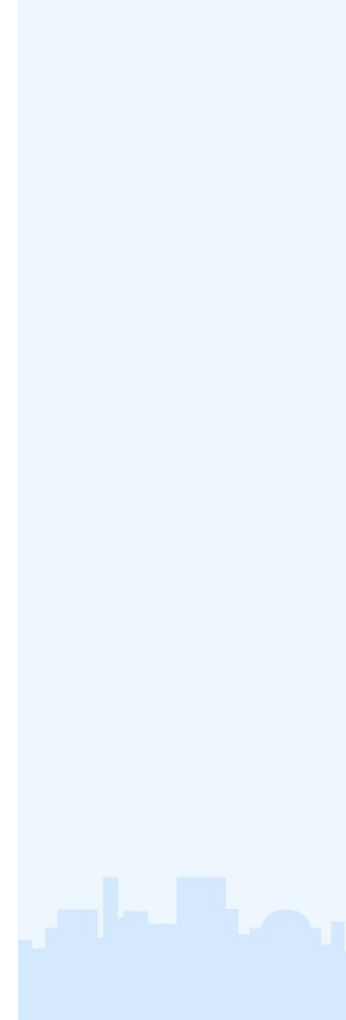




60th ECCE GENERAL ASSEMBLY

October 17 – 18, 2014

Warsaw, Poland





IT WAS A LONG WAY IN CIVIL ENGINEERING



ROMAN BRIDGE

MILAU VIADUCT



**1. THE
PRE-INFORMATIC
PERIOD**

(5000 YEARS AGO)

THE CONSTRUCTION SECTOR TODAY



THE STONE
Beam and column

(5000 YEARS AGO...)

THE CONSTRUCTION SECTOR TODAY



THE STONE

The arch

(2000 YEARS AGO ...)

THE CONSTRUCTION SECTOR TODAY



(150 years ago...)

**THE IRON /
STEEL**

THE CONSTRUCTION SECTOR TODAY



(70 YEARS AGO...)

THE CONCRETE

THE CONSTRUCTION SECTOR TODAY

AROUND 40 YEARS AGO...

2. THE INFORMATIC BIG-BANG

THE CONSTRUCTION SECTOR TODAY



YEARS

60s – 70s

DESIGN WITH MODELS

THE CONSTRUCTION SECTOR TODAY



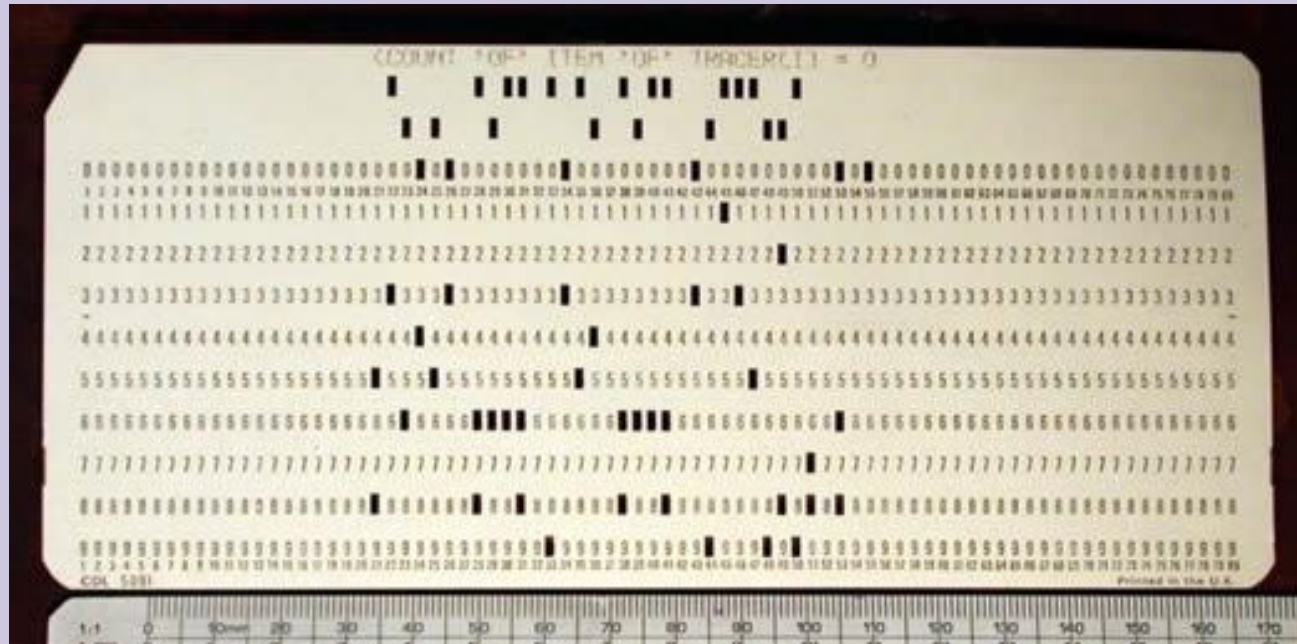
1970
ELECTRIC
CALCULATORS

THE CONSTRUCTION SECTOR TODAY



1960 - 1970
1st COMPUTERS

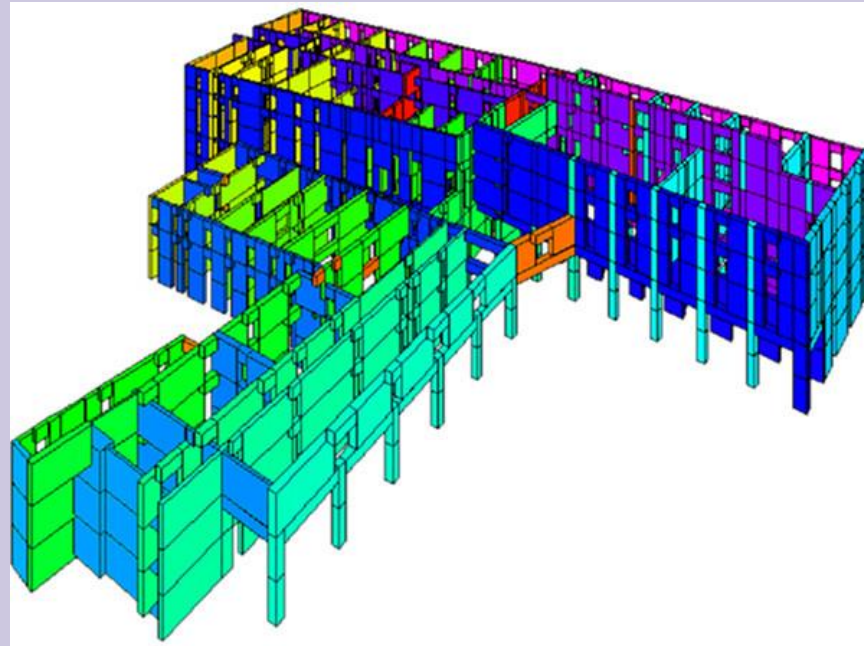
THE CONSTRUCTION SECTOR TODAY



WITH CARDS

1975

FINITE ELEMENT MODELS



THE CONSTRUCTION SECTOR TODAY



1985
The PCs
Macintosh
(with
windows)

THE CONSTRUCTION SECTOR TODAY



1986

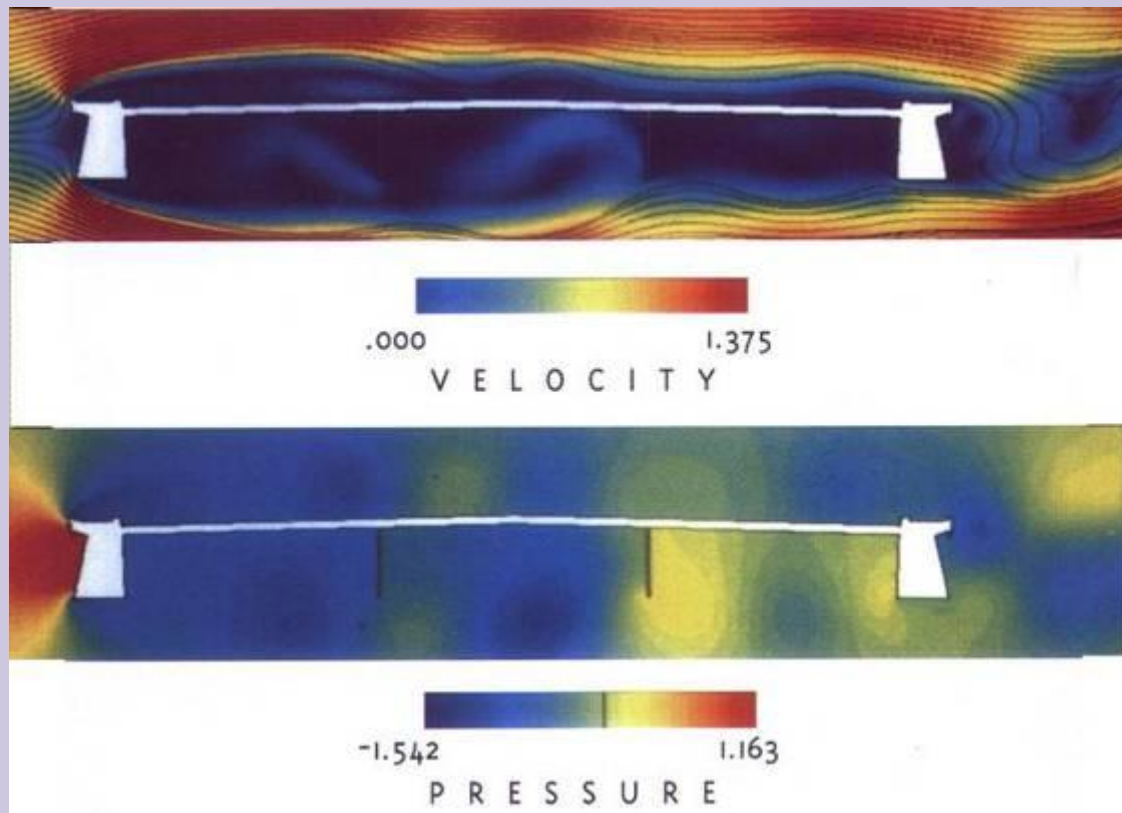


Arade and Guadiana Bridges

**3d FEM and dynamic
analysis**

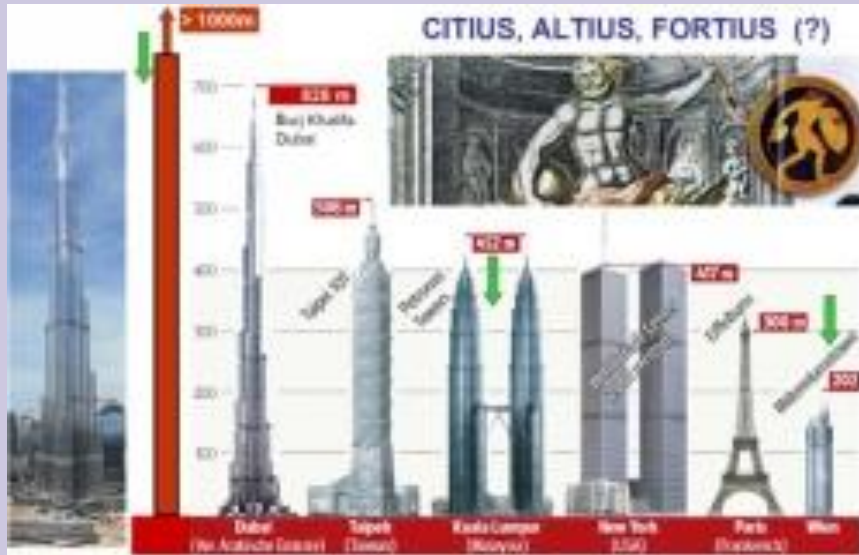
1990

Aerodynamic models



**3. AND THE
FUTURE ?**

THE CONSTRUCTION SECTOR TODAY



**HIGHER,
LONGER,
STRONGER**

THE CONSTRUCTION SECTOR TODAY



**BURJ TOWER
DUBAI
800m**

2008



THE CONSTRUCTION SECTOR TODAY

LONGER !



**Akashi-kaiko Bridge
Japan**

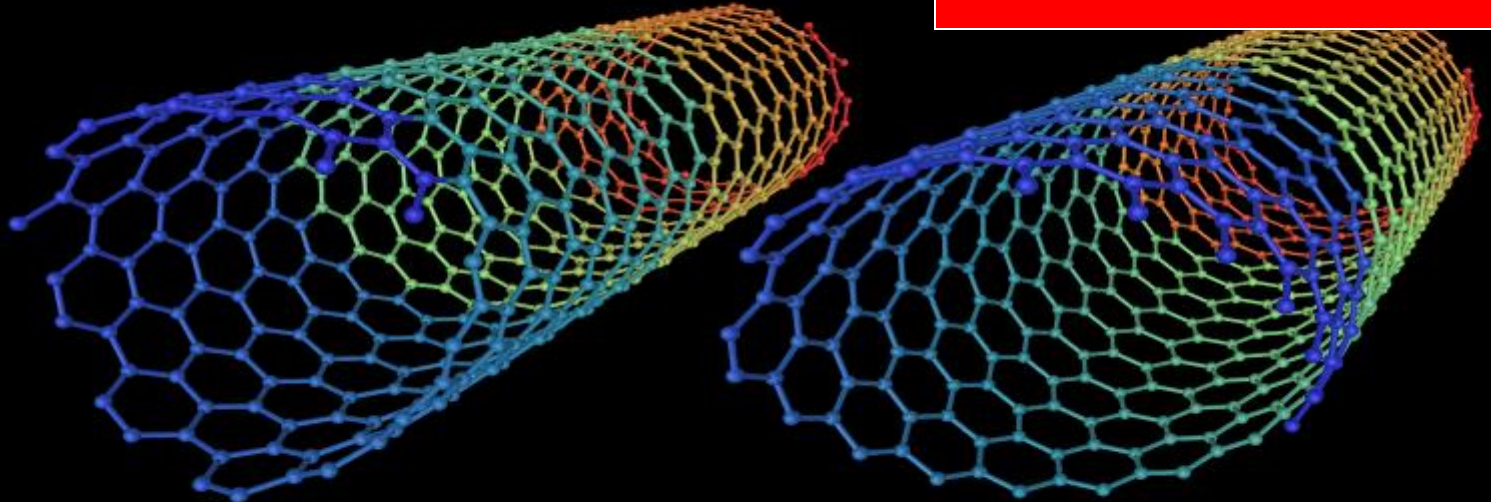
SPAN: 1991m, 1998

THE CONSTRUCTION SECTOR TODAY

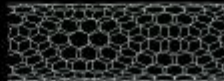
CARBON NANOTUBES

Fy= 60 GPa

STRONGER !



(7,10) nanotube
(chiral)



(10,10) nanotube
(armchair)



4. XXI Cent.

NEW CHALLENGES

THE CONSTRUCTION SECTOR TODAY

DURABILITY



THE CONSTRUCTION SECTOR TODAY

COMPOSITE MATERIALS



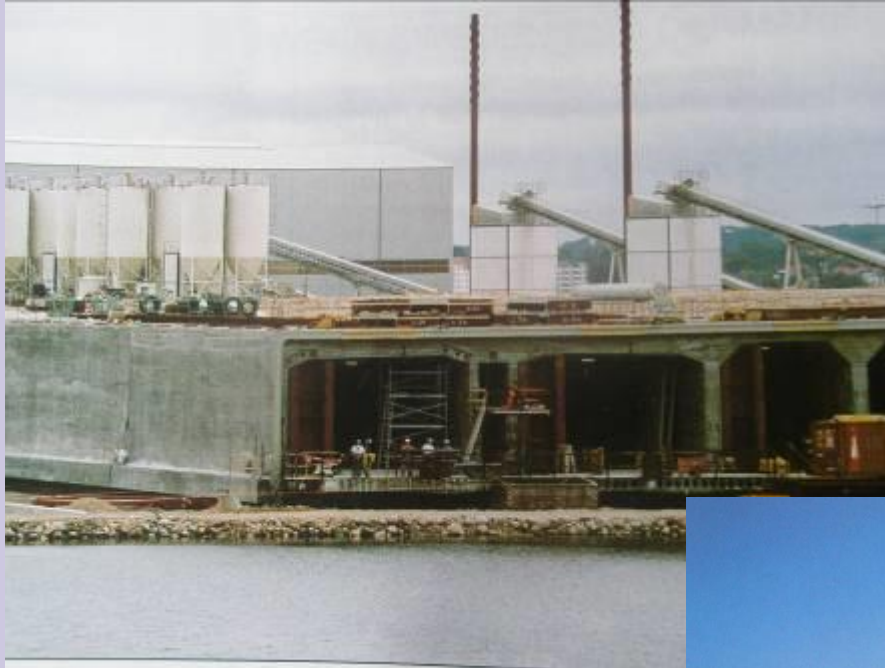
Kolding Bridge (Denmark)



Lleida Bridge (Spain)



THE CONSTRUCTION SECTOR TODAY



**NEW CONSTRUCTION
TECHNIQUES**

**SUBMERGED PRECAST
TUNNEL**

**CONST EQUIP.
FOR 2000 ton**



THE CONSTRUCTION SECTOR TODAY

CONSTRUCTION SUSTAINABILITY



**5. THE BUILDERS
OF THE FUTURE**

THE CONSTRUCTION SECTOR TODAY

**BUT FOR THAT WE NEED TO HAVE
CIVIL ENGINEERING STUDENTS !**





THE CONSTRUCTION SECTOR TODAY

**Engineering
your future**

ice
Institute of Civil Engineers

A career that builds a better world

Civil Engineering

Building a better
future

CAREER PATHS

in Civil Engineering

ASCE
American Society of Civil Engineers



THE CONSTRUCTION SECTOR TODAY

When I
grow up, 
I'm gonna be a
civil engineer. 



THE CONSTRUCTION SECTOR TODAY

... AND THEY WILL BUILD THE FUTURE



60th ECCE GENERAL ASSEMBLY



P O L S K A
I Z B A
I N Ż Y N I E R Ó W
B U D O W N I C T W A

