.

Films:

Le complexe Manic-Outardes. Dir. Aram Goudsouzian. Dir. Techniques audio-visuelles et Relations publiques. Hydro-Québec. 1968. DVD.

Du béton et des hommes. Dir. Fernand Rivard. Prod. Division Cinéma-Photo et Service des Relations publiques. Hydro-Québec. 1965. DVD.

"Hydroelectricity *chez nous*." *CBC Digital Archives*. Canadian Broadcasting Corporation, march 17, 1964. Accessed August 16, 2012.

Manic 2. Dir. Fernand Rivard and Aram Goudsouzian. Prod. Service Cinéma-Photo et Direction des Relations publiques. Hydro-Québec. 1967. DVD.

"Manic 5." *Les Archives de Radio-Canada*. Société Radio-Canada, May 31, 1963. Accessed June 2, 2012.

Manicouagan-5. Dir. Fernand Rivard. Prod. Service des Relations extérieures. Hydro-Québec. 1964. DVD.

De Montréal à Manicouagan. Dir. Arthur Lamothe. Prod. Fernand Dansereau. Office national du film du Canada. 1963. DVD.

La neige a fondu sur la Manicouagan. Dir. Arthur Lamothe. Prod. Marcel Martin. Office national du film du Canada. 1965. DVD.

Others:

Compagnie canadienne de l'Exposition universelle de 1967. *Rapport général sur l'Exposition universelle de 1967*. Montréal: Compagnie canadienne de l'Exposition universelle de 1967, 1969.

Department of Industry and Trade and Commerce. *Expo '67, Building Materials, Systems and Techniques*. Prepared by I Kalin. Ottawa: The Queen's Printer, 1969.

Expo 67: Official Guide, *April 28-October 27*. Montréal: Maclean-Hunter Publishing Company, 1967.

Pilon, Jean-Guy, ed. *Manicouagan.* Special issue of *Liberté* 6, no. 5 (September-October 1964): 322-380.

Secondary sources:

Banham, Reyner. *Megastructure: Urban Future of the Recent Past*. London: Thames and Hudson, 1976.

Bilodeau, Denis. "Modernisation et Utopie : l'architecture des infrastructures olympiques pour les jeux de 1976." In *Architecture et modernité. Histoire et enjeux actuels. Trames Revue de l'aménagement* 15 (2004): 215-230.

Caron-Dricot, Andrée. *Les Caron. Une dynastie d'architectes depuis 1867*. Québec : Les Racontages, 1997.

Cavell, Richard. *McLuhan in Space: A Cultural Geography*. Toronto: University of Toronto Press, 2002.

Colomina, Beatriz. "Enclosed by Images: The Eameses' Multimedia Architecture." *Grey Room* 2 (Winter, 2001): 5-29.

Comeau, Robert, ed. "Premier dossier thématique. L'Expo 67, 40 ans plus tard." *Bulletin d'histoire politique* 17, no. 1 (2008): 13-173.

Cronon, William. “The Trouble with Wilderness; or, Getting Back to the Wrong Nature.” In *Uncommon Ground: Rethinking the Human Place in Nature.* Ed. William Cronon. New York: W. W. Norton & Company, 1996. 69-90.

Curien, Pauline. “L'identité nationale exposée. Représentations du Québec à l'Exposition universelle de Montréal 1967 (Expo 67).” Ph.D. thesis. Québec, Université Laval, 2003. 410.

Debord, Guy. *Society of the Spectacle*. Detroit: Black and Red, 1970.

Desbiens, Caroline. “Producing North and South: A political geography of Hydro Development in Québec.” *The Canadian Geographer/Le géographe canadien* 48, no. 2 (2004): 101-118.

“Developing Outside Markets.” *Quebec hydropower: Energy for the Future*. Hydro-Québec. Accessed September 6, 2012, http://hydroforthefuture.com/projets /34/developing-outside-markets.

Escher, Cornelia. “Alan Boutwell: From the Modular Housing System to the *Continuous City*.” In *Megastructure Reloaded*. Eds. Sabrina van der Ley and Markus Richter. Berlin: Hatje Cantz, 2008. 158-168.

Foster-Rice, Greg, and John Rohrbach, eds. *Reframing the New Topographics*. Chicago: University of Chicago Press, 2010.

Fournier, Marcel. “Une société en mouvement. La révolution tranquille ou la montée des classes moyennes.” In *Les années soixante: Montréal voit grand*. Ed. André Lortie. Montréal/Vancouer and Toronto: Centre canadien d’architecture/Douglas& McIntyre, 2004. 31-51.

Frampton, Kenneth. “Urbanization and Discontents: Megaform and Sustainability.” *Aesthetics of Sustainable Architecture*. Ed. Sang Lee. Rotterdam: 010 Publishers, 2011. 97-108.

Germain, George-Hébert. *Le génie québécois: histoire d’une conquête*. Montréal: Libre Expression/Ordre des ingénieurs du Québec, 1996.

Helbig, Louis. “The Lost Villages.” *On Site* 27 (Spring 2012): 23-27.

Highmore, Ben. “Into the Labyrinth: Phantasmagoria at Expo 67.” In *Expo 67: Not Just a Souvenir*. Eds. Rhona Richman Kenneally and Johanne Sloan. Toronto: University of Toronto Press, 2011. 125-142.

Hogue, Clarence, André Bolduc, and Daniel Larouche. *Québec, un siècle d’électricité*. Montréal: Éditions Libre Expression, 1979.

Jansson, André. “Communication Clinics: Expo 67 and the Symbolic Power of Fixing Flows.” In *Strange Spaces: Explorations Into Mediated Obsurity*. Eds. André

Jansson and Amanda Lagerkvist. Farnham, England: Ashgate Publishing Ltd, 2009. 257-277.

Kaika, Maria, and Erik Swyngedouw. “Fetishizing the Modern City: The Phantasmagoria of Urban Technological Networks.” *International Journal of Urban and Regional Research* 24, no. 1 (March 2000): 120-138.

Kenneally, Rhona Richman and Johanne Sloan, eds. *Expo 67: Not Just a Souvenir.* Toronto: University of Toronto Press, 2011.

Kin-Gagnon, Monika. “The Christian Pavilion at Expo 67: Notes from Charles Gagnon’s Archive.” In *Expo 67: Not Just a Souvenir.* Eds. Rhona Richman Keneally and Johanne Sloan. Toronto: University of Toronto Press, 2011. 143-162.

Kitsopanidou, Kira. “The Widescreen Revolution and 20th Century-Fox’s Eidophor in the 1950s.” *Film History* 15, no. 1 (2003): 32-56.

Langford, Martha Whitney and Chris Debresson. "The Role of Hydro Quebec in the Rise of Consulting Engineering in Montreal 1944-1992: An essay in oral history and company genealogy." *Scientia Canadensis: Canadian Journal of the History of Science, Technology and Medicine / Scientia Canadensis : revue canadienne d'histoire des sciences, des techniques et de la médecine* 16, no. 1, (1992): 76-108.

Lortie, André, ed. *Les années 60: Montréal voit grand*. Montréal/Vancouver and Toronto: Centre canadien d’architecture/Douglas& McIntyre, 2004.

------. “Montréal 1960; les singularités d’un archétype métropolitain.” In *Les années 60: Montréal voit grand*. Ed. André Lortie. Montréal/Vancouver and Toronto: Centre canadien d’architecture/Douglas& McIntyre, 2004. 75-115.

Legault, Réjean. “Étude patrimoniale sur les témoins matériels de l’Exposition universelle et internationale de Montréal de 1967 sur l’île Notre-Dame et la Cité du Havre.” Montréal: Laboratoire de recherche sur l’architecture moderne et le design, École de design de l’Université du Québec à Montréal, April 27, 2007.

Linteau, Paul-André et al., *Histoire du Québec contemporain*. Tome II. *Le Québec depuis 1930*. Montréal: Boréal, 1989.

Macy, Christine, and Sarah Bonnemaison. *Architecture and Nature: Creating the American Landscape.* New York: Routledge, 2003.

“Manic 5, au cœur du courant.” *Urbania*. Accessed September 8, 2012. http://urbania.ca/canaux/quebec12/914/manic-5-au-coeur-du-courant.

McDonough, Tom. “Metastructure: Experimental Utopia and Traumatic Memory in Constant’s *New Babylon*.” In *Megastructure Reloaded*. Eds. Sabrina van der Ley and Markus Richter. Berlin: Hatje Cantz, 2008. 108-112.

McLuhan, Marshall. *Understanding Media: The Extensions of Man*. Cambridge, Mass.: MIT Press, 1994. (1964)

Mitchell, W.J.T. "Preface to the second edition of *Landscape and Power*: Space, Place and Landscape"; "Introduction"; "Imperial Landscape." In *Landscape and Power*, 2nd ed. Ed W.J.T. Mitchell. Chicago: The University of Chicago Press, 2002. vii-xii; 1-34.

Nadeau, Jean-Benoît. "Une histoire électrisante." *Québec Science* 51, no. 3 (November 2012). 38-44.

Nye, David E. *American Technological Sublime*. Cambridge: The MIT Press, 1994.

------. *Narratives and Spaces: Technology and the Construction of American Culture*. New York: Columbia University Press, 1997.

Perron, Dominique. *Le nouveau roman de l'énergie nationale : analyse des discours promotionnels d'Hydro-Québec de 1964 à 1997*. Calgary : University of Calgary Press, 2006.

Ponte, Alessandra. "Desert Testing." In *Architecture and the Sciences: Exchanging Metaphors*. Eds. Antoine Picon and Alessandra Ponte. New York: Princeton Architectural Press, 2003. 81-115.

------. "Journey to the North of Quebec: Understanding (McLuhan's) Media." In *Traversées/Crossings*. Ed. Catherine Mosbach. Paris: ICI Interface, 2010. 10-15.

------. "Journey to the North of Quebec: Understanding (McLuhan's) Media." *Winter 2012 lecture series from McGill's School of Architecture*. Montréal. January 23, 2012.

------. "Territorial Infrastructures." *Phyllis Lambert Seminar*. École d'architecture de l'Université de Montréal. March 31, 2012. Accessed July 18, 2012. http://www.arc.umontreal.ca/docs/ pdf/evenements/2011-2012/InfrastructuresTerritorialesProgramme.pdf.

"The Quebec Industries Pavilion." *Expo Lounge*. Personal blog. Accessed October 21, 2012. http://expolounge.blogspot.ca/2006/12/quebec-industries-pavilion_08.html.

Ragon, Michel. "Architecture et mégastructures." *Communications* 42 (1985). 69-77.

Rendell, Jane. *Art and Architecture: A Place Between*. New York: I.B. Tauris, 2006.

Réthi, Lili and William W. Jacobus, Jr. *Manic 5: the Building of the Daniel Johnson Dam*. New York: Doubleday and Company, 1971.

Rouillard, Dominique. *Superarchitecture. Le futur de l'architecture 1950-1970*. Paris: Éditions de la Villette, 2004.

Rutherdale, Myra and Jim Miller. ""It's Our Country": First Nations' Participation in the Indian Pavilion at Expo 67." *Journal of the Canadian Historical Association / Revue de la Société historique du Canada* 17, no. 2 (2006): 148-173.

Savard, Stéphane. "Retour sur un projet du siècle: Hydro-Québec comme vecteur des représentations symboliques et identitaires du Québec, 1944 à 2005." Ph.D. thesis. Québec, Université Laval, 2010. 400.

------. "Les communautés autochtones du Québec et le développement hydroélectrique : un rapport de force avec l'État, de 1944 à aujourd'hui," *Recherches amérindiennes au Québec* 39, nos. 1-2 (2009): 47-60.

------. "*Lieu-de-mémoiriser* Hydro-Québec comme symbole des représentations de la nature et de la technologie: esquisses de réponse et piste de réflexion." *Conserveries mémorielles* 2, no. 4 (2007): 46-64.

Schroeder-Gudehus, Brigitte. "Progrès et fierté: les expositions universelles." *Bulletin d'histoire politique* 17, no. 1 (2008): 15-24.

Singh Riar, Inderbir. "Montreal and the Megastructure, ca 1967." In *Expo 67: Not Just a Souvenir*. Eds. Rhona Richman Kenneally and Johanne Sloan. Toronto: University of Toronto Press, 2011. 193-210.

Sloan, Johanne. "Postcards and the Chromophilic Visual Culture of Expo 67." In *Expo 67: Not Just a Souvenir*. Eds. Rhona Richman Kenneally and Johanne Sloan. Toronto: University of Toronto Press, 2011. 176-189.

Soleri, Paolo. *Arcology: The City in the Image of Man*. Cambridge, Mass.: The MIT Press, 1969.

van der Ley, Sabrina and Markus Richter, eds. *Megastructure Reloaded*. Berlin: Hatje Cantz, 2008.

Warren, Jean-Philippe. "Hydroelectricity,Power and Democracy: Québec and Hydro-Québec in Comparison." In *Energy and Citizenship*. Eds. Stéphane Savard and Martin Pâquet. New Perspectives in Québec Studies Collection. Montréal: Globe. Revue internationale d'études québécoises, 2012.

Whiston Spirn, Anne. "Constructing Nature: The Legacy of Frederick Law Olmsted." In *Uncommon Ground: Rethinking the Human Place in Nature.* Ed. William Cronon. New York: W. W. Norton & Company, 1996. 91-131.

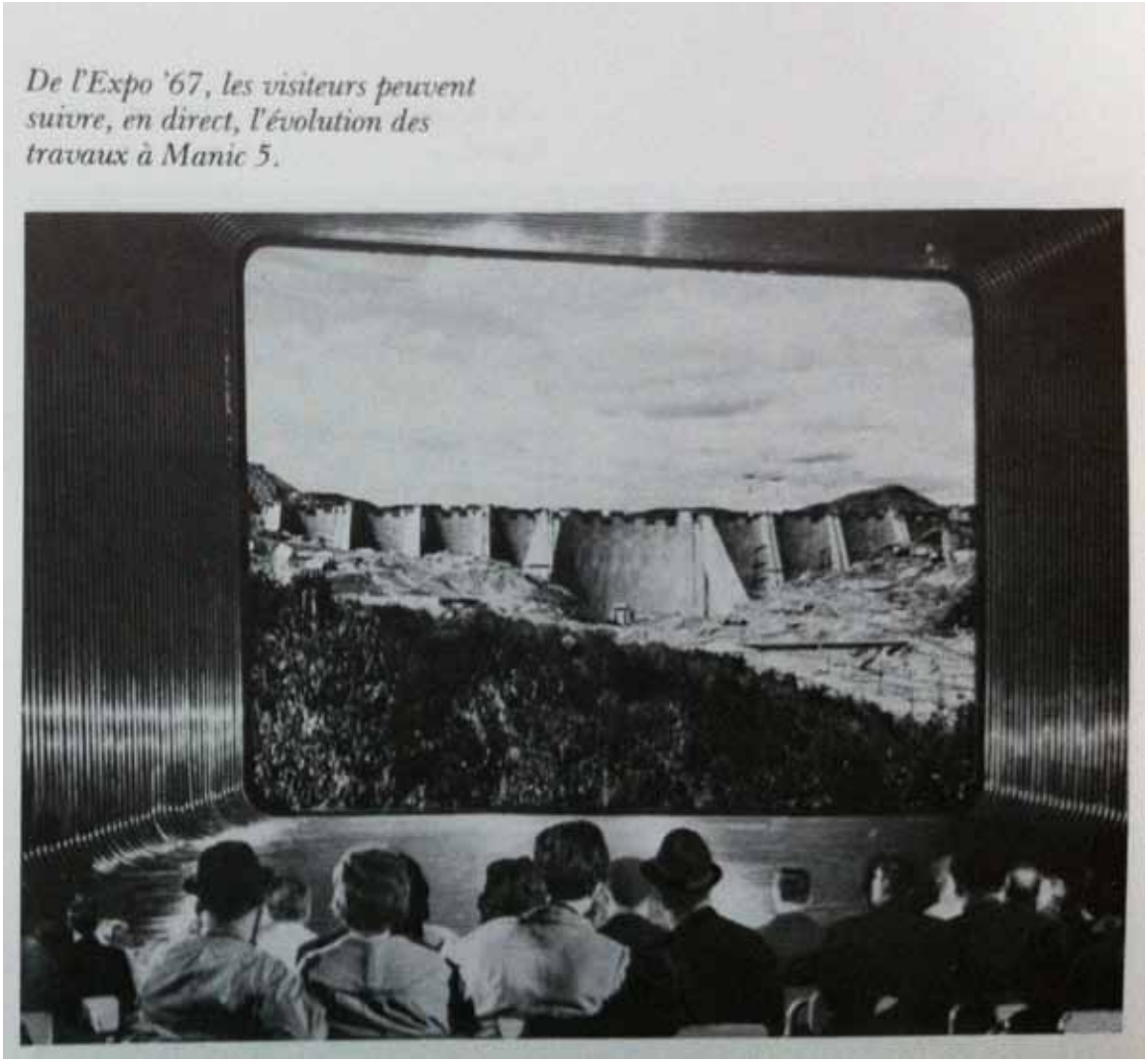


Figure 1 *Manic 5 at Expo 67.*
Photographer unknown. 1967. Photograph.
Source: Clarence Hogue, André Bolduc and Daniel Larouche. *Québec, un siècle d'électricité*. Montréal: Éditions Libre Expression, 1979. 305.

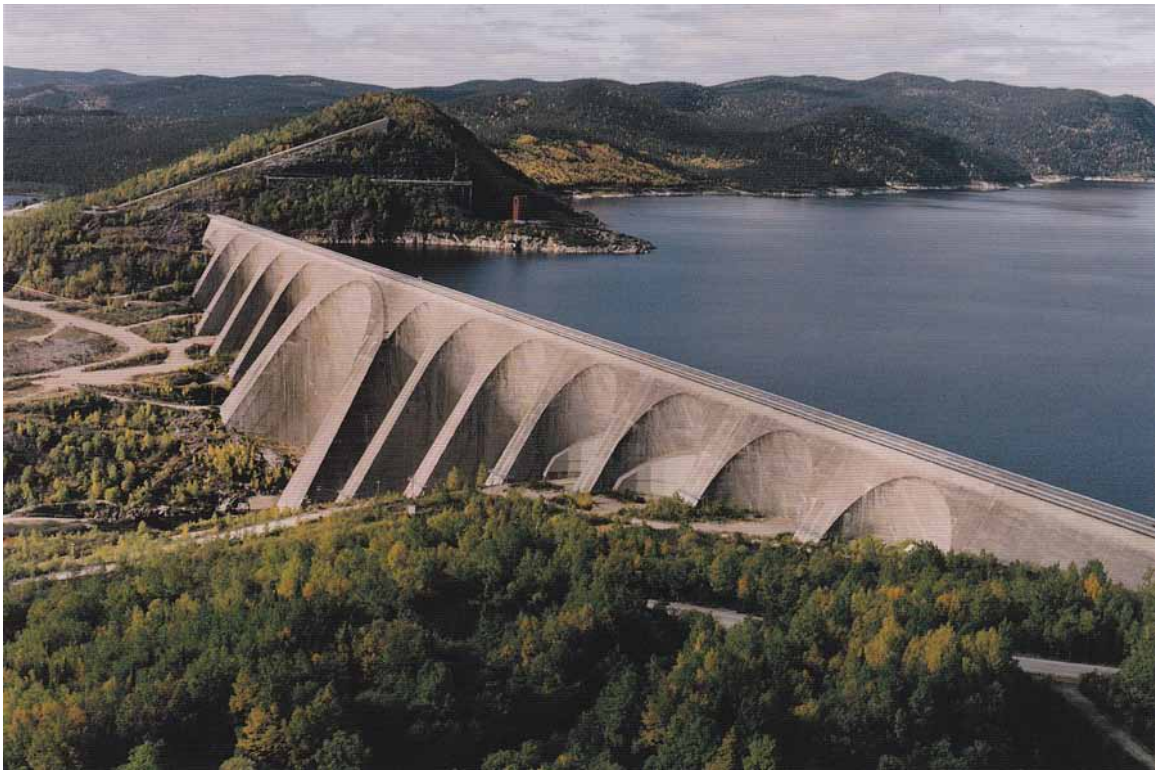


Figure 2 *Barrage Daniel-Johnson – Manic 5*.
Manicouagan: Hydro-Québec, n.d. Postcard.
Postcard given at the guided tour of Manic 5, August 2011.

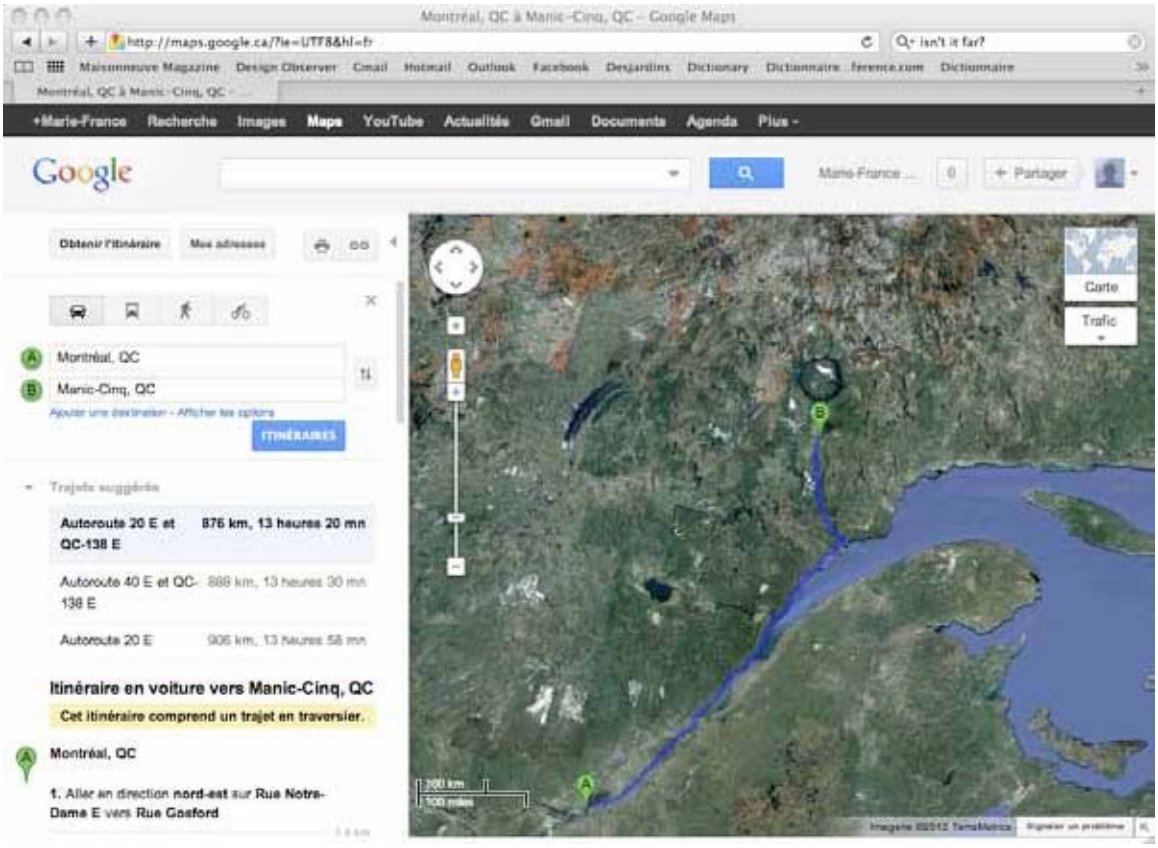


Figure 3 *Road from Montréal to Manic 5.*
Google Maps. 2012. Map.

Figure 4 *Photomontage of the projection of Manic 5 at Expo 67.*
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-4298.

Figure 5 *The Society of the Spectacle.*
Guy Debord. 1970. (J.R. Eyerman. 1953. Photograph.)
Source: Guy Debord. *Society of Spectacle*. Detroit: Black and Red, 1970. Back cover.

Figure 6 *Spectators in the Québec Industries pavilion.*
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-4244/45.

Figure 7 *Habitat 67.*
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-5518.

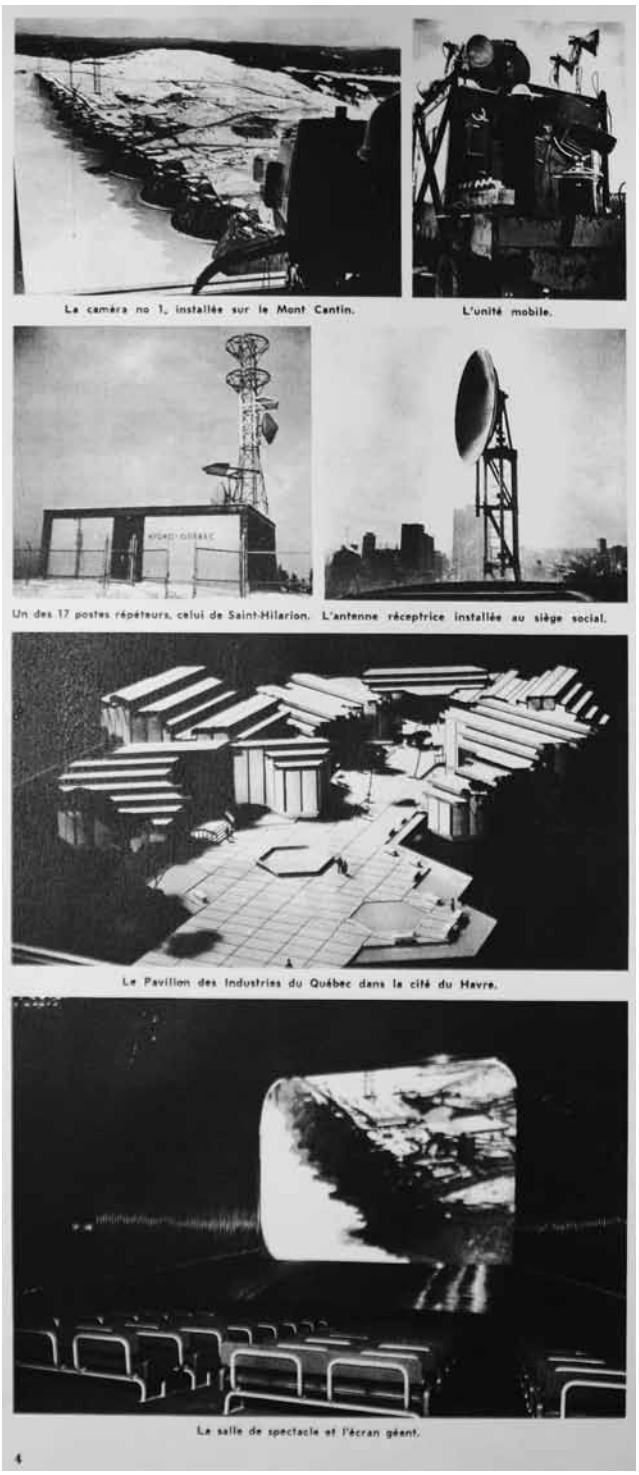


Figure 8 *Three spaces: production, transmission, consumption.* Photographer unknown. 1967. Photographs. Source: *Manicouta* (April 30, 1967): 4.

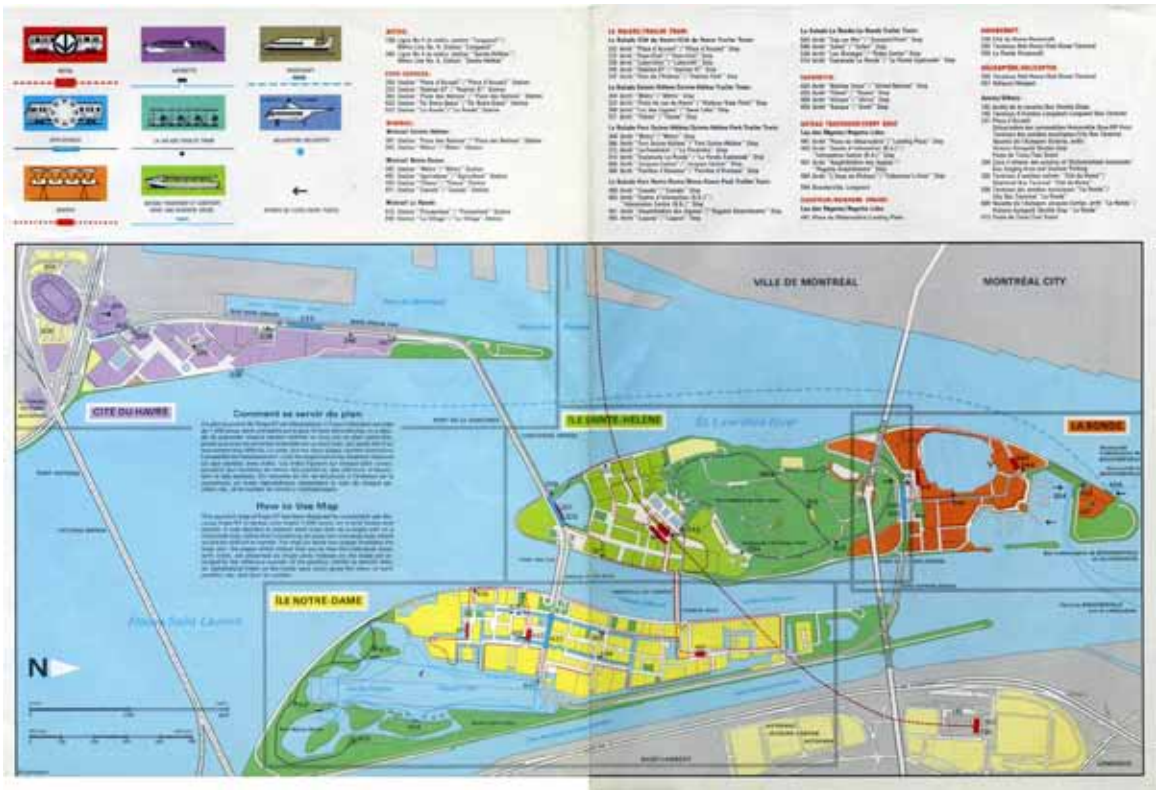
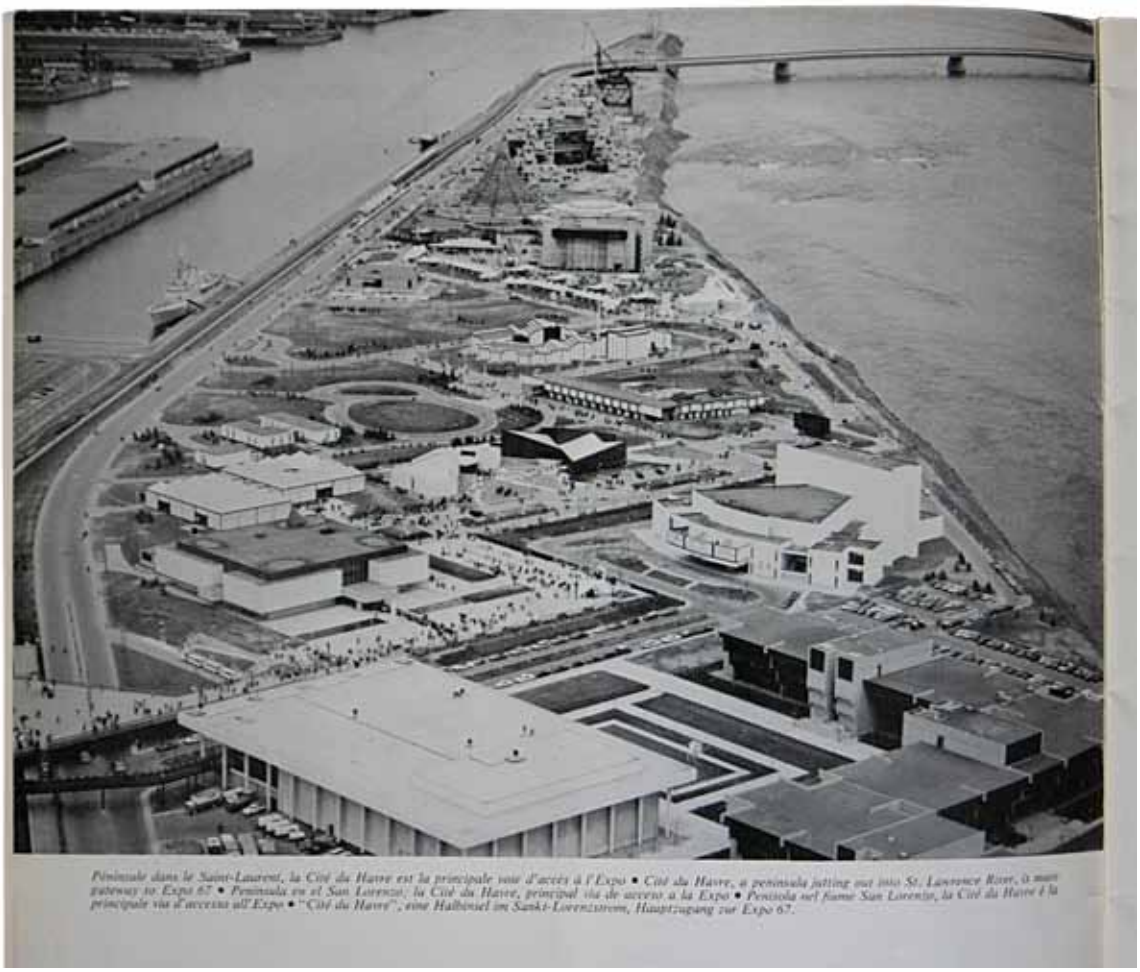


Figure 9 *Means of transport at Man and his World*. 1967. Map.
Source: Expo 67: *Official Guide*. Montréal: Maclean-Hunter Publishing Company, 1967.



Péninsule dans le Saint-Laurent, la Cité du Havre est la principale voie d'accès à l'Expo • Cité du Havre, a peninsula jutting out into St. Lawrence River, is main gateway to Expo 67 • Península en el San Lorenzo, la Cité du Havre, principal vía de acceso a la Expo • Penisola nel fiume San Lorenzo, la Cité du Havre è la principale via d'accesso all'Expo • "Cité du Havre", eine Halbinsel im Sankt-Lorenzstrom, Hauptzugang zur Expo 67.

Figure 10 *Cité du Havre.*
Photographer unknown. 1967. Photograph.
Source: *Montréal*, July 1967, 6.

Figure 11 *Québec Industries pavilion (model)*. 1967. Postcard.
Source: Collection du Centre d'histoire de Montréal.

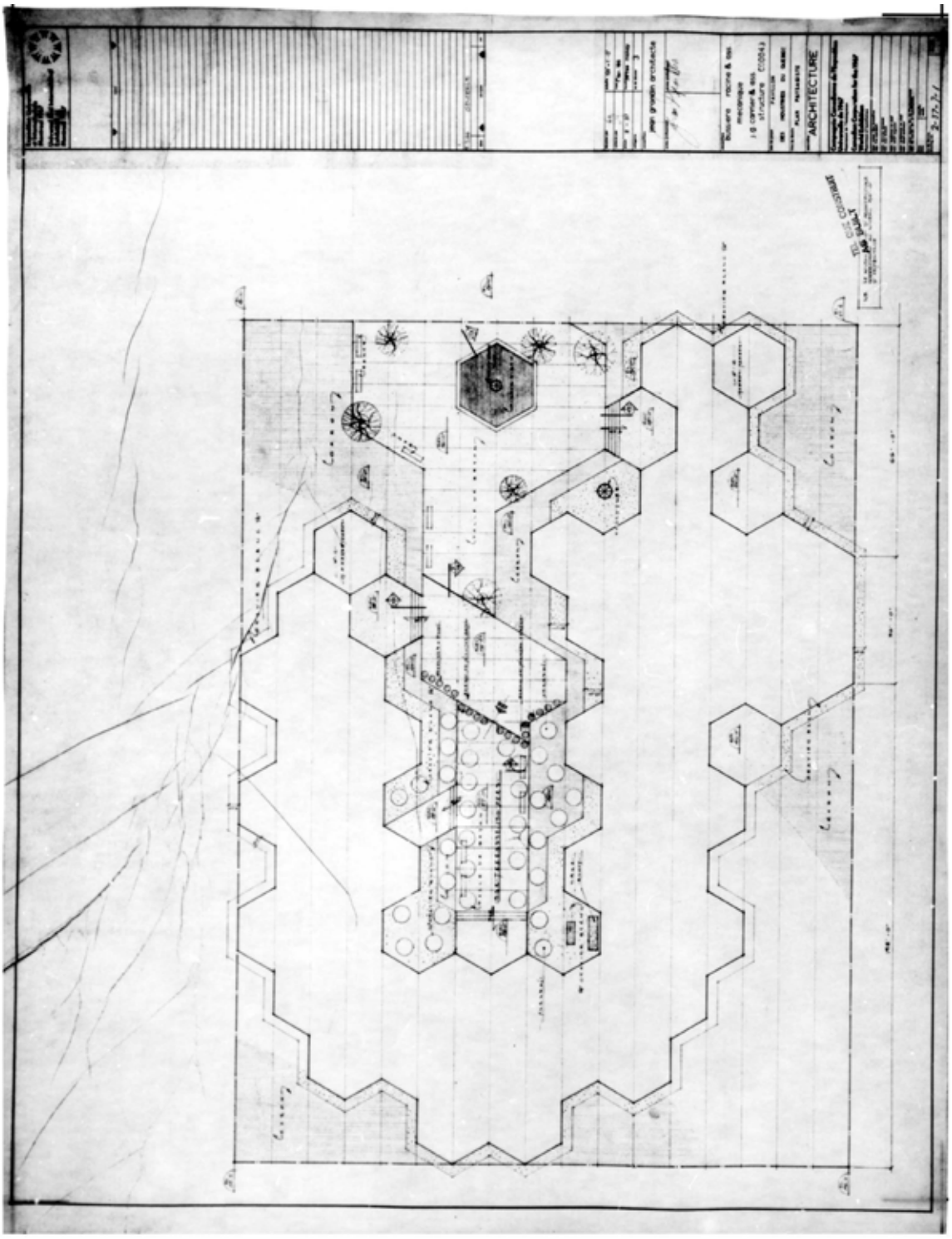
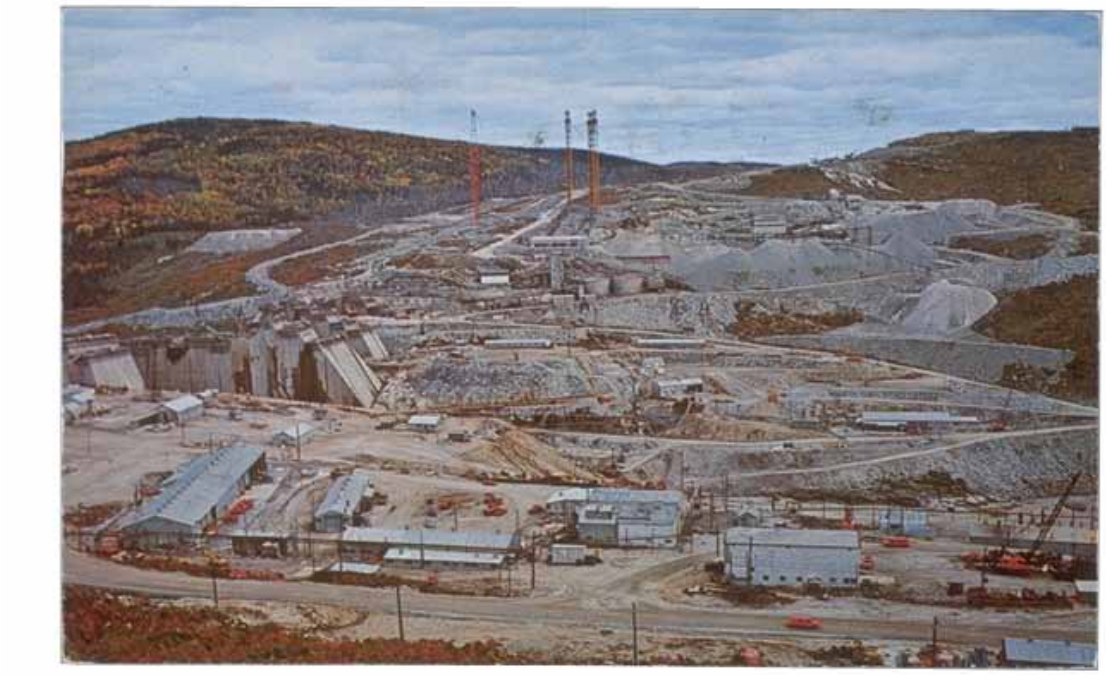


Figure 12 *General plan of the Québec Industries pavilion.*
Jean Grondin (architect). February 1966. Architectural drawing.
Source: Collection de la compagnie de l'Exposition universelle de 1967. City of Montréal Archives. 2-37-7-1.

Figure 13 *Official opening of the Québec Industries pavilion by M. Daniel Johnson.* H. Rémillard. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-3844.



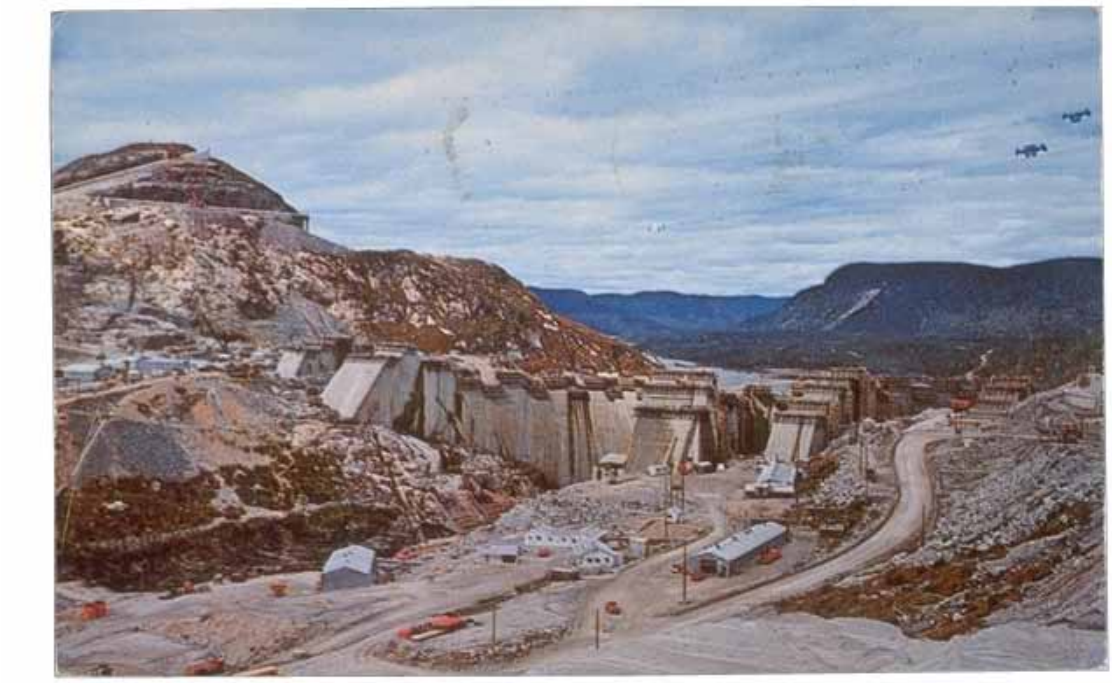


Figure 14 *General view of Manic 5 under construction.*
Manicouagan: Les Comptoirs Forestiers du Québec Inc., n.d. Postcard.
Source: BANQ Collection. CP 4021.

Figure 15 *General view of Manic 5 under construction.*
Manicouagan: Les Comptoirs Forestiers du Québec Inc., n.d. Postcard.
Source: BANQ Collection. CP 4023.

Figure 16 *Site of the Québec Industries pavilion, looking north.*
Marie-France Daigneault Bouchard. June 2012. Photograph.

Figure 17 *Site of the Québec Industries pavilion, looking north-east.*
Marie-France Daigneault Bouchard. June 2012. Photograph.

Figure 18 *Facing Manic 5.*
Marie-France Daigneault Bouchard. August 2011. Photograph.

Figure 19 *The road between Montréal and Manic 5.*
Marie-France Daigneault Bouchard. August 2011. Photographs.

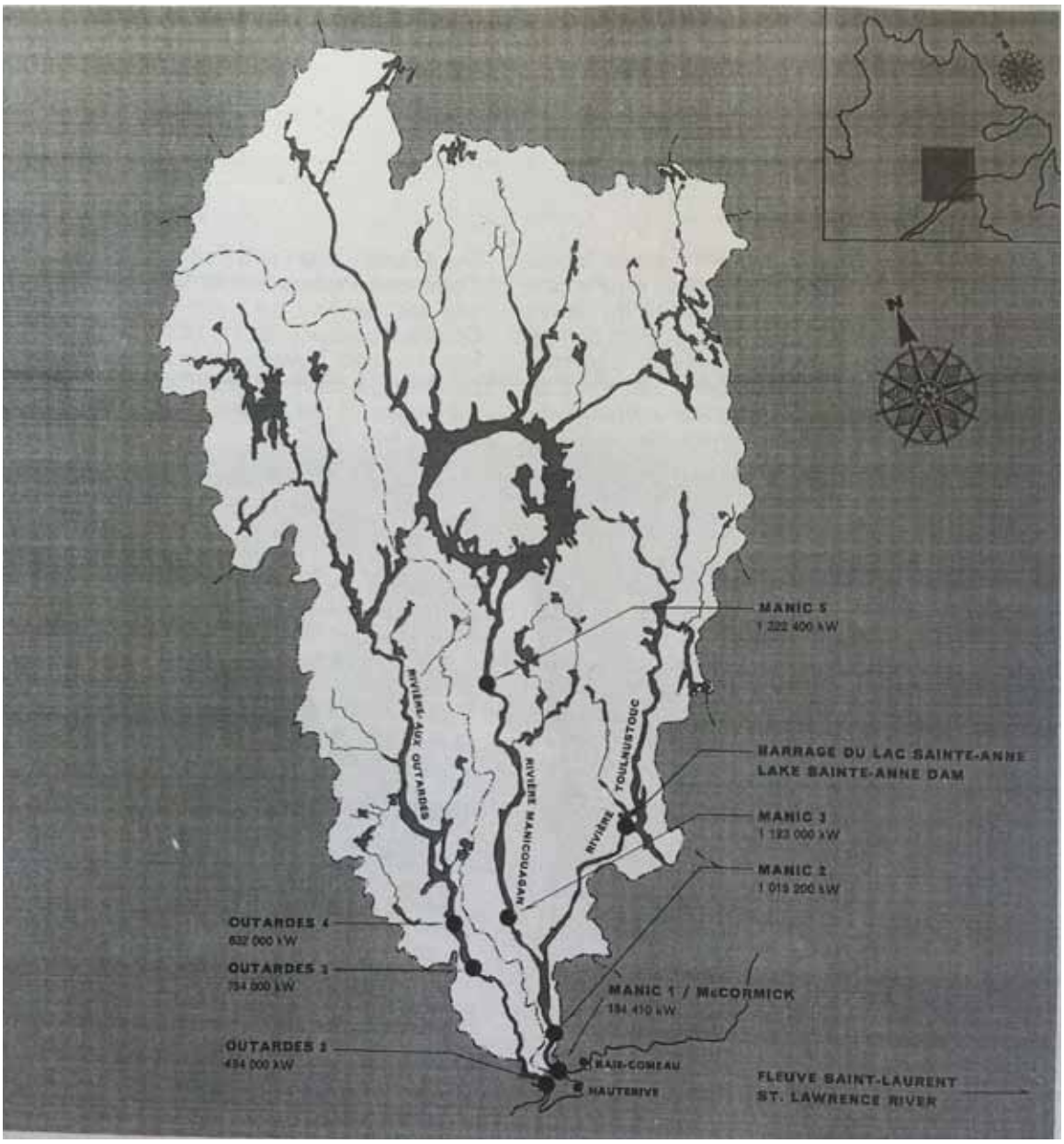


Figure 20 *Map of Manic-Outardes region.* [ca 1967]. Map.
Source: *Manic-Outardes*. Montréal: Hydro-Québec (Relations publiques), [ca 1967].

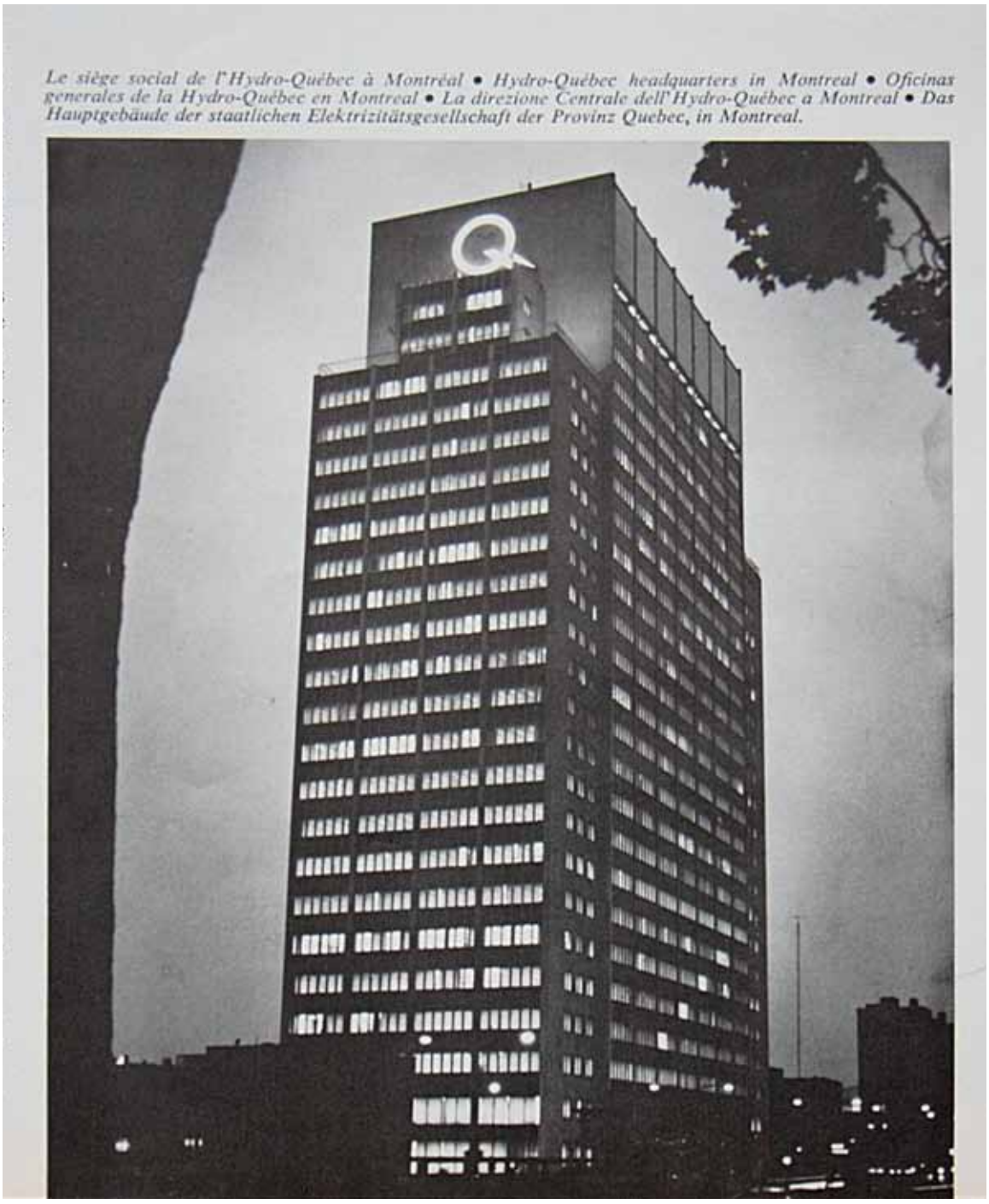


Figure 21 *Hydro-Québec headquarters in Montréal*. Photographer unknown. 1965. Photograph Source: *Montréal*, August 1965, 15.

Figure 22 *General view of the instant village at the base of the dam*.
Manicouagan: Les Comptoirs Forestiers du Québec Inc., n.d. Postcard.
Source: BANQ Collection. CP 4019.

Figure 23 *Mobile homes at Lac Louise*.
Manicouagan: Les Comptoirs Forestiers du Québec Inc. n.d. Postcard.
Source: BANQ Collection. CP 4017.

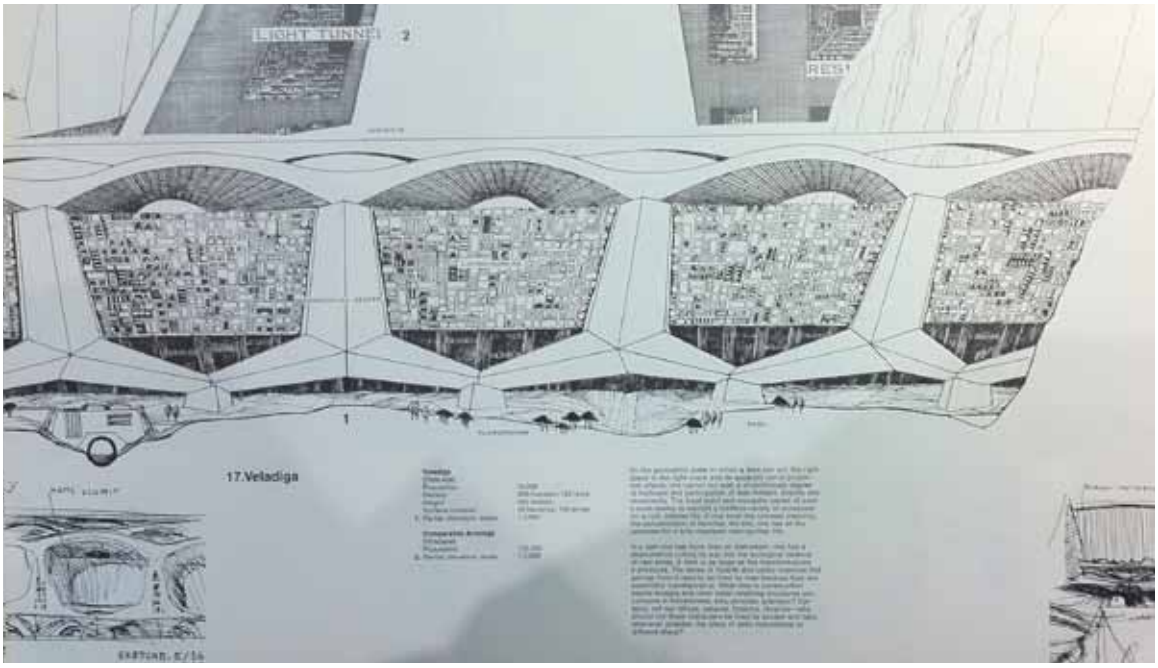


Figure 24 *Veladiga Dam.*
Paolo Soleri (architect). 1969. Drawing.
Source: Paolo Soleri. *Arcology: The City in the Image of Man*.
Cambridge, Mass.: The MIT Press, 1969.

Figure 25 *Québec Industries pavilion with silos and stock exchange building in the background.*
H. Rémillard. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-3218.

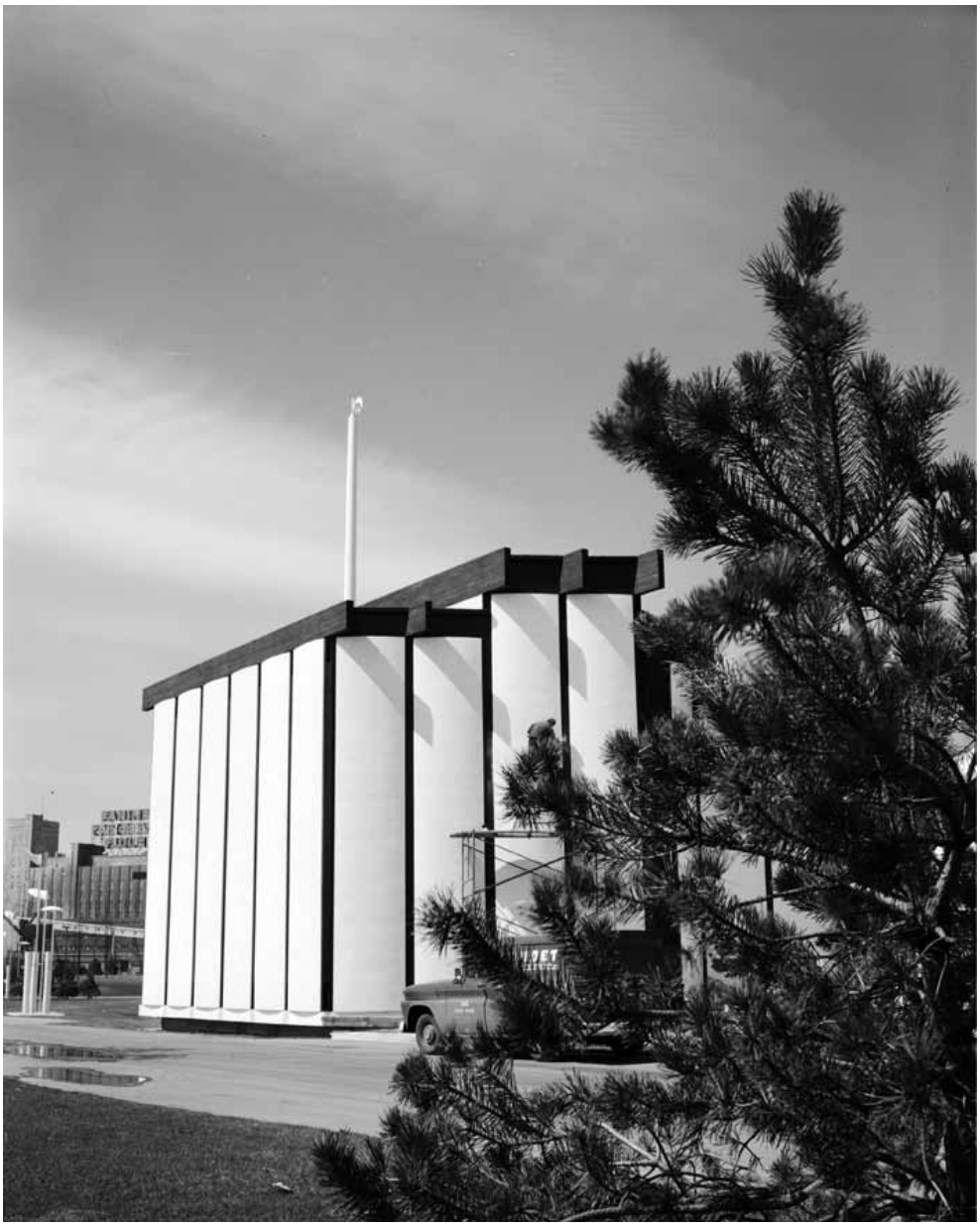


Figure 26 *Québec Industries pavilion with Farine Five Roses in the background.*
H. Rémillard. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-3221.

Figure 27 *Québec Industries pavilion, interior, fish industry.*
Photographer unknown. 1967. Slide.
Source: Dixon Slide Collection. McGill University.

Figure 28 *Québec Industries pavilion, interior, textile industry.*
Photographer unknown. 1967. Slide.
Source: Dixon Slide Collection. McGill University.

Figure 29 *Québec Industries pavilion.*
H. Rémillard. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-3945.

Figure 30 *Site of the Québec Industries pavilion.*
Marie-France Daigneault Bouchard. June 2012. Photograph.

Figure 31 *Manicouagan Station.*
Marie-France Daigneault Bouchard. August 2011. Photographs.

Figure 32 *Micoua Station.*
Marie-France Daigneault Bouchard. August 2011. Photographs.

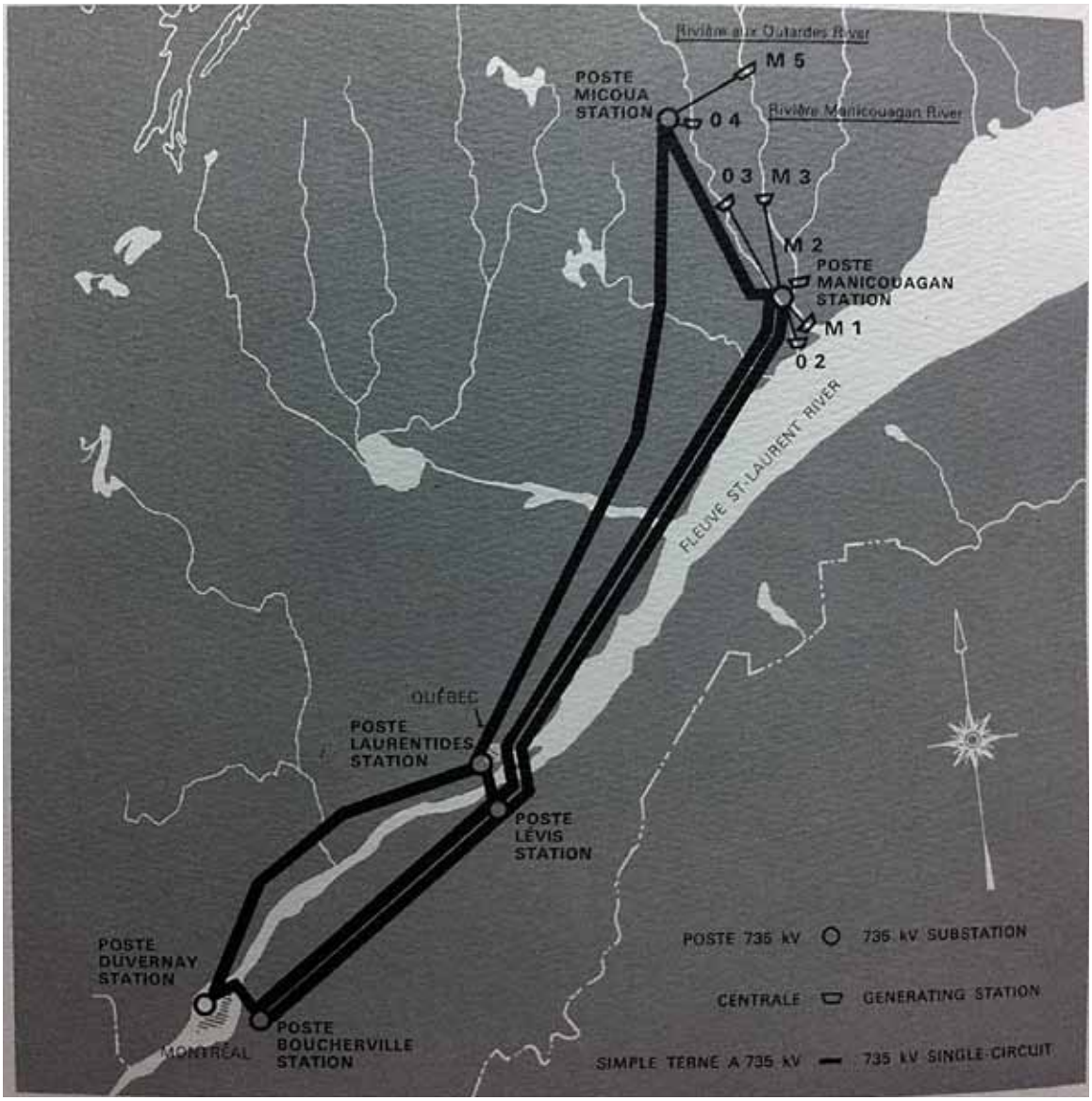


Figure 33 *735 kV lines between Manic-Outardes and Montréal*. Map. Source: Paul Paradis, *735kV, Manicouagan-Montréal*. Montréal: Hydro-Québec, [ca 1967].

Figure 34 *735 kV lines near the Saguenay River crossing*.
Marie-France Daigneault Bouchard. August 2011. Photograph.

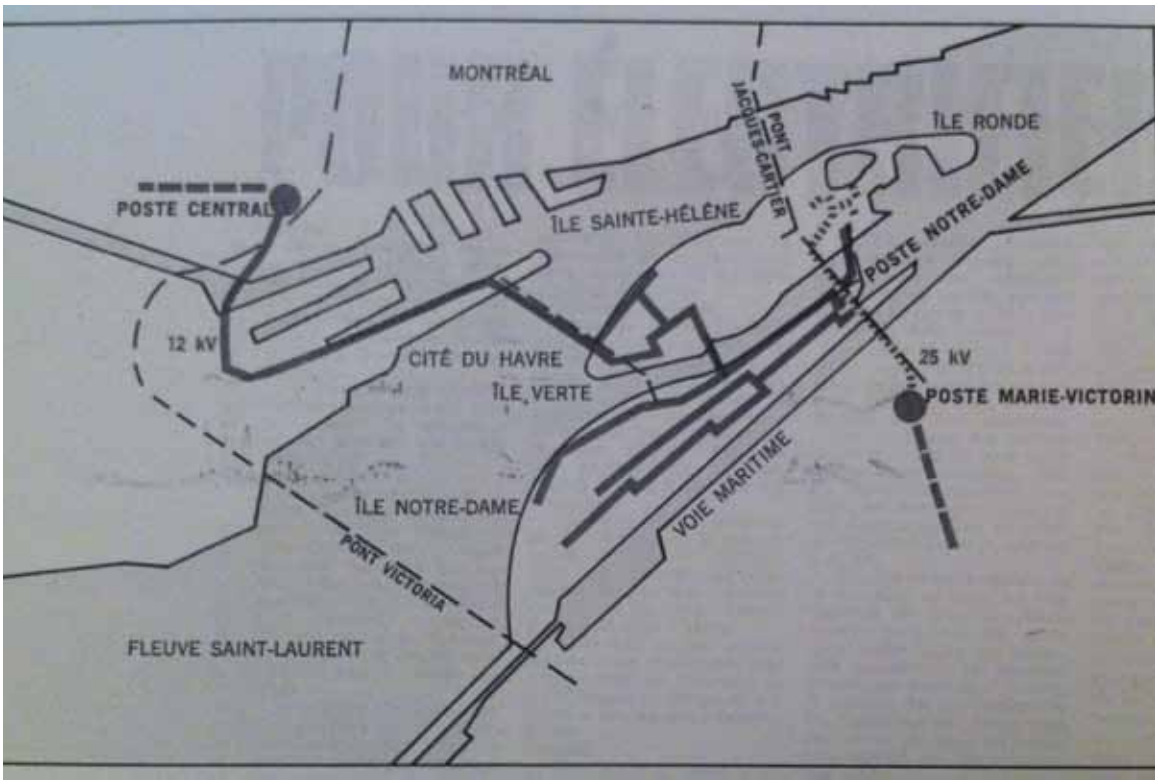


Figure 35 *Underground electric network at Expo 67*. 1967. Map.
Source: *Entre-Nous*, April 24, 1967, 6. Hydro-Québec Archives.

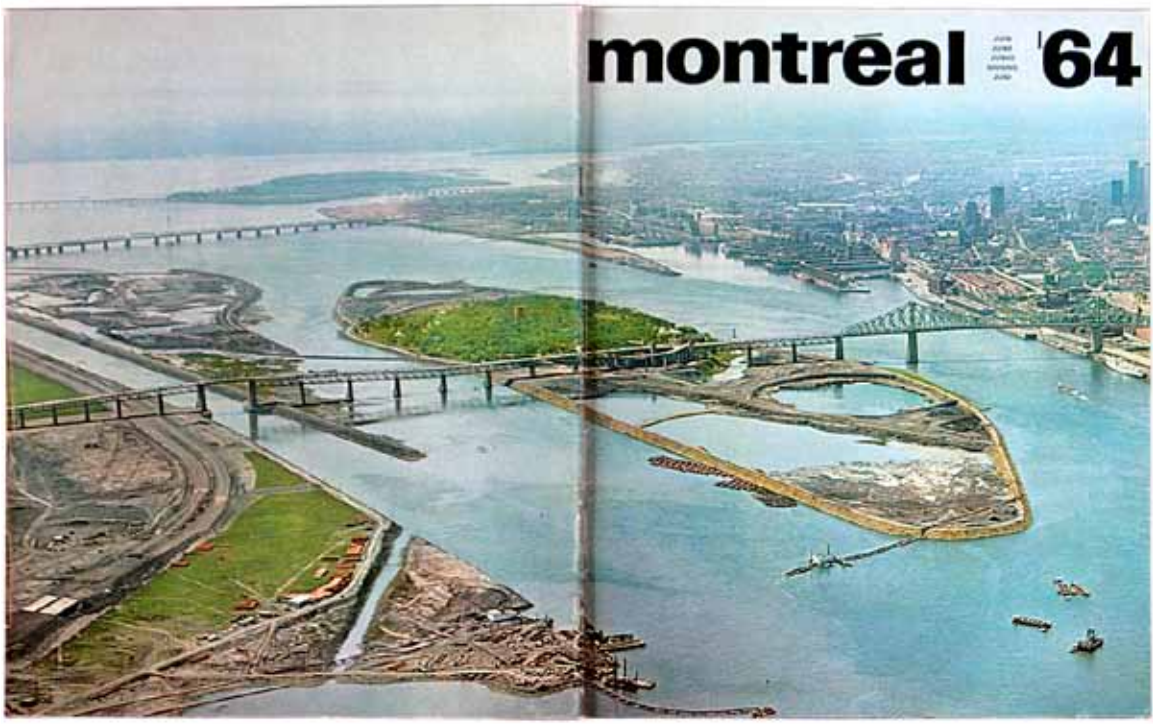


Figure 36 *The site of Expo 67 under construction*.
Photographer unknown. 1964. Photograph.
Source: *Montréal*, June 1964, cover.

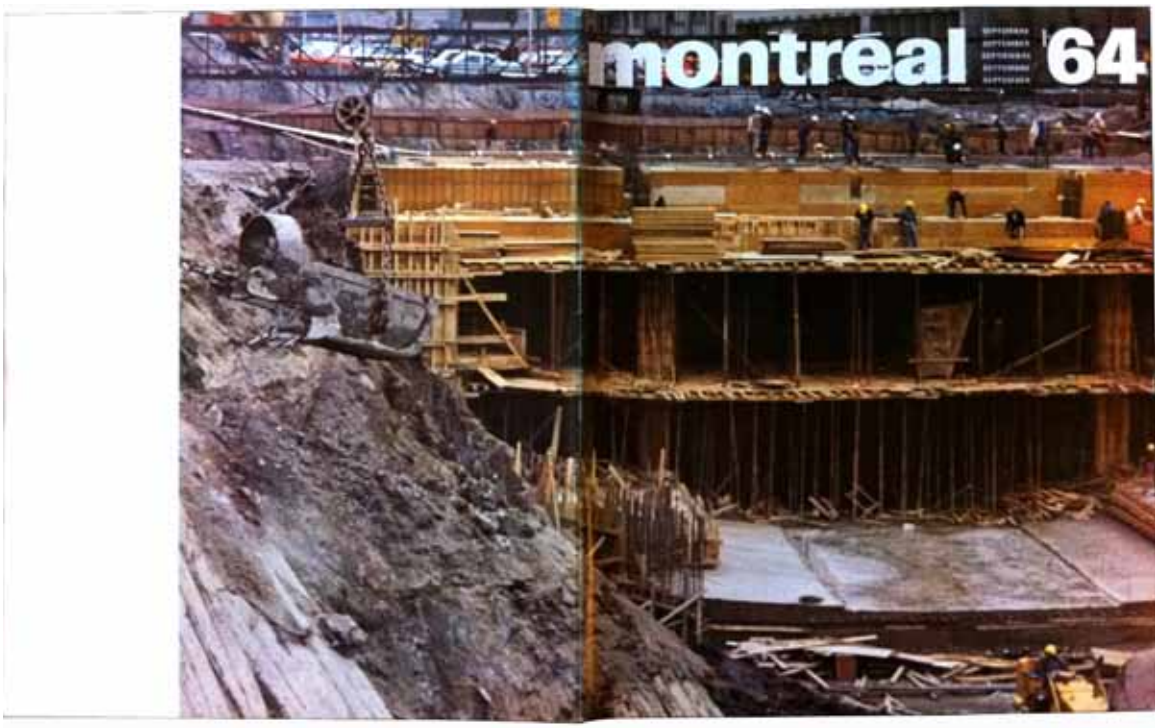


Figure 37 *The subway of Montréal under construction.*
Photographer unknown. 1964. Photograph.
Source: *Montréal*, September 1964, cover.

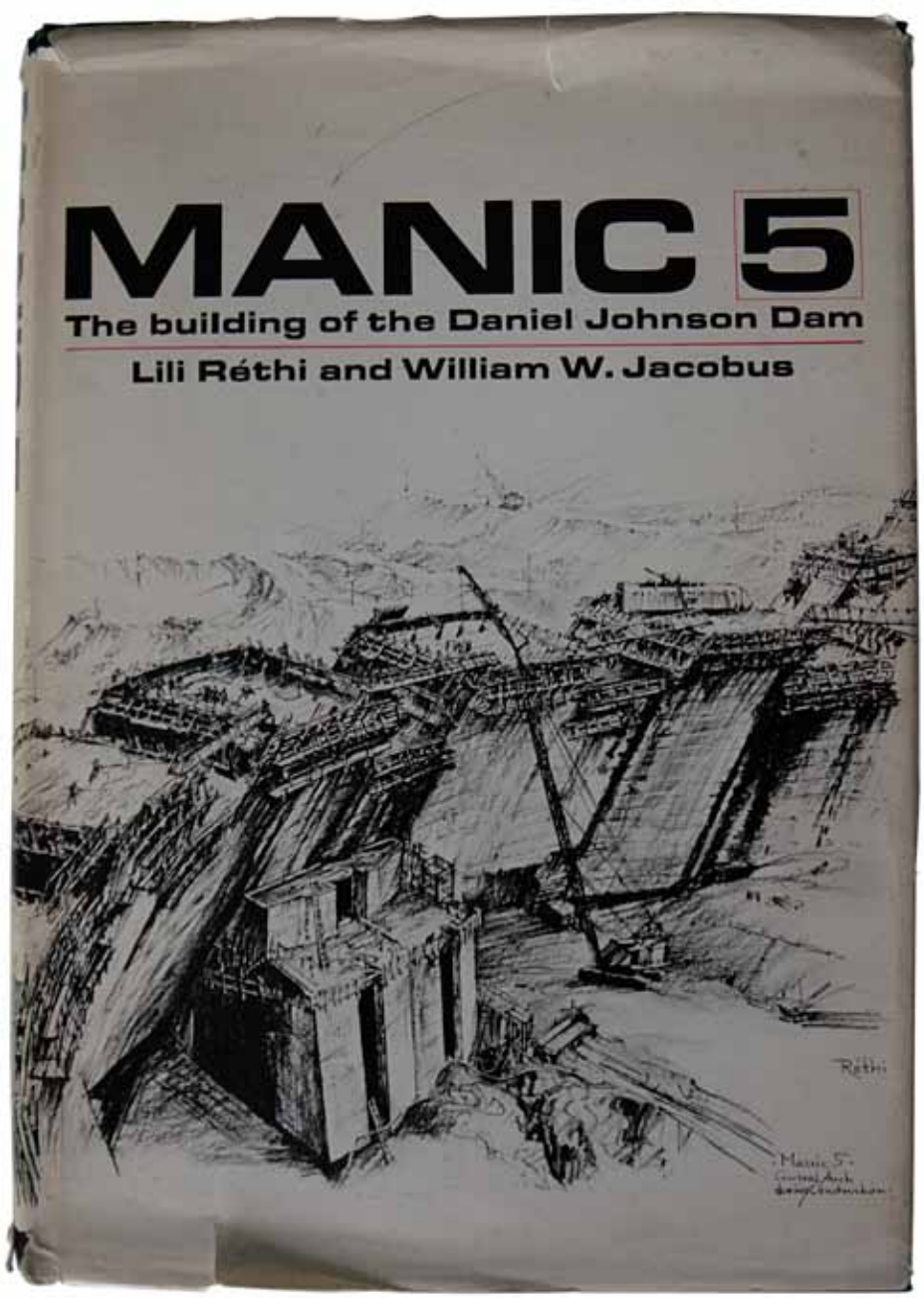


Figure 38 *Manic 5 under construction.*
Lili Réthi. 1965. Drawing.
Source: Lili Réthi and William W. Jacobus, Jr. *Manic 5: the Building of the Daniel Johnson Dam*. New York: Doubleday and Company, 1971. Cover.
Gift of Dr Jean Bélisle to Marie-France Daigneault Bouchard

Figure 39 *Entrance to the projection room in the Québec Industries pavilion*. Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-3945.

Figure 40 *Recording of the chorus.*
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-3088.

Figure 41 *The interior decor of the projection room*.
H. Rémillard. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-3115-c.

Figure 42 *Shed of camera no. 1 at Manic 5.*
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-5081c-d.

Figure 43 *View of camera no. 1 at Manic 5.*
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-5081c-a.

Figure 44 *View of camera no. 1 at Manic 5.*
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-5081c-c.

Figure 45 *View of camera no. 2 at Manic 5.*
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-5081c-b.

Figure 46 *Mobile camera no. 3 at Manic.*
Photographer unknown. 1967. Photographs.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-2772/3

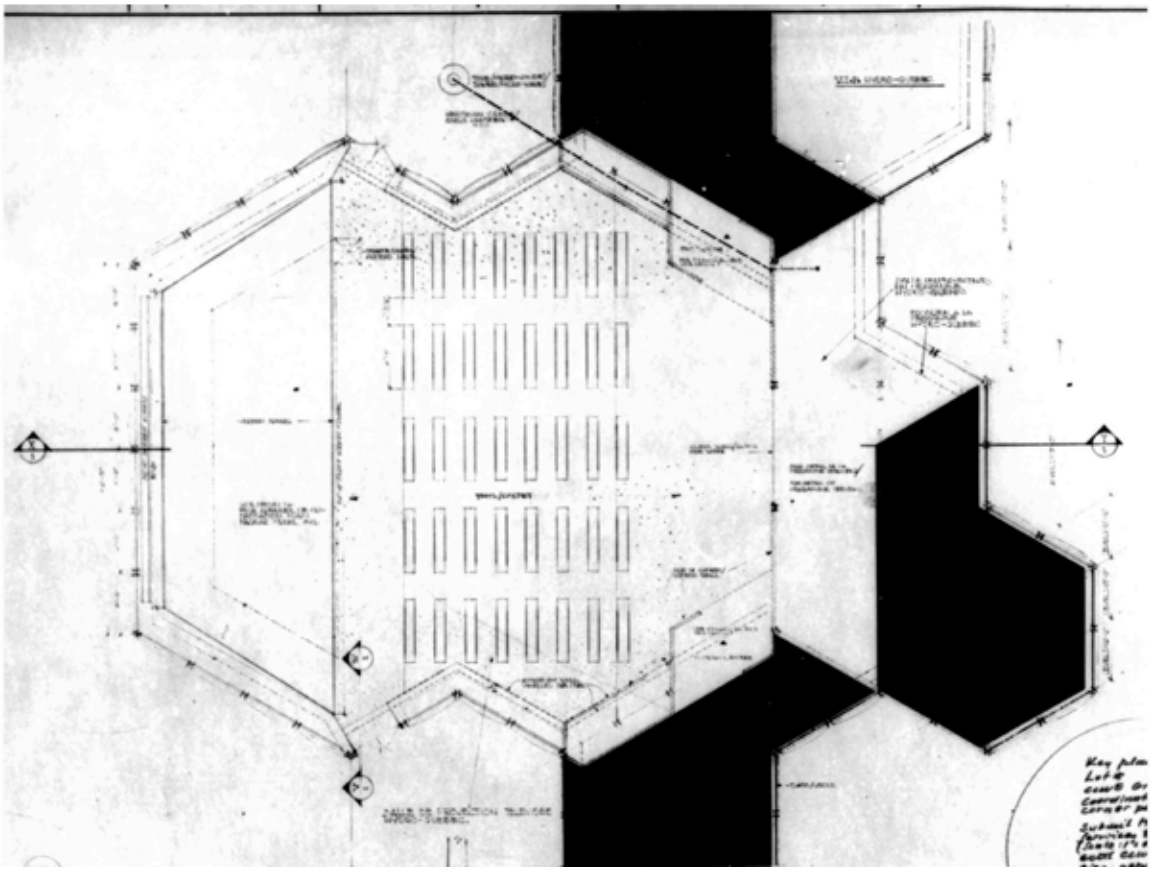


Figure 47 *Floor plan of the projection room in the Québec Industries pavilion.* Rodney Y. Hatanaka (designer). 1967. Architectural drawing. Source: Collection de la compagnie de l'Exposition universelle de 1967. City of Montréal Archives. 2-37-10-1.

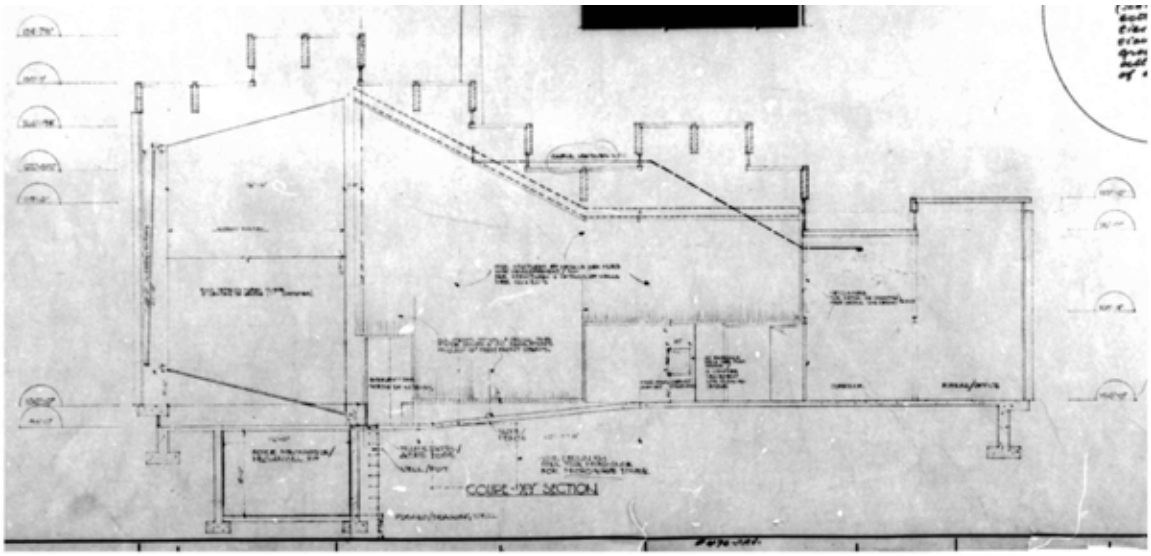


Figure 48 *Cross section of the projection room in the Québec Industries pavilion.* Rodney Y. Hatanaka (designer). 1967. Architectural drawing. Source: Collection de la compagnie de l'Exposition universelle de 1967. City of Montréal Archives. 2-37-10-1.

Figure 49 I*nterior of the projection room in the Québec Industries pavilion.*
H. Rémillard. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-2808.

Figure 50 *Antenna outside the projection room of the Québec Industries pavilion.*
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-2421.

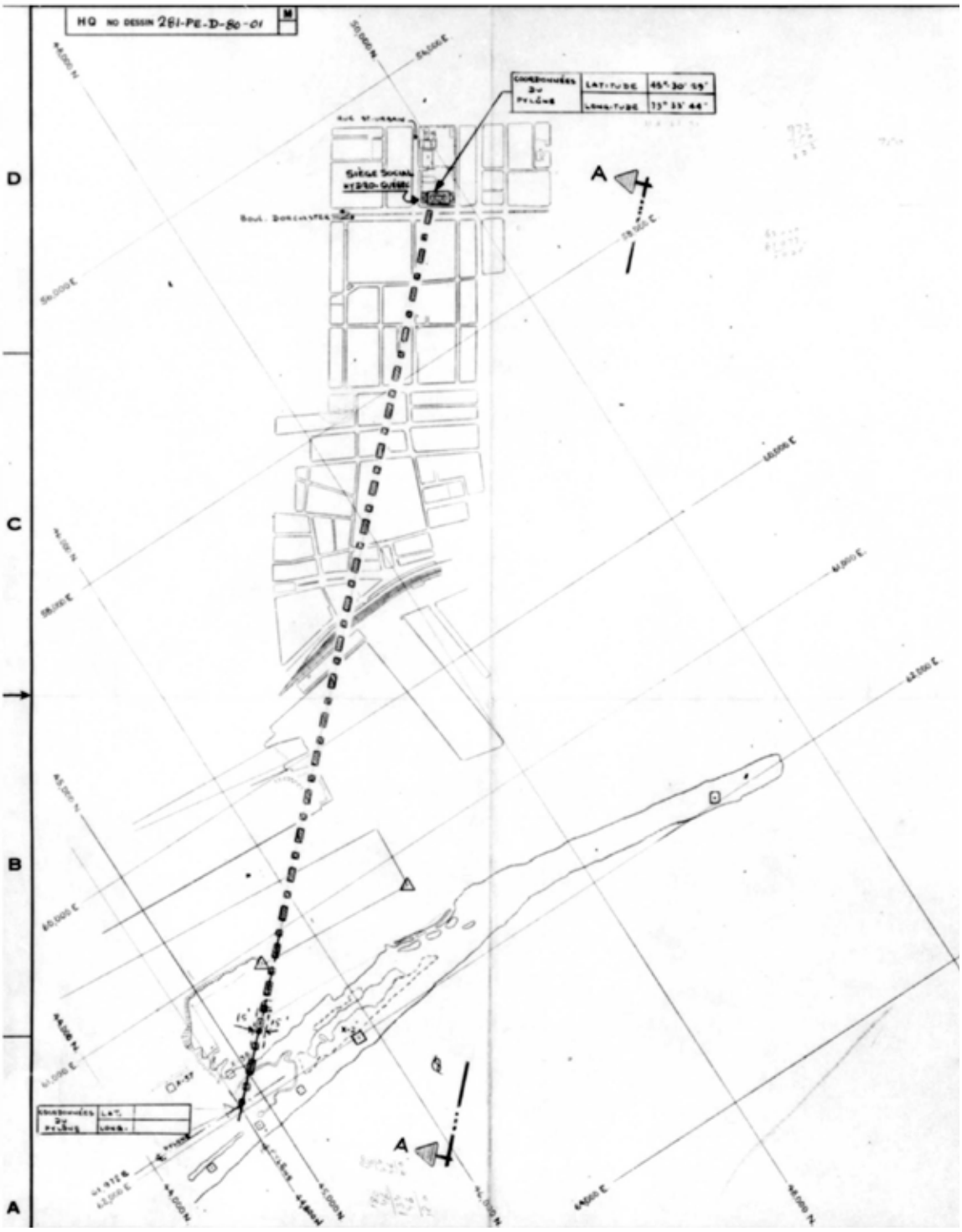


Figure 51 *Microwave link between the Hydro-Québec building and the Québec Industries pavilion.*
Author unknown. 1967. Architectural drawing.
Source: Collection de la compagnie de l'Exposition universelle de 1967. City of Montréal Archives. 281-PE-D-80-01.

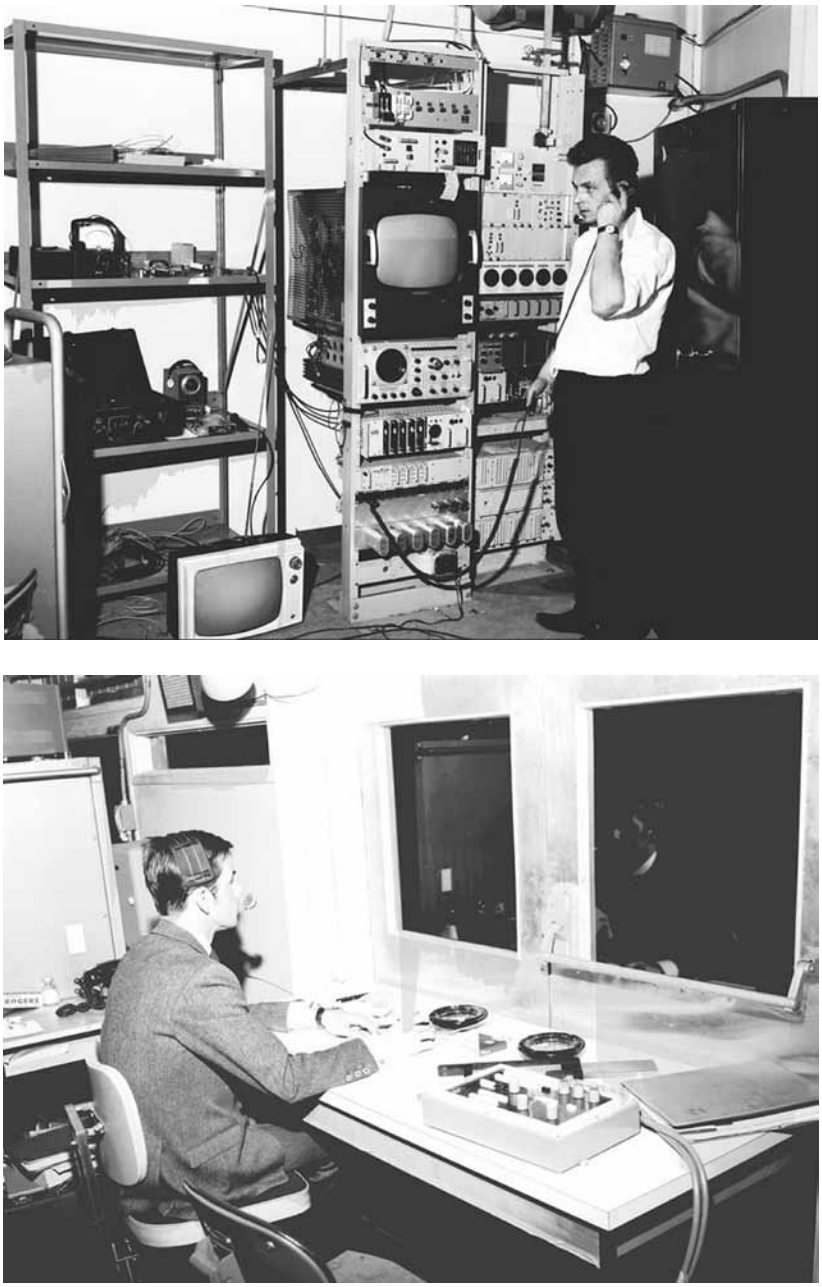


Figure 52 *Interior of the technical room in the Québec Industries pavilion.*
H. Rémillard. 1967. Photographs.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-4304/7.

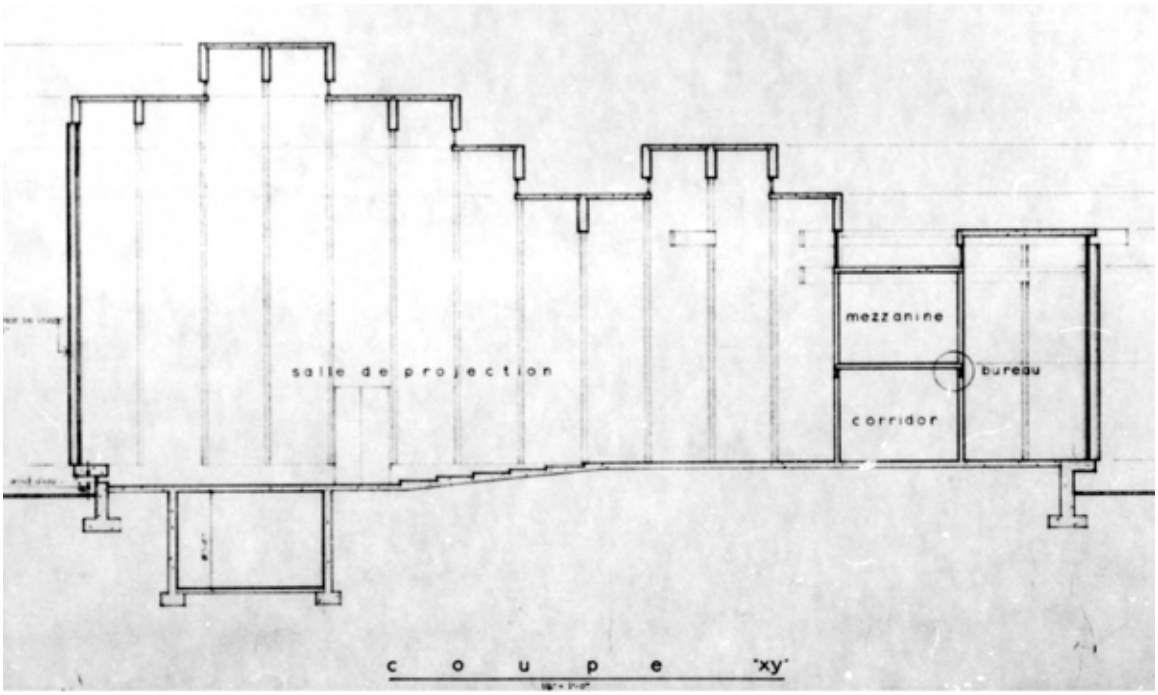


Figure 53 *Cross section of the projection room and the technical room (mezzanine) in the Québec Industries pavilion.*
Jean Grondin (architect). 1967. Architectural drawing.
Source: Collection de la compagnie de l'Exposition universelle de 1967. City of Montréal Archives. 2-37-2-11.

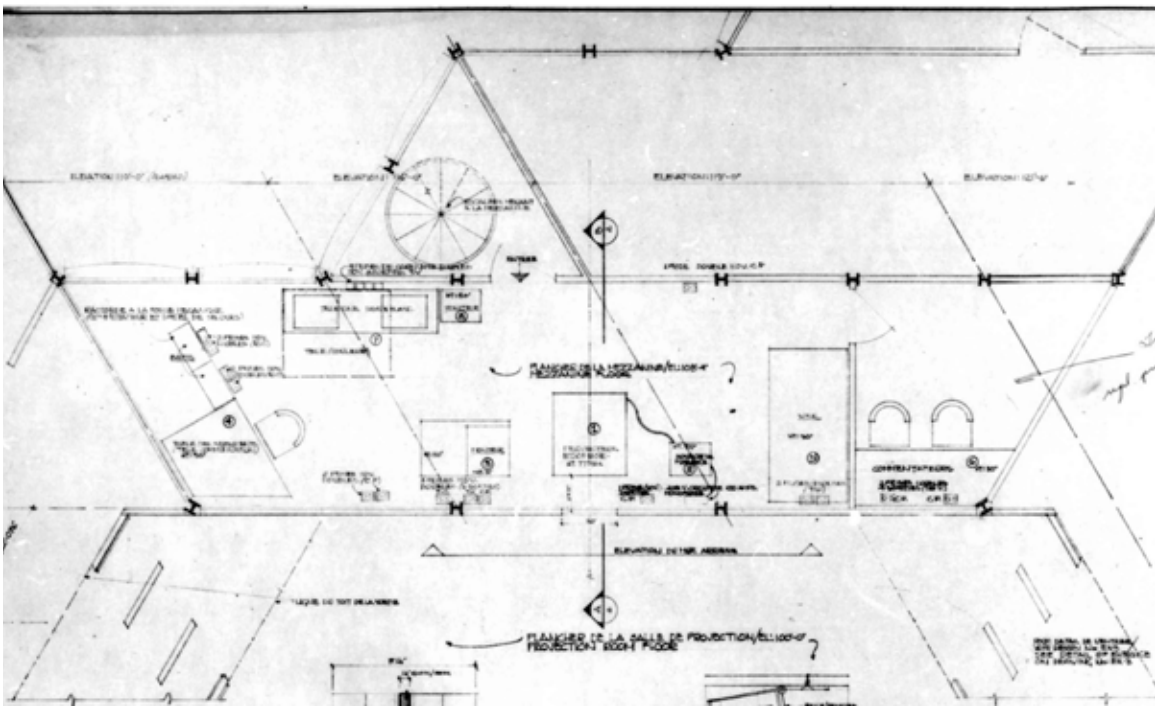


Figure 54 *Floor plan of the technical room (mezzanine) in the Québec Industries pavilion*.
Rodney Y. Hatanaka (designer). 1967. Architectural drawing.
Source: Collection de la compagnie de l'Exposition universelle de 1967. City of Montréal Archives. 2-37-10-2.

Figure 55 *Eidophor.*
H. Rémillard. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-3952.

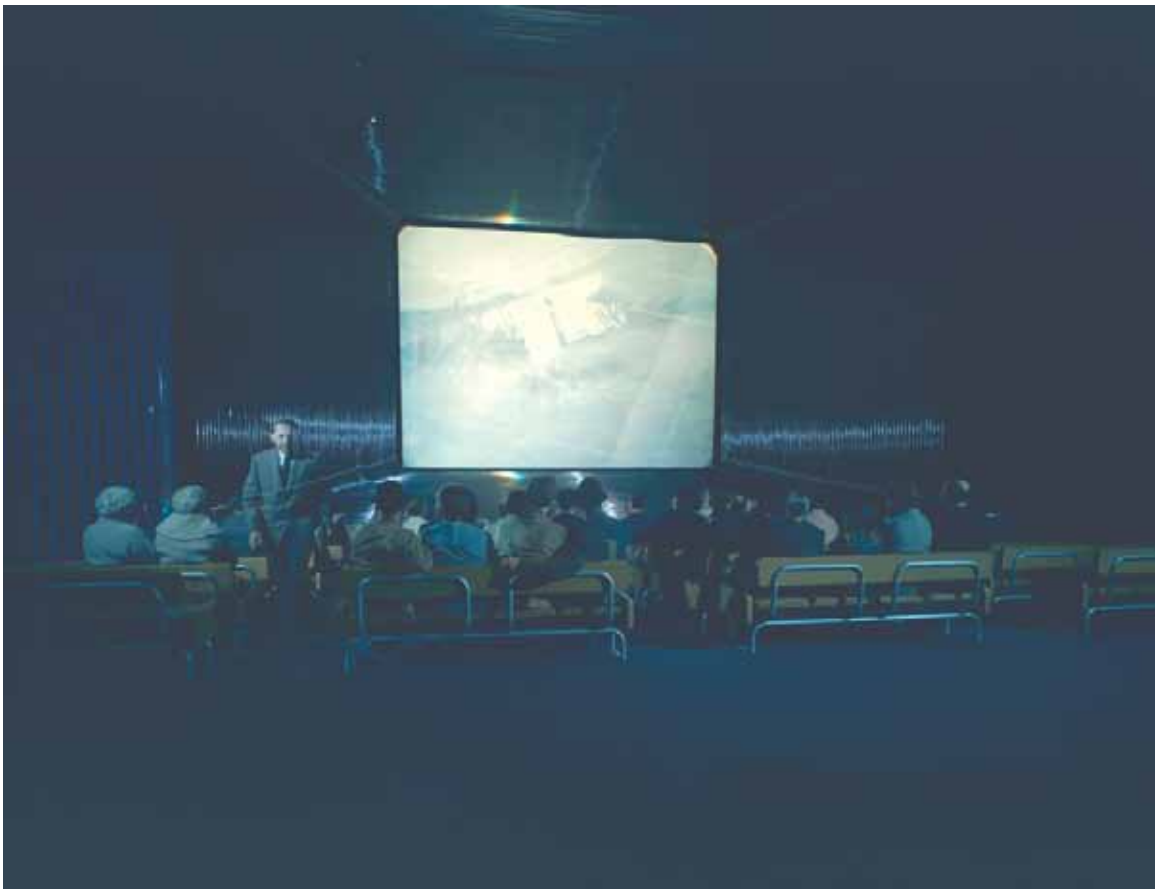


Figure 56 *Original photograph used for the photomontage*.
Photographer unknown. 1967. Photograph.
Source: Fonds Hydro-Québec. Hydro-Québec Archives. 67-4064c.