Imperial College London

EUROPEAN COUNCIL OF CIVIL ENGINEERS

Standing Committee on Education and Training,
Riga, 23 - 24 May 2008

EUCEET 3: WORKING GROUP H

DEVELOPING A SYNERGY BETWEEN ACADEMIC AND PROFESSIONAL WORLDS

BUILDING ON PREVIOUS WORK

- 2001: Synergies between Universities, Research Institutes, Industry and Public Authorities
- 2001: Challenges to the Civil Engineering Profession in Europe - Sinaia Conference
- 2002: Demands of the Economic and Professional Environments in Europe with Regard to Civil Engineering Education
- 2006: Enhancing the Attractiveness of the Civil Engineering Profession

AIMS OF GROUP H

- Development of a position on the Common Platform - not for EUCEET
- Review and update previous work; analyse nature of links
- Risk of repeating what has gone before
- Yet worth seeing if things have changed

NEW AIMS OF GROUP H

- What are the new things which involve Industry and support teaching and learning?
- Innovative Practice
- Industry/University interaction: bring together existing studies/reports as a concise literature survey
- Don't collect new data; we have plenty already

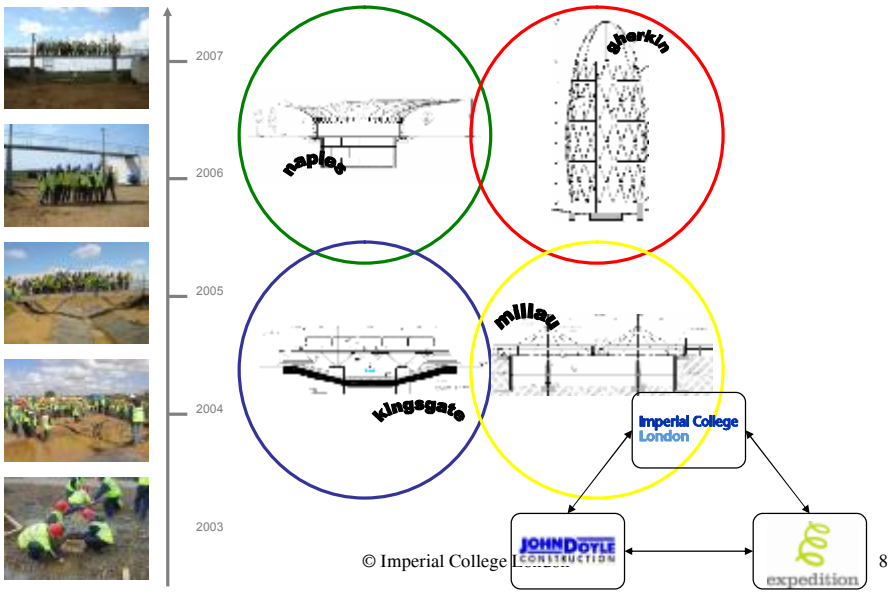
INNOVATIVE PRACTICE

- We want Industrial-University collaboration in support of teaching and learning
- Imperial has new, exciting initiatives for involving Industry in teaching
- Surely others do as well?
- Collect examples, collate, edit and publish as a best practice guide

THE CONSTRUCTIONARIUM

- A one week field trip where students build a real engineering artefact (to scale)
- Puts engineering theory into practice
- Develops skills: tools, building
- Involves Companies
- Simulates the construction process, both technically and contractually
- Theory meets design meets construction

Constructionarium 2007

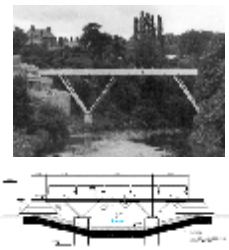


Kingsgate Footbridge

Kingsgate

Kingsgate Footbridge was designed by Ove Arup in 1967 and is a great example of a 'simple concept elegantly expressed'. It connects Durham University and the town centre across a steep gorge and had tight financial constraints - an economical, simple solution was essential.

In their scaled down version of the bridge, the students will have to ensure that the setting out of the steel supports meets very tight tolerances. The bridge consists of two precast segments that meet accurately in the centre to form a continuous structure.



Getting there ....

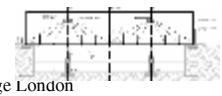
Finished!

Millau

Millau Cable Bridge

This 2460m long cable stay-bridge is on the A75 motorway between Clermont-Ferrand and Béziers in southern France. It stands some 275m above the Tarn River and consumed 72,000m^3 of concrete, containing 26,200 tonnes of reinforcing steel, and 40,600 tonnes of structural steel.

The student version will have an end span of 5m and middle span of 5m, 2 concrete piers (3.4m high) and 2 steel pylons (3m high) with a deck 1.5m wide (plywood). The challenge, apart from scale, will be to launch the two halves of the deck from each side, on schedule.



Early days …

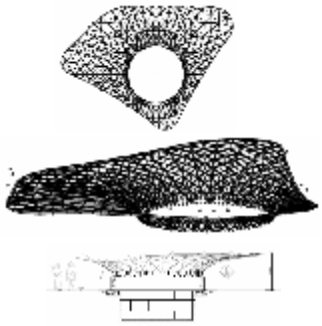
Getting there ....

Finished!

Naples

Canopy Roof Naples Airport Underground Station

Richard Rogers, Expedition Engineering and Italian Engineers are developing the design for a new transport interchange at Naples Airport. The structure has 46 main radial ribs which spring from the top of the station shaft giving a canopy area of 4,600m^2. It is a partial elliptical torroid reduced by engineers to a mere 18 elements without sacrifice of architectural integrity.



The students will build a canopy of 23 main radial ribs, the longest of which are 6m span. The access shaft is 4.5m diameter. Students will take the shaft down to tunnel access level and submit a method statement for opening up access to the tunnels. The challenge will be mass fabrication early in the project, whilst completing the concrete lining. This is the first timber Constructionarium project. Removal of the temporary supports will be a critical moment.

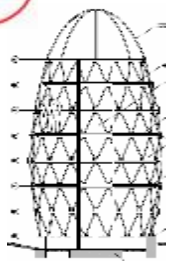
Early days …

Getting there ....

Finished!

Gherkin

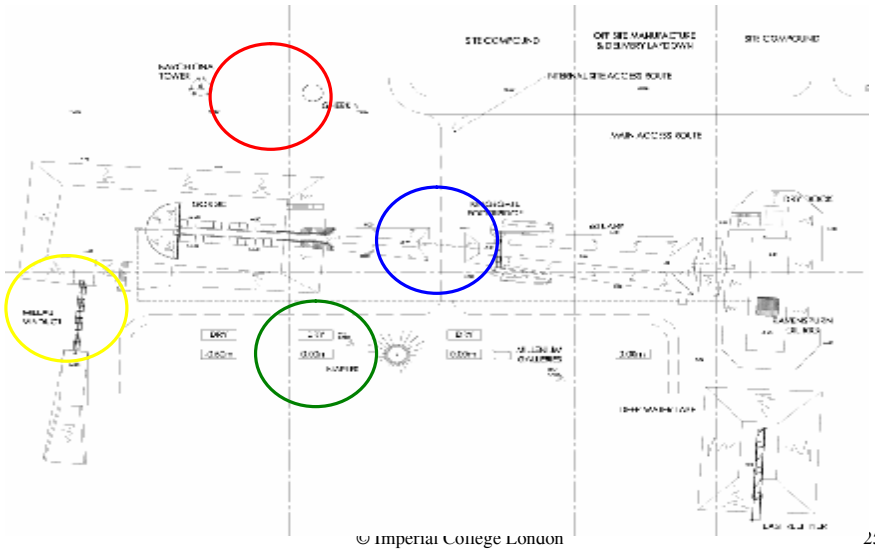
30 St Mary Axe -The Gherkin



This landmark 180m tall 40 storey office building in the heart of London's financial area was developed by Swiss Re. Foster and Partners with Ove Arup as the engineer who designed it. Its piles have a depth of 27m and the floor area is over 46,000m^2. The skeleton is made from 10,000tonnes of steel with 760tonnes of aluminium profiles supporting 46,000m^2 of glass and 34,000 m^2 of aluminium sheeting.

The students will build a three storey, 12m tall version using pre fabricated steel elements and tie in on site precast floor elements. Completion of the structure will be achieved by lifting the dome into place. Stability of the overall structure has to be ensured at all times.

site map



INDUSTRY-UNIVERSITY INTERACTION

- A much-studied topic
- UK: 17 Government, Professional Body reports plus technical articles, 2003-08
- Don't collect data again; look at what we already have
- One three-page report per country
- One author per country – involve ECCE?

SUMMARY

- Updating of work on ‘traditional’ links is under way
- Collection of examples of innovative new practice is under way
- Literature survey is under way for the UK
- Process of finding and nominating authors for other countries now begins – CAN YOU HELP US?
- The next instalment - Istanbul Sept 2008