

Unpack Living: Housing the Working Nomads

by  
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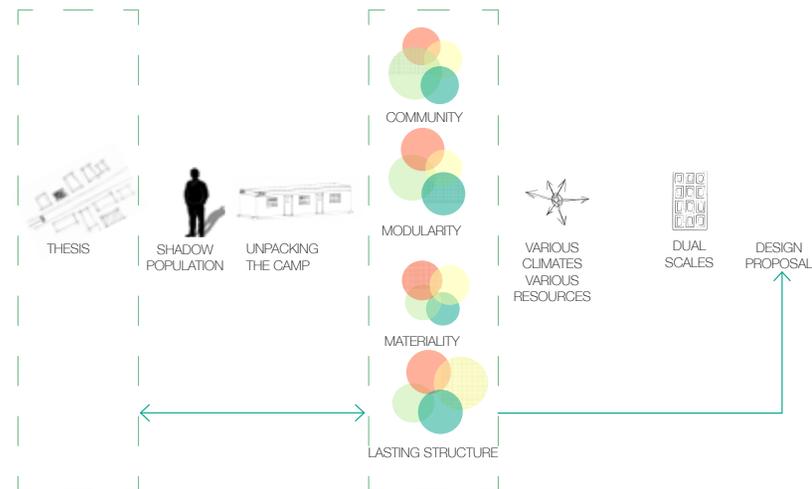
I would like to thank my advisor Janine Debanne for her guidance and the support of the faculty at Azrieli School of Architecture and Urbanism.

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## Abstract

The development of resource extraction sites in Canada has created a temporary, dynamic and nomadic work force that flies back and forth between worksites and geographically distant home-base residences on a three-to-one week rotation. Worker housing takes the form of prefabricated single-storey dormitory slabs arranged on a grid. These isolated, temporary, and fixed-form housing camps have been developed to support mining developers' ever-expanding business, and constitute an inexpensive and time-efficient alternative to working towns of old. However, their repetitive and undifferentiated morphology produces alienating environments; social problems abound therein. Secondly, when the mine closes, the housing is often left behind to waste. This thesis reexamines the architecture of temporary, industry-related dwelling with a view to creating more humane dwelling environments. Taking the full cycle of the mine's life span into account, the thesis also addresses the question of how trucked-in housing can leave a lighter environmental footprint on the Canadian landscape.

An Overview of the following thesis

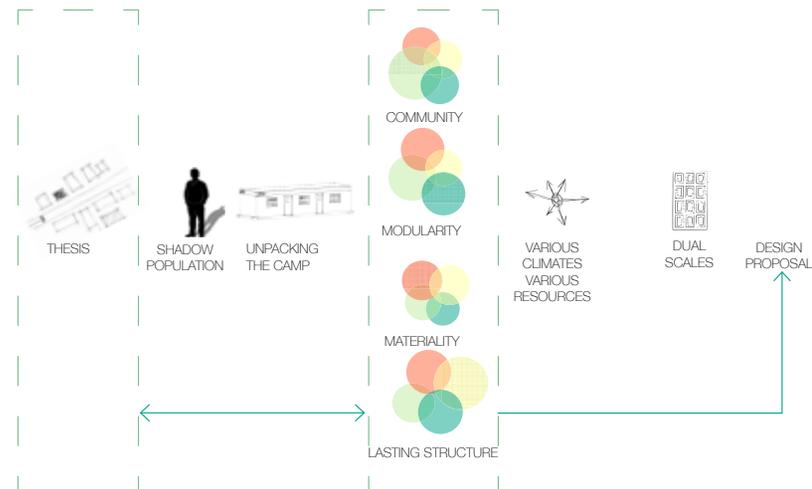


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**DIAVIK DIAMOND MINE, NORTHWEST TERRITORIES**

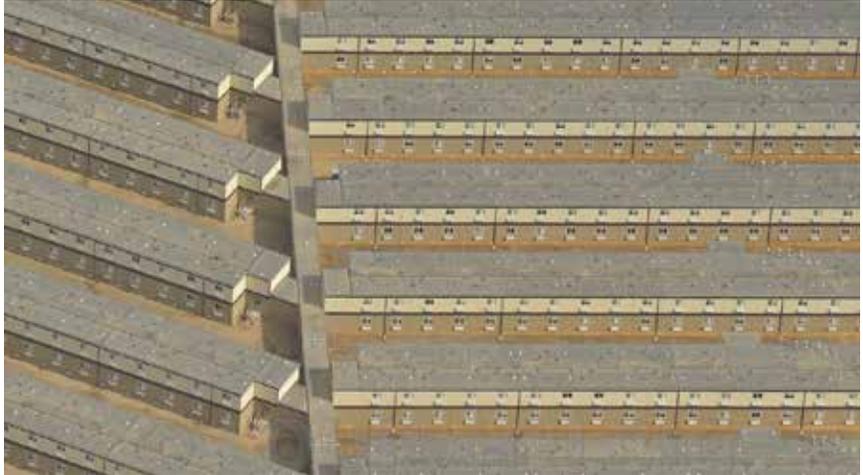
*This dramatic landscape is created by open pit diamond mining, one of many in the remote areas of the Northwest Territories. Accessed January 20, 2016: <<http://www.riotinto.com/diamondsandminerals/diavik-2232.aspx>>*



**BURTYNSKY: RESOURCE EXTRACTION**

Weststar Open Pit Coal Mine in Sparwood, British Columbia (1985):

Edward Burtynsky is a photographer who specializes in capturing the modern economy and its impact across the globe. With these pictures, we can actually see what resource extraction looks like. Accessed January 16, 2016: <<http://www.edwardburtynsky.com/>>



**LOUIS HELBIG- BEAUTIFUL DESTRUCTION**

These images are just a few of Louis Helbig's aerial images of the mining camp housing in Canada. These are part of a series from his book called 'Beautiful Destruction' Accessed January 15 < <http://www.beautifuldestruction.ca/> >

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# 1.0 Introduction

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As far back as can be traced, humans have traveled short and far distances to live, work and survive. People the world over leave their homes in search of work. In Canada, the action of travel has perennially been a part of human survival. From the aboriginal peoples of Canada who moved with the seasons and followed the migration of animals, to earliest European settlers traveling across the North American continent in search of land, resources, and work, the dweller has always been a sort of working nomad. What is more, few countries have the land mass or the wealth of profitable natural resources that Canada possesses. The fact that the location of these resources is most often geographically remote in relation to Canada's population means that workers will travel great distances to get to them. Canada is the second largest country on earth and with ninety per cent of its population living within 160 kilometres of the US border <sup>1</sup> the distances

<sup>1</sup> "By the numbers," *CBC News*, May 12, 2009/ accessed May 05, 2016. <http://www.cbc.ca/news/canada/by-the-numbers-1.801937>.

traveled in Canada to work in the resources sector are far larger than in most countries on earth. Up to 420,000 Canadians work on the road, in temporary camps or permanent jobs, in provinces where they do not keep a residence.<sup>2</sup> Often inhospitable climates, to find work, and they must live somewhere once they've arrived.

The profitable development of resource extraction in Canada has created a unique settlement condition that has a thriving and dynamic work force. This thesis investigates prefabricated housing systems destined for resources extraction sites in Canada. Current "drop and clip" models – prefabricated buildings that are trucked to mining settlements and clipped together to create housing and public buildings – yield a high number of housing units for costs that are controlled, but the resulting environments are unidimensional:

<sup>2</sup> Kael Campbell, "Canadians Earn \$13.7 Billion In Camp Jobs or Commuting Outside Their Home Province," Red Seal Recruiting Solutions, July 3, 2015/ accessed May 8, <http://redsealrecruiting.com/canada-interprovincial-employment>.



**LOUIS HELBIG: BEAUTIFUL DESTRUCTION**

Louis Helbig's aerial image of the mining industry in Canada. These are part of a series from his book called 'Beautiful Destruction' Accessed January 15 < <http://www.beautifuldestruction.ca/> >

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they serve as shelter for the workers during the hours when they are not in the mine proper, but little more than this. By operating under the pretext of temporary housing, companies construct and operate the camps emphasizing cost and efficiency. The quality of the human life on camp is left out of this equation. As a result, these temporary work camps are plagued by a series of social issues, including: isolation, depression, sexual harassment and substance abuse.<sup>3</sup> The search for a modified settlement form that considers the worker's experience more fully is central to this thesis.

More specifically, the thesis will search for alternatives to today's dominant form: the rigid, gridded, dormitory settlement provided and installed by the mining companies. The thesis will ask how prefabricated architecture and its arrangement on the site can be rethought so that the worker returns to a "community" – complete with an array of spaces from private quarters to shared realms, in which he or she may live more fully – after a day's work at the

<sup>3</sup> Phillapa Vojnovic, *The Mental Health and Community Impacts of FIFO Work* (Perth: 2015), page 117.

mine. Notably, the thesis seeks to expand the seam between public and private realms, so as to create the setting for a more complete life for the worker, and promote a sense of community in a transient environment. The search for a new housing form also takes seriously the question of the workers' total lack of agency in their living environment in the current model. The idea is to promote social interaction through a flexible, rather than fixed, approach to the settlement.

Finally, in the main, mining companies declare that their aim is to return their sites to pre-extraction conditions once the mine has reached the end of its operational life span. Companies promise to remove all structures used during extraction – including the housing – and to return land and waterways back to pre-extraction form. In reality, this return to a pristine state is impossible, and is never achieved. Post extraction sites are typically deeply modified landscapes, with industrial waste left behind. The photographs of Louis Helbig of and those of Edward Burtinsky of capture Canadian mining's devastation poignantly. This contradiction

between discourse and reality speaks loudly of a persistent distance between Canadians' proclaimed love of landscape and the reality of resource exploitation in Canada. And it is to this distance, this disconnect, that this thesis wishes to speak. *Unpack Living* pursues a settlement form and architecture that firstly, improves camp life from the point of view of the worker, while leaving behind durable, overt traces that openly acknowledge mining's radical transformation of the landscape. The idea here is that the camp – while providing the worker with a humane environment for the duration of their stay -- also leaves behind a commemorative trace, an imprint that becomes a carrier of history, memory, and environmental awareness, in the broader landscape of resource exploitation in Canada.

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## 2.0 A Glimpse into the Past

### 2.1 Nomadic Peoples

Nomadism has historically been a lifestyle adapted to infertile regions where mobility is the best tool for gathering scarce resources. These scarce resources were traditionally animals for hunting, plants for gathering or water but now in the case of resource extraction in Canada the mining company is in search of mineral resources while the worker is in search of quick money. The worker must follow the trail of the mining company's market plan. The First

Nations people of the Prairie's lived a nomadic lifestyle for centuries following the buffalo which would provide them with food and clothing wherever they were. A clear architectural system supported them along the way. The "fly in fly out" (FIFO) population of Canada exists at the collision of nomadism and the company town.

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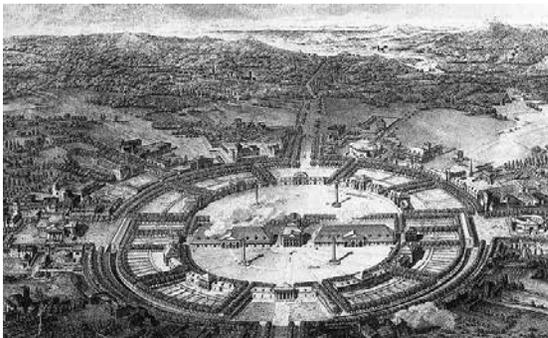
## 2.2 Company Towns

Company towns, towns created by a single company for its own employees, have their origins in the industrial revolution in Europe. Historically, company towns provided and controlled many areas of a worker's life, but they also strove to provide humane environments since the wellbeing of the worker was to the benefit of the company. Eighteen-century French visionary Claude-Nicolas Ledoux envisioned the salt works at Chaux, constructed in 1778, as an ideal city that organized working and living in a cosmologically balanced way. While organizing the royal salt-works at the eve of the French Revolution, Ledoux embraced the worker in a holistic manner, giving ideal form to all aspects of life. Beyond houses and workshops, Ledoux included a covered market, public baths, a house

of worship, gymnasia, schools and hospices, utopian programs such as a "house of tolerance," a temple of peace, and buildings dedicated to moral virtues. His aim was to create a utopic community. The town's semi-circular layout was to both facilitate economic production and ensure healthy and happy conditions for the worker, and its ideal, complete form, alluded to the completion of the worker's life in the town. The circular plan also is a controlling layout, and though benevolent, a director lived in the center and oversaw the entire town from that central position. Within the circular plan form, every aspect of the workers' life became controlled, something a fearful monarchy was happy to see.<sup>4</sup>

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<sup>4</sup> Allan Braham, *The Architecture of the French Enlightenment* (London: 1980), page 159.



#### THE IDEAL CITY OF CHAUX ▲

CLAUDE-NICOLAS LEDOUX, Les salines de Chaux

He is credited with maintaining a strong morale within the work force and putting an end to what were seen as anti-social habits. Ledoux wanted workers to have a complete life and live with their families on site. Ledoux saw the worker and their live on a holistic manner, wanted to control both work life and non-work life

Francisco Martínez Mindeguía, Universitat Politècnica de Catalunya, accessed on March 23, 2016< <http://etsavega.net/dibex/Ledoux-Chaux-e.htm>>

Controlling the worker wasn't just reserved for jittery pre-revolution French aristocracy. American George Pullman had similar intentions when he completed the construction of a new manufacturing complex and town near Chicago for the employees of his Pullman Palace Car Co. He intended for his planned community to help prevent labor unrest, attract a skilled workforce, and increase employee productivity. To do this he provided a clean, orderly environment away from what he saw as the vice-filled big city. The town featured more than a thousand homes, as well as public buildings and parks. Residences had yards, indoor plumbing, gas and daily trash removal - rare amenities for industrial workers of that era. In less than ten years, Pullman's population grew to 12,000 residents.<sup>5</sup> Understanding that skilled and productive employees were crucial to the success of his company, Pullman strove to provide high quality housing to attract the best workers. But he also strove to 'create'

<sup>5</sup> T. Newcomen, "Pullman, Illinois: Changes in community planning from the 1880s to the 1990s", *International Journal of Heritage Studies*, Vol. 4, No. 1 (1998) : page 10-29.

this ideal employee himself, through the town's design, by providing what he thought was necessary to improve human well-being.

A matter of miles from the birth-place of the industrial revolution, Port Sunlight, located just south of Liverpool, saw a new concept in British industrial towns. Beginning in 1888, Lever Brothers, William Hesketh and James Darcy, built a soap factory town to provide housing for their workers. The town took its the name from the Lever Brothers' brand of cleaning agent, Sunlight. Thirty different architects were involved in the design, all closely supervised by William Lever himself. Between 1899 and 1914, 800 houses were built to house a population of 3,500. This company town had allotments and public buildings including the Lady Lever Art Gallery, a cottage hospital, schools, a concert hall, an open-air swimming pool, a church, and a temperance hotel. William Lever introduced welfare schemes, and provided for the education and entertainment of his workforce, encouraging recreation and organisations which



**PULLMAN TOWN ▲**

The lavish design of Pullman. Accessed March 23, 2016 < <http://etsavega.net/dibex/Ledoux-Chaux-e.htm>>

promoted art, literature, science or music-- pushing his own social agenda onto workers.<sup>6</sup>

Lever's goals were "to socialise and Christianise business relations and get back to that close family brotherhood that existed in the good old days of hand labour." Lever sought to control the worker population by stating that Port Sunlight was an exercise in sharing, but that, rather than share profits directly he invested them in the village. Lever's vision approached the issue of control in a different way than Pullman. Very paternalistically, and considering his own morals to be superior to those of his workers, William Lever stated: "It would not do you much good if you send it down your throats in the form of bottles of whisky, bags of sweets, or fat geese at Christmas. If you leave the money with me, I shall use it to provide for you everything that makes life pleasant -- nice houses, comfortable homes, and healthy recreation."<sup>7</sup>

Company owners such as the Levers used strategies of paternalistic social engineering

<sup>6</sup> Adam Macqueen, *The King of Sunlight: How William Lever Cleaned up the World* (London: Corgi Books, 2004), page 80.

<sup>7</sup> Ibid, page 74.

-- including pushing religious or moral ideals onto the working-class employees -- as a way of gently controlling them. The company town offered a platform to exercise social advances while expanding business for the company. This form of control led to uprisings in some company towns including Pullman and by the 1920s, the architectural language of the company town changed dramatically.

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## 2.3 Camp Design History



**THE BULLDOZED ARENA OF CASSIAR, BC ▲**

Majority of the town was bulldozed after the asbestos mine ceased operation in 1992; CBC news accessed on April 17, 2016

< <http://www.cbc.ca/airplay/episodes/2012/08/06/cassiar-reunion-fuels-new->

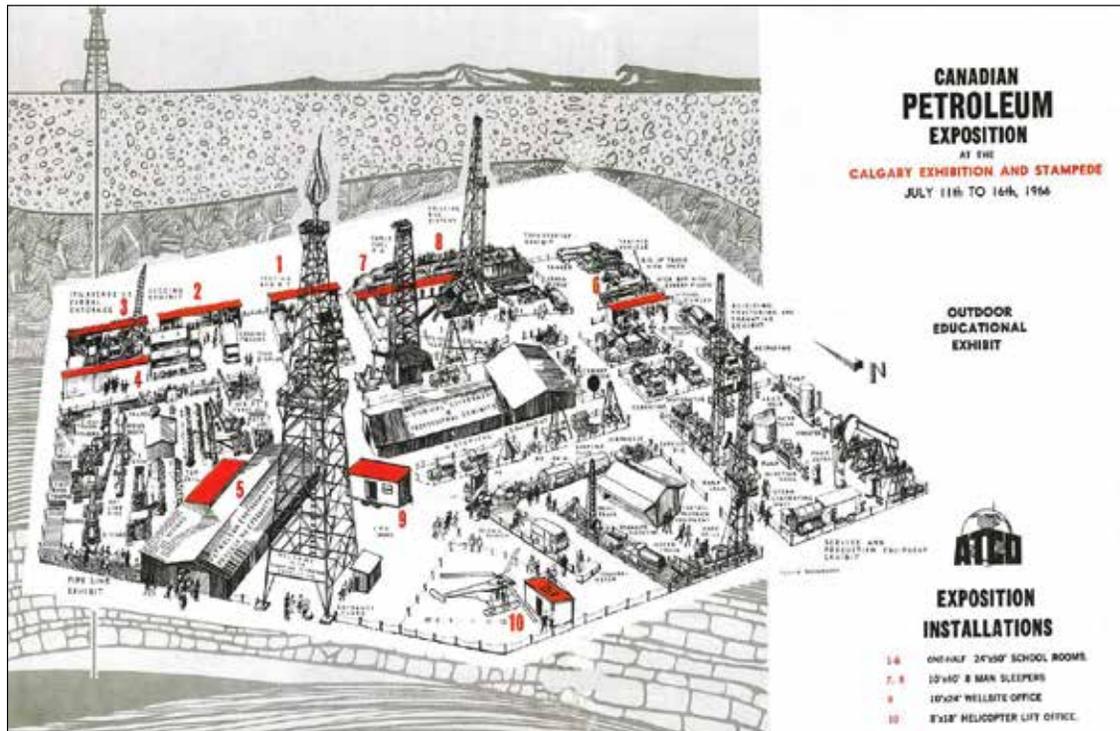
The temporariness of Canada's mining camps is a relatively new phenomenon. It is only in the last twenty-five years that "drop and clip" prefabricated buildings have replaced company towns proper. Markets and industries today are too fast changing to justify a permanent town on most sites in Canada. Even though some mine site may still exist for fifty years, with changing markets, the site may not be in 100% operation the entire time. Company towns in Canada were often abandoned or bulldozed after operation. For example, at the former fifty-acre gold mining town of Braiden, B.C., only twenty dwellings remain of the original eighty built during the town's heyday. Abandoned in the 1970s, the town was sold in 2014 after a long time on the

market.<sup>8</sup> When the asbestos mining town of Cassiar, B.C., ceased operation in 1992, many homeowners attempted to ship their houses to new locations. This was not possible for most residents and the remainder of the town was bulldozed.<sup>9</sup> As these cases illustrate clearly, the architecture of these company towns was not able to respond to mining's inescapable cycle.

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<sup>8</sup> Justin McElroy, "Ghost Town Mysteries: Bradian B.C.," *Global News*, August 19, 2014 / accessed May 22, 2016, <http://globalnews.ca/news/1513118/ghost-town-mysteries-bradian-b-c-a-ghost-town-for-sale/>.

<sup>9</sup> Nick Eaglane, "Can LNG and hydro projects jolt these B.C. ghost towns back to life?," *The Province*, September 26, 2015 / accessed May 21, 2016, <http://www.theprovince.com/technology/>



#### ATCO BROCHURE FOR THE 1966 CANADIAN PETROLEUM INDUSTRY ◀

Alberta, 1947. Risky, but lucrative, petroleum field operations from the oil boom were followed by pipeline construction, gas plants and other developments. Worksite living began in tents, then individual rental trailers, and by the early 1960's, the first work camps were buzzing with residents.

In 1966, it was recognized that the petroleum industry had assumed an important place in the economy of the province and hosted the Canadian Petroleum Exposition at the prime-time event of Western Canada – The Calgary Stampede. One of the aims was to introduce the youthful fun-seekers to the industry that was fueling the nation. Accessed May 10, 2016 < <http://www.atcosl.com/en-ca/Our-Stories/Lists/Posts/Post.aspx?ID=46>>

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## 3.0 Today's Situation

### 3.1 Temporary Settlements

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The landscape of the company town model shifted over the 20th century. In Canada, company towns stopped being built in the late 1970s. The mining town of Nanisivik, Nunavut, is one of the last company towns to have been built in Canada. Constructed in 1975 to support the zinc mining operation that opened in 1976, the town is now deserted following the mines closure in 2002 and the majority of the \$50-million worth of industrial and residential infrastructure has been demolished.<sup>10</sup> The combination of several forces brought about the end of the company town, from fast changing markets to the growing affordability of air travel. Housing in industrial operations therefore shifted from permanent forms to temporary, prefabricated solutions known as “work camps.” Settlements made of prefabricated, temporary trailers

gained popularity in the 1970s and continue to gain momentum today. One company that has secured much of the temporary prefabricated housing market is ATCO- Alberta Trailer Company, a company with nearly 8000 employees and assets of approximately \$19 billion. The latter had its beginnings in Alberta and provided trailers to the mining industry since the 1960s.

In rethinking camp housing, it is necessary to explore the layout of the accommodation on site and the design of the workers' camp from the mining resource company's perspective. It is implied that the mining company has provided facilities that they believe are sufficient for an acceptable quality of life. But many questions must be asked: what is required to achieve the minimum standards for a fulfilling life? How or why did the mining company decide upon what to provide and how to organize the settlements? Going further, might a more

creative approach to prefabrication methods make possible much higher standards of living than is currently provided? Logically, the mining company approaches the site as a machine for resource extraction; the worker's life on the camp is only one portion of the equation. To move towards a better understanding of the contemporary work camp, it is useful to look back and trace the steps that mining companies have followed to make their decisions about camp design. The following section examines what is currently provided on a camp, how today's camp supports a sufficient quality of life, and how camp conditions compare to those provided historically by mining companies to their workers.

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<sup>10</sup> Tee Wern Lim, *Inuit Encounters with Colonial Capital: Nanisivik - Canada's First Hight Arctic Mine* (Vancouver: University of British Columbia, 2013), page ii.



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### 3.2 What is a Work Camp?

Work camps are residential accommodations provided to an employee by their employer. Typically they are located near the resource extraction site as a solution to isolation and lack of local resources and services. They generally cater to shift-work arrangements, in which workers typically work for three weeks and leave for one week (or a different combination of time in and time out). Work camps come in a variety of types – some are large with a wide array of amenities and services on site, and some are small, providing only the basics. Small camps can house as few as five to thirty people and typically have limited facilities on-site. Large camps can house up to 5,000 people and have many amenities and services on-site. The need for camps follows varying timelines. Some exploration camps are only needed for a few weeks whereas others have a fifty-year lifespan.

Some large camps have amenities such as exercise facilities, dining halls, coffee shops, satellite TV and wireless Internet.<sup>11</sup> As for the settlement's residential component, the mine employer typically contracts out the housing to another company. The latter single handily designs and constructs the entire housing and amenity complex, complete with plumbed and wired living units. The supplier company has entire control over the camp design: the landscaping, the communal amenities, the food services and the individual worker units. An important feature of these camps and a reason for their shape is that the modular units are designed to fit on a 11'x 60' truck bed. This thesis reconsiders this highly deterministic logic of conception and assembly.

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11 Government of Alberta, "Wood Buffalo Work Camp Report", *Wood Buffalo Labour Market Information*, May 2012, <http://www.woodbuffalo.net/LMIResources/Reports/reports.html>.



**MINE SITES ACROSS CANADA - OPERATING 2014 ▲**

Mining sites operate in all areas across Canada, they are not restricted to Canada's north or Alberta's oil sands.

The Mining Association of Canada, Accessed May 05, 2016

Accessed May 10, 2016 < [http://mining.ca/sites/default/files/documents/Facts\\_and\\_Figures\\_2014.pdf](http://mining.ca/sites/default/files/documents/Facts_and_Figures_2014.pdf)>

### 3.3 Current Life at a work Camp: Fly in, fly out

The ephemeral group of 'fly in fly out' workers who go to camps to work, but who will not remain in the region after the job is over, have become known in Canadian media as the 'shadow population'. While the stereotype might be a "rig-pig" of young single men, the statistics tell a different story. According to the 2012 census, more than half of the men are over thirty five and a majority are over the age of forty five.<sup>12</sup> More than half are in a common law relationship or married and

a growing number — 17% are women.<sup>13</sup> The work camp population is diverse and complex. Mining companies should provide settlements that register this fact much more precisely. As one example, rather than assume that all workers are autonomous salary earners with no family ties, the camps could offer housing for workers who are members of partnerships or families.

<sup>12</sup> Brent Wittmeier, "Life in a northern work camp: Huge 'shadow population' of oil workers flies in, flies out," *Edmonton Journal* (Edmonton, AB), January 7, 2014.

<sup>13</sup> Ibid.





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reduced to a mere producer of labour on the mine site, constantly existing in a work-sleep cycle, with emphasis on the sleep.<sup>17</sup> The physical and mental isolation is difficult for workers to deal with. Alberta's rate of suicide is the highest in the country, and is thought to be associated with the FIFO lifestyle. The difficulties workers face on camp are complex; distance from family and friends is straining, facilities like washrooms and showers, which are private when one lives off-camp, are communal. In turn, dining, which is familial off-camp, is here shared with large groups of other workers with whom one shares no ties. A nurse on a site in northern Ontario commented: "facilities are communal, including washrooms showers, dining – and the two cherished telephones on site. I learned quickly there are no long, drawn-out hours of whispering

<sup>17</sup> Verna Murphy, "Time to talk about the toll of 'fly-in, fly-out,'" *Fort McMurray Today*, July 31, 2014, <http://www.fortmcmurraytoday.com/2014/07/31/time-to-talk-about-the-toll-of-fly-in-fly-out>

sweet nothings on this company phone, because the big bruiser behind you has two weeks of sweet nothings stored up and ready to explode if you don't hurry."<sup>18</sup> Working on an isolated camp in Alberta Lindsay Moore didn't think that her relationship with her spouse could survive the FIFO lifestyle. "Honestly if you were in a fresh relationship, I don't know how it would survive. You become so detached from your real life"<sup>19</sup> The work camp is a harsh environment marked by physical and mental isolation. Creating an improved work camp design, with a strong sense of community, would begin to tackle these issues.

<sup>18</sup> Gloria Tougas, "Nurse faces gruelling culture shock of mine camp life," *The Northern Miner*, February 20, 2006, <http://www.northernminer.com/news/nurse-faces-gruelling-culture-shock-of-mine-camp-life/1000201171/>.

<sup>19</sup> Jamie Hall, "Long-distance love: Couples deal with separation anxiety of the oilpatch variety," *Edmonton Journal*, January 7, 2014, <http://www.edmontonjournal.com/business/>.

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## 4.0 Camps: Philosophical Constructs

In order to conceptualize an architecture for camps, Italian philosopher Giorgio Agamben, observes camps as lenses through which to understand broader and highly determinant social and political configurations. Camps, for Agamben, are political constructs that reveal profound political entanglements. He argues that all citizens in a capitalist society live in a camp, having been stripped of their autonomy by external political and economic factors losing control their lives from the moment of birth right up until death. In reference to the concentration camps of World War II, he describes camps as “the ‘Nomos’ of the Modern.” “The camp is the space that is opened when the state of exception begins to become the rule.”<sup>20</sup>

Agamben revisits the Roman figure of the homo sacer, a figure with no status within society, a figure outside the law, whom anyone can kill without impunity. This poignant figure, for

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<sup>20</sup> Giorgio Agamben, *Homo Sacer: Sovereign Power and Bare Life* (Stanford: Stanford University Press, 1998), page 19.

Agamben, is similar to the camp dweller: a person endowed simply with, as Agamben calls it, a “bare life.”<sup>21</sup> The architecture of camps is thus an architecture of “bare life.” Agamben argues the obligation for the worker to succeed in a capitalist society has driven him or her to make quality of life sacrifices to go a work on a camp. Individuals make decisions based on money regardless of the outcome of their relationships to family, community and ‘humanness’ – and these fundamentals of life are all pushed aside.

German political philosopher Hannah Arendt’s idea of ‘worldlessness’<sup>22</sup> can be layered on to the workers human state in a camp. In a camp, the individual no longer can exercise the choice to interact in the public realm through action and speech because their schedule and the “public realm” do not belong to them.<sup>23</sup> Through losing this choice, the worker also loses their opportunity for

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<sup>21</sup> Ibid, page 36.

<sup>22</sup> Hannah Arendt and Margaret Canovan, *The Human Condition*, 2nd ed. (Chicago: University of Chicago Press, 1998), page 52.

<sup>23</sup> Ibid, page 26.

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individuality and the basic fundamentals of being human. The worldlessness of a person existing in such a camp comes from being stripped of the opportunity to actualize one's full humanity. In the work camp, the worker's actions and speech do not resonate in a truly common world; life in its full and public sense has been stripped away.

The experience of the person in such camps is distilled to labor production. There is no time nor space for any 'making.' Arendt writes that labor is the only activity that corresponds to the experience of worldlessness. Arendt goes further: "The simple erection of a material home, as, for example, nomadic tribes are wont to do, is in Arendt's view an insufficient remedy for the worldlessness of labour."<sup>24</sup> A shelter doesn't constitute a home, and building a shelter does not compensate for worldlessness. According to Arendt, persons who live in work camps would be experiencing the pure definition of worldlessness. Arendt writes about the importance of stability

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<sup>24</sup> Finn Bowring, *Hannah Arendt: A Critical Introduction* (London: Pluto Press, 2011).

and permanence in human life. The sheer set up of these camps does not allow for either. Their physical and mental isolation impedes workers' ability to participate in a political society.<sup>25</sup>

The idea of an employer desiring to improve the quality life of their employees, and to control more and more aspects of their life, still exists today. Google may be famous for creating fun places to work, but it could be argued that their intentions are not completely genuine. They create a dynamic work environment to get people to want to stay at work, thus completing more work.

So why do resource extraction companies in Canada choose to provide only the bare necessities of life with seemingly no concern for quality of life? Black Diamond, a company that provides temporary camp buildings (including housing), uses rhetoric such as "tough as a diamond"<sup>26</sup> (Black and Diamond Group 2015)

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<sup>25</sup> Hannah Arendt and Margaret Canovan, *The Human Condition*, 2nd ed. (Chicago: University of Chicago Press, 1998), page 31.

<sup>26</sup> "Black Diamond Camps & Lodging," Black Diamond Group, 2016, accessed March 20, 2016, <http://www.blackdiamondgroup.com/>.

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The slogan implies that the environment of the accommodation is something to survive. Living in a Black Diamond trailer means you are a macho and tough person. Companies try to attract employees through higher salaries as opposed to offering opportunities for workers to conduct a fuller life while in their employ. Conversely, workers, in their attempt to earn a living and support themselves and their families, make quality of life sacrifices. This contradiction, this desperate pairing of mining company's job opportunities and workers' need for a salary, poses profound economic and political questions. Architecture cannot hope to solve them. But architecture can rectify some of the imbalance, and empower the worker in an otherwise disempowered relationship. This is where this thesis operates: in a strategic design language that opens up space and agency for the dweller, wherever and however possible.

Mining companies have consistently tried to attract employees through generous wages. For workers to even consider it, the job must be financially very rewarding. The companies

also promote the notion of an "elite" work force to add to job appeal. Companies want their employees to be 'tough' in both the physical and mental sense, and sell the point that the "elite" worker should be proud to have survived a camp. This idea of toughness is antithetical to the historical idea of civility that permeated utopian discourse about company towns. This page from the Black and Diamond brochure celebrates the implied similarity between the diamond mine worker and diamonds themselves: Nothing's tougher than a Diamond'.<sup>27</sup> To be sure, the notion of toughness is intended to cover up, or make up for, what is in fact a shallow and hollow existence likely devoid of joy and fulfillment. Companies sell the notion of toughness disingenuously.

Historically companies have wanted to offer workers more than just jobs. As seen above, the promise of a fuller life veiled a desire to control the worker, either politically or morally, from Ledoux, to Pullman, to the Lever brothers. But regardless of these alterative motives, industrialist employers

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<sup>27</sup> "Black Diamond Camps & Lodging," Black Diamond Group, 2016, accessed March 20, 2016, <http://www.blackdiamondgroup.com/>.

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typically wished to give more than a job to their employees, and to provide them with a complete life. The company town was just that, a town, and thus, was imbued with a civic sense and logic. Its dwellers were always citizens, complete individuals that were part of a larger social entity. In today's fly in, fly out model, workers of Canada's temporary camps see their loved ones and families on an infrequent basis, something the Lever brothers would have no doubt seen as ungodly. The design of today's camps does not take living a fuller life into consideration. And while the industrialists of yester-year and their ideas about socially engineering their workers can easily appear manipulative and self serving, today's mining companies engage in a type of manipulation that is arguably more pernicious.

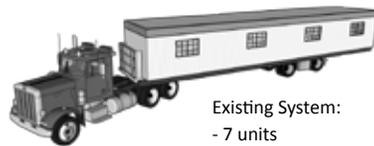
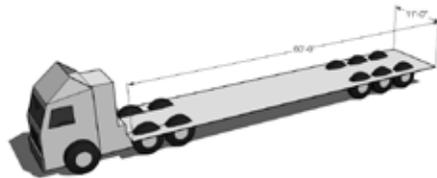
## 5.0 Design Concept Frames



### NAVIGATING A SHIFT IN THE OIL SANDS ▲

The PTI Athabasca Lodge, an enormous camp for migrant oil workers near Fort McMurray, sits empty. Taken from New York Times, Accessed May 05, 2016

Accessed May 10, 2016 <<http://www.nytimes.com/slideshow/2015/10/02/business/navigating-a-shift-in-the-oil-sands/s/20151006OILSANDS-SS-slide-HZRT.html>>



Existing System:  
- 7 units  
- Max 7 beds

Due to the ever changing nature of the resource industry in Canada, this thesis exists in the need for a flexible, temporary system that is both environmentally and socially sustainable. The current system which operates under the pretext of temporary housing, does not operate in a temporary manner quickly enough to keep up with changing markets. For example the, with current oil prices dropping and Alberta affected by the price drop camps are being closed and left abandoned. For example the 2,005 Athabasca

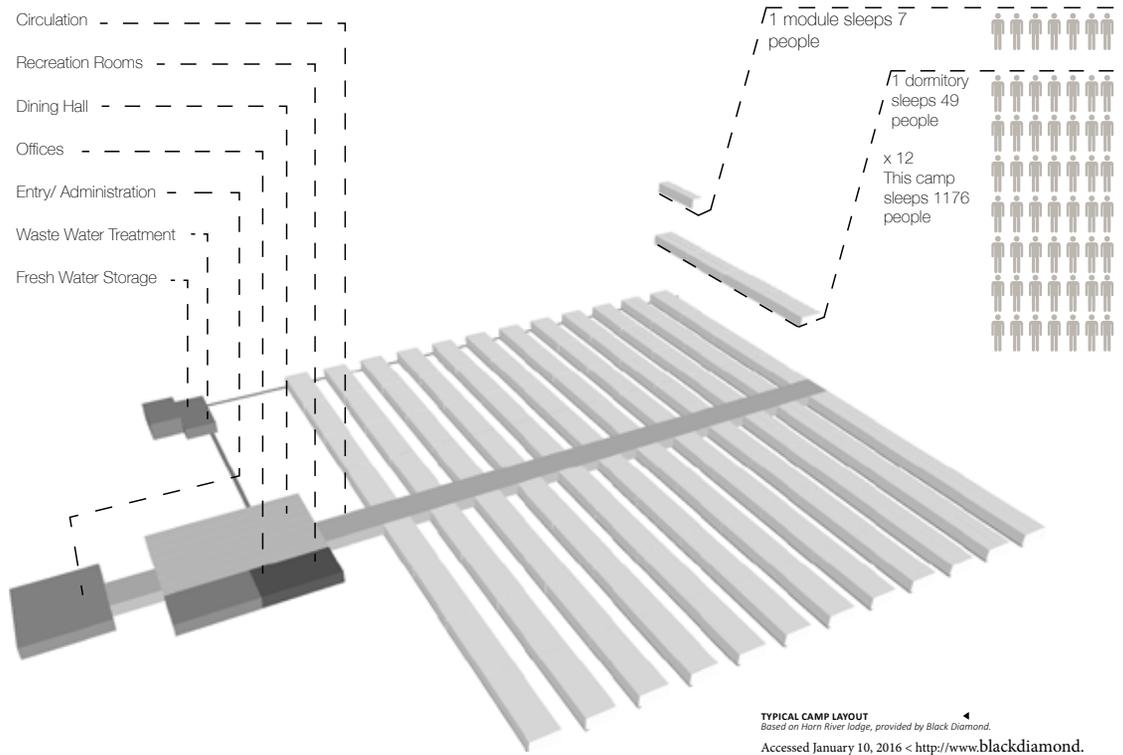
Lodge near Fort McMurray is currently closed, left abandoned and not operational.<sup>28</sup> Without losing sight of create a strong community, this thesis exists in temporary architecture that can easily adapt and shift to the economic changes of the mining site. Let us briefly return to the current system in order to understand it fully.

<sup>28</sup> "Athabasca Lodge | Open Camp N of Fort McMurray," Lodges and Villages, May 12, 2014, accessed July 20, 2016, <http://civeo.com/lodges-villages/canada/athabasca-lodge/>.

### 5.1 Prefabrication and Truck Beds

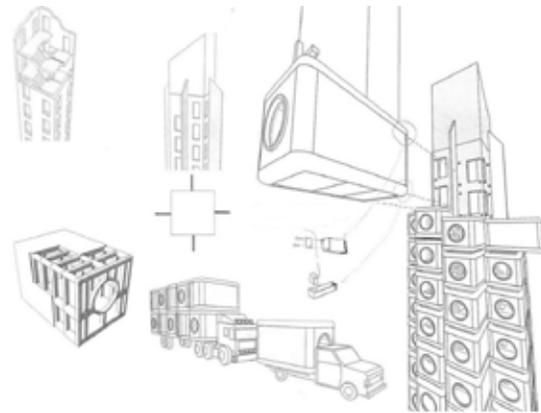
In Canada, almost all mining companies, including Barrick Gold, Suncor Energy and Syncrude Canada purchase their housing and contract its installation to one company. This company 'delivers' the prefabricated housing and amenity spaces to the mine site, and maintains it for the duration of the extraction activity. In a typical installation, one unit containing seven single dormitories is placed on a truck; these units do

not contain washrooms, hence a 'wet' module containing six showers and six toilets, is placed on an eighth truck. Typically, therefore, eight trucks are needed to complete a section of the camp that would house 49 single dormitory rooms. This thesis proposes to work within this existing system, and is intended to remain appealing to mining companies. The innovations this thesis brings to the current system are to do with a



**TYPICAL CAMP LAYOUT**  
 Based on Horn River Lodge, provided by Black Diamond.  
 Accessed January 10, 2016 <<http://www.blackdiamond.com.html>>

critical rethinking of what the trucks are, in fact, transporting to the sites, and how the truckloads are packed and unpacked. Rather than linear boxes of dormitory rooms measuring the width of a truck bed, the starting point for this proposition is to imagine different ways that a truck's load can be deployed to become a settlement. This thesis proposes to improve the number of beds per truck, with no need for a wet module. The modules will provide the worker with improved accommodations – and specifically, dwelling units that are more spacious, more varied in terms of layout, that have views of the landscape rather than of a facing row of dorm-housing, and that have a private bathroom - at similar shipping times and costs. In turn, the communal facilities will differ from existing models in that they will have their own logic and follow a site and population-specific organization rather than being made by joining single trailers together.



NAGAKIN CAPSULE TOWER ▲  
*Modular units create dense urban living.*

Accessed April 21, 2016 < <http://nohutoda.blogspot.ca/2013/11/ici-seni-ds-beni-yakan-nagakin-kapsul.html> >

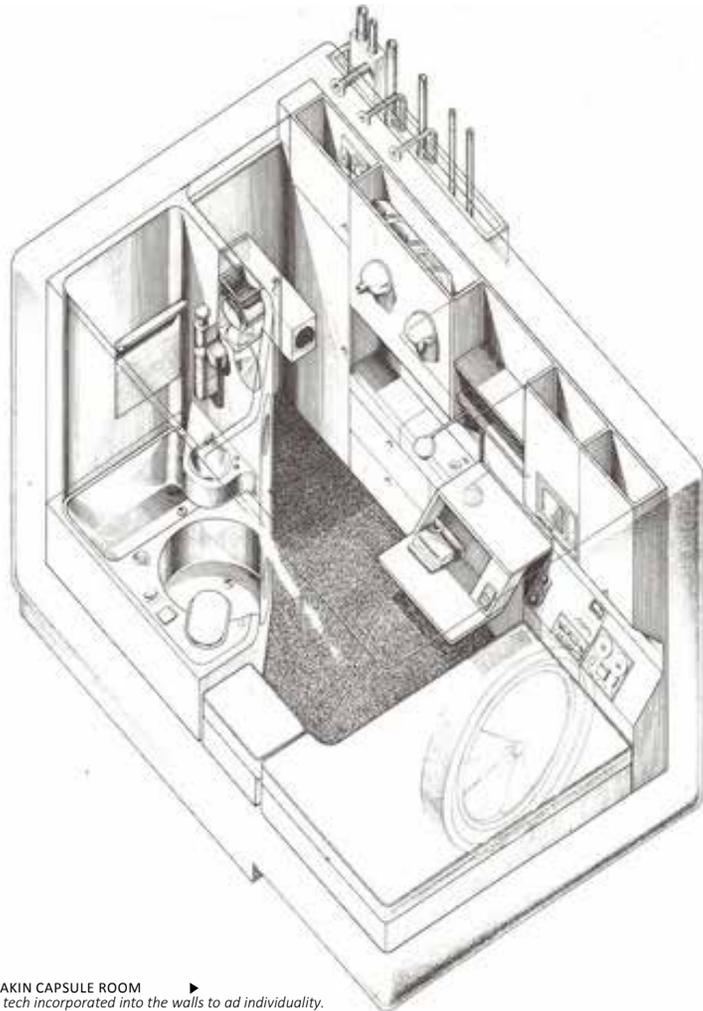
## 5.2 Pleasure in flexible dwelling

### Capsule Architecture

The architectural need for alternatives to permanent settlements is not new to the resource extraction industry. In the early post-war years, the Japanese Metabolists looked at development strategies that embraced the notions of organic growth and change. The group of visionaries and architects dreamed of future cities. Kiyonori Kikutake (1928-2011) was one of the first contributors to the first Metabolism pamphlet which laid out some of these futuristic development ideas- “Metabolism 1960: The Proposals for a New Urbanism.”<sup>29</sup> Kikutake’s

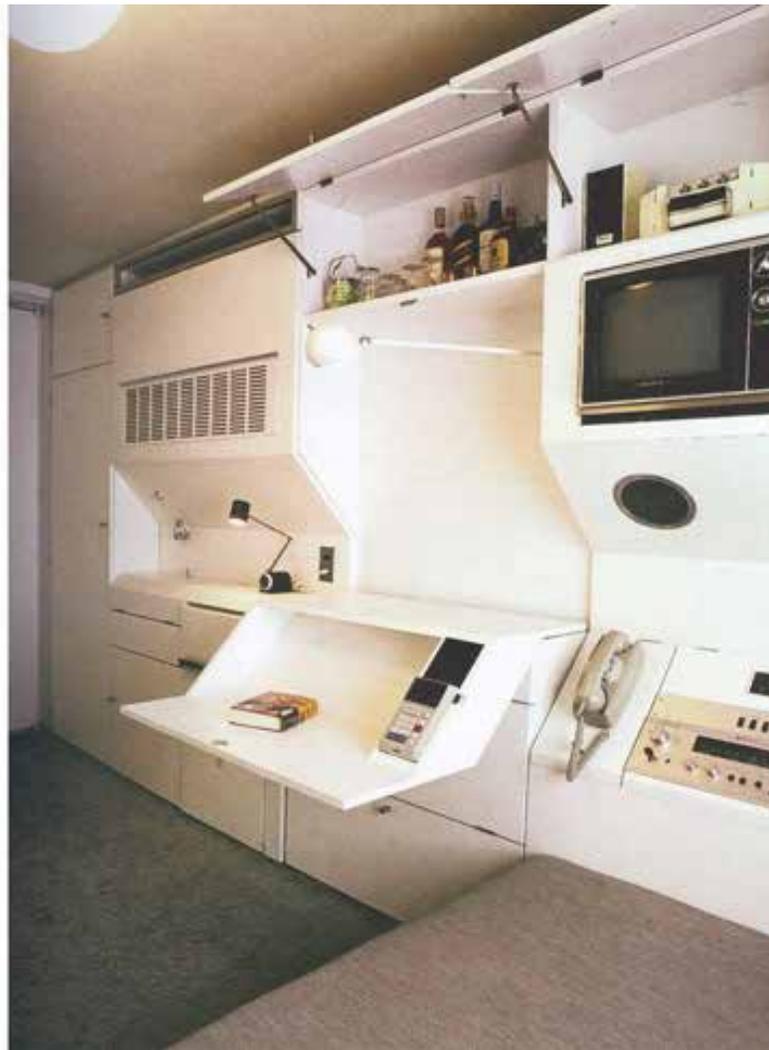
<sup>29</sup> “Lecture: What Was Metabolism? Reflections on the Life of Kiyonori Kikutake / Toyo Ito,” Arch Daily, November 10, 2012, accessed July 20, 2016, <http://www.archdaily.com/287150/lecture-what-was-metabolism-reflections-on-the-life-of-kiyonori-kikutake-toyo-ito>.

and his colleagues’ work embraced the idea of cities in flux: cities in constant change, accepting of impermanence. Many of the proposals incorporated technological advancements not of their time, which could not yet be realized as buildings. Notably, Metabolist concepts addressed the uncertainty of the ground condition with megastructures that could adapt to changing economic and environmental surroundings through the addition and removal of modules. Nakagin Capsule Tower, 1972, by Kisho Kurokawa is a very early example of capsule architecture. The Metabolists’ interactive approach to the ground plane and the principle of modularity have been layered onto this thesis proposition.



**NAGAKIN CAPSULE ROOM** ▶  
*High tech incorporated into the walls to ad individuality.*

Accessed April 21, 2016 < <http://nohutoda.blogspot.ca/2013/11/ici-seni-ds-beni-yakan-nagakin-kapsul.html> >



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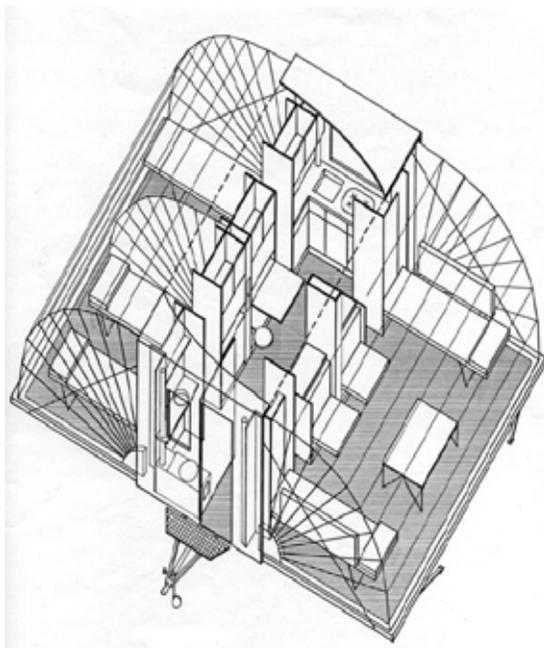
### Folding Architecture

In aboriginal and European architecture alike, there is a distinction between sedentary and nomadic architecture. Indigenous people of the Canadian North, for example, built igloos and tents, and combinations thereof, according to seasons. Their structures were flexible.

Liverpool School of Architecture specialist on mobile architecture, Robert Kronenburg, describes that the feeling of home and of belongingness to one's surroundings is dependent on the ability to modify them.

<sup>30</sup> The possibility of flexible personal space for temporary workers could create a stronger sense of belonging in a transient environment. More involvement in one's own surroundings could create a stronger sense of place. Flexible and changing personal furniture can be a way of nurturing agency and creating ownership.

Conceived by Dutch designer Eduard Bohtlingk, the Markies' camper easily triples a typical camper's floor space and is able to comfortably shelter a family of four thanks to its foldout rooms. Böhtlingk conceived the Markies as a mobile holiday house in his entry for the "Temporary Living" competition in 1985. This modern camper-trailer inventively employs the folding principle in order to increase the initial 2 m x 4.5 m interior space threefold when it is parked in a desired location. In 1996 the project was awarded the Public Prize at the prestigious Rotterdam Design Prize.<sup>31</sup> The strategy of folding as a way of producing spatial flexibility is an interesting one that will be referred to later on.



'THE AWNING' DE MARKIES ◀  
This mobile home was an entry in the "Temporary Living" competition in 1985

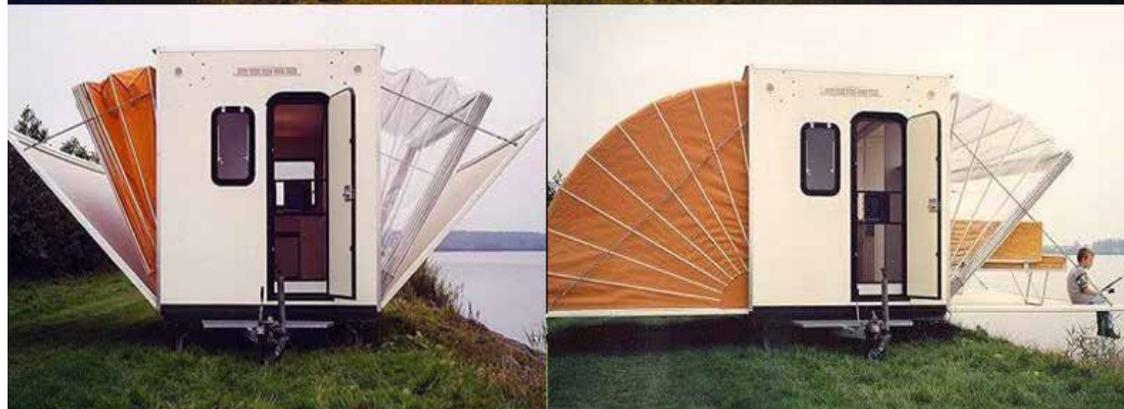
Accessed April 10, 2016 < <http://www.bohtlingk.nl/en/markies-2/>>

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30 M. Schwartz-Clauss and Robert Kronenburg, *Living in Motion: Design and Architecture for Flexible Dwelling* (Germany: Vitra Design Stiftung, 2002).

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31 Ibid.



EDUARD BOHTLINGK MARKIES' CAMPER ►  
*'Expanding' temporary architecture.*

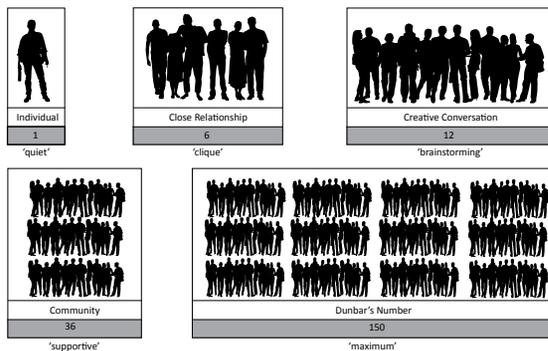
Accessed May 10, 2016 < <http://tinyhousefor.us/wp-content/uploads/2015/02/UrbanCampsite-Markies-6-IIHIIH.jpg> >

## 5.3 Social Grouping Scales

“Dunbar’s number” is a proposed psychological cut-off to the quantity of individuals with whom one can keep up stable social connections. These are connections in which an individual knows who every individual is and how every individual identifies with each other person. This number was initially proposed in the 1990s by British anthropologist Robin Dunbar, who found a connection between primate’s cerebrum size and normal social gathering size. After transposing his studies on primates to humans, he recommended that people can only keep up one hundred and fifty stable relationships.<sup>32</sup>

Apart from this large group of one hundred and fifty, studies show how different group sizes are conducive to different relationships. George Miller disclosed ‘a rule of seven, plus or minus two: Some Limits on Our Capacity for Processing

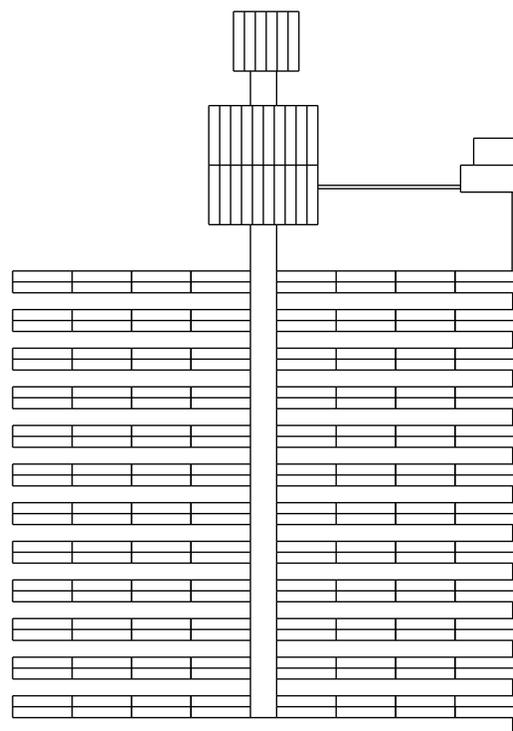
Information.<sup>33</sup> Groupings seem to naturally follow a factor of six or seven; a group of six is typically close family and maybe one or two very close friends, ‘the working group’. A group of twelve is considered conducive for creative conversation and for energizing brainstorming. Finally, a group of thirty people can operate on a community level.<sup>34</sup> Taking these group sizes into consideration, the housing design proposal will incorporate spaces supportive of each grouping sizes, with a maximum space of gathering at one hundred and fifty. In turn, gathering spaces will be designed for a maximum of one hundred and fifty people. In this sense, the proposition begins by scaling down the work camp by dividing it into parts and joining these parts via a connective circulatory structure and communal spaces.



<sup>32</sup> R. I. M. Dunbar, “Neocortex Size as a Constraint on Group Size in Primates,” *Journal of Human Evolution* 22, no. 6 (June 1992), doi:10.1016/0047-2484(92)90081-j.

<sup>33</sup> George A. Miller, “The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information,” *Psychological Review* 101, no. 2 (1994), doi:10.1037/0033-295x.101.2.343.

<sup>34</sup> Matthew E. Brashears, “Humans Use Compression Heuristics to Improve the Recall of Social Networks,” *Scientific Reports* 3 (March 21, 2013), doi:10.1038/srep01513.



TYPICAL WORK CAMP PLAN ▲  
 'Corridor' community

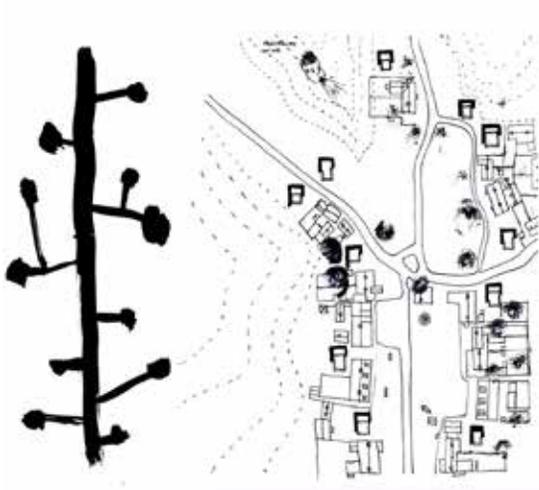
## 5.4 Existing Module Construction

A representative from Black Diamond, Toronto, provided me with a set of working drawings of a typical trailer used for camp office or accommodation. The following drawings are extracted from this set. These reveal that the system is intended to be durable while also demountable, such that trailers can be reused on other sites. Upon closer examination, I found the construction assemblies to be of conventional stick frame construction, and there was really nothing particularly modern or inventive about the trailer's detailing.

The trailer form and construction lends itself to repetition. The result is that work camps' site organization follows a corridor pattern. The work camps are effectively 'corridor camps.' All because all the circulation paths are organized with a corridor access logic. Direct, straight, double-loaded corridors shape the 'community' and create an abrupt distinction between

'public' and private realms, while evacuating any gradations from public to private (including semi-public and semi-private) realms. This leads to a lack of choices as to how one can get to one's own room. As one would never walk down any other 'corridor' than the one leading to one's own room, one's daily experience is devoid of surprise and spontaneity. Opportunities for encounter and human relationships are similarly limited. This thesis responds to this oversimplification of the circulation paths.

When considering themes of spontaneity and encounter in the built environment, the work of Team 10 is helpful. This group of avant-garde architects formed in 1953 and formulated a critique of CIAM's tenets that promoted a more relational approach to the urban realm. Team 10 responded to modernism's oversimplifications with "ground up" urbanism and architectural forms that rekindled spatial overlaps. Their



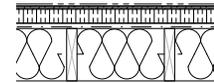
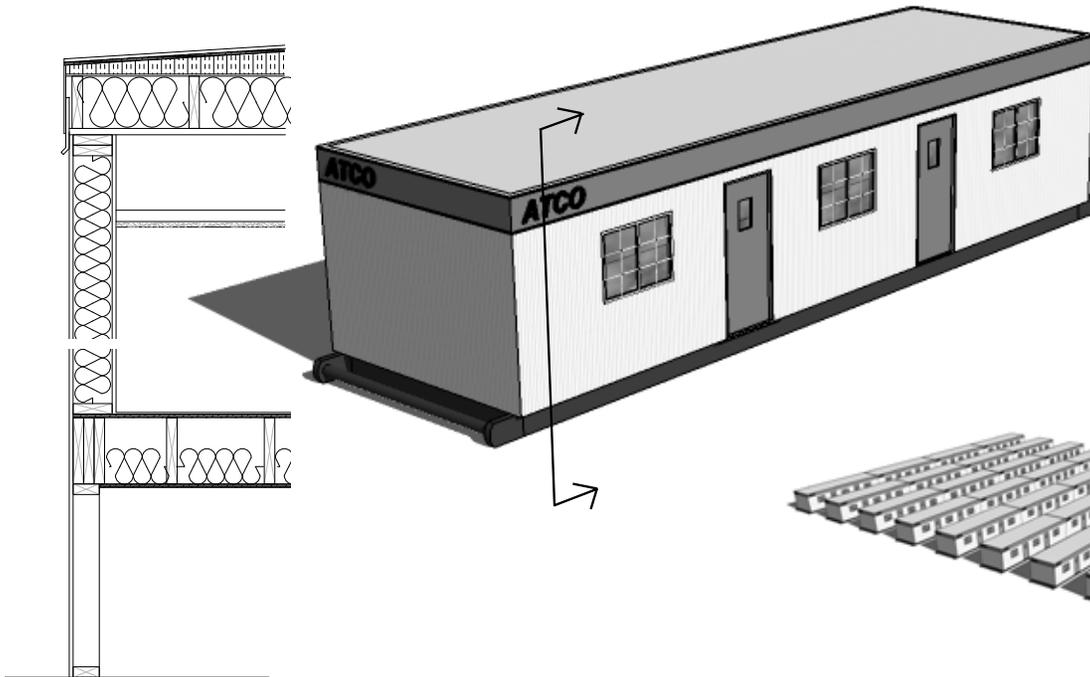
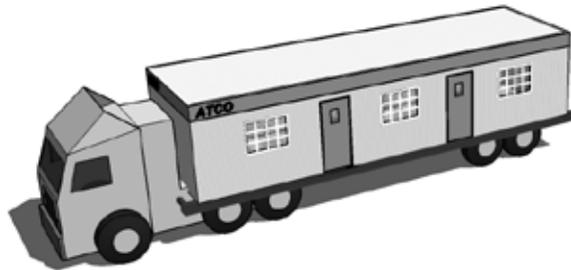
SMITHSON "FOLD HOUSES" ▲

Accessed May 20, 2016 <<http://jsah.ucpress.edu/content/73/2/226>>

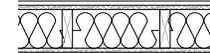
work started with a single dwelling cell, and this cell (which accommodated human activities) was then organized into clusters. From 'cell to cluster,' such was Team 10's motto. The cells were assembled into clusters to establish spatial variations and connections between the public and private realms of the urban fabric. The Smithson's cluster diagram of Fold Houses<sup>35</sup> it is within the space of these overlaps, in the realm of blurring of lines, that the design proposal for a renovated work camp unfolds.

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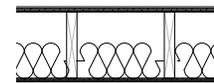
<sup>35</sup> Team 10 et al., *Team 10 in Search of a Utopia of the Present 1953-1981* (Rotterdam: NAI Publishers, 2006).



**ROOF ASSEMBLY:**  
 48 MIL MEMBRANE  
 1/2" PLYWOOD  
 FIBREGLASS INSULATION- FULL  
 ROOF CAVITY  
 ROOF JOISTS 2"X8" @ 12" O.C.  
 VAPOUR BARRIER, 6 MIL POLY  
 1/2" GWB



**WALL ASSEMBLY:**  
 28 GA. METAL SIDING  
 3/8" PLYWOOD  
 2"X6" @ 16" O.C.  
 R-20 FIBERGLASS INSULATION  
 VAOUR BARRIER: 6 MIL POLY  
 1/2" VINYL COVERED GWB



**FLOOR ASSEMBLY:**  
 VINYL TILES  
 5/8" T&G PLYWOOD  
 2"X10" JOISTS @ 16" O.C.  
 PERIMETER-WOOD BEAM- 3-2"X10"  
 R20 FIBERGLASS INSULATION  
 7/16" O.S.B. UNDERSHEATHING



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## 5.5 Biodegradability versus Lasting Structure

The proposition here presented resists the idea of complete erasure of the site, and aims to contribute to a national narrative regarding extraction of resources in Canada. While the units will be transported from site to site, a commemorative architectural residue will be left behind after the mine has closed, telling part of the story of Canada's history of resource extraction. In this design proposal, the worker housing is temporary and off the grid; it is durable and ready to be completely removed and transported to another site at any time. Other portions of the camp program, notably the circulation and the communal spaces, will leave a structure decomposing behind. The latter will eventually biodegrade. During this process of biodegradation and overgrowth by vegetation, the armature becomes a landscape folly telling the story of Canadian resource history.

In current practice, mining companies promise to return the site to its original state at the end of the mine's life span, as though the mine had never existed. This may be the official approach

but reality tells another story. One example is the Giant Mine, a large gold mine located just outside of Yellowknife, in the Northwest Territories. Giant Mine began operations in 1948 and ceased in 2004. According to an article published in The Toronto Star in 2006 a total of 237,000 tonnes of deadly arsenic trioxide dust, the lethal by-product of extracting gold from the mineral arsenopyrite ore, was left at the site in underground chambers. These underground capsules are now monitored by a staff of fifteen people, and will continue to be for an unlimited amount of time. Documentary filmmaker France Benoit has named these maintenance workers 'guardians of eternity.'<sup>36</sup>

Kobberling & Kaltwasser's *The Games are Open* was an art piece in built and installed in 2010 on a city-owned site in Vancouver not far from the recently vacated Olympic Village.<sup>37</sup> The

<sup>36</sup> "The Guardians of Eternity: Giant Mine Through Eyes of Yellowknives Dene," CBC News, November 7, 2015, accessed July 20, 2016, <http://www.cbc.ca/news/canada/north/the-guardians-of-eternity-giant-mine-through-eyes-of-yellowknives-dene-1.3309446>.

<sup>37</sup> "Köbberling & Kaltwasser: The Games Are Open," Other Sights, 2014, accessed May 19, 2016, <http://othersights.ca/kobberling-kaltwasser-the-games-are->



sculpture represented a huge bulldozer, and the artists positioned it to face vacant land that was awaiting redevelopment. The bulldozer was made from Microstrand (a compressed wheat chaff bi-product) and slowly biodegraded as the site it faced was built up. Over the five years of the project's existence, the artwork's form shifted from sculpture to garden to dirt pile. Within Vancouver's context of land speculation, and that city's cycles of building up and tearing down, the sculpture became an iconic presence. The Microstrand representation of a macho-machine devolved from within. The Microstrand representation of a macho-machine devolved from within as the structure weakened, the artwork's social value increased.<sup>38</sup> Games are Open was subject to economic, bio-environment, and social forces. Its vulnerability invited re-invention.

open/.  
 38 "Köbberling & Kaltwasser: The Games Are Open," Other Sights, 2014, accessed May 19, 2016, <http://othersights.ca/kobberling-kaltwasser-the-games-are-open/>.

THE GAMES ARE OPEN ◀  
*During the summer of 2010 the artist team Köbberling & Kaltwasser worked with materials recycled from the 2010 Olympic Games. Accessed January 20, 2016 < <http://www.koebberlingkaltwasser.de/the-games-are-open.html>>*

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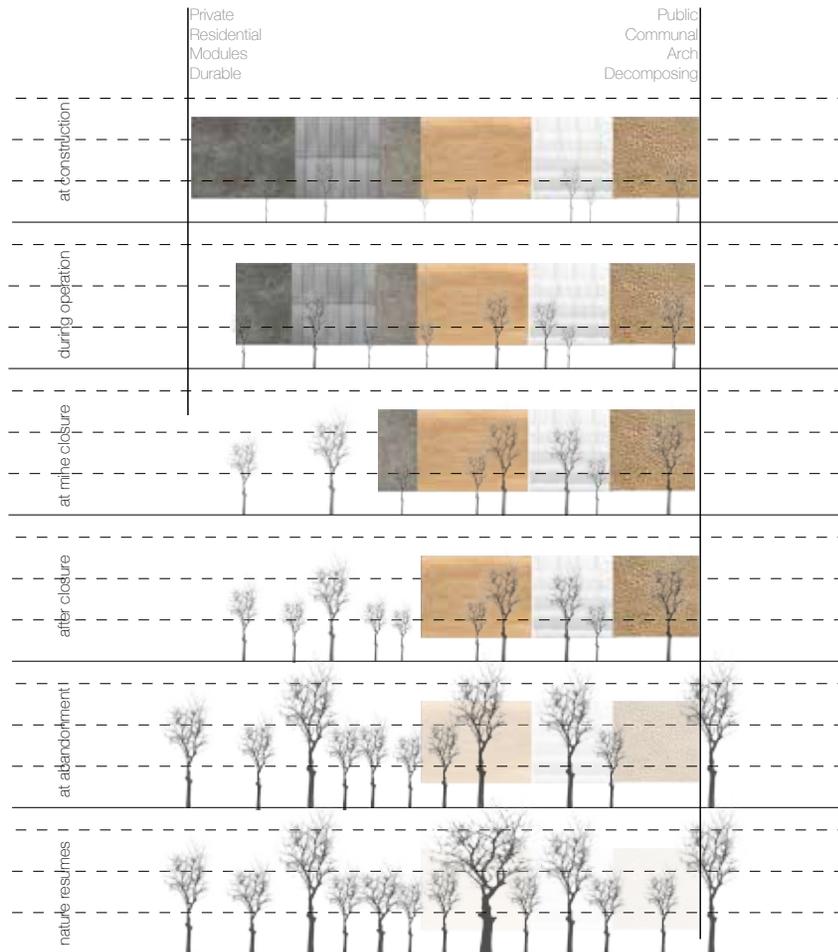
## 6.0 UNPACK LIVING: A NEW PREFABRICATED SYSTEM

The following section presents a proposal for a new prefabricated building system which, when unpacked, generates a new settlement designed to be installed near an extraction site. The goal is to devise a demountable modular system of private and public spaces whose parts and components are adaptable and responsive to various site types and to specific topographical and climatic conditions. As stated above, this thesis accepts the mining industry's premise of "settlement temporariness" and does not propose a return to the permanent company town model. The system here presented is conceived to operate on dual scales: the scale of the inhabitant, and the scale of the landscape.

The aim of the new system is threefold:

1. Improve all aspects of the worker's life on the site, from social life to private dwelling, through better environments and the provision of agency in the determination of environment.
2. Re-design the housing system so as to avoid the need for clear cutting. Devise a new system that can insert itself into existing sites in various ways; adopt a more organic approach in comparison to currently available systems.
3. Devise a prefabricated system with reusable and biodegradable parts that leaves an architectural residue of the mine after the site has been closed down.

### Material by Time, Material by Use

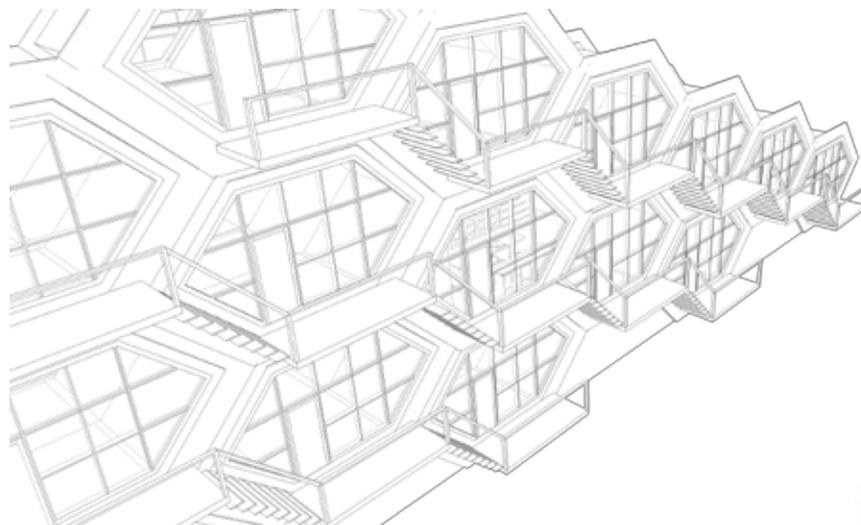
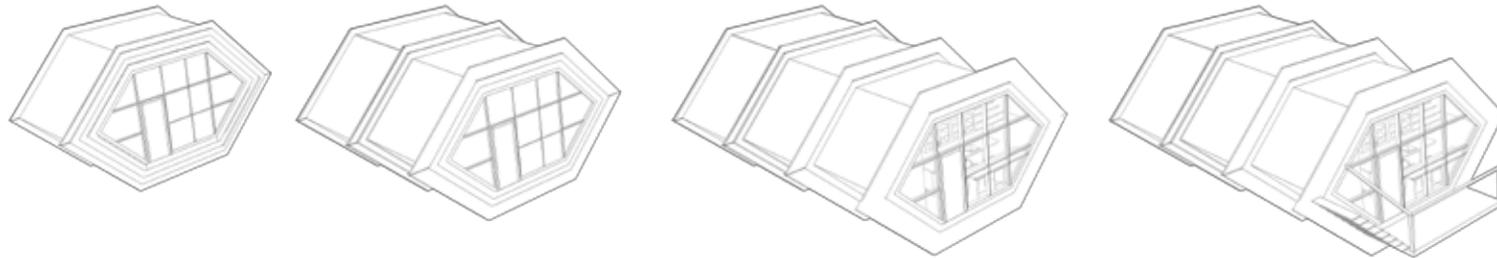


-  Steel Structure for modules
-  Metal Siding for modules
-  Temporary Concrete Foundation
-  Typical Dimensional Lumber
-  Biodegradable Translucent Plastic
-  Biodegradable Plastic Connections

**MATERIAL BY TIME** ◀  
*Choosing materials with an honest approach- the residential modular units will be completely removed from site, they must be durable therefore using materials like steel and metal. The communal spaces*

Transportation Mode

Living Mode



**A SHIFT IN SHIPPING ▲**

*Expanding units use the same if not less shipping than the conventional module, providing the worker with more than the bare minimum.*

**FLEXIBILITY IN DWELLING ◀**

*Pods deployed and expanded, easily stack and assemble with each unit having its own built in circulation, the 240' windowless corridor has been set free.*

**KNOW WHO'S NEXT DOOR ▼**

*With the floor plans of the unit organized with the semi private zone towards the circulation, it blurs the line between the 'public' and private spaces.*



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## 6.1 Modularity-THE UNIT

The dwelling units are conceived to allow for a high degree of customization per unit, from the exterior to the interior. Customization of the exterior adapt the unit to the surrounding site and climate. Specifically, the units are equipped with solar panels.

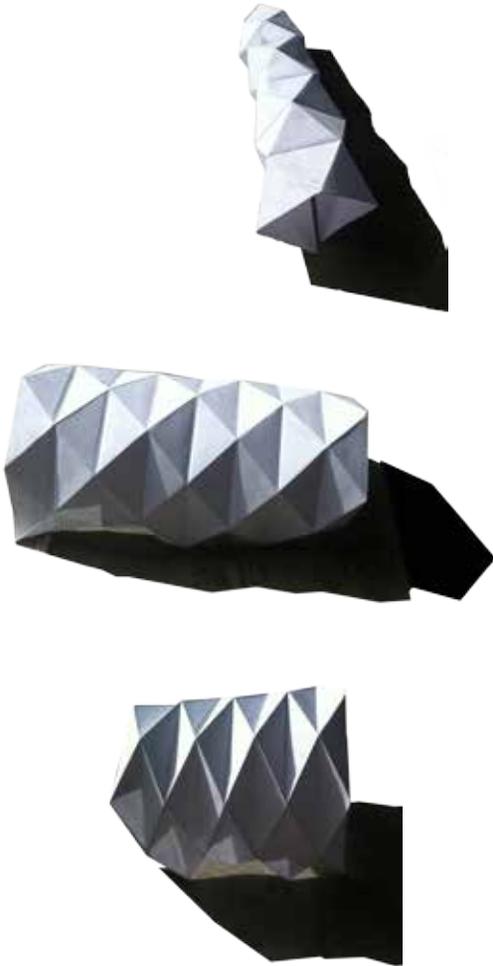
The interior space is to be customizable by the end user. A high tech abacus wall is key to this idea. These interactive walls will be designed on a customizable grid, allowing for the user to adjust the space exactly to their needs. This

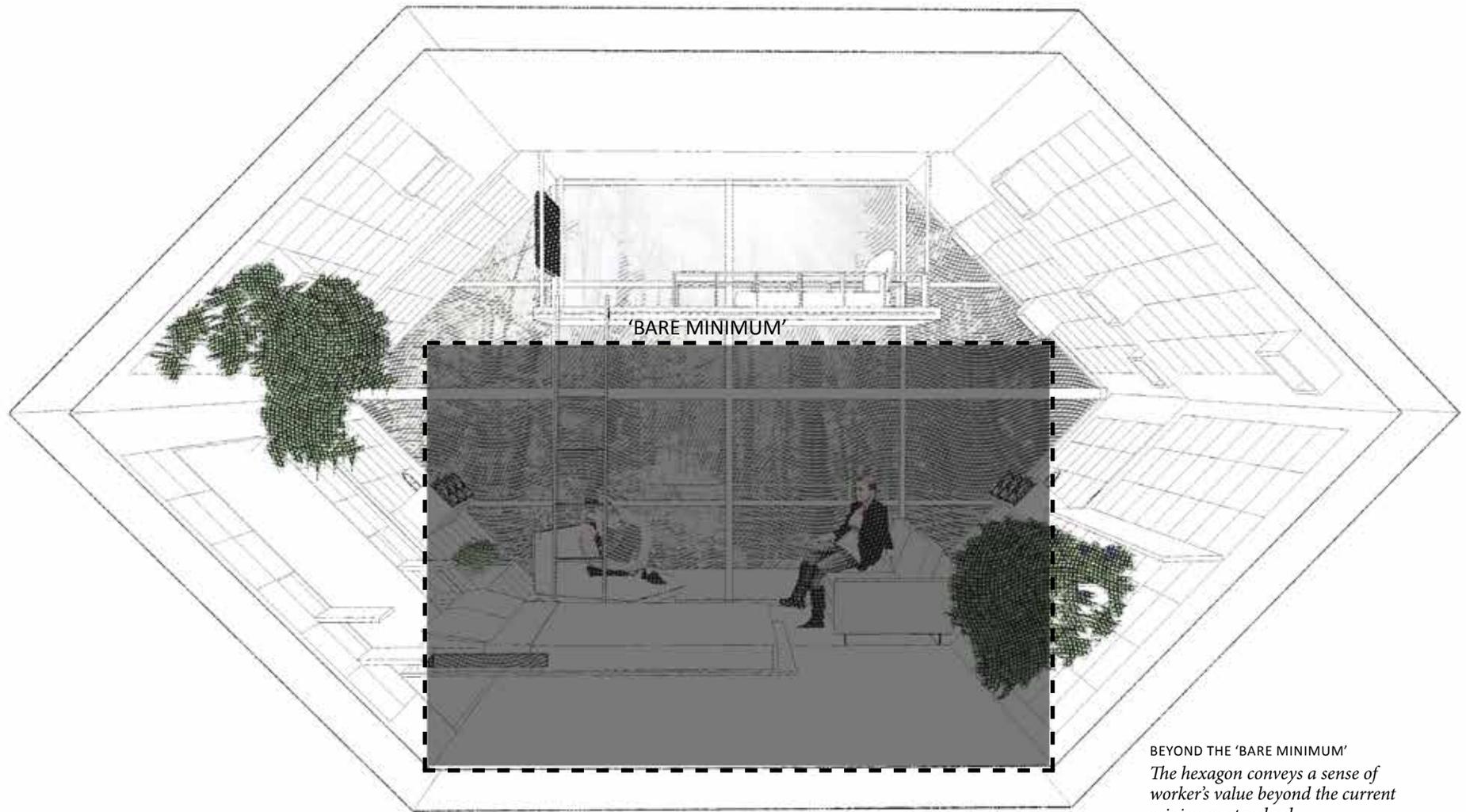
## 6.2 Hexagonal Form

The current minimum standard in housing tends to take the form of a rectangular box. This thesis proposes units that are hexagonal in form. The hexagon contains the square (or rectangle), but, as a mirrored trapezoid, it also includes triangles. This arrangement is very interesting: if the square refers to 'bare minimum' housing, the triangles are extra and non-needed spaces. In this thesis proposal, these extended triangular zones in the dwelling units are what convey a sense of the worker's value. Whereas a square geometry is customary in housing, the hexagon

customization will combat one of the main limitations of current work camp housing, which is that all of the units are identical no matter who lives in them. There are no options for couples to live together. No units are large enough for families. All units provide the same furniture and room layout. The new design provides units that a supervisor or labourer can adjust to suit their own needs and habits. Not every worker needs a desk, for example. In this system, the dweller can replace the desk area with a relaxing lounge space.

adds 'non-useful' square footage. A worker on a camp is accustomed to being provided with nothing but the bare minimum. A hexagon adds a realm beyond the square, an interstitial mystical space, to the worker's domestic world. The space beyond the square in the hexagon becomes a "para-utilitarian" space; it elaborates the typical domestic environment. The worker might use the space to add an additional loft space, or might use the area to bring the outdoors in with hanging planters.





BEYOND THE 'BARE MINIMUM'  
*The hexagon conveys a sense of  
worker's value beyond the current  
minimum standard.*



CUSTOMIZATION OPTIONS ►

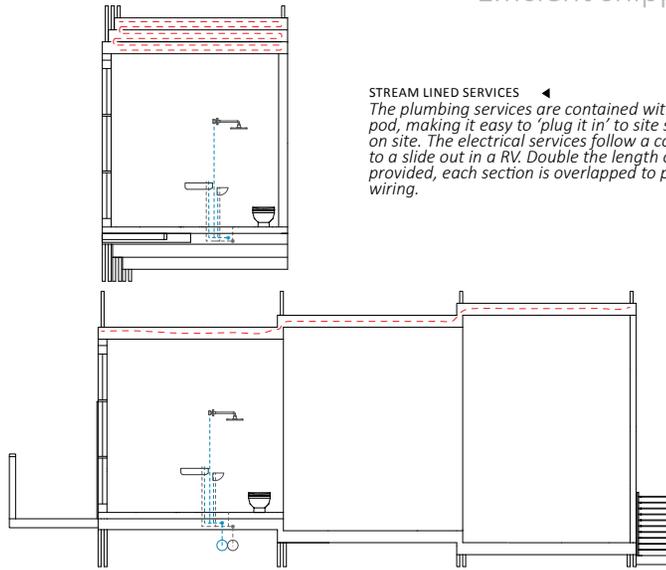
*The end user has the option to customize each wall as they wish. Whether it is where the electrical outlets are, the position of the speakers, the amount of greenery they wish to have inside, they can set up they space exactly as they wish.*



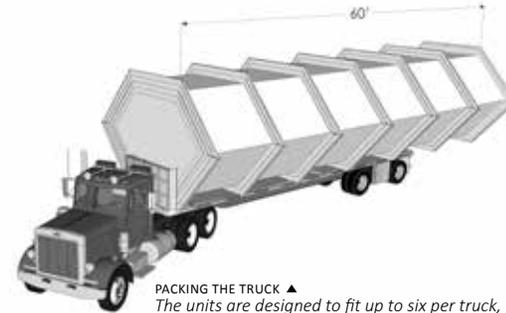
HIGH TECH ABACUS WALL

*Customization is crucial for individuals to feel empowered. This 'plug-n-play' wall works on a one foot steel grid system, shifting and sliding items exactly as the user defines them.*

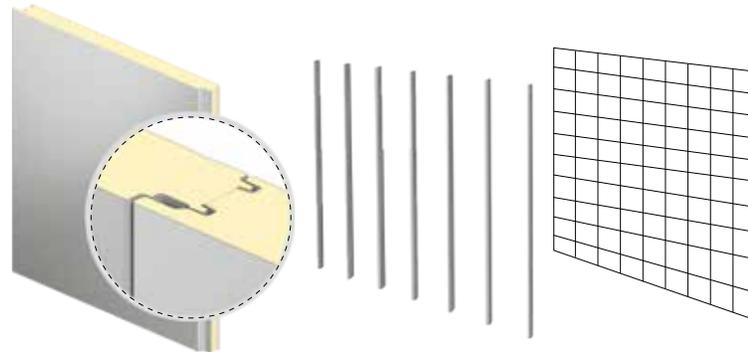
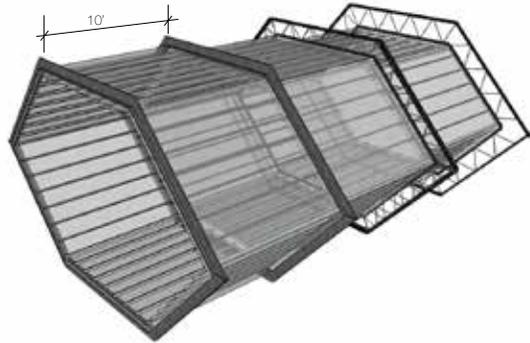
Efficient shipping. Straight forward construction.



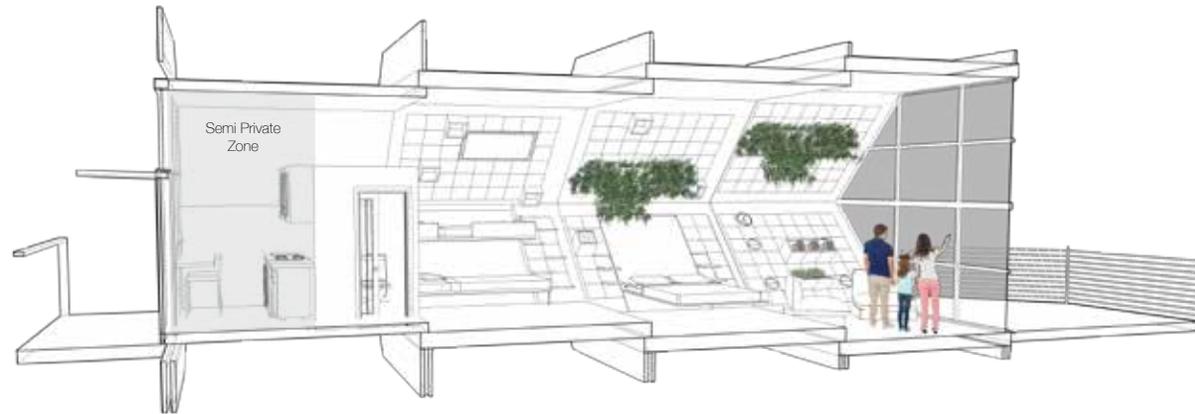
**STREAM LINED SERVICES** ◀  
 The plumbing services are contained within one section of the pod, making it easy to 'plug it in' to site services when expanded on site. The electrical services follow a coil approach, similar to a slide out in a RV. Double the length of electrical wiring is provided, each section is overlapped to provide a clear path for wiring.



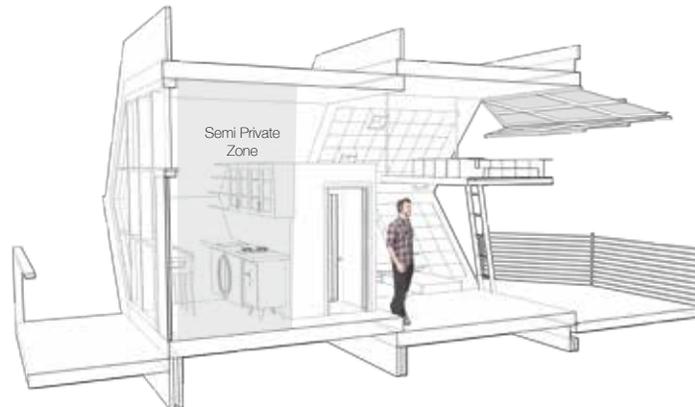
**PACKING THE TRUCK** ▲  
 The units are designed to fit up to six per truck, compared to the seven of the current system. But with double occupancy units, and family units (see the next page) up to 24 bed could be placed on a truck. Shipping efficiency is crucial due to the location of the isolated sites, and speed of construction.



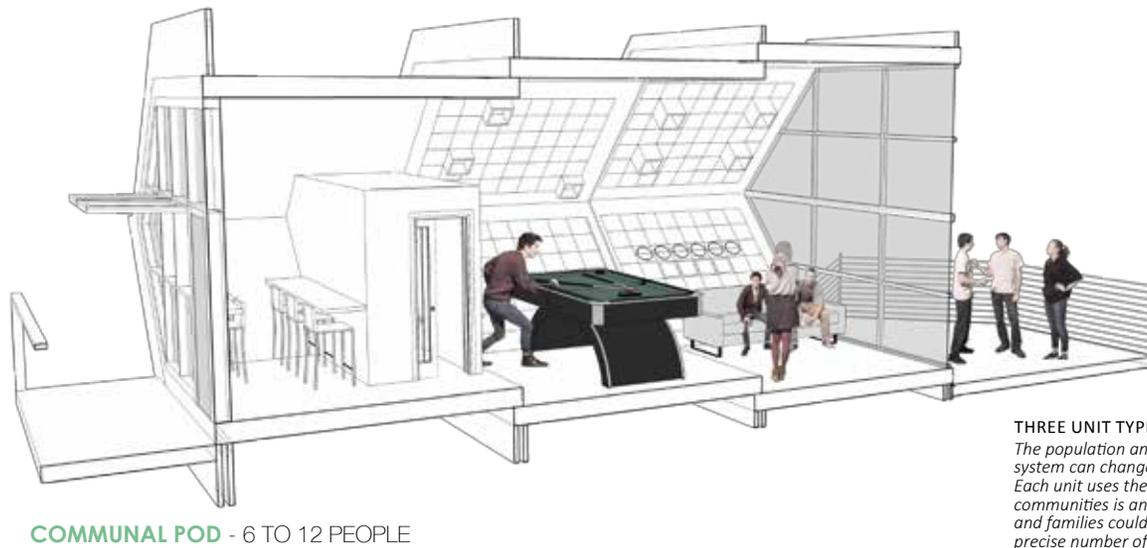
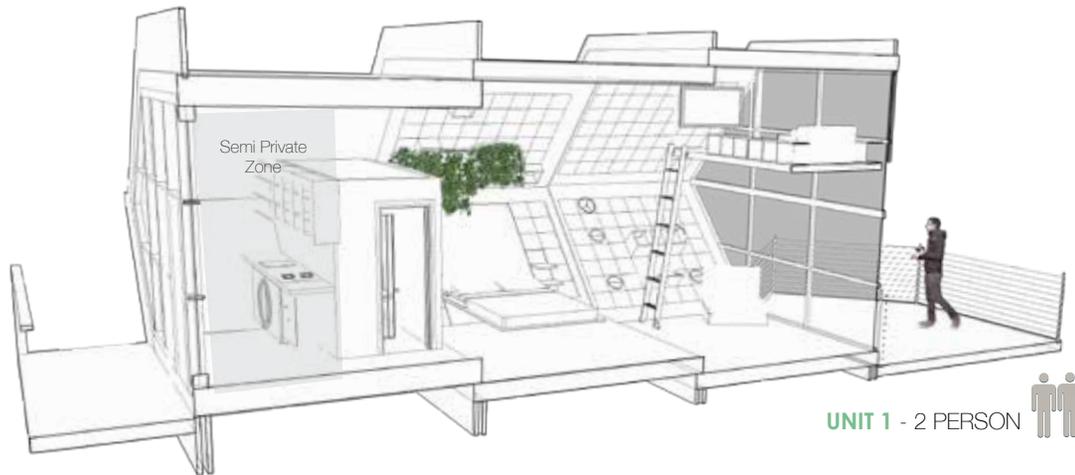
**SHORT SPANS, EASY ASSEMBLY** ◀  
 With the units compressing to ten foot sections, the spans are short considering. This allows the metal structural insulated panel to span the entire distance, enabling the steel studs to be exposed, ready to receive the high tech abacus wall, clad in light metal panels. These materials are durable, meant for long term use, and will not be as susceptible to varying site conditions such as moisture and mold.



 3-4 PERSON -UNIT 2



UNIT 3 - 1 PERSON 



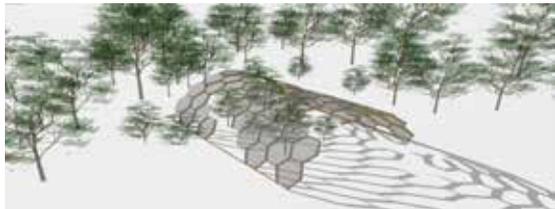
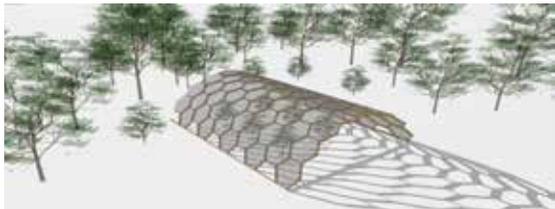
**THREE UNIT TYPES + COMMUNAL POD**

*The population and the groupings of the camp are always changing. This housing system can change along with the changing dynamics of the mining industry. Each unit uses the same structure and connection so assembly of tailor made communities is an ease. This now means couples can work on a mine together, and families could visit for extended periods. Also, with individual units, the precise number of units is provided without wasting extra modules that aren't needed.*

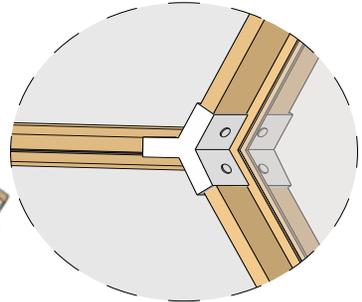
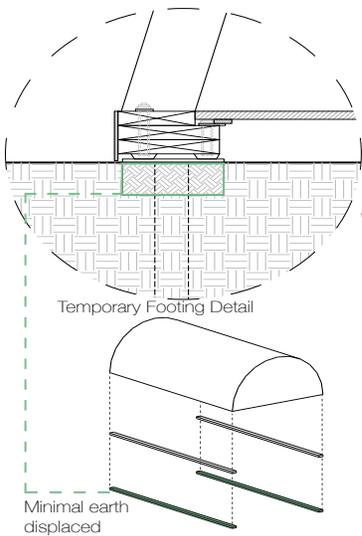
1.0 Section title goes here



Landscaping is the first to arrive on site instead of the first to leave

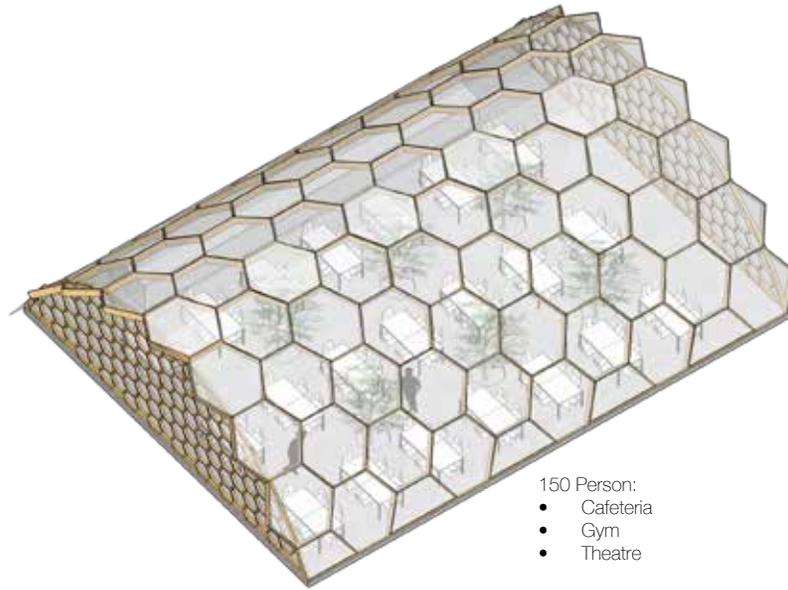


Concept of time

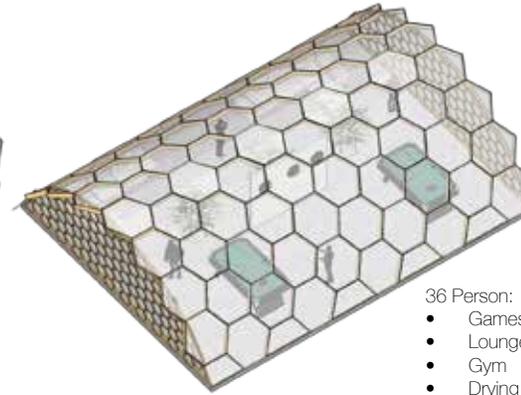


One Connection  
The hexagon only requires one connection, making construction simpler. One 3D printed biodegradable plastic connection, allows the communal arch to be left behind.

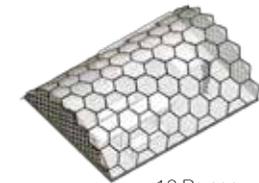
**COMMUNAL PAVILION** ◀  
A simple light structure composed of short spans of dimensional wood and biodegradable plastic allows the structure to touch the earth lightly. A gently footing detail minimizes the amount of excavation required.



- 150 Person:
- Cafeteria
  - Gym
  - Theatre



- 36 Person:
- Games
  - Lounge
  - Gym
  - Drying room
  - Kid's play area



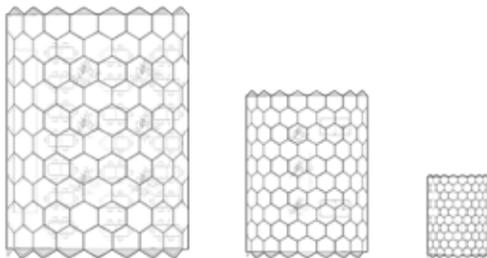
- 12 Person:
- Quiet
  - Gathering
  - Reading
  - TV

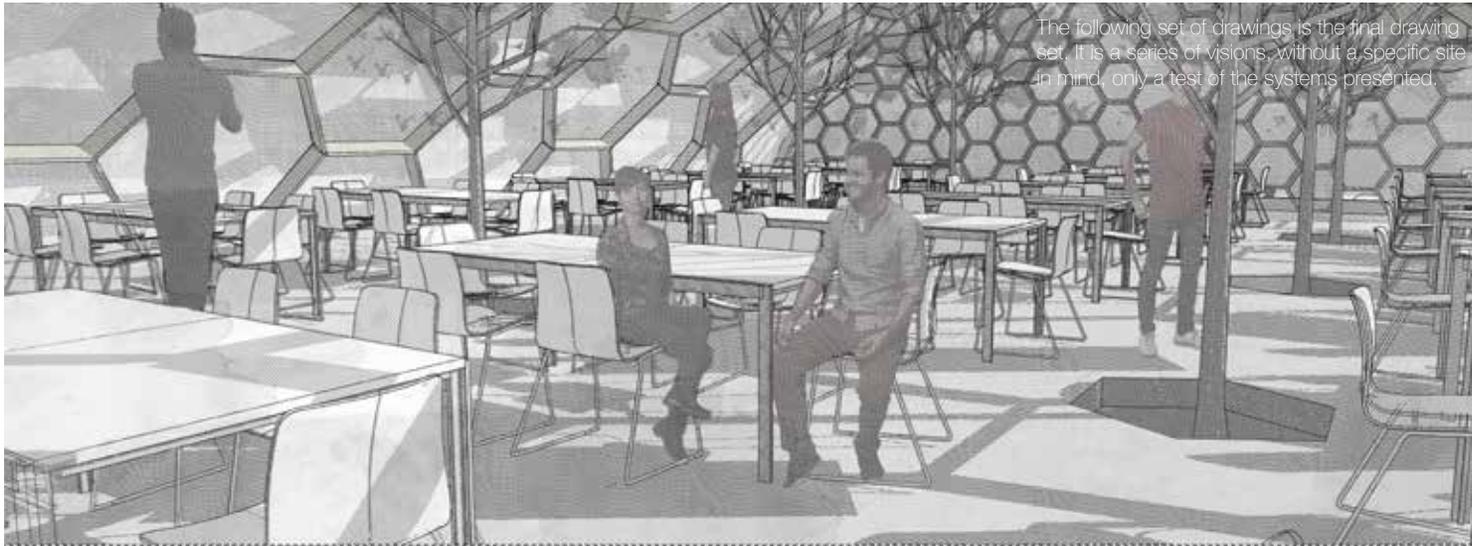
## 6.3 Community

One of the key aspects of the camp is its focus on the time that the worker spends outside of work and outside of their units. The communal spaces are crucial to the mental health of the workers, and are the first step to providing a fuller life on camp. This thesis is proposing an adaptable system that can provide a flexible, dynamic enclosure.

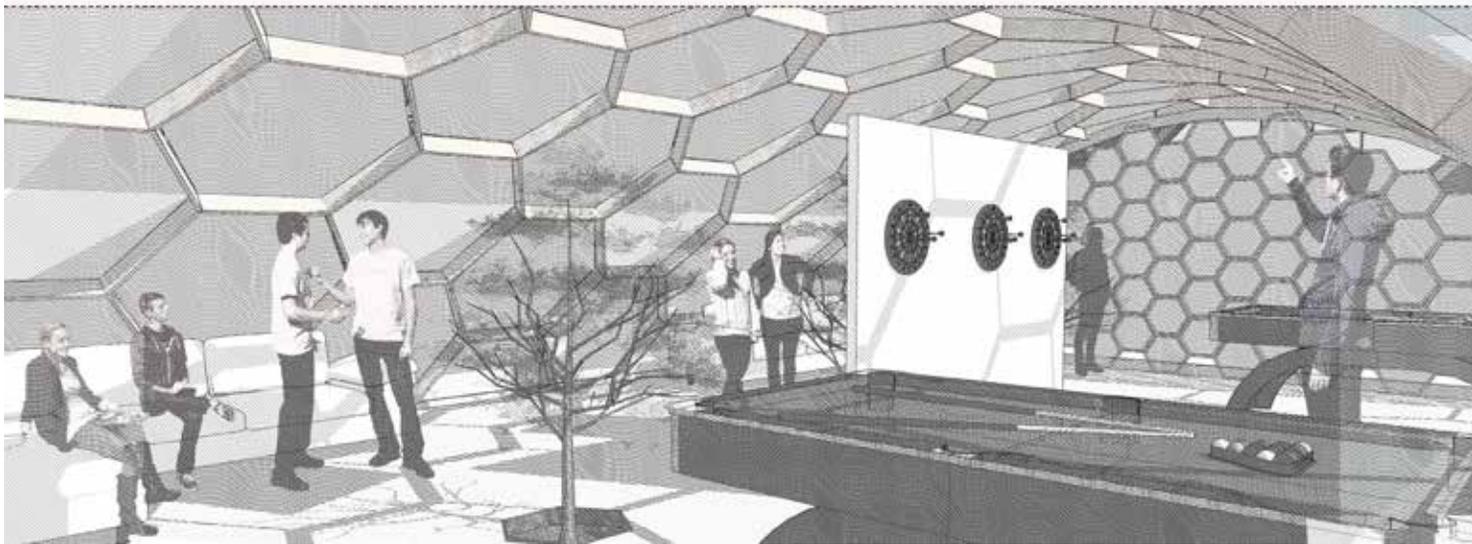
A range of amenity spaces will be incorporated in the camp. Due to the isolation of the camps, a grocery store is not feasible, and the possibility

for each worker to cook for themselves poses logistical problems. A cafeteria that provides three meals a day is needed. A communal drying room/mud room, linked to the cafeteria, gives workers a place to change as soon as they come 'home' so they do not have to take dirty work clothes to their units. As mentioned previously, a range of scales of social spaces and a variety of indoor and outdoor public spaces are necessary to produce a sense of community.

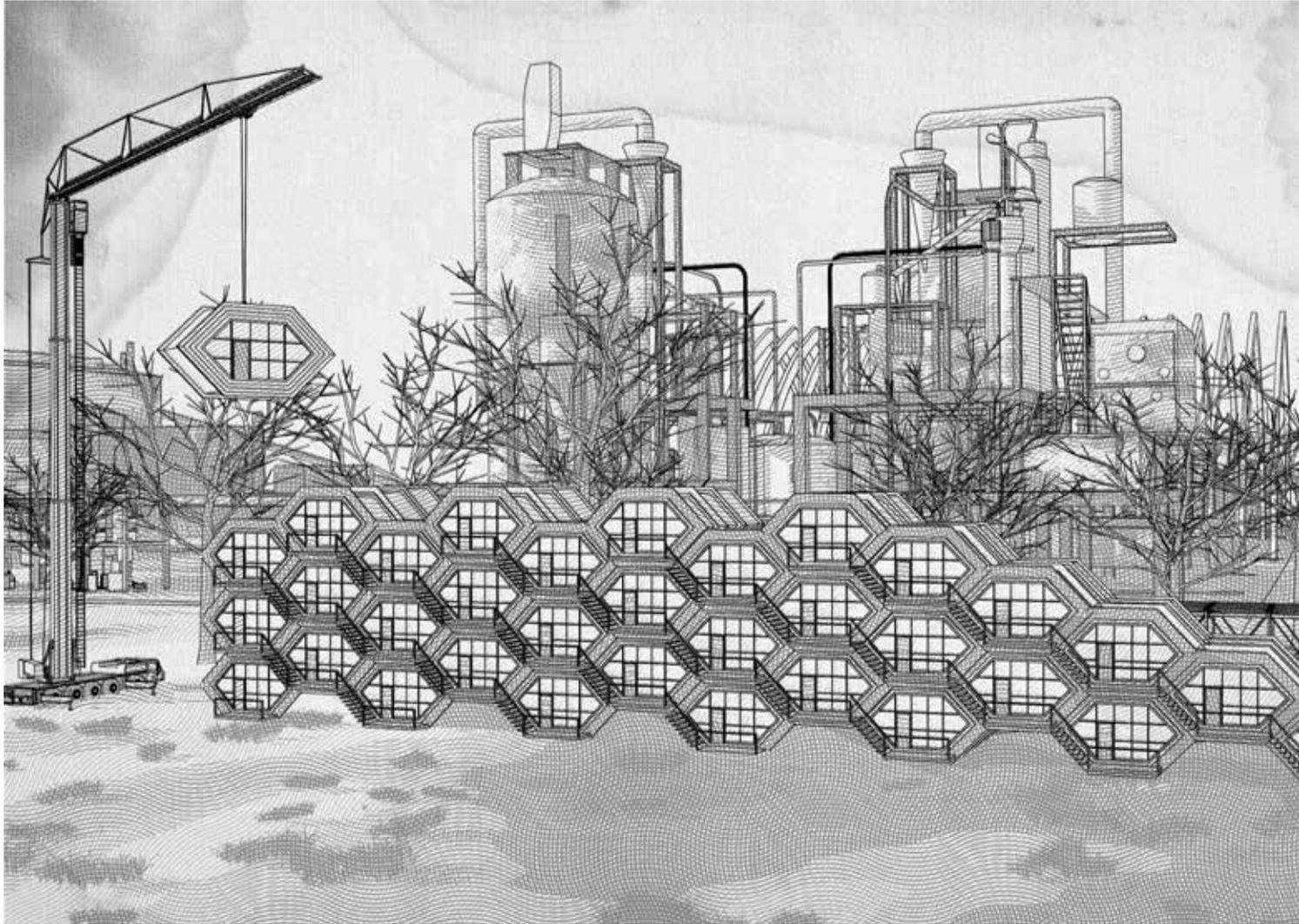


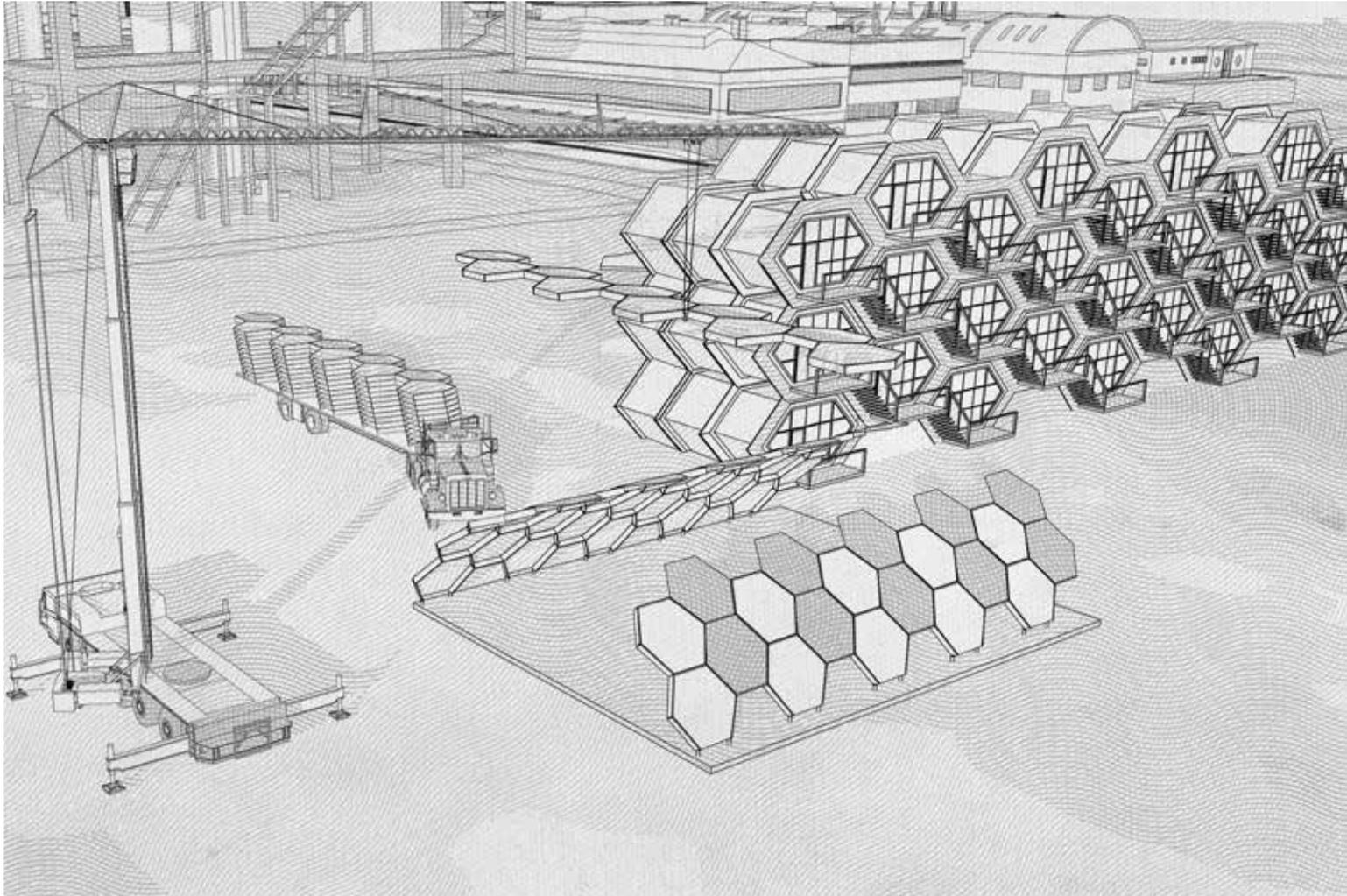


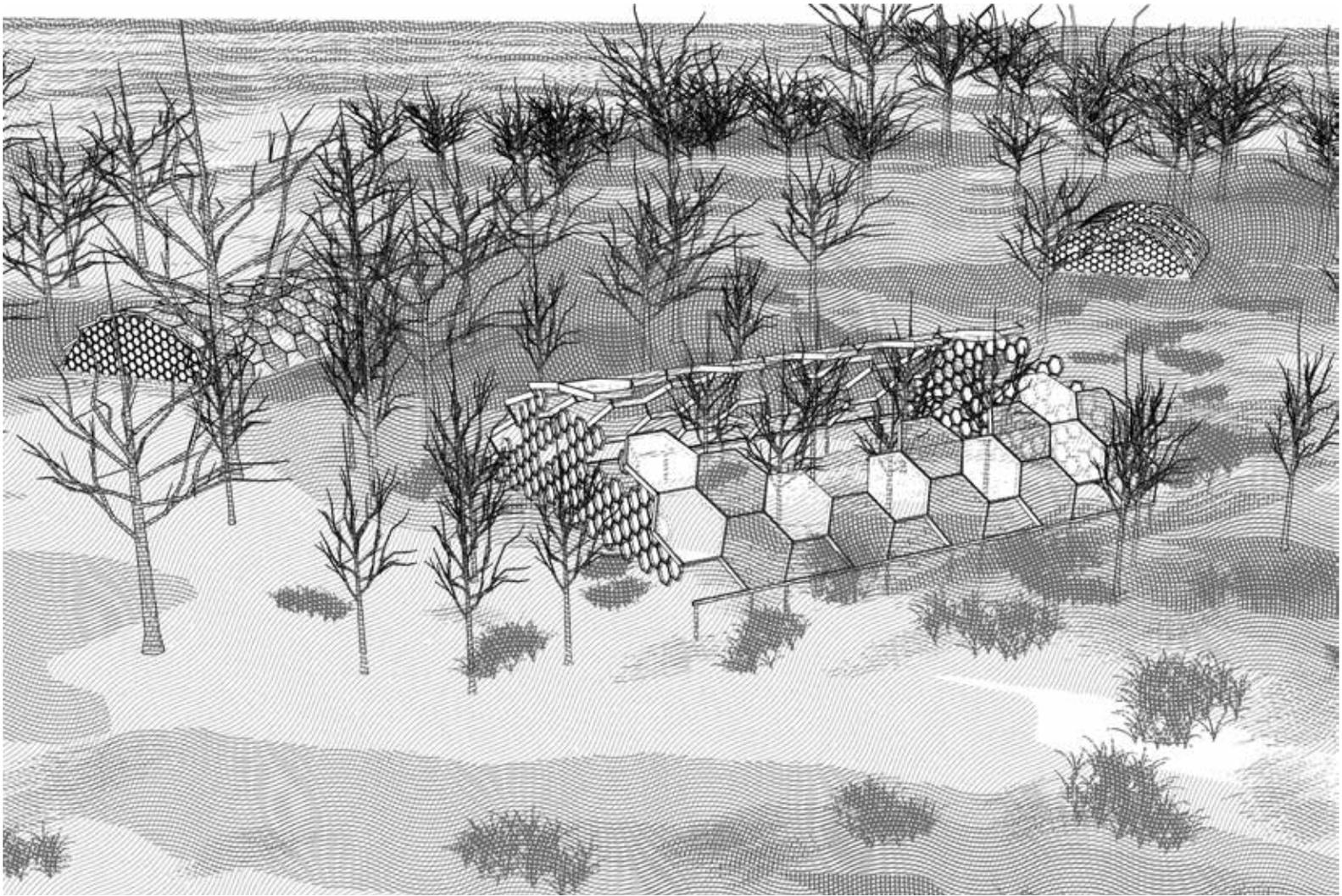
The following set of drawings is the final drawing set. It is a series of visions, without a specific site in mind, only a test of the systems presented.







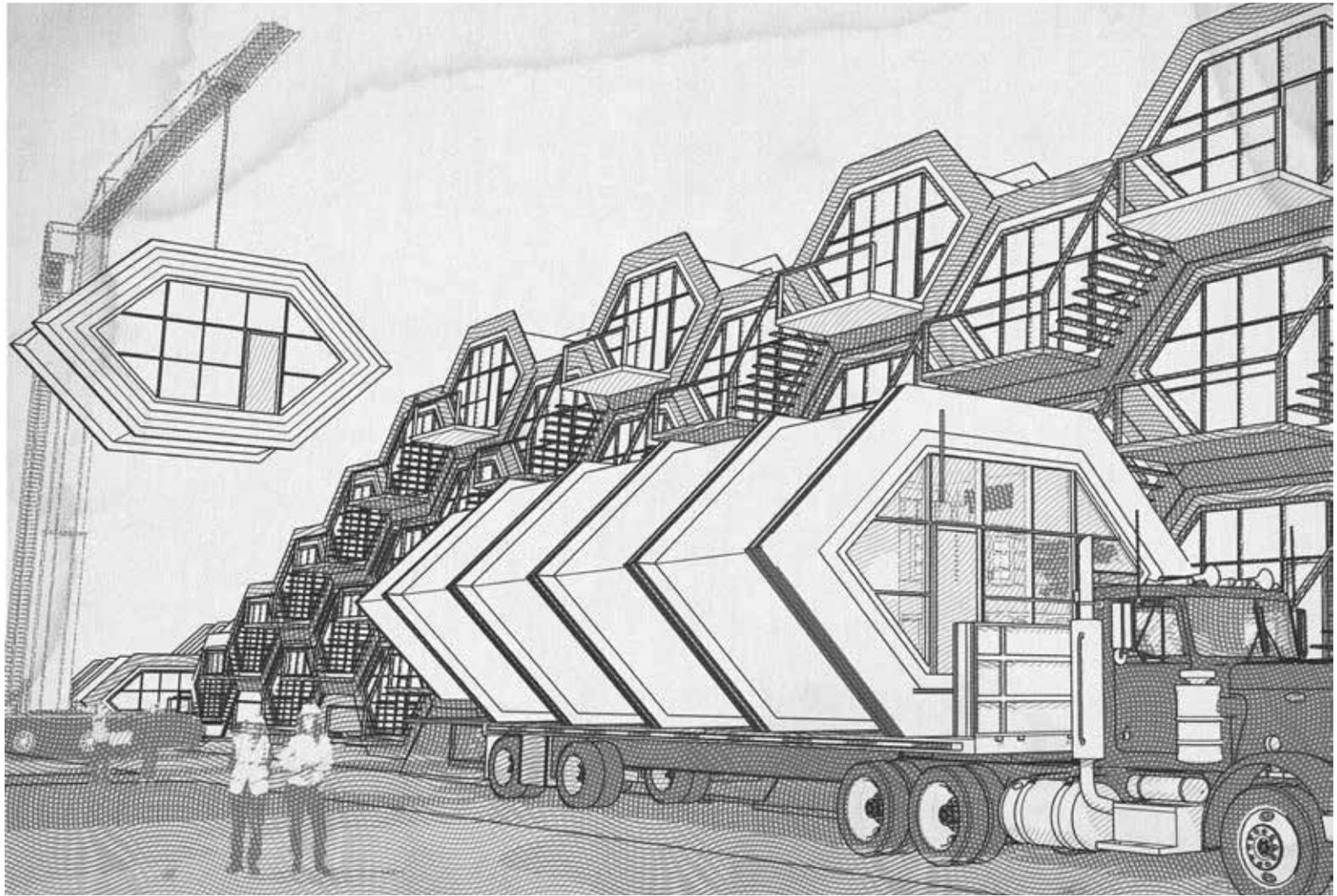












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## 7.0 The Anti Brochure

The following section contains two brochures. The first one is from Black Diamond, a company that supplies the kind of temporary camp housing discussed in this thesis, and was downloaded from their website ([www.blackdiamond.com](http://www.blackdiamond.com)). The second is a fictitious brochure produced by the author during the conceptual stages of this thesis, and is modelled on the Black Diamond Brochure. Packaging this vision as a viable and sellable one, the second brochure for a 'New Company' envisions how life on camp could be re-imagined.

**NOTHING'S TOUGHER THAN A DIAMOND ►**

*This brochure downloaded from Black Diamond's website, shows the current options to assemble a camp. Based on the one module of the truck bed, 11'x60' and using rhetoric such as "Nothing's tougher than a diamond" showing the machoness camp market.*

Accessed January 10, 2016 < <http://www.blackdiamond.com.html>>

# 49 PERSON DORMITORY

SINGLE OCCUPANCY | CENTRAL WASHCAR FACILITY | CLIMATE CONTROLLED | UPGRADED FINISHES | SECURE KEY ACCESS

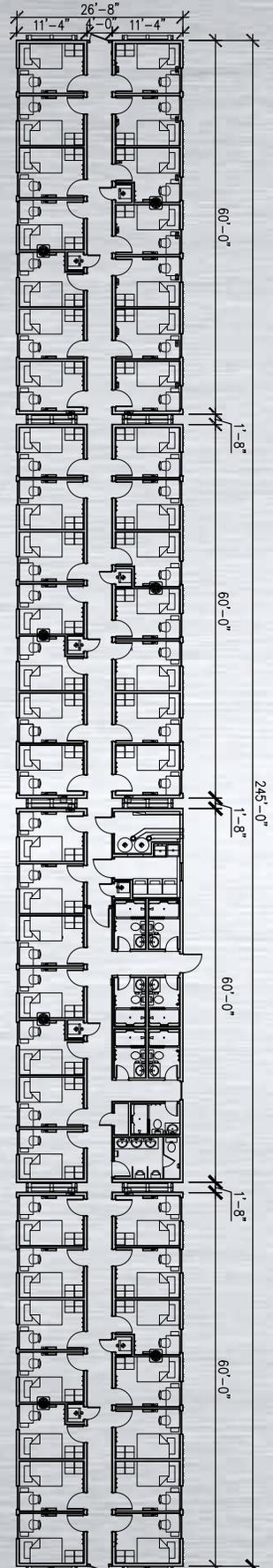


# ECONOMIC WORKFORCE LODGING

The 49 person dormitory offers all the amenities your crew needs in an economical, space-saving layout. A comfortable single-sized bed, in-room desk and chair and personal TV set-up give your crew everything they need to feel at home.

## SAMPLE SPECS:

- 8' x 10.5' size room
- Central washcar facility
- Standard single sized bed
- Personal in-room desk and chair
- Manufactured with upgraded finishes and amenities
- Air conditioned/climate controlled for year round comfort
- Personal 22" in-room television
- All rooms Internet, satellite and cable TV ready
- Venetian blind window coverings
- Premium shared laundry facility
- Built to meet Alberta, B.C and N.W.T building and operating codes
- Quick connect harnesses for efficient utility assemblies
- Heavy duty skids for ease of transport and installation



## NOTHING'S TOUGHER THAN A DIAMOND

Black Diamond Camp facilities are built to the highest quality and safety standards, with particular attention to durability, craftsmanship, temperature control, health and air quality.



Black Diamond Camps is a division of Black Diamond Group

# KITCHEN DINER COMPLEX

OPEN FLOOR PLAN | CLIMATE CONTROLLED | SALAD BAR | HOT SERVING LINES | ALL DAY SOUP & SANDWICH BAR







# RECREATION COMPLEX

LOUNGE ATMOSPHERE | OPEN FLOOR PLAN | CLIMATE CONTROLLED | PROFESSIONAL FITNESS EQUIPMENT



# A PLACE TO PLAY AT WORK

Black Diamond's fit to purpose recreation complex offers your workers the perfect place to relax and unwind after a hard day's work. They can stay in shape or blow off some steam in the full gym and aerobic room. If it's a little friendly competition they're after, we offer a variety of games tables like foosball, billiard and ping pong, and even professional poker tables for the card players. There's even a theatre for events and movies, and lots of comfortable places to watch TV or surf the web.

Your crew will feel so at home, they may not want to go home.

## NOTHING'S TOUGHER THAN A DIAMOND

Black Diamond Camp facilities are built to the highest quality and safety standards, with particular attention to durability, craftsmanship, temperature control, health and air quality.

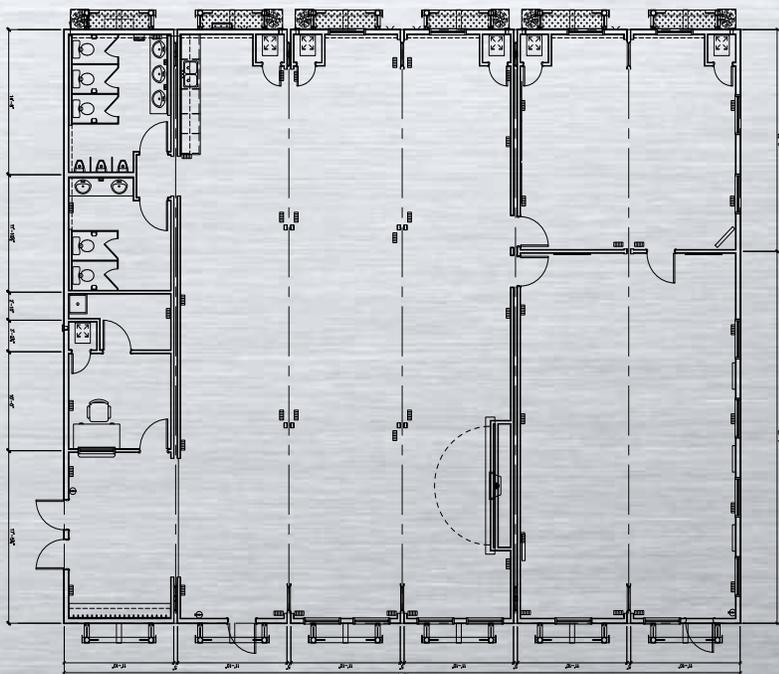


**BLACK DIAMOND**  
CAMPS

Black Diamond Camps is a division of Black Diamond Group

## SAMPLE SPECS:

- Fit to purpose to support clients needs
- Full gym with professional quality equipment including cardio, free weights, and machine assisted weights
- Fully mirrored aerobic room and television sets at each cardio station
- Sport games including: billiards, foosball, bubble hockey, ping pong, etc.
- Professional poker tables
- High and low top tables for comfortable social networking
- Theatre station with big screen television for events
- Internet, satellite and cable TV ready
- Well-lit, open concept facility
- Manufactured with upgraded finishes and amenities
- Built to meet Alberta, B.C and N.W.T building and operating codes
- Quick connect harnesses for efficient utility assemblies
- Heavy duty skids for ease of transport and installation



# CAMPLESS CAMP



'LEAVE ONLY FOOTPRINTS'



**YOU WON'T KNOW YOUR 'HOME' AWAY FROM HOME ▲**

*The following is an imaginary brochure, produced as part of this thesis work to explore concepts of a fuller life on camp. This brochure has been an underlying thread, constantly evolving as the research and design progresses.*



**NEW COMPANY**

YOUR NEW 'HOME' LIFE



Protection of Nature is not  
a small task.

We as a team will work together to protect the  
landscape that we are so proud of.



Wake up with nature, the nature you are a part of protecting.

# WORD FROM THE PRESIDENT

The everyday life of our employees comes first. You will never be a number here.



## We're here to help.

No issue is too big or too small, staff are available 24/7 to assist you or your family with whatever your needs may be.

## This country is a big place, but it doesn't have to be.

Never leave your family behind again. With multiple options for family living, your family will feel right at home here.

The world is a big place, but it doesn't have to be.

Canada will feel like your front yard.



A good idea often comes at the most unlikely of moments, but one thing all good ideas tend to have in common, is that they are inspired by nature. Welcome to New Company. In the way that a tree branch grows and sprouts a new beginning but still keeps attached to the solid trustworthy foundations of the trunk; New Company breathes life and sprouts comfort and innovation to work site living. All this while still keeping the strong foundation of home in place.

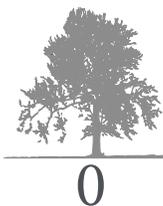
Connecting to nature doesn't have to mean sleeping in a tent and growing a beard. A true connection to nature is as organic as nature itself. New Company connects our clients with nature through our diverse, organic and subtle living quarters.

I am proud to be apart of New Company as we move into changing times, opening the industry to the new unexpected challenges, which lie ahead. With our cutting edge designs, ergonomically splendid concepts and practical approach to nature New Company are leading the field in temporary housing development - and that field is lush, green and organic.

I know for myself, seeing my family at the end of a hard day is a joyous moment and never fails to move me- these moments are the key concept to New Company's philosophy.

Home is the most important place on earth, so why compromise with anything else?

Choose a job you love and you will never work a day in your life.



Trees lost in the construction process.



Millions of gallons of water collected.



One healthier planet.

# INDIVIDUAL LODGING

The word 'dormitory' will not be mentioned here. Each unit is customizable to suit your party size and your work needs.

The New Company's housing is designed to touch ground lightly, but your hearts heavily. With 3 specific units types catering for singles, couples and families you will never have to sleep without your loved ones.

Comfortable beds, soft organic cotton sheets will all be found in your contemporary spacious pad.

Look out into the nature whilst sipping a cappuccino from your balcony in the morning, and enjoy a nice glass of sauv blanc from the same spot in the evening.

Personalized off the grid housing that can adapt to any site is also adaptable to your many needs. Energy efficient walls, solar panel electricity and on demand hot water will ensure your interior comforts are just like home.

With our new concept for a foundation system there is no need for clear cutting the site, allowing for fast installation of the temporary housing units.

New Company promotes a socially and environmentally responsible community through various social communal spaces. Such spaces include a large communal

kitchen, a theatre, games room, state of the art gym, and many play options for the kids and adults alike.

New Company will allow for your home family to intertwine with your work family- your two lives no longer need to be apart. But when they must be, our 24/7 skype pods will connect you in moments. The distance will fade away.

You and your family will look forward to staying at New Company that they won't know which home is their home away from home.



Your unit is customized to fit you and your family. Everyone will always be close by.



Time is balanced between your family life and your other activities.



You set up your surroundings to best suit your needs.



Work is only a portion of your life here.

# 1

You're home here.  
You just really won't ever want to leave.

# 2

All the amenities to enjoy family life.

You and your family will have multiple choices for private or communal time with your extended work family.

# 3

Social spaces to spend time with your colleagues.

Social time does not have to be confined to your dorm room, but with various options for hanging out you won't know where to start!

# 4

A workforce camp that won't leave a trace.

When the work on site is done, New Company will leave only an honest and memorable trace.

# 5

Places to enjoy your down-time when you need it.

The best thing about being 'on site' is that you are not on a site. Feel free to reconnect to nature anytime you need it.

## 'Leave only footprints, take only your memories'

The housing and amenities offered will promise to touch the earth lightly, healing the site after use.

Landscaping is the first to be designed on site-no longer the last. Mature trees will be a backdrop.

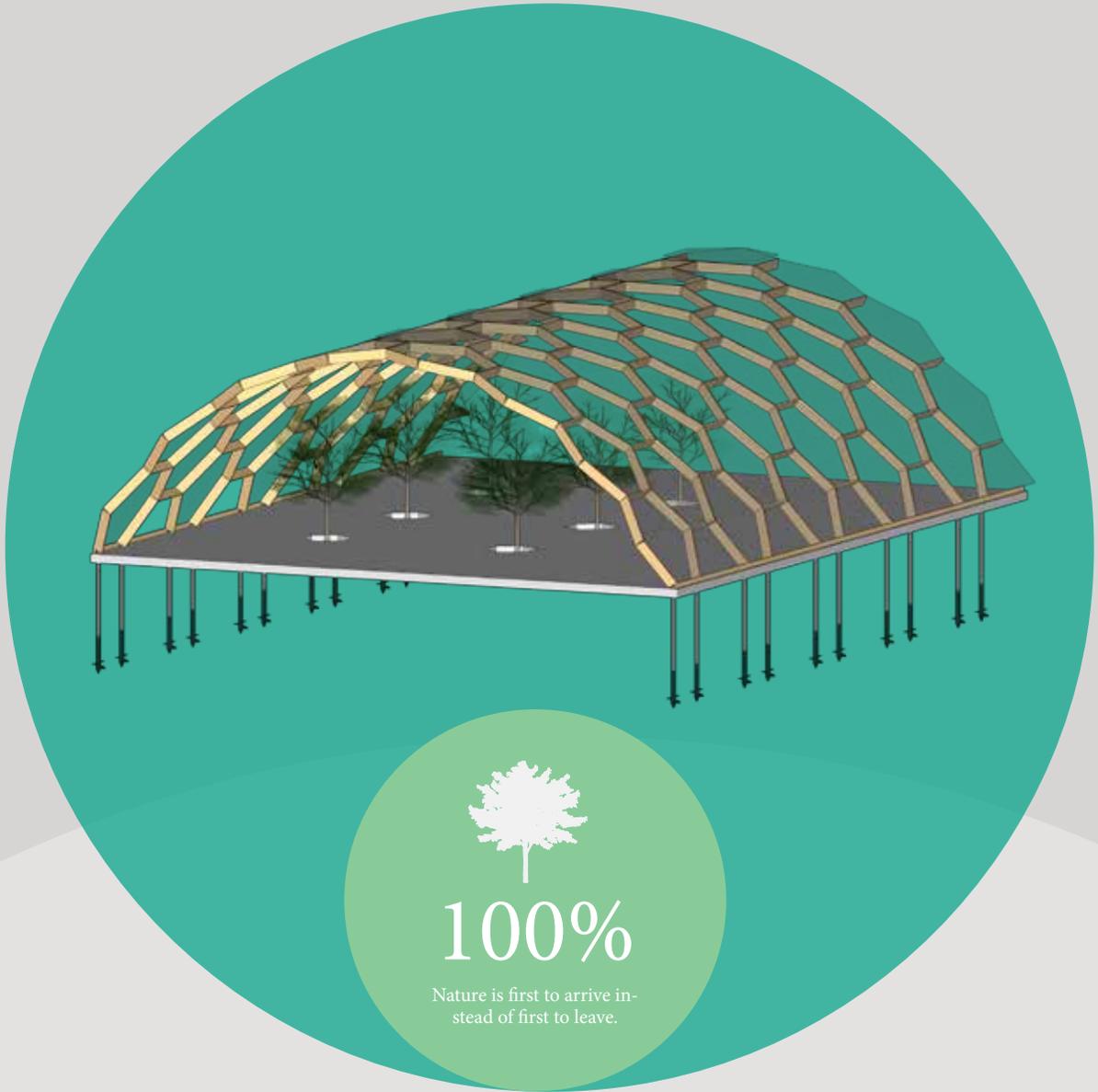


When your loved ones can't be here, our communication pods will feel like they are.



Skype Pods available 24/7

Large screen pods are available day or night to get in touch with your family when you need. They will always be a moment away.



The communal pavilion(s) will return to the earth.



Simple, honest materials used in spaces.



A commemorative piece to honour the community.

**Community**  
Has a voice now and in the future

**Materiality**  
Landscape Response

**Modularity**  
Simple Construction



# Our strategy, milestones, and implementation

A dynamic, flexible, and adaptable housing and communal amenity system that can respond quickly and efficiently to any mining resource needs.



## A response to any type of resource.

No matter what stage the mining project is at, New Company can respond to an exploration site with as few as 6 employees or as large as a fully operational mine up to 5000 employees.

- Horizontal deployment
- Stackable interior space
- Vertical deployment up to 4 levels high
- Suits all resource mining

Responsive

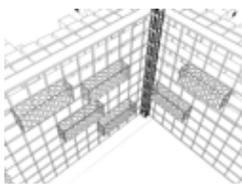


## Spaces for conversations.

The line between the public and private spaces is blurred to allow for impromptu conversations between you and your colleagues, combatting isolation.

- Various sizes of social spaces
- Double loaded corridor has disappeared
- Opportunities for alternate circulation scattered with public spaces

Effective



## Stay in touch with family, with nature.

Feeling connected to your environment doesn't stop at the door. Each unit has a mandate to preserve a view to nature in order to clear the mind's palette of the days work.

- Enjoy the view, enjoy nature
- Stay connected with family and friends
- Cherish the surrounding peaceful environment

Environment



## Efficient and cost effective.

New Company can provide up to 24 beds per truck compared to the standard 7 beds per truck with the current system. With sustainability in mind to lower the shipping required.

- Cost effective
- Lower shipping times and cost
- Faster set up time, no separate modules required for wet goods, self-contained units

Efficient



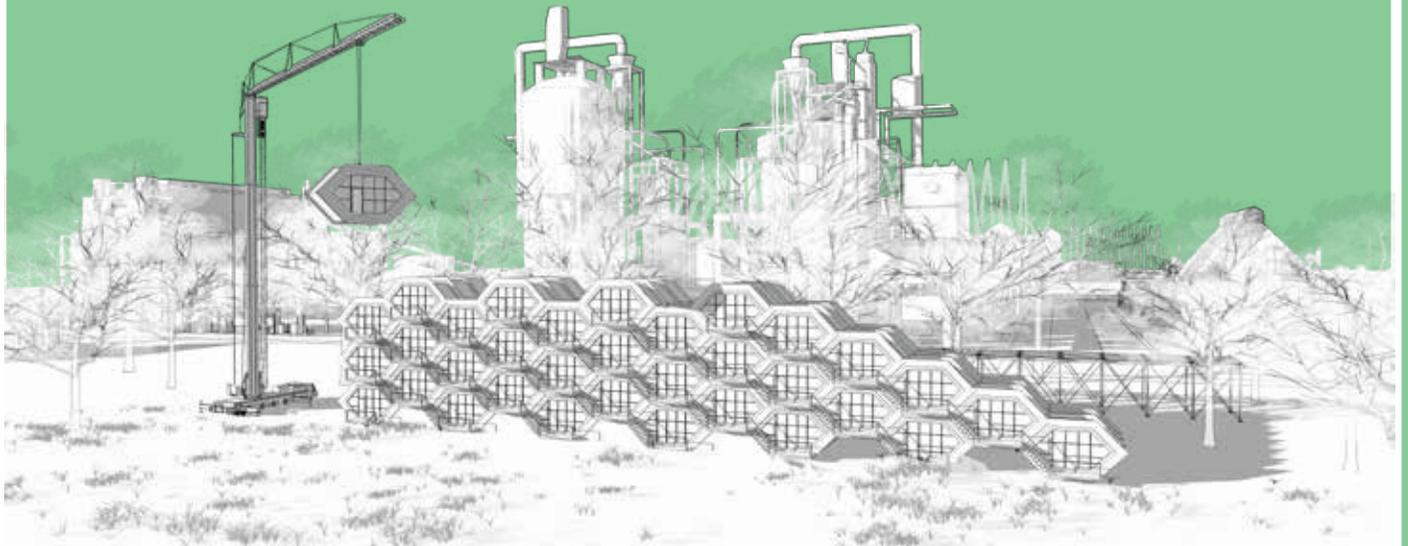
# CUSTOMIZATION

With a dynamic changing work force, a dynamic response is needed. With customization available from the small detail of a shelf to the organization of thousands in a tower.



Customize your camp to the exact number of units needed, to fit the population exactly.

With the flexibility of structure and circulation built into each unit, the ease of setting up camp is quick and easy.





A growing population of over 400,000 workers across Canada are currently living in FIFO accommodation.

There are currently 913 mining companies operating across Canada. A new strategy of housing is needed to respond to this growing, and changing population 121,000 new workers will be needed over the next decade, the current housing system cannot respond to this demand using current technologies.

70%

Growth in the number of women on mines

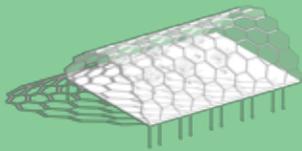


25%

of the workforce is in the 25-34 age group.

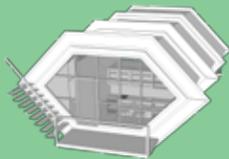


### Three-tiered system, builds a community.



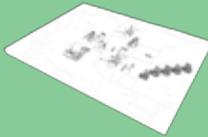
Various sizes of communal spaces available.

Using typical dimensional lumber and biodegradable plastic the communal arch can be left behind to commemorate those that have worked on site.



Adaptable units maximizes your space above and beyond.

Workers are used to being given the bare minimum but New Company optimizes the efficiency of the hexagon to provide you with more than a box.



Strategic site planning. Trees are first.

Our first response to site isn't to clear cut the site but to plant trees that will surround our workers for years to come. These trees will help with the decomposing and healing of the site.

### A layered, holistic approach.

The approach has not been a linear, single-sided approach, but a more involved layered approach with many different factors having been incorporated into the final design.



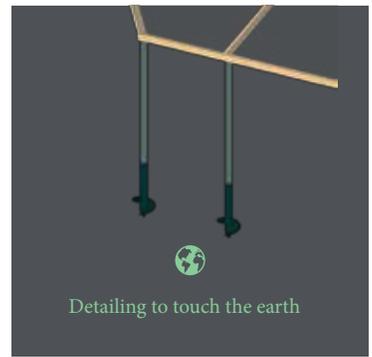
Community



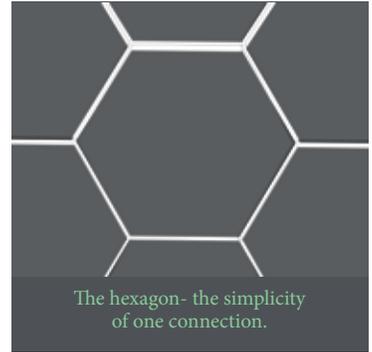
Modularity



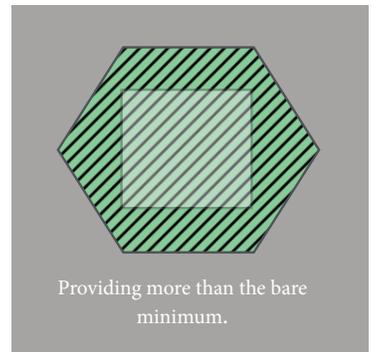
Materiality



Detailing to touch the earth



The hexagon- the simplicity of one connection.



Providing more than the bare minimum.



Enjoy the distance from the daily grind.





# NEW COMPANY

YOUR NEW 'HOME' LIFE





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## 8.0 Prefabrication and Site

### 8.1 The moving target- the shifting site

The following section explores different ways of unpacking and installing this proposed prefab system to create meaningful interactions with the site. One of the goals of this new housing type is to be adaptable to different environmental conditions. In order to put this housing into context, three distinct sites have been chosen. Each site has recently been approved for development and will be changing from an exploration camp to a fully operationally mine.



56.487235, -130.297221

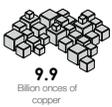


Construction  
16 PODS



Operation  
9 PODS

38.2  
Million ounces  
of gold



9.9  
Billion ounces  
of copper

191  
Million ounces  
of silver



213  
Million pounds  
of molybdenum

SUMMER HIGH: 18°C  
WINTER LOW: -1°C



52  
year mine life

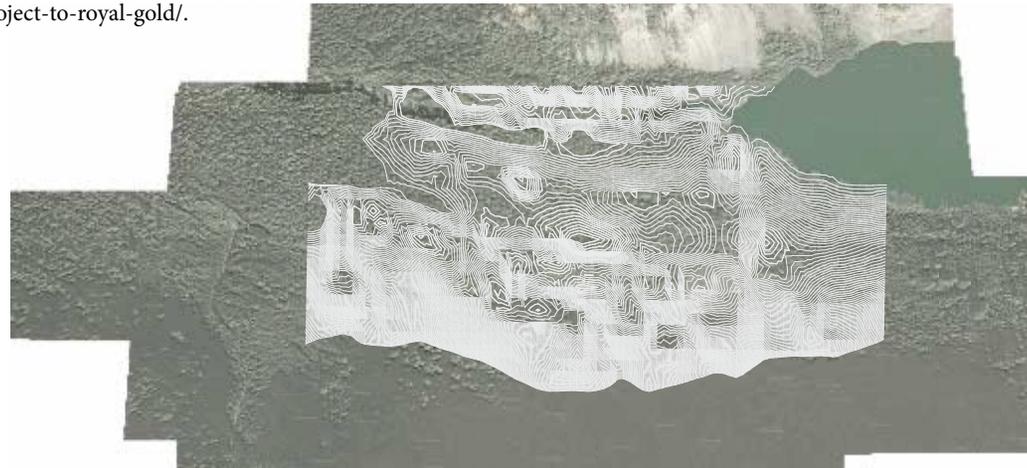
## 8.2 KSM Mine

The KSM Project is a proposed gold, copper and silver mine located 65 kilometers northwest of the town of Stewart, B.C. It has recently completed an environmental assessment process and received approval from both the provincial and federal governments. Construction will soon begin to transform the 40 person exploration camp into a 1800 person camp during <sup>38</sup> (Seabridge sells royalty option on massive KSM project to Royal Gold 2011) its five year construction, and a 1040 person camp during its 52 year life span. When

<sup>38</sup> “Seabridge Sells Royalty Option on Massive KSM Project to Royal Gold,” Mineweb, June 17, 2011, accessed April 13, 2016, <http://www.mineweb.com/archive/seabridge-sells-royalty-option-on-massive-ksm-project-to-royal-gold/>.

operational it will feature three open pit mines, a processing plant and a tailings facility. The project is the largest undeveloped gold deposit in Canada and one of the world’s biggest copper-gold porphyry deposits. The temperatures at the site are moderate with summer highs of 18°C and winter lows -1°C. The site is sloped and forested. The site will be accessed by plane, road and site circulation by tunnel.

The challenge for the housing on this site will be to adapt to the topography and disperse itself around the existing trees.



Lasting structure installed



Biodegradable skin installed



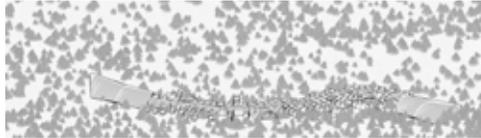
Communal pods added



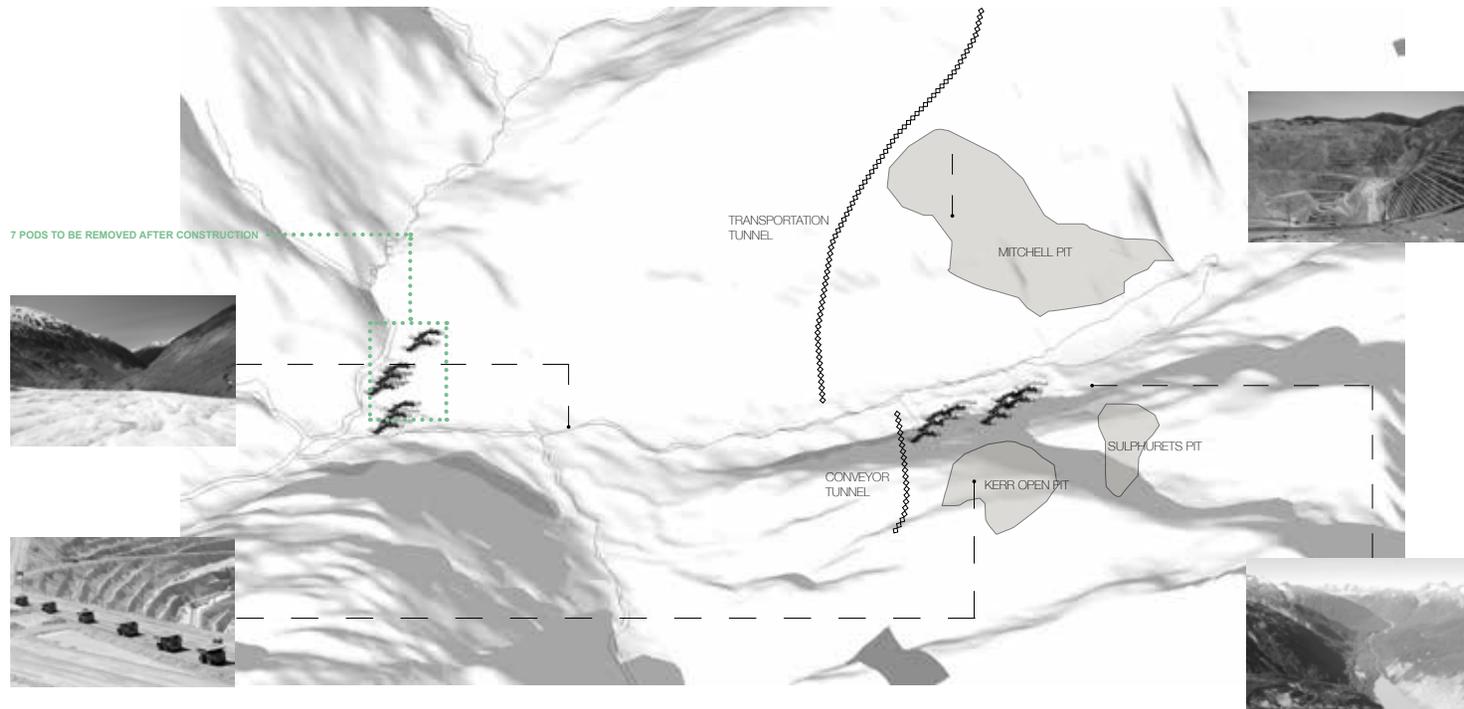
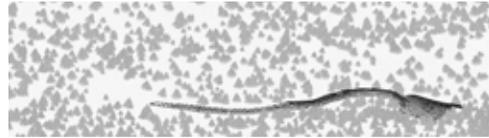
'Away' Mode



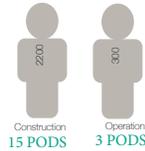
'Working' Mode



Structure to biodegrade



### 8.3 K+S Potash



The KS Potash mine project is located an hour west of Regina, Saskatchewan. It is currently in the process of constructing the Legacy project mine site with a projected mine life span of 20 years. It is expected that 2.6 million tonnes of potash will be extracted per year. The extraction of potash involves underground removal, with minimal effects to the top surface in comparison to open pit mines. The construction of the

mine will involve approximately 1700 workers and is to be completed by 2017. Once the mine is in operation a crew of 300 workers will be required for the following 15 to 17 years.



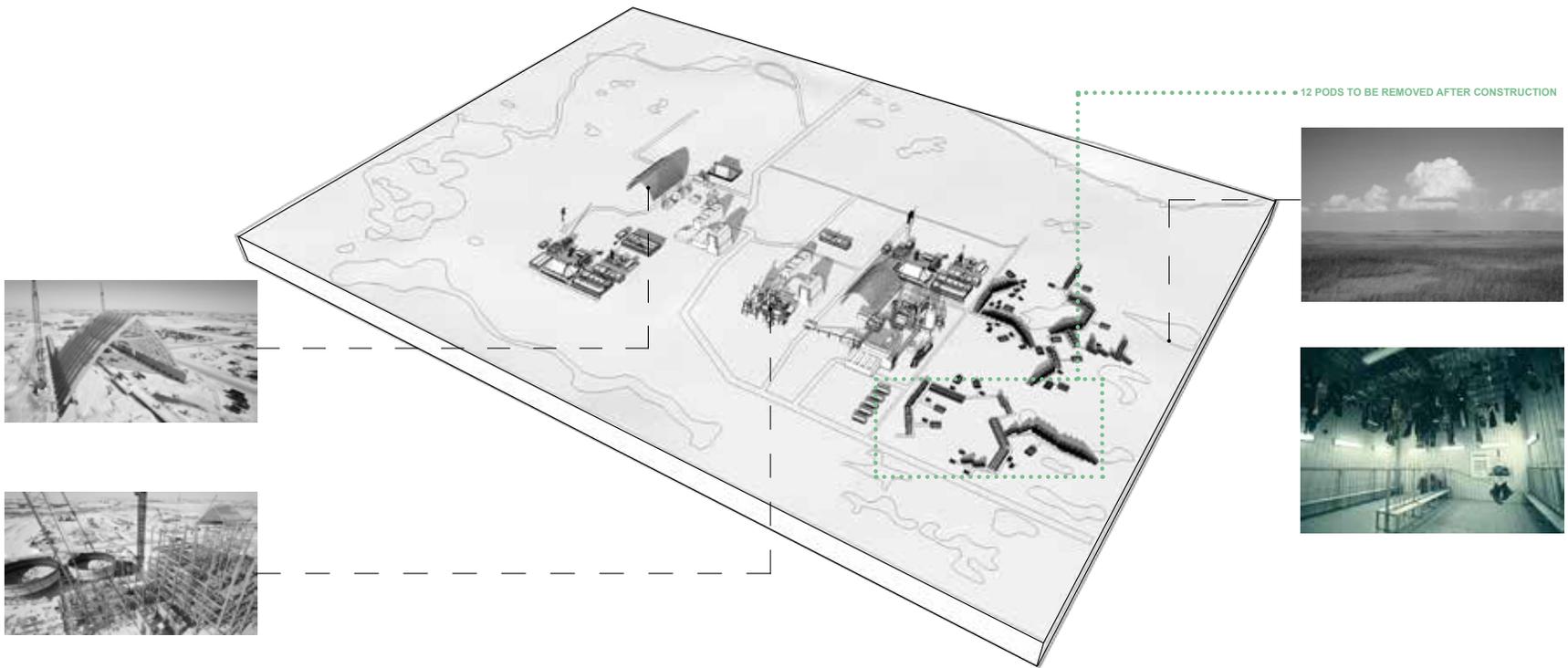
2.6 Million tonnes of Potash/year



20 year mine life

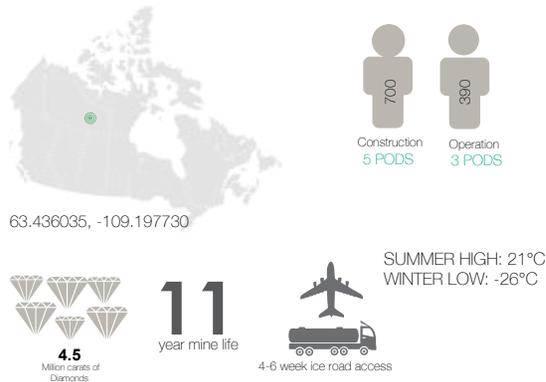
SUMMER HIGH: 26°C  
WINTER LOW: -17°C







## 8.4 Gahcho Kué- Diamond Mine

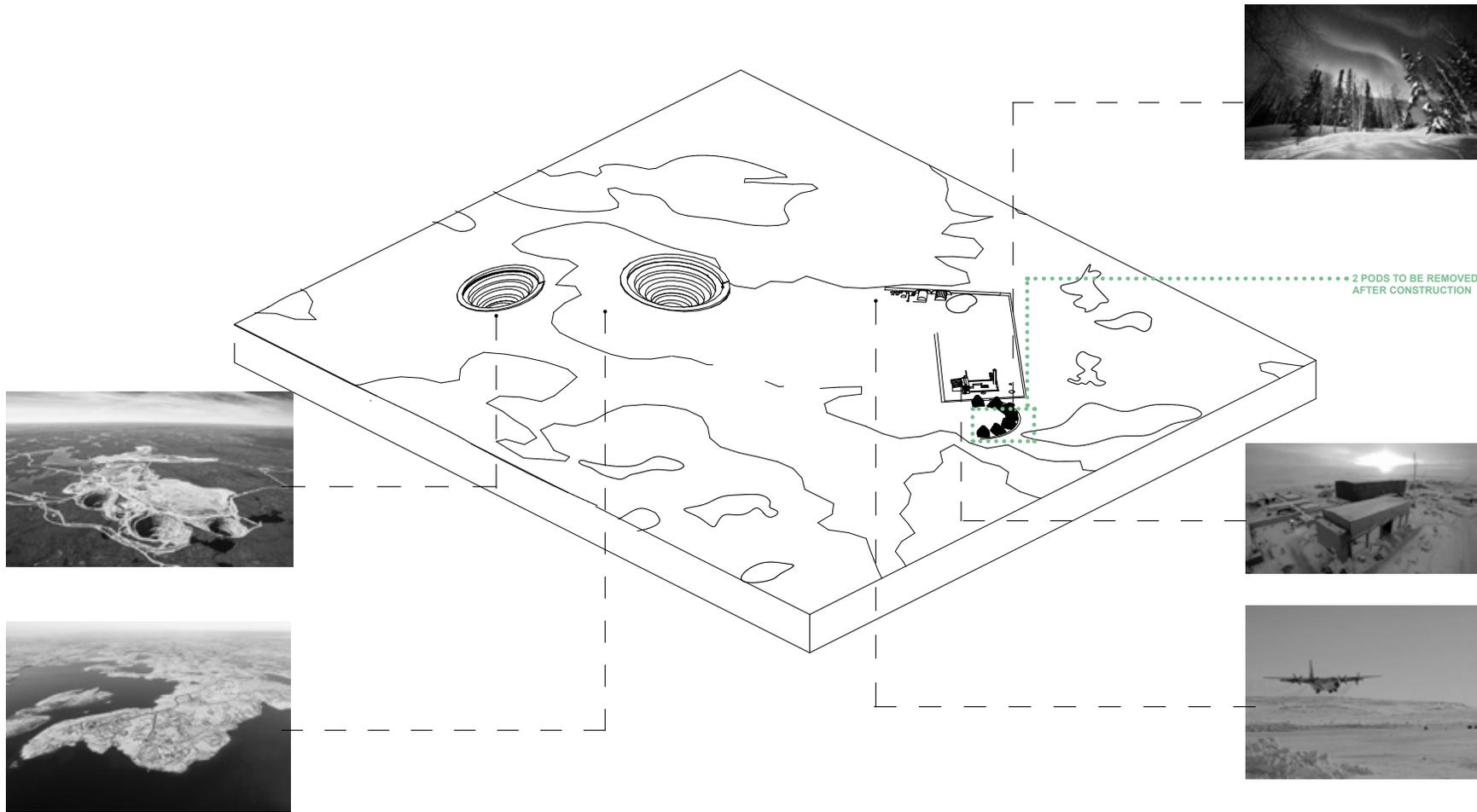


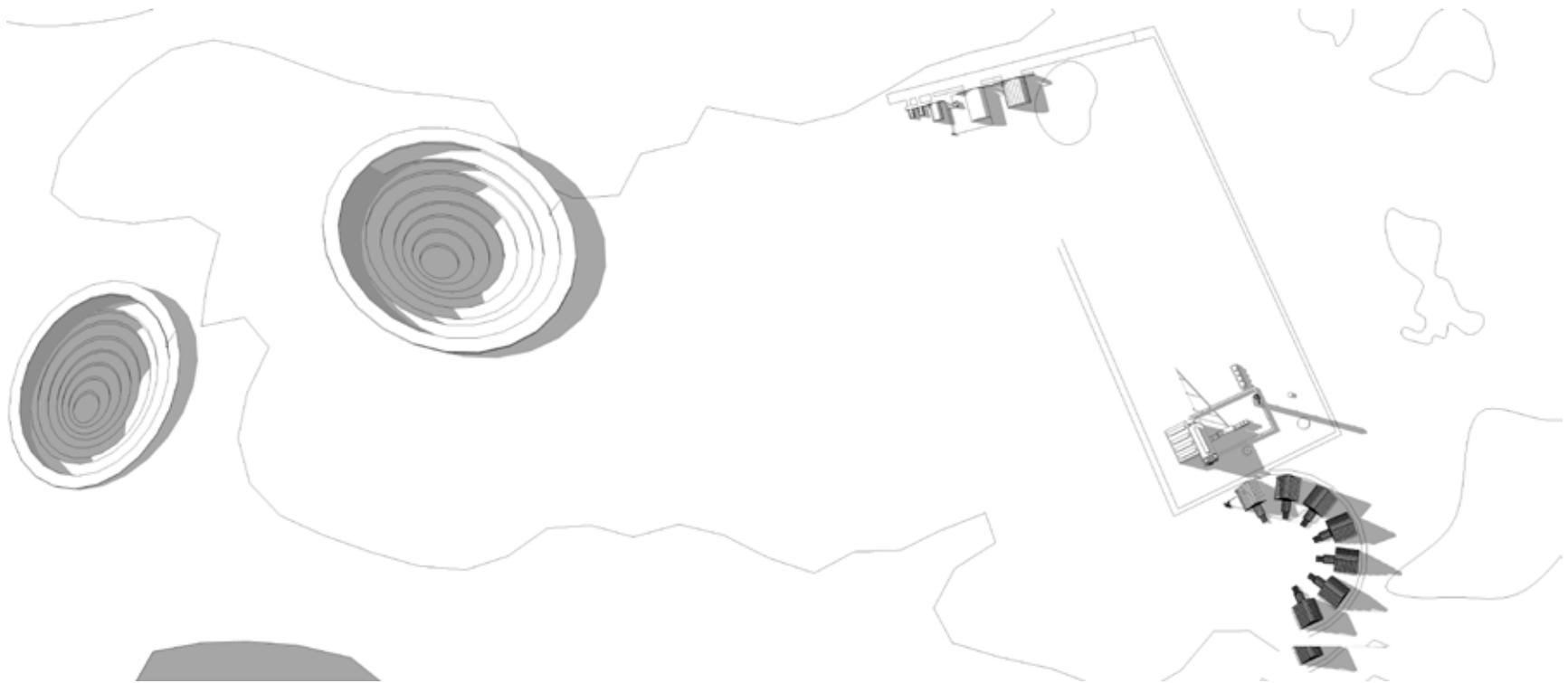
The Gahcho Kué project is the largest new diamond mine under construction.<sup>39</sup> It is located in the Northwest Territories, on a 10,353 acre site of Kennady Lake about 300 kilometers northeast of Yellowknife. Construction is projected to begin late in 2016. For the first three years 700 workers will be required. Following that, 390 workers will

be needed for the mine's 11 year Life span. The challenge of this site is the extreme weather: it experiences summer highs of 21°C and winter lows of -26°C. The site's isolated location and the fact that it can only be accessed by an ice road 4 to 6 weeks of the year means that almost everything will have to be flown in and flown out.

<sup>39</sup> "Mountain Province Diamonds," Mountain Province, June 22, 2016, accessed May 19, 2016, <http://www.mountainprovince.com/project/project-overview/>.







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## 9.0 Conclusion

This thesis took on the question of how to enhance workers' lives while they live remotely on mine sites. Current-day temporary work camp housing doesn't take into account the complexity and range of a person's needs from the point of view of human happiness, and only offers the worker a 'bare minimum' container for their life on camp. This design proposal envisions a dwelling unit and town arrangement for remote and isolated environments that would provide a much higher quality of life for workers. The design opposes reducing the individual into a simple cog in the machine. Through a non-rectangular unit volume, utilitarian essentials of domestic life on camp are wrapped with a zone of extra space to pay respect to the worker's uncontainable identity. Through an expandable volume, the worker can live alone or with family. Through cluster arrangements that respect the limits of a human being's capacity to be in relation to others, a more humane collective environment is proposed. Through open exterior circulation and naturally lit communal spaces, workers have a strong connection to the environment around them. In the revised proposal for "Housing the Working Nomad," Canada's resource-extraction worker finds a healthy, stimulating and above all enjoyable dwelling in which to live. The employer also gains

in this equation, with healthy productive workers.

This design proposal presents new architectural concepts to be taken into consideration when viewing the whole life cycle of the mine. As the traditional clear-cut approach to the provision of housing on isolated mine sites is dangerously destructive from an environmental point of view, this new system tries to tread more softly on the land. The use of structural pile foundations (for the communal and residential units) implies only small excavations and soil disruption; the use of biodegradable materials means that parts of the work camp will eventually vanish, allowing vegetation to renew itself; and the durability of the residential units ensures they are relocated multiple times. The system proposed above can insert itself into any Canadian resource extraction site. In a next stage of research, technical development of assemblies, details, and materials, would be required. The thesis underscores the importance of further research into the use of biodegradable materials for work camp housing. Complete with material discoveries and innovations, a new architecture for work camps will constitute both an important gesture of respect for workers and an action of protection of Canada's landscapes.

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# Appendix A

The following are images from a site visit to the K+S Potash mine on May 24, 2016 in Bethune Saskatchewan. All photos are those of the author.







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**DIAVIK DIAMOND MINE, NORTHWEST TERRITORIES**

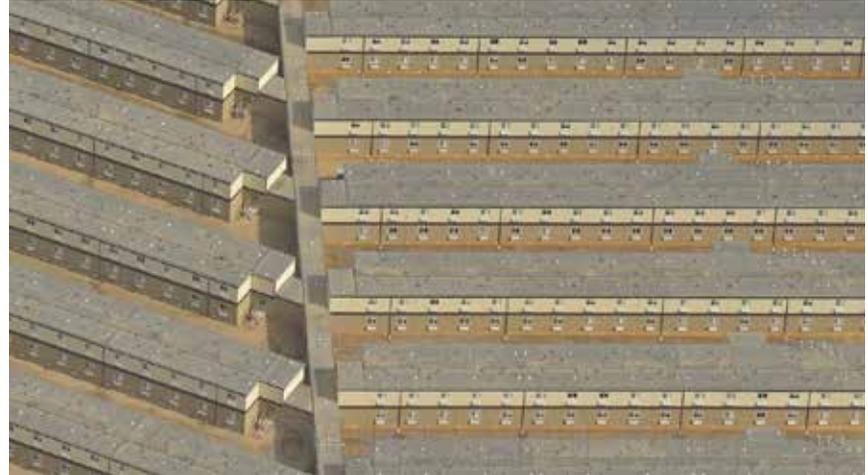
*This dramatic landscape is created by open pit diamond mining, one of many in the remote areas of the Northwest Territories. Accessed January 20, 2016: <<http://www.riotinto.com/diamondsandminerals/diavik-2232.aspx>>*



**BURTYNSKY: RESOURCE EXTRACTION**

Westar Open Pit Coal Mine in Sparwood, British Columbia (1985):

Edward Burtynsky is a photographer who specializes in capturing the modern economy and its impact across the globe. With these pictures, we can actually see what resource extraction looks like. Accessed January 16, 2016: <<http://www.edwardburtynsky.com/>>



**LOUIS HELBIG- BEAUTIFUL DESTRUCTION**

These images are just a few of Louis Helbig's aerial images of the mining camp housing in Canada. These are part of a series from his book called 'Beautiful Destruction' Accessed January 15 < <http://www.beautifuldestruction.ca/> >

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# 1.0 Introduction

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As far back as can be traced, humans have traveled short and far distances to live, work and survive. People the world over leave their homes in search of work. In Canada, the action of travel has perennially been a part of human survival. From the aboriginal peoples of Canada who moved with the seasons and followed the migration of animals, to earliest European settlers traveling across the North American continent in search of land, resources, and work, the dweller has always been a sort of working nomad. What is more, few countries have the land mass or the wealth of profitable natural resources that Canada possesses. The fact that the location of these resources is most often geographically remote in relation to Canada's population means that workers will travel great distances to get to them. Canada is the second largest country on earth and with ninety per cent of its population living within 160 kilometres of the US border <sup>1</sup> the distances

<sup>1</sup> "By the numbers," *CBC News*, May 12, 2009/ accessed May 05, 2016. <http://www.cbc.ca/news/canada/by-the-numbers-1.801937>.

traveled in Canada to work in the resources sector are far larger than in most countries on earth. Up to 420,000 Canadians work on the road, in temporary camps or permanent jobs, in provinces where they do not keep a residence.<sup>2</sup> Often inhospitable climates, to find work, and they must live somewhere once they've arrived.

The profitable development of resource extraction in Canada has created a unique settlement condition that has a thriving and dynamic work force. This thesis investigates prefabricated housing systems destined for resources extraction sites in Canada. Current "drop and clip" models – prefabricated buildings that are trucked to mining settlements and clipped together to create housing and public buildings – yield a high number of housing units for costs that are controlled, but the resulting environments are unidimensional:

<sup>2</sup> Kael Campbell, "Canadians Earn \$13.7 Billion In Camp Jobs or Commuting Outside Their Home Province," Red Seal Recruiting Solutions, July 3, 2015/ accessed May 8, <http://redsealrecruiting.com/canada-interprovincial-employment>.



**LOUIS HELBIG: BEAUTIFUL DESTRUCTION**

Louis Helbig's aerial image of the mining industry in Canada. These are part of a series from his book called 'Beautiful Destruction' Accessed January 15 < <http://www.beautifuldestruction.ca/> >

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they serve as shelter for the workers during the hours when they are not in the mine proper, but little more than this. By operating under the pretext of temporary housing, companies construct and operate the camps emphasizing cost and efficiency. The quality of the human life on camp is left out of this equation. As a result, these temporary work camps are plagued by a series of social issues, including: isolation, depression, sexual harassment and substance abuse.<sup>3</sup> The search for a modified settlement form that considers the worker's experience more fully is central to this thesis.

More specifically, the thesis will search for alternatives to today's dominant form: the rigid, gridded, dormitory settlement provided and installed by the mining companies. The thesis will ask how prefabricated architecture and its arrangement on the site can be rethought so that the worker returns to a "community" – complete with an array of spaces from private quarters to shared realms, in which he or she may live more fully – after a day's work at the

<sup>3</sup> Phillapa Vojnovic, *The Mental Health and Community Impacts of FIFO Work* (Perth: 2015), page 117.

mine. Notably, the thesis seeks to expand the seam between public and private realms, so as to create the setting for a more complete life for the worker, and promote a sense of community in a transient environment. The search for a new housing form also takes seriously the question of the workers' total lack of agency in their living environment in the current model. The idea is to promote social interaction through a flexible, rather than fixed, approach to the settlement.

Finally, in the main, mining companies declare that their aim is to return their sites to pre-extraction conditions once the mine has reached the end of its operational life span. Companies promise to remove all structures used during extraction – including the housing – and to return land and waterways back to pre-extraction form. In reality, this return to a pristine state is impossible, and is never achieved. Post extraction sites are typically deeply modified landscapes, with industrial waste left behind. The photographs of Louis Helbig of and those of Edward Burtinsky of capture Canadian mining's devastation poignantly. This contradiction

between discourse and reality speaks loudly of a persistent distance between Canadians' proclaimed love of landscape and the reality of resource exploitation in Canada. And it is to this distance, this disconnect, that this thesis wishes to speak. *Unpack Living* pursues a settlement form and architecture that firstly, improves camp life from the point of view of the worker, while leaving behind durable, overt traces that openly acknowledge mining's radical transformation of the landscape. The idea here is that the camp – while providing the worker with a humane environment for the duration of their stay -- also leaves behind a commemorative trace, an imprint that becomes a carrier of history, memory, and environmental awareness, in the broader landscape of resource exploitation in Canada.

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## 2.0 A Glimpse into the Past

### 2.1 Nomadic Peoples

Nomadism has historically been a lifestyle adapted to infertile regions where mobility is the best tool for gathering scarce resources. These scarce resources were traditionally animals for hunting, plants for gathering or water but now in the case of resource extraction in Canada the mining company is in search of mineral resources while the worker is in search of quick money. The worker must follow the trail of the mining company's market plan. The First

Nations people of the Prairie's lived a nomadic lifestyle for centuries following the buffalo which would provide them with food and clothing wherever they were. A clear architectural system supported them along the way. The "fly in fly out" (FIFO) population of Canada exists at the collision of nomadism and the company town.

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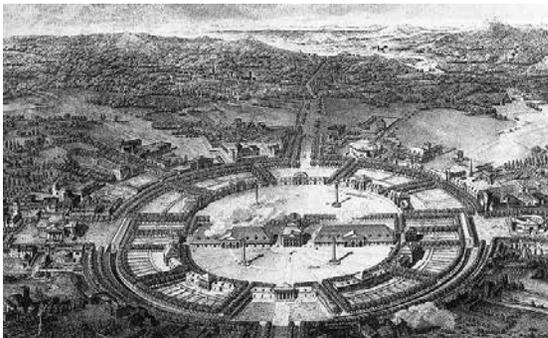
## 2.2 Company Towns

Company towns, towns created by a single company for its own employees, have their origins in the industrial revolution in Europe. Historically, company towns provided and controlled many areas of a worker's life, but they also strove to provide humane environments since the wellbeing of the worker was to the benefit of the company. Eighteen-century French visionary Claude-Nicolas Ledoux envisioned the salt works at Chaux, constructed in 1778, as an ideal city that organized working and living in a cosmologically balanced way. While organizing the royal salt-works at the eve of the French Revolution, Ledoux embraced the worker in a holistic manner, giving ideal form to all aspects of life. Beyond houses and workshops, Ledoux included a covered market, public baths, a house

of worship, gymnasia, schools and hospices, utopian programs such as a "house of tolerance," a temple of peace, and buildings dedicated to moral virtues. His aim was to create a utopic community. The town's semi-circular layout was to both facilitate economic production and ensure healthy and happy conditions for the worker, and its ideal, complete form, alluded to the completion of the worker's life in the town. The circular plan also is a controlling layout, and though benevolent, a director lived in the center and oversaw the entire town from that central position. Within the circular plan form, every aspect of the workers' life became controlled, something a fearful monarchy was happy to see.<sup>4</sup>

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<sup>4</sup> Allan Braham, *The Architecture of the French Enlightenment* (London: 1980), page 159.



#### THE IDEAL CITY OF CHAUX ▲

CLAUDE-NICOLAS LEDOUX, Les salines de Chaux

He is credited with maintaining a strong morale within the work force and putting an end to what were seen as anti-social habits. Ledoux wanted workers to have a complete life and live with their families on site. Ledoux saw the worker and their live on a holistic manner, wanted to control both work life and non-work life

Francisco Martínez Mindeguía, Universitat Politècnica de Catalunya, accessed on March 23, 2016< <http://etsavega.net/dibex/Ledoux-Chaux-e.htm>>

Controlling the worker wasn't just reserved for jittery pre-revolution French aristocracy. American George Pullman had similar intentions when he completed the construction of a new manufacturing complex and town near Chicago for the employees of his Pullman Palace Car Co. He intended for his planned community to help prevent labor unrest, attract a skilled workforce, and increase employee productivity. To do this he provided a clean, orderly environment away from what he saw as the vice-filled big city. The town featured more than a thousand homes, as well as public buildings and parks. Residences had yards, indoor plumbing, gas and daily trash removal - rare amenities for industrial workers of that era. In less than ten years, Pullman's population grew to 12,000 residents.<sup>5</sup> Understanding that skilled and productive employees were crucial to the success of his company, Pullman strove to provide high quality housing to attract the best workers. But he also strove to 'create'

<sup>5</sup> T. Newcomen, "Pullman, Illinois: Changes in community planning from the 1880s to the 1990s", *International Journal of Heritage Studies*, Vol. 4, No. 1 (1998) : page 10-29.

this ideal employee himself, through the town's design, by providing what he thought was necessary to improve human well-being.

A matter of miles from the birth-place of the industrial revolution, Port Sunlight, located just south of Liverpool, saw a new concept in British industrial towns. Beginning in 1888, Lever Brothers, William Hesketh and James Darcy, built a soap factory town to provide housing for their workers. The town took its the name from the Lever Brothers' brand of cleaning agent, Sunlight. Thirty different architects were involved in the design, all closely supervised by William Lever himself. Between 1899 and 1914, 800 houses were built to house a population of 3,500. This company town had allotments and public buildings including the Lady Lever Art Gallery, a cottage hospital, schools, a concert hall, an open-air swimming pool, a church, and a temperance hotel. William Lever introduced welfare schemes, and provided for the education and entertainment of his workforce, encouraging recreation and organisations which



**PULLMAN TOWN ▲**

The lavish design of Pullman. Accessed March 23, 2016 < <http://etsavega.net/dibex/Ledoux-Chaux-e.htm>>

promoted art, literature, science or music-- pushing his own social agenda onto workers.<sup>6</sup>

Lever's goals were "to socialise and Christianise business relations and get back to that close family brotherhood that existed in the good old days of hand labour." Lever sought to control the worker population by stating that Port Sunlight was an exercise in sharing, but that, rather than share profits directly he invested them in the village. Lever's vision approached the issue of control in a different way than Pullman. Very paternalistically, and considering his own morals to be superior to those of his workers, William Lever stated: "It would not do you much good if you send it down your throats in the form of bottles of whisky, bags of sweets, or fat geese at Christmas. If you leave the money with me, I shall use it to provide for you everything that makes life pleasant -- nice houses, comfortable homes, and healthy recreation."<sup>7</sup>

Company owners such as the Levers used strategies of paternalistic social engineering

<sup>6</sup> Adam Macqueen, *The King of Sunlight: How William Lever Cleaned up the World* (London: Corgi Books, 2004), page 80.

<sup>7</sup> Ibid, page 74.

-- including pushing religious or moral ideals onto the working-class employees -- as a way of gently controlling them. The company town offered a platform to exercise social advances while expanding business for the company. This form of control led to uprisings in some company towns including Pullman and by the 1920s, the architectural language of the company town changed dramatically.

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## 2.3 Camp Design History



**THE BULLDOZED ARENA OF CASSIAR, BC ▲**

Majority of the town was bulldozed after the asbestos mine ceased operation in 1992; CBC news accessed on April 17, 2016

< <http://www.cbc.ca/airplay/episodes/2012/08/06/cassiar-reunion-fuels-new->

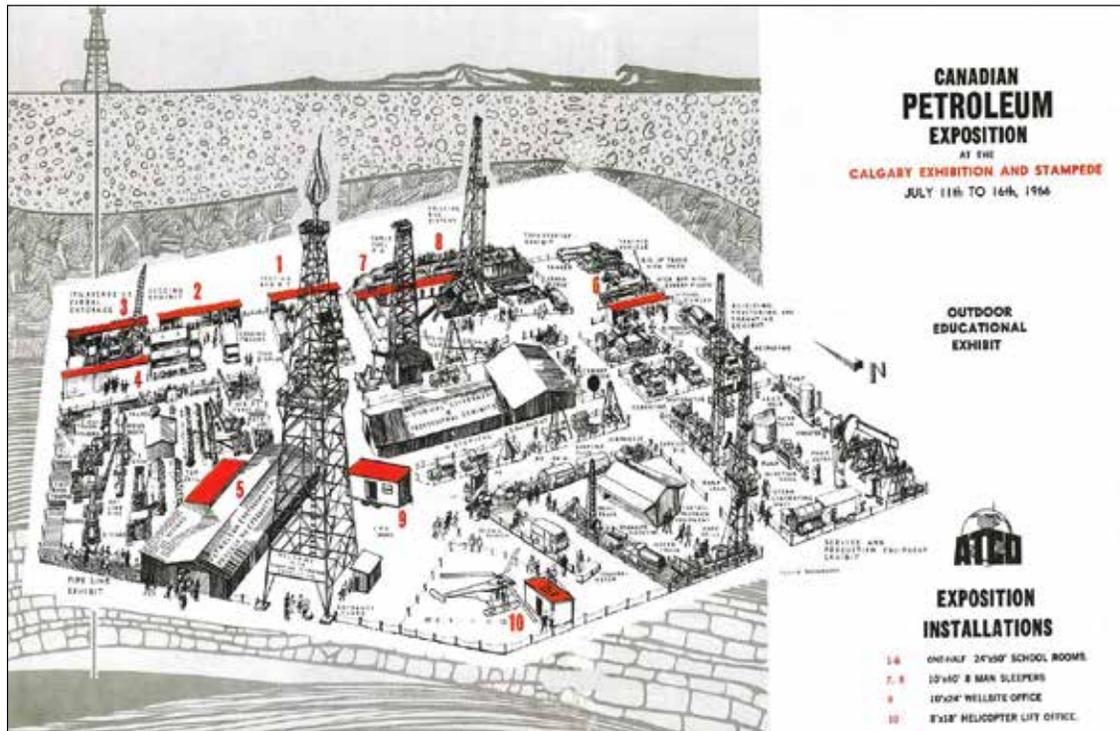
The temporariness of Canada's mining camps is a relatively new phenomenon. It is only in the last twenty-five years that "drop and clip" prefabricated buildings have replaced company towns proper. Markets and industries today are too fast changing to justify a permanent town on most sites in Canada. Even though some mine site may still exist for fifty years, with changing markets, the site may not be in 100% operation the entire time. Company towns in Canada were often abandoned or bulldozed after operation. For example, at the former fifty-acre gold mining town of Braiden, B.C., only twenty dwellings remain of the original eighty built during the town's heyday. Abandoned in the 1970s, the town was sold in 2014 after a long time on the

market.<sup>8</sup> When the asbestos mining town of Cassiar, B.C., ceased operation in 1992, many homeowners attempted to ship their houses to new locations. This was not possible for most residents and the remainder of the town was bulldozed.<sup>9</sup> As these cases illustrate clearly, the architecture of these company towns was not able to respond to mining's inescapable cycle.

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<sup>8</sup> Justin McElroy, "Ghost Town Mysteries: Bradian B.C.," *Global News*, August 19, 2014 / accessed May 22, 2016, <http://globalnews.ca/news/1513118/ghost-town-mysteries-bradian-b-c-a-ghost-town-for-sale/>.

<sup>9</sup> Nick Eaglane, "Can LNG and hydro projects jolt these B.C. ghost towns back to life?," *The Province*, September 26, 2015 / accessed May 21, 2016, <http://www.theprovince.com/technology/>



**ATCO BROCHURE FOR THE 1966 CANADIAN PETROLEUM INDUSTRY** ◀

Alberta, 1947. Risky, but lucrative, petroleum field operations from the oil boom were followed by pipeline construction, gas plants and other developments. Worksite living began in tents, then individual rental trailers, and by the early 1960's, the first work camps were buzzing with residents.

In 1966, it was recognized that the petroleum industry had assumed an important place in the economy of the province and hosted the Canadian Petroleum Exposition at the prime-time event of Western Canada – The Calgary Stampede. One of the aims was to introduce the youthful fun-seekers to the industry that was fueling the nation. Accessed May 10, 2016 < <http://www.atcosl.com/en-ca/Our-Stories/Lists/Posts/Post.aspx?ID=46>>

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## 3.0 Today's Situation

### 3.1 Temporary Settlements

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The landscape of the company town model shifted over the 20th century. In Canada, company towns stopped being built in the late 1970s. The mining town of Nanisivik, Nunavut, is one of the last company towns to have been built in Canada. Constructed in 1975 to support the zinc mining operation that opened in 1976, the town is now deserted following the mines closure in 2002 and the majority of the \$50-million worth of industrial and residential infrastructure has been demolished.<sup>10</sup> The combination of several forces brought about the end of the company town, from fast changing markets to the growing affordability of air travel. Housing in industrial operations therefore shifted from permanent forms to temporary, prefabricated solutions known as “work camps.” Settlements made of prefabricated, temporary trailers

gained popularity in the 1970s and continue to gain momentum today. One company that has secured much of the temporary prefabricated housing market is ATCO- Alberta Trailer Company, a company with nearly 8000 employees and assets of approximately \$19 billion. The latter had its beginnings in Alberta and provided trailers to the mining industry since the 1960s.

In rethinking camp housing, it is necessary to explore the layout of the accommodation on site and the design of the workers' camp from the mining resource company's perspective. It is implied that the mining company has provided facilities that they believe are sufficient for an acceptable quality of life. But many questions must be asked: what is required to achieve the minimum standards for a fulfilling life? How or why did the mining company decide upon what to provide and how to organize the settlements? Going further, might a more

creative approach to prefabrication methods make possible much higher standards of living than is currently provided? Logically, the mining company approaches the site as a machine for resource extraction; the worker's life on the camp is only one portion of the equation. To move towards a better understanding of the contemporary work camp, it is useful to look back and trace the steps that mining companies have followed to make their decisions about camp design. The following section examines what is currently provided on a camp, how today's camp supports a sufficient quality of life, and how camp conditions compare to those provided historically by mining companies to their workers.

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<sup>10</sup> Tee Wern Lim, *Inuit Encounters with Colonial Capital: Nanisivik - Canada's First Hight Arctic Mine* (Vancouver: University of British Columbia, 2013), page ii.



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### 3.2 What is a Work Camp?

Work camps are residential accommodations provided to an employee by their employer. Typically they are located near the resource extraction site as a solution to isolation and lack of local resources and services. They generally cater to shift-work arrangements, in which workers typically work for three weeks and leave for one week (or a different combination of time in and time out). Work camps come in a variety of types – some are large with a wide array of amenities and services on site, and some are small, providing only the basics. Small camps can house as few as five to thirty people and typically have limited facilities on-site. Large camps can house up to 5,000 people and have many amenities and services on-site. The need for camps follows varying timelines. Some exploration camps are only needed for a few weeks whereas others have a fifty-year lifespan.

Some large camps have amenities such as exercise facilities, dining halls, coffee shops, satellite TV and wireless Internet.<sup>11</sup> As for the settlement's residential component, the mine employer typically contracts out the housing to another company. The latter single handily designs and constructs the entire housing and amenity complex, complete with plumbed and wired living units. The supplier company has entire control over the camp design: the landscaping, the communal amenities, the food services and the individual worker units. An important feature of these camps and a reason for their shape is that the modular units are designed to fit on a 11'x 60' truck bed. This thesis reconsiders this highly deterministic logic of conception and assembly.

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11 Government of Alberta, "Wood Buffalo Work Camp Report", *Wood Buffalo Labour Market Information*, May 2012, <http://www.woodbuffalo.net/LMIResources/Reports/reports.html>.



**MINE SITES ACROSS CANADA - OPERATING 2014 ▲**

Mining sites operate in all areas across Canada, they are not restricted to Canada's north or Alberta's oil sands.

The Mining Association of Canada, Accessed May 05, 2016

Accessed May 10, 2016 < [http://mining.ca/sites/default/files/documents/Facts\\_and\\_Figures\\_2014.pdf](http://mining.ca/sites/default/files/documents/Facts_and_Figures_2014.pdf)>

### 3.3 Current Life at a work Camp: Fly in, fly out

The ephemeral group of ‘fly in fly out’ workers who go to camps to work, but who will not remain in the region after the job is over, have become known in Canadian media as the ‘shadow population’. While the stereotype might be a “rig-pig” of young single men, the statistics tell a different story. According to the 2012 census, more than half of the men are over thirty five and a majority are over the age of forty five.<sup>12</sup> More than half are in a common law relationship or married and

a growing number — 17% are women.<sup>13</sup> The work camp population is diverse and complex. Mining companies should provide settlements that register this fact much more precisely. As one example, rather than assume that all workers are autonomous salary earners with no family ties, the camps could offer housing for workers who are members of partnerships or families.

<sup>12</sup> Brent Wittmeier, “Life in a northern work camp: Huge ‘shadow population’ of oil workers flies in, flies out,” *Edmonton Journal* (Edmonton, AB), January 7, 2014.

<sup>13</sup> Ibid.

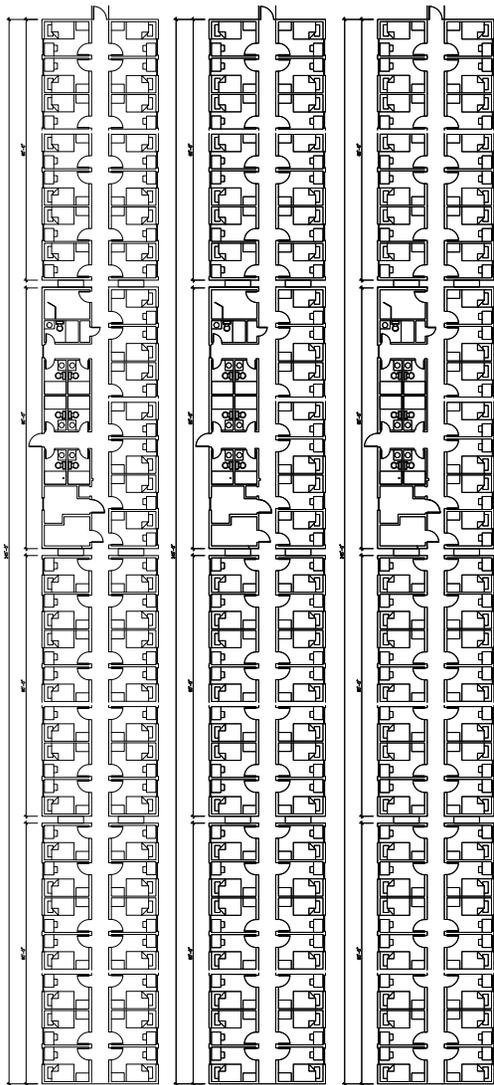


Three levels of stacked  
49 person dormitory

240' Double  
Loaded Corridor

700' Corridor

'Public' recreation spaces



### 3.4 Framing the Issue

The number of Canadians working on camps outside of their own province is growing. Every year, billions of dollars are earned by Canadians working on the road, in provinces where they do not keep a residence. Anecdotal reports have always maintained that the Atlantic Provinces, known for higher unemployment, count the highest number of people working out of province. The truth is 54,000 Albertans (more than twice the 20,000 Newfoundlanders who work out of province) work across the country in eastern Canada or in BC.<sup>14</sup> Canadian workers follow migratory patterns. According to Statistics Canada, about 420,000 people, or around three per cent of the paid work force in Canada, worked in another province in 2011. Around \$13.7-billion dollars in wages and benefits moved across provincial lines by direct deposit while workers travel in cars, buses and by the plane load.<sup>15</sup> This

<sup>14</sup> Kael Campbell, "Canadians Earn \$13.7 Billion In Camp Jobs or Commuting Outside Their Home Province," *Red Seal Recruiting Solutions*, July 3, 2015/ accessed May 8, <http://redsealrecruiting.com/canada-interprovincial-employment>.

<sup>15</sup> Rene Morissette and Qiu Hanqing, "Interprovincial Employment in Canada, 2002 to 2011," Statistics Canada, November 27, 2015, <http://www>.

number increased over the decade leading up to 2011, and beyond. Figures from Statistics Canada show inter-provincial migration has increased since 2011.<sup>16</sup> This number increased over the decade leading up to 2011, and continues to climb. Figures from Statistics Canada show that interprovincial migration has increased since 2011 and point to a growing industry trend.

The morphology of the camp is a result of unloading dormitory units and simply clipping them together. Because the units measure sixty feet in length and because four are joined to form one linear dormitory the result is two hundred and forty foot long windowless corridors. The opportunities for 'public' spaces are extraordinarily slim. Beyond the lack of physical communal space in which to relax or congregate, workers are subjected to surveillance. Adding to a lack of psychological space, an electronic card tracks every movement of their lives. The system has parallels to some minimum security prisons, and includes drug sniffing dogs. The worker is

[statcan.gc.ca/pub/11-626-x/11-626-x2015047-eng.htm](http://statcan.gc.ca/pub/11-626-x/11-626-x2015047-eng.htm)  
<sup>16</sup> Ibid.

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reduced to a mere producer of labour on the mine site, constantly existing in a work-sleep cycle, with emphasis on the sleep.<sup>17</sup> The physical and mental isolation is difficult for workers to deal with. Alberta's rate of suicide is the highest in the country, and is thought to be associated with the FIFO lifestyle. The difficulties workers face on camp are complex; distance from family and friends is straining, facilities like washrooms and showers, which are private when one lives off-camp, are communal. In turn, dining, which is familial off-camp, is here shared with large groups of other workers with whom one shares no ties. A nurse on a site in northern Ontario commented: "facilities are communal, including washrooms showers, dining – and the two cherished telephones on site. I learned quickly there are no long, drawn-out hours of whispering

<sup>17</sup> Verna Murphy, "Time to talk about the toll of 'fly-in, fly-out,'" *Fort McMurray Today*, July 31, 2014, <http://www.fortmcmurraytoday.com/2014/07/31/time-to-talk-about-the-toll-of-fly-in-fly-out>

sweet nothings on this company phone, because the big bruiser behind you has two weeks of sweet nothings stored up and ready to explode if you don't hurry."<sup>18</sup> Working on an isolated camp in Alberta Lindsay Moore didn't think that her relationship with her spouse could survive the FIFO lifestyle. "Honestly if you were in a fresh relationship, I don't know how it would survive. You become so detached from your real life"<sup>19</sup> The work camp is a harsh environment marked by physical and mental isolation. Creating an improved work camp design, with a strong sense of community, would begin to tackle these issues.

<sup>18</sup> Gloria Tougas, "Nurse faces gruelling culture shock of mine camp life," *The Northern Miner*, February 20, 2006, <http://www.northernminer.com/news/nurse-faces-gruelling-culture-shock-of-mine-camp-life/1000201171/>.

<sup>19</sup> Jamie Hall, "Long-distance love: Couples deal with separation anxiety of the oilpatch variety," *Edmonton Journal*, January 7, 2014, <http://www.edmontonjournal.com/business/>.

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## 4.0 Camps: Philosophical Constructs

In order to conceptualize an architecture for camps, Italian philosopher Giorgio Agamben, observes camps as lenses through which to understand broader and highly determinant social and political configurations. Camps, for Agamben, are political constructs that reveal profound political entanglements. He argues that all citizens in a capitalist society live in a camp, having been stripped of their autonomy by external political and economic factors losing control their lives from the moment of birth right up until death. In reference to the concentration camps of World War II, he describes camps as “the ‘Nomos’ of the Modern.” “The camp is the space that is opened when the state of exception begins to become the rule.”<sup>20</sup>

Agamben revisits the Roman figure of the homo sacer, a figure with no status within society, a figure outside the law, whom anyone can kill without impunity. This poignant figure, for

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<sup>20</sup> Giorgio Agamben, *Homo Sacer: Sovereign Power and Bare Life* (Stanford: Stanford University Press, 1998), page 19.

Agamben, is similar to the camp dweller: a person endowed simply with, as Agamben calls it, a “bare life.”<sup>21</sup> The architecture of camps is thus an architecture of “bare life.” Agamben argues the obligation for the worker to succeed in a capitalist society has driven him or her to make quality of life sacrifices to go a work on a camp. Individuals make decisions based on money regardless of the outcome of their relationships to family, community and ‘humanness’ – and these fundamentals of life are all pushed aside.

German political philosopher Hannah Arendt’s idea of ‘worldlessness’<sup>22</sup> can be layered on to the workers human state in a camp. In a camp, the individual no longer can exercise the choice to interact in the public realm through action and speech because their schedule and the “public realm” do not belong to them.<sup>23</sup> Through losing this choice, the worker also loses their opportunity for

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<sup>21</sup> Ibid, page 36.

<sup>22</sup> Hannah Arendt and Margaret Canovan, *The Human Condition*, 2nd ed. (Chicago: University of Chicago Press, 1998), page 52.

<sup>23</sup> Ibid, page 26.

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individuality and the basic fundamentals of being human. The worldlessness of a person existing in such a camp comes from being stripped of the opportunity to actualize one's full humanity. In the work camp, the worker's actions and speech do not resonate in a truly common world; life in its full and public sense has been stripped away.

The experience of the person in such camps is distilled to labor production. There is no time nor space for any 'making.' Arendt writes that labor is the only activity that corresponds to the experience of worldlessness. Arendt goes further: "The simple erection of a material home, as, for example, nomadic tribes are wont to do, is in Arendt's view an insufficient remedy for the worldlessness of labour."<sup>24</sup> A shelter doesn't constitute a home, and building a shelter does not compensate for worldlessness. According to Arendt, persons who live in work camps would be experiencing the pure definition of worldlessness. Arendt writes about the importance of stability

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<sup>24</sup> Finn Bowring, *Hannah Arendt: A Critical Introduction* (London: Pluto Press, 2011).

and permanence in human life. The sheer set up of these camps does not allow for either. Their physical and mental isolation impedes workers' ability to participate in a political society.<sup>25</sup>

The idea of an employer desiring to improve the quality life of their employees, and to control more and more aspects of their life, still exists today. Google may be famous for creating fun places to work, but it could be argued that their intentions are not completely genuine. They create a dynamic work environment to get people to want to stay at work, thus completing more work.

So why do resource extraction companies in Canada choose to provide only the bare necessities of life with seemingly no concern for quality of life? Black Diamond, a company that provides temporary camp buildings (including housing), uses rhetoric such as "tough as a diamond"<sup>26</sup> (Black and Diamond Group 2015)

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<sup>25</sup> Hannah Arendt and Margaret Canovan, *The Human Condition*, 2nd ed. (Chicago: University of Chicago Press, 1998), page 31.

<sup>26</sup> "Black Diamond Camps & Lodging," Black Diamond Group, 2016, accessed March 20, 2016, <http://www.blackdiamondgroup.com/>.

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The slogan implies that the environment of the accommodation is something to survive. Living in a Black Diamond trailer means you are a macho and tough person. Companies try to attract employees through higher salaries as opposed to offering opportunities for workers to conduct a fuller life while in their employ. Conversely, workers, in their attempt to earn a living and support themselves and their families, make quality of life sacrifices. This contradiction, this desperate pairing of mining company's job opportunities and workers' need for a salary, poses profound economic and political questions. Architecture cannot hope to solve them. But architecture can rectify some of the imbalance, and empower the worker in an otherwise disempowered relationship. This is where this thesis operates: in a strategic design language that opens up space and agency for the dweller, wherever and however possible.

Mining companies have consistently tried to attract employees through generous wages. For workers to even consider it, the job must be financially very rewarding. The companies

also promote the notion of an "elite" work force to add to job appeal. Companies want their employees to be 'tough' in both the physical and mental sense, and sell the point that the "elite" worker should be proud to have survived a camp. This idea of toughness is antithetical to the historical idea of civility that permeated utopian discourse about company towns. This page from the Black and Diamond brochure celebrates the implied similarity between the diamond mine worker and diamonds themselves: Nothing's tougher than a Diamond'.<sup>27</sup> To be sure, the notion of toughness is intended to cover up, or make up for, what is in fact a shallow and hollow existence likely devoid of joy and fulfillment. Companies sell the notion of toughness disingenuously.

Historically companies have wanted to offer workers more than just jobs. As seen above, the promise of a fuller life veiled a desire to control the worker, either politically or morally, from Ledoux, to Pullman, to the Lever brothers. But regardless of these alterative motives, industrialist employers

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<sup>27</sup> "Black Diamond Camps & Lodging," Black Diamond Group, 2016, accessed March 20, 2016, <http://www.blackdiamondgroup.com/>.

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typically wished to give more than a job to their employees, and to provide them with a complete life. The company town was just that, a town, and thus, was imbued with a civic sense and logic. Its dwellers were always citizens, complete individuals that were part of a larger social entity. In today's fly in, fly out model, workers of Canada's temporary camps see their loved ones and families on an infrequent basis, something the Lever brothers would have no doubt seen as ungodly. The design of today's camps does not take living a fuller life into consideration. And while the industrialists of yester-year and their ideas about socially engineering their workers can easily appear manipulative and self serving, today's mining companies engage in a type of manipulation that is arguably more pernicious.

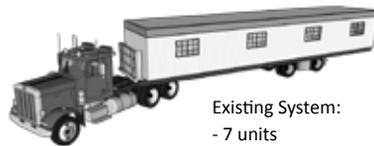
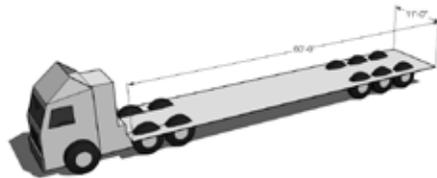
## 5.0 Design Concept Frames



### NAVIGATING A SHIFT IN THE OIL SANDS ▲

The PTI Athabasca Lodge, an enormous camp for migrant oil workers near Fort McMurray, sits empty. Taken from New York Times, Accessed May 05, 2016

Accessed May 10, 2016 <<http://www.nytimes.com/slideshow/2015/10/02/business/navigating-a-shift-in-the-oil-sands/s/20151006OILSANDS-SS-slide-HZRT.html>>



Existing System:  
- 7 units  
- Max 7 beds

Due to the ever changing nature of the resource industry in Canada, this thesis exists in the need for a flexible, temporary system that is both environmentally and socially sustainable. The current system which operates under the pretext of temporary housing, does not operate in a temporary manner quickly enough to keep up with changing markets. For example the, with current oil prices dropping and Alberta affected by the price drop camps are being closed and left abandoned. For example the 2,005 Athabasca

Lodge near Fort McMurray is currently closed, left abandoned and not operational.<sup>28</sup> Without losing sight of create a strong community, this thesis exists in temporary architecture that can easily adapt and shift to the economic changes of the mining site. Let us briefly return to the current system in order to understand it fully.

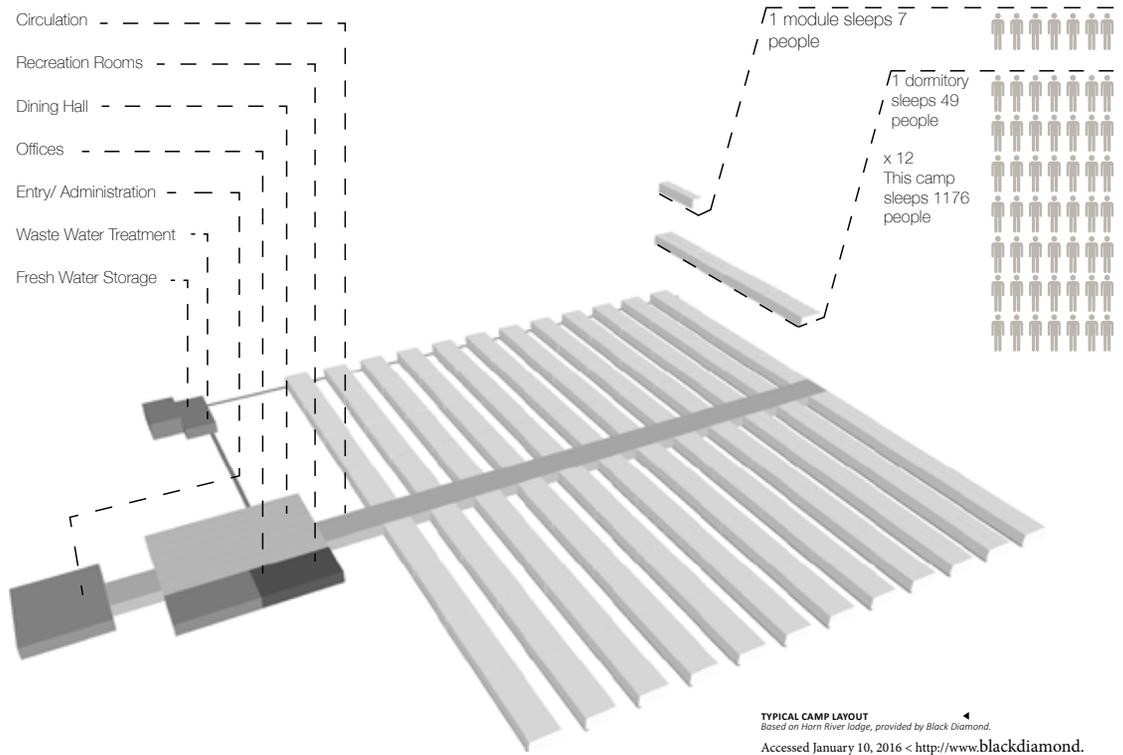
<sup>28</sup> "Athabasca Lodge | Open Camp N of Fort McMurray," Lodges and Villages, May 12, 2014, accessed July 20, 2016, <http://civeo.com/lodges-villages/canada/athabasca-lodge/>.

### 5.1 Prefabrication and Truck Beds

In Canada, almost all mining companies, including Barrick Gold, Suncor Energy and Syncrude Canada purchase their housing and contract its installation to one company. This company 'delivers' the prefabricated housing and amenity spaces to the mine site, and maintains it for the duration of the extraction activity. In a typical installation, one unit containing seven single dormitories is placed on a truck; these units do

not contain washrooms, hence a 'wet' module containing six showers and six toilets, is placed on an eighth truck. Typically, therefore, eight trucks are needed to complete a section of the camp that would house 49 single dormitory rooms. This thesis proposes to work within this existing system, and is intended to remain appealing to mining companies. The innovations this thesis brings to the current system are to do with a

- Circulation - - - - -
- Recreation Rooms - - - - -
- Dining Hall - - - - -
- Offices - - - - -
- Entry/ Administration - - - - -
- Waste Water Treatment - - - - -
- Fresh Water Storage - - - - -



**TYPICAL CAMP LAYOUT**  
 Based on Horn River Lodge, provided by Black Diamond.  
 Accessed January 10, 2016 < <http://www.blackdiamond.com.html> >

critical rethinking of what the trucks are, in fact, transporting to the sites, and how the truckloads are packed and unpacked. Rather than linear boxes of dormitory rooms measuring the width of a truck bed, the starting point for this proposition is to imagine different ways that a truck's load can be deployed to become a settlement. This thesis proposes to improve the number of beds per truck, with no need for a wet module. The modules will provide the worker with improved accommodations – and specifically, dwelling units that are more spacious, more varied in terms of layout, that have views of the landscape rather than of a facing row of dorm-housing, and that have a private bathroom - at similar shipping times and costs. In turn, the communal facilities will differ from existing models in that they will have their own logic and follow a site and population-specific organization rather than being made by joining single trailers together.

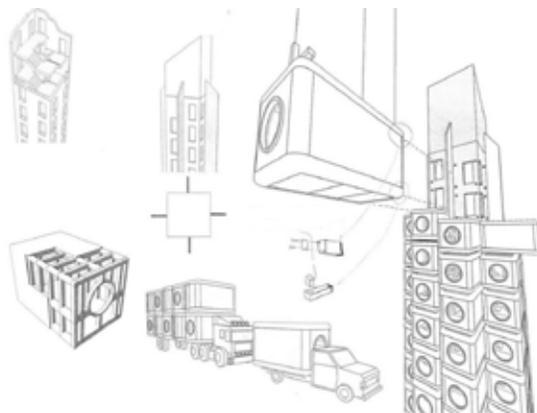


## 5.2 Pleasure in flexible dwelling

### Capsule Architecture

The architectural need for alternatives to permanent settlements is not new to the resource extraction industry. In the early post-war years, the Japanese Metabolists looked at development strategies that embraced the notions of organic growth and change. The group of visionaries and architects dreamed of future cities. Kiyonori Kikutake (1928-2011) was one of the first contributors to the first Metabolism pamphlet which laid out some of these futuristic development ideas- “Metabolism 1960: The Proposals for a New Urbanism.”<sup>29</sup> Kikutake’s

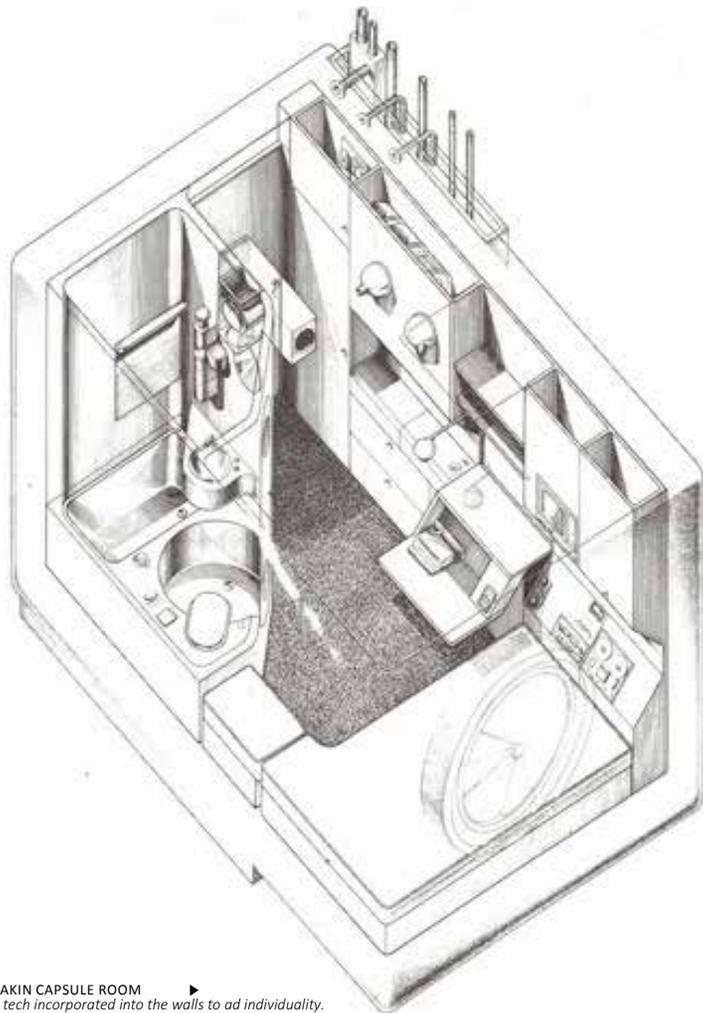
and his colleagues’ work embraced the idea of cities in flux: cities in constant change, accepting of impermanence. Many of the proposals incorporated technological advancements not of their time, which could not yet be realized as buildings. Notably, Metabolist concepts addressed the uncertainty of the ground condition with megastructures that could adapt to changing economic and environmental surroundings through the addition and removal of modules. Nakagin Capsule Tower, 1972, by Kisho Kurokawa is a very early example of capsule architecture. The Metabolists’ interactive approach to the ground plane and the principle of modularity have been layered onto this thesis proposition.



NAGAKIN CAPSULE TOWER ▲  
*Modular units create dense urban living.*

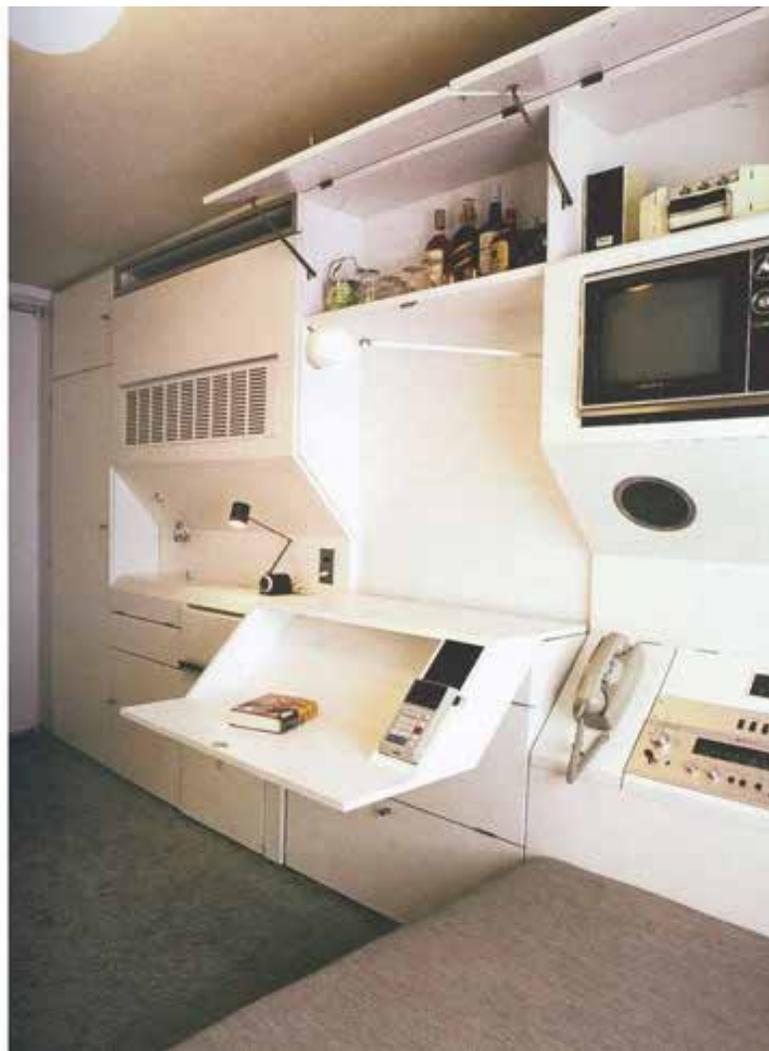
Accessed April 21, 2016 < <http://nohutoda.blogspot.ca/2013/11/ici-seni-ds-beni-yakan-nagakin-kapsul.html> >

<sup>29</sup> “Lecture: What Was Metabolism? Reflections on the Life of Kiyonori Kikutake / Toyo Ito,” Arch Daily, November 10, 2012, accessed July 20, 2016, <http://www.archdaily.com/287150/lecture-what-was-metabolism-reflections-on-the-life-of-kiyonori-kikutake-toyo-ito>.



**NAGAKIN CAPSULE ROOM** ▶  
*High tech incorporated into the walls to ad individuality.*

Accessed April 21, 2016 < <http://nohutoda.blogspot.ca/2013/11/ici-seni-ds-beni-yakan-nagakin-kapsul.html> >



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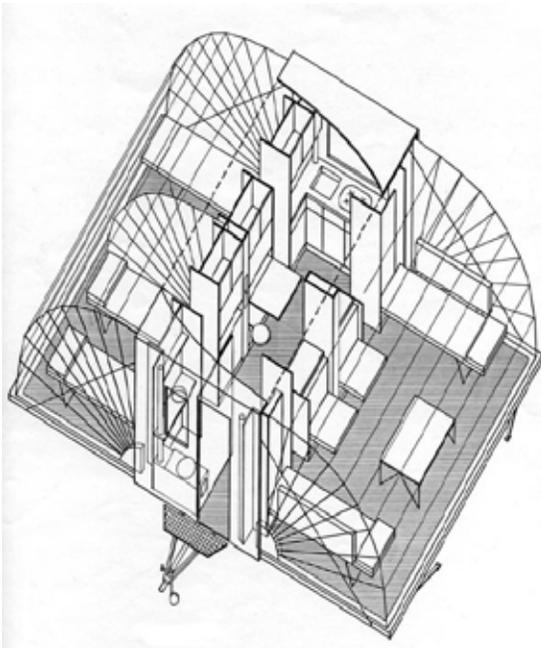
### Folding Architecture

In aboriginal and European architecture alike, there is a distinction between sedentary and nomadic architecture. Indigenous people of the Canadian North, for example, built igloos and tents, and combinations thereof, according to seasons. Their structures were flexible.

Liverpool School of Architecture specialist on mobile architecture, Robert Kronenburg, describes that the feeling of home and of belongingness to one's surroundings is dependent on the ability to modify them.

<sup>30</sup> The possibility of flexible personal space for temporary workers could create a stronger sense of belonging in a transient environment. More involvement in one's own surroundings could create a stronger sense of place. Flexible and changing personal furniture can be a way of nurturing agency and creating ownership.

Conceived by Dutch designer Eduard Bohtlingk, the Markies' camper easily triples a typical camper's floor space and is able to comfortably shelter a family of four thanks to its foldout rooms. Böhtlingk conceived the Markies as a mobile holiday house in his entry for the "Temporary Living" competition in 1985. This modern camper-trailer inventively employs the folding principle in order to increase the initial 2 m x 4.5 m interior space threefold when it is parked in a desired location. In 1996 the project was awarded the Public Prize at the prestigious Rotterdam Design Prize.<sup>31</sup> The strategy of folding as a way of producing spatial flexibility is an interesting one that will be referred to later on.



'THE AWNING' DE MARKIES ◀  
This mobile home was an entry in the "Temporary Living" competition in 1985

Accessed April 10, 2016 < <http://www.bohtlingk.nl/en/markies-2/>>

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30 M. Schwartz-Clauss and Robert Kronenburg, *Living in Motion: Design and Architecture for Flexible Dwelling* (Germany: Vitra Design Stiftung, 2002).

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31 Ibid.



EDUARD BOHTLINGK MARKIES' CAMPER ►  
*'Expanding' temporary architecture.*

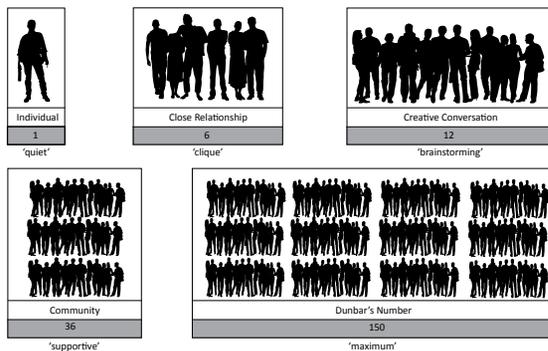
Accessed May 10, 2016 < <http://tinyhousefor.us/wp-content/uploads/2015/02/UrbanCampsite-Markies-6-IIHIIH.jpg> >

## 5.3 Social Grouping Scales

“Dunbar’s number” is a proposed psychological cut-off to the quantity of individuals with whom one can keep up stable social connections. These are connections in which an individual knows who every individual is and how every individual identifies with each other person. This number was initially proposed in the 1990s by British anthropologist Robin Dunbar, who found a connection between primate’s cerebrum size and normal social gathering size. After transposing his studies on primates to humans, he recommended that people can only keep up one hundred and fifty stable relationships.<sup>32</sup>

Apart from this large group of one hundred and fifty, studies show how different group sizes are conducive to different relationships. George Miller disclosed ‘a rule of seven, plus or minus two: Some Limits on Our Capacity for Processing

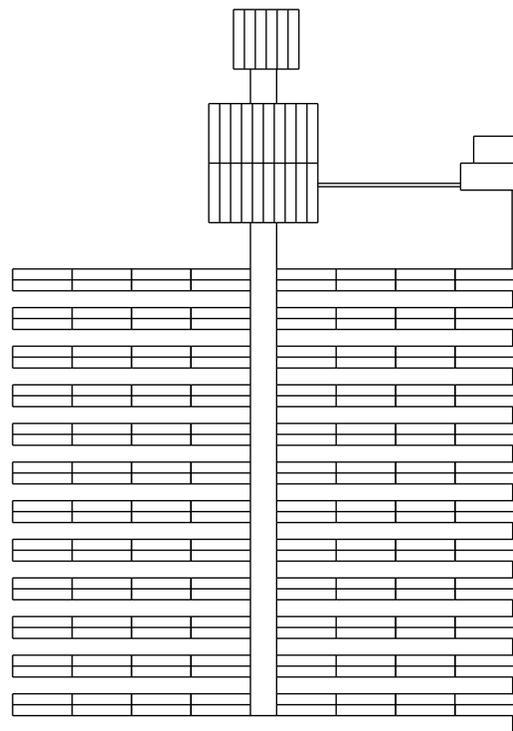
Information.<sup>33</sup> Groupings seem to naturally follow a factor of six or seven; a group of six is typically close family and maybe one or two very close friends, ‘the working group’. A group of twelve is considered conducive for creative conversation and for energizing brainstorming. Finally, a group of thirty people can operate on a community level.<sup>34</sup> Taking these group sizes into consideration, the housing design proposal will incorporate spaces supportive of each grouping sizes, with a maximum space of gathering at one hundred and fifty. In turn, gathering spaces will be designed for a maximum of one hundred and fifty people. In this sense, the proposition begins by scaling down the work camp by dividing it into parts and joining these parts via a connective circulatory structure and communal spaces.



<sup>32</sup> R. I. M. Dunbar, “Neocortex Size as a Constraint on Group Size in Primates,” *Journal of Human Evolution* 22, no. 6 (June 1992), doi:10.1016/0047-2484(92)90081-j.

<sup>33</sup> George A. Miller, “The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information,” *Psychological Review* 101, no. 2 (1994), doi:10.1037/0033-295x.101.2.343.

<sup>34</sup> Matthew E. Brashears, “Humans Use Compression Heuristics to Improve the Recall of Social Networks,” *Scientific Reports* 3 (March 21, 2013), doi:10.1038/srep01513.



TYPICAL WORK CAMP PLAN ▲  
 'Corridor' community

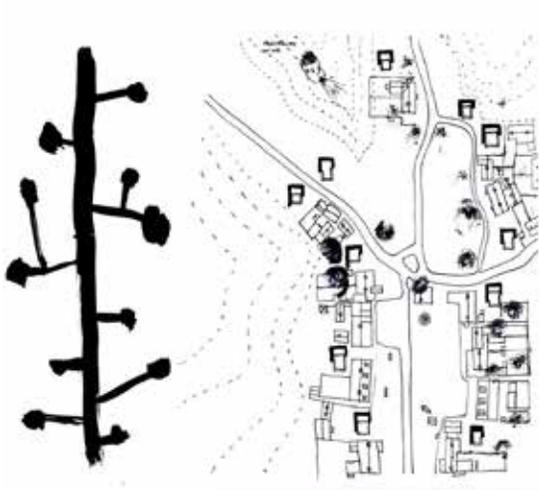
## 5.4 Existing Module Construction

A representative from Black Diamond, Toronto, provided me with a set of working drawings of a typical trailer used for camp office or accommodation. The following drawings are extracted from this set. These reveal that the system is intended to be durable while also demountable, such that trailers can be reused on other sites. Upon closer examination, I found the construction assemblies to be of conventional stick frame construction, and there was really nothing particularly modern or inventive about the trailer's detailing.

The trailer form and construction lends itself to repetition. The result is that work camps' site organization follows a corridor pattern. The work camps are effectively 'corridor camps.' All because all the circulation paths are organized with a corridor access logic. Direct, straight, double-loaded corridors shape the 'community' and create an abrupt distinction between

'public' and private realms, while evacuating any gradations from public to private (including semi-public and semi-private) realms. This leads to a lack of choices as to how one can get to one's own room. As one would never walk down any other 'corridor' than the one leading to one's own room, one's daily experience is devoid of surprise and spontaneity. Opportunities for encounter and human relationships are similarly limited. This thesis responds to this oversimplification of the circulation paths.

When considering themes of spontaneity and encounter in the built environment, the work of Team 10 is helpful. This group of avant-garde architects formed in 1953 and formulated a critique of CIAM's tenets that promoted a more relational approach to the urban realm. Team 10 responded to modernism's oversimplifications with "ground up" urbanism and architectural forms that rekindled spatial overlaps. Their



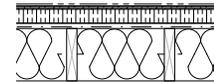
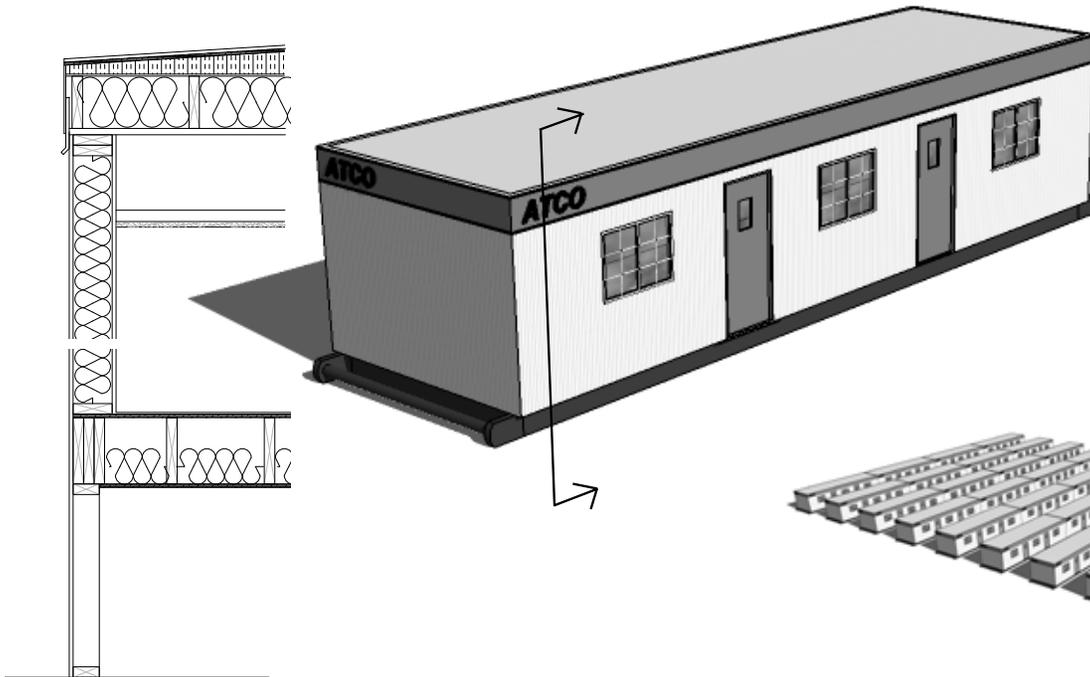
SMITHSON "FOLD HOUSES" ▲

Accessed May 20, 2016 <<http://jsah.ucpress.edu/content/73/2/226>>

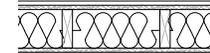
work started with a single dwelling cell, and this cell (which accommodated human activities) was then organized into clusters. From 'cell to cluster,' such was Team 10's motto. The cells were assembled into clusters to establish spatial variations and connections between the public and private realms of the urban fabric. The Smithson's cluster diagram of Fold Houses<sup>35</sup> it is within the space of these overlaps, in the realm of blurring of lines, that the design proposal for a renovated work camp unfolds.

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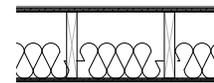
<sup>35</sup> Team 10 et al., *Team 10 in Search of a Utopia of the Present 1953-1981* (Rotterdam: NAI Publishers, 2006).



**ROOF ASSEMBLY:**  
 48 MIL MEMBRANE  
 1/2" PLYWOOD  
 FIBREGLASS INSULATION- FULL  
 ROOF CAVITY  
 ROOF JOISTS 2"X8" @ 12" O.C.  
 VAPOUR BARRIER, 6 MIL POLY  
 1/2" GWB



**WALL ASSEMBLY:**  
 28 GA. METAL SIDING  
 3/8" PLYWOOD  
 2"X6" @ 16" O.C.  
 R-20 FIBERGLASS INSULATION  
 VAOUR BARRIER: 6 MIL POLY  
 1/2" VINYL COVERED GWB



**FLOOR ASSEMBLY:**  
 VINYL TILES  
 5/8" T&G PLYWOOD  
 2"X10" JOISTS @ 16" O.C.  
 PERIMETER-WOOD BEAM- 3-2"X10"  
 R20 FIBERGLASS INSULATION  
 7/16" O.S.B. UNDERSHEATHING



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## 5.5 Biodegradability versus Lasting Structure

The proposition here presented resists the idea of complete erasure of the site, and aims to contribute to a national narrative regarding extraction of resources in Canada. While the units will be transported from site to site, a commemorative architectural residue will be left behind after the mine has closed, telling part of the story of Canada's history of resource extraction. In this design proposal, the worker housing is temporary and off the grid; it is durable and ready to be completely removed and transported to another site at any time. Other portions of the camp program, notably the circulation and the communal spaces, will leave a structure decomposing behind. The latter will eventually biodegrade. During this process of biodegradation and overgrowth by vegetation, the armature becomes a landscape folly telling the story of Canadian resource history.

In current practice, mining companies promise to return the site to its original state at the end of the mine's life span, as though the mine had never existed. This may be the official approach

but reality tells another story. One example is the Giant Mine, a large gold mine located just outside of Yellowknife, in the Northwest Territories. Giant Mine began operations in 1948 and ceased in 2004. According to an article published in *The Toronto Star* in 2006 a total of 237,000 tonnes of deadly arsenic trioxide dust, the lethal by-product of extracting gold from the mineral arsenopyrite ore, was left at the site in underground chambers. These underground capsules are now monitored by a staff of fifteen people, and will continue to be for an unlimited amount of time. Documentary filmmaker France Benoit has named these maintenance workers 'guardians of eternity.'<sup>36</sup>

Kobberling & Kaltwasser's *The Games are Open* was an art piece in built and installed in 2010 on a city-owned site in Vancouver not far from the recently vacated Olympic Village.<sup>37</sup> The

<sup>36</sup> "The Guardians of Eternity: Giant Mine Through Eyes of Yellowknives Dene," *CBC News*, November 7, 2015, accessed July 20, 2016, <http://www.cbc.ca/news/canada/north/the-guardians-of-eternity-giant-mine-through-eyes-of-yellowknives-dene-1.3309446>.

<sup>37</sup> "Köbberling & Kaltwasser: The Games Are Open," *Other Sights*, 2014, accessed May 19, 2016, <http://othersights.ca/kobberling-kaltwasser-the-games-are->



sculpture represented a huge bulldozer, and the artists positioned it to face vacant land that was awaiting redevelopment. The bulldozer was made from Microstrand (a compressed wheat chaff bi-product) and slowly biodegraded as the site it faced was built up. Over the five years of the project's existence, the artwork's form shifted from sculpture to garden to dirt pile. Within Vancouver's context of land speculation, and that city's cycles of building up and tearing down, the sculpture became an iconic presence. The Microstrand representation of a macho-machine devolved from within. The Microstrand representation of a macho-machine devolved from within as the structure weakened, the artwork's social value increased.<sup>38</sup> Games are Open was subject to economic, bio-environment, and social forces. Its vulnerability invited re-invention.

open/.  
 38 "Köbberling & Kaltwasser: The Games Are Open," Other Sights, 2014, accessed May 19, 2016, <http://othersights.ca/kobberling-kaltwasser-the-games-are-open/>.

THE GAMES ARE OPEN ◀  
*During the summer of 2010 the artist team Köbberling & Kaltwasser worked with materials recycled from the 2010 Olympic Games. Accessed January 20, 2016 < <http://www.koebberlingkaltwasser.de/the-games-are-open.html>>*

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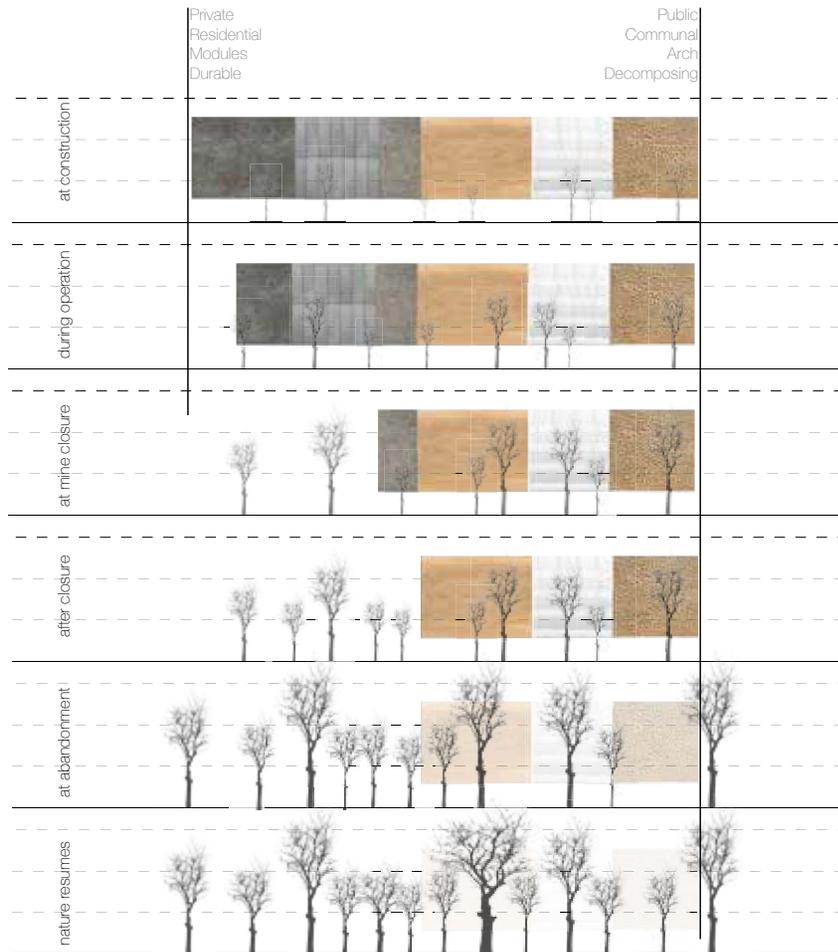
## 6.0 UNPACK LIVING: A NEW PREFABRICATED SYSTEM

The following section presents a proposal for a new prefabricated building system which, when unpacked, generates a new settlement designed to be installed near an extraction site. The goal is to devise a demountable modular system of private and public spaces whose parts and components are adaptable and responsive to various site types and to specific topographical and climatic conditions. As stated above, this thesis accepts the mining industry's premise of "settlement temporariness" and does not propose a return to the permanent company town model. The system here presented is conceived to operate on dual scales: the scale of the inhabitant, and the scale of the landscape.

The aim of the new system is threefold:

1. Improve all aspects of the worker's life on the site, from social life to private dwelling, through better environments and the provision of agency in the determination of environment.
2. Re-design the housing system so as to avoid the need for clear cutting. Devise a new system that can insert itself into existing sites in various ways; adopt a more organic approach in comparison to currently available systems.
3. Devise a prefabricated system with reusable and biodegradable parts that leaves an architectural residue of the mine after the site has been closed down.

### Material by Time, Material by Use

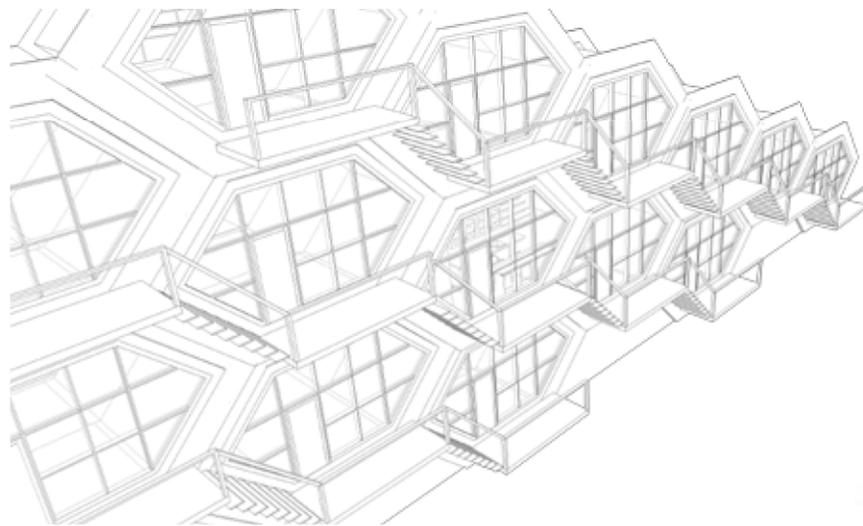
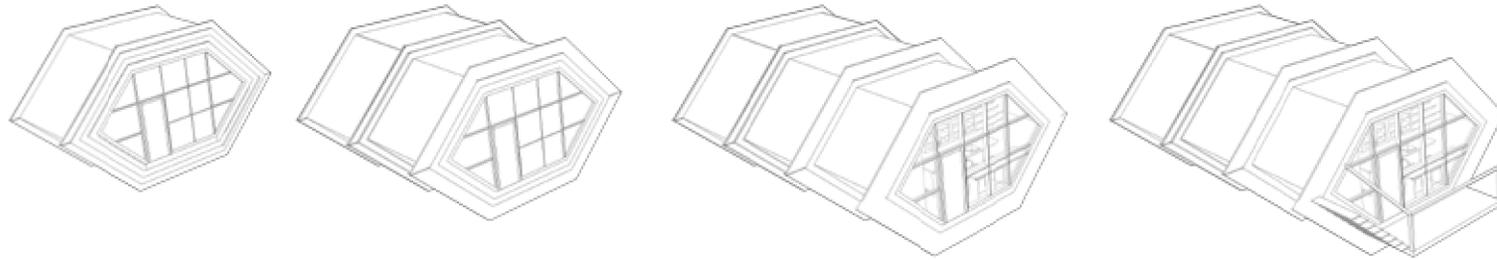


-  Steel Structure for modules
-  Metal Siding for modules
-  Temporary Concrete Foundation
-  Typical Dimensional Lumber
-  Biodegradable Translucent Plastic
-  Biodegradable Plastic Connections

**MATERIAL BY TIME** ◀  
*Choosing materials with an honest approach- the residential modular units will be completely removed from site, they must be durable therefore using materials like steel and metal. The communal spaces*

Transportation Mode

Living Mode



**A SHIFT IN SHIPPING ▲**

*Expanding units use the same if not less shipping than the conventional module, providing the worker with more than the bare minimum.*

**FLEXIBILITY IN DWELLING ◀**

*Pods deployed and expanded, easily stack and assemble with each unit having its own built in circulation, the 240' windowless corridor has been set free.*

**KNOW WHO'S NEXT DOOR ▼**

*With the floor plans of the unit organized with the semi private zone towards the circulation, it blurs the line between the 'public' and private spaces.*



---

## 6.1 Modularity-THE UNIT

The dwelling units are conceived to allow for a high degree of customization per unit, from the exterior to the interior. Customization of the exterior adapt the unit to the surrounding site and climate. Specifically, the units are equipped with solar panels.

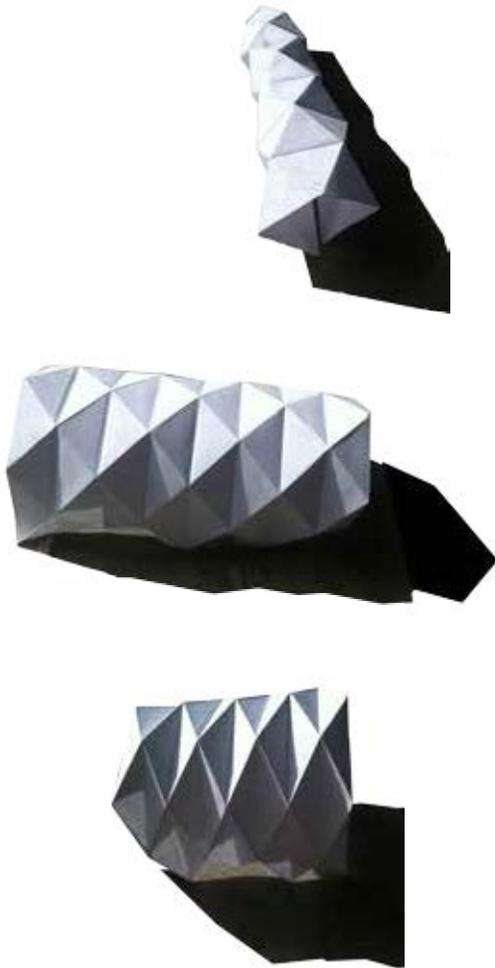
The interior space is to be customizable by the end user. A high tech abacus wall is key to this idea. These interactive walls will be designed on a customizable grid, allowing for the user to adjust the space exactly to their needs. This

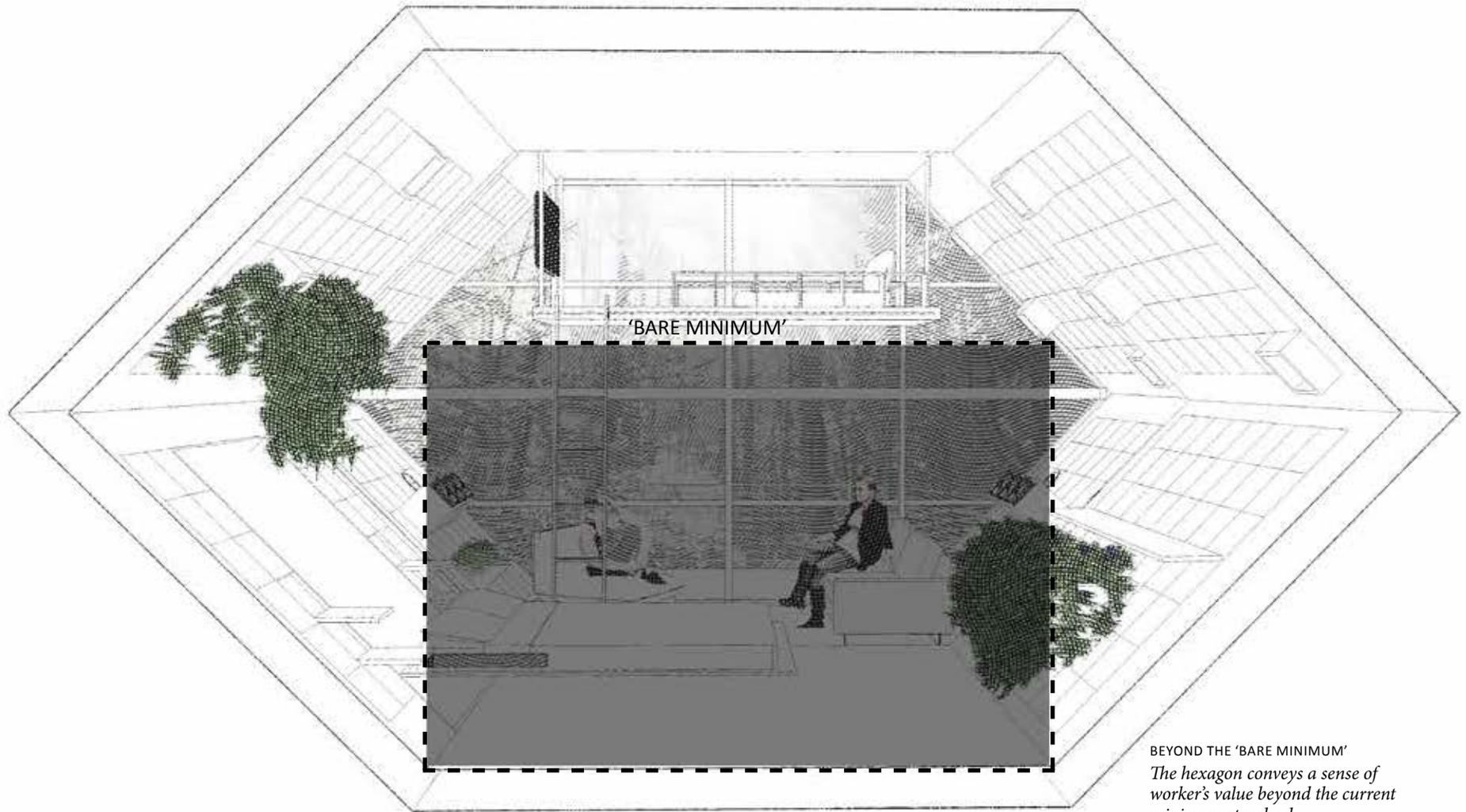
## 6.2 Hexagonal Form

The current minimum standard in housing tends to take the form of a rectangular box. This thesis proposes units that are hexagonal in form. The hexagon contains the square (or rectangle), but, as a mirrored trapezoid, it also includes triangles. This arrangement is very interesting: if the square refers to 'bare minimum' housing, the triangles are extra and non-needed spaces. In this thesis proposal, these extended triangular zones in the dwelling units are what convey a sense of the worker's value. Whereas a square geometry is customary in housing, the hexagon

customization will combat one of the main limitations of current work camp housing, which is that all of the units are identical no matter who lives in them. There are no options for couples to live together. No units are large enough for families. All units provide the same furniture and room layout. The new design provides units that a supervisor or labourer can adjust to suit their own needs and habits. Not every worker needs a desk, for example. In this system, the dweller can replace the desk area with a relaxing lounge space.

adds 'non-useful' square footage. A worker on a camp is accustomed to being provided with nothing but the bare minimum. A hexagon adds a realm beyond the square, an interstitial mystical space, to the worker's domestic world. The space beyond the square in the hexagon becomes a "para-utilitarian" space; it elaborates the typical domestic environment. The worker might use the space to add an additional loft space, or might use the area to bring the outdoors in with hanging planters.





BEYOND THE 'BARE MINIMUM'  
*The hexagon conveys a sense of  
worker's value beyond the current  
minimum standard.*



CUSTOMIZATION OPTIONS ►

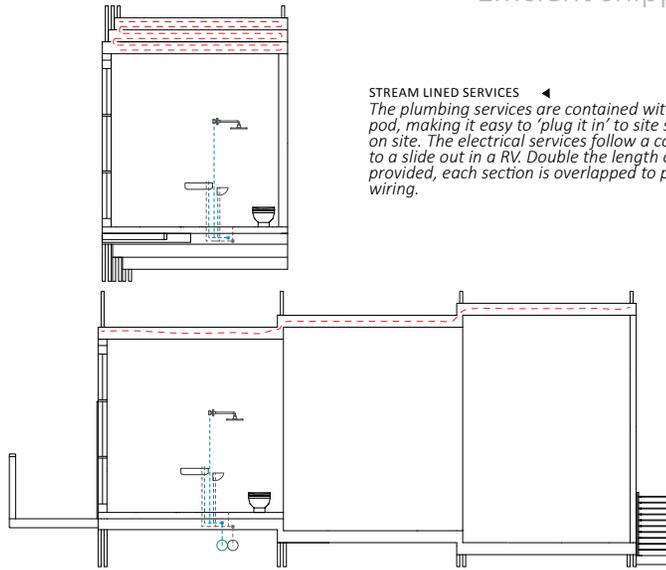
*The end user has the option to customize each wall as they wish. Whether it is where the electrical outlets are, the position of the speakers, the amount of greenery they wish to have inside, they can set up they space exactly as they wish.*



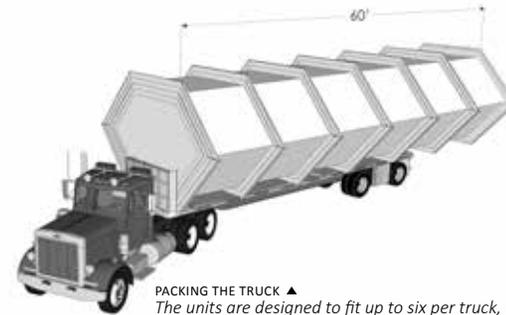
HIGH TECH ABACUS WALL

*Customization is crucial for individuals to feel empowered. This 'plug-n-play' wall works on a one foot steel grid system, shifting and sliding items exactly as the user defines them.*

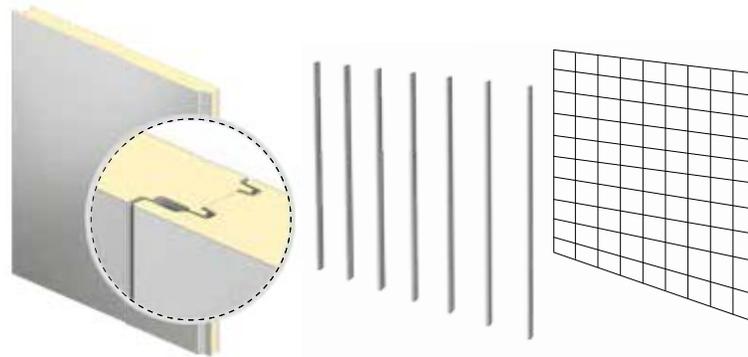
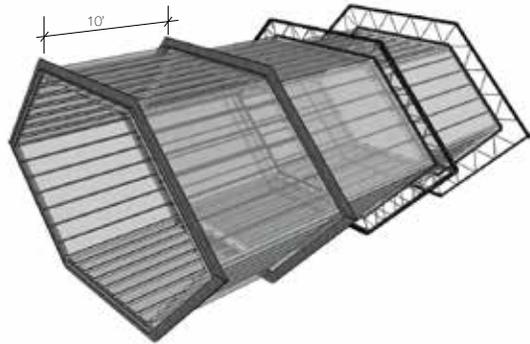
Efficient shipping. Straight forward construction.



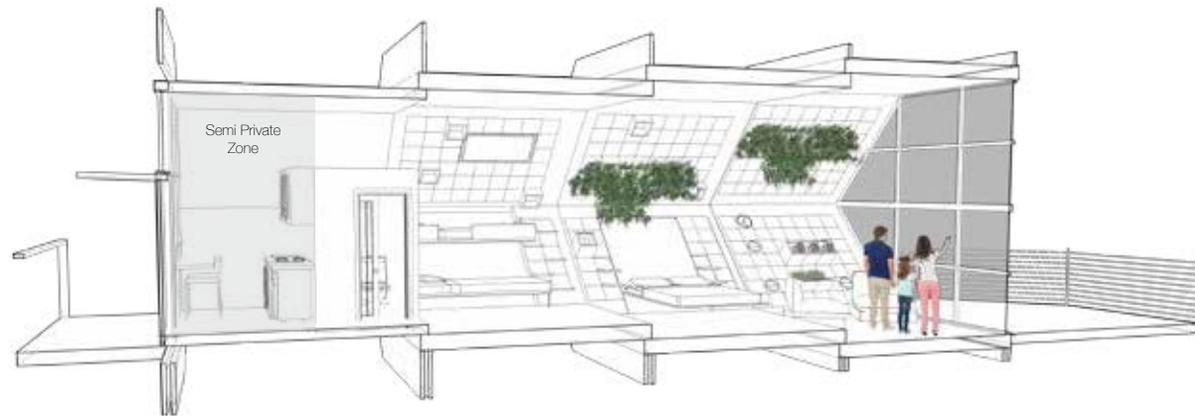
**STREAM LINED SERVICES** ◀  
 The plumbing services are contained within one section of the pod, making it easy to 'plug it in' to site services when expanded on site. The electrical services follow a coil approach, similar to a slide out in a RV. Double the length of electrical wiring is provided, each section is overlapped to provide a clear path for wiring.



**PACKING THE TRUCK** ▲  
 The units are designed to fit up to six per truck, compared to the seven of the current system. But with double occupancy units, and family units (see the next page) up to 24 bed could be placed on a truck. Shipping efficiency is crucial due to the location of the isolated sites, and speed of construction.



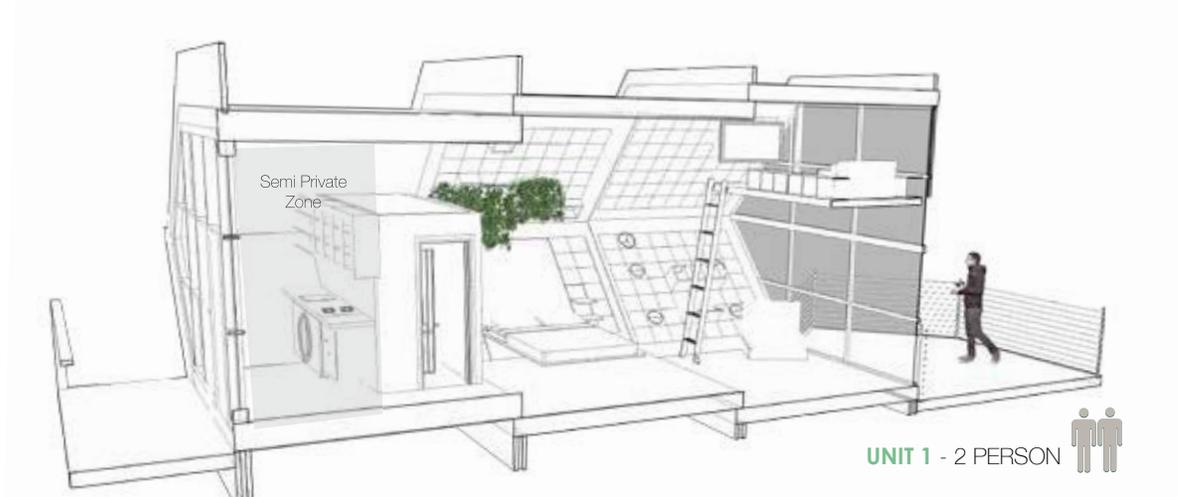
**SHORT SPANS, EASY ASSEMBLY** ◀  
 With the units compressing to ten foot sections, the spans are short considering. This allows the metal structural insulated panel to span the entire distance, enabling the steel studs to be exposed, ready to receive the high tech abacus wall, clad in light metal panels. These materials are durable, meant for long term use, and will not be as susceptible to varying site conditions such as moisture and mold.



 3-4 PERSON -UNIT 2



UNIT 3 - 1 PERSON 



COMMUNAL POD - 6 TO 12 PEOPLE

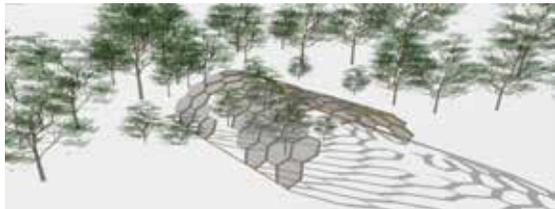
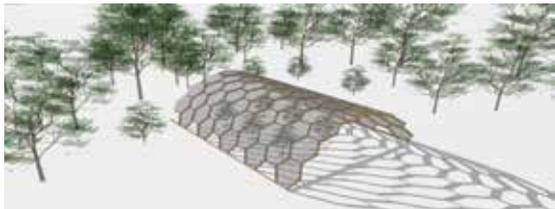
**THREE UNIT TYPES + COMMUNAL POD**

*The population and the groupings of the camp are always changing. This housing system can change along with the changing dynamics of the mining industry. Each unit uses the same structure and connection so assembly of tailor made communities is an ease. This now means couples can work on a mine together, and families could visit for extended periods. Also, with individual units, the precise number of units is provided without wasting extra modules that aren't needed.*

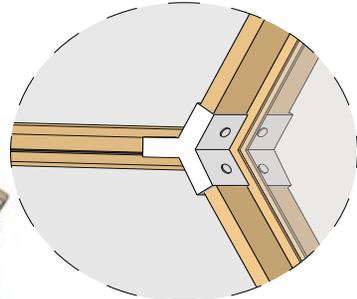
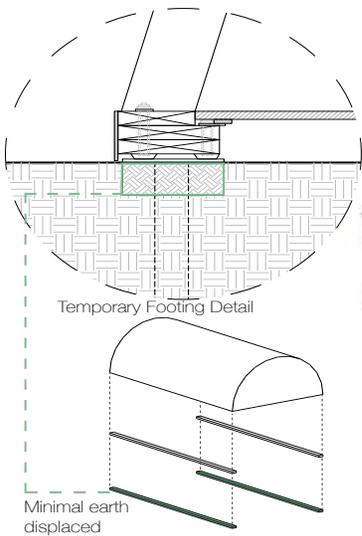
1.0 Section title goes here



Landscaping is the first to arrive on site instead of the first to leave

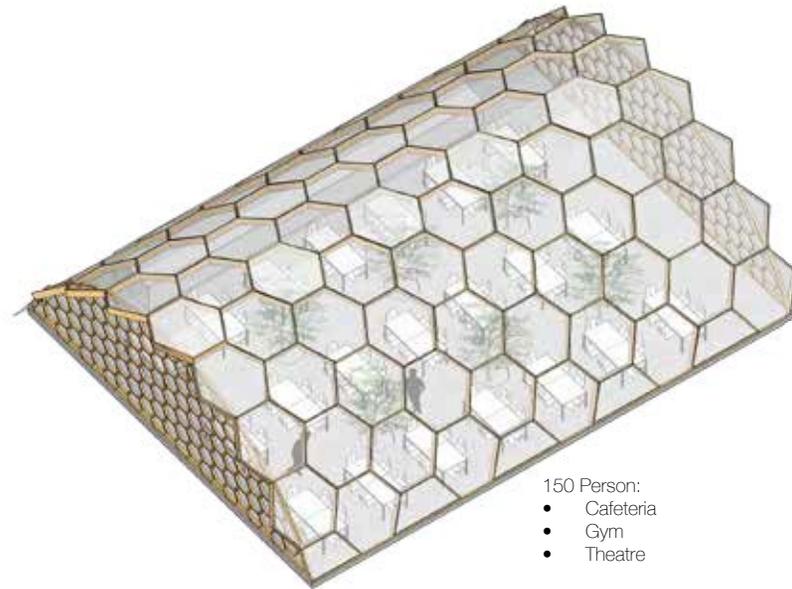


Concept of time

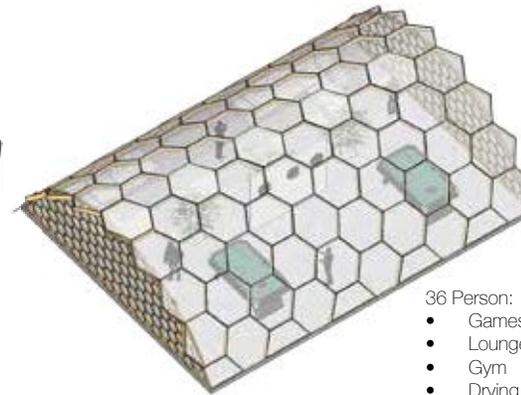


One Connection  
The hexagon only requires one connection, making construction simpler. One 3D printed biodegradable plastic connection, allows the communal arch to be left behind.

**COMMUNAL PAVILION** ◀  
A simple light structure composed of short spans of dimensional wood and biodegradable plastic allows the structure to touch the earth lightly. A gently footing detail minimizes the amount of excavation required.



- 150 Person:
- Cafeteria
  - Gym
  - Theatre



- 36 Person:
- Games
  - Lounge
  - Gym
  - Drying room
  - Kid's play area



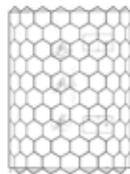
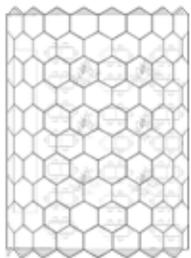
- 12 Person:
- Quiet
  - Gathering
  - Reading
  - TV

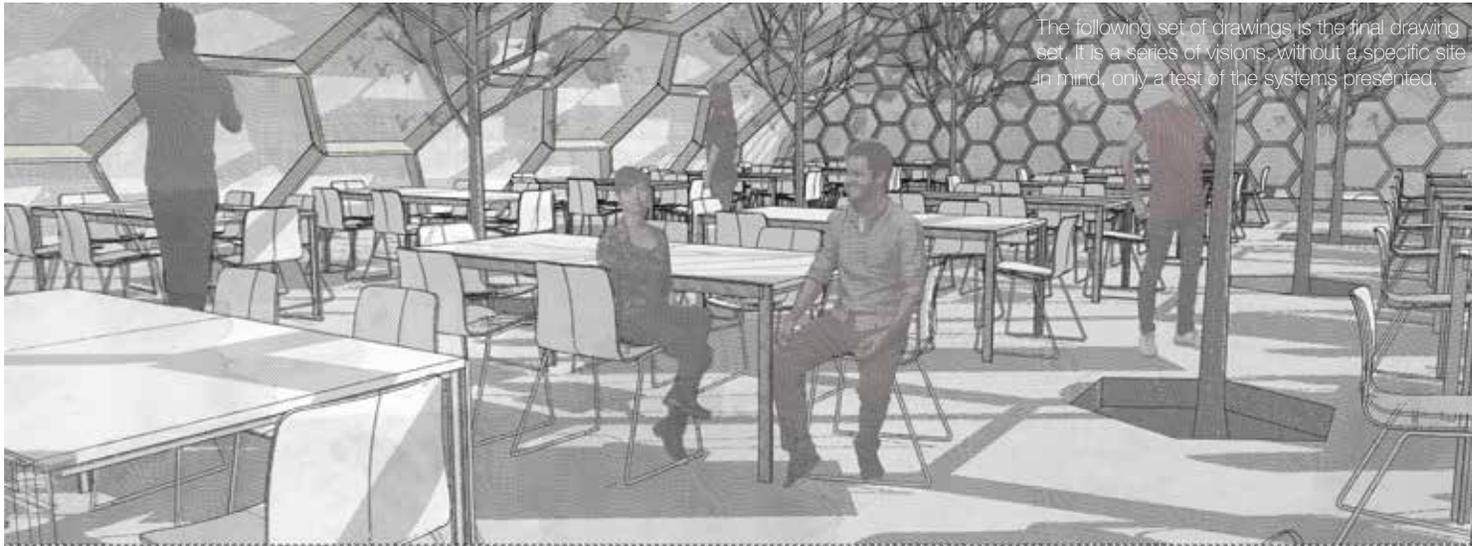
## 6.3 Community

One of the key aspects of the camp is its focus on the time that the worker spends outside of work and outside of their units. The communal spaces are crucial to the mental health of the workers, and are the first step to providing a fuller life on camp. This thesis is proposing an adaptable system that can provide a flexible, dynamic enclosure.

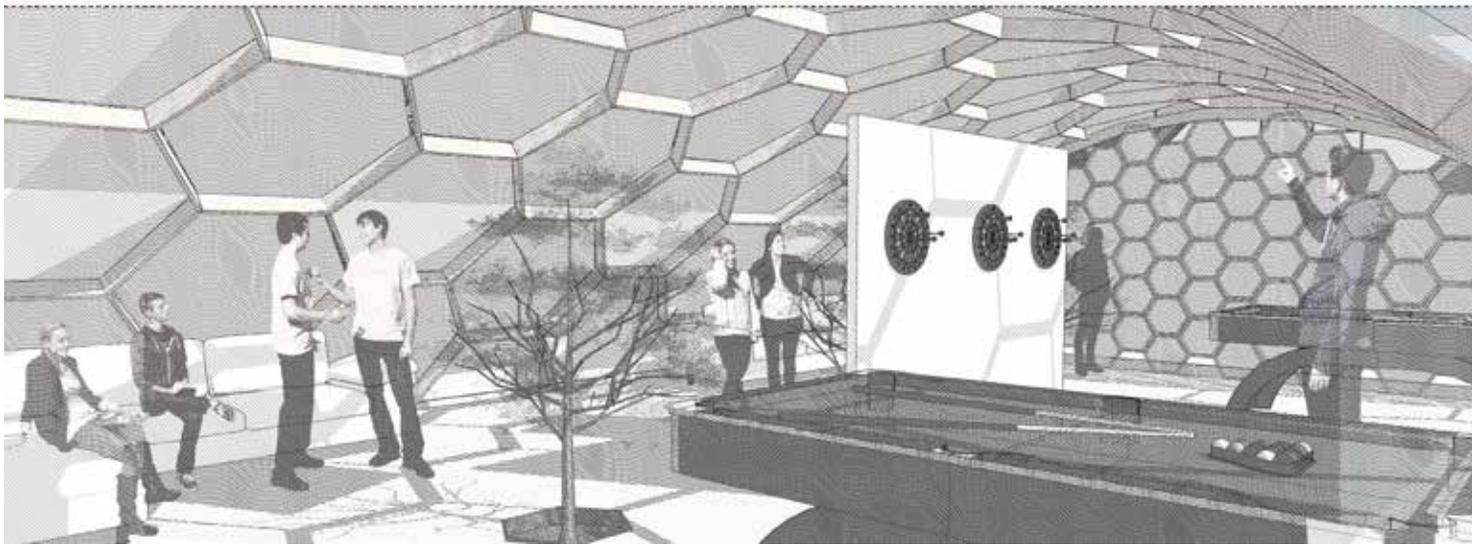
A range of amenity spaces will be incorporated in the camp. Due to the isolation of the camps, a grocery store is not feasible, and the possibility

for each worker to cook for themselves poses logistical problems. A cafeteria that provides three meals a day is needed. A communal drying room/mud room, linked to the cafeteria, gives workers a place to change as soon as they come 'home' so they do not have to take dirty work clothes to their units. As mentioned previously, a range of scales of social spaces and a variety of indoor and outdoor public spaces are necessary to produce a sense of community.

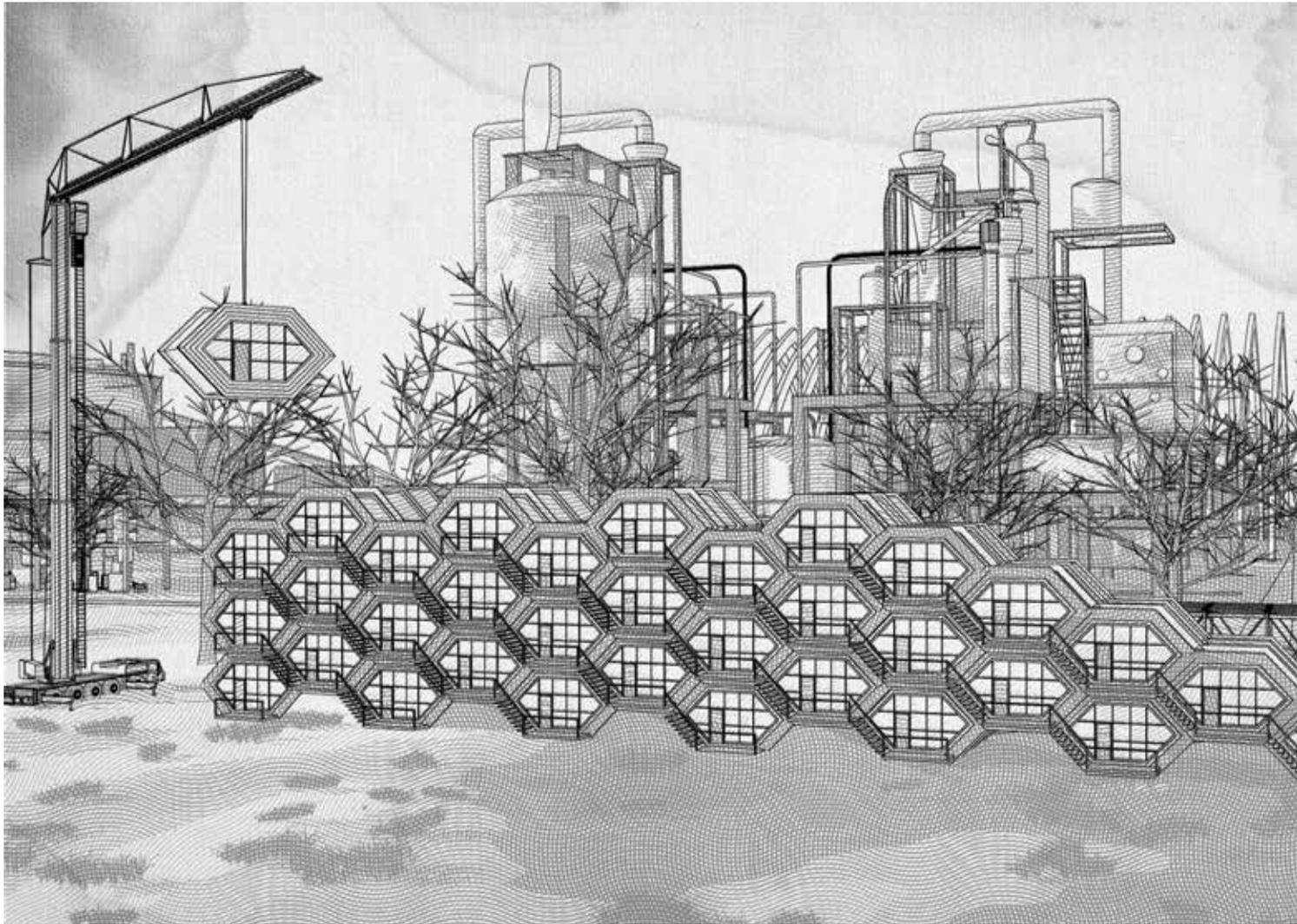


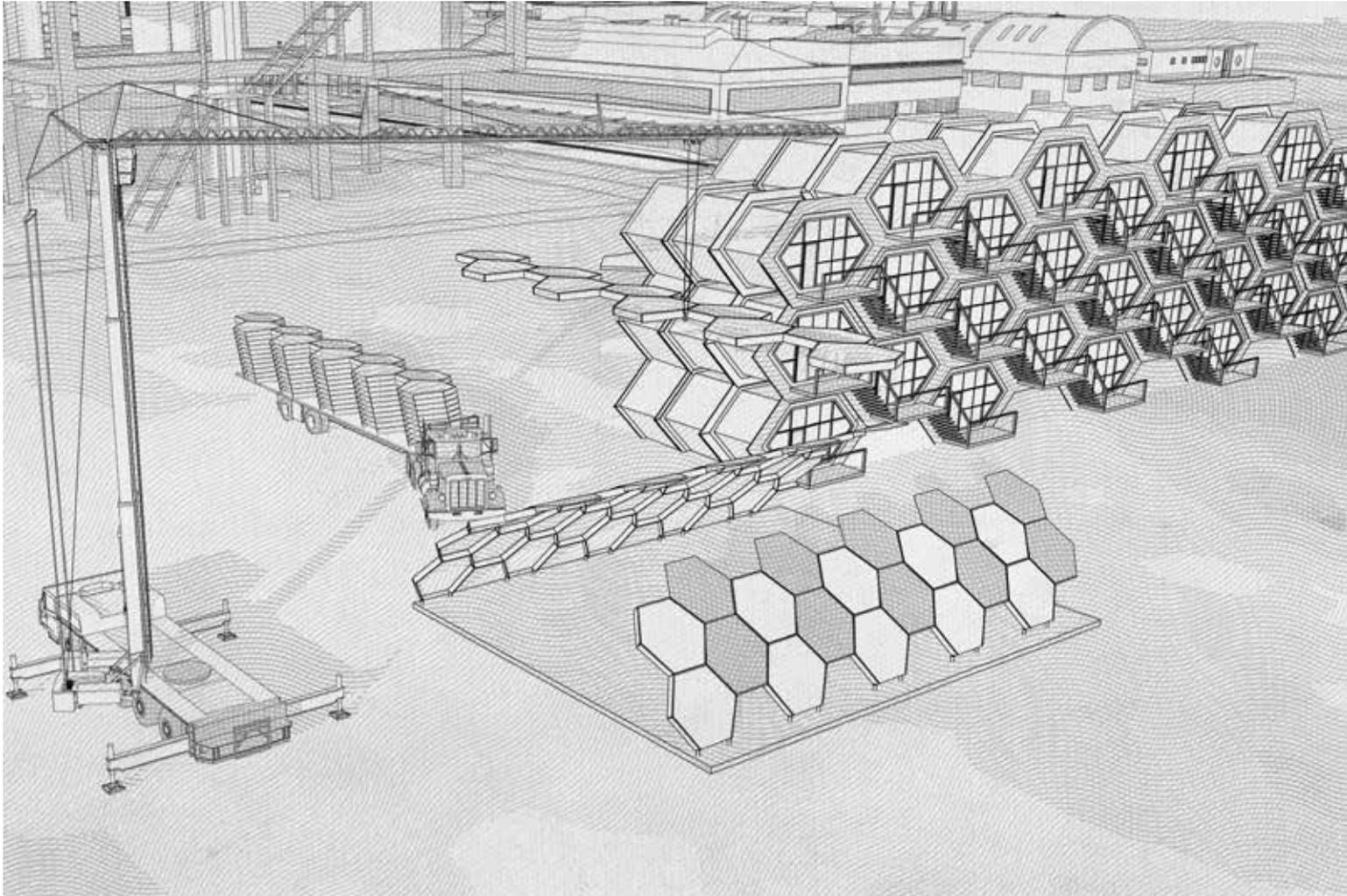


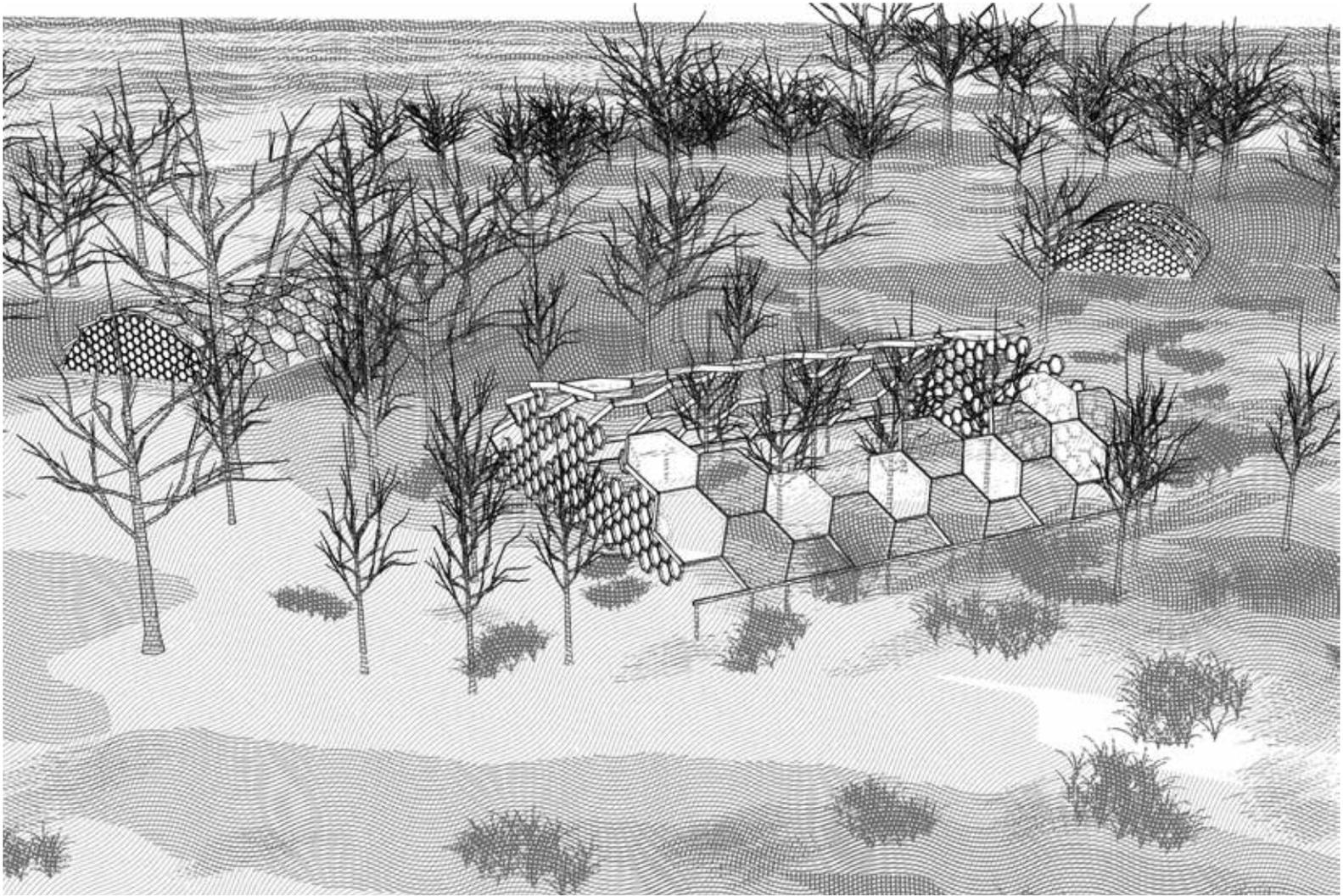
The following set of drawings is the final drawing set. It is a series of visions, without a specific site in mind, only a test of the systems presented.







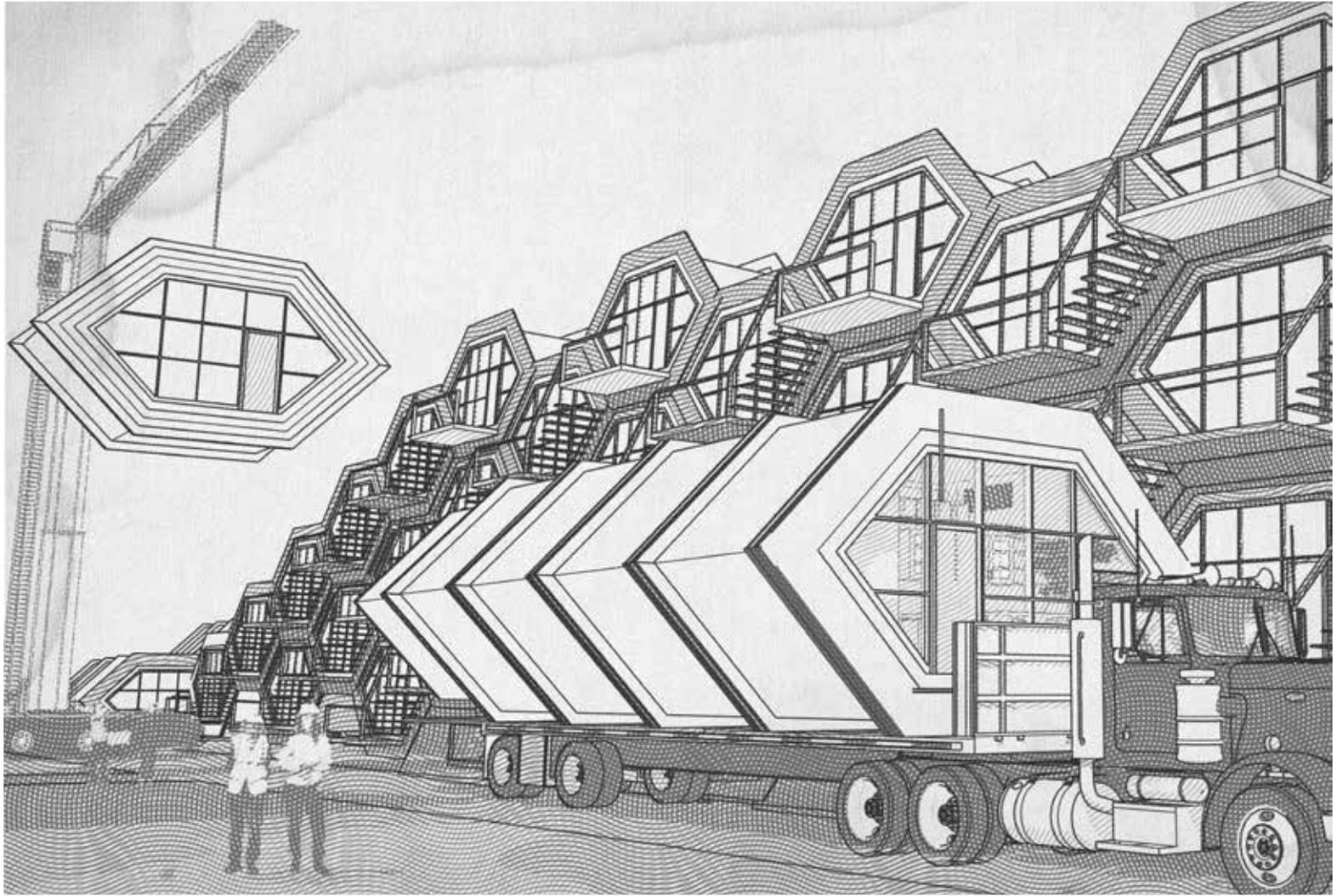












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## 7.0 The Anti Brochure

The following section contains two brochures. The first one is from Black Diamond, a company that supplies the kind of temporary camp housing discussed in this thesis, and was downloaded from their website ([www.blackdiamond.com](http://www.blackdiamond.com)). The second is a fictitious brochure produced by the author during the conceptual stages of this thesis, and is modelled on the Black Diamond Brochure. Packaging this vision as a viable and sellable one, the second brochure for a 'New Company' envisions how life on camp could be re-imagined.

**NOTHING'S TOUGHER THAN A DIAMOND ►**

*This brochure downloaded from Black Diamond's website, shows the current options to assemble a camp. Based on the one module of the truck bed, 11'x60' and using rhetoric such as "Nothing's tougher than a diamond" showing the machoness camp market.*

Accessed January 10, 2016 < <http://www.blackdiamond.com.html> >

# 49 PERSON DORMITORY

SINGLE OCCUPANCY | CENTRAL WASHCAR FACILITY | CLIMATE CONTROLLED | UPGRADED FINISHES | SECURE KEY ACCESS

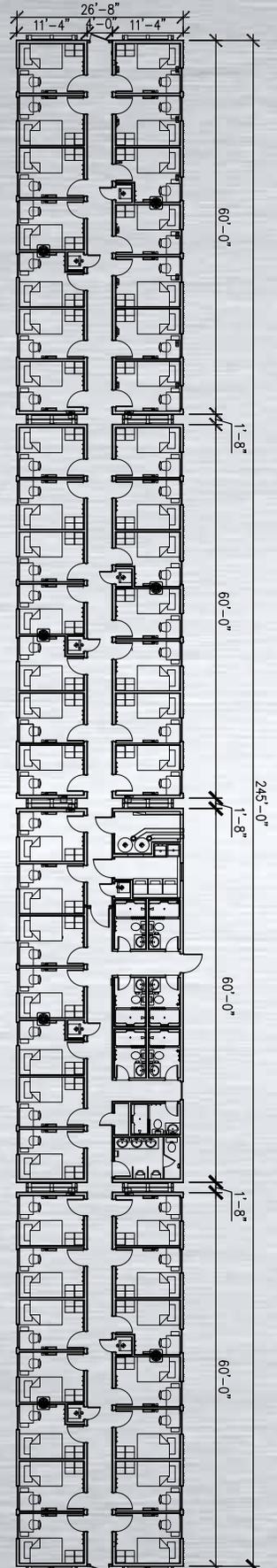


# ECONOMIC WORKFORCE LODGING

The 49 person dormitory offers all the amenities your crew needs in an economical, space-saving layout. A comfortable single-sized bed, in-room desk and chair and personal TV set-up give your crew everything they need to feel at home.

## SAMPLE SPECS:

- 8' x 10.5' size room
- Central washcar facility
- Standard single sized bed
- Personal in-room desk and chair
- Manufactured with upgraded finishes and amenities
- Air conditioned/climate controlled for year round comfort
- Personal 22" in-room television
- All rooms Internet, satellite and cable TV ready
- Venetian blind window coverings
- Premium shared laundry facility
- Built to meet Alberta, B.C and N.W.T building and operating codes
- Quick connect harnesses for efficient utility assemblies
- Heavy duty skids for ease of transport and installation



## NOTHING'S TOUGHER THAN A DIAMOND

Black Diamond Camp facilities are built to the highest quality and safety standards, with particular attention to durability, craftsmanship, temperature control, health and air quality.



Black Diamond Camps is a division of Black Diamond Group

# KITCHEN DINER COMPLEX

OPEN FLOOR PLAN | CLIMATE CONTROLLED | SALAD BAR | HOT SERVING LINES | ALL DAY SOUP & SANDWICH BAR







# RECREATION COMPLEX

LOUNGE ATMOSPHERE | OPEN FLOOR PLAN | CLIMATE CONTROLLED | PROFESSIONAL FITNESS EQUIPMENT



# A PLACE TO PLAY AT WORK

Black Diamond's fit to purpose recreation complex offers your workers the perfect place to relax and unwind after a hard day's work. They can stay in shape or blow off some steam in the full gym and aerobic room. If it's a little friendly competition they're after, we offer a variety of games tables like foosball, billiard and ping pong, and even professional poker tables for the card players. There's even a theatre for events and movies, and lots of comfortable places to watch TV or surf the web.

Your crew will feel so at home, they may not want to go home.

## NOTHING'S TOUGHER THAN A DIAMOND

Black Diamond Camp facilities are built to the highest quality and safety standards, with particular attention to durability, craftsmanship, temperature control, health and air quality.

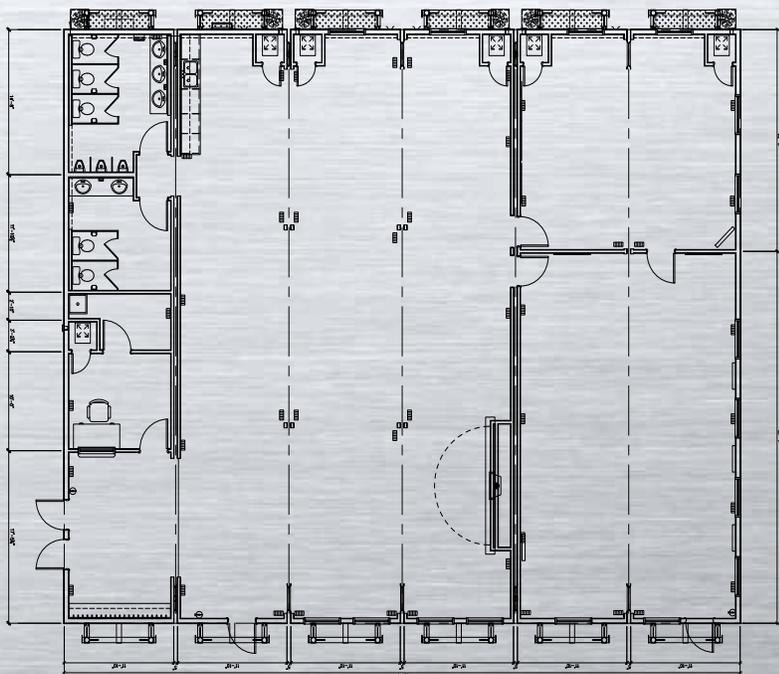


**BLACK DIAMOND**  
CAMPS

Black Diamond Camps is a division of Black Diamond Group

## SAMPLE SPECS:

- Fit to purpose to support clients needs
- Full gym with professional quality equipment including cardio, free weights, and machine assisted weights
- Fully mirrored aerobic room and television sets at each cardio station
- Sport games including: billiards, foosball, bubble hockey, ping pong, etc.
- Professional poker tables
- High and low top tables for comfortable social networking
- Theatre station with big screen television for events
- Internet, satellite and cable TV ready
- Well-lit, open concept facility
- Manufactured with upgraded finishes and amenities
- Built to meet Alberta, B.C and N.W.T building and operating codes
- Quick connect harnesses for efficient utility assemblies
- Heavy duty skids for ease of transport and installation



# CAMPLESS CAMP



'LEAVE ONLY FOOTPRINTS'



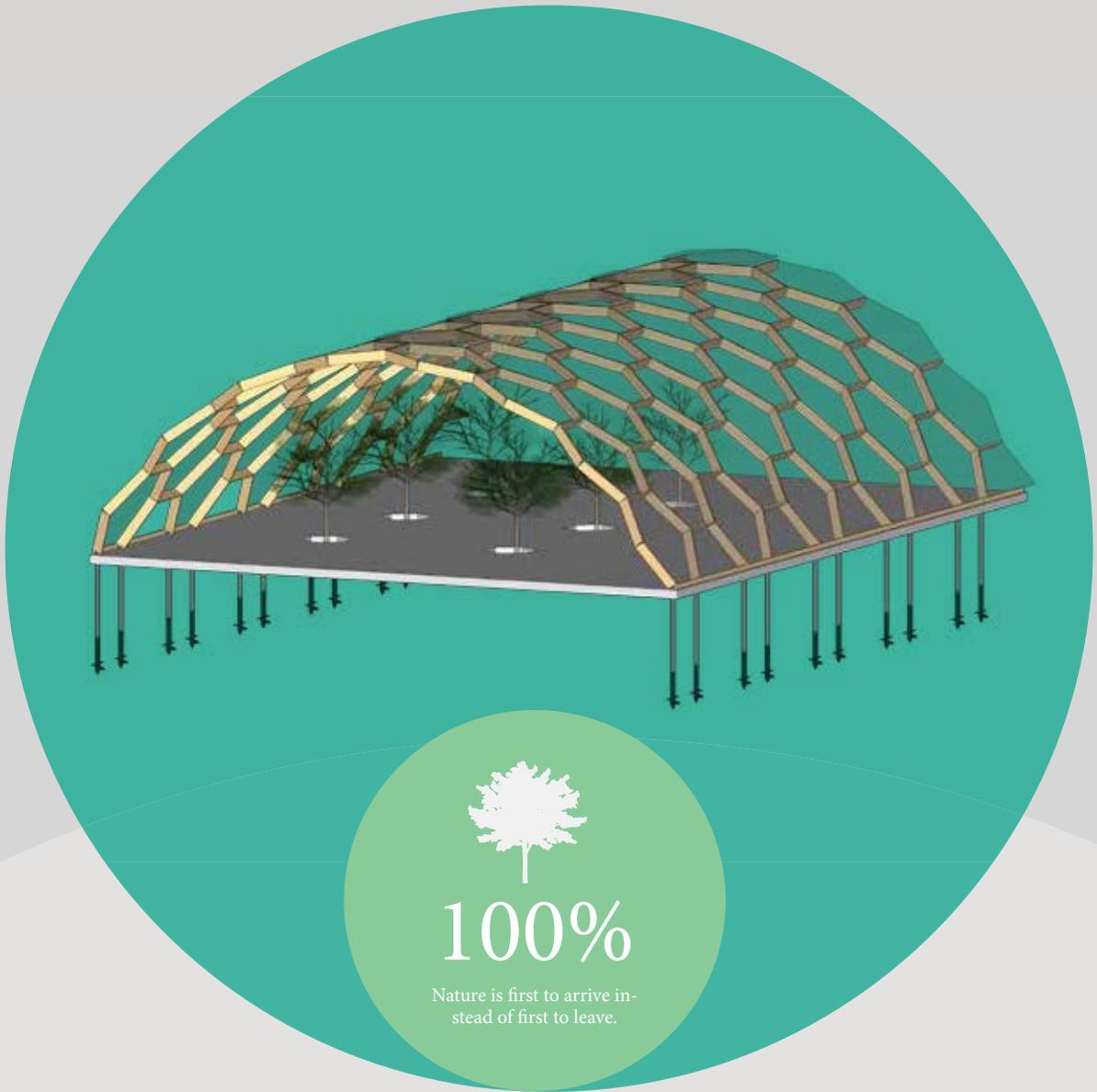
**YOU WON'T KNOW YOUR 'HOME' AWAY FROM HOME ▲**

*The following is an imaginary brochure, produced as part of this thesis work to explore concepts of a fuller life on camp. This brochure has been an underlying thread, constantly evolving as the research and design progresses.*



**NEW COMPANY**

YOUR NEW 'HOME' LIFE



The communal pavilion(s) will return to the earth.



Simple, honest materials used in spaces.



A commemorative piece to honour the community.

**Community**  
Has a voice now and in the future

**Materiality**  
Landscape Response

**Modularity**  
Simple Construction



# Our strategy, milestones, and implementation

A dynamic, flexible, and adaptable housing and communal amenity system that can respond quickly and efficiently to any mining resource needs.



## A response to any type of resource.

No matter what stage the mining project is at, New Company can respond to an exploration site with as few as 6 employees or as large as a fully operational mine up to 5000 employees.

- Horizontal deployment
- Stackable interior space
- Vertical deployment up to 4 levels high
- Suits all resource mining

Responsive

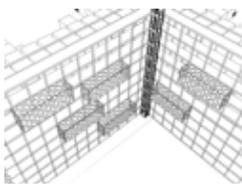


## Spaces for conversations.

The line between the public and private spaces is blurred to allow for impromptu conversations between you and your colleagues, combatting isolation.

- Various sizes of social spaces
- Double loaded corridor has disappeared
- Opportunities for alternate circulation scattered with public spaces

Effective



## Stay in touch with family, with nature.

Feeling connected to your environment doesn't stop at the door. Each unit has a mandate to preserve a view to nature in order to clear the mind's palette of the days work.

- Enjoy the view, enjoy nature
- Stay connected with family and friends
- Cherish the surrounding peaceful environment

Environment



## Efficient and cost effective.

New Company can provide up to 24 beds per truck compared to the standard 7 beds per truck with the current system. With sustainability in mind to lower the shipping required.

- Cost effective
- Lower shipping times and cost
- Faster set up time, no separate modules required for wet goods, self-contained units

Efficient



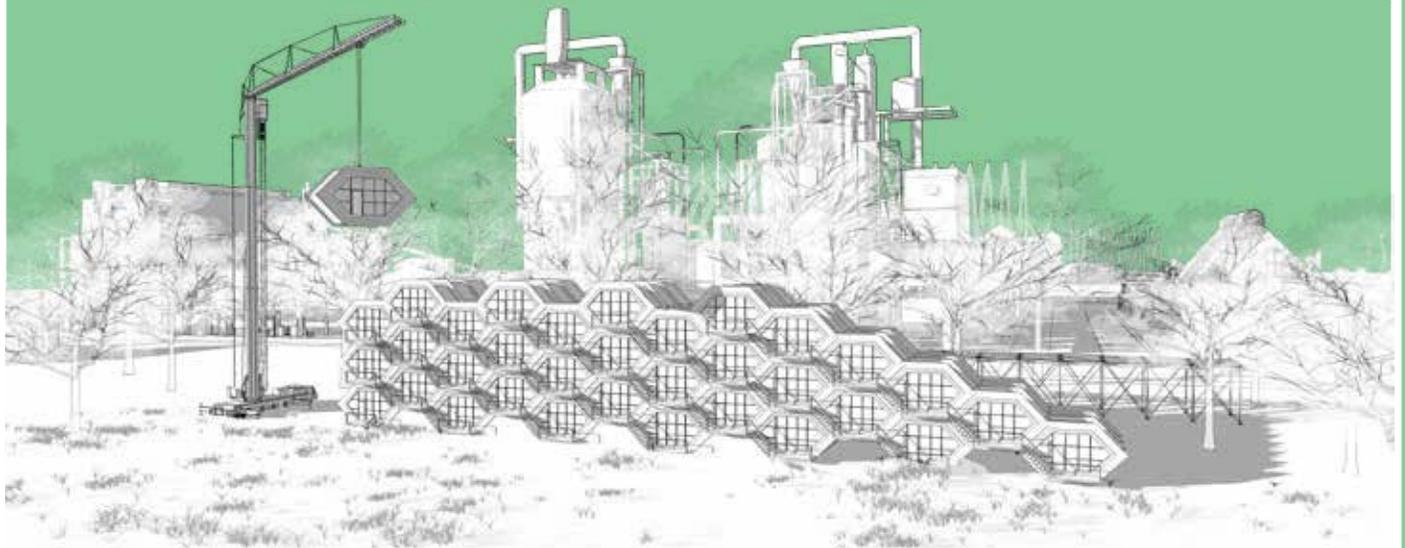
# CUSTOMIZATION

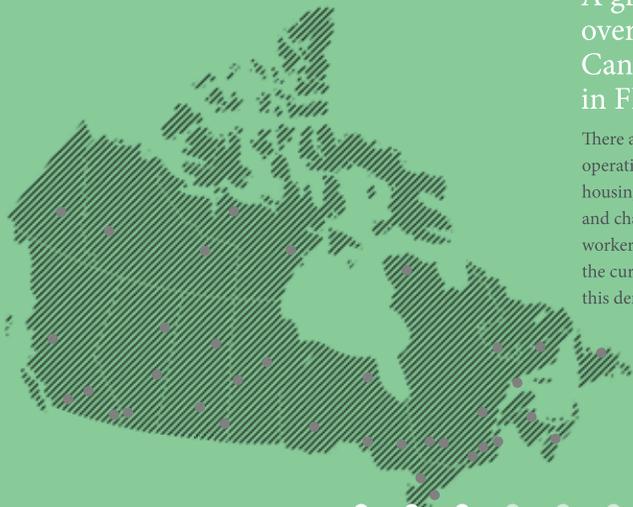
With a dynamic changing work force, a dynamic response is needed. With customization available from the small detail of a shelf to the organization of thousands in a tower.



Customize your camp to the exact number of units needed, to fit the population exactly.

With the flexibility of structure and circulation built into each unit, the ease of setting up camp is quick and easy.





A growing population of over 400,000 workers across Canada are currently living in FIFO accommodation.

There are currently 913 mining companies operating across Canada. A new strategy of housing is needed to respond to this growing, and changing population 121,000 new workers will be needed over the next decade, the current housing system cannot respond to this demand using current technologies.

70%

Growth in the number of women on mines

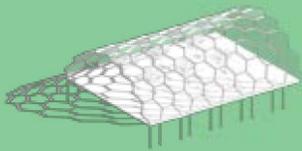


25%

of the workforce is in the 25-34 age group.

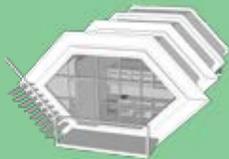


Three-tiered system, builds a community.



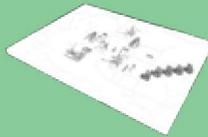
Various sizes of communal spaces available.

Using typical dimensional lumber and biodegradable plastic the communal arch can be left behind to commemorate those that have worked on site.



Adaptable units maximizes your space above and beyond.

Workers are used to being given the bare minimum but New Company optimizes the efficiency of the hexagon to provide you with more than a box.

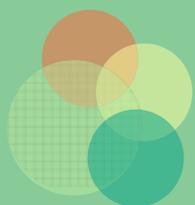


Strategic site planning. Trees are first.

Our first response to site isn't to clear cut the site but to plant trees that will surround our workers for years to come. These trees will help with the decomposing and healing of the site.

A layered, holistic approach.

The approach has not been a linear, single-sided approach, but a more involved layered approach with many different factors having been incorporated into the final design.



Community



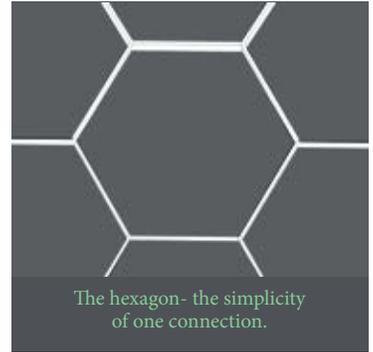
Modularity



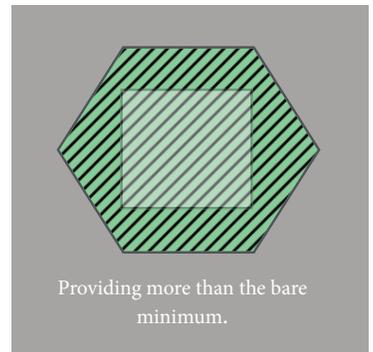
Materiality



Detailing to touch the earth



The hexagon- the simplicity of one connection.



Providing more than the bare minimum.



Enjoy the distance from the daily grind.



---

## 8.0 Prefabrication and Site

### 8.1 The moving target- the shifting site

The following section explores different ways of unpacking and installing this proposed prefab system to create meaningful interactions with the site. One of the goals of this new housing type is to be adaptable to different environmental conditions. In order to put this housing into context, three distinct sites have been chosen. Each site has recently been approved for development and will be changing from an exploration camp to a fully operationally mine.



56.487235, -130.297221



Construction  
16 PODS



Operation  
9 PODS



38.2  
Million ounces  
of gold



9.9  
Billion ounces  
of copper



191  
Million ounces  
of silver



213  
Million pounds  
of molybdenum

SUMMER HIGH: 18°C  
WINTER LOW: -1°C



52  
year mine life

## 8.2 KSM Mine

The KSM Project is a proposed gold, copper and silver mine located 65 kilometers northwest of the town of Stewart, B.C. It has recently completed an environmental assessment process and received approval from both the provincial and federal governments. Construction will soon begin to transform the 40 person exploration camp into a 1800 person camp during <sup>38</sup> (Seabridge sells royalty option on massive KSM project to Royal Gold 2011) its five year construction, and a 1040 person camp during its 52 year life span. When

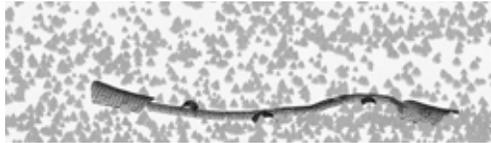
<sup>38</sup> “Seabridge Sells Royalty Option on Massive KSM Project to Royal Gold,” Mineweb, June 17, 2011, accessed April 13, 2016, <http://www.mineweb.com/archive/seabridge-sells-royalty-option-on-massive-ksm-project-to-royal-gold/>.

operational it will feature three open pit mines, a processing plant and a tailings facility. The project is the largest undeveloped gold deposit in Canada and one of the world’s biggest copper-gold porphyry deposits. The temperatures at the site are moderate with summer highs of 18°C and winter lows -1°C. The site is sloped and forested. The site will be accessed by plane, road and site circulation by tunnel.

The challenge for the housing on this site will be to adapt to the topography and disperse itself around the existing trees.



Lasting structure installed



Biodegradable skin installed



Communal pods added



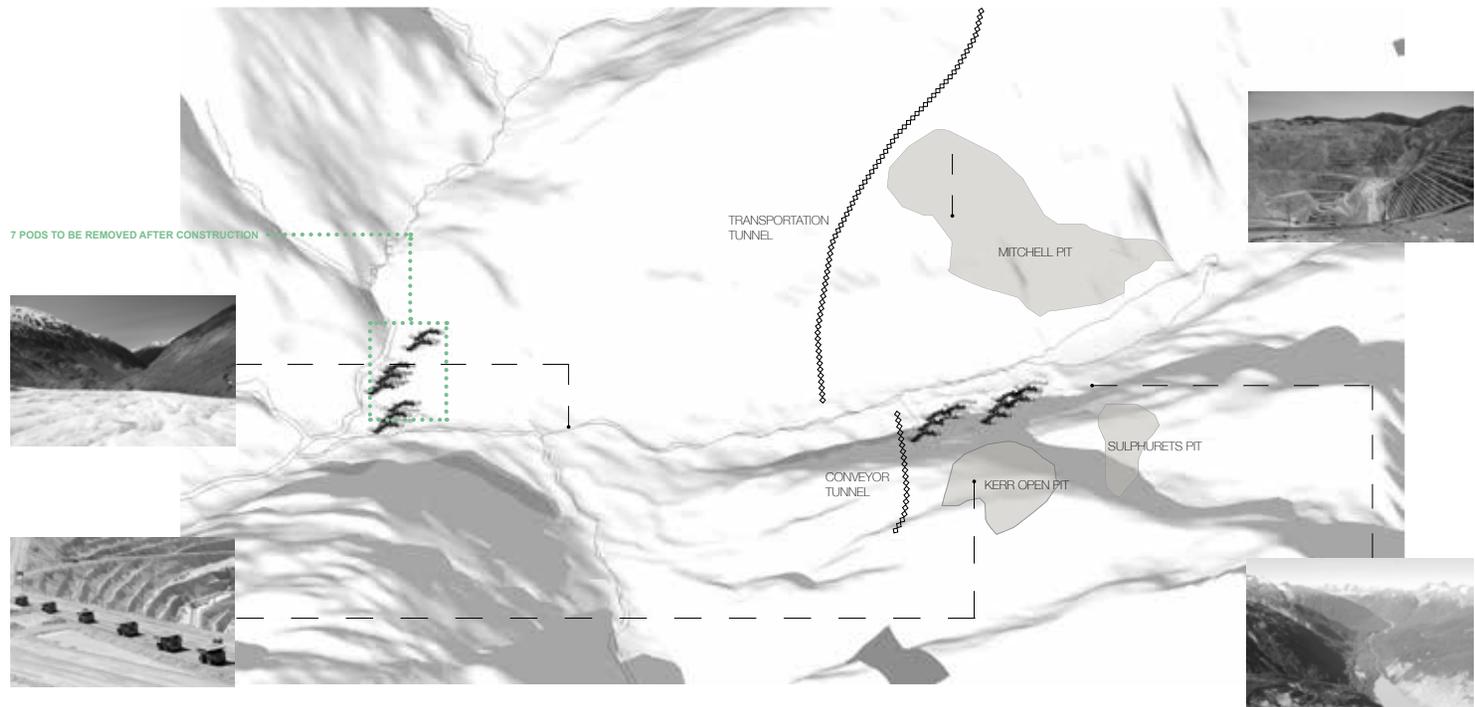
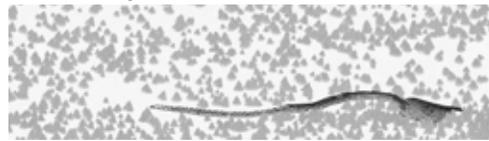
'Away' Mode



'Working' Mode



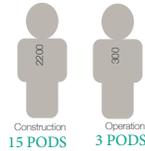
Structure to biodegrade



### 8.3 K+S Potash

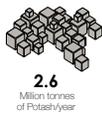


50.650338, -105.377716



The KS Potash mine project is located an hour west of Regina, Saskatchewan. It is currently in the process of constructing the Legacy project mine site with a projected mine life span of 20 years. It is expected that 2.6 million tonnes of potash will be extracted per year. The extraction of potash involves underground removal, with minimal effects to the top surface in comparison to open pit mines. The construction of the

mine will involve approximately 1700 workers and is to be completed by 2017. Once the mine is in operation a crew of 300 workers will be required for the following 15 to 17 years.



2.6 Million tonnes of Potash/year

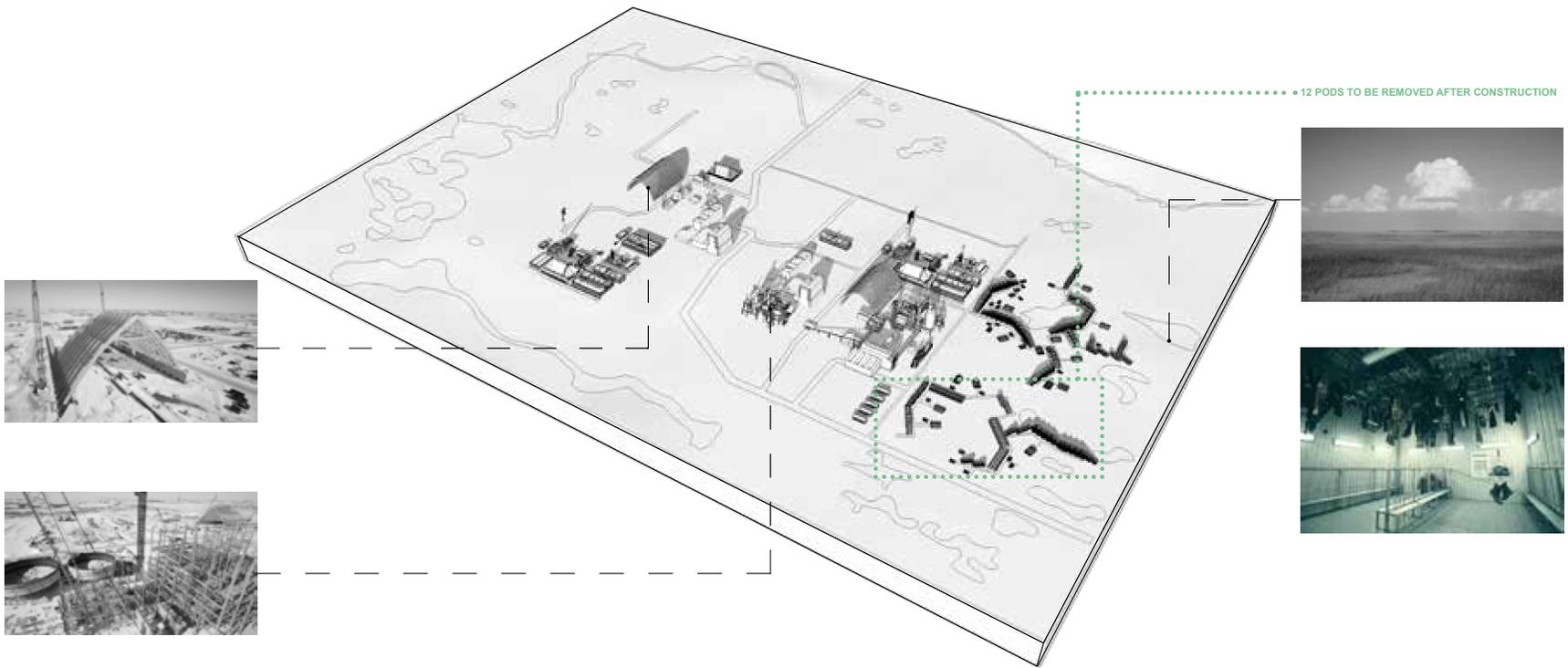


Year Round Ground Access

20 year mine life

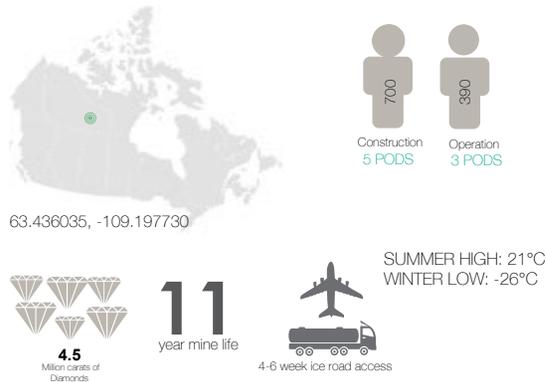
SUMMER HIGH: 26°C  
WINTER LOW: -17°C







## 8.4 Gahcho Kué- Diamond Mine

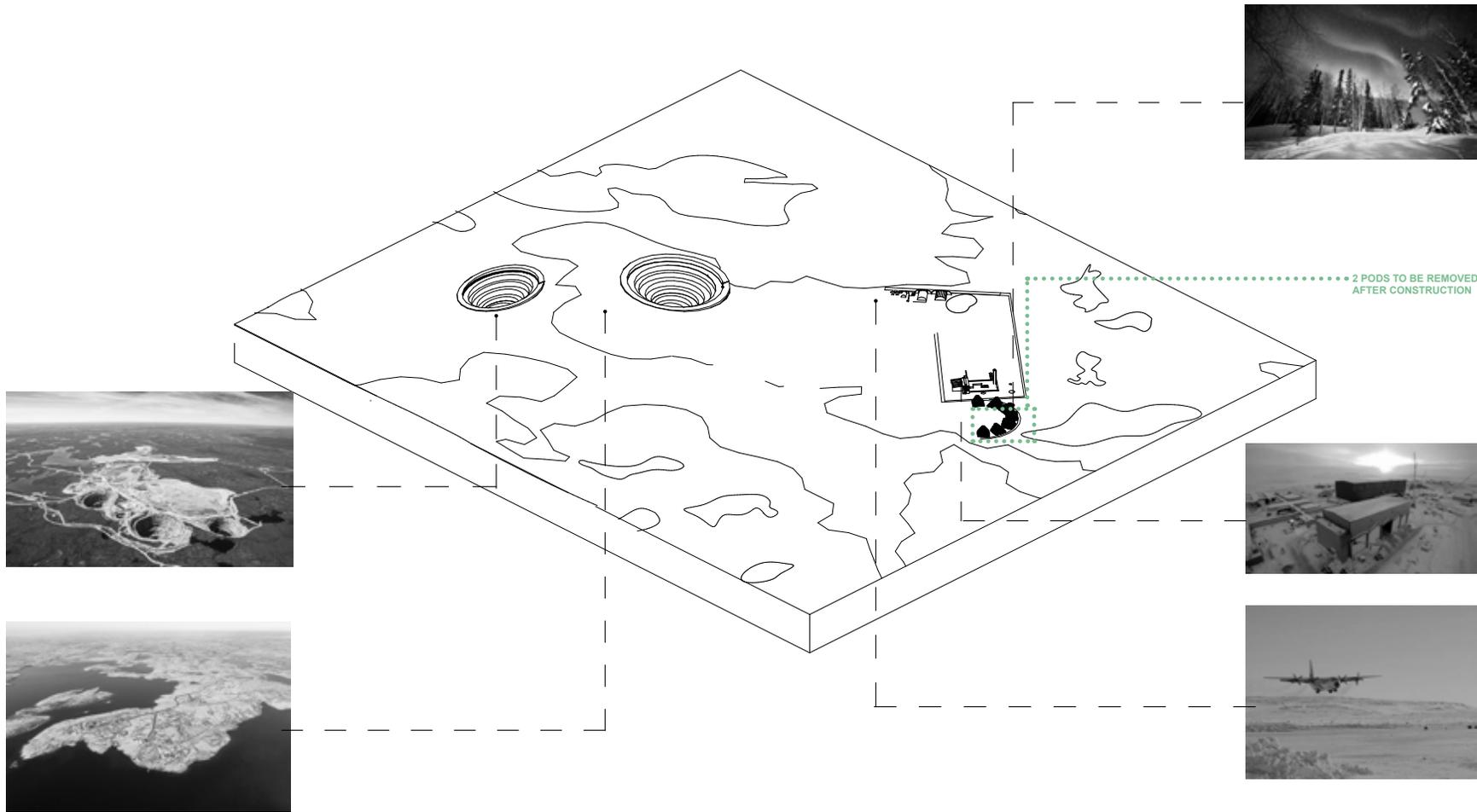


The Gahcho Kué project is the largest new diamond mine under construction.<sup>39</sup> It is located in the Northwest Territories, on a 10,353 acre site of Kennady Lake about 300 kilometers northeast of Yellowknife. Construction is projected to begin late in 2016. For the first three years 700 workers will be required. Following that, 390 workers will

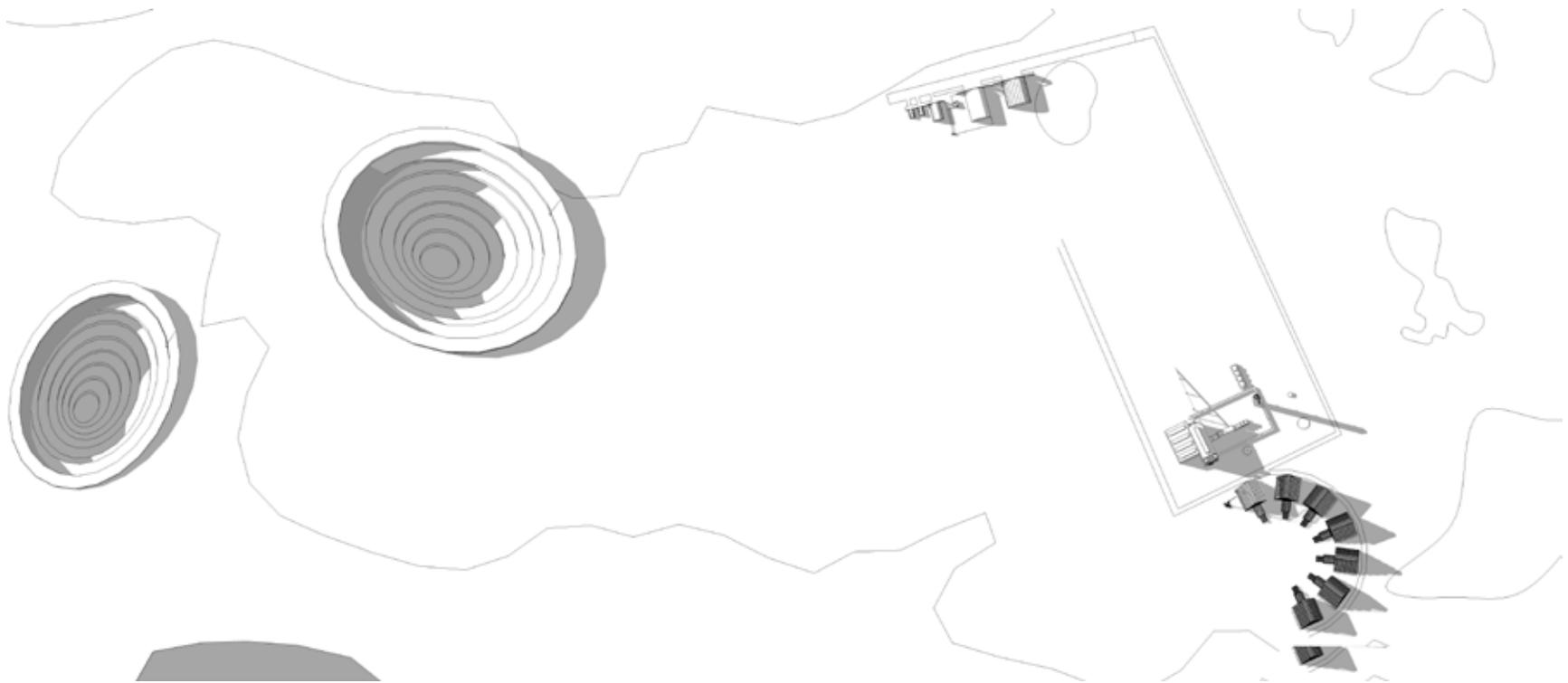
be needed for the mine's 11 year Life span. The challenge of this site is the extreme weather: it experiences summer highs of 21°C and winter lows of -26°C. The site's isolated location and the fact that it can only be accessed by an ice road 4 to 6 weeks of the year means that almost everything will have to be flown in and flown out.

<sup>39</sup> "Mountain Province Diamonds," Mountain Province, June 22, 2016, accessed May 19, 2016, <http://www.mountainprovince.com/project/project-overview/>.





2 PODS TO BE REMOVED  
AFTER CONSTRUCTION



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## 9.0 Conclusion

This thesis took on the question of how to enhance workers' lives while they live remotely on mine sites. Current-day temporary work camp housing doesn't take into account the complexity and range of a person's needs from the point of view of human happiness, and only offers the worker a 'bare minimum' container for their life on camp. This design proposal envisions a dwelling unit and town arrangement for remote and isolated environments that would provide a much higher quality of life for workers. The design opposes reducing the individual into a simple cog in the machine. Through a non-rectangular unit volume, utilitarian essentials of domestic life on camp are wrapped with a zone of extra space to pay respect to the worker's uncontainable identity. Through an expandable volume, the worker can live alone or with family. Through cluster arrangements that respect the limits of a human being's capacity to be in relation to others, a more humane collective environment is proposed. Through open exterior circulation and naturally lit communal spaces, workers have a strong connection to the environment around them. In the revised proposal for "Housing the Working Nomad," Canada's resource-extraction worker finds a healthy, stimulating and above all enjoyable dwelling in which to live. The employer also gains

in this equation, with healthy productive workers.

This design proposal presents new architectural concepts to be taken into consideration when viewing the whole life cycle of the mine. As the traditional clear-cut approach to the provision of housing on isolated mine sites is dangerously destructive from an environmental point of view, this new system tries to tread more softly on the land. The use of structural pile foundations (for the communal and residential units) implies only small excavations and soil disruption; the use of biodegradable materials means that parts of the work camp will eventually vanish, allowing vegetation to renew itself; and the durability of the residential units ensures they are relocated multiple times. The system proposed above can insert itself into any Canadian resource extraction site. In a next stage of research, technical development of assemblies, details, and materials, would be required. The thesis underscores the importance of further research into the use of biodegradable materials for work camp housing. Complete with material discoveries and innovations, a new architecture for work camps will constitute both an important gesture of respect for workers and an action of protection of Canada's landscapes.

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# Appendix A

The following are images from a site visit to the K+S Potash mine on May 24, 2016 in Bethune Saskatchewan. All photos are those of the author.







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