Terra Dispositions

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SYR ARCH THESIS 2021

REGISTRATION

reg•is•tra•tion

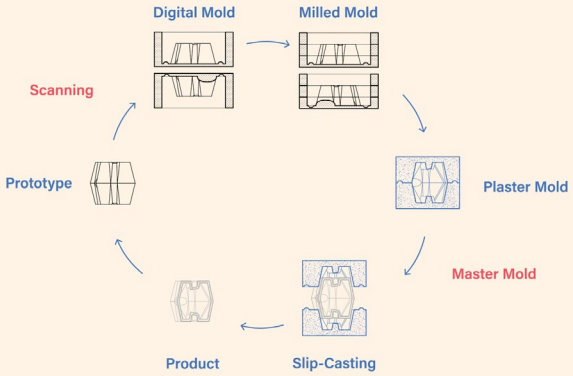
1. to convey an impression of
2. a written record containing regular entries of items or details
3. a condition of correct alignment or proper relative position

Terra Dispositions

Human intervention of the landscape by damming, filling wetlands and over-extracting is resulting in the rapid perversion of water bodies through the desertification or flooding of terrain and the ensuing contamination of reservoirs. In turn, these changes are disrupting ecosystems, reshaping geological borders, and causing irreversible damage that poses a threat to clean water supplies. As humans exert agency over local hydrology, there is scarce consideration of the ensuing ecological consequences.

This thesis aims to expose the ecological transformations of territories laced with human agency by examining the residues left by water in order to deviate from the misplaced nostalgia of a return to nature in favor of a critical awareness. Clay, a residue historically significant for its elasticity and widespread availability, becomes a registration of these transformations. Through the integration of traditional slip-casting and contemporary digital fabrication methods, the thesis attempts to reveal these changes through the form-making of a temporal ecological monument.

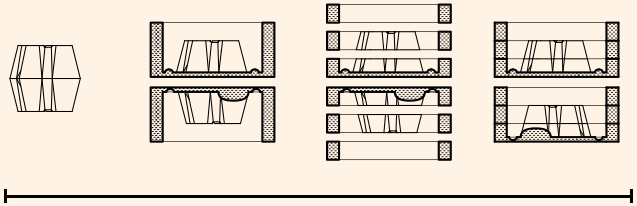
Production Cycle



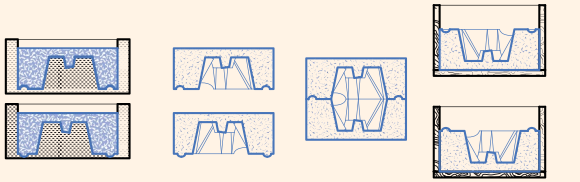
This thesis proposes a cyclical production loop. The cycle begins with a prototype, which is digitized with LiDAR or Photogrammetry software, then formed into a mold which is then re-produced physically by a CNC mill. The mold is used for slip-casting, an industrialized ceramic process that can mass produce quickly. The completed object can then be re-inserted into the cycle again through 3D scanning. This loop allows for the scaling and modification of the object at any point in the process, effectively altering the object in each subsequent step.

Instead of attempting to control the material, this process is responsive to the material behaviors of clay. As the object moves through the production cycle, it is inherently altered at each step by mishaps, inconsistencies and errors. The resulting object therefore becomes an index of each of the processes that were involved in its inception.

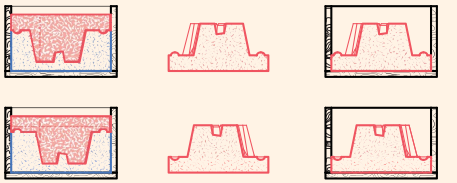
By observing and responding to this data, an iterative process resulted in the object's final form, in order to maximize mold compatibility and strength while minimizing weight, cracking and breakage.



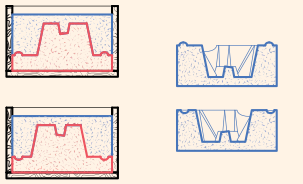
Digital Fabrication



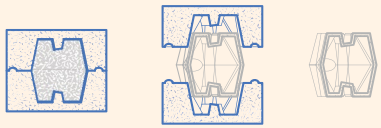
Plaster Mold Production



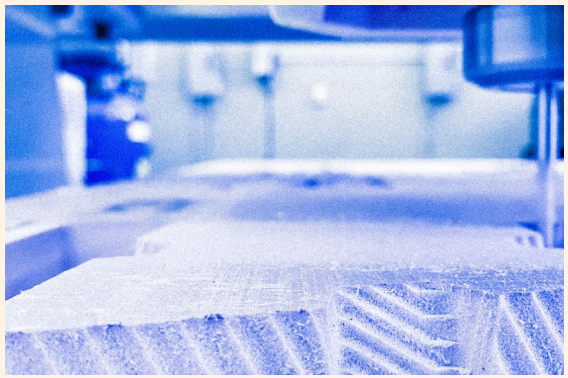
Master Mold Production



Mass Production

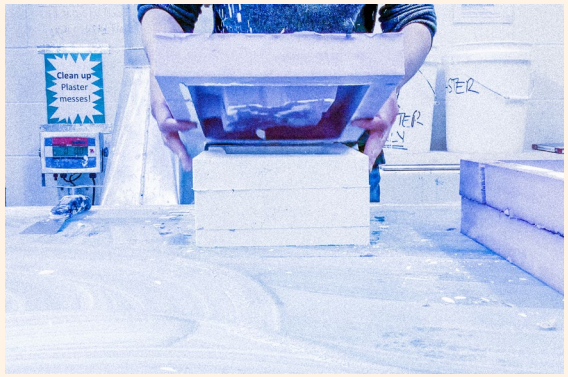


Slip-Casting

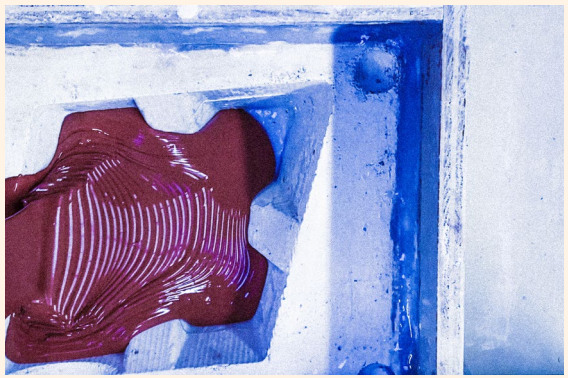


1.1 The digital file is sent to the CNC mill, a subtractive process that removes material from a 2" block of low density foam.

1.2 Plaster is mixed, poured into the foam mold, and allowed to cure for about three days.



1.3 When the plaster is cured, the foam mold is removed from the plaster. This process destroys the original foam mold.



1.4 A master mold is made to speed-up production. A silicone rubber solution is poured into a plaster mold and allowed to cure for 24 hours.

1.5 Once the master mold is cured, plaster is poured into it. After 30 minutes, the silicone master mold is easily taken out, to be used again for the next pour.

1.6 A coat of stained slip is applied to the interior of the plaster mold with a brush. The plaster mold is then assembled, shut and secured with a belt. Slip is poured in.

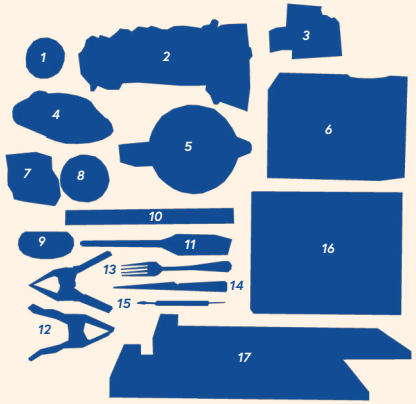
1.7 After an hour passes, excess slip is drained from the mold. The length of time the slip is left inside determines the thickness of the cast.

1.8 The mold is allowed two hours to dry. The mold is then carefully disassembled, to reveal the completed slip-cast object inside.

Tools & Mishaps

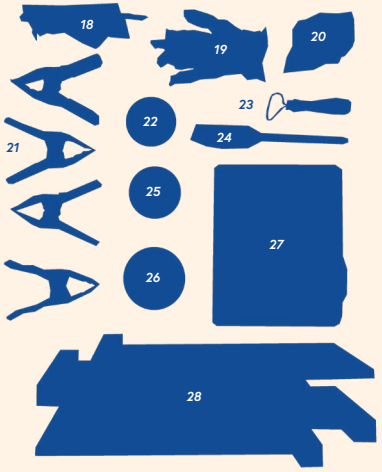
The various processes employed in the production of this thesis covers a large range of digital and analog tools. These photographs highlight the primary analog tools involved in the plaster mold and master mold making process, as well as slip-casting. Unsurprisingly, many of the tools were reused at various parts of the process. Common tools, such as a kitchen fork and knife were some of the most useful.

1.9 Plaster Mold Making



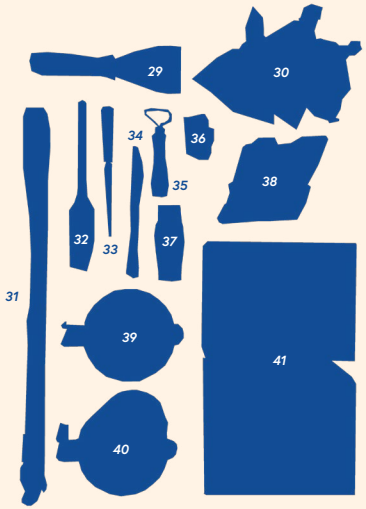
1. sponge
2. dry plaster
3. sandpaper
4. mold soap bottle
5. water
6. completed plaster mold
7. plasticine
8. mold soap in cup
9. metal rib
10. ruler
11. brush
12. spring clamp
13. fork
14. fettling knife
15. clean up tool
16. foam mold piece
17. cottles

1.10 Master Mold Making



18. silicone rubber residue
19. latex glove
20. plasticine
21. spring clamp
22. sponge
23. ribbon tool
24. brush
25. mold max 60 "part B"
26. spray bottle with mold soap
27. completed master mold
28. cottles

1.11 Slip-Casting



29. spatula
30. dry mason stains
31. belt
32. brush
33. fettling knife
34. knife
35. ribbon tool
36. clay
37. hand cream
38. completed slip-cast
39. mason stain mixed into slip
40. slip
41. plaster molds

INTERVENTION

in•ter•ven•tion

1. the act of interfering with the outcome or course especially of a condition or process
2. to occur, fall or come between points of time or events
3. to come in or between by the way of hindrance or modification

Deployment

This thesis proposes an intervention, consisting of an articulated surface of slip-cast "blocks" deployed onto a site. There are two phases for the objects: as a collective assemblage, and as individual indexical artefacts.

In an assembly, the objects function as a temporal ecological monument, which can be deployed in sites adjacent to increased human activity that is altering underlying hydrology. At this stage, the ceramic blocks are at their most absorbent, rapidly registering hydrological phenomena, deteriorating where they come into contact with water and marking floodlines with changes in color. These assemblies can be arranged into a "well" formation that serves as an indexical "cross section" into a site's hydrology. Serving both as a literal indicator of floods, humidity or rain, and as a visual representation of otherwise hidden phenomena.

These objects can be left to completely decay back into the earth, or be extracted and fired in a kiln. Firing the deployed objects "seals" the recorded hydrological phenomena, as the block will no longer react to water. In this phase, the blocks become artefactual objects, indexes of the various phenomena that acted upon them.

Through 3D scanning, these objects can be digitally archived, or physically exhibited and distributed or sold. In any case - they become artefactual pieces of evidence for intervention in the landscape.

2.1 Rear view of deployment

2.2 Section view of deployment

2.3 Assembly in progress

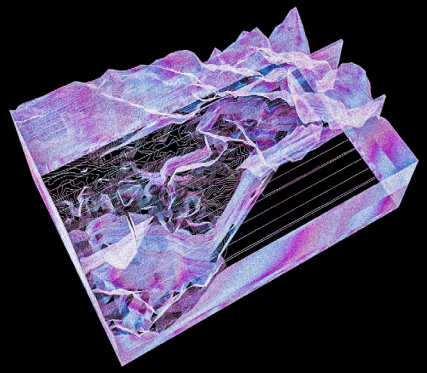
2.4 Assembly, legs for scale

2.5 Object decay in rainwater

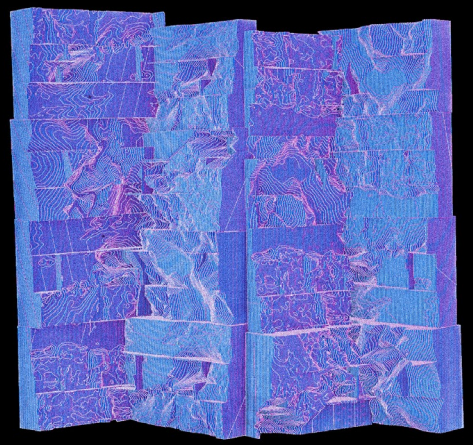
2.6 Slip-cast block pass-off

2.7 Detail view of deployment

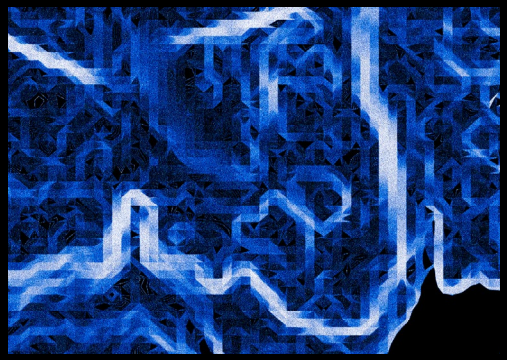
2.8 Deployment nearing completion



2.9 Topography collage block 1

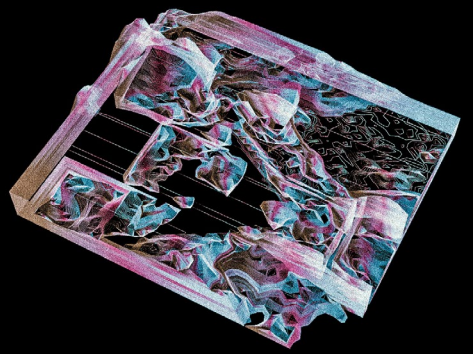


2.10 Topography block assembly

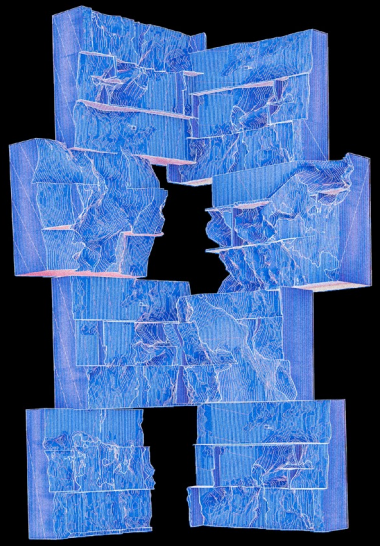


2.11 Plan view of topography block

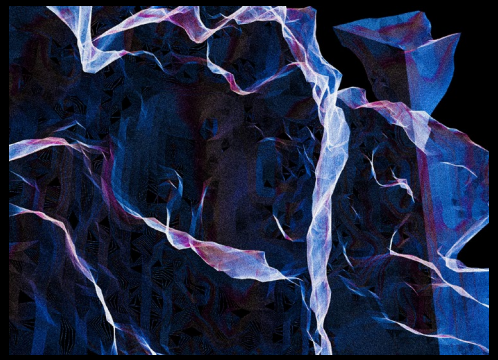
2.12 Topography collage block



2.13 Topography block assembly



2.14 Plan view of topography block



ALTERATION

al•ter•a•tion

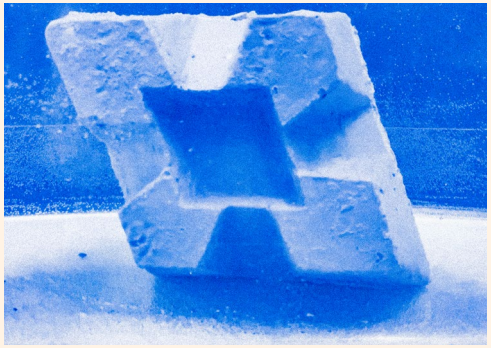
1. to become different
2. to make different without changing into something else
3. a mineral that has been altered by a chemical process

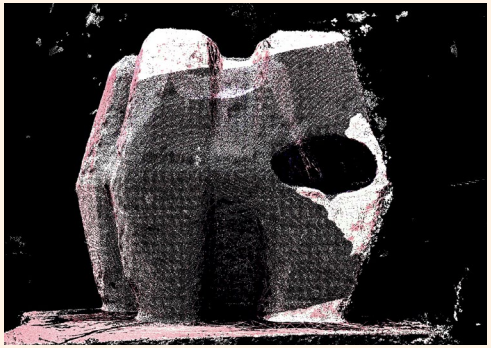
Process

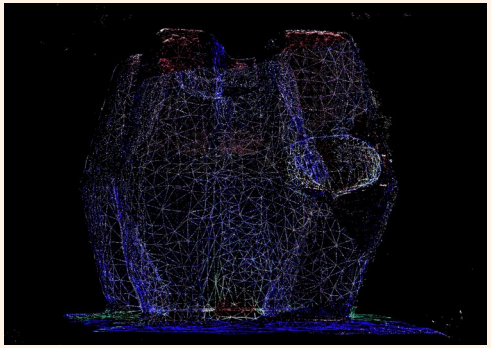
While the blocks are unfired, they are extremely absorbent and deteriorate when exposed to humidity. During this stage, they are very effective registrants of hydrological phenomena: marking water exposure with changes in color, texture and thickness.

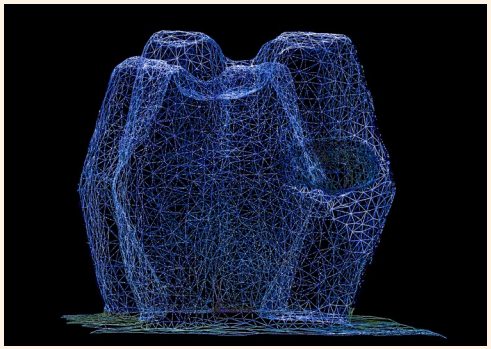
Different phenomena affect the block in various ways and at different rates. Factors such as water temperature, intensity, pressure and humidity were explored. Water exposure tests occurred both indoors under controlled conditions, and outside under environmental conditions. After these tests, some of the objects were bisque fired to "seal" these changes. Once the objects are fired, they become significantly stronger, but no longer able to register hydrological changes.

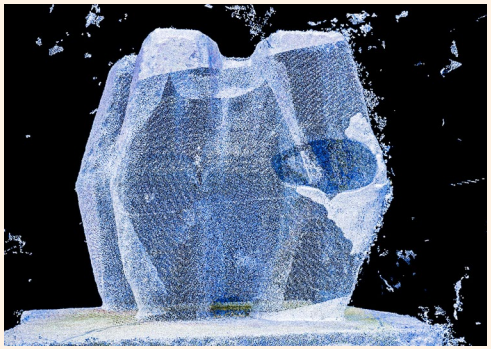
In addition to the physical decay of the block, digital deterioration techniques were also investigated. As the object was scanned, there was always inherent data loss. This was most profound in the areas that were out of view of the camera, specifically where the object touched a surface. However, digital data loss also occurred throughout, due to errors in camera positioning, low resolution and lighting inconsistencies.





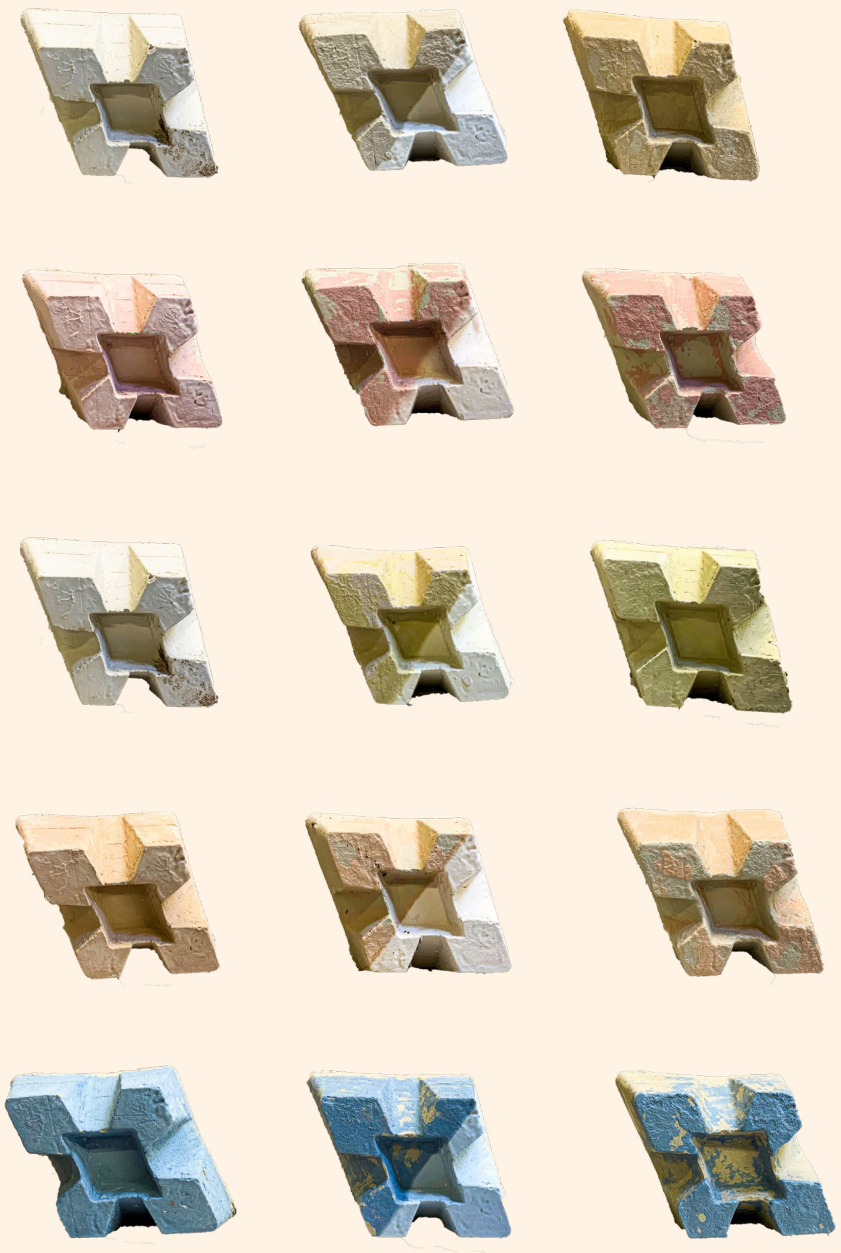






3.1 Physical decay in water

3.2 Digital decay in Metsashape



3.3 Physical decay matrix. Left: dry. Center: half-submerged. Right: soaked

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