

CONCRETE
DESIGN
COMPETITION
2017/2018

TACTILITY

FOR MORE INFORMATION

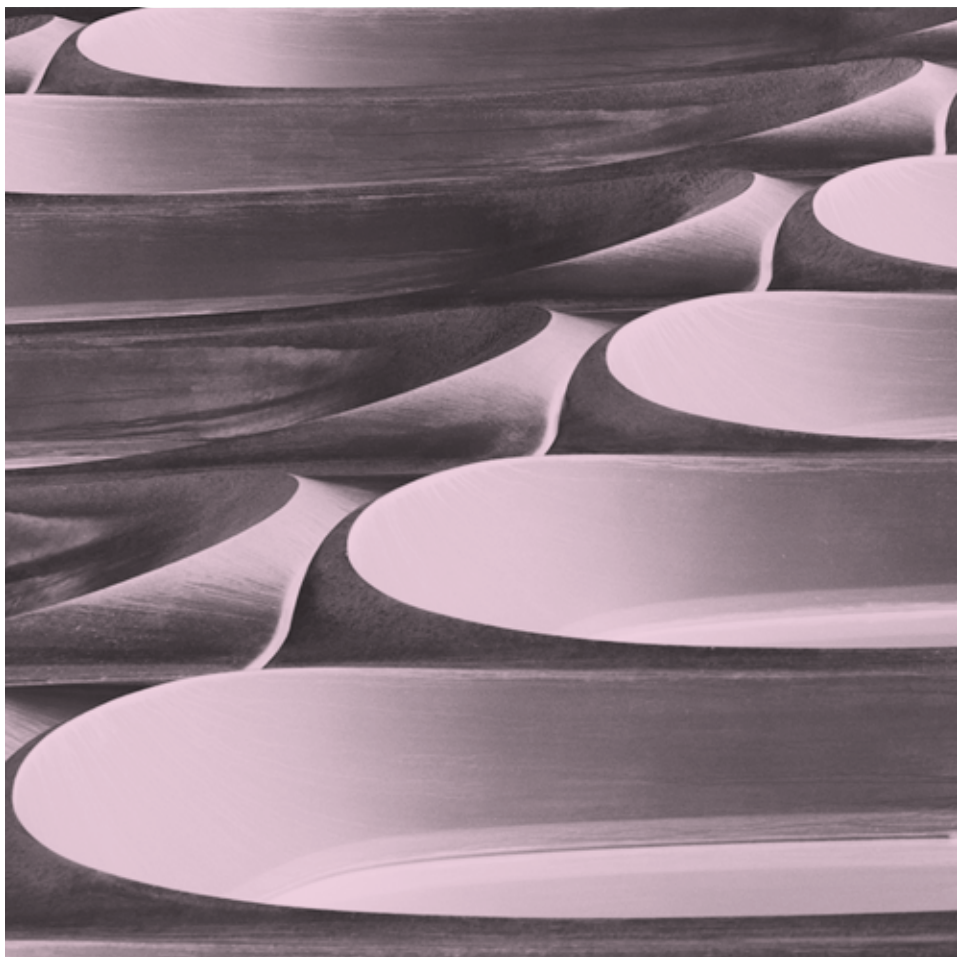
BELGIUM – FEBELCEM – Noël Naert – n.naert@febelcem.be

GERMANY – InformationsZentrum Beton GmbH – Ulrich Nolting – ulrich.nolting@beton.org

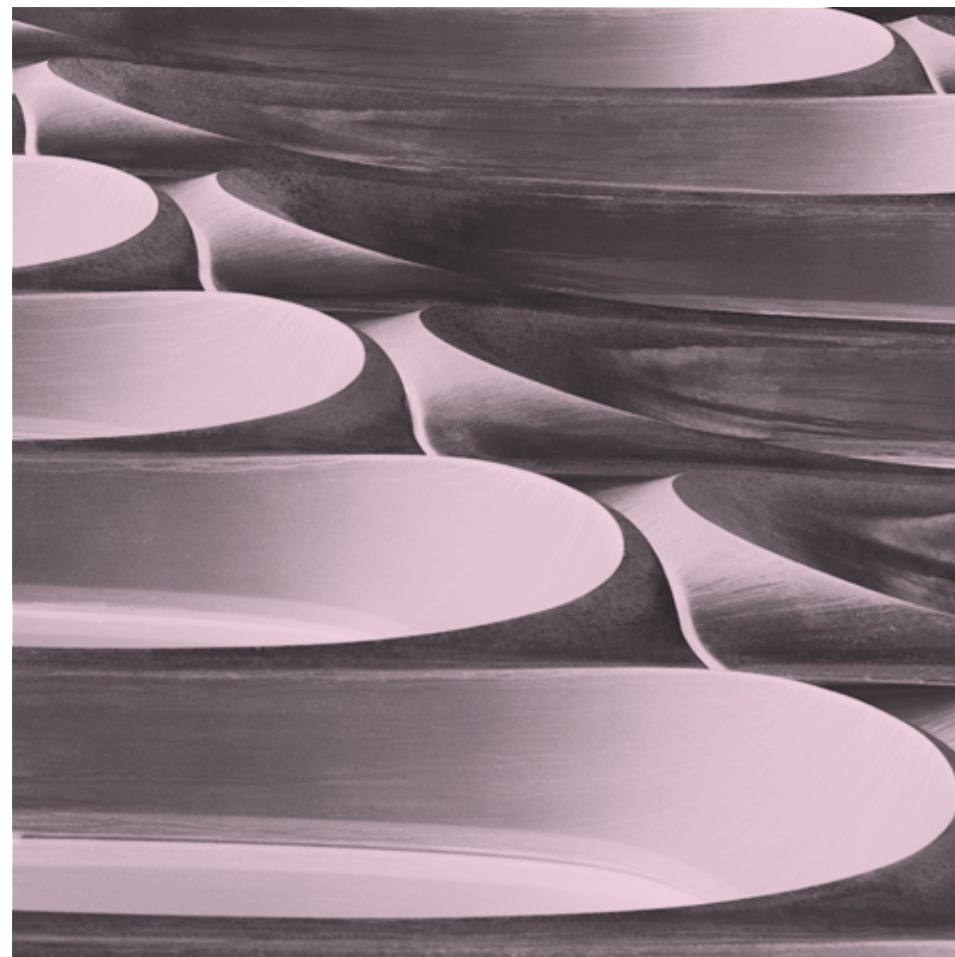
IRELAND – CMI – Richard Bradley – rbradley@irishcement.ie

or

bureaubakker – Siebe Bakker – mail@bureaubakker.com



WWW.CONCRETEDESIGNCOMPETITION.COM



WWW.CONCRETEDESIGNCOMPETITION.COM

THE CONCRETE DESIGN COMPETITION

The International Concrete Design Competition for Students is a biennial ideas and design competition for students in architecture, engineering, design and affiliated disciplines. It is organized and funded by a consortium of European cement and concrete associations and open for students registered in an educational institute in one of the participating countries.

The International Concrete Design Competition for Students aims at promoting innovative design attitudes related to the use of concrete as a material and a technology. It is characterized by its format: each competition cycle is framed by a theme designating a specific property of concrete. Nationally chosen laureates are invited to participate in an international master class. This master class continues the investigation of the theme.

The International Concrete Design Competition for Students is material based. It focuses design attitudes towards material as a design-leading phenomenon. It does not prescribe 'traditional' design requirements like programme, location or typology. It asks participants to explore and exploit the potential of the material in a design-led environment. They are invited to approach the material from within its own merits and to push its potential to 'realise' developed ideas. It asks to present these ideas through design proposals. Ideas can only show their merits when they are applied. The choice of a design topic or programme is free. It should be chosen such that it presents the participant's ideas as accurately as possible and can range from building details to large structures, landscape projects or building complexes.

The International Concrete Design Competition for Students is 'open' for adaptations. It's character offers a platform for material research and design that can either be approached individually as a complete assignment or it can be incorporated within 'host' design and research assignments and thus becoming part of existing curricula.

The International Concrete Design Competition for Students is an initiative by a collaboration of European cement and concrete associations. Their aim is to promote innovative design attitudes related to concrete. They recognise that the use of concrete as an architectural medium shows room for improvements and development. They see the material not only as a means to 'solve' formal design ambitions. Material research and understanding will lead to innovative design and create possibilities for architects, designers and engineers to surpass existing limitations and visions.



The International Concrete Design Competition for Students also recognises the abundant energy, enthusiasm and potential of those studying architecture, engineering and design, the future professionals that will work with concrete. The cement and concrete associations are convinced this competition offers additional expertise alongside the regular education on materials students receive. In order to learn about and understand a material one has to experience and explore its properties, preferably in a design-led environment. This competition including its master class for laureates offers a unique opportunity to be part of future developments and to immerse oneself in conditions where materials are at the core of developments and design.

TACTILITY

Concrete is often perceived as gray, dull and cheap. Indeed it is the most used construction material in the world and thus can be found in many places and applications where economics, speed, and simple and safe constructions are crucial. Nonetheless, concrete is also widely deployed to express specific architectural and aesthetic desires. Concrete's nature of seamlessly copying the formwork in which it is made - in terms of shape and texture -, makes it an ideal material to create many different expressions. Varying from raw and rough 'beton brute', to sleek and slender high-performance structures and ultra-dense maintenance-free surfaces. Concrete provides designers with endless possibilities to create slightly varying repetitions with pre-cast façade elements, truly three dimensional spatially complex building components, and as many surface treatments and textures one can imagine.

Tactility may be viewed as one of architecture's main languages. We all recognize craftsmanship and beauty in cleverly detailed and exquisitely executed pieces of architecture. From sensual wall textures in the works of Ando and Chipperfield, to sturdy and revealing structures of Zumthor and Ogiati. The material, and especially the way it presents itself, might be as important as the work's sculptural and functional presence. In the best examples, these 'come together' and reinforce each other. Material gives meaning to the work and the way it is perceived. When architecture is described as our third skin, tactility should be one of our first areas of attention. Material is where architecture meets our bodies, where the building interacts with our senses.

The 8th Concrete Design Competition on **TACTILITY** asks students of architecture, design and engineering to explore and exploit the potential of concrete's properties with respect to any notion of **TACTILITY**. These can be related to inherent material properties, concrete's production process, and its application in new or existing structures. They may address aesthetic desires, structural systems or fabrication methods and comment on economic realities, sustainability demands or social issues.

This competition does not prescribe a specific location or program; participants can choose a context of their own that supports their fascinations and ambitions and that fits an acute presentation of their ideas. Proposals may range from objects, furniture and architectural details, to housing, landscape interventions, complex buildings, infrastructure and structural systems. Competition entries need to address technical and functional aspects as well as formal and programmatic ones – ideas need to be tested through design proposals to convincingly demonstrate their potential. They will be reviewed

on the combination of inventiveness in addressing the competition's theme and architectural implications.

The 8th Concrete Design Competition – **TACTILITY** runs in three European countries during the academic year 2017 - 2018. National laureates will be invited to participate in a weeklong international workshop facilitated by the industry featuring renowned lecturers, experts and critics, further exploring concrete and tactility.

OXFORD DICTIONARY OF ENGLISH

tactile; of or connected with the senses of touch; perceptible by touch or apparently so: tangible; designed to be perceived by touch; given to touching others, especially as an unselfconscious expression of sympathy or affection

THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE

tac•tile 1.a. Perceptible to the sense of touch; tangible. b. Characterized by or conveying an illusion of tangibility. 2. Used for feeling. 3. Of, relating to, or proceeding from the sense of touch; tactual.





SOME REFERENCES ON TACTILITY





Akka Art Gallery
Osaka, Japan, 1988
Tadao Ando Architect & Associates



American Cement Building
Los Angeles, USA, 1964
DMJM Architects



Art Foundation Sachsen Anhalt
Halle, Germany, 2012
AHM Architekten with G.tecz



Atelier Bardill
Scharans, Switzerland, 2007
Valerio Olgiati



Atlantic Wall
Bray-Dunes, Dunkerque, France, 1944



Bunker 599
Culemborg, Netherlands, 2010
RAAAF

Caltrans District 7 Headquarters
Los Angeles, USA, 2004
Morphosis



Climbing Wall
Spaarnwoude, Netherlands, 1992
Frans de Wit



Fürstenwald Cemetery
Chur, Switzerland, 1996
Urs Zinsli & Kienst Vogt



Das Gelbe Haus
Flims, Switzerland, 1999
Valerio Olgiati

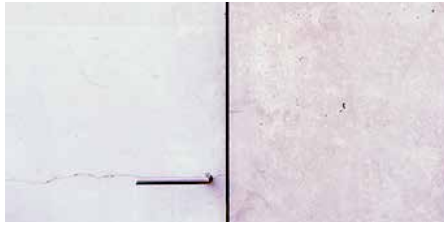


Haus 36
Stuttgart, Germany, 2015
Matthias Bauer Associates Stuttgart



Kantine
Berlin, Germany, 2013
David Chipperfield Architects





Kunsthau Bregen
Bregen, Austria, 1997
Peter Zumthor



Kunstmuseum Liechtenstein
Vaduz, Liechtenstein, 2000
Morger & Degelo, with Christian Kerez



Mercedes-Benz Museum
Stuttgart, Germany, 2006
UNStudio



MuCEM
Marseille, France, 2013
Rudy Ricciotti



National Park Centre
Zerne, Switzerland, 2008
Valerio Olgiati

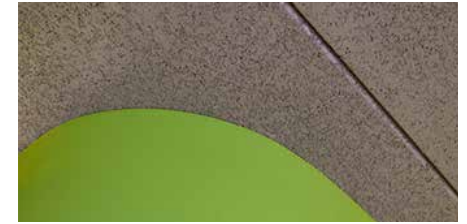


Neues Museum
Berlin, Germany, 2009
David Chipperfield Architects

Querini Stampalia Foundation
Venice, Italy, 1963
Carlo Scarpa



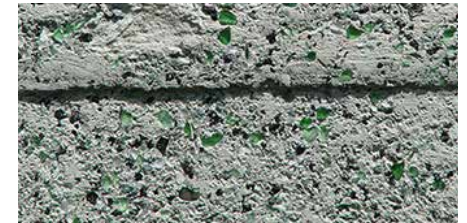
Radix
Wageningen, Netherlands, 2009
DP6



St. Antonius Church
Basel, Switzerland, 1927
Karl Moser



Swiss Re
Rüschlikon, Switzerland, 2002
Meili Peter Architekten



Unité d'Habitation - Cité Radieuse
Marseille, France, 1952
Le Corbusier



Utrecht University Library
Utrecht, Netherlands, 2004
Wiel Arets Architects





INFO & CONTACT



BELGIAN NATIONAL SECRETARIAT

FEBELCEM – Federation of the Belgian cementindustry (Federatie van de Belgische cementnijverheid – Fédération de l'industrie cimentière belge)

contact persons:
Noël Naert
tel. +32 2 645 52 50
n.naert@febelcem.be

Jean-François Denoël
tel. +32 2 645 52 59
jf.denoel@febelcem.be

Marina Scherps
tel. +32 2 645 52 18
m.scherps@febelcem.be

address:
Boulevard du Souverain / Vorstlaan 68
B-1170 Bruxelles / Brussel
Belgium



GERMAN NATIONAL SECRETARIAT

InformationsZentrum Beton GmbH

contact person:
Ulrich Nolting
tel. +49 211 28048 301
ulrich.nolting@beton.org

address:
Steinhof 39
40699 Erkrath
Germany



IRISH NATIONAL SECRETARIAT

CMI - Cement Manufacturers Ireland

contact person:

Richard Bradley

tel. +353 419 87 60 00

rbradley@irishcement.ie

address:

c/o Platin

Drogheda

Co. Louth

Ireland



INTERNATIONAL COORDINATOR

bureaubakker

Siebe Bakker

mail@bureaubakker.com





RULES



1 PARTICIPATION

The 8th Concrete Design Competition is open to any registered student in schools of architecture or related disciplines in countries that support the competition, regardless of the participants own nationality.

The supporting countries are: Belgium, Germany and Ireland.

Entries may be submitted by individuals or by teams. Teams may be interdisciplinary and may consist out of a maximum of three persons. All members of a competing team must comply with all of the terms and conditions given in these rules. Entries can only be submitted in the country in which the competitor is studying during the academic year 2017/2018.

2 INFORMATION / LANGUAGE

All general information will be provided through our website only (www.concretedesigncompetition.com).

All communication will be in English. Proposals have to be drafted in English.

3 ENTRIES

3.1 Items to be submitted

The entries submitted by competitors or teams of competitors comprise a maximum of:

- Two A1- format panels (width: 594mm x height: 841mm) mounted on flat, stiff, strong backings. These must be laid out vertically (portrait) and numbered one and two.
- One A4 size envelope containing:
 - one digital copy of each submitted panel. Format TIF, Jpeg or PDF; 300 dpi on original panel size (A1) and in the original layout of the submitted panels.
 - completed identity form
 - completed ownership declaration
 - a copy of the school registration card for the academic year 2017/2018

3.2 Content of entries

There are no regulations concerning the content of the A1 size panels. They may contain plans, sections, isometrics and so on. Competitors must decide themselves on the most effective ways to present their proposals. Juries will under no circumstances examine any additional documents or models.



3.3 ID-code

Each competitor or team of competitors must choose an ID-code made up of:

- two letters from the Roman alphabet (e.g. AA)
- followed by three figures (e.g. 123)

This ID-code (e.g. AA123), to the exclusion of any other mention, must appear on all documents and wrappings entered in the competition:

- on the outside of any packaging
- on each panel
- on all digital media
- on the sealed envelope containing the identification form, ownership declaration, digital copies of the panels and copy of school registration of the competitor or team of competitors. No other writing should appear on the envelope. On each document, the code must be written in a horizontal frame 25 mm high and 100 mm wide, in the top left-hand corner of the document. The identification form and ownership declaration can be downloaded from our website.

3.3 Anonymity

The panels and the outside of the envelope may not contain any information indicating the identity of the competitors.

3.4 Submission of entries

The date for submission of entries will be set by each national secretary individually. Please check the national secretary section of our website (www.concretedesigncompetition.com) for details.

Entries must be sent carriage paid to the national secretaries. The national secretaries are unable to reimburse any expenses whatsoever.

3.5 Nationally declared requirements

Individual national secretaries may provide additional specifications for submission of entries. Please check the national secretary section of our website (www.concretedesigncompetition.com) for details.



4 OWNERSHIP

All materials received by the organisers become the property of the organisers and may be used in any form for publication purposes. The intellectual property rights of each project are the exclusive property of the author(s) thereof. Results (i.e. objects and drawings) produced during the master class will become property of the organisers and may be used in any form for publication purposes. The same rights for publication purposes are also reserved equally for all participants of the master class. Artistic rights, copyrights or intellectual ownership on results produced during the master class remain the property of all workshop participants and contributors as a group.

5 TIMETABLE

The 8th Concrete Design Competition runs during the academic year of 2017-2018.

The date for submission of entries will be set by each national secretary individually. Please check the national secretary section of our website (www.concretedesigncompetition.com) for details.

The Concrete Design Workshop will run from August ... to ..., 2018.

6 JUDGING

6.1 National juries

Each national secretary organises a national jury. The Jury members will be announced through our website.

6.2 Competition outcome

The jury's decision is final and not open for debate. Each national jury will designate up to three winning entries, and may or may not specify a ranking. Additionally the national juries may award other entries with a 'honourable mention'.

6.3 Disclosure of competitors' names

No jury member will be made aware of competitors' names until after the judging session. In order to guarantee the anonymity of the entries, competitors may not use their projects for any kind of communication before the national jury results are made public with the exception of regular school requirements.

7 AWARDS

7.1 Concrete Design Master Class

National winners are invited to participate in a 6 day Master Class as an international event. The national secretaries will organise and fund travel, accommodation and programme costs. Travel costs will be funded based on travelling from and to the country in which the entries were submitted. Details on the program will be given on our website (www.concretedesigncompetition.com).

7.2 Publication

All winning, and awarded (honourable mention) entries will be published on our website (www.concretedesigncompetition.com).

7.3 Additional awards

Individual national secretaries may offer additional awards to their laureates. Please check the national secretary section of our website (www.concretedesigncompetition.com) for details.





PREVIOUS CYCLES





7 CYCLES

- 2003/2004 **ROBUSTNESS** - curator: Michael Speaks
- 2005/2006 *plastic-OPACITY* - curator: Hanif Kara
- 2007/2008 implicit performance - curator: Juan Herreros
- 2009/2010 **MONOLITHIC** - curator: Valerio Olgiati
- 2011/2012 ENERGY
- 2013/2014 Elegance
- 2015/2016 **METAMORPHOSIS**

11 COUNTRIES

19 NATIONALITIES

1907 PARTICIPATING STUDENTS

1476 COMPETITION ENTRIES

82 PARTICIPATING SCHOOLS

239 MASTER CLASS PARTICIPANTS



SELECTION AWARDED ENTRIES PREVIOUS CYCLES





community and environment

The public system we build (or construct) is vulnerable to continuity, continuity the single possession of use fitted to the world. These pieces have the power to stay connected together or not, they quit, figure ordinary or by force or despite that its duration. As such the change of this capacity is critical.

Typically, a community has the opportunity to organize its needs during the planning period of a building or public space. One built space can't be easily modified because a community forms in a fixed early stage; needs are set and evolve over time. Residents of the *Apnea* may not hold the same view about what defined the original intention as they do in spaces where the space and time interact. A space which was intended to satisfy the community but not by chance is a better design (argument).

What if a community could change a space in not 30 years, when it wanted to?

How might a self-transformation follow the characterisation of a highly complex biological system?

Given a task is presented here as a pattern space which can physically adapt to the changing needs of its community by allowing them to design the physical environment.

what is open source?

The idea "Tiger Knows" is grounded upon the common-sense notion of shared information community. This community member should share what he/she knows with the network. Besides, he/she can obtain timely and re-increase this information. Individually, they have added to the different knowledge and skills and can play an active role in the work. When managers and workers interact, they enhance the active exchange of knowledge and co-producing functions in a series of community and co-learning.

The goal of Taper's focus is to allow a community to design their own physical space in order to further a sense of ownership. This has been made possible with a new material concept that can be used to change culture.

concrete innovation

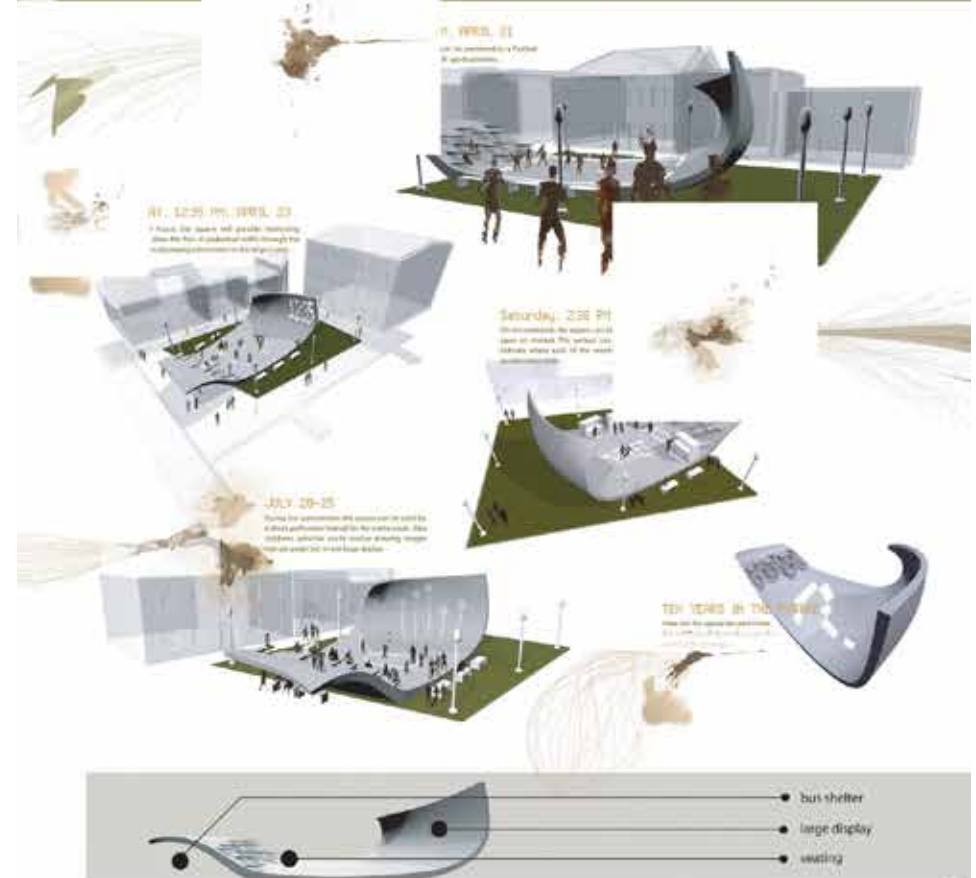
Open-Jointex incorporates a technology which has been developed by C20i which allows the colour of a concrete surface to be actively changed. Furthermore the tone of colour change can be controlled to make specific sections to change at will. By activating the controllability sensor in a grid pattern and connecting them via a computer, the concrete surface can be made to act like a digital display.

The present work extends this idea, finding porous, self-healing, and self-healing materials with self-healing abilities. The authors have developed a porous, self-healing material that is added to the concrete during the mix. When an internal crack is formed through the structure, the surface of the crack is exposed to the air. The porous material is exposed to the air, causing the pores to fill with air, increasing the initial volume of the concrete. This causes the concrete to expand and fill the crack, thus healing the crack. The authors have also found that the porous material can be used to heal the crack in the concrete.



- 1. **Thesis statement** – state the main message
- 2. **Support sentences** – the message itself
 - 2002 2008 = 6 years (2 years growth, one year reduction, increase 2008 = 2007)
- 3. **Concluding sentence** – summarizing (2008 = 2007)
 - 2008 = 2007 = 2008 = 2007 = 2008 = 2007

and training sessions are all available to you.



so124



The concept is a single-dimensional column that is designed to be a human support. The structure is a thick, hollow cylinder that is 10m high and 1m in diameter. It is designed to be a human support, with a person climbing it. The structure is made of a material that is strong and durable, and it is designed to be a human support.



The concept is a single-dimensional column that is designed to be a human support. The structure is a thick, hollow cylinder that is 10m high and 1m in diameter. It is designed to be a human support, with a person climbing it. The structure is made of a material that is strong and durable, and it is designed to be a human support.

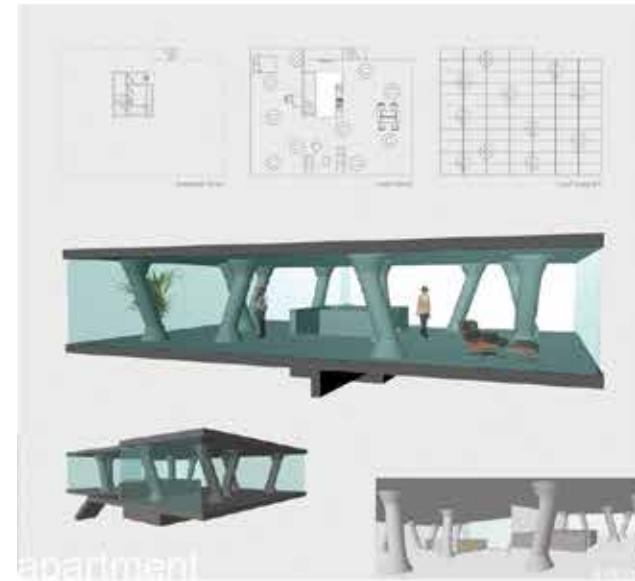


hangover
1
so124

so124



small > BIG
scale examples

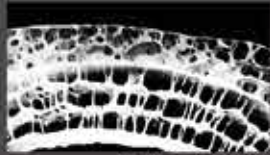


hangover
2
so124

TC120

Development of non-directional Spatial Skeleton Structure

Non-directional spatial skeleton structure, at selected from basic cubes to large forms was developed to meet the design condition of architectural spatial system of the building. The non-directional spatial skeleton structure could be a significant factor to be considered in the architectural design to create a new space.



Expanded section of the brick wall

The primary condition that has to be met was to achieve a structure with a clear, open, and light space.

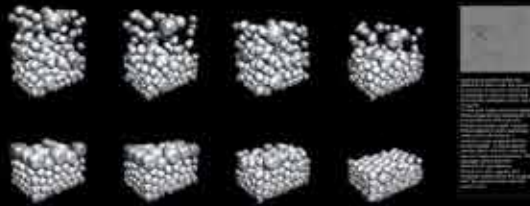
The design for the development of a non-directional spatial skeleton structure was achieved through a series of experiments. The design process was a series of experiments. The design process was a series of experiments. The design process was a series of experiments.



Brick wall

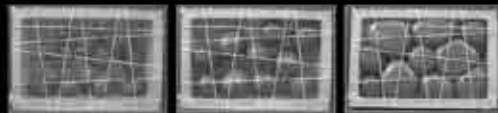
To meet the need for spatial difference, the design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed.

The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed.



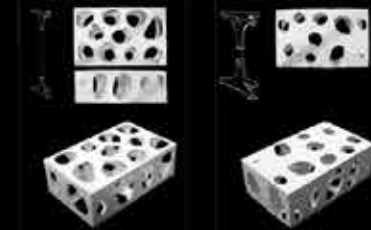
Experiment 01

The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed.



The form of the chamber is determined by the technical conditions in the system of neighboring chambers.

The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed.



Experiment 02

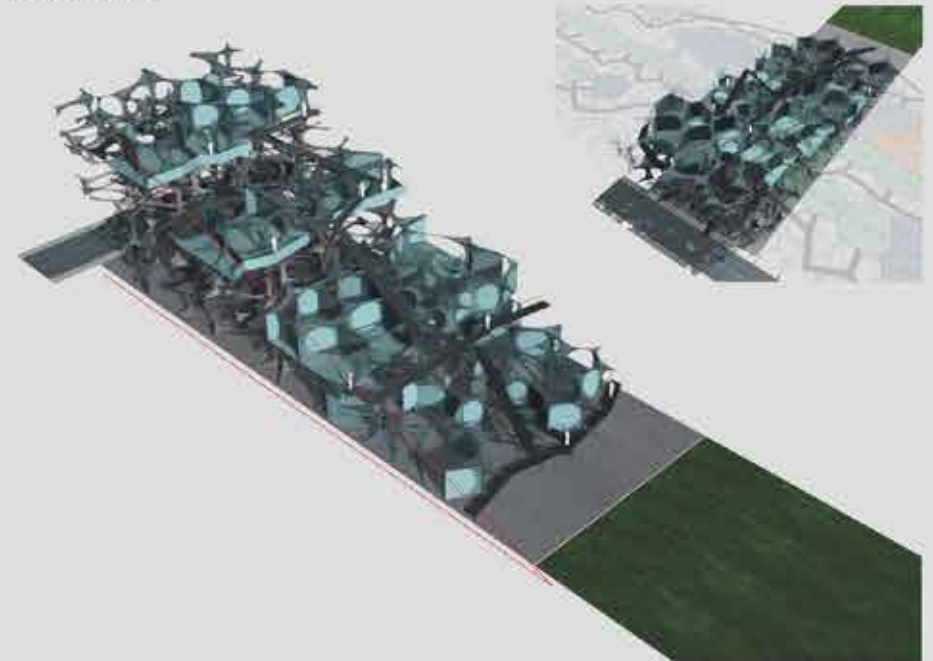
The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed.



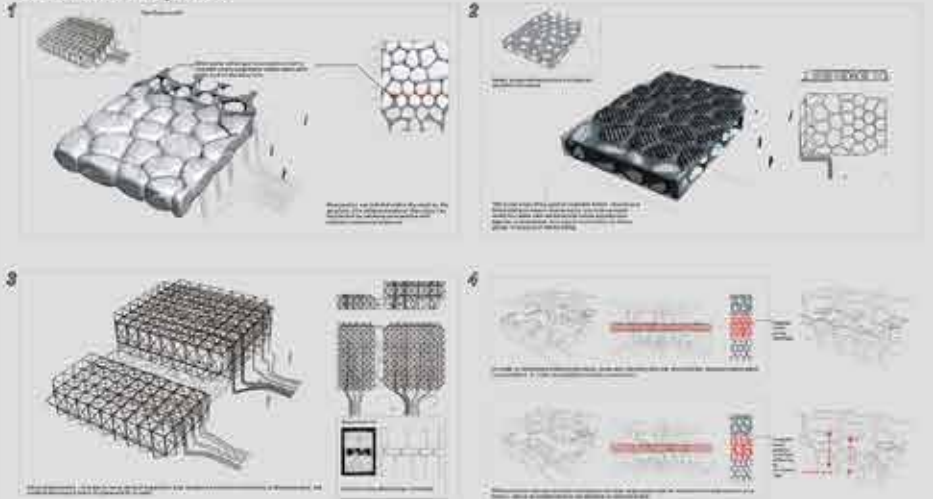
Experiment 03

The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed. The design of the brick wall was developed.

TC120



Construction sequence



BT282



Transparency can be an inherent property of material, as in the case of a curtain wall. Transparency can also emerge from a particular mode of organisation.

When two or several figures are superposed one to another, each one of them claiming the common part to both of them, human eyes perception is one of contradiction in spatial dimensions. In order to resolve this contradiction, one has to admit the existence of a new visual quality. These figures are transparent in a way, which means: they are able to interpenetrate one into another without cancelling themselves out optically. This transparency however proves much more than its visual quality. It even implies a spatial much broader arrangement. Transparency means one will perceive simultaneously various space layers. Such an organisation pushed to extremes obviously induces a certain plasticity in the plan and the visual perception that it offers.

Because of its intrinsic properties, concrete easily allows the production of similar elements on large scale. Therefore one can base oneself on a single element arranged and offered according to the needs of the project and this makes it possible to stick to the creation and the use of only one mould.



plastic-OPACITY

BT282



plastic-OPACITY

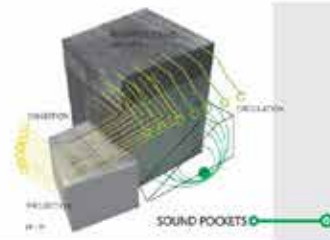


The proposal a walled landscape situated overlooking the Aran Islands, a space for the spoken word - like an Atrium. The strategy of the project consists of two complementary buildings. The first, a timber - lattice beam made from recycled shutters, where sound and possibly may flow and sink is a landscape platform - allowing for the celebration of culture. The second a tower, where the walls revealing a landscape over half of tall structures. The tower houses an archive and info station.

The materiality of the project draws upon the ancient tradition of homogeneous 'lattice gap' walls that characterize the islands. The gap is developed to house existing audio-cassette collections, future flow-optic sound technology it accommodated by the structure of the wall. These two conditions allow for the development of different 'lattice gap' walls. The wall is perforated using timber shutters and a bit gap system. Internal sound pockets are made when the 'gap' is built in - offering different qualities of opacity over time as the wall deteriorates. The accumulation of cavities rematerialises and when the transparency of the wall. Light is delivered to select sound spaces through upstream acrylic rails - referring to flow optic technology and digital media.



END OF THE GAP WALL STRUCTURE ARAN ISLANDS



DEVELOPING THE WALL SYSTEM



GLASS FIBRE REINFORCEMENT



ARCHITECTURAL SPACE / ALMOST INVISIBLE WALL / ROOMS OF SOUND



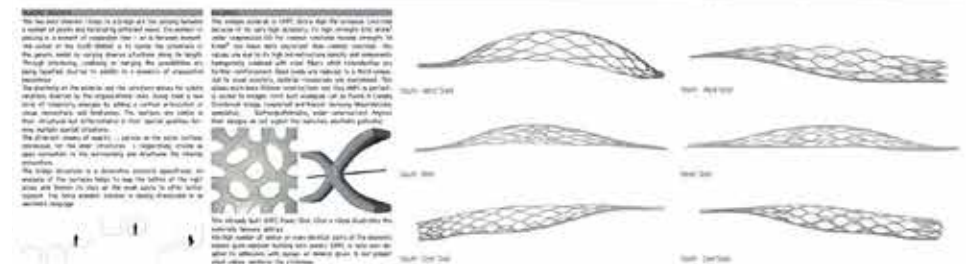
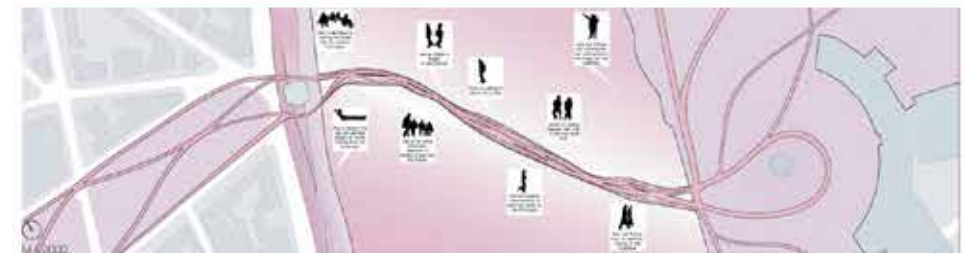
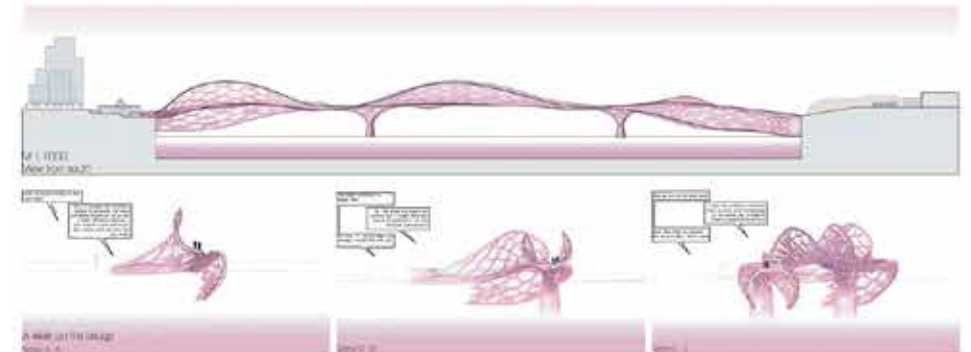
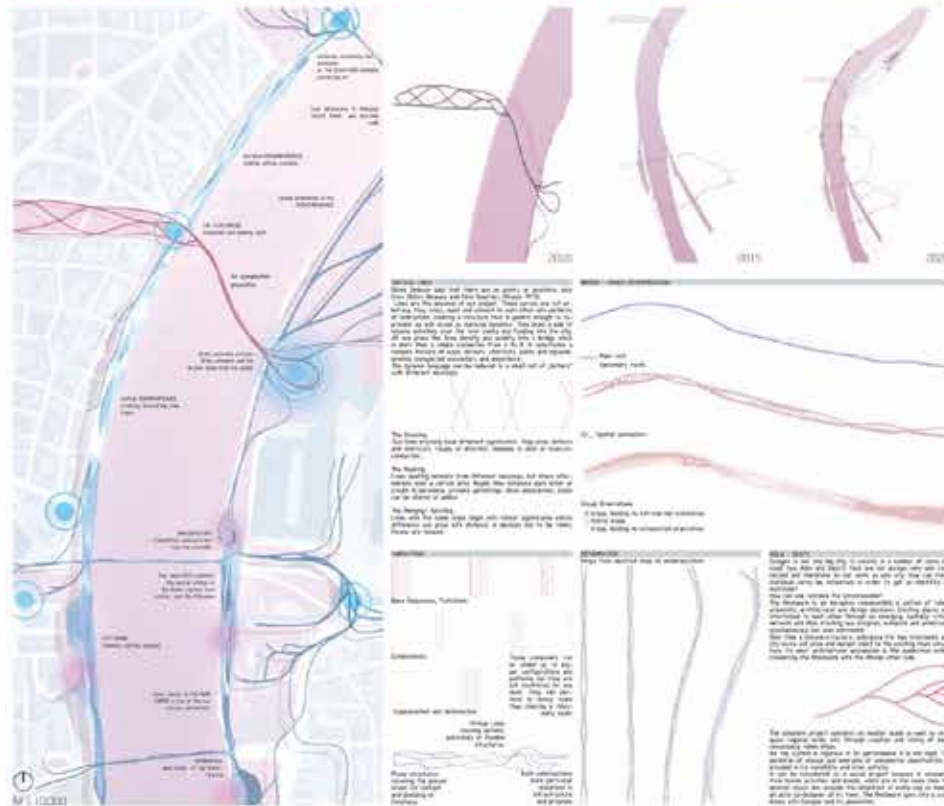
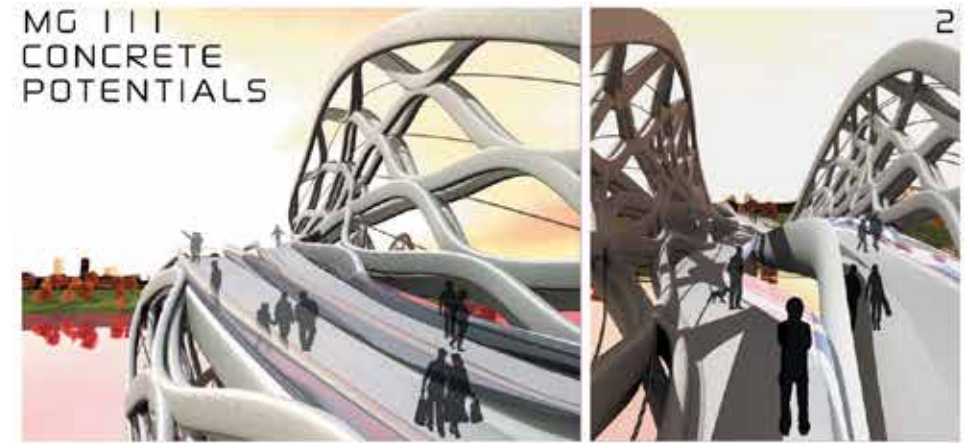
DEVELOPMENT OF GLASS FILAMENT / ACRYLIC WALL / DEVELOPMENT OF WALL / DEVELOPMENT OF WALL



PHOTOGRAPHIC EXHIBITION / LIGHT

CONCEPTUAL / 1ST OF NOVEMBER 2010 / 2ND OF NOVEMBER 2010 / 3RD OF NOVEMBER 2010 / 4TH OF NOVEMBER 2010 / 5TH OF NOVEMBER 2010





DC 288 | WHON..... 01



Las Palmas de Gran Canaria



Forms Sea



Model of Proof



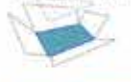
Section (Steel-Calcium Carbonate)



Superficial Texture



Inhabiting a portion of sea



WHY...?

Increasing the density,
relying on the existing

The project idea is to live in a marine object. An object built under water (ecosystem submarine), but that is intended to be inhabited by people outside of the sea (human ecosystem). The structure consists of 10 ribs that generate livable empty inside. These are linked through the closing, that unify the architectural object, and that they all work for skin.



HOW...?

Galvanic Corrosion is an electrochemical process in which one metal corrodes preferentially when in electrical contact with a different type of metal and both metals are immersed in an electrolyte. Conversely, a galvanic reaction is exploited in primary batteries to generate a voltage. When two or more different sorts of metal come into contact in the presence of an electrolyte a galvanic couple is set up as different metals have different electrode potentials. When a positively charged anode and a negatively charged cathode are suspended in sea water with an electric current flowing between them, calcium ions combine with carbonate ions and adhere to the structure (cathode). The result is calcium carbonate (CaCO₃).



DC 288 | WHON..... 02



WHERE...?

"La Puntilla" is one of the most important strategic locations on the "Las Canteras" beach. It operates as the hinge between landscape beach and rocky landscape. Hence, its undeniable link to ocean.



1/30



WHAT...?

The definition of housing unit of 40 m², is based on the geometrization of two circles decimates. The service area of the unit is in part compressed and the rest set a versatile space continuum.



Wireline Steel Structure



Coral Structure



Foreign Skin



Fossilized Internal

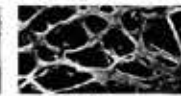


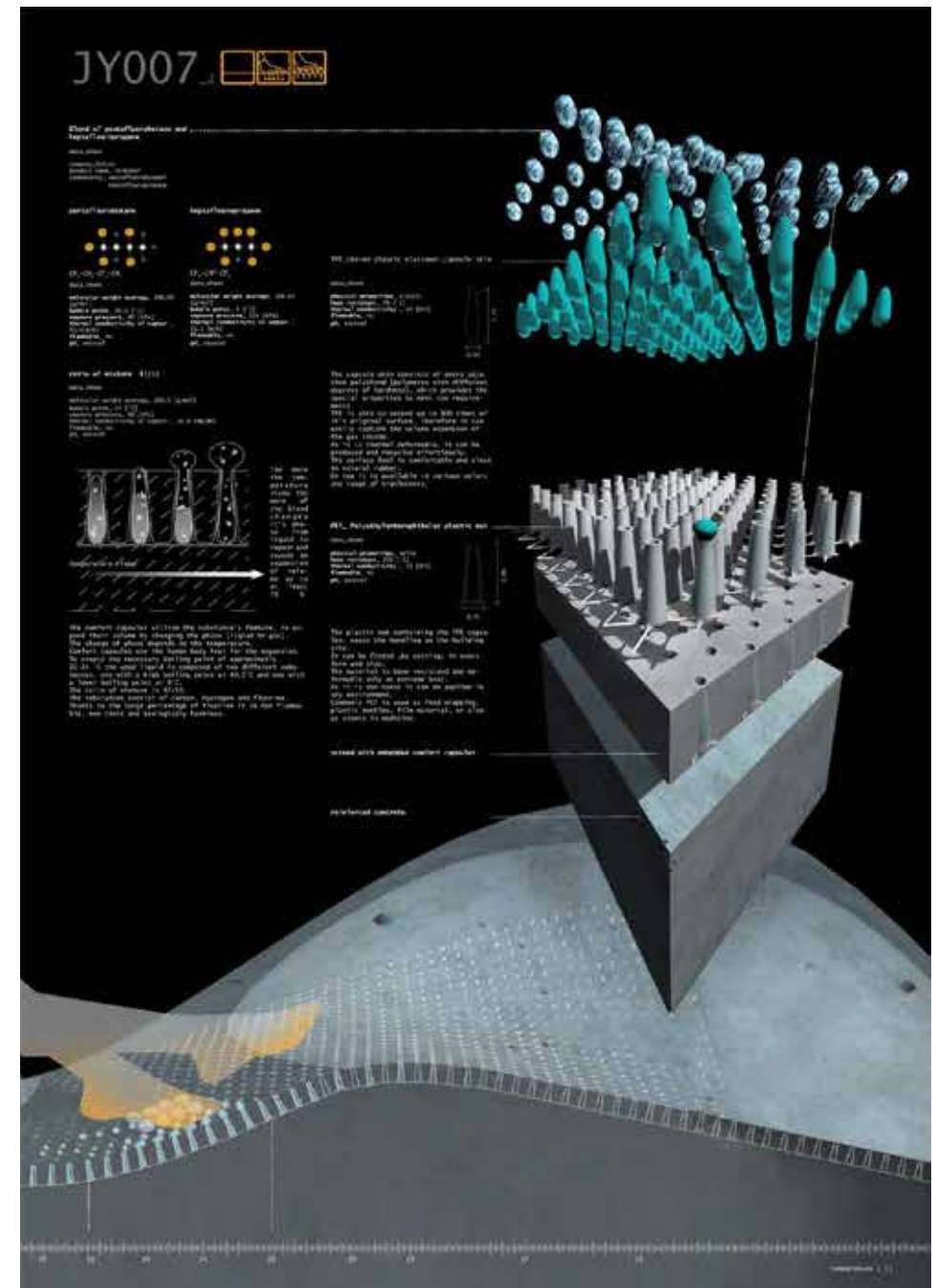
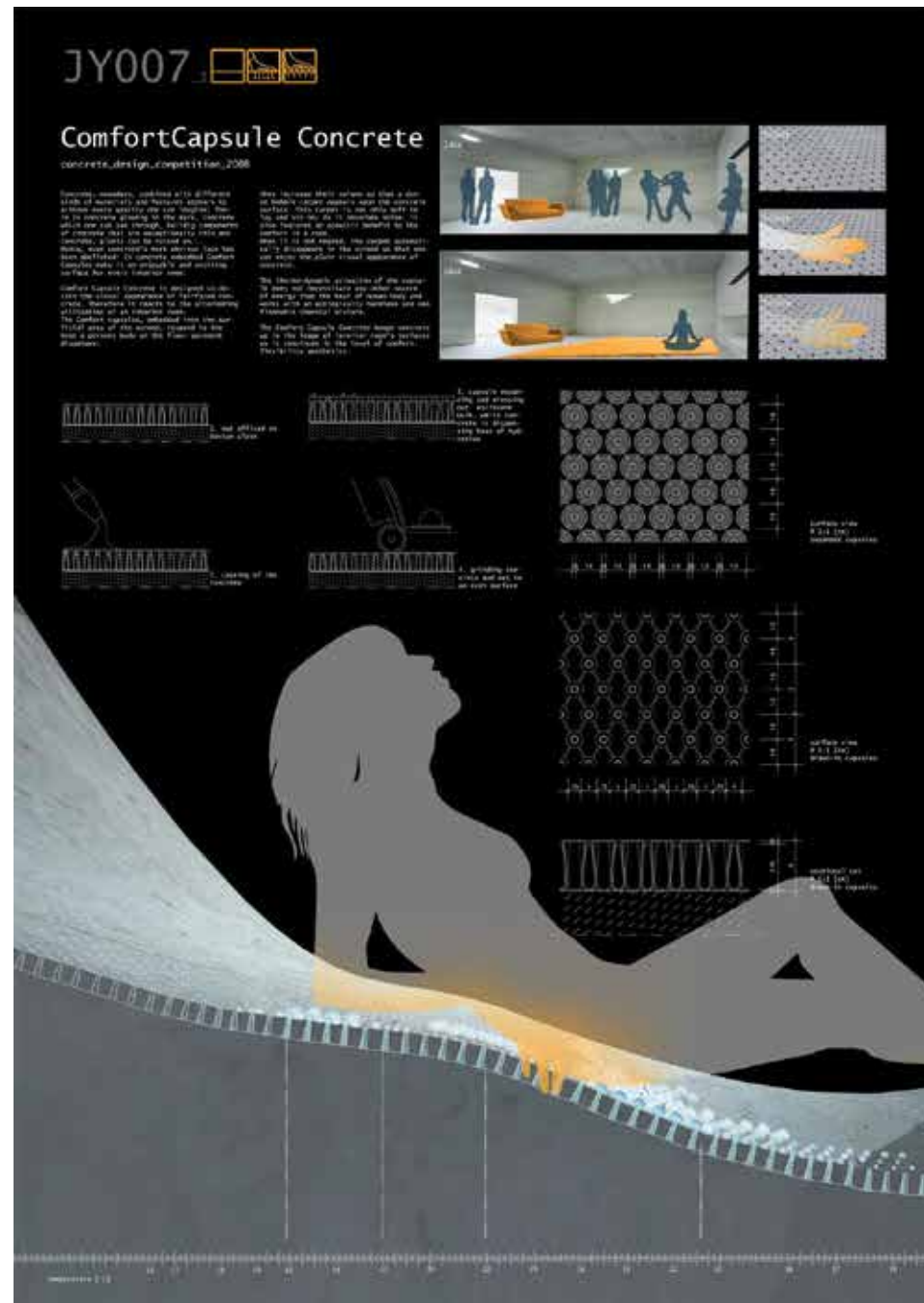
WHO...?



WHEN...?

References cell minimum

Jean-Louis Chassac
CelluleBuckminster Fuller
Dymaxion housePascual Hausmann
Bella de GillyLe Ricolais
The art of building with tubesFrederick Kiesler
Endless houseJuan Manuel
Mula a 6 papeles





SZ595

Urgent Performance

For most people around the world, living in poor housing conditions and lacking infrastructure, the urgent architectural need is still to fulfill basic housing necessities. This is especially the case for millions of refugees. Having been chased from their land and neighborhoods, they leave behind friends and family, property, and their old communities.

The first relief aid given refugees are often UN's standard tents (see upper left corner). They are lightweight, simple and cheap, and can therefore be shipped quickly in vast amounts when a crisis hits. Although they are completely unfit for permanent residence, but unfortunately their use is often far more prolonged than is intended. Climate: they can get too hot in the summer, leaking in the winter, and get easily blown away or torn down by monsoons or heavy winds. So as many refugee camps become prolonged settlements, the need for a more permanent solution is urgent. Often little follow-up sheltering is provided, even as many camps grow into local communities with tens of thousands of residents, who are to live and work there for often as long as 15 years.

As refugee camps often are crowded and overpopulated - the risk of violence, theft, and physical abuse of women and children can grow unduly high. Tents cannot provide sufficient privacy or security, and increases these risks.

Refugee camps are highly diverse when it comes to climate, topography, population and needs, and one standard shape can hardly meet the various needs.

But where resources are scarce, simple easy-to-use design can make a big impact on peoples living conditions. And by not providing a strict given form hopefully this concrete building method adapts to a rich variety of conditions, and is easily combined with local knowledge and materials.

By being an open-ended design, it empowers the local community and each individual to decide which design they want themselves, and how to best collectively shape their own new neighborhoods.

Problem: To provide cheap, adaptable housing for displaced long-term refugees.
Method: Examining multifunctional, mass-produced concrete mesh sheets.
Concept: "instant-concrete" mesh sheets.

Research and Sketches



Logistics



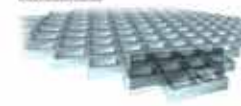
The sheets are transported to the site where they are used. With our new design, the sheets are added, either with a pump or a hose and held until completely full. The volume of the mesh is not fixed, the sheets are, therefore, held in tension, so no measuring material and pouring water can be reduced to most applications. Furthermore, the sheets are held in place by gravity, making it easy to measure the sheet. Then they are held together by gravity.



SZ595

long-term refugees.
 moulds.

Inside the sheet



Versatility

Sheds

Can be used to create a shed or a roof, or even a wall, or a fence, or a partition.

Domes

Can be used to create a dome or a roof, or even a wall, or a fence, or a partition.

Free-form

Can be used to create a free-form structure, or a roof, or even a wall, or a fence, or a partition.

Fences &

Can be used to create a fence or a partition, or a wall, or a roof, or even a shed, or a dome.

Landscaping

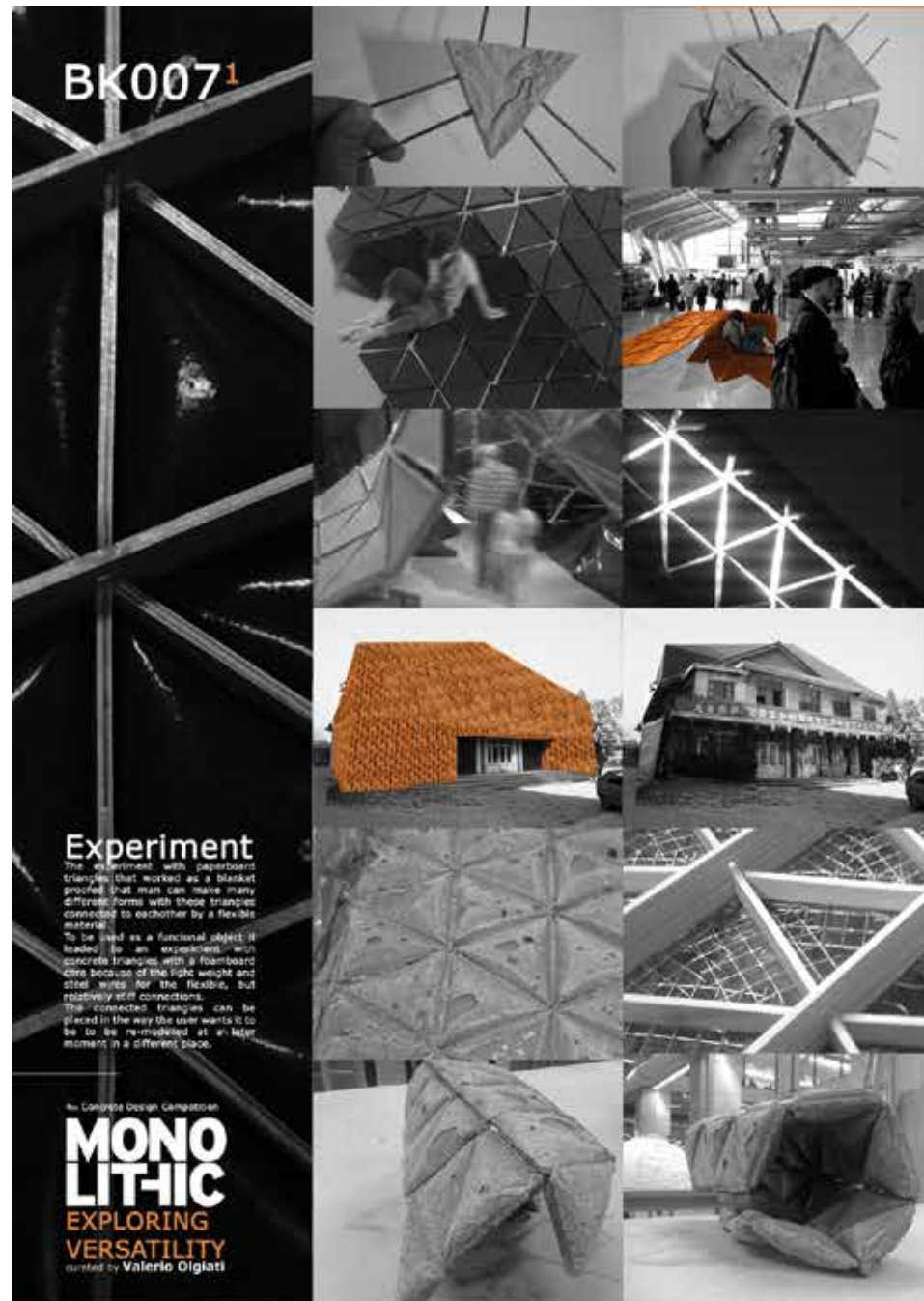
Can be used to create a landscape, or a roof, or even a wall, or a fence, or a partition.

Any other method

Can be used to create any other method, or a roof, or even a wall, or a fence, or a partition.

Choosing





LY 012



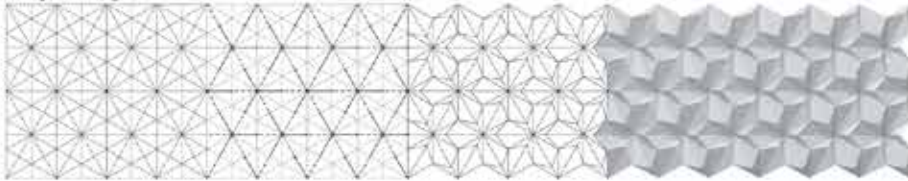
01

Introduction

Acoustic and noise control are generally not the main priority for the design of a building. This area is designed for the primary parameter when dealing with acoustics, especially in case of noise control in urban planning or sound insulation. This project intends to research specific rules/principles of acoustic methods can be applied through experimental acoustical system.

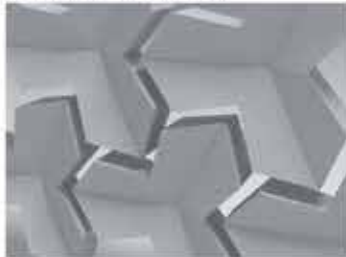
The geometry and the material define the main parameters.

folding pattern - regular

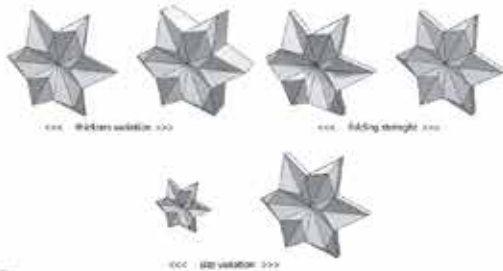


modular system

The folded geometry is developed by equilateral triangles, as the most of the original patterns and it can be segmented in equal modules. The thickness of the module vary according to the material. The density and the size of the buildings define the surface reflectivity.



module variations:



material

Two different types of concrete are used in the project according to their material properties:



UHPC ultra high performance concrete - light thin structure and reflective surface

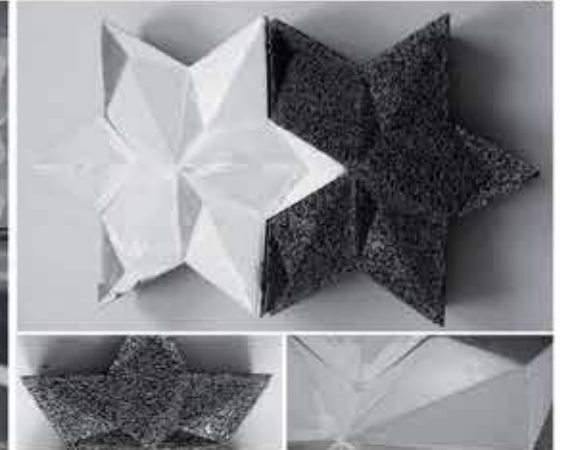


acoustic concrete - sound absorber, requires high thickness



LY 012

02

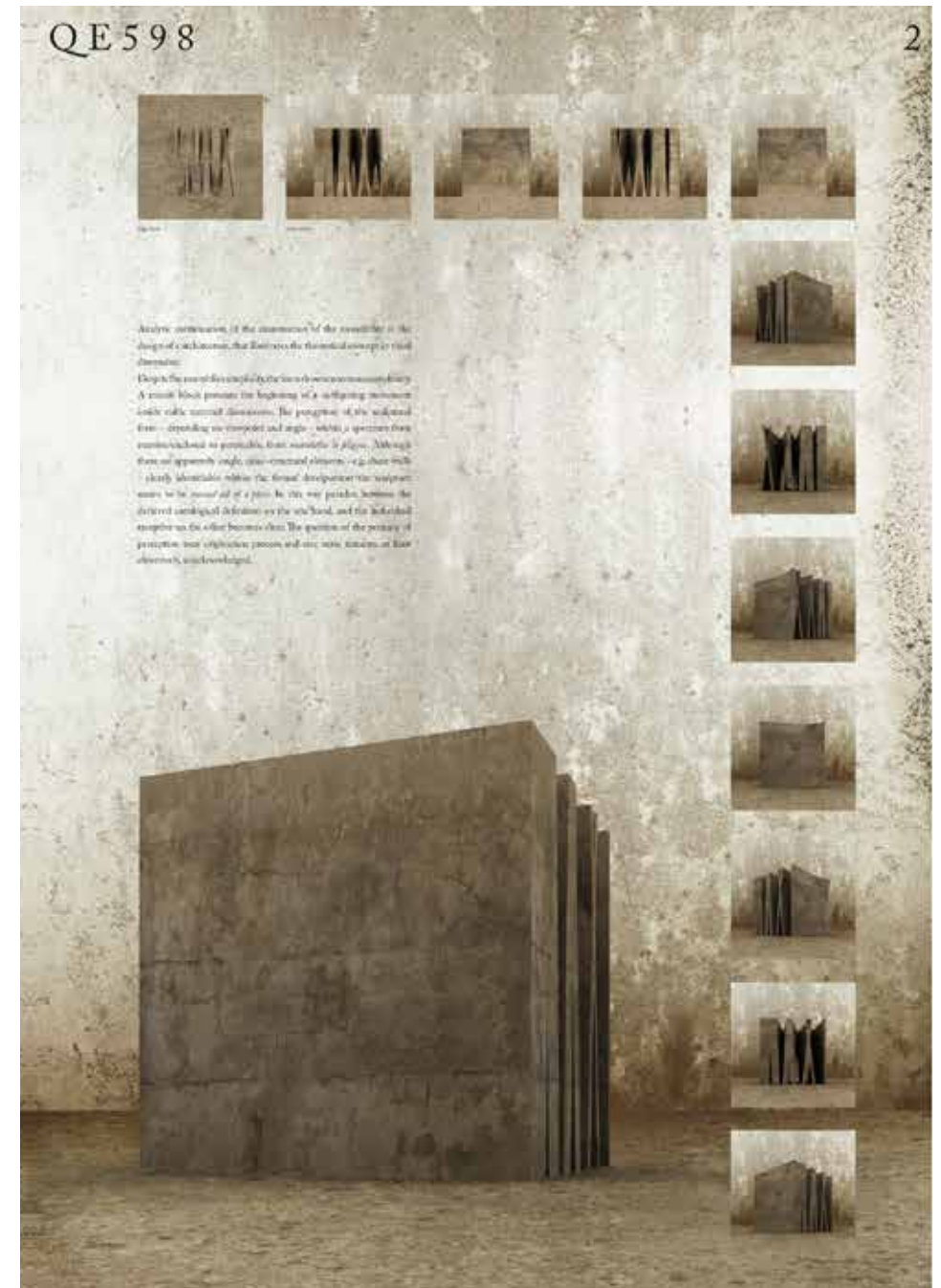
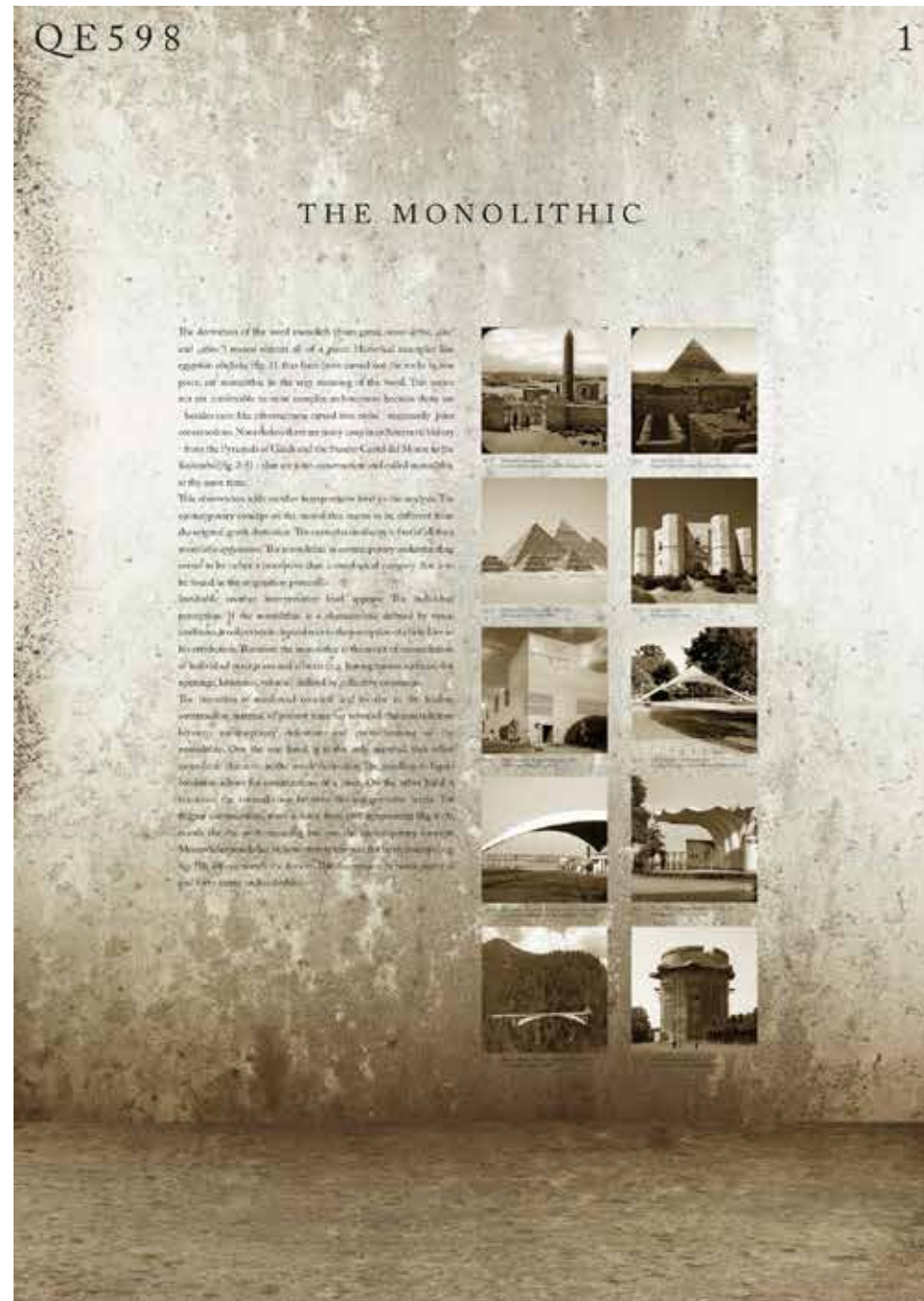


folding pattern - irregular >> for acoustics optimisation



formwork





AF111

CONCRETE CYMATICS

INTRODUCTION

Concrete and motion aren't exactly going through the 4th dimensional Archimedes today, but how about the 3rd building with concrete was in the last Century.

So how can we make concrete not again and not after "energy-aware" and not on? How can we bring concrete back and make it better?



Because of the competition theme "concrete and energy" we thought of approaching the task literally. Coming up with ideas on how to apply energy directly to concrete via kinds of the concept of Cymatics (in physics to do research on it without the concrete to test).



So what is Cymatics?

Roughly, it's the study of solid sound and vibration and its parts, comes from the Greek word "cyma" (wave). Normally, the fluid to be tested should sit on a plate (vibrating in membrane). While vibrations, regions of maximum and minimum displacement are made visible in a thin coating of particles (dust or liquid). Different patterns emerge depending on the frequency of the waves of the vibrations applied.

DOING IT WITH CONCRETE

Concrete is a Non-Newtonian fluid, when mixed with water its viscosity depends on the shear rate or deformation applied. Between different Non-Newtonian fluids (like water) organizing its particles in different ways. Working with concrete then becomes very interesting combined with Cymatics and research its potential to us as we study its possibilities.



During our research we were lucky enough to work with an expert in this field, he is an architect, sound expert and artist who has been experimenting with paint and Cymatics for three years and making art pieces with the technique. He was of course very interested in trying with concrete. He pointed us with the materials and gadgets we needed and guided us during the process. Also we were very inspired by his work and we learned a lot about the whole sound spectrum.

We used a home-made amplifier and passed a customized round, flat plate on it with a small distance to the speaker. Attached to the amplifier was a synthesizer in which we changed the sound through.

We decided to work with 3 parameters when doing the tests: Amount of concrete, amount of water (very carefully) the vibrator "frequency" on its own and frequency of the sound waves produced. The next panel explains and compares the different samples we took.



The conclusions we make from reading the results were: Very high frequencies produce interesting shapes at first, but the liquid moves too fast and the waves aren't as noticeable and they are very small in height. Also it is noticeable how the water separates from the concrete and stays on the surface.

For lower frequencies, and impact of the rest of the apparatus, it was visible in form of patterns that split too much. For almost all the musical notes we took, even if different containers the outcomes were very similar.

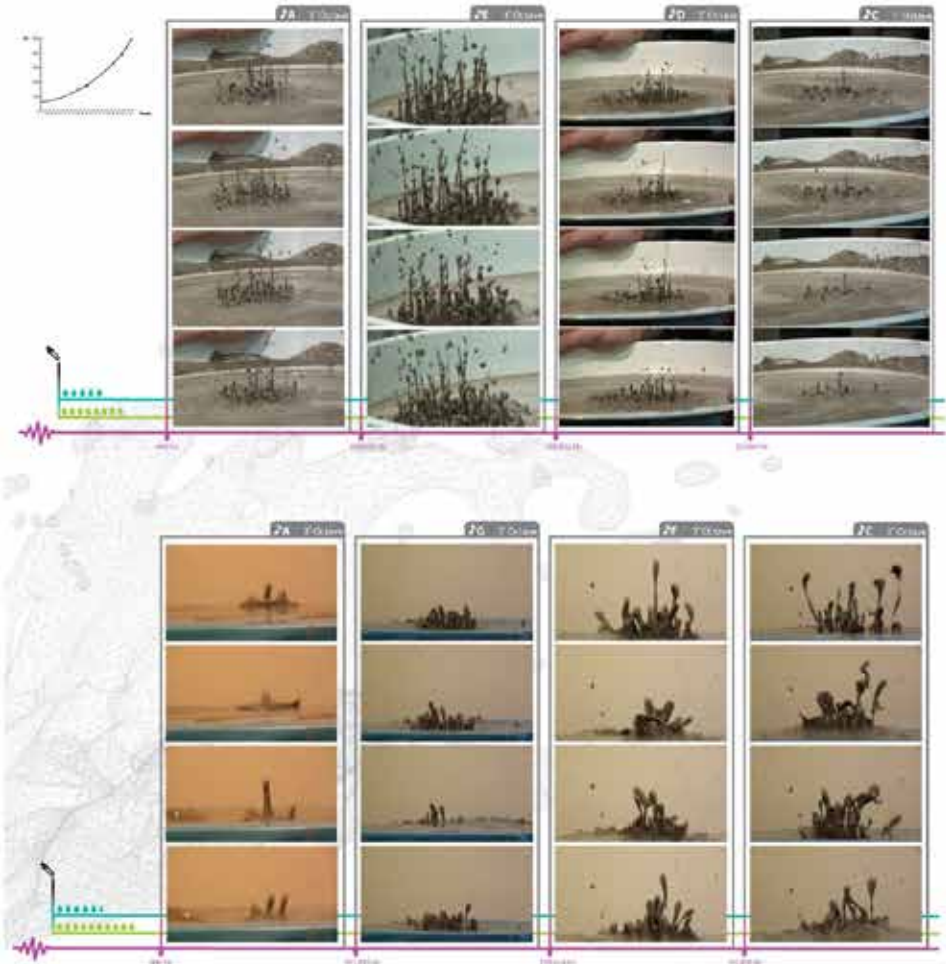
APPLICATIONS

If we could manage with some sort of additive to create a hybrid and speed up the setting process. It is to be short enough to obtain an interesting shape for the final product requirements, we could avoid one of the most expensive and environmentally aggressive steps of the building with concrete process, its casting.

If we look into it at a smaller scale it could also be used for making concrete panels for facades for interesting textures. If the forms (molds) were visible to the outside or for superinsulation (thermal insulation) if they were trapped inside the panels creating porous complex or other layers.

AF111

CONCRETE CYMATICS



To Cast Light On Seaweed

We sculpted a piece of infrastructural sculpture to display a close image, has of human activity and the growth of seaweed. We have made a floating seaweed sculpture that will act as a visual metaphor for the growth of a human organism.

The first stage of the sculpture is the use of a human figure to create a form that will act as a visual metaphor for the growth of a human organism. The growth of the human organism is the first stage of the sculpture.

The second stage of the sculpture is the use of a human figure to create a form that will act as a visual metaphor for the growth of a human organism. The growth of the human organism is the first stage of the sculpture.

The sculpture of the piece is the use of a human figure to create a form that will act as a visual metaphor for the growth of a human organism.

1. The sculpture of the piece is the use of a human figure to create a form that will act as a visual metaphor for the growth of a human organism.
2. The sculpture of the piece is the use of a human figure to create a form that will act as a visual metaphor for the growth of a human organism.
3. The sculpture of the piece is the use of a human figure to create a form that will act as a visual metaphor for the growth of a human organism.



Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Image 7



Image 8



Image 9



Image 10



Image 11



Image 12



Image 13



Image 1



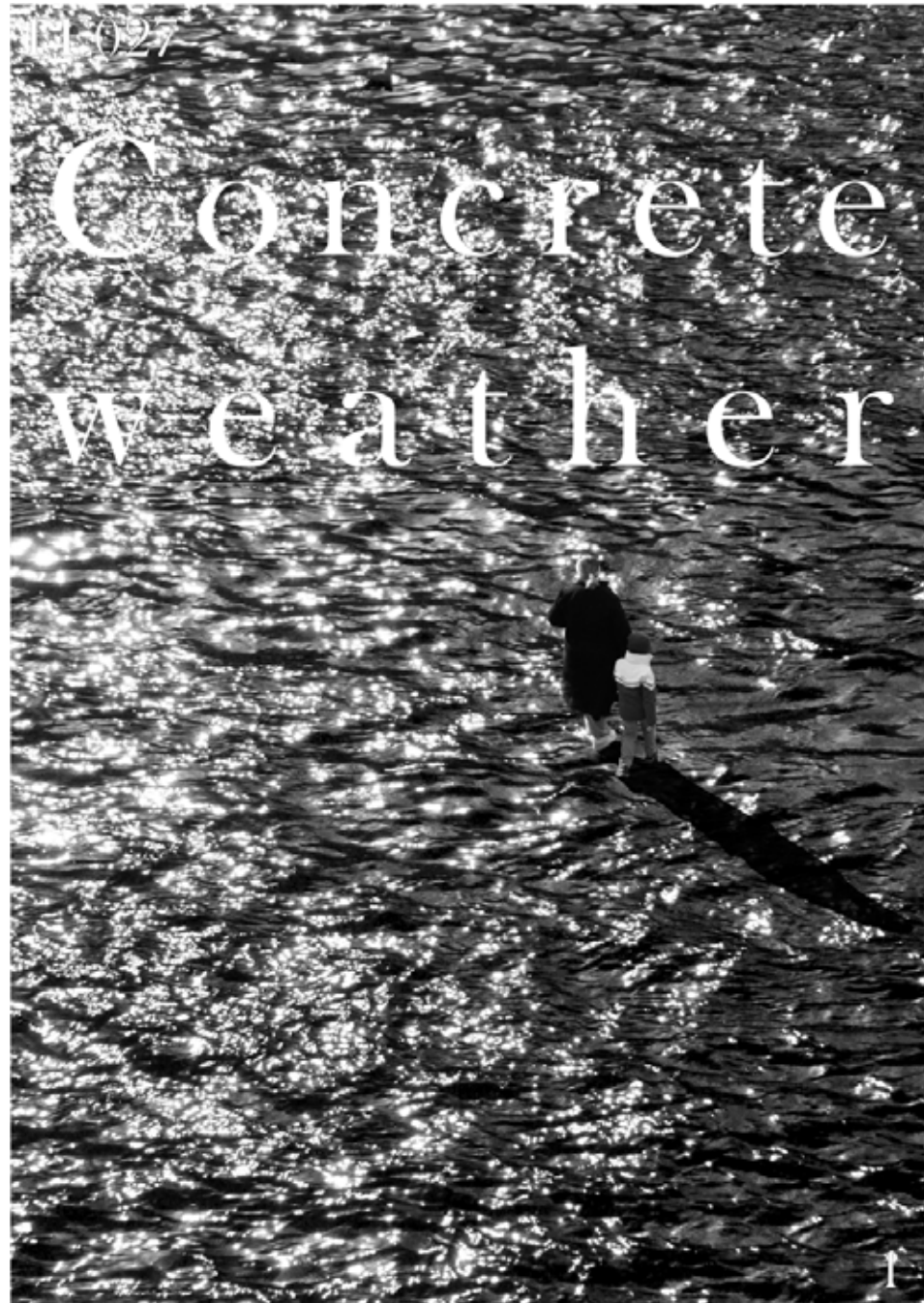
Image 2



Image 3







FE027

When I think about concrete I have this image in mind of a solide monolithic and rough artificial stone which has its own silent and powerful presence.

Let us conceptualize it in a new way.

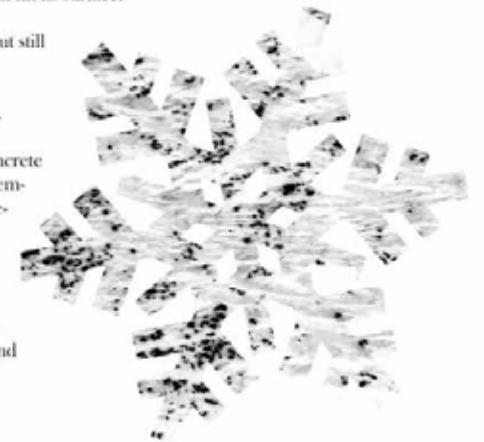
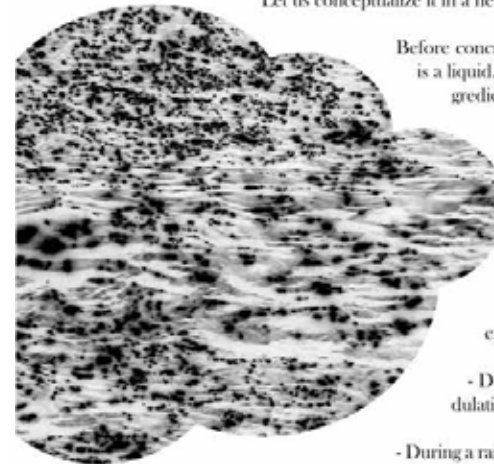
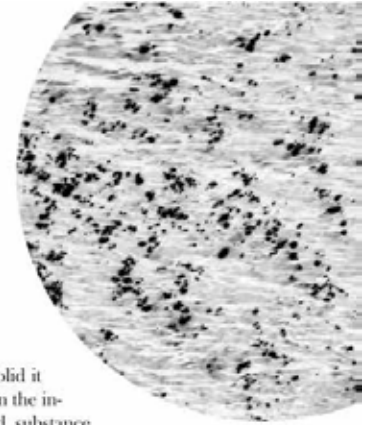
Before concrete turns to solid it is a liquid. Depending on the ingredients this liquid substance slowly solidifies itself to become a solid stone.

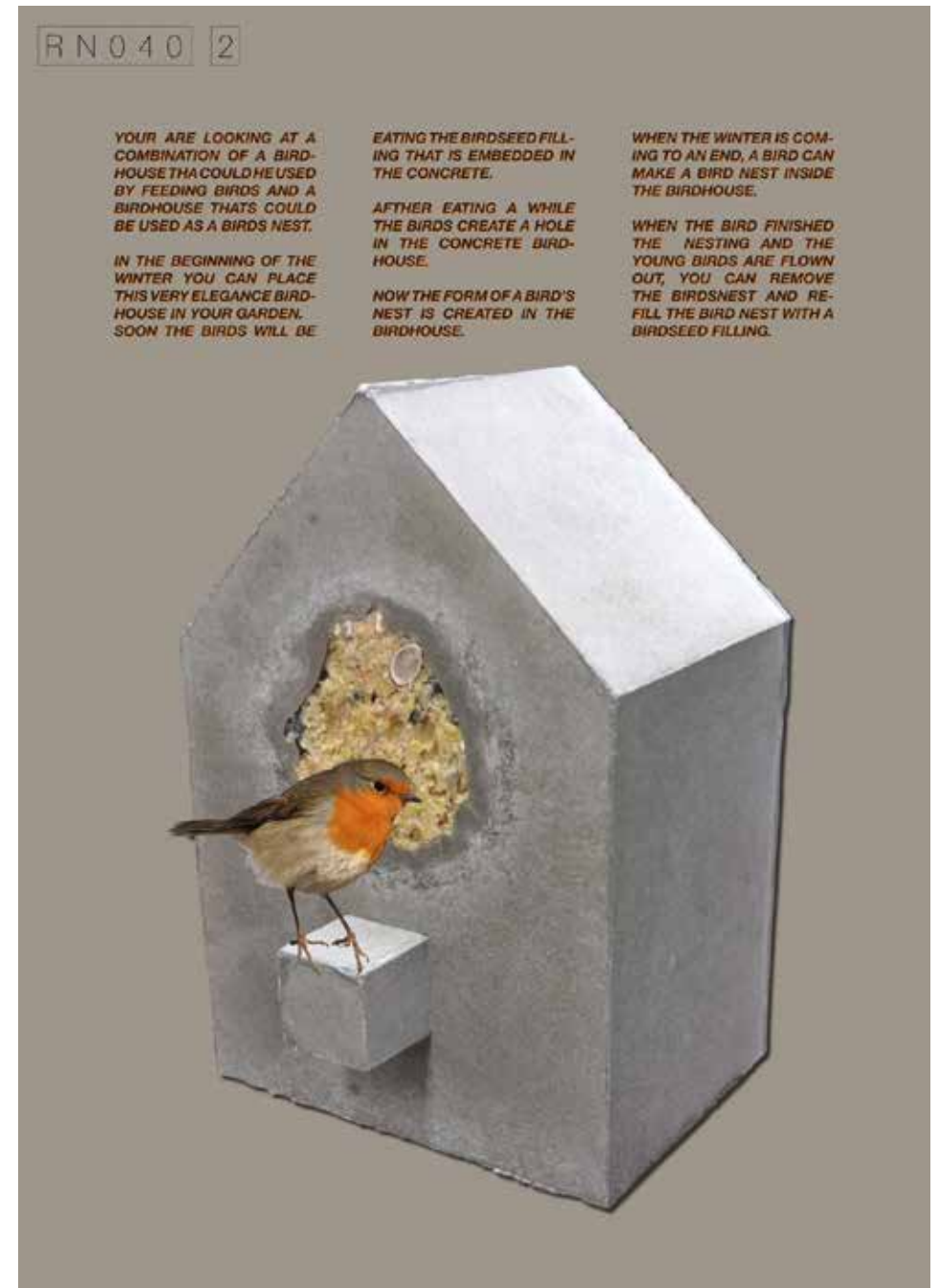
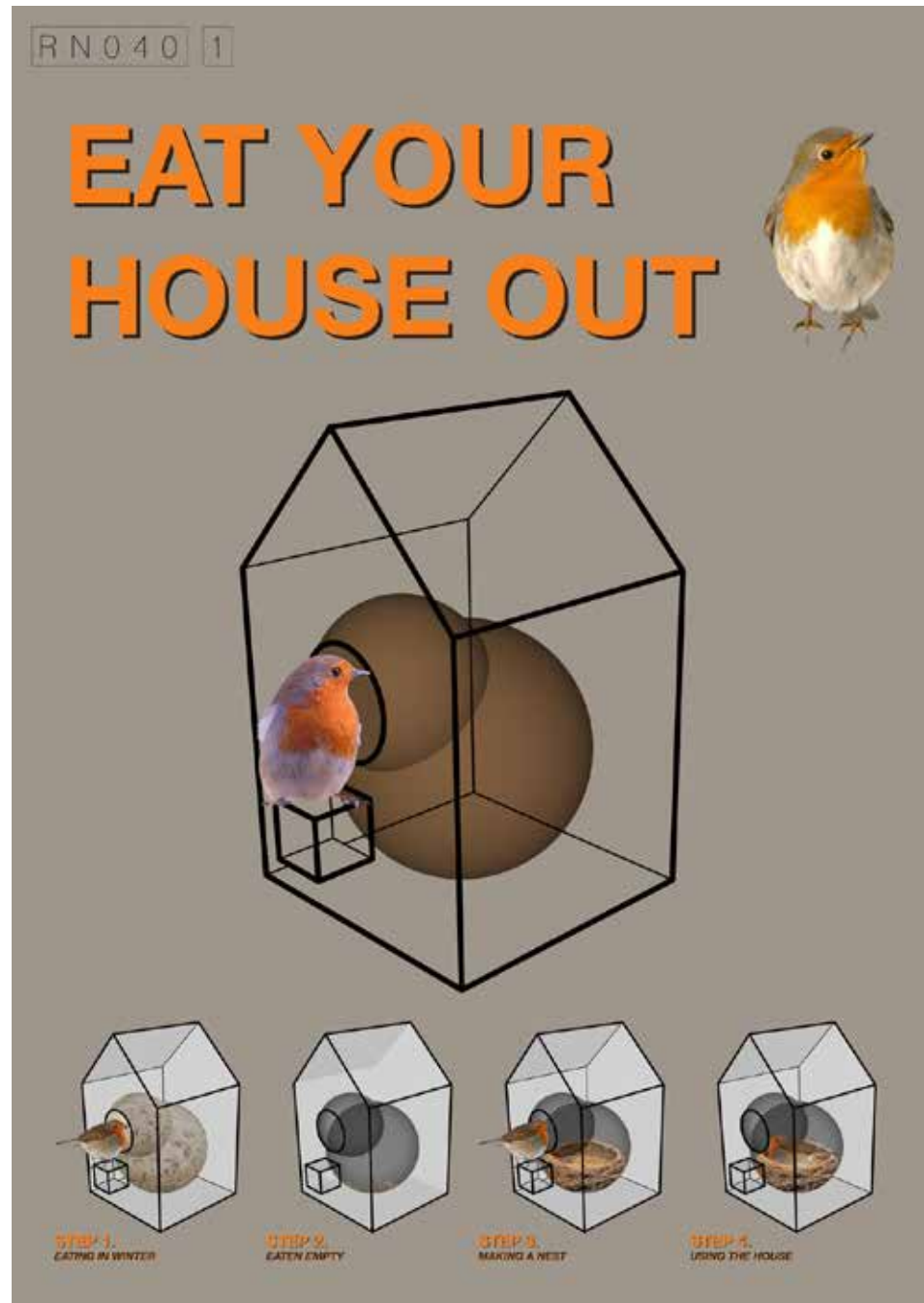
I conceive concrete as a liquid that can and should be reshaped by causes that naturally affect construction materials. More precisely movements that are caused by the wind, the rain or even the sun and the snow. The weather is here a new ingredient that gives life to concrete. Imagine four examples :

- During a windy day it could be marked by a thousand undulations.
- During a rainy day it could have some ripples because of the drops that hit its surface.
- During a sunny day it could be almost smooth but still marked by subtle variations.
- During a snowy day it would seem to be frozen.

In addition to its features this new idea of concrete could open possibilities for a sensitive and contemporary architecture. It implies an unfamiliar experience for dwellers : a mental and physical reconnection to Nature.

This «concrete weather» is a idea that goes beyond architecture knowledge. It involves cooperation with Artists, craftworkers, chemists and others to become real.



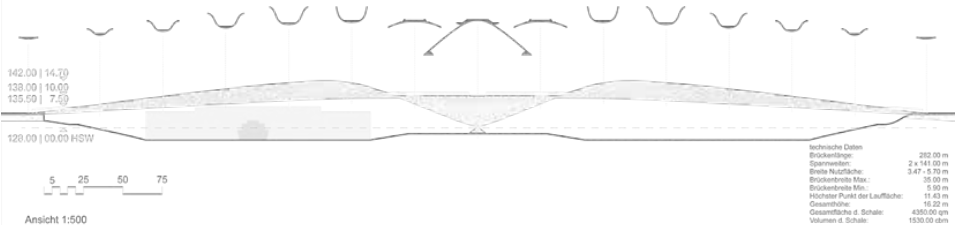
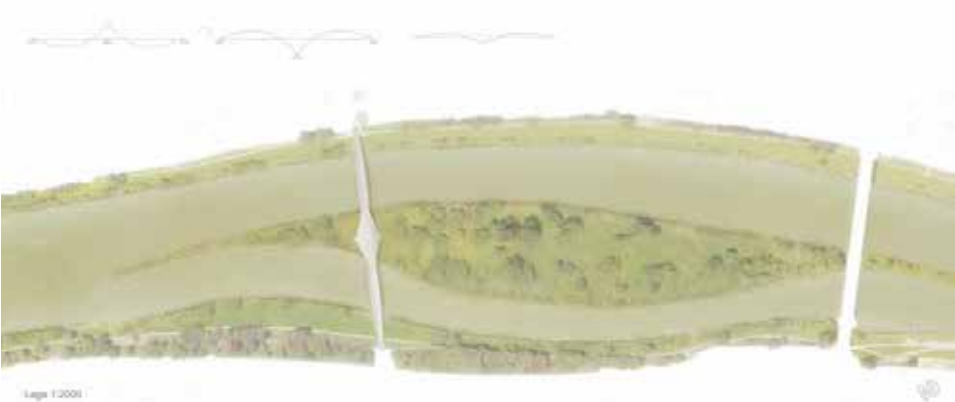




Einleitung
Die Irminenstek Trier ist ein Landschafts- und Gartengestaltungsbauwerk, das die Irminensteine in Trier wieder in den Stadtbild einbringt. Die Irminensteine sind die Reste der Irminen, die im 19. Jahrhundert in Trier abgebaut wurden. Die Irminensteine sind die Reste der Irminen, die im 19. Jahrhundert in Trier abgebaut wurden. Die Irminensteine sind die Reste der Irminen, die im 19. Jahrhundert in Trier abgebaut wurden.

Einleitung
Die Irminenstek Trier ist ein Landschafts- und Gartengestaltungsbauwerk, das die Irminensteine in Trier wieder in den Stadtbild einbringt. Die Irminensteine sind die Reste der Irminen, die im 19. Jahrhundert in Trier abgebaut wurden. Die Irminensteine sind die Reste der Irminen, die im 19. Jahrhundert in Trier abgebaut wurden.

Einleitung
Die Irminenstek Trier ist ein Landschafts- und Gartengestaltungsbauwerk, das die Irminensteine in Trier wieder in den Stadtbild einbringt. Die Irminensteine sind die Reste der Irminen, die im 19. Jahrhundert in Trier abgebaut wurden. Die Irminensteine sind die Reste der Irminen, die im 19. Jahrhundert in Trier abgebaut wurden.



oo360 ————— Metamorphosis ————— Membrane-Shell Structure ————— Metamorphosis ————— oo360

Metamorphosis – To create a specific form in relation to its specific requirements for given purpose.
To apply an analysis to make a fluid to form a solid. To perfect a specific man-made rock, optimized to its specific characteristics concerning structural performances, architectural aspirations and/or meticulous techniques.

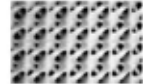
From the first roman concrete (opus caementicium) to the revival in the 19th and 20th century by the invention of Portland cement and introduction of reinforcement components to resist tensile stresses, it has had an enormous impact to architecture, structural design and a broad spectra of industries. The process of designing concrete has been undergoing a lot of change due to stress and upgraded material components, insight about the characteristics and artistic explorations.

The manifestation of concrete in the architectural and structural practice has known different kinds of archetypes.
A subjective enumeration:

Modern use example Le Corbusier, Dom-ino, 1946



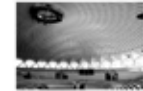
Pre-fabricated elements example Mark West, NYC, USA Photo Anne-Marie Mandel



Controversial edition example La Roche/Geisler, Expo 1988, Brussels, Belgium



Grid structure example Luigi Nervi, Palazzetto dello Sport, 1957, Rome, Italy



Shell construction example Heinz Beck, Highway Station, 1968, Dettighen, Switzerland



Recently the fast technological evolution allows to increase complexity by increasing the quantity of relevant information (environmental, artistic, management, financial, durability, ...) parametrically and provides advanced designing tools. These tools, in return, has changed the design process, the concrete manifestations and thus enrich the intuitive sensitivity towards the material itself.

Catenary arches result from hanging models. Antonio Gaudí used this method to make compression structures. This relation converting one catenary, or combination of tensile elements, into a series of compression elements was a privilege for architects, engineers and designers of the 20th century.

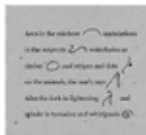


Minimal surfaces in tension-only structures (or the inverted catenary compression-only structures) are biomimetic examples of an evolutionary progress of a building system. Because they derive from examples we observe in nature, we intuitively regard them as elegant and fascinating. The minimal surface allows to divide the stresses optimally and thus requires a minimum of material.



Deep structure is felt by all of us, informing our everyday interactions and acts of creation. These primal memories are ancient, and as Cecil Balmond explains, inescapable. Here he contemplates how we come to make sense of our world and the mysterious power of these very first archetypes.

Deep structure is a down (but) built organization – a primal memory of the algorithms that paved the way for survival.
Reference: 'Deep Structure' Cecil Balmond, 2015: <https://www.youtube.com/watch?v=1m0u0l>



Due to high costs of scaffolding, environmental issue concerning non-reusable components of scaffolding and a possible lack of research and interest, shell structures became rare.

oo360 ————— Metamorphosis ————— Membrane-Shell Structure ————— Metamorphosis ————— oo360

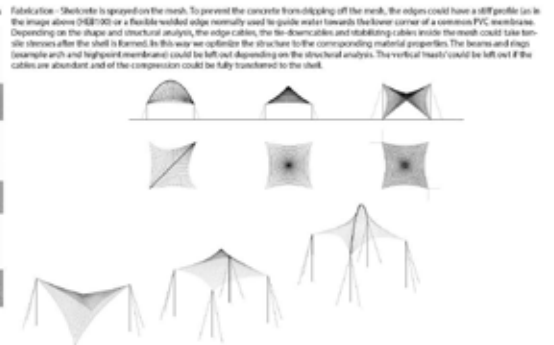
This project introduces the concept of the membrane-shell structure. A minimal surface based tensile component with internal cables for support which works as a mold and as an active structural member. A concrete shell is sprayed upon a mesh membrane to initiate the shape and over time gives structural compressional support. (Anhalt Universität, BfS, Henning Dörre, Dessel)



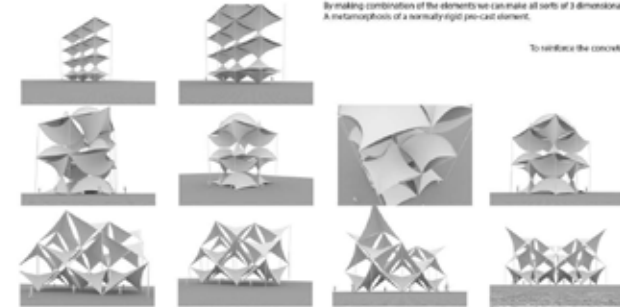
1. One simple element 1 shell elements based on common membrane typologies



This allows for a synergistic system (cf. Buckminster Fuller, Synergetics, 1975) where both tension and compression members are necessary and provide more than three qualities separately. There has been some research about this method (MVB, Brussels and Aachen University, Dessel) but there has been little response in practice. This project is an attempt to initiate and expand this system in order to contribute to a more natural formal architectural language, a structural synergistic system which optimizes material forms in relation to its respective properties. A parametric system to find optimized concrete shape due to its properties, A Metamorphosis.



2. Combining elements 1 The precast element combination



By making combination of the elements we can make all sorts of 3 dimensional structural configurations.
A metamorphosis of a normally rigid pre-cast element.

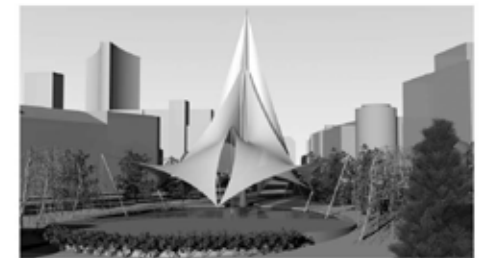
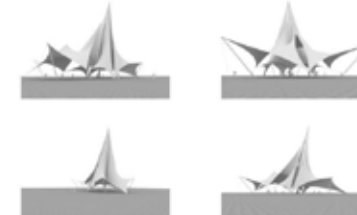
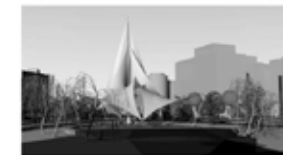
To reinforce the concrete flexible fibers are used.

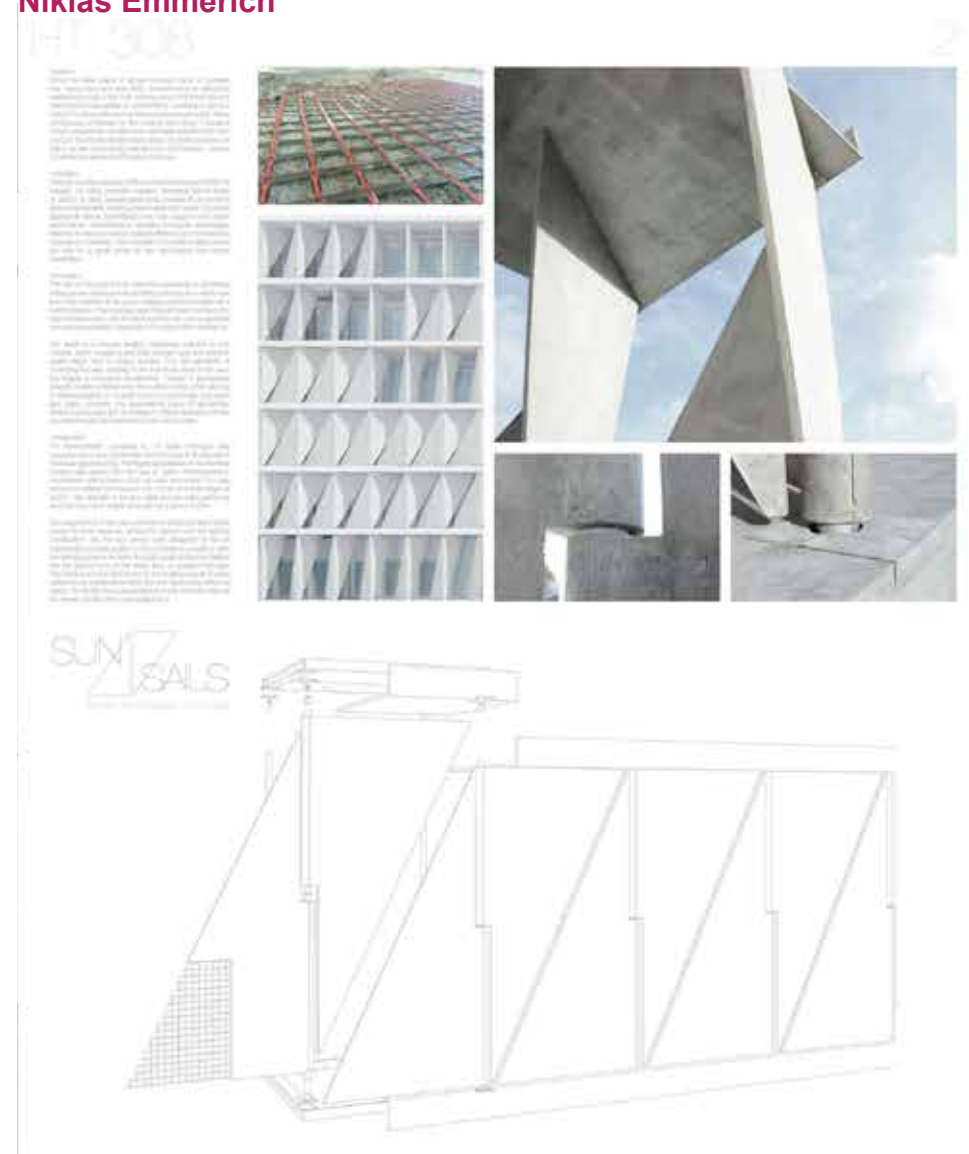
Recycled steel fibers

Concrete with fibreglass fibers

Carbon fibers

3. Complex minimal surface membrane shells







SEVEN MASTER CLASSES



MASTER CLASSES



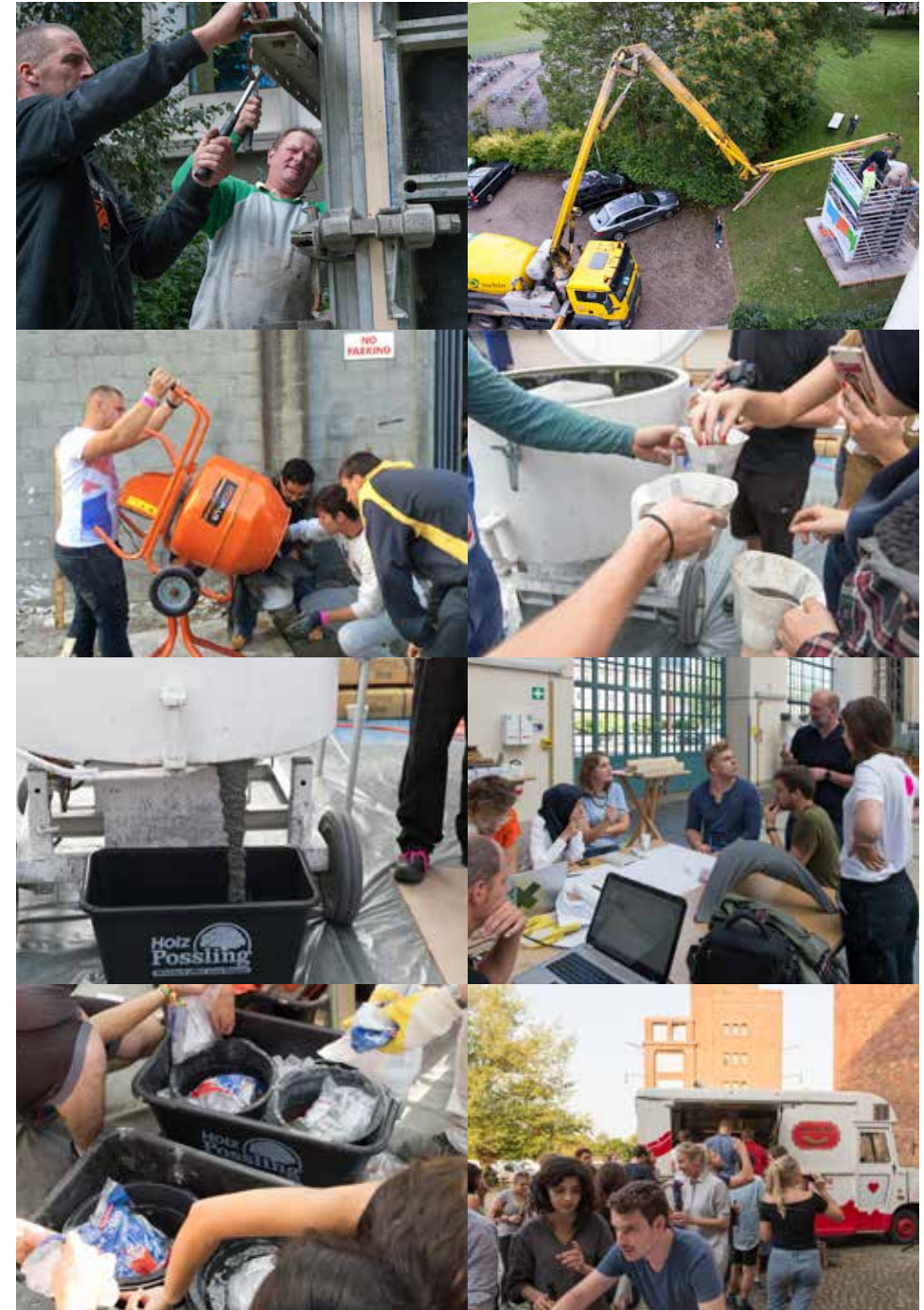
International Group Work



MASTER CLASSES



Industry Expertise



12 The most exciting new design practices are now redefining the relationship between design and business. This is not to say that the "old" design world is disappearing, but rather that the "new" design world is emerging. This is a new world of design, one that is more focused on the business of design, one that is more focused on the business of design, one that is more focused on the business of design.

Designing product offers has made much of the work of design firms in the past. The design firms of the past were not concerned with the business of design, but rather with the business of design. The design firms of the past were not concerned with the business of design, but rather with the business of design. The design firms of the past were not concerned with the business of design, but rather with the business of design.

Not content to accept design practice as it has been, many of these firms instead seek to redefine design practice in an effort to discover the business of design. This is a new world of design, one that is more focused on the business of design, one that is more focused on the business of design, one that is more focused on the business of design.

The business of design is a new world of design, one that is more focused on the business of design, one that is more focused on the business of design, one that is more focused on the business of design. The business of design is a new world of design, one that is more focused on the business of design, one that is more focused on the business of design, one that is more focused on the business of design.

The business of design is a new world of design, one that is more focused on the business of design, one that is more focused on the business of design, one that is more focused on the business of design. The business of design is a new world of design, one that is more focused on the business of design, one that is more focused on the business of design, one that is more focused on the business of design.

A collage of eight photographs documenting the Green Innovation Design Strategy event. The images show a variety of activities: a large audience in a lecture hall listening to a speaker; a man speaking at a podium in front of a stained-glass window; a presentation slide titled 'GREEN INNOVATION DESIGN STRATEGY' featuring a robot; three men in a meeting discussing documents; a man speaking to a group in a workshop; a man presenting to an audience in a lecture hall; a man speaking to a group in a large room with high ceilings; and a group of people standing together for a photo.

MASTER CLASSES



Critics & Support



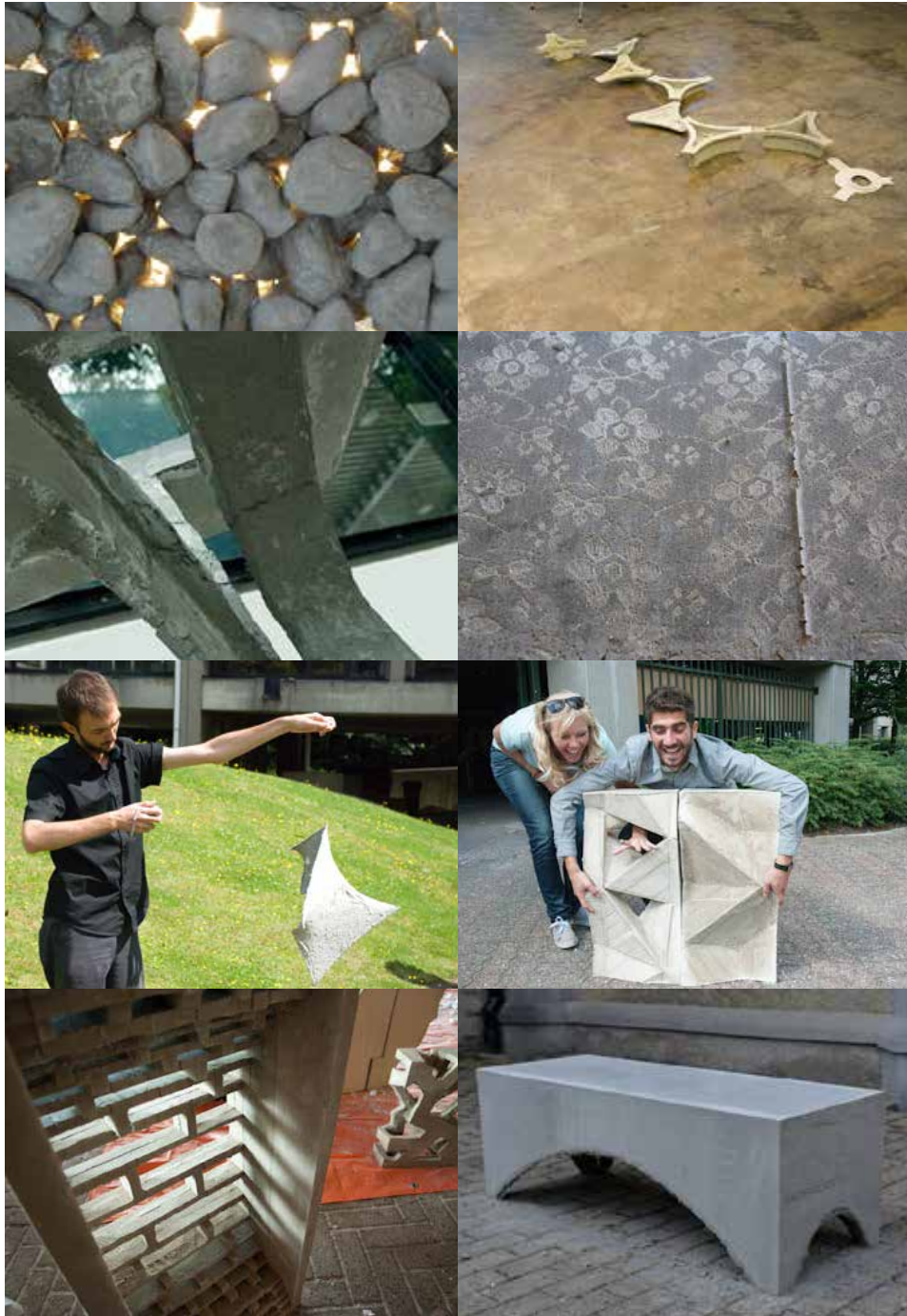
MASTER CLASSES



Hands-On Experience



MASTER CLASSES



Concrete Prototyping

