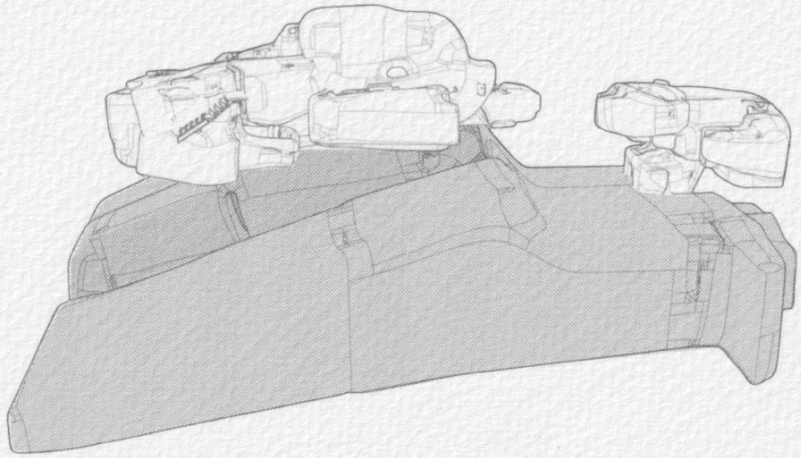


Grant Beaumont

Short form Portfolio

1. **Bartlett BSc and M.Arch**
   Work from undergraduate and post graduate studies at the Bartlett School of Architecture, UCL.

2. **Other Projects**
   Projects undertaken outside of academia, for personal use or as part of a commission.

Portfolio Contents

Bartlett Studio work

Fifth Year Unit 25

Fourth Year Unit 25

Builds and Personal Work

Work in Practice

Show Construction and Commissions

Thesis writing, video content and more work can be found at www.cascade.work

See Video 003 and 004 - Habitat 1

Portland Ecology Centre

1.1 Preemptive Architecture ▸

Designed as part of a postgraduate research thesis, The Isle of Portland Falconers Lodge is an experiment into pre-emption, anticipation, and finding home.

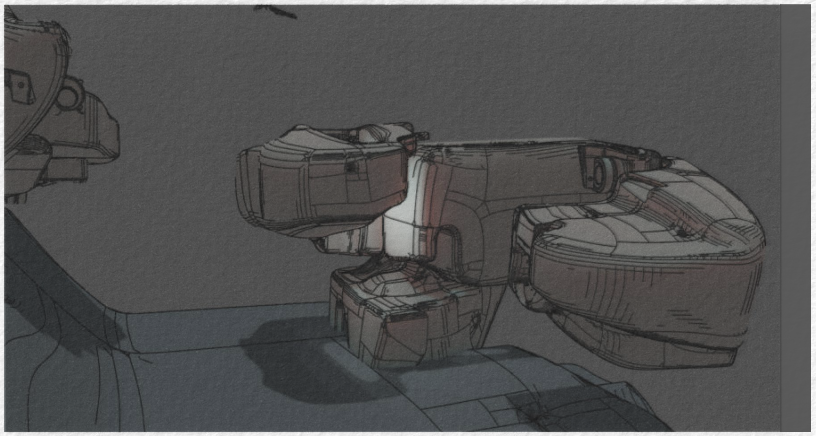
Developed from the unit brief on local ecologies, the project has a fascination with how a building can form intimate relationships with its site on a micro-specific level.

The project is developed as a narrative though the eyes of a falconer and her bird, implementing ecological control on the cliff edge of the East coast of Portland, suggesting the use of falconry to deter and catch damaging invasive species such as rabbits. Playing into the hand of local superstition, the mentioning or sighting of a rabbit is notoriously bad luck.

Using the operations of a falconry lodge, the architecture explores how it can position itself on the site in the most meaningful way possible to perform a particular operation, and hold itself in a state of apprehension in between tasks.

As it does this, it allows for new conditions and spaces to emerge, and with them, the potential for new ecological discoveries.

1



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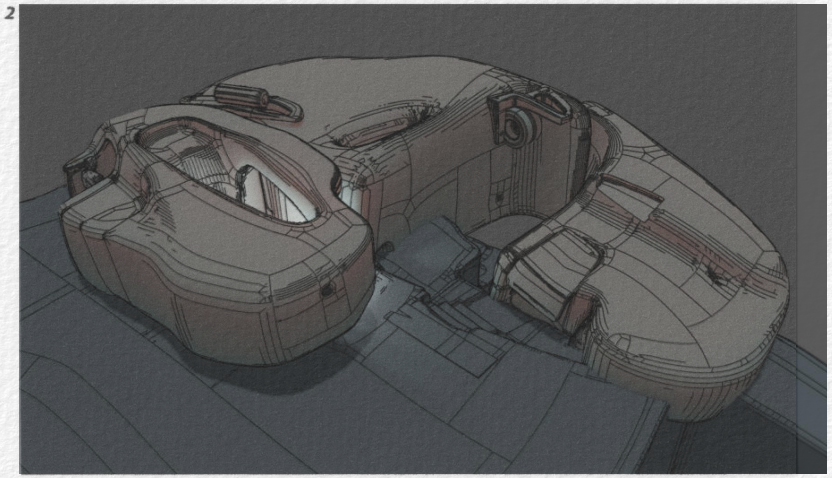

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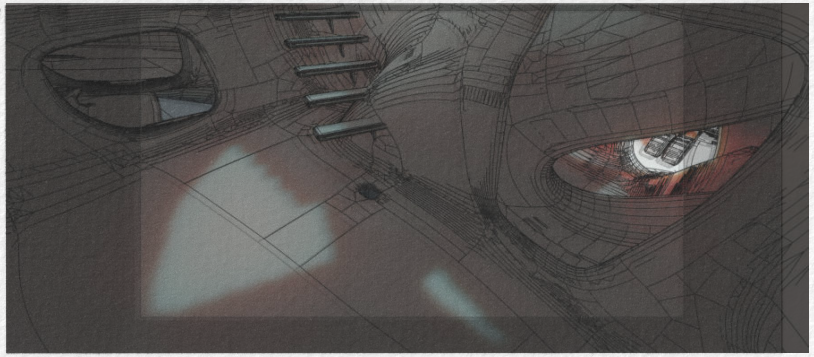
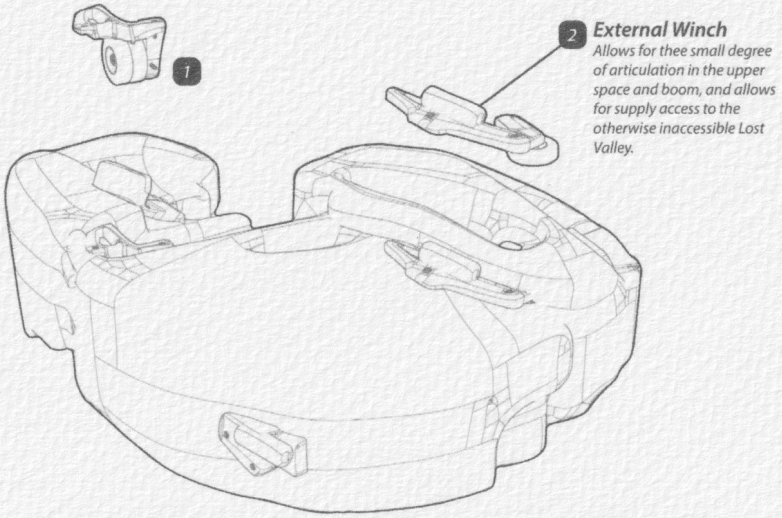


▲ ***The Lost Valley Living Quarters.*** *Spaces are designed to lock together during building movement. Modelled in Rhino SubD, animated, simulated and rendered in Blender.*

1

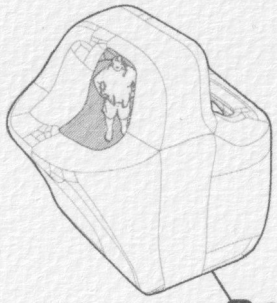


Key Model

Lower Space
Pf600 PU Milling Foam

1 ***Sleeping Space***
The lower living element of H1 is reserved for sleeping.

2 ***Apertures***
Openings in the passage downstairs reveal close access to the cliff surface.



4 ***F5 Lower Living***
A fully private, and largely insulated envelope, for sleeping.

▲ ***The Lost Valley Living Quarters.*** *Habitat 1 is largely rigid, but has a small degree of articulation in its upper levels, as the boom can be adjusted to counterbalance the edge dwelling structure. As revealed in image 1, when the Cliff is removed from view, the arrangement of spaces becomes clear, as the lower levels are pinned into a divot in the upper space, providing access.*

Portland Ecology Centre

1.2 Design for Fabrication ▸

This project was then developed as a means of testing the limits and failures of digital fabrication, and explore how these shortcomings may be a valuable design tool.

By machining the fragments of the lodge from two sides, each element of each envelope must be considered both structurally and specially. For example, Tabs to hold the stock in place become load bearing bulkheads, and Clamps to secure the stock to the CNC bed become fixings in the building. This allows the modelling process to have a direct impact of the architectural outcome.

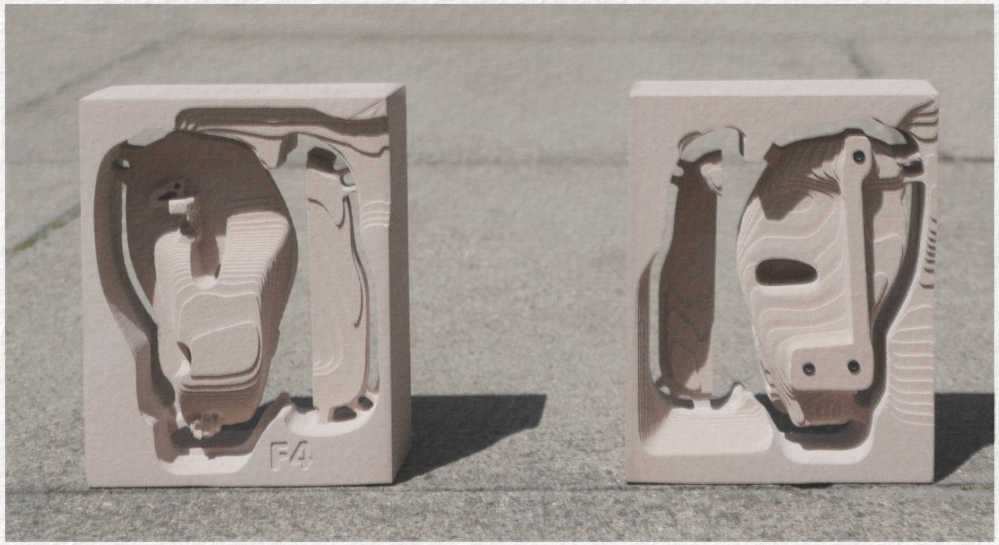
The stock from which the pieces are cut must also be augmented to allow for particular operations. To gain a higher resolution cut with a smaller cutting tool, parts of the stock must be removed to avoid collisions with the bulky chuck. As such, the structure of the building has a digital shadow, and an impact on the surrounding landscape. This process was also used to maximise the synergy between the modelling and architectural process, and allow the fragments to more easily slip between scales.

Thesis Study

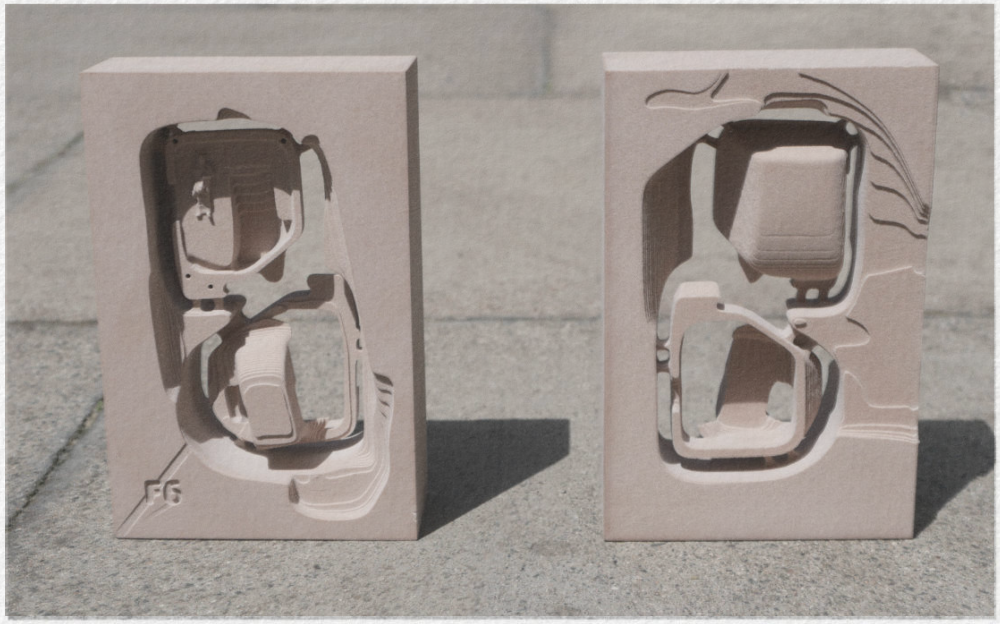
Working in parallel to this research, a postgraduate written thesis was developed, entitled 'The Potential of Failure'. This research explores the philosophical and practical role of failure and things going wrong in the development of the built environment, suggesting that the omission of failure may be a threat to the future of Architecture as a practise.

Exerts of this thesis are available upon request.

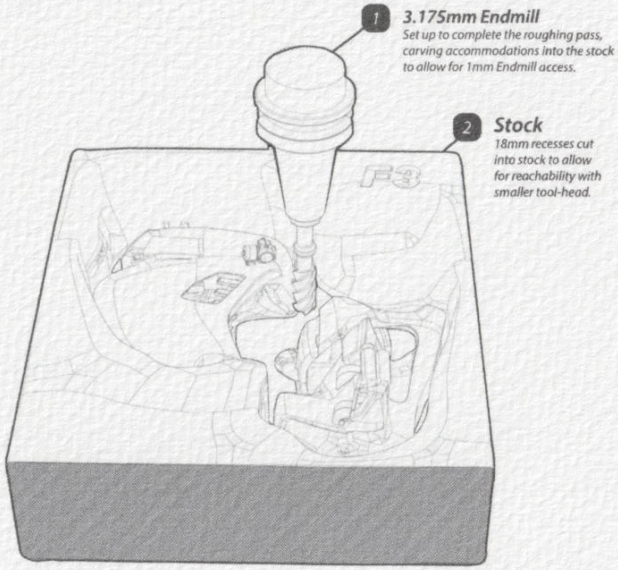
See Video 003 and 004 - Habitat 1



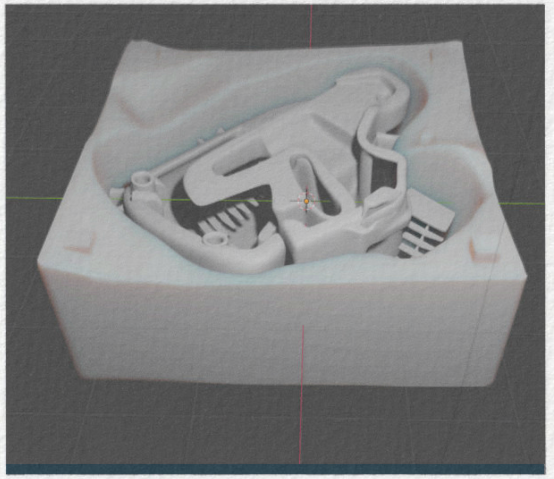
▲ **The Drying Space (F4)** *The First milled space in the building, used to dry out the quarry that the falcon catches. 130mm x 90mm, milled into reclaimed PU600 model board over three tool passes, finished with a 1.5mm ballnose smoothing path.*



▲ **The Lower Living Space (F6)** *As seen rendered on the previous page, this space is milled into two components that assemble post production. 170mm x 90mm, milled into reclaimed PU600 model board over two tool passes, finished with a 0.5mm Endmill path.*



▲ **Augmented Stock**
The stock for the final milled pieces (reclaimed high density PU foam) is also partly milled to allow particular tool access. Smaller tools to create the detail resolution needed in parts of the work piece can only access areas that are free from sheer edges. As such, the work piece begins to have an ***overburden*** *as it must have an impact on the space beyond its boundaries in order to be physically created.*



▲ **The Aviary (F1)** *Each fragment of the building is modelled in Rhino 7, augmented and animated in Blender, and placed into Fusion 360 to develop toolpaths for fabrication.*

Specific Envelopes

1.3 Exploring the Spaces ▸

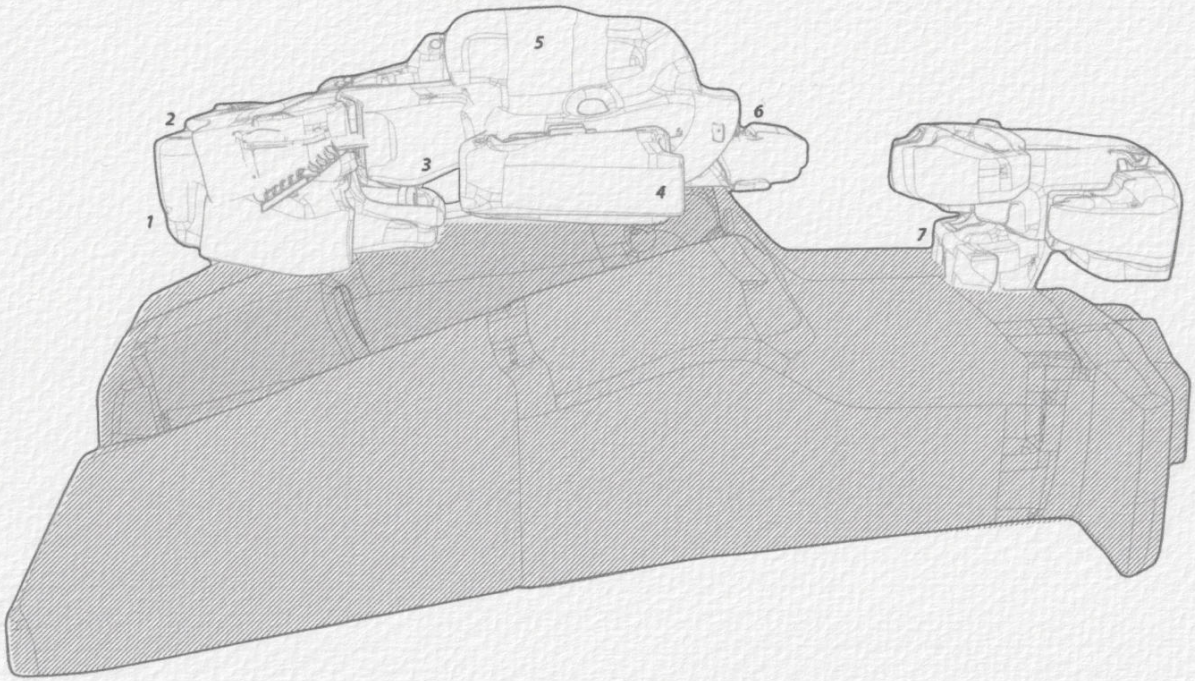
By mapping out each of the operations that needs to occur as part of the falconry and ecological process, a number of specific envelops can be created to accommodate these activities.

These Envelopes can then come together to form two habitats: A space for bird operations and a space for the Falconer to live. Four of the falconry spaces (Habitat 2) Are explored in further detail below.

As Habitat 2 is designed to reconfigure its spaces in order to perform particular operations (Such as drying out the falcons quarry) each of these envelopes much have a carefully considered relationship to one-another. By rotating the drying space (5) through tension, the entire habitat can close itself off.

Details on reconfiguration, including physical testing and simulation are available via the full online portfolio at www.cascade.work.

Habitat 2



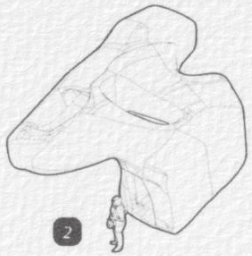
◂ Habitat 1

Accommodation for the falconer and Guests

The primary human habitation area, split into upper and lower floors. Lower floors allow for undisturbed sleep, whilst upper floors can become a research space for visitors

7 Cliff edge contact
Using the fragments of architecture to explore exactly how H1 will rest on the edge of the Lost Valley.

◂ **The Lost Valley**



▲ The Aviary (In two Parts)

Accommodation for the falcon

Two connected enclosures for the falcon to occupy. Upper enclosures connect to the landing strip on the roof, providing an area for landing.

1 Rest Space
Equip with perches, this space is used exclusively for the bird to rest undisturbed.

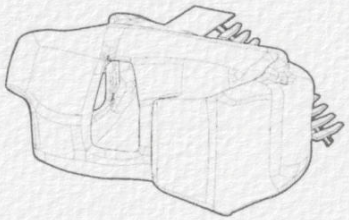
2 Tiring Space
A space for feeding the falcon, with access to the landing strip.

▲ The Airlock

Separating Enclosures

A 5m² enclosure that separates the aviary from the other operational spaces, ensuring that there is not direct line of site out of the rest space.

3 Lines of sight
Two doors in the airlock ensure that even if the falcon were to enter the space, it can't proceed into the dryer.

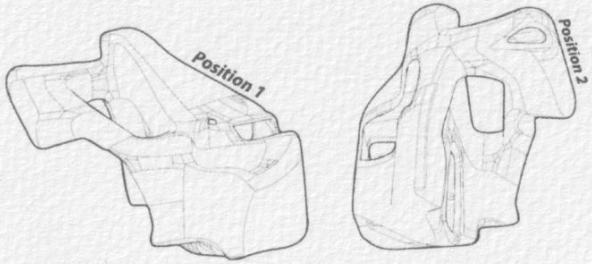


▲ Tensioning Entryway

Adjusting the buildings movement

A predominantly static enclosure, providing access to Habitat 2 for the falconer, and home of the winch to contract the building depending on operation

4 Mechanical Movement
Tension applied to a cable in this space is capable of shifting the dryers orientation, and contracting H2.



▲ The Drying Space

Treating the Catch

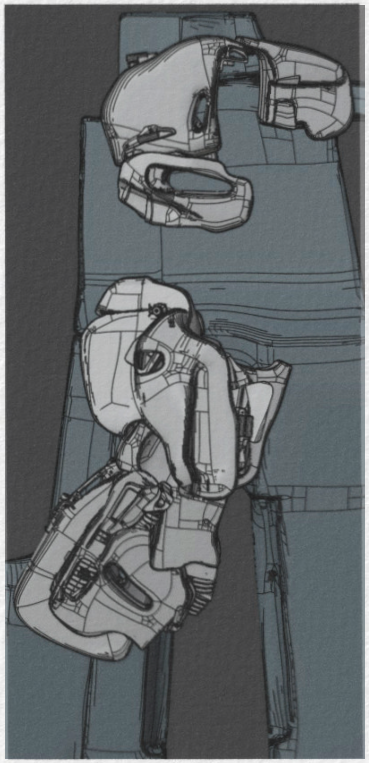
Used to dry out the quarry that the falcon catches before feeding it back to the bird for tiring. Rotating the space allows for the heat from a heat pump to be contained or vented.

5 Inverting the Horizon
When reorientated, the operation of the space changes, but it must also be re-navigated from a new perspective.

Portland Ecology Centre

1.4 GA Digital Studies ▸

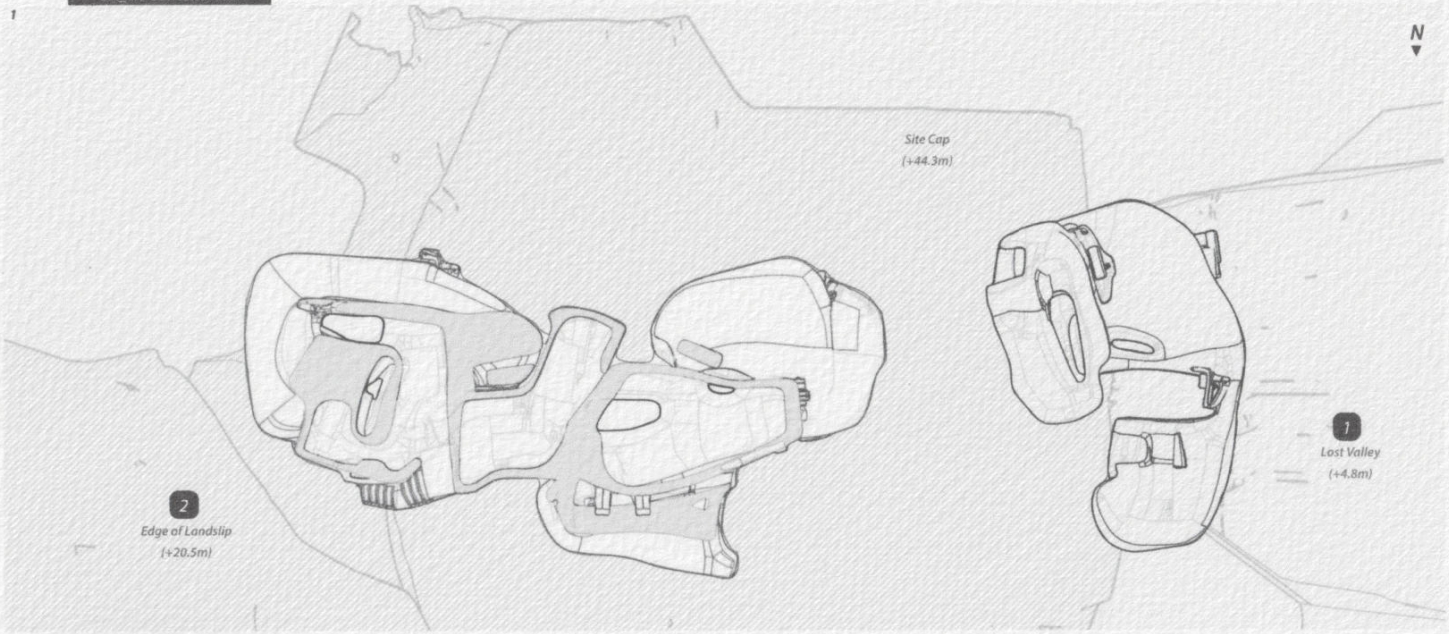
The two habitats that make up the falconry lodge and ecology centre have a resting home position. When no tension is applied to the building, it sits comfortably between the edge of a valley (the Lost Valley) and the sea edge on the East coast of the Isle of Portland. This part of the cost regularly has land slip activity, and the plates of Portland stone that the building rests on are in constantly flux. Because of this, the building will undergo constant adjustments even between operations.



▲ *Cast wax fragments of building, used to explore how the spaces rub up against one-another when tension is applied though them. Surgical thread is routed though each of the pieces, and tethered to a fixed point to emulate the winch.*

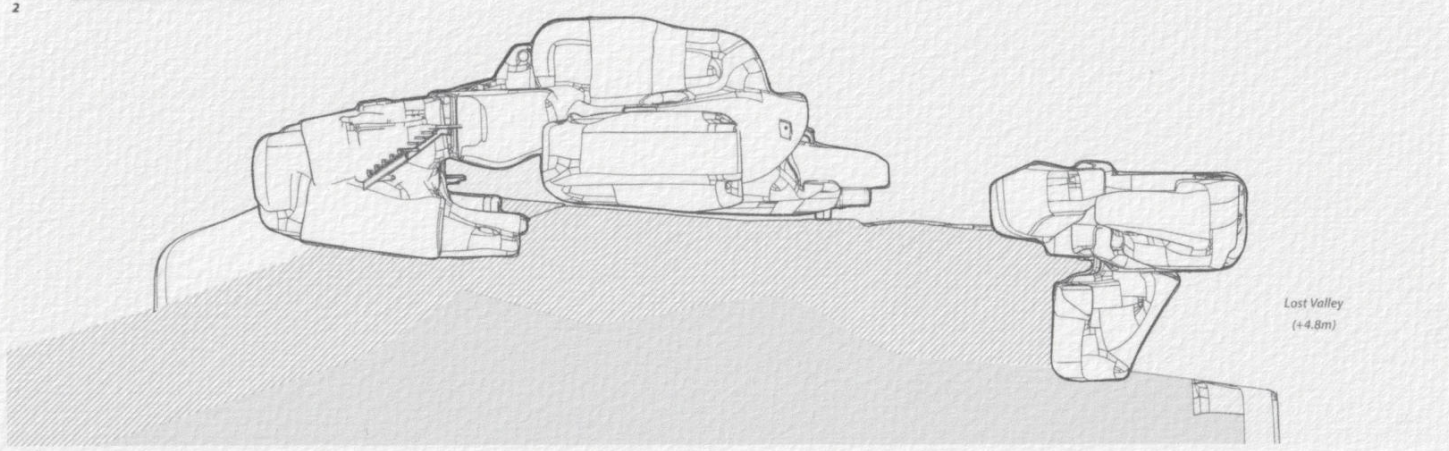
1

GA_01 Context Plan



2

GA_02 Context Elevation



1 The Lost Valley
A 12m valley running along the rear of the site, separating the shifting landslip from the active quarry. This part of the site is largely inaccessible, but can be reached on foot from the corner of the site.

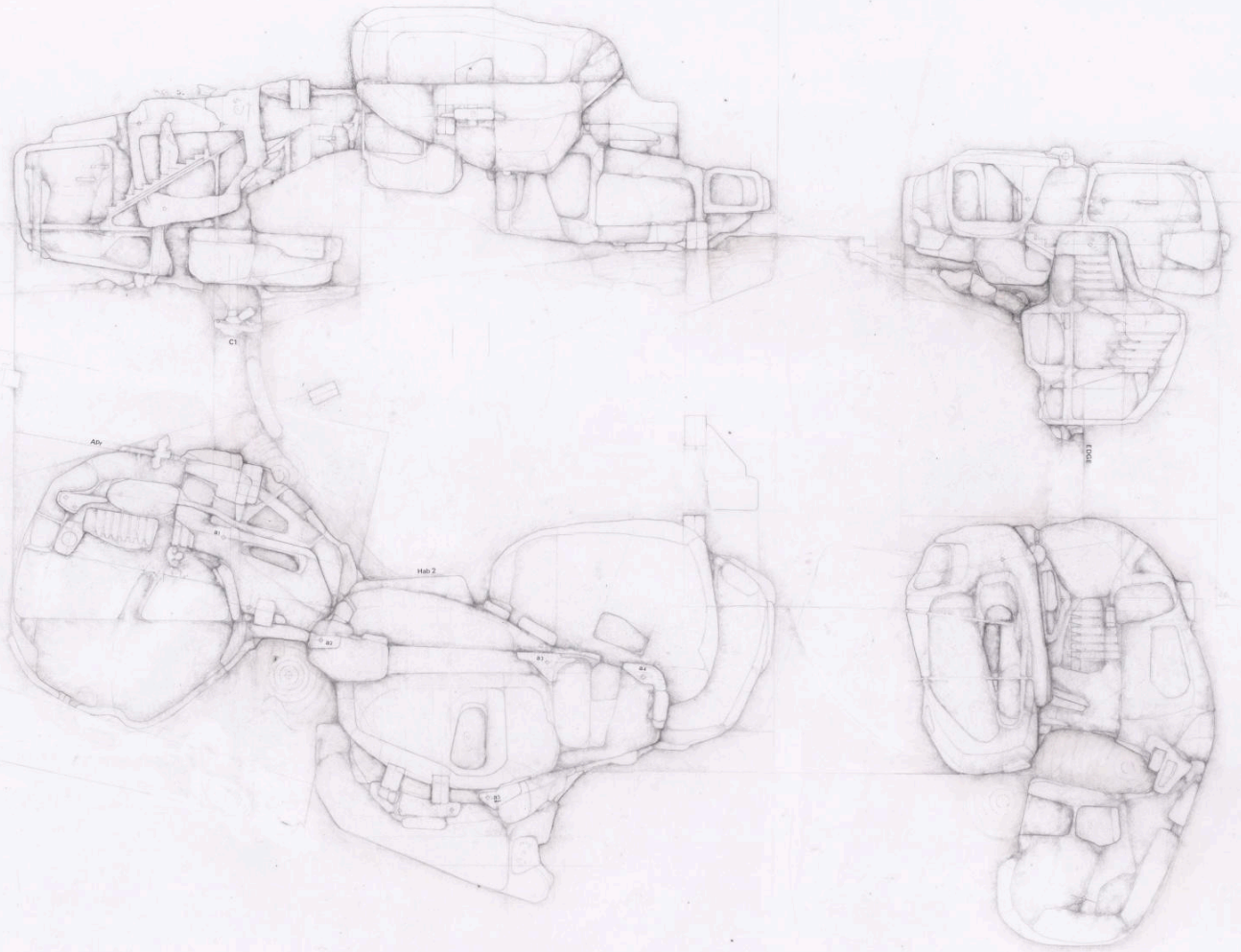
2 The Gradual Landslip
The main landmass that the lodge is located atop, and anchored onto. This section of Portland stone is gradually slipping Eastwards towards the sea edge, at an incremental rate. Sudden and unexpected landslips are however possible at this location.

0 4 8 12 16 20 M
1:200 at A3 Print

1.5 Graphite Anatomical Studies

A 1100 x 1500 hand drawing exploring the GAs of the building through an anatomised, dissected lens. The top down approach, more familiar to the falcon calibrates with the models through the bolt on details such as the Air supplies and buffer wheels.

The plan and section are elevation hybrids. Areas of importance on the outside of the building such as access staircases and wheels are kept visible, whilst areas of homogeneity in the buildings skin are carefully unfolded to reveal the context of what lies beneath.

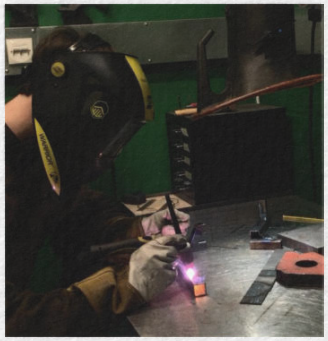


Designing an Accomplice

1.6 Making tools ▸

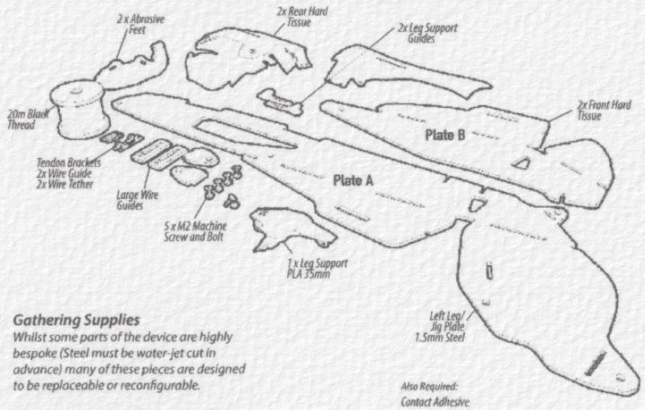
Before arriving at the site, the falconer begins construction of her accomplice device, to explore moments of interest and discover how the falconry lodge will need to behave in such a turbulent and unpredictable environment.

The companion goes though numerous prototype iterations, before a rigid 2mm Steel chassis is machined. The specific curvatures allow for a range of shell tissue to be formed that may enhance the device as it first goes to site. As more specific needs arise, the jig is adapted with tendons and soft tissue, allowing of this rigid shell to find particular approaches to position itself for the site in its roaming explorations.



▲ ***Piece B is developed in an identical way to Piece A, simply utilising a different part of the Steel jig (Section 1.3)***

1.1
Required Components



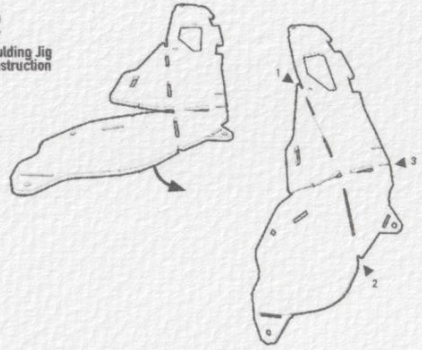
1.1 Gathering Supplies

Whilst some parts of the device are highly bespoke (Steel must be water-jet cut in advance) many of these pieces are designed to be replaceable or reconfigurable.

The hard tissue used in this pamphlet is an example leg structure, but depending on specific use, and specific location; different pattens should be explored.

Also Required:
Contact Adhesive
A Securing vice
A steady hand

1.2
Moulding Jig Construction

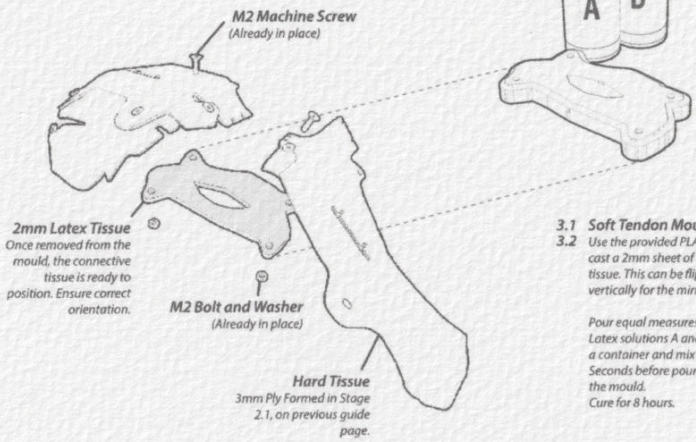


1.2 Bending the Jig

Plates A and B are primarily designed to be used in structuring the hard tissue (Step 2.2). In order to do this, they must first be bent along three planes, pointed here. Each bend is a mountain bend, between designated folding cut-outs.

Repeat this process for plate B.

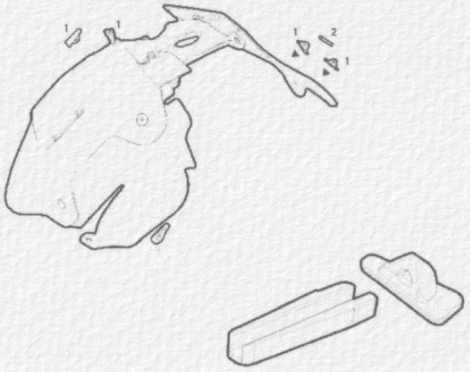
1.3
Attaching Connective Tissue



3.1
Casting Connective Tissue

3.1 Soft Tendon Moulding
3.2 *Use the provided PLA Mould to cast a 2mm sheet of connective tissue. This can be flipped vertically for the mirrored leg.*

Pour equal measures of Latex solutions A and B into a container and mix for 60 Seconds before pouring into the mould.
Cure for 8 hours.



3.3 Tendon Preparation

Before the accomplice tendons can be constructed to apply pressure on the device, the infrastructure to support this must be put in place.

5 x Cable tethers and 2 x Cable guides should be secured directly to the hard tissue with contact adhesive in the positions shown in diagram 3.3.

1 Cable Tether
Allows tendons to be tied onto the frame, or pass through at a specific point

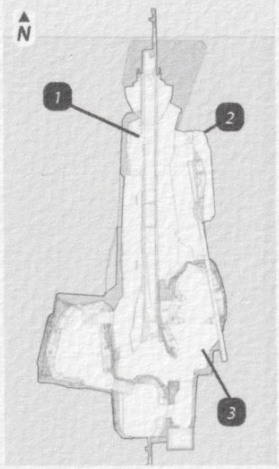
2 Cable Guide
Guides the tendon over uneven surfaces to prevent ware or damage to the hard tissue.

Boat Repair Station

1.7 Fourth Year Design ▸

The Brighton boat repair station is designed to be a testbed of belonging, shadows, and displacement, creating a building that doesn't quite belong in its context.

The project explores displacement by testing how boats undergoing restoration or demolition can become embedded within the schemes architecture in fragments, and how this acquisitional act allows the architecture to claim experiences it never had- if a barnacle is earned through venture at sea, what right does the workshop have to exhibit one? The project then goes on to explore how these jarring moments may be experienced within the building, simulating and rendering how the hulls, workers, context and structure may homogenise during the restoration process.

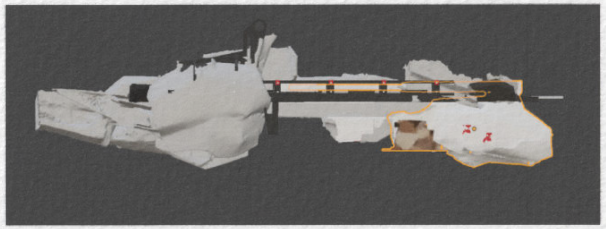


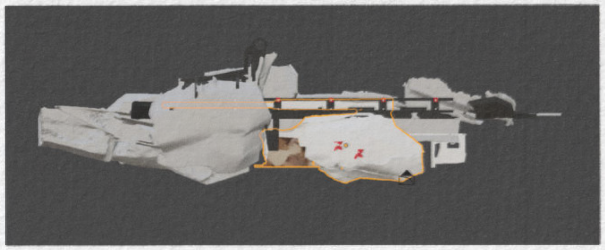
▲ ***Position One (Top)*** *Boats being loaded into the gantry system from Church Street.*

1. Boat entry point
2. Door System
3. The Silo

Workshop Gantry ▼

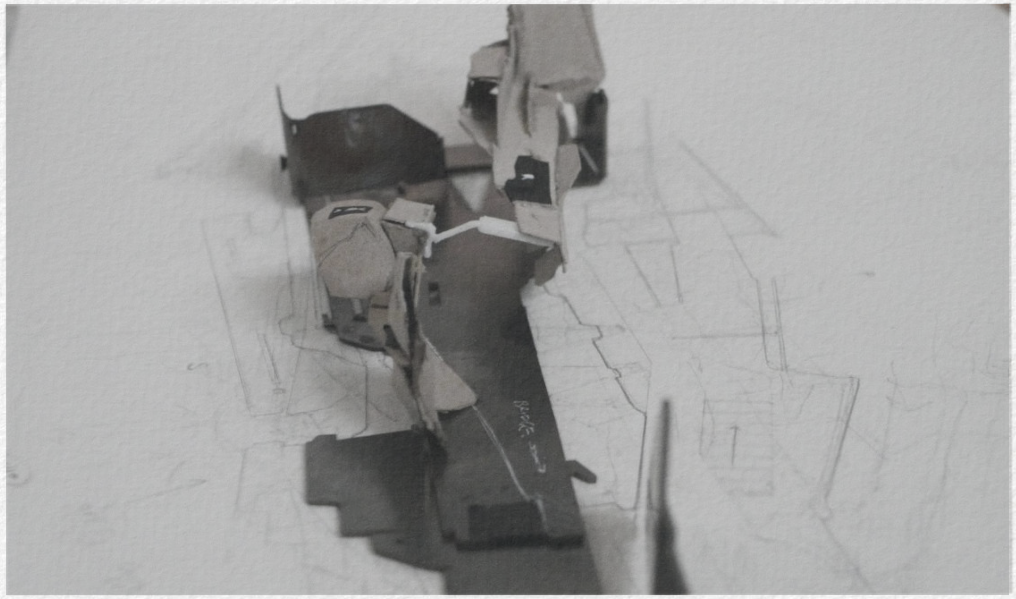
The atrium of the workshop space was designed around a prominent boat gantry that collected, moved and suspended the hulls inside the architecture during the refurbishment or decommission cycle. The Boats will remain suspended on the Gantry during work, but can be lowered to the floor of the atrium and chocked if a particular operation requires this. Boats will connect to the gantry through 4 ratchet straps, rated to hold up to 4 tonnes each.



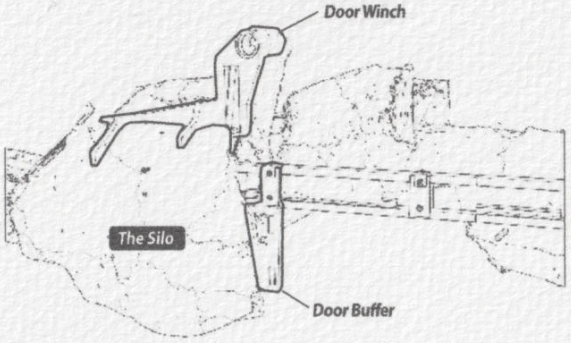


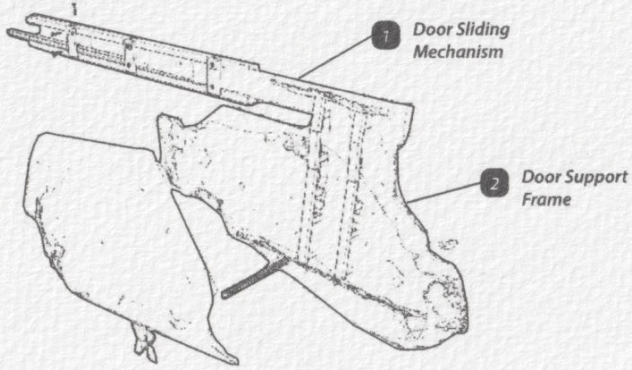
▲ ***Position One (Top)*** *Boats being loaded into the gantry system from Church Street.*

Position Two (Bottom) *Boats being winched into the belly of the atrium to be worked on.*



▲ ***PLA Gantry mounting points*** *The PLA Gantry in the test model iteration is suspended between the edge of the Atrium and the deck of the Classroom. This allowed for 30m of hull movement through the building. The rear wings of the gantry are wrapped/mounted directly around the drying space and silo to provide lateral support.*





▲ ***The washing Silo and door gate*** *Once spaces had been established to allow for the building operations, they then became clad with functional infrastructure. Using the silo as an anchor point, door gantry mechanics latch onto its timber shell wall.*

Work in Practice

1.8 Stages 2, 3 and 4 ▸

Working at BDK Architects (Jersey) and Adams and Sutherland (London), my time has been split evenly between working on projects between stages 2 and 4. Early stage work has focused on surveying, data collection and site model construction (Analogue and digital) allowing for contextually sensitive work to emerge.

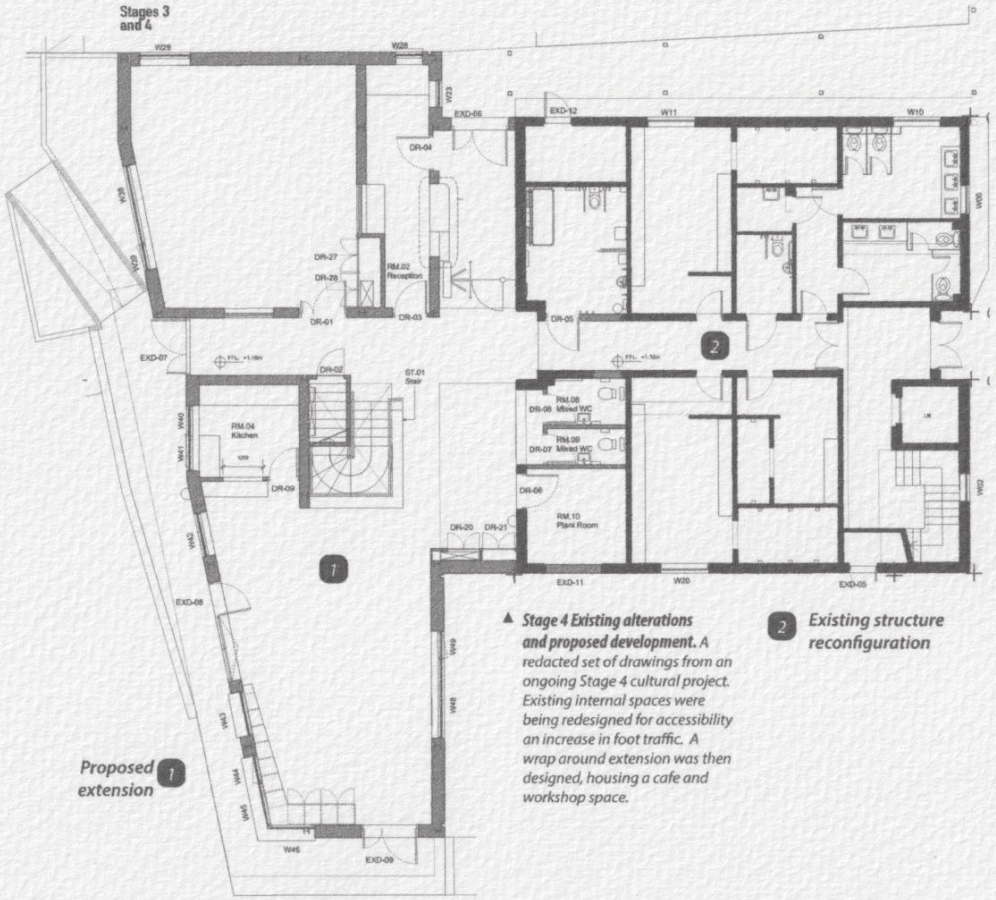
I have I assisted with the Stage 4 technical development of numerous cultural and public sector developments, centred around model building, and exploration of material samples to investigate passive way-finding. This involved drawing and revising technical construction details for tender, allowing me to become familiar with ArchiCAD and Vectorworks, and to gain experience in a structured delivery system.

I was responsible for creating and compiling visual communication material (Adobe Creative Suite) for presentation to clients and future users of the spaces, and became a point of contact for liaison with consultants, authorities, and suppliers, allowing me to gain an understanding of UK Planning and Building regulations.

Stages 3 and 4
Redacted Spatial Coordination and Technical Design of an ongoing sport and culture project.

1. Plan - *Proposed Extension*
2. Plan - *Existing Reconfiguration*
3. Elevation - *Extension and existing*

1.1
Stages 3 and 4



Proposed extension 1

▲ ***Stage 4 Existing alterations and proposed development.*** *A redacted set of drawings from an ongoing Stage 4 cultural project. Existing internal spaces were being redesigned for accessibility an increase in foot traffic. A wrap around extension was then designed, housing a cafe and workshop space.*

2 *Existing structure reconfiguration*

3 Proposed Elevation - South
Scale: 1:50

Site Context Prototyping

▲ ***Analogue site modelling*** *Using Vector-works site plans to construct surrounding context models, used to develop the stage 3 work. Templates printed at 1:50, used to create 250GSM card structures.*

Show Builds + Large Scale

2.0 Design for Fabrication ►

Work shown is from a series of larger scale productions, including summer show builds, commissioned group projects and academic work.

Four show spaces have been designed and fabricated from scratch as part of a small unit team on behalf of the annual Bartlett Summer show. Typically this involves taking on a particular fabrication task, followed by operating as a larger team for assembly and installation. This system allows for highly developed bespoke details and junctions to emerge.

The most resent iteration of shown build (Right) was designed and constructed in two weeks from reclaimed steel not used during the academic year. Steel up beams supported a series of 24 welded armatures to hold models in front of larger flat work (drawings and renders). Up-stand feet were CNC'd, Unit signage was robot cut, and shelf ends were resin printed.

Work from time spent at garden centres and wildlife conservations in a non design role is not documented.

Unit 25 Show (2022) ►
25mm Steel profile frame, making use of 3 up stands to secure models in front of drawings and renders.

Steel, Birch, PLA, SLA Resin.

◄ ***Unit 8 Show (2016)***
12mm Aluminium extrusion fixed to 15mm birch ply beams.

Water jet cut steel armatures were fabricated bespoke to particular junctions. These could then be bent into place, to secure the junction and provide a model shelf.

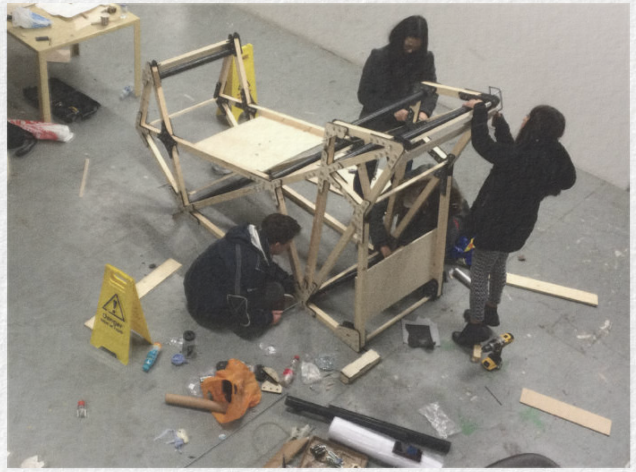
Steel, Birch, aluminium.

◄ ***Unit 8 Show detail (2016)***
2mm Steel junction plate secured directly to aluminium extrusion with M4 countersunk machine screws.

Cut at Here East.

All brackets were retained post show and used for bookshelf mounts.

Steel, Birch, aluminium.



◄ ***Float Construction (2020)***
Creating a lightweight timber frame to be mounted to a float for the Southwark Carnavaldel Pueblo community event, as part of the CDP's Latin American community outreach in London.

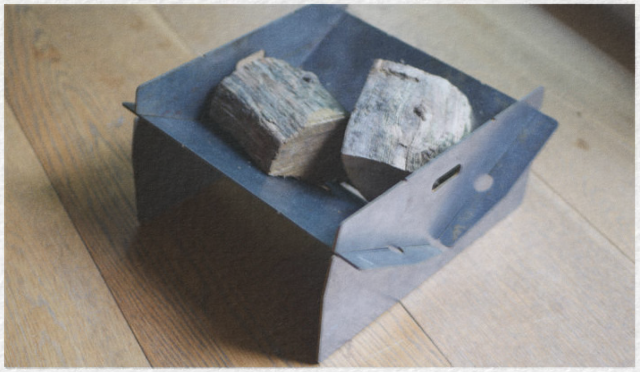
Personal Projects

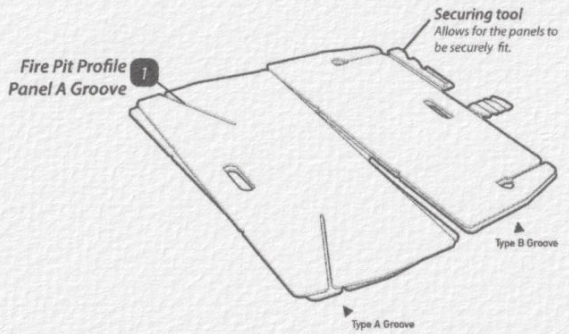
2.1 Small Scale Production ▸

Making use of university workshops and equipment in the time since graduation, a series of personal projects and commissions have been designed, developed, fabricated and tested. Compliant shelving, fire pits, tools, and cycling equipment have all been developed for quick commission pieces, and have all gone on to be tested in the field.

Most recently, based off my experience building a micro CNC unit for my postgraduate academic research, I have been focusing on maximising the availability and accessibility of traditionally closed off fabrication methods by sharing the techniques, resources, and adaptations that allows for anyone to make use of highly bespoke digital fabrication.

Beginning with the flatpack Birch Ply CNC Enclosure, I have prioritised the construction of a number of devices, upgrades, and modifications to enable me to continue designing and digital fabricating from home. Tools were built to allow for more alterations to be made, alongside purchasing a second hand 3D printer, allowing for further gradual alterations to design tools as far as budget allows.

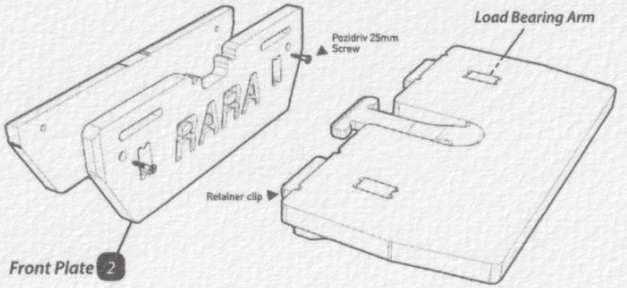




◂ ***Portable Fire Pit*** *A fire pit designed to be used on short section hikes and overnight trips. Cut from 2mm Steel, each section has an identical profile allowing for the components to be nested together saving space. This stack can be split to allow for shared carrying on the trail.*

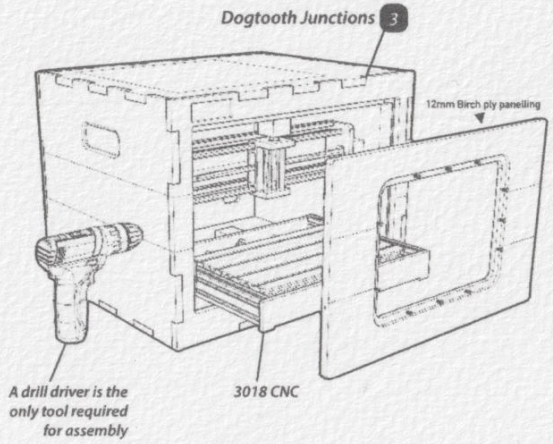
When the four sections are slotted together, the attachment hole allows air in underneath the fire. A 0.5mm tolerance was used to accommodate for the steels expansion in use.

4 Small indents in the steels edge allow for easy marshmallow toasting.



◂ ***Compliant Shelf***
Explorations for RARA on compliant furniture, re-purposed as a C Clamp shelf.

The shelf can be milled from two offcuts of 9mm Ply in two passes. Removed material on the front panel allows for a the latch to bend upwards and lock over the front plate without fixings or adhesive.



◂ ***Birch ply CNC Enclosure***
To house a self assembled 3018 CNC Machine used in postgraduate studies, the 12mm birch ply enclosure allowed for continued milling from home post graduation, maximising digital fabrication accessibility.

The enclosure was cut on a full sheet piranha CNC. Laser cut 5mm Acrylic safety windows and 15mm fire retardant foam internals allow for safe and quiet milling from a home space.