

# Mining For Thetford's Identity

Reclaiming the Mine Sites of a Former Asbestos Town

by  
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**Fig. 1:** Photograph showing the author's grandfather working in one of Thetford's asbestos mines, the National Asbestos Company (circa 1959).

## Abstract

Canada has a long history of production, use, and export of asbestos, starting in 1876 when the first Canadian asbestos mine opened. With the industrial era of asbestos nearing its end, postproduction asbestos towns will remain not only as urban entities but also – and perhaps more importantly – as communities.

This thesis considers the question of a new architectural and landscape design strategy for Thetford Mines, a former asbestos town wavering between success and failure. At one time the driver of the city's economy and core of its identity, Thetford's asbestos mines are now an uncomfortable impediment to a holistic approach to urban development. This thesis addresses two main critical issues: 1) how to repurpose a former mine site?; and 2) how to reconcile a contested past with the town's present-day identity? The goal is to trigger both reconciliation with a problematic past as well as urban development for the present.

## Acknowledgements

This thesis would not have been possible without a number of important people. First, I owe my deepest gratitude to my advisor, Professor Janine Debanné, for her invaluable contribution to this thesis. Her presence throughout this year-long process was greatly beneficial and, more importantly, highly pleasant and appreciated.

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## Introduction

On December 15th 2016, the Liberal government of Prime Minister Justin Trudeau marked Canadian industrial history by announcing its intention to ban the use, exportation, and importation of asbestos throughout the country. Within the next two years, the National Building Code of Canada will be modified, prohibiting the use of asbestos minerals in the construction and renovation of any building in the country.<sup>1</sup> This decision brings Canada in line with more than 50 other countries (Tab. 1) and implies that the industrial era of asbestos in Canada, a once highly prosperous industry, is nearing its absolute end.

Algeria	Argentina	Australia
Austria	Bahrain	Belgium
Brunei	Bulgaria	Chile
Croatia	Cyprus	Czech Rep.
Denmark	Egypt	Estonia
Finland	France	Gabon
Germany	Greece	Honduras
Hungary	Iceland	Ireland
Israel	Italy	Japan
Jordan	Korea	Kuwait
Latvia	Lithuania	Luxembourg
Malta	Mozambique	Netherlands
New Caledonia	Norway	Oman
Poland	Portugal	Qatar
Romania	Saudi Arabia	

**Tab. 1: Countries with bans on all types of asbestos, as per 2016.**

Retrieved January 13, 2017, from  
<https://www.asbestossafety.gov.au/countries-bans-all-types-asbestos>.

Canada has a long history of production, use, and export of asbestos, starting in 1876 when the first Canadian asbestos mine opened. Now that the Canadian government has promised a full ban on asbestos by 2018, the future of former asbestos towns in Canada emerges as a pressing question. While the industrial era of asbestos nears its

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<sup>1</sup> Raphael Bouvier-Auclair, *Ottawa interdira l'amiante d'ici 2018*, from Radio-Canada.ca, 1:57 minutes, <http://ici.radio-canada.ca/nouvelle/1006077/federal-bannit-amiante-utilisation-importation-gouvernement-canada>.



**Fig. 2: Photo of asbestos, also referred as “white gold” in the past.**

*Retrieved April 30, 2017, from  
[http://www.ehatlas.ca/environmental-  
contaminants/asbestos](http://www.ehatlas.ca/environmental-contaminants/asbestos)*

end and as a postproduction context begins, asbestos towns beg to be redefined, not only as urban entities but also – and more importantly – as communities.

The history of asbestos in Canada can be traced back to 1876, a year during which the mineral was first discovered in the Appalachian region, near what is known today as the town of Thetford Mines<sup>2</sup>. The discovery of asbestos in the region quickly led to a rush for the so-called ‘white gold’ (Fig. 2), with the acquisition of the best land by a handful of mining developers. The Johnson Mine, an open-cast mine inaugurated in 1877, was the first asbestos mine in the Thetford Mines area. The King Brothers Co., located to the north of the Johnson Mine, is the second mine to be opened in Thetford Mines, in 1878.<sup>3</sup> The exploitation of asbestos was not limited to these first two companies, nor was it limited to the territory of Thetford Mines alone. The opening and development of other asbestos mines in nearby towns – Black Lake, Asbestos, East Broughton and Robertsonville – followed a few years later. Thetford Mines, however, is where the mining industry developed most rapidly. The exploitation of asbestos in

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<sup>2</sup> Throughout this thesis, “Thetford Mines” and “Thetford” are used interchangeably.

<sup>3</sup> Ville de Thetford Mines, *Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992* (Thetford Mines: La Ville de Thetford Mines, 1994), 90.

the region was not an activity reserved for a few privileged industrialists. Between 1876 and 1895, there were more than thirty mining companies exploiting asbestos, several of which were founded on old companies or on sections of land granted, leased or sold. As workers flocked to the mines to seek new job opportunities, the town of Thetford Mines came to be, growing to become one of the world's largest producers of asbestos before its last mines closed in 2011.

In many respects, the history of Thetford Mines goes beyond the town's local and regional boundaries. The Manichean discourse that characterized the fate of asbestos in the past decades – in Canada and beyond its border – has arguably fed the present-day controversy associated with this mineral, more specifically its carcinogenic risks for humans. In that regard, the World Health Organization is unequivocal: 'all types of asbestos cause lung cancer, mesothelioma, cancer of the larynx and ovary, and asbestosis.'<sup>4</sup> This declaration casts a shadow on the legacy of asbestos production in the world, and more specifically, on Canada's well-established role in it. In fact, a report on the Quebec mining industry published in 1947 indicates that Canada, during the

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<sup>4</sup> World Health Organization, "International Programme on Chemical Safety: Asbestos," last modified in 2016, [http://www.who.int/ipcs/assessment/public\\_health/asbestos/en/](http://www.who.int/ipcs/assessment/public_health/asbestos/en/).

<b>Country</b>	<b>Tons of 2000 lbs</b>
Canada	558 181
Rhodesia	55 872
Swaziland	25 900
Union of South Africa	20 225
USA	14 426
Italy	4 912
Cyprus	4 566
Transvaal	2 500
France	587
Turkey	61

**Tab. 2: Top asbestos-producing countries in 1946.**

*Retrieved March 28, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".*

peak of the asbestos production historically, was by far the top asbestos-producing country worldwide (Tab. 2). Moreover, another report published in 1939 specifies that 62% of the exports of asbestos from Quebec were going to the United States, 20% to Europe<sup>5</sup>, 8% to Japan, and the remaining 10% to other parts of the globe.<sup>6</sup> These numbers are good indicators as to why asbestos can be found in nearly all building types in Canada and around the world, from homes and hospitals to elementary schools and universities. As such, eliminating asbestos from the built environment is highly problematic; this fact only adds to the difficult legacy with which Thetford Mines is associated.

What to do now? What lies in the future for cities like Thetford? The “undoing” of the asbestos era is not possible: asbestos was extracted, exported, processed, and used in the making of a plurality of products. Industry, construction, and commercial sectors have used asbestos in products like cement and plaster, heating systems, building insulation, floor and ceiling tiles, house siding, car brake pads, and vehicle transmission

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<sup>5</sup> The European countries included in these statistics are England, Germany, Belgium, France, and Italy.

<sup>6</sup> Ville de Thetford Mines, *Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992*, 259.

components, such as clutches.<sup>7</sup> But today, with the mines closed and the upcoming nationwide ban, future ills caused by asbestos have been halted. Thetford is, as such, a site replete with potential for symbolic repair and healing. And yet, while there is a consensus in the scientific community with regards to afflictions caused by asbestos on human health and the burden of the associated health care expenses and administrative costs, the socio-economic and environmental impacts of total cessation of mining activity in former asbestos towns have received little attention.

In the case of Thetford Mines, the Beaver, Bell, King and Johnson mines occupy a large landmass to the south west of the historical downtown (Fig. 2). As a settlement, Thetford must continually sidestep these former mines. The neighbourhood of Mitchell, as a result, is isolated and disconnected from the historical downtown and a large area of the city remains unknowable and inaccessible to the *Thetfordois*. What is more, because of the immutable status of the currently inactive mine sites, the city can only grow in a north-easterly axis, further accentuating sprawl and disconnection with the original town and historic neighbourhoods.

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<sup>7</sup> <https://www.canada.ca/en/health-canada/services/air-quality/indoor-air-contaminants/health-risks-asbestos.html>



**Fig. 3: Satellite image showing the mining zone adjoining the southeastern flank of Thetford Mines.**

This thesis takes the position that it is time to think about towns like Thetford, that asbestos mining territories must be reckoned with as human settlements, and, finally, that they are deserving of architectural re-imagining. A new approach to neighbourhood planning in this city could trigger both reconciliation with a problematic past, healthful living conditions in the present, and physical reconnection with the entirety of the territory, extraction sites included. If well-conceived, the action of territorial re-imagining in Thetford Mines might even offer prototypical directions for other post-industrial mining cities with similarly scarred landscapes. More specifically, this thesis project considers the question of new landscape design strategies for Thetford Mines aimed at reclaiming and repurposing its former asbestos mine sites. Fundamentally, the thesis asks how an architectural proposition can assist in reconciling a contested past with the town's present-day identity. In order to do this exploration, the area covered by the Beaver, Bell, King and Johnson mines, located in between the neighbourhood of Mitchell and Thetford's historic downtown – the Saint-Alphonse neighbourhood – is used as a canvas.

## Part One | Thetford Mines: An Overview

### Geography & Demography

Thetford Mines is a Quebec town located in the regional county municipality of Appalaches in the Chaudière-Appalaches region. It is situated halfway between Quebec City and Sherbrooke, approximately 100km from each (Fig. 4). With a total population of roughly 25,600 inhabitants, Thetford Mines is by far the largest town in the region (Fig. 5). Like many other rural communities in Canada, Thetford is facing important demographic challenges. The city's population decreased by 5,6% in the past 15 years, and is predicted to further decrease by 12,1% in the next 15. The population is also aging: more than one quarter of the population is 65 or older. Finally, 40% of the population older than 15 does not have a high school degree.<sup>8</sup>

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<sup>8</sup> Société d'aide au développement de la collectivité de l'Amiante, *Profil socio-économique de Thetford Mines: Compilation 2011* (Thetford Mines: SADC de l'Amiante, 2011), 6.



**Fig. 4: Geographical location of Thetford Mines.**

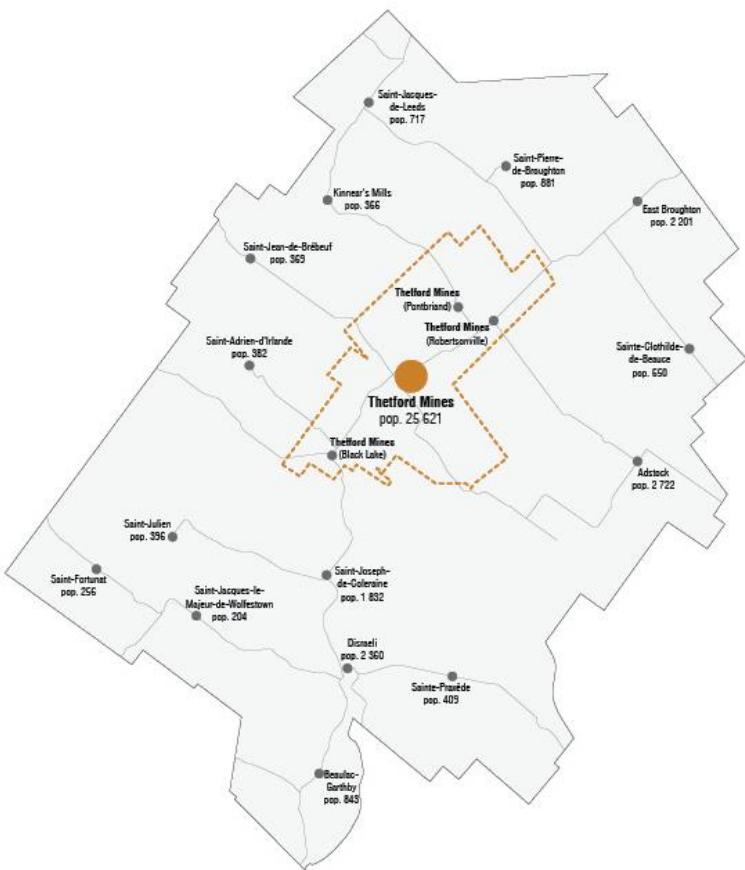


Fig. 5: Demographic data and city boundaries of Thetford Mines.

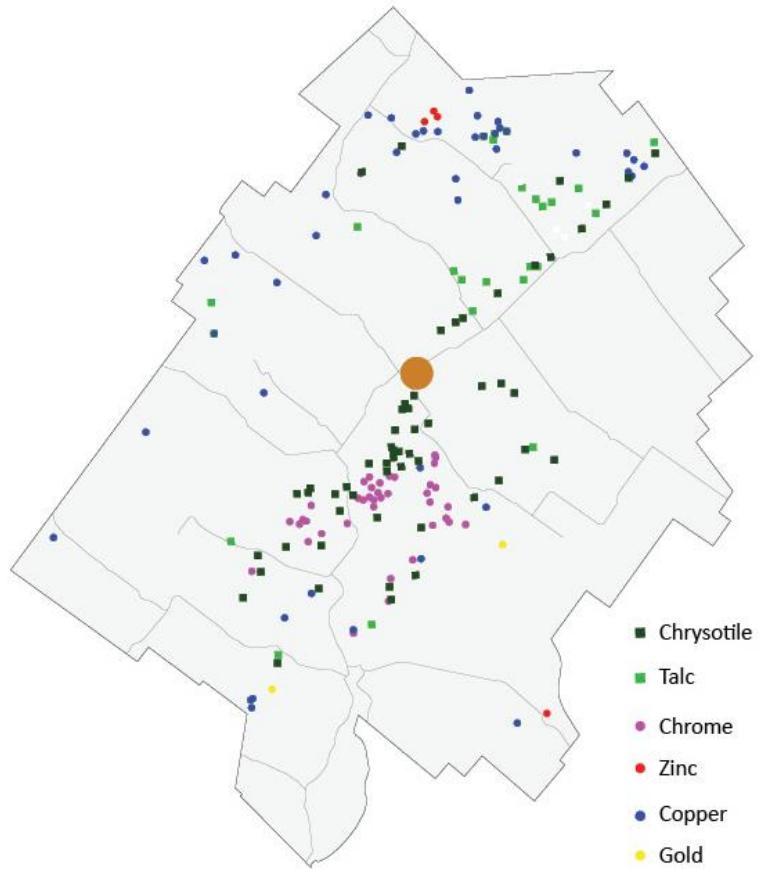


Fig. 6: Mineral deposits in the Thetford Mines area (active and inactive).

## Mining & Environment

Several mineral deposits can be found in the region of Thetford Mines, the most common being chrysotile, talc, chrome, and copper (Fig. 6). The mining of chrysotile – an asbestos mineral – has indeed raised many questions regarding the impacts on the local population, mainly due to health concerns. In fact, the respiratory health of people living in asbestos towns has been studied in Quebec since 1958 and has incidentally generated much scientific, political, and social debates. In that regard, Thetford has often been used in such debates as a case study to exemplify the opinion of all parties.

The latest major addition to the debate dates back to 2009, when the Health and Social Services Agency of the Chaudière-Appalaches region stated that exposure to asbestos fibres in Thetford's ambient air is low.<sup>9</sup> Additionally, the Agency indicated that there is a very low risk of developing asbestos-related diseases (lung cancer or mesothelioma) within the population of Thetford Mines.<sup>10</sup> This official statement was based on the conclusions of a risk analysis carried out by the *Institut national de santé publique du*

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<sup>9</sup> The Canadian Press, "Thetford Mines peut respirer," *Le Devoir*, December 12, 2009, accessed January 12, 2017, <http://www.ledevoir.com/economie/actualites-economiques/279184/thetford-mines-peut-respirer>.

<sup>10</sup> *Ibid.*

*Québec*, on the basis of two scientific studies, one published in the International Journal of Occupational and Environmental Health, and the other carried out by the Quebec Ministry of Sustainable Development, Environment and Parks. The analysis further suggests that the presence of asbestos fibres in Thetford Mines' ambient air could lead to one additional death every 35 years.<sup>11</sup> The *Institut national de santé publique du Québec* also compared asbestosis death rates with those related to cigarette smoking: approximately 30 people per year in Thetford Mines die from lung cancer due to cigarette smoking. The *Institut* might well have been motivated to present data that would reduce fear of asbestos-related illness, but the data was based on scientific study, for this reason, the press transferred its conclusions to the public with articles such as "Thetford Mines peut respirer," in 2009 in *Le Devoir*.

If the air in Thetford is safe to breathe, there are still risks from asbestos, especially with asbestos-containing building materials during demolitions and renovations. Research suggests that deaths resulting from asbestos exposure often happen in the workplace. In fact, since 1996, almost 5,000 approved death claims stem from asbestos

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<sup>11</sup> *Ibid.*

exposure, making it by far the top source of workplace death in Canada.<sup>12</sup> Mine facilities aside, the range of occupations with workers exposed to asbestos has expanded in recent decades, the five largest groups being specialty-trade contractors, building construction, auto repairs and maintenance, ship and boat building, and remediation and waste management. Despite the low risks for the general population – as opposed to those exposed to asbestos in their workplace – the authors of the studies cited above all underline the fact that there is no safe exposure threshold and that the smallest possible exposure is the ultimate aim.<sup>13</sup> As such, many recommendations to further decrease risks stemming from asbestos exposure are put forward. Among these, we observe the restriction of activities that may re-suspend asbestos fibres from mine tailings, the prohibited access to mining residues, the proscription of handling and transport of asbestos, as well as the regular monitoring of air quality evolution.<sup>14</sup> These recommendations are taken into account in the landscape and architectural design proposal, as it will be explained in Part Four of this thesis.

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<sup>12</sup> Tavia Grant, "Asbestos revealed as Canada's top cause of workplace death," *The Globe And Mail*, January 2, 2015, accessed January 12, 2017, <http://www.theglobeandmail.com/report-on-business/asbestos-is-canadas-top-source-of-workplace-death/article22081291/>

<sup>13</sup> Institut National de Santé Publique du Québec, *Présence de fibres d'amiante dans l'air intérieur et extérieur de la ville de Thetford Mines: estimation des risques de cancer du poumon et de mésothéliome* (Quebec City: Government of Québec, 2011), 5.

<sup>14</sup> *Ibid.*

## Part Two | Thetford's History Dictated By Asbestos

The story behind Thetford Mines' foundation is rather singular. Asbestos is the *raison d'être* of Thetford Mines' existence. While the vast majority of Quebec towns were typically developed from a primitive village core containing at least a church, a parish framework, and a few houses, the case of Thetford Mines is different.<sup>15</sup> Thetford's location and its later development in the late 19th century are explained by early mining activity, not an early settlement. Thus, one cannot overlook the importance of asbestos extraction in examining the history of Thetford Mines, formerly known as the village of Kingsville.

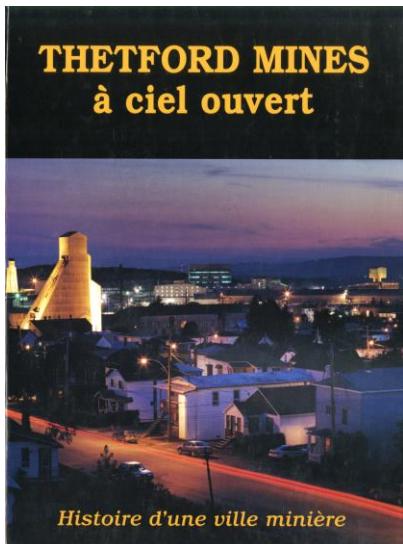


Fig. 7: Cover of the book "*Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992*".

*Thetford Mines À Ciel Ouvert: Histoire d'une ville minière 1892-1992* is a six hundred-page volume published by the City of Thetford Mines on the occasion of the city's centennial in 1994 (Fig. 7). Edited by François Cinq-Mars and Romain Dubé with contributions from many scholars and historians, the book provides invaluable documentation of the town's history and is the primary reference for the following

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<sup>15</sup> Ville de Thetford Mines, *Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992*, XI.

chapter. The very detailed volume is organized into three temporal sections: *De la forêt à la mine* (1876-1911), *Le règne de la pierre à coton* (1912-1951), and *De l'impasse à l'espoir* (1952-1992). Each of these sections is replete with data about a multitude of themes, namely population and urban space, economic and mining development, labour and working class, and society and culture. Drawing from this important volume, the following section provides a brief overview of the complex and unique history of Thetford Mines, with an emphasis on the territorial and urban evolution of the town.

## The Reign of Asbestos

Before the discovery of asbestos minerals in the region in 1876, the land currently occupied by Thetford Mines was devoid of permanent settlements.<sup>16</sup> The advent of the asbestos industry profoundly impacted the region's territorial development and provoked an unprecedented urban phenomenon in Quebec at the time: a town was born in symbiosis with mines and grew thanks to them. In 1905, the village of Kingsville received its incorporation as a city and was henceforth called Thetford Mines. At the time when Thetford Mines was officially founded as a municipal entity, only ten urban

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<sup>16</sup> *Ibid.*, 12.



**Fig. 8: View of Thetford Mines from the Bell Tower of Saint-Alphonse Church (1905).**

*Retrieved January 3, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".*



**Fig. 9: Locomotives and wagons near the King Mine in 1907.**

*Retrieved January 3, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".*

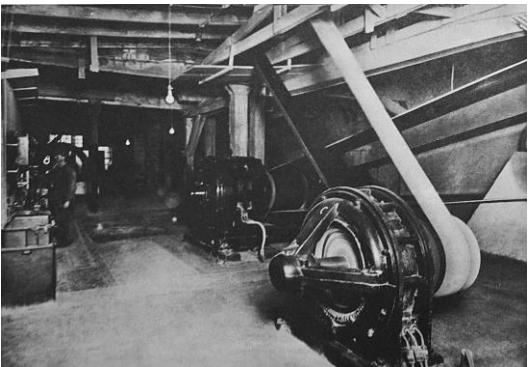
municipalities in Quebec had more than 5,000 inhabitants. Thetford, with its 5,141 inhabitants, was therefore among the largest and most important towns in the province.<sup>17</sup> The rapid expansion of the mining industry in the region led, however, to a chaotic and anarchic urban development (Fig. 8), which had enormous consequences on land ownership and public health.

At the end of the nineteenth century in Quebec, land-use planning was done by private interest, most notably landowners seeking to continually increase the surplus value of the land. In the case of Thetford Mines, land development was done by land-owning companies that owned both the ground and the underground. This implies that the most important landowners of Thetford Mines – mining companies for the most part – did not seek to develop the land surface in order to obtain as much revenue as possible. Rather, they greatly limited this development in order to eventually take over the land and exploit its subsoil.<sup>18</sup> In other words, the urban development of Thetford Mines is in contrast with the traditional pattern generally observed in Quebec insofar as land capital was being substituted by mining capital.

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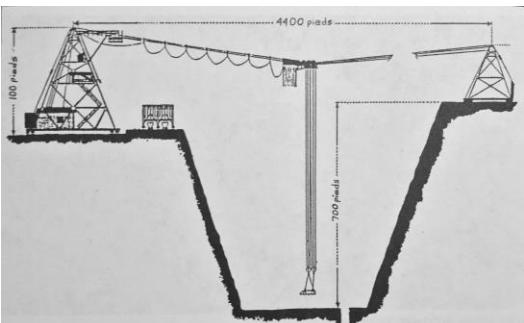
<sup>17</sup> *Ibid.*, 13.

<sup>18</sup> *Ibid.*, 14.



**Fig. 10: Engine room machinery of the Bell Mine, circa 1910.**

*Retrieved January 3, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".*



**Fig. 11: Diagram of an open-cast asbestos mine featuring the use of cable cranes across the pit to hoist up the wooden bins loaded with asbestos.**

*Retrieved January 3, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".*

At the time, there was a direct correlation between the evolution of Thetford's population and the development of mining activities. For example, from 1900 to 1910, the introduction of new technologies in the asbestos industry led to a considerable increase in production volume (Fig. 9, 10 and 11). Over the same decade, the production of asbestos in Canada quadrupled, going from 29,141 to 125,175 tons per year.<sup>19</sup> Logically, the number of employees working in the Quebec asbestos industry also grew significantly, going from 823 to 3,193 workers. Half of these individuals – roughly 1700 – worked in Thetford's extraction sites in 1911 (Fig. 12 and 13). As it remains the case today, the cohabitation of the mines and the local population was not always easy. The physical development of the city is closely related to the rugged outlines of the asbestos mines in operation throughout the years. For example, in order to encourage workers to reside near mine sites, mining companies decided to grant small lots where their workers could live.<sup>20</sup> Although this may appear generous at first glance, this way of proceeding reinforced the precarious nature of the worker's perpetual tenant status, not to mention the health hazards of living so close to these extraction sites.

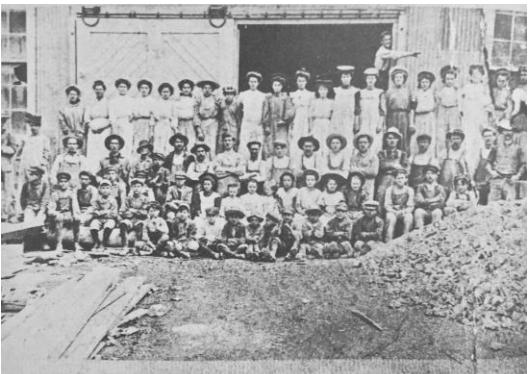
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<sup>19</sup> *Ibid.*, 38.

<sup>20</sup> *Ibid.*, 185.



**Fig. 12: Miners of the King Mine, circa 1890.**  
Retrieved January 3, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".



**Fig. 13: Female cobbers and workers of the British Canadian Mine in 1910.**  
Retrieved January 3, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".

Mining operations continued to leave their indelible mark in the town's urban fabric, most notably because of the increasingly problematic disposal of tailings. The expansion of mining activities in Thetford in the first half of the twentieth century was undeniably done at the expense of the local population's living environment. In that regard, Smith Street, inhospitably flanked by mine tailings, exemplifies the neglectful and unsympathetic urban development of Thetford Mines vis-à-vis the living conditions of its population (Fig. 14 and 15).

Despite the inherent tensions in the geographical settlement of Thetford, the city expanded. The asbestos industry consistently grew until 1945, mainly due to a favorable international situation.<sup>21</sup> The military needs associated with the two World Wars, the automobile industry, the textile sector, and homebuilding construction, all were booming industries at the time, and all consumed high volumes of asbestos. Nevertheless, as we now know, a major downfall was awaiting the Canadian asbestos industry

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<sup>21</sup> *Ibid.*, 250.



**Fig. 14: View of Smith Street atop from a tailings pile in 1950.**  
*Retrieved December 19, 2016, from  
<http://www.flickr.com/places/Canada/Quebec/Theford+Mines/search/>.*



**Fig. 15: View of Smith Street atop from a tailings pile in 1978.**  
*Retrieved December 19, 2016, from  
<http://www.ville.thetfordmines.qc.ca/info.php?noPage=68>.*

## The Decline of Asbestos

The years 1931-1934 proved to be one of the first difficult periods for the economic development of Thetford Mines. Due to the poor performance of the asbestos industry – the driving force of the local economy – other industries of the town suffered the same fate.<sup>22</sup> After the recovery in the asbestos industry during the second half of the 1930s and the 1940s, mining companies faced a series of obstacles, most particularly the failed negotiations with the National Federation of Mining Employees that resulted in a strike unprecedented in magnitude and fallout, in Quebec.<sup>23</sup> Nevertheless, the focus here, as mentioned earlier in this chapter, will be directed towards the urban and territorial aspects.

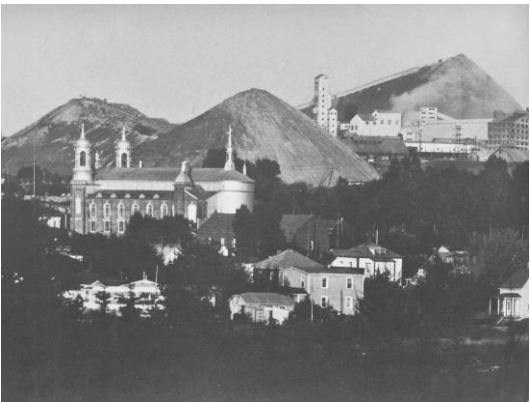
By 1950, the city faced serious urban development issues stemming from the presence of the mining industry on its territory. The main reason behind this problematic situation was a lack of planning in the urban development by the municipality, caused by the absolute control by mining companies of the town's ground and underground.<sup>24</sup>

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<sup>22</sup> *Ibid.*, 253. – Other industries' growth was highly dependent on that of asbestos.

<sup>23</sup> *Ibid.*, 315.

<sup>24</sup> *Ibid.*, 283.



**Fig. 16: View of the Johnson Mine and Saint-Maurice Parish in 1950, before the first displacement.**  
Retrieved January 3, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".



**Fig. 17: Aerial view of the Saint-Maurice Parish before the second displacement of 1973.**  
Retrieved March 30, 2017, from  
<http://www.patrimoine-culturel.gouv.qc.ca/rpcq/detail.do?methode=consulter&id=201500&type=bien>

The leases granted to the workers enabled these companies to regain possession of rented lots whenever it was required for the expansion of their operations.<sup>25</sup> The consequences of this clause were disastrous for Thetford. In fact, the two largest and oldest population centres, the Saint-Maurice and Saint-Alphonse parishes, happened to be located directly adjacent to major mining sites. This meant that the expansion possibilities for the companies could only be achieved by displacing these residential clusters. That was in fact the destiny of the Saint-Maurice parish.

Because of the expansionist plans of the Beaver Mine, the Saint-Maurice Parish, which used to be located to the northeast of the Beaver Mine's open pit, had to be partially demolished and displaced on two occasions: in 1953 and 1970-1973 (Fig. 16 and 17). In total, 910 families were forced to move, many of which tried, in vain, to contest their expropriation.<sup>26</sup> The area of the neighbourhood that was first moved has since been swallowed up by mines and nothing of it remains as of today. Some of the streets of the area that was the subject of the second displacement, however, remain visible (Fig. 18). More recently, a cross with the inscription "St-Maurice 1967" was added on the

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<sup>25</sup> *Ibid.*, 283.

<sup>26</sup> *Ibid.*, 396.



**Fig. 18: Arial view of the old Saint-Maurice Parish's site (2004).**

Retrieved January 3, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".



**Fig. 19: View of the Saint-Maurice's old cemetery now covered by tailing residues (2004).**

Retrieved January 3, 2017, from "Thetford Mines à ciel ouvert : Histoire d'une ville minière 1892-1992".

land of the old cemetery of Saint-Maurice – now fenced off and covered with mining residues – to commemorate the original place of the Saint-Maurice Parish (Fig. 19).

Even aside from the issue of human impact – which of course would be immense – one may wonder why the mining companies had the desire to expand their activities in the 1970s given that the future of the asbestos industry was already uncertain. For example, one can look at the evolution of Canadian exports of asbestos to the United States: 648,000 tons in 1971, 550,000 tons in 1979, 133,000 tons in 1985, and 50,000 tons in 1992.<sup>27</sup> This downward trend was the result of the beginning of a campaign to ban asbestos in the country in 1984, followed by a gradual prohibition order (1989-1996) of asbestos by the United States Environment Protection Agency.<sup>28</sup> Concurrently, in 1986, the King-Beaver Mine was the first to definitely end its operations in Thetford Mines. The closure of this first mine in the 1980s was a concrete warning sign of the future for the protagonists of the Canadian asbestos industry. Ultimately, the last asbestos mine in Thetford closed in 2011, while the last in Canada – the Jeffrey Mine in the town of Asbestos – officially closed four years later, in 2015.

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<sup>27</sup> *Ibid.*, 438.

<sup>28</sup> *Ibid.*, 440.

2004
Centre hospitalier de la région de l' <b>Amiante</b>
Centre hospitalier de la région de <b>Thetford</b>
CHSLD de la région de l' <b>Amiante</b>
CHSLD de la région de <b>Thetford</b>
2005
Commission Scolaire de l' <b>Amiante</b>
Commission Scolaire de <b>Thetford</b>
Collège de la région de l' <b>Amiante</b>
CEGEP de <b>Thetford</b>
Coop du Collège de la région de L' <b>Amiante</b>
Coopérative étudiante de <b>Thetford</b>
2008
MRC de l' <b>Amiante</b>
MRC des <b>Appalaches</b>
2009
Comptoir Familial de la région de l' <b>Amiante</b>
Comptoir Familial de <b>Thetford Mines</b>
<b>Tab. 3: Toponymical change of Thetford's institutions since 2004.</b>

Following the official announcement by the European Union to ban the use, import, and export of asbestos in 2003,<sup>29</sup> many of Thetford's institutions renamed themselves as of 2004. The reason behind this choice is clear: almost everywhere in the Western World, the word asbestos evokes negative subjects such as cancer, asbestosis, class actions, etc. One can easily understand the challenges of attracting tourists or foreign investors when representing the “Asbestos region”. Significantly, the word “amiante” – French term for asbestos – was replaced by “Thetford” or “Appalaches” in the names of a vast majority of Thetford's institutions (Tab. 3).

Name changes suggest a sense of guilt that Thetford's population may have towards asbestos. Nonetheless, the mining landscape of Thetford Mines will forever remain in spite of all the effort to superficially conceal the past of this former asbestos town. The collapse of the asbestos industry, one could argue, is in fact the best opportunity to redefine Thetford's identity in a novel, contemporary way.

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<sup>29</sup> World Health Organization, “International Programme on Chemical Safety: Asbestos”

## Part Three | Mining Landscapes

### Analysing the Mining Landscape

Beside the six-hundred-page volume *Thetford Mines À Ciel Ouvert* aforementioned, little is written on the case of Thetford's mining landscape specifically. There are, however, a number of excellent studies that tackle the challenges and issues that other mining towns face – both here in Canada and in other countries. Cultural geography is a discipline that can provide insightful and relevant qualitative data pertaining to the relationship between mining landscapes and the people who inhabit them.<sup>30</sup> In fact, prominent Chinese-U.S. geographer Yi-Fu Tuan defined geography as 'the study of the Earth as the home of people.'<sup>31</sup> This definition of the discipline resonates quite strongly with that of architecture, especially because of the notion of "home" put forward by Tuan.

In his article entitled "No Bad Landscape", American cultural geographer Kit Salter claimed that 'all landscapes possess lessons waiting to be perceived and learned

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<sup>30</sup> The author of this thesis holds a B.A. Honours in Geography.

<sup>31</sup> Yi-Fu Tuan, "A View of Geography," *Geographical Review* 81, no. 1 (1991): 99.

from'.<sup>32</sup> Although Salter writes about landscapes in general, one can easily argue that mining landscapes are included in his claim. He further argued that the only way to achieve a comprehensive and accurate understanding of any landscape is by showing 'how central geography is to its essence and patterns'.<sup>33</sup> In other words, the title of Salter's article says it all: there is no "bad" mining town landscape, only mining town landscapes badly misunderstood and mismanaged. As pointed out by David J. Nemeth, professor at the Department of Geography and Planning at the University of Toledo, an illustration of Salter's theories can be found in the work of Canadian cultural geographer David Robertson.<sup>34</sup> Robertson examined the notions of place and identity in the American mining town using three case studies: Toluca, Illinois; Cokedale, Colorado; and Picher, Oklahoma. He argued that 'although mining has created a stigmatized symbolic landscape in the popular imagination, these iconic landscapes of dereliction and decay [...] may function as meaningful communities and homes for the local inhabitants'.<sup>35</sup> As pointed out by the author, there exist stereotyped imaginaries

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<sup>32</sup> Christopher L. Salter, "No Bad Landscape," *Geographical Review* 91, no. 1-2 (2001): 108.

<sup>33</sup> *Ibid.*, 112.

<sup>34</sup> David J. Nemeth, "Book Review – Hard as the Rock Itself: Place and Identity in the American Mining," *The Professional Geographer* 59, no. 4 (2007): 558.

<sup>35</sup> David Robertson, *Hard as the Rock Itself: Place and Identity in the American Mining Town* (Boulder, CO: The University Press of Colorado, 2006), 2.



**Fig. 20: View of the decommissioned and rehabilitated uranium mine sites of Elliot Lake, Ontario.**

*Retrieved January 14, 2017, from  
<http://www.sudburyminingsolutions.com/elliot-lake-hailed-as-reclamation-success-story.html>.*

associated with mining towns coming from outsiders. In a context of industrial postproduction, one could reasonably argue that there is no reason to remain in a mining town in which mines are no longer active. The local population is then faced with a serious dilemma: whether to stay or to leave. Robinson and Wilkinson examined this notion of social cohesion – also referred to as “sense of belonging” or “sense of place” – quantitatively, in a study of Elliot Lake, a remote Canadian single-industry town (Fig. 20). Although the focus of the study was to determine the fitness of a statistical model predicting the Neighbourhood Cohesion Index (NCI), the authors did conclude that significant positive predictors of NCI in Elliot Lake included years spent in neighbourhood, duration of home ownership, home equity, and the presence of both pre-school-age and school-age children at home.<sup>36</sup> The notion of social cohesion also figures prominently in the work of urban planner and theorist Kevin Lynch, who explored city form in many of his writings. Lynch argued that ‘the quality of a place is due to the joint effect of the place and the society which occupies it.’<sup>37</sup> He further claimed that ‘if development is the process of becoming more competent and more

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<sup>36</sup> David Robinson and Derek Wilkinson, “Sense of community in a remote mining town: Validating a Neighborhood Cohesion scale,” *The American Journal of Community Psychology* 23, no. 1 (1995): 137.

<sup>37</sup> Kevin Lynch, *Good City Form* (Cambridge: MIT Press, 1984), 111.

richly connected, then an increasing sense of connection to one's environment in space and in time is one aspect of growth.<sup>38</sup> Simply put, Lynch greatly valued the social and human aspects behind good city form as well as for city development.

All in all, both the qualitative and quantitative data explained above should be taken into consideration in the elaboration of landscape design interventions for mining towns in a postproduction context, such as Thetford Mines.

## Designing the Mining Landscape

Mining is now an integral part of the Canadian landscape. Nonetheless, mining activities are by nature ephemeral, as they deal with non-renewable resources. What happens with a mining landscape when mining activities have reached an end remains unclear and rather enigmatic for most. In the rare cases where former mine sites have been successfully repurposed and adapted to postproduction economies, architects, urban planners, and landscape designers played a central role. In sum, the question of post-mine site habitation is not only ecological: design has a role to play.

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<sup>38</sup> *Ibid.*, 116.



Fig. 21: IBA- Terraces project: former coal mine.

Retrieved March 30, 2017, from  
<http://www.brandenburg-tourism.com/detail/id/7572/theme/a-z.html>

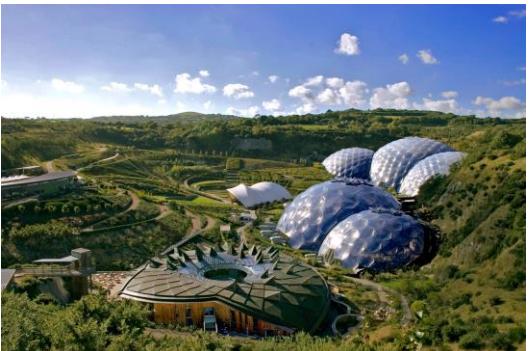


Fig. 22: Eden Project: former clay pit.

Retrieved March 30, 2017, from  
<http://www.edenproject.com/>

Examples of post-mining landscape designs are numerous. Among the realized ones, we can name IBA-Terraces in Großräschken, Germany designed by architect Ferdinand Heide and completed in 2010 (Fig. 21), the Eden Project in Cornwall, England designed by Grimshaw and Partners and completed in 2001 (Fig. 22), Zeche Zollverein XII (former coal mine) in Essen, Germany designed architects Schupp and Kremmer and completed in 1998 (Fig. 23), and finally Landschaftspark in Duisburg, Germany designed by Latz + Partner and completed in 1991, which will be used as a case study later. To these examples featuring architectural design, we can also add some reforestation projects, such as in Sudbury, Canada (former nickel mine) and in Richards Bay, South Africa (former coal mine), which were both influenced by the discipline of landscape architecture.

Landscape architecture is generally described by scholars as ‘the conservation and development of natural and cultural landscape resources, together with their associated meanings and values, for the benefit of current and future generations’.<sup>39</sup>

When specifically discussing the case of mining landscapes, the notion of reclamation

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<sup>39</sup> Simon Bell, Ingrid Sarlöv Herlin, and Richard Stiles, *Exploring the Boundaries of Landscape Architecture* (London: Routledge, 2012), 1.



**Fig. 23: Zeche Zollverein XII Project: former coal industrial complex.**

Retrieved March 30, 2017, from <http://www.ruhr-guide.de/freizeit/industriekultur/zeche-zollverein-essen/1147,0,0.html>

often comes into play. The 2008 publication *Designing the Reclaimed Landscape*, edited by Landscape Architecture Professor Alan Berger of Harvard University's Graduate School of Design, makes clear the fact that the post-industrial landscape is a provocative one inviting much imaginative speculation. This four-part book collects a total of seventeen essays written by scholars, practitioners, and policy makers who shared their opinion and knowledge on how post-industrial mining landscapes can be reclaimed through design and strategic interventions. While none of the authors treat Thetford Mines, the case studies from the American landscape therein provide in-depth design thinking on the real and pressing issue of reclaiming the thousands of abandoned mine sites in North America.<sup>40</sup> This book provides a complete vocabulary for post-mine site strategies and responses, ranging from landscape alteration, reclamation, regeneration, preservation, and revitalisation. This thesis chooses to employ the term “reconciliation” because this term encompasses the socio-historical controversy of the asbestos mines of Thetford – by physically separating communities, and by causing illness – while also referring to the ecological enterprise of healing the landscape.

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<sup>40</sup> Alan Berger (ed.), *Designing the Reclaimed Landscape* (New York: Taylor & Francis, 2008), xvii.

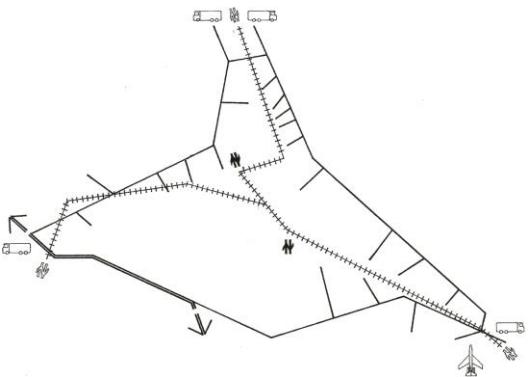
## Case Studies

The use of precedents in architecture is a valuable analytical tool. The desired outcome of the analysis of past projects is to generate ideas and theories with which to design new architecture.<sup>41</sup> In fact, projects analysed as precedents may result in the production of a plurality of design ideas, depending on personal interpretation. For instance, scholars from the Faculty of Architecture at Delft University of Technology in the Netherlands have studied the relationship between architectural precedents and identity. They argued that ‘the critical use of precedents seems to help in the production of building/places that embody a critical notion of identity’.<sup>42</sup> Since the redefinition of Thetford’s present-day identity is central to this thesis, the study of regenerative landscape projects that celebrate the identity and craftsmanship legacy of former industrial sites appears highly relevant. Drawing upon Berger’s approach, and in an attempt to maximize the future potential of Thetford’s reclaimed land, two case studies will be analysed as architectural precedents: 1) Pottery Thinkbelt (1960s) in Staffordshire, England; and 2) Landschaftspark (1991) in Duisburg-Nord, Germany.

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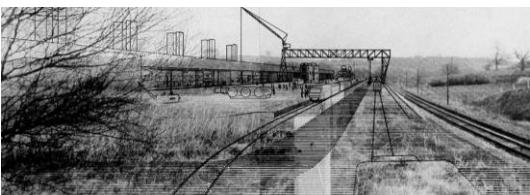
<sup>41</sup> Roger H. Clark and Michael Pause, *Precedents in Architecture: Analytical Diagrams, Formative Ideas, and Partis* (Hoboken, New Jersey: John Wiley & Sons, Inc., 2012), xiii.

<sup>42</sup> Zarina Moraes Zarzar and Ali Guneys, *Understanding Meaningful Environments: Architectural Precedents and the Question of Identity in Creative Design* (Amsterdam: IOS Press, 2008), 1.



**Fig. 24: Master diagram for Pottery Thinkbelt's site plan.**

*Retrieved January 14, 2017, from "Supercrit #1, Cedric Price, Potteries Thinkbelt".*



**Fig. 25: Photomontage of the Madeley transfer area with educational buildings.**

*Retrieved January 14, 2017, from "Supercrit #1, Cedric Price, Potteries Thinkbelt".*

### 1) Pottery Thinkbelt (1960s) in Staffordshire, England

Cedric Price was a British architect and theorist who was known for his keen interest in movement and mobility in architecture. One of his most famous projects is the Pottery Thinkbelt, an ambitious project for a centre of higher education among the coal fields of Staffordshire, England. Following the de-industrialisation of Britain in the 1960s, massive pits were left in a dilapidated state throughout the region.<sup>43</sup> Price envisioned the industrial infrastructure of Staffordshire turned into a new kind of High-Tech University. One of the key points of the project's master plan was the desire to connect, both locally and regionally, the post-industrial site with the nearby residential neighbourhoods (Fig. 24). Moreover, the project featured educational buildings as well as temporary housing for students (Fig. 25).

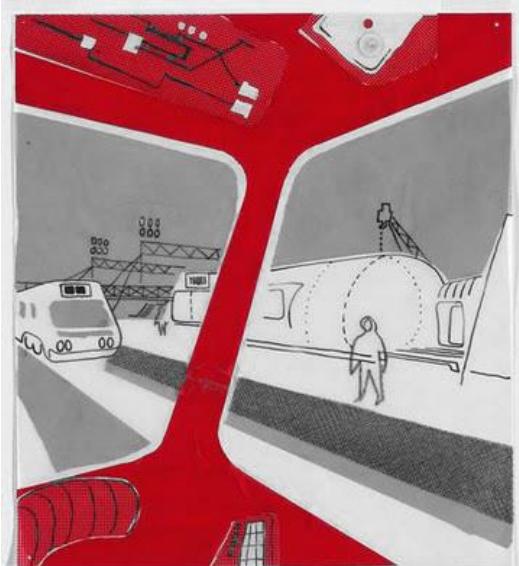
Architectural writer and teacher at the Architectural Association Samantha Hardingham argued that 'the fact that Potteries Thinkbelt is an un-built project, existing solely as a work on paper is a most compelling feature.'<sup>44</sup> In fact, Price's design is a

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<sup>43</sup> MoMa, "Potteries Thinkbelt Project, Staffordshire, England (Perspective of Madeley Transfer Area)," last modified in 2016, <https://www.moma.org/collection/works/849?locale=en>

<sup>44</sup> Kester Rattenbury and Samantha Hardingham, *Supercrit #1, Cedric Price, Potteries Thinkbelt* (London: Routledge, 2007), 11.

manifesto for education: a critical and somewhat polemical alternative to traditional university campuses that have characterized England for centuries. Price said: ‘when the next round of university building starts, perhaps we should treat education less as a polite cathedral-town amenity.’<sup>45</sup> In a sense, Price’s goal is to challenge architectural and urban planning conventions by implementing a high-end program in a post-industrial site, as a way to revitalise both. This desire is further expressed through the drawing techniques utilized by Price to present his project. All hand-drawn, his drawings always portray the project as the occupants would see it on site, at the human scale (Fig. 26). What makes Price’s proposal so provocative is its re-imagining of a conventionally high-status program – a university campus – as part of a greater mine reclamation project. As such, Pottery Thinkbelt stands as a valuable and inspiring architectural precedent for the novel programmatic response to a post-industrial mine site.



**Fig. 26: View from train as arriving at transfer area.**  
Retrieved January 14, 2017, from “Supercrit #1, Cedric Price, Potteries Thinkbelt”.

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<sup>45</sup> *Ibid.*, 17.

*2) Landschaftspark (1991) in Duisburg-Nord, Germany.*



**Fig. 27: View of the Old Emscher waterpark.**  
Retrieved January 14, 2017, from  
<http://www.landezine.com/index.php/2011/08/post-industrial-landscape-architecture/>.



**Fig. 28: View of the Sinter Garden.**  
Retrieved January 14, 2017, from  
<http://www.landezine.com/index.php/2011/08/post-industrial-landscape-architecture/>.

The Landschaftspark project is a public park designed in Duisburg, Germany in 1991 by Belgian firm Latz + Partner. It was realized in the context of the International Building Exhibition Emscher Park (IBA) in the Ruhr District, Germany as an attempt ‘to set quality building and planning standards for the environmental, economic and social transformation of an old industrialised region.’<sup>46</sup> The park is closely associated with the past use of the site, a coal and steel production plant abandoned in 1985. The area, left significantly polluted after the end of industrial activities, was transformed into a green public park. The new landscape park contains individual systems that operate independently, such as a low-lying water park (Fig. 27), gardens and clumps of vegetation (Fig. 28), a railway park with high level promenades featuring recreational zones called Play-Points (Fig. 29). The central and most symbolic feature of the Landschaftspark is, however, the Piazza Metallica (Fig. 30). While operating independently from each other, these systems all connect at certain points ‘through specific visual, functional or merely imaginary linking elements.’<sup>47</sup> The overarching

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<sup>46</sup> Latz+Partners, “NODU Duisburg Nord Landscape Park, DE,” last modified in 2016, <http://www.latzundpartner.de/en/projekte/postindustrielle-landschaften/landschaftspark-duisburg-nord-de/>

<sup>47</sup> *Ibid.*



**Fig. 29: View of the Railway Park and Play-Points.**  
Retrieved January 14, 2017, from  
<http://www.landezone.com/index.php/2011/08/post-industrial-landscape-architecture/>.



**Fig. 30: View of the Piazza Metallica.**  
Retrieved January 14, 2017, from  
<http://www.landezone.com/index.php/2011/08/post-industrial-landscape-architecture/>.

principle of the project was to integrate, develop, and connect existing signs - formerly used for industrial purposes - and provide a new interpretation of the environmental syntax, thus creating a new landscape.<sup>48</sup> At the time of its construction, Landschaftspark was extremely controversial. The idea of creating habitable public spaces in the midst of a blast furnace plant was seen as rather hazardous. Today, the fear of pollution and contamination has given way to a calm acknowledgement of the old structures.<sup>49</sup> In other words, the intention of the project was to heal and understand the industrial past of the place rather than to reject it, which appears to be what Thetford Mines needs.

The two architectural precedents above, whether realized or unrealized, present diverse strategies that aim to regenerate and celebrate former industrial sites. Each embodies, in its own way, examples of the theoretical standpoints that were previously explained and analysed. One can argue that the post-industrial and disused asbestos mine sites of Thetford have the potential to be turned into an innovative project with similar qualities to the ones featured in the aforementioned architectural precedents.

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<sup>48</sup> *Ibid.*

<sup>49</sup> *Ibid.*

## What About Thetford Mines?

In a press conference following the declaration of the nationwide asbestos ban by the federal government, Quebec Premier Philippe Couillard affirmed that ‘Thetford’s economy is undergoing a major transformation – but there still remains economic potential around the asbestos mining sites, not the asbestos itself’.<sup>50</sup> Couillard is not the first person to express this type of argument about Thetford’s post-industrial mining reality. In a report published in 2007 by the Regional Conference of Elected Officers of the Chaudière-Appalaches Region – written as part of the broader Quebec Mining Strategy – the authors specifically address a plan for action for the region where Thetford Mines is located. Among a total of nine recommendations, the report includes the following three:

- #1. To develop and organize programs to stimulate mining prospecting in the region;
- #4. To transform the Geological Information Centre of Thetford’s CEGEP to make it a regional geoscience resource centre that would be harmonized with that of *Géologie Québec*;
- #5. To invest in the expansion and modernization of the Mineral and Plastics Technology Centre of Thetford Mines.<sup>51</sup>

Although the above recommendations are laudable, they fail to address the territorial impairment caused by the intrinsically disruptive nature of mining activities. In that regard, we shall mention a first concrete attempt to address and solve this territorial impairment. Recently in 2015, a Thetford-based company initiated a revegetation project on the mining tailings scattered all across the town. Expected to last ten years, the plan is to buy 1500 to 2000 tons of dead leaves on an annual basis from the City of Quebec and lay them over the mining tailings in order to generate organic matter, which would in turn enable vegetation to grow at the scale of ten hectares a year.<sup>52</sup> It is said that greening the mine tailings will contribute to reducing greenhouse gas emissions, promote the development of local wildlife, and restrict the movement of asbestos fibres in the air.<sup>53</sup> The overall ambition of this initiative is to rebalance the ecosystem of the region and bring back “nature”.

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<sup>50</sup> Raphael Bouvier-Auclair, *Ottawa interdira l'amiante d'ici 2018*, from Radio-Canada.ca, 1:57 minutes, <http://ici.radio-canada.ca/nouvelle/1006077/federal-bannit-amiante-utilisation-importation-gouvernement-canada>.

<sup>51</sup> Conférence régionale des élus de la Chaudière-Appalaches, *Préparer l'avenir du secteur minéral québécois : Défis et pistes d'action pour la stratégie minérale du Québec : La région de la Chaudière-Appalaches* (Montmagny: Conférence régionale des élus de la Chaudière-Appalaches, 2007), 1.

<sup>52</sup> Jean-François Nadeau, *Des feuilles mortes de Québec pour embellir Thetford Mines*, from Radio-Canada.ca, 1:53 minutes, <http://ici.radio-canada.ca/nouvelle/1000801/recyclage-feuilles-mortes-quebec-thetford-mines>

<sup>53</sup> *Ibid.*

While both this ecological revegetation initiative and the recommendations from the aforementioned report on mining strategies for Thetford's region are certainly a step in the right direction, it seems imperative to explore new and innovative ways to reclaim and repurpose Thetford's former asbestos mine sites and industrial heritage, and perhaps more importantly, to reconcile its contested past with the town's present-day identity. This can be achieved through design.

## Part Four | The Project

### Site Analysis

Thetford Mines features many mine sites across its large territory. The mining zone selected specifically for this design project is situated between Thetford's historic downtown – Saint-Alphonse neighbourhood – and the residential neighbourhood of Mitchell (Fig. 31). Largely covered with mining residues with dramatic topographical variations (Fig. 32) and, the site of slightly less than 4 km<sup>2</sup> is occupied by four former asbestos mines: 1) the Bell Mine, adjoining the Saint-Alphonse neighbourhood on its south-western flank; 2) the King Mine, south-east of the historic downtown (now a mining interpretation Centre)<sup>54</sup>; 3) the Johnson Mine, to the northeast of the Mitchell neighbourhood; and finally 4) the Beaver Mine, located on the western end of the overall mining zone. While the Bell, King, and Johnson mines are all underground mines, the Beaver Mine is Thetford's sole open-cast mine. All four mines feature abandoned mining infrastructure and several industrial buildings, the most recognizable being the headframes because of their impressive height.<sup>55</sup>

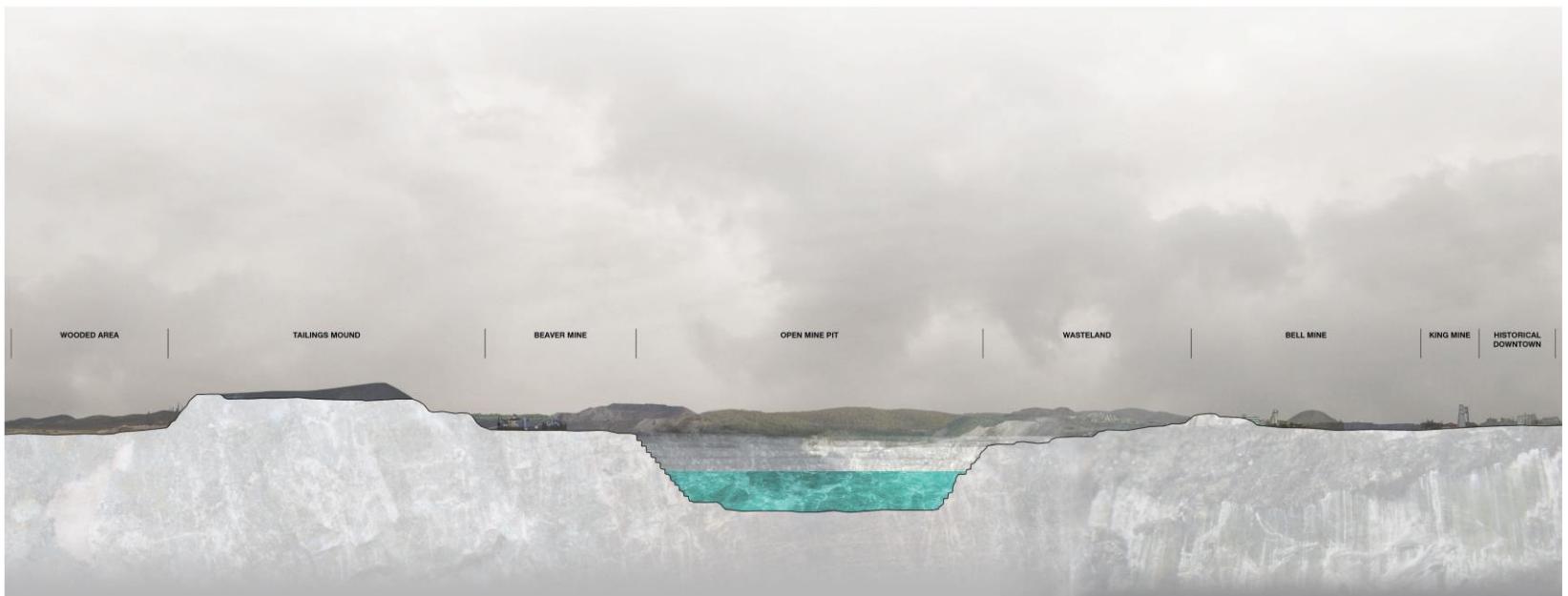
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<sup>54</sup> The KB3: *Musée minéralogique et minier de Thetford Mines* opened its doors in the summer of 2016.

<sup>55</sup> Refer to Appendix A for a series of photographs of Thetford Mines taken by the author.



Fig. 31: Satellite view of the selected site.



**Fig. 32:** Section through the selected site.



**Fig. 34: Headframe of the Bell Mine.**  
Retrieved January 14, 2017, from  
<http://www.patrimoine-culturel.gouv.qc.ca/>.



**Fig. 35: Former headframe of the King Mine, converted into a mining interpretation centre.**  
Retrieved January 14, 2017, from  
<http://www.courrierfrontenac.qc.ca/>.



**Fig. 36: Headframe of the Johnson Mine.**  
Retrieved January 14, 2017, from  
<http://www.patrimoine-culturel.gouv.qc.ca/>.

The site emerges as a distinctive location for a design intervention for several reasons.

First, the site has a direct – and somehow uncanny – physical and visual relationship with Thetford's historic downtown. Encircling the downtown's southern limits, and with a width of roughly six meters, Bennett Street is what separates the mines from the town's oldest neighbourhood (Fig. 33).

Second, the historical significance and the distinctive architectural character of the buildings still present on the site, most notably the headframes, call for their enhancement through design interventions. At one time the signature building of mining companies, headframes have now become the landmark of Thetford's built environment as a whole (Fig. 34, 35 and 36). Standing at a maximum height of 46 meters, headframes are the highest structures in the entire town, even higher than any of the churches. An even more impressive measurement, albeit invisible for all, is the depth of the shaft below those headframes, which typically reaches between four and five hundred meters.<sup>56</sup>

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<sup>56</sup> This data was retrieved from a poster in the KB3 mining interpretation centre.



**Fig. 33: View from the King Mine's headframe showing Bennett Street, delimiting the mining zone from the Saint-Alphonse neighbourhood.**  
Photograph by author.

A third reason for selecting this site is the presence of the immense open-pit Beaver Mine. The open mine's impressive dimensions – 900 meters long, 450 meters wide, and over 100 meters deep – produce its sublime character (Fig. 37). The pit presents ten visible stopes, each roughly fifteen meters in height.<sup>57</sup> The stopes – the physical outcomes of the conventional mining method used to make open-cast mines – step the ground's surface down to an oval lake. Rainwater started to accumulate in this massive hole in 2008, the year during which the mining company LAB Chrysotile ceased mechanical pumping. Today, it is estimated that the water reaches the half-line of the pit.<sup>58</sup> Furthermore, the artificial lake's mesmerising turquoise colour – the result of very fine particles on the water surface reflecting the blue and pale green wavelengths of sunlight<sup>59</sup> – makes it a thing of beauty. Despite its origins in asbestos mining, the lake is a remarkable feature of Thetford's landscape today, and one that can be mobilized in a positive manner.

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<sup>57</sup> Répertoire du patrimoine culturel du Québec, “Mine Beaver,” last modified in 2016, <http://www.patrimoine-culturel.gouv.qc.ca/rpcq/detail.do?methode=consulter&id=201284&type=bien>

<sup>58</sup> *Ibid.*

<sup>59</sup> *Ibid.*



**Fig. 37: Open pit of the Beaver Mine.**  
Retrieved January 14, 2017, from <http://www.patrimoine-culturel.gouv.qc.ca/>.

© Odette Tremblay

Overall, the selected site offers several opportunities: 1) the reconnection of Thetford's historic downtown with the residential the Mitchell neighbourhood; 2) the reclamation and repurposing of a large portion of the city's landmass; and 3) the enhancement of the industrial and cultural heritage associated with the mines and its people, including the production of a new neighbourhood complete with a nearby "cottage country" around the lake. The combination of all these opportunities gives this mine site an inestimable value as a place for reconciliation, for both current and future generations.

## Programming

In order to invest this large and complex mining site with an architectural proposal, the elaboration of a suitable program is crucial. As such, this project proposes the design of a new district for Thetford Mines that includes a very diverse, mixed-use program:

### **Housing Program**

Apartment Units	20 000m <sup>2</sup>
Social Housing Units	10 000m <sup>2</sup>
Senior's Residence	10 000m <sup>2</sup>
Hotel	6000m <sup>2</sup>
Cottage Country	4000m <sup>2</sup>

**Public/Community Program**

Municipal Library	4000m2
Tennis Courts	2000m2
Tendanse Dance School	800m2
L'Accolade Music School	800m2
Parks and Recreation Department	600m2
Urbanism Department	600m2
Regional Art Centre	600m2
Kindergarten	600m2
Medical Clinic	600m2
Family Counter	600m2
Institute for Senior Citizens	400m2
Archives Centre and Genealogical Society	400m2
Association of Horticulture and Birdwatching	200m2
Immigrant Integration Community Centre	200m2

**Industrial/Research Program**

Cranberry Packaging Shop	6000m2
Institute for Post-Industrial Mine Solutions	600m2
Mineral and Plastics Technology Centre	600m2
Geological Information Centre	400m2

**Commercial Program**

Convention Centre	8000m2
Grocery Store	3000m2
Farmer's Market	2000m2
Hardware Store	2000m2
Drug Store	1000m2
Mechanics Shop	800m2
Slaughterhouse / Butchery	600m2
Restaurants	3x400m2
Bar	400m2

In sharp contrast with the conventional single-use districts that currently exist in Thetford Mines, this new district would be characterized by the spatial juxtaposition and overlapping of the program, thus creating a true mixed-use district (Fig. 38).

## Design Parti

The proposed design interventions aim to:

1. Overturn the mine's formerly impenetrable boundaries, and establish a new continuity between the two neighbourhoods that straddle the mines – Saint-Alphonse and Mitchell – with the implementation of a new linear neighbourhood;
2. Accentuate the most significant mining infrastructure (the three headframes and the open-cast mine);
3. Integrate the formal grid of the town and the informal grid of the mine site in a sensitive manner, into the new linear neighbourhood;
4. Connect the new linear neighbourhood with the surrounding context – the mine site, agricultural fields, the wooded area, and the Saint-Alphonse and Mitchell neighbourhoods – at either end of the new district;
5. Create new public spaces where people may identify with and engage in the mining environment of their city at these points of connection.

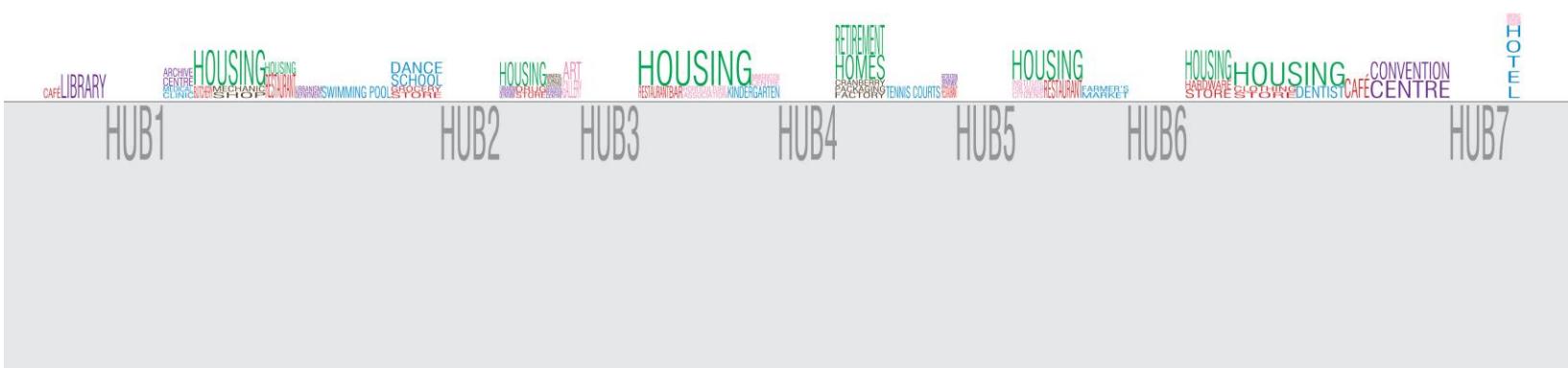


Fig. 38: Conceptual section diagram showing the mixed-use program along the linear district.

## Design Process

### *1. Tracing the New Neighbourhood*

The proposed new district follows a curvilinear path measuring approximately two kilometres in length. The footprint of the district corresponds to that of the former rail track of the Quebec Central Railways company that served the mining industry throughout the twentieth century and that ran along the now defunct mine sites. After closing in the late 1980s, the railway was dismantled to make way for a new bike lane and greenbelt. These traversed Thetford's urban fabric following an east-west axis from the town's eastern extremity defined by Mooney Street to its western edge defined by Smith Street, the last street in Thetford's historic old town before the mine site district. At present, upon reaching the mine sites, the bike path makes a turn to the North, avoiding the mining area altogether. Thetford's mining landscape cannot be entered today.

The linear project takes a new approach by reviving the traces of the former railroad in the mine site area. This formerly forbidden section between Smith Street (in the neighbourhood of Saint-Alphonse) and the Beaver Mine's main facilities (adjacent to

the Mitchell neighbourhood) constitutes the project site. The intention of the project is to reconnect two neighbourhoods separated by mining with a new post-mining neighbourhood (Fig. 39). What is more, it will not be enough for this new post-mining neighbourhood to be adequate: it will strive to be a superior, pedestrian and sustainable, living and working environment for the contemporary era.<sup>60</sup>

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<sup>60</sup> Refer to Appendix B for preliminary cross sections of the linear district.

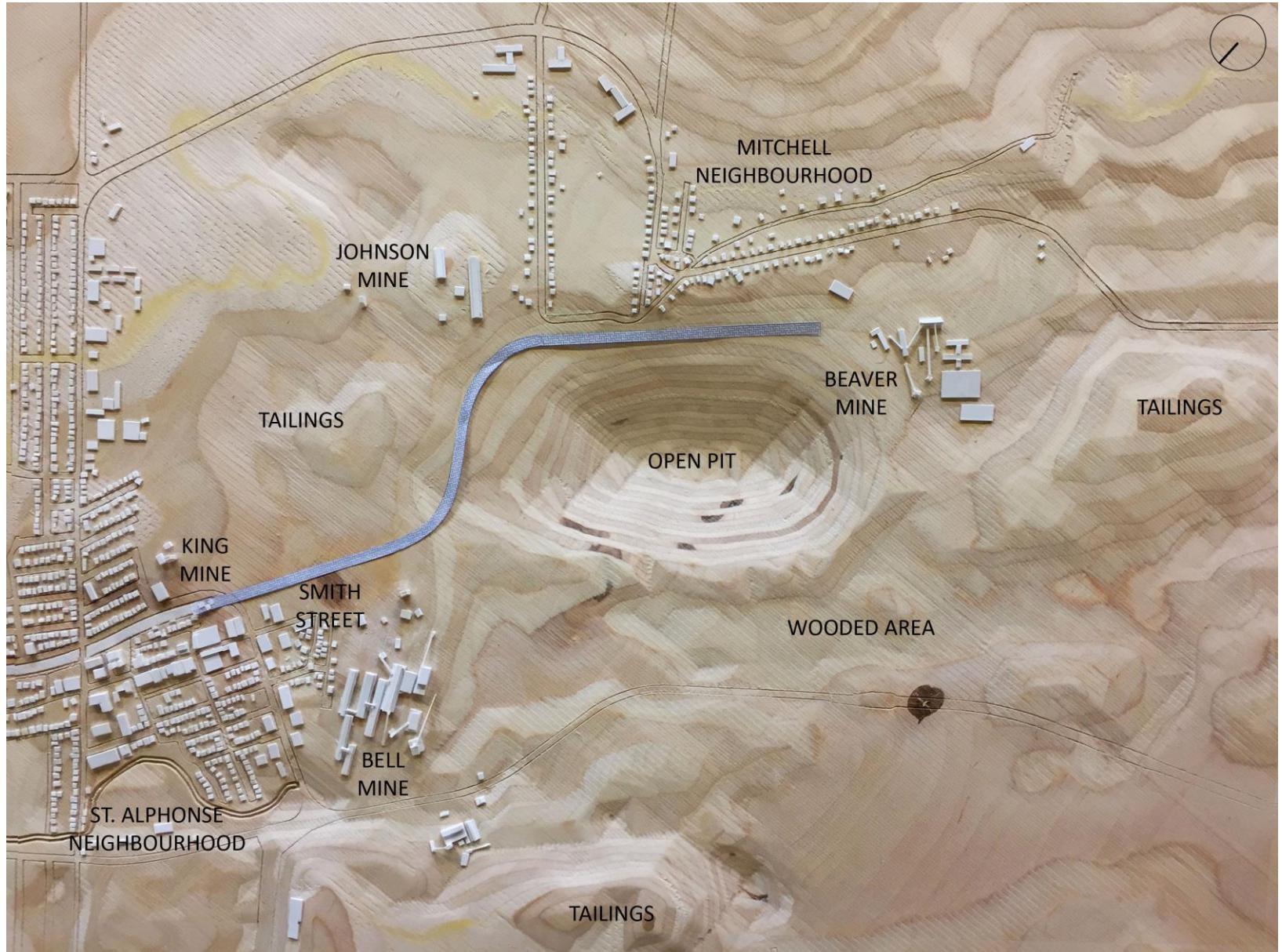


Fig. 39: Photo of model – Tracing the new neighbourhood.

To be sure, the new linear district is a megastructural project. Incorporating a road, bicycle paths, and buildings, and to be built incrementally over time following a pre-established modular approach, the project, of course, recalls certain precedents. It will be important to examine their successes and shortcomings here. International and local examples of megastructural linear buildings include “Il Biscione” in Genoa, Italy and “Le Mur” in the mining town of Fermont in Northern Quebec.



**Fig. 40: View of “Il Biscione”.**  
Retrieved March 30, 2017, from  
<http://www.impresedilinews.it/luigi-carlo-daneri-progettista-percorso-virtuoso-nella-sua-liguria/>

Inspired by Le Corbusier's vision for the North African city of Algiers developed between 1930 and 1933, “Il Biscione” is an enormous residential quarter designed by Luigi Carlo Daneri between 1956 and 1958 (Fig. 40). It is comprised of five curvilinear buildings of three to five stories spatially organized around the flanks of a hilly terrain. University of Southern California's School of Architecture Professor, Diane Ghirardo, recounts that although “Il Biscione” was touted as a modernist icon at the time it was erected, the project ‘constituted yet another example of architects playing with architectural and planning languages in dialogue only with one another [...] because the future inhabitants were not part of the discussion.’<sup>61</sup>

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<sup>61</sup> Diane Ghirardo, *Italy: Modern Architectures in History* (London: Reaktion Books Ltd, 2013), 148.



**Fig. 41: View of "Le Mur".**

*Retrieved March 30, 2017, from  
<http://www.lapresse.ca/le-soleil/affaires/les-regions/201108/01/01-4422714-fermont-ville-miniere-en-ebullition.php>*

Closer to us, in Northern Quebec, “Le Mur” is another example of a megastructural linear building (Fig. 41). Located in the single-industry mining town with socioeconomic realities dissimilar to those of Thetford Mines, “Le Mur” – formally known as Place Daviault – is a one-kilometre-long building. Varying between three and five stories in height, “Le Mur” is currently completely occupied. This superstructure truly embodies the “city building” idea, blurring the boundaries between architecture and infrastructure. In addition to its five hundred housing units, “Le Mur” contains a high school, a shopping mall, an arena, a town hall, and even the city’s police station. The building, shaped like a V, was also conceived as a windbreaker, mitigating the effects of the harsh climate of Fermont’s subarctic region.

In many ways, the analysis of the successes and shortcomings of these two superstructures appears as an edifying exercise insofar as the proposed district for Thetford is also a megastructural project. Both projects exemplify the typical manner of modernist housing estates and ideals. Both are megastructures that were conceived as armatures into which things could be plugged. Nonetheless, the case of “Il Biscione” shows that this kind of megastructural project can trigger strong critical responses,

being seen as uninhabitable and inhuman structures. In the case of “Le Mur”, one can question whether its full occupancy is due to the architectural quality of the building or to the housing crisis that has afflicted the town for the past few years.

## *2. Mat-Building Approach*

Drawing from the design principles supported by Team 10’s work in the late 1950s and through the 1960s, mat-building is a strategy of formal organization that appears relevant for the present project. Mat-building is a provocative, yet useful and relevant tool for architectural design and urban planning in a contemporary context. In an essay published in *Projections*, the Journal of the MIT Department of Urban Studies and Planning, Spanish architect Jaime J. Ferrer Forés described the mat-building approach as ‘a process, a growing structure of additive elements characterized by a delicate interplay between variations and repetitions of form.’<sup>62</sup> More specifically for Thetford’s former asbestos mine site, the use of a grid derived from the mat-building approach helps to create a dynamic and flexible armature in which the complex program of the new district can be coordinated and implemented incrementally over time.

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<sup>62</sup> Jaime J. Ferrer Forés, “Mat Urbanism: Growth and Change,” *Projections* 10 (2011): 73.

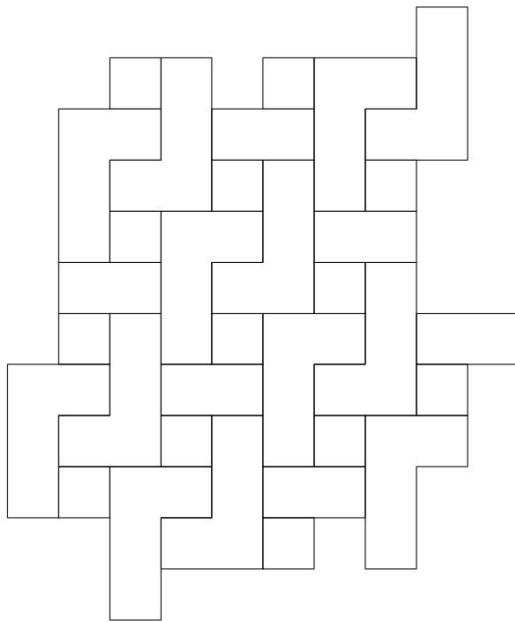


Fig. 42: Module used for the project as part of the mat-building approach.

Recalling in this way Aldo Van Eyck's Orphanage at Amstelveenseweg (1955) and Moshe Safdie's «Habitat» in Montreal (1967), the proposal relies on a six metre by six metre organizing module. This module is the basis for a grid composed of three geometric shapes: a square with a 36 m<sup>2</sup> footprint, a rectangle with a 72 m<sup>2</sup> footprint, and an L shape with a 144 m<sup>2</sup> footprint (Fig. 42). The module of this grid-based system is not arbitrary. Given the scale of the new district and the scope of its programming, the modular approach allows for structural efficiency and effective space planning. Using mat-building design principles for the proposed two-kilometre-long district in Thetford's mine sites is not only good for purposes of design unity, it is also a useful tool for expressing design rules within the given canvas. Serving as a basis for design, the predetermined modular system can however be punctually interrupted to allow for creative, non-gridded design.

### *3. Hubs and Axial Connections*

With the intention to highlight and enhance certain elements on the site, a total of seven hubs are integrated into the new linear district. In order to resist self-referential closure and detachment from locality, and in order to promote spontaneous

connections with pedestrian, bicycle and local car travel, the strategy entails intersecting the mat-building approach with the site's topographical and sensorial specificities. The seven hubs punctuate the mat-building grid and erode the space around them. They are manifested through open and un-built spaces that are public in nature, such as parks, sport facilities, and squares. The hubs are framed by civic buildings, thus enhancing the significance of each other.

Furthermore, the locations of the seven hubs along the curvilinear path of the new district are determined by distinctive axial connections that they each have with the surrounding landscape (Fig. 43).

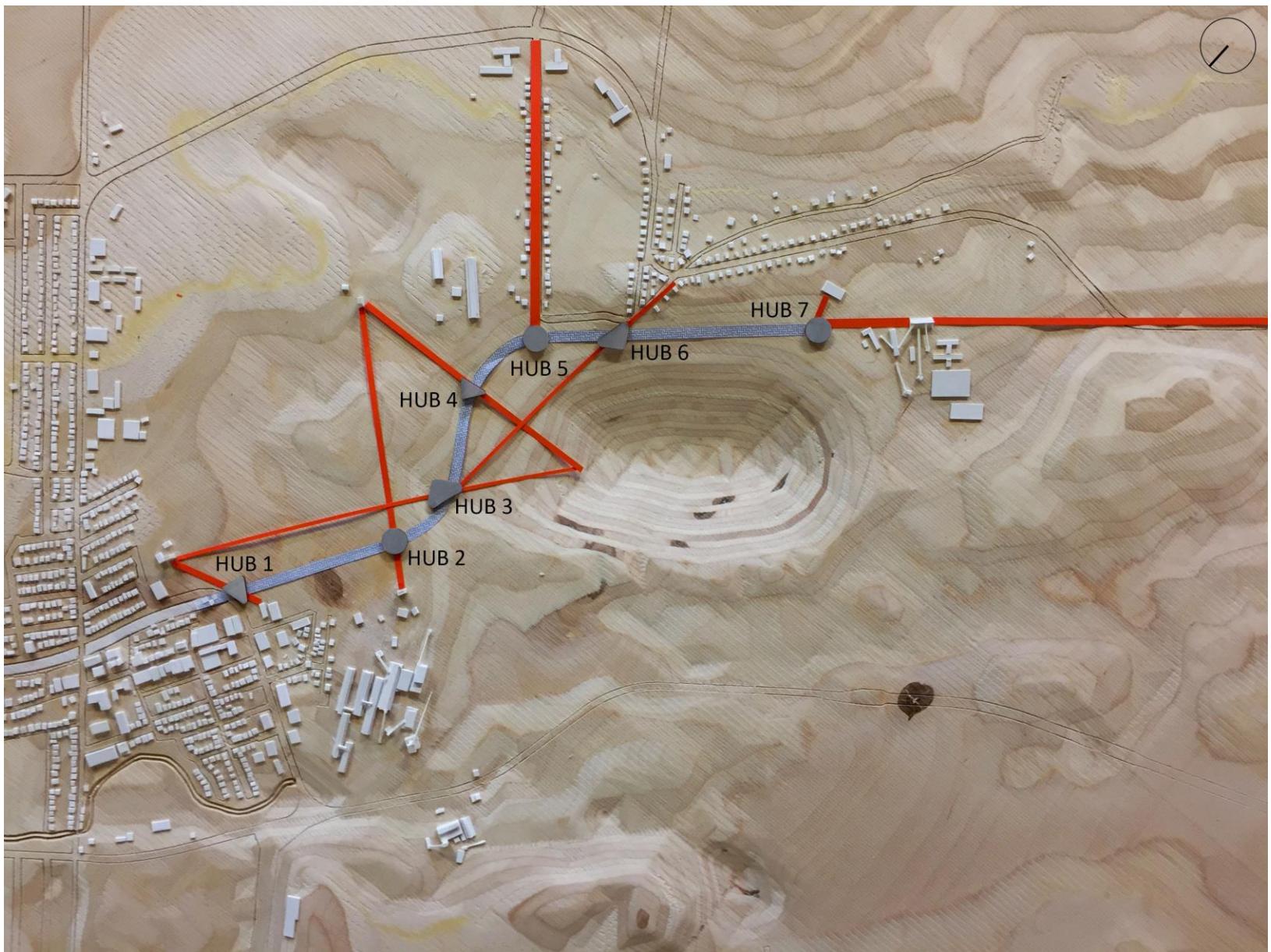


Fig. 43: Photo of model –Hubs and axial connections.

More specifically, the axial connections for each hub are:

*Hub 1* Mining Interpretation Centre (King Mine's headframe)

Société des Arts de Thetford (former train station)

*Hub 2* Johnson Mine's headframe

Bell Mine's headframe

*Hub 3* Mining Interpretation Centre (King Mine's headframe)

Water of the Beaver Mine's open pit

Hub 6

*Hub 4* Johnson Mine's headframe

Water of the Beaver Mine's open pit

*Hub 5* Main residential road of the Mitchell neighbourhood

*Hub 6* Mitchell neighbourhood's core

Hub 3

*Hub 7* Beaver Mine's industrial building complex

Du Lac Noir Street (leading to the asbestos mines of Black Lake)

The above seven hubs become the primary organizing entities for the positioning of, and spatial relationship between the numerous programmatic elements proposed along the curvilinear path, from Saint-Alphonse to Mitchell (Fig. 44). In sum, Fig. 45 comprehensively illustrates the project's overall conceptual approach at the site scale.

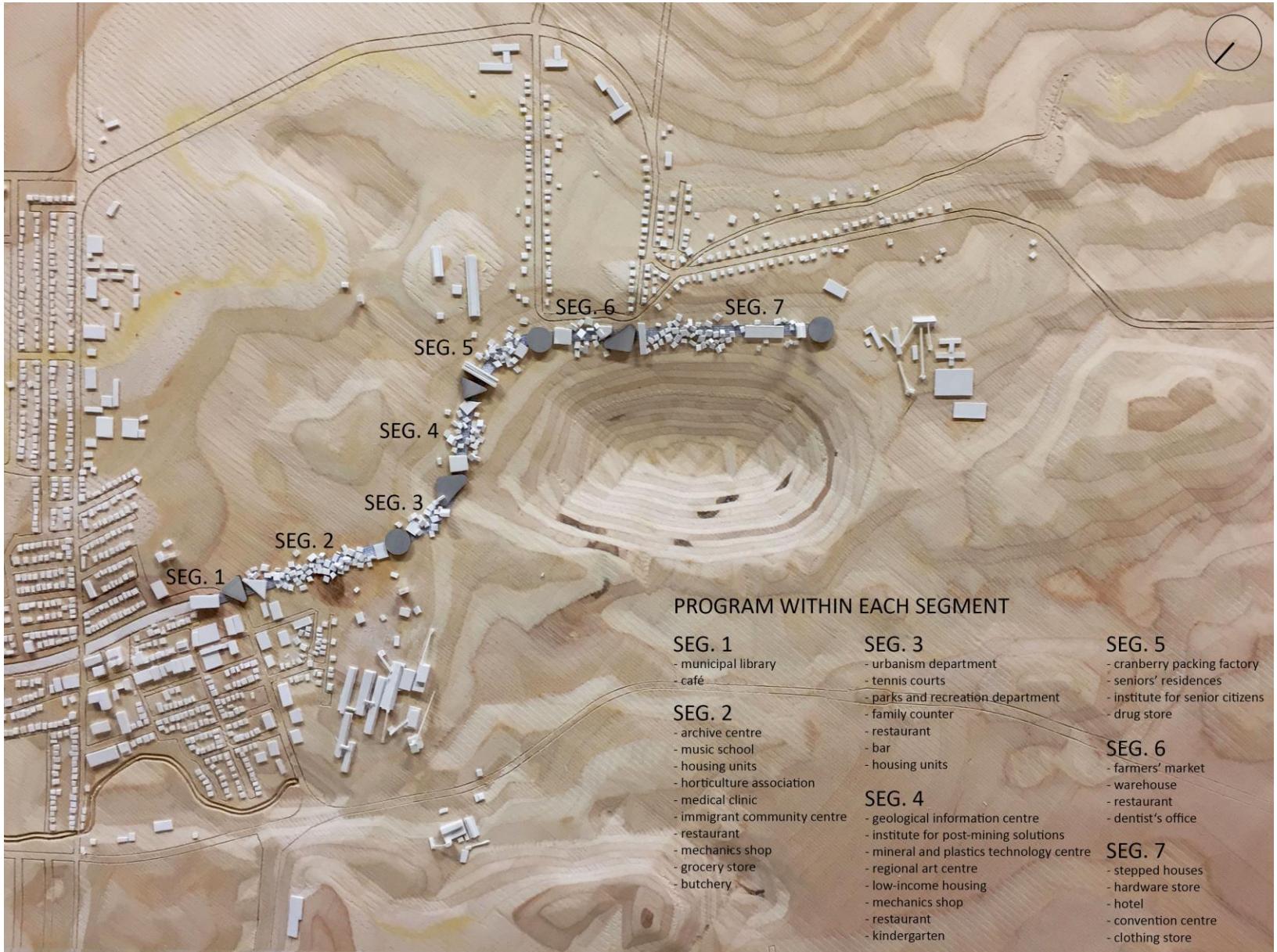
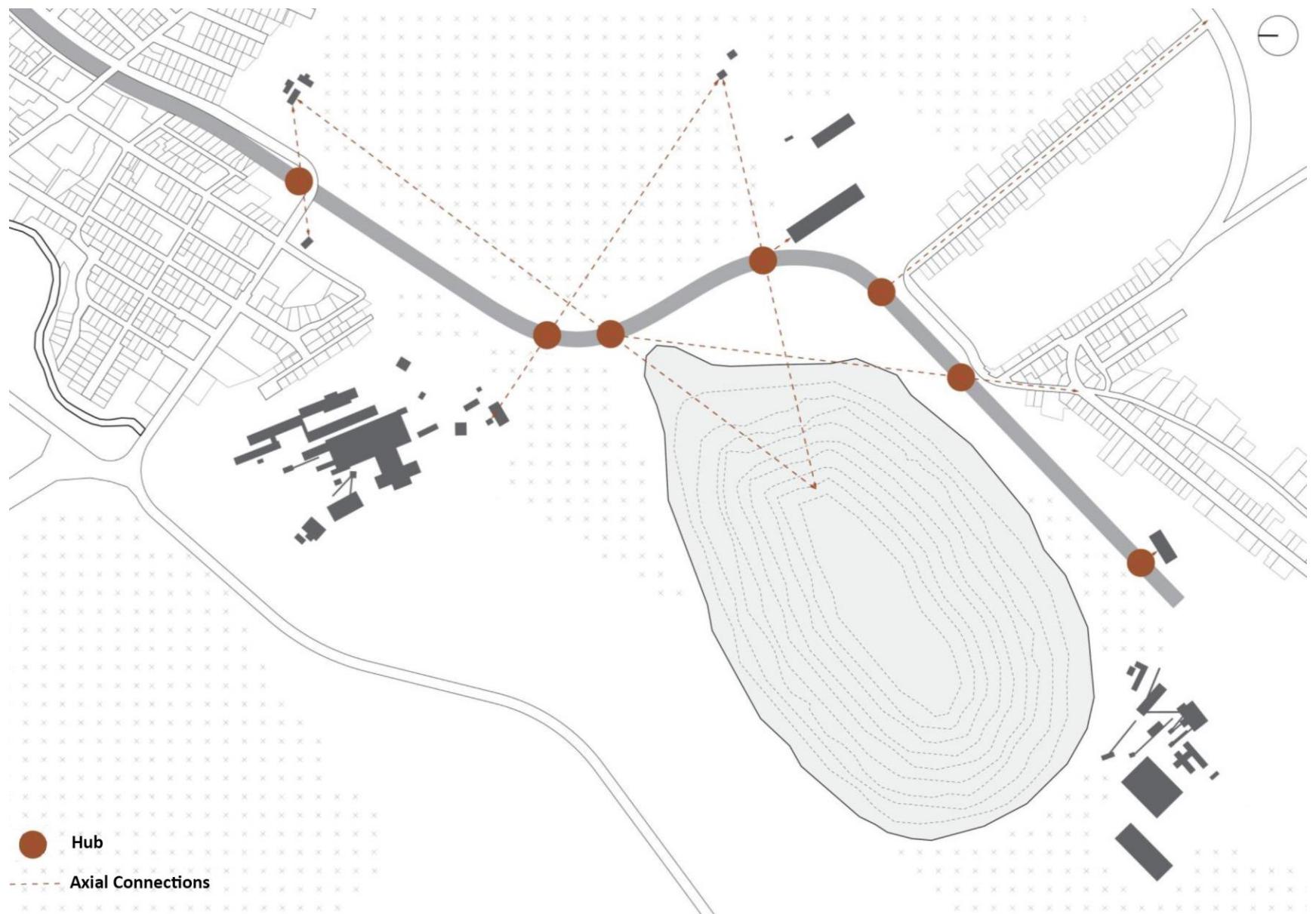


Fig. 44: Photo of model – Integration of the project's programmatic elements based on the hubs along the curvilinear path.



**Fig. 45:** Comprehensive conceptual diagram of the project's overall approach at the site scale.

#### *4. Detailing One of the Hubs*

One of the seven hubs is here detailed as an architectural proposition as a way to exemplify the experiential and spatial qualities of the new curvilinear neighbourhood.

By entering into one of the mixed-use buildings in greater depth, a sense of what this new town might be like as a whole will emerge. We choose here to develop “Hub 3”.

The third hub is chosen because it is the only one that has three axial connections with its surrounding environment. It connects with the Mining Interpretation Centre – King Mine’s headframe –, the water of the Beaver Mine’s open pit, as well as with “Hub 6”, located near the residential core of the Mitchell neighbourhood. More precisely, the third hub is located on the close periphery of the open-cast mine, which coincidentally corresponds to where the slope to reach the water is the least steep. All these reasons explain why Hub 3 was chosen among the seven hubs.

Programmatically, “Hub 3” is also significant insofar as it is framed on one side by the mine-related research program, namely the Mineral and Plastics Technology Centre and the Geological Information Centre. Following the mixed-use logic of the overall project, this research program is combined with the Regional Art Centre. This thesis

advances that the integration of a science-based program with an art-based program within the same building, with increased opportunities for social interaction in the workplace, could lead to an enhanced sense of community. These interactions have the potential to spur novelty and creativity in the work of both the scientists and artists.



**Fig. 46. Photo showing a vein of asbestos fibres in a fractured peridotite rock.**

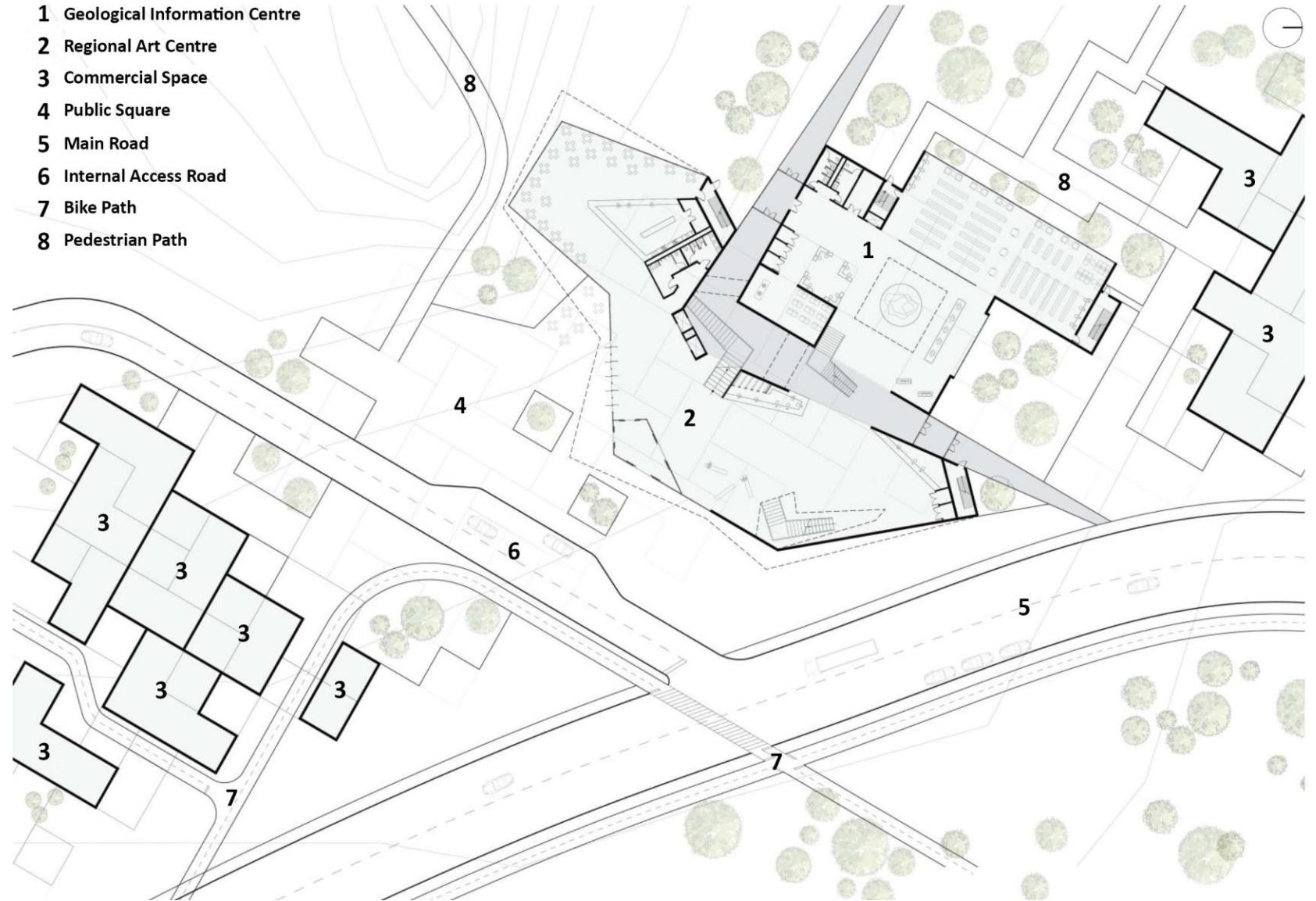
*Retrieve January 13, 2017, from  
[https://www.flickr.com/photos/asbestos\\_pix/6069286452](https://www.flickr.com/photos/asbestos_pix/6069286452)*

From an architecture perspective, the shape of the building resulting from the combination of the aforementioned programs is inspired by the geological formation of the asbestos mineral itself. Asbestos fibers are generally localized in veins within fractures in peridotite or granitic rocks (Fig. 46).<sup>63</sup> In the architecture of the project, the asbestos vein is metaphorically manifested through a long and narrow liminal space which contains the main circulation for the entire building, including two celebratory staircases. On each side of this circulation vein, symbolically representing the peridotite and granitic rocks, the building of the science based-program follows the orthogonality of the mat-building grid, while the building of the art-based program, adjoining the hub, contravenes the grid and extends towards the landscape, resulting in an irregular shape reminiscent of that of a rock (Fig. 47 and Fig. 48).

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<sup>63</sup> David S. O'Hanley, "The origin of the chrysotile asbestos veins in southeastern Quebec," *Canadian Journal of Earth Sciences* 24, no. 1 (1987): 1.

- 1 Geological Information Centre
  - 2 Regional Art Centre
  - 3 Commercial Space
  - 4 Public Square
  - 5 Main Road
  - 6 Internal Access Road
  - 7 Bike Path
  - 8 Pedestrian Path



**Fig. 47: Ground floor plan of the third hub and its surrounding built environment.**

1 Mineral and Plastics Technology Centre

2 Regional Art Centre

3 Housing

4 Public Square

5 Main Road

6 Internal Access Road

7 Bike Path

8 Pedestrian Path

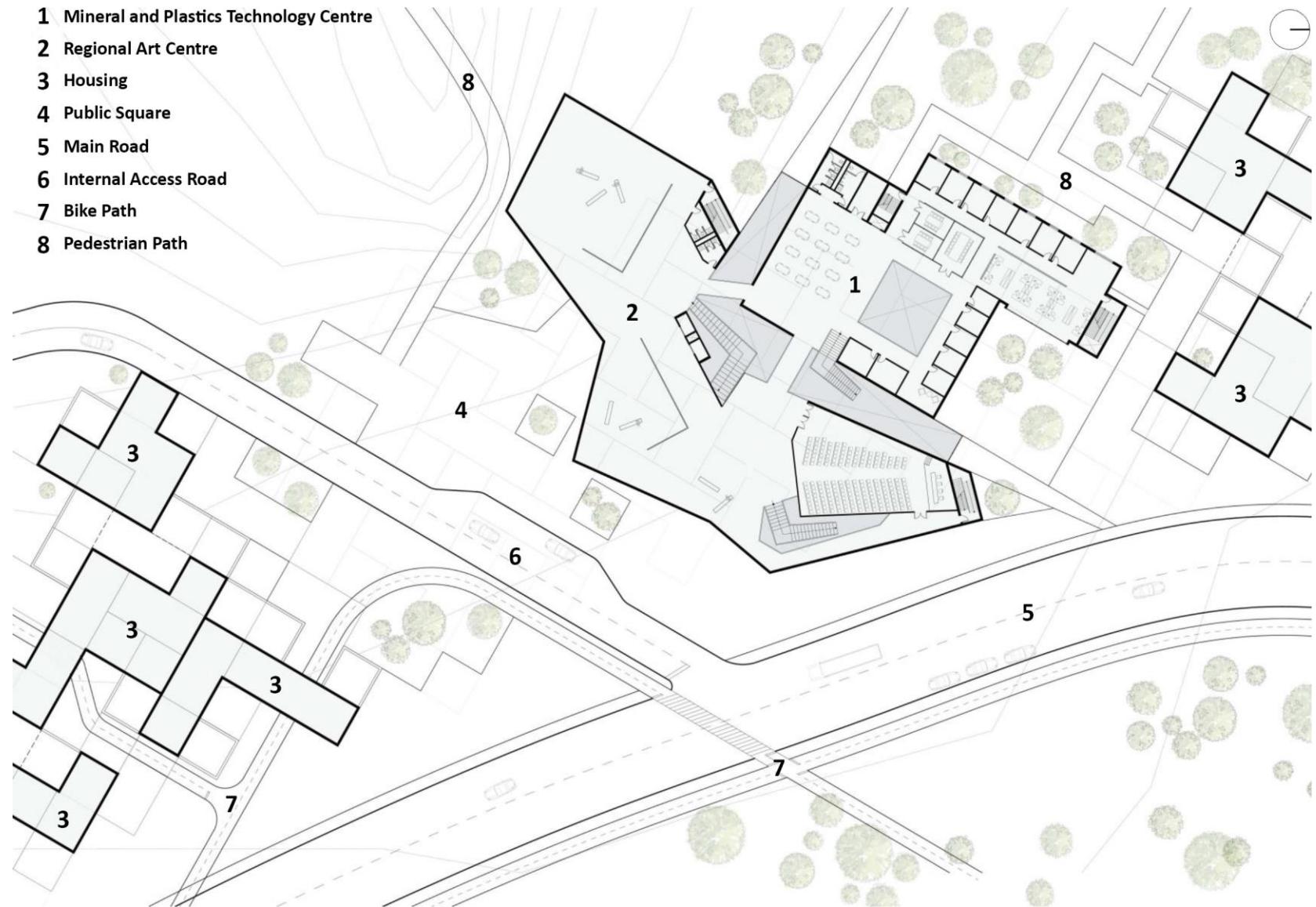


Fig. 48: First floor plan of the third hub and its surrounding built environment.

Framing the other side of the hub at the ground level, more “casual” programmatic elements, namely a bar and a restaurant, are incorporated. This commercial program is strongly connected to the stepped public square of the hub. Finally, the three stories above the restaurant and bar feature housing units of different sizes and shapes, with several individual and communal patios. From there, the dwellers of those housing units can enjoy a privileged view of the surroundings.

Representing the unbuilt core of “Hub 3”, the central public square extends into the landscape, making it a space where both locals and tourists can gather to experience a deep connection with the surrounding environment. Additionally, the public square becomes a path leading pedestrians and bikers down to reach the turquoise water inside the Beaver Mine’s open pit.

Finally, the diverse experiential and spatial qualities that emerge from “Hub 3” – as an architectural proposition – are meant to typify the whole two-kilometre-long curvilinear neighbourhood (Fig. 49, Fig. 50 and Fig. 51).

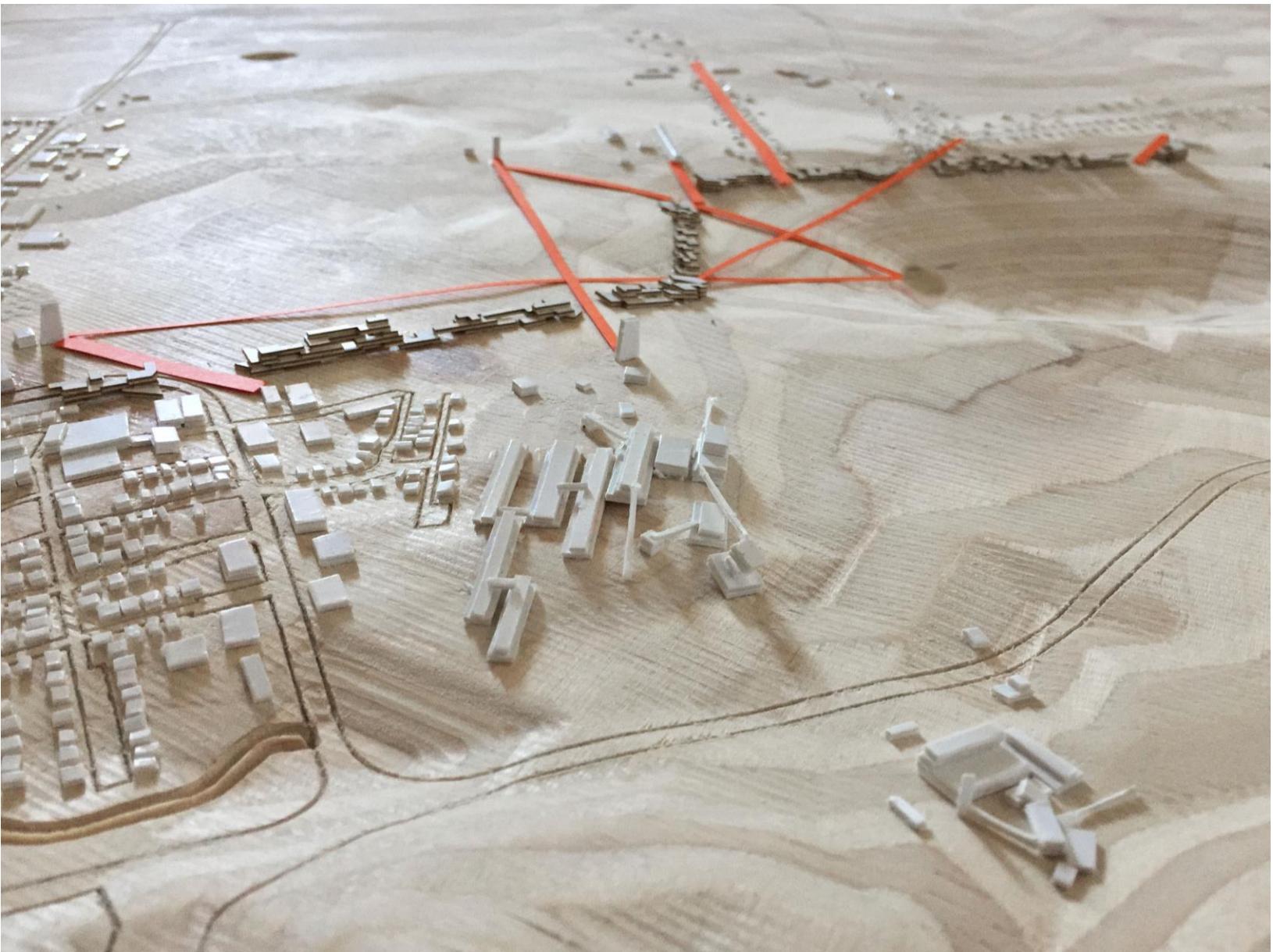


Fig. 49: Site model showing the mat-building approach of the linear neighbourhood as well as the axial connections generating the hubs.

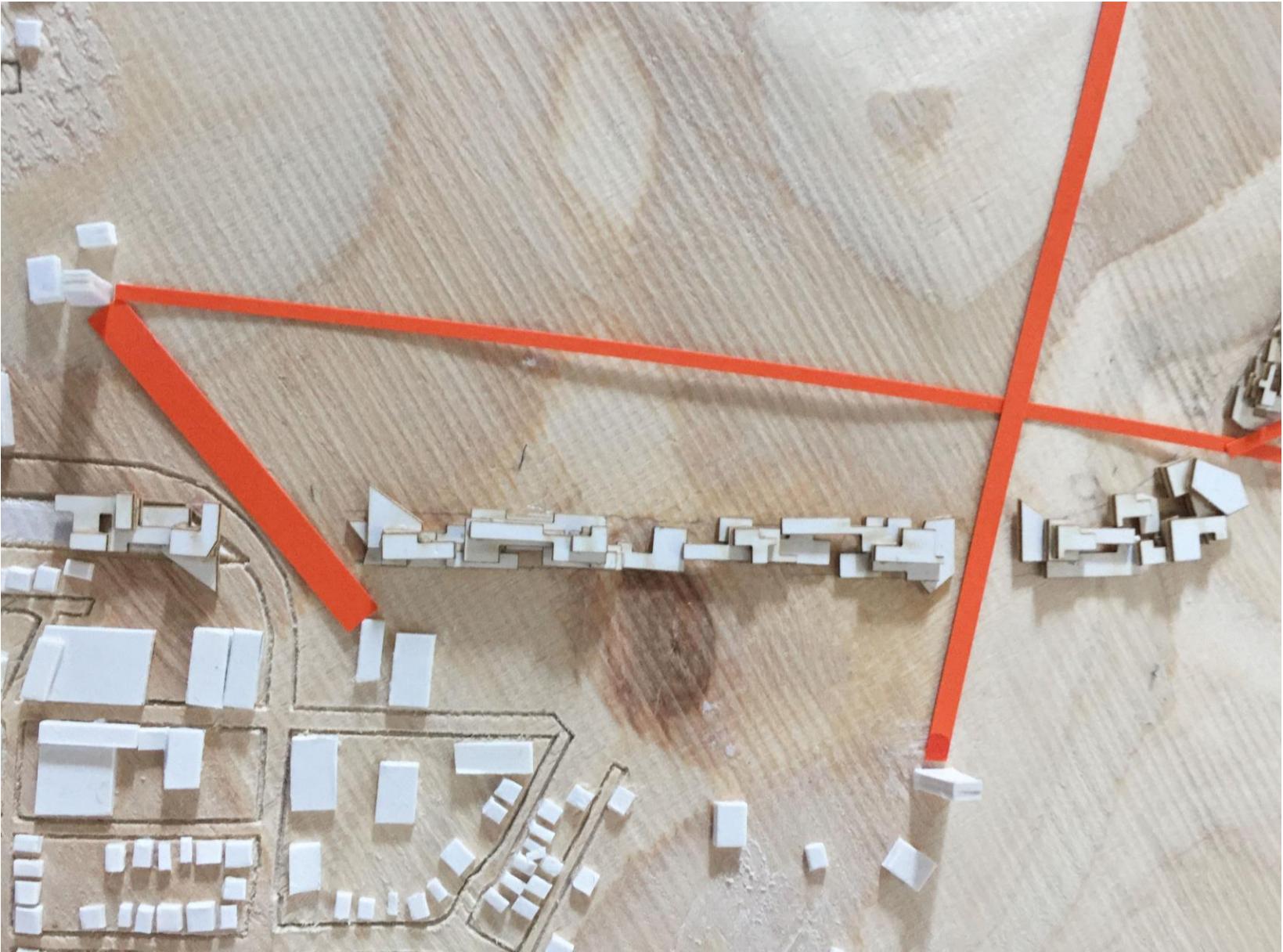


Fig. 50: Site model showing the portion of the linear district in relation with the Saint-Alphonse neighbourhood, the King Mine, and the Bell Mine.

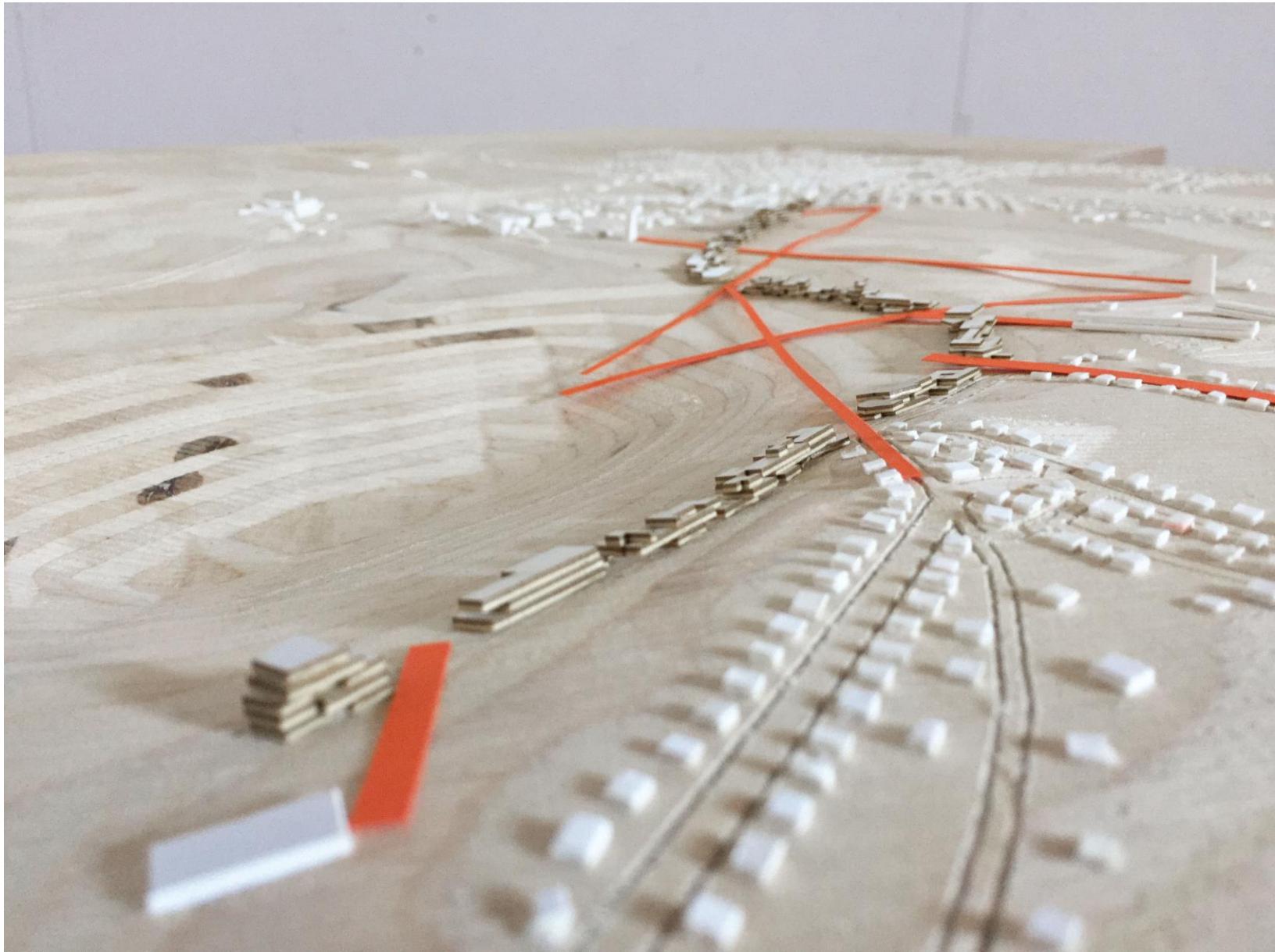


Fig. 51: Site model showing the portion of the linear district in relation with the Mitchell neighbourhood and the open pit on the Beaver Mine.

### *5. Interpreting Thetford's Mining Landscape*

There are many ways through which the mining landscape of Thetford Mines can be interpreted and analysed. As such, four architectural collages were produced as part of this thesis as an attempt to interpret the mining landscape of Thetford Mines in a more creative and playful manner (Fig. 52, Fig. 53, Fig. 54, and Fig. 55). The four collage drawings all juxtapose different features of Thetford's mining landscape with simplified sections of existing contemporary civic buildings.<sup>64</sup> The intention here was to explore the spatial and experiential potential of combining architectural sections with the distinctive mining context of Thetford Mines. The resulting collages of this juxtaposition exercise leads to a creative reading of Thetford's landscape, in a way that would not be possible through conventional representation and analytical methods.

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<sup>64</sup> The civic buildings used for the four collages are municipal libraries recently built in Quebec, as the initial thesis project of the author was to design a new municipal library for Thetford Mines.

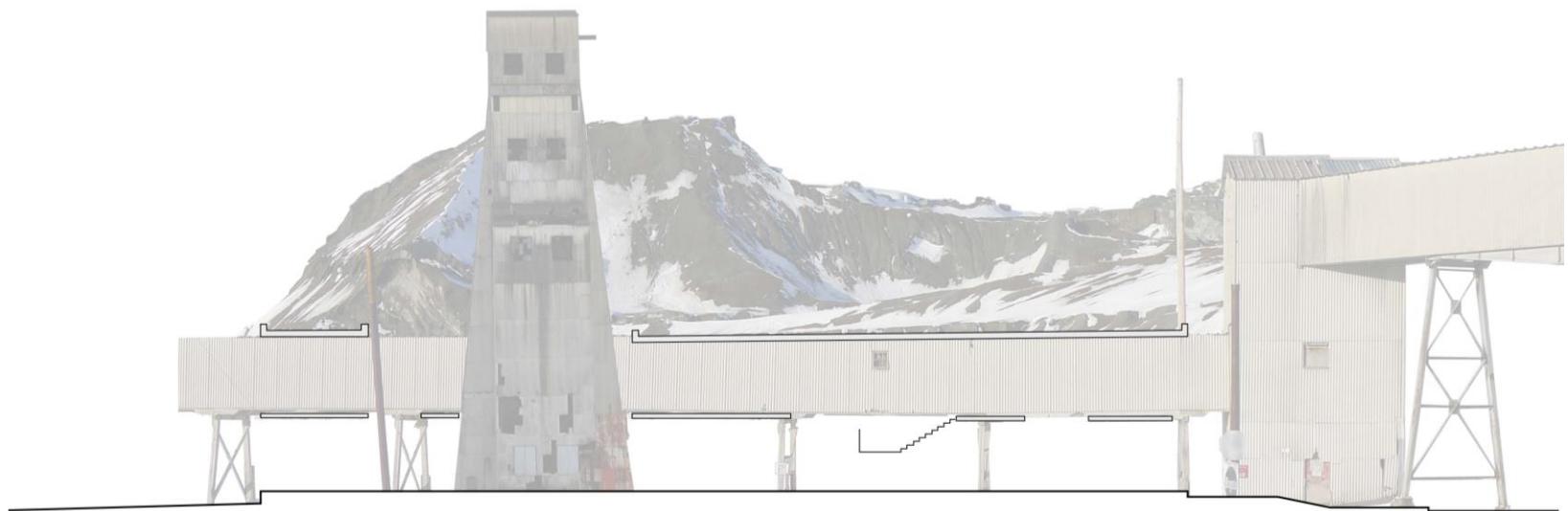


Fig. 52: Conceptual collage juxtaposing the distinctive typology of Thetford's mines with a simplified section of the Marc-Favreau Library in Montréal.



Fig. 53: Conceptual collage juxtaposing the materiality associated with asbestos mines with a simplified section of the Benny Library in Montréal.



Fig. 54: Conceptual collage juxtaposing the Thetford's mining topography with a simplified section of the Raymond-Lévesque Library in Longueuil.

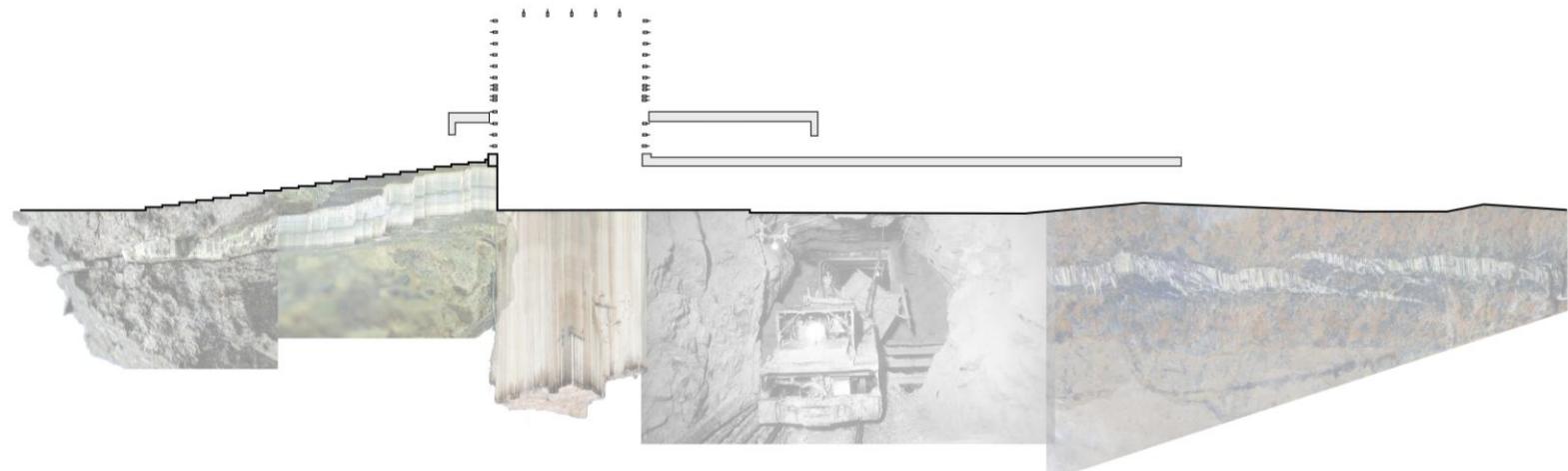


Fig. 55: Conceptual collage juxtaposing Thetford's underground with a simplified section of the du Boisé Library in Montréal.

## *6. Reclaiming Thetford's Mining Landscape*

Building a two-kilometre-long megastructural mixed-use project will inevitably take many years; and so will the ecological regeneration of Thetford's mining sites. As such, this thesis proposes a thirty-year long-term plan for the implementation of several strategic interventions to address the challenges related to Thetford's mining sites, at a landscape level. After decades of being dynamited, extracted, moved, and exploited for the economic endeavours of a few mining companies, the land of Thetford's mines has now become a bleak, unattractive, neglected, and unused post-industrial landscape. To address this situation, this thesis aligns itself with the ecological regeneration efforts begun in 2015, and which include such endeavours as vegetation regrowth on the tailing piles scattered across Thetford's territory. We strongly believe that this incremental initiative will, over the years, drastically alter the mining landscape in a positive way: transforming it from grey to green again.

Additionally, as the revegetation process is occurring, this thesis proposes the reactivation of the mine sites through non-mining activities that are respectful of the land and that would benefit both the *Thetfordois* and future visitors (Fig. 56 and Fig. 57).

These include, for instance, new industries, such agricultural organic farming, cranberry production and packaging, and welding shops, as well as outdoor recreational activities, such as biking and trekking in the summer, and skating, snowshoeing, and cross-country skiing in the winter.

The tourism industry refers to Thetford as *Le Pays des Mines et des Lacs*: this thesis takes this name seriously and imagines Thetford as a place where dwellers can derive pleasure from their landscape, and where a “cottage country” might even unfold in proximity to the city. Thetford’s mining landscape and its artificial lake provide opportunities for new forms of habitation today, from lake side retreats in summer, skating in winter, and dramatic stepped buildings that embrace the mine pits proper (Fig. 58).



Fig. 56: View from Smith Street showing the linear district and new agriculture field, with the Bell Mine in the background.



Fig. 57: View from a common space in the linear district, showing a bike path adjacent to a cranberry field and the old facilities of the Johnson Mine.



Fig. 58: View from the south-end of the Mitchell neighbourhood showing the new recreational purposes of the Beaver Mine's open pit.

## Conclusion

The road from tainted city to place of dream is a complex one for former mining towns, and even more so for former asbestos towns. On the one hand, Thetford must be physically sutured back together and its topographical mining gashes repaired. On the other, the built fabric and the architecture used to operate this repair must also behave as a point of social gravitation that persons would choose as places of long-term dwelling. The new curvilinear neighbourhood must be a space of reconciliation in the deepest sense of the word, of opening up a positive space of dwelling in the very place that once interrupted social continuity and fabric – the traces of the twice displaced Saint-Maurice Parish. The new district must not only provide useful spaces to live and work, but the very best and most appealing of them, to redeem the land's past.

It is important to set up an architectural and landscape project that leads from shame to pride, not only for Thetford, but for all mining towns nearby. This can only be done by turning the negative “effects” of mining on the landscape into features that make dwellers’ lives better, while reconciling with the past. In particular, the open pit, now a

lake, presents a unique and beautiful landmark today, worthy of attention. Any city would be fortunate to have a lake in its heart. Thetford Mines must now find a way to celebrate this residue of its past life, activate it as a space of leisure, and include it in its town planning. The volume *Thetford Mines À Ciel Ouvert* documented and celebrated Thetford's history as a mining town and community. This thesis proposal for a town "reconnected" to its landscape, its people, and its past, imagines a built version of Thetford's future: a future that is deserving to be optimistic, superlative, and celebrated within and beyond the town (Fig. 59, Fig. 60, Fig. 61 and Fig. 62).

In an attempt to respond to the magnitude and power of Thetford Mines' landscape scars and tailing mounds, the design proposal experimented with a mega-structure. This came with some challenges. By intersecting the linear mat building with site-specific hubs and non-orthogonal buildings at these hubs, the design strategy aims to create a porous neighbourhood that organizes linkages with the environment and settlement. The mega-structure is intended to act as a filter. Nonetheless, one can still ask: Does the mega-structure run the risk of becoming a wall, an obstacle, instead of a unifying device? Might the latter become too static and unable to adjust to variations

in population in the future? In further developing this proposal, it would be important to consider the relationship between the main road and the mat building in greater detail. The road and megastructure building interface could be further refined to ensure spatial quality, reciprocity, and organic flow. A transportation system such as a rail line that would run alongside the linear neighbourhood – making frequent stops – would also be an important element to consider as part of the overall design strategy. Finally, precise techniques for the reclamation of the mining tailings constitute another area of much needed research for the future development of this site. In an ideal scenario, the megastructure's design would be a central element within a broader reclamation strategy.

The question of Thetford's size and growth is also a delicate one. Despite marked effort to rekindle the town's economic vitality and population growth – most notably through the creation, in 2015, of a venture capital fund called *Capital expansion région Thetford*<sup>65</sup> – Thetford Mines remains today a shrinking city. Does this type of small-scale, incremental funding have the capacity to halt and reverse the town's shrinkage?

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<sup>65</sup> This \$5 million fund aims to support the creation, development, promotion, and succession of local businesses and companies through direct investments, capital shareholdings, or equity loans.

Will economic investments alone suffice to reactivate the town's growth? If so, what size will it become, in the long term? And what settlement form would best prepare that outcome? Optimistically, if Thetford Mines does end up growing as a city once again, this thesis offers a map for a possible way in which this growth might happen. In Thetford Mine's next chapter, districts dislocated by past mining activity beg to be fluidly joined, and the surrounding landscape, including mining-era scars, await creative and fruitful habitation.

## Prologue

Thetford Mines is not only the subject of this M.Arch thesis project; Thetford Mines is, perhaps more importantly, my hometown. For the longest time, I genuinely disliked my hometown. As a young and creative individual with university aspirations, I felt that I did not belong to the place where I was born. That unpleasant feeling of estrangement explains why I decided, at the age of sixteen, to move away from Thetford Mines.

More than a decade later, after years of studying architecture and other subjects, I deliberately chose to focus my M.Arch thesis project on Thetford Mines – the same

hometown that I have been shunning since moving away from it. Working on this project for a whole academic year opened up my eyes on how unique and inspiring my background is. As a person who grew up in a former asbestos town, I am attuned to cities' temporal and fragile natures. As part of my project, I went back to my birthplace for few days to conduct field research and observations. This short visit led to a totally unexpected paradigm shift in my personal relation with Thetford Mines. I finally gave my hometown a chance to speak to the architect in me.

Architecture has made me appreciate and feel for my hometown, a sentiment that had not moved me since my childhood. Going back home also made me realise that Thetford Mines is in fact the kind of town that fascinates many architects, urban planners, and landscape designers. Sometimes one is simply too close to a situation to fully understand how singular that situation can be. The undertaking of my M.Arch thesis has transformed the way I see my future as an architect. Despite being in my final year of architecture school and having work experience in the field, I can honestly say that it is the first time I feel so inspired by and involved in an architectural project.

I knew before that I wanted to become an architect; now I know that I want to practice architecture. In my view, the making of buildings and built environments entails a social and personal dimension that exceeds the strict professional obligations and responsibilities of architects. Such an emotional and sensorial connection between the architect and the people who are in relation with the architect's designs, produces meaningful buildings and places. In addition to enriching my perspective on the architectural profession, this M.Arch thesis has helped me reconcile my present self with my roots.

Thetford Mines, asbestos town.

Thetford Mines, an ideal place to live.

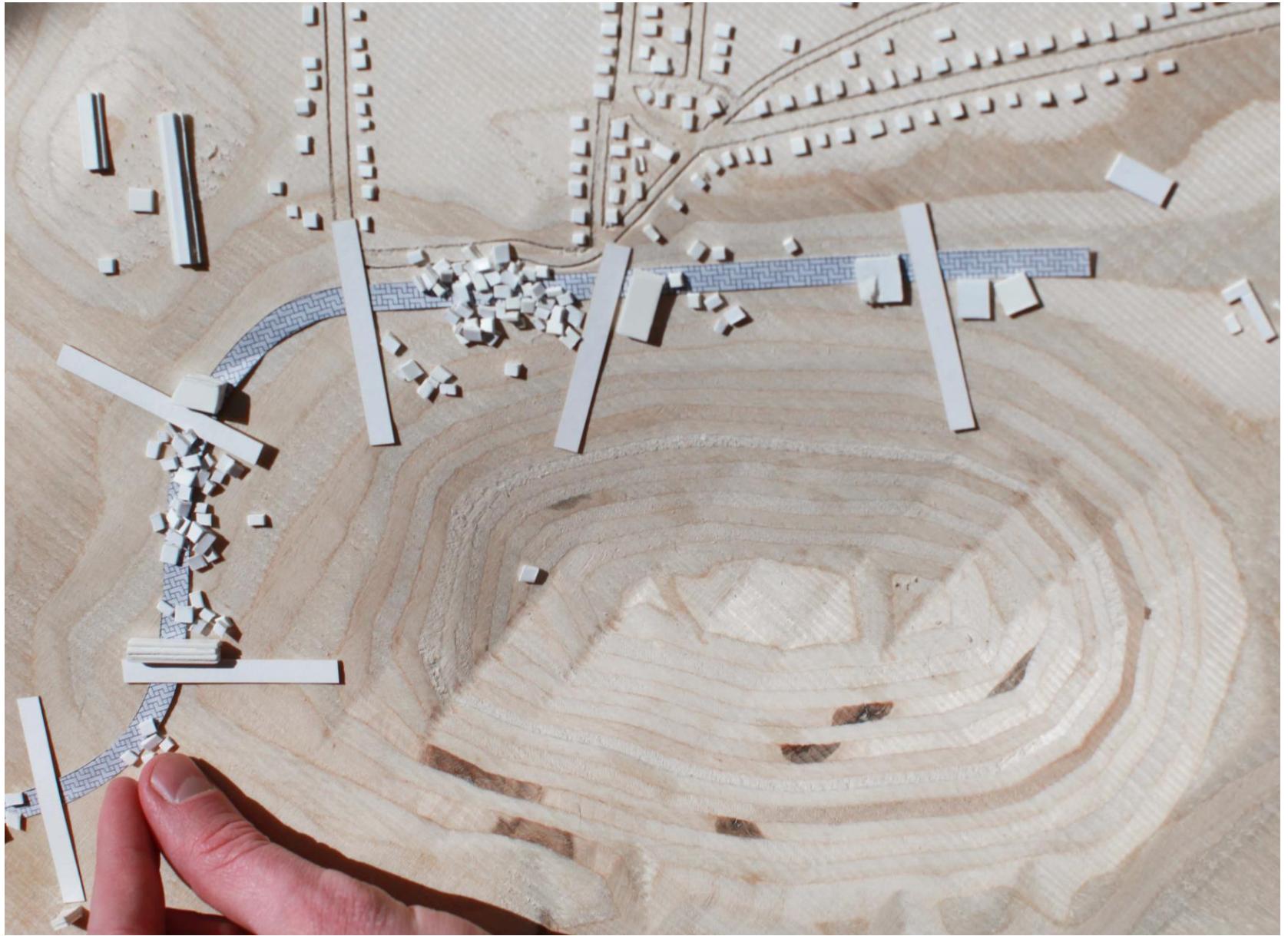


Fig. 59: Site model showing growth of linear neighbourhood at various points in time (1).



Fig. 60: Site model showing growth of linear neighbourhood at various points in time (2).



Fig. 61: Site model showing growth of linear neighbourhood at various points in time (3).



Fig. 62: Photomontage showcasing a speculative and artistic vision for Thetford's former asbestos mines in fifty years.

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## Appendix A | Site Photographs





## Appendix B | Preliminary Cross Sections of the Linear District

