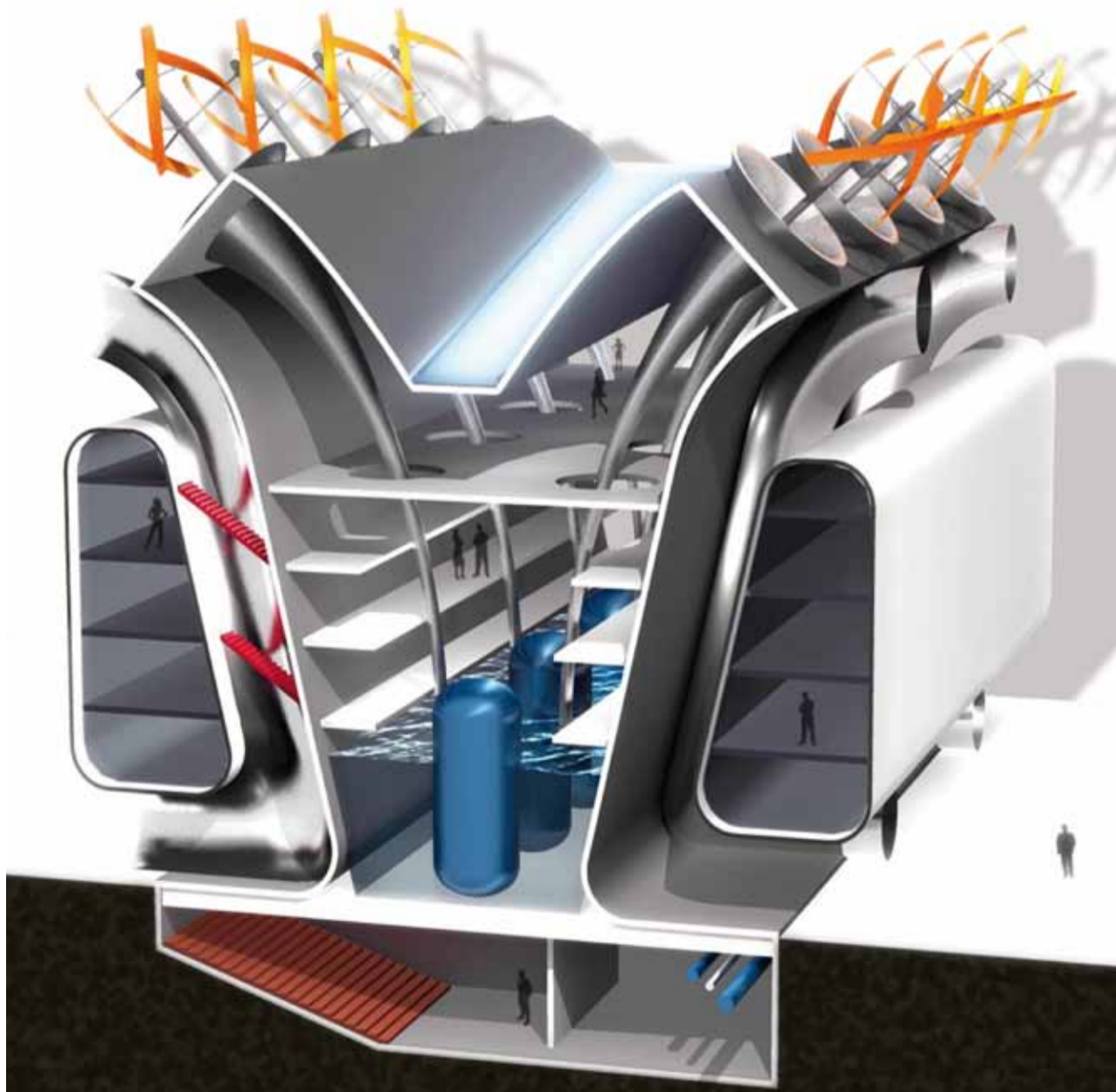


aE journal

journal architectural engineering studio

Bernard Aukema Hydrogen Architectural Machine



Architectural Engineering at its finest!

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I N T E C T U R E

Architectural Engineering brings spatial, functional, social design and technical possibilities and developments together. Subjects like product design, material research, building physics, structural mechanics, computation and model and production techniques all play a major part in architecture. In fact architecture and engineering are irreversible connected with each other. Research in the field of technology leads to all kinds of improvements in architecture. This also works the other way around, for instance improvements in architecture help inspire research and innovation. If you choose for Architectural Engineering, you'll choose for architecture as a complete design discipline in which technical possibilities are an inspiration and an important contribution to the architectural design.

This annual journal gives the faculty insight in our master programme and it shows recent work made by students of the architectural Engineering studio.

I hope you all like the work of INTECTURE, integration of technology in architecture! And please feel free to visit the Westwing of BK City at room BG.WEST.250!

Thijs Asselbergs

BERNARD AUKEMA - aE STUDIO 6
ARCHITECTURAL MACHINE DRIVEN BY
HYDROGENTECHNOLOGY

The building is an energy self-sufficient design using hydrogen technology in combination with renewable energy. It is situated at one of the most inspiring hotspots of Amsterdam, the NDSM old shipyard terrain, where it forms an attractive addition in this already energy-experimental environment. The research and business center supports Dutch initiatives and informs people about hydrogen research and solutions in society.

The Architectural Engineering studio focuses on architectural design that is mostly based on a technological research and fascination. In this case the research goal was to investigate the feasibility of being energy self-sufficient using hydrogen technology as an energy storage system.

Read more on page 10!

aE Studio: Architecture as an

In 2012, the chair of Architectural Engineering welcomed two new tutors. Integration of technology and architecture is the key theme running through the studio. In this conversation, “eminence grise” Jan Engels and the new tutors Tjalling Homans and Annebregje Snijders express their views on the studio, on architecture and on teaching. By Marcello Soeleman

Jan Engels has been a teaching at this school for more than thirty-five years. Therefore it seems like a good time to put him once more into the spotlight. In a discussion about his long standing career in the faculty, Engels talks about his views regarding architecture, the joy of teaching young people, and about teaching “how to look”.

On fascinations, architecture and professional life

“One of my fascinations throughout my professional life has been the experience, use and materialisation of indoor spaces. This is because, in my opinion, architecture is experienced from the inside out. When you talk about the experience of indoor spaces, the story starts in their immateriality and thereby it deals with the conditions of light. Modulating light is the pre-condition of space and thereby of architecture. This modulation then has consequences for the materiality, the facade, the layout and the form of the building: it’s not the other way around. This attitude towards architecture has become apparent both in my office and in my teaching at this university.”

“When I was asked to become a teacher at the Faculty, I had my own office. I was already interested in becoming a teacher so I applied, and never left since. At the same time I continued working in the office. At TU Delft I first taught at Interior Design, back then still a separate track and a separate discipline in graduation (students were graded in Architecture, Building Technology and Interior Design). In Interior Design, materialisation and detailing from inside out was the central focus. In those days I was mainly involved in the Final Projects and Interior teacher in the Graduation of Architecture students.”

“When Fons Verheijen, Thijs Asselbergs’ predecessor, asked me to join what was then called Architectonics, I immediately took the job. This track was exactly on the tightrope between light, matter and technology that had interested me from the very beginning. In my office this interface between different disciplines was becoming more and more apparent as well: there I was managing many people professed in many different fields of knowledge. You have to be able to address this knowledge, which means that you have to ask the right questions, in order to understand what you get. This is what we do at Architectural Engineering: we challenge students to ask specific Building Technology related questions, in order for them to design Architecture according to their interpretation of the answers and research findings. Working together with students within this interface is why I’ve worked here with so much pleasure for all these years.”

“At the same time, the knowledge I try to transfer to the students is not only aimed at the aforementioned aspects, but most importantly, it serves to make them realize that they are at the edge of a professional life. This also brings us to the third ‘component’ in my life: my work in the ‘welstand’ of Wassenaar and The Hague. In contrast to what often is thought and said about welstand, the discussion there is not about beauty or ugliness; it’s about the objectification of architecture, specifically focused on the image in relation to its surroundings. Aspects regarding beauty thus have to be made value free and objective: this objectiveness results in an academic approach towards architecture, a position that reflects on this school as well.”

One can wonder whether students approach architecture from the inside out: some have an entirely different approach, especially when researching new technologies that make complex shapes possible. How do you deal with this difference?

“This question deals with one of my most important criticisms. I can ask a technological question while still realizing that I have to design a building. I’m not someone who delves deep into a technical aspect. I wouldn’t even want that: then I’d become a specialist, where I want to be a generalist. Projecting this on education, it shows that many students delve so very deep into their technological fascination that the other aspects of our profession are left unattended. This is one of the most common traps, and it can take a lot of energy sometimes to pull students out of their technical ‘bubble’, to get them into building.”

“Teaching is sometimes like pumping up a punctured tire. You can pump all you want; the students have to realize that they have to patch the tire first. And when you do so, if you succeed to pump up this the tire and it stays inflated, this can give you much joy and satisfaction. Then you’re educating people that belong to our society. In an Architectural Engineering group, you are not trained to get a job in an office because you are good at drawing, or because you have some nice ideas. You get a job on the basis of your specific knowledge in relation to your skill with regard to building. And it gets even more interesting, for your generation, that the sources of information are all around us nowadays: what you don’t know you can find at the click of a mouse. In that sense I am jealous that I have missed this stream of information coming through the internet because I’m of a generation of books and magazines. It has to be said that the internet is much more impermanent, since pages disappear where books remain in your bookcase. This vast access towards information is a great asset of our present time, however, only if you can classify and store effectively that information that is relevant to you.

On the beauty of our profession

The most important and most beautiful aspect of our profession is that it is all around us, all the time. Therefore you have to learn how to look carefully. Then you – again – touch upon the immateriality of building: it’s very important that you develop a notion of this balance. And that’s only the first step into understanding a space, while we didn’t yet even begin to talk about implementing what you see into your own project. Getting this sequence through to students is the essence of teaching. The value of this institution is that all the people here can contribute to this understanding. I have some experience, but all the other teachers complement me as well. For thirty-five years I have been surrounded by people that have taught me “how to look.”

While Tjalling Homans isn’t a teacher as experienced as Jan Engels, his career has spanned for much longer than his age might suggest. Having taught before in the Bachelor 5 and 6, from February 2012 he has been teaching graduate students as well, becoming their primary architecture teacher from September 2012 onwards.

Exchange between teaching and an office

After I graduated here, I immediately started my own office: I could start working on an assignment right away. After two years I was asked to start teaching, and as teaching has remained an ambition, I immediately accepted. I wouldn’t want to only work at my office or only work as a teacher: I find it very stimulating to enrich my teaching with experience at the office and vice versa. This exchange is very important to me.

What’s interesting in this regard is that with my office I’m dealing with concrete problems for clients, while as a teacher of a graduation studio there’s much more opportunity to think about the needs of the future. At this faculty we’re constantly talking about the problems we’re facing in the future and how we might suit ourselves as architects for this future; this then becomes important for my office as well.

Everything is connected

Thinking and designing from the act of building is a very important approach for me. I can be very happy designing a bathroom for example, up to the very last seam. The detail is the place where all aspects of a building come together: light, space etcetera. For me a detail becomes a symbol for the larger scales, for the beauty of the whole.

All scales and all layers are related. A detail says something about a larger scale, but also about everything in between. When you’re designing a structure for example, you might find an answer regarding the routes in your building. Designing then becomes a quest for finding the specialities, demands and peculiarities of all layers and scale levels within a building and how they interrelate: do they complement each other?

Who are your role models?

The first name that comes to mind is Peter Zumthor. Mostly because he’s a very ‘earthly’ designer: his starting point is matter and light. He’s a very pure designer in that regard: it greatly fascinates me how his details can spur emotions, while still taking the whole experience into account. By starting from the material, by asking what a material wants, he achieves a great richness in both the material and the immaterial side of architecture.

Another office that I find very special is Lacaton & Vassal. They have a very raw, unorthodox way of looking at the quality and use of buildings. I like that. They don’t aim for a visual masterpiece, but they still achieve just that, precisely because they’re completely unafraid to use otherwise mundane elements in a very unconventional way. They leave out all generally accepted notions of what’s considered ‘beautiful’ and come up with their own way of looking at an assignment in an out-of-the-box way. The cheapest building material can be beautiful as well.

Engineering Act

Thinking for yourself

It's about challenging yourself and the world to look at things in a different way. To me it's very important, in life, that you think for yourself. Think about who you are, how you want to live, how you express yourself. It's reflected in your design.

A student once remarked that I never talk about styles. But that's the very least of my concerns. My question is: what do you want to achieve in your project? What's your dream? And is that something that comes from your own drives, your own intrinsic motivations, or is it a certain image that you pursue? I want to know who my students are, to be able to help them realizing their dream.

New-teacher-on-the-block Annebregje Snijders started teaching her first graduation studio at aE in September 2012. Before this she has already been a visiting critic at several institutions, bringing much experience from practice to the field of academia.

Contributing to student work from practice

I have studied architecture here at TU Delft, after which I began working at Atelier Rijksbouwmeester (government architect, at that time Jo Coenen). When Coenen ended his period as government architect, I started working at his office where I still work to this day. In the mean time I'm also managing my own office. As I've been a visiting critic several times, I've had the opportunity to see the fascinating freedom in which students operate. It's interesting then to see how the world of practice can contribute and relate to student work.

During my whole career, I've worked on both small-scale, private projects as on large European tendering. One thing that stood out during this time is that no matter the scale, you're immediately asked about integral knowledge of technology while designing. This nowadays happens in ever earlier stages of the design process: it's no longer the case that you first make a spatial design where other considerations follow in a later stage. Nowadays all these considerations should be tackled from the beginning of the project. This especially becomes apparent at European tendering, where a preliminary design with all aspects taken into account has to be delivered in three weeks. Architectural Engineering therefore becomes ever more relevant. This studio is about a 'total concept': the integration of form and space, structure, energy use and so on, depending on one's fascinations.

Teaching is about asking the right questions, but it's mostly about finding dreams and making them explicit. This to me is the most enjoyable aspect of teaching students: to keep digging and digging to find the core essence of students' projects and fascinations and thereby of their dreams. By making them explicit, they can become of utmost importance in relation to society. What I want to discover with students is how they can give meaning to their projects: how can their dreams be a solution for social and societal issues?

Who are your role models?

I mostly look up to people who have a strong message, and who believe in themselves to dare to get it across. These are mostly people who struggle for certain values, like Barack Obama or Nelson Mandela. These people believe in their message and do everything within their power to get it across. What I would love is when certain students get to

the point that they 'freak out' so much that they push the envelope of what's possible. That they dare to think freely about technology, programme and context, thereby developing new typologies. That excites me very much. For instance, by thinking in a different way about pollution, we can turn this into something positive, creating possibilities for novel developments.

However, following your dreams might conflict with the notion of integration mentioned earlier. Perhaps compromise is a dirty word, but isn't this often a consequence of a dream?

Well, compromise is a dirty word, but necessary sometimes. What I'd like to stress is that you should follow your ideas as close as you possibly can, having a positive stance towards all aspects related to your questions while not seeing these aspects as problems. Because then you do end up with compromises.

Being human

What's important at Architectural Engineering I believe, is that you don't just start with a technical fascination, but you already have an architectural goal in mind. This gives direction to your questions and to your project. To give an example, if you're researching the structural properties of glass made with a certain process, why not make a skyscraper out of this glass? This idea then can direct your technical as well as architectural research a great deal, while challenging yourself to push boundaries.

Being an architect nowadays to me is being human. What values can we give to this world? This I aim to discover when guiding students. What are your dreams? Do you dare to believe in them? Do you dare to take steps to realize them?



BSc5

Minor: Archineering

MATERIALISATION AND THE DESIGN PROCESS ARE THE TWO MAIN THEMES IN THE MINOR ARCHINEERING.

Architecture and *materialisation* are inextricably intertwined. The idea or concept can be enriched and made more profound with the material development. Designing the climate, detail and structure can lead to new insights and unexpected perspectives on a design. In three short design exercises structure, detail and climate will be emphasised. All aspects will be covered in one longer exercise. In this design the fascination of the student for a material, a climate aspect, sustainability or another topic will be leading.

Just like an athlete can train to become a master, a designer can train the *design process* as well. By training designing in short exercises and explicitly studying the design process, more insight in the design process will be acquired. In short, designing is exploring and discovering the unknown by means of a guiding theme within a frame of reference and with a design language: sketching and models.

The minor, which starts every fall semester, consists of two quarters, each concluded with one grade. Designing, plan analysis and reflection on the design process are the subjects of assessment. Next to tutoring in the design studio, several seminars are held.

Archineering 1 (first quarter, 15 ects) can be followed separately, Archineering 2 (second quarter, 15 ects) only when combined with Archineering 1.

Tutors: Erik Hehenkamp, Roel van de Pas, Joep Manschot

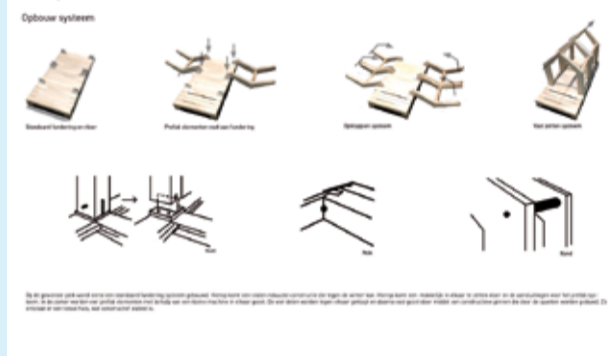
Consultants: Eric van der Ham, Hans Daane, Gerrie Hobbelman

Coordinator: Elise van Dooren

Lecturers: Elise van Dooren, Gerrie Hobbelman, Eric van der Ham, Thijs Asselbergs

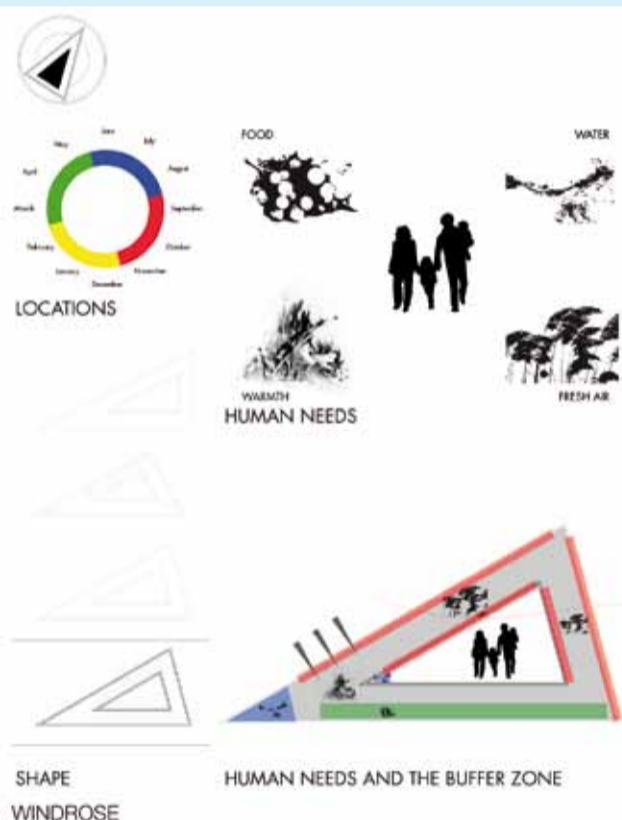
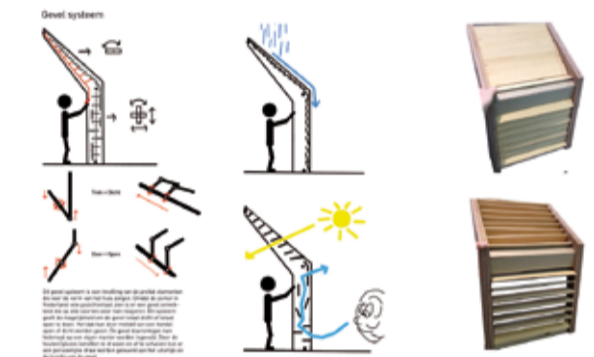


Concept



FLORIS SIKKEL: STRANDHUISJE

With this assignment we had to design a beach house that will stand in a line of houses with a metre in between. The house had to be demountable and 50% of the facade had to be operable. The shape was given, it had to be an archetypical house of 3 by 4 metres and 3,2 metres high. Detailing is central to the beach house. Early in the design process I started to develop a facade system. This has been elaborated in a 1 to 5 detail model. A demand of the assignment was a 1 to 20 model. After the presentations a row of 44 beach houses was made.



EVA GAAFF: DE WINDROOS

This mobile home does not close itself for the outside world, but uses the local climate conditions in its advantage. The key is the double shell which creates a broad buffer zone. The shape of the mobile home is chosen to make optimal use of wind-directions and sun-heights of the chosen locations. Thanks to the water reservoirs and the possibility of cultivation of fruit and vegetables in the buffer zone the dwelling is highly self-sufficient. Both facades consist of revolving panels, being either PV-cells, triple glazing or aerogel. These allow air to flow through for natural ventilation.



A selection of Archineering models

Design Project

Architectural Engineering

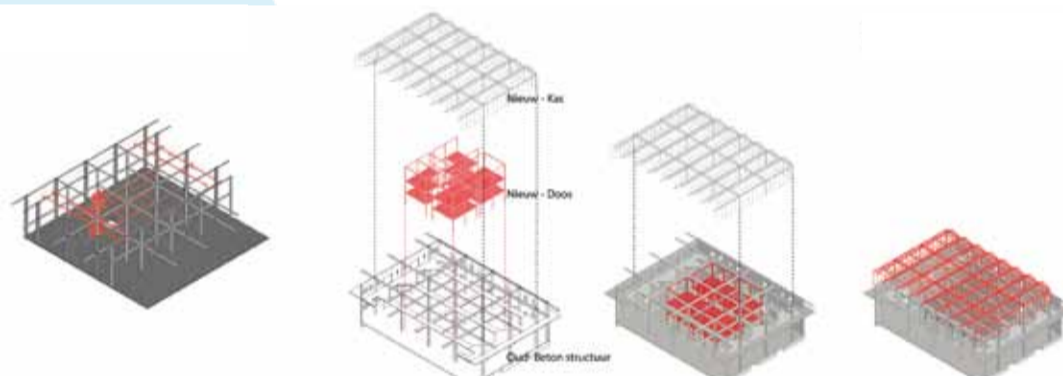
BSc6



The Katoenveem warehouse

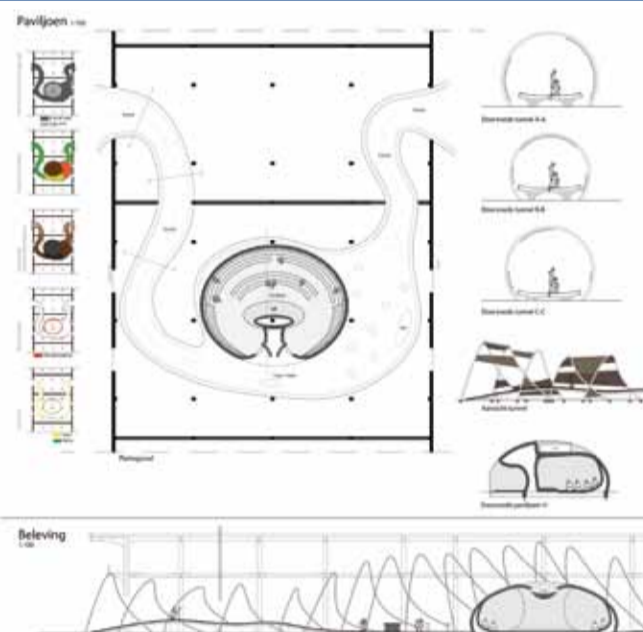
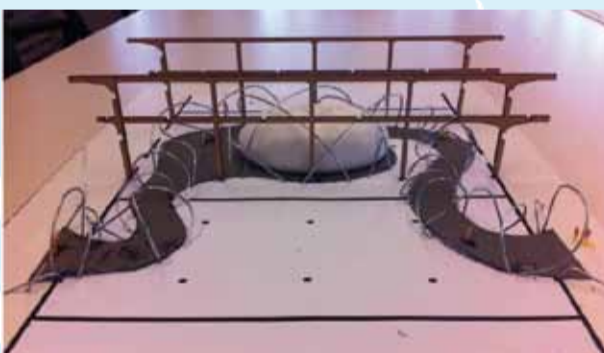
ELMAR VAN CLEYNENBREUGEL

Greenhouses in the city; reusing existing buildings for sustainable food production. The specific (climate) conditions for specific crops are studied together with sustainable climate systems so that down cascading of heating and water use is brought to a minimum.



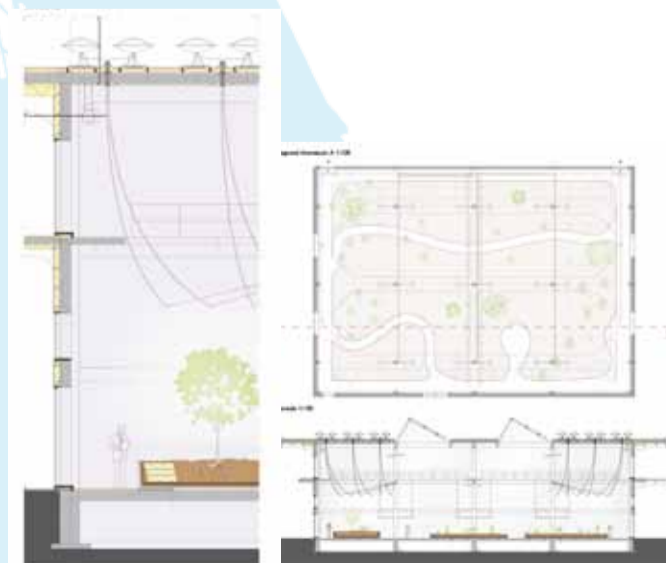
PIM SEVERIEN

Parasite architecture_funnelweb with eggsack. Looking at the nature of funnel web spiders and wanting to use the typology to set an "experience". Lightweight versus mass; open versus closed. Choosing the right construction, materialization and detailing in relation to the existing warehouse was here the main issue.



JEROEN VAN LITH

A botanic garden for Katoenveem. Analyzing the possible daylight (transport)- and climate systems on the market for the necessary light and climate conditions for a botanic garden. The result of the study is an experience of nature with sustainable installations in an existing warehouse...



DESIGN OF A PAVILION (A SMALL CONSTRUCTION) WITHIN THE CONTEXT OF THE KATOENVEEM WAREHOUSE IN THE REDEVELOPMENT AREA OF THE HARBOR OF ROTTERDAM

Within a timeframe of six weeks the design assignment is not the program, but is driven by a technical fascination in combination with a research topic chosen by the individual student.

The warehouse Katoenveem, built in 1920, has an inspiring concrete structure which has to be analyzed in advance of formulating ones fascination.

When the student starts designing, he/she needs to analyze and research the three engineering topics construction, climate and materialization in an holistic way. Only when the three topics as specified for his/her own design and research theme are well balanced, is the student able to bring the spatial and functional qualities of the design to an higher level.

Twice a week the student is offered architectural design assistance by a mentor and once a week/ every two weeks a consultancy of a construction and climate engineer will take place.

The cohesion between technical research and Architectural design is the main focus within this course. Translating an Engineering topic into your own Architectural assignment by studying references, scientific literature, real materials or making sketches and small experimental models until a 1:5 scale.

Tutors: Suzanne Groenewold, Hans Kalkhoven, Roel van de Pas

Coordinator: Suzanne Groenewold

MSc1

Delft Seminars on Building Technology

Why this course?

To create architecture you need more than aesthetical tools. Technical design aspects are important for the design and realisation of a building. The task of an architect is to take all demands in perspective to be able to be the supervisor in the design process.

Why building technology?

We believe that designing a good building is integration of architecture and building technology on all levels. That is why the course concentrates on the assembly and the mutual integration of structure, climate and façade construction. A structure is not an row of columns added to the floor plans. A structure forms space, creates rhythm, makes good spaces. If you know how the façade will be produced and assembled you can use this knowledge to connect it to your structure in a way that benefits both. With the same knowledge you can develop details that show integration. A well-functioning climate design is not only important for the wellbeing of the users, to stay in control you have to know how and in what amount energy flows through your façade.

How to do it?

You will use the method of research by design. It starts with an analysis of the current situation in your design process and make an inventory of questions to research. These questions guide you through this research process. In the reference projects and literature you find the evidence for the focus of your design direction and the proof for the selected solutions.

What is the result of the assignment?

In this course you will make a redesign of a fragment of one of the case-study buildings. On a poster (A0) you will present your redesign in technical drawings 1:20 and 1:5/1. In a scientific paper your will discuss the reasons and arguments of your design decisions. You will make the assignment individually, but your will attend tutored classes of about 16 students

When to do it?

The course Delft Seminars on Building Technology (AR1A075 -DSBT) is a compulsory subject on Building Technology during the master 1 of Architecture and Building Technology. It prepares you on your graduation track in which Building Technology is an important part of the design process and it's evaluation. You can participate every semester in the academic calendar.

Bas Gremmen, coordinator Delft Seminars on Building technology
b.gremmen@tudelft.nl

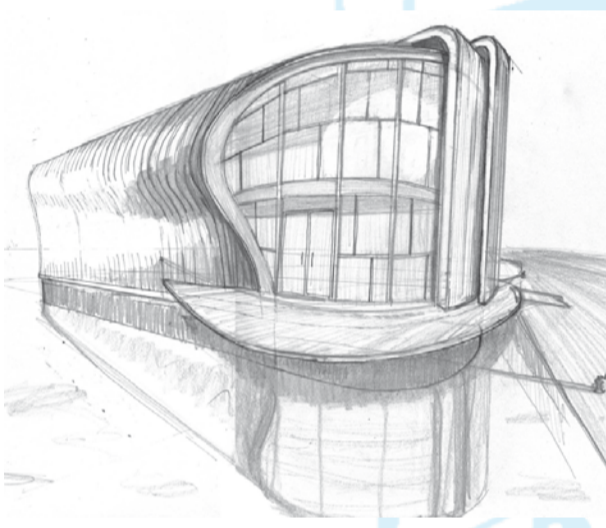
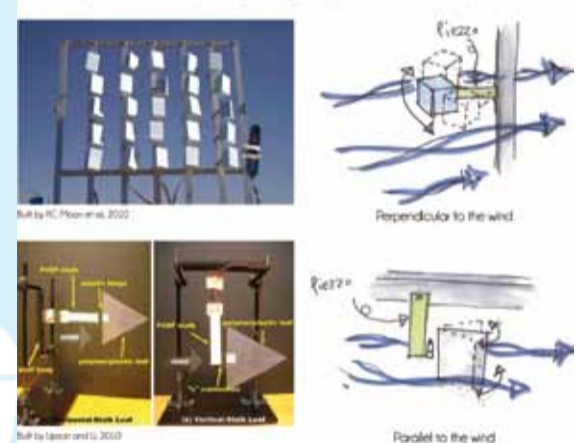


SAMUEL DEVRIES - FLUTTERING FACADE

Research question: How can a building facade be used to generate energy from vibrations caused by wind and how can this be integrated and expresses into an architectural design?

Refurbishment of Building Westraven, Utrecht

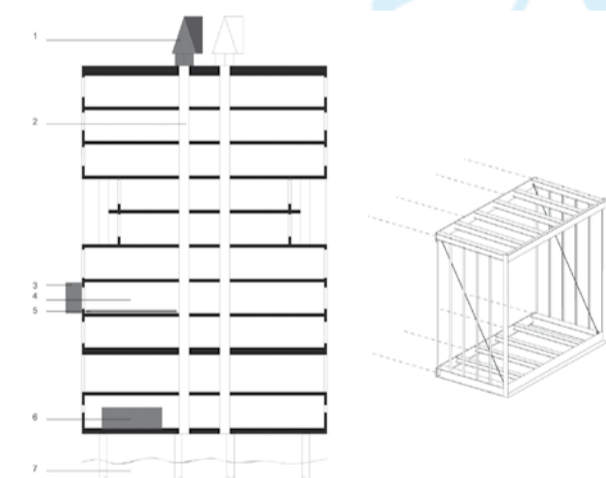
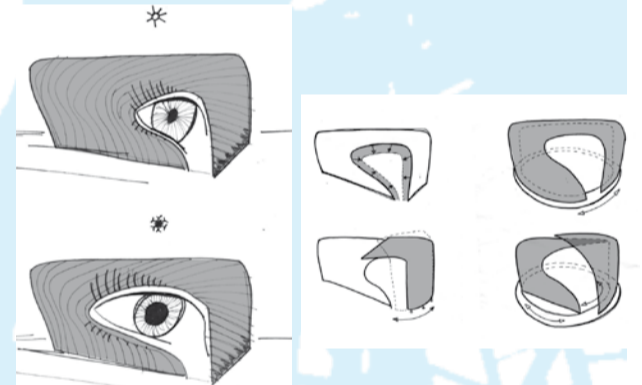
Reference projects: 2 vibro-wind power generating prototypes from Cornell University



BRAM VAN HEMMEN - IF THE EYE COULD BLINK

Research question: How can I redesign arcam, so that its indoor temperature is regulated by passive solar energy?

Refurbishment of ARCAM, Amsterdam



WILLEM BARENDREGT - SILODAM II, THE RECTIFY

- How can the facade cladding be improved?
- How can residents sit outside without wind problems?
- How can heat and ventilation problems be solved by using sustainable methods and using the local properties?

Refurbishment of Silodam, Amsterdam

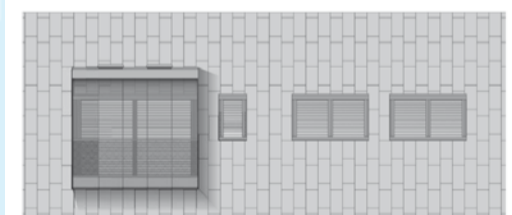


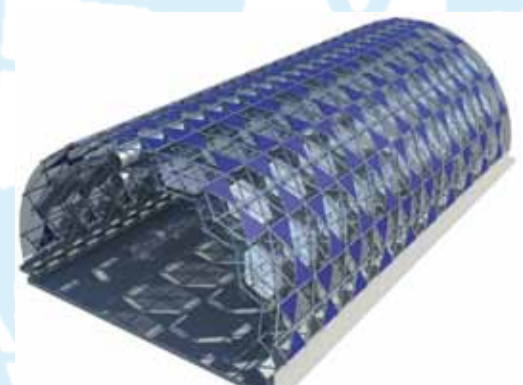
Image 51



RUDO KOOT - A REDESIGN OF THE BK CITY STUDIO FLOORS

Research question: How can the idea of 'climatof-fice' (Foster, 2002), proposed by Sir Norman Foster and Richard Buckminster Fuller, be used when re-designing elements of an existing underperforming building?

Refurbishment of the Faculty of Architecture, Delft



Bucky Lab Facade Design

MSc1

10 THINGS YOU NEED...



what you really need ● what you want ●

...SAFETY FIRST !

Dr. Bucky Lab recommends to get proper stuff, you have to buy the cheap ones twice and good tools and protection makes the job easier and more comfortable ! And if you don't like it, you won't use it.



As a Building Technology project – designing an innovative facade concept, working it out in detail and ultimately building a 1:1 prototype – Bucky Lab has been running at the Faculty of Architecture for quite some time. However much of the assignment has changed over the years, the emphasis has always been on detailing and prototyping, something that current teacher Marcel Bilow embodies with much passion.

“We mostly draw students who are interested in construction and technology. An idea doesn't have to be pretty: it has to work,” Bilow says. “Our innovative, sometimes crazy projects then become interesting for architects as well.”

One thing that Bucky Lab has been famous for is its metal workshop. However after the fire of 2008 and after some time in the Faculty of Civil Engineering, this workshop now has been replaced by a mobile workshop. Bilow: “It made no sense running a workshop an entire year when it was only really needed for four weeks per year – two for each semester. Therefore we came up with the mobile workshop: a collection of cases containing all the tools and machines we need, able to be set up anywhere we want, whenever we want. The entire world then becomes our workshop.”

“Developing and building innovative facades remain our goal. What is very important to me as well is that experimenting and prototyping is done intelligently. For example, you don't need elaborate scaffolding to show your idea. The idea has to be made clear; if that means that the prototype is not built out of the real material, but shows its potential and function, then that's perfect. Also, it's very important that students get acquainted with a broad range of tools. Therefore there are a number of practica during the semester, so students can get to know these tools and ways of building, in order to get a feeling for what fabrication is like.”



This summer the mobile workshop was built outside the campus in a tent



Gelly window



Sun shading flowers on a facade prototype

This semester, work is being done on two separate projects: a dome structure made of wood or cardboard and concepts for solar shading in cooperation with ROMAZO, the Dutch sunshading association. These solar shading concepts then become an infill for the dome, bringing the two projects together again. And as always, these structures are to be built on a 1:1 scale at the end of the semester. So keep an eye out for a number of students dressed in safety clothes, building the facades of the future!

Also, make sure to visit the blog:
<http://buckylab.blogspot.nl>

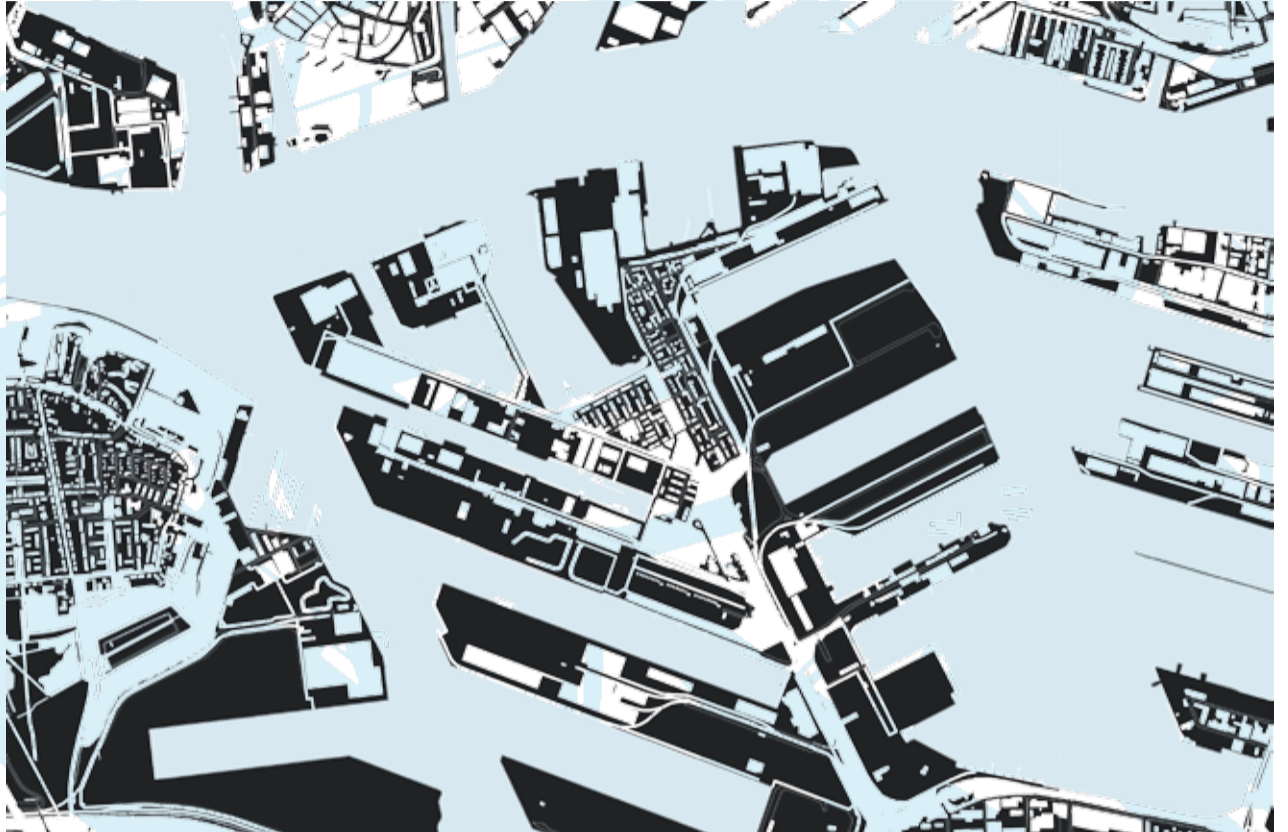
Tutors: Dr. -ing. Marcel Bilow, Peter van Swieten

MSc3/4 aE Studio⁰⁴

RDM Rotterdam

Rotterdam is one of the largest ports of the world. Docklands and shipyards are industrial areas we turn our backs to by default. They can be found at the edges of the cities we live in, far away in our appreciation, while physically many times as close. As ship-handling moves seawards to accommodate larger ships the old shipyards have become redundant. The Rotterdam Kop van Zuid development and the Amsterdam Westerdokskade are precedents of wastelands turned into high-density housing, combined with cultural functions. However, is erasing what exists and replacing it with something new the only option? Or can the hidden beauty of the industrial landscape be captured as a start for something never done before?

This is the challenge of the RDM site, which is a large redundant dry dock with adjacent halls for shipbuilding. In addition it includes the young industrial archaeology of post WWII industrial building in combination with post war housing for the labourers at the Heijplaat suburb nearby.

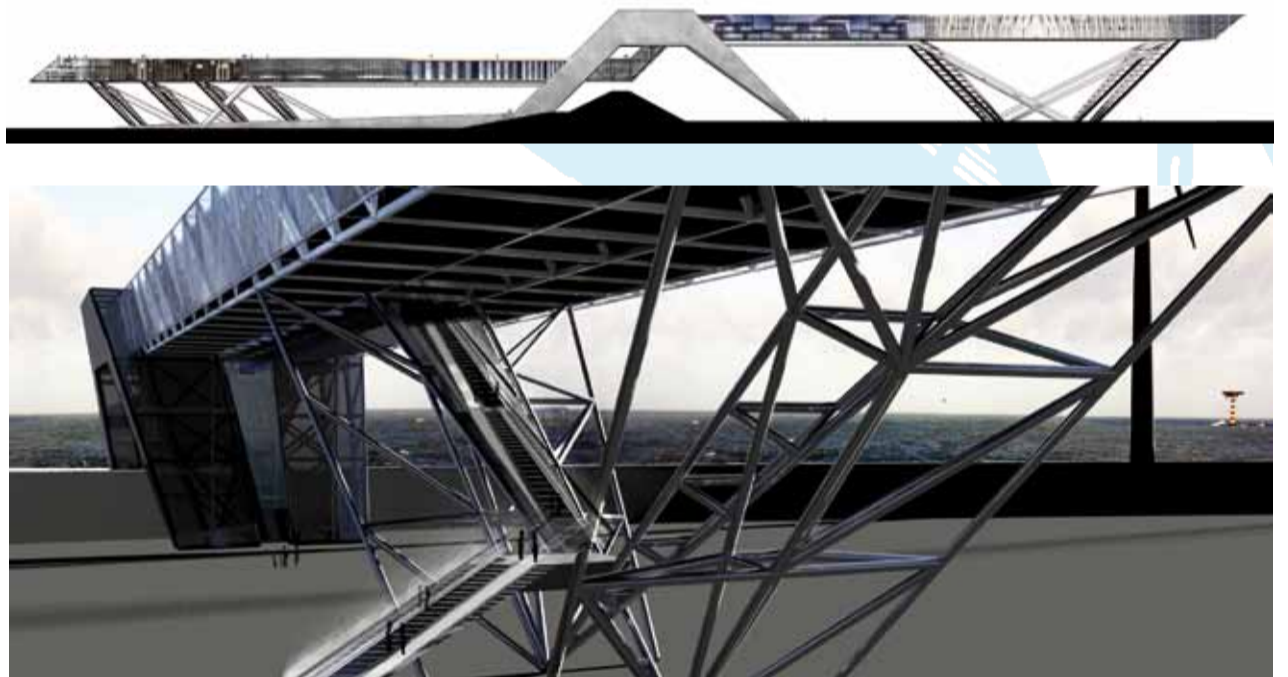


Maria Vera van Embden Andres: The Last Resort

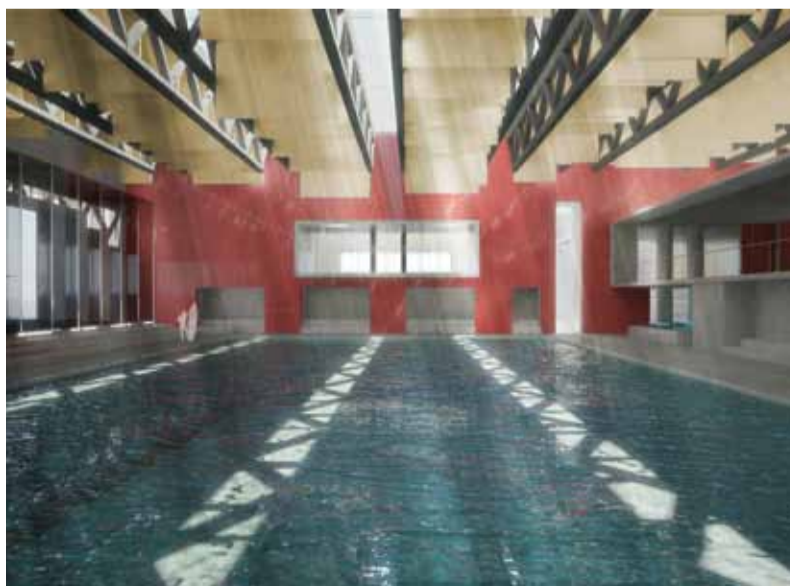
DOUBLE TRACK ARCHITECTURAL ENGINEERING
AND BUILDING TECHNOLOGY

The Last Resort illustrates how the specific formal language of the Port of Rotterdam is used to come up with a functional and formal concept for a building at the entrance of the harbour. The contrast between industry and serenity. Logistics and dreams. A building that emerges from the world of trade with personal experience of emptiness and intense exposure to natural forces. The structural challenges of large spans and tilted columns have inspired the architectural design and vice versa.

Tutors: Jan Engels, Wim Kamerling



Dayanara Franken: Aquatic Centre Rotterdam



The aquatic centre is a facility with a bathhouse, swimming pools and the ability to surf on a mechanically induced wave, that connects with humanity's fascination with water.

The design is clean and geometric with a sense of anticipation that is created through the contrast between the outer and inner world. The aquatic centre lies at the north side of the quarantine island. The volume is orientated as a cuboid in front of the beach, which gives a visual connection between the visitors on the beach and the visitors with the building. With water being the most important ingredient of the design the main question was: how to deal with the enormous energy consumption these kind of function bring with it? The three functions renowned for their energy demands, meant that the building needed to function like a rechargeable battery. An in-depth research into sustainable energy was done to obtain, sustain and give green energy to the building and in this manner reduce the energy demand.

Tutors: Jan Engels, Arjan van Timmeren

Eastwards Haarlem

Like Amsterdam, Haarlem has a history that goes back to mediaeval times. The area between these cities contains all elements of infrastructure one can imagine: highways, waterways, railways, airways, nondescript industrial areas and peaceful rural places with abundant green and recreational water. If Haarlem wants to expand it has to do so eastwardly. Twelve aE master students have collaborated in developing four master plans East of Haarlem, inspired by a specific theme. A transit oriented development, based on the presumption that a satellite of Schiphol airport will be built in the North Sea; a plan that emphasizes the use of sustainable energy; an Urban Green scenario making connections between the green areas around Haarlem; and a Water City plan, un-reclaiming land thus giving Haarlem a new waterfront. These master plans in turn provided the context for individual designs ranging from a large airport terminal like building to small scale industrialized housing.



Jeroen Westgeest: A living factory in a purifying landscape

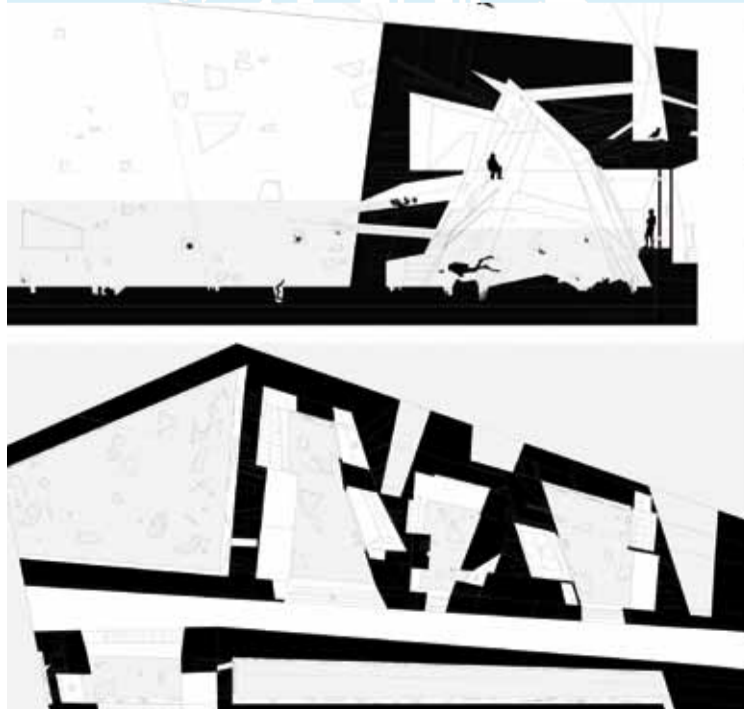
The aim of this project was to transform the negative connotations associated with waste water treatment into a positive element in the redevelopment of Haarlem-Spaarnwoude, both technologically and aesthetically.

The central building can be read as a 'castle': its possibilities and potentials regarding energy streams in relation to the building and program could be used to make the area energy neutral. The programme entails a greenhouse, a restaurant / food court where biological food is being served and living quarters. These living quarters utilize energy waste streams coming from the other programmatic elements and have been designed to make optimal use of these waste streams. All parting walls are both load-bearing and are carrying all ducts in order to cool and heat the living apartments; all ducts are visible in the entire edifice to emphasize the relationship with the waste water treatment.

Tutors: Jan Engels, Andy van den Dobbelsteen



Carlo Maria Morsiani: La Casa del Paguro: from Biology to Craftsmanship



La casa del Paguro is a clear artificial intervention that does not try to mimic the environment but rather wants to modify its course by letting nature acting on it, defining therefore, a new state of wilderness through the action of time. A building that orbits around few cubic meters of pure energy, where an endless variety of micro habitats give birth to more than one fourth of all the animal life on earth. An ecosystem that let us discover another galaxy in the universe, one easily within our grasp.

The result is a shell for human and animals. An idea of erecting a disposable iconic building. A formalistic approach on sustainability. A fascination for the BEAUTY OF THE IMPERFECTION.

Tutors: Jan Engels, Henriette Bier

[Read more on page 11!](#)

Architectural Engine

Bernard Aukema

Architectural Machine *driven by* Hydrogen Technology

Continued from page 1

The roof is harvesting rain and solar energy. Just these two elements are used by the electrolyser located in “the head” of the building to produce hydrogen and oxygen. The wind is directed through the building. Airspeed is increasing at the narrowest point where a wind turbine produces the energy that is primarily used to compress the gases in their tanks. In the lower part of the building the fuel cells can convert these two gases back into electricity when the solar panels are insufficient.

Even though the efficiencies of the electrolyser and fuel cells are limited, the energy losses (heat) contribute to increase the feasibility of hydrogen technology by heating the building.

The building has been engineered and designed to obtain optimization for the processes which are related to hydrogen technology, as well as for the architectural expressions that explain the functioning of the building as a whole. The researched technology is the structuring element that forms a real-time processing, walk-through, energy self-sufficient architectural machine. Visitors move like molecules through the self-explaining building and they experience the city, the environmental conditions, the building itself and its internal processes as one integrated and structured architectural design.

Tutors: Jan Engels, Andy van den Dobbelsteen



Steven Goeman

Rotterdam Olympic Stadium Fleet



Olympic Legacy

Olympic architecture isn't only about presenting the Games, it is about proposing the Olympic dream. The main question of is whether the impact of hosting the Olympic Games justify the enormous costs and footprint. Isn't there a way of rethinking these enormous events completely, where legacy and sustainability is part of the central architectural question? The Rotterdam 2028 Olympic Games should become the next chapter in legacy driven Olympic architecture.

Stadium Concept

The Rotterdam Olympic stadium is built up out of floating elements and temporary components. A traditional stadium bowl is cut into separate parts to increase the post-Olympic legacy potential. The floating stadium elements can be reused as housing elements elsewhere in the Netherlands and abroad, but can also be used for other purposes such as flood shelters. The temporary parts can be reused as stands for different sport clubs and temporary events.

Waalhaven Floating Residential Community

The Rotterdam harbour area is moving towards the sea. The Rotterdam Stadshavens are developed into the pilot project for floating buildings. A number of stadium elements are reused into a floating residential community in the Waalhaven area. The elements are reminders of the Olympic Games of 2028 and form the infrastructure and architectural expression for the transformation of this area.

Sustainability

The waste in this post-Olympic stadium conversion strategy is minimised by limiting the adjustments necessary for the transformation. Most of the stadium elements are being reused. The stadium parts which can't be reused are developed as lightweight structures and make use of materials that produce less carbon dioxide during their manufacture. This both reduces the embodied energy and financial costs.

Tutors: Jan Engels, Arjan van Timmeren

Learning in Archiprix

Carlo Maria Morsiani

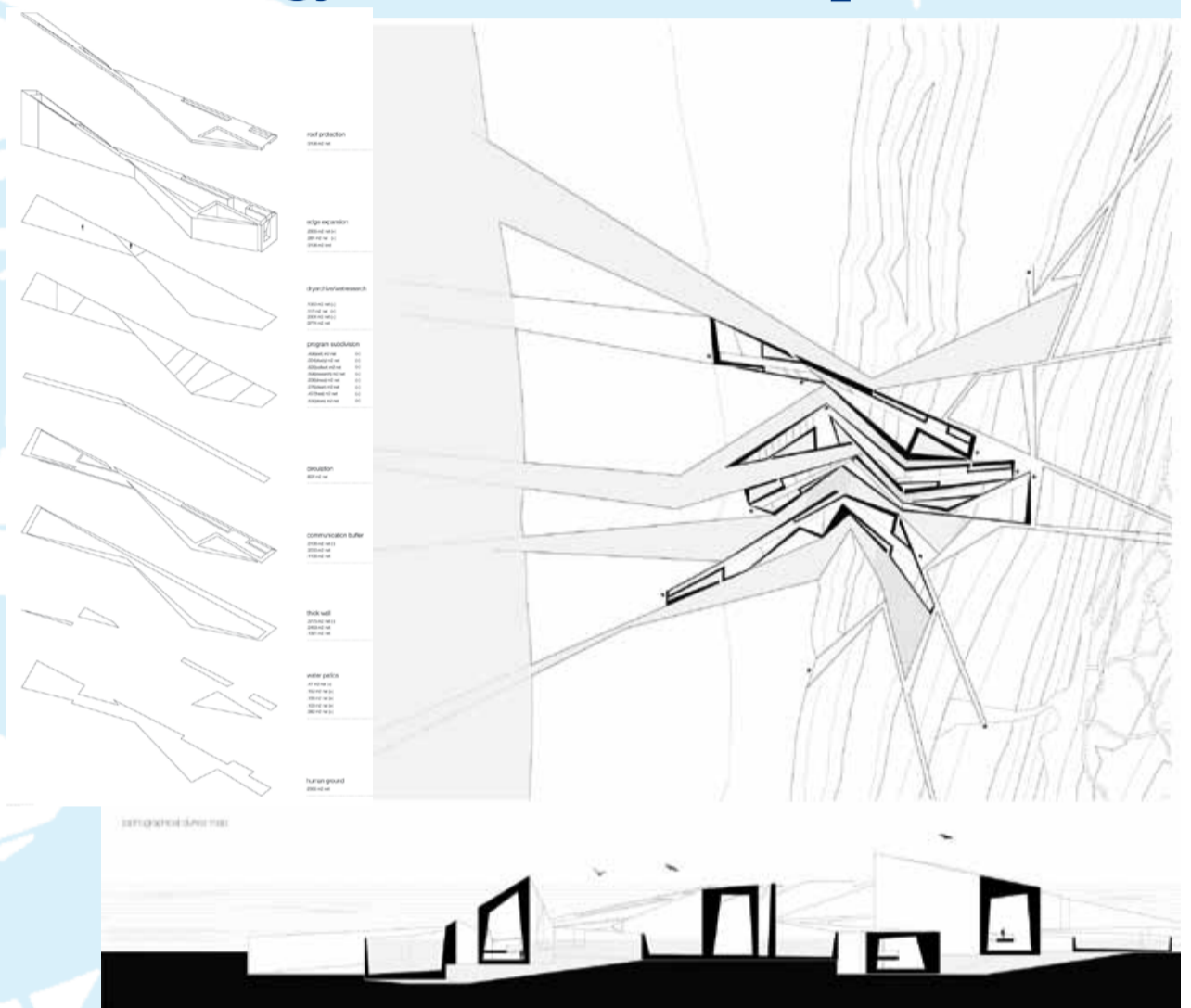
La Casa del Paguro: from Biology to Craftsmanship

Contradiction, intended as a possible way to determine tension in design, lead the whole exploration. The main question focuses on how an architectural composition can relate to environmental conditions, so how natural and artificial collide, how smooth and rigid interact or how space and time dialogue; basically understanding the ambiguity of compromise. The project has the ambition to let tidal movements, benthic fauna and human science interact in a distorted sandy habitat.

La casa del Paguro is a clear artificial intervention that does not try to mimic in the environment but rather wants to modify its course by letting nature acting on it, defining therefore, a new state of wilderness through the action of time. A building that orbits around few cubic meters of pure energy, where an endless variety of micro habitats give birth to more than one fourth of all the animal life on earth. An ecosystem that let us discover another galaxy in the universe, one easily within our grasp.

Time as one of the crucial element in the foundation of a respectful dialogue between human settings and natural spheres. How to cast a one generation building composed with the same constituent of the ground, a body that arises from its environment but discloses itself in a different anatomy, a stone on a sand beach which leaves only a trace of its transition. A shell for human and animals. An idea of erecting a disposable iconic building. A formalistic approach on biodiversity. A question on history and the role of monumentality. A fascination for the beauty of imperfection!

Tutors: Jan Engels, Henriette Bier



Marco Visser

RDM Convention Centre: the Variability of Streams



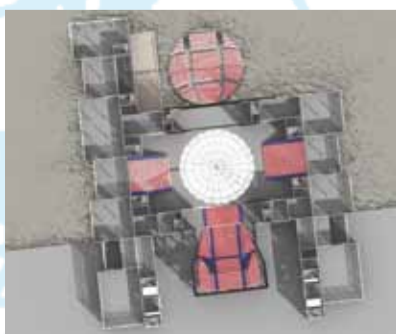
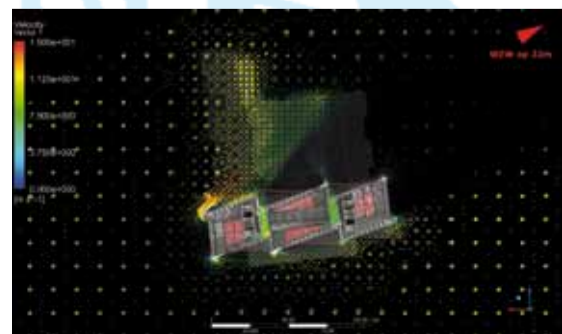
DOUBLE TRACK ARCHITECTURAL ENGINEERING AND BUILDING TECHNOLOGY

This design, an event centre which is part of the Architectural Engineering double track, focuses on two elemental streams: The variability in streams of people, when a certain area is usable in several ways, was part of the first semester. The second semester focuses on the stream of air through the design.

The event centre can be used for 3 basic scenario's: Basic Theatre, Theatre new style (public in the centre) and the central podium scenario. In every scenario the stream around the centre is different and this is exactly where the design program is organized for. Where a place in one scenario is used as a stage it can be used for tribunes in a different scenario.

To prevent that the ventilation of the building costs a lot of energy the variability of the air stream around the building is used. The shape of an climate axis is based on the variety in wind direction on the location. The holes in this axis and the shape of the main facade make sure that an air steam can be used for generating energy and for the stimulation of natural ventilation.

Tutors: Jan Engels, Arjan van Timmeren



MSc3/4 aE Studio⁰⁶

Northwards Amsterdam

The aE6 lab has selected the northwest Amsterdam docklands Buiksloterham as the location for their thesis design. The site was studied and explored by making architectural designs for a pavilion, based on engineering fascinations. These are the works of the students who proceed with their final design.

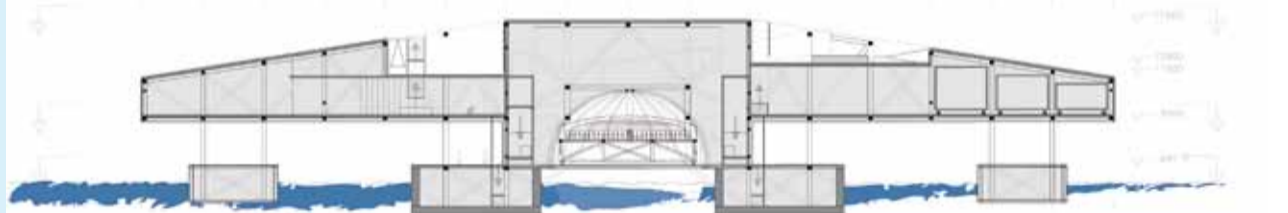


Jan-Kees de Vries: The IJ Water Experience

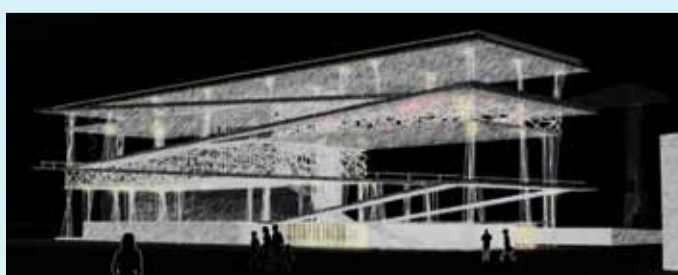
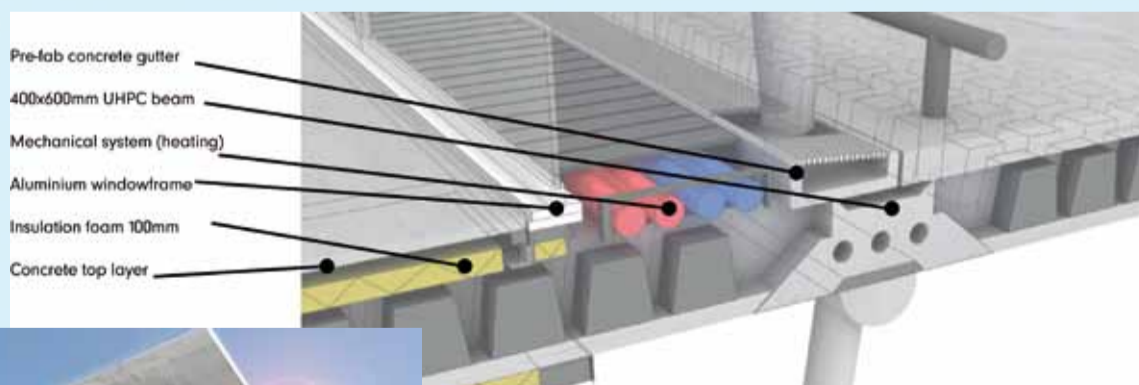
the IJ water experience is a research and design project for an adaptable floating ship-bridge-building as a module of a possible connection between the centre of Amsterdam and Amsterdam-North at the spot of Buiksloterham. It serves as cultural boulevard, joining the ambitions of the city to this area. The ship-bridge-building has several theatre spaces, and as a highlight the watertheatre with floating tribune, as the ultimate experience of theatre on water. The roof creates, as a park with its lower terraces, a useful terrain for events.

The structural part of the design consists of 4 floating pontoons, which are connected to a steel bridge construction. Hereby the building reacts as a whole by acting forces like moving crowds or the dynamics of water.

Tutors: Jan Engels, Wim Kamerling



Berend Strijland: NDSM - A Culture Park



A technical fascination for Ultra High Performance Concrete (UHPC) was applied for a design of a parking structure on the former NDSM wharf in Amsterdam. Car parks have been built in concrete since the early thirties, and its architectural expression goes hand in hand with the technical development of concrete. Reinforced concrete allowed for concrete structures, pre- and post-tensioned steel allowed for larger spans and UHPC will allow for a completely different approach for concrete structures. Its fiber reinforcement allows architects to develop forms that were previously deemed impossible. A parking structure is proposed on the festival terrain of the wharf. Providing parking space during office hours, the building provides expansion during events. The relative freedom of form provided by advancements in UHPC development allowed a playful environment fit for both parking and cultural events. Innovative UHPC structures were analyzed and optimized with GSA software.

Tutors: Jan Engels, Patrick Teuffel, Thijs Asselbergs

Lisette Kooiman: Musical experience inside and outside

DOUBLE TRACK ARCHITECTURAL ENGINEERING AND BUILDING TECHNOLOGY

In this study the acoustic performance of a traditional concert hall that can be opened toward the river "IJ" to create a stage for an "open air" concert was explored.

Starting point of this project was the formula on the echo of concert halls (by Wallace Clement Sabine) and the parameters that define their acoustical behaviour in general combined with a thorough study on existing CONCERT HALLS and their size/shape/volume/materialisation.

Architectural Engineering

The relationship between the architectural/programmatic starting point and the consequences for the acoustical performances of the building was the central focus for the first part of this project. The organisation of the program, the setting on the border of the river IJ close to a busy road as well as the composition of the different building parts were more or less leading in this part of the study. The acoustical consequences were studied and calculated both inside and outside the building.

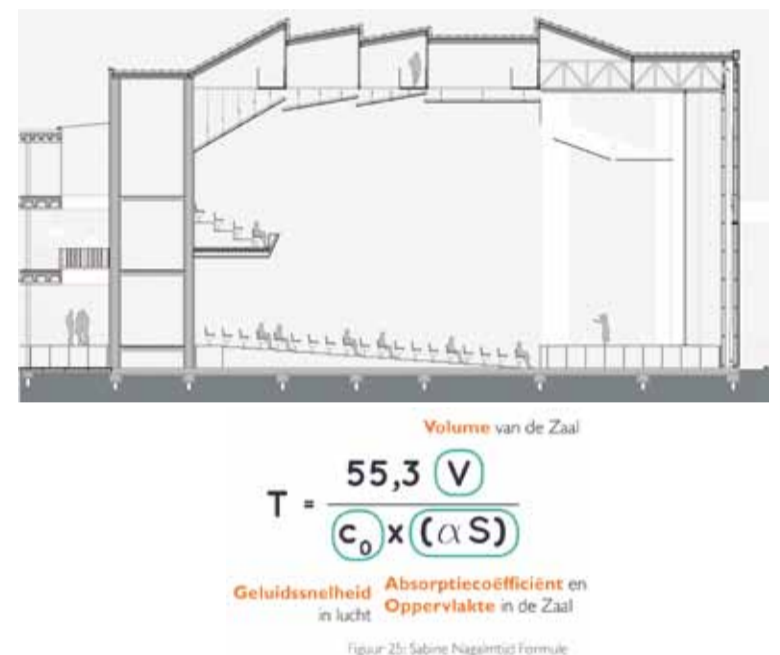
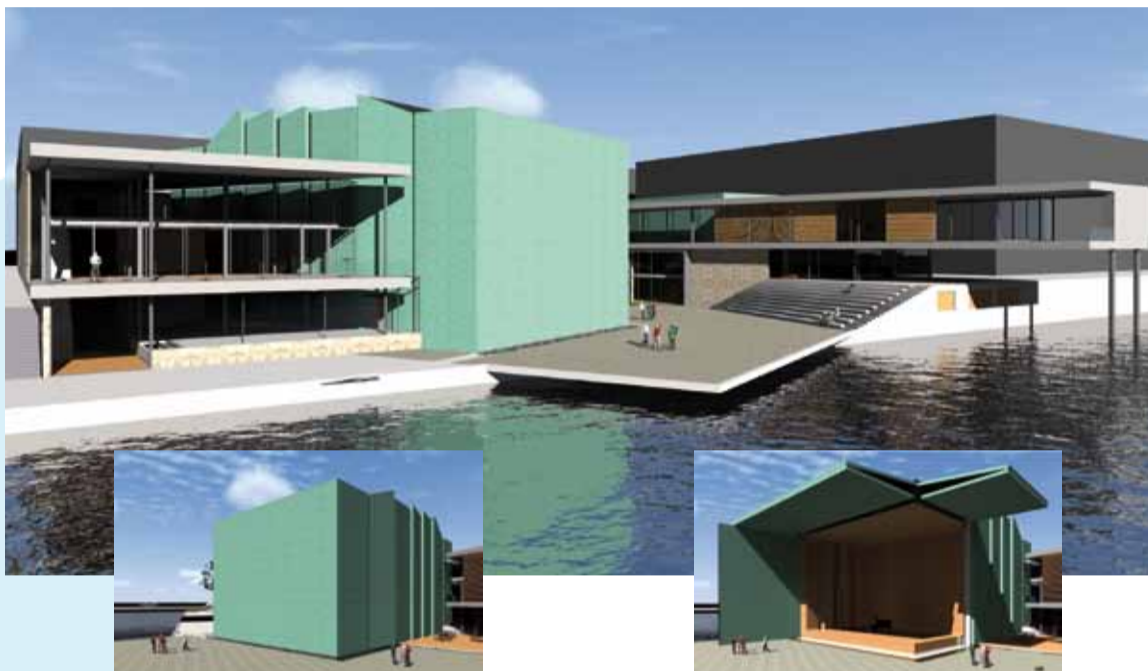
Building Technology

Subsequently calculations have been done in an advanced research for Building Technology. The calculations have been made and visualised with the simulation software CATT-Acoustics.

This is done both for the concert hall as for the outdoor/open air stage and setting. The consequences of these calculations have been translated into the initial design.

As a result the setting of the surrounding buildings was altered to optimize the reflections of sound in an open-air concert situation. The final detailing of the façade structure to open-up the building as well as the overall materialisation was elaborated. The differences between the two design proposals were made "audible" in the final presentation

Tutors: Jan Engels, Martin Tenpierik



Bert Vinke: Kinetic Architecture

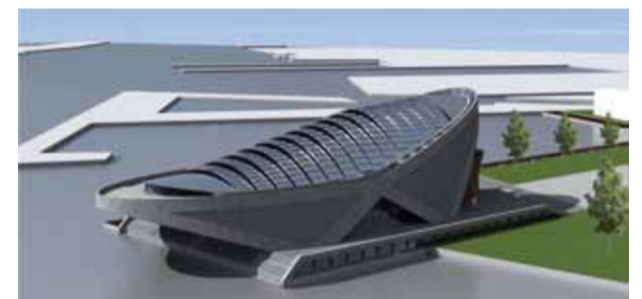
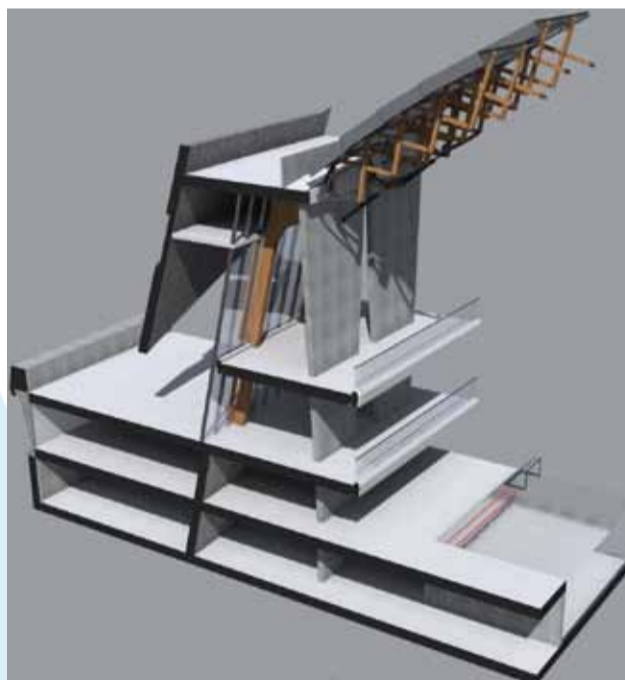
Inspired by the "Hoberman" constructions and the moving roof structure of the Milwaukee Art Museum by Santiago Calatrava this projects explores the feature of KINETIC ARCHITECTURE, more specific the adaptable roof structure of a waterpolo stadium along the river "IJ".

To enable the daylight and wind to penetrate into the building and to ventilate the space of this huge public space the roof is adaptable and gives the building its multipurpose use. From sport events to pop concerts, anything is possible.

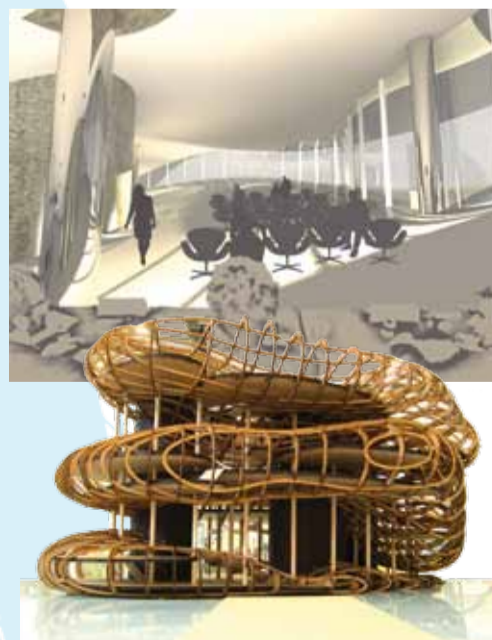
A movable skin on top of a flexible "siccor" mechanism driven by "actuators" was explored and tested in several handmade models.

A base structure was designed to support this roof, thus giving the building a strong and solid image. Although the research and model making was interesting the ambition of lightness and elegance was not reached with the given materialisation and detailing.

Tutors: Jan Engels, Frank Schnater



Jaap Bijlstra: Shell Structures, A Study of the Skin



The Skin of a shell structure is used a lot for roof structures, like domes and hypershells in de 60s. Not very often does the skin of the shell flow through the building creating other transitions between interior and exterior. In this building, the shell is not always a roof or only a thin enclosure. Skin and construction can be integrated or split up in a wider sense of perceiving the void. This means that parts of the shell will be used for accommodation area's, daylight transmission and walking lanes.

Tutors: Jan Engels, Tillmann Klein

MSc3/4 aE Studio⁰⁷

Westwards Scheveningen

Scheveningen has a long history as a Dutch fisherman's village and as the seaside resort of The Hague. As the Norfolk terminal that connected Scheveningen to England, became redundant new wastelands appeared to be developed. The municipality of The Hague has published its future potential in the report Scheveningen Harbor, Pearl at Sea. The Scheveningen harbor and its surroundings will serve as the location for the Architectural Engineering MSc4 studios. The site contains all elements for exciting master plans with space for residential and commercial buildings and for cultural purposes. The buildings to be designed will be the vehicle for technology driven architecture, exploring ways to build for an unknown future with new technologies in the field of material science, structural and computational design, climate design, product development, green building and new management strategies. Fixing what can be fixed, with options left open for what we cannot foresee.

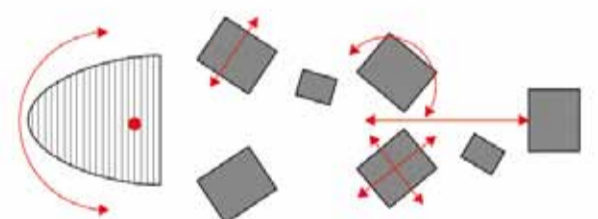
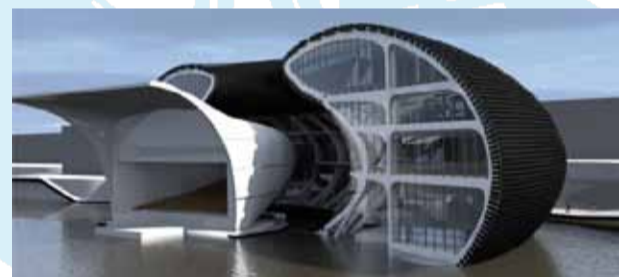
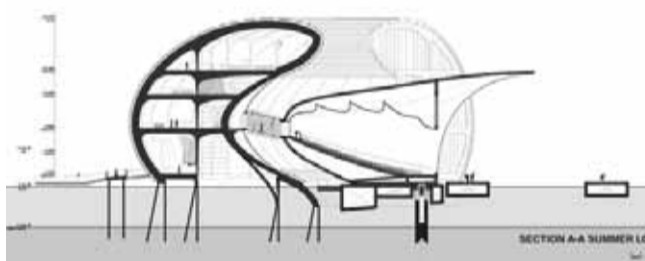
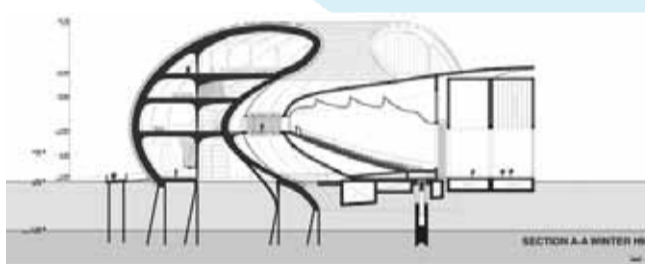


Theo Mestemaker: Floating Centre for the Performing Arts

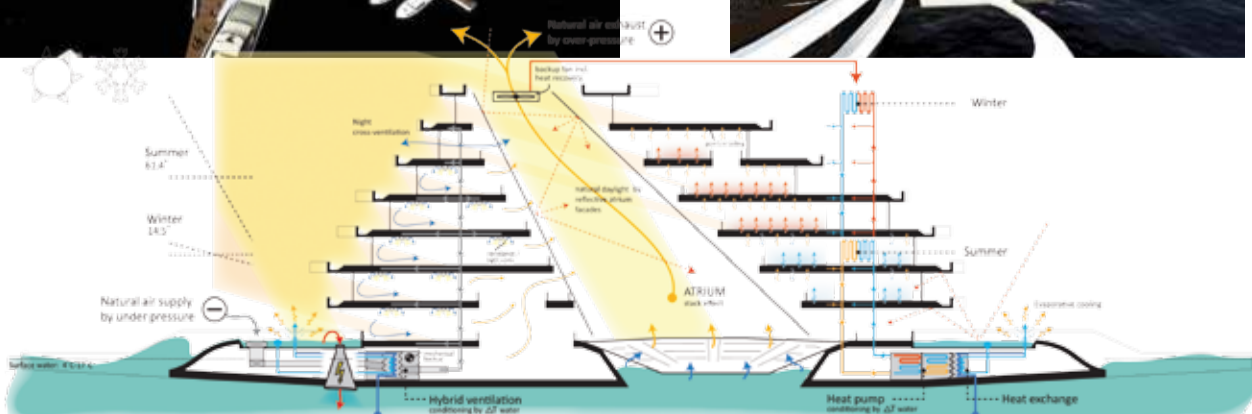
The inspiration for this project was derived from the context of Scheveningen-Harbour. This location has many dynamic aspects, like the wind that moves the sand and grass of the dunes and the water. Water is everywhere in this context, and Scheveningen is famous for its water (beach) and harbour (fish). The fascination of floating architecture was asking for a flexible function. Therefore I decided to design a Floating Centre for the Performing Arts. Performing Arts need a lot of flexibility in its plays because of the changing scenes.

For this Performing Arts centre I created a new type of theatre, that has a floating rotatable tribune and a floating movable stages. In this way great flexibility is created. The theatre is also usable in the stormy winter period as a traditional theatre.

Tutors: Jan Engels, Suzanne Groenewold, Wim Kamerling, Florian Heinzelmann



Erik van der Thiel: Floating: embodied energy potentials on sea



Embodied energy potentials on sea - It all started with a quote of the national government of the Netherlands: 'De Noordzee bevat een zee aan energie' (the North Sea contains a sea of energy), to make a statement when announcing the future plans of green energy. There are many potentials in green energy that we don't use.

According to calculations by Panicker the total quantity of energy available in deep water is estimated to be 1-10 TW (1 terawatt = 10¹² watts) [Brooke 2003]. The total power used by humans worldwide is about 16TW in 2006.

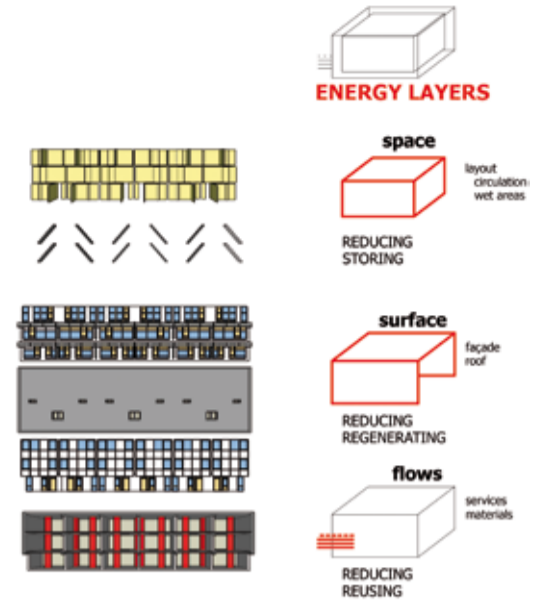
Combined with the proven combination of what the sea can do with a city (Scheveningen) I introduced the floating element on sea into Architecture, which have never been done before. By making use of passive architecture and active cooling to reduce the heat inside and optimizing the light by reflection of the water and using the waves to gain electricity, this can result in a energy neutral building.

Tutors: Jan Engels, Suzanne Groenewold, Wim Kamerling

Yasemin Sümbül: Refurbishing Shrinking Vrieheide

An aspect of the post industrial era that we are living in is the decline of population in areas that were built for industries. In these areas the buildings become vacant, there is a drop in the property values, provision of services and infrastructure become a problem. Until recently these areas were attempted to be upgraded with large scale projects that completely erased the existing formations. This project uses SystemsThinking as a methodology for developing a holistic approach and explores the potentials of energy refurbishment in a shrinking area in Heerlen.

Tutors: Jan Engels, Suzanne Groenewold, Bob Geldermans, Andy van den Dobbelsteen



Ifigenia Riga: Closing the Material Cycles; Hotel Building Design



The thesis concerns an alternative design approach in relation to architecture's inherent nature of materialisation. Opposed to the prevailing context of a linear building process, design and construction methods are studied through technical research and research by design in order to understand the framework and set the related strategies of a Closed Material Cycles sustainable architectural approach. The technical research results to specific architectural and engineering directions regarding design techniques aimed at the recollection of building materials and the selection of healthy materials for humans and the environment which can be infinitely recovered as technical and/or biological nutrients. These outputs are accordingly implemented in a hotel building design proposal -the refurbishment and extension of a fishing warehouse- in Scheveningen harbour in the city of Den Haag.

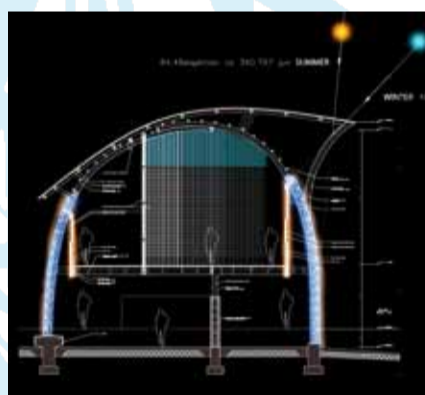
Tutors: Jan Engels, Suzanne Groenewold, Suzanne van Dijk, Andy van den Dobbelsteen

Diana Roitman: Urban Living Room - Jacmel, Haiti

The project Urban Living Room (ULR) unfolded through multifaceted research on the condition of pre- and post-earthquake construction, environmental hardships, and socio-economic development throughout Haiti.

It became clear that the project's focus needed to challenge the status quo by promoting decentralized development, restoring the ecosystem, and supporting economic growth of local communities. Guadua bamboo was employed (currently grown in the vicinity of the proposed building site) as a sustainable alternative for seismic resistant reconstruction, showcasing the high level of versatility available in bamboo based products and the generation of numerous new markets per respective product (bamboo cable, composite/mat/split/woven panels), in addition to utilizing natural culms with enhanced curvature during growth for structural purposes.

Tutors: Jan Engels, Suzanne Groenewold, Arjan van Timmeren



Yinghao (Ryan) Lin: the Sand Engine



Wind and coastal dunes are two dominant natural elements of the Netherlands. Coastal dunes are the first defence against storm tides and hence are vital for the Dutch people most of whom live below sea level. The phenomenon of dune formation is the result of the aggregation of the interaction between wind and sand particles. In this project, architecture tries to present itself as a wind intervener and cause the ever changing wind situation to accumulate sand and a restless dunescape, by the application of a kinetic membrane system. The architecture, which functions as a museum for the Dutch coastal environment, with its prominent exhibit - the restless dunescape, will become the attractive spot and gateway of the Scheveningen beach, raising public awareness of the very nature and the fragility of the coastal environment.

Tutors: Jan Engels, Suzanne Groenewold, Mauricio Morales Beltran

MSc3/4 aE Studio⁰⁹

Amsterdam at Sea

coördinator: Jan Engels, hoofdmentoren: Annebregje Snijders & Tjalling Homans

tweede mentoren: Tillmann Klein – Frank Schnater – Martin Tenpierik – Craig Martin – Siebe Broersma – Bob Geldermans – Rob Nijse – Arjan van Timmeren – Wim Kamerling – Giancarlo Mangone – Andy van den Dobbelsteen e.v.a.

The Brettenzone is a testing ground for all kinds of projects: it is an area full of cultural heritage, textured with many layers of development. Bordered on the urban side by the Haarlemmerpoort (Haarlemmer gate), the area stretches westward towards the sea. In the past, the area has been partially submerged by rising sea water; this period however has left few marks nowadays. Only some pieces of the Spaarndammerdijk (Spaarndammer dike) remind us of those times. Many layers have taken its place: reclaimed land, long infrastructural lines as railroads, highways and water; living areas in the Westelijke Tuinsteden (Western Garden Cities), harbour areas and the office area Sloterdijk; yet also places for recreation like the Westergasterrein, or on a smaller scale the many allotments and residences. Relations between this high programmatic diversity are often invisible or non-existent. Many interpretations can be made of this in-between land.

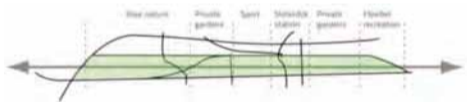
The Brettenzone is a testing ground for the assignments of the future. Just some of these are pollution, energy use, our dwelling needs, rising sea levels, uncertainties in food supply and infrastructural barriers. In our studio, your technological fascination is leading. What is your interpretation of the Brettenzone?

Discover it in the aE Studio. A new studio starts in the second (spring) semester!



Overview of the Brettenzone

karst kortekaas
Living Roads



How can a building-structure eliminate the physical and pollution related boundaries in dense urban cities?

nada sellami

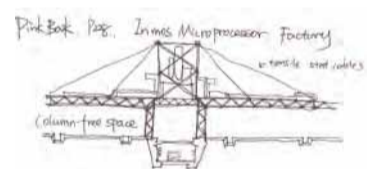
Renovation through energy management in Westelijke Tuinsteden

How to optimize energy performance with respect to cultural heritage?



zhang zhe zhang

Re-use of industrial heritage



How to use the extraordinary crane structures as an attraction to show the harbors beauty?

chao wang

Mass production & customization

How can mass-customization be an answer to the redevelopment of the vacant office area?



jos noordzij

Healthy school in an unhealthy environment



How can a school building in the vicinity of a polluting highway provide its occupants with a healthy inner-environment?

ruben smits

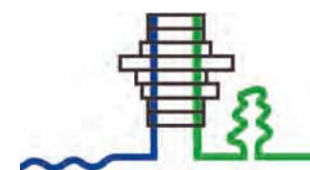
The living plant

Turning local waste streams into food streams.
How to design a building that is lungs and liver for the teleport area?



jan de ruiter

Urban Camping



How to transform a vacant office into the new typology of a slow-tech urban camping?

Are you interested in the questions of our times? Drop by on a Tuesday in our West Wing, BG.West.250

aE at Work Alumni

Over the past four years, many Architectural Engineering graduates have entered the job market. And not without success. On this page, two alumni are put into the spotlight, illustrating the wide range of work fields that you can end up in when graduating at Architectural Engineering.

Jerry Volkman Building Envelope Design at Inoclad



Having started graduation in aE Studio 3 (fall 2010), Jerry Volkman graduated with a new IMAX theatre to be placed next to the old prison building of Haarlem (see also aE Journal 2).

After graduation, did you start working right away?

Since I was 14 I was working at a small building contractor during the weekends and in school holidays. During the study time in Delft I grew within this company and had the opportunity to stay after I graduated in April 2011. I did so for 7 months and then left to a (much) more international orientated company in Germany.

Please provide a short description of your current job, and of a project you're working on.

I currently work at Inoclad, a relative young company focussing on the design, engineering and building of complicated building envelopes. My job is to get in contact with architects during design stage and design them a building skin that fills the architects ideas. One of the last projects was the Busan Opera Hall in Korea for Snohetta. For this project I designed a (double curved) prestressed facade, clad with alternating stone and glass elements.

What other projects have you realised after your graduation?

At the contractor (van Alphen in Hoogvliet Rotterdam) I have realised lots of small projects (design and build) as a project manager. Please refer to the website mentioned below for references. At Inoclad I have made design proposals for different big international projects. Most of the projects are in the Middle East. The project preparation time for these projects takes most of the time more than a year, so there has not been realised a project yet. But we are currently working on the Ithra-project (google it!) and some minor facade projects in Germany.

How can you apply what you've learned at aE in your current job?

I am feeling very comfortable at this spot, because I have close contact with architects that want an design / engineering solution for their buildings. We aE-people are able to both understand the architects ideas as well as creating engineering solutions. This is of great help to the architects. Right now I am using almost all the knowledge of the different disciplines learned at aE, except for real creative building design.

What can aE learn from the work field?

It is funny that since I have finished the study in Delft it became very clear to me that in practice the architect is even more the creative painter then I thought. A painter that really needs aE people to make his or her piece of art buildable. What really is the case for a lot of international projects is that the constructions for building envelopes are a lot thicker than really needed (3 meters between internal and external skin is not uncommon!). There is lack of people who are able to comprehend the integration of the structural design, the design for the envelope and the climate. Integration was already a hot item, but will be even more since the economic situation forces companies even more to provide the best for the least.

www.jerryvolkman.nl
www.inoclad.com



building cladding for Inoclad

Xing Wang Designer at Benoy



Proudly graduated with a 10 in 2011 on a parametric canal pavilion in Haarlem, Xing Wang moved back to Hong Kong after working in The Netherlands.

When did you graduate at aE? Did you start working right away or not?

I graduated in June last year. I started working 3 months after the graduation. My first job was at Octatube which is an engineering company very close to our faculty. I worked as an engineer there for six months. mainly use engineer software autodesk Inventor. I finished a canopy and some other project there.



canopy for Octatube

Please provide a short description of your current job, and of a project you're working on.

After Octatube, I wanted to have more challenges as an architect. So I come to Benoy, a British company in Hong Kong. We mainly design for retail projects, our competitors are such offices as Callison and JADE Architects. Now I am working on shopping malls and mix-use complexes. We always have ambitions to build special structures to serve as a landmark, so my previous experience is very helpful and useful.



shopping mall for Benoy

How can you apply what you've learned at aE in your current job?

Mostly, the 'engineering' way of thinking. How you can find a balance between the real world, and the more 'arty' world of architecture.

What can aE learn from the work field?

In practice you often have to do with commercial clients. aE can learn from these clients to get more informed about the clients' needs.

www.xing-wang.org
www.benoy.com
www.makeahybrid.org

Student Association BouT

BouT is the student and practice association for BuildingTechnology. We are a platform for students and alumni, PhD students, researchers and other academic staff and commercial enterprises. Within our network we aim to exchange building technology related knowledge and experience. Our board consists of Msc students who commit to the association for at least a year, next to their study activities.

Throughout the year we organize events that complement the Msc curriculum. Excursions to companies within the field of building technology offer insights in what to expect after graduation and give you the opportunity to gain knowledge. In collaboration with other associations or companies we organize symposia.

To keep our members up to date about everything happening in and around the Building Technology world, we publish the magazine RUMOER. This periodical revolves around a different BT-topic each

time. Next to our own publication, we also have a small library of building technology related magazines like Detail and Bouwwereld. These are available for you to read at our office.

We hope to see you around!

Website: www.praktijkverenigingbout.nl
Mail: info@praktijkverenigingbout.nl
Office: BK 02.west.090



An excursion to the Stedelijk Museum in Amsterdam

aE: Who's who?

Architectural Engineering

Thijs Asselbergs (Professor of aE)
www.ataindex.nl/

Ype Cuperus (teacher)
<http://nl.linkedin.com/in/ypecuperus>

Elise van Dooren (teacher)
<http://bk.tudelft.nl>

Florian Eckardt (guest teacher)
<http://www.architectinamsterdam.nl/index.php/cv/>

Jan Engels (teacher)
<http://bk.tudelft.nl>

Jelke Fokkinga (guest teacher)
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Bas Gremmen (teacher)
<http://www.gremmen.nl/>

Suzanne Groenewold-Stengs (guest teacher)
www.gsarchitecten.nl

Erik Hehenkamp (guest teacher)
www.ontwerpersadam.nl

Sjap Holst (guest teacher)
www.artchitecture.nl

Tjalling Homans (teacher)
www.tjallinghomans.nl

Rob van Houten (guest teacher)
<http://nl.linkedin.com/pub/rob-van-houten/2/164/254>

Pierre Jennen (guest teacher)
www.ovo.nl

Hans Kalkhoven (guest teacher)
<http://nl.linkedin.com/pub/hans-kalkhoven>

Hans Karsen (guest teacher)
<http://nl.linkedin.com/pub/hans-karssen/10/291/865>

Gilbert Koskamp (guest teacher)
<http://www.bureausse.nl/#>

Jos Lafeber (guest teacher)
<http://nl.linkedin.com/pub/jos-lafeber/1b/945/568>

Joep Manschot (guest teacher)
<http://nl.linkedin.com/in/joepmanschot>

Henk Mihl (teacher)
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Hans Nout (guest teacher)
<http://www.noutarchitecten.nl/>

Mauro Paracivini (guest teacher)
<http://mauroparravicini.eu>

Roel van de Pas (guest teacher)
<http://www.burobouwstof.nl/>

Huib Plomp (teacher)
<http://nl.linkedin.com/pub/huib-plomp/14/905/34a>

Annebregje Snijders (teacher)
<http://nl.linkedin.com/pub/annebregje-snijders/18/152/a72>

Martin Sobota (guest teacher)
<http://www.cityfoerster.de/index.php?id=28>

Jan van der Voort (teacher)
<http://www.attika.nl/>

Arno de Vries (guest teacher)
<http://nl.linkedin.com/in/arnodevriesarchitect>

Luc de Vries (guest teacher)
<http://www.lucdevriesarchitect.nl/>

Ger Warries (guest teacher)
<http://www.warries.nl/>

Design of Structure

Hans Daane (guest teacher)
<http://bk.tudelft.nl>

Wim Kamerling (teacher)
<http://nl.linkedin.com/pub/wim-kamerling>

Mauricio Morales Beltran (phd'er)
<http://nl.linkedin.com/pub/mauricio-morales-beltran/52/570/199>

Rob Nijse (Professor Structural Design)
<http://www.abt.eu/nl/actueel.asp?cid=1&nid=36>

Joop Paul (Professor Structural Design)
<http://www.arup.com>

Structural Mechanics

Andrew Borgart (teacher)
<http://nl.linkedin.com/pub/andrew-borgart/11/136/1a7>

Gerrie Hobbelman (teacher)
<http://nl.linkedin.com/pub/gerrie-hobbelman/12/293/332>

Climate Design & Sustainability

Andy van den Dobbelsteen
(Professor of Climate Design & Sustainability)
<http://bk.tudelft.nl>

Eric van den Ham (teacher)
<http://nl.linkedin.com/pub/eric-van-den-ham>

Giancarlo Mangone (phd'er)
<http://www.linkedin.com/pub/giancarlo-mangone/14/346/17>

Cradle to Cradle

Suzanne van Dijk (teacher)
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Bob Geldermans (teacher)
<http://www.except.nl/en/#.en.userprofiles.99-bob-geldermans>

Building Services

Peter Luscuere (Professor of Building Services)
<http://nl.linkedin.com/pub/peter-luscuere/6/b21/b28>

Light

Truus Hordijk (teacher)
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Acoustics

Martin Tenpierik (teacher)
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Design of Construction

Tillmann Klein (teacher)
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Ulrich Knaack
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Koen Mulder (guest teacher)
<http://nl.linkedin.com/pub/koen-mulder/0/b58/b32>

Frank Schnater (teacher)
<http://www.rsw-architecten.nl/bureau/buopers/buopers.htm>

Engbert van der Zaag (teacher)
<http://www.mir.nl/track/studio/page/128>

Product Development

Marcel Bilow (teacher)
<http://www.imagine-envelope.com/team/marcel-bilow/>

Mick Eekhout
(Professor of Product Development)
www.octatube.nl

Peter van Swieten (teacher)
<http://www.swietenpartners.nl/>

Karel Vollers (teacher)
<http://nl.linkedin.com/pub/k-j-vollers/14/935/a6a>

Environmental Design

Arjan van Timmeren
(Professor Environmental Design)
<http://www.bk.tudelft.nl/nl/actueel/laatste-nieuws/artikel/detail/arjan-van-timmeren-nieuwe-hoogleraar-environmental-technology-design-aan-de-faculteit-bouwkunde-tu/>

Computational Design

Henriette Bier (teacher)
<http://bk.tudelft.nl/index.php?id=15158&L=1>

RMIT

Job Roos (teacher)
<http://www.braaksma-roos.nl>

Lidy Meijers (teacher)
<http://www.lidymeijers.nl>

Architectural Engineering Master Programme

MSc-1 aE – Bucky Lab

In the Bucky Lab and Bucky Lab Seminars the combination between architecture and building technology is brought to a higher level. The assignment is to design an innovative building facade.

Research is done by virtual simulation and physical testing of the design's material and structural performance. The results are used as feedback to optimize the design.

The final test is the realization of a full scale prototype of a part of the facade. This means that the design will be translated into shop drawings, material quantities and a production strategy as a preparation for the actual building.

Bucky Lab Design (AR1AE015) - 12 erts
Bucky Lab Seminars (AR1AE025) - 6 erts
Compulsory courses - 12 erts



MSc-2 aE – Building Design + Engineering

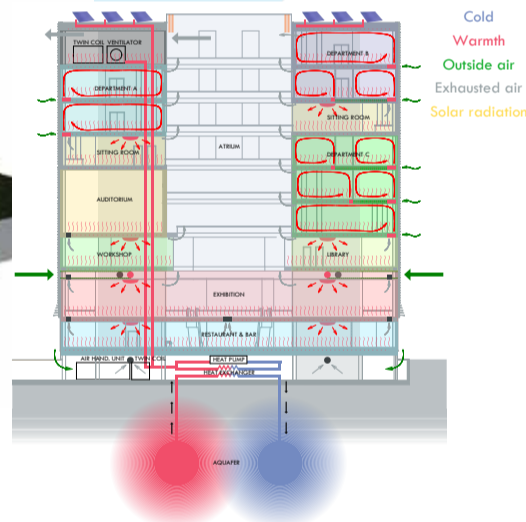
In the Building Design & Engineering projects and seminars the focus lays on sustainable and innovative building design.

Flexibility, robustness, resilience and adaptability are not only guiding ideas in the design but are profoundly worked out in detail.

The design encompasses the creation of space, function, structure, climate and facade in a multi storey building with various functions. The main theme of the project is the climate of the building in all its aspects.

This course can be a part of the TU graduation specialization 'Technology in Sustainable Development' (TIDO).

BD+E (AR2AE035) - 12 erts
BD+E Seminars (AR2AE045) - 6 erts
Compulsory & elective courses - total of 12 erts



MSc-3/4 aE – Graduation

The MSc-3 consists of extensive thematic research. Research focuses on a certain materialization, climate or structural fascination. Previous projects explored the possibilities of building with straw, floating buildings and parametric design.

aE Research (AR3AE011) - 7 erts
Graduation Preparation (AR3AE015) - 15 erts
Thesis Plan (AR3U012) - 4 erts
Theory of Urbanism (AR3U022) - 4 erts

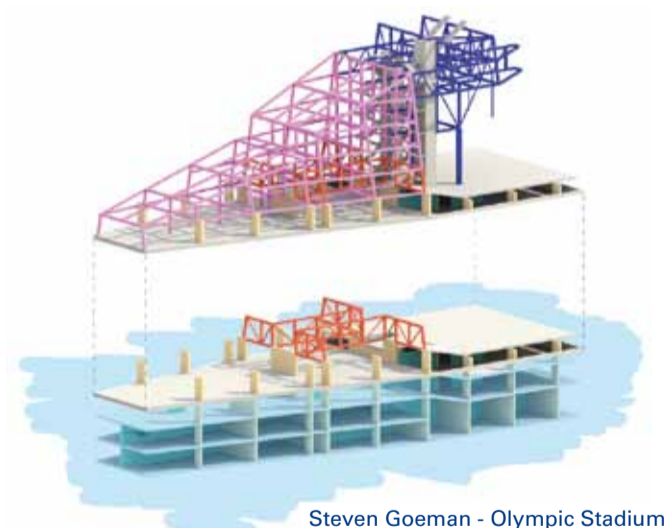
In the MSc 4, the emphasis lies on the integration of architectonic aspects and building technology within the design, guided by technical research (material, structural, climate & parametrical design).

The MSc 4 project deals with various building types and programs, situated in different interesting and challenging surroundings. You'll be supported and examined by architecture instructors, specialized in the materialization of buildings, and a building technology specialist dependant of the focus of the research and design.

This graduation lab can be a part of the TU graduation specialization 'Technology in Sustainable Development' (TIDO).



Dong Eung Lee - Energy City



Steven Goeman - Olympic Stadium Fleet

MSc 1 - BUCKY LAB
 dr.-ing. Marcel Bilow
 m.bilow@tudelft.nl

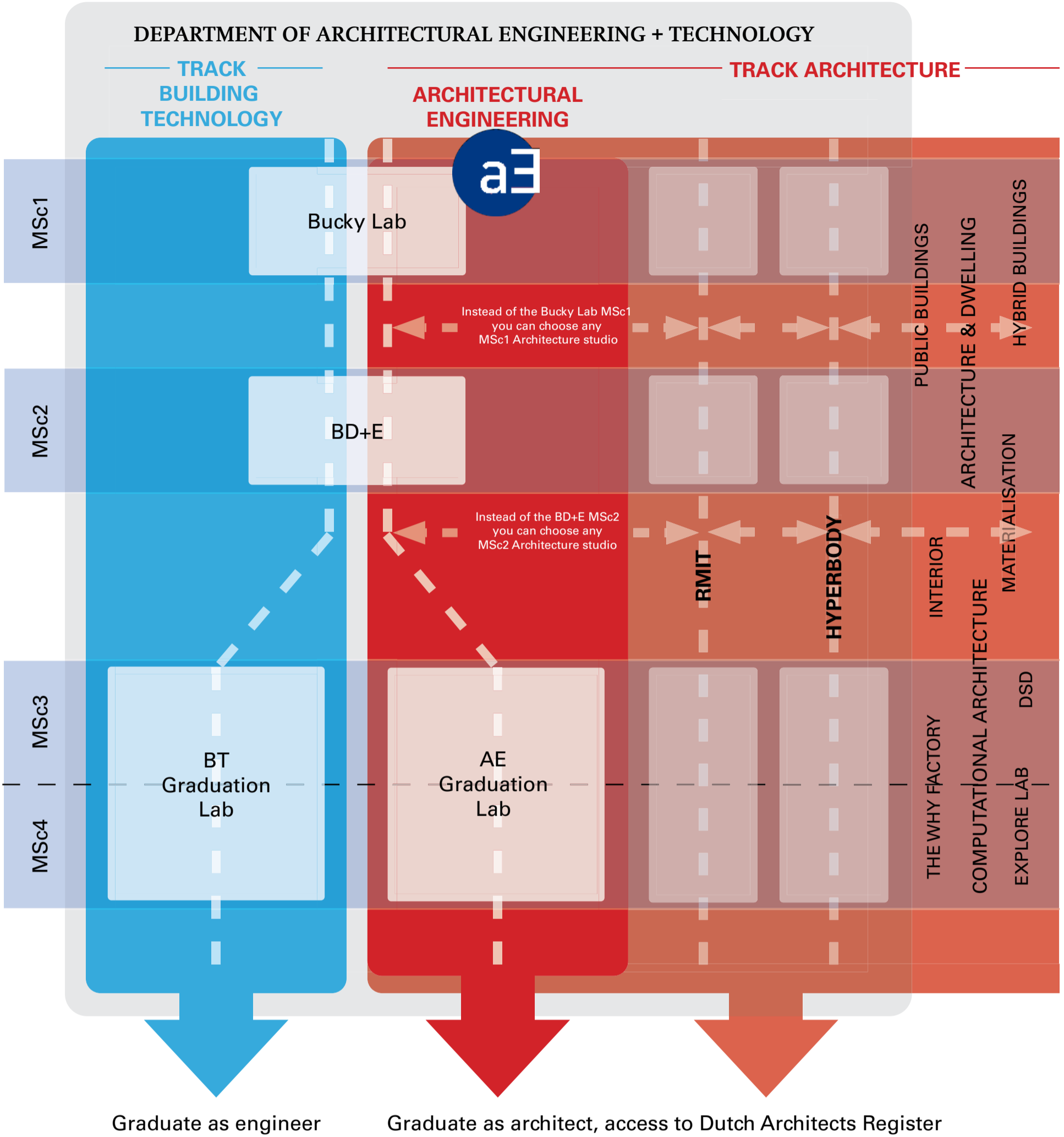
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COLOPHON

aE journal | Volume 3, no 1/2012

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Publisher: Chair of Architectural Engineering

Layout Design: Bureau Arjan Karssen BNO
Haarlem

Layout: Marcello Soeleman

Printing: Lenoirschuring drukkers
Amstelveen

