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Dear reader,

Benjamin Franklin, the Greek police, the US Senate, the sum of the first nine prime numbers, and the KOersief all have something in common: the number one hundred.

It has been over 30 years since the first edition of the KOersief was made, and now, with this edition, a milestone has been reached! Therefore, this KOersief is no ordinary edition: it is a special, extra thick anniversary edition, celebrating 100 editions of the magazine for and by students of study association KOers.

The more astute amongst you may have noticed by now that the start of this anniversary section is in black and white. This has everything to do with our journey back in time, to the founding of KOers and the KOersief. This section of the 100th KOersief contains a timeline of the history of the KOersief and KOers, including study trips, concrete canoes, and lustrums; an interview with one of the first editors; and we will give you an exclusive look behind the pages of the KOersief!

Because we cannot print every piece of uncovered information in the timeline, you can explore the timeline even more on our website. By now, it is also possible to read and download all the former editions of the KOersief online! To start exploring, visit [www.KOersTUe.nl/KOersief100](http://www.KOersTUe.nl/KOersief100).

On behalf of the editorial board, I wish you a great trip through time: bon voyage!

Sander Montrée  
Editor-in-chief KOersief 100



## INTRODUCTION

=====

1978, the year that everything changed for the students of the study track Structural Design in Eindhoven. Three pages, full of plans and goals for a study association, were published under the name 'KOersief'. Unfortunately, no existing copy has stood the test of time, which leaves us guessing for the actual plans and goals in the first KOersief. On December 21st, 1978, KOers was officially founded. It was on this day that Reni van Vliet and Huub Heygele visited the notary office to sign the declaration of incorporation. In this notary office, the goal of the study association was written:

-----DOEL EN MIDDELEN.-----

Artikel 2.

De vereniging stelt zich ten doel het behartigen van de belangen van de studenten binnen de afstudeerrichting Konstruktief Ontwerpen/Technische Mechanica/Materiaalkunde van de afdeling der Bouwkunde van de Technische Hogeschool Eindhoven.

"The association aims to represent the interests of students of the study track Structural Design / Technical Mechanics / Material Sciences of the department of the Built Environment of the Technical College Eindhoven"

Soon, KOers grew out to a real study association. Within five years, the membership numbers rose to about 100 students, teachers, staff, and former students. The number of activities grew in a similar pace to the number of members. Yearly participation to Concrete Canoe Races both in the Netherlands and abroad, excursions to foreign countries, and a KOers party were amongst the activities organized.

### Founding of KOers

Preceding the official founding of KOers, several attempts were made to start a study association for the students of Structural Design. The first attempt to start KOers was in March 1975, just one year after the suggestion in Hotel Christina (see KOers Crossing Borders (I)). Unfortunately, the association was very short-lived, and within months, KOers had almost completely disappeared.

November 26, 1975, with lots of interest, an attempt was made to revive KOers. This new attempt to start a study association was reinforced by organizing the first study trip to England in June 1976. Once a month, a film was shown during the lunch breaks and in April 1976, the first KOers-party was organised. KOers even had its own representative in the board of the Unit Structural Design. To bring professors, staff, and students in contact with each other in an informal way, a drink was organized after the monthly meetings.

In order to ensure the continuity of KOers, much time was spent on creating a plan for the following years. In one of the weekly meetings in January 1977, a fierce discussion was held about the question what KOers was and what the goals should be. Hoping to ensure continuity by institutionalisation, a board was chosen. On November 10, 1977, the tasks were distributed. The first chairman of KOers was René van Vliet.



In this first unofficial year, KOers had 28 members. Nevertheless, lots of activities were organized: a study trip to Berlin, a lecture series, and participation in the second international Concrete Canoe Race. The board was also busy trying to get their own KOers-space on the second floor of the Main Building, the home of the Department of the Built Environment.

During the General Members Meeting of October 10, 1978, the board announced that they would not be eligible for re-election and a new board was chosen. Later that year, the previous board would be responsible for the official founding of KOers.

Over the years, KOers gathered two honorary members who helped the association: former professor Jan Siebelink (†) and former secretary of the unit Structural Design: Muriel Alblas.

## KOersief

Since the founding of KOers, the KOersief has been published approximately three times a year. In the past, sometimes an edition was skipped, which leaves us today with the 100th edition of the KOersief. Although the KOersief was mostly a magazine for the Structural Design students only and mostly focused on events inside the study association in the early years, the KOersief has grown out to be a respected magazine with articles by many great companies in the building industry.

As many of our frequent readers may have noticed, this edition of the KOersief is a special one. Since the current edition is the 100th edition of the KOersief, the editorial board has decided to include a theme-related part, as you are used to, but also a special part on KOersief's anniversary. In this anniversary part, a history of the KOersief is outlined, using a timeline with the corresponding layouts of the KOersief of that time. This gives the reader an impression of the development of the KOersief over the years. Of course, many changes in layout and design can be distinguished, often dependent on the growing technical possibilities in the past. The first couple of numbers of the KOersief were typed on an actual typewriter, while nowadays, the KOersief is printed at a printing office and several hundreds of copies roll out of the printer in no time.

The timeline is built up out of several unique events and a number of recurring events. The recurring events consist for example of International Study Trips or participations in the Concrete Canoe Race or Bata444race. These can all be identified by different icons on the timeline. These icons are shown in the column on the right.

In addition to these events, former editors of the KOersief were asked to write about their experiences and some old traditions of the KOersief were given a new look and included in this edition as well.

Arno Poels, 2016



Sports



Anniversaries/lustrums



Beer Crate Bridge



Concrete Canoe Race



Study Trips



KOersief



New activities



Special drinks

Study Trip  
Germany



Study Trip  
Sweden

1976

1974

Study Trip  
England

1977



First Dutch  
Concrete Canoe Race

# koersief



## CROSSING BORDERS (I) (1974 - 1978)

=====

Even before the official founding of KOers, study trips were organized for Structural Design students. Some years after the founding of the Faculty of the Built Environment, a group of students of the study track Structural Design organized various activities for students and staff. In October 1974, the first big trip was organized in cooperation with a German firm. The group visited (amongst others) Munich, Frankfurt, and Neurenberg.

The last day of the trip was spent in Düsseldorf, where the group stayed in Hotel Christina. In the hotel bar-restaurant, the end of the trip was celebrated. At the end of the night, 'Willem' proposed to start a study association. All agreed and the unofficial founding of KOers was a fact.

Before the official founding of KOers, the students also visited England (June 1976), Sweden (October 1977), and Berlin (Germany, 1978).



## FIRST DUTCH CONCRETE CANOE RACE

=====

The first Dutch Concrete Canoe Race took place in 1977 in Delft. The idea was born several years before in the USA and was very popular among universities and institutions, involved with building technology and building structures. Back then, the shape of the canoe did not matter, floating was the main priority. They already discovered how important the weight was: the lower the weight of the canoe, the higher the final ranking would be. At that time, there was a special 'Concrete Canoe Association'. In 1977, only members of the study association KOers were involved. Later, members of the study associations FAGO (Building Physics) and UT (Construction Technology) could also participate.

The Concrete Canoe Association had its own meeting room, storage space for canoes and materials, house regulations, and had about nine members. The members of the Concrete Canoe Association can be described as: 'People who are not afraid to get their hands dirty and who can easily manage to use tools.' Besides the construction of the canoes, the members also trained, which often included getting wet. Especially the kayak model required some extra training before a competition could be won.

1978



Study Trip  
Berlin

Concrete Canoe Race  
Eindhoven

1979



1978 FOUNDING OF KOERS  
=====

December 21, 1978, study association KOers was officially founded.



CROSSING BORDERS (II) (1979 - 2005)  
=====

KOers has always been attracted to foreign countries. The association therefore organized multiple study trips and excursions. From 1979 to 2005 KOers organized 18 study trips to various destinations in Europe. Some locations were more popular than others, for instance, France was only visited once (in 1979), while the United Kingdom was visited four times: England was visited three times (in 1993, 1996, and 2000), of which London was the main destination twice. Scotland was visited once (in 2003).

Germany was visited five times. The trip in 2002 focused only on Berlin, while the trips in 1983 and 1999 visited more than one city in Germany. The study trip of 1992 combined Hamburg with Denmark. Thirteen years later, in 2005, the study trip paired the main financial city of Europe, Frankfurt, with one of the most historical cities in southern Europe: Rome.

The trips to Denmark/Hamburg and Frankfurt/Rome were not the only trips combining two countries in the period between 1979 and 2005. Denmark was also paired with Sweden in 1984 and one year later, Austria was paired with northern Italy.

Until 1995, Switzerland remained as one of the last countries unvisited by a KOers excursion close to the Netherlands. The 1955 study trip visited Basel and Zürich and the group visited many structures by Isler, Corbu, and Calatrava. Switzerland was visited again in 2004 and 2014.

In 1998 the first excursion to Spain was organized. The destination: the city of Gaudi. A group of 48 KOers members visited Barcelona and its (structural) highlights. Barcelona proved to be a very popular city. So popular that the study trip of 2000 and 2001 also visited Barcelona, combined with the beautiful city of Bilbao. Visiting the same destination two times in a row was too much for some KOers members; they decided to organize a study trip on their own. This first (and to date only) alternative Study Trip went to Italy, where Milan, Florence, Rome, and Pisa were visited.

# koersief



1984 - Participants Study Trip Sweden & Denmark

Study Trip  
France

Study Trip  
Moscow

1980

1982

First participation  
Bata444Race

Study Trip  
England



1982 - Cover of KOersief 2



1984 - Group picture KOers



#### 1982 DESIGN COMPETITION

=====

In 1982, one of the first design competitions, organized by KOers, took place. This competition was meant for first year students and consisted of building a cantilevered beam over the Dommel. The materials that were available to each group of students were a steel angle section of 28 meters long, several steel strips, bolts and nuts, and a sheet of fiberboard. The winning design comprised a varying height over the length of the beam, following the moment diagram.

The concept of a design competition would later be transformed into building a beer crate bridge, about which more can be found later in this timeline. In addition to the beer crate bridge, a new design challenge was organized in 2015: the KOers Design Challenge (KDC). You can find more about this in 2015.



#### 1982 INTERVIEW EDITOR FIRST KOERSIEF

=====

A conversation with Jack Reijnen in 2016, editor of the first KOersief

The first KOersief was released in May, 1982. Hans Rijvers, Johan Vreede, Jack Reijnen, and scientific employee Wim Huisman started the KOersief: a magazine for students, by students.

#### Starting the editorial board

In the General Members Meeting of KOers (March 2, 1982) Johan and myself came forward because we wanted to do something for KOers. The committees were already filled up and there was a need for a magazine to convey announcements to students and staff.

At the time, we wanted to make four editions a year, one for each quartile. Together with professor Huisman and Hans Rijvers, we made the first editions. The first edition is the second KOersief: one KOersief was made long before we made it and therefore, we thought it would be fitting to begin numbering at 2.

#### Making of the first KOersief

Back in 1982, we met twice to discuss the subject of the articles we would write. For the first edition, this was



First KOersief  
released



Study Trip  
Germany

First crossword  
puzzle



1983



First design  
competition

Concrete Canoe  
Race song

'suspension bridges', due to a mini-symposium and a guest lecture on that topic. We were responsible for writing articles, because communication with external parties was difficult; the internet did not exist and there was only one phone for the entire department of Structural Design.

The first edition was released around the time that the first computers came into use on the university. Every student had a certain amount of dedicated time on the machine, which worked with punched cards. Because the KOersief was not study-related, we could only use the computer at night.

As you can see in the old editions, we typed on different typewriters, creating different fonts throughout the magazine. Then we had to cut all the articles and paste them on the lay-out; the text in the large column, and the pictures in the smaller column. If you look closely, you can spot the shade of the pasted paper. Then the stack of pages was delivered at the reproshop in the university, which copied the papers and stapled them together.

Release

There was never a hard deadline for the KOersief, nor was there a certain amount of pages we had to fill. If there was something to write about, we did, otherwise the KOersief just had less pages. When the reproshop was done copying, we distributed the magazine to the students who sat in the Structural Design section of the building (north wing of the Main Building, floors 2 and 3). The number of magazines printed was about 30 to 40, a little less than today I imagine.

Editions 2 onward

After the first edition, I made another seven editions of the KOersief, together with other students of course. We did not make major changes in the KOersief. The cover was changed into a thicker and coloured sheet; the images were getting larger and were put into the text, instead of in the separate column, which could therefore be smaller. The KOersief as it is now has obviously improved. It is more professional and it looks great. I did not expect the KOersief, or even KOers itself, to have survived all these years, but now we are here, let's go for 100 more!



1983 CONCRETE CANOE ASSOCIATION SONG  
=====

In 1983, the Concrete Canoe Association made their own song, which is shown in the column on the right.

# koersief



1985 - Jack Reijnen

Concrete Canoe Association song

Music: Downtown / Petula Clark

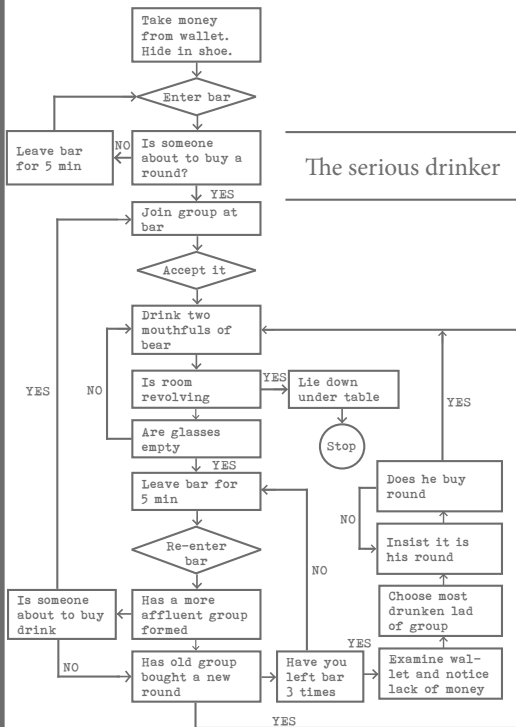
This is a concrete, concrete canoe race,  
canoe race

We are the students  
From the low lands of Holland  
We came to win this race, canoe race

Chorus:  
You know we're from Eindhoven  
The city with great knowledge  
We make boats far most better  
Than any other college  
How can we lose this race  
Forget all your chances  
Forget all your hope  
Because Eindhoven is winning this race  
Because Eindhoven is winning this race  
Je-He Hoe.



# koersief



## 1983 FIRST LUSTRUM

=====

KOers celebrated its first lustrum on December 21, 1983. A brief story about this special evening was written in the 7th edition of the KOersief. The members of this first lustrum commission were Joep Thijs, Els Gerritsen, Jan van Mier, and Lucas van Spaendonk. In the 8th edition of the KOersief, it was stated that the lustrum party was well visited. It was a huge success, also because of the activities organized by companies, which were well executed.



## 1989 SECOND LUSTRUM

=====

On the occasion of the tenth anniversary of KOers, a huge party was held at the Philips stadium in Eindhoven on Friday, February 17, 1989. About 150 students, graduates, associates, and professors were invited. They experienced a compelling and convivial evening in the 'Business class' entourage of the new stadium building. A few lectures were given about the construction of the new stadium in Eindhoven and about stadium construction in the Netherlands in general. The attendees were lucky enough to receive a guided tour around the stadium; they saw where the famous soccer players at that time prepared themselves for the games of PSV and where they showered afterwards. The guided tour also took them to the dressing room of the referee and the luxurious sponsor rooms. The evening ended with a feast and, while enjoying the tasty finger food and cold beers, old memories and stories were told, people danced and laughed, and the party lasted until early in the morning.



## 1990 BATA444RACE

=====

As many of you may not know, the KOersief has a rich tradition of reporting and supporting their members in sports. The Bata444race is one of the yearly events that was reported in detail for a substantial number of years. The first occurrence of a report on the Bata444race was in the 33rd edition of the KOersief in 1993. The Bata444race is a 175-kilometer run from Nijmegen to Enschede, divided into 25 stages: 16 stages for men and 9 stages for women. The 1993 report also compared the performance of 1993 to the performance of 1990 (of which only an announcement was found in the KOersief). Although the team of 1993 finished 178th instead of 182nd in 1990, the total time was longer in 1993.

1990



Bata444race

1992



Concrete Canoe  
Race Mechelen

The tradition of reporting the Bata444race continued until the 70th edition of the KOersief in 2006. The last reported Bata444race, in which a team of KOers members participated, focused on beating the 116th place of the year before and, of course, finishing above the team of SUPport. In order to achieve this performance, again a team of 22 KOers members (and three female non-KOers members) went to Nijmegen to defend their title, and not without success: Team KOers crossed the finish line at a wonderful 64th place. Moreover, the SUPport-team was beaten by six places.



1992 CONCRETE CANOE RACE

=====

Understanding the importance of the weight of the canoe, Team Eindhoven built impressively lightweight canoes since the beginning. Already in 1992, they managed to make a canoe with a weight of 25 kilograms for the competition in Mechelen. Unfortunately, this canoe was too long and was therefore disqualified. Two weeks later in Delft, the initial contacts were made with the American team from Boston to participate in the concrete canoe race at the other side of the Atlantic.

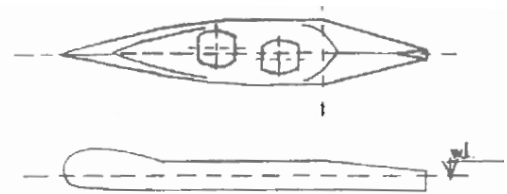
So in 1993, it was time to show the concrete canoe building skills of Eindhoven in Boston, USA. By the use of glass fiber mats, the canoes were much lighter than the American canoes. It caused a lot of sensation when the light canoe was carried by two women. Team Eindhoven did not win a prize because it was a combination of a presentation, innovation, and the rowing competition. The same year in Utrecht, Team Eindhoven showcased an even lighter closed model with a weight of 26 kilograms, which won the first prize for the lightest canoe. Many lightweight first prizes would follow: Utrecht 1993, Zwolle 1994, Eindhoven 1995, Zwolle, 1996, Twente 1999, Veerse Meer 2003, Zwolle 2005, Enschede 2007, Delft 2008, and Utrecht 2010. They continuously beat their own record and called their canoe the lightest canoe ever three times, weighing in at 15.5, 13.5, and 11.2 kilograms. Unfortunately, the latter did not reach the finish line; the limit seemed to be reached.

With their focus on lightweight canoes, Team Eindhoven was not that successful in the rowing competitions. They used the Canadian model for years, which they still do for these competitions. And if they did win a prize, it was mainly due to the rowing skills of the ladies.

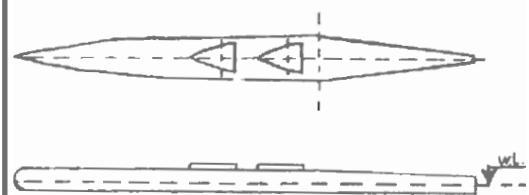
# koersief



1992 - Concrete Canoe Race (photo TU/e)



Canadian model



Kayak model



Study Trip  
London

Concrete Canoe  
Race Utrecht

# koersief



## 1993 HELLA MAESSEN CUP

=====

In addition to running, some KOers members played indoor soccer in Team KOers. This resulted in the idea for an indoor soccer competition between the CHEOPS-sections FAGO (Building Physics), SUPport, and KOers in 1993. The KOers-team won all of its three games and therefore received the Hella Maessen Cup, personally awarded by Hella Maessen herself. For the story behind the founding of the Hella Maessen Cup, we contacted Hella Maessen, who agreed to write a paragraph on this subject:

In the early 90s, the use of computers was becoming more common. Laptops were not yet available and not everyone had a computer at home. E-mail was just invented and no one had internet at home. At that time, I had already chosen for the specialization FAGO (Physical Aspects Built Environment), which now is Building Physics. Back then, the FAGO group was situated on the ninth (or tenth?) floor of the main building, where the whole faculty of the Built Environment was situated. For the students, a computer room was created with the ability to e-mail (very exciting at the time). One day, I sat there doing something. The organization of the soccer tournament sat a few computers further. They were thinking out loud about a name for the tournament. Then I actually called: "You can always use my name, right?". I was not present at the first edition, I do not even like soccer! I did however award the Hella Maessen Cup in the Sky-bar, which then was still at the rooftop of the main building (literally in the sky). I do not remember the second edition. In your report, I read that I had to follow the course Practical Illumination. That explains it.

Hella Maessen, 2016

The Hella Maessen Cup was again organized in 1994 and was meant to be a recurring event for each trimester. This time, the sections VIA (Urban Planning), SerVicE (Real Estate), and 'De Inhoud' (Architecture) participated in the competition as well. The finale of the second Hella Maessen Cup was again between KOers and SUPport, the initiators of the tournament. The game ended in 4-1 in the advantage of KOers, who again took the trophy home. After this, the Hella Maessen Cup was never found in the records again.





1993



Logo design  
competition

New  
logo



EDITOR - HERM HOFMEYER - 1993-1994

Number 34 of the KOersief was issued in November, 1993. It had been edited to a large extent by Annemiek van Dijk. She taught me how to cooperate with authors and how to put together the magazine in Word Perfect 5.1, the DOS version, to be sure. A puzzle was added by me and a cover showing all submitted KOers logos for a contest. I found the winning logo aggressive and incredibly awful, and assumingly connected it on the next issue's cover with an overly sweet flourish fill of fonts and squares. Respect or appreciation was not where a KOersief editor was looking for. Merely it was nice to document life at KOers, and fun to know the nuts and bolts of the editing involved. Contents up to issue 36, the last edition I edited, were not that different from the current issues: summaries of M.Sc.-theses, excursions, and interviews with new professors (some of which left mixed feelings). However, whereas nowadays the KOersief has an appreciable professional and external character, at that time, it was clearly a more informal magazine for an internal audience, with its own charm: bringing back precious memories of KOers as a group of good friends, truly caring about buildings and structural engineering, and looking forward to our future contributions. Will current and future issues still serve that role? I hope so, and with that in mind I would like to wish the future editors all possible success with our ever evolving KOersief. Finally, it was asked to me to provide a puzzle once again. But the next generation slowly takes over, rightly so, and it is fun to feel as an editor once again. Therefore, I asked Ph.D.-student Sjonnie Boonstra to provide a puzzle he recently solved with some smart branching algorithms. I am sure this problem will provide you some hours of fun, especially as you know it can be solved. Just like old times, I will personally treat one of the correct solutions a bottle of wine or a 'vlaai'.

Herm Hofmeyer, 2016



LOGO KOERSIEF

In 1993, a logo design competition was held. The winning design would be printed on the new KOers T-shirts, but also became the basis of the first KOers corporate identity. In the end there were five persons who entered the competitions and during a week, all student members could cast their votes on their favorite design. All logos were featured on the cover of edition 34 and the winning logo, by Annemiek van Dijk, became part of the new cover design as of edition 35.

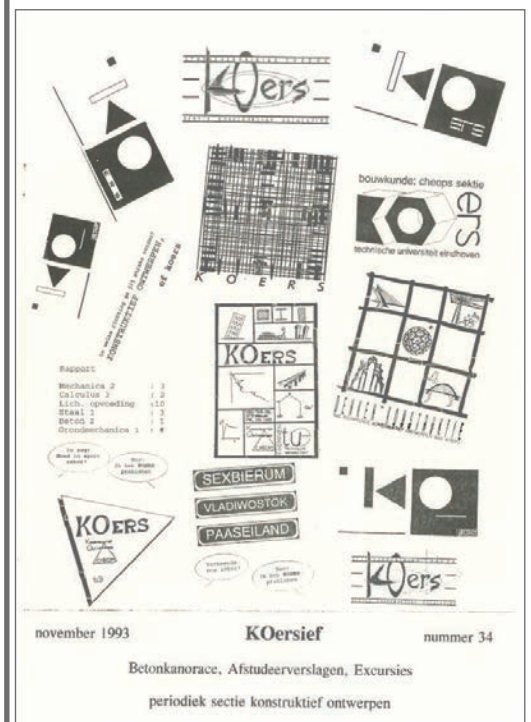
# koersief

"Deze KOersief bevat een paar kleine elementen van mijn hand. De kافت: een symbiose tussen de jullie bekende kافت en een nieuw te ontwerpen kافت met het KOers-logo van Annemiek. De puzzel, een probleem uit de wiskunde, die mijn interesse verraaft.

Ik denk dat het een uitdaging is de kwaliteit van Annemiëks werk voor de KOersief te evenaren. De grootste plannen zoals zij die noemt in haar redactionele voorwoord wil ik dan ook met voorzichtigheid invoeren.

Ik wens iedereen veel leesplezier."

Herm Hofmeyer, 1993



1993 - Cover KOersief 34  
with logos of design competition

New layout  
KOersief



1994



Third  
lustrum

Concrete Canoe  
Race Orono, Maine

Study Trip  
Switzerland

First advertisement  
in the KOersief

Hella Maessen  
Cup

1995

Concrete Canoe  
Race Eindhoven



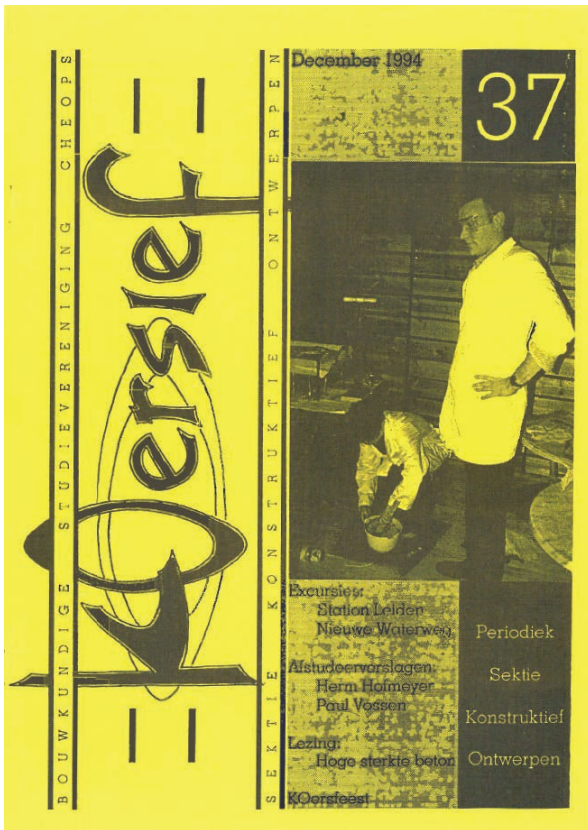
### 1994 Layout KOersief

As of the 37<sup>th</sup> edition, the text was divided into two columns, but in some cases in one column.

The typewriter font was replaced by the Arial font, depending on the edition. The article titles were in a bigger font and sometimes also bold. The writer of the article was mentioned in italic text, but also in bold text in some editions. Pictures were placed in the text and always aligned left. The layout of the other headings still changed per edition.

The layout had a footer with 'KOersief #, date' in white text and black marking at the inside of the page, next to the binding, and the page number on the outside of the page. The header and footer were changed, starting from edition 46. The header consisted of only one continuous line, the footer also had that line, but with the page number on the outer side of the binding and the text 'Sektie Konstruktief Ontwerpen' centered.

The 'ief' of KOersief was also adapted into the style of the new KOers logo instead of just adding it after the logo. Until



1984 - New layout of the KOersief

the 55<sup>th</sup> edition, January 2001, the cover was still in black and white, printed on colored paper. Afterwards, the cover became a front, mainly printed in blue gradients, with the 'London Eye' illustrated on it. The main articles of the edition were still displayed on the cover.



### 1994 Third lustrum

Over 80 people signed up for the lustrum party of KOers on March 11, 1994, in the Philips stadium. This special evening took place after the research day. KOers' gift to the department of the Built Environment was presented during the opening speech. It was a concrete plaque with the KOers logo on it. People in the crowd proposed to hang the plaque to the 'special' column in the Jan Siebelink corner.

"Everyone who does not know the 'special' column has to visit the Jan Siebelink corner and has to lean against every column in this corner. Then you will know why it is called the 'special' column".

An exhibition was held, covering subjects from the founding of the Concrete Canoe Races and Bata444races to the new technology of laser printers to cut timber for models. The party was a huge success. Therefore, special thanks goes out to the lustrum commission: Onno Dooms, Hilbert-Jan Kuijter, Geert Ravenhorst, and Marco Welhuis.

During this lustrum, an interesting idea was born: If someone wants to install a bronze plaque, with the fifty or one hundred years of existence, at the place where the idea of setting up KOers was born, this is the correct address.



Uit het Archief Siebelink

1978 - Place where the idea of setting up KOers was born

Concrete Canoe  
Race Zwolle

Bata444race

Fourth  
lustrum

1996

Study Trip  
London

1997



First KOers  
abroad

1998



Study Trip  
Spain



### 1997 KOers abroad

In the present day KOersief, the rubric 'KOers abroad' is included every once in a while. This rubric originates from the 44<sup>th</sup> edition of the KOersief (1997), in which Sabine Delrue writes about her experiences as an intern in a Brazilian concrete company. Of course, a brief description of the beautiful country Brazil itself was included as well. The latest occurrence of 'KOers abroad' was in edition 98, in which Dion Goris writes about studying in Australia and the process of deciding to go and applying for the opportunity.



### 1998 Fourth lustrum

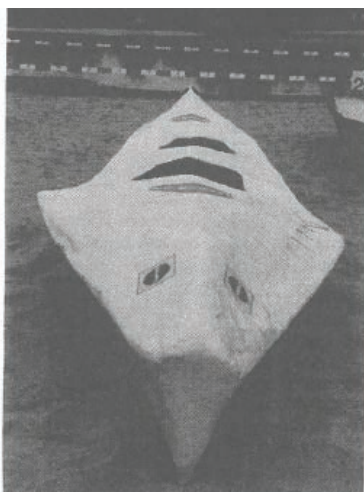
KOers celebrated its 20<sup>th</sup> anniversary in a special week from December 14 to 18, 1998. For this week, a special committee was introduced, led by Sander Zegers. On December 14, a symposium was held with the theme 'Design for changeability'. The symposium took place in the Auditorium and it comprised lectures, given by companies and professors. The big question of this symposium was: Why and how do we have to design for changeability?

On the second day of the lustrum week, an excursion to the 'Resident' and the 'Haagse Hogeschool' in The Hague and the 'Maastheater' and 'Millennium Tower' in Rotterdam was planned.

During the lustrum week, there was a 'Dol Dwaze Donderdag'. Students were equipped with wheelbarrows, helmets, burlap sacks, hot chocolate, whipped cream, and a 'kloot'. They were also divided in groups of five for this adventure. Many tough challenges had to be completed, such as the beer relay, piling up as many beer crates as possible, sack-race, and darts. As usual, a good day ended at the Skybar. The lustrum week was closed with a KOers-party at the 'Ambassadeur'. All members of KOers of the past twenty years were invited to this party.



1997 - Team picture



1996 - Yellow BEAMIX canoe



1997 - Canoe production with lightweight mixture



1999 - Lightweight canoe of 16.9 kilograms

2000

Study Trip  
Germany

Study Trip  
Bilbao & Barcelona



KOers  
drinks



### 2000 KOers drinks

In the early '00s, KOers organized drinks with special guests every month. The special guest had to come up with a special cocktail. A nice example are the cocktails made by professor Bert Snijder. He introduced the 'Strong Little Steels', available in S235, S355, S420 (on request), and S690 (after showing your healthcare card). Only Twan Hendriks took the perilous risk by drinking the S690. With this legendary gathering, Bert Snijder earned a first place at the KOers Bartender list. Other cocktailmasters were Gerald Lindner, Dick Hordijk, and Theo van Loo.

In 2016, the board decided they wanted something other than a physical activity, and organized a pub-quiz. The old and new members were challenged with questions about KOers, structural design, the built environment, and music, featuring a variety of structural terms.



### 2000 KOers Introduction Day (KiD)

The KOers Introduction Day is a yearly recurring activity where new (potential) members are invited to meet the association. It is tradition to have a small meal and some drinks and to do a spectacular activity. The activities range from an exciting soccer- and basketball tournament in 2000, to an exhilarating game of bowling in 2009.



2008 - Swinging chair design during the KiD

That the KiD did not always have to be a sports activity was proven in 2007, when the KOers Introduction Day posed a design challenge. The new and old members had to design and construct a picnic table that could seat the entire team. In 2008, another design challenge was organized for the KiD: the design of a swinging chair.



### 2001 Click the chick

This challenge was already organized before 2001, but this one is really worth mentioning. This edition of the 'Click the Chick' contest was held at the study trip of 2001 to Barcelona and Bilbao, organized by KOers. The mission was very clear: take a picture of the most beautiful Spanish woman you see. Extra points could be earned by originality, crazy poses, stories, and so on. There were a lot of submissions, but only one could be the winning photo: The Casanova of the 2001 trip: Twan Hendriks.



2006 - Bowling during the KiD



2001 - Click the chick - Barcelona and Bilbao





2001



Study Trip  
Italy



Click the chick  
competition



### 2001 Logo KOers

During the General Members Meeting, the 29<sup>th</sup> board proposed a new logo to showcase KOers' corporate identity. However, there was not an enthusiastic response: eight votes against and two votes for. As a compromise, a logo design competition was initiated with the old logo being one of the entries.

In the end, the design by Twan Hendriks was chosen to be the new KOers logo. Its design with the slash is similar to the logo of Eindhoven University of Technology, which had also recently changed its corporate identity.



2003 - Study Trip Scotland



### LUSTRUMWEEK 15-19 DEC



KOERS 25 JAAR  
EEN STERK RAAMWERK

2003 - Fifth lustrum

Study Trip  
Berlin

First color-  
printed KOersief

Study Trip  
Scotland

2003

2004

2002



Fifth  
lustrum

Concrete Canoe  
Race Veerse Meer

Study Trip  
Switzerland

2002 - FROM EDITION 60 ON, THE NEW LAYOUT HAD THREE COLUMNS INSTEAD OF TWO. THIS WAS DONE TO GIVE THE PAGES A MORE DYNAMIC AND INTERESTING LOOK. ESPECIALLY THE PLACINGS OF THE FIGURES MADE IT MORE INTERESTING AS THEY DIFFERED IN WIDTH OF ONE, TWO, OR THREE COLUMNS, DEPENDING ON THE FIGURES.



#### 2003 Fifth lustrum

The fifth lustrum of KOers was also celebrated with a week full of activities, starting with a symposium on the structural design possibilities of glass on December 15, 2003. On Tuesday, an excursion to a floatglass factory and the 'Bos en Lommergebouw' was organized.

A workshop was held at Wednesday. The participants had to build the strongest cantilever possible with an alternative structural material. After this challenge, the KOers gala took place at a nice location around Eindhoven. Prior to this gala, the KOers diner took place. This diner and gala were described as a wonderful and nice evening.

Thursday will be remembered as the day of 'The Ultimate KOerscruise'. Everyone, who thought to know Eindhoven and KOers very well, was extremely deceived after this cruise.

During the lustrum reception, everyone was invited to congratulate KOers on its 25<sup>th</sup> anniversary. Paul Smit broke the ice with his famous cabaret show 'Soldier Smit'. As usual, the KOers lustrum week ended with a huge KOers party, which again was a success.



#### 2004 First themed KOersief

The 65<sup>th</sup> edition of the KOersief was the first modern edition to be built around a theme: 'Large Spans'. From this time on, each KOersief was dedicated to a theme, including several articles about this theme and a number of reoccurring rubrics.



#### 2004 Konijnenborrel

It was Thursday, September 16, 2004. The first KOers gathering of the academic year 2004/2005. Like the title says, this drink requires a rabbit. The lucky rabbit for this drink was Lars Koops. During this drink, the following idea came up: the person who has his birthday a day before, a day after, or on the day itself has to drink his beer in one sip, standing on the bar. From this KOers gathering on, every gathering should have a special drink or cocktail. The following gathering would be in '(ab) sint' theme.



#### 2004 Editor

By: Gertjan Coenen –  
2004-2005

In the board of 2004-2005, I was member of the board as editor of the KOersief. In the year that I had the

honor to be the editor-in-chief, we started building the KOersief around a theme. It was a nice job to work on the themes and to search for external writers of the articles. Furthermore, we were able to publish a special edition that year, because of the first Beer Crate Bridge in Eindhoven. Of course, we wrote about the newly set record. With maintaining and servicing the website in addition, it was a hectic period sometimes, but I sure learned a lot from it. Like setting deadlines and writing large articles.



#### 2005 Beer Crate Bridge

##### *The initiation*

The first Beer Crate Bridge was built in 2004 by Civil Engineering students in Delft. These students, who were participating in the study association 'Practische Studie', came up with the initial idea to make a bridge out of plastic beer crates. The structural principle of their bridge was based on a three-hinged arch, by which they were able to set the first beer crate bridge world record with a span of 7.4 meters. Structural Design students from the TU/e were triggered by this record to make a Beer Crate Bridge themselves. KOers hereupon formed a new Beer Crate Bridge building committee. Study association SUPport was asked to participate in order to cope with the large amount of work. It proved to be a smart decision for all Eindhoven's Beer Crate Bridges. Big effort from the KOers and SUPport committee led to a new Beer Crate Bridge record, which was set in Eindhoven in 2005. It was the start of a healthy battle between the two universities,



Konijnenborrel

Beer Crate Bridge  
Delft 7.4m

2005

Concrete Canoe  
Race Zwolle



2005 - Daily construction progress of Eindhoven's first Beer Crate Bridge

in which even civil engineering students of the university of Twente participated twice.

#### The design

The design of Eindhoven's first Beer Crate Bridge started with a design competition, in which two teams participated. These teams came up with two different designs, which were criticized by a jury, consisting of Structural Design professors, lecturers, and the chairman of KOers, which had the task to choose the winning design. Both designs were declined by the jury, due to the absence of practicability and structural efficiency. The strongest design concepts of both designs were afterwards combined to make a new design, in which both teams participated. They represented the structural design team of a new committee initiated by KOers. Study associations KOers and SUPport completed the committee with an architectural, construction, and

construction technology team. The practical knowledge of the SUPport members was very welcome.

To get a better understanding of the structural behavior of the plastic beer crates, practical experiments were carried out in the 'Pieter van Musschenbroeck' laboratory. Here, the shear and compressive strength of individual and stacked beer crates was determined. A simplified finite element Ansys model was made to get a better understanding of the global force distribution. The final design of the Beer Crate Bridge was optimized using these tools. For instance, the beer crates were placed horizontally and upside down to take full advantage of the shear strength between the crates.

The final design consisted of 12,000 empty beer crates. To be able to make the span, the shape of an inverted catenary arch characterized the design.

#### Construction and record

The building process of Eindhoven's first Beer Crate Bridge went well, due to good preparations and the help of 100 builders. The record attempt started by removing some supporting scaffolding. After one hour, the new record span was 9 meters. The Beer Crate Bridge committee was not satisfied with this distance and increased the span by removing more supporting scaffolding until a final record of 12.80 meters was reached. Some building heroes tried to remove even more supporting scaffolding, but quickly, large cracks occurred, leading to a mandatory demolition of the bridge. A larger span was not possible.

With mentions in both local and national media, including Cobouw and 3FM, Eindhoven's first beer crate record may be called very successful. It was up to Delft to defeat the new record, which took a while, but they succeeded in 2011.

## Study Trip Frankfurt & Rome

## Concrete Canoe Race Leeuwarden

### Beer Crate Bridge Twente 7.6m



### First ENCI Excursion to cement factory Maastricht

# 2006



### Multiple Day Excursion Berlin



#### 2005 First ENCI excursion Maastricht

Excursions have been a key part of the activities organized by KOers over the years. Many of the KOers members have participated in excursions to, for example, the Steel Day and Concrete Day. The first ENCI excursion, however, was headed to the concrete factory of ENCI in Maastricht in 2005. After this first visit to the concrete factory, this has been a yearly recurring excursion for KOers members.



#### 2006 - 2016 Crossing Continents (III)

In 2006, the structure of the study trips was changed: instead of one trip in Europe, two trips were organized each year: one study trip to a country outside of Europe and one smaller Multiple Day Excursion to one or more cities in Europe.

The first trip to leave Europe went to Canada, where the group visited Montreal, Ottawa, and Toronto. One year later, KOers visited Malaysia and Singapore, to this date the furthest destination (over 10,000 kilometers from Eindhoven) of any KOers study trip. This trip was also the last International Study Trip that visited more than one country.

In 2008, KOers returned to Northern America to see Boston and New York. Two years later, the West coast of the United States of America was visited, where San Francisco, Las Vegas, and Los Angeles were seen. In 2014, KOers returned to the USA once more to see the East coast, where Washington DC, Philadelphia, and New York City were visited. In 2009 and in 2015, the United Arab Emirates (UAE) were visited. The structural engineers heaven, Dubai, was visited. Abu Dhabi (the UAE Capital) and Al Ain (a desert oasis) were also visited during these study trips.

After the trip of 2007, Asia remained unvisited until 2011, when a group of KOers members visited Shanghai and Hong Kong. Two years later, in 2013, the Korean peninsula was visited when KOers went to Seoul and Busan in South Korea.

The first, and still only, study trip to South America was organized in 2012. Brazil, as a future host of the FIFA World Cup and the Olympic Games, was chosen for the study trip, where sixteen KOers members visited São Paulo and Rio de Janeiro.

The most recent studytrip, which took place in May 2016, went back to explore the Asian structures in Singapore. A travel report can be found in this KOersief.

Besides the study trips, the Multiple Day Excursion (MDE) is a yearly recurring trip to a destination within Europe. The first official MDE went to visit Berlin. One year later, in 2007, KOers went back to visit London, a location that was again chosen in 2008 and 2012. In 2006 and 2007, another smaller excursion was organized to visit a foreign company. In 2006, KOers visited Oevermann in Münster (Germany) and one year later, a group of students visited Arcelor Mittal in Luxembourg.

In 2009, two MDEs were organized. One went to visit Valencia and the other went to Stuttgart. In 2010, Oslo was visited and one year later, KOers members visited the capital of Poland: Warsaw.

In 2013, KOers decided to visit two cities during the MDE, which has been continued up to this date. The



2005 - First ENCI excursion to the concrete factory in Maastricht



2007

International Study Trip Canada

Completion 'KOE'

2013 MDE went to Hamburg and Copenhagen. In 2014, Switzerland was chosen as destination and Basel and Zürich were visited. In 2015, Frankfurt and Cologne were visited and in 2016, Germany was again chosen as KOers visited Munich and Stuttgart.



Canada, here we come!

By: Maarten Braem

2006 was the year that KOers organized its first non-European study trip, something that has been more rule than exception in recent years.

The 34<sup>th</sup> board of KOers (Bas Bijnbeld, Jop Courage, Wil van de Wouw and myself) wrote in our policy plan for our board that we wanted to organize a study trip that went further than Europe. With Frederik Roebroek, Lex Pelkman, and Jan Pieter Kansen, we found an enthusiastic committee to organize this special trip.



2006 - Bata444race

The committee explored two options: South Korea and Canada. The main obstacle for the committee was making a balanced budget, which soon meant that South Korea was eliminated as destination. Another point of discussion was the money the students had to pay for the trip, as this was kept

relatively low in recent years (< € 400). The sponsors and a favorable exchange rate made it possible to visit Canada.

April 1, 2006, we were ready. The 14-day trip to Canada was about to start. In Montreal, we looked into high-rise construction, the Biosphere and Habitat 67 of 'Expo 67', and the Olympic Stadium of the 1976 Olympics. In the capitol of Canada, Ottawa, we visited the Canadian War Museum, the National Gallery, and Parc Oméga. In Toronto, we visited the University, the famous CN-tower, and a construction site for the expansion of the Royal Ontario Museum, and we could not leave Canada before we had seen the Niagara Falls.

It took a lot of preparation to organize the first non-European study trip, but it definitely payed off!



2006 - International Study Trip to Canada



2008

International Study Trip  
Malaysia & Singapore

Multiple Day  
Excursion Valencia

### 2007 Columns Hans



The frequent readers of the KOersief know that the KOersief always ends with a column written by Hans Lamers, director of the structural laboratory. The trend of including columns in the KOersief started in edition 56, with a column by Martini about the news and the safety in buildings. It was not before edition 71 in 2007 that Hans Lamers wrote his first column. In his first columns, he exposed several problems and contradictions you would sometimes not expect at a university of technology. Over the past years, Hans has provided the KOersief with a column for each edition. The later columns were often related to the theme of the KOersief and represented Hans' opinion about certain subjects.

### 2008 Concrete Canoe Race



After the canoe of 11.2 kilograms, it was time for a new challenge: the innovation prize. So in Delft 2008, the first innovative canoe was built; a segmented canoe made of lightweight concrete. This seemed to be too much change at a time. They did not win the innovation prize, but of course, they won the lightweight prize. The next year in Roermond, the main goal again was the innovation prize. The innovative canoe consisted of two trays, with one person in each tray, connected with a container beneath water level. This canoe was built of the same lightweight concrete as the year before with a self-weight of 11 kN/m<sup>3</sup>, instead of the usual 24 kN/m<sup>3</sup>. Unfortunately, the canoe did not even make it to the start, but it did win the beauty prize for the originality.

## LAB-PRAKTIJKEN

Of ik een stukkie wil schrijven voor KOERSief? Natuurlijk! De communicatie tussen vloer 0, vloer 5 en vloer 9 kan altijd beter. Dat is feitelijk een understatement. Weet eenieder al dat we sinds kort een 'high-speed'-camera bezitten? Afhankelijk van de ingestelde resolutie is 5000 beelden per seconde haalbaar (512x512p). Deze is al enkele keren nuttig ingezet; constructief glas (Huveners), druksterkte van kalksteen muren (firma Xella), valproef op een pneumatisch kussen-dak (Koster). De laatste genoemde is afstudeerwerk voor bouwtechniek. Het laatste jaar is een trend waarneembaar dat steeds meer studenten van de Unit ADE lab-werk willen verrichten in het Pieter van Musschenbroek laboratorium. Behalve de financiële verrekening tussen units, vraagt dit ook om een inname van een standpunt. Is het 'eigen volk eerst' of 'alle studenten zijn gelijkwaardig'. Momenteel kiezen we voor optie twee. Gelet op de schaarste met betrekking tot menskracht en materiaal is het niet duidelijk hoe lang wij dit kunnen volhouden. Met minder 'goochelaars' moeten wij steeds meer ballen in de lucht houden. Dat betekent dat dit jaar meer aan de planning moet worden gewerkt. Het is een uitdaging om de flexibiliteit te behouden. Een vraag als: ... oh ja, kan bij de laatste



twee proeven uit de serie even de ESPI lasermeting worden toegevoegd... wordt in de toekomst lastiger. Voor de studenten die onlangs in het lab een project hebben gedaan, hebben gemerkt dat ze van schoeisel moeten wisselen. De stickers op de deur naar het lab geven het al aan: veiligheidsschoenen verplicht! Inmiddels staan er retro-design schoenen, oftewel een restpartij verstofte schoenen met stalen neuzen in de kast variërend van maar 37 tot en met 46. Het verzoek aan jullie studenten is om regelmatig schone sokken aan te trekken om de voethygiëne te waarborgen. Hoewel goede voornemens vaak verzanden, wordt er dit jaar naar gestreefd om in het lab een flinke sprong te maken met het TU/e-breed project betreffende de 'machineveiligheid'. Op de faculteit Werktuigbouwkunde heeft een pilot-project gedraaid, waaruit lering kan worden getrokken. Het wordt gelukkig geen grote papieren tijger, maar een meer praktisch instrument. Dat er toch enig papierwerk mee is gemoeid lijkt onontkoombaar. Verder blijft het lab, onderwijl een muzikaal gezang van Theo, nog steeds de onmiskenbare sleutel tussen de harde confronterende praktijk en de abstracte theorie.

Hans Lamers, 2007

Concrete Canoe  
Race Roermond

International Study Trip  
Dubai & Abu Dhabi

2010

2009

International Study Trip  
Boston & New York

Multiple Day  
Excursion Stuttgart

Beer Crate Bridge  
Twente failed

The foldable canoe, built for the race in Eindhoven in 2011, was the first one to win the innovation prize. Although this was a home game, this was the only prize that the KOers team won. The next innovation prize was awarded to the catamaran with floaters, made using a vacuum mold, built for the race in Utrecht, 2013. After that, there was the foldable, origami inspired, canoe in 2014 and the vacuum infusion canoe in 2015, which both won the innovation prize. It looks like Eindhoven has a taste of this victory. Unfortunately, the challenge to make a 3D printed concrete canoe in 2016 was too large and the competition was entered without an innovative canoe.



2008- Segmented canoe made of lightweight concrete

### 2008 Sixth lustrum



The theme of the sixth lustrum was 'KOers pushes its boundaries'. The lustrum week, held in November 2008, started with an enormous blue cake (50 x 70 centimeters) with the lustrum logo on top of it. Then, there was a presentation about the history of KOers at the Alumni-day. Former members met each other again in combination with a nice drink and food. The following day, a symposium about complexity was held.



2008 - Sixth lustrum

Legendary was the game show introduced by KOers. Various teams, categorized by construction material, tried to win the most important show of the year, but in the end, team André Jorissen of timber structures won. The lustrum week ended with an enormous party. The party location was unknown for the guests. The attendants were transported to the exact location by bus. The location was a party room in the caves of 'Kanne' in Belgium. The gentlemen had to walk the last few hundred meters. The ladies were driven to the party by a small train. Again, it was a successful party. Only the way back home was a bit more difficult.



2008 - Gala during the sixth lustrum



2008 - Cake made for the sixth lustrum

Rotterdam  
Run

Multiple Day  
Excursion Oslo

Beer Crate Bridge  
Delft 15.6m

Concrete Canoe  
Race Utrecht

International Study Trip  
Westcoast USA

2011



2010 - Concrete Canoe Race Utrecht



2011 - Bata444race

### 2011 Logo KOers



The old logo was in need of a refreshment; therefore, the 40<sup>th</sup> board of KOers launched a design challenge to design a new logo for study association KOers. In a special general members meeting, there could be voted on five new designs and the old one, where a raised hand was a positive vote. After some redesigns logo 5 was voted to be the winner.

For many students, the load-displacement diagram from Stability of Structures (and Mechanics 7b) led to questionable faces; What was that again? First order or maybe second order? Elastic or plastic material behaviour? But not for KOers member Marinus Nomden: for him, this turned out to be the inspiration for the new KOers logo.



Figure 1: Logo 1, the link between students and the education



STUDIEVERENIGING CONSTRUCTIEF ONTWERPEN

Figure 2: Logo 2, no background thoughts



Figure 3: Logo 3, the Mohr-Coulomb criterion



Figure 4: Logo 4, no background thoughts



Figure 5: Logo 5, elastic and plastic material behaviour

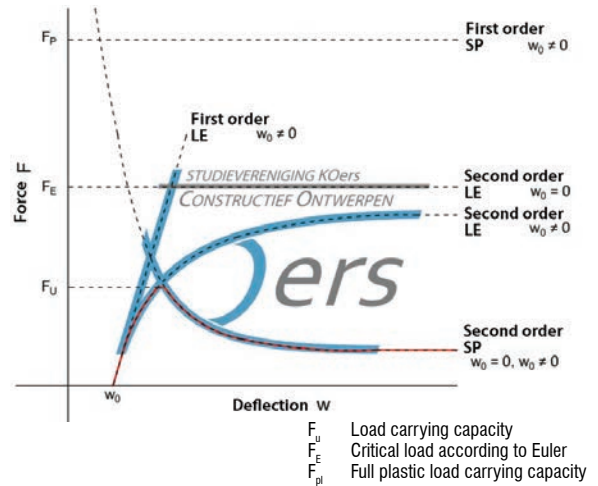




By: Marinus Nomden

The current KOers logo is inspired by the force-displacement-diagram that illustrates the Merchant-Rankine formula:  $1/F_u = 1/F_E + 1/F_{pl}$ . The letter K of the logo is shaped by the rising curve of the first order elastic behavior, the rising curve of the second order elastic behavior, and the decreasing curve of the second order plastic behavior.

The diagram, with corresponding formula of Merchant-Rankine, was described during a lecture of the course Stability of Structures. While I was making notes and sketched the diagram, I saw the letter K with a lot of fantasy. The only thing left was filling in the missing letters of KOers and the new logo was born. Afterwards, my logo had to compete with four other submissions, in which it was also attempted to form the word KOers out of symbols and graphs from literature. It was a big relief to me that I eventually won. With Theo Tempels in mind (inventor and patent holder of the rusk notch/'beschuit inkeping' red.) I had already counted myself rich. I thought I could live years of the merchandise of the study association, because I suspected commission from all of the sold KOers mugs, hats, lunch boxes, and duvet covers. But that did not happen. I received an invitation for the first upcoming KOers activity and an honorable mention in the KOersief. Also nice. As well as it is genuinely nice to often run into your own creation and to be able to look back on the origins of the current KOers-logo.



2011 - New logo KOers with its meaning



2010 - Bata444race



2011 - KOers Introduction Day



2011 - Group picture International Study Trip China

2012



Concrete Canoe  
Race Zwolle

ENCI started sponsoring the  
Multiple Day Excursion



World Record of 19.55 meters!

## Beer Crate Bridge 2012

By: Douwe Stellingwerff & Tom Relker  
2012 Beer Crate Committee

**It is a rainy day in October, 2011, when news hits the faculty that the students of TU Delft have made a successful attempt to break the world record Beer Crate Bridges. The record belonged to the study associations KOers and SUPport since 2005 and both felt that it would be better that the record came back to Eindhoven. Without any hesitation, the heads were put together and the counteraction started. The world record Beer Crate Bridge building had to come back to Eindhoven!**

By: Douwe Stellingwerff

The main goal was to defeat the Delft record substantially. Until this moment, the construction method was to simply stack the beer crates horizontally. However, this method required a large number of crates and in a time of innovation and evolution, we desired a new construction method. Soon, after several experiments, we found out that beer crates could be stacked vertically as well. The only requirement for this method is that a horizontal load presses the beer crates together in order to activate the shear force capacity. The idea of a compression arch had arisen.

The possibilities of this new method were investigated further and it soon became clear how effective it was. This led to the idea to beat the record in a spectacular way with three bridges (16.1, 20.4, and 24.7 meters). Delft would have a very challenging task to defeat the newly set record.

With a lot of enthusiasm and commitment, the whole committee continued and in September 2012, on a beautiful Monday morning, the construction of the new 'world-record-breaking' Beer Crate Bridge started. With the help of many volunteers, the first bridge was finished in a little more than one day. However, the difference between theory and practice, fully controlled environment and the harsh outside world, became very clear. The first bridge became a learning project, which showed the teething problems of the new construction method. Fortunately, construction of the second bridge started and the acquired knowledge could be put into practice directly. However, the construction was still subjected to many delays and working hours extended far beyond midnight.

On Thursday, we reached our moment of truth! Although a third bridge turned out to be a 'bridge to far', the second bridge was completed and ready for a successful record

attempt. Under the eye of many bystanders and a delegation of Delft's bridge builders, the new official world record span became 19.55 meters!



Figure 1: Beer Crate Bridge, 2012

Since 2012, a healthy competition between both universities has started and the Beer Crate Bridge has become a yearly event. As the 2012 committee, it makes us proud that the record is back in Eindhoven after a year of absence. It is fantastic to see how the construction process develops and boundaries are pushed to the limit. Delft is challenged once again, but for now, the best bridge builders are from Eindhoven!



### Joetjoep

In the column Joetjoep, which first appeared in edition 83 (March 2011), a member of the Pieter van Musschenbroek Laboratory points the reader to a peculiar internet video. The columns showcase, amongst others, the Azerbaijani singer Aziza Mustafa Zadeh, African street musicians Staff Benda Bilili, and British singer David Sylvian. ◀



First Joetjoep

## International Study Trip Brazil

By: Tom Relker

Back in 2012, we (student associations SUPport and KOers) managed to break the world record Beer Crate Bridge with a completely new and innovative design.

In October 2011, TU Delft broke the world record with a free span of 15 meters. From that moment, SUPport and KOers started a committee to bring the record back to Eindhoven. After almost one year of preparations, we managed to break the world record with a span of 19.55 meters.

Instead of the 'traditional' way of stacking beer crates, we came up with a completely new and innovative design. We rotated the crates by 90 degrees and created an arch, which was under total compression. To obtain this compression, we used heavy towers, consisting of crates with filled bottles, on both sides of the bridge (see Figure 1).

To make this project more exciting and to find the boundaries of this design, we chose to build three bridges in extension of each other. The first bridge, with a planned span of 16.1 meters, was designed to be certain to break the previous record from TU Delft. The second bridge, with an expected span of 20.4 meters, was designed to prove that the new design was able to span way more than the 'traditional' design. The third bridge was designed to find the ultimate span of this design and to set a record that would not be easy to beat.

During the construction of the bridges, we had to deal with several problems. During the construction of the first bridge, we noticed a failure mechanism; the line of thrust of the arch was higher than expected, which eventually made the bridge collapse. During the construction of the second bridge, we had to deal with this problem. The solution was to fill up the space between the towers and the arch with additional beer crates (see Figure 2). This way, the line of thrust of the arch



Figure 3: Beer Crate Bridge, 2012

was able to arrive higher at the tower and the bridge would not collapse due to this failure mechanism. Unfortunately, we had some planning problems, which meant that we were not able to build the third and largest bridge.

Eventually, we achieved a free span of 19.55 meters. To prove the strength and stiffness of this design, two persons were able to stand on top of the arch (see Figure 3). A funny story about the battle between Delft and Eindhoven is the fact that the committee of the world record of Delft in 2011 had a lot of negative remarks in the media about our new design. But after we proved that this design worked, they copied the exact design to start a new attempt in 2014. However, they forgot one essential thing; during the construction of our second bridge, we made some last-minute changes (see Figure 2), which they did not include in their design. Eventually, this led to a collapsed bridge and a failed record attempt.

Eventually, TU Delft did a second attempt one year later and managed to beat our record with a span of 22.15 meters. Luckily, the battle continued and last April, TU Eindhoven returned the record to Eindhoven with a span of 26.69 meters. I am looking forward to the new (or copied) plans of TU Delft. ◀

## BRIDGE 2

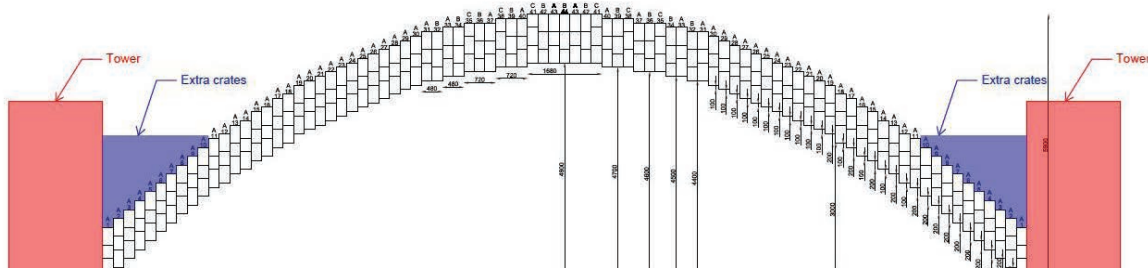


Figure 2: Front view of the Beer Crate Bridge, 2012

2013

ENCI Multiple Day Excursion Hamburg & Copenhagen



Seventh lustrum



www.KOersTUe.nl

# KOers webpages through the years

## 2012 New website

The KOersief was the first method for KOers to make announcements. When computers and internet became more common, KOers got its own website and a digital newsletter.

The old websites are no longer 'in the air' but they essentially were the same as the current website: a way for members to read about important KOers news, subscribe for events and activities, a place to view photos of past activities, and another method for advertisers to place vacancies. The old websites were built using nothing more than html, css, and php code (for the digital illiterates: html is the language to build the website, css makes it look pretty and with php, you can make scripts to allow interaction with users). The current website, which was released in December 2012, uses Wordpress, a CMS-interface (Content Manager System), which makes it much easier to add content to the website without knowledge of the previously mentioned languages.

The modern newsletter is called the K-m@il, short for KOers Mail, and is sent every two weeks. The first K-m@il dates from August 8, 2003. Before that, there was also a digital newsletter sent once a month, called the KOerier. The oldest KOerier in the archive is from April 2000, but, as this newsletter is numbered as KOerier #11, we are quite certain the KOerier dates back to the previous century. ◀

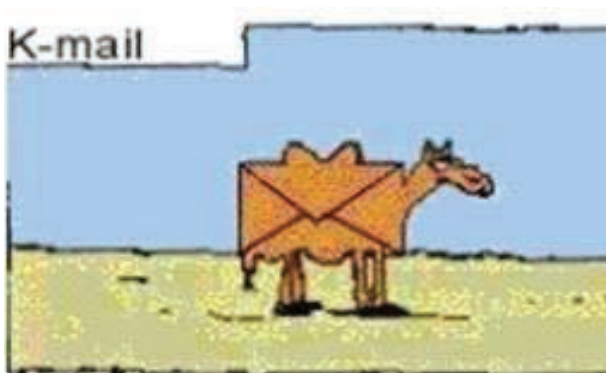


Figure 1: Logo of the KOers K-mail



Figure 2: First KOers website released in 1999



Figure 3: Second KOers website released in 2001



Figure 4: Third KOers website released in 2005

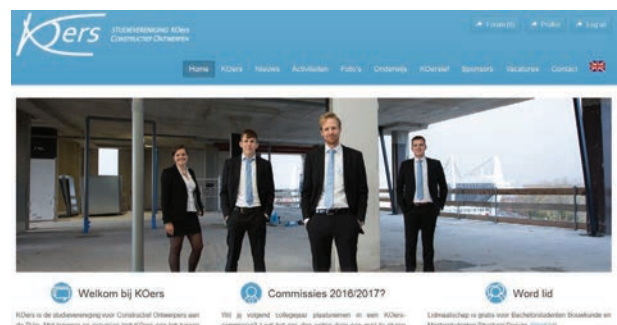


Figure 5: Current KOers website released in December 2012

Beer Crate Bridge  
Delft failed

ENCI Multiple Day Excursion  
Basel & Zurich

2014

Concrete Canoe  
Race Almelo

International Study Trip  
Eastcoast USA

35<sup>th</sup> Anniversary of KOers

Seventh lustrum



**2013 Seventh lustrum**

The lustrum week started with an alumni-day on December 8, 2013. A huge cake, specially delivered from Rotterdam, was ordered for about 60 (former) members of KOers that were invited to this special day. The two honorary members of KOers were also present, namely Jan Siebelink and Muriel Alblas.

In the evening of the first day, KOers organized a lustrum quiz. Eight student teams battled against each other and a team of research contributors battled against a team, consisting of Theo Salet, Bert Snijder, and Faas Moonen. A team of 'almost' graduates won the student competition. The battle between research contributors and professors was narrowly won by the professors.

The following day, a symposium was held about the theme: 'Evolution or Revolution'. After this day, KOers organized a concrete workshop on the December 13, about smart design of aerated concrete. During this workshop, students had to build the largest bridge or cantilever possible.

On the last day, another legendary KOers gala was organized. The secret location this time was Castle Heeswijk. After a three-course diner, the party was started. This party would be remembered as fantastic and one-of-a-kind. ◀



Figure 2: Gala during the seventh lustrum, 2013



Figure 3: Honorary members of KOers, 2013



Figure 1: Concrete workshop (left) and lustrum quiz (right), 2013



**2012 First KOers at the workplace**

Over the years, the KOersief evolved from a magazine for the section 'Structural Design' and its students into a renowned magazine, in which students are given information about interesting building projects and future plans. In this light, the 87<sup>th</sup> KOersief (2012) included an interview with Nina Tabink, at that time working for ARUP, Londen. This interview focused on the transition from student to the working environment and the importance of contacts in the building industry. This rubric has afterwards reoccurred in several editions and is a good way to acquaintance the students with the working environment and to give them an idea of the career path after studying at the TU/e. ◀



2015

Concrete Canoe  
Race Rotterdam

International Study Trip  
Dubai & Abu Dhabi



Floating Structures

## KOers Design Challenge

### 2015 KOers Design Challenge

After the bridge designing competition of 1982, a new design challenge was organized in 2015: the KOers Design Challenge (KDC). The 2015 and first edition of the KDC was all about floating structures. The design challenge consisted of a bridge between two water basins with a free span of 5 meters. In this challenge again, a limited amount of material was available to each group of students: several wooden slats, screw eyes, rope, and four pontoons. A design had to be made with the focus on stiffness and efficient material use. The stiffness was determined at the moment of failure, thus by dividing the highest load by the corresponding deflection. In order to provide the students with sufficient inspiration and experience, several engineers from practice were invited to help the students. In the end, Group 8 (which used the name "Niet Groep 4") won the design challenge with a respectable distance to the runner up. A staggering stiffness of 16.5 kg/cm was reached, more than double the stiffness of the runner-up. ◀



Figure 1: The winning group with the highest stiffness, 2015

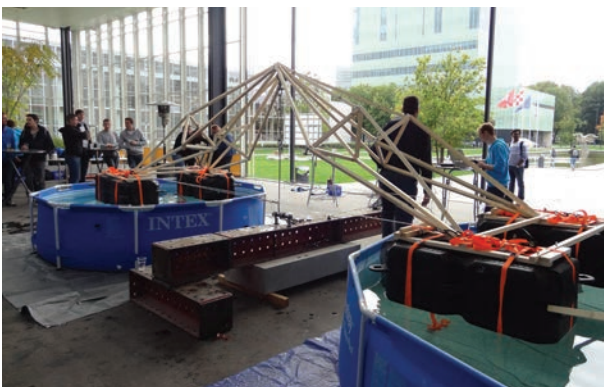


Figure 2: The most beautiful design of the day, 2015

### 2016 Beer Crate Bridge world record

Building a beer crate bridge is a big challenge. Building a beer crate bridge over water is a bigger challenge. Building a bridge over a flowing river is a huge challenge. Nevertheless, students of study association KOers and SUPport succeeded to break the world record Beer Crate Bridge, building over the Dommel river with a distance of 26.69 meters. That is over 4.5 meters longer than the 2015 Beer Crate Bridge record by Delft's study association 'Practische Studie'. The fact that the record was set during TU/e's 60<sup>th</sup> anniversary Dream and Dare festival provided lots of extra publicity.



Figure 1: Drone overview of the Beer Crate Bridge, 2016

The new world record was made possible by the effort of seventeen committee members and even more builders. The Beer Crate Committee put a lot of effort in investigating the construction, structural design, the structural properties of the crates, and much more. By means of studying Beer Crate Bridges, built in the past, the committee was able to detect possible errors at an early stage.



### 2015 KOersief in English

Due to the modifications of the Bachelor and Master tracks of the faculty Built Environment at the end of academic year 2014/2015, both the Bachelor 'Built Environment' and the 'Graduate School' became English educations. Edition 97 of the KOersief (2015) was therefore the first KOersief that was mainly in English. The editions to follow will all be in English, and will therefore be readable for the international students as well. ◀



2016

KOers Design  
Challenge

International Study Trip  
Singapore

The record is back in Eindhoven!

## Beer Crate Bridge record of 2016

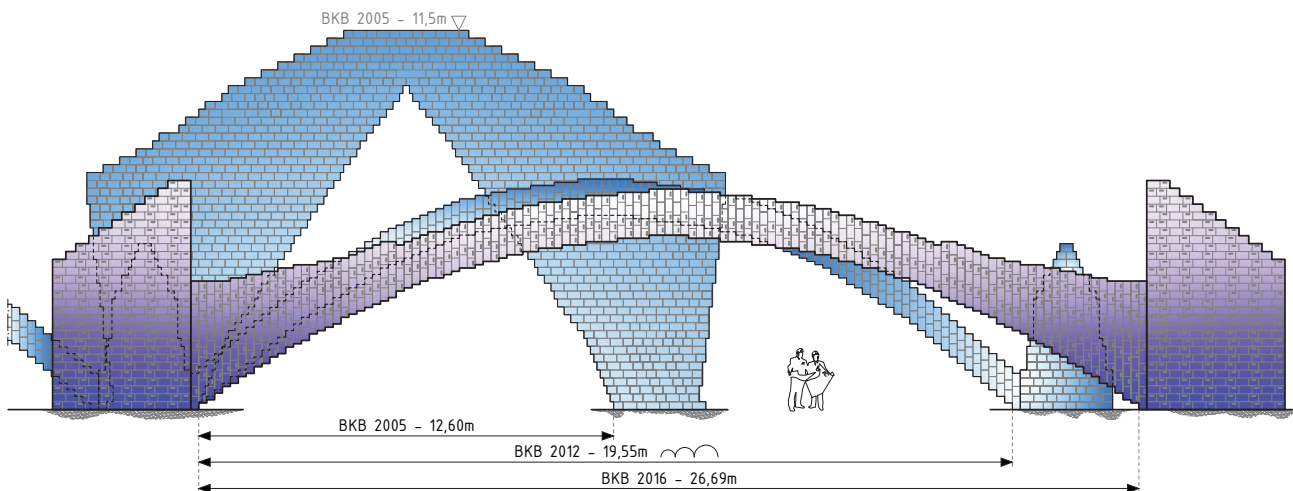


Figure 2: Span development of the Beer Crate Bridges constructed by KOers and SUPport, 2005 - 2016

Mistakes that were made in the past were overcome. Even all dirty work, like filling the sometimes moldy empty beer bottles with water, was done without complaining.

Eindhoven's Structural Design students again proved to the outside world that they understand the intricacies of structural design, thanks to the committee and builders. The design of the bridge was both beautiful and efficient. The principle of the inverted catenary arch has proven its strength for Eindhoven three times.

A new, hard to beat, record is the result. The stakes are high! More in-depth information about the 2016 Beer Crate Bridge Record can be found in KOersief 99 and on [www.bierkrattenbrug.nl](http://www.bierkrattenbrug.nl). ◀



Figure 4: Unfinished Beer Crate Bridge by night, 2016



Figure 3: Supporting structure of the Beer Crate Bridge, 2016

### The Beer Crate Bridge history:

- 2004 Delft – 7.4 meters
- 2005 Twente – 7.6 meters
- 2005 Eindhoven – 12.6 meters
- 2010 Twente – Failed
- 2011 Delft – 15.6 meters
- 2012 Eindhoven – 19.55 meters
- 2014 Delft – Failed
- 2015 Delft – 22.15 meters
- 2016 Eindhoven – 26.69 meters

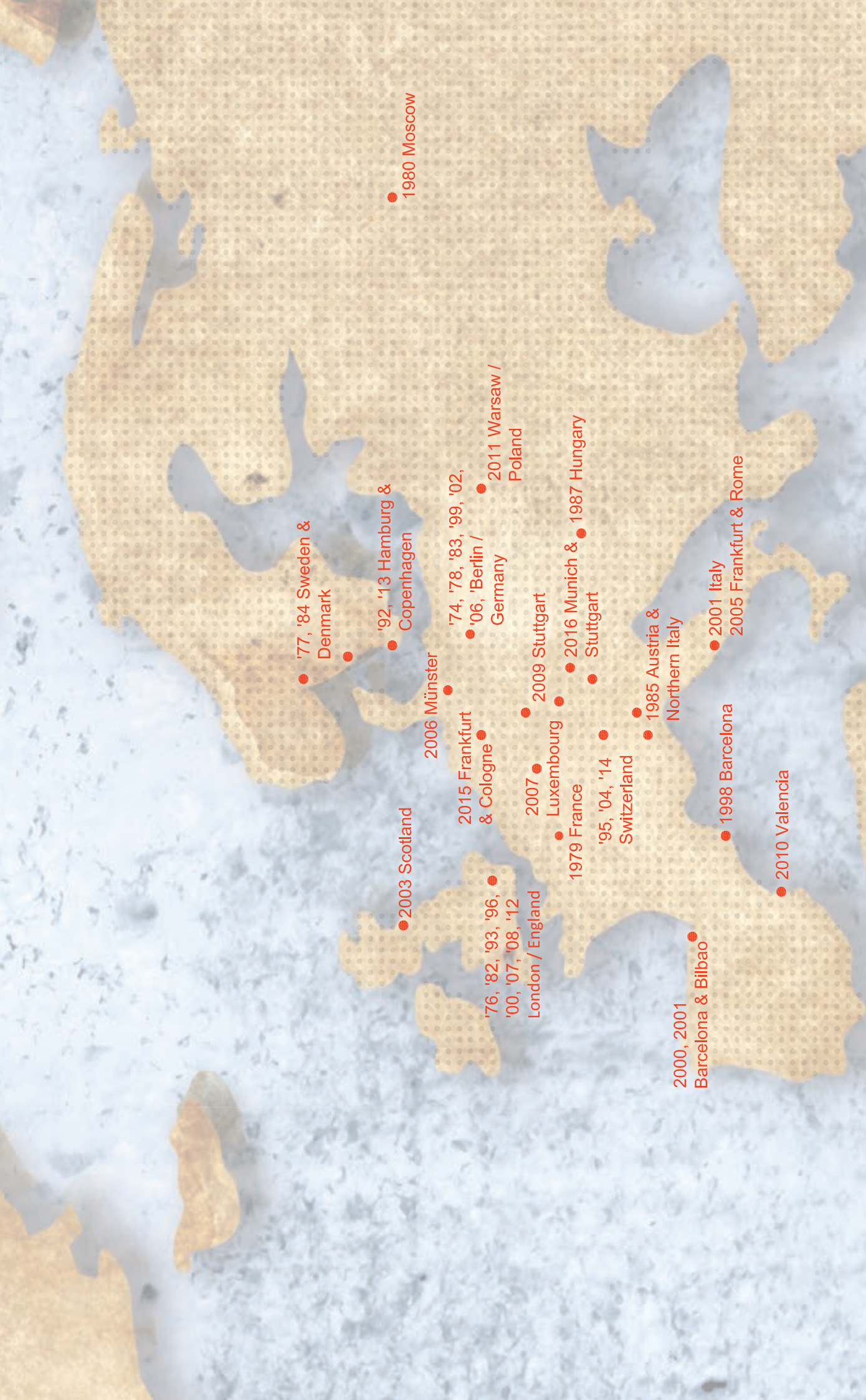


Structural explored countries by KOers worldwide

# Locations International Study Trips







Structural explored countries by KOers in Europe

# Locations European Study Trips

# KOers Photo Contest over the years



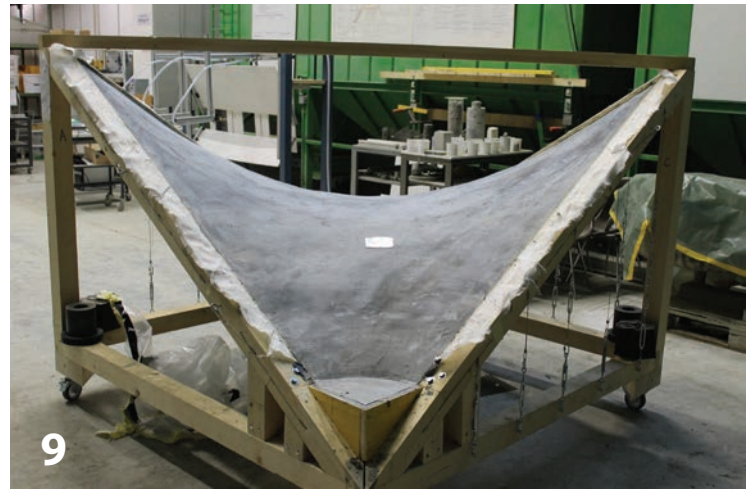
### Contributers

- 1 Steven Schoenmakers, Rio de Janeiro, 2012
- 2 Steven Schoenmakers, Eindhoven, 2012
- 3 Wouter van der Sluis, Delft, 2012
- 4 Wouter van der Sluis, Delft, 2012
- 5 Wouter van der Sluis, White Rocks, Portrush, United Kingdom, 2012
- 6 Marco Schmeitz, Unknown, 2012
- 7 Marco Schmeitz, Unknown, 2012
- 8 Douwe Stellingwerf, BKR Utrecht, 2013
- 9 Angelique van de Schraaf, Switzerland, 2014
- 10 Omar Sarfatij, Empire State Building USA, 2012
- 11 Omar Sarfatij, Engineers Gate USA, 2012
- 12 Angelique van de Schraaf, USA, 2014
- 13 Angelique van de Schraaf, USA, 2014
- 14 Hein de Groot, London, 2012





8



9



10



11



12



13



14

# The 100<sup>th</sup> KOersief: behind the pages

Sander Montrée  
Editor KOersief

**The making of the KOersief has been a trade secret, handed over from generation to generation of editorial boards. How do they choose a theme, who decides on the layout and how did the idea of this special anniversary edition start? We will show the secrets of the editorial board as we go behind the pages of the 100<sup>th</sup> KOersief.**

## The archive

The first steps towards the 100<sup>th</sup> edition were made at the end of 2015. In November, the special committee started with what would become the anniversary part of the 100<sup>th</sup> KOersief. The committee started with the basics; what does the KOers archive contain? The archive was somewhat lost in the previous years and when found, it needed some cleaning up.

In the archives, we found, obviously, a vast number of old editions of the KOersief. Besides that, we also found some reports of old lustrums, books on study trips organized by KOers in the past, the official agenda used for the erection of CHEOPS, and old photos of boards of the early ages of KOers, forgotten in time.

While organizing the archive, the committee also started with the digitalization of the archive. It took some hours of scanning, checking, and scanning again of the hundreds of pages written by former editors. The hard work has paid off: you can now read all the old editions of the KOersief on the special website [www.KOersTUe.nl/KOersief100](http://www.KOersTUe.nl/KOersief100).



Figure 1: The KOersief archive, 2016

## The idea

When the archive was complete, the committee gathered to determine what the general idea of the 100<sup>th</sup> KOersief should be. The first big decision was to make the 100<sup>th</sup> KOersief 100 pages thick. To fill these pages (about twice the normal number of pages), the editorial board of the KOersief decided that this special edition should contain a theme-related part, as usual, and a special part on KOersief's anniversary. We essentially wanted to make two editions in one KOersief.

The anniversary part should be something other than just articles. After a brainstorm session, the idea of a timeline was born. The timeline gave the editorial board a virtual coat rack for all the different activities of KOers.



Figure 2: A first draft of the timeline and the general idea of the anniversary part

To fill the timeline, the editorial board spent weeks going through the old editions of the KOersief, thereby reading hundreds of pages and thousands of words; all to make an overview of the most interesting moments. Each member of the committee received an individual topic to explore, which meant that some had to dive deeper into the archive to read the endless numbers of travel reports and lustrum books, or scour the internet for more information on concrete canoes.

At the same time, the committee worked on the 99<sup>th</sup> edition of the KOersief, which meant that every member of the editorial board worked on articles for two editions.

## The other part

The preparations for the anniversary part of the 100<sup>th</sup> KOersief were in full swing when the theme of the normal section was still to be decided. At the time, we were still mainly focused on the 99<sup>th</sup> edition, but another meeting was devoted to brainstorming for ideas for the theme part of KOersief 100.



Figure 3: The committee going through all editions of the KOersief

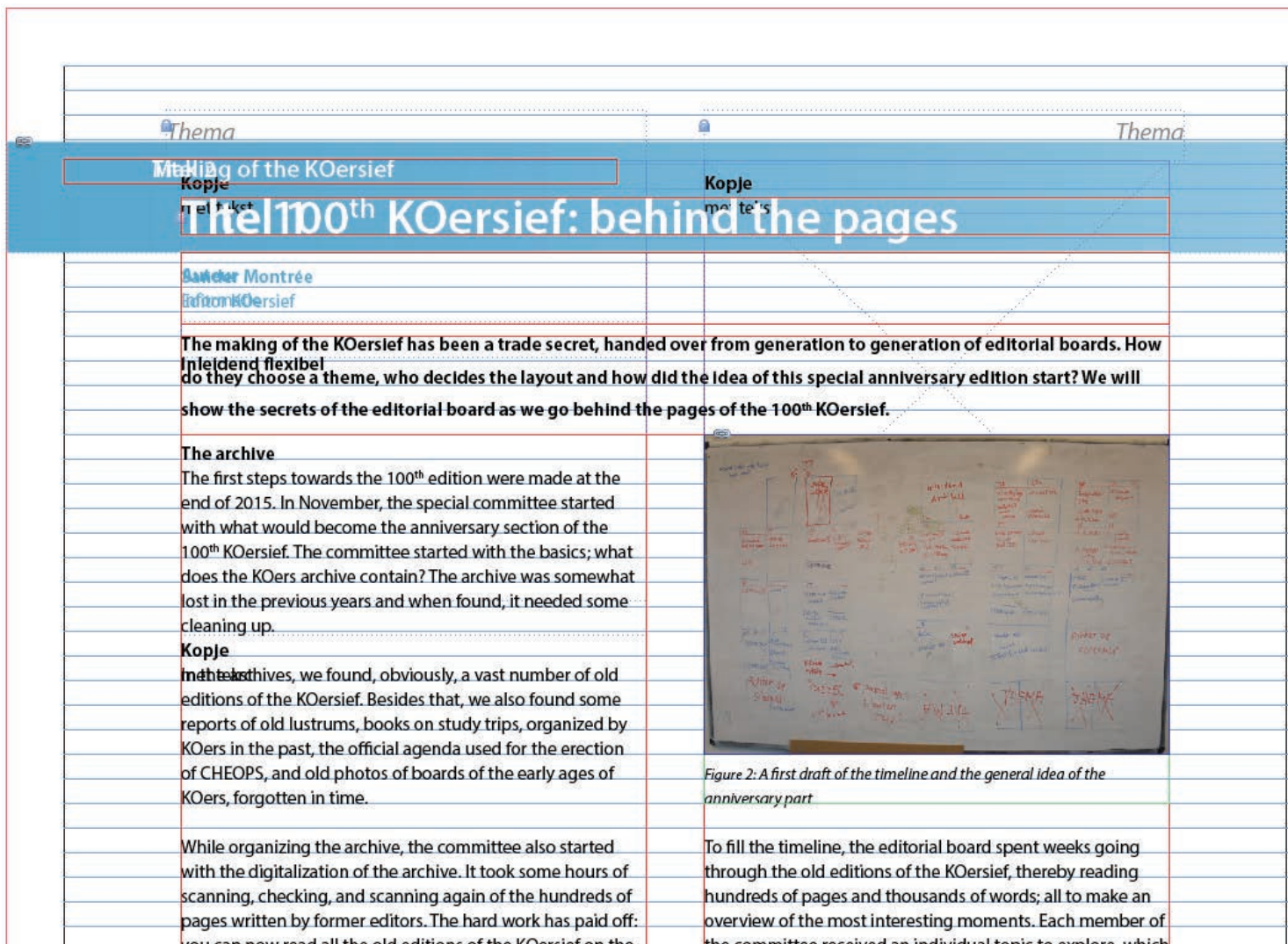


Figure 4: This is how we see the KOersief in InDesign, including all kind of lines that help us while making the layout of the KOersief.

It was decided that, because the anniversary part looked back in time, the theme-related part should look into the future. Now, it was just a matter of finding projects and companies with a vision on the future and writing them to ask their cooperation. That is easier said than done.

After the first round, we had ten articles and two backup articles on the list for the theme of KOersief 100. Of course, we also had the usual articles: reports of the International Study Trip to Singapore and the Concrete Canoe Race in Arnhem, the presentation of the 47<sup>th</sup> board, a graduation report, and an education update, for which writers had to be found as well. While the 99<sup>th</sup> KOersief was still to be released, the articles for the 100<sup>th</sup> KOersief were almost filled in completely. This is also due to the holidays coming up, and the expectation that the 100<sup>th</sup> KOersief would take more time to make.

### Layout

A major part of the work on the magazine consists of making the layout, a process that starts even before any articles are submitted.

The editors, responsible for the layout, start by determining the order of the articles and also start filling in the advertisements. When the final order is determined, the editors start with the preparation of the standard layout

in InDesign. For the theme part, this standard layout was already available, but for the anniversary part, the layout had to be made from scratch.

Multiple drawings were made on how to visualize the timeline, and how to incorporate it into the layout. We wanted to use the layouts of the old editions of the KOersief to show how the magazine has evolved over the years. Therefore, the anniversary part starts with the layout of the first editions: two blocks per page, one for text and one for images. The text was at that time written by typewriter, so an appropriate font was chosen.

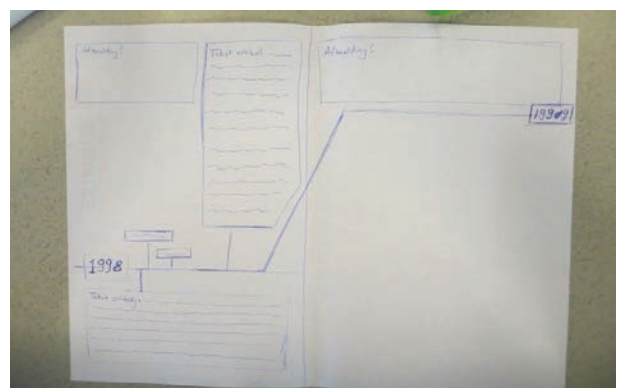


Figure 5: One of the designs for the timeline



Figure 6: The committee is discussing the contents

Over the pages, the lay-out of the anniversary part changes to the more modern lay-outs of the KOersief, to end with the layout we now know and love: the use of KOers blue banners for the titles and the standard font.

### The final check

The articles are always checked multiple times by the editorial board. The first check is when they are submitted; are there mistakes in the spelling or grammar of an article, or are there sentences not correct?

After the article is checked and put in the layout, the article goes back to the authors, so they can make some final adjustments in text or the location of the images. Finally, the complete KOersief is reviewed by the editorial board, the board of KOers, and some former editors. The committee evaluates all comments together and makes the final changes before the KOersief is released for printing.



Figure 7: A discussion on the final draft of the 99<sup>th</sup> KOersief.

### Printing

The final step before releasing the KOersief is printing. The KOersief is printed by Meesterdrukkers BV, Eindhoven. When our pdf-file is submitted, they start preparing the printing plates for the printers.

When the pages of the magazine are placed in the right order, the file is sent to Belgium, where they etch the images on aluminium plates.

The aluminium plates are then put in the massive printer: a ten-color printer that simultaneously prints both sides of the paper with five inks: Black, Magenta, Yellow, Cyan, and a transparent glossy finish.

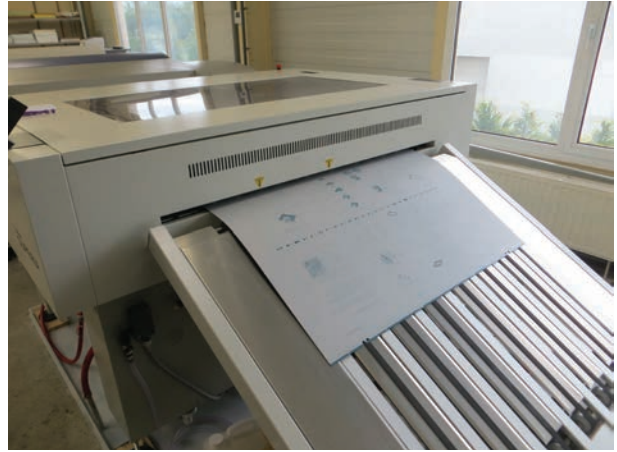


Figure 8: The printing plates are manufactured

After the sheets are printed, they are roughly cut to the right size, stapled together, folded, and trimmed to the exact size. This 100<sup>th</sup> edition has a special glued binding, this is outsourced to another location.

The actual printing time of the KOersief is, for a normal KOersief of 300 – 400 copies, about four hours. Including the preparation and fabrication of the printing plates, the cutting, stapling, and transportation, it can take up to two weeks before the printed version of the KOersief arrives back in Eindhoven, ready for distribution.



Figure 9: The ten-color printer

### Releasing the magazine

It has grown custom to release the magazine at an activity. This usually requires nothing more than a brief introduction to the subject of the KOersief. After the official release, the KOersief is distributed to all the KOers members and relations.

Shortly after the release, the committee starts sending the KOersief to all members who have not received their copy by hand; about 250 – 350 copies. Sending the KOersief is a very time-consuming and boring duty, which involves a lot of envelopes, stickers, letters, and magazines. About two days later, the KOersief will be waiting in your mailbox for you to finally read it! ◀

# Contest

The release of the 100<sup>th</sup> KOersief is a special event. For this occasion, a contest was defined. During the making of the KOersief, the question came up what the tensile capacity of a KOersief would be. For this reason, KOersief 99 was loaded in tension in the Pieter van Musschenbroek laboratory. Everyone knows that one piece of paper has a low tensile strength, but the combination of multiple pages leads to an enormous increase of the tensile strength.

This KOersief has 52 pages, 48 inside pages, and 4 cover pages (24 sheets + 2 cover sheets). The tests are performed in a tensile test setup; a load-displacement graph is the

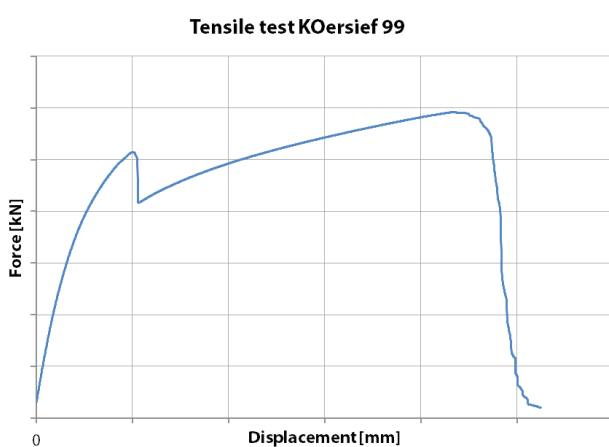


Figure 1: Load-displacement graph of the tensile test on KOersief 99

result, shown in *Figure 1*. The test setup and the magazine after testing are shown in *Figure 2*. So the question for this contest is:

## What is the tensile strength of KOersief 99?

Answers can be submitted to [KOersief100@KOersTUE.nl](mailto:KOersief100@KOersTUE.nl). The first correct solution wins a KOers beer package.



Figure 2: Test setup and result of tensile test

Wist je datjes...

## Did you know...

- ... that professors are people who help us with problems we would not have without them?
- ... that science is knowing you cannot know everything?
- ... there are at least five similarities between KOers and sex?
  1. It makes you sweat enormously (for those who know the KOers corner during the summer);
  2. Stiffness is very relevant;
  3. Tension is preferred over pressure or bending;
  4. If you do it really well, you go KO;
  5. A rigid connection brings great tension along with it.
- ... there were steel worms in the Newport Transportation Bridge?
- ... Professor Snijder simply ordered 30 beers for his 'mechanica 7b' students?
- ... the TU Delft was HOT on May 13, 2008?
- ... they switched to 'Brand' in Delft?
- ... the news spread like a wildfire?
- ... a concrete boat made of steel sinks like a brick?
- ... the difference between a living statue and a real statue is sometimes not that clear?
- ... the KOersief is printed in Belgium?
- ... that some (former) board members can be found on YouTube under a pseudonym?
- ... about the joke of the mummy?
- ... has participated 40 times in the Concrete Canoe Race?
- ... has participated in 28 races in the Netherlands and 12 abroad?
- ... has won the prize for lightest canoe 20 times?
- ... has won this prize in 1977 with a canoe of 270 kilogram and in 2004 with a canoe of 15.4 kilogram?
- ... has won the overall prize for men's and women's teams seven times?
- ... has won the beauty prize, the unlucky prize, the structural engineer prize, and the innovation prize four times?
- ... has received an honorable mention three times for the construction method applied?
- ... has set a course record twice?
- ... had organized the Concrete Canoe Race three times?

# KOers puzzle

By: Sander Montrée  
Editor KOersief

**The chairman and secretary of KOers are playing a game of Scrabble™ together. They are using a standard Dutch Scrabble™ set and will not only use words that are in the Dutch dictionary and on [www.scrabblewoord.nl](http://www.scrabblewoord.nl), but have agreed to use words that are common for KOers members. Words are played on the best scoring position on the playing board. Below is a description of the game. Who wins, and what is the final score? The submission deadline is November 21 and submissions can be send to: [KOersief100@koerstue.nl](mailto:KOersief100@koerstue.nl). The first correct solution wins a KOers beer package.**

1. Chairman starts with the word 'KANO'.
2. Secretary plays 'KMAIL' across the first word, in the best scoring position.
3. Chairman plays 'BETONKANO'.
4. Secretary plays 'EVEN', and also creates two other words.
5. Chairman returns with 'LOT', obtaining a triple letter score.
6. Secretary gets to a triple word score field with 'BETONKANORACE'.
7. Chairman plays 'JOETJOEP'.
8. Secretary uses the second 'E' from 'JOETJOEP' and plays 'ZWEDEN'.
9. Chairman places 'QUOTE' on the board, doubling the value of the Q.
10. Secretary plays 'LUSTRA', while using an already placed letter.
11. Chairman plays three tiles, forming 'FEE' and two other words.
12. Secretary also places three tiles, forming the word 'PAGE'.
13. Chairman has 'CEISUX' and a blank tile on his board and plays an eight-letter word.
14. Secretary plays 'VEN' on the lower half of the board.
15. Chairman uses the last word to play 'VLAG'.
16. Secretary places 'NEWYORK', playing a blank tile for the 'O'.
17. Chairman plays 'OPA', forming three other words.
18. Secretary plays three tiles on the upper half of the board forming 'GEN' and two other words.
19. Chairman plays 'EENDEN', using an 'E' he played earlier.
20. Secretary plays 'COMMISSIE'.
21. Chairman plays 'VER'.
22. Secretary makes an earlier played word longer by adding an 'N'.
23. Chairman plays 'HERZ', creating two other words.
24. Secretary plays 'HA' on the lower half of the board, creating two other words.
25. Chairman plays a 'D' on last row.
26. Secretary plays an 'F', making 'FAR'.
27. Chairman plays his final tile making 'BEL'.



## Rules

1. Each player starts with seven tiles. A player has to place one or more of these tiles horizontal or vertical on the board, forming a word. After the play, the player takes as many new tiles as played, bringing the number of tiles back to seven. When there are no more tiles to take, the player only has his remaining tiles.
2. The first player has to play his word on or over the yellow center square..
3. The second player has to use at least one of the tiles to form a word. The newly placed tiles have to be connected to one or more previously played tiles. All tiles have to be connected to at least one other tile.
4. The game is over when a player has no more tiles in his possession and there are no more tiles to take.

## Scoring

1. The word-score is determined by adding all the individual letter values. If a player played on a letter-bonus-field, the letter value is multiplied by the bonus. If a player played on a word-bonus-field, the combined score of the word is multiplied by the bonus. The center square is also a '2x word'-bonus-field. Once a bonus-field has been used, it becomes inactive.
2. If a player has played all seven tiles, he obtains a bonus of 50 points.
3. At the end of the game, the score of each player is reduced with the total value of his remaining tiles. When a player has used all his letters, the total number of points of the unplayed tiles of the other player is added to his score.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
1	3xW			2xL				3xW				2xL			3xW	1
2		2xW				3xL				3xL				2xW		2
3			2xW				2xL		2xL				2xW			3
4	2xL			2xW				2xL				2xW			2xL	4
5					2xW						2xW					5
6		3xL				3xL				3xL				3xL		6
7			2xL				2xL		2xL				2xL			7
8	3xW			2xL								2xL			3xW	8
9			2xL				2xL		2xL				2xL			9
10		3xL				3xL				3xL				3xL		10
11					2xW						2xW					11
12	2xL			2xW				2xL				2xW			2xL	12
13			2xW				2xL		2xL				2xW			13
14		2xW				3xL				3xL				2xW		14
15	3xW			2xL				3xW				2xL			3xW	15
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	

# The meaning of numbers

Hans Lamers



This is kind of an anniversary for the KOersief: number 100. The glossy magazine of the Structural Design study association KOers. Congratulations! Everyone will agree this is something special, a memorable milestone. But why do we attach special value to certain numbers?

The sacred numbers 3, 7, and 40 frequently occur in biblical stories, for example, the Holy Trinity of God (Father, Son, and Holy Spirit), the Creation of the world was done in 7 days, and the 40 days Jesus Christ spent alone in the desert.

Number 11 is associated with foolishness. People from 'Brabant' and 'Limburg' will agree. Number 13 stands for bad luck; in many hospitals and hotels, you will not find room 13 and row number 13 is lacking in most airplanes. In some Asian countries, number 4 has the same sound as the word 'death' and is therefore avoided. When we see 666 we think of Satan. Peculiar is the fact that 666 is the sum of the square of the first 7 prime numbers ( $2^2 + 3^2 + 5^2 + 7^2 + 11^2 + 13^2 + 17^2$ ), very spooky!

For more technical minded people, the mathematical number  $\pi$  (3,14159 ...) or the natural logarithm base number  $e$  (2,71828 ...) are more appealing numbers. Numbers have always fascinated people. Instead of the usual saying 'what's in a name', we could say 'what's in a number'?

I really wonder what will be the next special number of the KOersief to celebrate? Of course, that must be 360, so KOers will not drift off course!

## Colophon

KOersief is a student magazine, published three times per year by KOers, section association Structural Design within study association CHEOPS and the unit Structural Design of the department of the Built Environment at the Eindhoven University of Technology.

## 46<sup>th</sup> board of KOers 2015-2016

Gosse Slager	Chairman
Pierre Hendrikx	Secretary & Com. Public Relations
Wessel Manders	Treasurer
Lieneke van der Molen	Com. Education

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Arno Poels	
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Tom Relker  
Hans Lamers  
Sjonnie Boonstra

## Cover

Manhattan, New York, by Richard Rummell, 1910-1911  
<http://io9.gizmodo.com/we-wish-these-retrofuturistic-versions-of-american-citi-1678191294>

## Print run

600 copies, distributed to students, professors, sponsors, and other relations of study association KOers.

## Printing office

Meesterdrukkers BV, Eindhoven

# Puzzle cube

By: Sjonnie Boonstra MSc  
Ph.D.-student

**This puzzle cube was given to me by fellow Ph.D.-students, who falsely led me to believe that all of the people before me had solved it in under twenty minutes, I failed. I decided to write an algorithm instead and found a solution in 105 milliseconds (beat that!). Besides the cube, I also validated five other solutions, see how many you can find.**

Create the solutions shown in *Figure 1*, given the six pieces in *Figure 2*. Each piece can be constructed by equally sized blocks with rectangular faces. Pieces c, d, and f consist of four blocks each, the other three pieces consist of five blocks each.

Submission of solutions must include solution a from *Figure 1* (three by three cube), all other solutions will count as a bonus

in the event of multiple correct submissions. Solutions can be submitted on isometric drawing paper, or can be shown physically to Herm Hofmeyer before November 21. A bottle of wine or a 'vlaai' can be won.

There is a 3D-printed version of the puzzle available at the KOers corner; however, you could also create your own version to keep your friends and family busy.

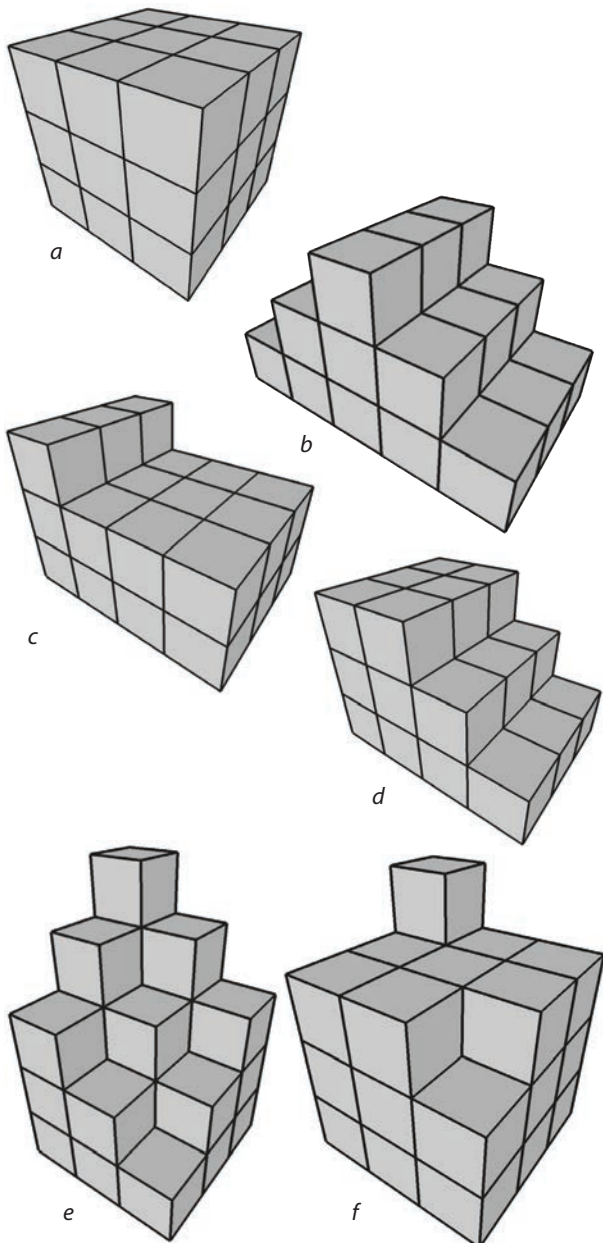


Figure 1: Solutions

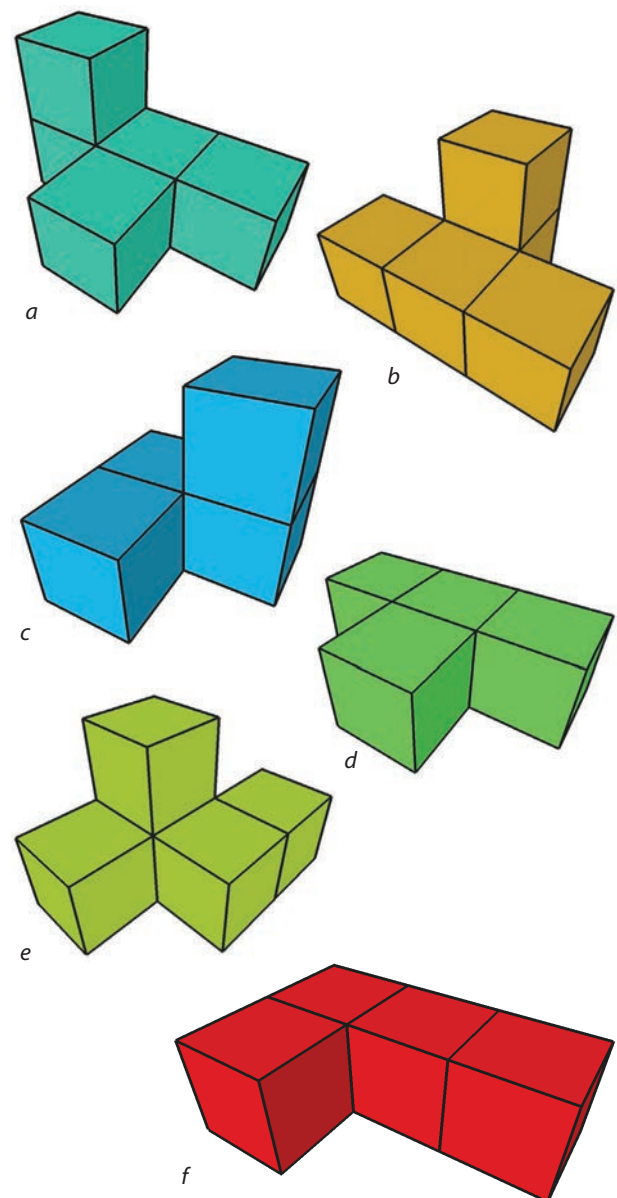


Figure 2: Pieces