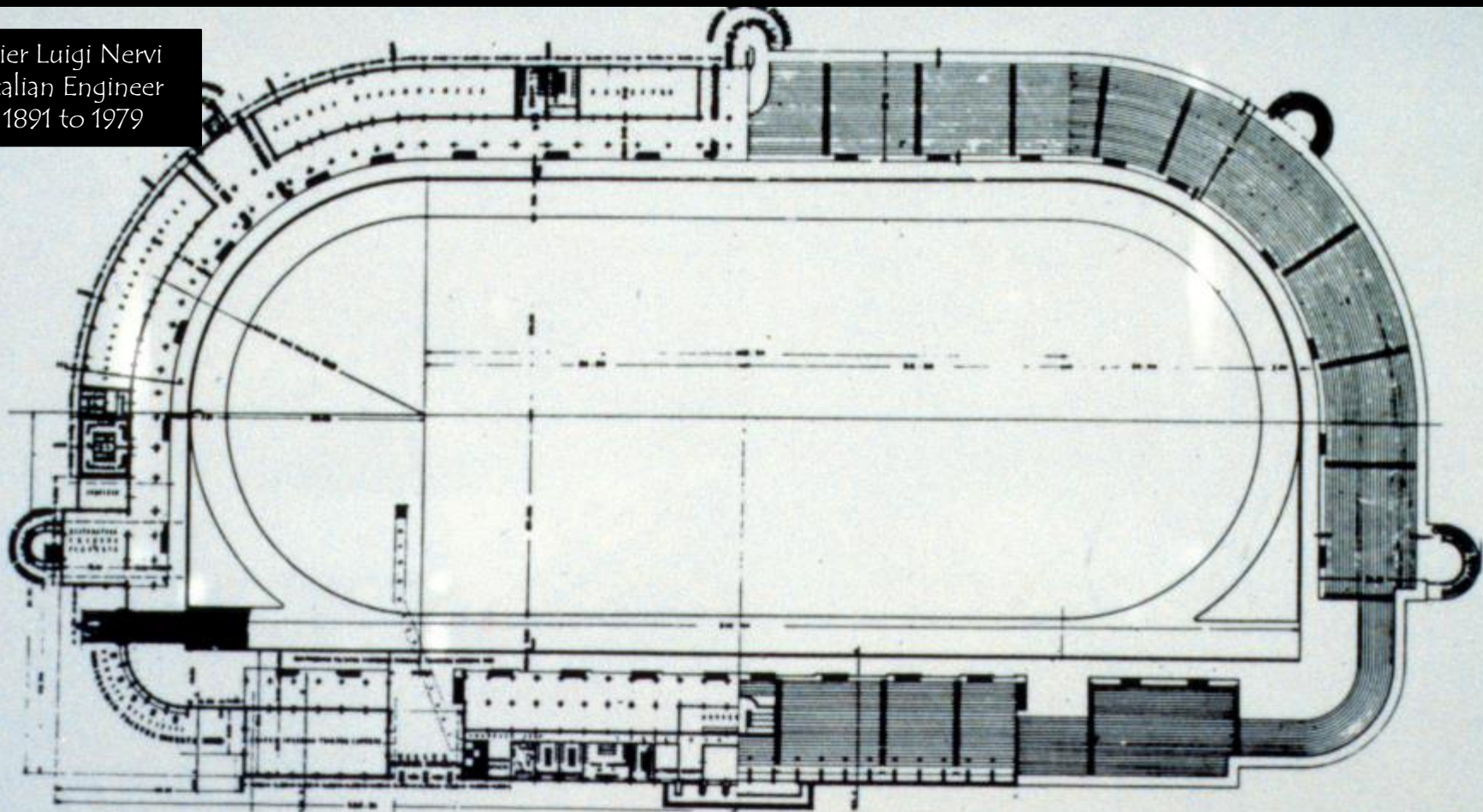


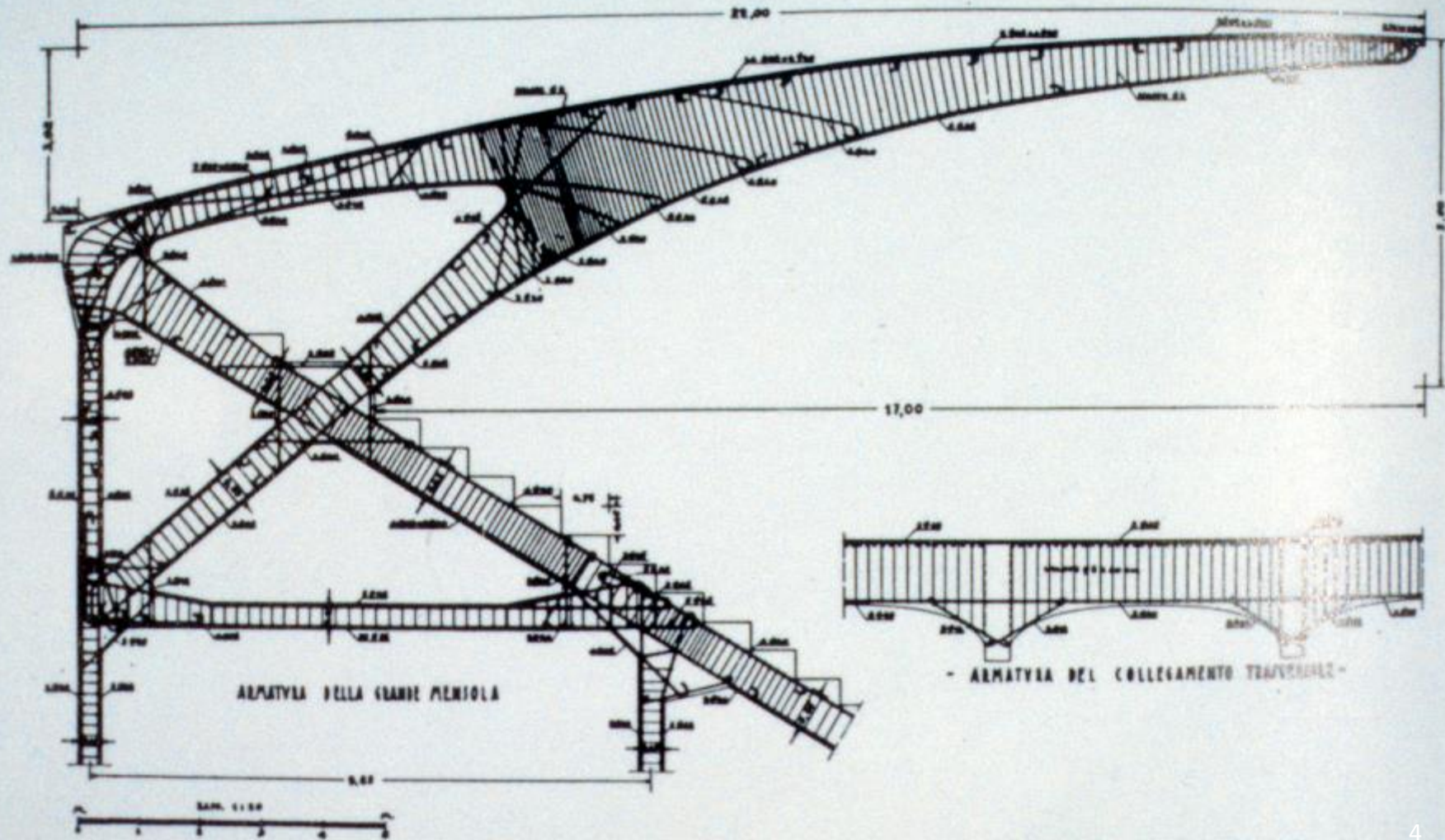
Developments in Concrete Construction

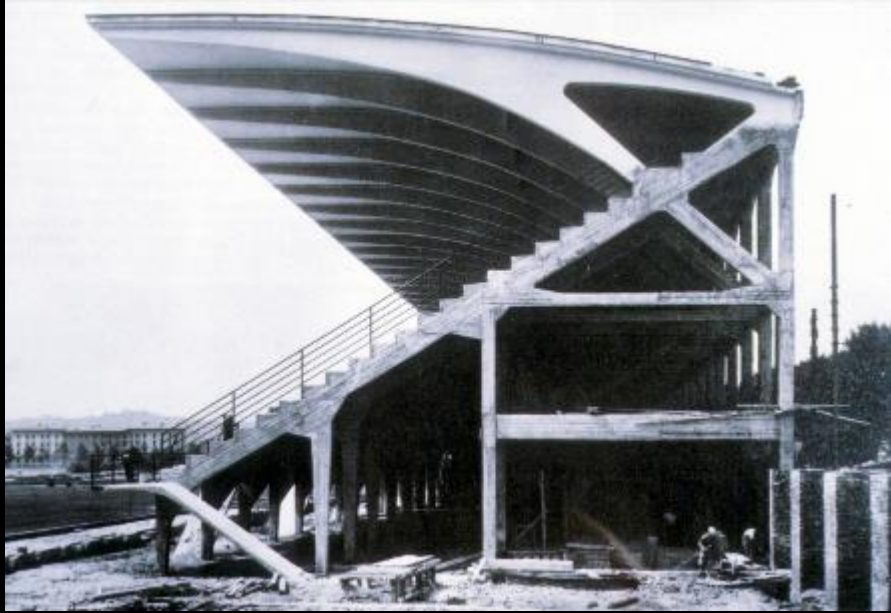
Part 2: Curves, Cantilevers and Brutalism

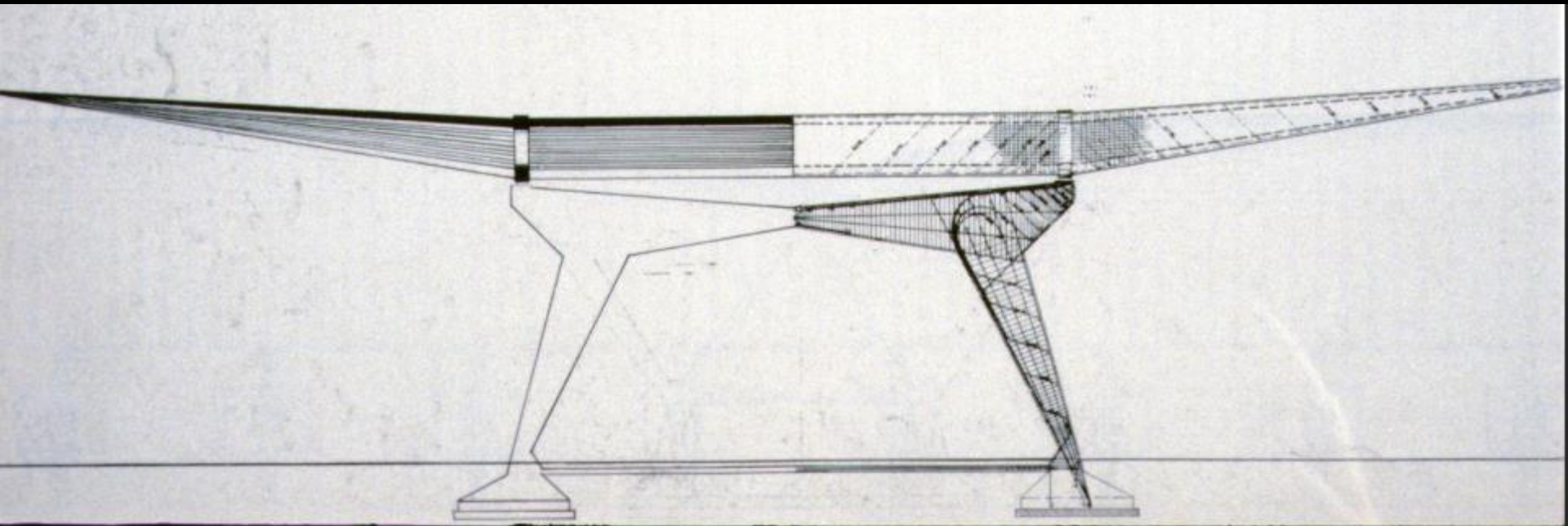
Cantilevers

Pier Luigi Nervi
Italian Engineer
1891 to 1979

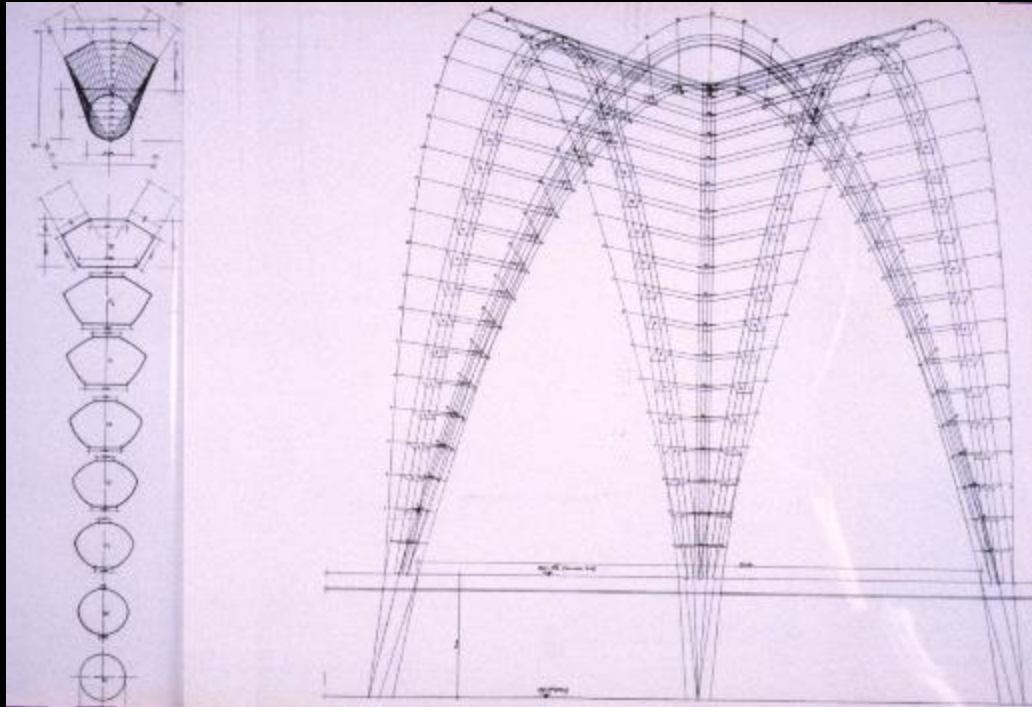
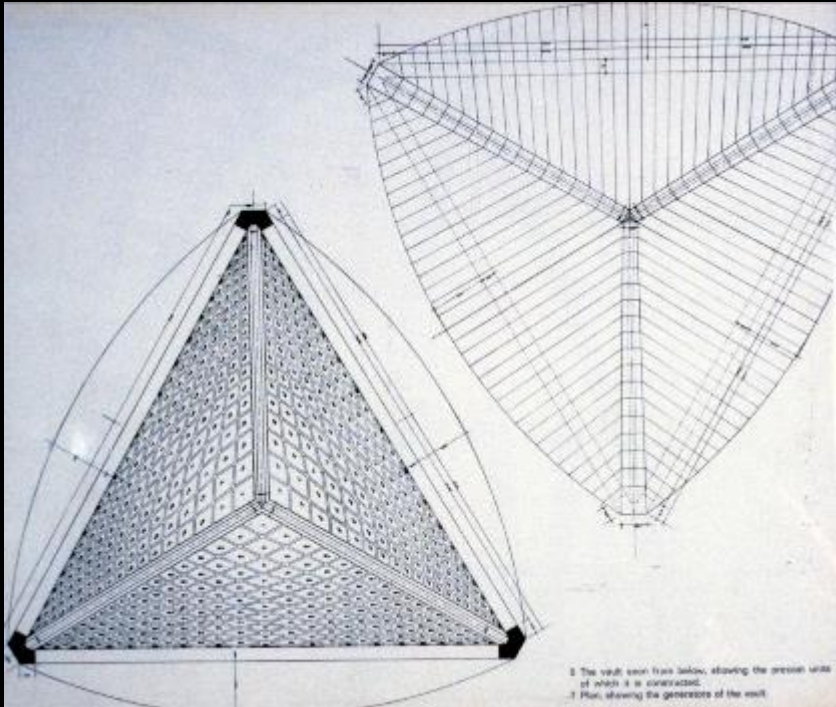


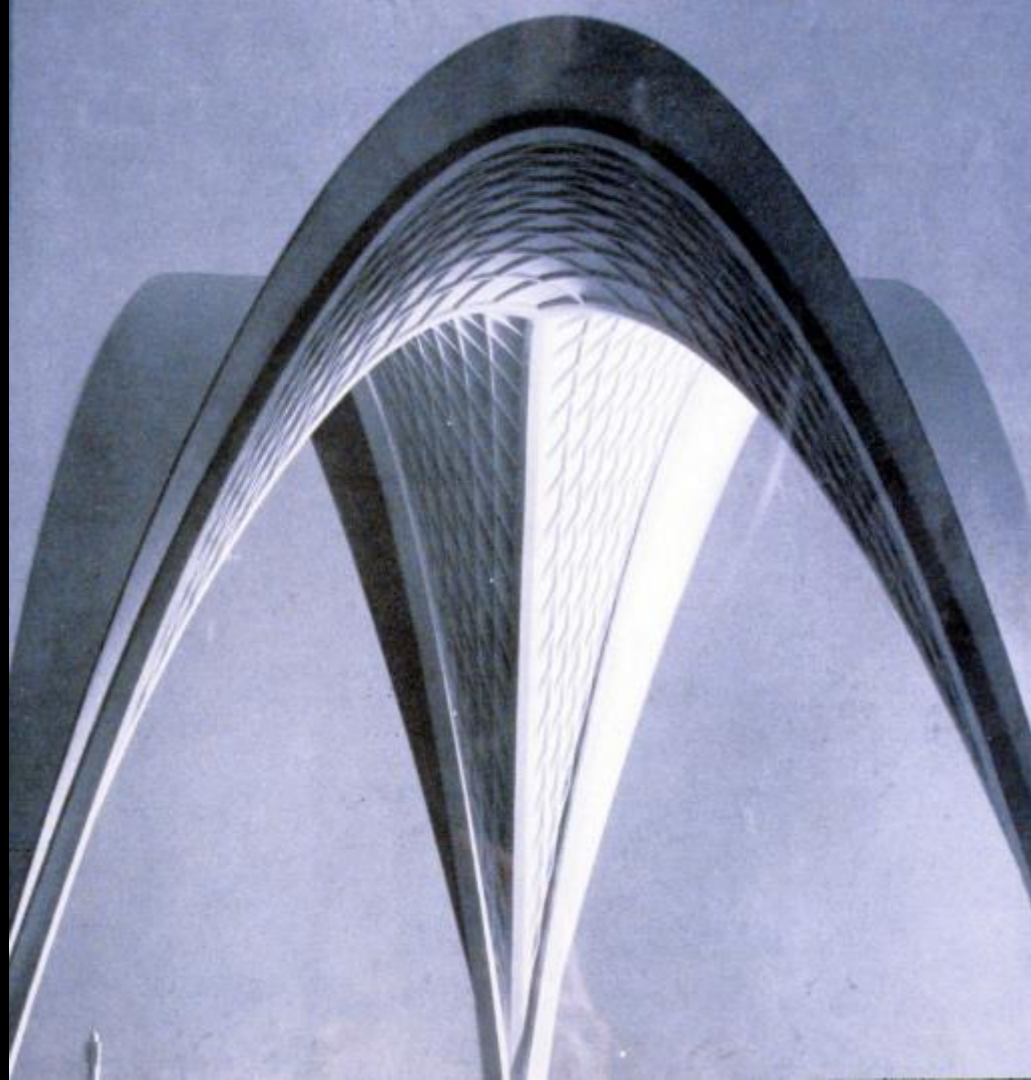










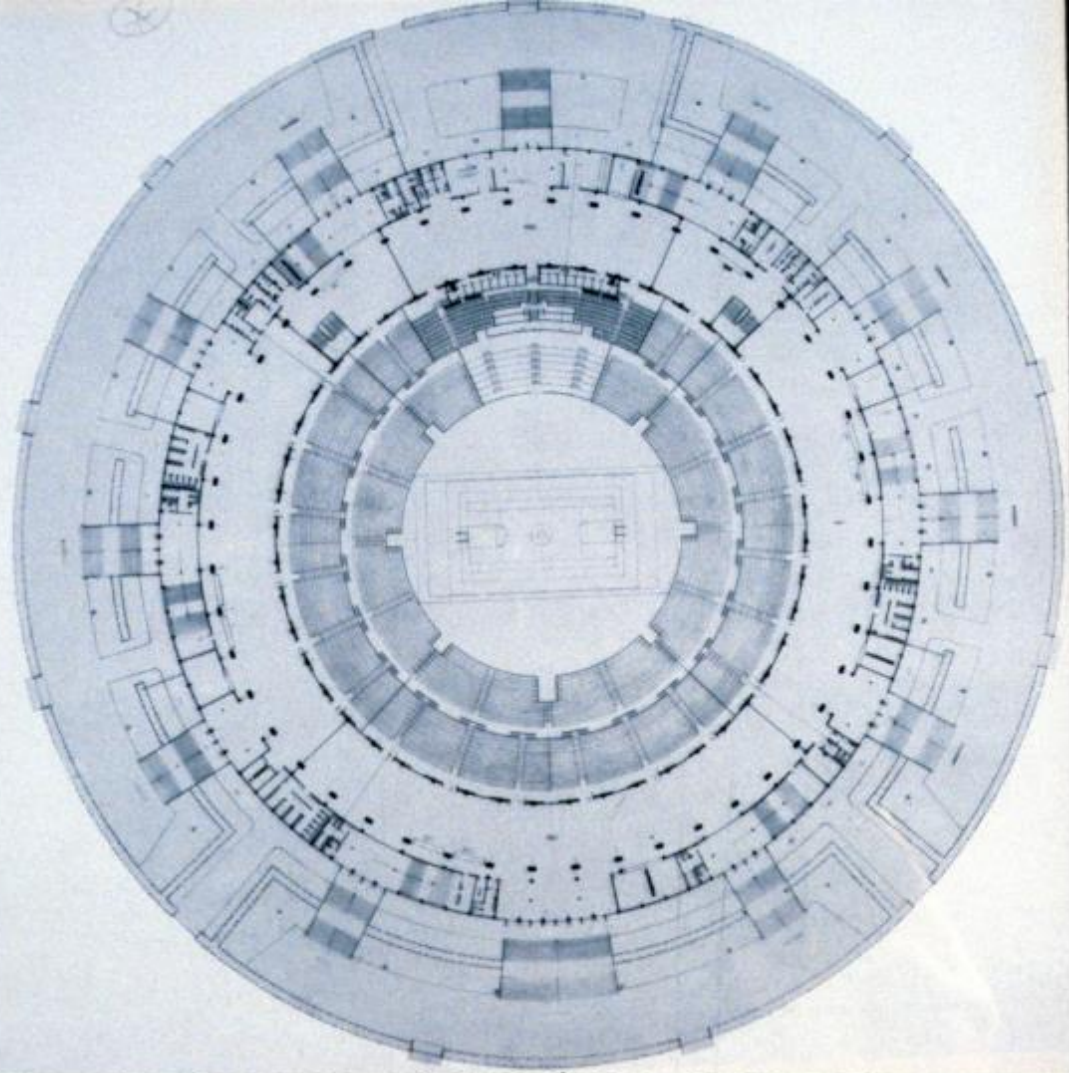


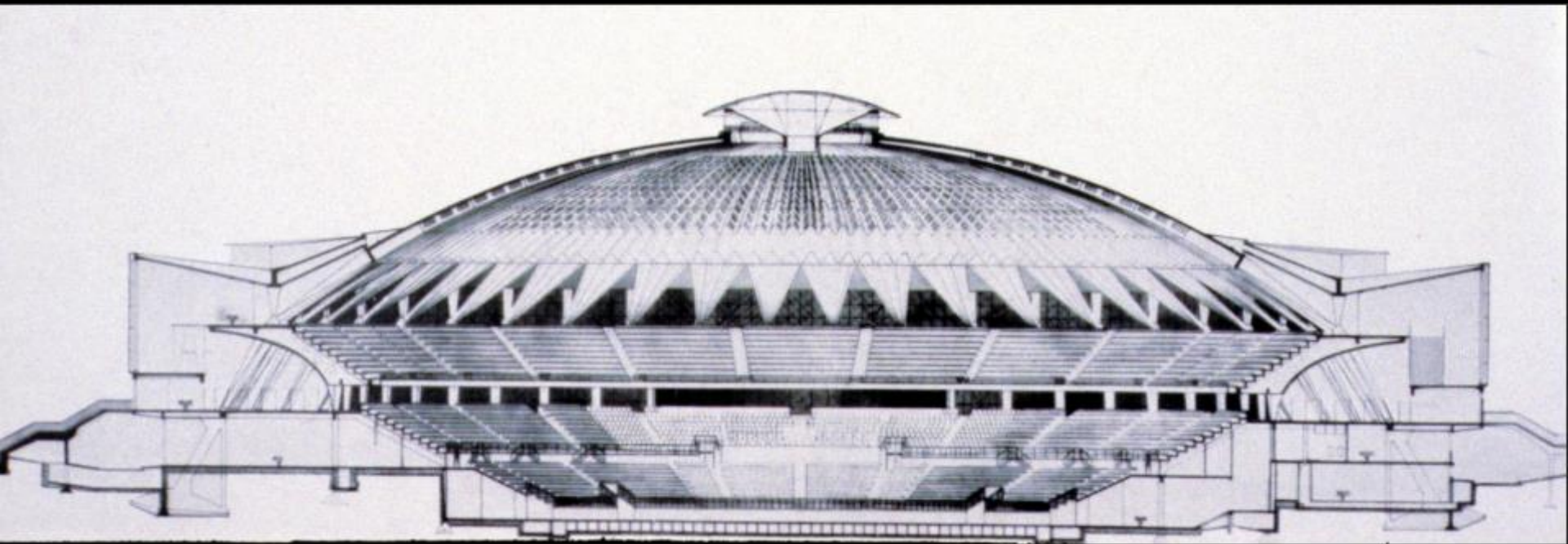




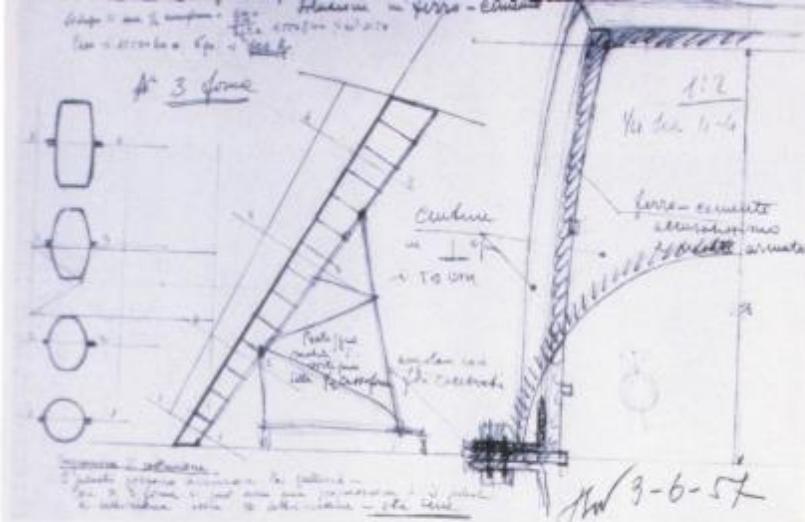
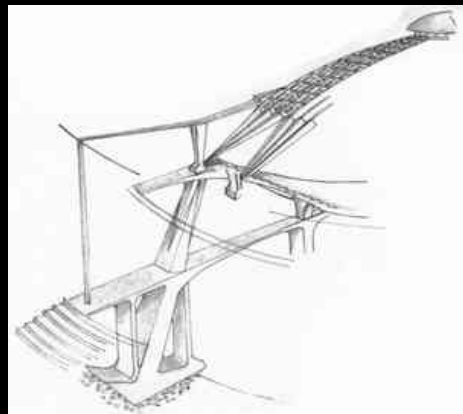
PalaLottomatica
(Palazzo dello Sport)
Rome, Italy
1960

Pier Luigi Nervi Engineer
Marcello Piacentini Architect

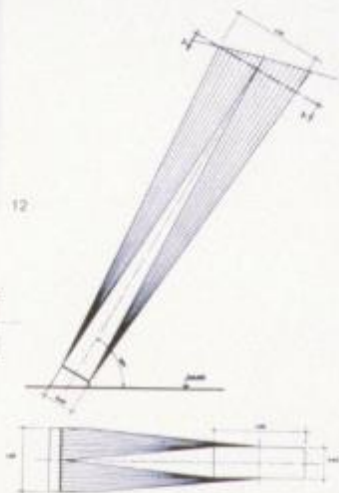
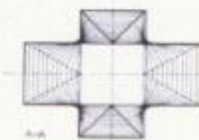








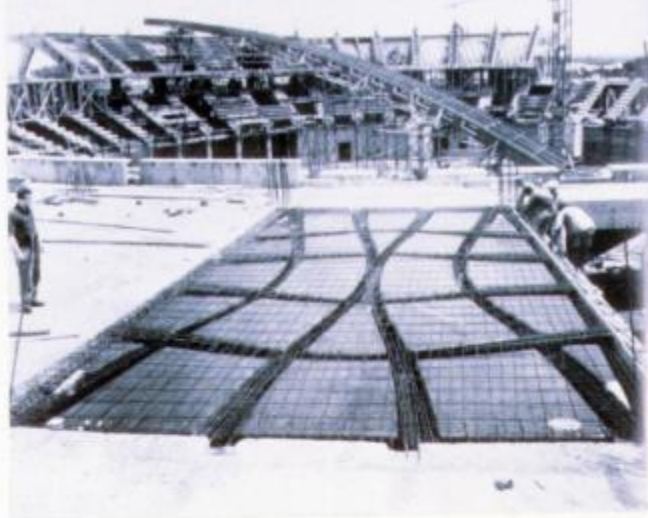
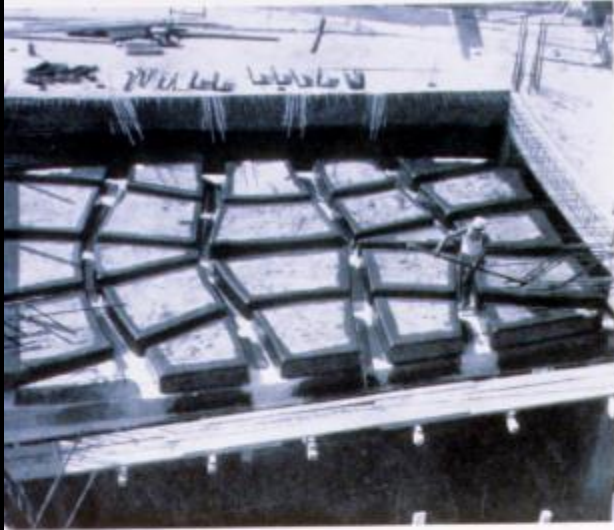
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15

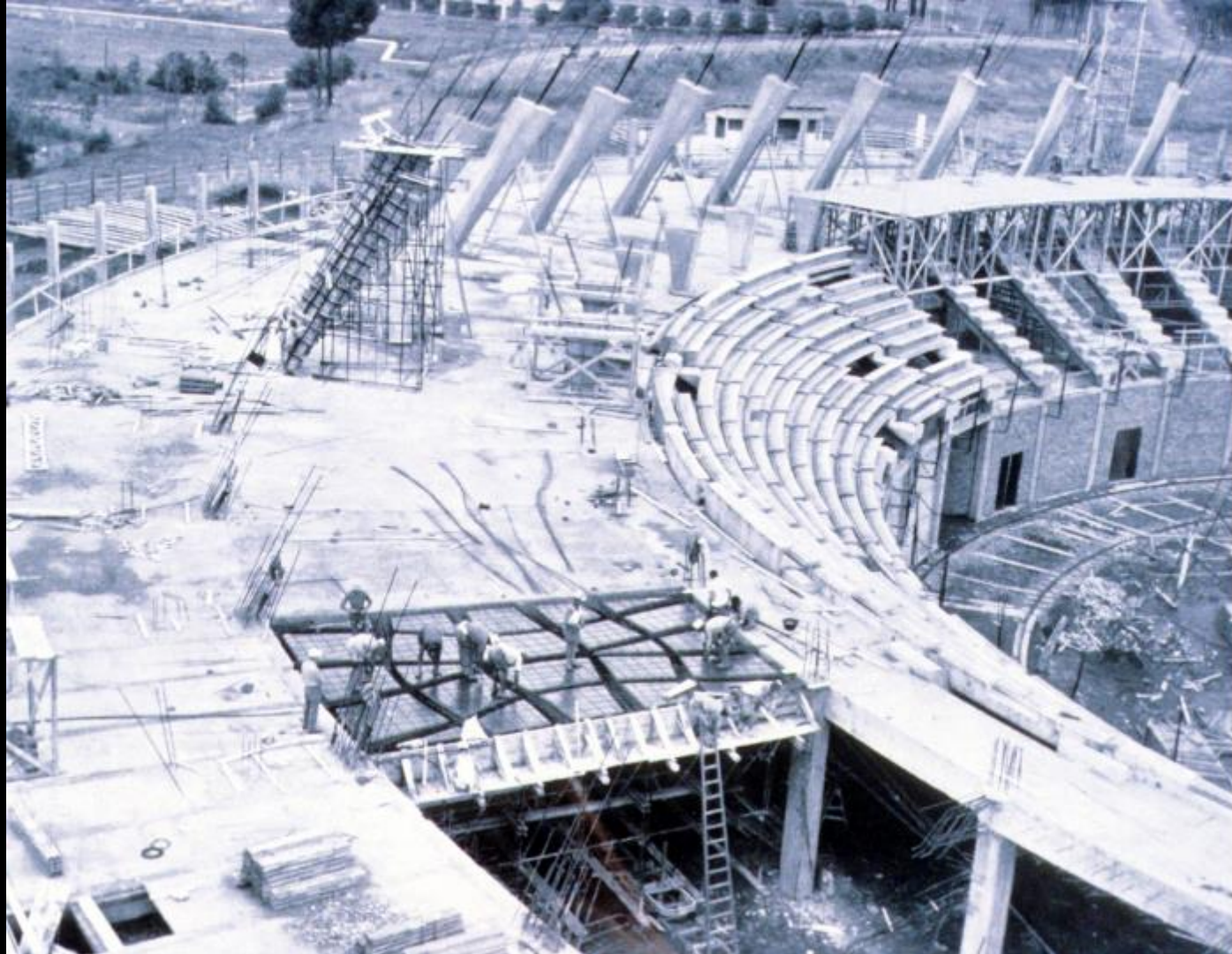
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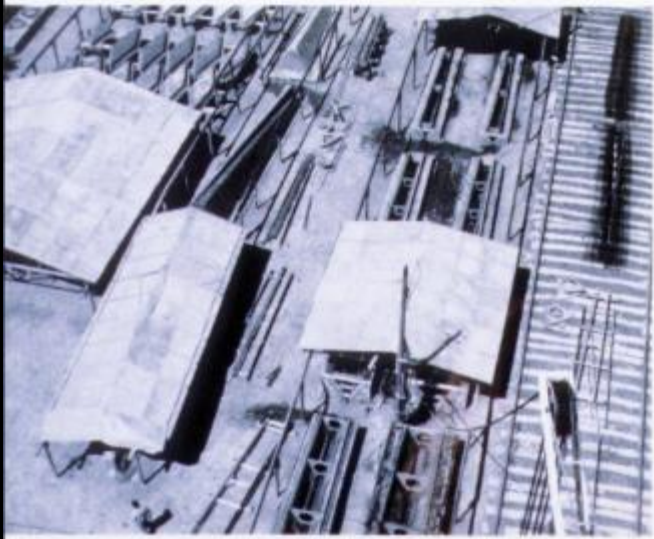
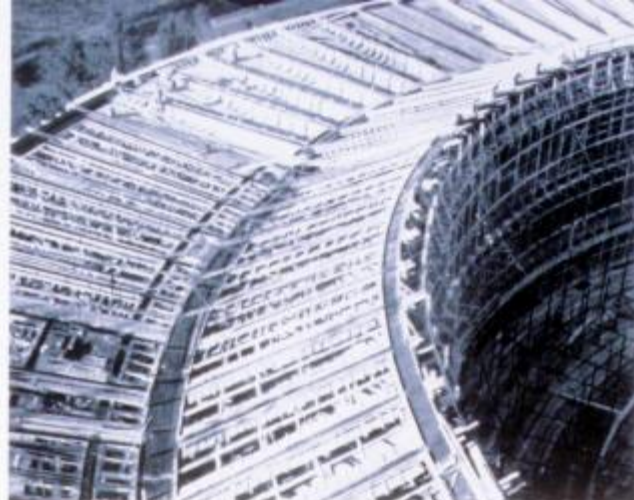
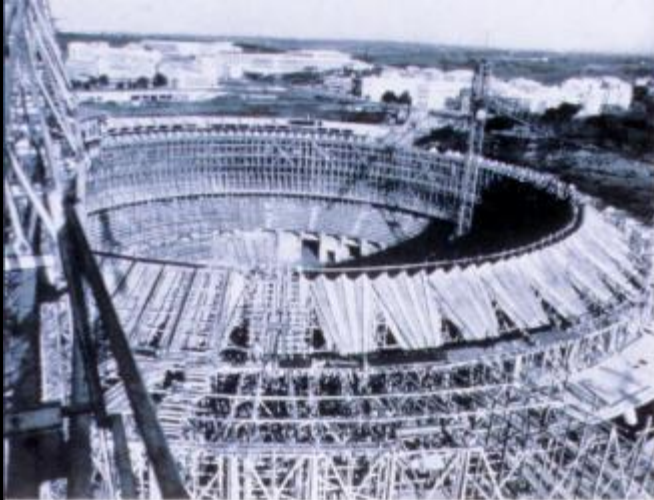
- 12 Studies for the formwork of the inclined columns (in "ferro-cemento")
- 13 Construction of the moulds, in rendered brick, for casting the units forming the peripheral gallery.
- 14 Placing the precast units roofing the peripheral gallery.
- 15, 16 Timber formwork for the columns.
- 17 Column details. The inclination exactly follows the resultants of the thrust of the dome and of the vertical reaction due to the upper bank of seats and the roof of the peripheral gallery.
- 18 View of the gallery and the inclined columns.



Reusable "ferro-cemento" forms used for casting the gallery floor, in which the ribs follow the lines of the principal stresses (P. L. Nervi, 1951).
 Reinforcement ready for concreting.
 Finished floor, from below.
 Hall under construction, showing the three sections of timber formwork reinforced with steel which were used for casting the 45° inclined







22 The prefabricated fan-shaped supports.
23 Timber formwork in position for casting the peripheral roof.
24 The casting yard.

















Palazzetto dello Sport
Rome, Italy
Pier Luigi Nervi
1960







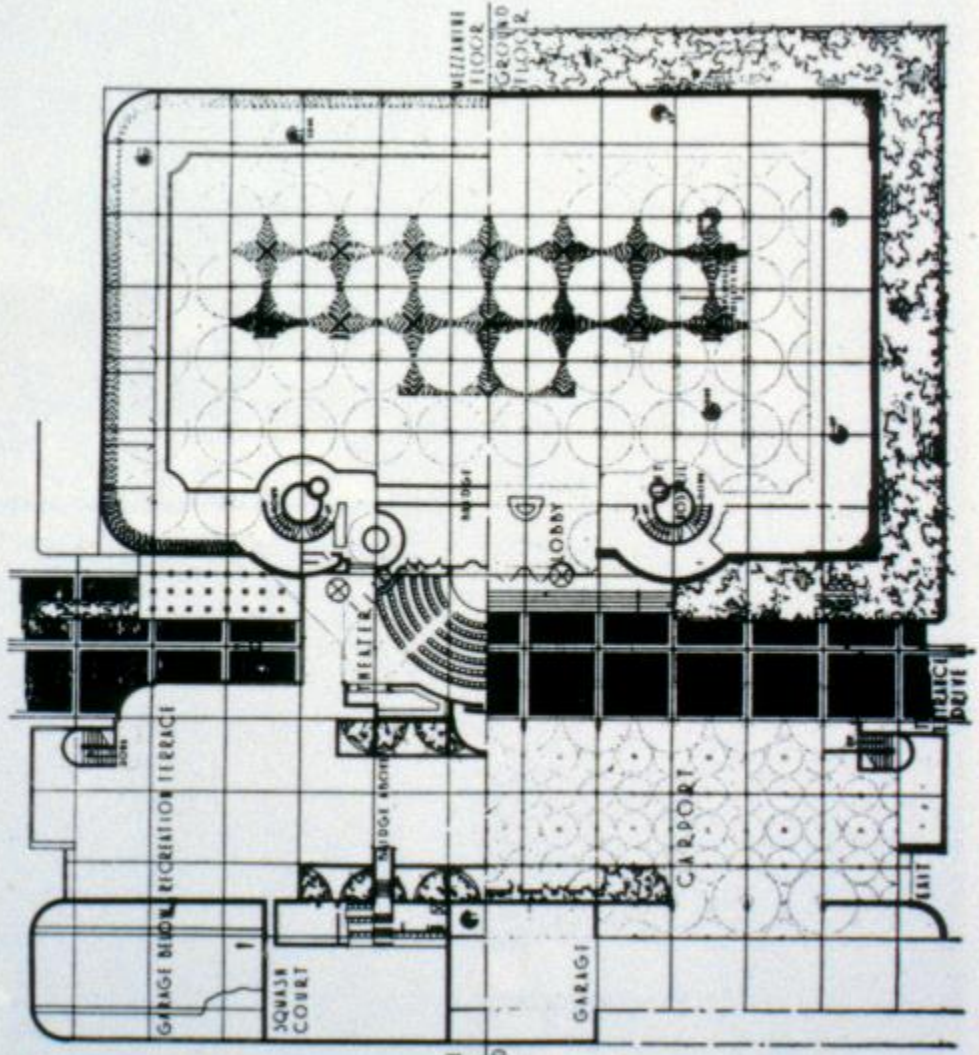


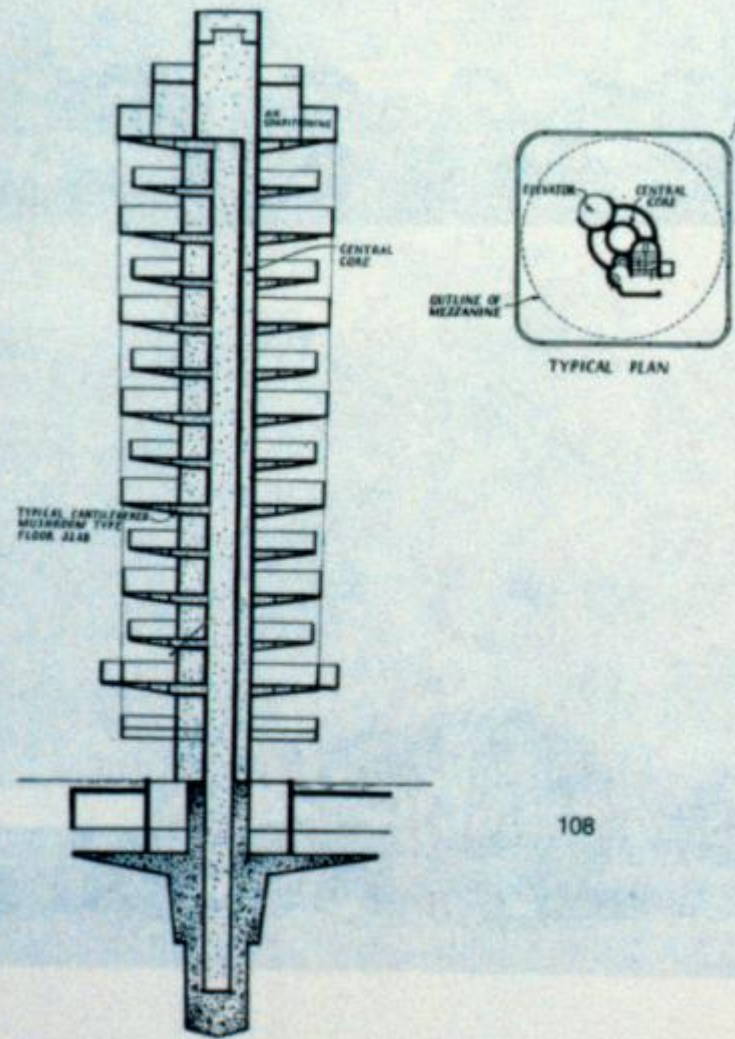
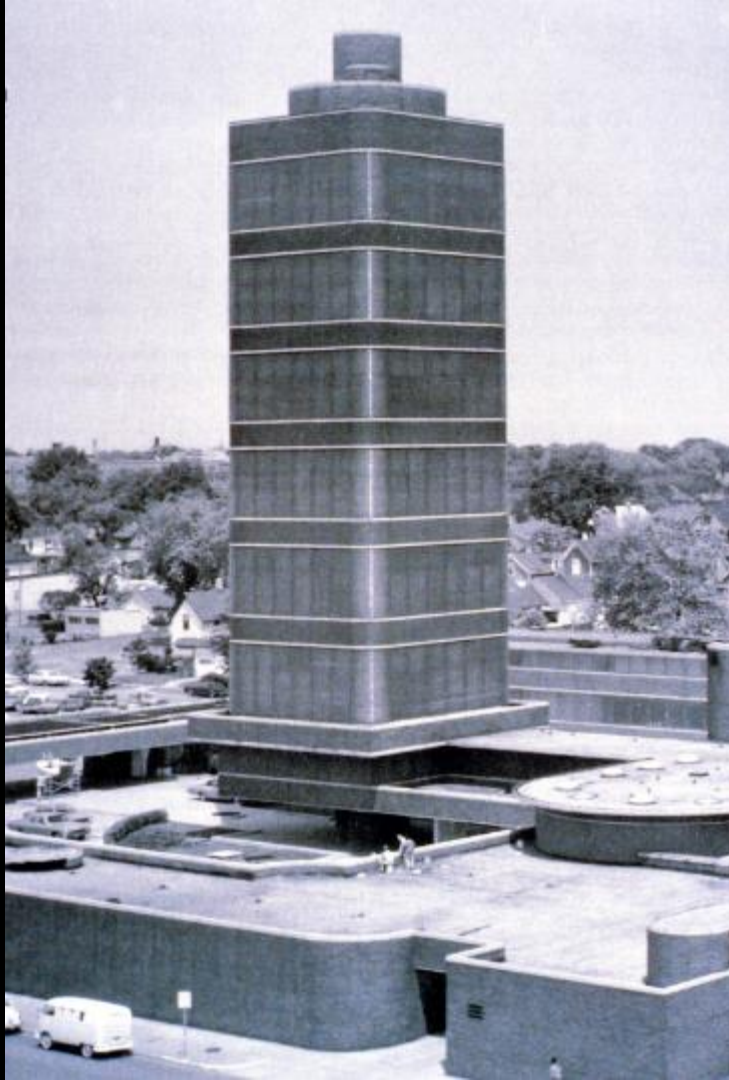






Johnson Wax Headquarters
Racine, Wisconsin
Frank Lloyd Wright 1939













Marina Towers
Chicago, Illinois
Goldberg & Associates
1968



FIGURE 7.18 Marina Towers in Chicago during construction.

FIGURE 7.17 Model of Marina Towers in Chicago. Architects and engineers: Bertrand Goldberg and Associates. Consulting Engineers: Severud-Elstad-Krueger Associates. Foundation Consultants: Moran, Mueser and Rutledge and R. B. Peck. Sponsors: Building Service Employees International Union.

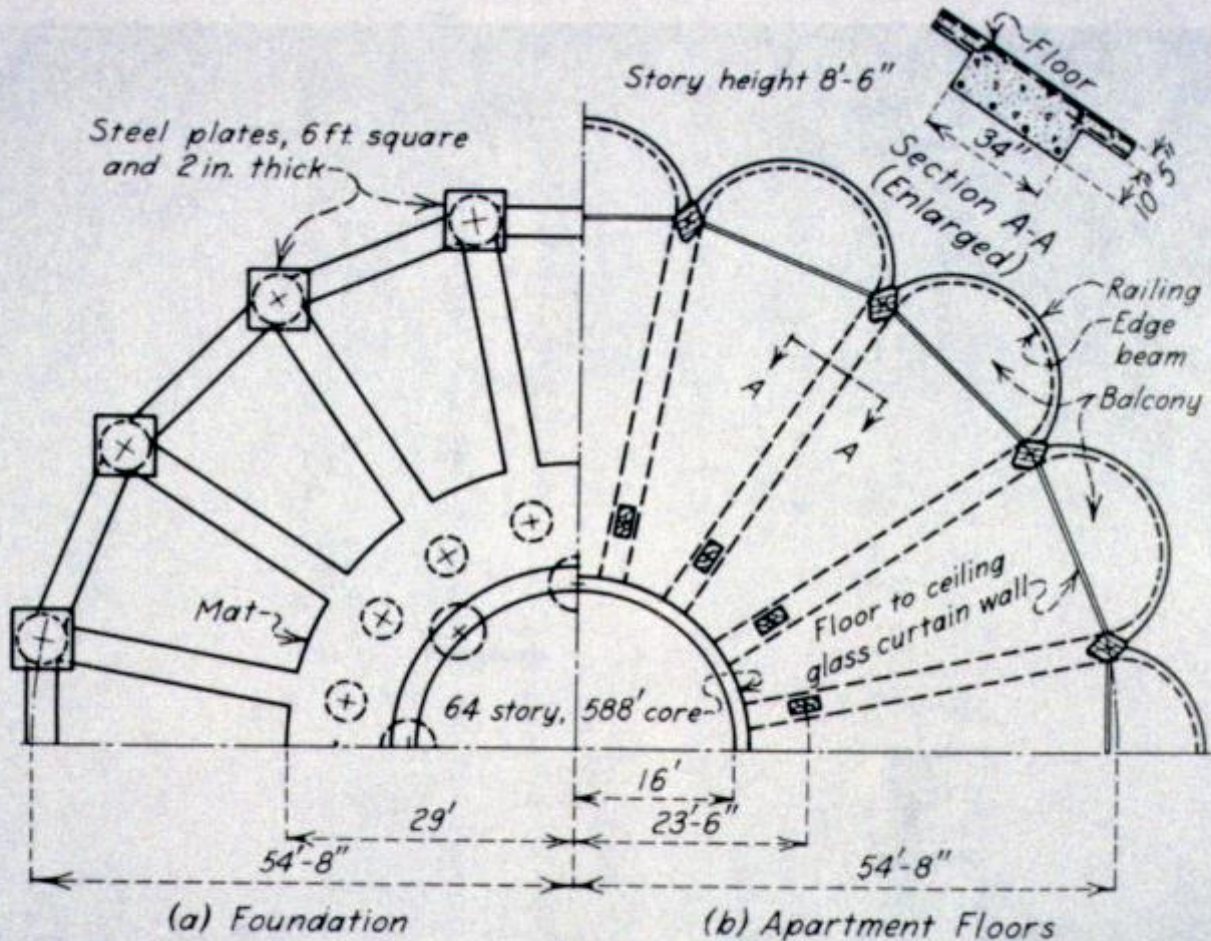
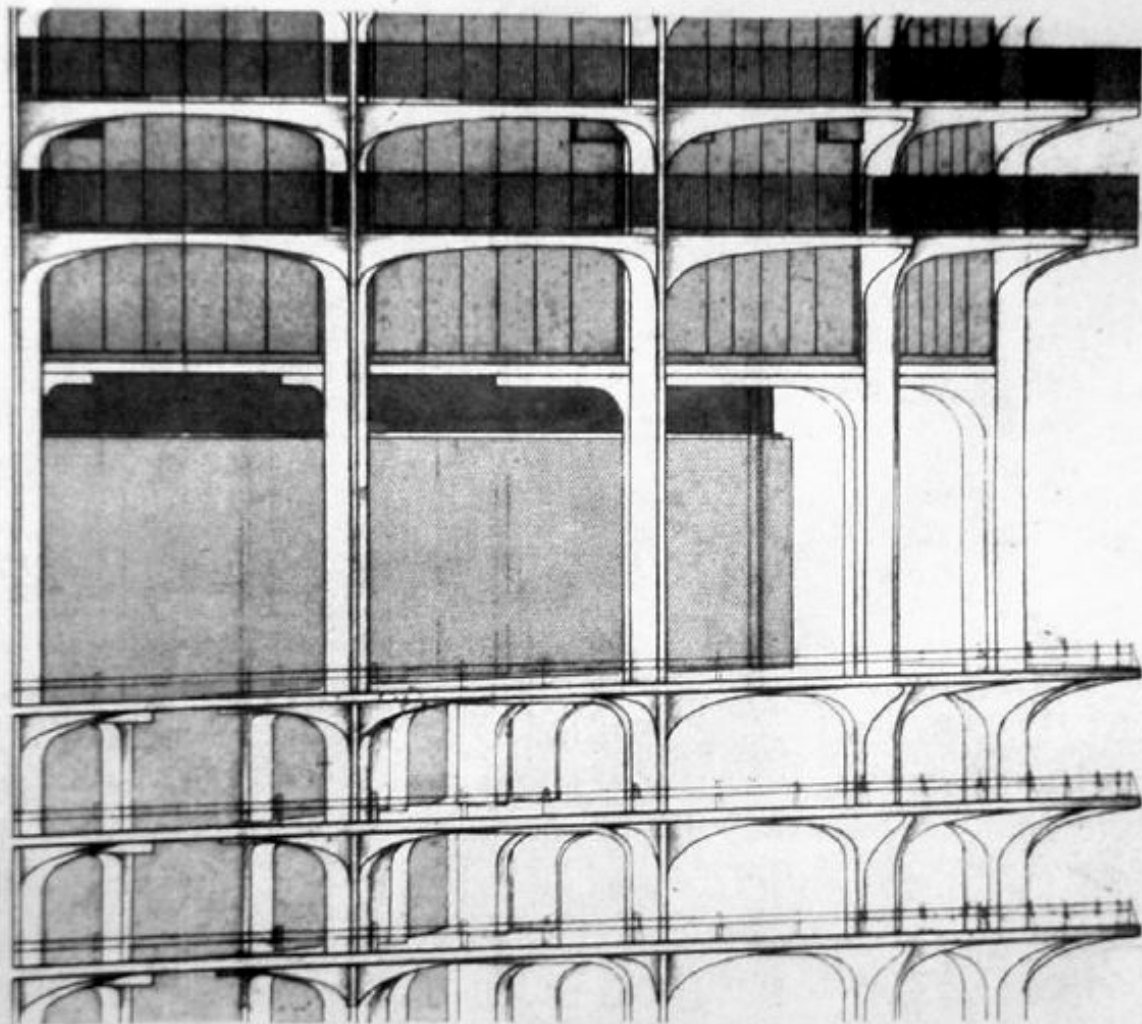


FIGURE 7.19 Partial plans of Marina Towers.





















NA
737
S28F87
1977
U.N.B.

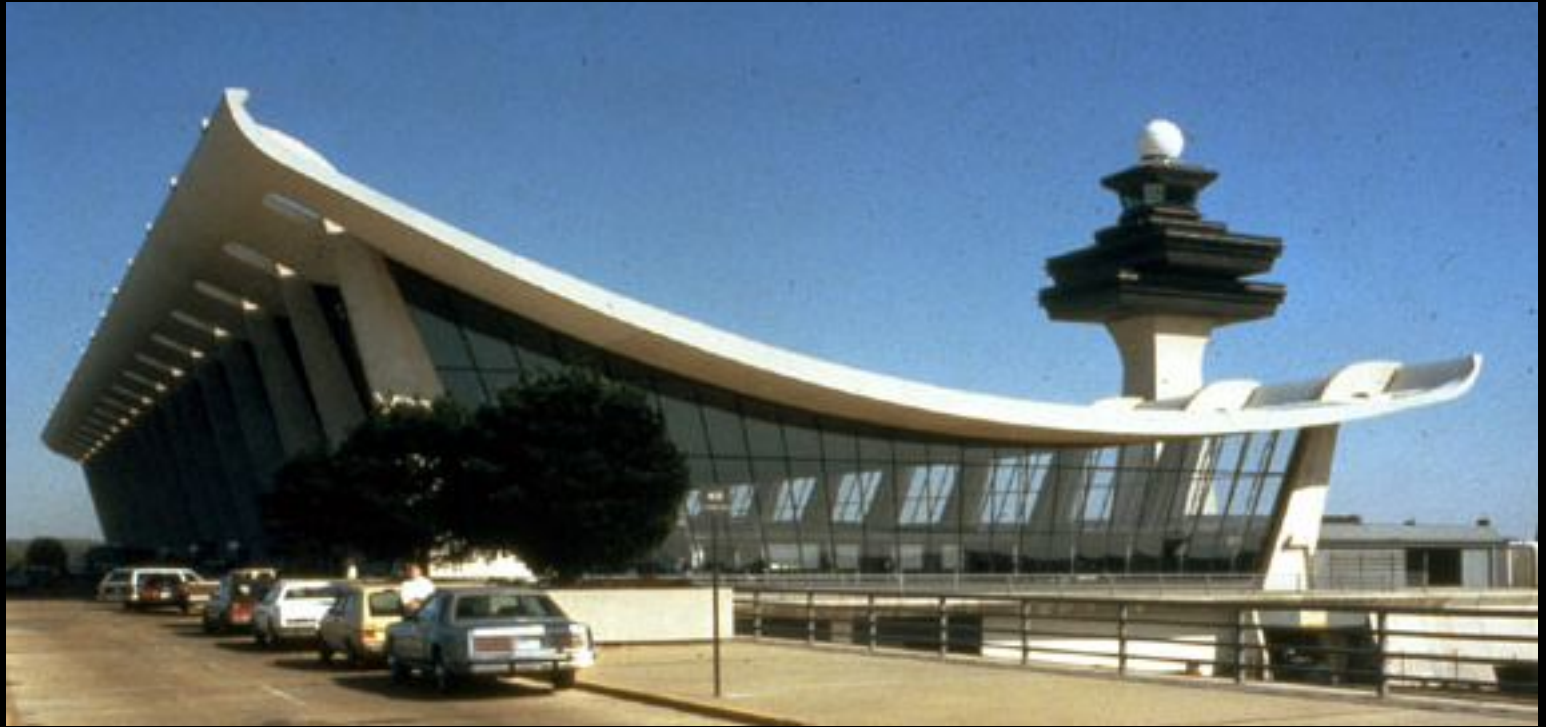


Washington Dulles International Airport
Washington, DC, USA
Eero Saarinen Architect
1962



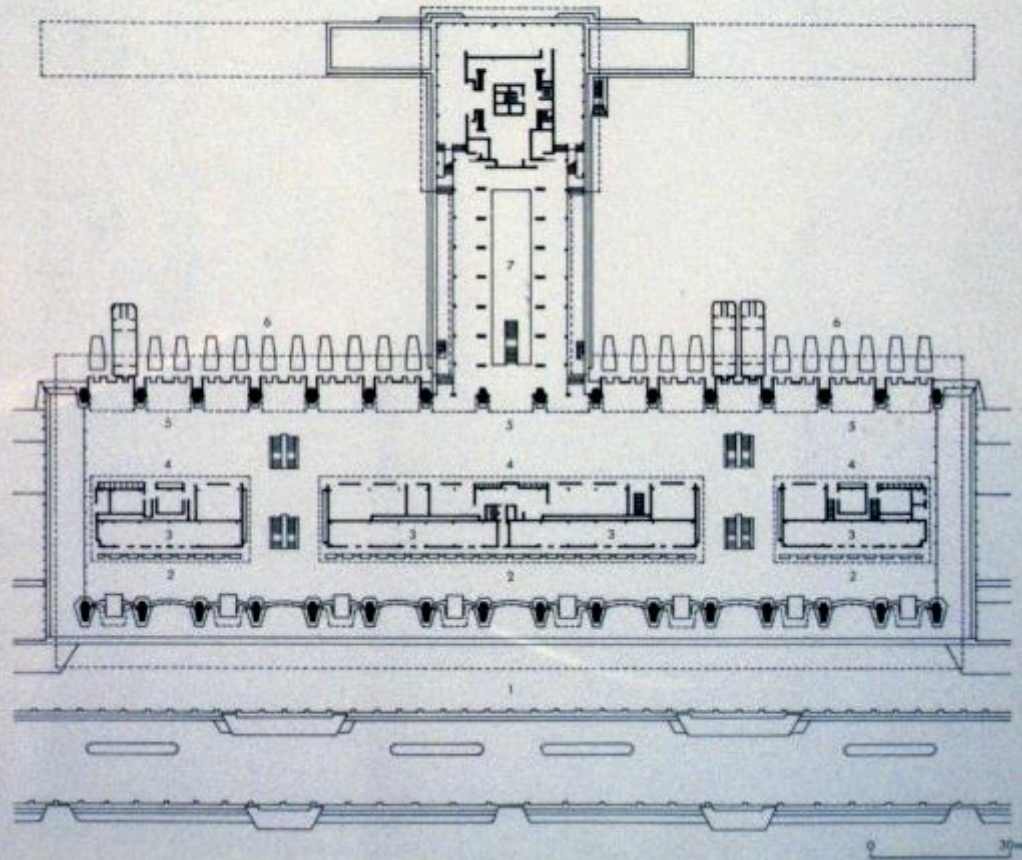
GTA
Global Architecture

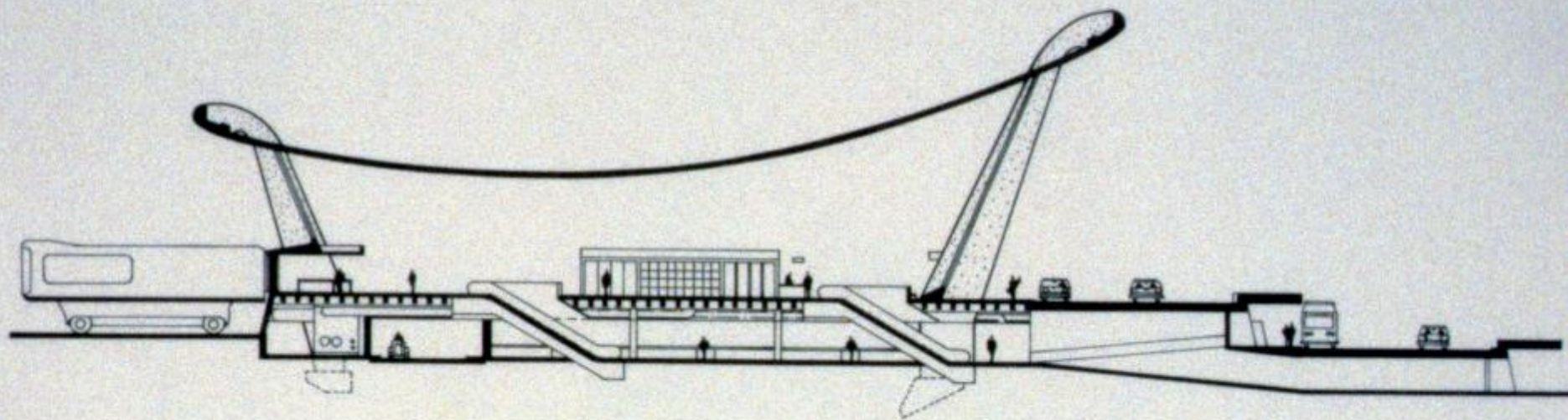
*Eero Saarinen
DWA Terminal Building,
Kennedy Airport, New York. 1956-62
Dulles International Airport (Washington, D.C.)
Chantilly, Virginia. 1958-62
Edited and Photographed by Yukio Futagawa
Text by Nobuo Hozumi*



Plan

- 1 Explaining road*
- 2 Ticketing*
- 3 Offices*
- 4 Concessions*
- 5 Waiting area*
- 6 Transporter docks*
- 7 Concourse*





Section











Another architectural pilgrimage:
How far will you go to visit a building?
How important are buildings to you?















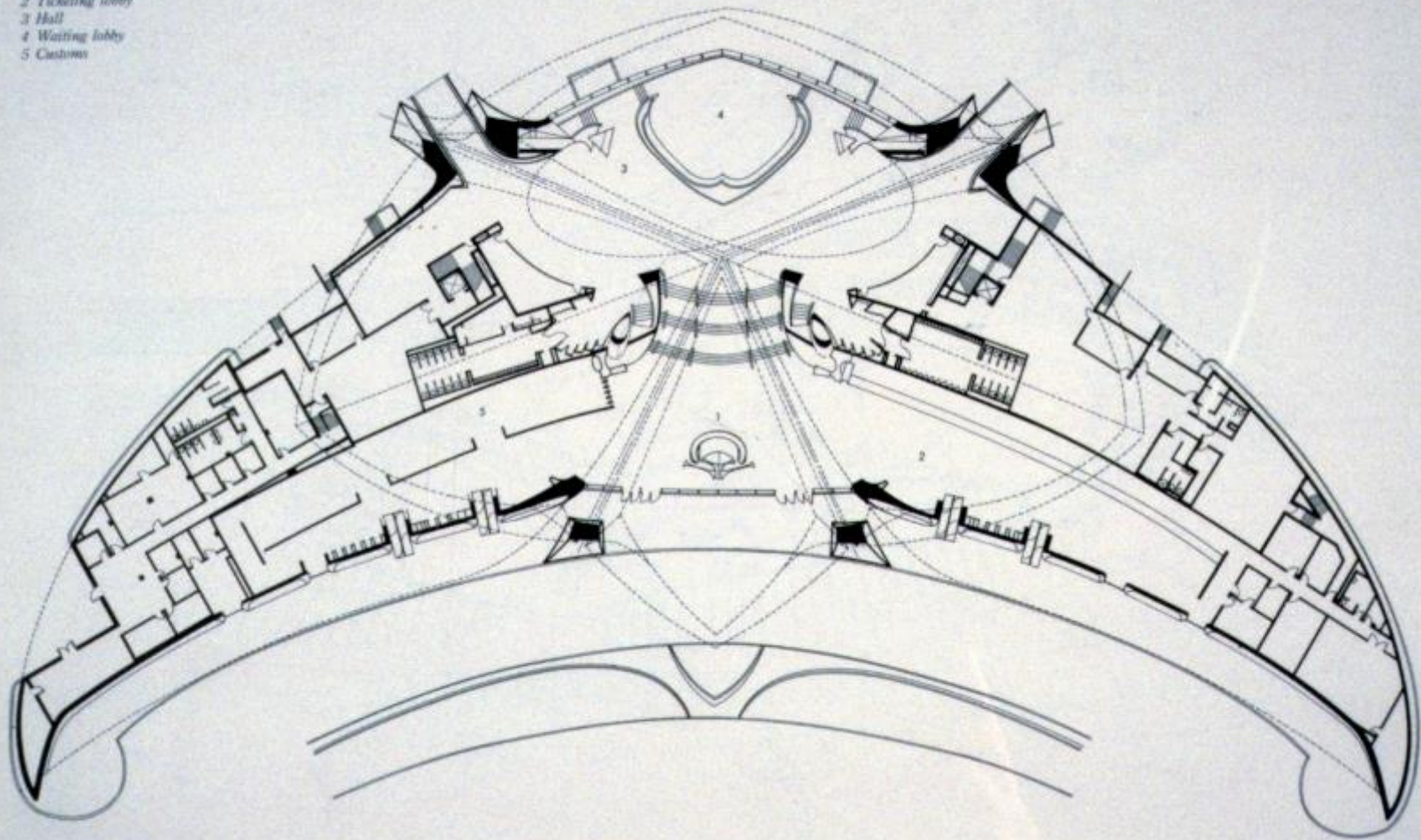




TWA Flight Center
New York City, USA
Eero Saarinen
1962

Plan

- 1 Information counter*
- 2 Ticketing lobby*
- 3 Hall*
- 4 Waiting lobby*
- 5 Customs*



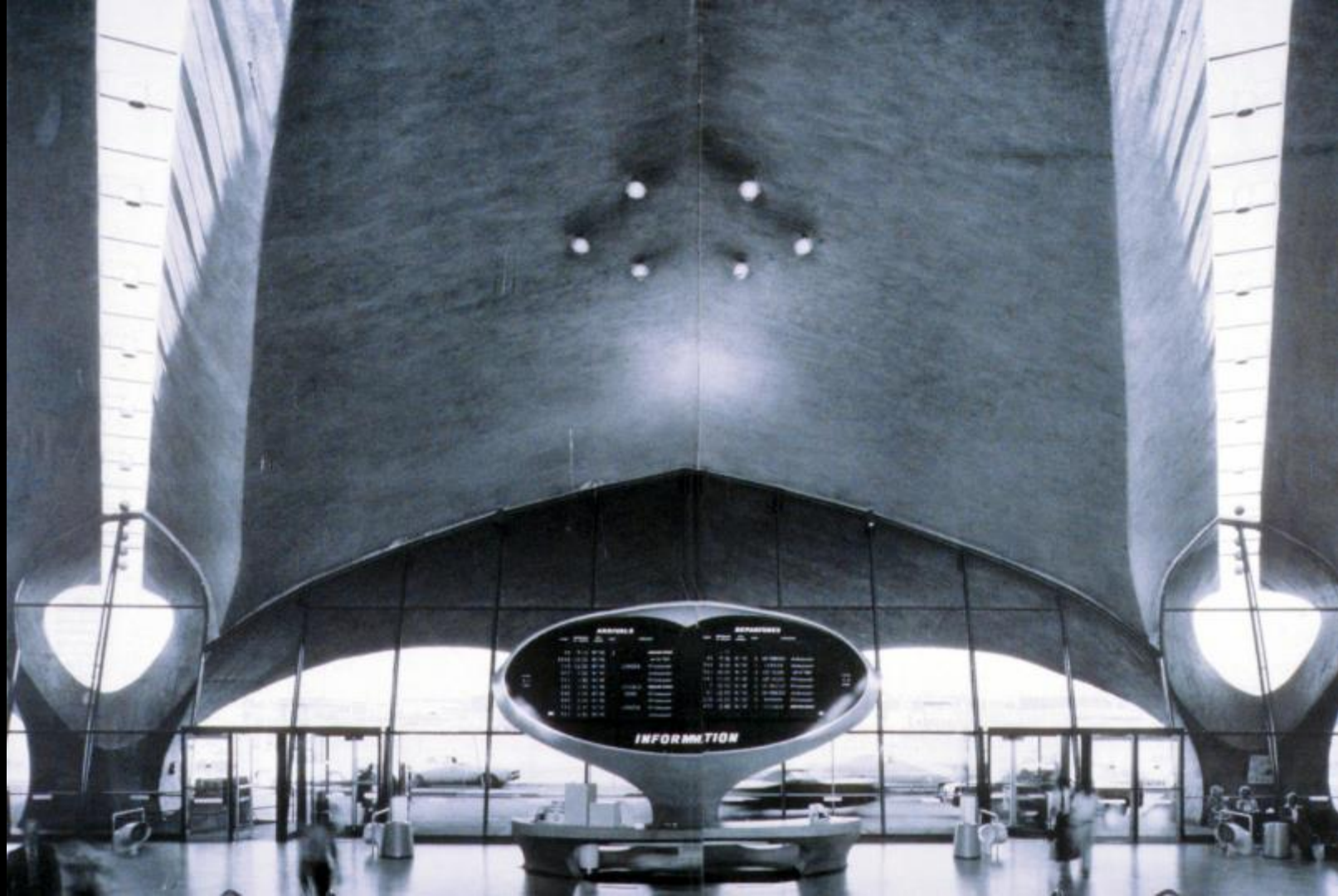


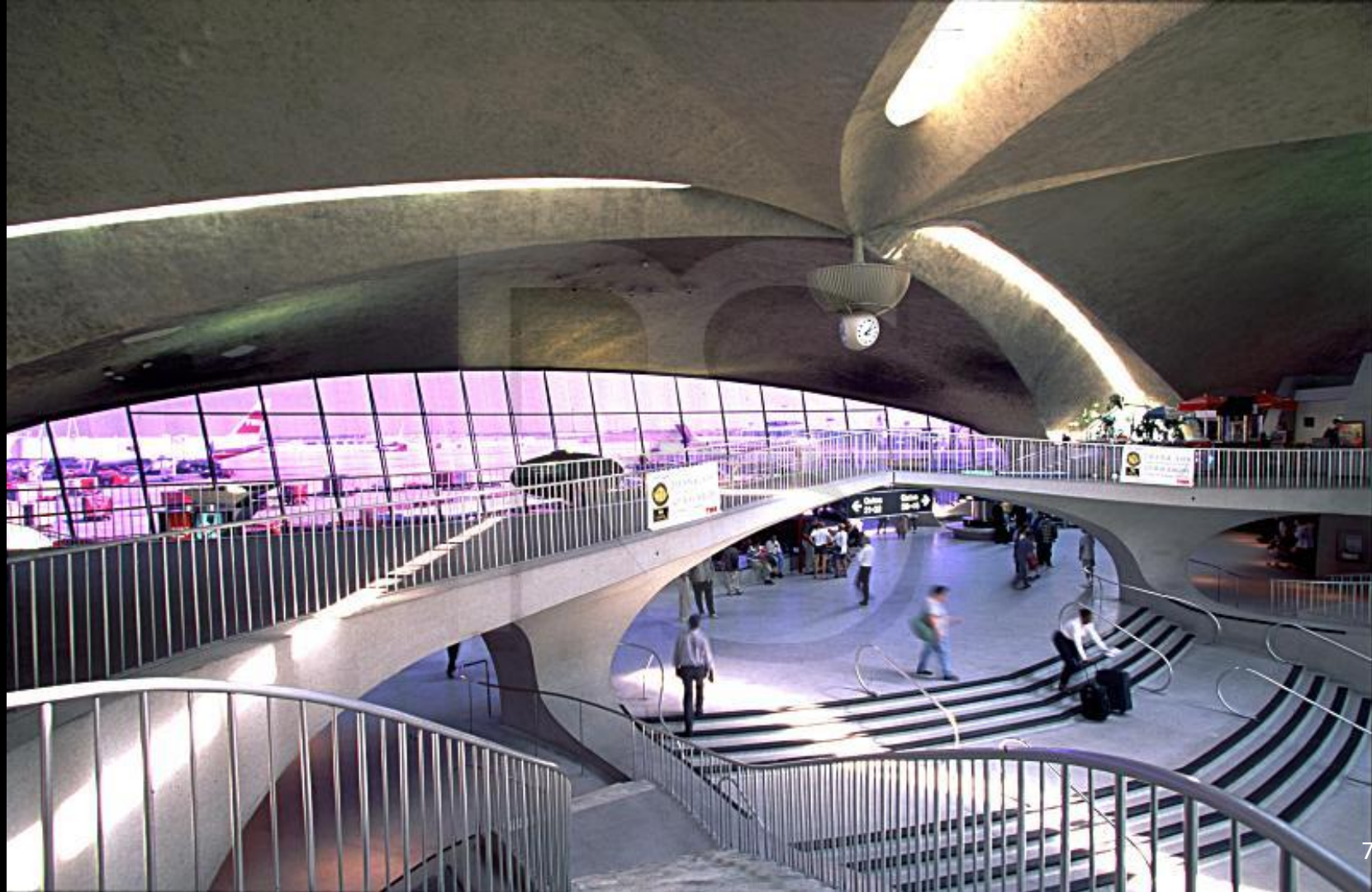












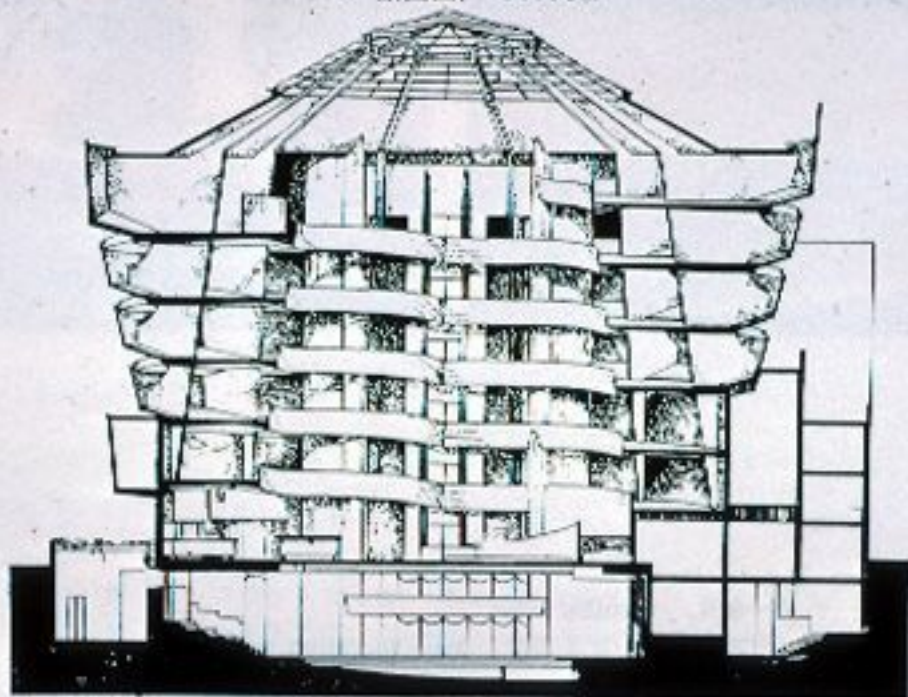
Curves and Plastic Forms



Solomon R. Guggenheim Museum
New York City, USA
Frank Lloyd Wright
1959



5- 塔圖, Section.















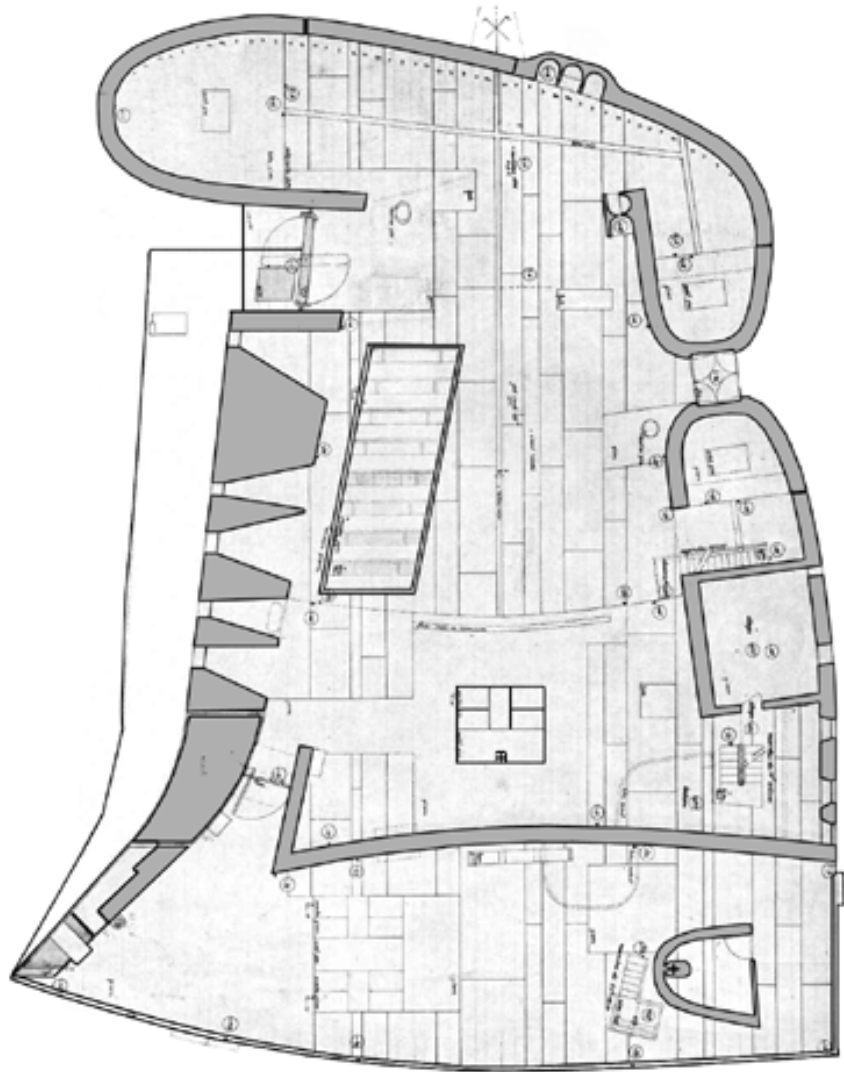
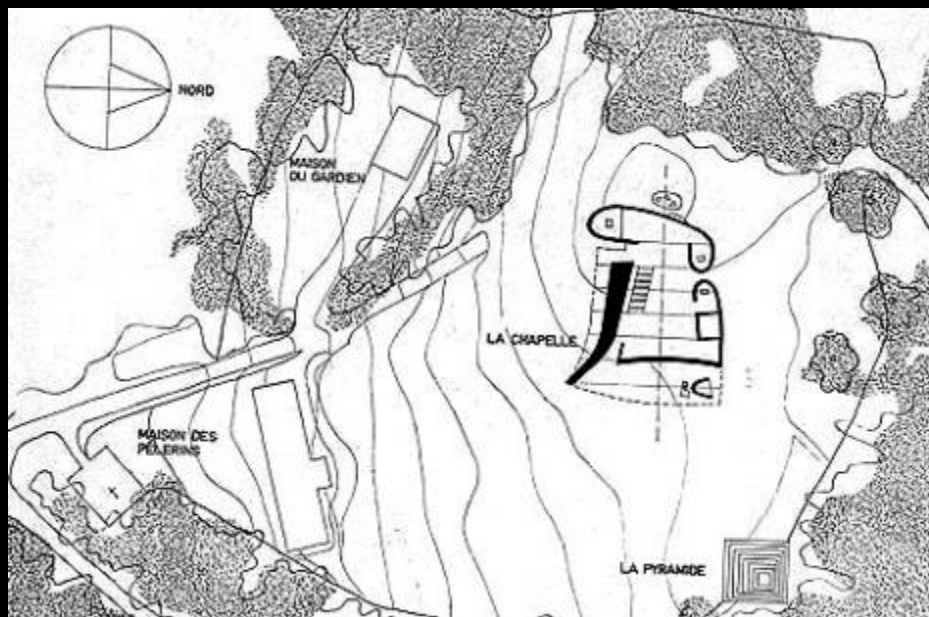








Chapelle Notre-Dame-du-
Haut de Ronchamp
Ronchamp, France
Le Corbusier
1955





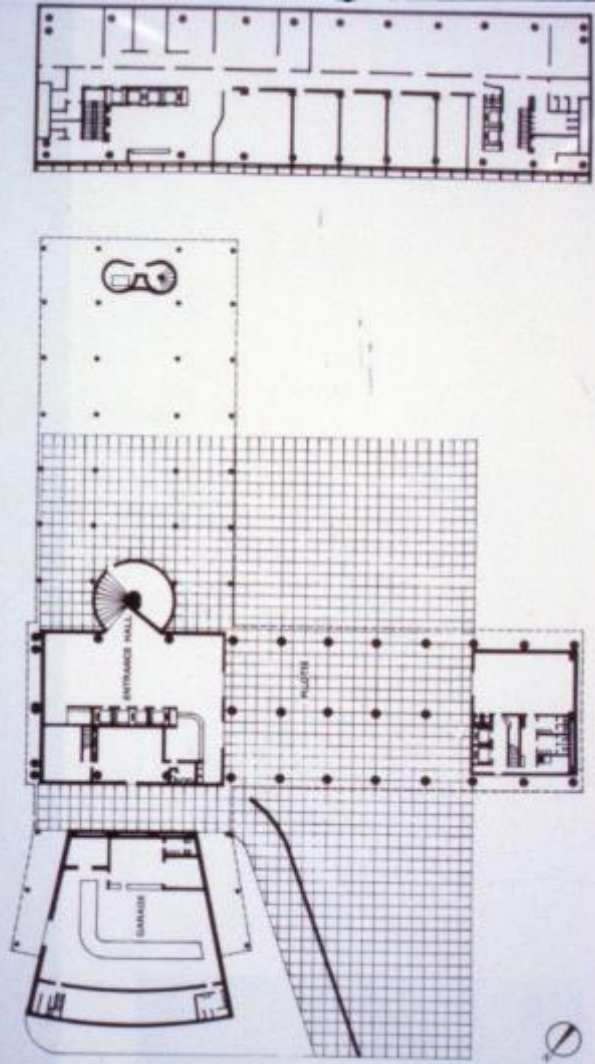












Ministry of Education
and Health
Rio de Janeiro, Brazil
Oscar Neimeier
1943







Cathedral of Brasília
Brasília, Brazil
Oscar Niemeyer
1970



National Congress Building
Brasília, Brazil
Oscar Neimeier
1960





Niterói Contemporary Art Museum
Niterói, Brazil
Oscar Neimeier
1996








Museu Oscar Neimeier
Curitiba, Brazil
Oscar Neimeier
2002





Auditorio Ibirapuera
São Paulo, Brazil
Oscar Niemeyer
2005



Brutalism



Maisons Jaoul
Neuilly-sur-Seine
Le Corbusier
1955







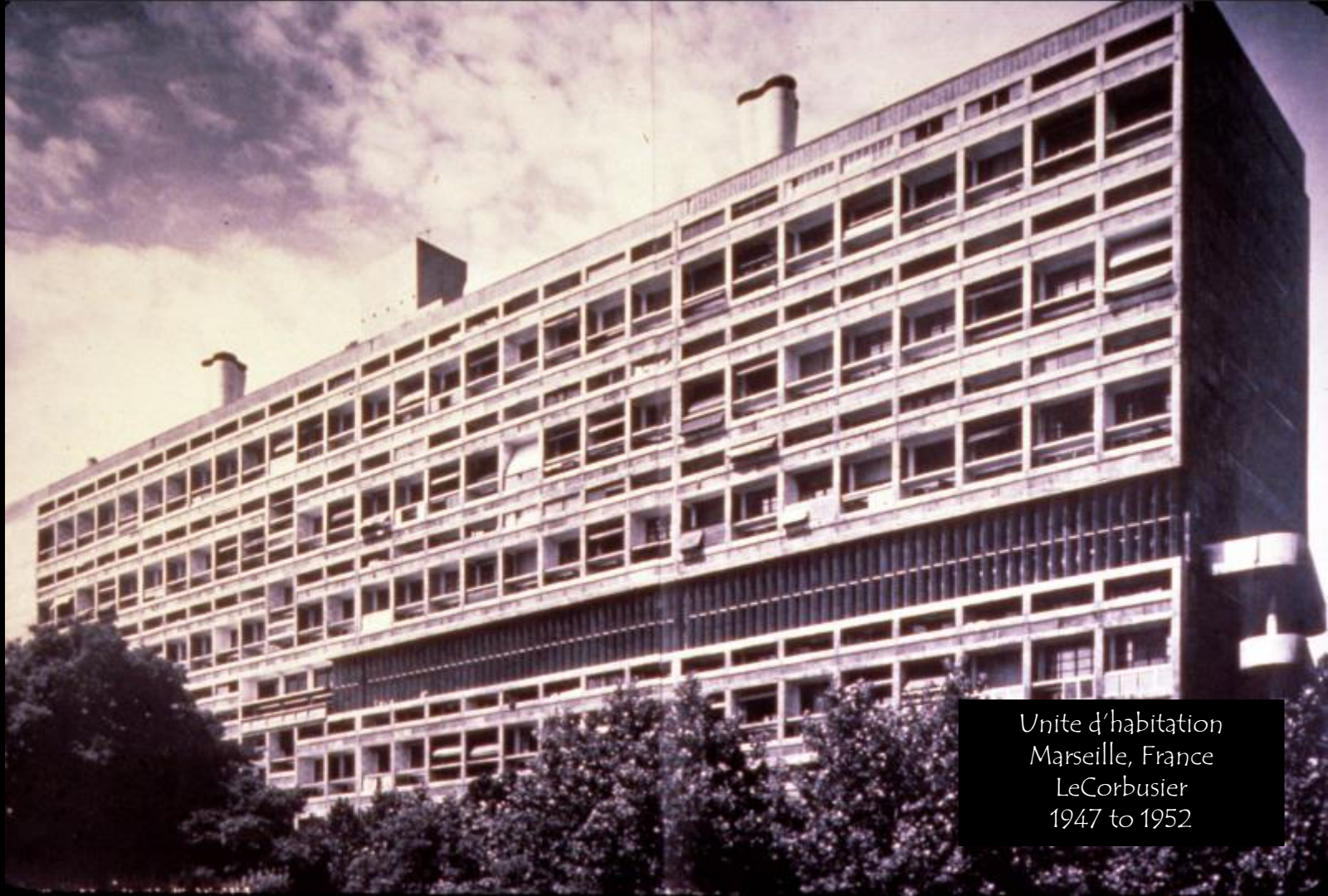
Sainte-Marie de La Tourette
Convent
Eveux, France
Le Corbusier
1960



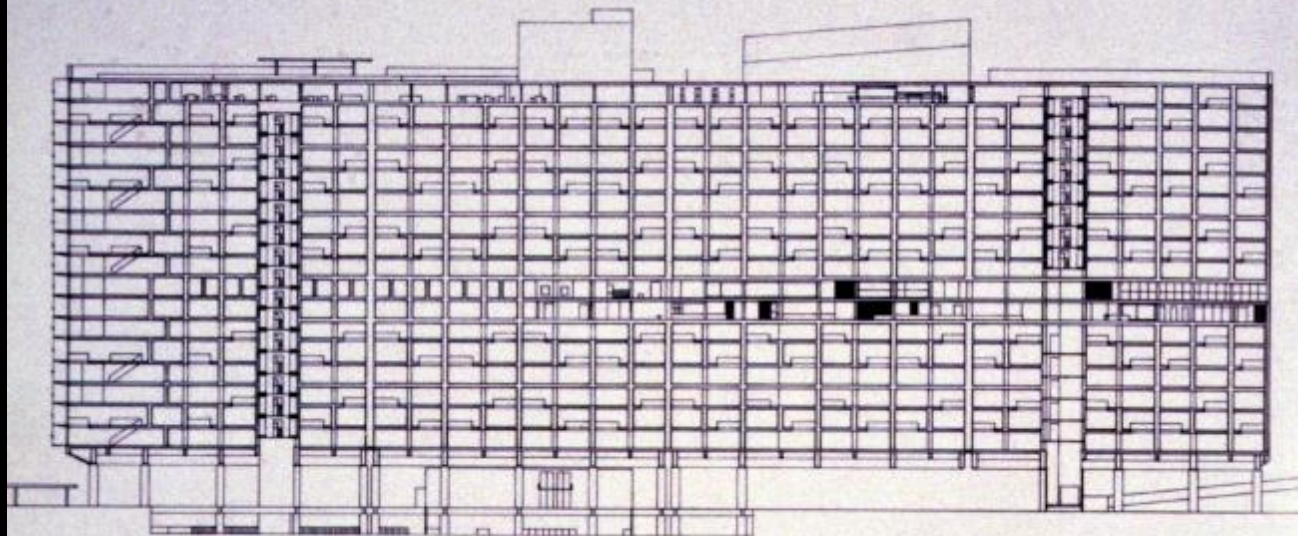




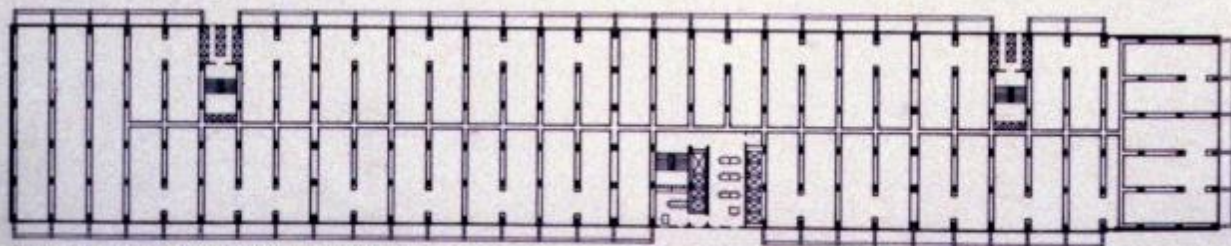




Unité d'habitation
Marseille, France
LeCorbusier
1947 to 1952



Long section looking west.



Typical floor plan of apartments, lower level.





Unite d'habitation of Berlin
Berlin, Germany
Le Corbusier
1958





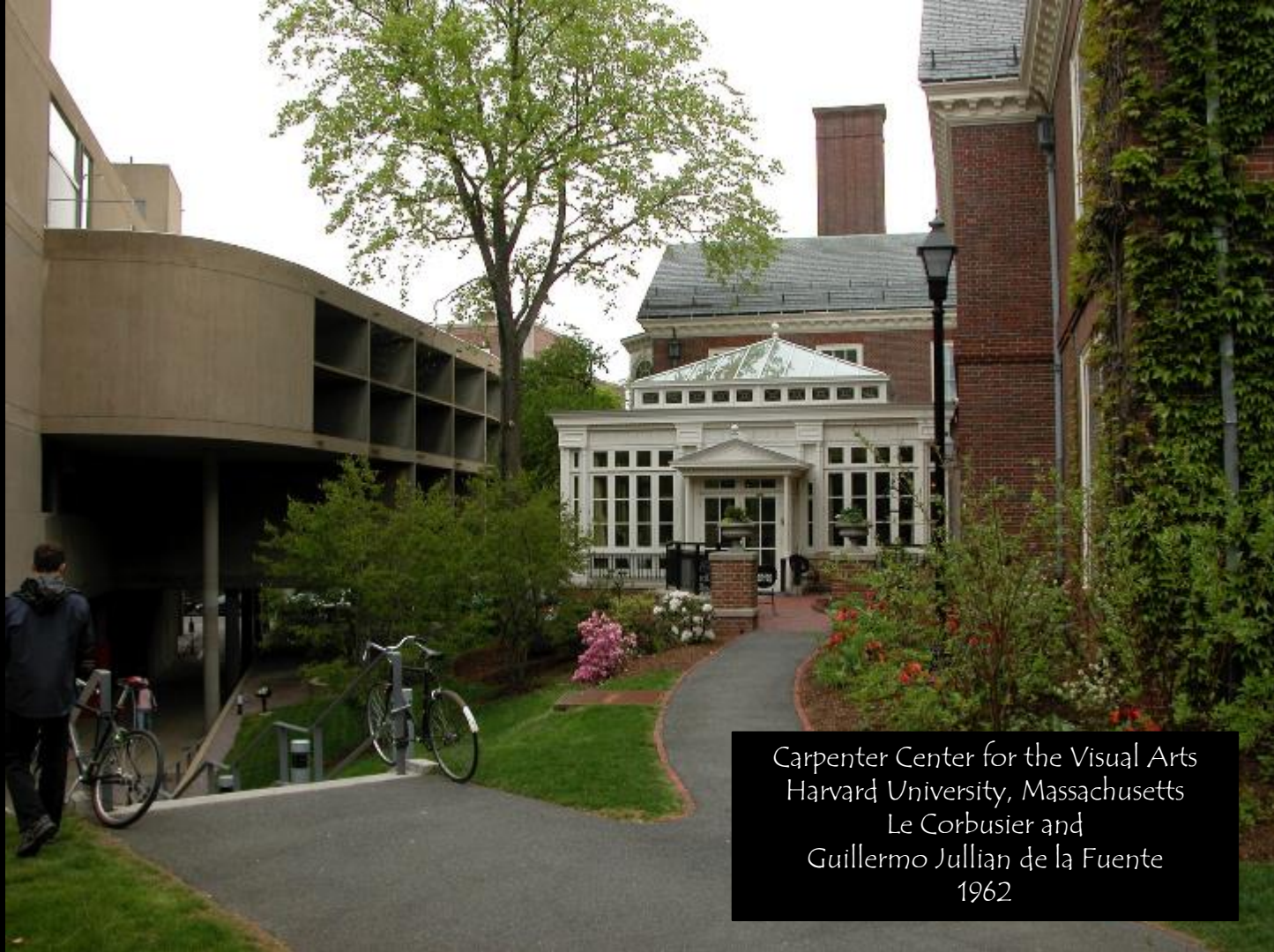












Carpenter Center for the Visual Arts
Harvard University, Massachusetts
Le Corbusier and
Guillermo Jullian de la Fuente
1962















Boston City Hall Plaza
Boston, Massachusetts
Kallmann McKinnell & Knowles
1962















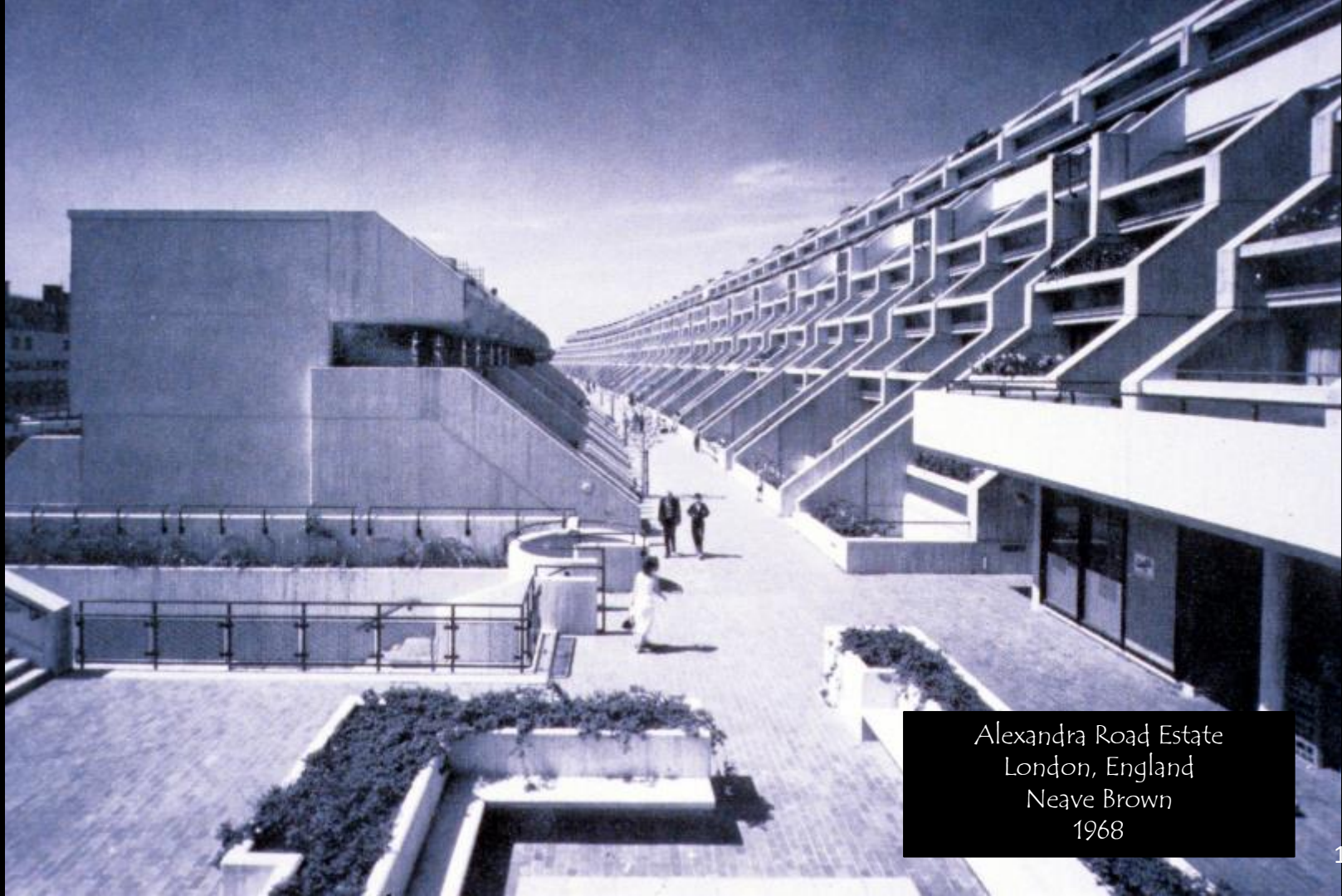


Math and Computer Building
University of Waterloo

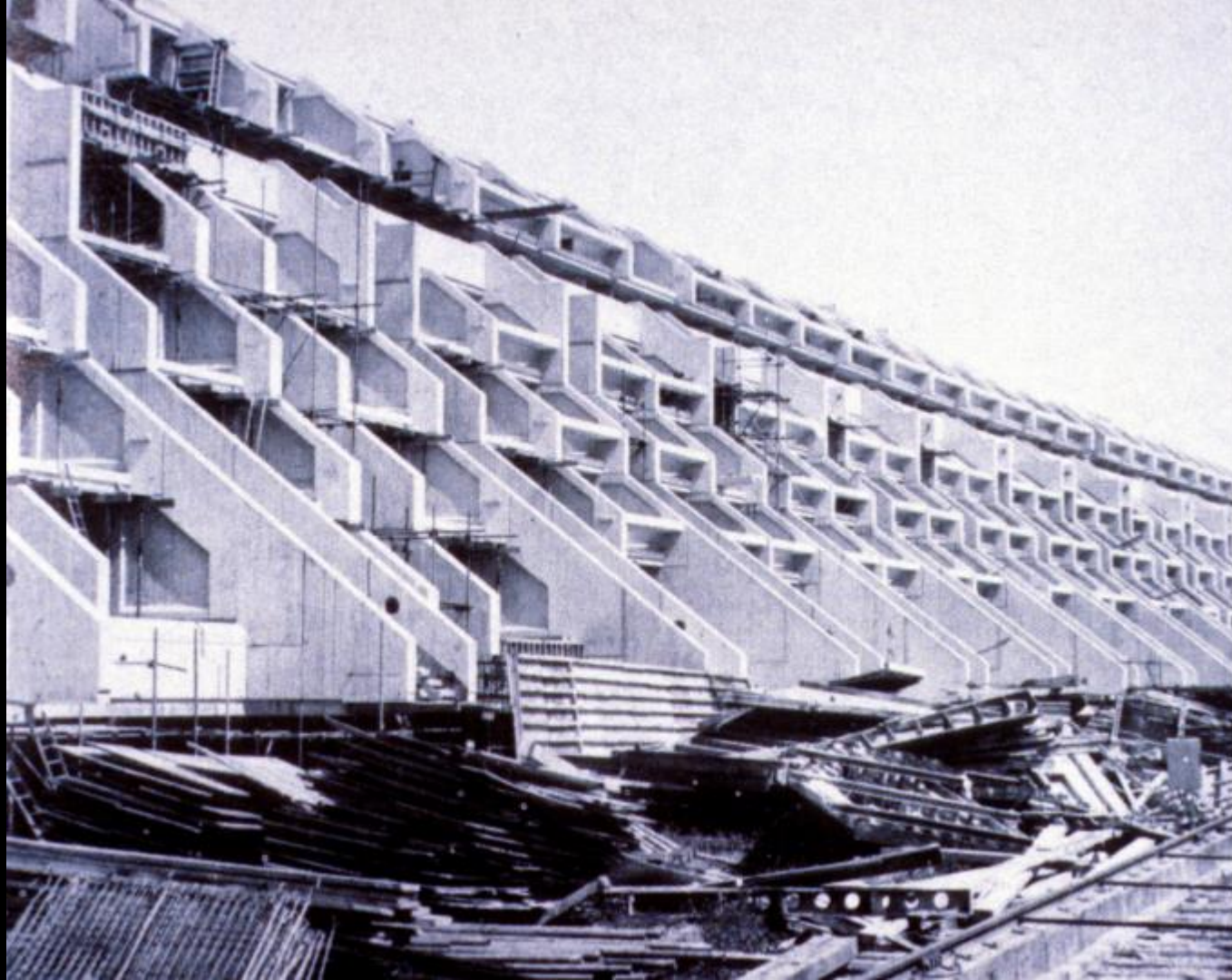


Atelier 5
Swiss Architectural Firm





Alexandra Road Estate
London, England
Neave Brown
1968







Brunswick Centre
London, England
Patrick Hodgkinson
1967 to 1972













Trellick Tower
London, England
Erno Goldfinger
1972



















Robinhood Gardens
London, England
Peter and Alison Smithson
1972
(demolition 2017-2019)













"A Clockwork Orange"
Film by
Stanley Kubrick



Thameshead Estate
London, England

