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STEEL IN STRUCTURAL RESTORATION 1

* **PROTECTION OF RESTAURATION SITES**

* **CONSERVATIVE RESTAURATION**

* **RE-USE OF EXISTING BUILDINGS :
The industrial archeology**

* **DRASTIC CHANGE
OF STRUCTURAL SCHEME**

**RESTRUCTURING
OPERATIONS**

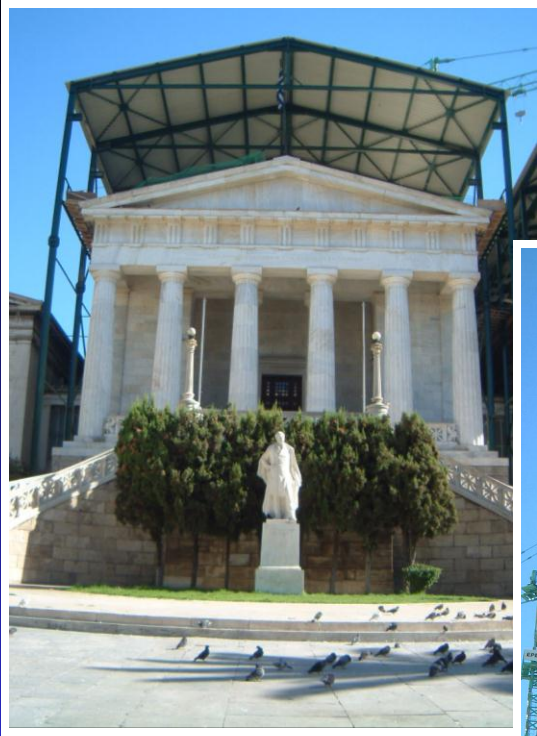


PROTECTION OF RESTAURATION SITES

PROTECTION OF RESTAURATION SITES



ATHENS : ACADEMY





LISBON :
Old buildings around
St.George castle

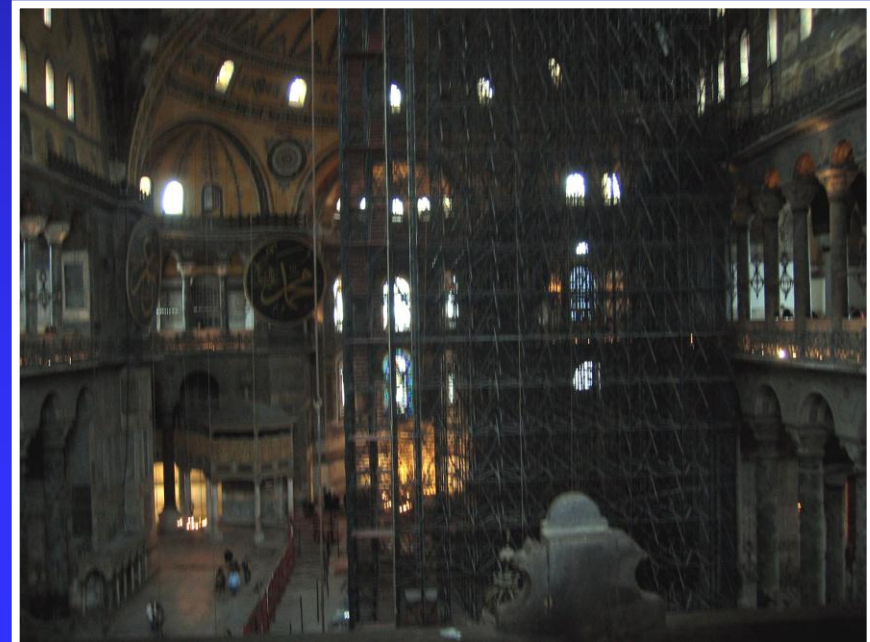


CATANIA: Historical centre





Santa Sophia (Istanbul)



**Le Fresnoy, Tourcing (France):
Centre National des Arts Contemporains
(Bernard Tschumi, 1991-1997)**





CONSERVATIVE RESTAURATION



Refurbishment of a building block (Bologna, Italy)



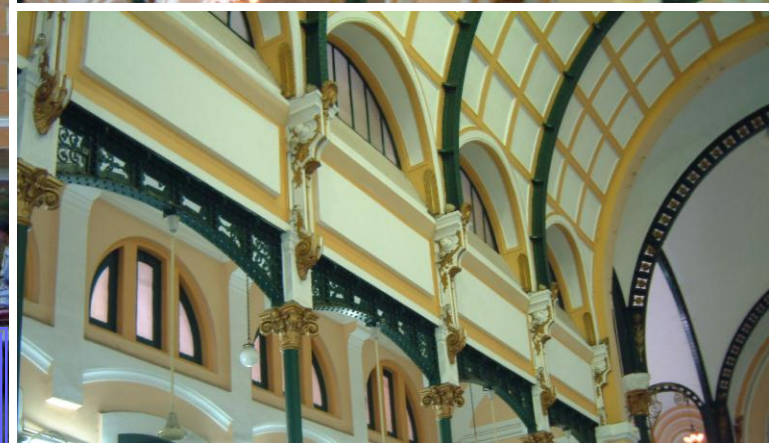
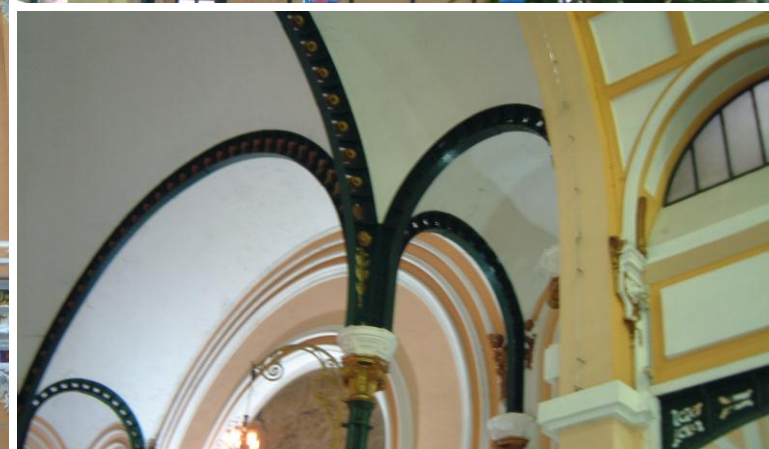
Refurbishment of a building block (Bologna, Italy)





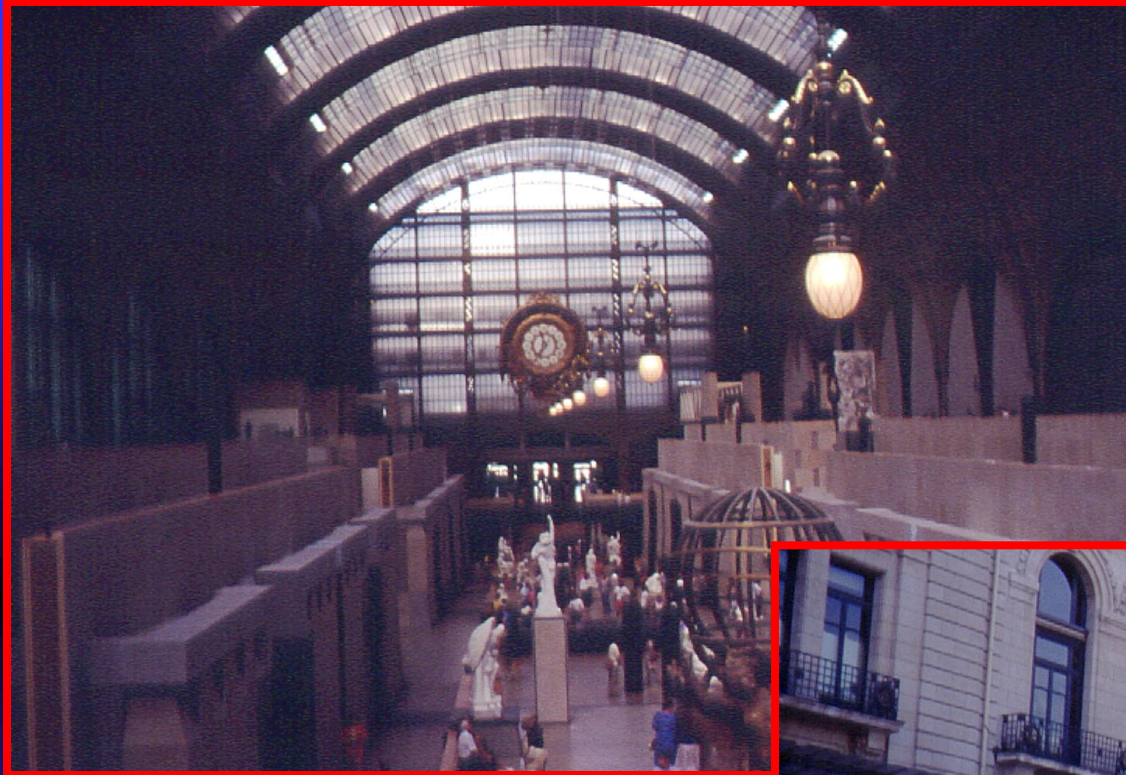
Bristol Hotel (Genova, Italy)





Post Office of Saigon (G.Eiffel)

THE MUSEUM OF MODERN ART IN PARIS



Gare d'Orsay - Paris
(Gae Aulenti)

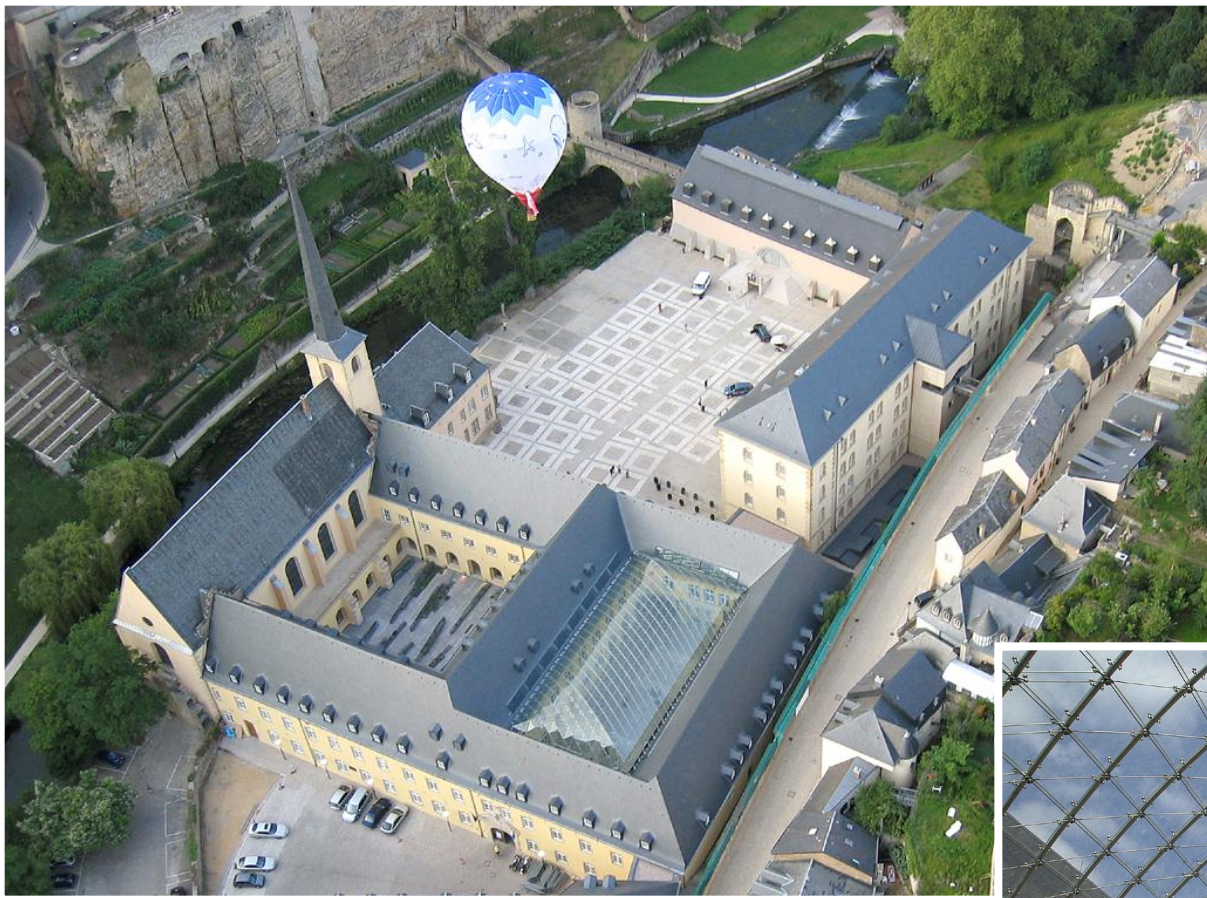
THE BRITISH MUSEUM IN LONDON



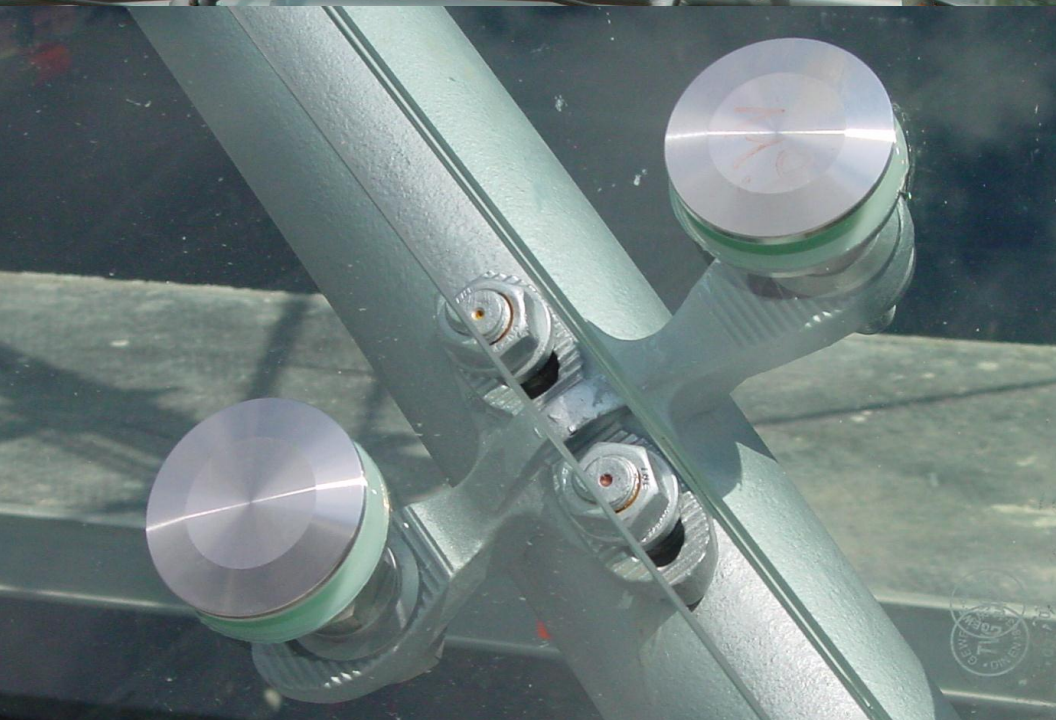
The inner court (Norman Foster, 2000)



Neumunster Glazed Roof, Luxembourg 1998-2003

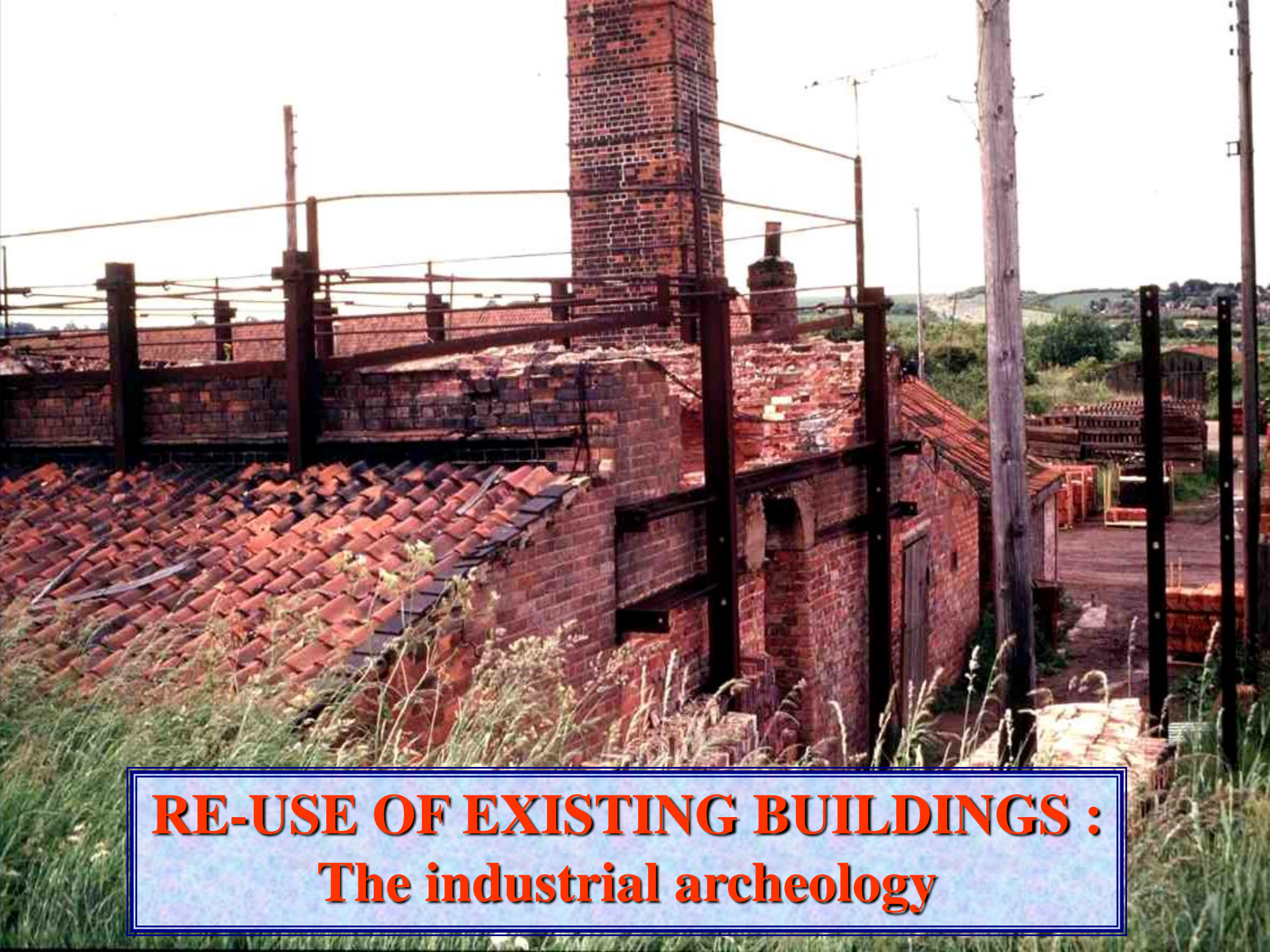


Neumunster Glazed Roof, Luxembourg 1998-2003



Details



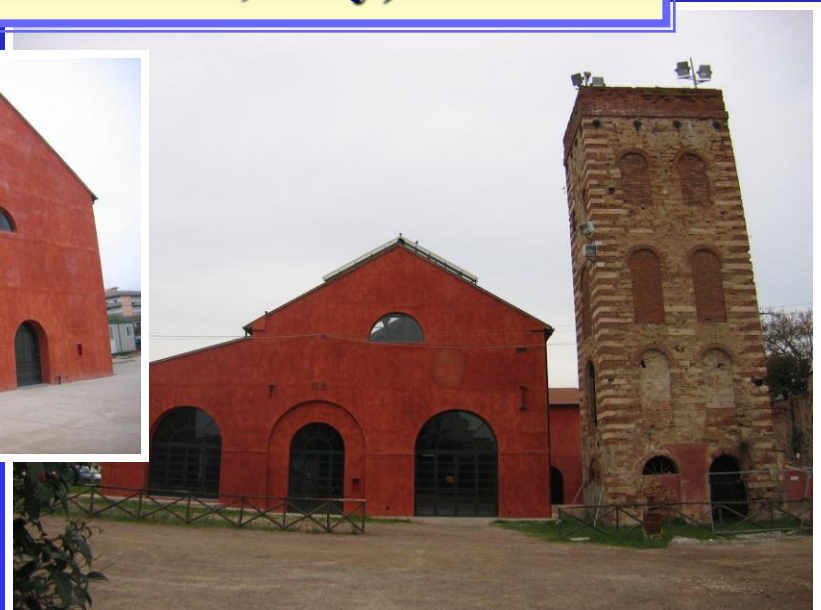


RE-USE OF EXISTING BUILDINGS :
The industrial archeology





Conversion of the cast iron mill into the Faculty of Maritime Biology (Follonica, Italy)



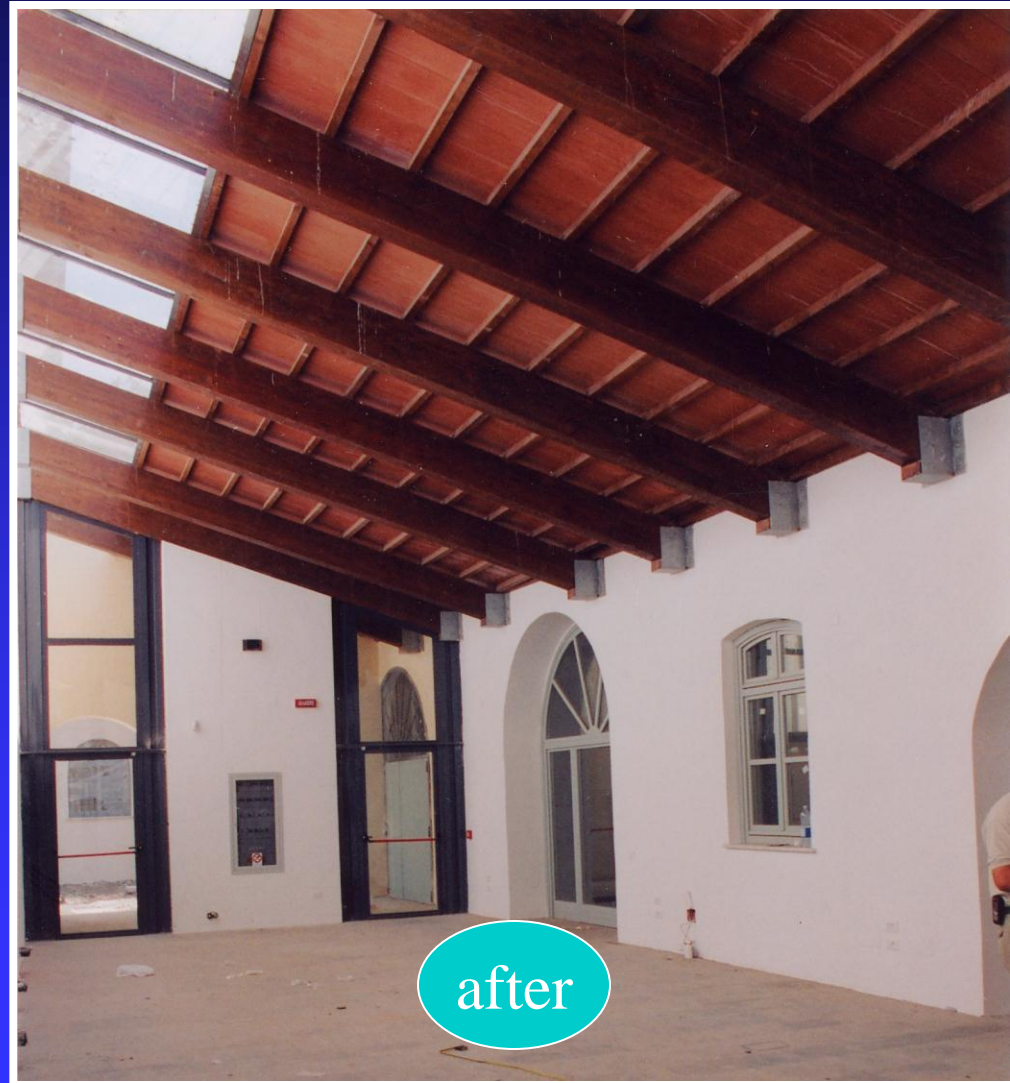
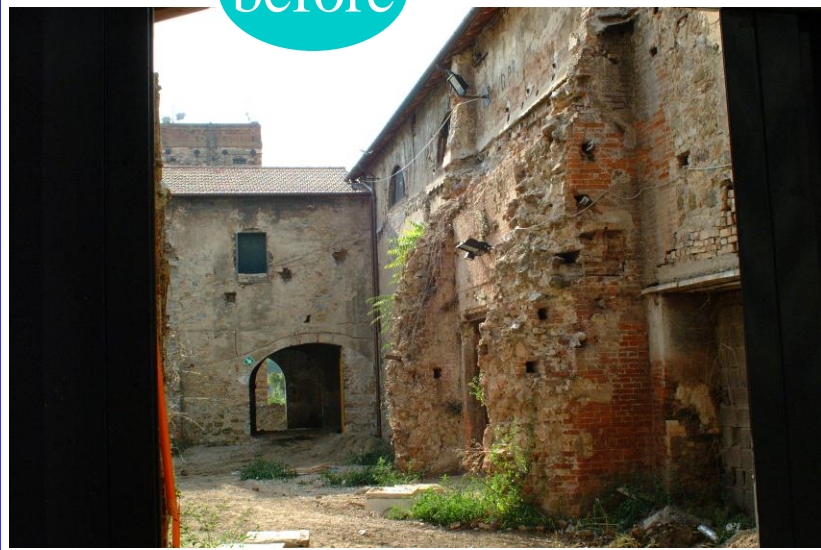
**Conversion of the cast
iron mill into the Faculty
of Maritime Biology
(Follonica, Italy)**



Conversion of the cast iron mill into the Faculty of Maritime Biology (Follonica, Italy)

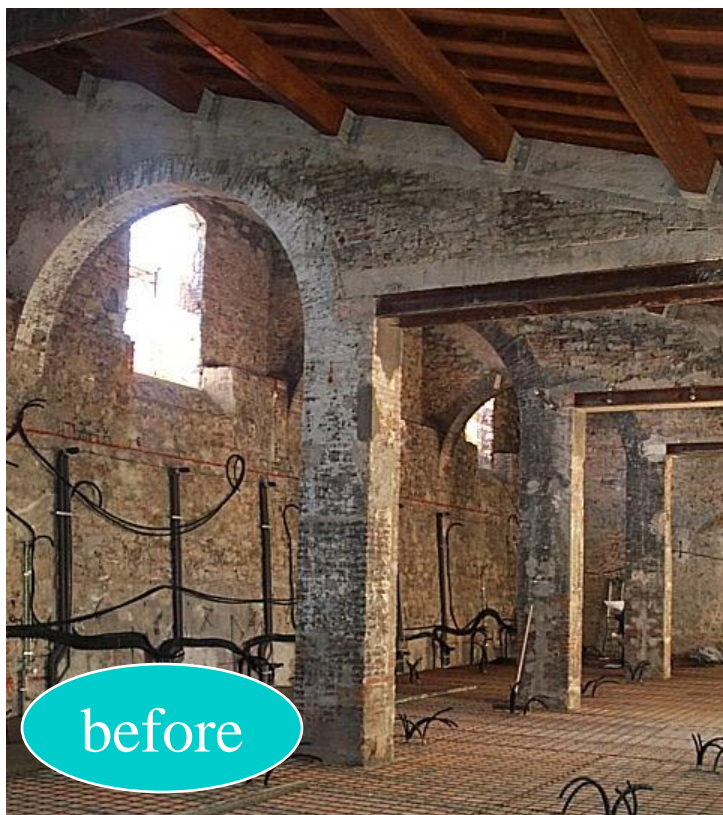


before



after

Conversion of the cast iron mill into the Faculty of Maritime Biology (Follonica, Italy)



before



after



Conversion of the cast iron mill into the Faculty of Maritime Biology (Follonica, Italy)

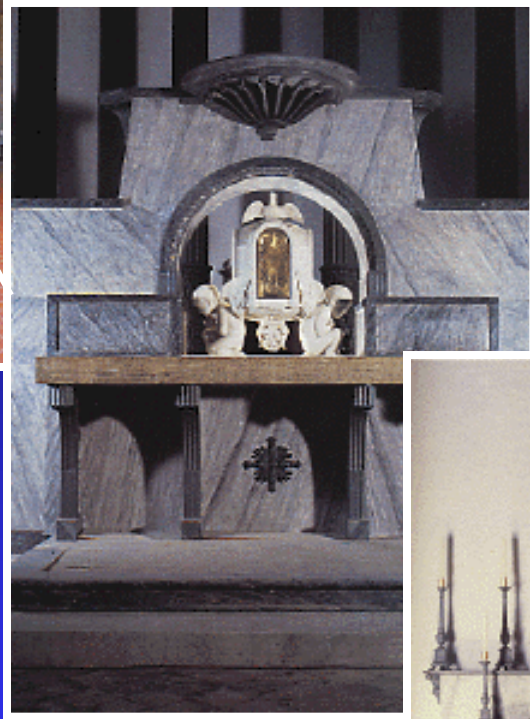
**The new building
for technological
plants (addition)**





**The church
of Follonica**

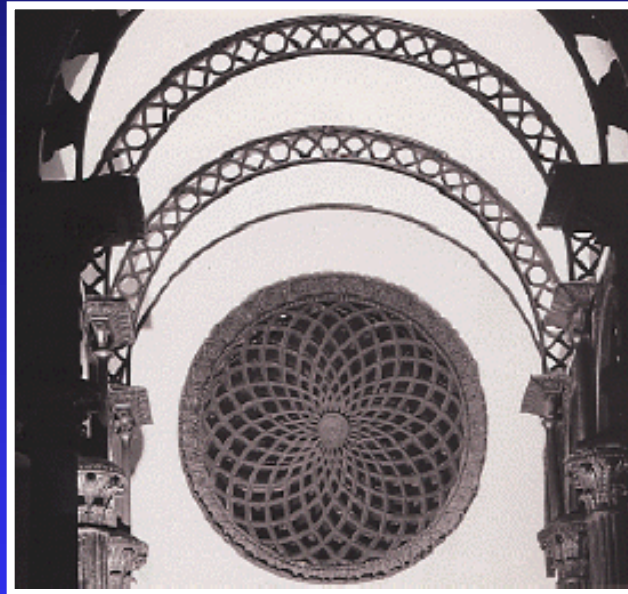
The inside of the Follonica church



The cast iron decorations

The bell tower of the Follonica church



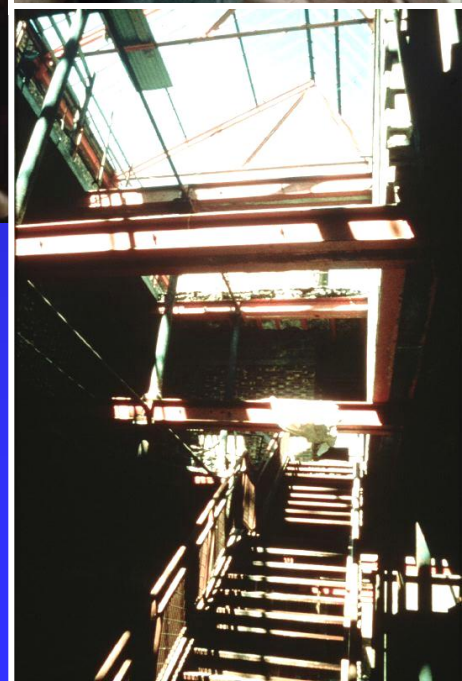


**The Follonica church :
cast iron details of the façade**



Conversion of an industrial building into an apartment building (Paris, France)





**Conversion of an industrial
building into an apartment
building (Paris, France)**



**Conversion of an
industrial building
into an apartment
building
(Paris, France)**



**Conversion of an industrial
building into an apartment
building (Paris, France)**



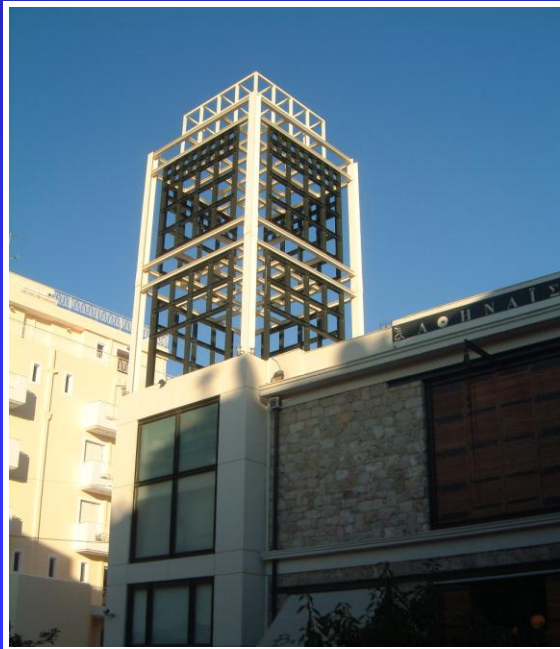
Conversion of an industrial building into an apartment building (Paris, France)



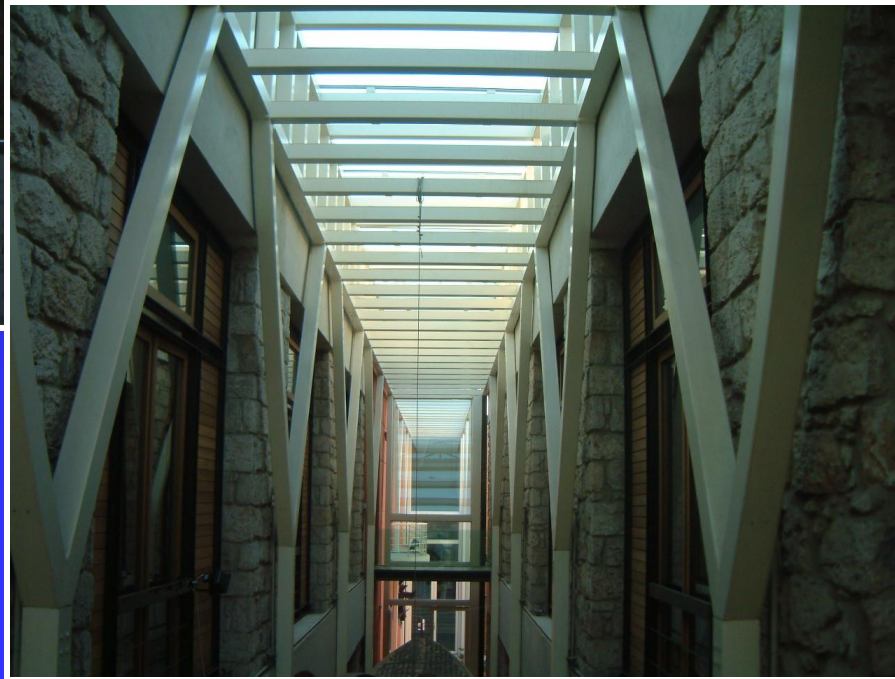
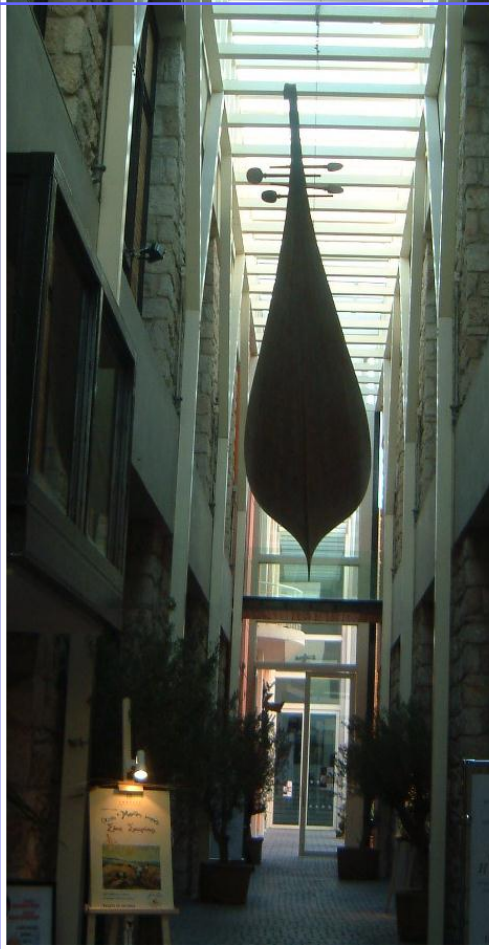
Conversion of a silk factory into a cultural centre (Athinais-Athens)



Conversion of a silk factory into a cultural centre (Athinais)



Conversion of a silk factory into a cultural centre(Athinais)



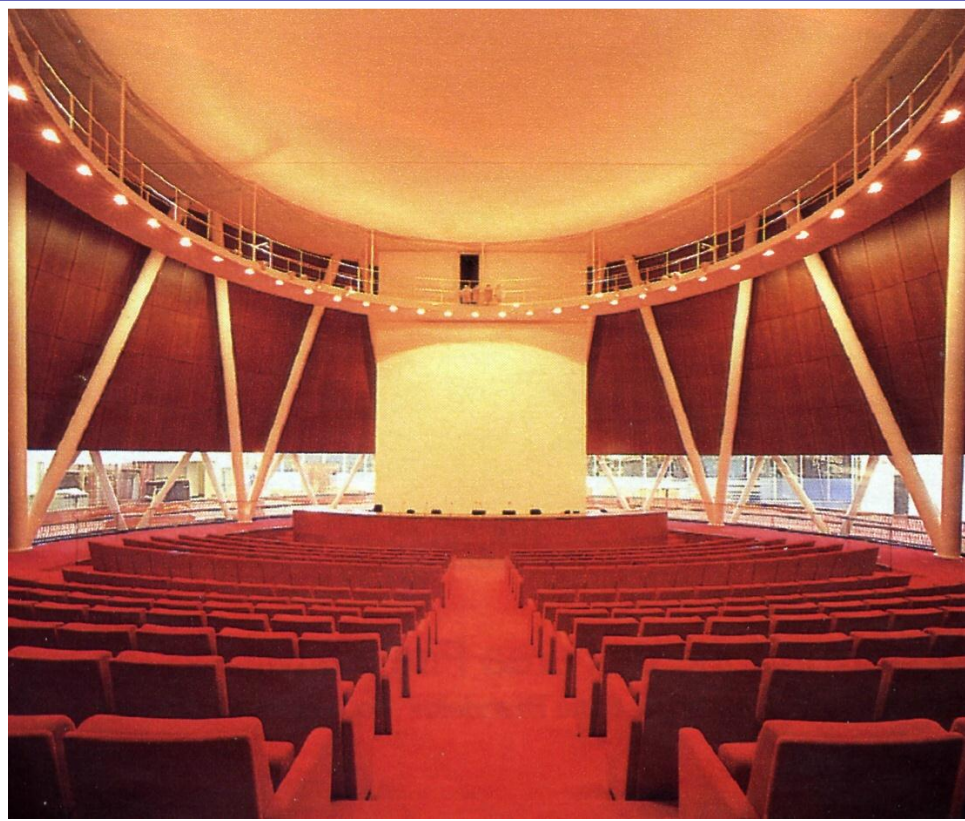
Conversion of a silk factory into a cultural centre(Athinais)

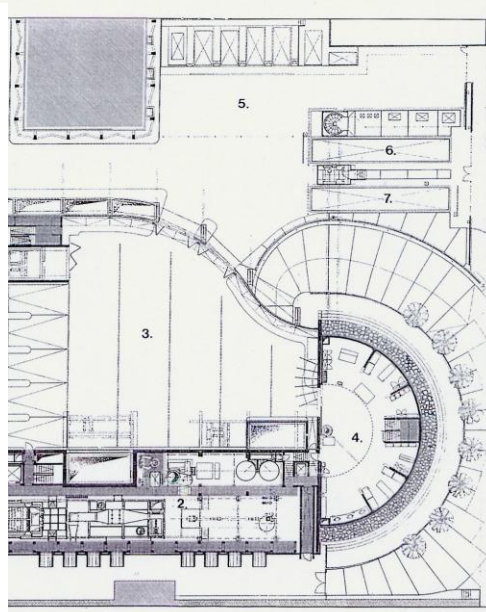


INSERTION OF A COOLING TOWER INTO THE “PIRELLI” HEADQUARTERS IN MILAN



INSERTION OF A COOLING TOWER INTO THE “PIRELLI” HEADQUARTERS IN MILAN





**RE-USE OF GASOMETERS FOR THE INCINERATION PLANT
OF CHAUX-LE-FOND (CH,1994)**



The “Ciminiera” of Catania (Italy)





The “Ciminiera” of Catania (Italy)





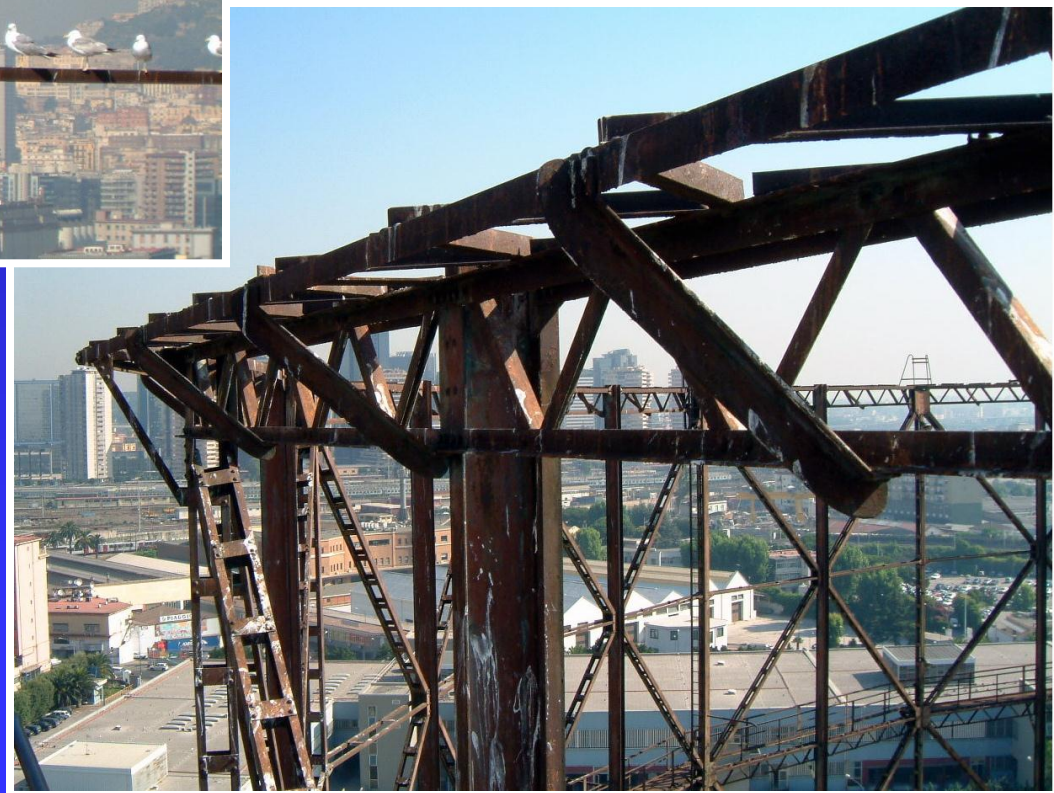
The “Porto Antico” of Genoa

RE-USE OF GASOMETERS :

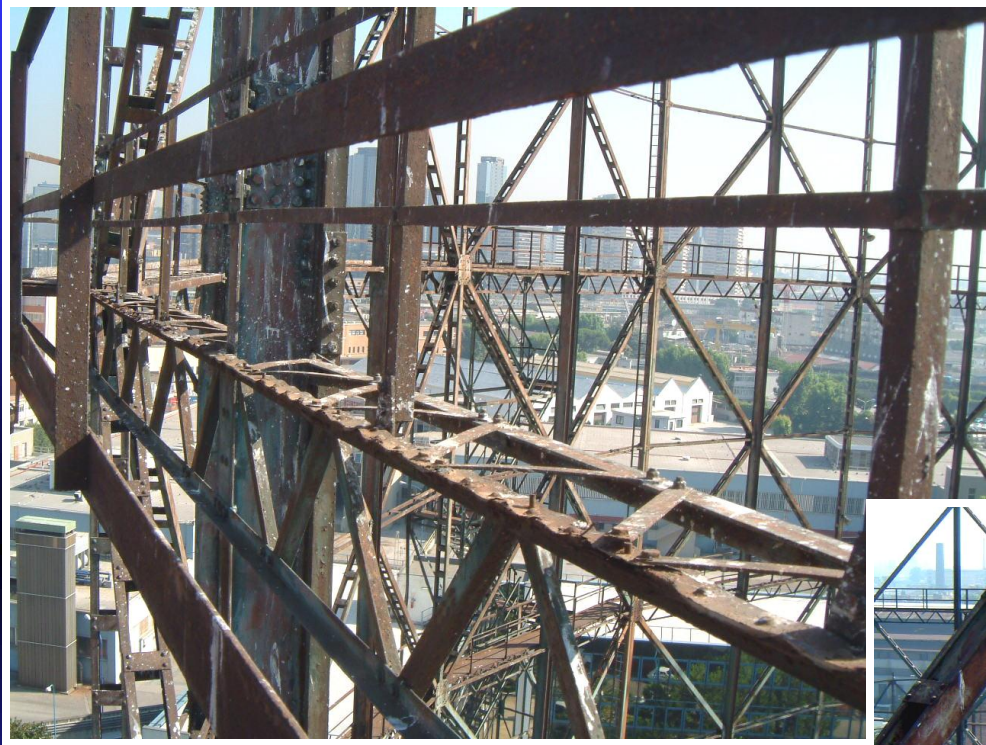
The industrial archeology



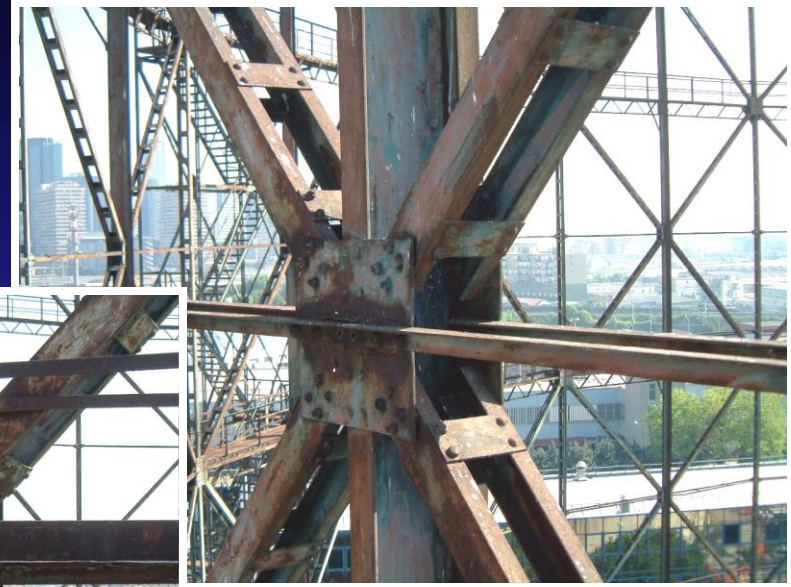
RE-USE OF GASOMETERS



RE-USE OF GASOMETERS

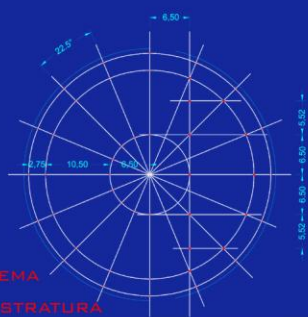
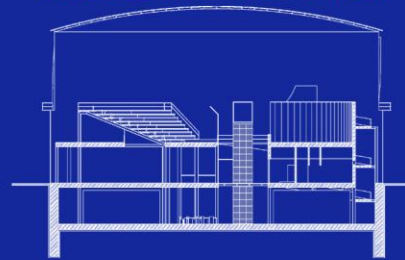
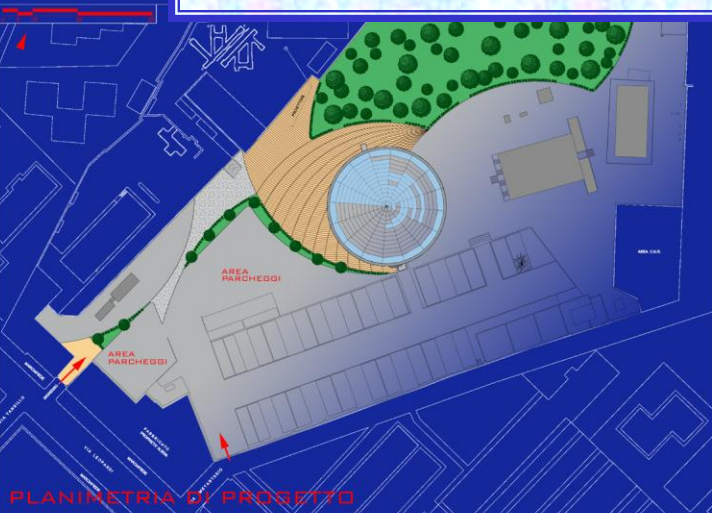


RE-USE OF GASOMETERS

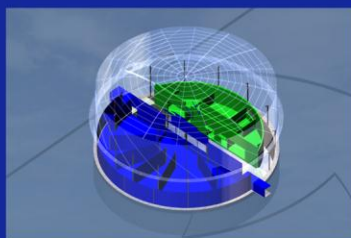
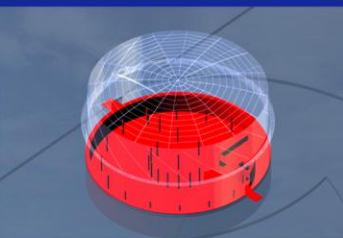


RE-USE OF GASOMETERS : a design competition

SCALA 1:200

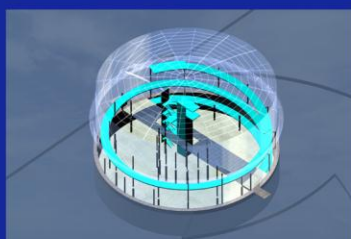
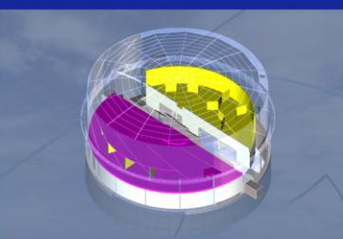


DISTRIBUZIONE FUNZIONI



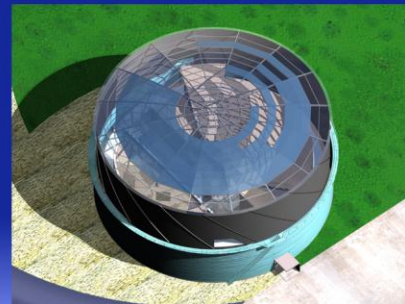
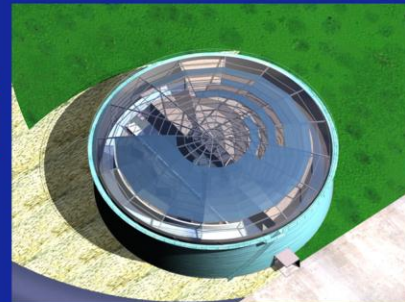
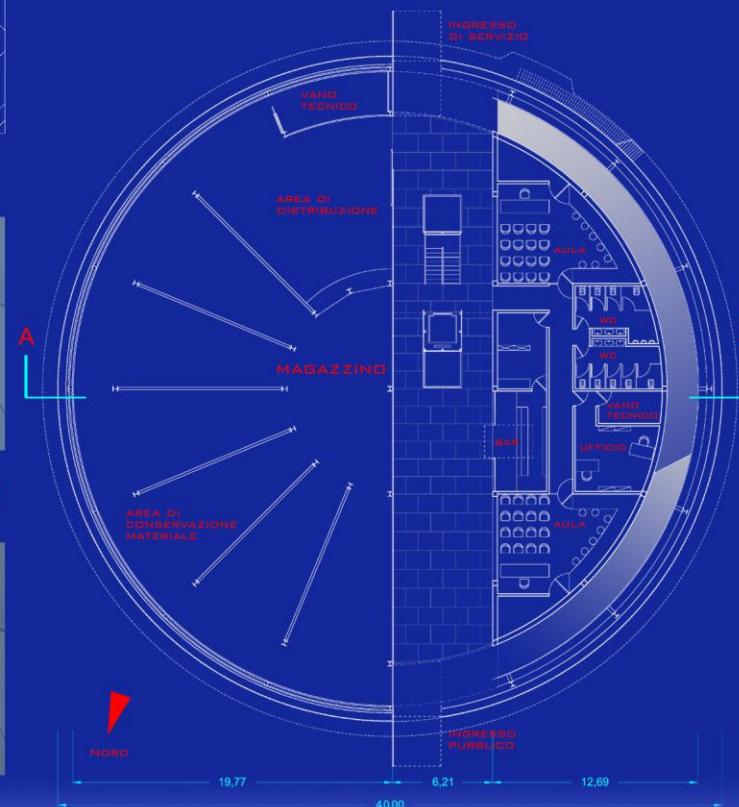
LIVELLO -1: ARCHIVIO

LIVELLO 0: MAGAZZINO
AULE FORMAZIONE

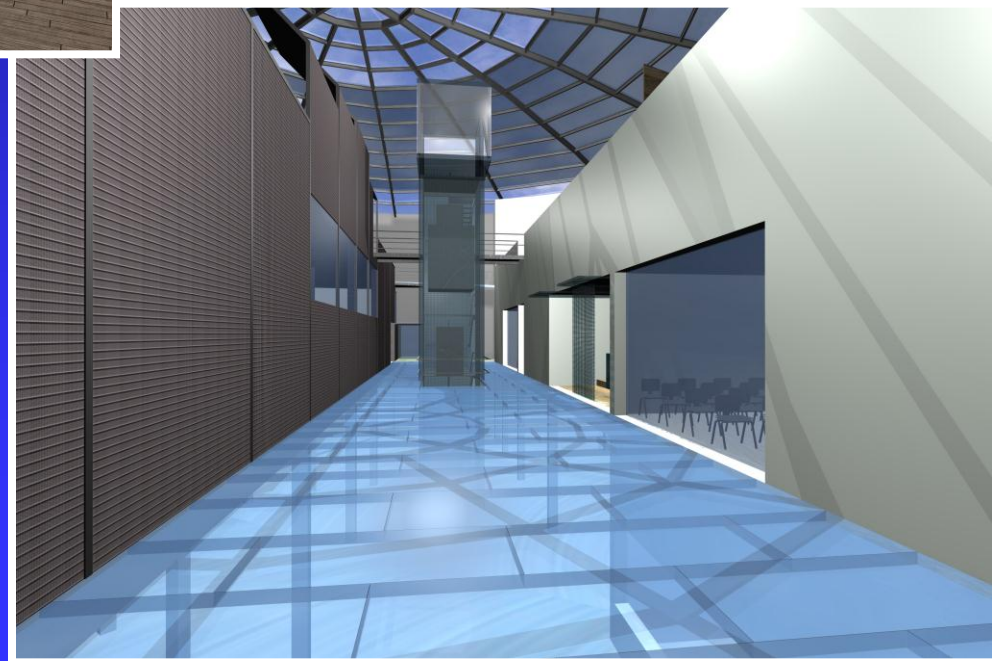
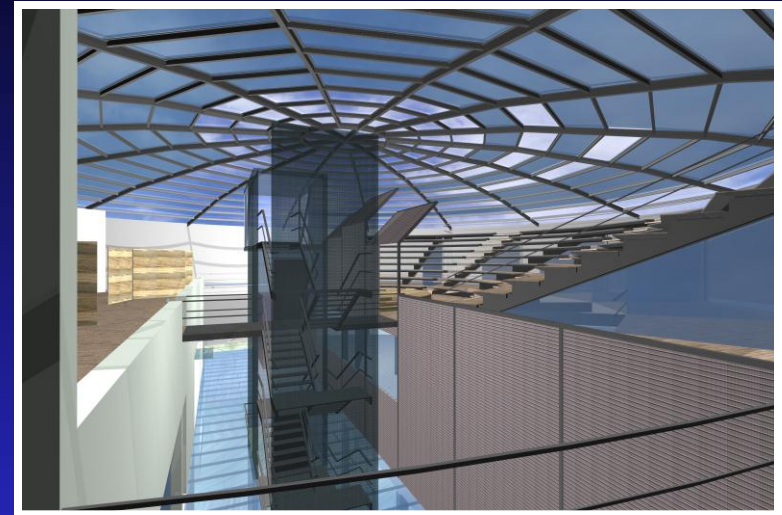
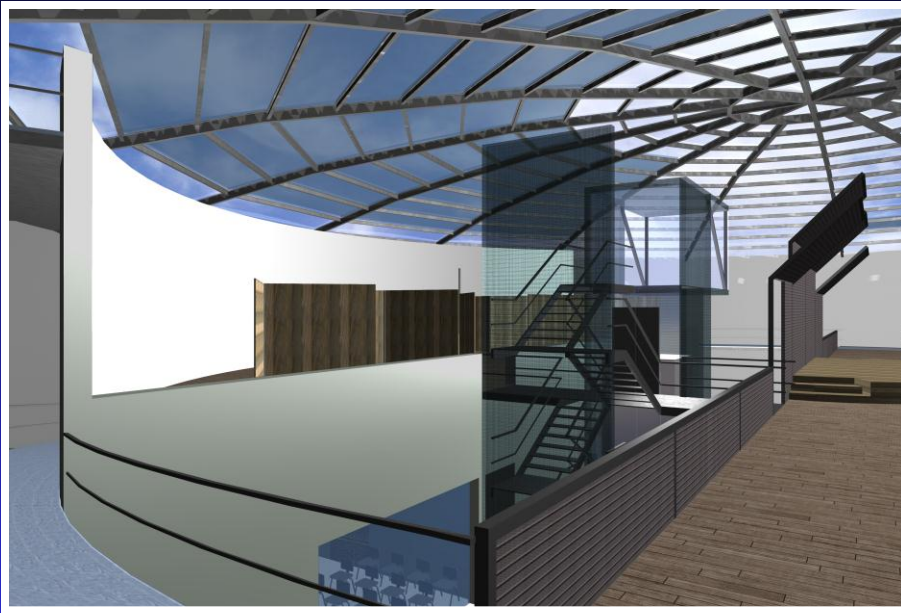


LIVELLO +1: SALE ESPOSITIVE
SALA CONFERENZE

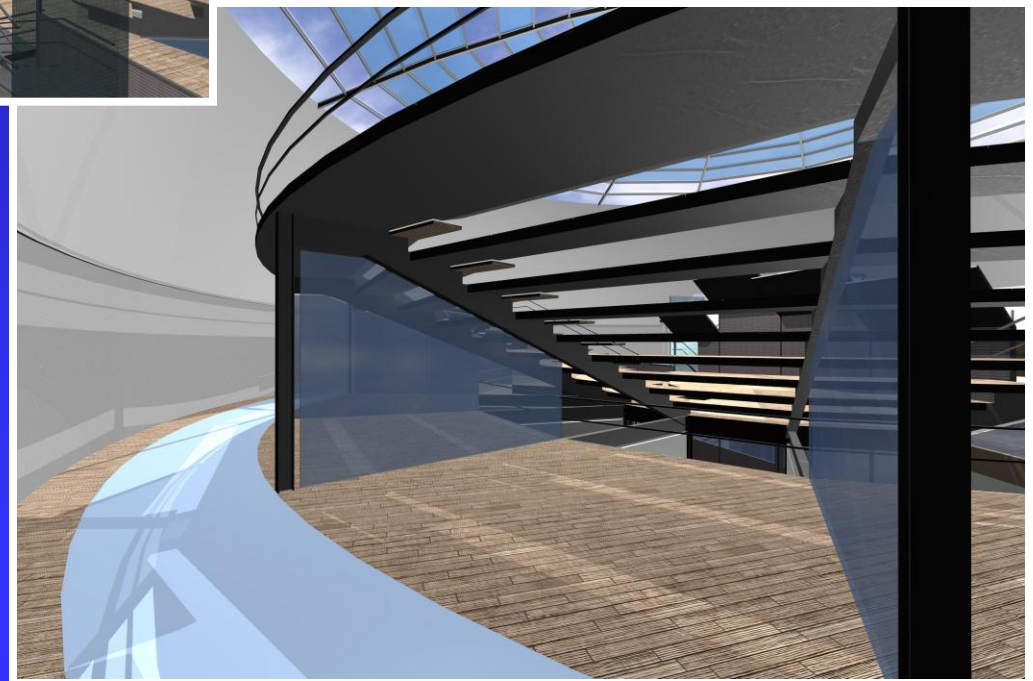
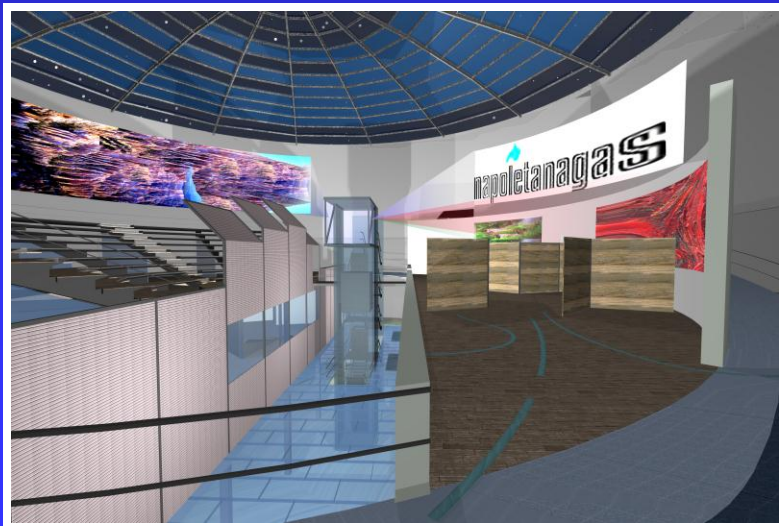
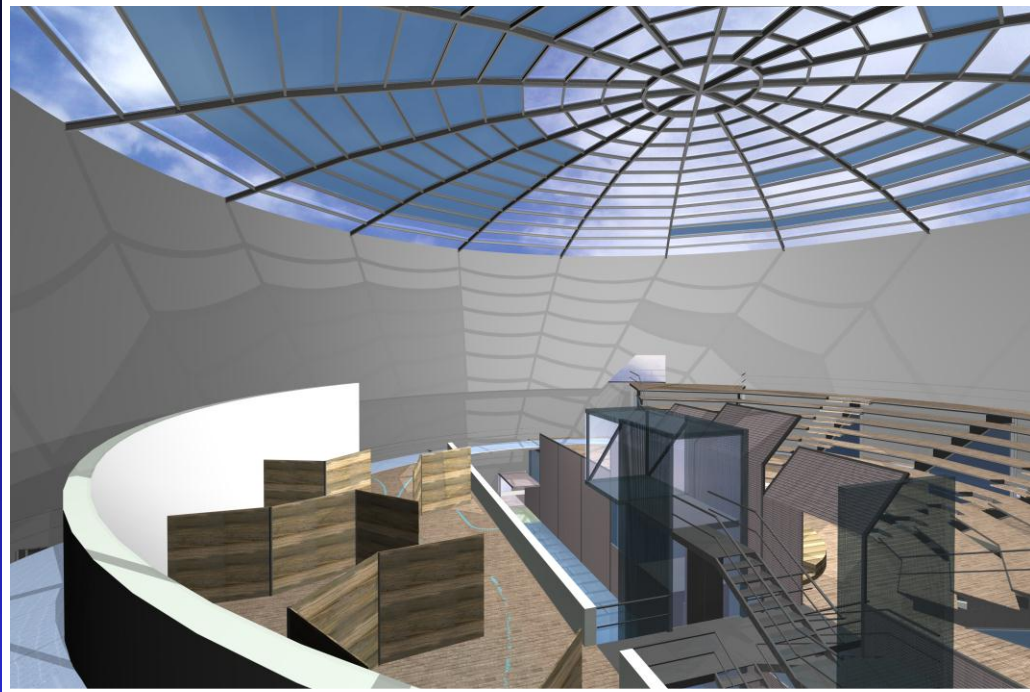
COLLEGAMENTI VERTICALI



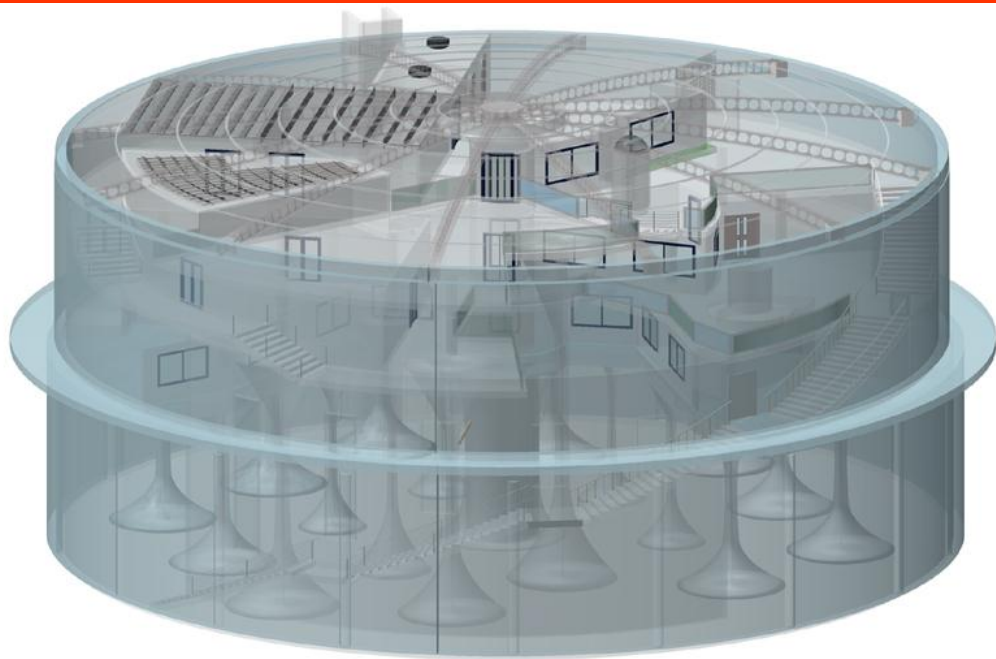
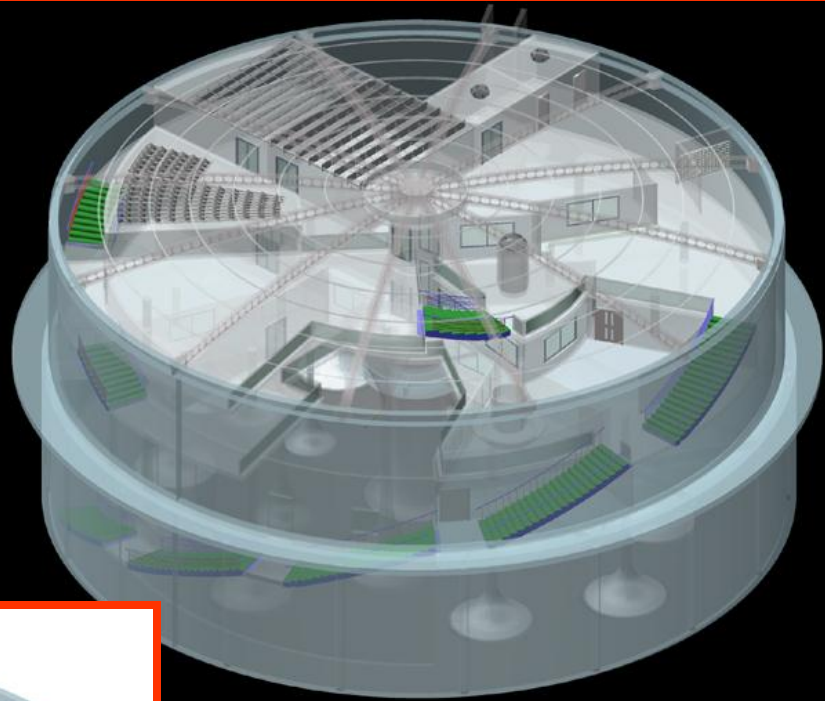
RE-USE OF GASOMETERS : a design competition



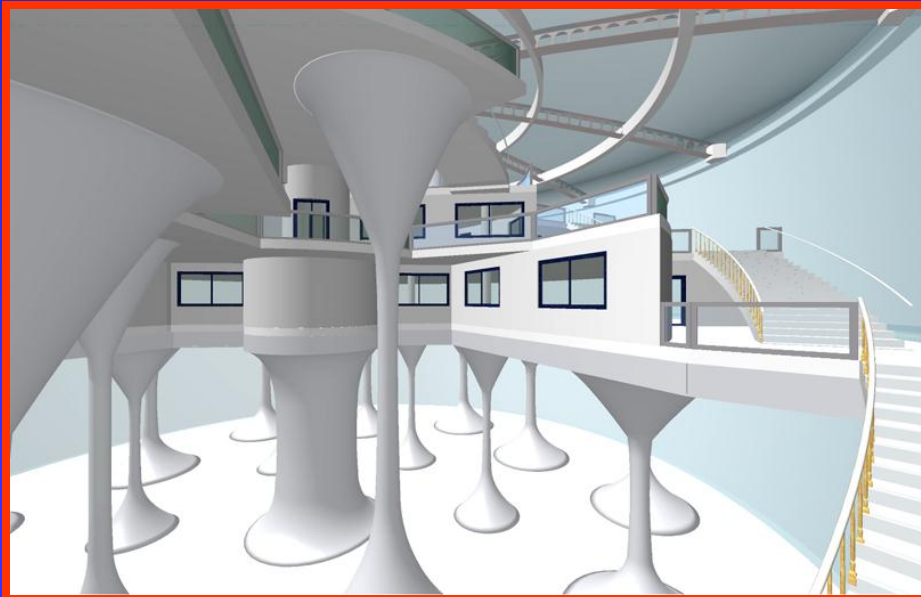
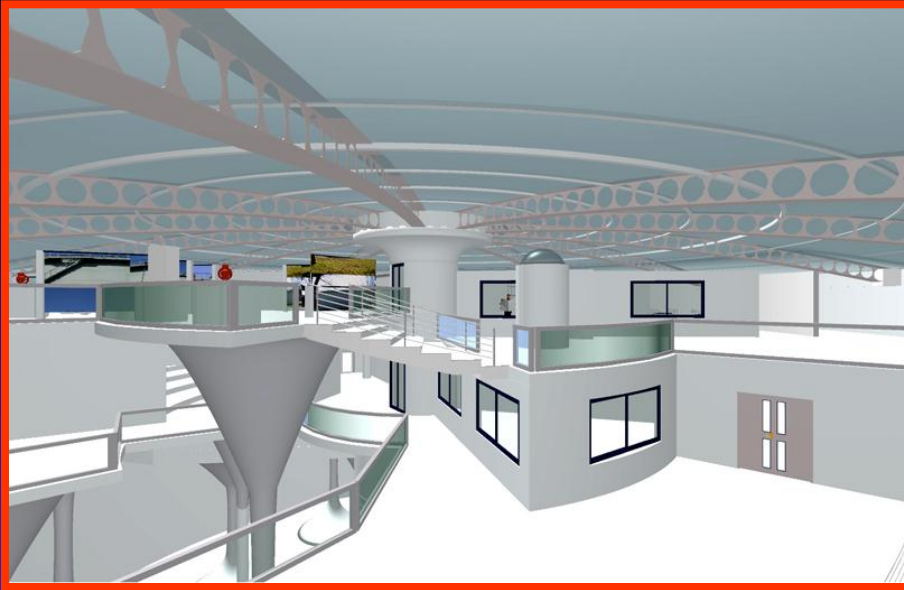
RE-USE OF GASOMETERS : a design competition



RE-USE OF GASOMETERS : a design competition

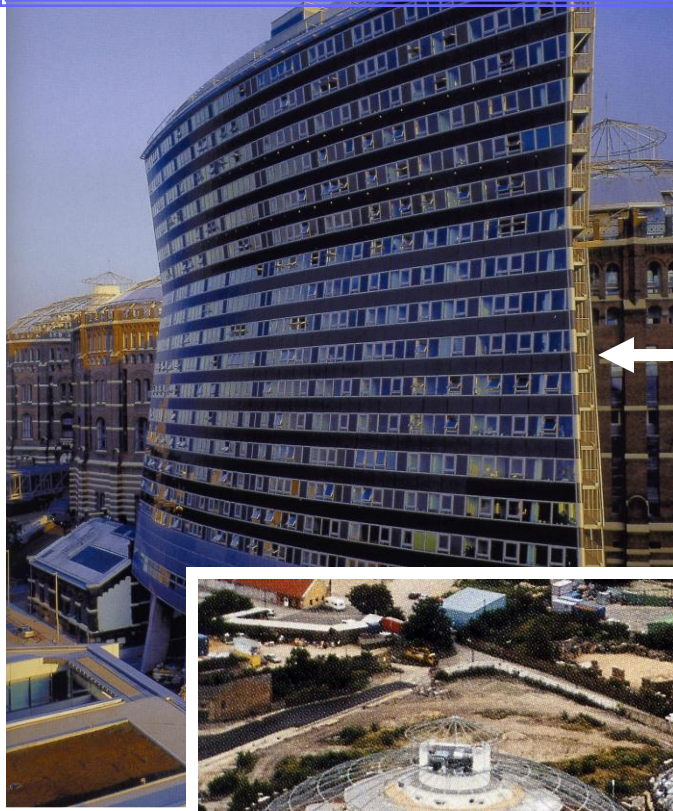


RE-USE OF GASOMETERS : a design competition



GPA GASOMETER TOWERS (VIENNA , 2001)

Four existing masonry gasometers converted into radial residential units plus a new structure shaped as a bent curvilinear slab.



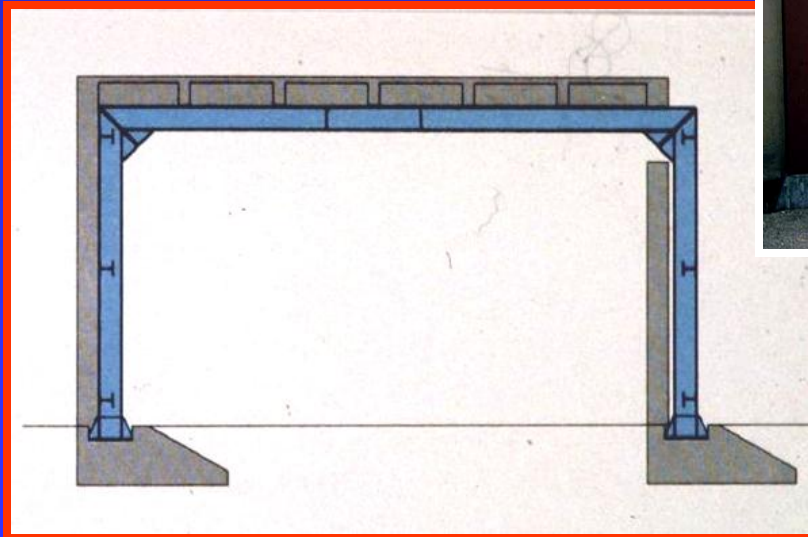
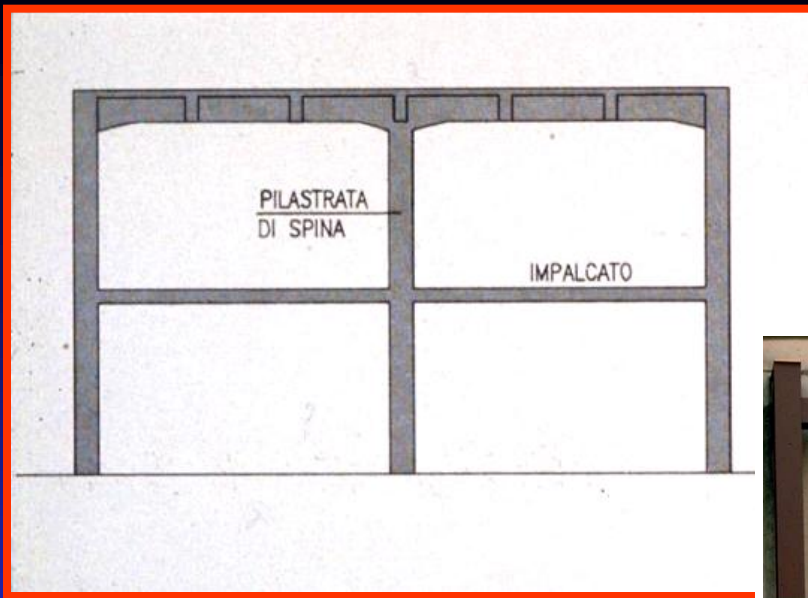


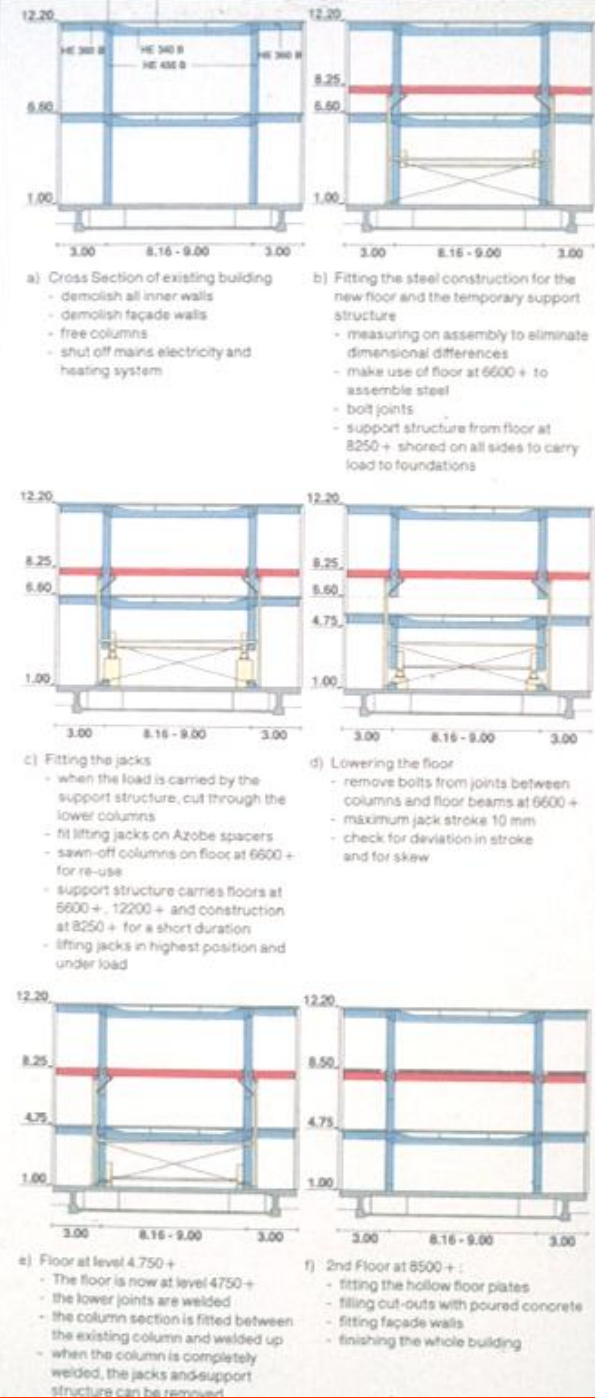
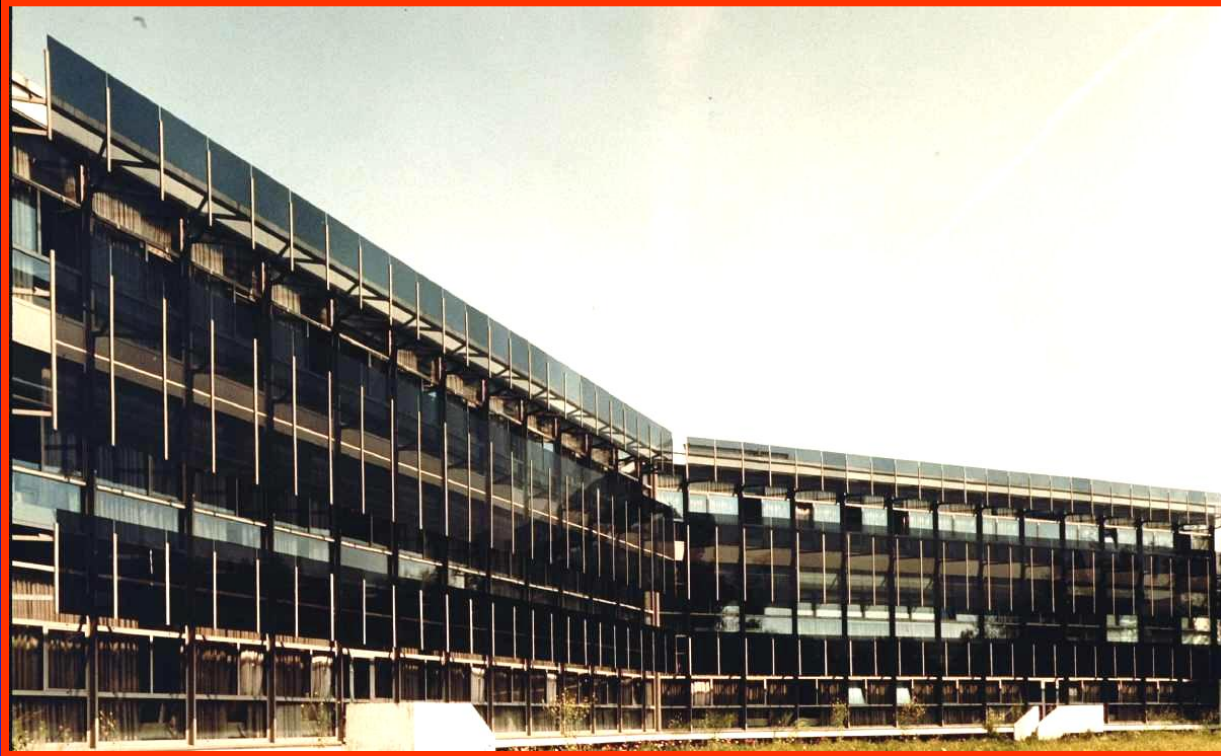
**RE-USE OF GASOMETERS FOR THE NEW
MARIA CALLAS MUSEUM (ATHENS, 2004)**

A black and white photograph of a large-scale construction project. The image shows the interior of a building under construction, featuring a grid of concrete columns and beams. Scaffolding is visible around the central columns, and various construction materials and equipment are scattered on the floor. The ceiling is high and shows exposed ductwork and pipes. The overall scene depicts a complex structural framework in progress.

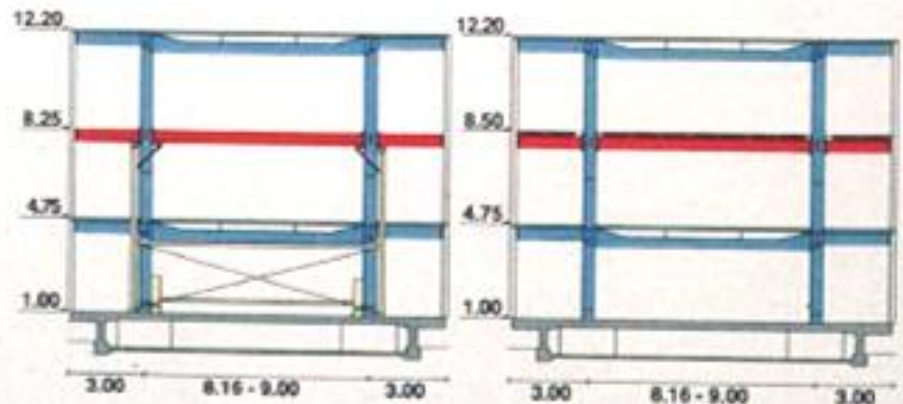
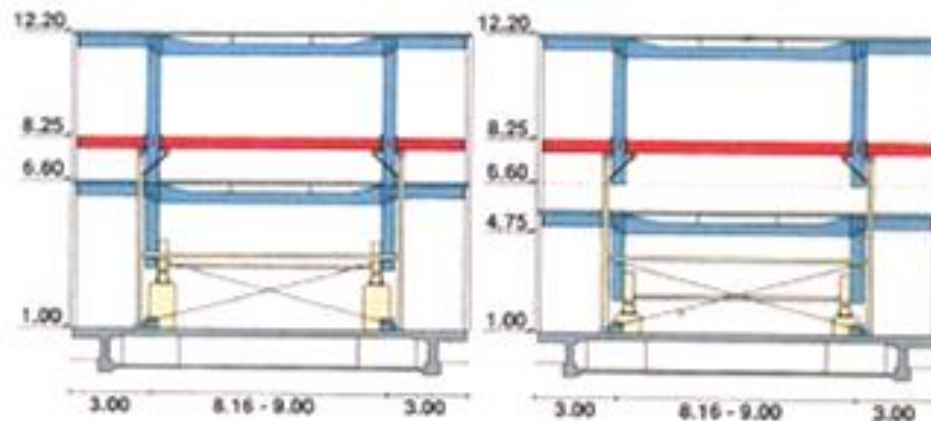
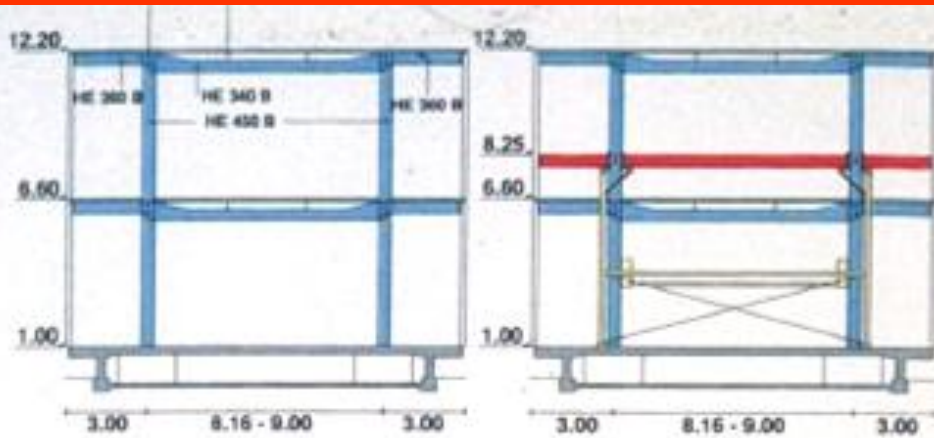
DRASTIC CHANGE OF STRUCTURAL SCHEME

Restructuring from an industrial r.c. building to a gymnasium (Cantù, Italy)



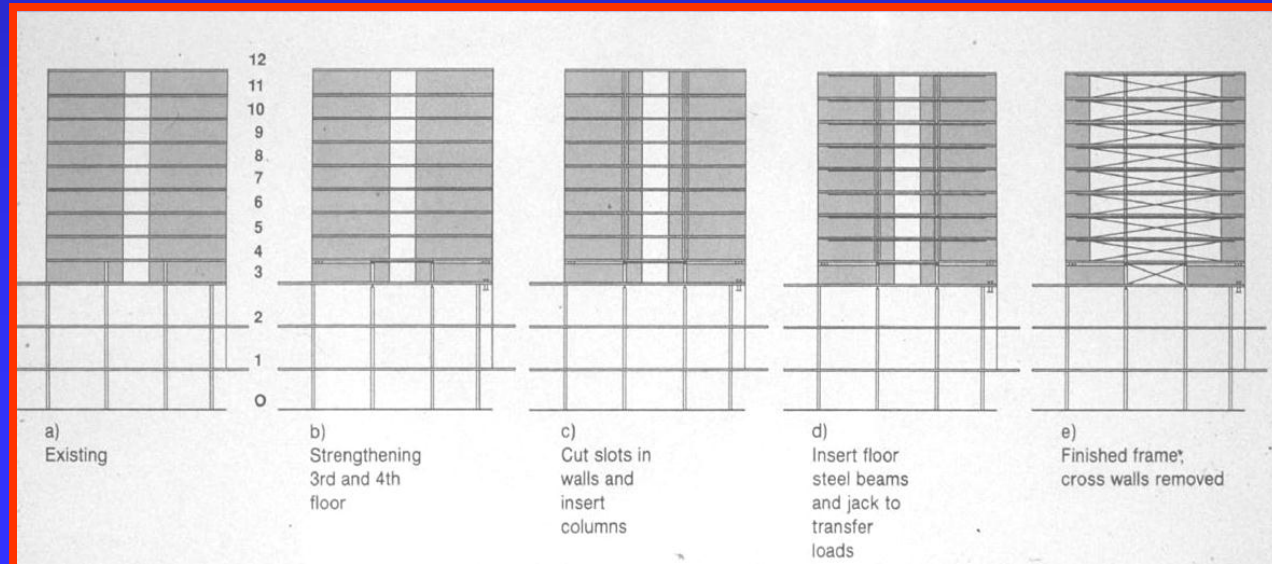


Van Leer Building (The Netherlands)



**Van Leer Building
(The Netherlands)**

The Kings Reach Hotel conversion into the Sea Containers House (London, U.K.)



**Deutsche Bank in via S. Brigida
(Naples, Italy)**

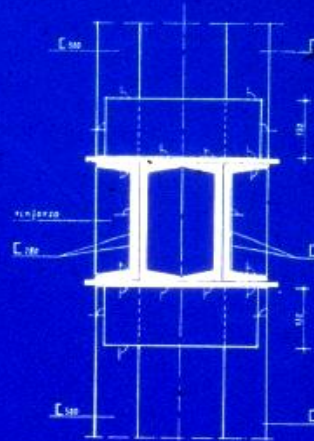
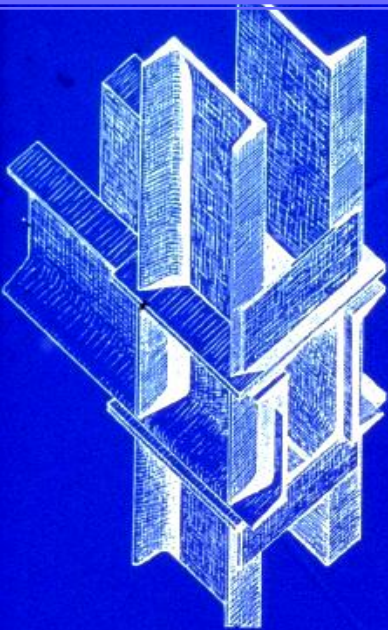


Deutsche Bank in via S. Brigida (Naples, Italy)



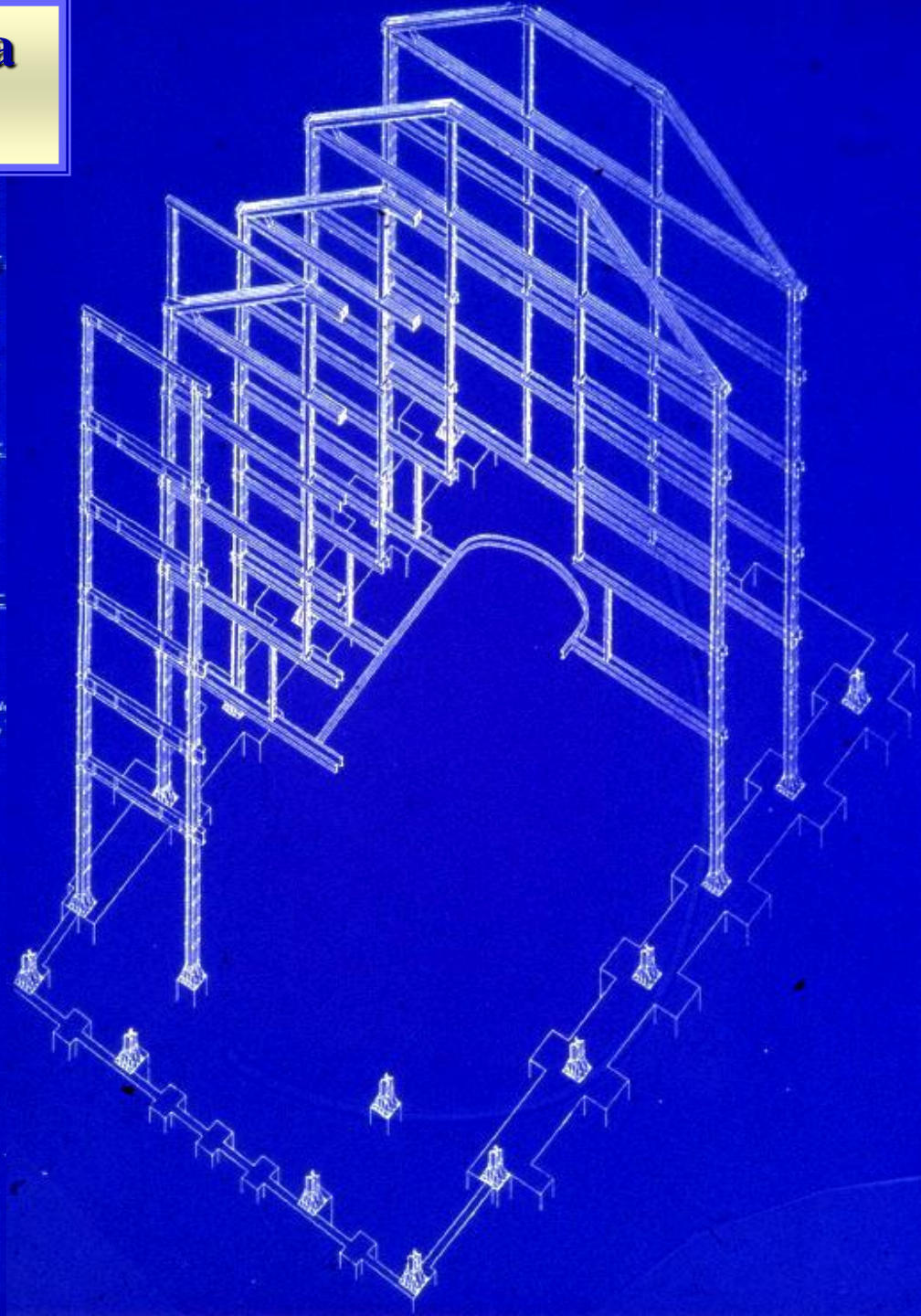
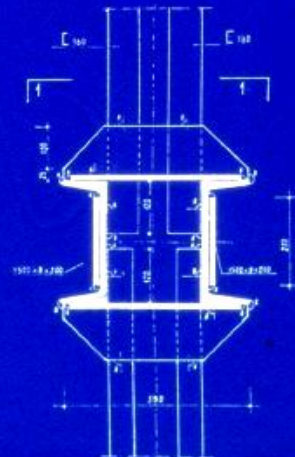
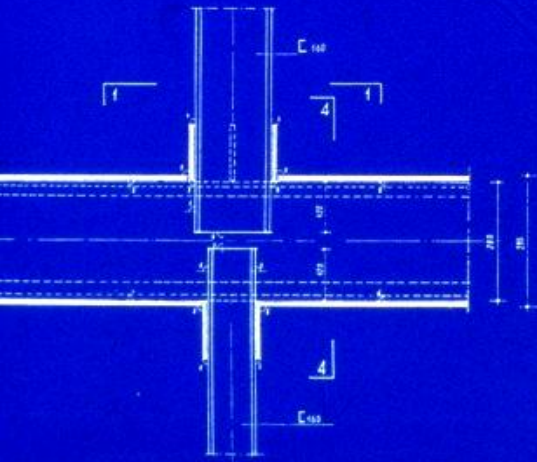
■ Corrosion attack

Deutsche Bank in via S. Brigida (Naples, Italy)

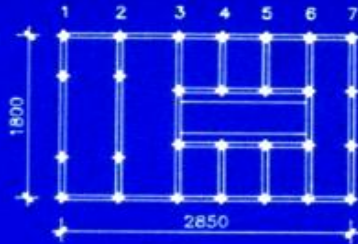


A sinistra: Assonometria di un nodo perimetrale di assatura di acciaio (colonna e trave). — A destra: sezione del detto. — In basso: Due sezioni di nodo interno (trave e tirante).

■ The structural scheme



Deutsche Bank in via S. Brigida (Naples, Italy)

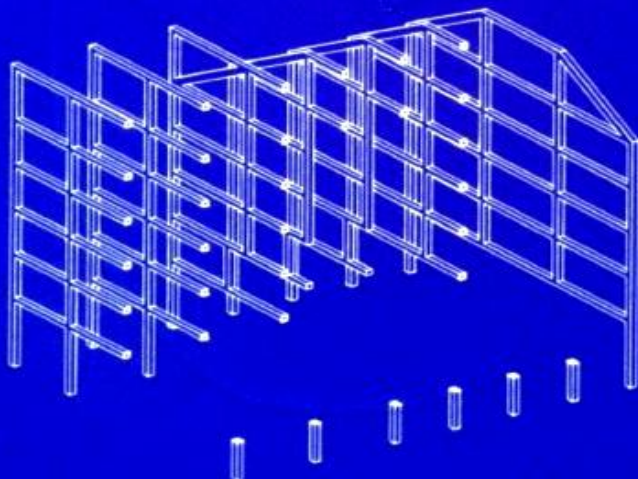
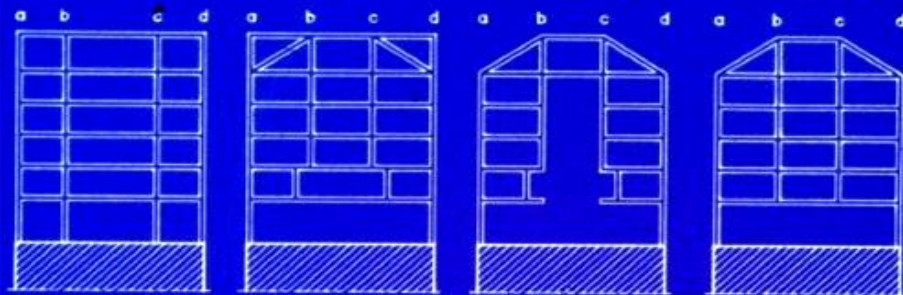


FRAMES 1, 2

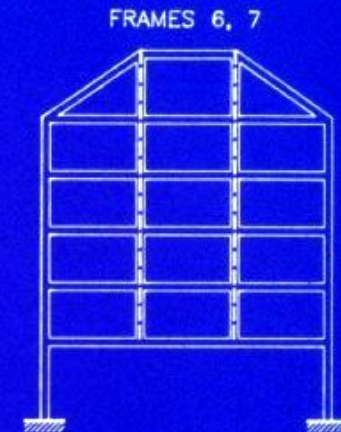
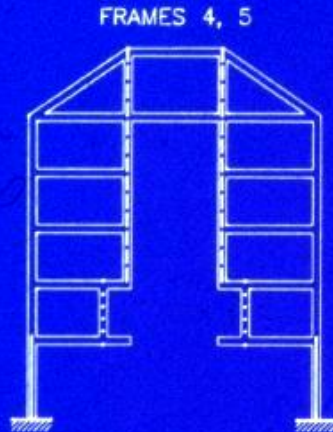
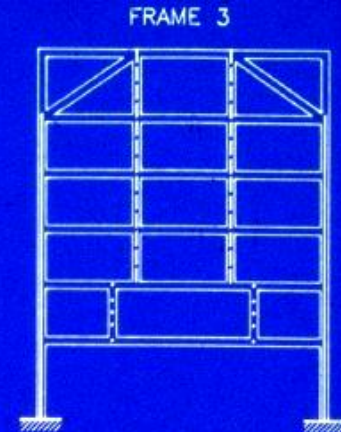
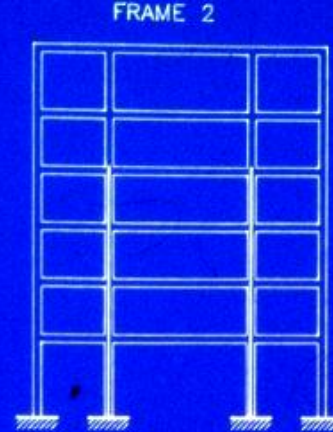
FRAME 3

FRAMES 4, 5

FRAMES 6, 7

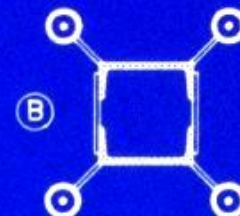
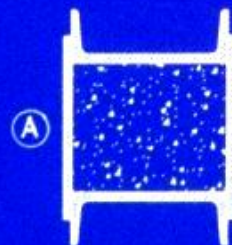


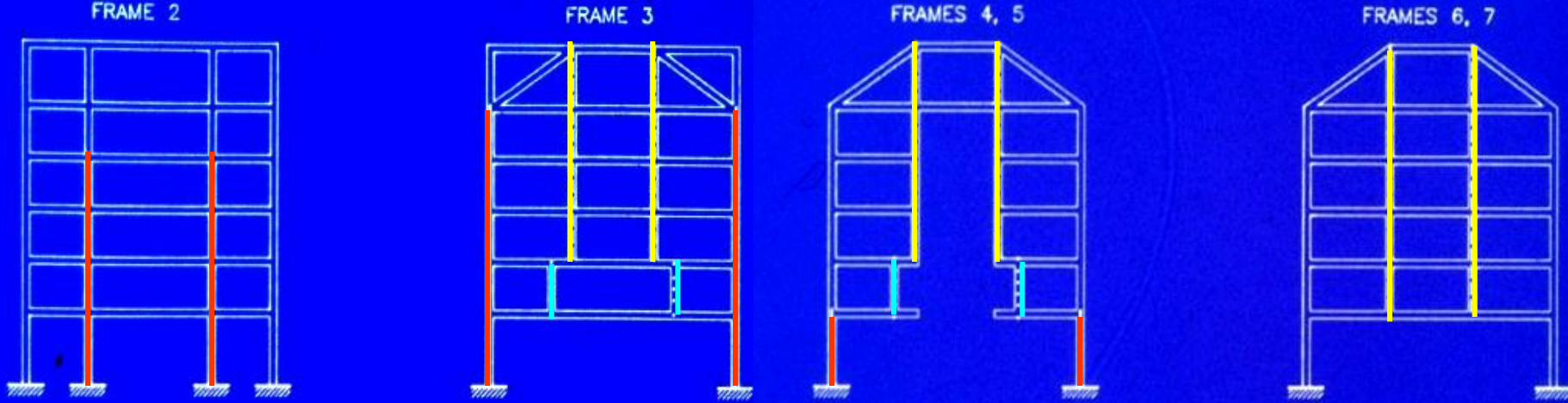
■ The main frames



■ The consolidation system

- (A) ——— REINFORCEMENT WITH STEEL PLATES AND INFILLED CONCRETE
- (B) - - - - - STEEL CABLES
- (C) DYWIDAG BARS



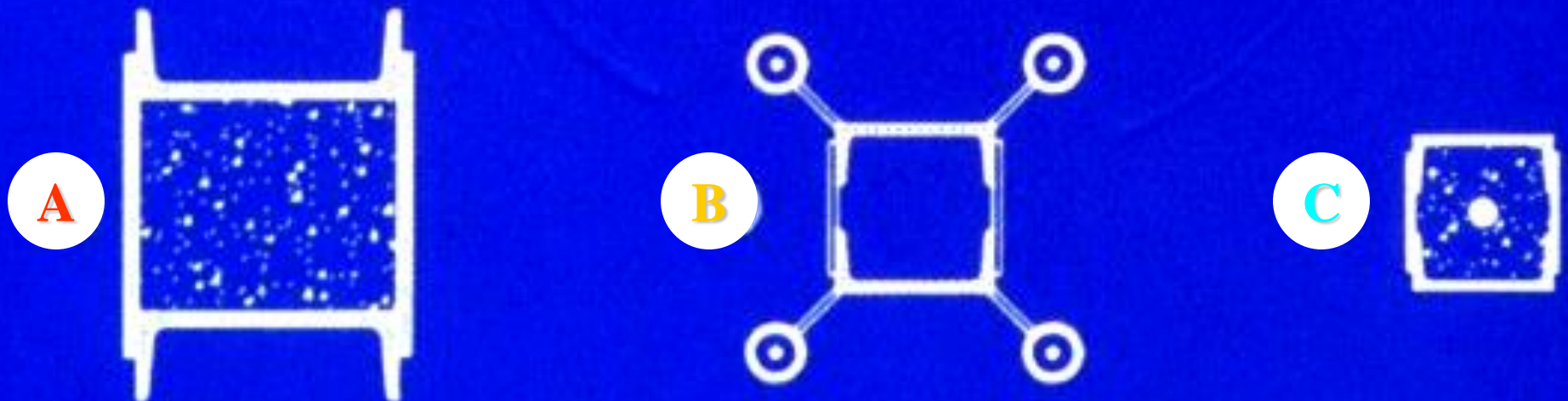


■ The consolidation systems :

A ----- reinforcement with steel plates and in-filled concrete

B - - - - - steel cables

C steel plates, in-filled concrete and Dywidag bars



The consolidation systems



**reinforcement with steel plates
and in-filled concrete**

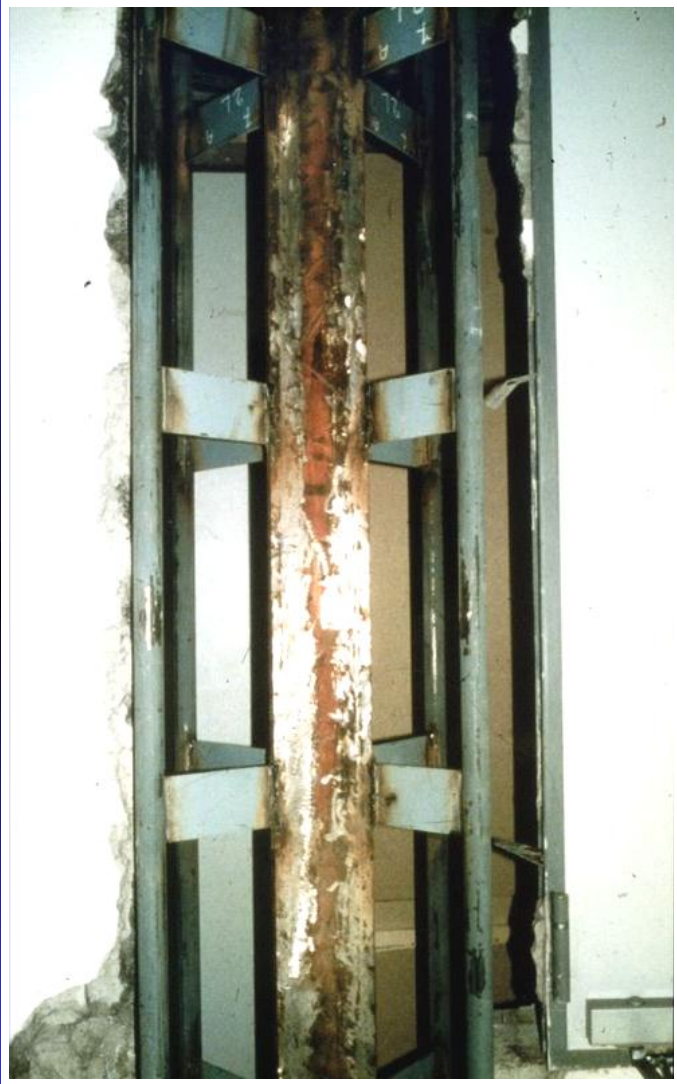
Deutsche Bank in via S. Brigida (Naples, Italy)



**steel plates, in-filled concrete
and Dywidag bars**

The consolidation systems

Deutsche Bank in via S. Brigida (Naples, Italy)

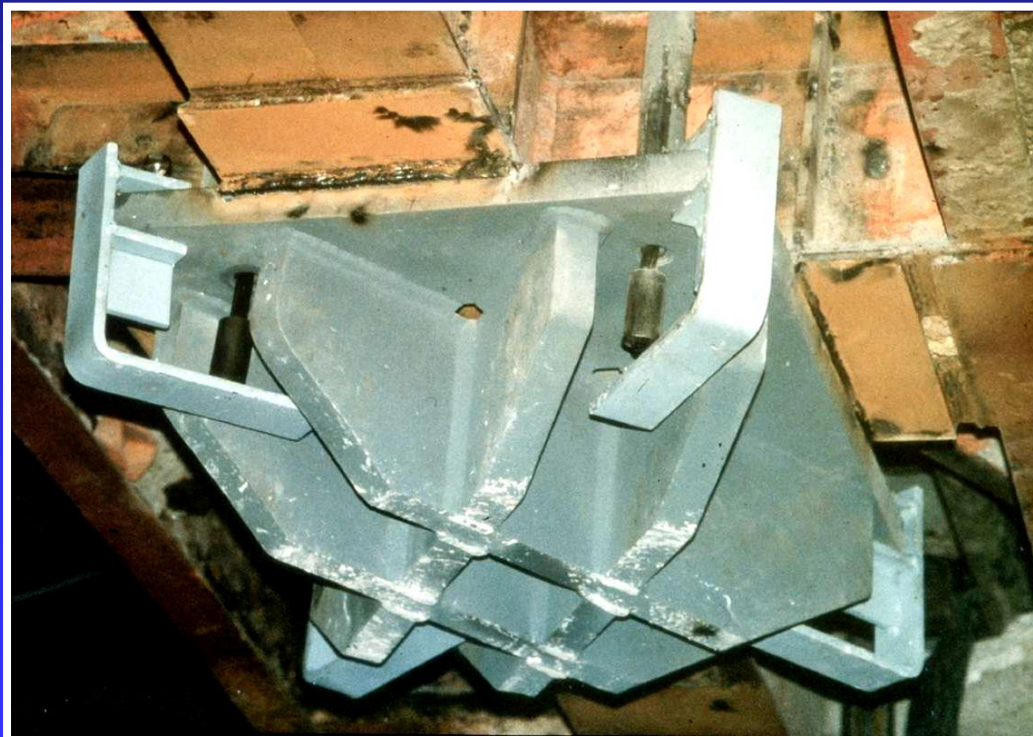


B - - - - - steel cables in four tubes

**Deutsche Bank in via S. Brigida
(Naples, Italy)**



steel cables location in tubes



steel cables anchorage



**Deutsche Bank in
via S. Brigida
(Naples, Italy)**

**Hydraulic jacks on the
top for pre.stressing the
steel cables**



The consolidation systems

**Deutsche Bank in via S. Brigida
(Naples, Italy)**



Composite floor with polystyrene blocks



**New shop in Innsbruck
(Austria)**

