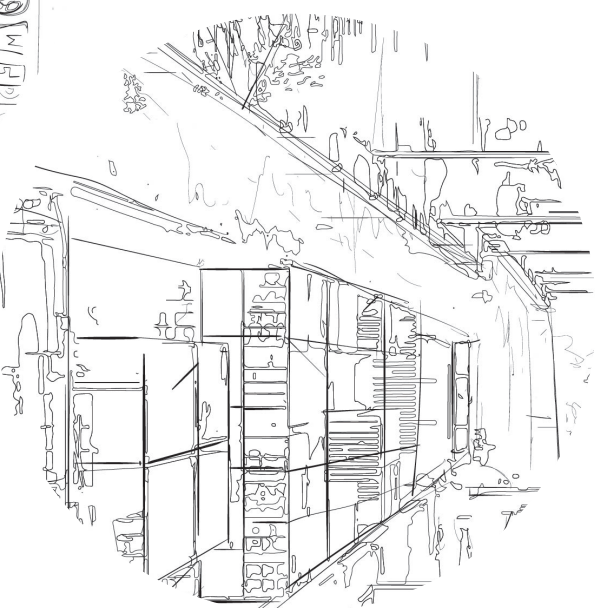


# END ROUGH SLEEPING

## RM1 GROUP PROJECT

ELISE COLLEY, (CRYSTAL) YUET WAH POON, JOLYNN TAN



# 2.0

## THE BRIEF

### 2.1 Introduction

Through working with Dr Jonathan Silver a representative from GMHA (Greater Manchester Housing Action), Trees Not Cars campaigners and local residents we have been tasked with creating a prefigurative intervention to overcome the following injustice:

"On Thursday 17th, Manchester City Council's planning committee voted through controversial plans to use a former retail park in Ancoats as a temporary 440-space car park for up to two years. (Build a Green Space in Manchester, not a CAR PARK (nd) TREES NOT CARS [online] [Accessed on January 3, 2020]<http://www.treesnotcars.com>)

This was a very controversial decision leaving the local community angry as this decision creates/dismisses the following issues:

- Levels of pollution in the area are already illegal
- The site is directly located next to a primary school putting children's health at risk
- There is a need for green spaces in the area
- The proposal does not address the climate emergency and goes against the council's own plans for a greener future
- There is a huge housing crisis in Manchester which this proposal ignores

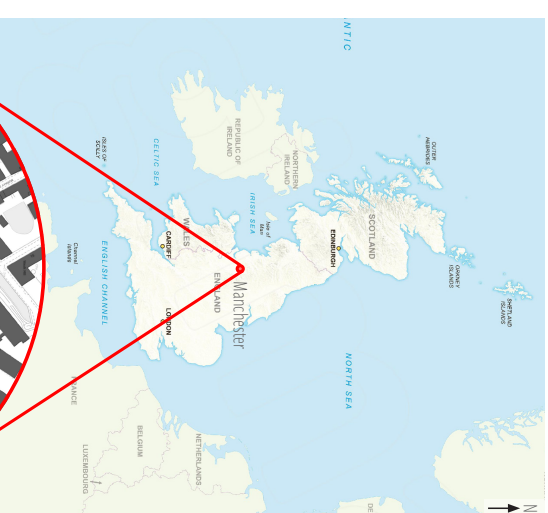
### 2.2 What is Prefiguration?

Prefiguration is a temporal disruption, where politics no longer mediates process, demand frames or antagonic fields.

In architecture, prefiguration entails revisiting the margins of design and exploring the transformative potential of spatial practices. It subordinates form development to a critical understanding of the socio-economic conditions that underpin the production of space.

### 2.3 The Site

Our site is located off Great Ancoats Street, Ancoats, Manchester. The whole site (Site Masterplan) is approximately 38,000m<sup>2</sup> but our project will be focusing on the northern end of the site which is approximately 1,800m<sup>2</sup>.



= Site Masterplan = Our Site = Buildings

### 2.4 Wider Context

#### Great Ancoats Street

Great Ancoats Street, a major A-road, runs alongside our site and around Manchester City Centre. Pollution levels in the area are already high (illegal levels have been identified) and so we think that enticing more vehicles into the area through the provision of a car park is inappropriate.

= Great Ancoats Street

#### Existing Car Parks Around the Site

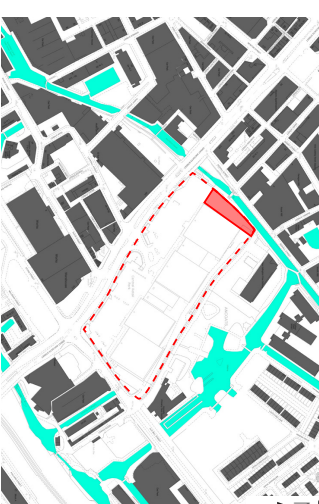
This map shows that there are already a large number of car parks located near our site.

= Car Park

#### Proximity to the Canal

Two canals (the Rochdale Canal and the Ashton Canal) lie in very close proximity to the site masterplan. The Rochdale Canal runs next to our specific part of the site.

= Canal



# 3.0

## UTILISING THE CANAL

### 3.1 A History of Land Use

The maps on the right show that from the 1900s to 2020 the number of industrial buildings/sites has significantly declined and these have been replaced by residential and commercial buildings. These buildings rarely make use of the canal network around them.

Our project aims to utilise this canal network from Liverpool to Manchester and show that a once key piece of infrastructure can still be used in today's society.

(Maps based on Landmark Information Group Ltd and Crown Copyright (2020) 1900s 1960s contemporary maps [Online] [02/01/2020] <https://digimap.edina.ac.uk/roam/map/history/>)

1900s Nollie Map



1960s Nollie Map (scale 1:10,000)



2020 Nollie Map (scale 1:10,000)



### 3.2 The Manchester Ship Canal

The Manchester Ship Canal (the canal connecting Liverpool to Manchester) was officially opened in 1894. Its purpose was to ease pressure off of the railway lines connecting the two cities, a result of Manchester asserting itself as a major industrial city.

**1894** The opening of Manchester Ship Canal

**1993** Purchase of docks at Salford by Peel Holdings

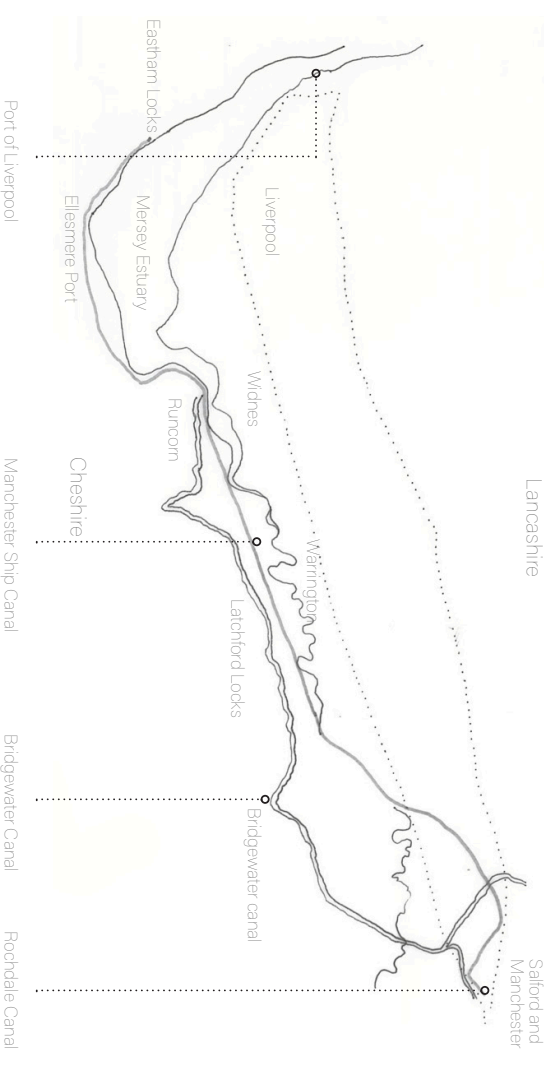
**2011** Peel Ports declared a £50 billion **Atlantic Gateway** plan to develop the Port of Liverpool and Manchester Ship Canal

To combat increasing road congestion and form an innovative **green highway**

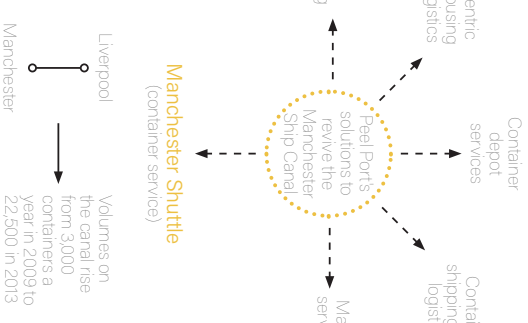


**2014** Peel Holdings owned and operated by Peel Ports, which also owns the Port of Liverpool

#### The Manchester Ship Canal Route



#### Manchester Shuttle (container service)



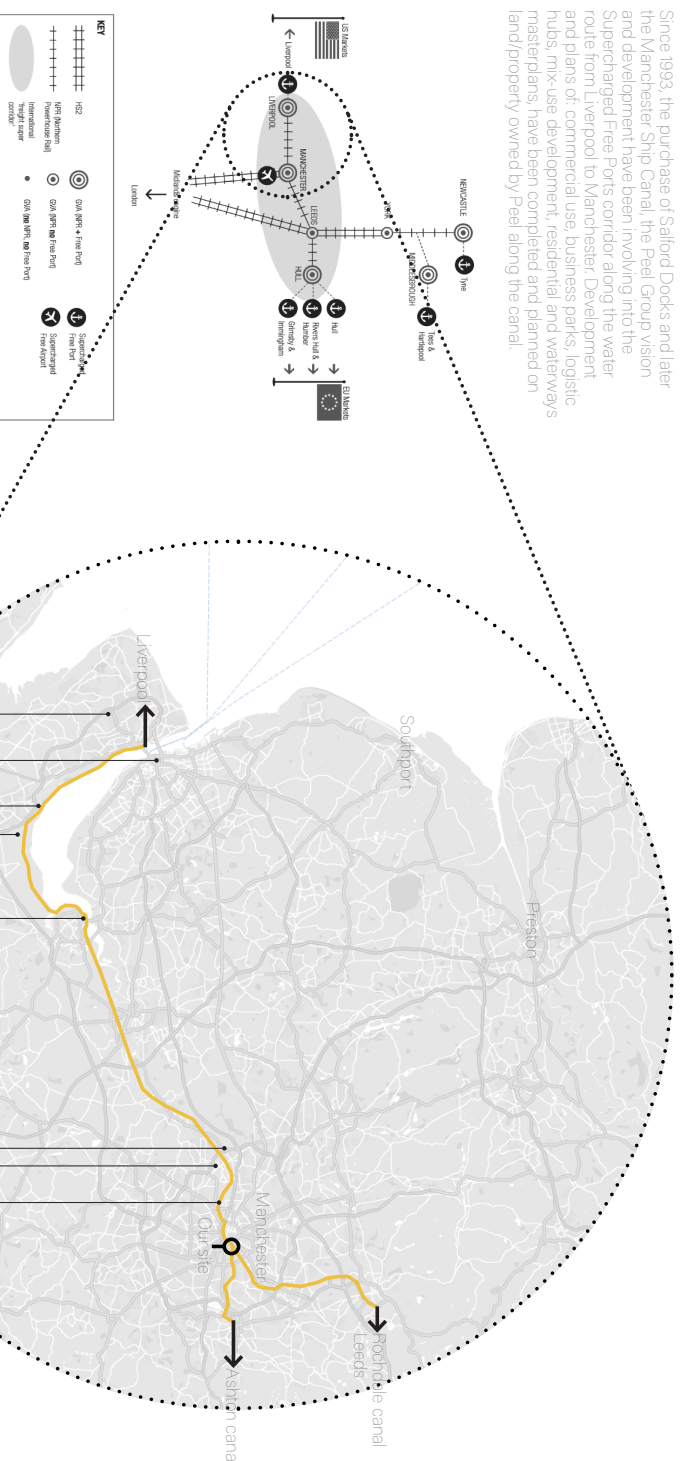


# 3.0

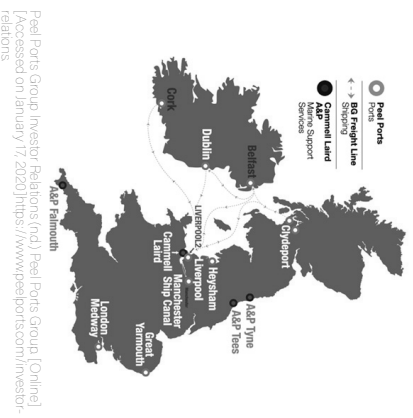
## UTILISING THE CANAL

### 3.6 The Peel Group Vision

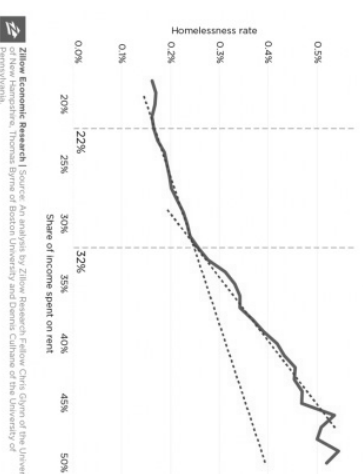
Since 1993, the purchase of Salford Docks and later the Manchester Ship Canal, the Peel Group vision and development have been involving into the Supercharged Free Ports corridor along the water route from Liverpool to Manchester. Development and plans of commercial use, business parks, logistic hubs, mix-use development, residential and waterways masterplans, have been completed and planned on land/property owned by Peel along the canal.



Walker, C. (2018) Insights - Supercharged Free Ports: March



**Homelessness climbs faster when rent affordability reaches 22% and 32% thresholds**  
An uptick in rent affordability beyond 22 percent translates into more people experiencing homelessness. Beyond 32 percent means a faster-rising rate of homelessness. The 2019-2020 period means a homelessness crisis, unless there are mitigating factors within a community.

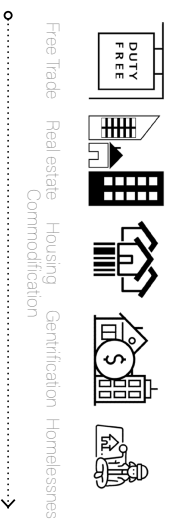


**Zillow Economic Research** Source: An analysis by Zillow Research's Fellow Chris Goyens of the University of Pennsylvania. Thomas Byrne of Boston University and Dennis Cullen of the University of Pennsylvania.

Chelton, E. (nd) This is the critical number that shows when housing breaks down. World Economic Forum. [Online] [Accessed on January 17, 2020] <https://www.weforum.org/agenda/2019/01/here-s-a-way-of-predicting-when-homelessness-is-likely-to-rise/>

With the developers interest in the construction of hyper expensive real estate (Peel Group envisioned one of their projects to achieve rent of £5 per ft), housing development has been commodified as a form of investment, but not the homes. This has led to an increase in rental affordability and the displacement of lower income communities in these 'prime' locations. This phenomenon results in the gentrification and further worsening of the homelessness crisis.

(Data based on: Trinity of the North (2019). [Online] [Accessed on January 14, 2020] <https://www.ppcparty.com/trinity-of-the-north/>.)





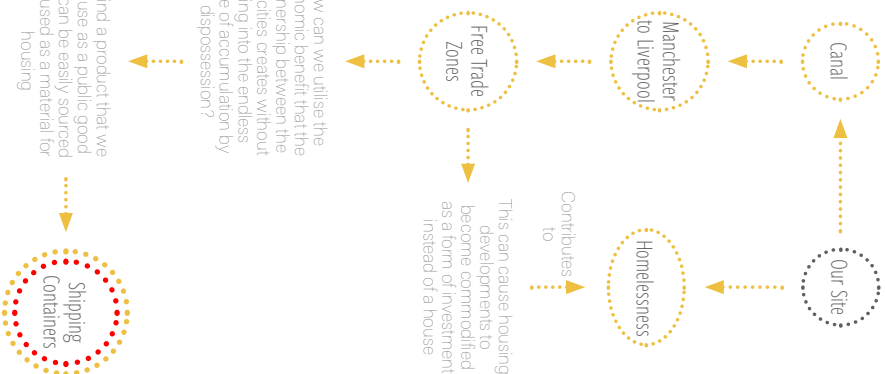
# 4.0

## THE SHIPPING CONTAINER

### 4.1 Disrupting Accumulation Through Dispossession

As mentioned at the beginning of this project our aim is to address Manchester's housing crisis through the provision of emergency housing for the homeless. The issue we now face is that as Peel Ports push to develop the free trade relationship between Manchester and Liverpool to create the most advantageous economic climate; this is likely to result in housing developments becoming commodities as a form of investment instead of houses. This in turn adds to the rise in house prices (forcing the displacement of people) and contributes to the housing crisis (a cause of homelessness).

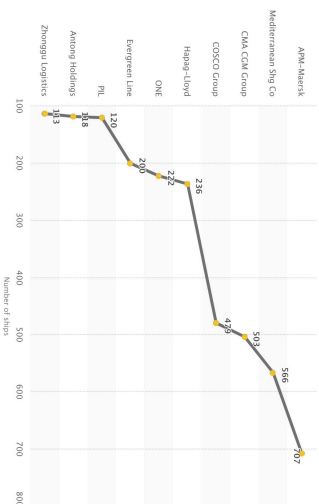
To utilise the Peel Group's Free Ports corridor without contributing to accumulation through dispossession, we will use the shipping container as a public good.



How can we utilise the economic benefit that the partnership between the two cities creates without falling into the endless cycle of accumulation by dispossession?

We find a product that we can use as a public good that can be easily sourced and used as a material for housing

### 4.2 Global Use



The graph above shows the leading container shipping companies worldwide based on the number of ships in January 2020

(source: Wagner, I. (2020). Leading container shipping companies - number of ships 2020. Statista [Online]. Accessed on January 17, 2020. <https://www.statista.com/statistics/263291/container-shipping-companies-worldwide-number-of-ships/>)

Since the late 1960s and early 1970s, the International Organization for Standardization (ISO) established the standard capacity of intermodal containers, presenting the twenty-foot equivalent unit (TEU) as a standard measure used in the water transportation industry. Today, approximately 90 percent of containers shipped around the world are either forty or twenty foot standard length. As per the graph above, APM Maersk has the capacity to transport around 4.2 million TEU containers on its ships.

According to records based in the year 2017, there were approximately 17 million shipping containers in total across the globe. Nevertheless, of those 17 million containers, only 6 million are being used for transport or any other usage as per demand. The figures shows an estimation of 11 million shipping containers are unused and are just sitting stagnant around the globe.

(Data based on: 'Port Let' These Millions of Shipping Containers Go Unused (2017) Shipping Container Sales & Modifications (Intermodal Equipment Sales [Online]. Accessed on January 17, 2020) <http://intermodalequipmentsales.com/port-let-millions-shipping-containers-go-unused/>)

17 000 000 globally  
6 000 000 in use (shipping or storage)

2% of 17 000 000 =  
340 000 donated for temporary structures

17 000 000 - 6 000 000 - 340 000 =  
10 660 000 immobile (unknown usage)

62.71% of the total amount of containers globally are left stagnant

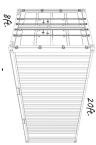
This flow chart shows how the use, construction and transportation of shipping containers has evolved overtime:

95%

Manufactured goods shipped globally with Container

1970s: Hakane Maru shipped 752 20ft. container

Standardized dimension for the efficiency in stacking and forms of transportation



75%

Cut down in transportation costs



Global shipping companies



90%

Manufactured goods containerised in 1980s

Networks (e.g. canals) to ports developed

NOx

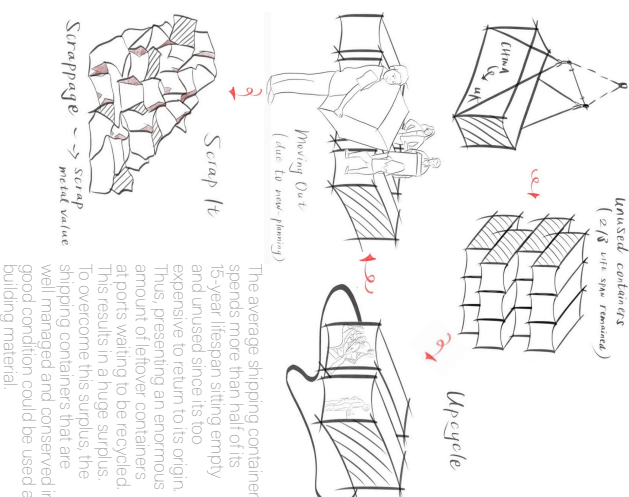
Plague by amount of ships on the ocean

Cheap transportation of goods results in constant blooming of industry

Asymmetric Maritime Network

Easier to produce container close to shipmer then to re-position

### 4.3 Life Cycle



Islam, H., Zhang, G., Selvaraj, S., Buayuan, M. (2016). Life cycle assessment of shipping container home: A sustainable construction. RMIT University Melbourne [Online]. Accessed on 28th November 2019. <https://www.sciencedirect.com/science/article/pii/S2212567114009836>

98%

Recycled and reused as new steel product or storage units

2%  
Donated for temporary structures

97%

Of containers are produced in China and distributed around the world  
Steel or aluminium made containers allow it to be used and reused throughout the supply chain

## 9.0

## DESIGN DEVELOPMENT

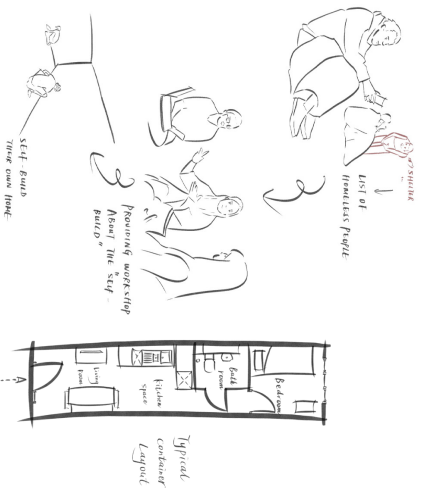
## 6.2 Help Bristol's Homeless

Help Bristol's Homeless is a social enterprise created by Jasper Thompson, providing temporary housing for Bristol's homeless community. The project recycles shipping containers, transforming them into temporary secure, self-contained homes. The project hopes to attract businesses and members of the community to sponsor the containers and become involved in the project.

This social enterprise not only provides temporary homes for vulnerable people, but also offers them the opportunity to work on the project itself, providing a fixed address and the chance to learn new skills and integration back into the community.

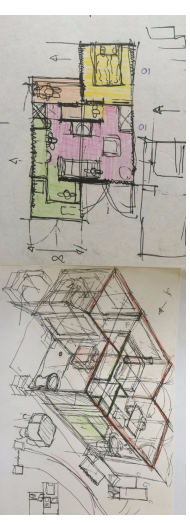
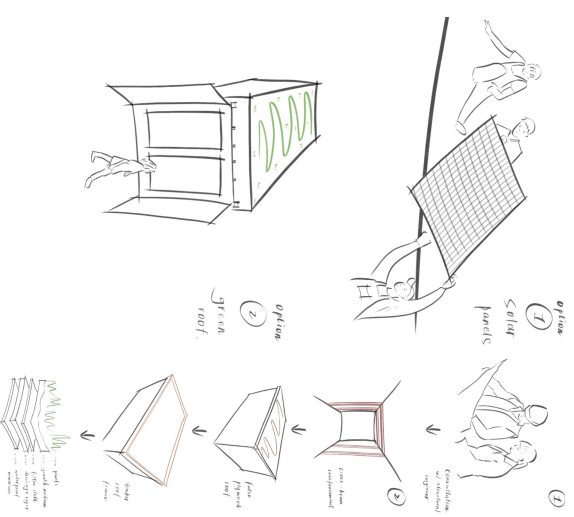


Collaborating with an organisation called *Shelter* would make it easier for our data to run our workshop. This is because they have sufficient data on how homelessness has spread, as they help millions of people every year struggling with bad housing or homelessness through advice, support and legal services. Therefore *Shelter* could provide a list of homeless people wanting to build their temporary home, and we could provide the participants with a series of workshops. These workshops would include promoting the concept of our project, and as well as instructions on how to build a home with shipping containers.



Having youths build their own emergency living pods reduces the labour cost, subsequently lowering the budget. However, this precedent is not a temporary housing scheme, the container home is fully fitted and so the cost is relatively high in comparison to what we are proposing. We propose a temporary design, which can move from one site to another.

### 6.3 REACH Homes in Sheffield

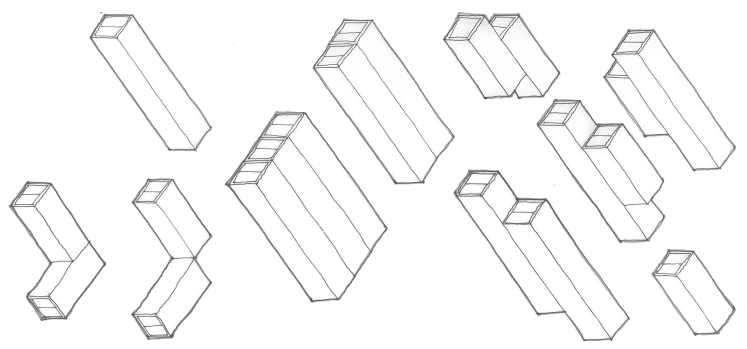


# 6.0

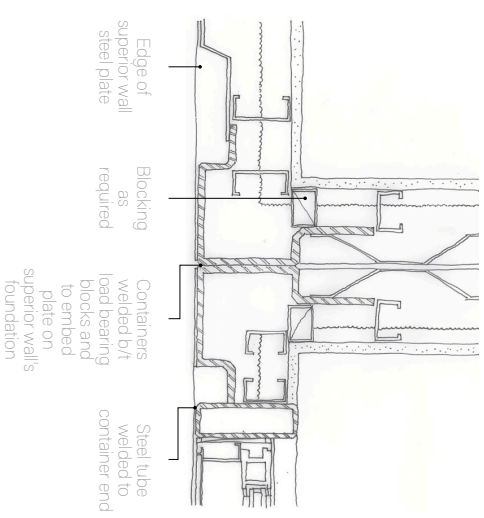
## DESIGN DEVELOPMENT

### 6.4 Modularity and Construction

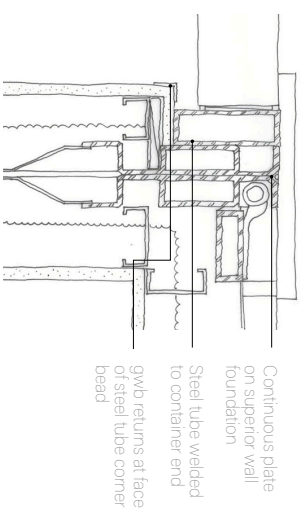
Our scheme of creating emergency housing out of shipping containers was developed due to its highly adaptable structure in terms of its flexibility and modularity. Contextually it also works well for relocation as per future requirements. It is also an affordable choice as it is a discarded material with comprehensible building techniques and simple tools.



Typical Container Connection at End-wall Plan Detail:

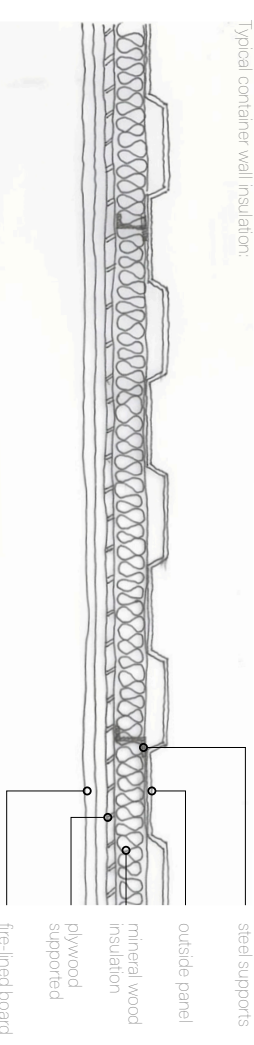


Typical Container Connection Plan Detail:

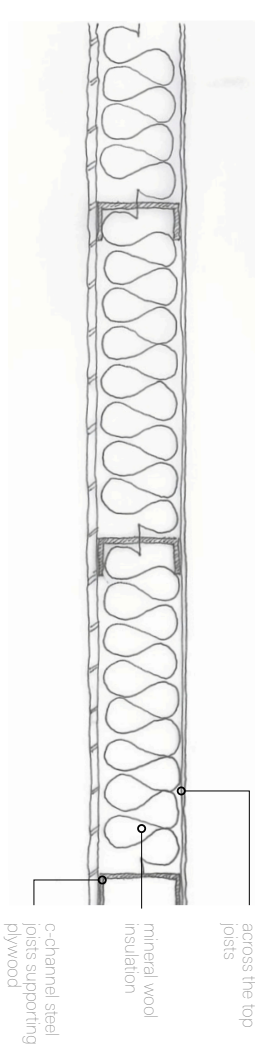


### 6.5 Functionality

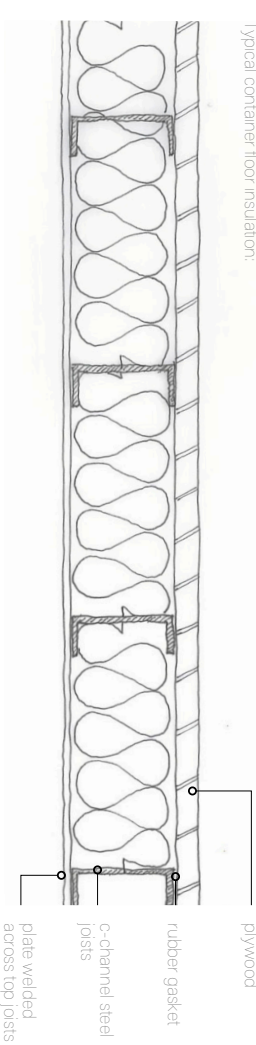
Typical container wall insulation:



Typical container roof insulation:

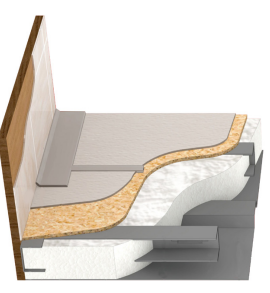


Typical container floor insulation:



The illustration above is drawn based on consideration of a cold climate that requires an R-30 value for exterior walls. This could be achieved with batts (R 3.25 per inch ~ R30 would require 9-10”), foam panels (R 5 per inch ~ R30 would require 6”), and standard spray foam (R 6.75 per inch ~ R30 would require 4.5”).

(Based on: How to Build a Shipping Container Home (2010) [Online] <http://www.residentalshippingcontainerhome.com/focus-1/>)





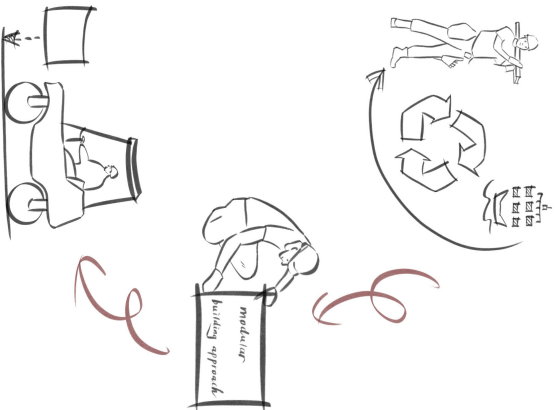
# 6.0

## DESIGN DEVELOPMENT

### 6.6 How is it self-sustaining?

Carbon Footprint - An eco friendly choice

Construction of a mixed material building with the same dimensions as a 40 ft shipping container is estimated to release 9.9 tons of carbon. Having a recycled shipping container as a building material releases around half of these emissions.



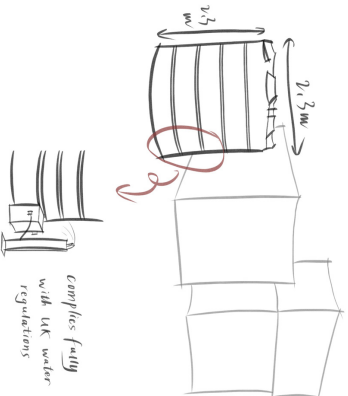
### 6.7 Water

The most common way to access a water supply is to connect a service pipe from the existing water main to your site. Since the possible sites we have picked are in built up areas, it is likely there will be a water main in the road nearby which we can connect to.

However, what we need is temporary access to the water in 28 days, so connecting service pipes to the water main may take too much time. Therefore, an alternative option for water access would be:

#### Potable static water storage tanks

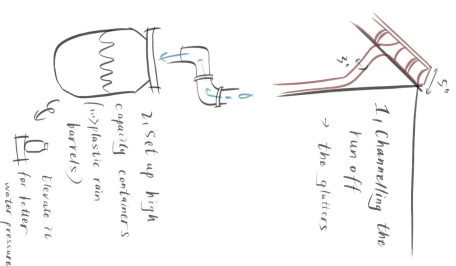
These can either be connected up to a single or multiple tap stand(s), ideal for drinking water or for site services. The static tanks come with a digital level monitor so you can keep track of how full or empty the tank is. This allows you to pre-empt when you need to book in your next water delivery to refill the tank.



#### Rainwater harvesting system

Since our scheme is temporary, we have picked the simplest rainwater harvesting system. It is a non-pressurized system, such as having rain barrels, where the pipes run from rain gutters into a tank.

Designing a rainwater harvesting system can help reduce the cost of ordering static water tanks from a retailer. It can also help reduce flooding and erosion.



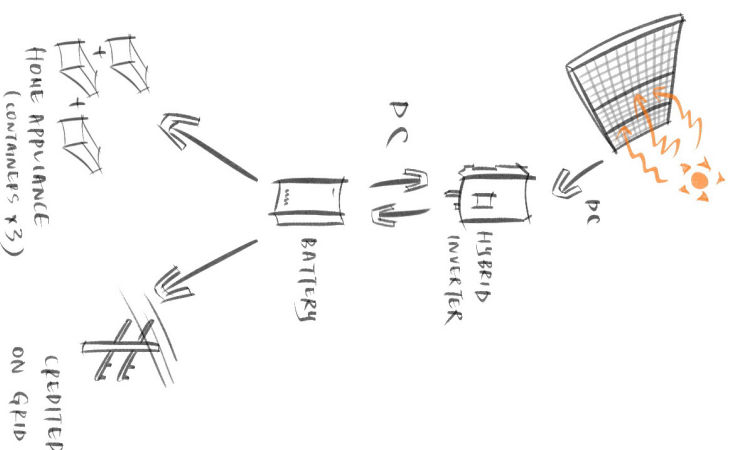
### 6.8 Electricity

Our container homes will need a temporary electricity supply. We can assume that the sites we have picked do not have any electricity supply and so we will connect a new electricity cable to a **temporary kiosk**. Building a temporary home only requires a small temporary connection (up to 70 kVA).



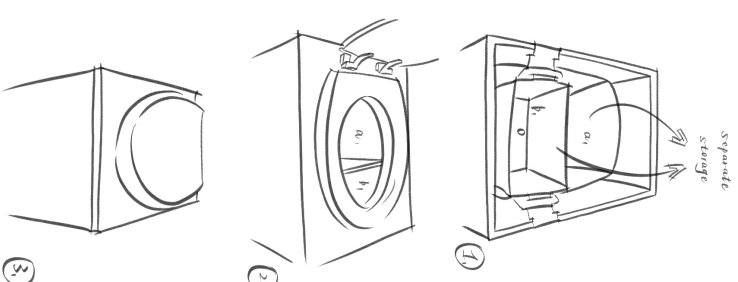
#### Installation of solar panels

Having solar panels installed can reduce electricity bills and the maintenance cost of it is relatively low. Therefore this could be a good environmental strategy for our design.



### 6.9 Sanitation

A **composting toilet** is a good option when there is a limited water supply because it does not require water for flushing. Neither connections or drains are necessary for installation, and it is just as comfortable and hygienic as conventional toilets. It is possible to DIY your own composting toilet, to cut the cost from buying from a retailer.



# 6.0

## DESIGN DEVELOPMENT

### 6.10 Container Transport Journey



International Imports

Port of Liverpool

Manchester Ship Canal

Bridgewater Canal

Rochdale Canal

Our Site

Here is a more detailed look into the exact route our containers would need to travel from the Port of Liverpool through the canal network, to our site. It is important to note that the Peel Group own all but one canal (the Rochdale Canal) connecting the Port of Liverpool to our site.

From the Port of Liverpool, across the River Mersey to Eastham Locks

General Information:

Operator: Mersey Docks & Harbour Company Ltd  
Owner: Peel Ports Ltd  
Approximate Annual Tonnage: 33.4 Million

Principal Traffic:

- Containers
- Passengers
- Food
- Metals and Steel
- Forest Products
- General Cargo
- Vehicles

From Eastham Locks to 'Pomona Dock J, Bridgewater

General Information:

Operator: The Manchester Ship Canal Company Ltd  
Owner: Peel Ports Ltd  
Approximate Annual Tonnage: 8 Million

Principal Traffic:

- Bulk Liquids
- Dry Bulks
- General Cargo
- Containers
- Passengers

Pomona Dock J, Bridgewater to Castlefield J, Rochdale Nine

General Information:

Operator: The Bridgewater Canal Company Limited  
Owner: Peel Ports Ltd  
Approximate Annual Tonnage: Now used for leisure (3 million in its peak)

Principal Traffic:

- Passengers

General Information: Castlefield J, Rochdale Nine to Our Site

General Information:

Operator: Canal and River Trust  
Owner: Canal and River Trust  
Approximate Annual Tonnage: Now used for leisure

Principal Traffic:

- Passengers

(Based on: Liverpool (n.d.) UK Ports - 'The reliable guide to the UK's Ports. [Online] [Accessed on January 10, 2020] <http://uk-ports.org/liverpool>.)

(Based on: Manchester Ship Canal (n.d.) UK Ports - 'The reliable guide to the UK's Ports. [Online] [Accessed on January 10, 2020] <http://uk-ports.org/manchester-ship-canal/>.)

(Based on: About us (n.d.) Bridgewater Canal [Online] [Accessed on January 10, 2020] <http://www.bridgewatercanal.co.uk/aboutus>.)

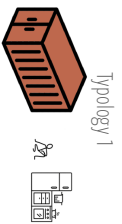
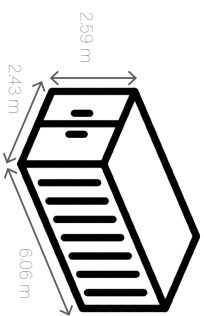
(Based on: Rochdale Canal: Canal & River Trust (n.d.) Canal Route Planner [Canal & River Trust [Online] [Accessed on January 10, 2020] <https://canalrivertrust.org.uk/enjoy-the-waterways/canal-and-river-network/rochdale-canal/>.)

# 7.0

## THE PROPOSAL

### 7.1 Typologies

20ft Container Dimensions:



Typology 2



Typology 3



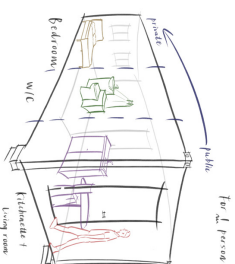
To portray the idea of modularity and flexibility, to relocate the containers as temporary structures, we came up with 3 typologies that can be re-arrange around different sites to create a communal environment for the emergency homes.

Typology 1 aims to provide a studio unit for a single occupant.

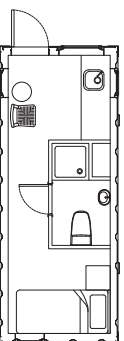
Typology 2 is made out of 2 container units and consists of communal facilities on the ground floor and a shared space for a double occupant unit above.

Typology 3 intends to create an elevated communal space and balcony, with 2 containers of double occupancy per unit at the ground floor.

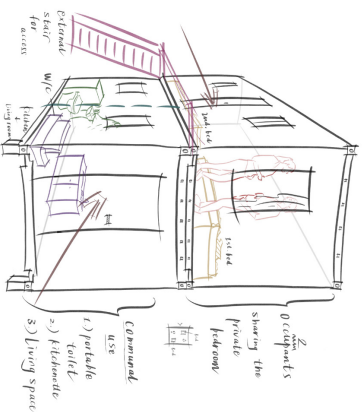
Typology 1



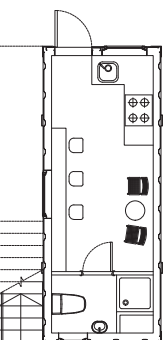
Ground Floor (not to scale)



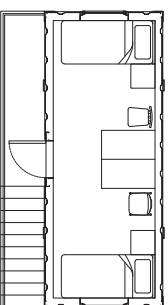
Typology 2



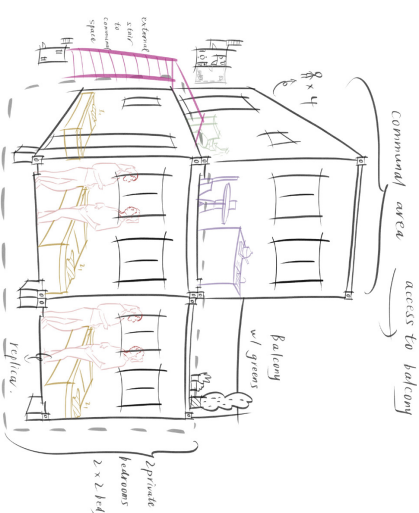
Ground Floor (not to scale)



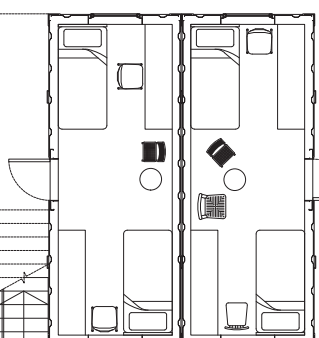
First Floor (not to scale)



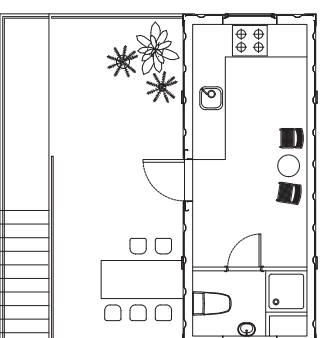
Typology 3



Ground Floor (not to scale)



First Floor (not to scale)





## THE PROPOSAL

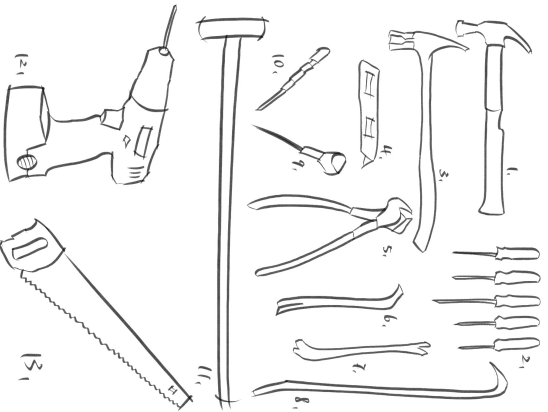
### 7.4 Equipment Manual

PPE:

1. Custom hard hat
2. Earplugs
3. Safety vest
4. Work Gloves
5. Safety glasses
6. Mask

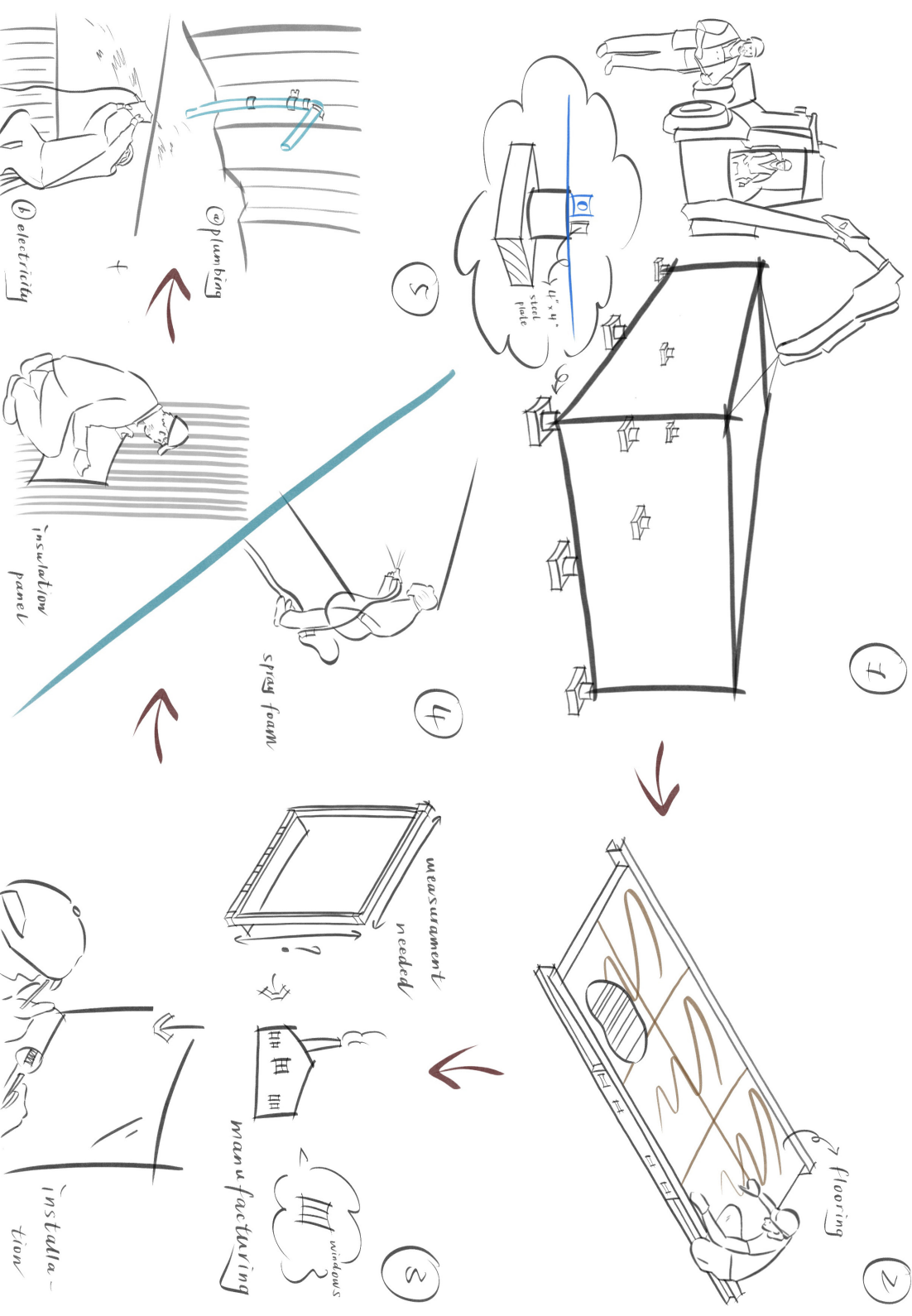


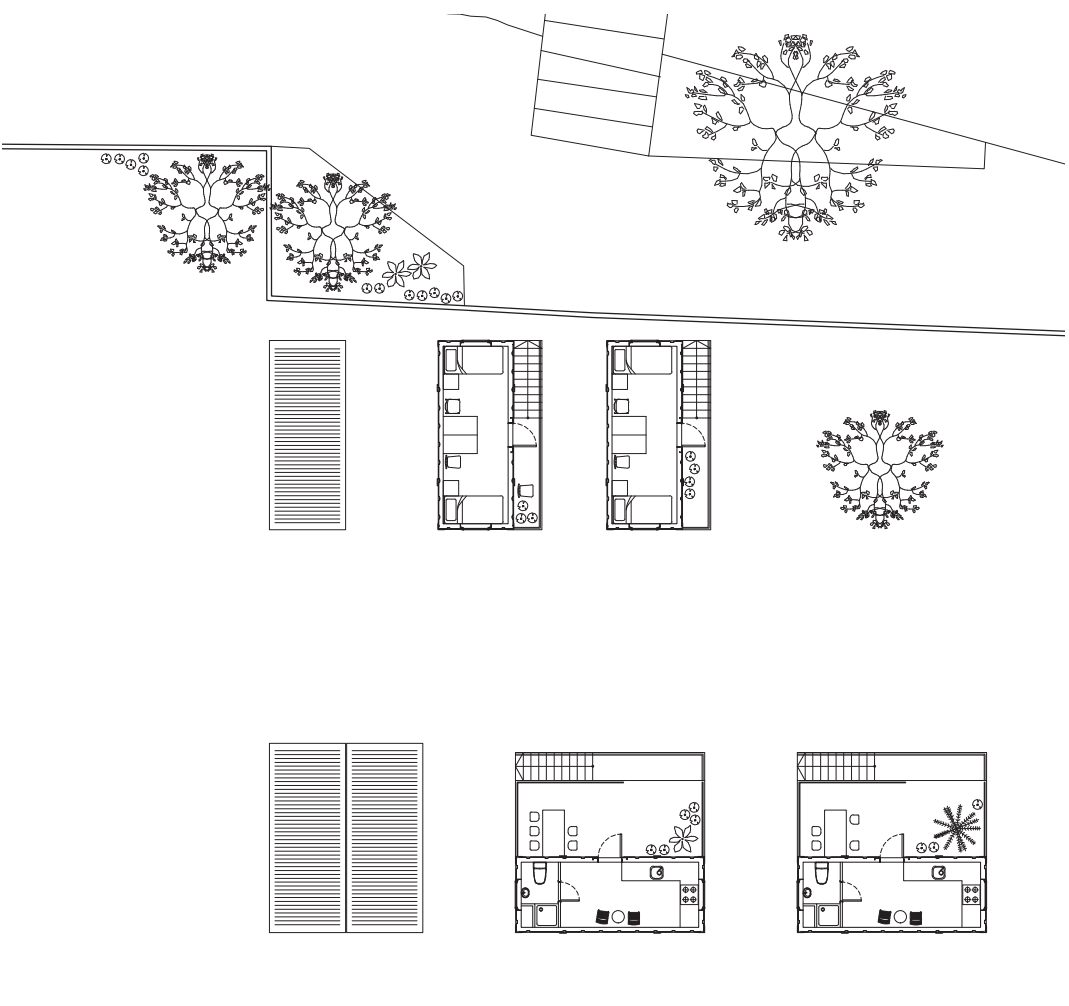
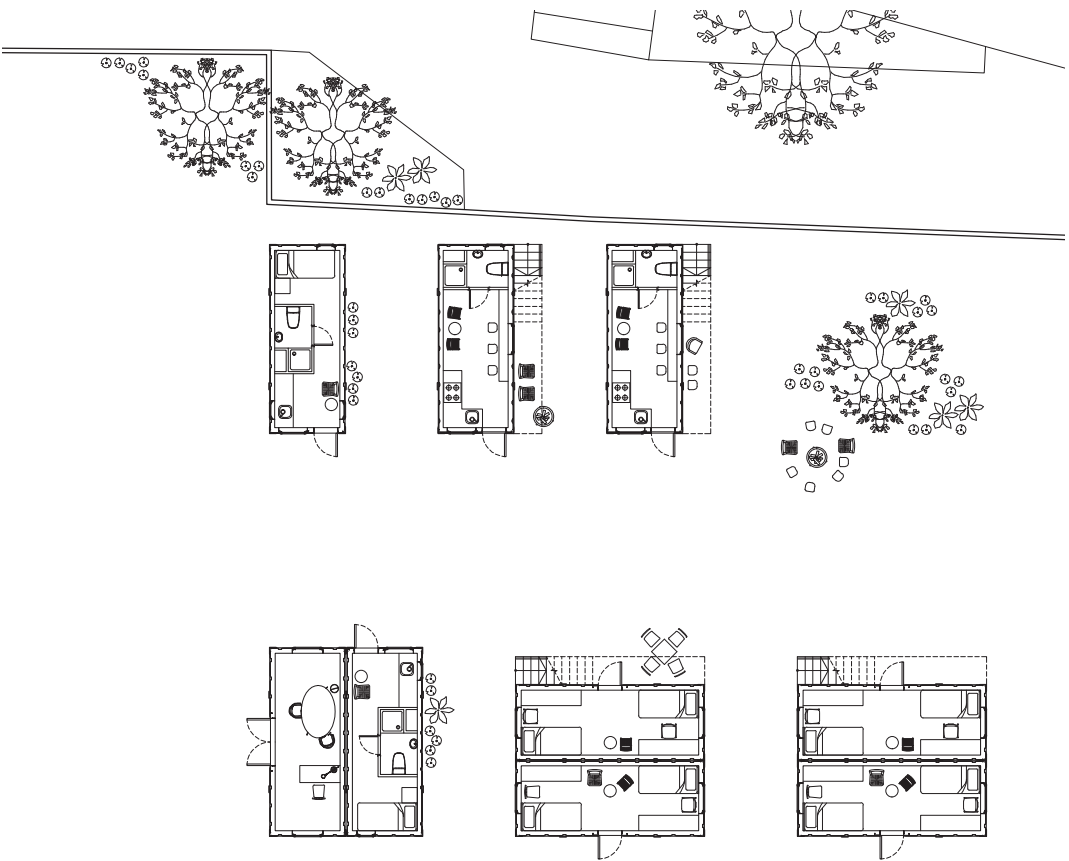
1. 16-ounce framing hammer
2. Philips and straight hammer
3. 22-ounce framing hammer
4. Utility knife
5. End nips
6. Flat bar
7. Cat's paw
8. Ripping bar
9. Awl
10. Nail set
11. Sledgehammer
12. Electric drill
13. Handsaw



### 7.5 Construction Manual

A step by step guide on how to construct our temporary container homes.





Ground Floor Plan  
(not to scale)

First Floor Plan  
(not to scale)