Small Changes

Portfolio by Georgia Hobden

'The Brief'

To create a new architecture, that will benefit the community of Lewes, whilst making Contact with Site through the Lenses explored in Term 1.

Term 1; Thesis

Interested in the relationship between the "water" and the "land", and the ways in which these might be perceived and how they might affect one-another, I am investigating how I understand these terms on Site.

Last Term, a carefully drawn study of the materials present on the site; from the weathering on various materials, and the fertile area that appeared after the 2000s Lewes flood.

In addition, I carefully photographed a process- the process of Clay Imprinting and Plaster Casting, which helps me to bridge the gap between The River Ouse and the materials on site- to see what materials and textures are transferred in the process.

From this research, I have found that it is not so simple to see how water and land affect one another, and that it is a matter of perspectivelooking beneath the surface and through the cracks, as Precedent 1: Alphonse Bertillon, hints at in his studies 'can certain features identify a persons nature', depicting that form can tell a story. I have also been inspired by the work of Tanya Kovats (Precedent 2), who has drawn and sculpted various 'geologically explicit landscapes' - drawing focus to the tension between the spaces that are primarily 'water' and what is 'land'.

My Site lies at the far end of The Phoenix Industrial estate; I chose this area as it lies adjacent to The River Ouse itself, with a staircase acting as bridge between their spaces.

I chose to have my project near the stairs because I want to work with the water and the variety of materials closest to any infrastructure; both of natural and/or artificial makina.

Through my current programme idea, I hope to further my understanding on my position of the boundary between the Water and Land.



Bertillon identity card.











- 1- Plaster Casting Mould
- 2- Mirrored Clay Time Stamp
- 3- Metal Ruler (1:1)
- 4- Clay Imprint Fragments
- 5- Plaster Cast Imprint
- 6- Embossed Time Stamp
- 7- Embossed Thumb Print

1.1 Drawing & Corresponding Photo_3



The Site; Topography of Lewes

Rhino Model; mapping the topography and building heights on site in correlation to the River Ouse.

This has allowed me to observe the site is fairly flat, and essentially at the dip of a valley, making it more prone to flooding.



Scala 1:10000

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The Relationship; Town and Nature

Last Term, while investigating the Town of Lewes, through the process of casting 'the flooding marks' around The Phoenix Industrial Estate, raised the question regarding the hierarchy between the urban and the rural Landscapes.

The River Ouse is a clear link between the town and its nature; from last term, I know that the relationship between mankind and the River has changed through history; from a main material transport route in Sussex, adapting over time for canoes.

However, after the railway way introduced, the river system fell void. This day, the connection between man and river is mainly through sight and leisure, or even the occurrence of a flood such as the great 2000s flood.



Figure: Paula Oakley, The Cement Works In 1900, image, 2013.



Figure: CanoeTrail, Canoe Jousting 1909, image, 2022.



Figure: alamy, Riverside Buildings In Lewes, East Sussex, UK, Photographed During A Very High Tide Of The River Ouse, image, 2022.



A-Ardingly Reservoir

- **B-** Scrase Stream
- C- Pellingford Brook
- D- Longford Stream
- E- Bevern Stream
- F- Plumpton Mill Stream
- G- North End Stream
- H- Winterbourne Stream I- Increasing Sea Levels
- J- Uckfield/ River Uck
- K- Framfield Stream
- L- Ridgewood Stream
- M- Little Horsted Stream
- N- Lewes

The Wider Picture; flood factors

If we zoom out from the River Ouse passing through Lewes, and look further North, it can be observed that there are many factors contributing to the flood risk on site.

In October 2000, the great Lewes flood occurred when the Sluice gates at Barcombe Mills were opened to relieve Uckfield, that was already severely flooded, causing a large volume of water to travel down the river at a greater speed, flooding the town of Lewes.



The Flood

In the 2000 flooding, the water level rose by 1.6m.

The industrial estate is situated next to the Pells Brooks Wetlands; an area of land set to act as a flood defence, holding and slowly releasing large volumes of water.

When the bank broke, the water rose by 2.5cm per minute, until it reached its peak.



1:500 on A3 Figure: Site Flood Level to Structure Comparison

River Precedents



River Cuckmere, East Sussex ^



Denton Island, Newhaven ^

The redirected rivers cut a straight path, water flow still travels through the existing meander(s), but their erosion rate has been slowed down, reducing the risk of flooding





Currently, the flow of the River Ouse is eroding its meander and riverbank.

Over time, this will force the river to reduce its path and create an ox bow lake.

In this instance, the surface is artificial and therefore, instead of allowing nature to alter the rivers form, the water is continuing to rise and flood the Industrial Estate.

I aim to reduce, and/or, utilise the flooding on site by reforming the landscape.

The main concern of flooding is on the inner meander, where the river meets the industrial estate, as the excess water can not be filtrated, due to the hard tarmac surface.

Geology and Landscape

Due to the flood risk surrounding site, an understanding of how water acts on site is needed; to do so I have mapped the landscape and geology of site



1:1250 on A3 Figure: Filtration/ Geology Hard surfaces such as tarmac and concrete have a fast surface run off, due to the water travelling over the surface.

To allow the land a greater chance to deal with the water flow in a more natural way, surface runoff needs to be decreased to reduce the risk of high flow further down the river.

Infiltration

Soft surfaces such as soiled and vegetated areas have a slow runoff, due to the water passing through the ground

In this way, the water can be naturally filtered, improving the water quality, and decreasing the pollutant levels.

How Water Acts: An Investigation





Water overfill

No water



Dried up water, no felt filter



Felt underlays for filtration

For the hard surfaces like concrete, wood lined with greaseproof paper was used to show how the water builds up on the surface. There was no gradient to this model, so when 'flooding' the river, no alternative route was made.



Landscaping Idea

Reformed landscape will allow minimised erosion.

Over time, the 'Island' will erode, however the long term consequences of that, in comparison to the increasing flood risk, are not as dire.

The island will be utilised in the workshop design.

Rejoining near the Brewery may increase the flood risk to the North- Eastern Facade, however there is currently a very low risk of flooding there.

A- Cutting the River B- New Island C- Rivers rejoin D- The Brewery

Flood Risk

Low

Medium

High

River Reformation: Experimentation

Using sand to create a rough river model, I can start to explore the best route for the river to cut off and rejoin further downstream, to reform the landscape on site.





















The left over sand, displays the poetry of the river, alongside its freedom and deposition; a 'ghost' landscape of site, so that we may place ourselves.

It has allowed me to identify the most 'susceptible point to flooding': the most common water route taken, and map the most sufficient additional river route to create an island, in hope to tame the flooding on site.



Term 1- Bird Study on Site to explore the 'relational lens',

Findings- mainly sparrows were sighted, flight breaks mainly on top of the existing structures



The Annual Rafting Competition:

To the right, an image of the raft race, taken from across the river meander, to where the programme will be situated

- Annual Summer event in Lewes
- Organised by The Lewes and District Round Table

- Competitors construct their own rafts, and paddle down The River Ouse from Lewes to Newhaven

- Between Lewes and Southease, the rafters have eggs, flour, water and seaweed thrown at them from the viewers



The Programme

Last Term, after analysing the site and its location, adjacent to The River Ouse, I propose that the town of Lewes would benefit from a boat/ raft building Workshop, and Watch Tower.

Workshop:

-Annual Raft Racers can work on their rafts - Behind the Raft scenes view for the community - Local made fishing boats to leisure on the Ouse

Watch Tower: - Higher view for spectators of the Raft Race - Front row seat for the community to sight wildlife - Observe the Town from a new perspective

The Cllient

The idea surrounding material movement and its process to define the boundary between 'water' and 'land', during Project 1, is what led me to meeting my clients: The RSPB, working with Human Nature.

Human Nature

- Human Nature is planning a new neighbourhood on the former Phoenix Industrial Estate in Lewes, looking for a programme to benefit the community, using Site influences.

Jonathan Smales

Founder and CEO

- working in sustainable

development for over 30

- a recognised leader in

sustainable design and

years,

urbanism

Figure: Human Nature, Jonathan Smales, https://humannature-places.com/ctrl/wp-content/uploads/2021/10/Jonathan-Smales-1-edited.jpg

and

The RSPB



Figure: Beccy Speight, Ben Andrew RSPB Images. https://e3.365dm.com/20/05/1600x900/ skynews_4982764.jpg?bypass-service-worker&20200504105621

- RSPB has noticed a decline in the wildlife within this town, and would life to encourage specicies back to the Site.

Beccy Speight

RSPB Chief Executive

- a distinguished career in the conservation sector

- working to create a greener UK

I will be consulting with both groups whilsti carry out every aspect of the design process; taking into, not disregarding he constraints within the Phoenix Insdustrial Estate, while endevouring to accomodate requests

Other Stakeholders

The programme should be based around the idea to enhance wildlife and community socialistaion, in a sustainable manner.

The Community

- Raft racers, from the annual lewes raft race, can come to refine their rafts, with ease of access to The Ouse, adjacent to the start line.

- The chickens onsite will provide eggs to throw at the raft races

- Citizens can use the observation tower to gain a nw perspective on the races, or watch birds nesting in the proposed habitat space.

- The community can have a firsthand insight on how boats are made, and have a go at crafting their own miniture raft or boat

The Prison, and Addicts

- The programme will give the chance for ex-convicts to learn/ advance a new trade.

- Provides a fresh start for both ex-cons and addicts

- Provides addicts with a hobby/ trade to enhace their well-being

Local Trades

- The chickens onsite, will provide eggs for local traders: such as the many bakeries along the highstreet

The Jon Boat

The 'Jon Boat' can be made from wood, aluminium or fibreglass- the programme will focus on wooden boats due to the local and low carbon resource. This type of boat is beneficial as, not only is it suited for fresh water fishing along the River Ouse, but is also known for its resourcefulness during a flood.













Precedent 1 Boat House 04, Portsmouth



Figure: Atmospheric, Walters and Cohen

- Programme

Boundary

→ Dominant

Wind

Solar Gain

Summer

Winter

Solstice

Solstice







Figure: Structural Perspective, Walters and Cohen

A- Boat workshop display space B- Exterior spaces for community engagement C- Sunlights D- Load Bearing grid structure E- Tidal canal, connecting to the river



Material Consideration

Due to the history surrounding the Phoenix Industrial Estate, I am looking to up-cylce and reuse the materials on site, or local to site.

Brick

Concrete

Light-weight Steel frame

1:1250 on A3 Figure: Materials on Site



Material Palette

The bricks on site holds history- not only is it aesthetically pleasing, but in the form of cladding can also protect the structure its being installed upon from forming cracks and other damage: mold, temperature changes.

Additionally, it will provide the workshop with enhanced insulation from both noise and heat loss, which is important as it will be in a busy environment.

As for the timber side of things, I propose that the main structure be a Sweet

Chestnut timber frame, with Ash flooring, due to the felling of vast wooded areas from Ash Die-back.

As there is an influx of Ash throughout the UK, the boats will also be crafted from this.







Knapped Square Flint Facade



Timber, Historic Facade



Textured Pathway: -Brick vs Stone and Cobbles -Moss

Potential Materials

In or Local to Lewes



Existing Site and Structure

1.200 aligned plan and section





Back elevation

Front Elevation





Scale 1:100 on A3_Portrait





Iteration_1

Initial ideas; working with the idea of reusing material, iteration 1 looks at the idea of reusing the existing structure, and replicating it.

I had two iterations from last term, that allowed me to visualise this, and join them together much like a jigsaw.



Pouring Plaster







Plaster Cast versus Ply Mould _Front Elevation_



Plaster Cast versus Ply Mould _Back Elevation_







While intrigued by this concept, I don't feel as though it considers the environmental impacts on site: it provides alot of shading which would have to be oriented to the south for summer shade.

How would this idea be affected by the flooding?



The Solar Situation

Using rhino rendering, alongside illustrator, I have mapped the shading from both summer and winter solstice, to decide how to maximise solar efficiency.

Figure: Summer Solstice Shading 5am - midday - 7pm



Winter Solstice:

Southern solar gain, shading all around the northern façades: need to maximise solar gain so boats can be crafted in a comforting environment

Summer Solstice:

Southern shading: need to prevent glare and overheating, so workers can be in a comforting environment.

Figure: Winter Solstice 9am - midday - 3pm



Solar Gain



Solstice

Also used in Technology_A672, Construction

Roof Overhang

- Cost effective method of preventing glare and overheating to the workers while giving comfort and shade to the paths below - Allows water collection and rain shelter, taking some pressure away from the river

Brise Soleil

Cost effective method of preventing glare and overheating to the workers while giving comfort and shade to the paths below
An idea for the potential fishing area as it would be open and potentially in use at all hours



Sawtooth Lights

- Increases sunlight to the mid- northern façades which would allow for a larger workshop with maximum daylight.

 Protects the potential workers from direct sunlight, reducing glare and excess heat (cooling benefits).
 Energy efficient



Deciduous Planting

- Canopy to sit outside 45^{·f} from the base of the structure, to provide solar shading to the southern and west façades while preventing glare to potential workshop spaces.

The deciduous trees won't prevent solar gain in winter.
The canopy allows extra habitat areas for the existing wildlife to expand;

for example the Birds on site.

Iteration_2

After careful consideration involving the environment and the surrounding landscape, this design was formed.





Iteration_2 Next steps

Considering how the island and river reformation can be achieved without causing too much damage to the river bed and surrounding environment; while endevouring to find ways to entice fish and biodiversity back to the this section of the River Ouse.

Can I attract other species to the site? more birds?



Floating Treatment Wetlands



A way to naturally create an island that can grow with time, while re-routing the river. The wetland can over grow due to the ongoing river erosion.

- The island material and root system provide valuable surface area for beneficial microbes to rapidly reproduce and uses hydroponics to pull pollutants and problematic nutrients out from the water.

- The island shade and roots provide cover and allow fish to thrive.

- Plants provide wildlife

- Aesthetic

- Plants attract and sustain insect populations





Idea

FTW Structural ideas:

Light weight steel structure Temporary flood defences on island floating structure bouyant foundation

Iteration_3

Looking in section, in correlation with the Spa across the void, the workshop will need to be well insulated acoustically.

While experimenting with 'floating treatment wetlands to create an island for fishing



1:200 on two A2 landscape

Section cut on plan

- A- Spa Section by Natalia Matasova B- Void between the two Programmes C- Main Programme Structure: workshop and observatory D- Bridge? access to FTW fishing hut E- FTW Fishing Hut

Iteration_3: Model

Making a model to further observe the workshop and the floating structure



















River Reformation: New Observation

Even though the experiment didn't work as I had expected/ hoped, while observing new river routes; taking a second look at the now dried out sediment paper, observing them in a different light, I could see the additional water effects such as 'the once flat piece of paper', turned crumpled and contoured







Idea

Mimic this effect in the form of a roof? Contoured? Green roof? Give additional habitat for birds and bio-diversity,





Structural Poetics: Growth and Reduction

Chicken feed wall decreases in size over time Island grows over time





How to collect and join sediment to island? Velcro mechanisms? magnetics? Woven Willow?

Next Steps

Narrower the river, the faster the stream, where do boats dock? Change the river bank shape, like a wharf? Does the river go into the structure? ease of boats access into river How can the island collect sediment to grow?

Catching Sediment

Finding ways that will add to the 'fishing dock' structure, and allow it to grow









Velcro under the microscope: hooks and loops

Paracord Weaving Trial Attach fish-hooks? Act like Velcro?





0 1cm 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

Fishing Scissors

ICM





Types of FIsh hooks







Paper Base, String Woven



Paper base, Paper Woven



Woven Willow foundation? Part of the island and structural element?

Living Vs Decaying: Living Willow

Experiment with the idea of a living 'fishing dock' structure on the floating wetland: a floating treatment wetland that grows with the tides, meanwhile the structure itself is living too, to create a new habitat for bird observation.









Figure: Botanical architecture, Marcel Kalberer

Figure: Marco-Casagrande-Sandworm, wenduine beach





Figure: spencer jenkins willow arch full

Figure: Adobe And Rammed Earth Buildings Design And Construction Ebook, PDF, image, 2019 ©

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The Feeding Wall Western Facade Part Axo, 1:200 on a4

The wall pockets within the Rammed Earth structure would require 'ritualistic' maintenance, to keep both wild and domestic birds fed.

Both the community and the rafters can come together to take part in this experience, strengthening the bond between man and nature

North





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Figure: Retrospective: Martin Rauch -Architectural Review

The Green Roof with a View Western Facade Corner Part Axo, Perspective, Not to scale

The skylights create views through all floors, giving natural light to the chicken coop, while proving a top-down display space into the coop without disturbing the animals



Rammed Earth and Timber Frame, 'degrading/ decaying' material. Up keep: Earth Binder.

Western facade- Wall Pockets- would require ritualistic maintenance- to renew the chicken/ bird feed:

On exterior walls to attract wild birds while feeding the domestic chicken

Living Vs Decaying: Living Willow Final Iteration_ Buoyant Island



Woven Concept/ Woven Living Willow Representation

Buoyant Structure, Before Living Willow Takes form

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The Island Northern and western Facades Part Axo, 1:200 on a4

←Z

The wall pockets within the Rammed Earth structure would require 'ritualistic' maintenance, to keep both wild and domestic birds fed.

Both the community and the rafters can come together to take part in this experience, strengthening the bond between man and nature





Final Iteration_Buoyant Island Main Frame Structure Reuse (from existing on site steel frame)

A model section to show the structural make-up of the floating island

Thesis:

The island would sit on the water line while, the pontoons and skirt/ platform formation remain submerged









Detail 3a



Platform, above the surface

Detail 3b



Platform, below the surface

Detail 4b

Detail 4a



Buoyant Pontoon, above the surface



Buoyant Pontoon, below the surface



Findings:

The structural makeup of the pontoon platform enables the island and fishing hut to float, and react to the increasing/ decreasing tides

Contrary to my thesis, only half of the platform stays submerged, which means the 'woven skirt' to collect sediment, only needs to be woven around the lower half

The other half stays above the waterline, for the community leisure on.







Raft and Craft Space

Temporary walls come together to make a private square for the annual raft racers to build their designs.

When the race is over, the walls can be moved to the side of the space to create an open area for the programme to hold small boat craft workshop stations



River Pockets

River pockets will allow ease of access for both rafters and fishermen to the River Ouse. They will have a slower current, creating a safe docking space,

The additional advantage of giving The Ouse a larger volume to hold potential flood water





- Existing Structure River Existing Structure reused in proposal Proposed structure/ River
- A Lobby/ Entrance
- B Emergency Exit/ External Stairs
- C Chicken Coope (Internal)
- D Ground Viewing Deck, External, Sacrificial 1m Brick Wall surrounding
- E Toilet Blocks: Male, Female, Disabled, Disabled with Hoist (gf)
- F Kids small Raft making stations
- G Chicken Run (Exterior)
- H One time a year, annual raft race large making stations
- I Boat/ raft ramped exits to reformed river pockets
- J Buoyant Fishing Island



(E- Disabled with Hoist) Toilet Perspective Sketch, Not To Scale

Proposed Raft cubicle layout

Client: needs to be accessible for all Toilets:

- Men's and women's, both with baby change access
- Regulation Disable Toilet

- **(E- Disabled with Hoist)** Additional Disabled toilet: with a hoist and a shower tray



1:50 (E- Disabled with Hoist) Toilet Plan







Final Iteration_ Top floor S Exterior Staicase entrance to Lvl 1 Skylights/ View ports through to 'C' Interna Ichicken coope
 M Fishing/ Jon Boat Machining Workshop
 N External Viewing Platform, angled to the River Ouse and Island Tool Store Open Work Stations (Varnishing, Sanding/ Joinery) 1:200 on A3

- Roof overhang (to protect rammed Q earth wall
- R
- Roof Lights through LvI 1 to 'C' Interior Bird Hide/ Observation Space S
- Open Green Roof, with surrounding safety fences, or parapet walls



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Final Iteration_ Secton 1 1:50 on A1 First floor, Second floor Cut through Chicken inhabited area - bird feed wall pockets in rammed

- earth
- Scale; chicken:structure
 Skylights/ Viewing deck for visitors while giving chickens natural light







Final Iteration_Secton 2

Cut through middle of Structure A and part of Floating Structure (B)

- A emergcy exit stairs/ exterior stairs to first floor
- B Sky Lights through Roof- First floor-Chicken Coope
- C Viewport/ Large window overlooking Chicken Run
- D Chicken Run
- E Chicken (showing structure scale)
- F Rammed Earth structural wall
- G Workshop with viewing window
- H Green roof
- I Bird Hide viewing windows
- J Tool store
- K Raft and Bird watching platform, over looks river and floating island
- L Brick wall, additional flood precaution
- M Lining willow, Floating fishing hut
- N Buoyant Foundation
- O Pile into river bed
- P River Bed





Final Iteration_ Atmospheric Axonomtric from the North

1:200 on A3





Final Iteration_ Atmospheric Axonomtric from the South

1:200 on A3



Final Iteration_ Secton 3 Cut through the centre of the inland structure 1:100 on A3

Final Iteration_ Atmospheric Tidal and Seasonal Small Changes

1:200 on A4

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