

THE NEWFOUNDLAND ROOT CELLAR:
Adapting Passive Strategies for the New Corner Store

by
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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

ABSTRACT

Since the re-settlement programs and the cod moratorium in Newfoundland, rural residents have migrated en masse to urban areas. As they move to cities, their connection to food production is diminished as farms are abandoned and reliance on exported goods is increased. Newfoundland's island condition has exacerbated the issue causing a shortage of fresh produce leading to significant health issues and a loss of connection to rural roots. The people who move to larger cities in Newfoundland are not only leaving their family homes, gardens, and root cellars, they are leaving their communities. Through this urban migration the next generation of Newfoundland is losing the collective memory of these deep, culturally rich practices: the Root Cellars that allowed them food security, community and sustainability.

In today's era of climate crisis, skills that support food security, food storage, and passive energy use are ever-more critical and cannot be left in the past. This thesis aims to revive this collective community knowledge by reinterpreting the root cellar into a semi-urban building shared amongst the St. John's community. The all familiar corner store is a fixture in both small Newfoundland towns as well as the city of St. John's. Acting as a community hub, the corner store allows for communities to gather in social exchange. However, corner stores are greatly disconnected to regional farms and local food supply throughout Newfoundland. By combining the strengths of both the traditional Newfoundland root cellar and the corner store, a new form of corner store can be designed to create a more sustainable, passive and community-based hub that centers around food security. This thesis project translates the root cellar into an existing corner store located in the heart of the city of St. John's. The corner store root cellar becomes a place for passing down local food growing and storing knowledge.

ACKNOWLEDGMENTS

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My supervisor, Jane Hutton. Thank you for pushing me to create a thesis that I am so proud of. I am beyond grateful for your enthusiasm, curiosity, and patience during every meeting. Thank you for your guidance and thought provoking questions.

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To the Thériault-Pataki family and Clavette-Séguin family I would like to extend my sincerest thanks for exposing me to art and architecture at an early age. Your lifelong friendship has shaped me and my work in more ways than I could have known.

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This book is affectionately dedicated to my family.

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“Our children should enter adulthood with a basic knowledge of how to store food over winter without the cooperation of a nuclear power plant a hundred miles away. Every animal in the forest is taught this skill; we owe our children no less. “

Jerry Minnich,
“Energy-Free Food Storage,” *Countryside*

INTRODUCTION

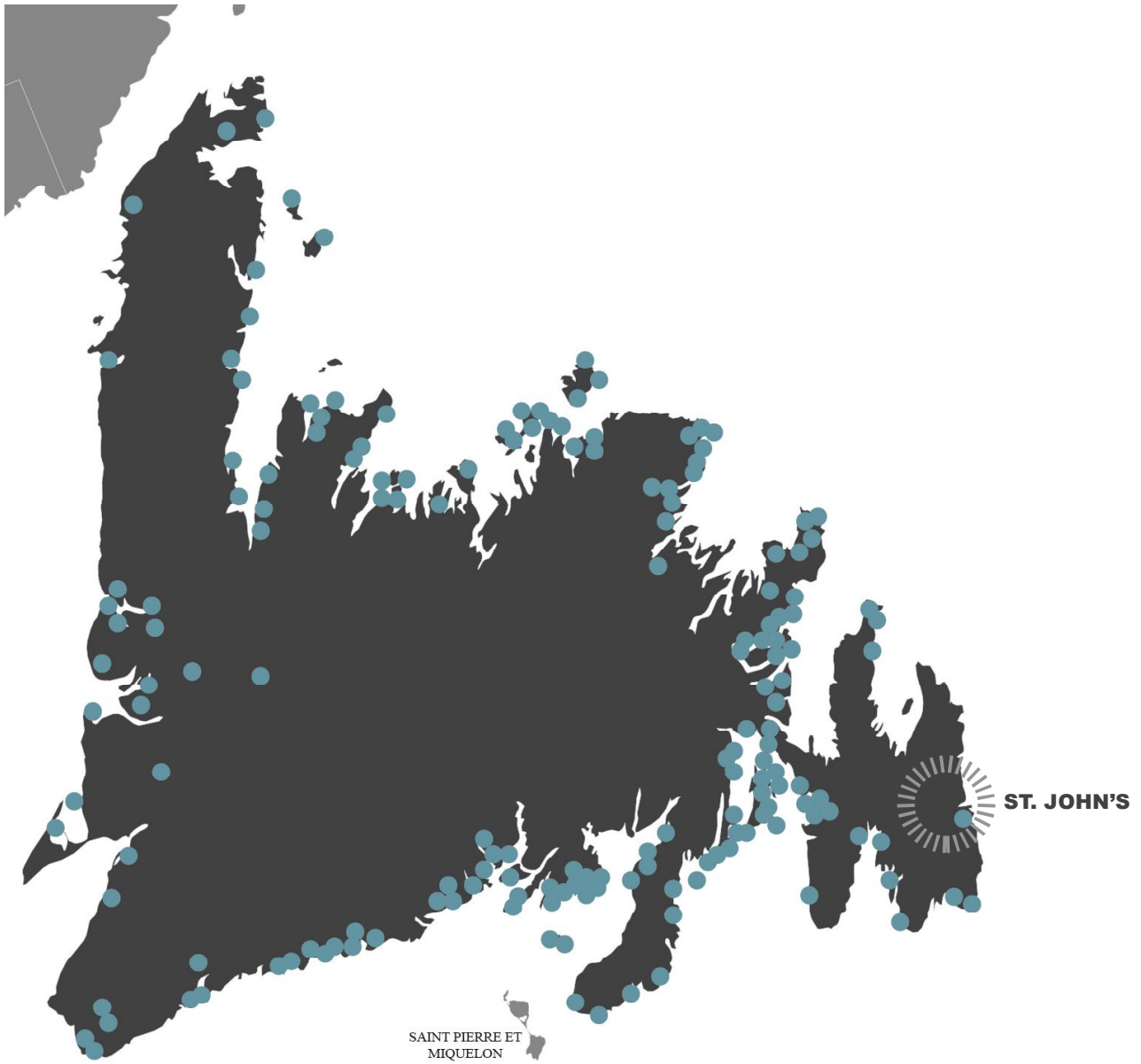


Figure 1.1 *Newfoundland towns that have closed between 1950 and 2000.*

Small outpost towns are the heart and soul of the island of Newfoundland. These outposts are filled with a rich history of self sufficiency through extreme environments.¹ Over the last century, Newfoundland's population has shifted from small tight-knit rural communities to life in the city. Between globalization, resettlement programs and the cod moratorium these small Newfoundland outposts are quickly shrinking. Though this shift in population has created growth in cities like Saint John's, its citizens are losing connections to their rural roots. These lost connections include the self-sufficiency and resiliency that have been historically prevalent in small Newfoundland outposts. Today, with pandemics and climate change exacerbating food insecurity, sustainability and self-reliance we cannot afford to lose these invaluable rural skills and practices that are so crucial to Newfoundland.

Between 1954 and 1975, three resettlement programs initiated by the Newfoundland government. The purpose of these resettlement programs was to create a more centralized population amongst the growing cities of Newfoundland. Like many other provinces, the government of Newfoundland believed that it would create more accessible and economically fruitful cities throughout Newfoundland. However, at the time the resettlement programs were considered highly controversial and caused serious backlash amongst the smaller rural Newfoundland communities.² However, not all communities in Newfoundland were resettled. Certain communities, like Fogo Island, fought back when faced with the resettlement program. Up until the program was issued many small Newfoundland outposts had very little reason to interact. However, the Memorial University Extension service allowed the residents living in isolated outposts on the northeastern coast to band together through a series of films. These films showcased the many residents concerns regarding resettlement. Once they were made aware of their strength in numbers they created the Fogo Island Cooperative Society and managed to remain relatively untouched by the resettlement. Unfortunately many Newfoundland residents were unable to achieve the success that Fogo Island had with the resettlement. One of the locals Ted Burke, currently a Tilting resident on Fogo island who originally lived in Cape Cove recalls his resettlement:

“T’wasn’t enough people left to keep a school, so the government got after them, so they all shift. We kept our place - house, stables and stores - we could go back in the summer - but the government wouldn’t allow us to stay the winter...”³

While the resettlements were a long and arduous process, many Newfoundlanders today still miss their original hometowns.

1 Newfoundland and Labrador, Come From Away, (Newfoundland and Labrador Tourism)

2 Lindsay Jones, Is the sun setting on outpost Newfoundland?, (The Globe and Mail, November 12, 2017)

3 Robert Mellin, Tilting: House launching, slide hauling, potato trenching, and other tales from a Newfoundland fishing village, (New York, Princeton Architectural, 2008), 206-207.



Figure 1.2 *Twillingate Home and Root Cellar*

After nearly five centuries of cod fishing in Newfoundland, the 1992 Cod Moratorium ended the industry in Newfoundland for the foreseeable future. At the time, the overall population of Newfoundland was 580,109 people⁴, due to the irresponsibility of the Canadian Federal government⁵ 30,000 people's jobs were lost overnight.⁶ Not only were these people directly affected in terms of work, but the towns who depended on these people earning income and spending their money in these towns disappeared as well. Twenty-eight years later, Newfoundland is still dealing with its life-altering affects, causing even more of the population to relocate to the city of Saint John's.

As the people of Newfoundland left their rural villages for St. John's, they became disconnected from many of their rural activities.⁷ This disconnect has been further exacerbated by Newfoundland's island condition causing significant food insecurity throughout the province.⁸ Due to this loss many skills that allowed Newfoundland its self reliance, sustainability and food security are quickly disappearing.

4 Newfoundland and Labrador Statistics Agency, Department of Finance, Population and Demographics, (Department of Finance. Government of Newfoundland and Labrador, August 2012)

5 Augustine Etchegary and Stephanie Porter, Empty Nets: How Greed and Politics Wiped out the World's Greatest Fishery, (Portugal Cove-St. Philips, Newfoundland and Labrador: Boulder Publications, 2013), 3786

6 Jenny Higgins, Cod Moratorium, (Newfoundland and Labrador Heritage Web Site, 2009)

7 Daniel MacEachern, Townie vs. Bayman: Vital Signs Report Compares Urban and Rural Life in N.L., (CBC news. October 05, 2016)

8 Alex Kennedy, What Did Snowmageddon Teach Us about Food Insecurity? (CBCnews. CBC/Radio Canada, February 26, 2020)

THE ROOT CELLAR



Figure 2.1 *Two Root Cellars in Elliston, Newfoundland*

For generations the people of Newfoundland have depended on root cellars to make it through the tough winter months. Long before electrically powered refrigeration, the root cellars were the most important outbuildings to build.⁹ The root cellars were constructed with earth surrounding their structures in order to maintain a constant temperature. This constant temperature in the cellar allowed the local residents to keep their fresh produce, aging cheeses, and cured meats from spoiling over the cold winter months. In cold climates like Newfoundland's, these root cellars are necessary for prolonging the harvest. The cellars would be filled up during the fall when the harvest is abundant and slowly the produce is eaten away throughout the winter and early spring, until new, fresh produce can be grown.

Newfoundland has always been rooted in its landscapes, both land and sea. For a plentiful harvest elements from the ocean were incorporated into local agriculture. The community would gather together every year to harvest kelp from the high tide waterline and place it further back from the beach, allowing it to rot over the winter while the salt leached out. Once this process was complete the kelp would be gathered in March by each individual family and placed in piles by the garden. In May and June the rotted kelp would be spread over the garden creating a deeply rich fertilizer to start off the agricultural season. A local tilting resident, Annie Foley, recalls the time when they harvested the kelp during Holy week.

“Holy week was the week you'd bring the kelp - because you'd be in the church for holy week and the smell of the kelp off people's feet - and you wouldn't have second pairs of boots to change. Be in the kelp all day and you could smell it off our clothes. Good rotten seaweed.”¹⁰

Over the summer and fall months different vegetables and fruits are harvested at different times allowing each family to harvest consistently throughout the year. Harvesting for the root cellar is almost entirely dependent on when the frost comes. Softer fruits like tomatoes, eggplant, sweet potatoes and peppers are picked at the first sign of light frost. Harder fruits like squash and pumpkin must be picked near first frost, but are allowed to mature a little while longer on the porch so as to develop a harder rind for storage. Finally the vegetables that are least susceptible to frost can be picked even after a black frost since they continue to grow below ground and are much heartier than the others.¹¹

9 Neal K Tucker, “The Elliston Root Cellar.” Elliston Root Cellars. <https://www.townofelliston.ca/2at/rootcellars.html>.

10 Robert Mellin, *Tilting: House launching, slide hauling, potato trenching, and other tales from a Newfoundland fishing village*, (New York, Princeton Architectural, 2008), 206-208.

11 Bubel, Mike, and Nancy. *Root Cellaring.: Natural Cold Storage of Fruits & Vegetables*. (Pownal, VT: Storey, 1995), 35-38.

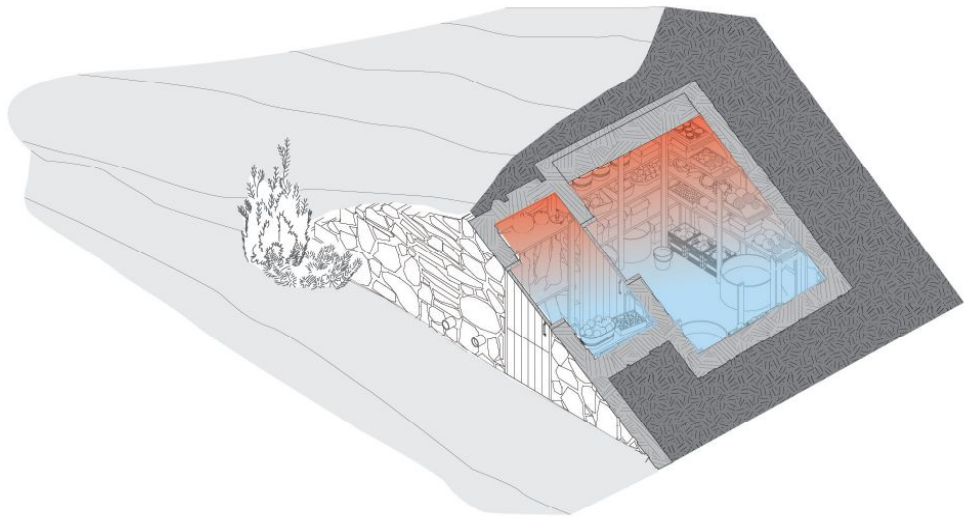
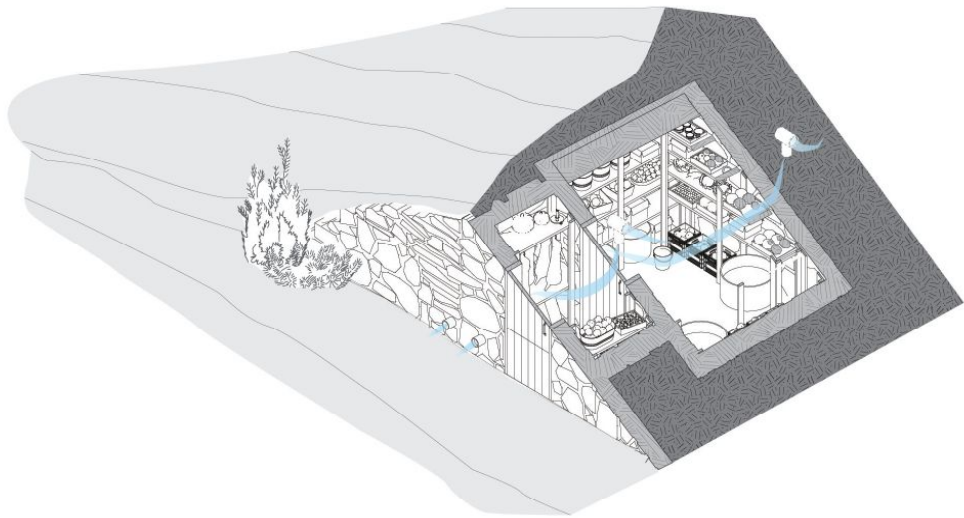
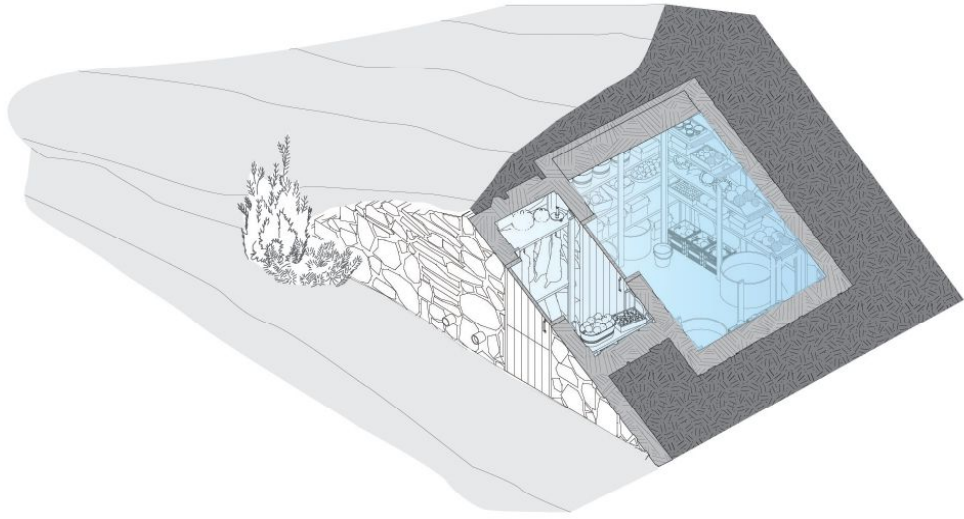


Figure 2.2 *Humidity, Ventilation and Temperature inside the Root Cellar*
These three climatic elements influence how each individual item is stored in the root cellar.

When planning a root cellar there are three main principles that need to be considered: Humidity, Ventilation, and Temperature.¹² These three different climatic elements will affect both the method of root cellar construction as well as the positioning of the harvest within the cellar itself. The first main principle to be considered is humidity. The deeper into the ground the cellar is built, the more humid it will be. The second principle is air circulation, in order to keep the harvest from spoiling their needs to be air flow throughout the space. This removes the ethylene gas that is released as the produce ripens. The third principle is temperature. Due to the earth surrounding the cellar, it will maintain temperatures that vary between 0-15 degrees Celsius, depending on depth, and time of year. The upper area of the cellar will remain warmer, while the lower portion will remain cooler. Two of these principles, humidity and temperature are easily understood in a graph. Shown on the following page, humidity is represented on the y axis, and temperature on the x axis. This information, drawn in graph form, allows the further understanding of the optimal micro climate for each individual harvest item. With these graphs, it is made visible in two dimensional space that hot peppers and beans all have larger ranges and levels of flexibility for where they could be positioned throughout the cellar. While potatoes and winter radish are more specific. All of this information dictates the exact position that benefits each item best. The ripening cheese should be at the top and nearest the vent so as to allow maximum “warmth”, and ventilation. While the pumpkin and squash, which have been curing over the fireplace for a few weeks have dried and hardened their rinds and can be placed in the front room of the cellar where they are more prepared to deal with a change in temperature.

Each vegetable is stored differently according to its needs. For example, carrots are stored in buckets with slightly moist sand allowing them to stay crunchy over the winter. The sand and carrots are carefully layered throughout the bucket. The carrots must be carefully placed so as to not touch, otherwise they will potentially mould and ruin the crop.¹³ Often times, a family might run out of a certain crop eventually, often due to a bad harvest season or a lack of means. During those times, neighbours would lean on each other for food throughout the winter sharing what they had in their individual root cellars.¹⁴

¹² Bubel, Root Cellaring, 134-140.

¹³ Little Mountain Ranch, Root Cellar Update | How to Store Your Root Veggies for the Winter, (YouTube, October 03, 2018.) https://www.youtube.com/watch?v=rIuMH_eLVIs&t=275s

¹⁴ Mellin, Tilting: House, X.

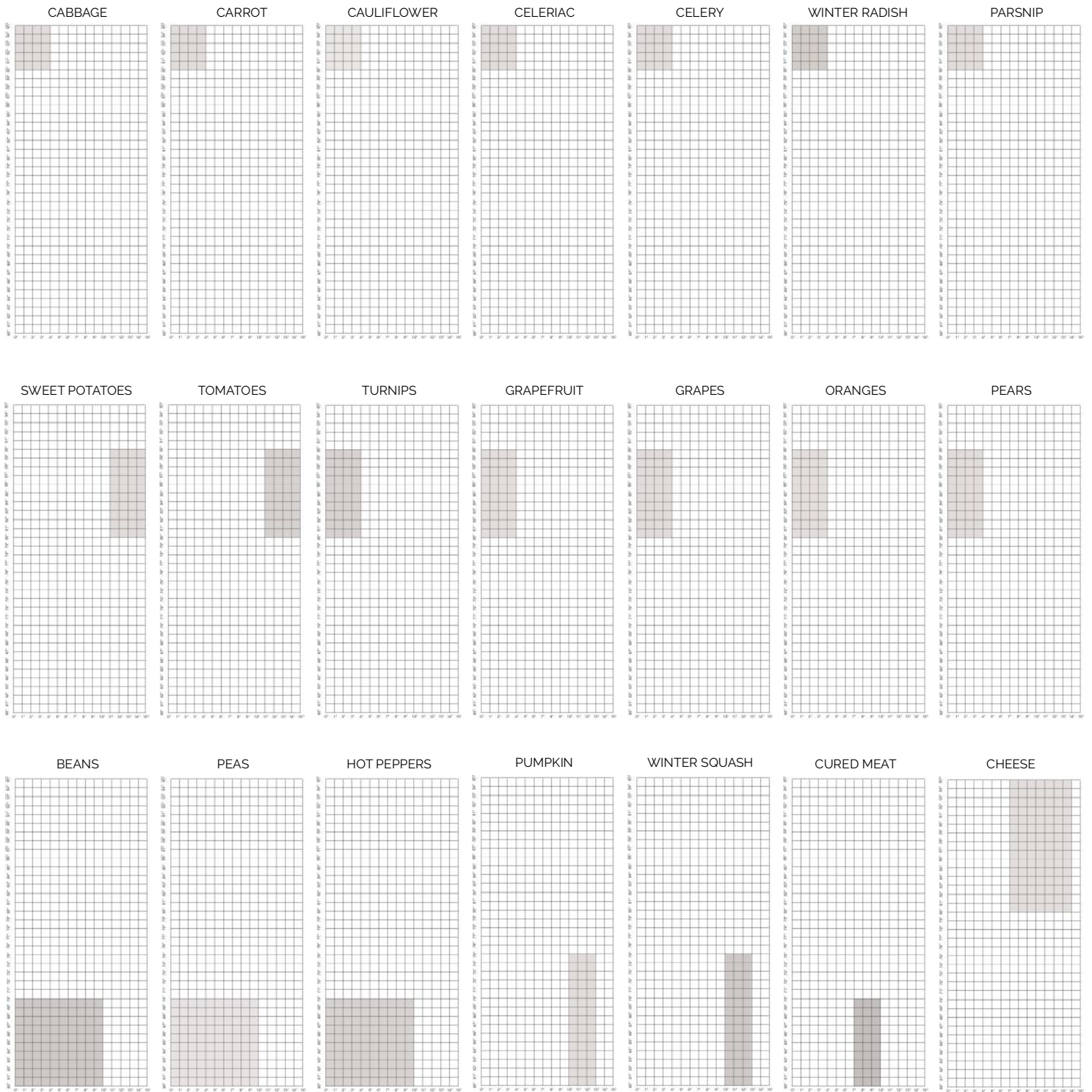


Figure 2.3 *Produce charts based on humidity and temperature requirements in the cellar:*
 To understand and organize each items placement in the cellar charts were drawn based on humidity and temperature to allow for ease of spatial understanding, the produces' levels of flexibility within the cellar and grouping of items with similar condition requirements.

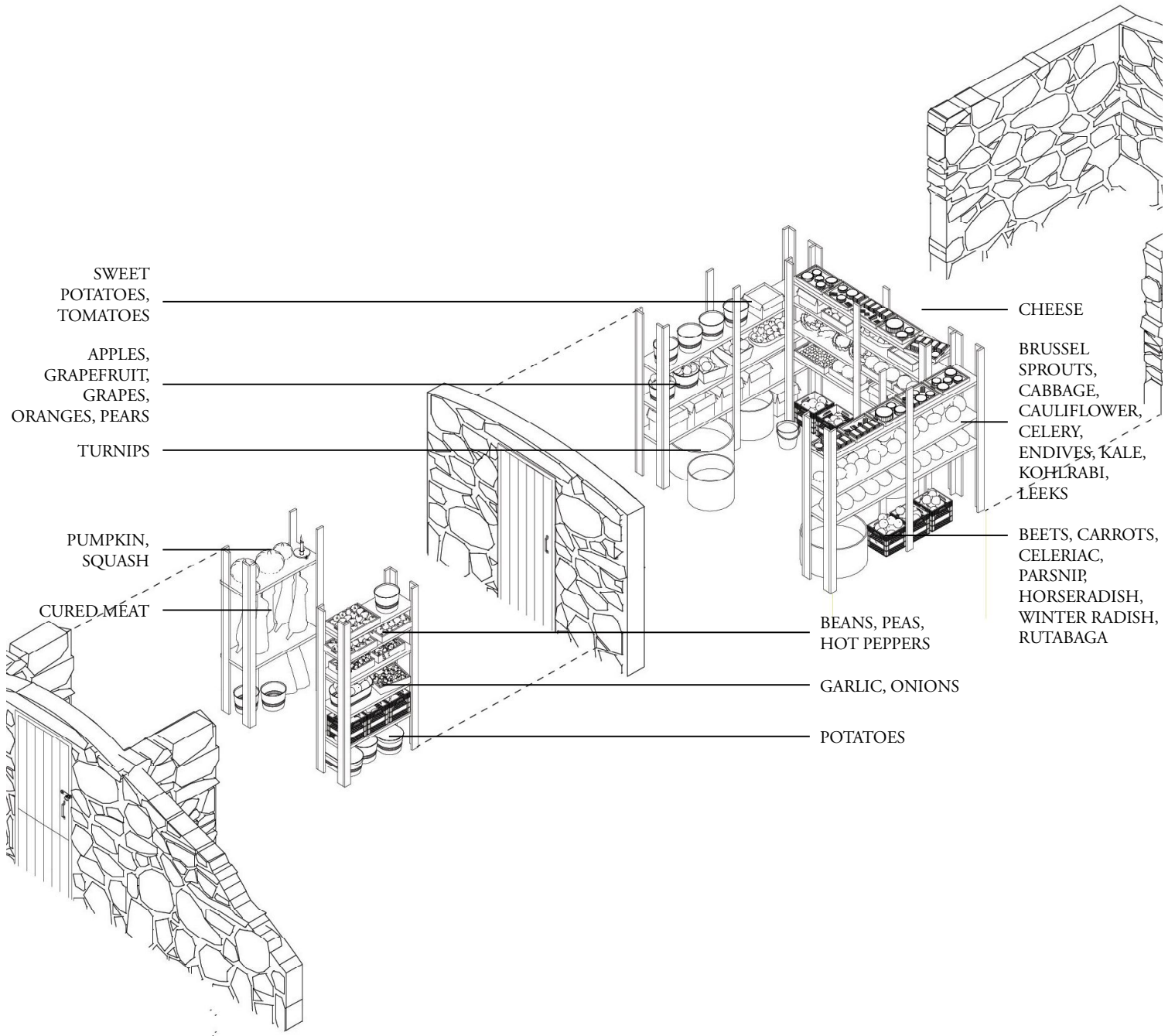


Figure 2.4 Exploded Interior Axonometric of Root Cellar Produce Placement.

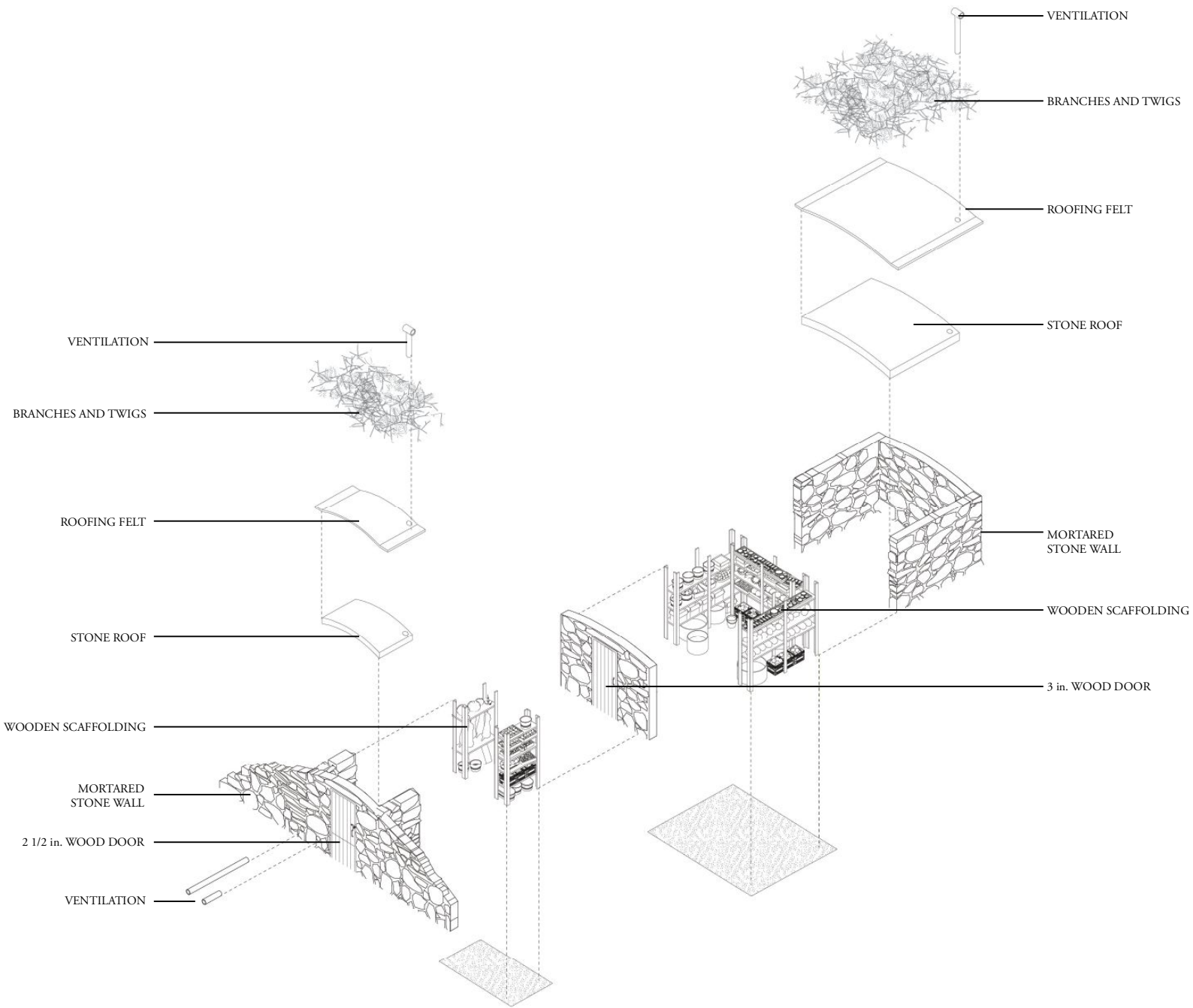


Figure 2.5 Exploded Axonometric of Typical Dug-In Root Cellar Construction

Root cellar construction has been a practice for hundreds of years in Newfoundland. For the most part, early spring was the only time when root cellars could be built, since fishing season went from late spring until late fall, and wood cutting season was from fall through the winter. The root cellars could be built by a single person, however, it was typically more efficient if the people in the community got together and built a few all at once.¹⁵ Regardless of what kind of root cellar is being constructed, the first thing needed when building a root cellar is choosing the correct location. In Robert Mellin's book a Tilting local named Jim Greene explains it perfectly:

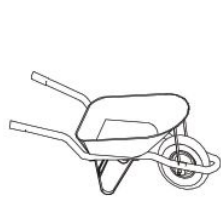
“First thing, you got get a good place to build it. That's the hard thing to do. That's the worst job you got, trying to find a good place to build that cellar. On a hill is the best you don't have no water. You get down a hollow, you're sure to have water.”¹⁶

The construction of the root cellar is quite humble, however it is also incredibly resourceful and intelligent in its design. Typically, a rocky cliff-face or hillside is located, then an area is dug out, slightly larger than the intended cellar size. Then stone is stacked and mortared together in order to hold the ground back. The exposed dirt floor is left as-is, since the levels of humidity that emanate from it allow for many of the vegetables and fruits to keep over the winter.¹⁷ Wooden scaffolding is installed to construct a stone and mortar curved roof, this scaffolding will later be used to hold all of the harvest when the cellar is complete. Then some kind of felt or woolen material would be draped over the top, as well as branches and leaves in order to slow rainfall until proper grasses and shrubbery could grow atop the cellar's earthen roof. To moderate humidity levels ventilation is included, this is done to prevent mold. There are two rooms to each root cellar, the front room, often called the 'lintel', and the main room. Both of these rooms require ventilation intake from the front of the building, ideally the windiest area of the site, as well as outtake at the top of the roof. A pipe would puncture the lower and upper areas of the cellar in order to provide ventilation. Finally, thick wooden doors complete the cellar.

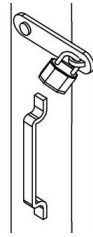
15 Tucker, Elliston Root

16 Mellin, Tilting: House, 198.

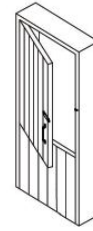
17 Heritage Newfoundland, The Memory Store: “The root cellar - that is built heritage...”, (Youtube, June 24, 2015.) https://www.youtube.com/watch?v=Rd_WAF5mcUo



WHEELBARROW



PADLOCK



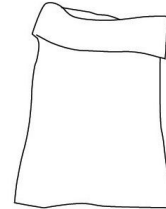
HALF DOOR



CANDLE



BUCKET OF WATER



BAG OF CHARCOAL

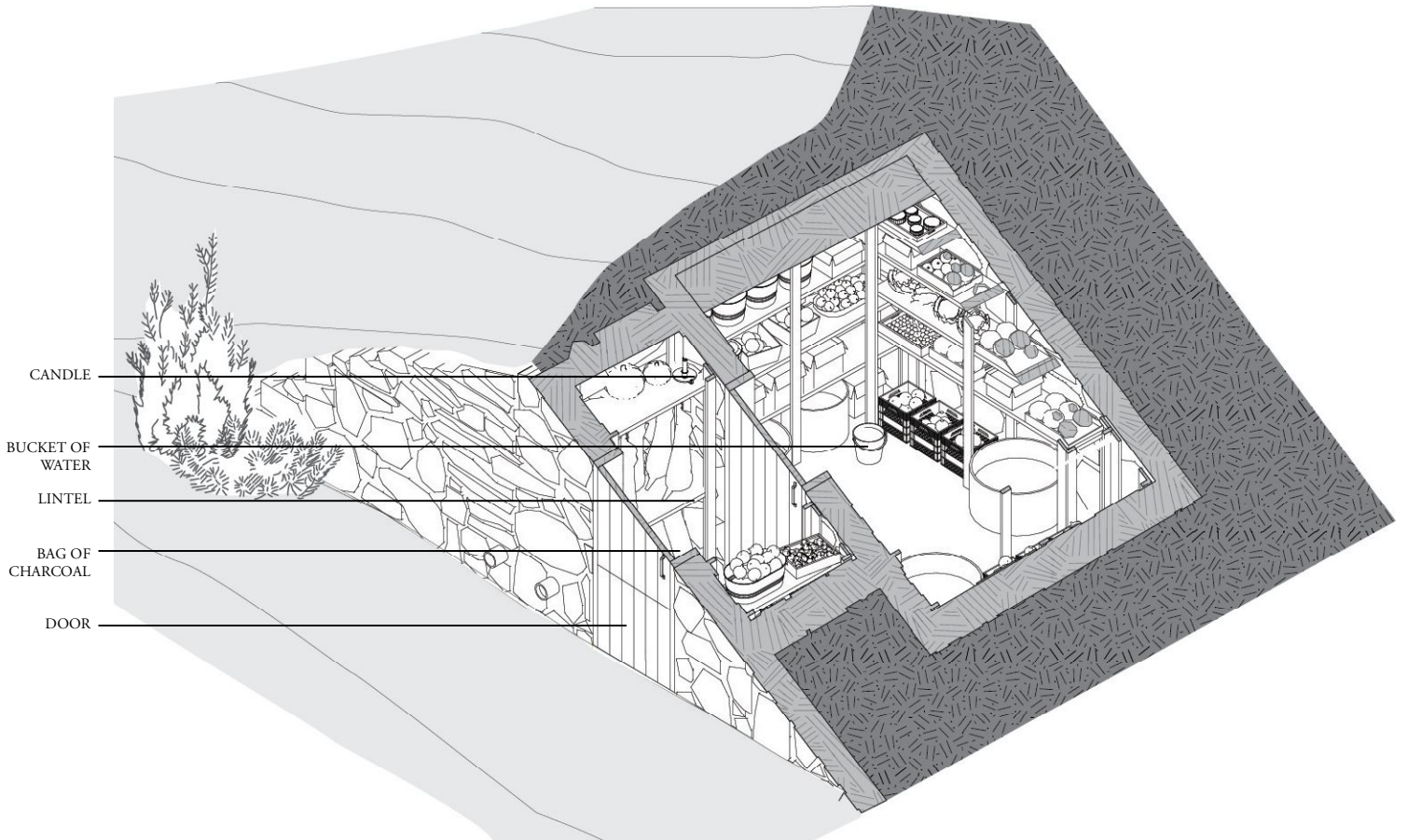


Figure 2.6 Cut away Axonometric of Typical Dug-In Root Cellar Interior

Though the construction methods and materials used in the cellars are very important, so are the tools that are a part of it. For example, a bucket of water, though terribly simple, would add moisture to a space that may not have had enough. Throughout the dead of winter, the bucket of water would freeze and alert the resident that the cellar was simply too cold for the harvest to last. A root cellar's ideal temperatures should never reach below zero Celsius, therefore the bucket of water was a good solution. Once a frozen bucket was discovered in the cellar, a lit candle would be added to the space, to add warmth overnight. The next morning the candle could be replenished, lit again, and used for visibility whenever a grocery trip was needed in the cellar.¹⁸ On the days that were simply just too humid, a burlap sack of charcoal could be placed inside the cellar to absorb any excess of moisture, keeping the vegetables ripe and ready.¹⁹ Practicalities like latches and locks are often added to the doors. This is not so much for keeping humans out but more so for local wildlife. The doors are designed as a variation of a Dutch door. The difference being that the lower door only has a height of about 2-3 feet above ground. In winter, this is perfect for allowing the root cellar visitor to step into the cellar when they don't have the time or energy to shovel the snow.²⁰ Inside the cellar, the curved roof allows for any condensation to run down the sides of the walls instead of landing on produce and potentially spoiling it. While, the exposed dirt floor add to the humidity and warmth that the earth gives the cellar. Often, for added security chicken wire is buried below the earthen floor, so as to keep rabbits and other animals from digging their way in.²¹ The lintel, as it's called, creates a barrier between the main cellar and the outdoors, allowing the temperature to fluctuate less in the main space. Though ventilation is necessary, the lintel, allows for a secondary layer to further bury the main cellar room into the ground, providing even more humidity for the harvest.²² The dappled light from the trees allow for certain vegetables to be dried and prepared before their entry into the cellar. Finally, the trusty wheelbarrow brings in loads of soil, sand, produce and other equipment needed for the root cellar.²³

18 Newfoundland, The Memory Store

19 Steph thVIDEOguy, Bill Edwards on Root Cellars, (Youtube, Sept 4, 2013) <https://www.youtube.com/watch?v=6iHK-GKR85o>

20 Don Johnson, personal communication, October 15, 2015.

21 Hardcore Sustainable, Natural Refrigerator: The Root Cellar in My Floor, (YouTube, Feb 8, 2016) <https://www.youtube.com/watch?v=9FEIJ1PLzoQ>

22 Tucker, Elliston Root

23 The Elliott Homestead, The Beauty of Preserving Food for Winter | Root Cellar Storage | Potager Garden Bounty, (YouTube, Sep 4, 2019) <https://www.youtube.com/watch?v=oJt4z1gE9Fg&t>



Figure 2.7 An Elliston Resident Walks with his bag of potatoes from the shared root cellar.



Figure 2.8 A Glimpse of some potatoes inside a root cellar in Elliston, Newfoundland.

For the last few hundred years root cellars have been an incredibly important part of many rural Newfoundland towns. The root cellars were not only just a way of managing food over the seasons, but were the place that dictated every part of their daily lives. Before the 1950's many rural towns in Newfoundland had nearly no method of purchasing vegetables and so many citizens, if not all of them, depended on vegetable gardens and root cellars for sustenance. The lack of grocery stores and shops meant that root cellars were significant to the survival of Newfoundlanders throughout the winter. These root cellars were overly engineered so as to stand the test of time for as long as possible and were passed down from generation to generation.²⁴

Today, intact root cellars are less common than they used to be, so much so, that a local town by the name of Elliston has attracted tourists with its many cellars. Elliston is a town with a population of 308 people²⁵ and is the self declared "Root Cellar Capital of the World" boasting 133 documented root cellars within its city limits.²⁶ Unfortunately, a large portion of Elliston's root cellars are meant only to generate tourism. However, they do still share a few of the cellars amongst the community. As can be seen in Fig. 2.7 a local Elliston Resident is seen carrying his bag of potatoes home from the shared community cellar. This shared root cellar is one of the earliest cellars constructed in Elliston and was built in 1839 by George Porter.²⁷

With access to electricity and grocery stores the use of root cellars in Newfoundland has changed significantly.²⁸ However more recently, Newfoundland has been dealing with heavy amounts of food insecurity making local residents yearn for the past simplicities of the root cellars.²⁹ Don Johnson of Tourism Elliston describes how he sees the future of root cellars changing over time:

"This is green energy...This- This could be- This is something from the past, but it could be something from the future. This requires no energy except for the initial building. And it's a better way to keep vegetables... for a long time! If we ever do find ourselves in an energy poor future, where we can't have bananas from South America in Elliston within two weeks... We're gonna have to go back to storing food long term. The gardens now are disappearing and are being taking over again by the trees might expand again, and people are gonna be looking for this! The intangible cultural heritage that is the keeping of a root cellar."³⁰

24 Tucker, Elliston Root

25 Statistics Canada, Census Profile - Elliston Population, 2016

26 Tucker, Elliston Root

27 Tucker, Elliston Root

28 Newfoundland, The Memory Store

29 Sarah Elton, The Food Storage Secret Our Grandparents Knew, (The Globe and Mail, May 01, 2018)

30 Newfoundland, The Memory Store

FOOD INSECURITY

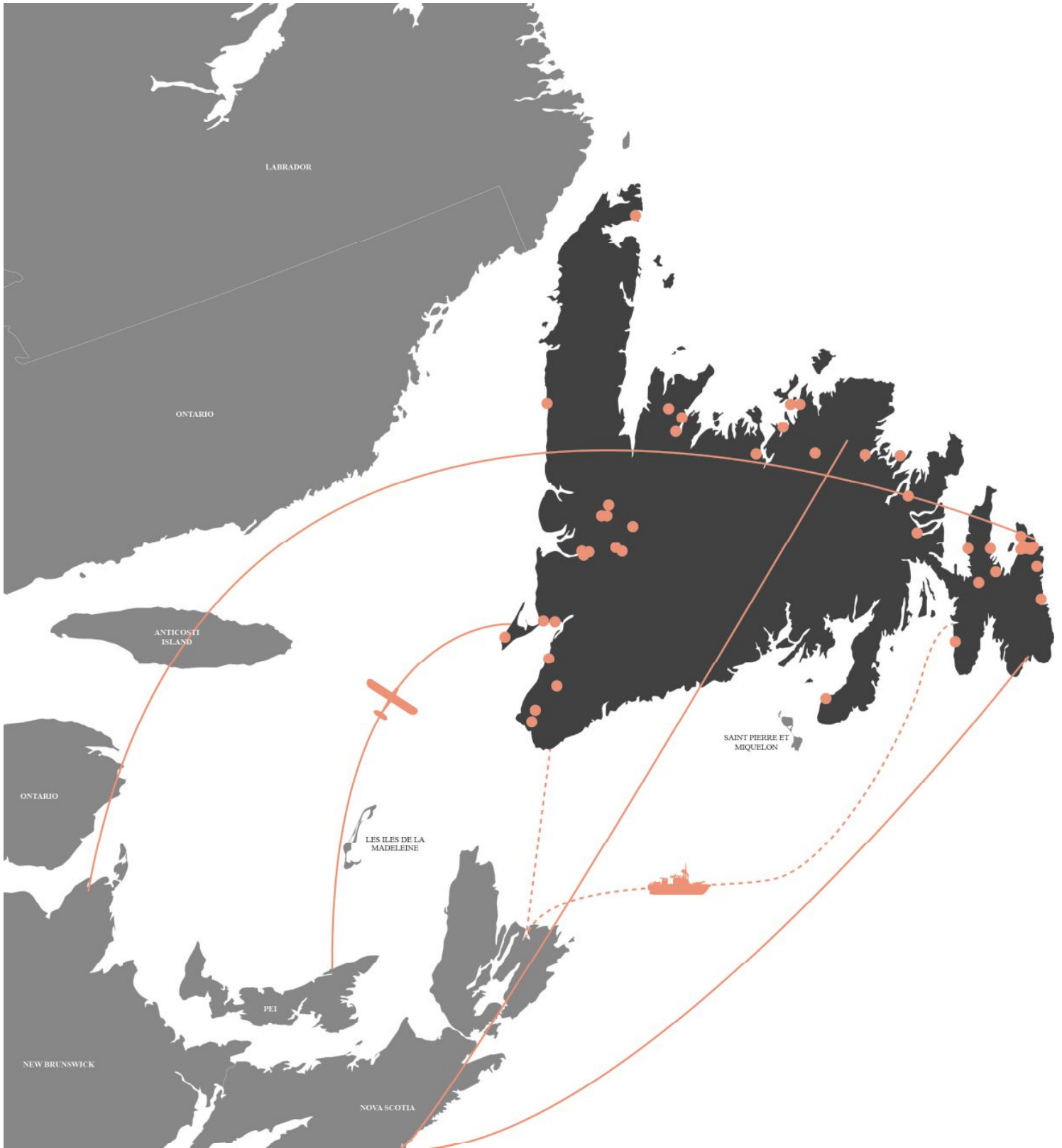


Figure 3.1 Map of Farms located in Newfoundland and food export routes.

Though Newfoundland's history of root cellars indicates a long tradition of agriculture, the farms in Newfoundland are slowly disappearing. For example, back in 1951, 1 in 18 Newfoundlanders lived on a farm. In 2006 there are only 1 in 430.³¹ Throughout Canada it is quite common for smaller farms to be absorbed by larger farms over time, with the industrialization of agriculture. However this is not the case for Newfoundland. Newfoundland's farms aren't disappearing because they are being amalgamated, they have been disappearing along with the rural communities that they used to inhabit. Currently 71% of Newfoundland's fresh vegetables are grown outside of the province.³² Which means, when there is a storm and the planes and boats can no longer get to the province there are significant food shortages. These storms are very frequent, which means that the people of Newfoundland have grown accustomed to dealing with food insecurity.³³

To combat food insecurity in Newfoundland the provincial government has made commitments to double the food production in Newfoundland by 2022.³⁴ This means that the government, farmers, and scientists from Memorial university have been coming together to further this pursuit. Not only is the government making commitments, but organizations like Food First NL are also working towards these goals by teaming up with communities to implement learning initiatives related to local food security. Their projects include; mapping root cellars around Newfoundland, and implementing healthy produce being sold in corner stores.³⁵ In a recent study done by Food First NL, there was a recognition that a large portion of communities in Newfoundland and Labrador don't have access to a full time grocery store. 84% of these communities rely on corner stores.³⁶ Though Food First NL has tried to implement healthy food options in corner stores - they have limited resources and access to them. In the corner stores that I visited the employees informed me that the produce is purchased from Costco and sold with a markup through the corner store.³⁷ Then the produce is improperly stored in the refrigerated section. On the following page, Fig. 3.2 shows the products that are often available in these corner stores, in this diagram their sizes represent the amount of space in the store dedicated to selling these items.

31 Statistics Canada, Newfoundland and Labrador's farm population: changes over a lifetime, 2014. <https://www150.statcan.gc.ca/n1/ca-ra2006/agpop/nf-tn-eng.htm>

32 Food First NL, What is food security?, <http://www.foodfirstnl.ca/what-is-food-security>

33 Catherine L. Mah, The health Effects of Buying Food in stores and what Policymakers Should do About it (Memorial University of Newfoundland, 2015) 43-45

34 Lindsay Bird, With far fewer farmers, how can N.L. grow more food?, (CBC News, November 23, 2018) <https://www.cbc.ca/news/canada/newfoundland-labrador/nl-agriculture-problem-getting-new-farmers-in-industry-1.4916521>

35 FoodFirst NL, Our Projects, <http://www.foodfirstnl.ca/recent-projects>

36 Food First NL, Healthy Corner Stores NL, <http://www.foodfirstnl.ca/our-projects/healthy-corner-stores-nl>

37 Personal conversation with Store Employee. June 30th, 2019.

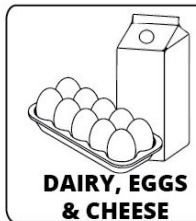
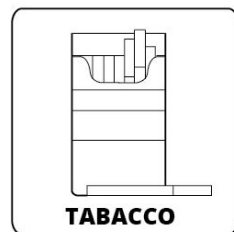
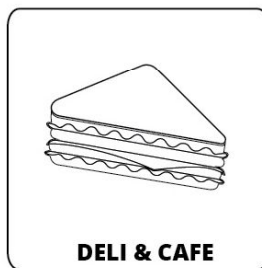
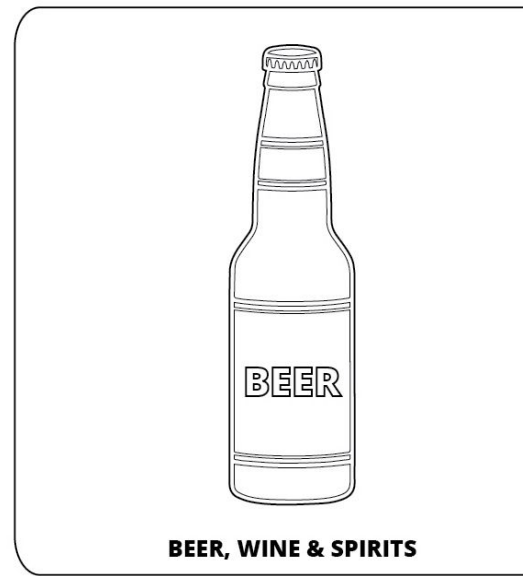
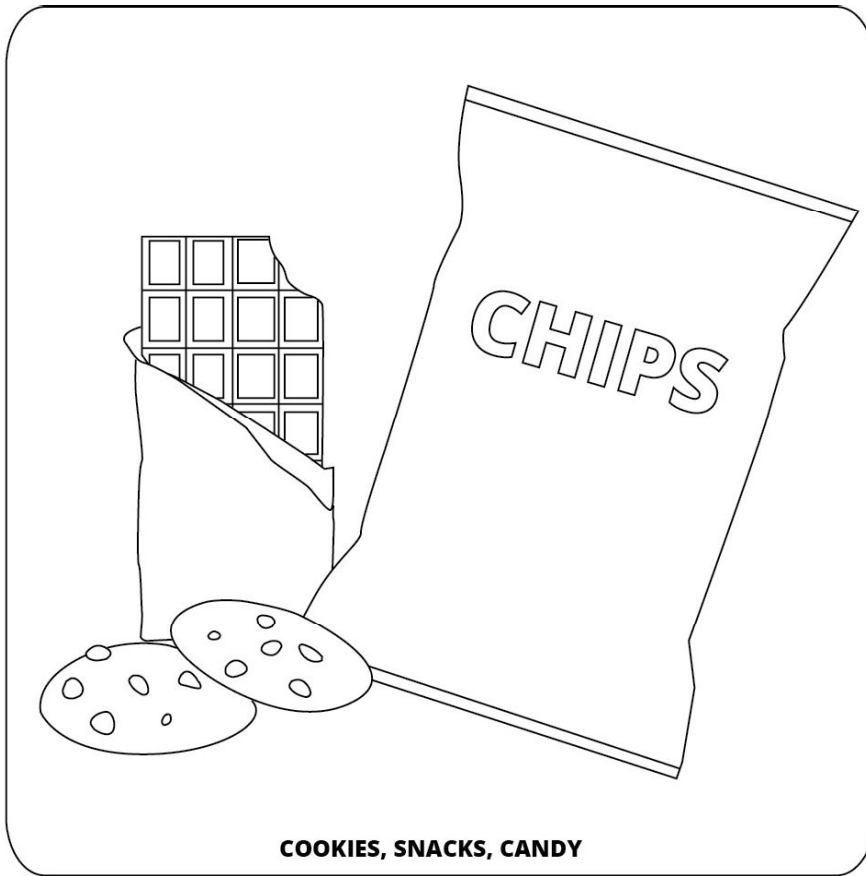


Figure 3.2 Distribution of Marie's Mini Mart corner store products, drawn by quantities sold. This drawing represents the amount of shelf space occupied by each item within Marie's Mini Mart Corner Store.

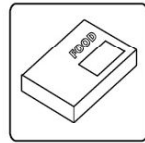
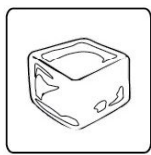
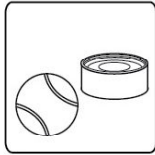
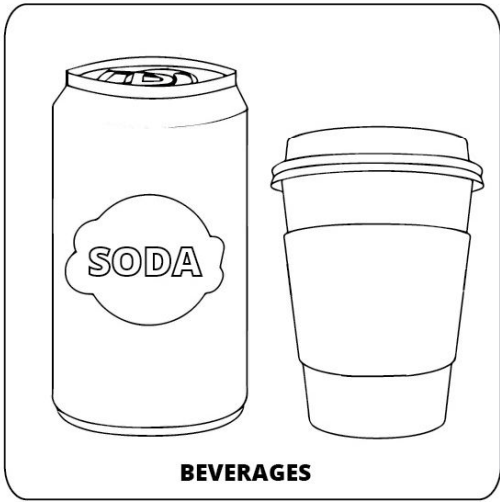




Figure 3.3 Produce Shortages in Toronto due to panic buying during the COVID-19 pandemic.



Figure 3.4 Produce shortage in Saint John's due to a large winter storm.

Though there is some fresh produce being sold in corner stores all over Newfoundland as well as Saint John's, there is still a great need for far more fresh produce. There is far more land available in rural Newfoundland towns, the city of St John's has tried to supplement this by providing community gardens. The community gardens are well used, however local residents find that food insecurity can be especially prevalent over the winter when these community gardens are no longer available.³⁸ This is made very apparent by Newfoundland's short growing season compared to its long winters.

Currently, Newfoundland only has a 2-3 day supply of food available if ferries are unable to get to the island.³⁹ Which means, that earlier this year in January when a large winter storm hit the coast of Newfoundland, stores were left with very little to sell. When local residents were interviewed by the news they expressed very little surprise, seeing as this is, unfortunately, a common occurrence in Newfoundland.⁴⁰ However, in Southern Ontario, the Covid-19 Pandemic has caused food shortages due to panic buying by many local residents.⁴¹ Luckily, Southern Ontario grocery stores will quickly recover since it is an area with a abundance of farms and a harvest friendly climate. Unfortunately, many areas all over the world are not as lucky. Many areas, like Newfoundland, are experiencing an overwhelming amount of food insecurity. It's of great importance that we take this time to rethink our food systems and properly invest in local food security everywhere.

38 Dara Squires, From statistic to survival: How one family deals with food insecurity, (CBC News, March 1, 2020) <https://www.cbc.ca/news/canada/newfoundland-labrador/fed-up-statistic-to-survival-dara-squires-food-insecurity-1.5478428>

39 Food First NL, What is food security?, <http://www.foodfirstnl.ca/what-is-food-security>

40 Colleen Lewis, Grocery stores in central anxious to get products back on the shelves, (NTV News, January 23, 2020)

41 Wendy Gillis, 'Rest assured, we have plenty of food.' Ontario shoppers urged to cease panic buying amid the coronavirus outbreak. (The Star, March 14, 2020) <https://www.thestar.com/news/gta/2020/03/14/rest-assured-we-have-plenty-of-food-ontario-shoppers-urged-to-cease-panic-buying-amid-the-coronavirus-outbreak.html>

MARIE'S MINI MART



Figure 4.1 *Photograph of Marie's Mini Mart.*

Corner stores are important the communities social fabric in Saint John's, as well as the rest of Newfoundland. Individuals truly have a strong connection with their local corner store.⁴² In particular, corner stores in Saint John's are believed to be an integral part of their communities cultural fabric.⁴³ Therefore corner stores play a key role in the tackling of the food security issue in Newfoundland. Catherine Mah, a Dalhousie University Professor believes that:

“Rural stores have a long history of serving as community hubs. A healthy corner store strengthens that role ... [and] small store owners' capacity to innovate and respond to the local market, represents a wealth of possibility for building a healthier, more equitable, and resilient food system in NL.”⁴⁴

To aid in tackling the food security issue, non-profits like Food First NL have tried to implement healthy produce throughout corner stores. However, many corner store owners have expressed that fresh produce is a difficult item to sell. Since fresh produce is far more perishable than the processed food that they are often used to selling.⁴⁵ Translating the passive, sustainable and winter resistant root cellar into the corner store will help aid the issue of food security in Saint John's, and to a large extent the whole of Newfoundland.

A prototype site was selected near the downtown area of Saint John's. This site was selected because of its ideal south facing sloping site, and close proximity to a community garden. In addition to these elements, an abandoned building adjacent to the corner store provided opportunity for further expansion. This expansion will further connect the corner store to the community garden.

42 Michelle Porter, “The Corner Store,” *Saltscapes Magazine*, accessed April 26, 2019, <https://www.saltscapes.com/people-culture-section/people-culture-category/1288-the-corner-store.html>)

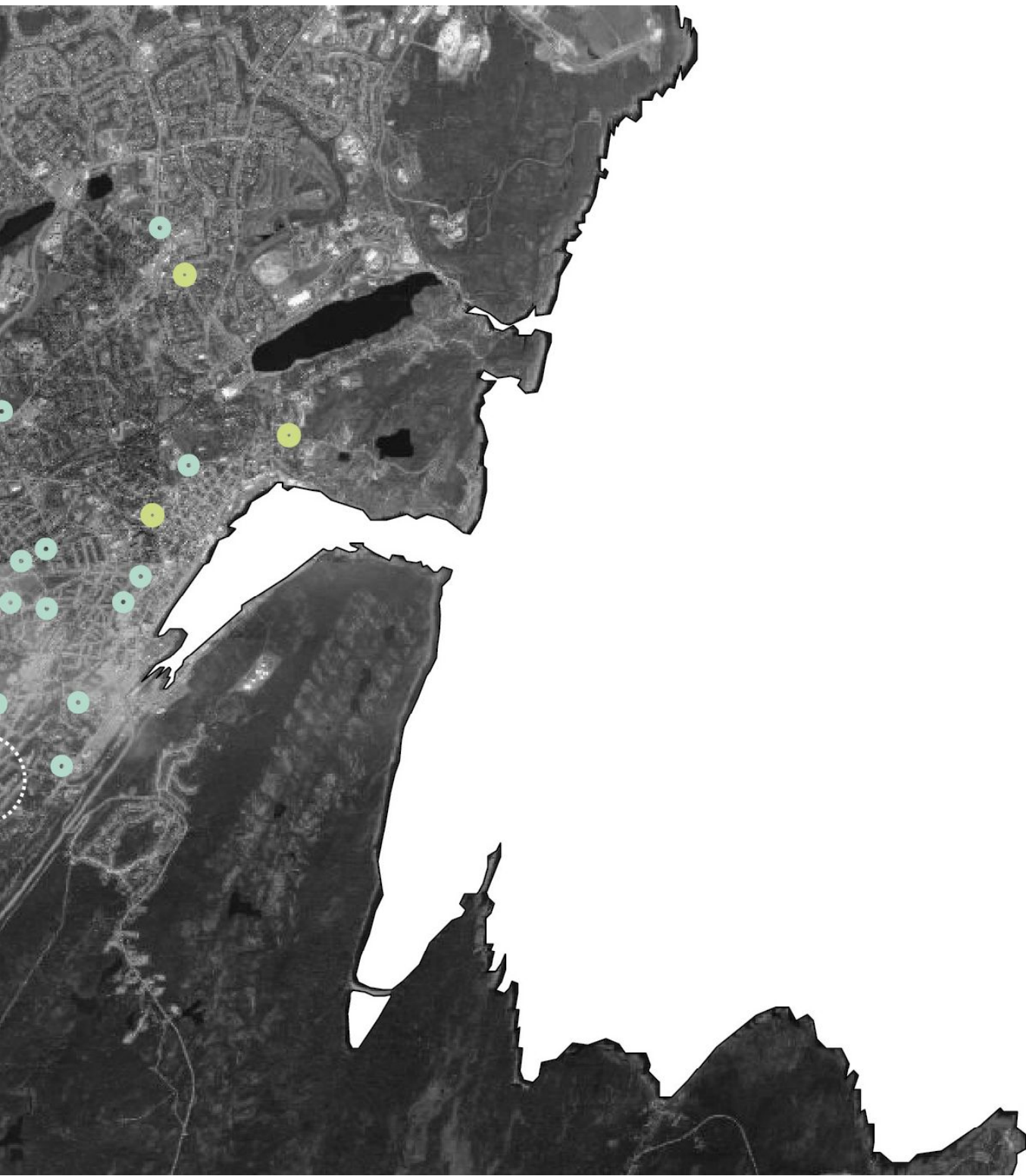
43 Shawn Hayward, “Neighbourhood Convenience,” *The Scope Archive*, November 5, 2009, <http://thescope.ca/city/neighbourhood-convenience>)

44 Catherine L. Mah, *The health Effects of Buying Food in stores and what Policymakers Should do About it* (Memorial University of Newfoundland, 2015) 43-45

45 Food First NL, *Healthy Corner Stores NL*, <http://www.foodfirstnl.ca/our-projects/healthy-corner-stores-nl>



Figure 4.2 *Map of Corner Stores and Community Gardens in St. John's.*



CORNER STORES IN ST JOHN'S 

COMMUNITY GARDENS IN ST JOHN'S 



Figure 4.3 Aerial view of Marie's Mini Mart and surrounding neighbours.



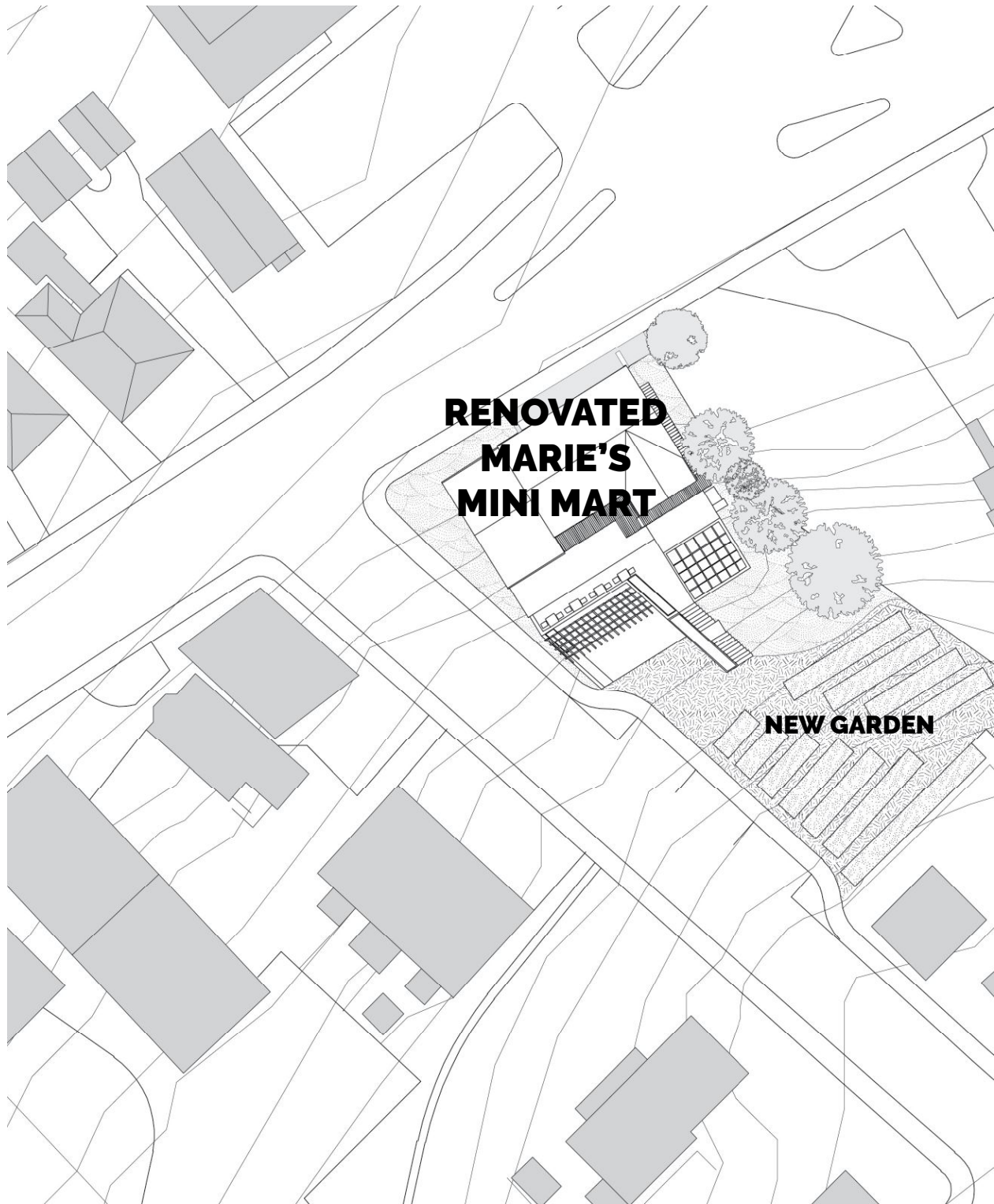
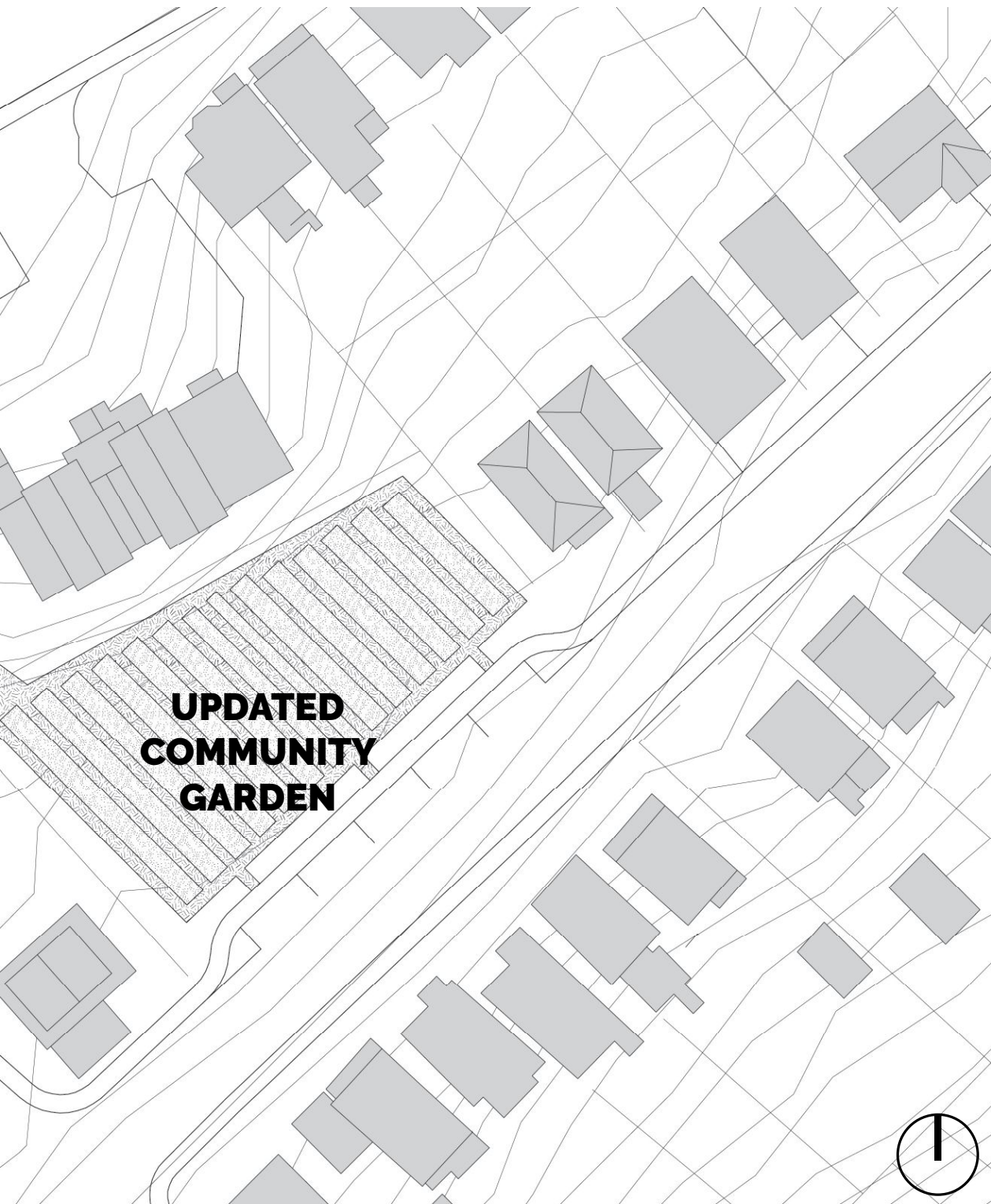


Figure 4.4 Site Plan of new design.



**UPDATED
COMMUNITY
GARDEN**

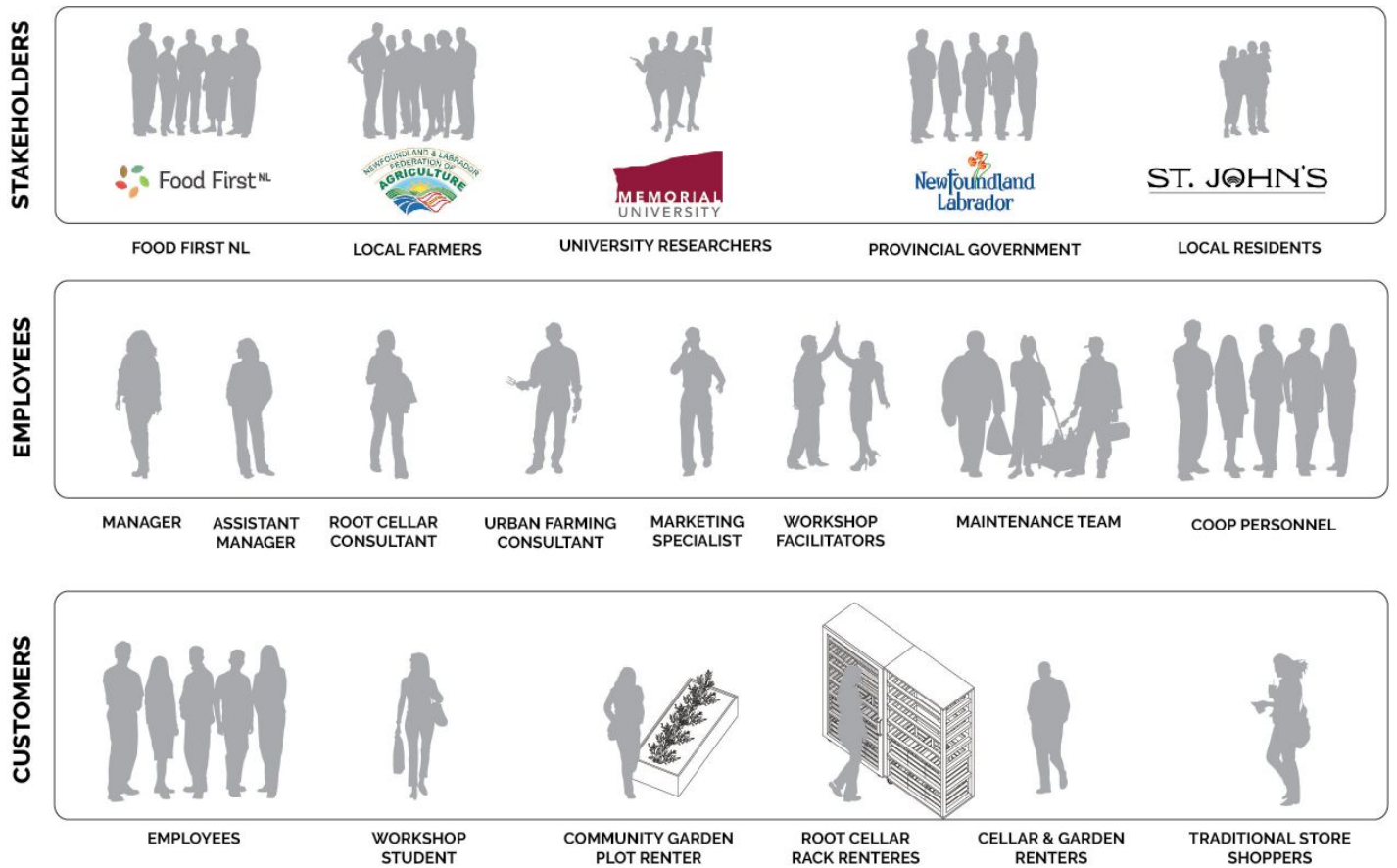


Figure 4.5 Diagram representing Stakeholders, Employees and Customers.

The existing structure includes a main floor that consists of a Marie's Mini Mart and a local beauty store. On the second floor, there are residential apartments, while the dirt floor basement includes storage for the beauty supply store. In renovating this corner store, the abandoned residence would be taken over to expand the community garden.

In this thesis the renovation of the corner store will implement root cellar practices through a cooperative scheme. This cooperative would be made up of Stakeholders like, Food First NL, Local Farmers, Memorial University, and the Provincial Government as well as any local residents who wish to be part owners of the Coop. The key employees would consist of traditional corner store personnel, as well as specific experts, like the root cellar consultant, and urban farming consultant. Their combined expertise would allow for an incredibly efficient merging of the corner store, root cellar and community garden. For those who participate in the coop program as customers, there would be a verity of options available to them. Some customers could be made up of employees who exchange some of their time for discounts on goods and free use of both the community garden and cellar. While, other customers could rent a rack in the cellar. In doing so, they would be able to stretch out their summer gardening into the fall and winter providing them with fresh produce throughout the year.

The majority of the produce sold from the corner store would come from local farmers selling their harvest. Any land not used by individuals within the community garden would become available for the corner store to utilize in growing their own produce. In calculating the total amounts of produce available and comparing it to the area that is available to Marie's Mini Mart, it can be deduced that at peak capacity the corner store can feed 775 people for a whole month without restocking. Currently, Newfoundland has a 2-3 day supply of produce if there are ferry delays.⁴⁶ Though a month long supply timeline is encouraging, it is only based off of one corner store root cellar prototype located in Saint John's. At the moment, St John's has 30 corner stores, 2 grocery stores, and 6 small scale grocery stores.⁴⁷ Even if all of those stores were renovated with the root cellar model that would still leave a population of 1500 people relying on Marie's Mini Mart and Corner Store. This concludes that there would either need to be more corner stores available, or a larger renovation of the Marie's Mini Mart.

46 "What Is Food Security?," Food First NL, accessed April 19, 2019, <http://www.foodfirstnl.ca/what-is-food-security/>

47 "THE BEST Convenience Stores in St. John's, NL - Last Updated May 2020," Yelp, accessed April 20, 2019, https://www.yelp.ca/search?cflt=convenience&find_loc=St.+John's,+NL

DESIGN METHODOLOGY

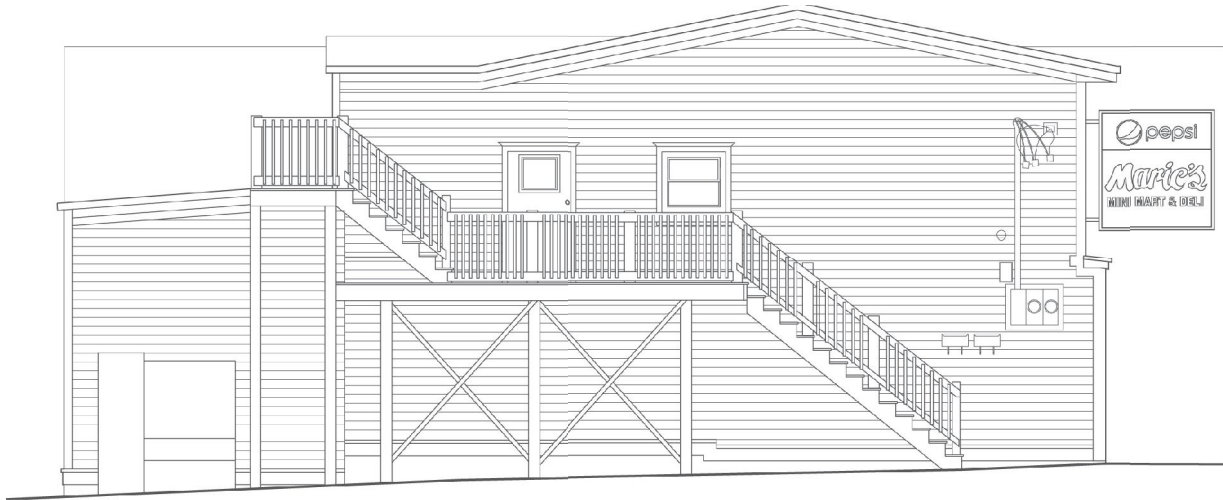


Figure 5.1 East Elevation of Marie's Mini Mart.



Figure 5.2 North Elevation of Marie's Mini Mart.

Marie's Mini Mart is a 20 minute walk from the downtown core of Saint John's. The site sits between both residential and commercial neighbourhoods situating itself on the corner of Hamilton Avenue and Richmond Street. The existing Marie's Mini Mart floor plan is that of a typical Newfoundland corner store. Inside the mini mart there is a beer fridge and a drink fridge. There are many rows of candy, chips and toilet paper. Towards the back of the store there is a lunch counter with weekly specials. Behind the counter cigarettes and lotto scratchers are available. To the front there are ice cream bins filled with treats for the summer.

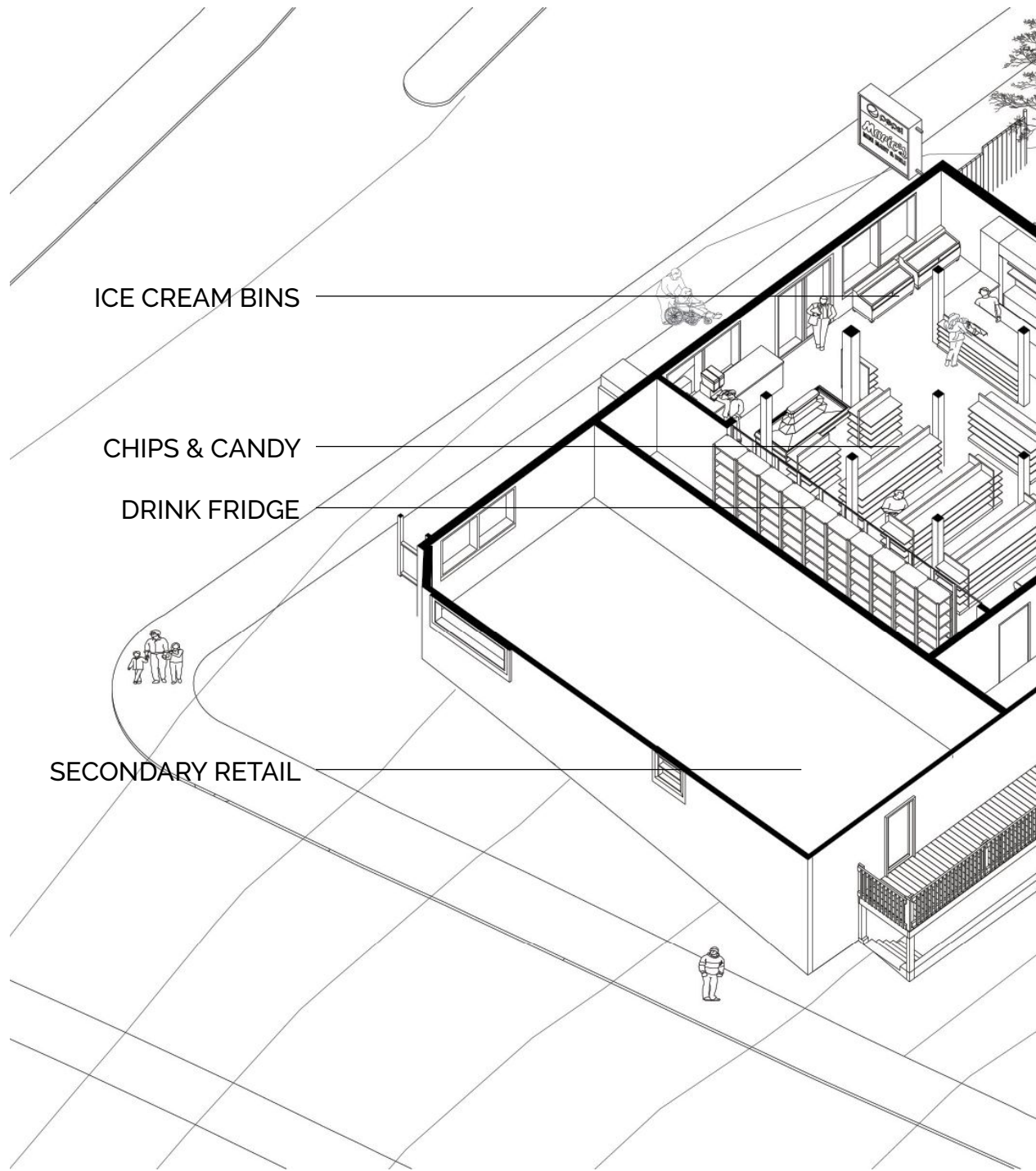
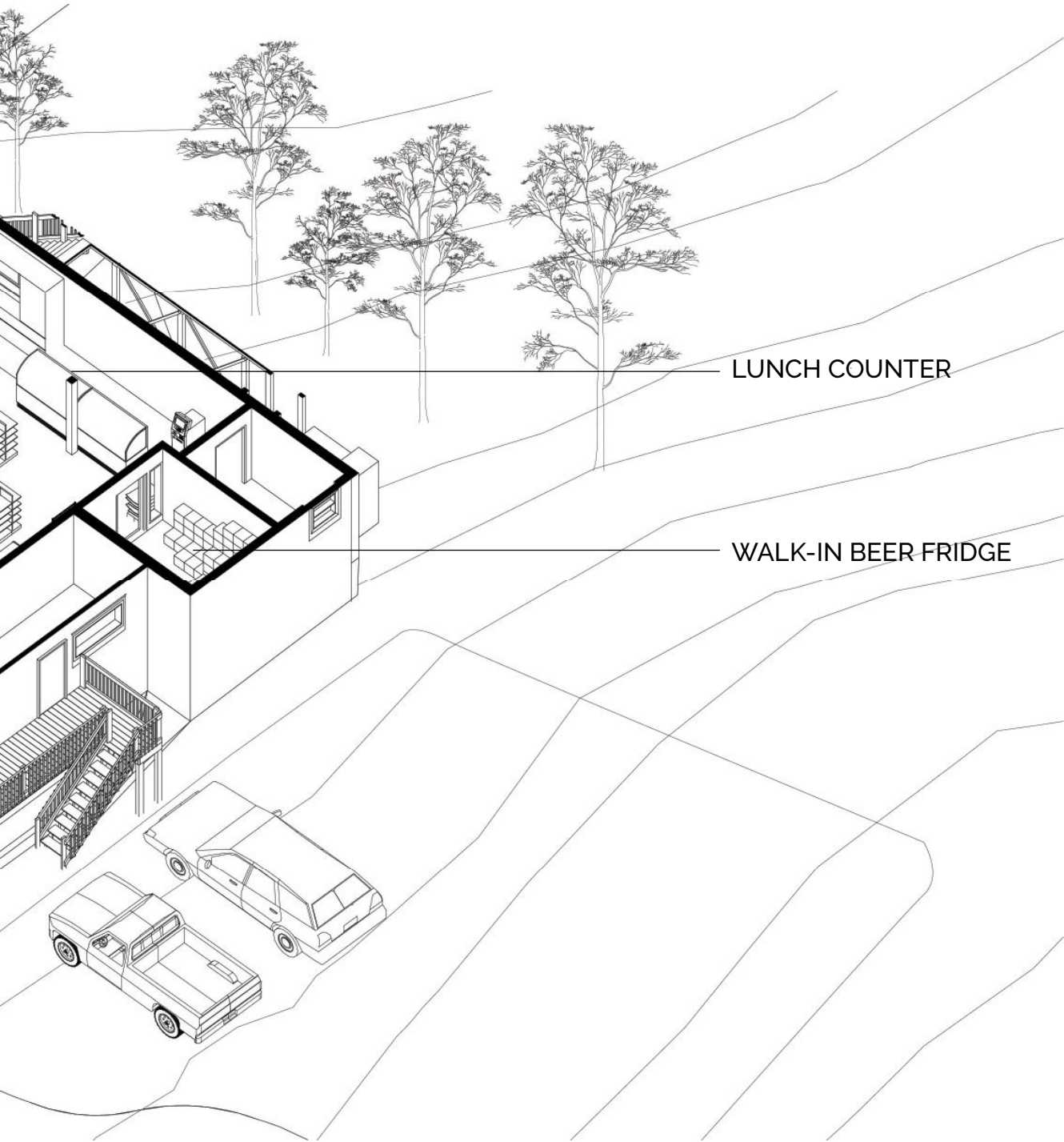


Figure 5.3 Cut away axonometric of existing Marie's Mini Mart Plan.



LUNCH COUNTER

WALK-IN BEER FRIDGE

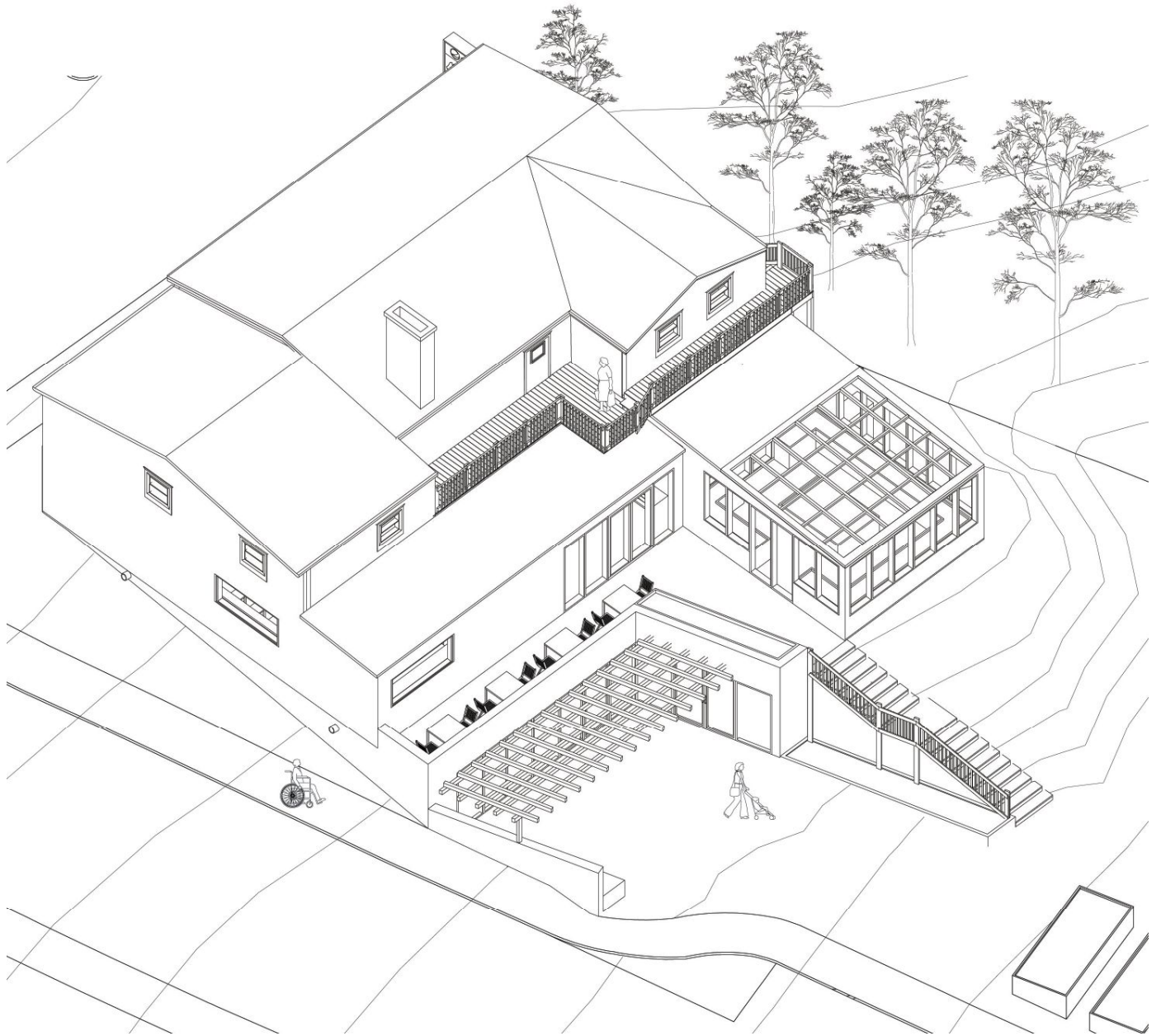


Figure 5.4 Axonometric of New Marie's Mini Mart.

This corner store renovation is not meant to take away from its existing charm, but to add to it by increasing its square footage and adding elements from the root cellar. The overall design plan for the renovation is to utilize the existing basement, take over the secondary retail space, and expand further at the back of the store to maximize the southern sun by adding a small greenhouse. In this new design the walk-in beer fridge remains, as well the pop fridge and main corner store rows which include all of the standard items that you would expect any corner store to have. The lunch counter remains as well, however its connection to the greenhouse allows the lunches to be prepared with whichever ingredients can be freshly picked that day. For ease of access between floors an elevator is included taking both customers and employees to its two floors. The elevator opens onto a storage room and prep space as well as the main level allowing for multi-purpose use. Access from the main corner store is included through the back doors onto a summertime terrace that leads to the community gardens and trellis below. A winter lounge is added with a fireplace so as to give patrons an area to enjoy their lunch and socialize, while the fireplace doubles as a means of curing squash and pumpkins over the late fall and winter. To entice new customers to venture downstairs, drying herbs hang above the staircase, leading customers to the lower level of the corner store and into the root cellar section.

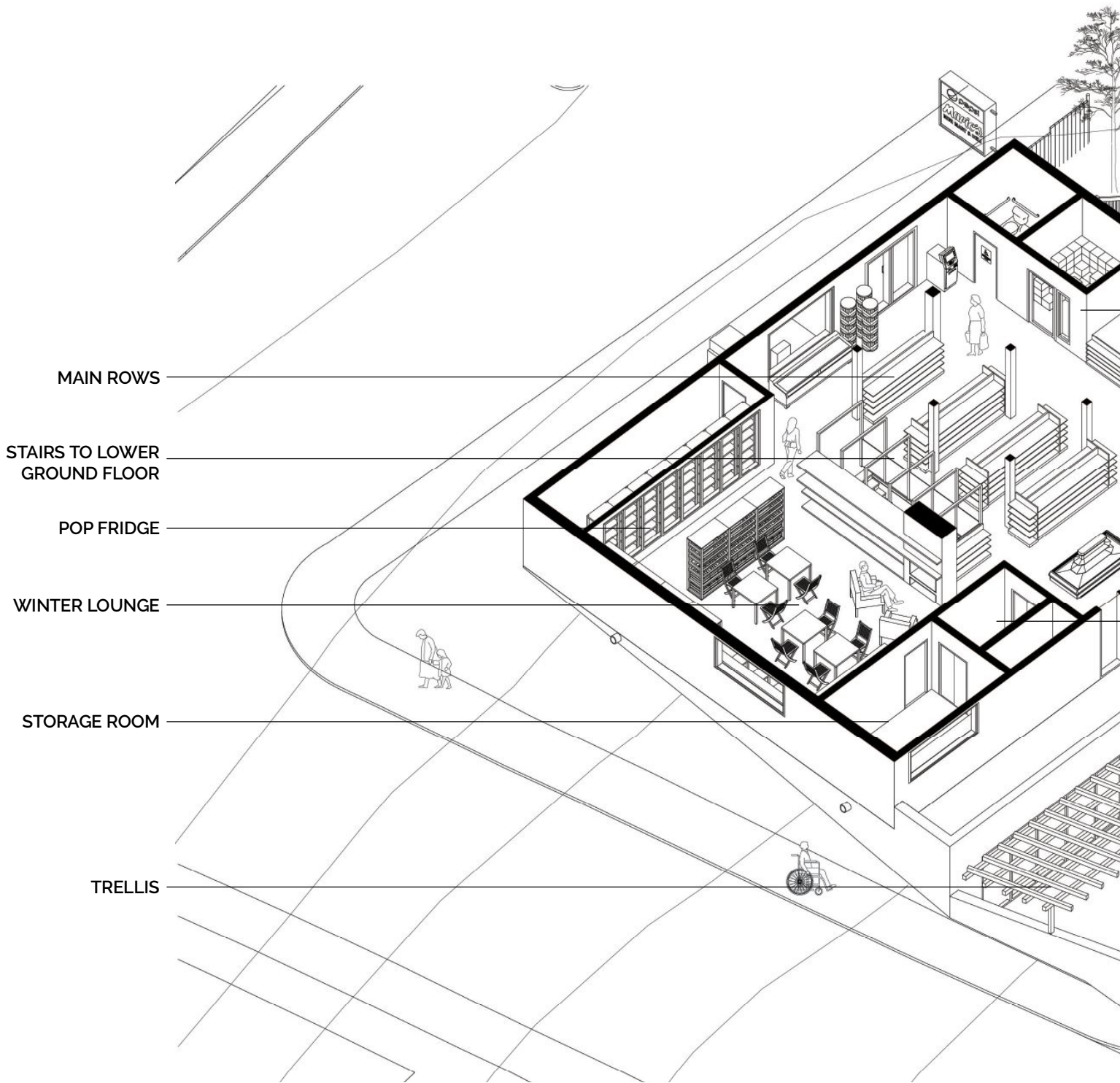
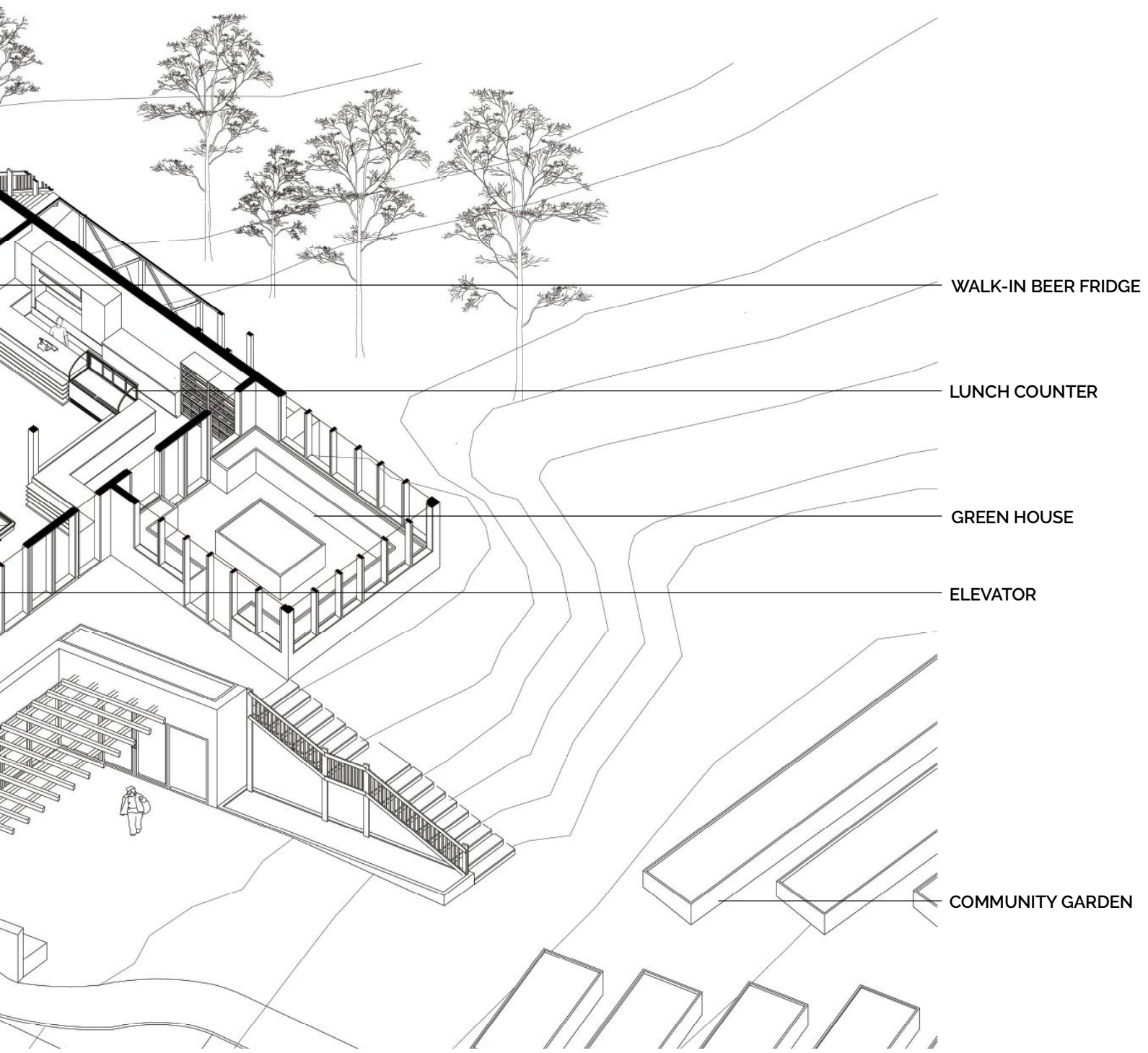


Figure 5.5 Cut away axonometric of existing Marie's Mini Mart Plan.



WALK-IN BEER FRIDGE

LUNCH COUNTER

GREEN HOUSE

ELEVATOR

COMMUNITY GARDEN



Figure 5.6 *Entrance to Marie's Mini Mart Root Cellar.*



Figure 5.7 *Photograph of oldest functioning Root Cellar in Elliston. Built in 1839.*

On the southern side of the corner store, lies the entrance to the root cellar level. This entrance is inspired by the entry into the traditional root cellar. The steps and guardrail that lead to the upper terrace of the mini mart, once overgrown by foliage below, mimic the moss and grass covered walls that rest on the outside of the traditional root cellar. Behind the foliage, a gabion retention wall holds back the soil needed to temperature control the cellar inside. This new gabion wall is reminiscent of the stone and mortar walls that typically retained the soil in a traditional Elliston cellar.



Figure 5.8 *Temperature and humidity room categories.*

At the lower level lies the root cellar portion of the corner store. To maximize efficiency of produce preservation as well as program planning a strategy. Based on charts derived from humidity and temperature preferences of varying produce 7 different temperature and humidity zones were created. On the main floor there is a temperature and humidity range that is more consistent with human needs. The produce that benefits most from a temperature range of 15-21 degrees Celsius and humidity levels of 60-70% rests there. Below ground, 6 different rooms are devised. At the most northwestern corner there is the coldest and most humid space, resting at 0-4 degrees Celsius and 80 to 95% Relative Humidity. At the northeastern corner the second of the cellar is at the same temperature, however falling at 80%-90% relative humidity. The two most humid spaces are mostly separated from the circulation space by being surrounded by slightly less cold and less humid cellars. The spaces with dryer humidity requirements are located nearest to the vestibule/workshop space, while more humid spaces are placed deeper into the earth.

Patrons of the store can either take the stairs or the elevator and land themselves at the first set of doors leading into the cellar, then a relatively circular path leads them through the cellars, and back to their original location. This program planning allows for more efficient circulation allowing for tighter rows and an increase in food storage.

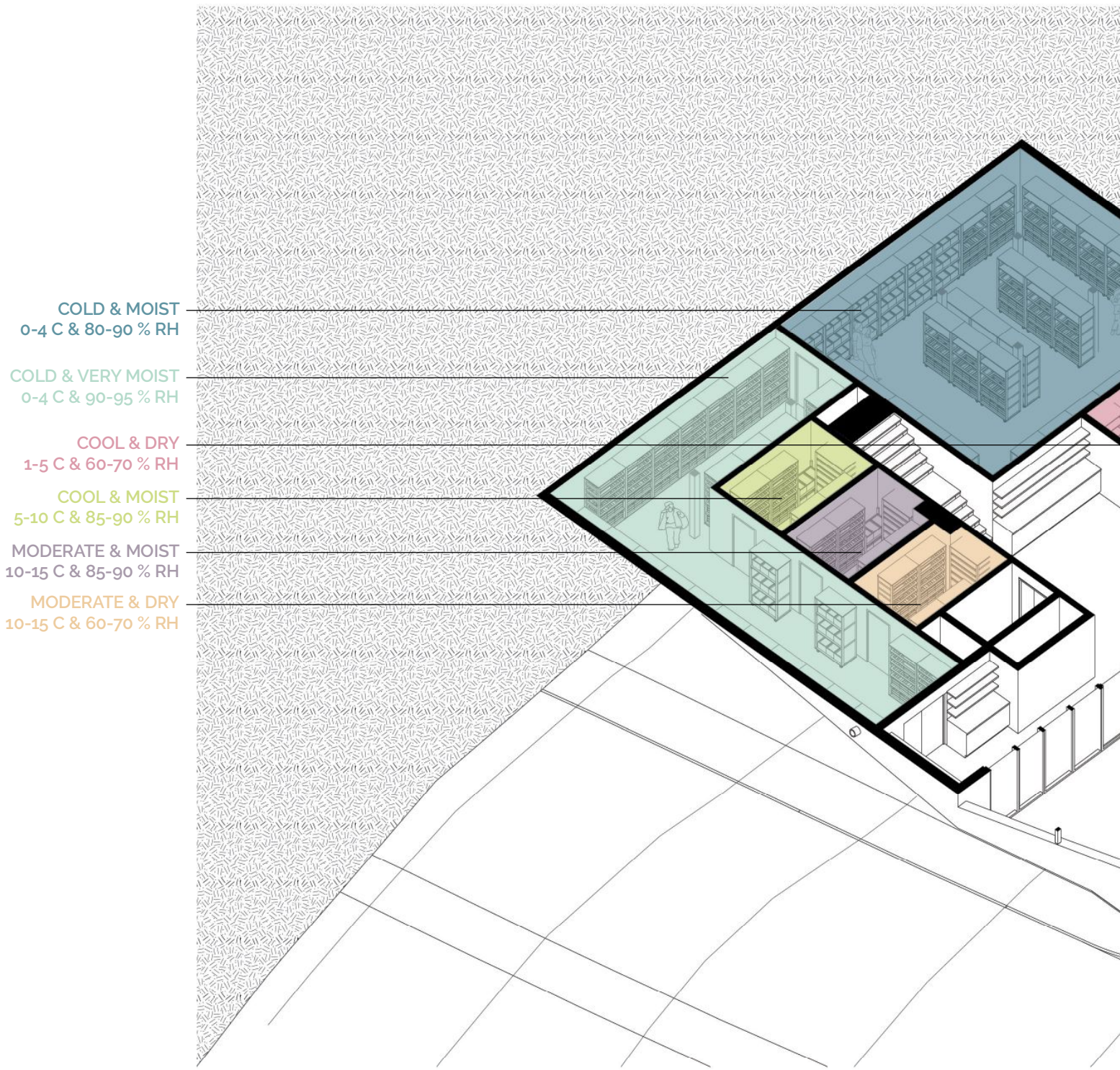
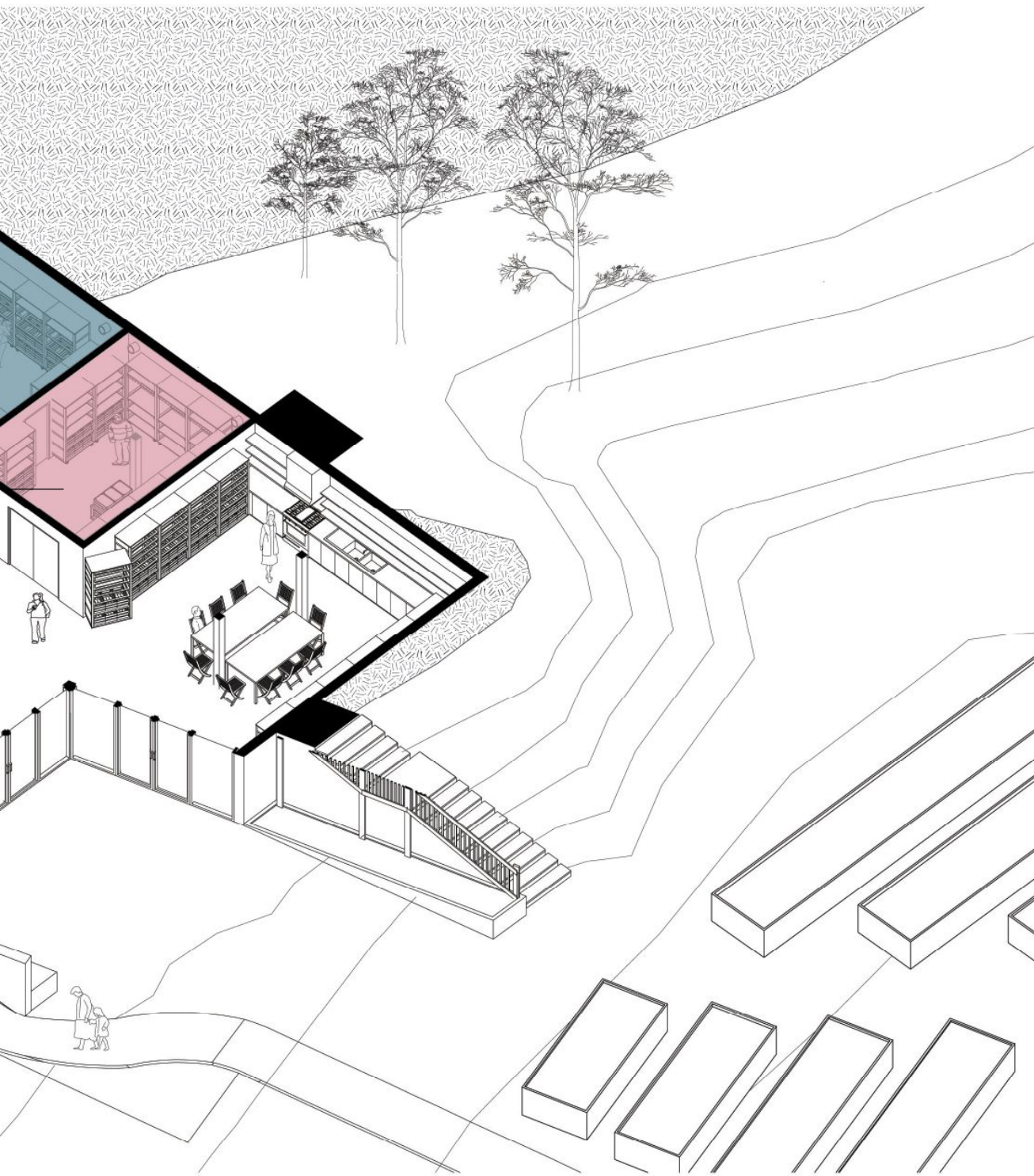


Figure 5.9 Colour-coded Axonometric of New Marie's Mini Mart Root Cellar level.



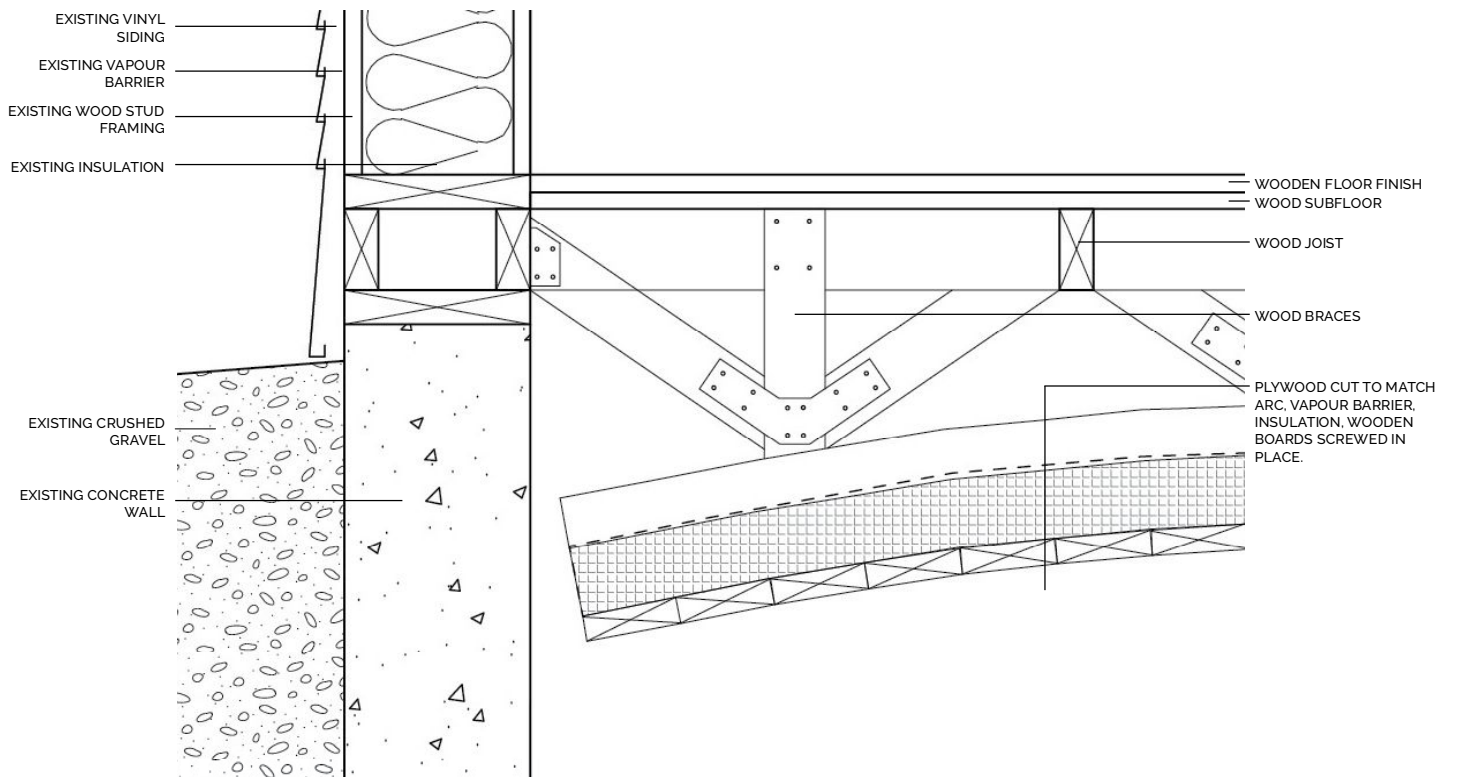


Figure 5.10 Root Cellar Ceiling Detail.

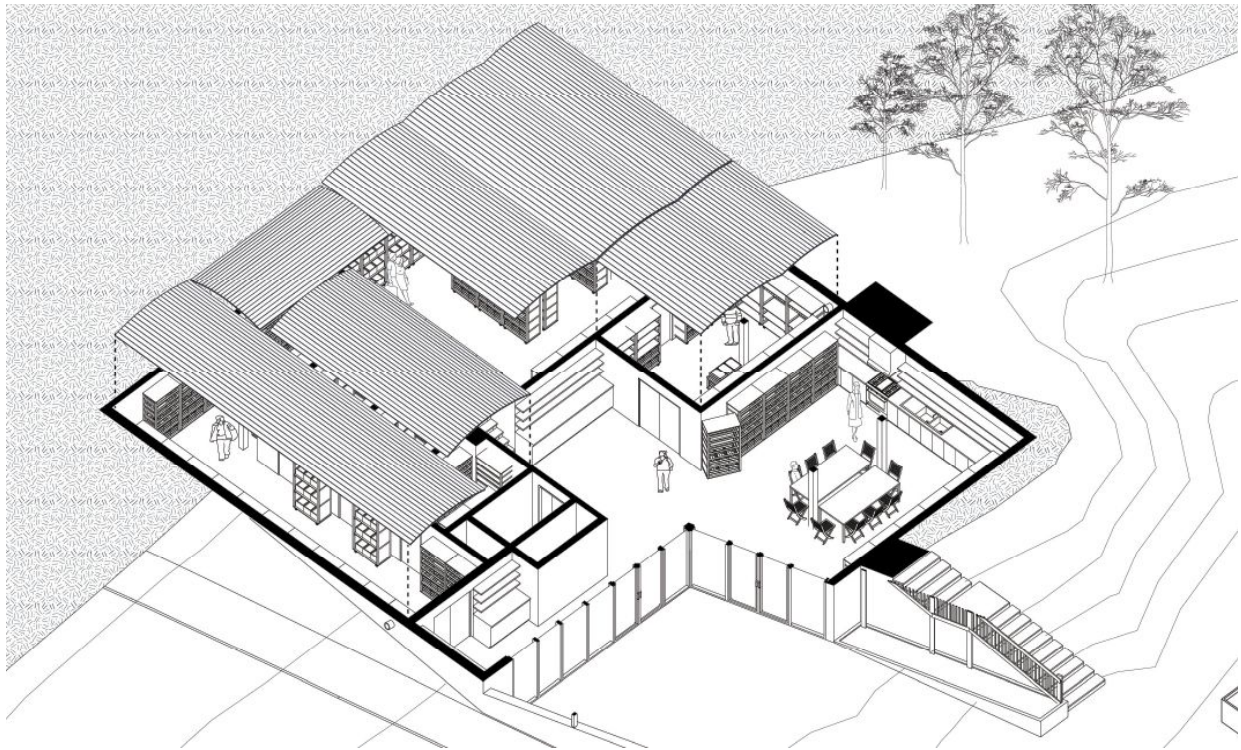


Figure 5.11 Exploded axonometric ceiling plan of new Marie's Mini Mart root cellar level.

To increase the efficiency of the temperature zones inside the cellar certain construction strategies were implemented. Much like the root cellars' dirt floors, the floors in these cellars are constructed from rammed earth. The flat surface allows for furnishing to be wheeled throughout the space while still adding moisture to the air. Stone walls make up the construction of the interior walls to allow for a more humid environment when necessary. Finally a curved wooden ceiling is installed to allow condensation to drip down the sides of the walls.

The construction of the ceilings in the root cellar portion of the corner store are designed for both function and cultural significance. Traditionally, root cellars in Newfoundland have a curved roof. These roofs were often constructed from stone and mortar masonry. Occasionally, an old boat was flipped over and a root cellar was constructed within it. The purpose of the curved roof was to allow condensation to drip down the sides of the cellar, therefore continuing the circulation of humidity in the air.⁴⁸ The ceiling is of wood frame construction to allow for variety of levels of expertise to be involved in the renovations. The curved frame is suspended and attached from the floor structure above. This suspension allows for moisture to build onto the vapour barrier causing it to drip off the sides of the curved ceiling. This allows the moisture to drop down onto the floor, only to be re-absorbed into the air, causing a higher moisture content.

The construction methods and materials used in the cellars are very important, so are the tools that are a part of it. The inspiration for the rolling racks came from the wheelbarrow, allowing the corner store personnel to prep produce in the workshop and load up the racks. Finally placing the rack into the root cellar that it corresponds to. Similarly to the bucket of water, the rolling water bin racks regulate humidity in the cellars. Instead of adding a candle in the root cellar for warmth, the foundation of the fireplace allows for the radiant heat to radiate into the two cellars that surround it. Much like the bags of burlap holding charcoal, the charcoal bins regulate moisture content in each individual cellar. For patrons of the store who wish to grow and harvest produce all on their own can rent a rack. A special door is added with a lock to designate private use. Finally the lintel is translated into the workshop which acts as both a demonstration space for those who wish to learn, as well as a vestibule for the cellars themselves. This workshop space is a combination of what can be found in a rural kitchen as well as the space just outside the garden where many prepare produce for the cellar.

⁴⁸ Robert Mellin, *Tilting: House launching, slide hauling, potato trenching, and other tales from a Newfoundland fishing village*, (New York, Princeton Architectural, 2008), 199-201.

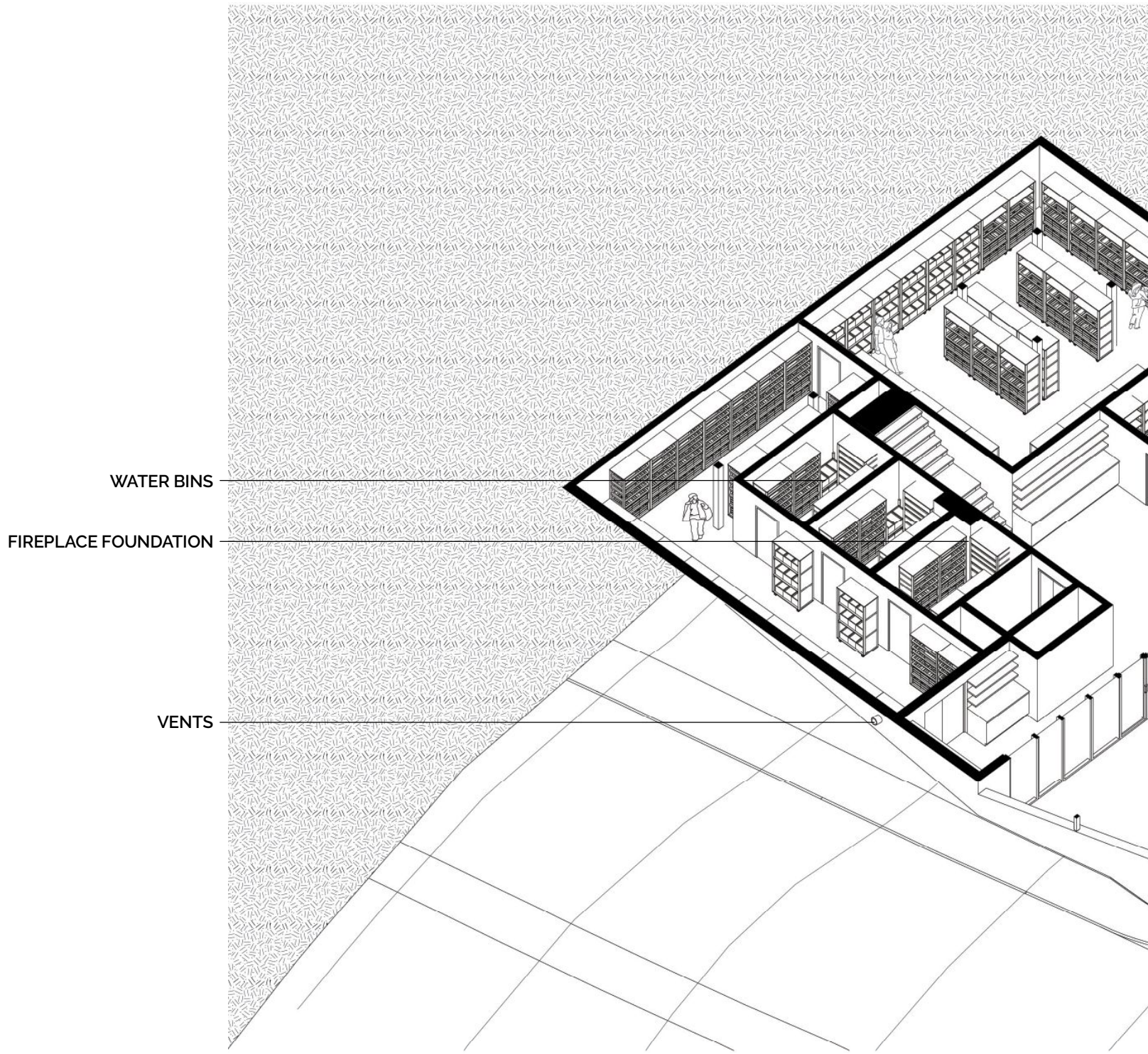
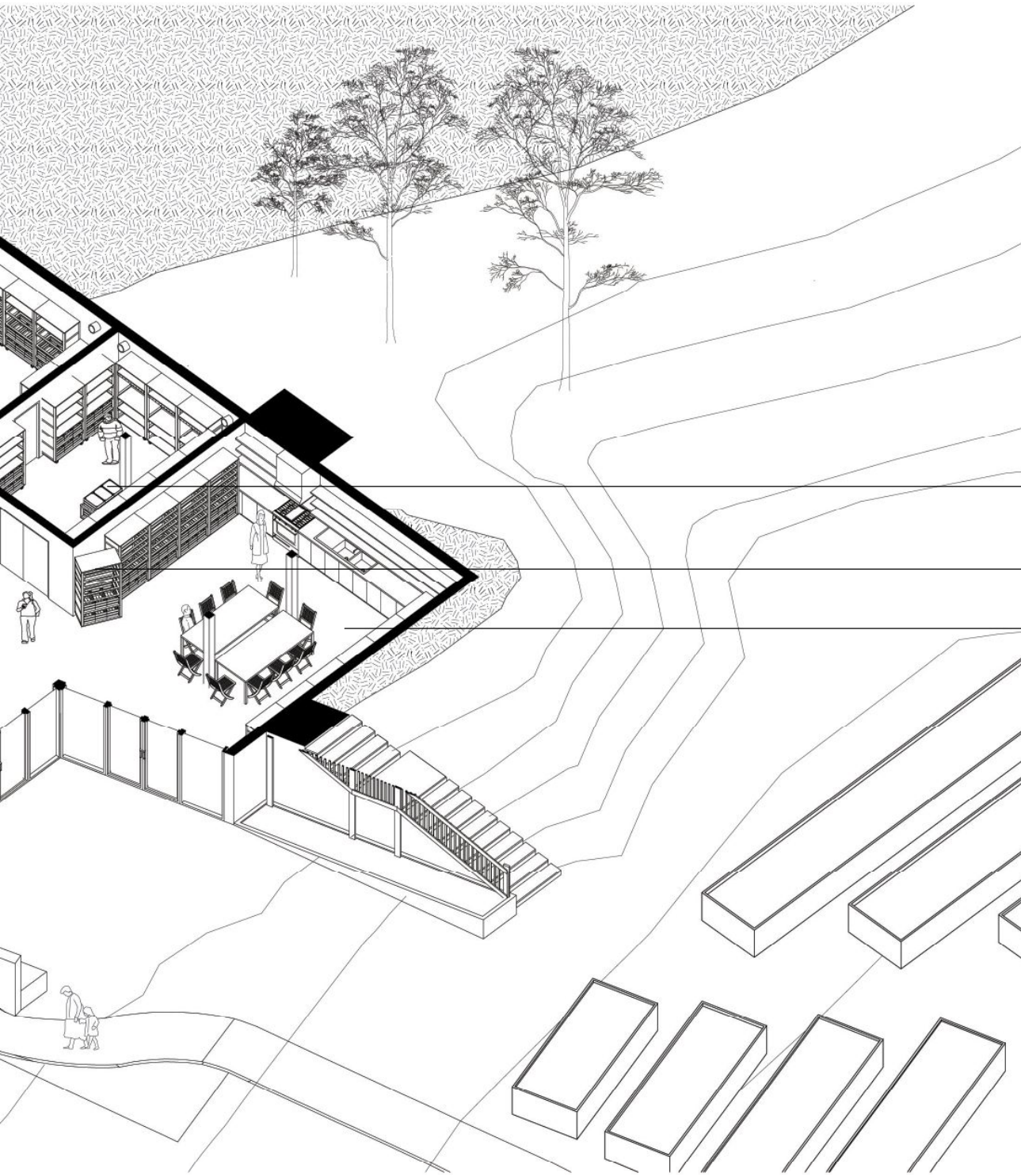


Figure 5.12 Cut away axonometric of existing Marie's Mini Mart Plan.



CHARCOAL BINS

ROLLING STORAGE RACK

WORKSHOP AREA

THE SEASONS

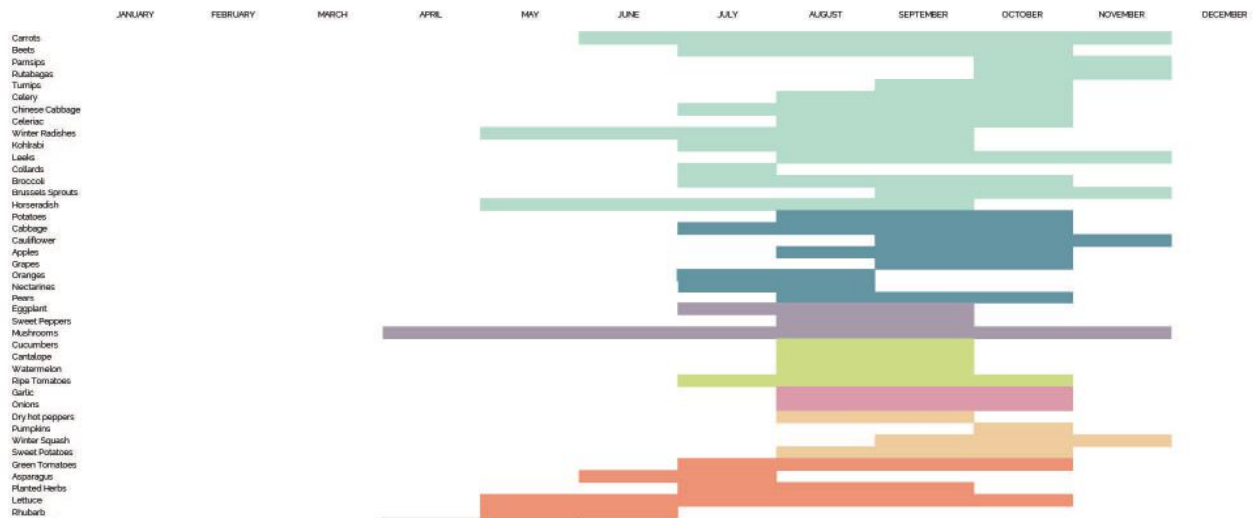


Figure 6.1 Newfoundland Produce Harvest Diagram

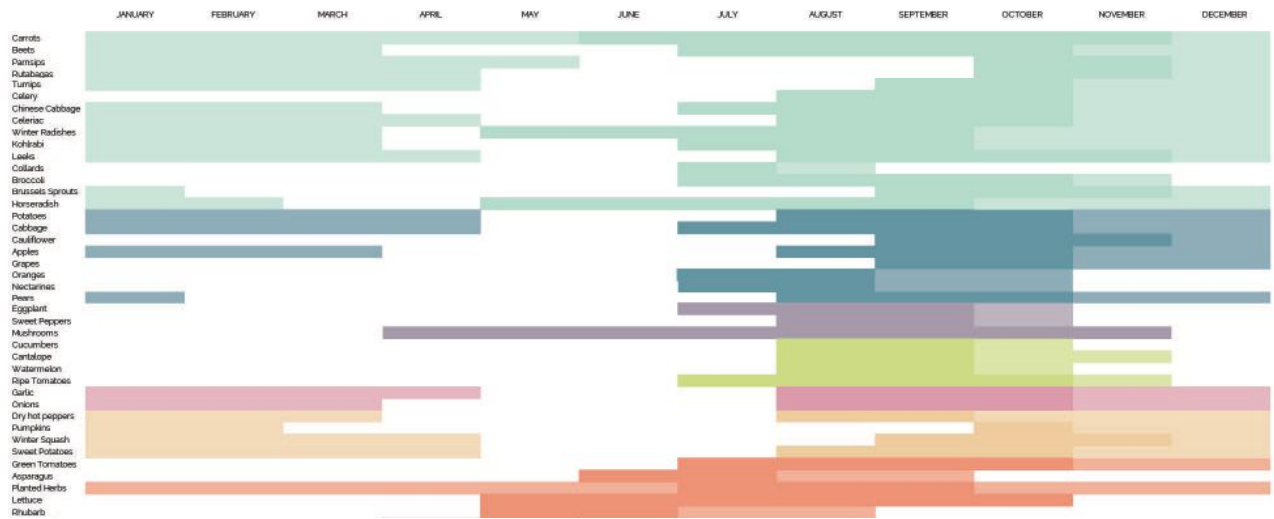


Figure 6.2 Newfoundland Produce Harvest Diagram, including Storage Period

Newfoundland has a very rich history of storytelling. Today, YouTube is a modern storytelling tool. An increasing number of videos on root cellars, homesteading, and Newfoundland culture has been disseminated over the last 15 years.⁴⁹ This wealth of knowledge is paramount to the understanding of residential agriculture in Newfoundland. Throughout the online videos available related to root cellar, one theme is most clear: Seasonality. The seasons are the most key element to be understood when designing a root cellar. Newfoundland has a relatively short growing season. However, with the help of root cellars, their season can be extended significantly. See Figures 6.1 and 6.2. Through the exploration of instructional videos and drawn material the seasonality of the new corner store becomes apparent.

Each vignette and illustration drawn in the following pages is inspired by the gathering of dialogue from different videos found over the course of this research. Even though the videos all pertain to rural life habits there is a strong relevance to the New Corner Store. For example, the vignette that illustrates the month of December showcases a discussion between a couple who run their homestead together. The text included in the vignette is an excerpt of this couple's conversation as they reflect on the end of the year and how they feel it went for them considering all of the challenges of the season. Though they are a couple who run a homestead and a family this conversation is easily translated into the running of a business, therefore the conversation in the illustration is shown between the two managers of the New Corner Store. Running a business is very much a partnership, in the same sense that a homestead is a partnership as well. The concept for this is that the family bubble has been expanded to something larger, growing into a community based bubble.

49 GRIND MIND, Fairies & Fetches - A Storytelling Session with Clifford George, (YouTube, July 27, 2018.) <https://www.youtube.com/watch?v=CBz7vNcivwk>

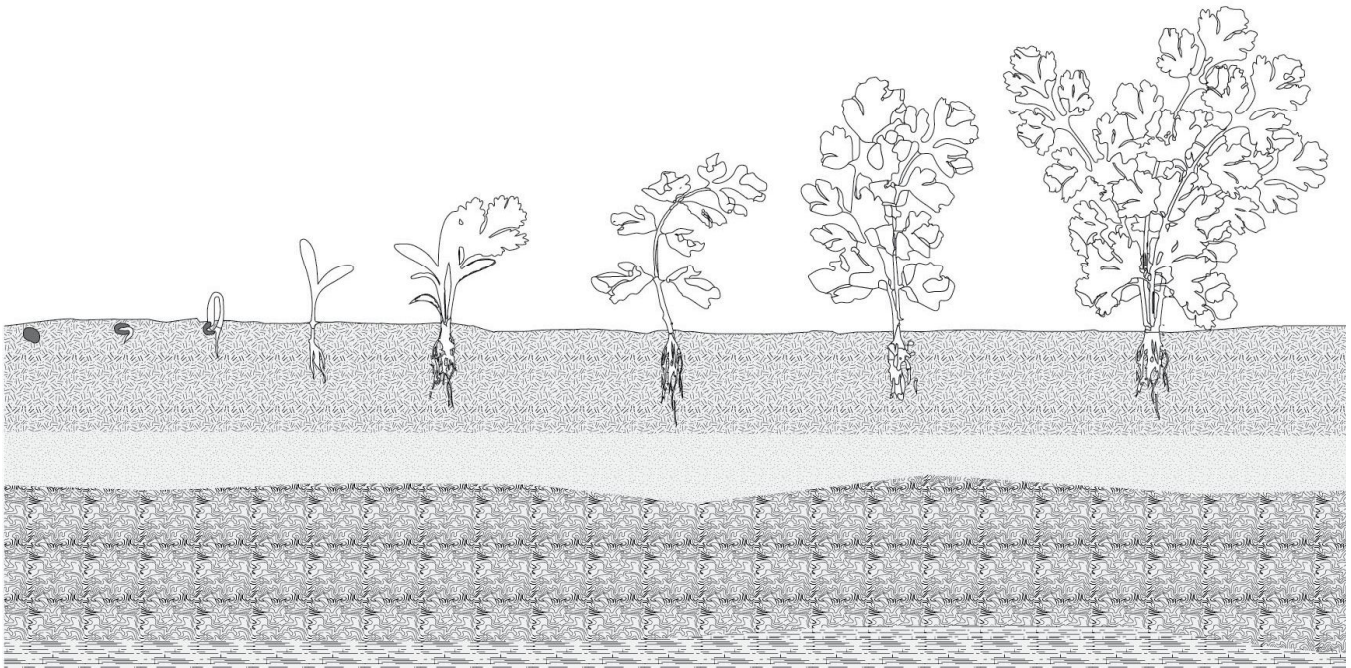


Figure 6.3 *Lovage growth from seed to harvest.*

The exploration of seasonality begins in March. March is referred to as “The long and hungry month of March” because it follows the shortest month February, and usually there is very little produce left in the cellars by then.⁵⁰ However, in this design, the greenhouse allows many seedlings to be started as early as January, which can then be planted in April and May. This added element increases the growing season significantly allow the community garden to get a jump start on growing. In addition to the seedlings, a large variety of year round herbs are being grown in the greenhouse. The small bunches of herbs are picked just before flowering when their aromatic content is at its highest. The herbs are bound together with twine and hung upside down over the staircase to dry for a few weeks. Once taken from the staircase, the herbs can be ground up and placed into jars, or hung again in the cellar to be preserved throughout winter.

⁵⁰ Larry Dohey and Larry Dohey, “The Long and Hungry Month of March,” Archival Moments, March 2, 2019, <http://archivalmoments.ca/2019/03/01/the-long-and-hungry-month-of-march/>

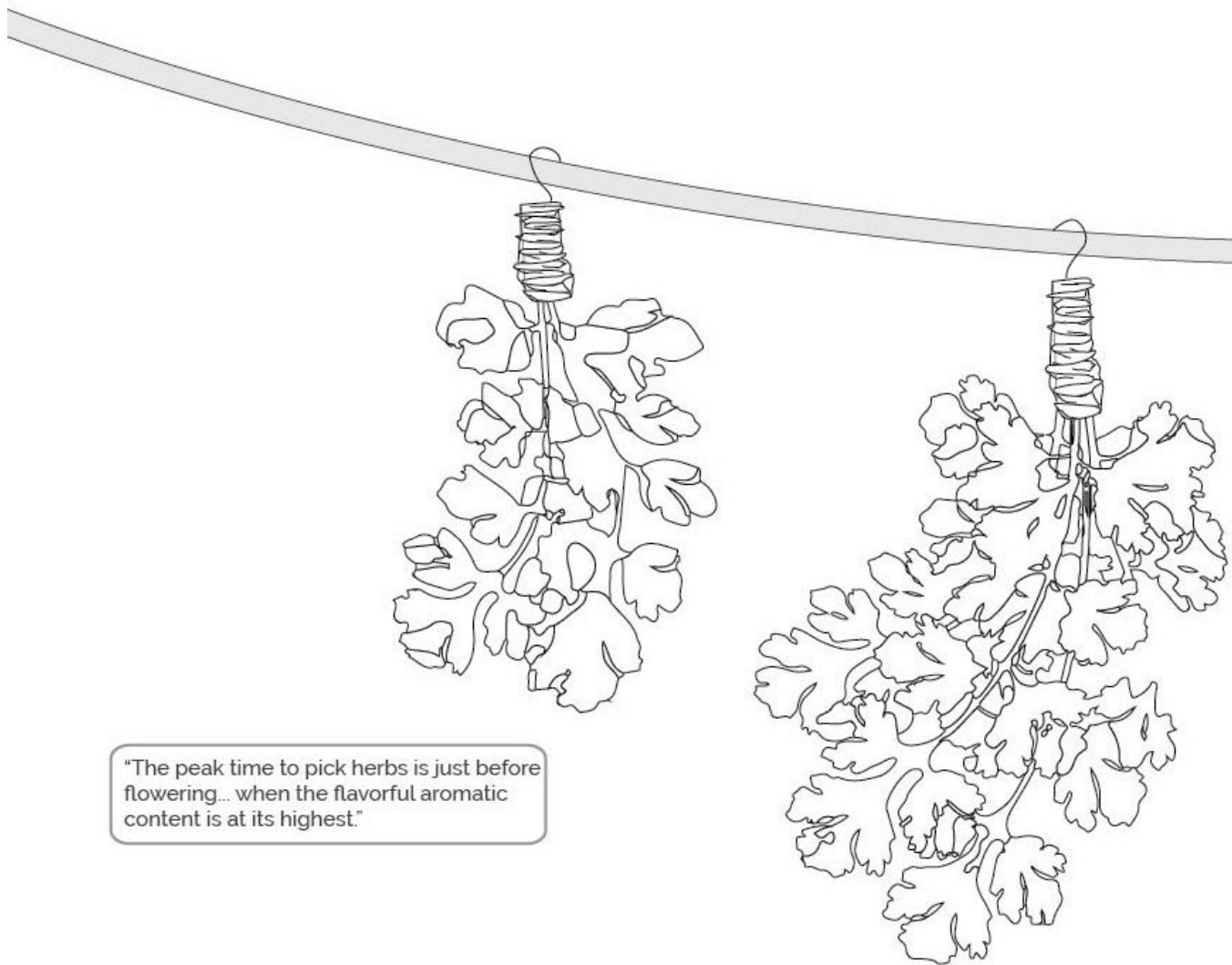
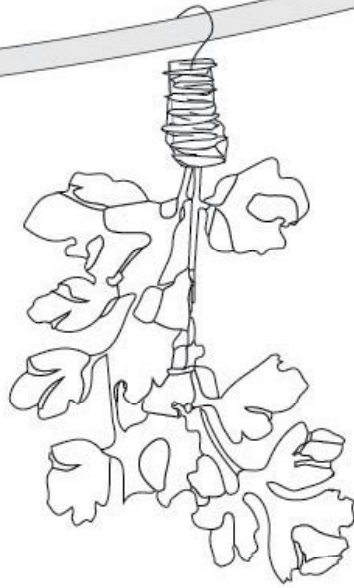
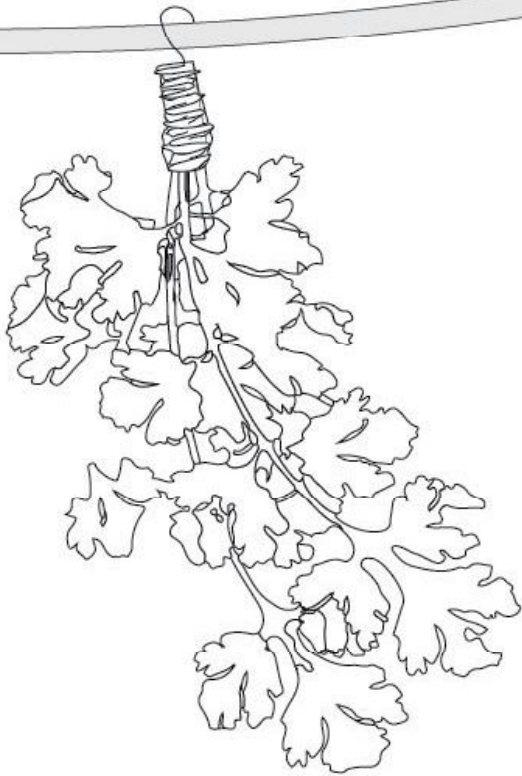


Figure 6.4 *Herbs hanging to dry.*





"Its best to harvest in the morning, after the dew is dried."

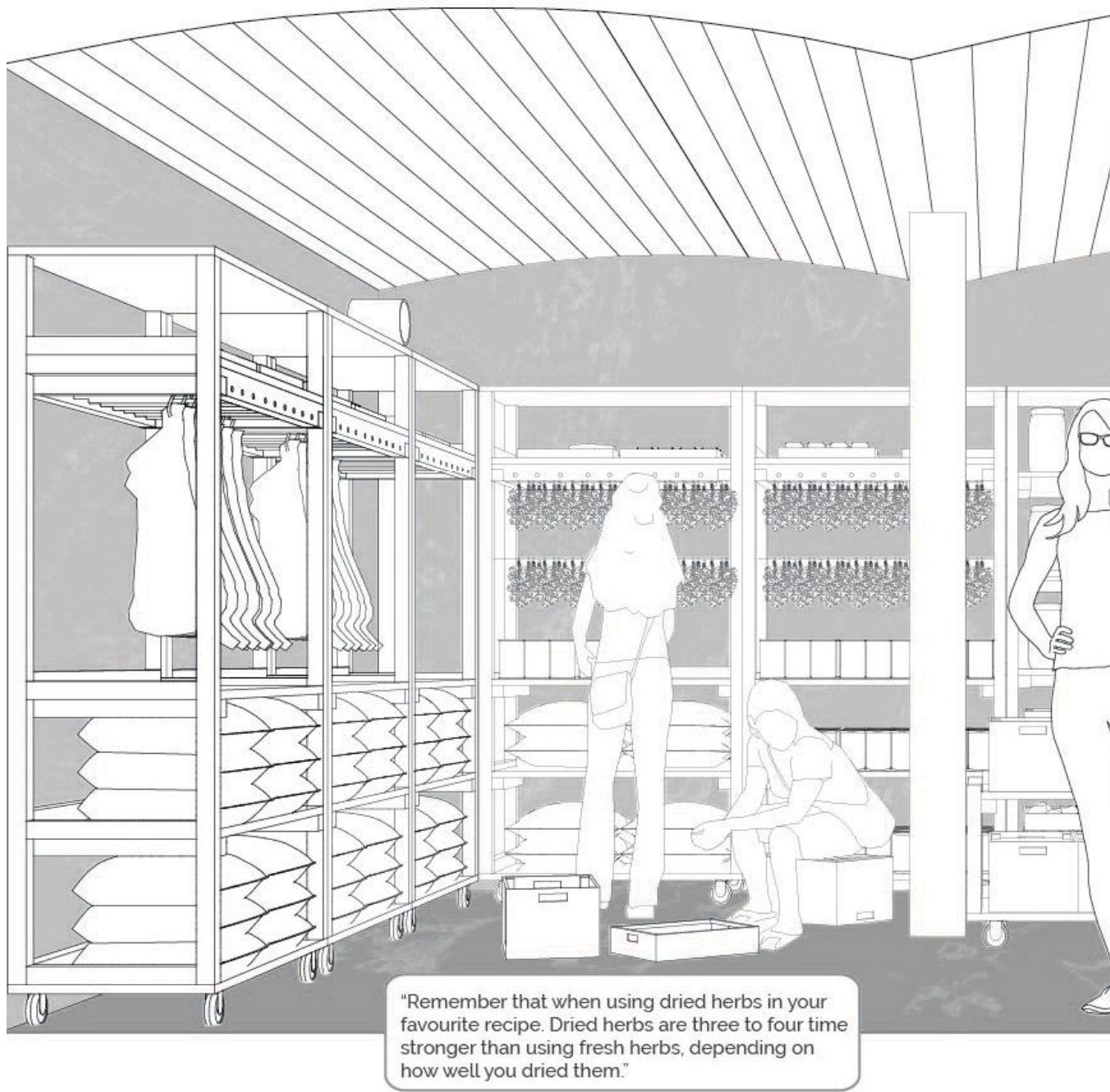


Figure 6.5 The staff loads up the shelves with dried herbs, while the customers shop.

"Many herb varieties can be grown through the summer, but with the help of our greenhouse, we've been able to pick them this March."

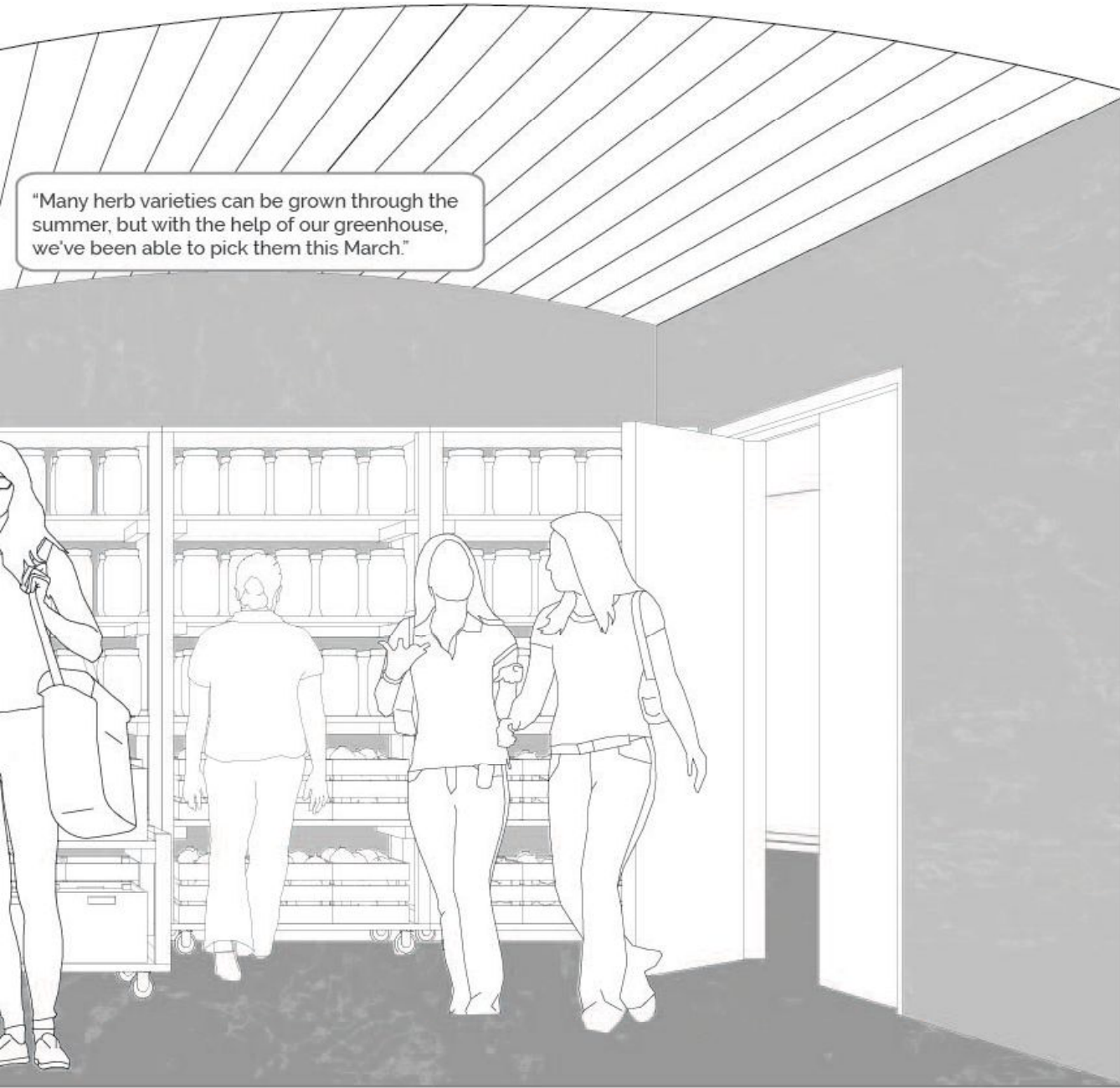
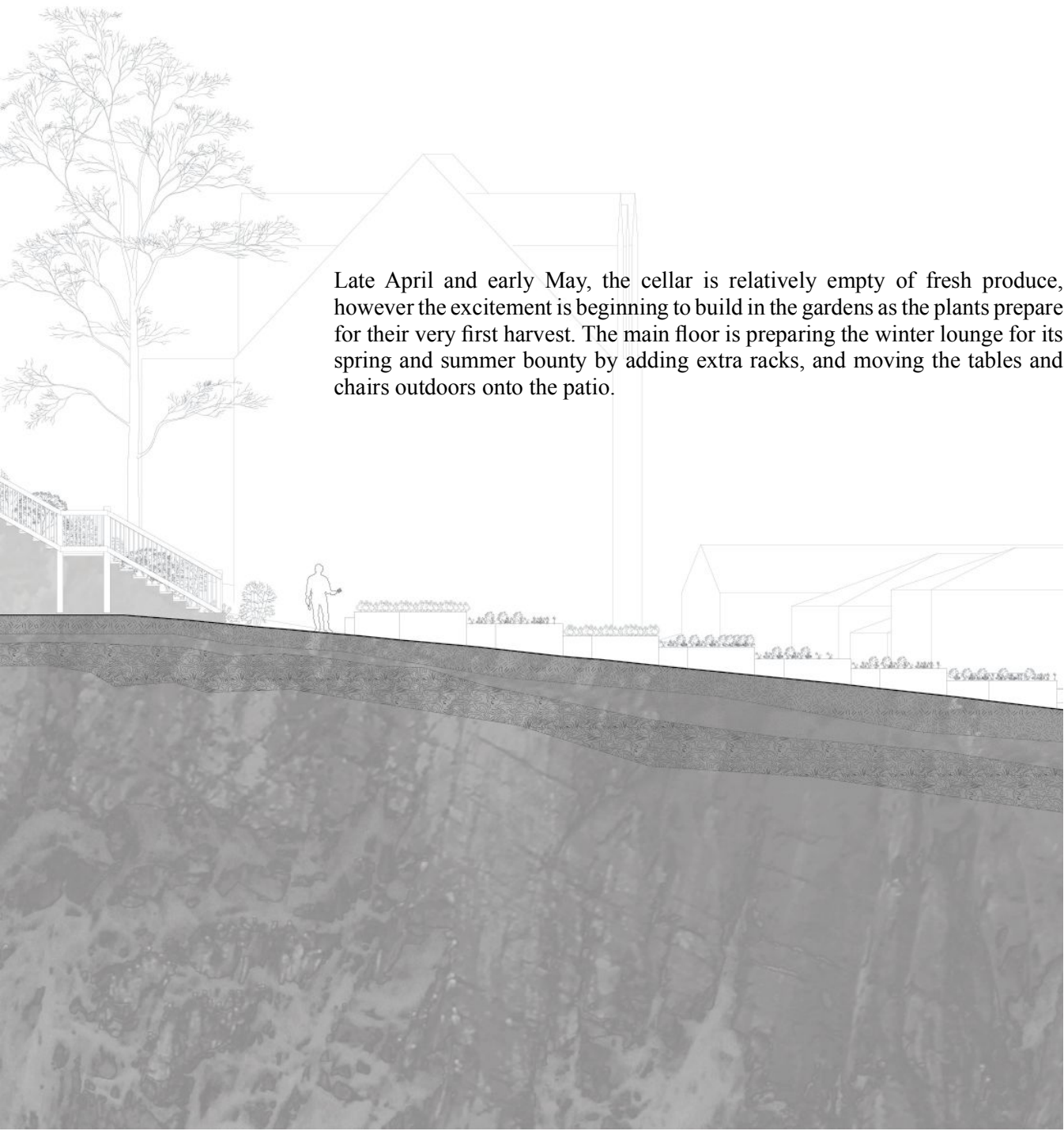




Figure 6.6 Section through late April and early May.



Late April and early May, the cellar is relatively empty of fresh produce, however the excitement is beginning to build in the gardens as the plants prepare for their very first harvest. The main floor is preparing the winter lounge for its spring and summer bounty by adding extra racks, and moving the tables and chairs outdoors onto the patio.



Figure 6.7 Zoomed in section through late April and early May.



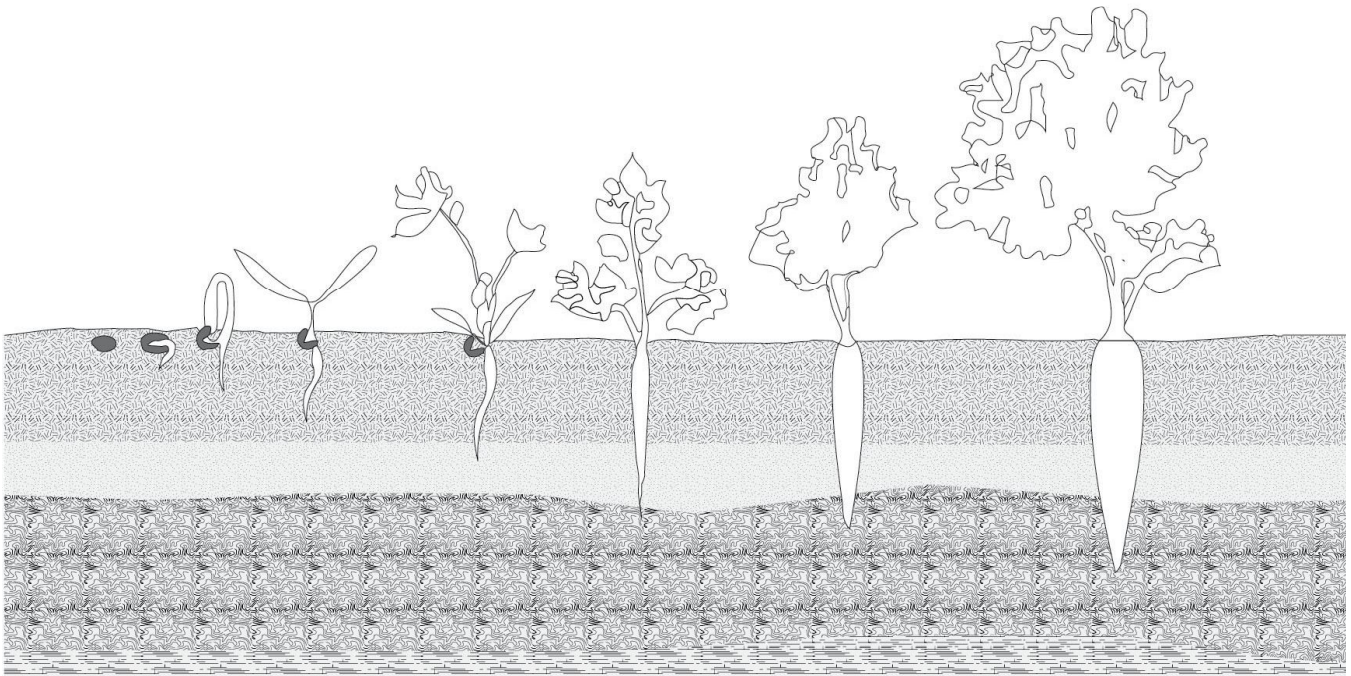


Figure 6.8 *Carrot growth from seed to harvest.*

June, the hard work in the cellars begin as the first round of carrots are ready. The carrots are carefully picked, so as not to be nicked, allowing for their further preservation in the cellar. The carrots are sorted before being tucked away. The carrots that are too damaged are to be eaten as soon as possible. While, the carrots that are in pristine condition are reserved for the cellar. The carrots are lightly packed into bins and layered with damp sand allowing the moisture to preserve them in the cellar for the next 6 months.

"As my mom was pointing out she said that when I was little, when I was just a baby, she had her first big garden and a root cellar and they didn't know that the sand had to be damp. SO they put the carrots in some dry sand and when they went to pull them out all of the carrots were shriveled up."

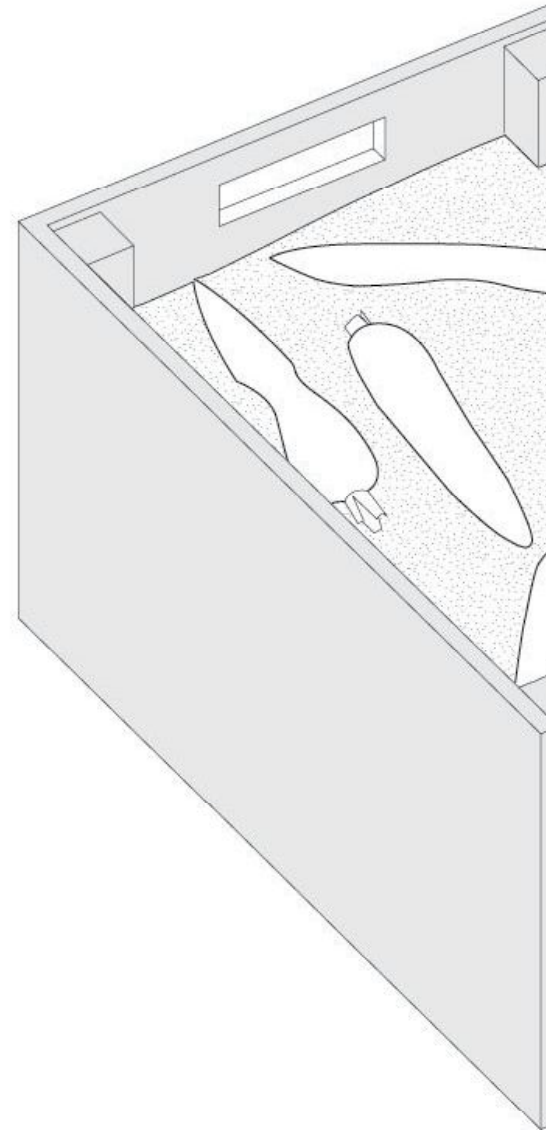
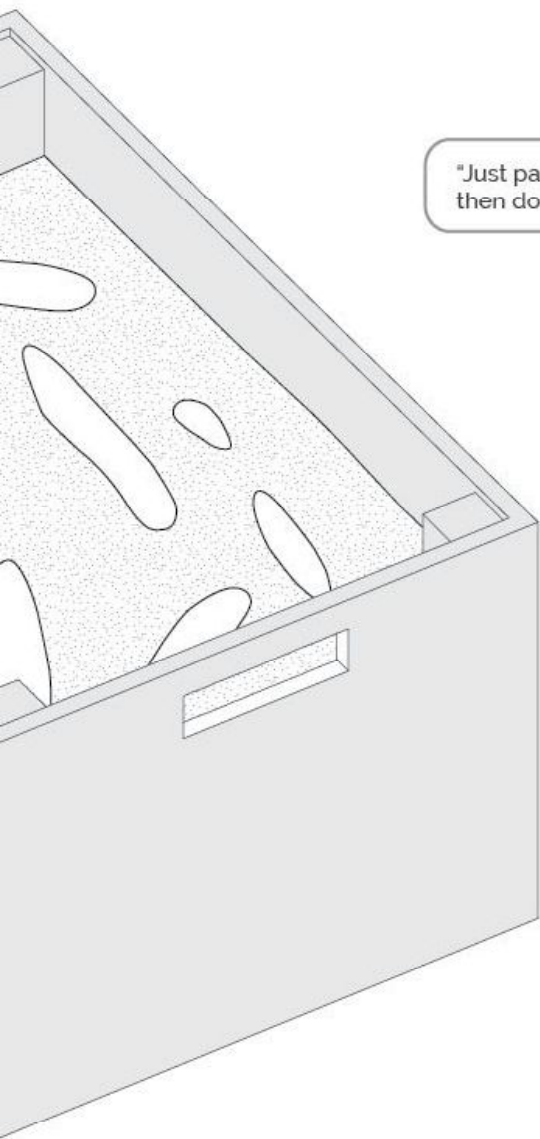


Figure 6.9 Carrots being put away for winter.





"Just pack it down slightly you don't have to go crazy. And then do it all again!"

"Now the first thing you want to do is put about 2 inches of damp sand at the bottom of your bin, like so. And then you want to place your carrots in, now its very important that your carrots aren't touching when you put them in..."



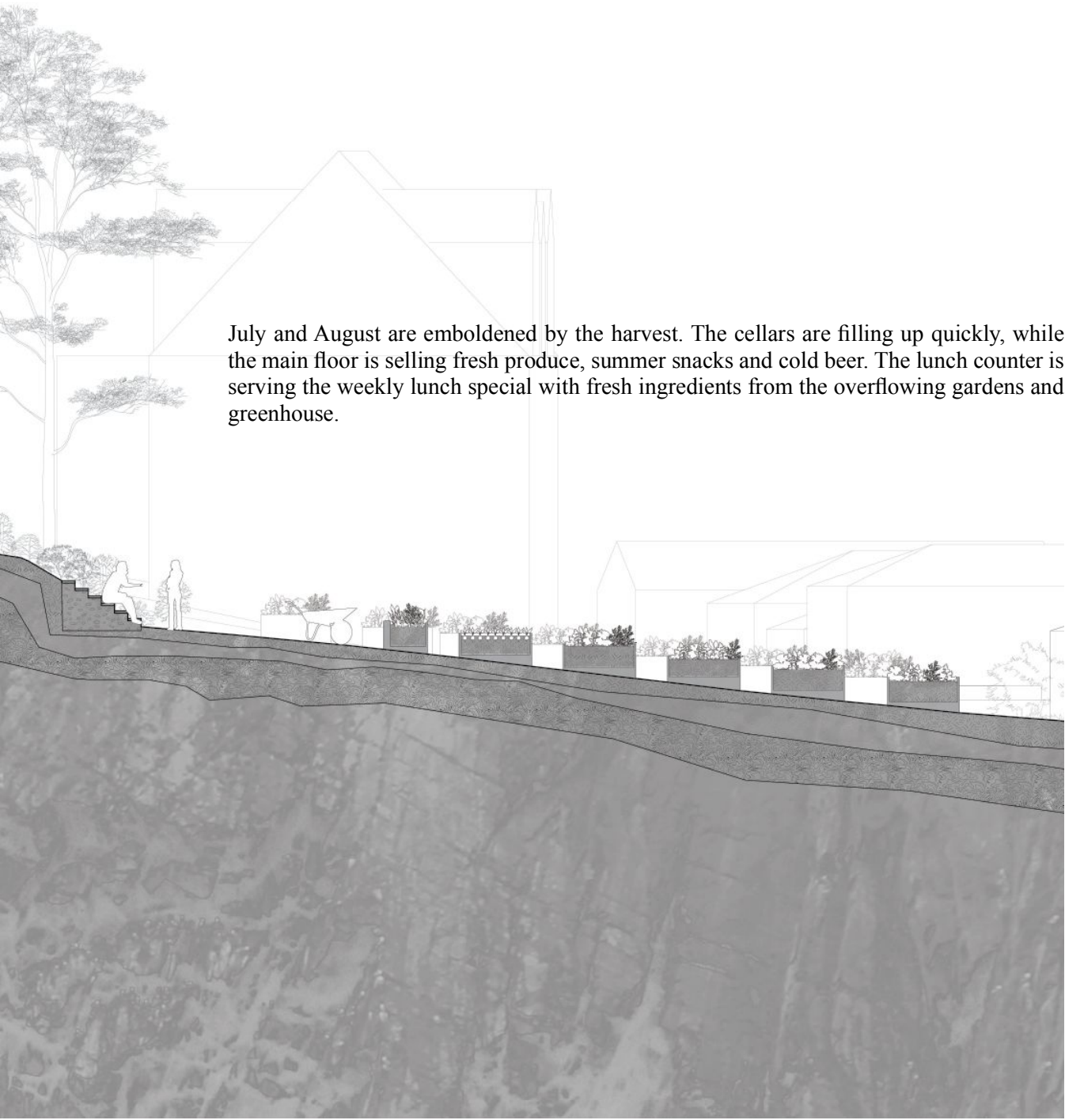
Figure 6.10 *A carrot storing workshop class begins.*

"The first thing we're going to do is get these carrots into some big bins and we're going to layer them with damp sand. Now it's very important that you use damp sand."





Figure 6.11 Section through late July and early August.



July and August are emboldened by the harvest. The cellars are filling up quickly, while the main floor is selling fresh produce, summer snacks and cold beer. The lunch counter is serving the weekly lunch special with fresh ingredients from the overflowing gardens and greenhouse.

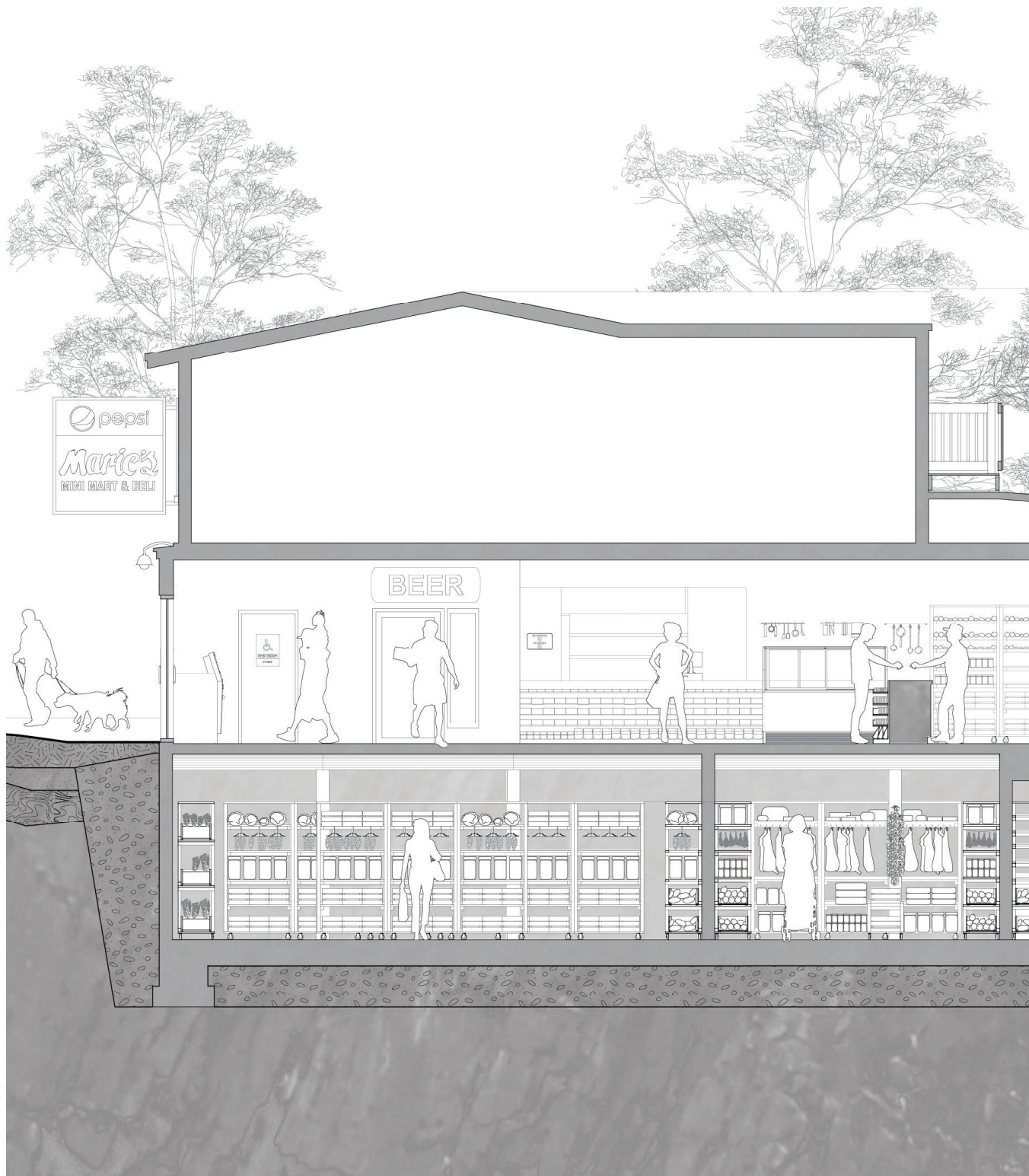


Figure 6.12 A zoomed in section through early July and late August.



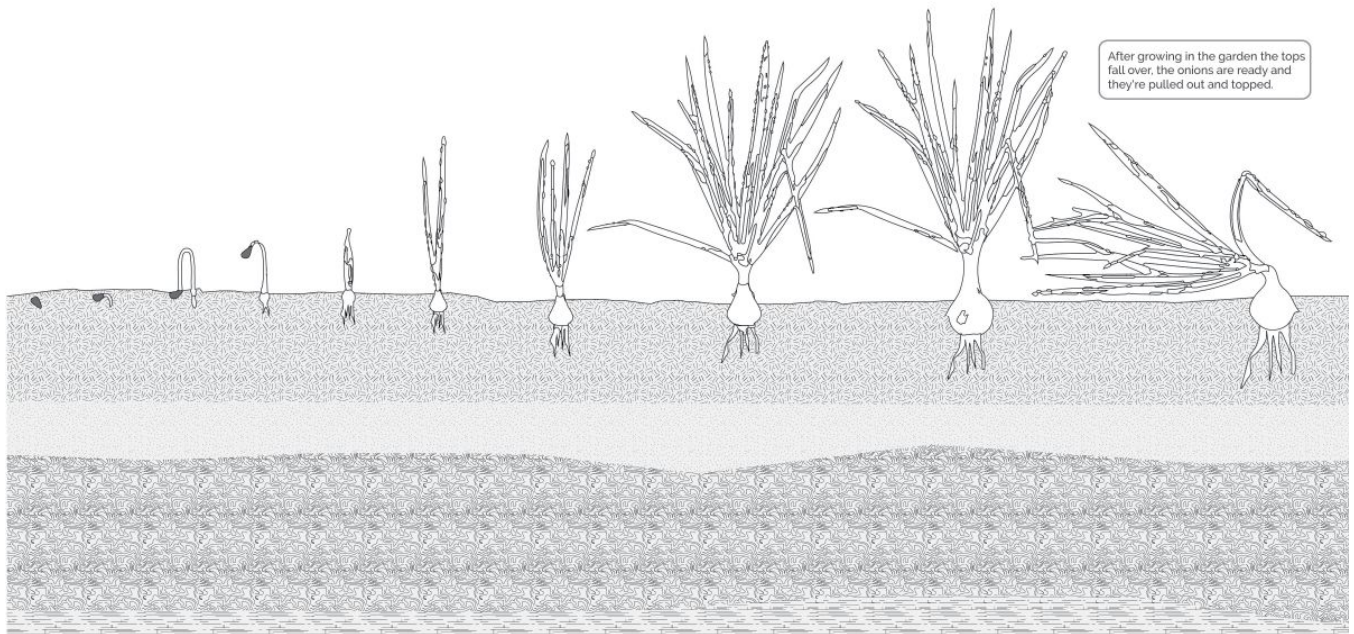
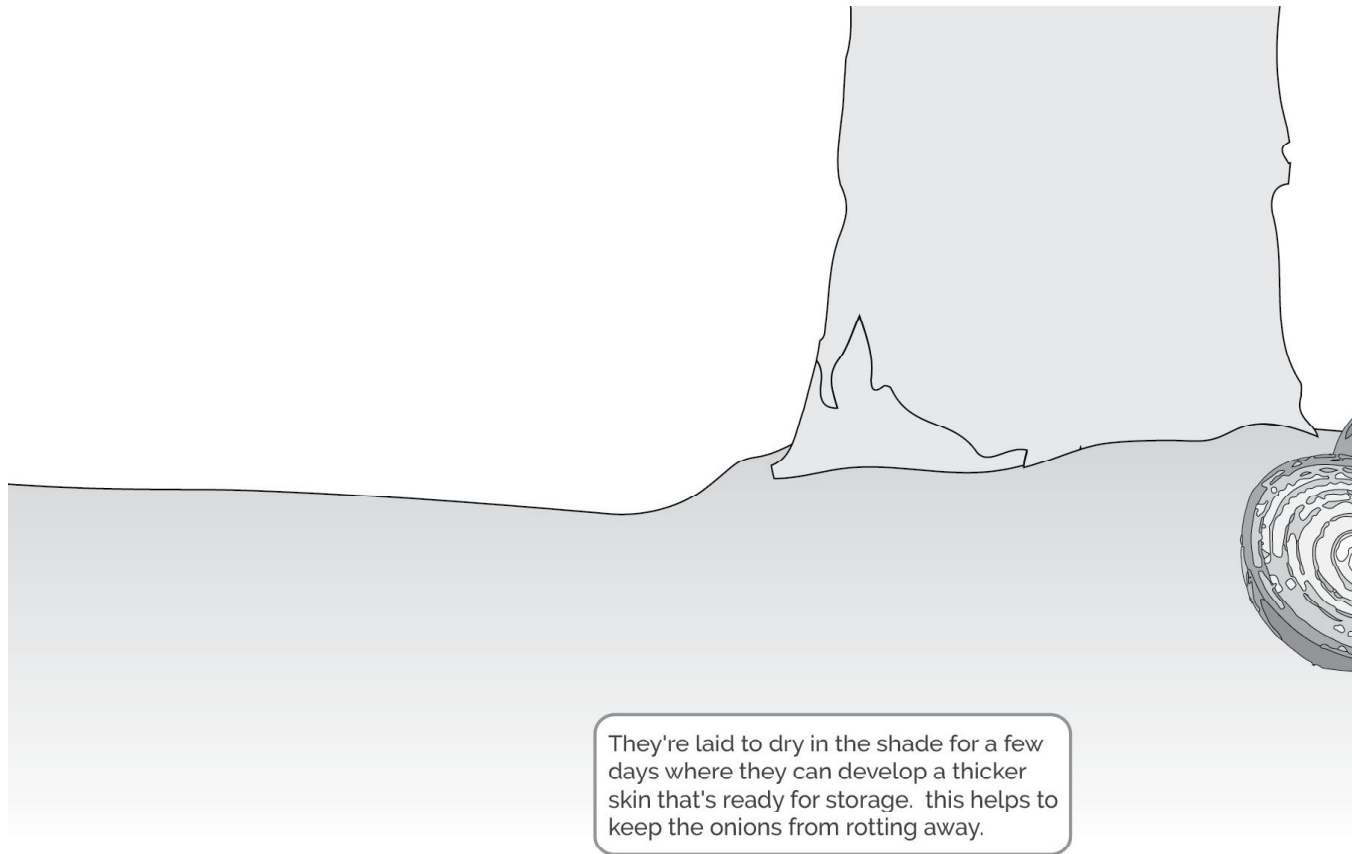


Figure 6.13 *Onion growth from seed to harvest.*

September brings the busiest month of the year. Nearly all the vegetables are ready to be pulled out. Primarily the onions, their tops have fallen over indicating it's time to harvest. To allow the onions to dry and thicken their rind further, they are topped and placed below the trellis outside the workshop to dry for a few days. With the onions curing below the dappled light of the trellis, the corner store staff begins to place the onions into their bins preparing them for transportation to the cellar.



They're laid to dry in the shade for a few days where they can develop a thicker skin that's ready for storage. this helps to keep the onions from rotting away.

Figure 6.14 *Onions curing below the shade of a tree.*



the very first food i ever preserved was a corn and tomato chowder, and i remember getting into that soup in February and almost crying at the taste of a summer tomato. at a time when we weren't eating anything fresh. it was such a welcome treat. And I try to remember that now as the workload gets heavy and burdensome and hot... and I'm ready to tuck in for fall, but the garden isn't quite ready to give up yet.

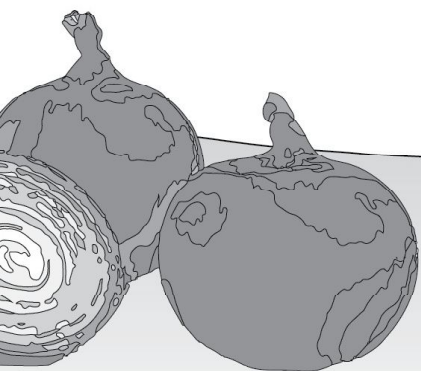




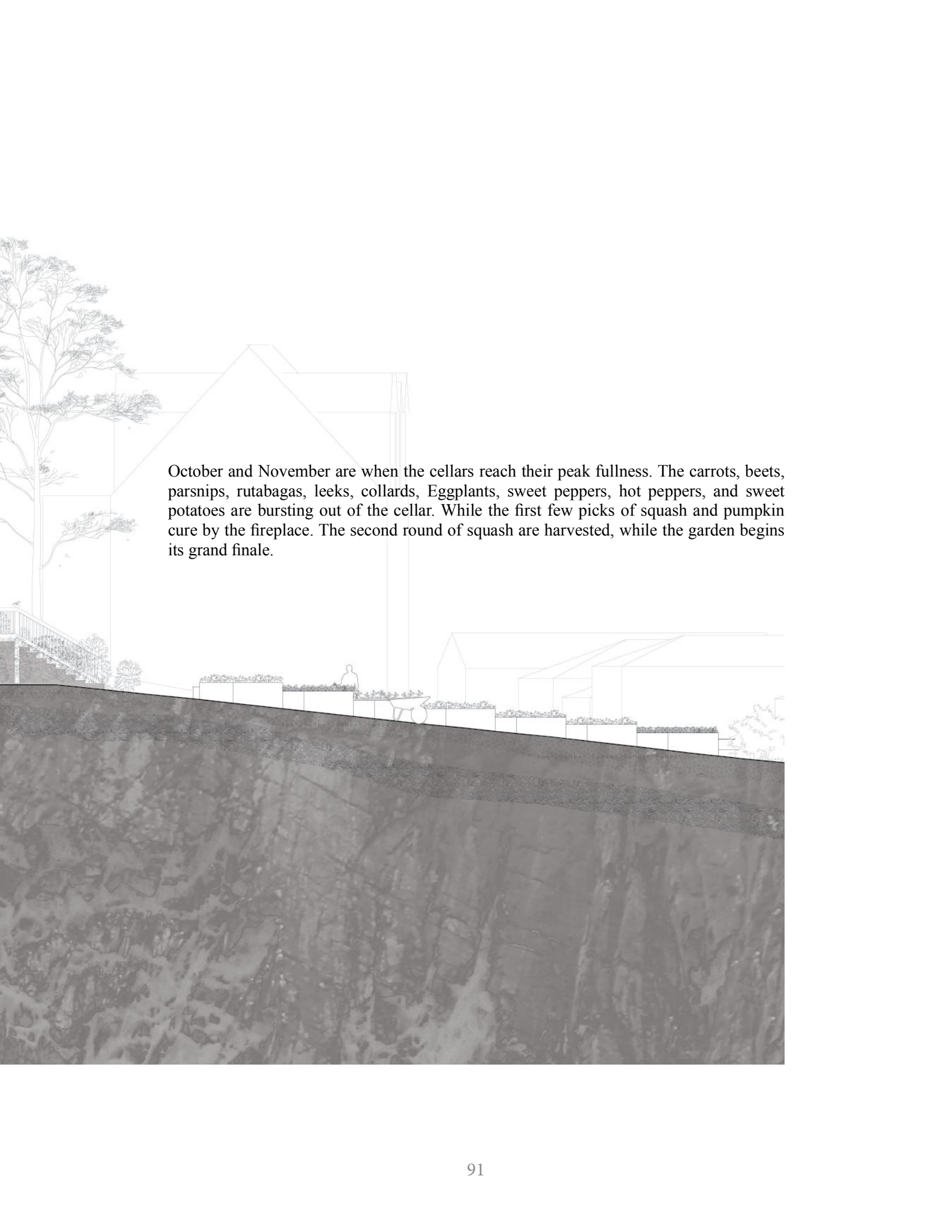
Figure 6.15 Onions curing below the trellis.



Its about to be the fullest
it will be all year... this is
going to be brimming
with food for the winter.



Figure 6.16 *A section through late October and early November.*



October and November are when the cellars reach their peak fullness. The carrots, beets, parsnips, rutabagas, leeks, collards, Eggplants, sweet peppers, hot peppers, and sweet potatoes are bursting out of the cellar. While the first few picks of squash and pumpkin cure by the fireplace. The second round of squash are harvested, while the garden begins its grand finale.

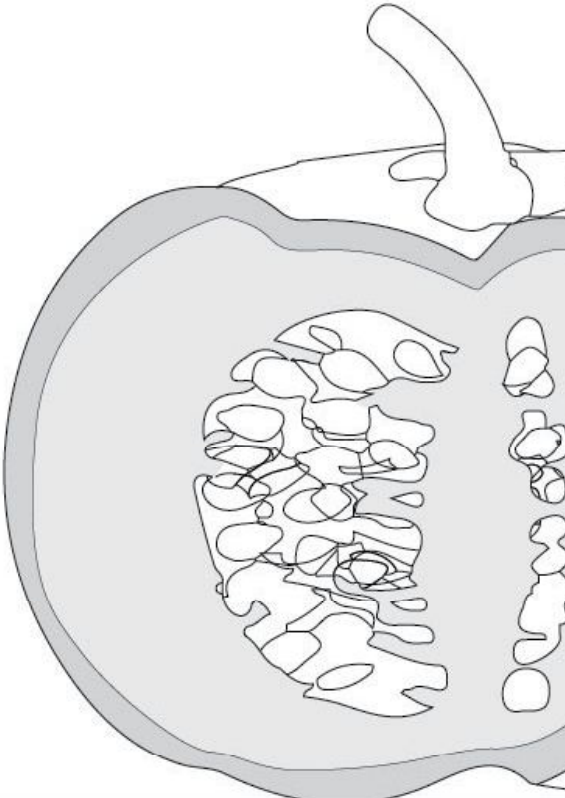


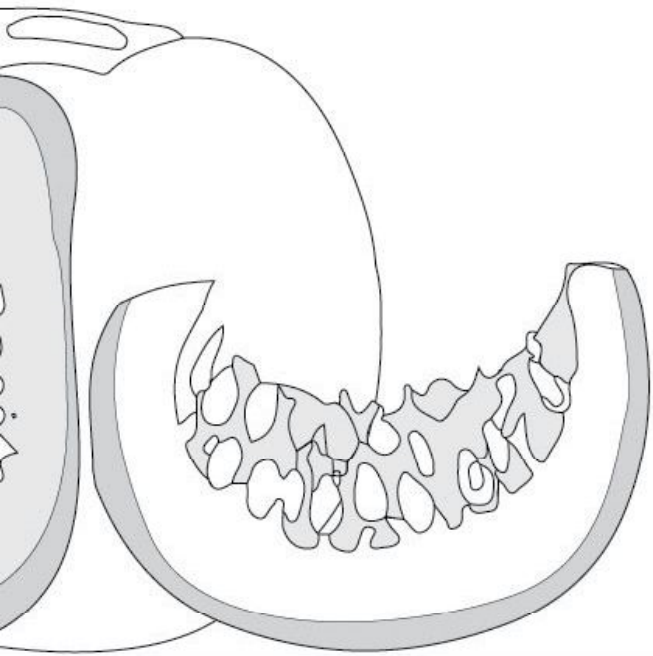
Figure 6.17 A zoomed in section through late October and early November:



In December, the remnants of the gardens must come inside. Pumpkins that were picked in late November are being prepared to cure. They are carefully wiped down and placed by the fireplace in the winter lounge to cure for a few weeks and allow their rinds to thicken. It's finally time to sit by the fire with some hot cocoa and reflect on the last year. We continue to shop from the cellar below for the rest of this season until it's time to sow, harvest and store again.

"Once you get your pumpkin inside give it a good wash. Then just set it near someplace warm like above your fireplace or near your heater and let it cook. This will let the rind cure up nice and good, give it a thick layer to protect it."





"Then after a couple weeks you can take it to the cellar."

"Once they're up to the size you want and your ready to harvest, or you're forced to harvest because of the frost, cut and leave a nice stem on it, and when you pick it up be careful with it, don't grab it by the stem so many people want to grab it by the stem and that's a mistake you don't wanna do. that'll lead to rot."

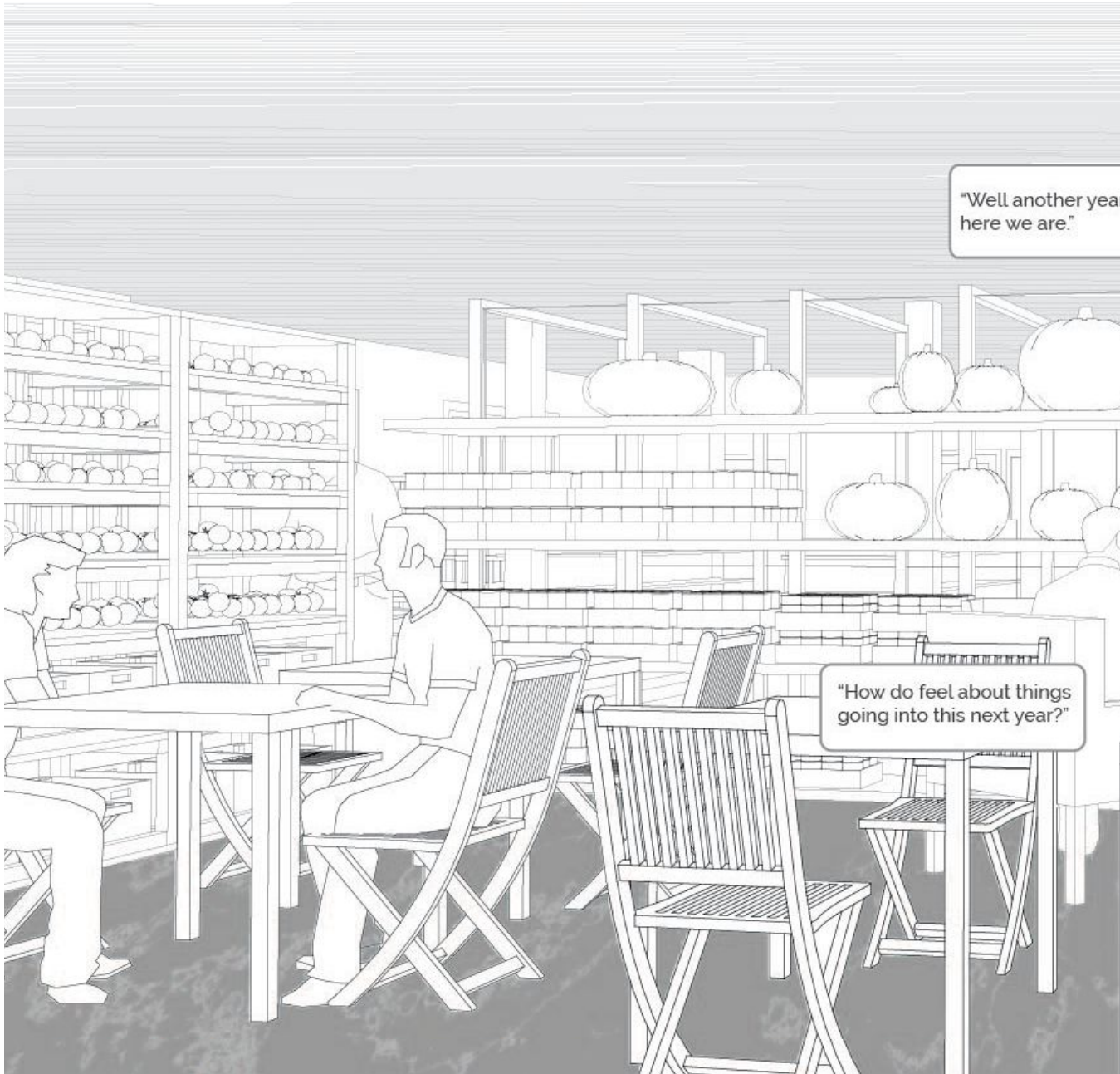


Figure 6.20 *The corner store managers sit in the winter lounge.*



"This is the perfect example of what we do here... cause nothing ever goes the way you think its gonna go...we didn't think the pumpkins would last this long this year.. you constantly have to adapt and change and rethink things. How very fitting that this is how we end this year."

"I feel really good about it."

CONCLUSION



Figure 7.1 *Two Root Cellars, side by side. Elliston, Newfoundland.*

This thesis proposes a project that has learned from multi-generations of local knowledge, and imagines how this can support urban residents. Through the translation of construction methods, rural artifacts, and rural practices into a semi-urban context, this design begins to tackle food insecurity in Newfoundland, caused by both environmental conditions, economic challenges, and urban migration.

When translating the root cellar, a form of vernacular architecture that is intended to store food for a family into a semi-urban building that stores food for the community, there are certain challenges that pertain to its scalability. When scaling a root cellar into something the size of a corner store there are two main concerns. The first challenge is the temperature fluctuations throughout the space due to its size. The majority of research regarding the storing of vegetables in a root cellar pertains to a smaller scale, therefore this thesis is proposed as an experiment in the storage of vegetables in a larger space. The furnishings designed throughout the project, and translated from the tools of the vernacular architecture, are created with flexibility in mind. This flexibility is intended to allow for the experimentation of the placement of vegetables to take place. Secondly, with the increase in scale there is an increase in the potential for stagnant air, causing produce to ripen further, however, with the change in program the frequency of visits into the cellar increases as well. In increasing the amount of circulation and use of the space in comparison to a traditional root cellar the air throughout the space is frequently shifted. Again, this requires further trial and error in order to determine if it would function at this scale.

Though there are challenges when expanding this form of architecture to a larger scale, the corner store appears to be an adequate size for the needs of these spaces. However, translating the root cellar into something like a large grocery store chain, would be an entirely different thesis. There would need to be several more experiments done with the translation of scale in order to design something of that size. It is possible that because of the difficulties revolving around scale, there may be far too many limitations involved in expanding this type of architecture into something like a large chain grocery store.

The New Corner Store has the potential to expand throughout the rest of St. John's as well as the rest of Newfoundland. With the majority of Newfoundland towns only being able to support a small corner store, the concept of the new corner store would be far more favourable in size. This size would allow many communities in Newfoundland to benefit from this reinterpreted form of vernacular architecture. Furthermore, because the root cellars are suited to cold climates there is potential for the new corner store to be implemented throughout Canada and other countries that have similar climatic conditions and food insecurity.



Figure 7.2 *A Home, an Outhouse, a Garage, and a Root Cellar.*



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APPENDIX



































