



Composite Bridge Alliance Europe

July 2003 COBRAE NEWS No. 07-03

COBRAE NEWS is distributed to over 1.200 addresses among the composites industry, bridge builders, bridge designers & bridge owners.

COBRAE NEWS gives information about the development and application of fiber reinforced polymer composites in bridge and other engineered constructions.

This newsletter depends on you for information and news on the design or maintenance of bridges.

We would like to ask you to submit articles, press releases or information on present projects.

This newsletter features:

COBRAE Membership Info

- * Lightweight bridge deck conference
- * COBRAE annual members meeting
- * Not a COBRAE Member yet?

COBRAE Members

Bridges News Flashes

- * Philips builds composite bicycle bridge over river Dommel
- * Rijkswaterstaat chooses sustainable wooden structures
- * Polymer & steel sandwich plate system creates breakthrough structural design & repair opportunities
- * Enerpac hydraulic system integration for Millau Viaduct pushing the 4000 ton deck out into space
- * Composite replaces hardwood decks on 17 Alkmaars footbridges
- * Composite catapult review
- * China builds longest bridge

WWW

New Announced Events

- * JEC composites show changes dates
- * IABSE symposium

Event Calendar

* If you would like to be removed from this mailing list, please reply to info@nedland.nl and type in the subject line "remove: e-mail address" (please type e-mail address you received this e-mail at).

* If you would like to add people or companies to this e-mail list, please give us their contact details/ e-mail.

* To become a Founding Member of the COBRAE Alliance, please fill out the enclosed form.

Visit COBRAE on the Internet at <http://www.nedland.nl>

European Composites Bridge Initiative

You will shortly receive a special issue of the COBRAE News letter. This issue will provide more information regarding the European Composites Bridge initiative (ECBI).

Jaap H Ketel, COBRAE

COBRAE MEMBERSHIP INFO

LIGHTWEIGHT BRIDGE DECK CONFERENCE

Time flies so fast! I want to thank you for inviting me to your Lightweight Bridge Deck Conference way back in March. It was one of the best and best managed conferences that I have ever attended and participated in. All the events went according to schedule, the food and drinks for beaks and lunches were good an ample, and the venue superb with the stunning view out the window of the Erasmus Bridge.

My wife, Janet, also enjoyed the conference particularly with your friendly welcoming, and we both enjoyed the dinner cruise up and down the river. We also enjoyed staying at the New York Hotel with its whimsical decorations. It was fun.

Peter Head did an exemplary job in his summaries of the papers presented at the conference and with his own presentation. I want to thank those who sponsored me in attending the conference. Without that support, I could not have made it - no thanks to my own company! And finally, I have to thank and compliment you, Jaap (and your son too), for your planning and orchestration of this marvelous undertaking. I will remember it and will recommend Brisk Events to others.

Again, Janet and I thank you very much.

Chuck Seim
Vice President
T. Y. Lin International
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cseim@tylin.com

NOTE FROM COBRAE: it is possible to order the proceedings of this conference at just Euro 156,-, please contact Brisk Events for more information: info@briskevents.nl

COBRAE ANNUAL MEMBERS MEETING

The COBRAE Annual Members Meeting will be held on November 12th. at Hotel Casa Branca Porto, Portugal.

This meeting will coincide with the COBRAE Composite Bridge Technology Seminar, November 13 and 14 at the same hotel. Members will receive a 20 % discount on the Seminar Fee. The Seminar is open to Non Members also.

NOT A COBRAE MEMBER YET?

We would like to ask our readers to become a member of this Alliance. COBRAE will need more members to accomplish all its goals. The Alliance has already established a close co-operation with IABSE and the MDA.

For more information about the Alliance and its goals, please visit our website at <http://www.nedland.nl/cobrae.html>

You are also invited to contact the administrative office to discuss activities or actions, which you think COBRAE should take. You can either call to (31) 33 4343 500 or e-mail to info@nedland.nl

We look forward to your positive response.

In the end of this newsletter you will find a registration form for membership.

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To register as a founding member, please fill out the attached form (last page of this document) and return it to the KCA office.

Bridge News Flashes

PHILIPS BUILDS COMPOSITE BICYCLE BRIDGE OVER RIVER DOMMEL

Eindhoven – Philips has decided to build a bicycle bridge made to a large extent of composites. What Philips really wanted was an all composite bridge, however for the by the City of Eindhoven approved design this solution turned out to be unaffordable. Therefore the structural part of bicycle bridge over the Dommel River will be constructed out of steel. Composites will be applied on the outside to protect the steel structure.

The bridge, which has a 27 m span, enables a fast crossing to the new Philips High Tech Campus from North West Eindhoven. It is expected that daily about 8000 employees will use the bridge, avoiding the long way trip around the river Dommel.

The supervisor for the 330.000 square meter gross floor space campus project is Mr. E. Nagelsmit. Mr. Nagelsmit informed us that the project is going to be a "Design and Construct" tender. He hopes that the contractor can be selected in September. Philips could start to work on the abutments already, but wants to wait until the bird breeding season is over. Mr. Nagelsmit hopes that the bridge can be completed mid summer 2004.

Interested parties who wish to bid on the project can contact Mr. Nagelsmit at Philips:

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RIJKSWATERSTAAT CHOOSES SUSTAINABLE WOODEN STRUCTURES

XX Architects of Delft has designed an all wood footbridge for DWW-Rijkswaterstaat of the Netherlands. This Department of the Ministry of Transport, Public Works and Water Management, also based in Delft, is concerned with developing and applying sustainable civil and other engineering structures for the Netherlands road and water infrastructure.

To replace steel and concrete structures with wood, the Department has developed and build wood structures such as road signs, overhead traffic direction systems and light post. Now the unique wooden bridge design should complete this range of more sustainable highway structures.



POLYMER & STEEL "SANDWICH PLATE SYSTEM" CREATES BREAKTHROUGH STRUCTURAL DESIGN & REPAIR OPPORTUNITIES

By Ed Sullivan, technical writer based in Hermosa Beach, California

If you inspect the deck of a ship made of stiffened steel panels, it will eventually begin to take on a gaunt appearance, as the stiffeners begin to protrude like ribs through thinning and warped plated surface. The same problems occur wherever stiffened steel plating is subjected to heavy wear, such as road bridges. Under the continuous stress of jarring impacts, metal fatigue occurs, causing surface plate to sag across the steel stiffeners, giving the deck a warped or corrugated appearance. These damaged surfaces reduce the overall strength of the structure and become increasingly difficult to maintain.

Ultimately, as this type of damage mounts, ships are forced into dry-dock and bridges close for time-consuming and expensive replating that can involve months of work and hundreds of thousands of dollars in costs. "The problem is quite widespread," says Tim Kennedy, project director, at intelligent engineering based in London, England and Ottawa in Canada. " many vessels, such as ferries, RoRos (roll-on, roll-off ships) and bulk carries, are in need of periodic replating. Thousands of metal-decked bridges, including those that overpass roadways, are now classed as structurally deficient. And there are countless numbers of rail cars and other structures with worn stiffened-steel decking."

SANDWICH PLATE SYSTEM

Intelligent Engineering (IE) has developed a new, proprietary technology that not only makes the repair/rebuilding of stiffened steel plated structures less expensive and inconvenient, but also greatly reduces labor and construction time while vastly improving the service life of the plating itself.

This patented and licensed technology, known as the Sandwich Plate System (SPS), incorporate the injection of a polyurethane-elastomer core between a "sandwich" of two steel plates. In a repair application, SPS Overlay, the sandwich consists of: (1) the original deformed plate, left in place; (2) a new steel plate, overlaid on the deformed plates and (3) the polyurethane-elastomer core injected between the two steel plates.

Contact: Gusmer , info@gusmer.com, <http://www.gusmer.com>

SPS is available around the world in partnership with BASF. For Intelligent Engineering in London, tel: +44 1753 890 575, enquiries@ie-sps.com

To read the full article: Advanced Materials & Composites News Vol. 25, No. 13, Issue #565 7 July 2003

Contact: info@compositesnews.com, <http://www.compositesnews.com>

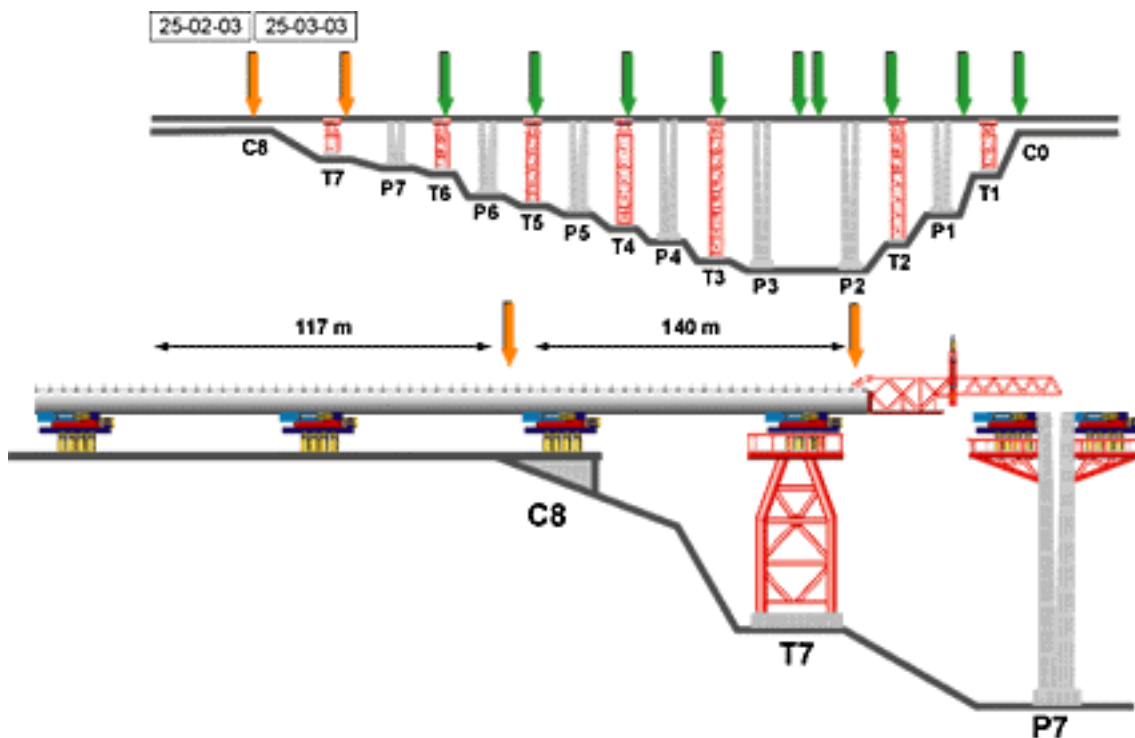
ENERPAC HYDRAULIC SYSTEM INTEGRATION FOR MILLAU VIADUCT PUSHING THE 4000 TON DECK OUT INTO SPACE

The deck of what is going to be the world's highest bridge is being launched over the Tarn valley, in the South of France, with hydraulic technology from Enerpac, a US multinational that specializes in Hydraulic System Integration for large-scale construction projects. The hydraulic system was designed and built by Enerpac's Construction Centre of Excellence in Madrid, Spain.



Pier P7 to pier P1.

The technically advanced hydraulic system is designed to push the 27,35 m wide deck (with a capacity for six lanes plus hard shoulders) from both sides onto the seven concrete piers (see photo 1, pier P7 to P1). During the launching process, the deck will be supported by seven temporary metal piers (pier T7 to T1). The first of these temporary piers was raised using cranes, but all other temporary piers will be raised using a hydraulic telescopic system also designed and built by Enerpac. Once put in place, the deck will be 245 metres high and 2460 metres long.



Current status of launching process.

The enormous yet at the same time 'light' deck is pushed by means of hydraulic launching devices on each pier, which first lift and then push the deck. An adjustable nose structure at the end of the deck, allows the deck to land on each pier as it approaches it.

Basically, each system consists of a lifting cylinder, with a capacity of 250 ton, lifting the deck off the supporting structure of the pier, and two or four skates, each equipped with two 60 tons cylinders, which retract to launch the deck a maximum of 600 mm. All of this rests on a system of single-acting lock nut cylinders supporting both the launching device and the deck.

The launching process was started on the western slope (C8) with two launching devices, each with two 120 ton cylinders. In total, in the last phase of the launch, there will be 5280 tons pushing capacity from the southern slope (1752m of deck) and 2400 tons from the northern one (708m of deck, making up a total length of 2460m). Each push-cycle moves the deck 600 mm and takes 4 minutes, which means that there will be 3280 pushes from the west and 1540 from the east.

Illustrations on the webpage shows the launching process.

http://www.enerpac.com/html/Projects/Millau/Millau_LaunchingSystems.html

As you can see, each launching system rests on a system of cylinders which allows the load of the skates to be balanced right and left on each pier, to compensate for the rotation of the deck during the launch phase, and correct or modify the height of the skate and thus of the deck where necessary.

Manufactured by Enerpac, these cylinders are of different capacities according to the needs of the deck. The most demanding system having an absolute capacity of 14.400 tons, supporting four skates and 24 support cylinders of 600 tons each, with a stroke of 500 mm. Other piers use cylinders of 280 tons with a stroke of 300 mm. Valves are used to make the different groups of cylinders independent of each other and so control the height and angle of the deck, each system having an independent control centre for the skates and the jacking cylinders.



The nose of the deck

The weight of the deck means that, as it is pushed along and gets further from its support, it curves downwards, so that it approaches the next pier below the proper level. In order to compensate for this deviation, a nose recovery system is constructed at the end of the deck. This independent system, consisting of a hydraulic group of four 270 tons cylinders, pulls the nose upwards to the level of the skate. Another hydraulic system allows the nose-end to pivot.

PLC-Control system

All hydraulic systems for pushing the deck are operated from the Control Centre on the bridgehead. This control centre receives data via a PROFI-BUS cable, where it is automatically handled so that the system can follow the parameters established when programming the cycle. Although all hydraulic systems installed on each pier are controlled from this centre, each single hydraulic system has a local control panel, which allows local movement of the skates to be made from that pier independently, as long as this is allowed by the Control Centre, which in turn must receive the approval of each local control centre in order to make synchronised pushing movements from all the pushing cylinders of all the piers. The outer cylinders on each pier have a positional transducer that indicates the amount of travel, and each hydraulic system has its independent hydraulic control centre. Movement of the deck can be made in three modes: manual, semi-automatic and automatic. The manual mode is used for adjusting the system and, if necessary, to make instant corrections. In semi-automatic mode, each movement is made step by step: raise, push, lower, withdraw cylinders. Automatic mode completes the entire cycle.

Hydraulic system integration, of high force hydraulics and advanced control technology, nowadays play an important role in the controlled movement of large-scale civil engineering projects, like the launching of the Millau Viaduct.

For more information please contact:

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http://www.enerpac.com

COMPOSITE REPLACES HARDWOOD DECKS ON 17 ALKMAARS FOOTBRIDGES

Fiberline of Kolding Denmark has supplied composite planks for the replacement of hardwood decks of 17 footbridges in the town of Alkmaar. The expected lifetime of the composite decks (50 years) is double that of hardwood decks it replaces. Also it saves the hardwood of the tropical forests in Africa, Asia and South America. The decks are prefabricated by composite specialist Marant of Heerhugowaard and installed by contractor Kuiper & Leeuwenkamp of Schoorlдам.



Although the material cost of the composite deck is double that of hardwood, the city of Alkmaar believes that in the long term it will save money in the maintenance on deck and substructure.

Hardwood planks need space between the planks, because wood will expand and contract with moisture content, whereas a composite deck is closed and will better protect the substructure of steel or hardwood. It is expected that other cities in the Netherlands will follow Alkmaars example and use composite decks as replacement of hardwood. (Source Telegraaf Daily)

Photo: One of Alkmaars bridges with the Fiberline composite deck installed

COMPOSITE CATAPULT COMPETITION REVIEW

Sunny skies, breathtaking scenery, fierce competition and exuberant students and public, were the highlights of the exciting Composite Catapult Competition that was held on 9 - 11 July 2003 at the Royal Netherlands Artillery Base, 't Harde, The Netherlands!

This first International all Composite Catapult Shoot was organised by the European Pultrusion Technology Association (EPTA). After two years of planning this unique educational event, which was to enable the promotion and use of fibre reinforced composites profiles amongst European engineering students, finally went ahead. EPTA invited technical students of different European Universities to design, engineer and build a catapult out of fibre reinforced composite profiles. The objective was to successfully launch a polyester bowling ball weighing 12 lbs. (5.6 kg) at a designated target with a high degree of accuracy and to launch



the same bowling ball over as great a distance as possible.



The requirements for the competing teams, consisting of 4 students and a tutor were; to research and design the engineering of the catapults in 2D and 3D, make a portfolio of the drawings and materials used, and build a website. It was also up to the teams to get sponsors to financially support their projects. The main activities at the army base would be the chance to present their catapult and to shoot with their machine.

The event got off to a good start from the very beginning. The Finnish team **Triple Strike** took the lead from the start with their impressively engineered catapult. It was clear that this team had invested a lot of time, effort and money in their shooting machine. Their hard work paid off as they took the not only the prize for the “**Best Engineered Catapult**”, but also the first prize at the end of the event for winning both the precision and the distance shoot. Their last shot was also the best of all, with a striking shot of almost 200 meters (189.6 meters to be precise!).

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The Belgian teams; **Team Katapuleuven**, **Team Kratapult** and **Team Bowlers Unlimited** performed reasonably well although the latter had to pull out. The German teams **Team Das TC-Domine Catapult** and **Team PoTeLo** unfortunately had to pull out because they were both unable to propel their Catapult to a scoring position.

The jury members were able to come to a unanimous decision regarding the three best catapult teams. The final scores at the end of the event were as follows:

	Precision shot	Distance shot	Total	Result
Team Triple Strike	179.6	189.6	369.2	1st
Team Katapuleuven	146.4	0	146.4	2nd
Team Kratapult	31.9	38	69.9	3rd
Das TC-DOMINE Catapult	8.4	18.1	26.5	4th
Team PoTeLo	0	-	-	-
Team Bowlers Unlimited	0	-	-	-

All in all, the competition, which consumed a lot of energy of the organisers, participants, jury members and supporters, was a great success.

Because the event received a lot of publicity through the various media in several countries, it at least fulfilled the objective that the innovative use of composite profiles should be more exposed, not only to young engineers, but also to the general public.

EPTA is considering a repeat event in July 2005 at the same venue. This to promote the almost unlimited technical characteristics of engineered composite profiles.

For more information and pictures visit <http://www.pultruders.com>

This event was made possible by:

BEKAERT COMPOSITES, PPG INDUSTRIES, EXEL, JOHNS MANVILLE, OWENS CORNING, ASHLAND COMPOSITE POLYMERS AND DSM COMPOSITE RESINS

CHINA BUILDS LONGEST BRIDGE

Civil Engineering: After nine years of planning, in which seven hundred civil engineering professionals participated, China has commenced with the construction of the longest bridge in the world this month.

The 36 Km bridge over the Hangzhou Bay will shorten the distance between Shanghai and the southern region around Ningbo by 120 Km.

The S-shaped bridge that will link Cixi City on the South Bank with Jiaxing on the North Coast is a cable bridge.

From a distance, these kinds of bridges look like suspended bridges, in both cases the bridge deck hangs onto cables and pylons. However, thanks to the difference in suspension, the two bridges share the load in different ways.

With suspension bridges the cables can freely move through the towers, and with cable bridges the cables are tightly fixed to the towers. This means that fewer cables are necessary and the construction is faster.

When it comes to length, the six-lane bridge easily exceeds the 25,23 Km long Chesapeake Bay Bridge-tunnel in the USA and the 25 Km long Baharia Bridge in Saudi Arabia.

Half way through the bridge is a service island standing on piles with a recreational area. The life expectancy of the Hangzhou Bridge is a hundred years.

With an investment of 1.42 billion dollars, this is the most expensive bridge in China. After completion in 2009, 45,000 cars are expected to use the bridge annually.

Source: Technisch Weekblad (Technical Weekly Newsletter)

WWW

The following websites can be of interest:

<http://yourbridge.hku.nl/index2.htm>

Bridges speak to the imagination of people.
They are fought over in wars.
Bridges have their own language,
and seem to write history by themselves.
They are the middle of society.
People start romances on them.
Bridges are realistic abstract images
From the past, the future and the here and the now.

<http://www.cobrae.org>

NEW ANNOUNCED EVENTS

JEC COMPOSITES SHOW CHANGES DATES

The JEC Composites Show 2004 will now take place at Paris Expo, Porte de Versailles on 30, 31 March and 1 April 2004, and not on March 23, 24, and 25, as previously announced.

The 2003 session recorded 880 exhibiting companies including 87 new exhibitors, a growing rate of international participation (74%), and 20,992 visitors.

WWW Link: <http://www.jecomposites.com>

Source: NetComposites News, 12 July 2003

Contact: info@netcomposites.com, <http://www.netcomposites.com/news.asp?1746>

IABSE Symposium

- IABSE Symposium, Antwerp August 27-29, 2003
'Structures for High-Speed Railway Transportation'

IABSE Awards 2003

- The 2003 International Award of Merit in Structural Engineering to Mr Michel Virlogeux, France
- The 2003 IABSE Prize to Mr Juan A. Sobrino Alumnia, Spain
- The 2002 Outstanding Paper Award to Prof. S. Sorace and Dr G. Terenzi, Italy
- The 2003 IABSE Outstanding Structure Award to the Bibliotheca Alexandrina, Alexandria, Egypt and the Bras de la Plaine Bridge, Reunion Island

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European Composite Bridge Technology Meeting

13 & 14 November 2003

hotel Casa Branca, Porto, Portugal

PRE-ANNOUNCEMENT & CALL FOR PAPERS

COBRAE announces the European Composite Bridge Technology Meeting, on November 13 and 14 at hotel Casa Branca, Porto, Portugal.

This meeting will discuss the following themes:

- Design rules for composite materials in Engineered Structures under cyclic loading
- European standardization for Composite Materials in Bridge Constructions
- Use of Polymer Composite reinforcement in concrete structures.
- Latest technology developments in Composite structural Engineering
- Performance of proprietary Bridge Deck systems under full traffic loading
- Case Stories

Contact: COBRAE, info@nedland.nl, <http://www.cobrae.org>

EVENT CALENDAR

2003

27-29 August 2003
Antwerp, Belgium

IABSE: Structures for high-speed railway transportation
Contact: <http://www.iabse.ethz.ch>

9-10 September 2003
University of Newcastle, UK

Composites in Fire - 3rd International Conference
louise.blackburn@compositelink.com, <http://www.compositelink.com>

- 11-12 September 2003
University of Plymouth
ACMC/SAMPE Conference on Marine Composites
<http://www.tech.plym.ac.uk/sme/acmc/sampeconference.htm>
- 16-19 September 2003
University of Calabria, Italy
Composites in Construction International Conference (CCC)
conf@asce.org, <http://www.aeinstein.org>
- 17-20 September, 2003
Austin, Texas.
Building Integration Solutions Conference
- 18 September 2003
Spain
International Congress in Civil Engineering Education
Contact: congreso.caminos@uclm.es,
<http://212.161.99.225/infoshare/latest/external.asp?SID=1623>
- 1-3 October, 2003
Anaheim, California
COMPOSITES 2003 Education, Innovation, the Future...
Contact: conferences@cfa-hq.org, <http://www.cfa-hq.org>
- 13 & 14 November 2003**
Porto, Portugal
European Composite Bridge Technology Meeting
Contact: COBRAE, info@nedland.nl, <http://www.cobrae.org>
- 17-18 December 2003
Cairo, Egypt
Egypt conference on composites repair of concrete structures
Contact: tarek@egyptcomposites.com, <http://www.egyptcomposites.com>
- 2004**
- 24-25 March, 2004
7th World Pultrusion Conference 'Composite profiles, Speed and Performance
Contact: info@pultruders.com, <http://www.pultruders.com>
- 30, 31 March & 1 April, 2004
JEC 2004
Contact: <http://www.globalcomposites.com>
- 22 - 24 September, 2004
Shanghai, China
IABSE Symposium 'Metropolitan Habitats and Infrastructure'
Contact: secretariat@iabse2004.org.cn, <http://www.iabse2004.org.cn>
- 8-10 December, 2004
Adelaide, Australia
2nd Int. Conference on FRP Composites in Civil Engineering
Contact: rseracin@civeng.adelaide.edu.au

COmposite BRidge Alliance Europe

REGISTRATION FORM FOR FOUNDING MEMBERS

We wish to participate in the COBRAE group as one of the founding members.

We pay Euro 1.000, - for the period 2003 until end 2004. COBRAE will be an unincorporated association, which will be run by Ketel Consulting Agents B.V. in the Netherlands. The Euro 1.000, - is made up out of two times Euro 250, - for annual membership and Euro 500, - for a one time joining fee. Payment can be made after receipt of invoice.

COBRAE's mission is to promote the research, development and application of fibre reinforced polymer composites in rehabilitation, upgrade and new build bridge constructions and infrastructure.

Organisation : (Please write clearly)

Address :

Town :

Postal code : Country:

Phone : Fax :

E-mail :

Website :

This website to be linked from the COBRAE website: yes / no

Contact person :

Payment can only be made by:

Cheque made out to Ketel Consulting Agents c/o COBRAE

(Inter) National Bank (Euro) Transfer

Credit Card:

MasterCard

Amex

Visa

Diners Card

Credit card number : Expiry date:/.....

Credit card holder :

CVC (Card Validation Code): (3 numbers, please also provide private address)

Date : City :

Signature :

Please return this registration form by fax or mail to Ketel Consulting Agents.

COBRAE

P.O. Box 18
3830 AA LEUSDEN
The Netherlands

Tel: (31) 33-4343500

Fax: **(31) 33-4343501**

E-mail: info@nedland.nl

<http://www.cobrae.org>