



Composite Bridge Alliance Europe

January 2002 COBRAE NEWS No. 01-02

COBRAE NEWS is distributed to over 300 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:

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WWW

NEW ANNOUNCED EVENTS

- Composites in Construction International Conference (CCC)
- Call for papers: ISEC-02

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>

FROM THE COBRAE OFFICE

COMPOSITE BRIDGES TUTORIAL

COBRAE is planning a Composite Bridge Tutorial coinciding with the JEC Exhibition in Paris. This tutorial will be conducted on Wednesday morning April 10th at FLATOTEL EXPO starting at 7.30h with a joint breakfast and last until 12.30h with a joint luncheon.

This tutorial will be given by some very experienced Composite Bridge Engineers from Europe and USA. After the tutorial there will be plenty of opportunity to visit the largest Composite Exhibition in the world, JEC (Journée Européenne des Composites) at the Parc Exposition ,which is next to FLATOTEL EXPO.

Cost for participating in the Tutorial (including Breakfast and Lunch) is kept low at Euro 195,- for COBRAE members and Euro 295,- for Non-COBRAE Members.

Because there is limited space at the class room, we suggest that those who wish to participate make their interest known at an early stage.

Next issue of COBRAE News will give full details of the tutorial.

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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<http://www.wsatkins.com>

To register as a founding member, please fill out the attached form and return it to the KCA office.

Venice's bridges: composites to the rescue

Leading industry players have come together to develop innovative solutions to an age-old problem in Venice: ageing of the city's oldest cast iron bridges.

The engineering fabric & prepreg manufacturer Seal SpA has joined forces with DuPont (owner of the Kevlar® superstrong yet ultra lightweight technology) and the Architectural Department of the University of Venice to develop a solution for reinforcing and renovating a number of old bridges in Venice.

Built in 1850, the "Ponte della Corona" is now showing signs of age due to the ravages of the humid conditions that prevail in its surroundings. Following joint consultations, it was decided to restore this unique structure using an innovative reinforced fabric made with Kevlar®. The strict construction and restoration requirements imposed by the Venice City Maintenance Authority meant that very few traditional techniques would have been acceptable. The solution developed by Seal using Kevlar® delivers the reinforcement performance required while meeting regulatory and aesthetic requirements.

Read more in:

Source: Composites International, no. 49 January-February 2002

Contact: press@globalcomposites.com

<http://www.globalcomposites.com>

Tests confirm success of dampers

Millennium Bridge, London

Secret tests carried out last week on London's notorious "wobbly" Millennium Bridge have convinced structural engineer Arup that its chosen solution to the opening day sway problem will be accepted by the

client. Late at night, away from the glare of publicity, Arup put 700 of its own staff onto each of the three spans to test the new damping mechanism. That test was due to be repeated on 30 January, with 2,000 volunteers marching across the bridge. Full story: <http://www.nceplus.co.uk>

Source: NCE, 31 January 2002

<http://www.nceplus.co.uk>

Arup undertakes tests to confirm success of dampers

Secret tests carried out last week on London's notorious "wobbly" Millennium Bridge have convinced structural engineer Arup that its chosen solution to the opening day sway problem will be accepted by the client.

Yesterday evening (30 January) 2,000 volunteers were due to march across the bridge, to test the damping mechanism installed to minimise lateral sway. . It has been fitted with 91 dampers by Cleveland Bridge in an attempt to minimise the alarming sway which developed when thousands of pedestrians crowded the bridge during its opening day in June 2000.

Yesterday's tests were to be observed by WS Atkins, advisor to the London Borough of Southwark and the Corporation of London, and Professor John Newlands of Cambridge University on behalf of the Millennium Bridge Trust. They were seen as the final hurdle before the £18M crossing could be re-opened.

But last week, without any publicity, Arup put 700 of its own staff onto each of the three spans in turn, in a larger scale repeat of an earlier series of tests which had satisfied the Arup team that its damping concept would work (NCE 22 February 2001).

On Tuesday this week (29 January), in an exclusive interview with *NCE*, Arup chief

executive Bob Emerson said the bridge had performed "better than expected".

He added: "In the absence of any performance criteria in current bridge codes we had long since agreed with our client's advisors to use figures for maximum lateral accelerations similar to those specified for office buildings.

"Last week it was impossible to see any lateral movement – and, although there was some very slight vertical movement on the southern span, the tie-down dampers there were only moving 1mm."

Readings from 24 acceleration sensors on the crossing provided the final reassurance to Arup last week.

Similar readings from this week's test will be studied by the client's advisors before a final decision on re-opening the bridge is taken.

Paying tribute to the "great job" done by Cleveland Bridge and the American and German damper suppliers, Emerson added: "We believe that this is the most onerous test ever applied to any footbridge anywhere. Results from this and previous tests will be fed into the appropriate bridge code committees.

Source: NCE, 31 January 2002
<http://www.nceplus.co.uk>

Bridges need repair 'to prevent another Selby crash'

Up to 200 bridges across railway lines need urgent repair work to prevent another crash like the one which prompted the Selby disaster, an engineer warned today. Professor John Knapton, from Newcastle University, said cash shortages and confusion about responsibilities were delaying vital safety work. "If action is not taken there will be a repeat of Selby. It's just a question of when," he said.

"Many bridges do not have barriers. Instead, the only thing to stop a car plunging on to the tracks is something not much stronger than a garden fence."

Cars and lorries normally end up on rail tracks several times a year following accidents, he said.

"It was only the Selby crash that brought our attention to this problem, but we now realise it is something we need to address urgently."

Prof Knapton, who has conducted research into the problem following the Selby crash, said 200 bridges were dangerous and another 500 needed work. It would cost £10 million to make them all safe.

The Government should take responsibility for organising the work because confusion over whether the Highways Agency or local authorities were responsible was causing a hold up, he said.

One of the bridges in need of repair crosses the line where the Selby crash claimed 10 lives last February.

Gary Hart, from Strubby, Lincolnshire, was jailed for five years after his Land Rover plunged off the M62 and on to the East Coast mainline last February near the North Yorkshire village of Great Heck. Moments later, a GNER express, travelling from Newcastle to London, smashed into the Land Rover and derailed before colliding head-on with a fully-laden coal train.

Source: PA News, by Tom Kelly
29 January 2002

Strongwell's largest FRP beams used for Virginia vehicular bridge

The Virginia Department of Transportation (VDOT) officially opened its new fiber reinforced polymer (FRP) bridge in Sugar Grove, Virginia on October 23, 2001. The FRP superstructure utilized eight (8) of the 36" deep x 18" wide Extren DWB™ beams manufactured by Strongwell Corporation of Bristol, Virginia to provide an AASHTO HS-20

reated bridge capable of carrying full tractor-trailer traffic.

Source: Advanced Materials & Composites News, Vol. 24, No. 2, Issue-531, 21 January 2002
Contact: sloud@compositesnews.com
<http://www.compositesnews.com>

American Concrete Institute 2002 Seminars Involving Fibers or FRP Composites

The American Concrete Institute has scheduled seminars in the spring of 2002 on a variety of concrete-related topics throughout the United States.

All seminars provide the latest information for the specification, design, testing, and construction of concrete for government agencies, engineers, architects, contractors, specifiers, designers, material suppliers, building inspectors, testing agencies, and all others involved in concrete design and construction. All seminar participants receive free publications related to the seminar topics.

For more detailed information contact the ACI website:
www.aci-int.org/ads/Promo.asp?SourceID=3&DestID=36&pc=SPO2.

Source: Steve Loud's Composites eNews - Abstract edition, Vol. 3, #3, 20 January 2002

Wood-Plastic Composites: A Sustainable Future

14-16 May 2002, Renaissance Penta Vienna Hotel, Vienna, Austria

AMI is pleased to announce the launch of another innovative event, which aims to offer a comprehensive itinerary covering the latest developments in natural fibre-based plastic composites.

ALL are Organized by Applied Market Information Ltd in Bristol, England.
Website: www.amiplastics.com

Source: Steve Loud's Composites eNews - Abstract edition, Vol. 3, #3, 20 January 2002

No Record That NY Jet Damaged in Storm

Airbus has no record that the A300 jet that crashed in New York last November was damaged in a storm before it was delivered to American Airlines, an Airbus spokeswoman said on Wednesday.

Full story:
<http://www.netcomposites.com/news.asp?1051>

Source: NetCompositesNews, 11 January 2002
Contact: news@netcomposites.com
<http://www.netcomposites.com>

United Airlines finds flaw in Airbus plane tail: Raises Questions About Composite Makeup

WASHINGTON, Dec 13 - United Airlines said on Thursday it had detected evidence of a flaw in the vertical stabilizer on one of its Airbus planes, raising more questions about the composite makeup of the tail fin on an aircraft that crashed in New York last month, killing 265 people.

Airbus and United said evidence of a flaw was revealed during recent ultrasonic tests in an area where the tail connects to the fuselage. The defect was described as a possible tiny ply separation within layered carbon fiber. David Venz, a spokesman for Airbus, said the problem was in the rear section of the tail structure in an area that did not support the weight of the stabilizer. Learn more on this in <http://www.e-composites.com/commonfiles1/news.asp> de tailed newsletter.

Source: *CompositesWeek Newsletter no. 51, 17 December 2001.*

Contact: editor@e-composites.com

Airbus Composite Tail Defect Found At United Airlines

United Airlines said 13 December that its mechanics have detected a flaw in the carbon fiber and epoxy composite vertical stabilizer on one of the Airbus A320 aircraft in its fleet (built in 1994). The vertical fin is similar, though smaller, to those on the twin-aisle A300 that crashed in New York, American flight 587. The inspections were requested by the FAA.

Airbus spokesman David Venz advised that the problem was located in the aft area of the tail fin in an area that did not structurally support the mass of the stabilizer.

United and Airbus stated that evidence of a flaw was detected during ultrasonic NDT tests in the area where the tail fin is attached to the fuselage. The defect was described as a possible, small separation in the plies of the carbon fiber prepreg composite.

NASA Langley is one of the organizations inspecting the wreckage of AA587's tail fin and rudder and whether there are any composites issues involved.

Another accident theory being investigated is whether the pilots may have maneuvered the rudder in a way that overstressed the vertical fin during the wake turbulence event at the time of the New York crash. Both Airbus and Boeing are said to have alerted American Airlines that its crew training involving use of the rudder could be too stressful and that the vertical fins were not designed for such loads.

Source: *Composite eNews #44, Abstract Edition, Vol. 2, 13 December 2001.*

Contact: composites@compuserve.com

<http://www.compositesnews.com>

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http://www.europa-club.com/default_nl.htm

You can submit your URL in return for a backlink from your page for free.

From: 520069728606@t-online.de

Workshop Held to Discuss Next Wave of Composites

About 60 representatives from over 35 governmental and industrial organizations across the nation met in Tallahassee, Florida in December to discuss the future of the composite industry.

Full story:

<http://www.netcomposites.com/news.asp?1039>

Source: *NetCompositesNews, 21 December 2001*

Contact: news@netcomposites.com

<http://www.netcomposites.com>

NTSB Reveals Flight 587 Failures

The components that keep an airplane's nose up and the aircraft from swaying failed to work during a preflight check of American Airlines Flight 587, the National Transportation Safety Board reported Tuesday.

Full story:

<http://www.netcomposites.com/news.asp?1034>

Source: *NetCompositesNews, 21 December 2001*

Contact: news@netcomposites.com

<http://www.netcomposites.com>

Folding Hall Well Insulated And Friendly To The Eye

Take a piece of cardboard and fold and cut it with diamond shapes in a pre-designed manner and it only takes small effort to create an arch. Rik Brouwer of the Centre for Lightweight Structures TUD-TNO, the Netherlands has designed a construction with large sandwich panels, which has the same effect. The Institute would like to make efficient buildings in this manner, like sports halls, exhibition halls, factories, garages. The ease of building and dismantling allows also semi-permanent use such as winter roofing of sport facilities.



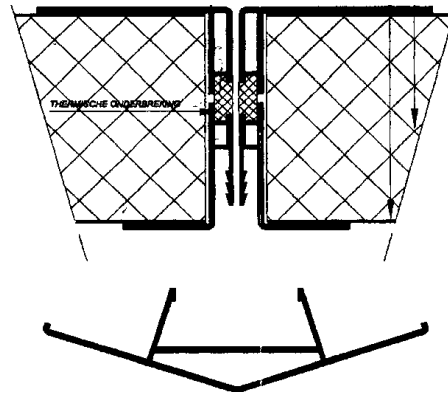
These structures have off course been used before, but the use of plastics in those days was labor intensive, and the plastics were expensive and not durable.

Nowadays composites are able to withstand the wheel of time and sandwich panels are affordable standardised products. The following design is a result of research, a triangular sandwich panel with inner- and outer skin of each 1 millimeter thick composites, with in between an 8 centimeter thick polystyrene core. All this is glued together with two-component glue, which controls the friction between the panels.

The edges of the panels have aluminium extrusion profiles, which are used to click the different panels together. A rubber

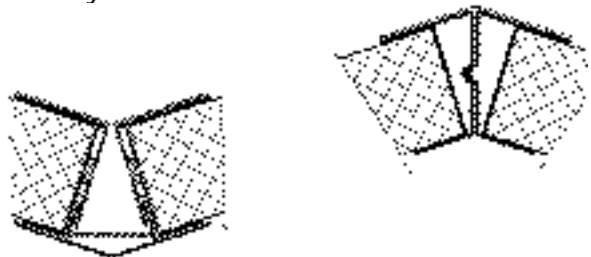
profile takes care that the structure does not leak water.

The profiles can also be made of composite pultrusion profiles. This would give better heat insulation. On the other hand more detailed work can be realised in aluminium. An example of the hinge system for the connections of the profile can be seen in the below sketches.



Above the components before assembly. The panels can be transported flat.

Below you find the panels when constructed, left in 'valleyfold' and right in 'mountainfold'. The hinge is realised by a fiber reinforced elastomeer, which is welded on the top of the panels. This is a very usual procedure for roof layers.



These halls will be more expensive than the well-known Romney-version. However this system is well isolated and has a stronger architectural look.

Contact: r.brouwer@lr.tudelft.nl

Source: Cobouw (Technical Daily), 21 December 2001

*Contact: cobouw@wkths.nl,
<http://www.cobouw.nl>*

"Guidance for good Bridge Design"

FEB, the international federation for structural concrete, has published a guide to good practice, entitled "Guidance for good bridge design".

You will find this guide on the FIB-website:

<http://fib.epfl.ch/publications/fib>

under bulletin 9.

Maybe you will also be interested in Bulletin 14. For information on FIB-membership, please see above website.

The discount rate for COBRAE Members is 10 %.

If interested, please print out the order form you find on their website, fill in your details and fax it directly to FIB, quoting that you are an associate and/or member of COBRAE:

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Principia Partners Launches Practice on Polymer Wood Composites

Principia Partners, a leading global monitor of the natural/wood fiber-based polymer composites industry, has launched a practice on polymer wood composites. Full story..

<http://www.netcomposites.com/news.asp?1025>

Source: NetComposites News, 14 December 2001.

Contact: <http://www.netcomposites.com>

On The Road To Plastic Bridges In The UK

An innovative research project to test the performance of fibre-reinforced polymers (FRP) in bridge decks is being undertaken by the Highways Agency. The Agency is looking at new ways to improve the durability and reduce whole life cycle costs of road bridges across the United Kingdom, and at new technologies for bridge rehabilitation which can be applied rapidly and reduce traffic disruption. FRP has the potential to provide a cost-effective alternative to conventional materials used in construction, such as concrete and steel. It has the advantage of being strong, yet lightweight and is resistant to attack from de-icing salts. It has a track record in the aerospace and automobile industries and is already being used on footbridges and, in the form of bonded fabric and plates, for strengthening bridges on the trunk road network.

Source: Highways Agency Press Release published in Structures & Buildings Newsletter, 14 December 2001

http://www.highways.gov.uk/news/pressrel/notices/general/12_12_2001.htm

Innovation gives new life to old bridges Material was first used to strengthen airplane hulls

GRAYSON - The very notion of wrapping old bridges in polyester-thin fabric to make them stronger may sound absurd, but a University of Kentucky researcher isn't laughing. Civil engineering professor Issam Harik said a super-strong carbon fiber material may be the key to giving new life to the nation's aging bridges, of which about 30 percent are considered substandard by the Federal Highway Administration.

Crews gathered at one such bridge in eastern Kentucky recently to prove Harik's case. In what could have been mistaken for a beautification project, the workers glued thin sheets of the fiber to the girders of a 200-foot span across the Little Sandy River. Now, Harik said the bridge is stronger than when it was first built.

"If you were to ask people five years ago about using this material for bridge repair, they would have laughed at you," he said. The material, first used to strengthen the hulls of airplanes, has been slow to catch on in construction fields in the United States, where it has been available for a decade. State regulatory agencies have been slow to establish guidelines and bid specifications for engineers and contractors to follow when using the material on public projects, said Ali Ganjehlou, president of Advanced Building Materials Corp. in New York, which markets the material.

That's beginning to change as civil engineers such as Harik experiment with carbon fiber, which sells for \$7 to \$14 a square foot.

In Georgia, transportation officials are considering draft guidelines written by Georgia Tech professor Abdul-Hamid Zureick, who has been researching the material's benefits for bridge repairs.

"It's a promising technology," Zureick said. "There are still some questions about the long-term performance."

A bridge over Interstate 20 in suburban Atlanta was treated with the material three years ago. Zureick said the span still is standing strong.

Jim Simpson, a bridge analyst for the Kentucky Transportation Cabinet, said expanding the use of the material from aerospace applications to construction was not a giant leap.

"One of the big pluses of this fabric -- it will take any form or shape that you want it to," Simpson said. "It doesn't take its final form until it's laminated in epoxy."

The Japanese used the material to reinforce buildings against seismic activity. In the United States, engineers quickly identified

carbon fiber as a possible fix for aging bridges.

"This material is totally flexible," Ganjehlou said. "It is very thin sheets of carbon, like a fabric. It goes over any shape, any curve. Just imagine putting wallpaper on the wall. It's that easy to apply."

That was the case with the Kentucky bridge, Harik said. The carbon fiber was glued in place with epoxy, then coated with an additional layer of epoxy.

"The state would have had to repair the entire superstructure in the next three to four years," Harik said. "Cracks were growing at a fast rate. Now, we are confident that it will last at least 50 years."

Glenn Givan, chief bridge engineer in the state Transportation Cabinet, said the Grayson span was the first in Kentucky to receive the treatment. It will be closely monitored, but Givan said the method already has been proven in other states as a viable option for bridge repairs.

"It has potential," Givan said. "The economic benefits would have to be weighed in a case-by-case basis."

The cost of repairing the Grayson bridge was less than \$100,000, Harik said. To replace the bridge in three to four years would have cost \$300,000 to \$400,000.

"The cost is not only the bridge replacement. It's also inconvenient to motorists. In order to replace that bridge, the road would have to be closed. With this repair, we did not stop any traffic."

Harik said many people can't believe that a bridge can be repaired with a thin fabric.

"But when I tell them the strength of it, then they reconsider their opinion," he said.

A carbon fiber thinner than a human hair will break at about 1 million pounds of pressure per square inch, Ganjehlou said. In comparison, steel used in reinforcing bridges, he said, breaks at about 90,000 pounds per square inch.

A number of states, including California, New York and Florida, have started using the material on bridges. Ganjehlou said the material has become the option of choice for repairing steel and concrete pillars damaged when struck by trucks beneath overpasses.

In eastern Kentucky, Harik used similar material to reinforce two pedestrian bridges, one across Clear Creek in the Daniel Boone National Forest, another across the Big Sandy River in Johnson County. Ganjehlou said the material also has been used to reinforce light poles, repair boats, strengthen swimming pools and to make buildings more resistant to earthquakes.

Source: Messenger Inquirer, 2 December 2001

By Roger Alford, Associated Press.

Contact: webmaster@messenger-inquirer.com

Suppliers Of CFRP Laminates

Suppliers of CFRP laminates are (known to COBRAE office, please inform about other suppliers):

Fibreforce Composites Ltd.
Brunel Road
Clacton on Sea, Essex
GB- CO15 4LU
England
Tel: +44 1255 220 569
Fax: +44 1255 431 002
E-mail: sales@fibreforceclacton.co.uk

S&P Clever Reinforcement Company
Dammstrasse 2
CH- 6440 Brunnen
Switzerland
Tel: +41 41 825 0070
Fax: +41 41 825 0075
Info@sp-reinforcement.ch
<http://www.sp-reinforcement.ch>

Companies published in last COBRAE News:

Epsilon Composites
FRANCE

Exchem Mining and Construction
UNITED KINGDOM

Exel Oyj
FINLAND

Nedri Spanstaal
THE NETHERLANDS

Prince Fibre Tech
THE NETHERLANDS

Sika BV
THE NETHERLANDS

If your company is not mentioned in this list, please inform us by return e-mail and we will list you in the next issue of COBRAE news.

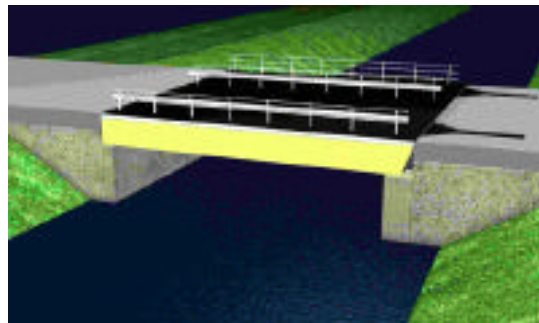
WWW

The following websites can be of interest:

NEW:

http://www.clc.tno.nl:80/projects/recent/bridge_deck.html

The testing of the bridge deck of a composite lift bridge. A study towards the feasibility of a composite lift bridge for heavy traffic.



<http://www.fhwa.dot.gov/discretionary/piib0103.htm>

Innovative Bridge Research Program

<http://www.ce.udel.edu/news/O2-2001/cibe.html>

University of Delaware

<http://www.strongwell.com/NEWS/currentnews.htm#dwb>

EXTREN DWB™ Planned for Infrastructure.

Strongwell has big plans for the 36" high x 18" wide EXTREN DWBTM, a carbon /glass hybrid composite double web beam.

More info on Strongwell bridges on:

<http://www.strongwell.com/NEWS/pastnews.htm#bridge>

<http://www.sika.com>

Technology and concepts for reinforcement of existing constructions with the Sika® CarboDur System

PREVIOUS:

http://www.ecgf.uakron.edu/~civil/com_p_eng.html

University of Akron
A new course in polymer composite structural engineering.

<http://www.fhwa.dot.gov/bridge/frp/>

FHWA, the USA Federal Highway Authority special page on composite bridges.

<http://www.fiberglass.com.hk/footbridge.htm>

The use of G.R.P. in footbridge covers is one of the excellent alternative materials.

<http://www.cerf.org/research/summary/composit.htm>

Downloadable report on 'Gap analysis for Durability of Fiber Reinforced Polymer Composites in Civil Infrastructure'

<http://www.ce.udel.edu/faculty/chajes/bridget.html>

Civil & Engineering Dept of the University of Delaware.

<http://iti.acns.nwu.edu/composites/lasalle.html>

LaSalle Street Composite Pedestrian Walkway

<http://www.bbrsystems.ch/Reference/Ref.htm>

Cable stay applications in bridges

<http://www.best.com/~solvers/bridge/home.html>

Bridge Engineering Home Page, create a link to your company

<http://www.cies.umr.edu/>

The Center or Infrastructure Engineering Studies

<http://www-civ.eng.cam.ac.uk/brg/>

University of Cambridge, Bridge Research

<http://www.gprmc.be>

GPRMC= European Composite Industry Association

<http://www.k3c.com/eng/content.htm>

Knowledge Circulation Centre Composites

http://www.mdacomposites.org/bridge_team.htm

Composites Bridge Team MDA

<http://www.shef.ac.uk/uni/projects/tmrnet/galleries/applications/figgett.htm>

ConFibreCrete, Development of Guidelines for the Design of Concrete Structures, Reinforced, Prestressed or Strengthened with Advanced Composites

<http://www.techwood.nl>

NEW Manufacturer of extruded wood/thermoplastic composite bridge decks for pedestrian and bicycle bridges.

<http://www.nedland.nl>

COBRAE

NEW ANNOUNCED EVENTS

BS8110: Design of Reinforced Concrete Structures

Get started in concrete design immediately. Learn to recognise the link between fundamental principles of structural

mechanics and BS8110, as well as how to design beams, slabs and columns in reinforced concrete to meet the requirements of BS8110.

Dates: 23-24 April 2002 - Ascot, UK
3-4 July 2002 - Bristol, UK
7-8 August 2002 - Glasgow, UK

<http://www.thomastelford.com/training>

Source: *Maritime & Offshore Newsletter*,
14 December 2001

Composites in Construction International Conference (CCC)

16-19 September 2003

University of Calabria, Italy
http://www.netcomposites.com/calendar_details.asp?104

Call for Papers:
2nd International Structural
Engineering and Construction
Conference (ISEC-02)

September 23-26, Rome - ITALY

Co-sponsors: CIB, ACI, and Italian Association for Reinforced and Prestressed Concrete (AICAP).

Promoted by: Italian Association for Building Industrialization (CTE).

Hosted by: University of Rome "La Sapienza".

Topics: All branches of structural, earthquake, construction, and geotechnical engineering; steel structures, ocean and coastal structures, industrial structures, bridges, tunnels, precast structures; structural analysis, structural damage assessment, hazard and risk management, performance of constructed facilities, etc.

Contact: Prof. Franco Bontempi,
Dept. of Structural and
Geotechnical Engineering,
University of Rome
"La Sapienza",
Via Eudossiana
I- 18-00184 Rome
ITALY

E-mail: franco.bontempi@uniroma1.it
or bontempi@stru.polimi.it

EVENT CALENDAR

COBRAE Activities

Initially 3 meetings per year. Other contacts through web and E-mail.

2002

February 9-11 April	Council Meeting Construction Forum at JEC	To be decided Paris, France
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2002

31 Jan - 1 Feb 2002 Rosenheim, Germany	Verbindungstechnik im Bauwesen Contact: http://www.iff-gmbh.de
7 - 9 February 2002 Chennai, India	International conference and exhibition on reinforced plastics - ICERP 2002 Contact: ramesh@xlweb.com, frpinst@xlweb.com
15 - 17 April, 2002 Southampton, United Kingdom	Advanced polymer composites for structural applications in construction (ACIC 2002) Contact: mb8@soton.ac.uk, http://www.cosacnet.soton.ac.uk/ACIC2002/ACIC2002.html

- 10 - 12 June 2002
San Francisco, CA, USA
3rd International Conference on Composites in Infrastructure
Contact: epd@engr.arizona.edu or www.az-icci.org
- 12 - 14 June 2002
Helsingør, DK
XVII Symposium on Nordic Concrete Research
Contact: ibi.ahlm@teknologisk.dk or www.itn.is/ncr/
- 14-17 July 2002
Barcelona, Spain
IABMAS'02: First International Conference on Bridge Maintenance, Safety and Management
Contact: iabmas02@cimne.upc.es,
<http://www.cimne.upc.es/congress/iabmas02/>
- 31 July - 2 August
Vancouver, BC, Canada
CSCE International Conference Short & Medium Span Bridges
- 11 - 13 September
Melbourne, Australia
IABSE Symposium "Towards a Better Built Environment - Innovation, Sustainability, Information Technology"
Contact: secretariat@iabse.ethz.ch or www.iabse.ethz.ch
- 23-26 September
Rome, Italy
2nd International Structural Engineering and Construction Conference (ISEC-02)
Contact: franco.bontempi@uniroma1.it or bontempi@stru.polimi.it
- 9 - 11 October 2002
Tokyo, Japan
3RD DIANA World Conference Finite Elements in Civil Engineering Applications
Contact: Tokyo2002@bouw.tno.nl or <http://www.diana.nl/Tokyo2002>
- 9 - 12 October 2002
Yokohama, Japan
SEWC Congress, Structural Engineers World Congress
Contact: http://sewc2002.gr.jp/english/e_right.html
- 13 - 18 October 2002
Osaka, Japan
FIB Congress; Concrete Structures in the 21st Century
Contact: fib2002@jpcsa.or.jp or www.fib2002.com

2003

- 18-20 February 2003
Cairo, Egypt
International Conference on Performance of Construction Materials in the New Millennium - "A New Era of Building"
Contact: icpcm@ucalgary.ca, <http://www.ucalgary.ca/~icpcm>.
- April 2003
Rotterdam, The Netherlands
Ultimate lightweight composite bridges
Contact: info@briskevents.nl or <http://www.briskevents.nl>
- 8 - 10 July 2003
Singapore
6th International Symposium on FRP Reinforcement for Concrete Structures (FRPRCS-6)
Contact: cvetankh@nus.edu.sg,
<http://courses.nus.edu.sg/course/cvetankh/internet/frprcs6>
- 27-29 August 2003
Antwerp, Belgium
IABSE Symposium
Contact: <http://www.iabse.ethz.ch>
- 16-19 September
University of Calabria, Italy
Composites in Construction International Conference (CCC)
http://www.netcomposites.com/calender_details.asp?104

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 750, - for the period 2001 until end 2002. In this time COBRAE will be an unincorporated association, which will be run by Ketel Consulting Agents B.V. in the Netherlands. The Euro 750, - is made up out of Euro 250, - for 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

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The Netherlands

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