# 2Degrees More

Bespoke student residences in response to the inevitable.



#### 2 DEGREES MORE

Bespoke student residences in response to the inevitable

'2 Degrees More' is a project designed in response to a study by Climate Central which found that a 2c rise in temperatures would result in a rise in sea levels and the Port of Leith coast in Edinburgh would be submerged underwater. As well as this problem, Edinburgh is named the most expensive Scottish city for housing and is becoming unaffordable. With research, a large abandoned floodplain site at Edinburgh's coast was found to be underutilised for a city in demand for affordable living.

In response to the inevitable, 2 Degrees More is designed to be a sustainable and affordable housing community built above ground for Edinburgh's growing number of students attending one of the cities many Universities and Colleges.

With research into the history of the Port of Leith, it was learnt that the site was once part of a shipbuilding yard, which often built ships for the British Naval Army. One memorable ship type being 'Dazzle Ships'. Further research into Scottish history discovered there was a connection to a loch dwelling known as a Crannog, which was used for defence against enemies, much like the army ships.

Combining these two wildly different yet symbolically similar constructions with a modern approach enables us to preserve the authenticity of the site and remember forgotten Scottish history and link it with Scotland's future.

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## JENNA **FLEMINGTON**

+44 (0) 7712206531 jennasaraflemington@gmail.com @jenn.adesigns jennasf.wixsite.com/designportfolio

My name is Jenna Flemington. I have studied Interior and Environmental Design at DJCAD for 4 years and studied 3D Design at Dundee and Angus College for a year previously. One thing I am passionate about is the environment and the impact that global warming and climate change is having on our planet. As a designer I feel a sense of responsibility to tackle these issues and find a solution which would allow people to live safely in conjunction with the inevitable.





#### PROBLEM 1-THE RISE IN SEA LEVELS

In 2018, a new record was set for ocean heating. A report from NASA found that the sea is rising another 3.3 mm every year with the biggest increase gained in the last 25 years. This is due to humans putting more greenhouse gases into the atmosphere causing the seas to absorb 90% of the heat.

#### Effects?

#### Flooding

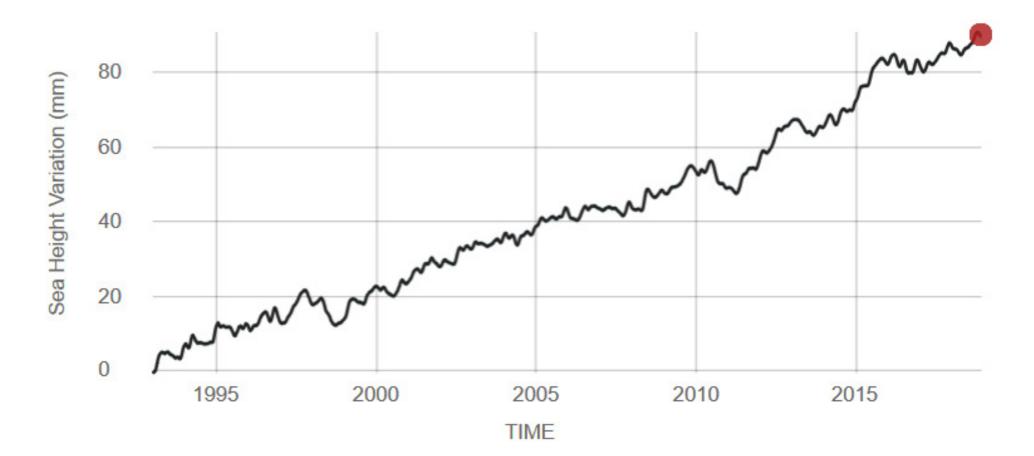
The rise in sea levels comes with the threat of an increase in flooding which can have a devastating effect on the economy, environment and people's livelihoods. Inevitably this is going to be a problem in the future so it is important that we find long term solutions and implement them now so we are prepared for what is to come without it causing such a damaging effect.

#### **SATELLITE DATA: 1993-PRESENT**

Data source: Satellite sea level observations. Credit: NASA Goddard Space Flight Center

#### RATE OF CHANGE

13.3 millimeters per year

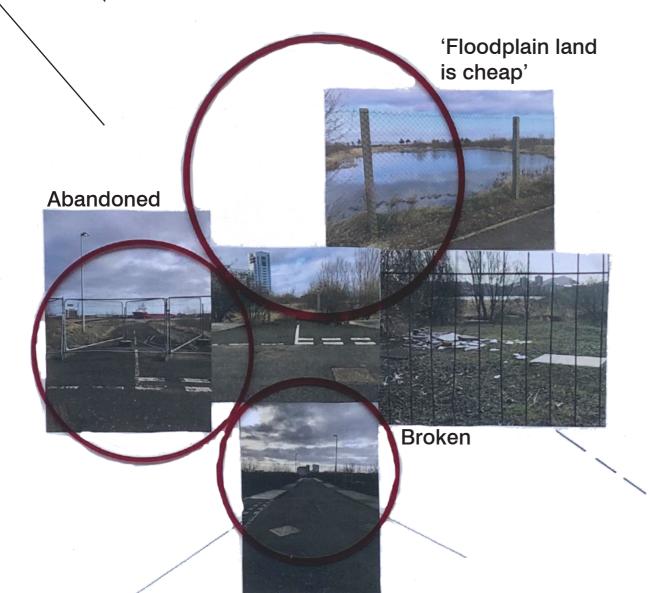


#### SITE VISIT

When visiting the site I was surprised with what I discovered. The area seemed abandoned, as though there once was something there but due to no human activity, nature had taken over with duck families and overgrown marsh land. It appeared that construction work had started but then been forgotten about. With roads half completed, broken parts and metal fences stopping you from going to certain areas made me feel as though I shouldn't be there yet nothing was telling me I couldn't be.

It is such a beautiful location which looks on to the Port of Leith coast yet the land was being completely underutilised presumably due to the fact that no one has taken the opportunity to build on the floodplain land.

An advantage to building here is that its less expensive and property developers are less likely to build on it due to the complications it brings. However with research on how to design with the inevitable in mind, gives opportunity to find an effective solution for the future which could be implemented in other flood risk areas.





#### Boom! The sound of Edinburgh's housing crisis

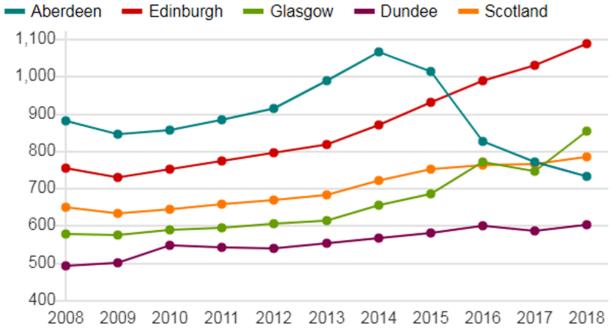
#### PROBLEM 2 -UNAFFORDABLE HOUSING IN EDINBURGH

As well as the cities flood risk threat, Edinburgh is also facing the current issue of unaffordable housing with the average house prices 6.12 times average earnings which increases renting prices also. The need for Edinburgh to provide affordable living is in higher demand now more than ever, in particularly student housing developments. With Edinburgh being home to 6 universities and many more colleges, they are lacking access to affordable housing.

The development of 2 Degrees More could regenerate Edinburgh's waterfront and help tackle the cities housing shortage.



#### Average monthly rents £



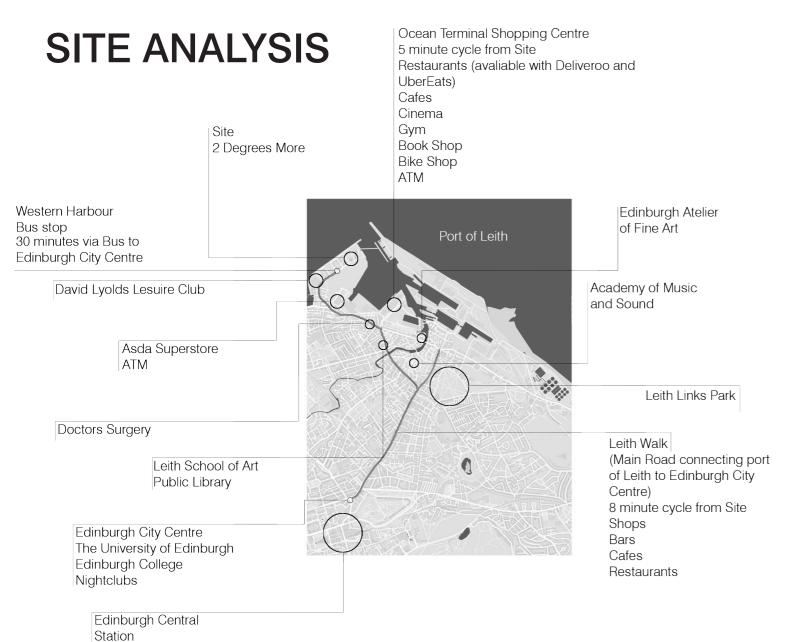
Edinburgh is named the most expensive city in Scotland for housing which is becoming unaffordable.

### Edinburgh Exodus: Sky-high property price and rents force more people out of Capital

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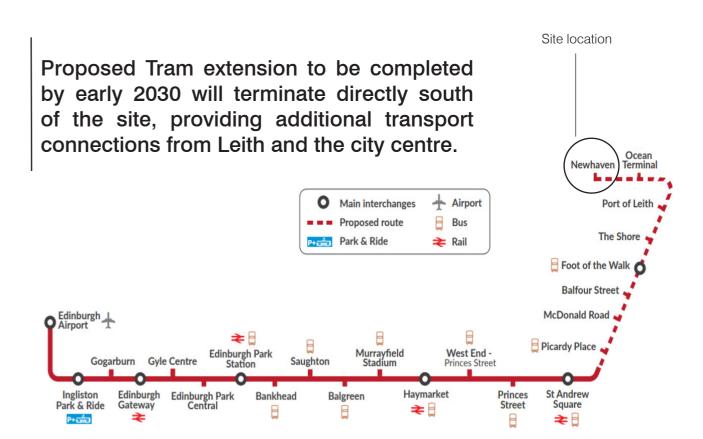
Rents have risen by 46.3 per cent since the start of 2010, Scottish Government figures show





When analysing the site, it was important to make sure it was an appropriate location with regards to what is near by and what would be essential for student living. The diagram above shows the key things in the surrounding area including the 3 closest colleges within walking distance. Due to the site not being in the centre it would be recommended to the students to have access to a bike to make travelling around the city more time efficient.

When it comes to transport to and from the city centre, there are direct bus links from the site which take around 30 minutes. This would be essential for students studying at the one of Edinburgh's Universities. As well as this, a proposed tram extension is to be ready for 2023 around the same time 2 Degrees More would be completed, allowing more travel options.





#### **INTERVIEWS**

As part of my thesis project research, I felt it was important to speak to students about their experience of living in a shared space and take some of the positives or negatives to consider in my design. As well as this I wanted to speak to someone who is already a resident in Leith and find out their thoughts on living in the area. This helped back up my design thinking and rationale for choosing the Port of Leith location.

'I ENJOYED BEING IN HALLS BUT THE BUILDING WAS OLD AND BLAND. IT FELT MORE LIKE A PRISON THAN A HOME AND HAD A TINY WINDOW WHICH DIDN'T ALLOW IN MUCH DAYLIGHT'



Kieran Moran Former Student Previously lived in halls

'LEITH **PROVIDES ALLOFYOURNEEDS** LIKE SHOPPING, **LEISURE AND** ENTERTAINMENT. IT'S A GREAT PLACE FOR A YOUNG **PERSON** WHO WANTS TO ENJOY SOCIAL LIFE EITHER HERE OR IN THE CITY CENTRE WHICH IS NO MORE THAN A WALKING **DISTANCE.**'

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Karolina Rzeznik Lived in Leith for 7 years

'OUR KITCHEN
AREA WAS SMALL
AND ONLY HAD
A SMALL TABLE,
NO SOFA OR
A N Y W H E R E
TO SOCIALISE
COMFORTABLY'



Harvey Smith Former Student Previously lived in halls





#### **Urban Rigger**

Urban Rigger is a floating, carbon neutral property made from upcycled shipping containers. Built to be an affordable and sustainable home for students studying in Copenhagen, Denmark. It has 12 living spaces articulated around a green courtyard, using 9 shipping containers in a circle. It is a solution for the growing demand for housing, using the underutilized yet centrally positioned harbour for the floating building.

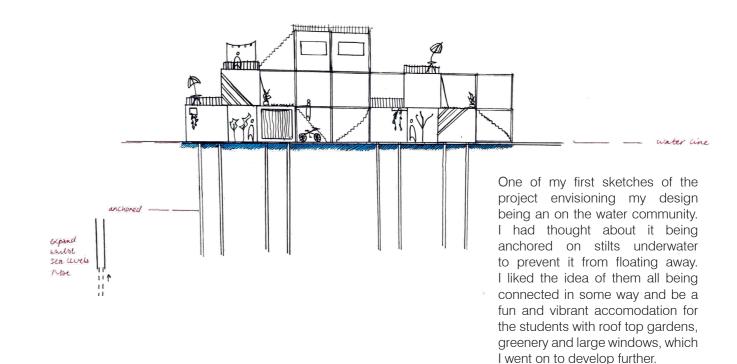
'We want to invest in the future and students are the future' Bjarke Ingels Group

#### Sustainable solution

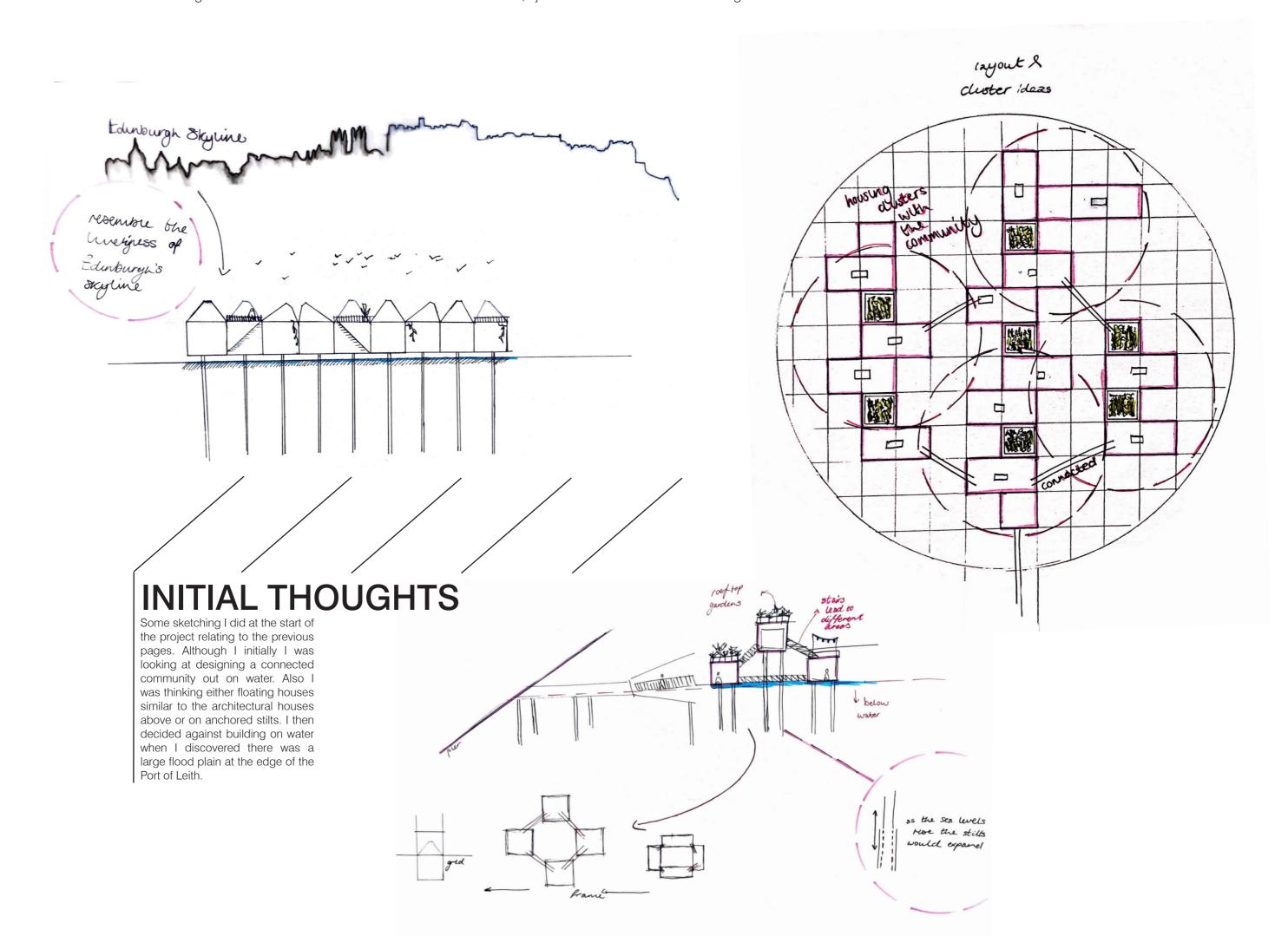
Both of these designs had a big influence on my project. Although both are built on water which is what I was first originally looking to do, they both have found a solution to use underutilsed space on water for cities that are in great demand for more housing. Examples like these show that building housing on water or floodplain land is possible and is the way forward when it comes to building sustainable and afforable homes in densely populated cities.

#### Floating Houses Ijburg Amsterdam

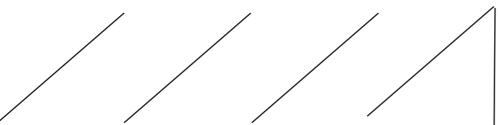
This floating housing community in the Netherlands designed by Architectenbureau Marlies Rohmer are Amsterdam's solution for the rising sea level in the city, as well as the growing density of population in Holland similarly to the situation in Edinburgh. These 120 homesteads help with Amsterdams housing shortage preventing citizens from having to move away.







5.2020



Collection of images which were influential for my design



M.A.Di Home, Renato Vidal Zig-zag walkway





Designer Unknown Large window seating



VRTIŠKA • ŽÁK, Prague Indoor 'Mini' Golf Course



Unknown Modernised circled around the fire



House in Ourem, Filipe Saraiva Entrances, Modernised Crannog shape



Designer Unknown Roof top garden



Unknown Skylights



Wellington Airport, New Zealand Windows and shadows



Waipara House, Linetype Architectural Exterior Design

When doing research into living on water, I came across an interesting part of Scottish history where people lived on water hundreds of years ago. A Crannog is a loch dwelling which was built on lakes or in waters that were surrounded almost by land. Crannogs are a significant part of the prehistoric Scottish landscape. Historians believe the construction of Crannogs was to favour access to the surrounding land for cultivation, livestock tending and hunting, as well as being built for defensive purposes. The Crannog has several unique design features which I chose to be one of my design themes and strongly influenced the design of my project.

I went to visit the Scottish Crannog Centre in Aberfeldy and it was really interesting for me to see it up close and go inside one, as well as speak to one of the archaeologists about my project. The interior was very dark inside as the only source of light coming in was from the entrance. When I entered I sat around a fire with other guests and listened to one of the workers sing and play the guitar, which I later discovered why this was happening. Going to visit the Crannog Centre was really helpful for my project to gain insight and help me drive my design process.



# SCOTTISH CRANNOG CENTRE SITE VISIT



#### HISTORY OF THE PORT OF LEITH

The Port of Leith was once a thriving shipbuilding yard which continued for more than 600 years and being the largest deepwater port in Scotland. Leith has played a long and prominent role in Scottish history that was for a long time hard working and bustling with ships on their way to the four corners of the globe. However with the decline in shipping and industry the waterfront began a regeneration which locals say has gone too far. The once gritty port known for its sense of community has become gentrified with its historic assets stripped by property developers.

#### 'Once buoyant and tight-knit community has gradually disappeared' Local Resident

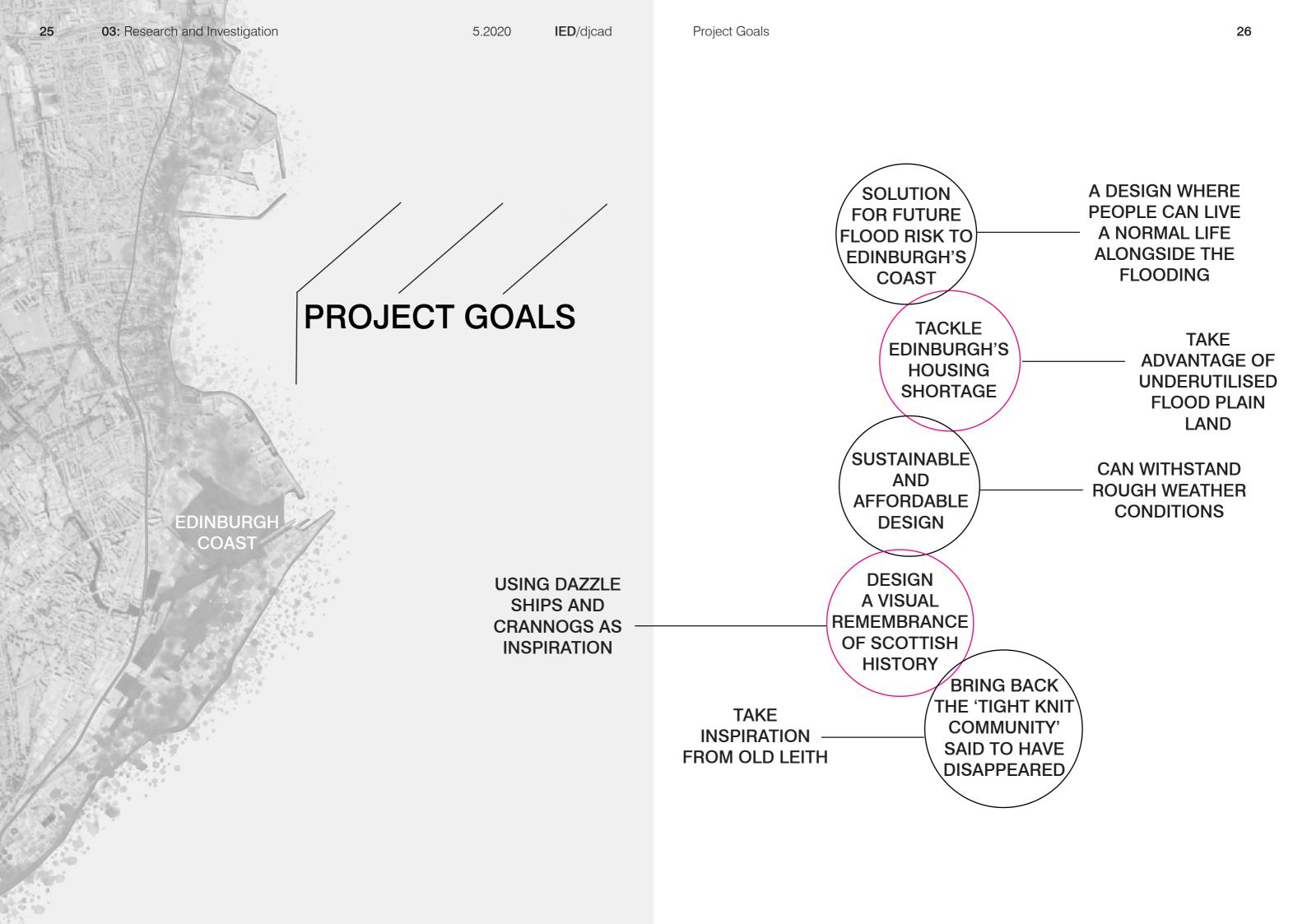
This made me realise that to design student accomodation for this area I had to take into consideration what the current locals are saying and bring back the sense of community that has been lost as well as incoporate some of the historical assets from the 'lost way of life' that has been forgotten.

#### **DAZZLE SHIPS**

Before sonar and radar technology was quite so developed, Dazzle Ships were created by British Artist and Naval Officer Norman Wilkinson in the First World War to confuse German boats by disguising a ship's size, distance and direction. Dazzle camouflage was an 'extraordinary phenomenon' that saw over 2,000 vessels painted in complex bold designs combining bright, loud colours and contrasting diagonal shapes creating an optical illusion on a massive scale.

When coming across the Dazzle Ships, I realised that there was a strong link between them and the Crannogs. Both completely different yet have many similarities. Both an important part of Scottish history as a defensive strategy, as well as the fact they were both used out on water to do so. This then gave me the idea to combine the two together to create the design for 2 Degrees More, and in this case, not being used to defend from war but from the threat of climate change. By doing so, links Scotland's historical past with the future.





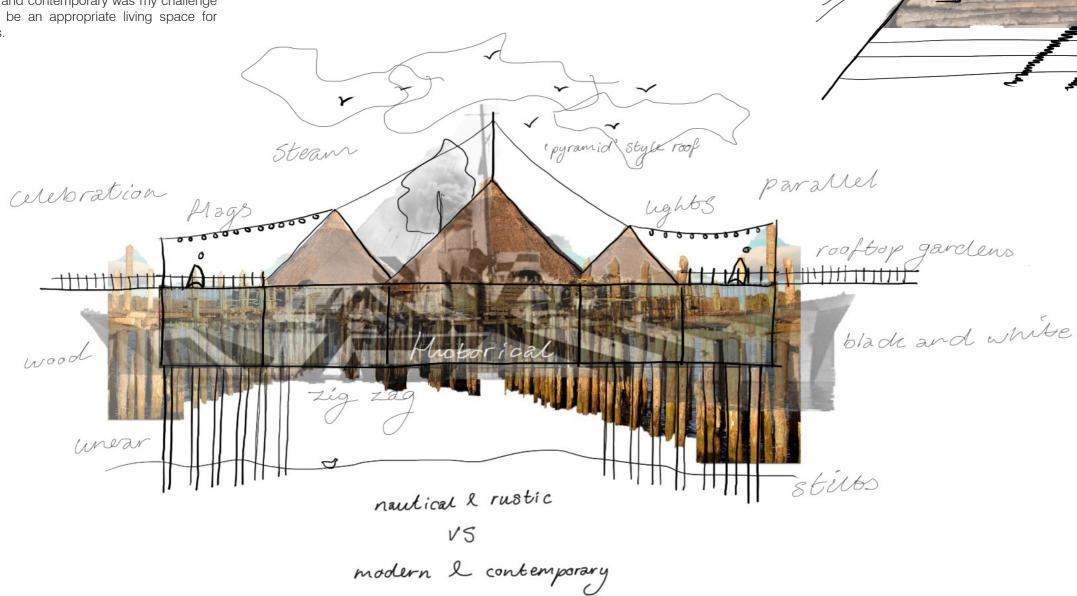
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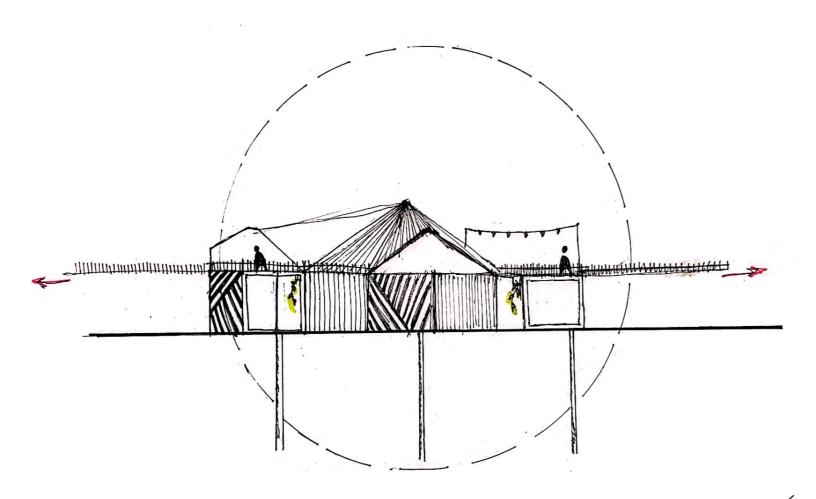


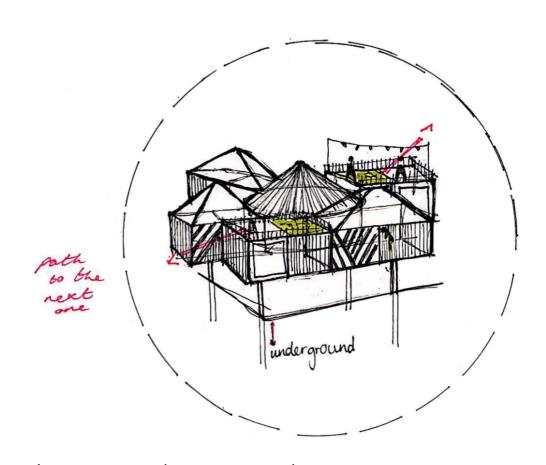
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#### **DESIGN PROCESS**

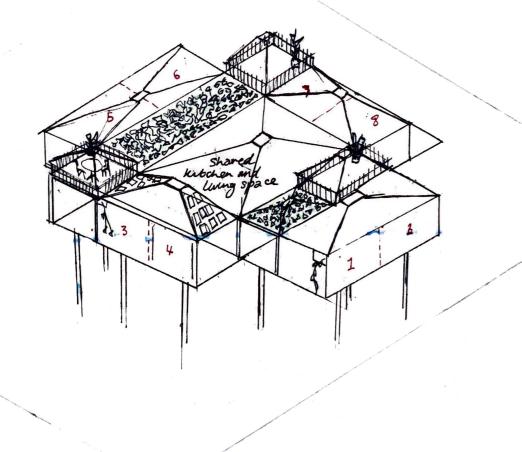
When sketching over the top of the collages I could really see the design come to life from an elevation view point. I started to pick out the features I wanted from the Dazzle Ships and Crannogs. Taking some of the ideas forward from my initial thoughts, designing the student accomodation to be a fun 'tightknit community' that was all connected was my main focus point. When thinking about the overall design to ensure I was bringing that forgotten part back to Leith. Combining the nautical and rustic to become something modern and contemporary was my challenge for it to be an appropriate living space for students.



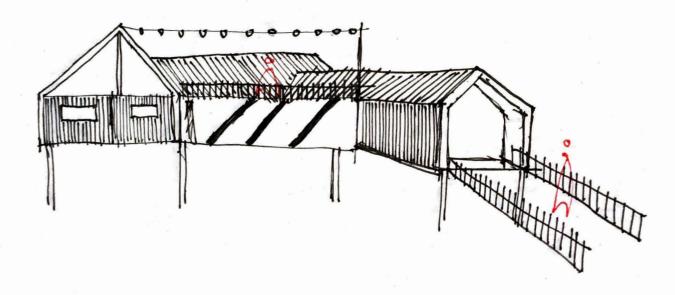




#### EXTERIOR SKETCH PROCESS



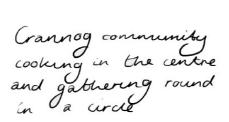




#### **INTERIOR PLANNING**

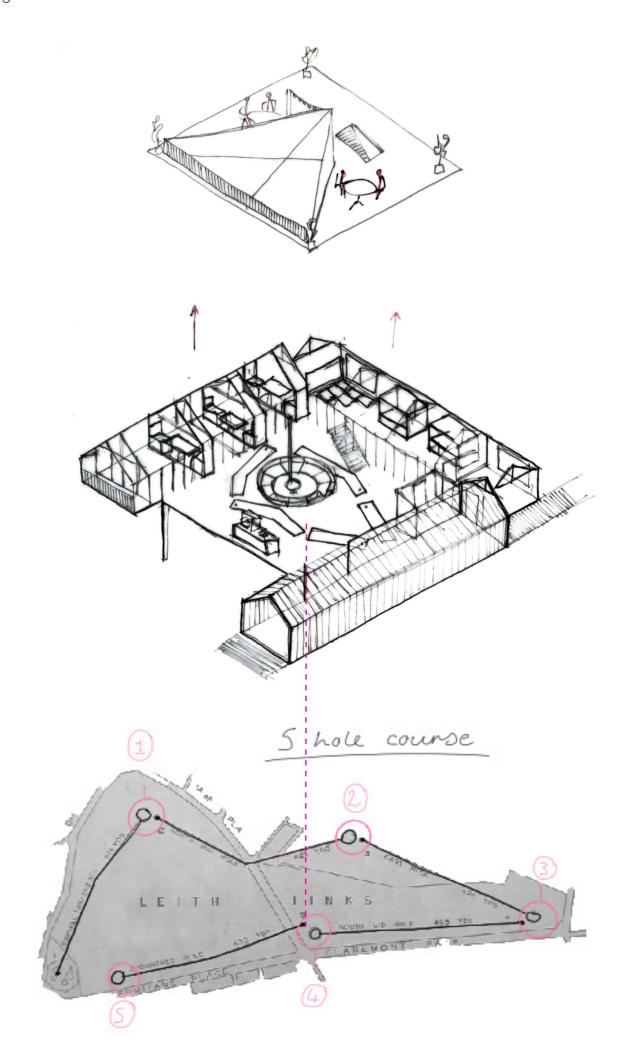
'Life was centred around the hearth'

When visiting the Crannog Centre I came across a plaque of information about the domestic lives of the Crannog dwellers. 'Life was centred around the hearth inside the Crannog. Here they ate their meals,repaired tools and made clothes. Theirs was an oral tradition, without the written word, so sharing news and stories around the fireside would have been an important pastime.' This gave me the idea to centre my whole design around the 'hearth' in the units where the students would gather as a way of socialising and coming together as a community, much like sitting round a campfire, listening to music, singing and eating etc.



#### **LEITH LINKS**

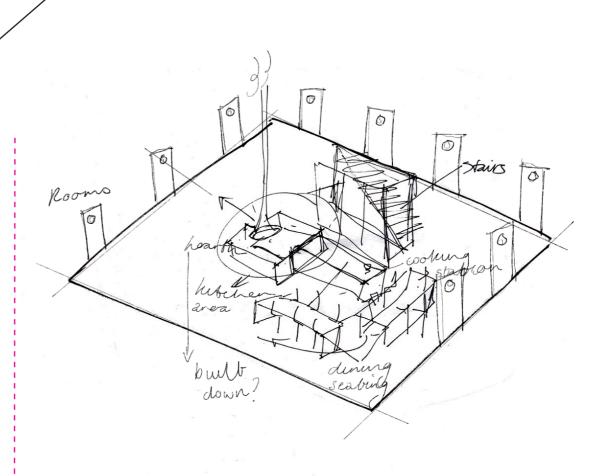
I decided that although I had planned to design several accommodation units, students also needed to have a communal space too where they can all come together and socialise outwith their own units. So I researched further into the lives of the shipmen working at the Port of Leith and one thing I found interesting was that in their free time they would play golf at Leith Links. The golf course is a very important part of Edinburgh's history as the first ever organised golf competition was held there. With the course having a very distinctive layout, consisting of 5 holes, I felt it would be a fun and appropriate feature to have inside the communal unit to have a replica 'mini' Leith Links course. This is one way of bringing back the 'lost way of life' that has been forgotten about the Port of Leith.



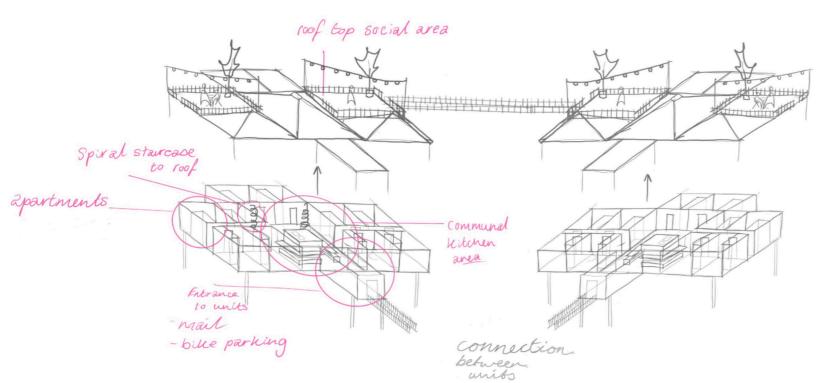
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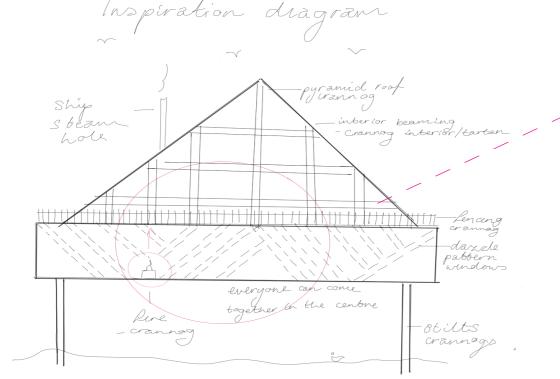
#### CONCEPT DEVELOPMENT SKETCHING

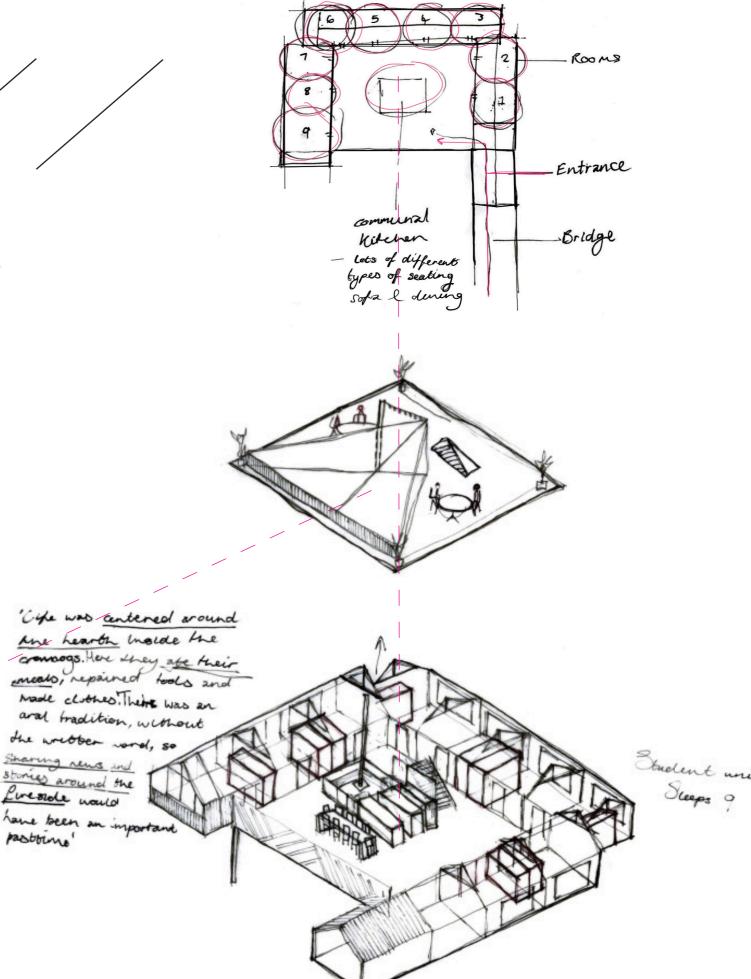
The sketches above are developing the communal space. Figuring out what the design and planning the layout around the Leith Links mini golf course and the hearth. The sketches to the right and on the next page are planning the layout for the student accomodation units, working out how many rooms there would be in each and the layout of the communal kitchen around the hearth.

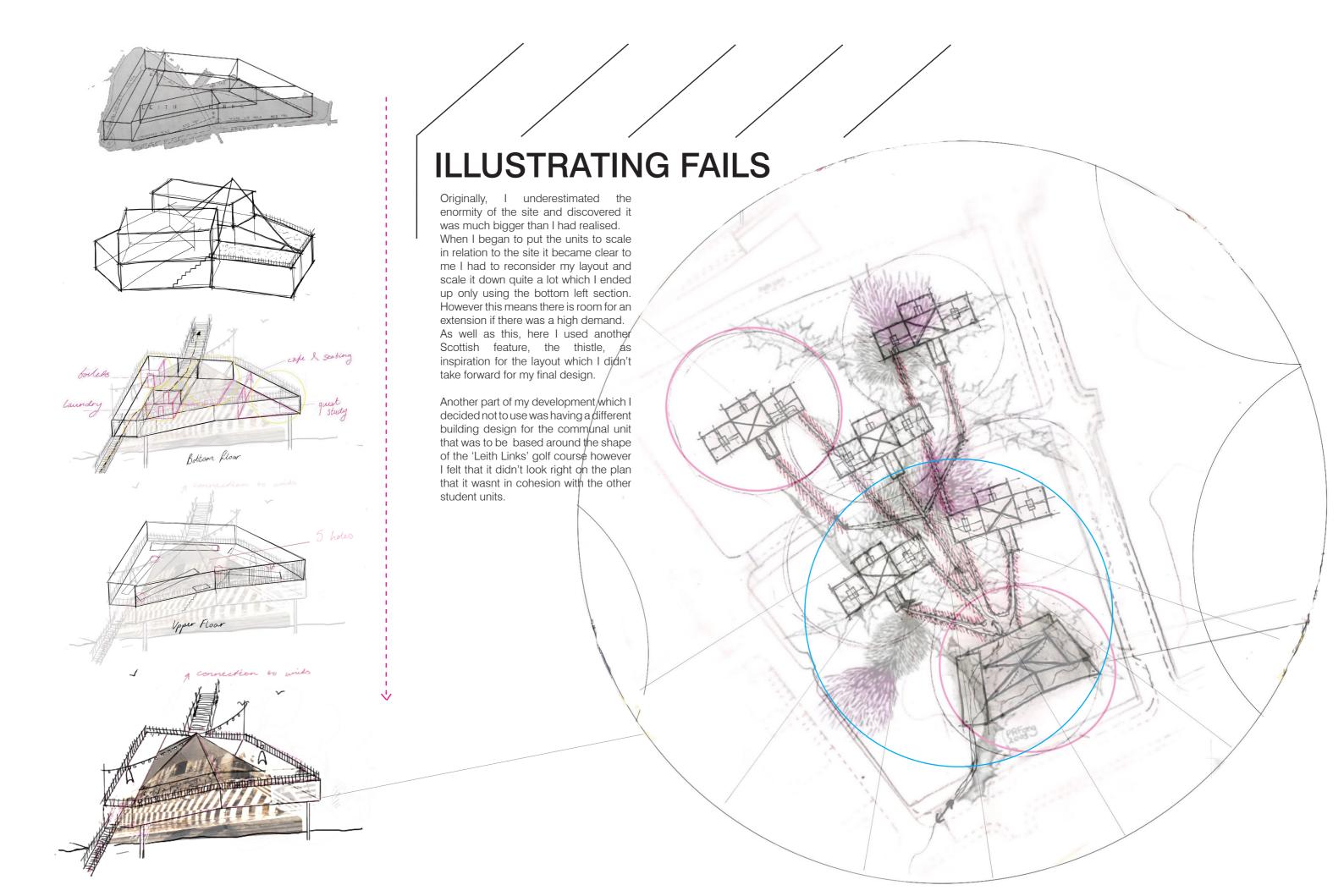


# CONCEPT DEVELOPMENT SKETCHING



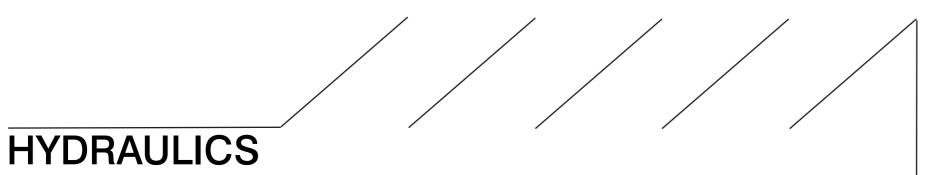






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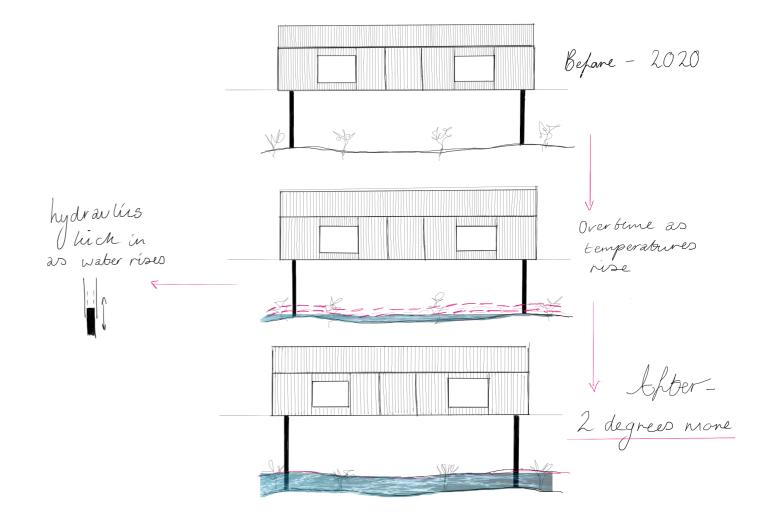


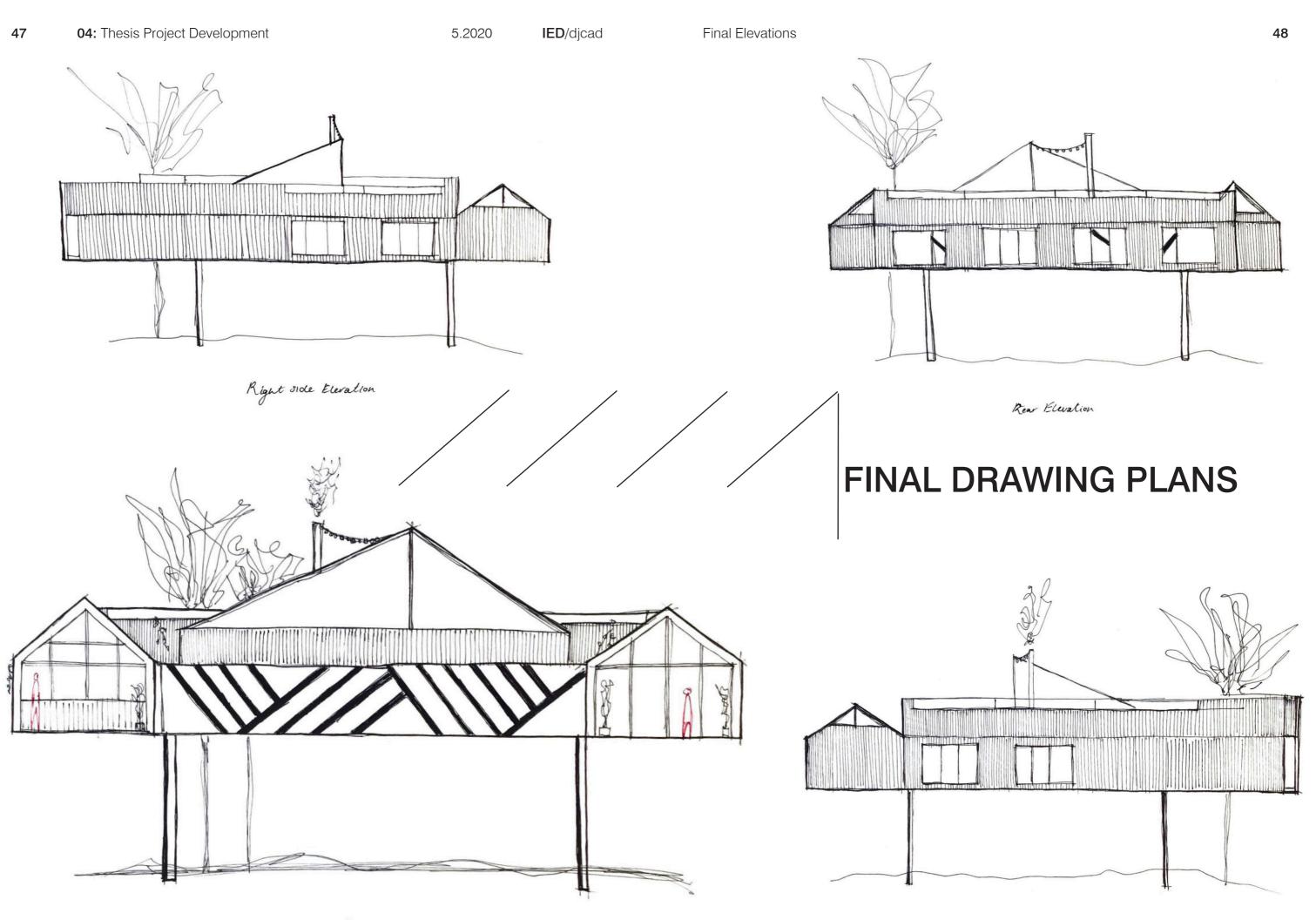
#### **HOW DOES IT WORK?**



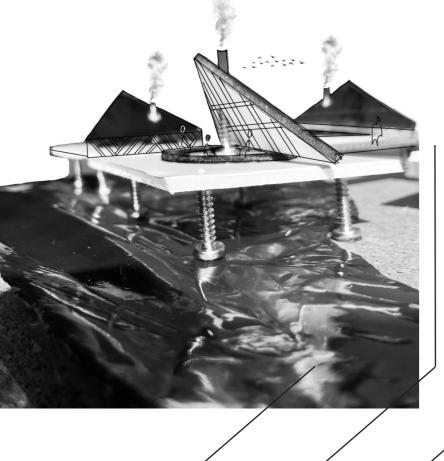
In regards to how 2 Degrees More would work when the area floods, I have incorporated a system of hydraulic jacks which would lift the units if the flood water got too high. Although this may be initially expensive to install, the cost of constant flood damage would be far more and investing in this technology is very sustainable when thinking about the long term savings.

buildings **'Putting** on hydraulic legs is the ultimate flood protection' **Design Boom** 



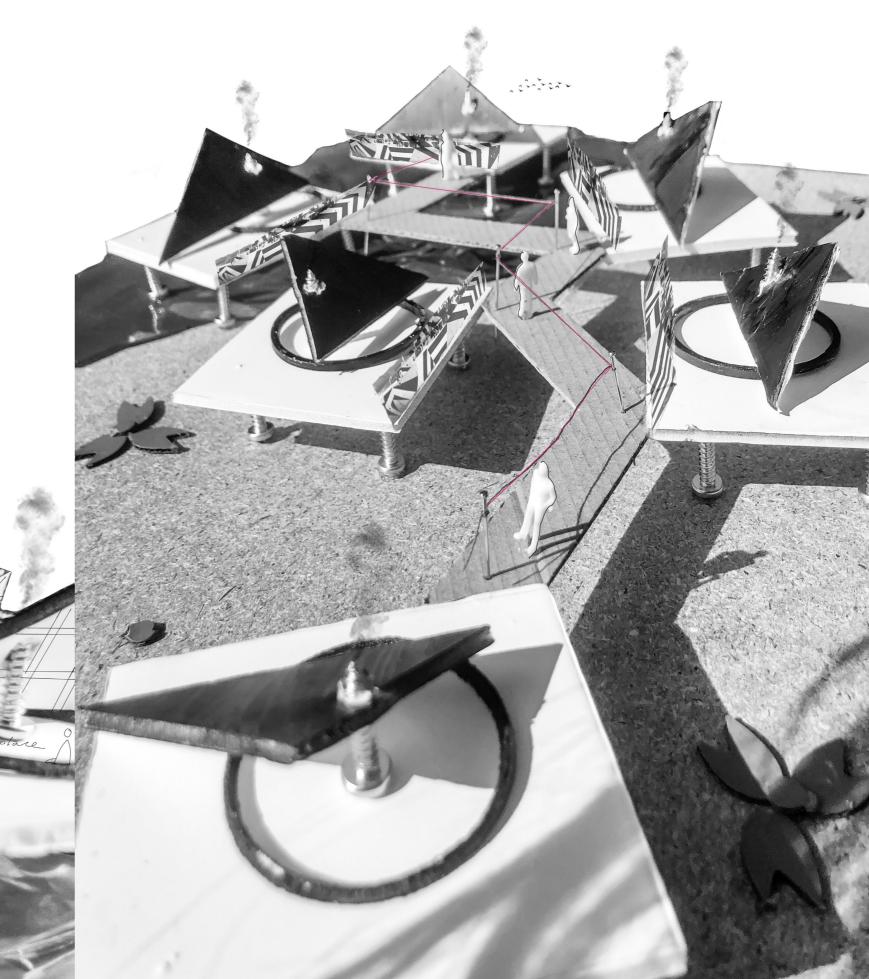


Front elevation Left side Elevation



#### **MODEL**

With a lack of materials and resources and not having access to professional equipment, I made an abstract model of the site plan. Focusing on the connection between the units and really emphasise the sense of community you would feel no matter what one you stayed in. The circles on each unit are to represent the coming together in the centre around the hearth. As well as this I wanted to show the water coming in under the units to capture an image of the flooding.



Materials

#### **FURNISHINGS**

#### **MATERIALS**

#### Zinc cladding



For the exterior, Zinc cladding is used with a prepatinated finish called NedZink NOVA which gives it a lovely matt finish. Zinc cladding is ideal for the units and site as it is weatherproof and corrosion resistant making it very sustainable, being said to last up to 100 years. With the long life of zinc material makes it cost effective when considering whole life costs. The material is also 100% recyclable and takes just half the energy to produce than steel or copper, and a quarter of the energy required for Aluminium. Zinc cladding makes for a sustainable and affordable exterior which is beautiful yet can withstand Port of Leith's coastal weather conditions.

#### Oak Wood



All wood used in the project is from Fife Scottish wood Sawmill, which supplies Scottish timber from environmentally sustainable local sources. Scottish Wood is part of Dynamic Woods, a Scottish Charity formed to promote the revitalisation of our local woodland culture with all the social, environmental and economic benefits that brings with it.



It was important to me that I used locally sourced wood from a Scottish company as when Crannogs were built, the wood they used was what that they had closest access too. Sourcing locally has lots of sustainable benefits.



#### Furniture designs by **ALTEREGO DESIGN**



bute



Pendant lighting

**Nautical** themed lighting



**Fabrics** 



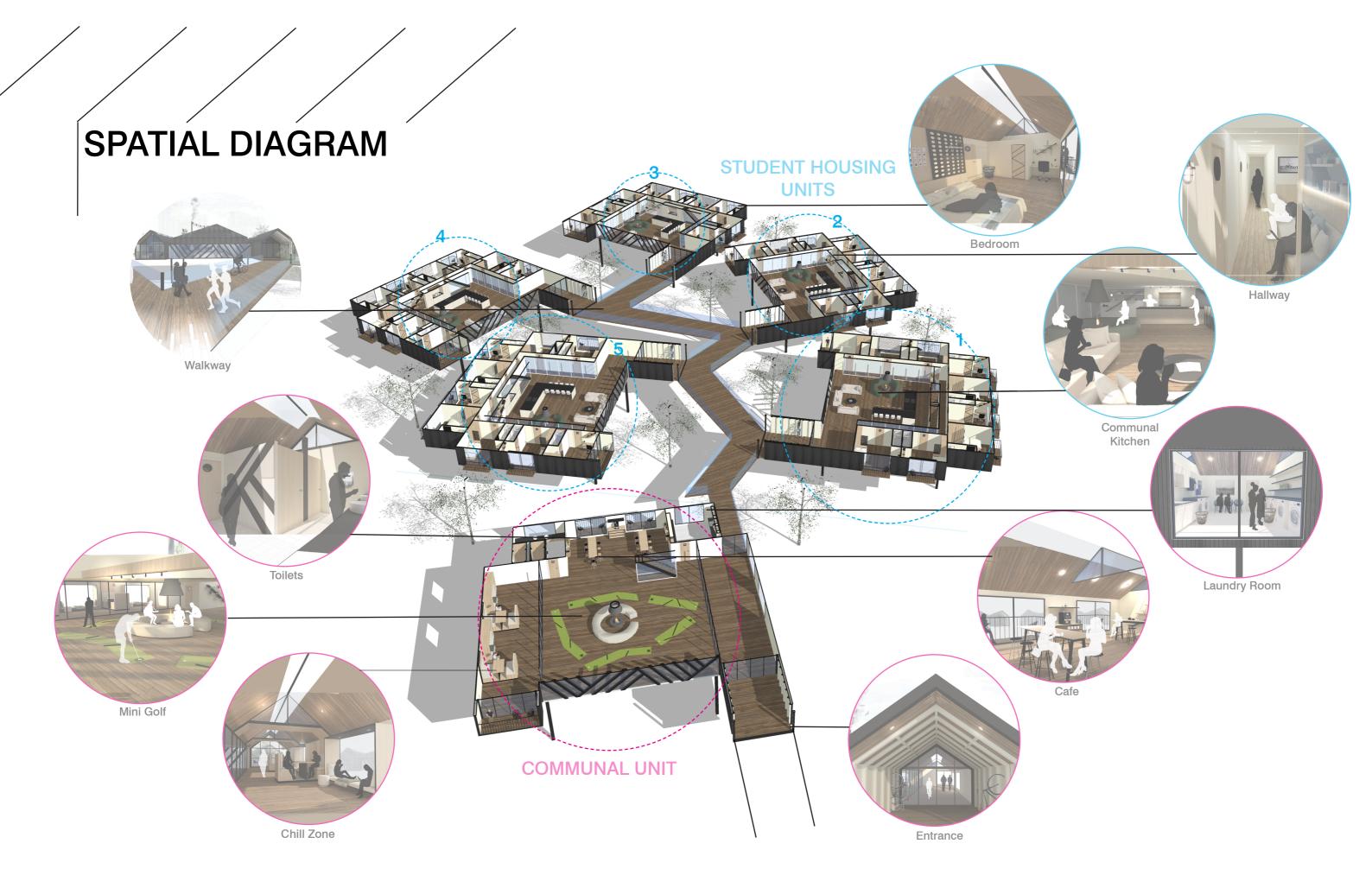
All fabrics in the project are sourced from Bute Fabrics, a Scottish mill creating wool fabrics for upholstery and drapery.

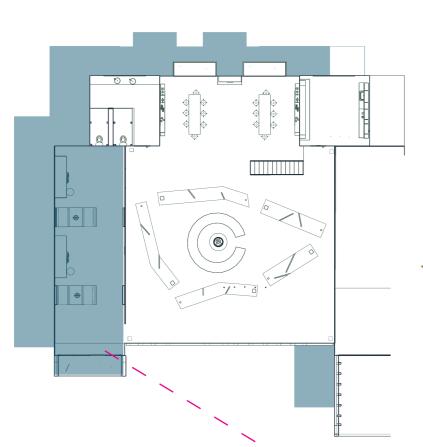


Welcome to the entrance of 2 Degrees More. Here you can turn left into the communal space. Park your bike and you can hang out.
This unit has 54

- -Mini Golf Course -Cafe
- -Chill Zone
- -Rooftop Garden -Laundry Facilities
- -Toilets

Continue straight on through the walkway to the accomodation units.

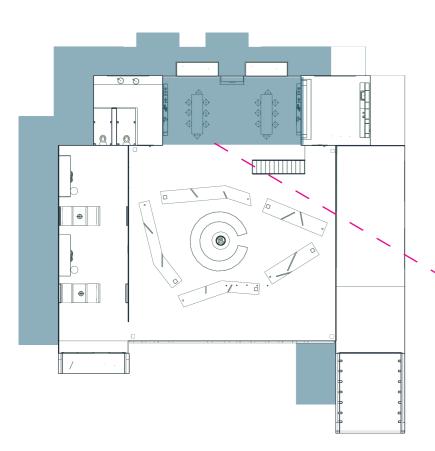




#### CHILL ZONE

Here is the chill zone where the students can sit and relax on the comfortable window seating which offers a beautiful view into the neighbourhood or you can sit at the booth style seating to socialise or have a study session.

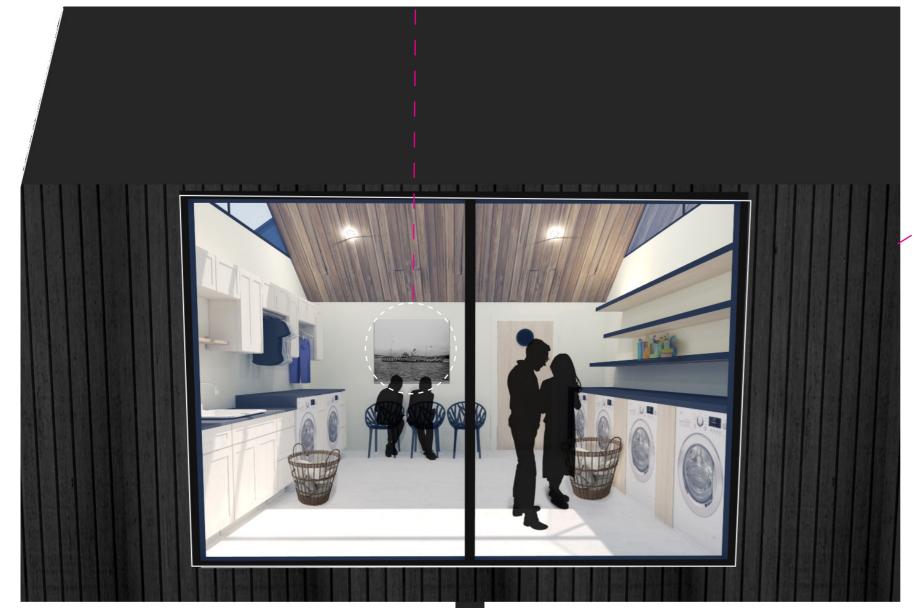




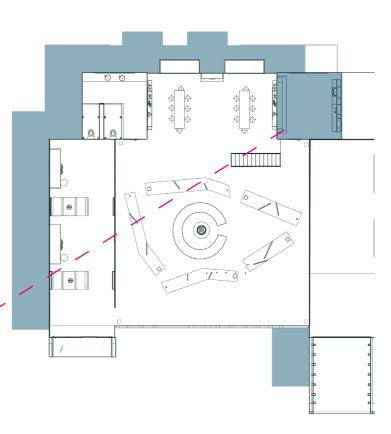
#### CAFE

The cafe has a self service coffee machine for the students to help themselves and plenty of seating to sit and socialise inside or outside on the balcony.



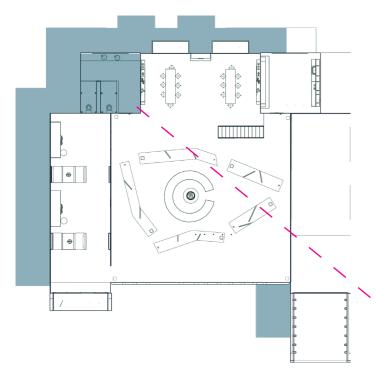






#### LAUNDRY ROOM

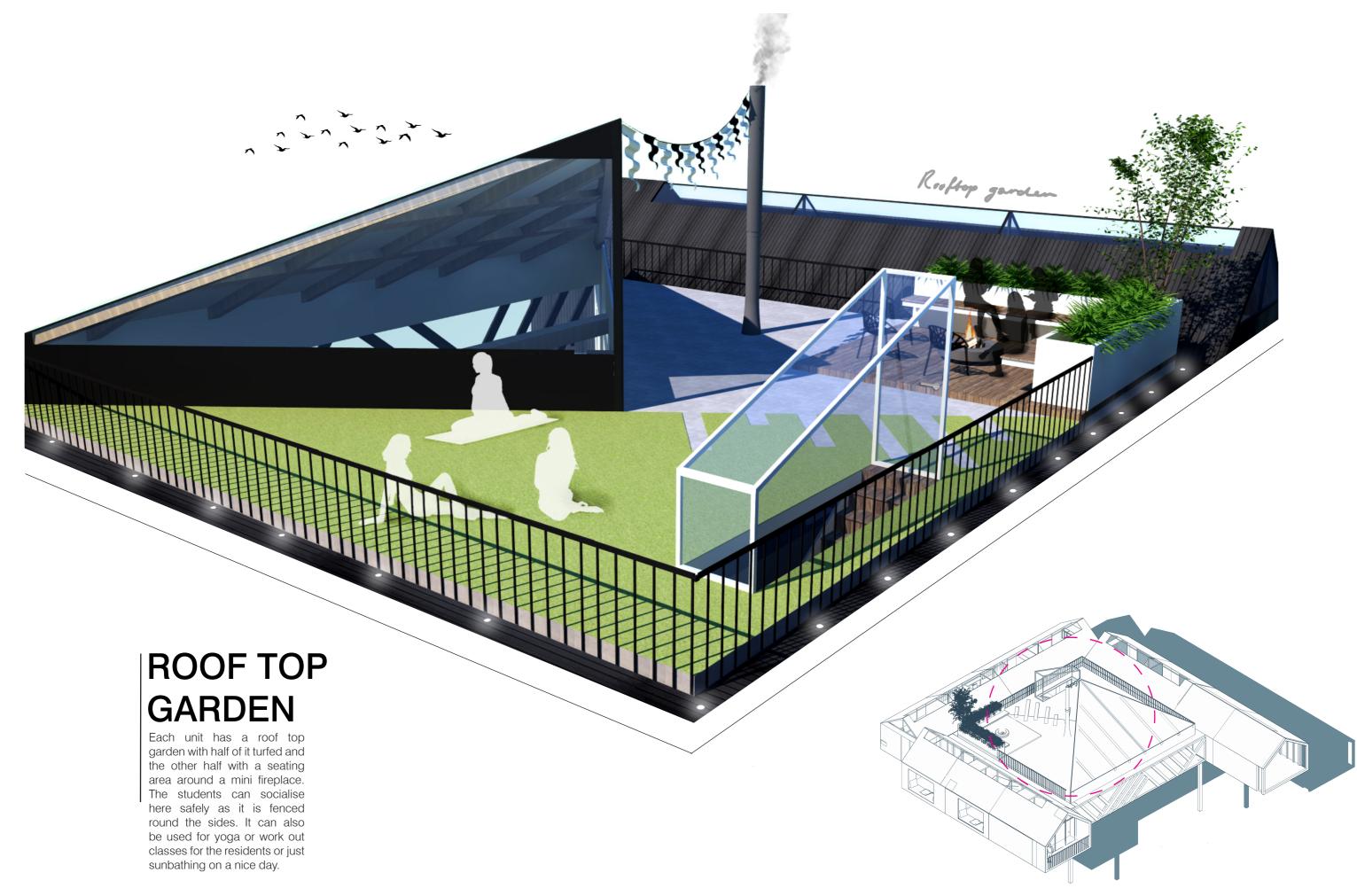
There is one laundry room in the communal unit which provides facilities for all residents.



#### **TOILETS**

Spacious unisex toilet cubicles in the communal unit.





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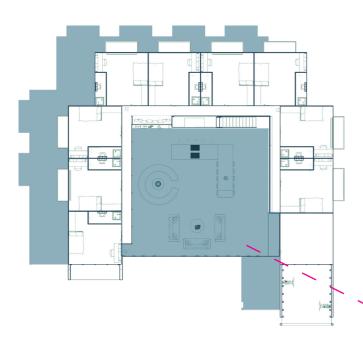
#### CONNECTION

This is the walkway which leads to each of the 5 accomodation units. The wooden zig zag path is a key part of the design. It is the main point of connection which allows 2 Degrees More to be a 'tight knit community'. The path symbolises the horizontal wooden walkway leading to the Crannogs out on water as well as the signature zig zags of the Dazzle Ships.

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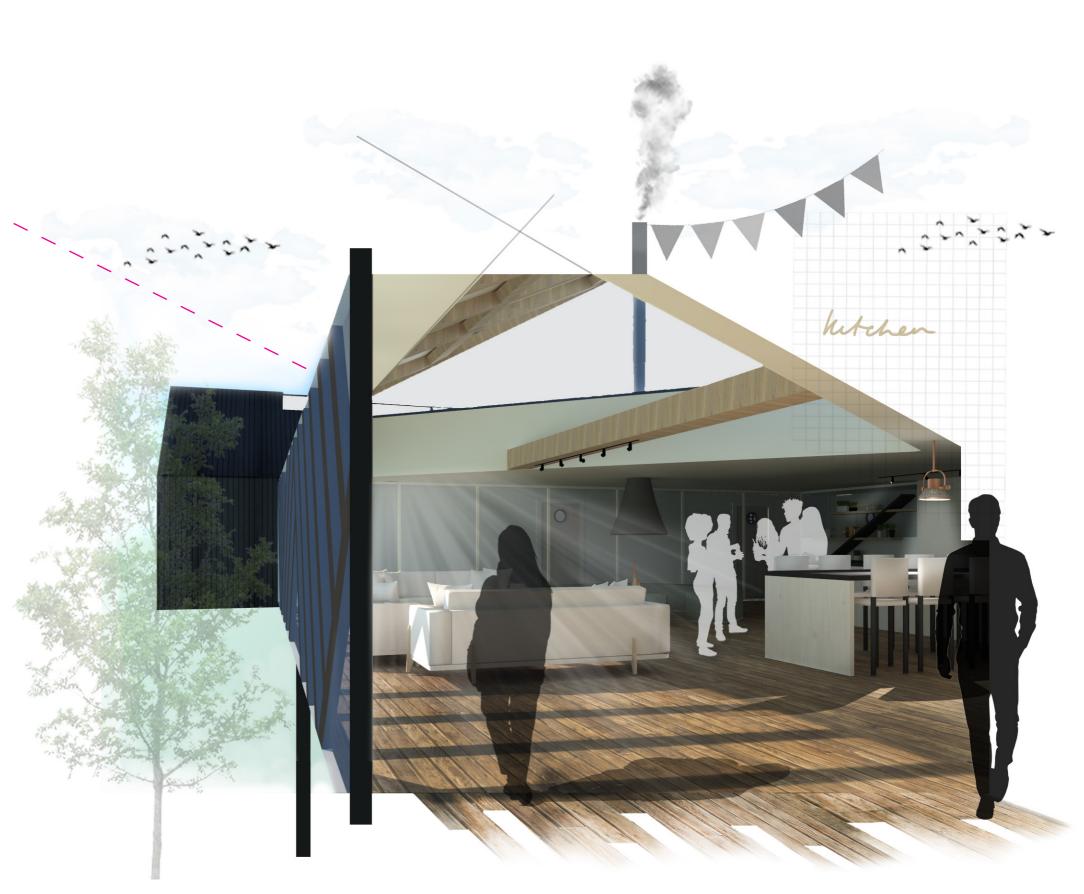
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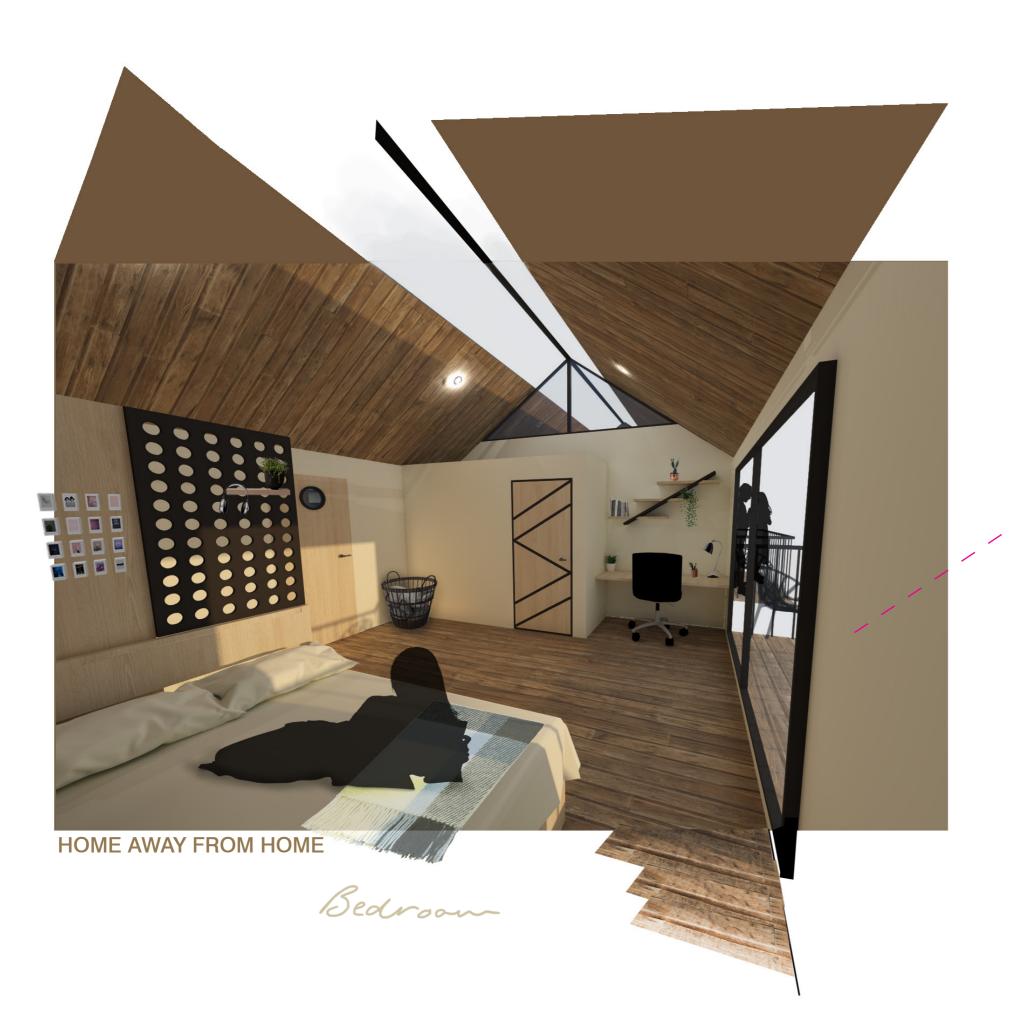
### STUDENT ACCOMODATION UNIT

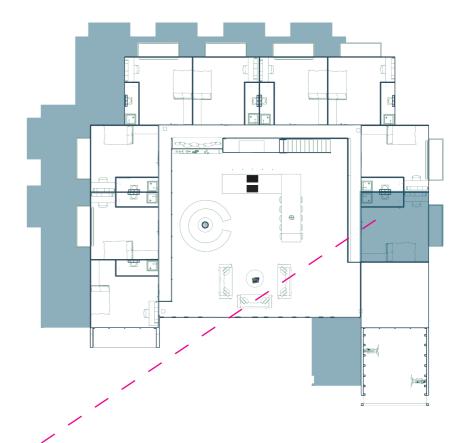
Welcome to a student accomodation unit. There are 5 in total with each housing 9 students. Each unit has a central communal kitchen area which offers several types of seating for it to be used a social space also.





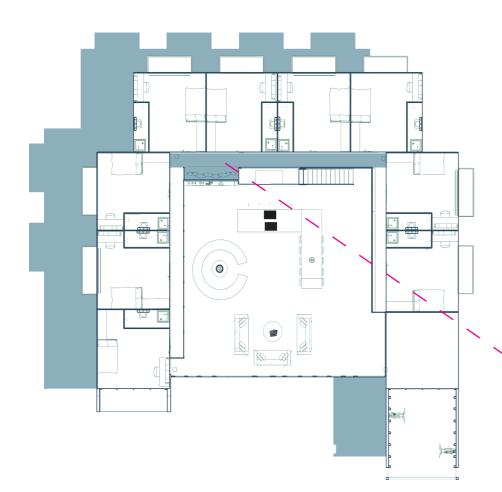






### **BEDROOM**

At 23.5m2, each room is spacious with a private bathroom which includes a toilet, sink and shower as well as a built in wardrobe, desk and shelves and a double bed. All rooms have a brilliant view of the neighbourhood and/or the water through the large windows which all step out on to a private balcony.



### HALLWAY

In the hallway of each accomodation unit there is a small seating area which can be used for a quieter place to sit if a resident didn't want to be in their room or the main kitchen space. In the corridors there are a few nautical themed features in memory of the ships that were once built at the Port of Leith. These include wall lights and 'port' holes on each students door as well as a photo tribute of a dazzle ship that the unit is named after.







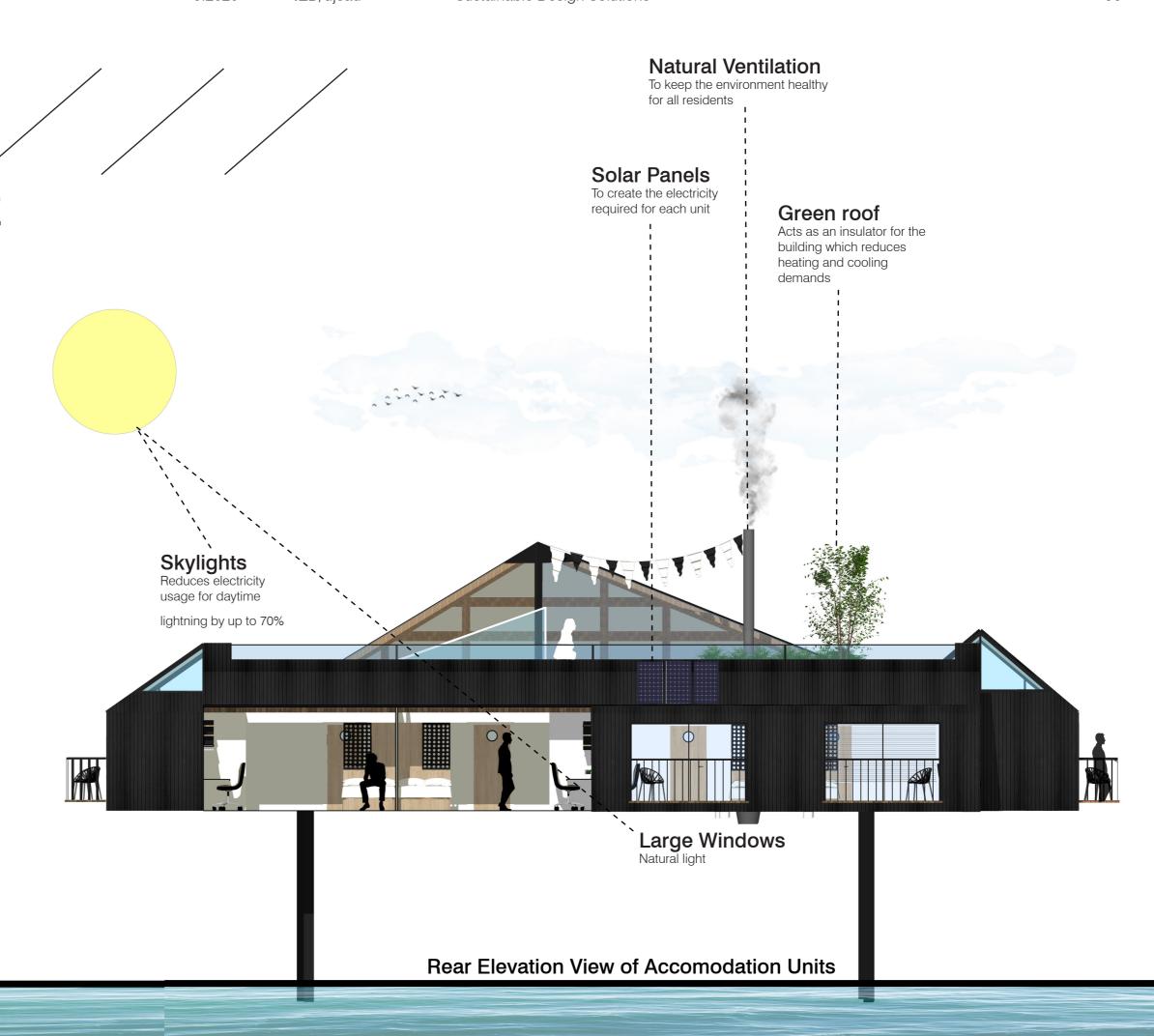
# Walkway 60 unflooded grow

## END OF WALKWAY

Following from the previous page, the walkway will continue all the way to the main road to a safe zone that won't be affected by the flood risk. Thia will provide the residents a safe and easy access point to their accomodation.

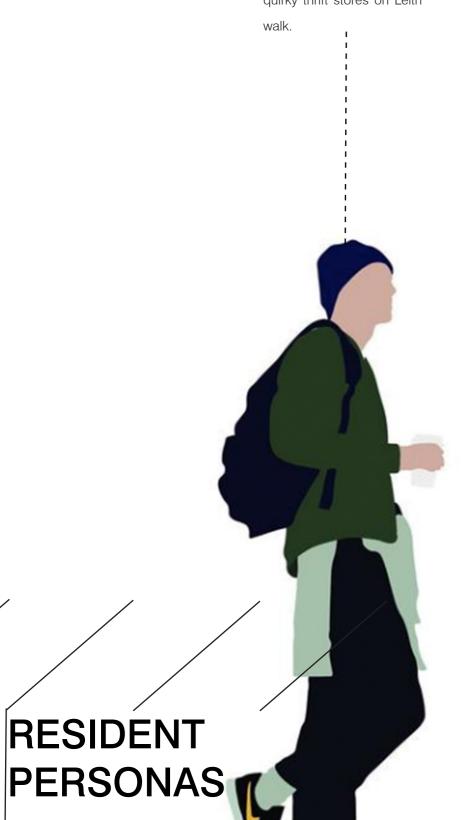


my project was for it to be sustainable for the future, I made sure I designed with this in mind. Here is a diagram showing how I implemented these in to my design.



#### **JED**

Studies at Edinburgh Atelier of Fine Art and is a very passionate about it. He loves to collaborate with the other art student residents. He usually goes to the local pubs for a drink after uni and enjoys looking in the quirky thrift stores on Leith



RESIDENT

#### LEAH

Studies at Leith School of Art. She is quiet and quite introverted. She stays in a unit where there are people with similar personalities and doesn't like to party and socialise as much as others. She likes to have chill nights in the kitchen with her hall mates and she is also in charge of the photography and graphics for the 2 Degrees More website, instagram and blog.



#### **RACHEL**

Studies at Edinburgh University. She takes the new tram line to uni every day which takes 30 minutes and likes that she has this time to read over course work. Rachel likes to go on nights out in the centre with her course mates and the EUSA taxi scheme ensures

she gets back home safely.

#### **DANNY**

Studies at the Academy of Music and Sound. He and some of the other residents on site like to play music around the fire in his kitchen or together in the communal unit. He likes that this gives him an opportunity to practice his music and also provides entertainment for the other students. Danny and a few others have arranged a coffee house night in the communal unit where the students can do a performance if they like or simply come and enjoy the

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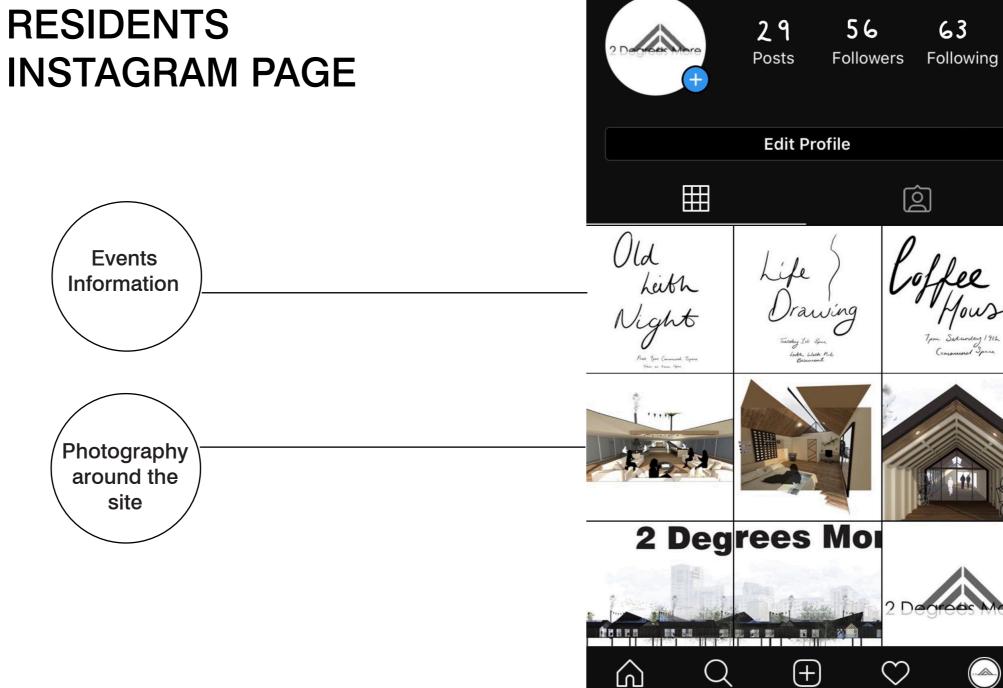
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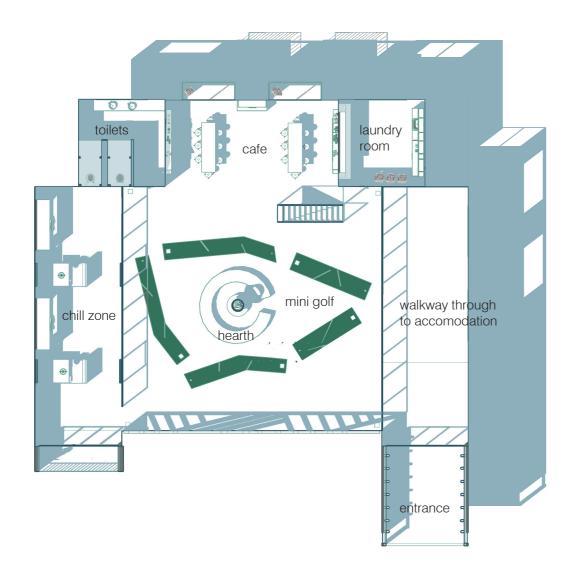
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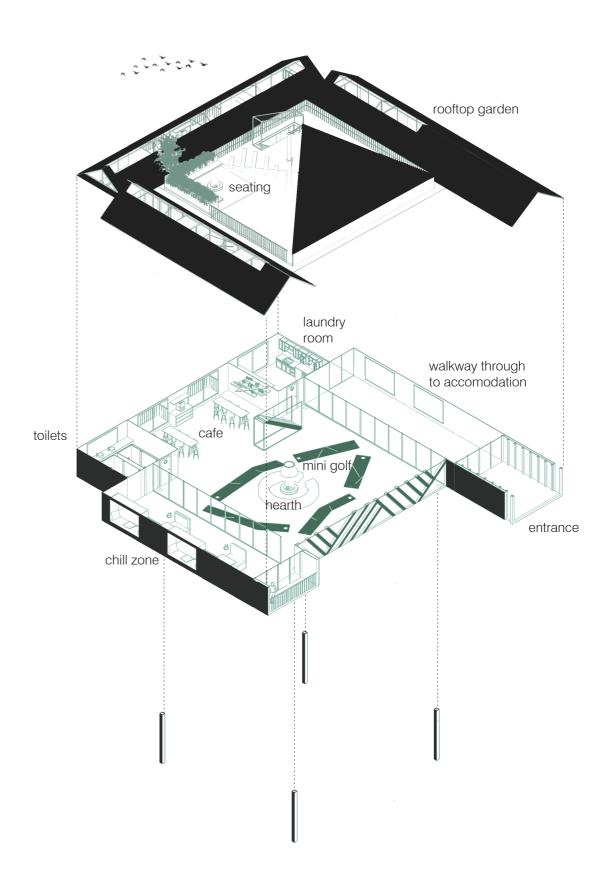
Here is the 2 Degrees More Community Offical Instagram Page set up by the residents. It provides important information about what is going on in and outwith the community and keeping everyone connected and in the loop. This could be events that are happening in the city centre or on Leith Walk or in the communal unit. It is also used as a creative outlet to post what they are up to or some nice pictures they have from on site. Having social media platforms like Instagram in this day and age is essential to provide a sense of community.



5.2020



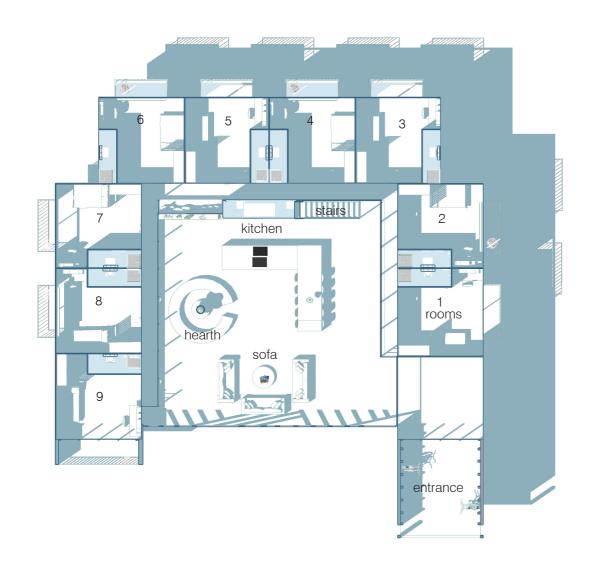


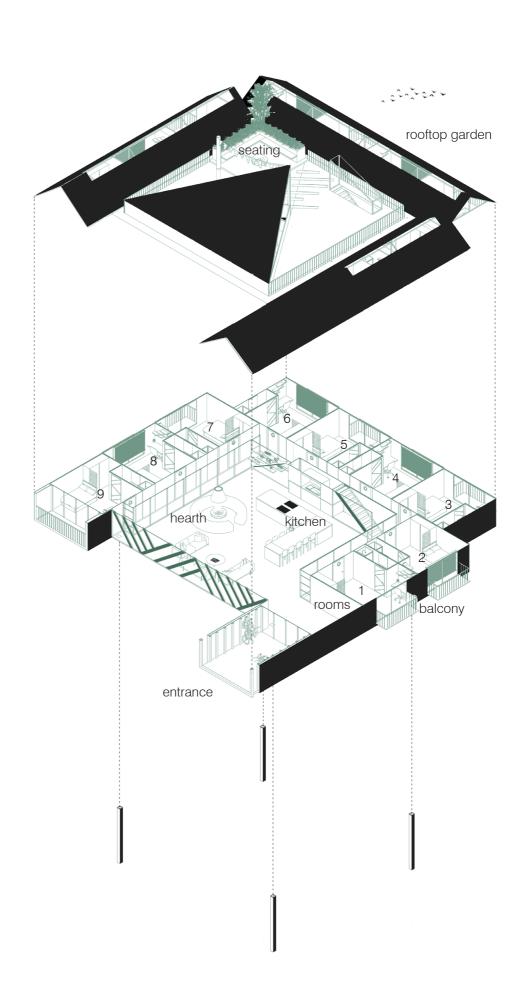


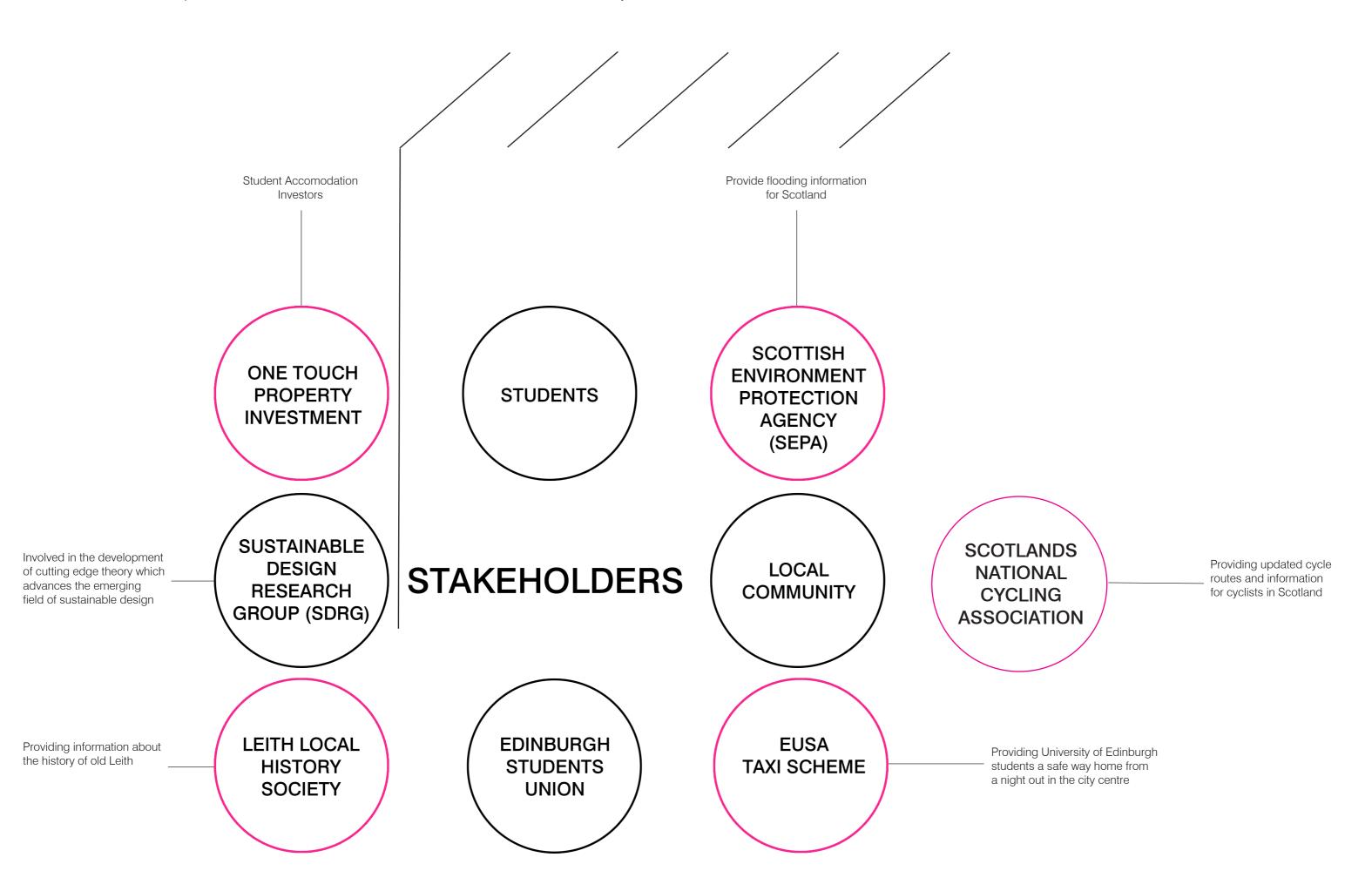
5.2020

Technical Plans

**ACCOMODATION** 







## 2 Degrees Before



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## 2 Degrees More







Special Thanks to Dovetail





