

INFO TUA

Experts in steel solutions

Newsletter

N° 12

December 2005

Viewpoint

2005 is drawing to a close ... and it has been a successful year for Otua and for steel.

- Our website has seen a big increase in the number of visitors, with a record number of hits in October (almost 27,000) and, strikingly, unprecedented numbers of visitors to the sections dedicated to Engineering (and tool steels in particular).

- The activities that Otua has been conducting over a long period for the Environment in Construction are beginning to bear fruit:

- establishment of an Environment Committee for Otua members;
- publication of the first environmental and sanitary product declaration (relating to single-skin steel cladding);
- publication of "L'acier pour une construction responsable" ("Steel for responsible construction"), which presents steel's advantages with regard to the 14 targets of the High Environmental Quality programme.

- On the educational front, a few highlights to report: the production of the CD-ROMs "L'acier dans tous ses états" ("Steel production") 2nd generation, recognised by the Roberval Prize, and its children's edition; the "Steel and co" competition, organised in conjunction with FNSAI⁽¹⁾, which attracted 300 entries; the participation, with APK, in BTS teachers training in the Eurocodes. An important initiative, since the curricula will incorporate these European regulations at the start of the next academic year.

- There were numerous site visits and seminars which were much appreciated. The year concludes with the organisation, in conjunction with IUAV⁽²⁾, of Footbridge 2005 in Venice. And above all the organisation, with technical support from Sêtra, of a workshop on the dynamic design of footbridges to take account of pedestrian behaviour.

For 2006, our objectives remain ambitious. In particular, we will further increase our contacts with construction sector specifiers, with regard to three major subjects: rehabilitation, offices and industrial buildings.

Happy New Year to you all and keep reading InfOtua for detailed reports on our progress and the progress of steel.

Joëlle Pontet

MANAGING DIRECTOR OF OTUA

(1) French National Federation of Associations of Interior Designers

(2) Venice University Institute of Architecture

Construction

TWIN TOWERS AUTOPSY: STEEL EXONERATED

Steel is not implicated in the collapse of the Twin Towers in New York on 11 September 2001. This is one of the conclusions of the report of the National Institute of Standards and Technology (NIST), the final version of which was published in October 2005. According to this report, on which more than 230 experts in this field worked for 3 years, the towers were well-designed and the steel was correctly used and protected. But it could not withstand the combined effect of the impact and overheating. We look back at the three technical sequences involved in the collapse.

1° The planes' impact on the towers destroyed or substantially deformed many facade columns and parts of some floors. It also damaged columns in the central core. Consequently, the structural elements that remained intact experienced a substantial increase in loading.

2° The resulting fires led to the overheating of structural elements (beams, floors, columns), which was particularly severe in certain cases because their protection had been destroyed or damaged. Those structural elements that were no longer protected attained temperatures in the order of 650/700°C, whereas they did not exceed 300°C in the columns that were still protected.

3° As a result of the severe overheating, the already overloaded columns lost their mechanical strength. As the floors deformed, they "pulled" the facades inwards, thus creating additional bending moments that the overheated columns could no longer withstand. Subsequently, the dynamic effect of the collapse of the upper storeys, storey by storey, resulted in the total collapse of the towers, after 56 minutes in the case of the south tower and 102 minutes for the north tower.

Briefing courtesy of Joël Kruppa of CTICM

FOR FURTHER INFORMATION:

Gérard Delassus TEL. : + 33 1 41 25 59 52

gerard.delassus@otua.ffa.fr

See also the NIST website <http://wtc.nist.gov>

New York's Twin Towers collapsed on 11 September 2001.

Four years on, a report by experts reveals that steel bears no responsibility for this tragedy.



■ Civil engineering: our members in the spotlight

Arcelor RPS: sections from A to Z

- Arcelor has 3 sheet piling production plants:
 - 2 hot-rolling mills at Belval and Differdange (Luxembourg).
 - 1 cold-rolling mill at Messempré (France).
- Arcelor RPS's speciality: hot-rolling of long products and cold-rolling of sheets to the desired form and dimensions, according to subsequent use and loadings.
- Standard grades: from S 240 to 430.
- Fields of application for sheet piling: maritime (dams, quay walls, cofferdams, gabions...), riverine (bank works, flood defences, launching slips...), land-based (underground car parks, embankment retaining walls, bridge abutments and piers, tunnel walls, sound barriers, urban development...).
- Customers: construction companies, contracting authorities and project managers throughout the world. Latterly, the largest French purchasers of steel sheet piling have been RFF (the Eastern France High Speed Railway) and the Provence-Alpes-Côte d'Azur region (for the work carried out following the floods of 2004).

DISCREET BUT EFFECTIVE: STEEL SHEET PILING

“Sheet piling”: if the term sounds familiar, the applications are less so. And for good reason: steel sheet piling is rarely visible in structures and sometimes employed in temporary works on construction sites. Manufactured by Arcelor RPS (Rails, Piles & Special Sections), this discreet product with highly specialised applications nevertheless offers many advantages in the field of construction.

Perhaps you have wondered how one goes about carrying out work on a bridge pier standing in water... The answer: using sheet piling. Interlinked, it forms a watertight steel wall – known as a “cofferdam” – which is driven into the river- or sea-bed around the pier. Then it is simply a matter of pumping the water out of the enclosure thus formed and working in a dry environment.

Often employed in temporary works on construction sites, sheet piling is also employed in permanent structures. For embankments or bank reinforcement, flood defences, retaining walls, bridge piers and abutments, tunnel walls, etc.

A practical, tailor-made, ecological solution

Steel sheet piling is characterised by rapid deployment, a small site footprint, and provides ecological construction solutions because it is recyclable. Installed along riverbanks, it retains the soil, thus facilitating the rooting of vegetation on the banks. Apart from its aesthetic aspect, this plant covering encourages fauna.

Sheet piling may be painted or trimmed with brick, wood, stone or vegetation. Its dimensions (up to more than 30 metres in height) and profile are tailored to the loading, the nature of the ground, the substance to be retained (soil, water, air...). The special expertise of Arcelor RPS lies in bespoke production in accordance with technical requirements. To this end, a team of engineers and technicians assists design engineers in the choice of the best solution (preliminary design, advice on deployment...).



A sheet pile is a long steel section provided, on each of its edges, with interlocks by means of which it can be connected to another sheet pile to form a continuous wall. It is available in various forms: flat, Z or U profiles. It may be hot- or cold-rolled.



Tunnel walls are one of the land-based applications of sheet piling.

Employed for bank works, sheet piling retains the soil, thus facilitating the rooting of vegetation and encouraging fauna.

“Cofferdams” are used when working on bridge piers. These walls of flat sheet piling are driven into the river- or sea-bed in order to create a watertight screen around the pier. Then it is simply a matter of pumping the water out of the enclosure in order to work in a dry environment.

FOR FURTHER INFORMATION:

Jean-Michel Vigo
TEL : 33 1 41 25 64 89
jean-michel.vigo@otua.ffa.fr

Also, visit the <http://www.sheet-piling.arcelor.com> website

photos: Arcelor RPS



Education - Training

THE CD-ROM "L'ACIER DANS TOUS SES ÉTATS" ("STEEL PRODUCTION") SHORTLISTED FOR THE 2005 ROBERVAL PRIZE.

In November 2005, the CD-ROM "L'acier dans tous ses états" ("Steel Production") was one of the 22 publications shortlisted for the Roberval Prize, also known as the French language prize for books and communication on technology.

Out of 355 entries this year (a record), 22 were shortlisted. The Otua CD-ROM was one of four shortlisted in the multimedia category. Awarded annually since its creation in 1986, this prize affords recognition to publications devoted to the presentation of technological knowledge to the layman in four categories: general public, higher education, television, multimedia. More than 200 experts from the world of industry, universities and scientific communication conduct an in-depth examination of each of the submitted works. Any technical inaccuracy is sufficient to reject an entry. For the works selected, shortlisting for this prize is therefore evidence of outstanding quality and attention to detail. For further information: <http://prixroberval.utc.fr/>



The Roberval prize was founded in 1986 by Compiègne University of Technology.

EDUCATORS EAGER FOR STEEL DOCUMENTATION.

In September 2005, Otua inserted a full-page advertisement in magazines for educators (TDC - Textes et Documents pour la Classe - and JDI - Journal Des Instituteurs), presenting its educational documentation relating to steel: CD-ROMs, videos, magazines... This advertisement did not go unnoticed: several hundred requests have since arrived at Otua, coming from teachers, librarians, pupils... from primary, secondary and high schools, from France and abroad. It is to be hoped that large numbers of young people will catch the steel bug.

STEEL & CO INSPIRES INTERIOR DESIGN STUDENTS

The competition launched by Otua on the use of steel in interior design met with great success. More than 300 applications received and 98 actual entries, from which a technical committee consisting of journalists, interior designers and Otua members selected 15 projects in November 2005. The shortlisted candidates will present their project at the Paris Furniture Fair, where the awards ceremony will take place on 6 January 2006.



From the 98 projects submitted, a technical committee shortlisted 15.

FOR FURTHER INFORMATION:

Valérie Dusséqué TEL : + 33 1 41 25 83 61
valerie.dusseque@otua.ffa.fr

Sustainable Development

REGULATION ABOUT ENVIRONMENTAL AND SANITARY CONSTRUCTION PRODUCT DECLARATION : EUROPEAN DEVELOPMENTS

The first "Construction Environment Committee", established by OTUA for the benefit of its members, was held on 12 December 2005. Among the subjects discussed was the progress of European standardisation relating to environmental and sanitary declarations for construction products. A presentation by David Amadon of AFNOR, the key points of which he summarises here.

Major economic implications

First and foremost, European standardisation regarding the environmental and sanitary characteristics of construction products has economic implications. It is a question of harmonising practices, references and specifications in order to facilitate these products' free circulation within Europe, irrespective of their country of origin.

France in the lead

France is well advanced in this field compared with other European countries.

In the 1990s, it established the Po1E standards committee, intended to promote the environmental quality of construction products and buildings. This committee's first undertaking related to the preparation of environmental and sanitary product declaration (FDES). This exercise – in which Otua collaborated – resulted in the publication, in December 2004, of an initial official standard (NF P 01-010), defining the principles applicable to the provision of information relating to the environmental and sanitary characteristics of construction products.

Putting French experience to good use in Europe

In their turn, CEN (European Committee for Standardization) and ISO (International Organization for Standardization) are addressing this issue (since 2002 in the case of ISO and from 2006 in the case of CEN).

France's preoccupation is to promote its practices, now covered by standards, because European standards are required to be incorporated in the catalogue of national standards, thus entailing the withdrawal of incompatible existing standards (whereas the adoption of ISO international standards, on the other hand, is entirely voluntary).

Involvement of stakeholders in the French construction sector is required

According to David Amadon, France is well-placed, since it provides the secretariat (AFNOR) and the chair (FFB - French Building Industry Federation) of the ISO technical sub-committee responsible for this work, as well as the secretariat (AFNOR) of the equivalent CEN technical committee. Nevertheless, to defend French interests, all participants in the construction sector must understand and take on board the implications of this standard development process and involve themselves in its progress, particularly by contributing to the drafting of environmental and sanitary product declaration and to their distribution.

FOR FURTHER INFORMATION:

Jean Dalsheimer TEL: +33 1 41 25 61 31
jean.dalsheimer@otua.ffa.fr

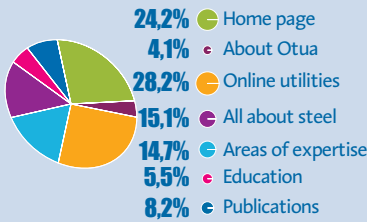


Construction products will soon be subject to the same environmental and sanitary requirements throughout Europe. The CEN (European Committee for Standardization) is working to this end.

Website Hits

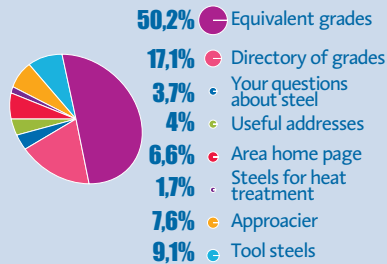
MORE SERVICES, MORE CONNEXIONS

Breakdown of visits to the website



Breakdown of visits to the "Services" section

(Figures at end October 2005)



More than 18,000 visitors per month! Visits to Otua's website increased by 10% between September 2004 and September 2005, reaching their peak in recent months. There were almost 27,000 visitors in October, a large number of them viewing the Millau viaduct video ("Expertises /Ponts et ouvrages d'art" section) and the "maison contemporaine" pages (see below).

Surfers like Otua's website. It must be said that it is regularly updated with:

- informational sections such as Steelguide, which takes the visitor on a worldwide voyage of discovery of steel buildings;
- document repositories: "tool steels", "physical data in respect of some steels in common use", "steels for heat treatment"...
- information repositories: the directory of steel grades, the surface treatments glossary, or the directory of surface treatments subcontractors;
- thematic case studies for comprehensive information on steel in design, welding or sustainable development in construction...

FOR FURTHER INFORMATION:

Cécile Guichard TEL : + 33 1 41 25 58 84
cecile.guichard@otua.ffa.fr

SURFING INTO STEEL HOUSES

On the Otua website, you will find the steel houses presented during the Contemporary Home Open Days, held in June 2005. They are sorted by region, with photos, the name of the architect, the cost of the work as well as technical information.

<http://www.otua.org/formation/maison-contemporaine/paris.htm>

FOR FURTHER INFORMATION:

Valérie Dusséqué TEL : + 33 1 41 25 83 61
valerie.dusseque@otua.ffa.fr

Thematic case study

WEATHERING STEELS



These steels, also referred to as steels with enhanced resistance to atmospheric corrosion and principally known under the Indaten and Corten brand names, fascinate architects. Otua regularly receives questions relating to the use of these grades, with their attractive protective patina. We have therefore decided to devote the next case study to this subject. Furthermore, you will find all the answers to your technical questions in the Expertises/Bâtiment section.

Available online by the end of the year at www.otua.org.

Diary

15 and 16 December 2005

International steelmaking conference in Paris

In particular, Otua, a co-organiser of this event, organised Session 4, on 15 December, entitled "Innovative steel construction solutions". The seven presentations featured in this session will soon be available on Otua's website in the "Expertises" section.

Just out at Otua

PUBLIC WORKS PLANET.

The "public works virtual museum" has just updated its Steel section with the contribution from Otua and Wasoodev Hoopah, a specialist consultant in civil engineering structures. This section refers to steel's ubiquity in public works and civil engineering structures, gives examples of completed projects and presents steel products and their utilisation. This website is published by Asco-TP (Public Works Promotion Association), sponsored by the Ministry of Infrastructure and the National Public Works Federation. <http://www.planete-tp.com/en/LesTechniques/Acier> section.

THE STEEL STRUCTURES REVIEW OUVRAGES MÉTALLIQUES NO. 4 – DUE TO BE PUBLISHED EARLY IN 2006.

The review is essentially devoted to footbridges, in France and around the world, echoing the Footbridge seminar held in Venice from 6 to 8 December 2005 which deals in particular with the question of the dynamic behaviour of footbridges under pedestrian loading.

CAHIERS DE L'APK NO. 41, IN DECEMBER 2005.

With, inter alia, a feature on "Steel and fire", and an illustrated presentation of PBOM (most attractive steel structure competition) award-winning structures from 1972 to 2004.

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OTUA
(OFFICE TECHNIQUE POUR L'UTILISATION DE L'ACIER)
IMMEUBLE PACIFIC - 11 COURS VALMY -
92070 LA DÉFENSE CEDEX (FRANCE)
<http://www.otua.org>