"Experiment som metod"
"Experiment as method"

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A series of tests of building methods and building materials constitute the backbone of my project. It has been an experiment of method and material in the human scale. From the beginning a few themes were set up that I have been exploring. Preconceived ideas of seating as well as how different materials perform, have been examined.

The experiments have been about getting from an idea to a built object in a short period of time, while moving focus from making a perfect object, to production and progress. My ambition was to carry out a project process based on curiosity and activity, where analysis and conclusion is made after objects have been created.

The chosen methods reflect my own curiosity and interests. As a beginner in most of the methods tried, my belief is that there is an advantage in being a novice: If you have never done it before, you cannot fail.

A material or a vague idea got me started in the different experiments. The awareness of the limited time frame has sparked the beginning of the process in every test.

A sitting device – an object that holds a human body above ground

Tectonics, tactility and joints are examples of vocabulary that can be translated from furniture to architecture. To broaden the conception of what a chair is the idea from the beginning has been to call the produced objects sitting devices.

Project context - Full scale studio philosophy

This year I have been part of full scale studio, in the description of the studio it is stated that:

“Full Scale is a mode of thinking. It is about shifting from representation into testing. It is about making instead of estimating. It is about experiencing instead of simulating. It is about cooperation rather than authorship. About research and discovery of knowledge and new ways to make architecture.”
In planning the project, the second half was left open. I had to rely on the belief that new ideas would occur as I went into making and testing.

When does design happen?

Looking back at my work, the question of when design happens comes up. Though differing between the objects, a thing that they all have in common is that design decisions have been made step by step in a gradual process along the way. There was no complete plan/idea/drawing in the outset. Since all built objects in my project have been made by hand, without sketching, they relate to a human hand and body. I have been forced to trust my intuitive thinking and rest assured that one thing can lead me to another.

Form follows function, or function follows form?

The project experiments have in a way been reversing the design process that we’re taught in architecture school. The project is an openended work in progress that could continue and be developed further.

Instead of form follows function I have been testing form vs function. Some of the experiments have been about testing the concept of chairs, while others have been about getting to know a material or building method and how the material gives form to an object or how I can manipulate a material to a form.

Methodology

From the beginning a strict methodology was set up to test one material or method per week. Themes were set up, defined and the tests were executed. The second half of the project was left unplanned in order to let my intuitivity lead me forward. The method changed as the project developed, with the testing of materials consistent throughout the project.

PART 1
COLLECTING:
Collecting and refining undesired material and objects

First day, at a scrap yard in Stockholm
At the scrap yard

Searching in a container

Seasonal issues
Metal scrap
Steel wire netting found in the container

Trunk of car filled with scrap
Red wire netting

Green table tops from Ikea
The harvest
Planks from demolished interior

Dissecting the harvest to get to know it

Planks and pallets

Measuring and cutting

Pallets

Cutting through board, found out it had paper filling
Cutting legs

Sketch of legs' structure principle

Testing of seating height

Legs

Concealing core of seat with veneer cut from found planks

Legs joint
Thoughts on collecting

One thing I learned from the experiment is that when using found materials, one can choose whether to show the objects’ original purposes or conceal them. I chose the latter.

Collected materials raises the question of economy, most of what I took had been part of buildings, either as interior or furniture. How do we value undesired stuff? What is quality? By reusing and remaking, building industry could become cost efficient and more sustainable.

The method of finding and reusing was something I took with me in the further experiments. I tried to buy as little new material as possible.
LAMINATING:
Thin flexible layers of a sheet material glued on top of each other to form a shape

First lamination test, using a paper bag found in studio

Cutting pieces of paper, 3 centimeters

Bucket as mold, wood glue and clamps
Testing of flexibility in material

Veneer made from pine wood

Laminated pine, using blue bucket as mold

Cut veneers

Double mold, made from pine wood

Paper lamination
Different thicknesses of birch veneers were cut and glued.

Gluing of second round.

Planing edges.

Different thicknesses to compare durability.

“Free laminating” paper test, no mold was used.

Paper and spray glue.
Laminating flexible plywood and birch veneers

A lamination and its mold

Laminating without mold, using only pressure from clamps

Result from laminating without mold

Wider lamination with clamps on both sides

Cut outs in mold to hold clamps
Two different thicknesses, same mold, a seat and a back?

Sketch of lamination process

Flexible plywood was bent as far as possible to make a mold

Mold for base made from bending the material to its max

Gluing of base

Measuring seat and base before cutting off their edges
Cutting holes in seat and base for wood plugs

Clamps helping to hold seat in place while drilling holes

Testing design

Making wood plugs using a plug drill

Gluing seat and back

Protruding plugs were cut after gluing

Gluing seat and back
Sitting device made from three laminated pieces

The seat and back are made from the same mold

Three laminations of flexible plywood joint with wood plugs

Thoughts on laminating

Different materials and molds were tested during the week. Such as Paper, solid wood and flexible plywood. The final outcome of the week became a sitting object made of flexible plywood with the same curve in the seat and back and a base where the flexible plywood was bent to its max. A goal with the design was to be consistent with the building method. The same method was used for all parts of the sitting device.

Mastering the art of laminating takes time. During the 20th century some of the biggest furniture designers developed the method and molds.

The method is time consuming because of mold making and drying time for glue. In regards to my project where my aim was to conduct several quick tests.
CASTING:
Liquid material poured into a mold to become solid

Mixing water, white cement and gravel to make concrete

Concrete poured over balloons

A concrete shell structure shaped by balloon
Equipment for casting

Using balloons as mold in cast

Green fluid colour pigment was poured into the mix

Pouring cement into black paper bag

Sitting down on bag to give shape to the casting

Curing casting, tape held together by tape
Removing plastic bag

The plastic bag made marks in the surface.

The casting turned out heavy so it was put on a rolling chair.

Which gave the idea to use the base of an office chair.

Drilling holes in seat with concrete drill.
Thoughts on casting

Most of my casting tests were made without a traditional mold. Instead I used my own body and balloons to shape the castings, and a black plastic bag to hold the cement. In a traditional mold a negative makes a positive. In my tests, for example with the balloon concrete was instead poured on top, as a positive to positive. I call the method free casting.

The seat that I casted became heavy, so I put an already existing rolling base on it. This broke the idea of consistency in the test. This action made it look more like a regular office chair and less as a test of the method of casting.

It made the casting movable, in comparison to regular concrete sitting devices, which are usually seen as permanently placed furniture in public spaces.
POURING:
Liquid material poured over an object to give it shape
The foam expands when it dries

Object standing up to cover legs

The front left leg was broken off

Continued with further layers of sealing foam

Sketch of sealing foam covering chicken wire

The foam expands when it dries
A sitting device?

Gravity pulled the foam towards the floor

Crooked legs, still a sitting device?

Thoughts on pouring

The method of pouring sparked my interest and imagination. I decided that I wanted to further explore the foam material and the technique of pouring.

The experiment was about testing the formal concept of a chair. If an object has the formal features of a chair, with four legs, a seat and a back, but a person can not sit on it, is it still a chair?

If one of the legs break, is it still a chair?

How far can the concept be taken from the formal concept to still be called a chair?
PART 2
DEVELOPING AND COMBING METHODS

From the first part’s experiments I found that I wanted to continue working with the concept of pouring and free casting, combining the two methods. The way the cement seat was shaped by a human body interested me, as well as the method of pouring a liquid material on top of an object to give it shape and expression.

The technique of pouring in itself comes with several features that can be used as part of the formal expression. For example the liquid can be colored and layered to achieve a marbling effect. The technique combines a level of control with an uncontrolled aspect that I found interesting.
I decided the next step would be making a sitting device with spatial qualities. I wanted to create a larger object than before, based on the concept of pouring and shaping, using the human body as a shaper.

Inspiration for its shape came from the type of spontaneous sitting that occurs outdoors, for example finding a comfortable position against a smooth rock in the archipelago, or leaning against a tree.

The coming experiments were based on the vision of creating an artificial rock, using the technique and formal features of pouring and using the human body to give shape.
Colours picked to be used in creating the last sitting device

Water colour testing to find a colour combination

Shaping chicken wire to make a rock model

Two different versions were made

Stuffing shapes with wood wool
Pigment and plaster used

Mixing plaster with pigment

Pouring plaster over models

Layering blue and white mixes of plaster

The plaster mix flows with gravity to find its way

The expression differs depending on the density of the mix
The poured plaster flows over the edge of the model

Trying scagliola, an Italian marbling technique

Plaster is mixed with hare skin glue and color pigment

The mix becomes dough like and can be combined
Pouring red pigment on top of scagliola dough

Mixing scagliola dough

Dry mix with yellow pigment

An attempt to make a “rock model” with scagliola

After the object is dried its sanded and polished

Different scagliola technique tests
Sanded and dried scagliola piece

Could the scagliola principle be transferred to cement?

Mixing cement to a dry dough

Blue pigment mixed with cement
Adding red pigment

Mixing white, red and blue cement

Adding parts of red mix to the dough

Pouring the wet mixes onto model

Adding more cement to the object

Red, white and blue pigments mixed
The material behaves differently depending on density of mix

Pouring acrylic paint on sealing foam

Conclusion from pouring experiment

Using colour pigment when mixing both plaster and cement works well with the pouring method.

Going back to sealing foam, to test its qualities within the poured theme, regular acrylic paint was poured on top of dried foam. The surface became stronger than without the paint, which helped me understand that the layering as a method would help the structure. Sealing foam is made stronger by adding a surface.
SWITCHING SCALE

Taking the idea of chicken wire that is shaped and then stuffed with a light soft material to a larger scale. Textile was dipped in the cement mix to understand how a soft material would perform as a reinforcement. A few more layers of cement were poured on top to get a stronger surface and the desired result of the object’s formal expression.
Dipping textile in cement to be used to cover model

Model made from chicken wire, stuffed with wood wool

Covered in textile dipped in cement

Extra cement poured on top of model

Color pigment was poured on top of the concrete mix...

...to achieve the marbeling result when poured
Testing to colour sealing foam with pigment

An arc was used to try the structural properties of the foam

Rinsing off excess colour pigment that did not stick

Reinforcing the inside of the arc

Cement mixed with green pigment

Yellow pigment added to mix
Learnings from combining methods

The pouring of cement on top of sealing foam was the last experiment before moving on to making a larger sitting device. The technique of adding materials on top of each other, first shaping chicken wire, then adding foam and covering it with cement became the basis for the final build.
A SITTING DEVICE

Basis for the object’s structure is a cube made of chicken wire. I decided to use a wire net because it will stay in the shape it is forced to. This allows the use the human body as a tool for shaping the object by sitting down on it. Another property of the net is that you can fill it up through the mesh. By using scrap polystyrene as a filler and spraying sealing foam on top, the shape of the chicken wire net is transformed into a rock like sculpture, defined by the two sitting bodies.
Making a tube with steel wire and chicken wire net

Base made from found wood, at sitting height

Chicken wire tube

Chicken wire tube to be shaped

Sitting down to give shape

Adding shape while sitting on object
Chicken wire shaped from two human bodies

Pouring sealing foam onto shape

The foam technique is both controlled and uncontrolled

Using scrap polystyrene to fill structure

Adding polystyrene pieces to fill structure
Adding more foam

Sanding dried polystyrene to shape seating areas

Sanded sitting areas

Sealing foam object placed on top of base

Testing shape

Comfortable but lacking of surface
The final step of the process is pouring white cement mixed with pigment powder. The technique with the pigment powder is inspired by the Italian marbling technique called scagliola.

Letting the colored cement to flow freely is in itself an uncontrolled design method. The result can be manipulated by pouring layers of concrete on top of each other.

The final object is an experiment in itself. Although the previous material tests led up to it.
Blue cement mix was poured first

Red pigment was part of the first layer

The pink parts were later covered with all blue and white

The expression can be altered along the process...
... an advantage of the building technique

Different shades of blue made the final expression

Details
A sitting device shaped by human bodies and poured technique
Seating for two people?

... Or more?
EXPERIMENT AS METHOD

[ONE SEAT PER WEEK]

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