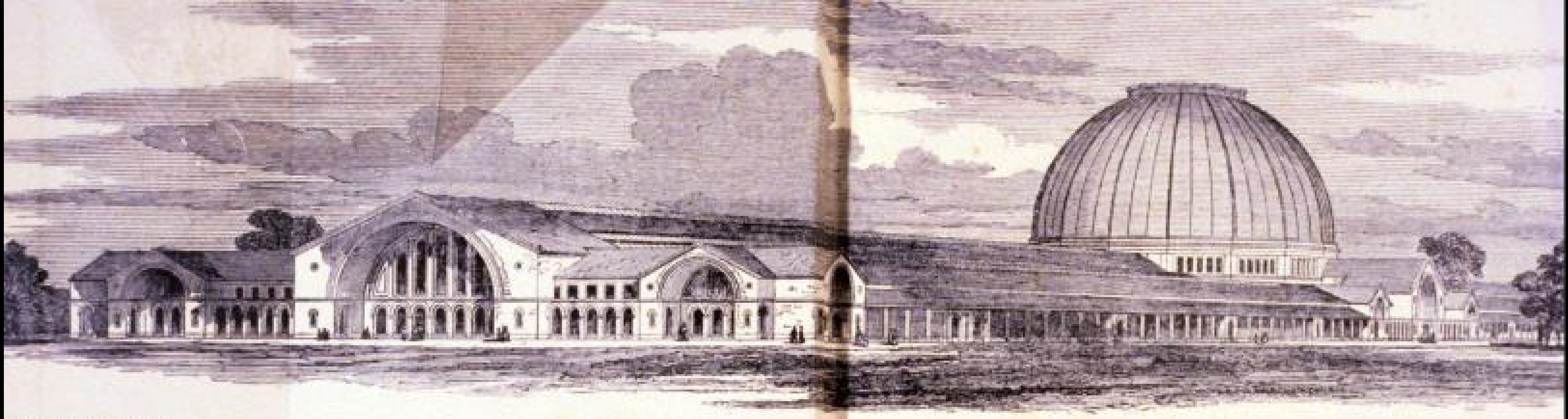
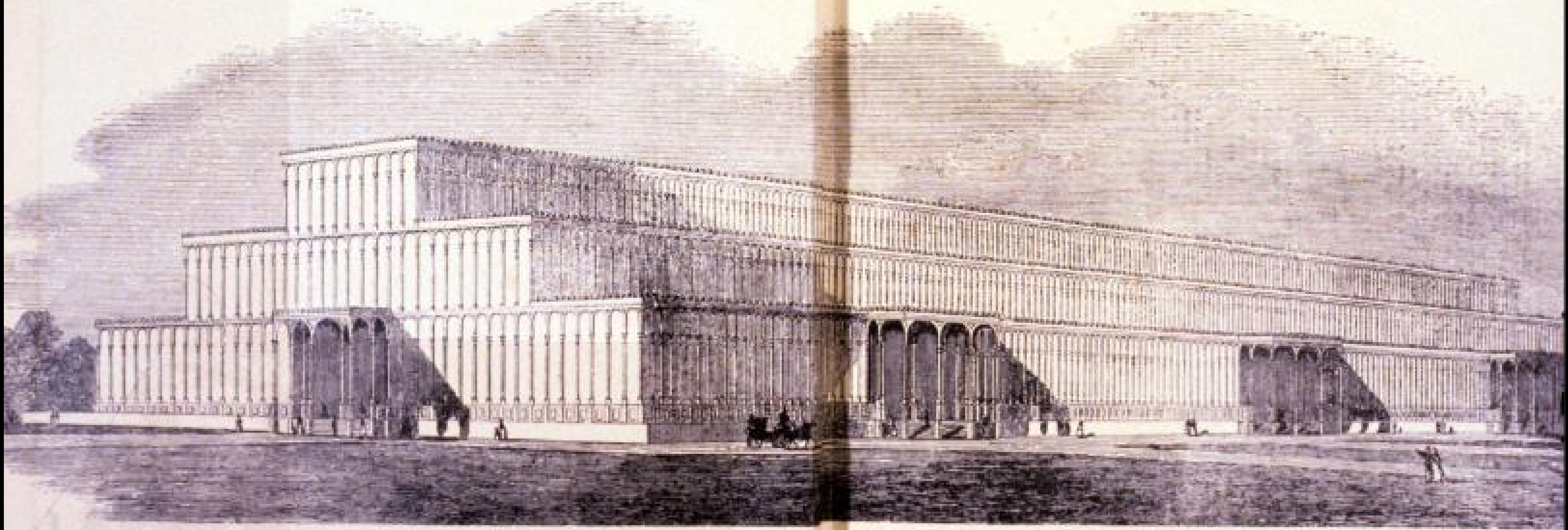
HIGH TECH ARCHITECTURE
The Origins of Detailing and Expression
in
Architecturally Exposed Structural Steel
(AESS)

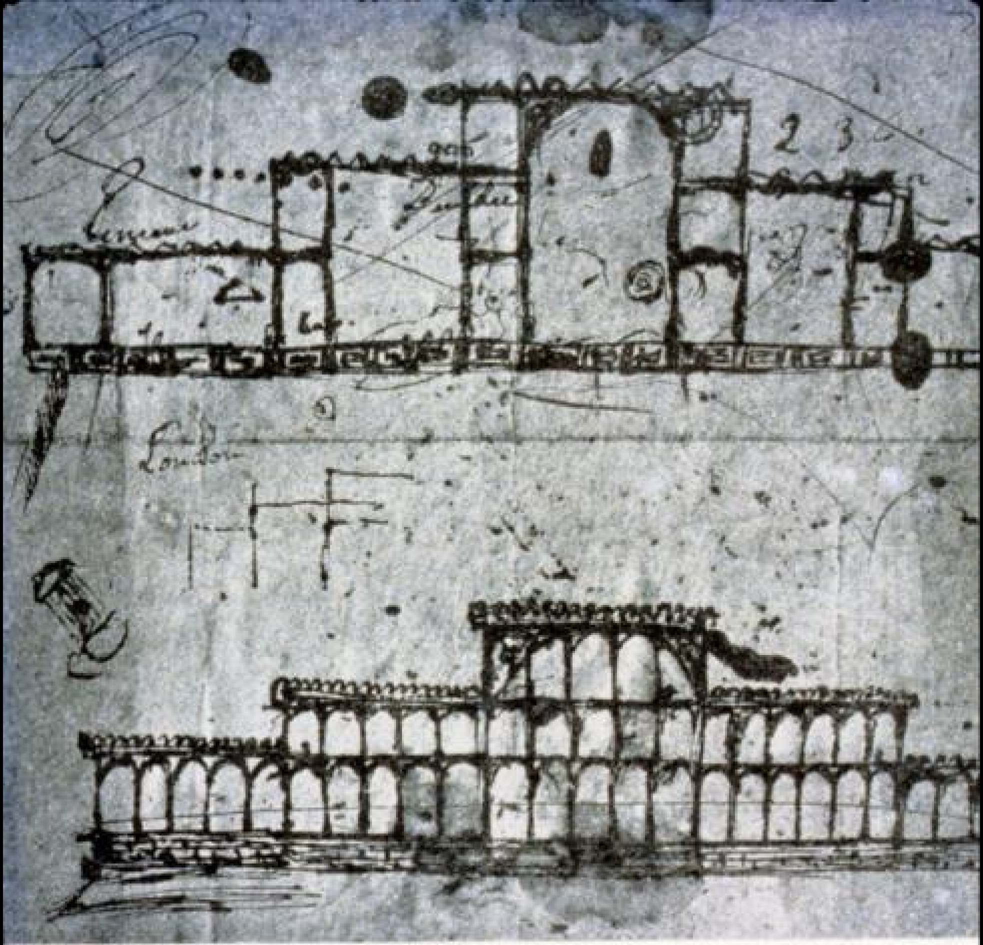


THE OFFICIAL DESIGN.



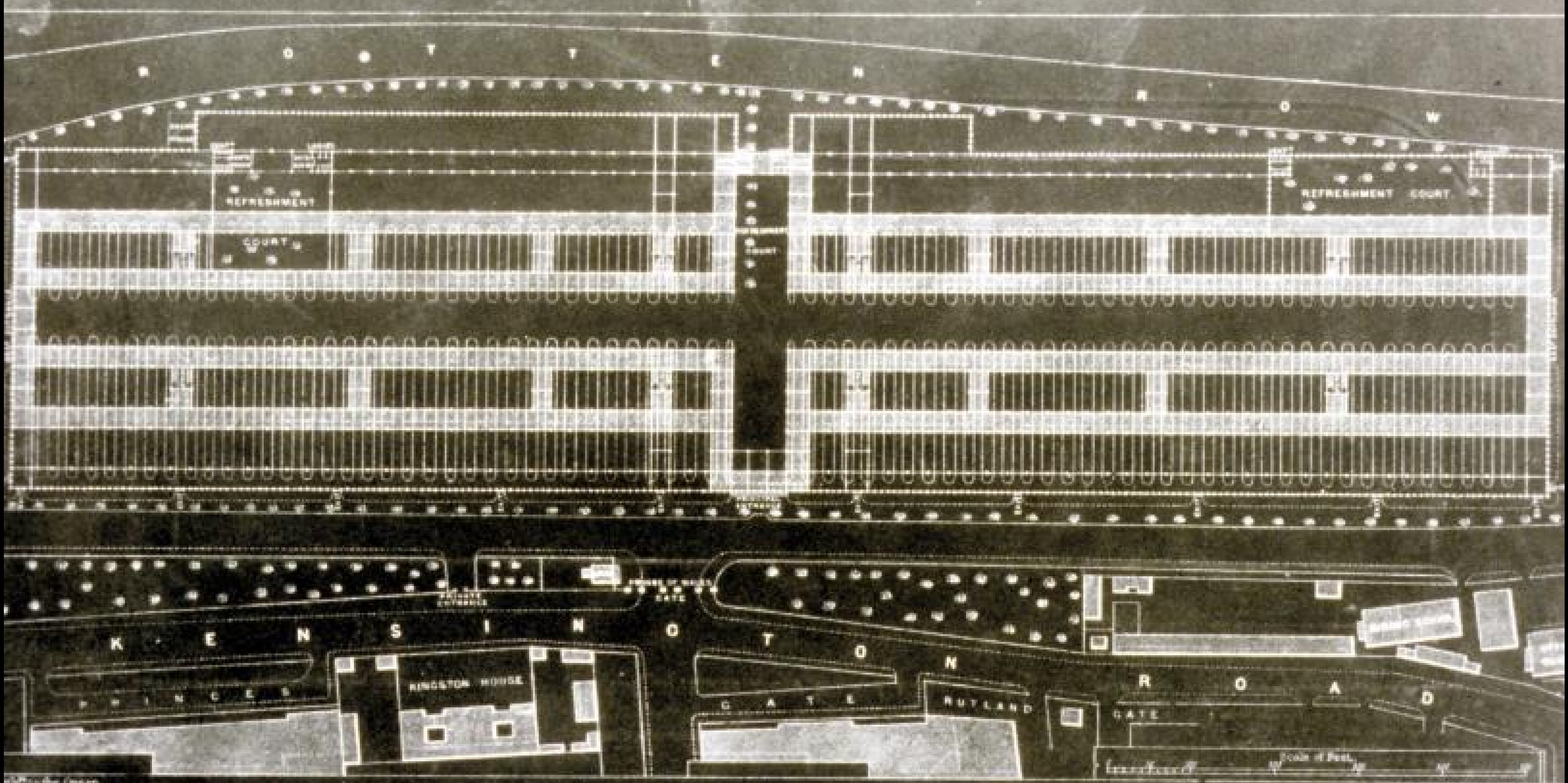
PAXTON'S DESIGN.

PROPOSALS FOR THE EXHIBITION BUILDING



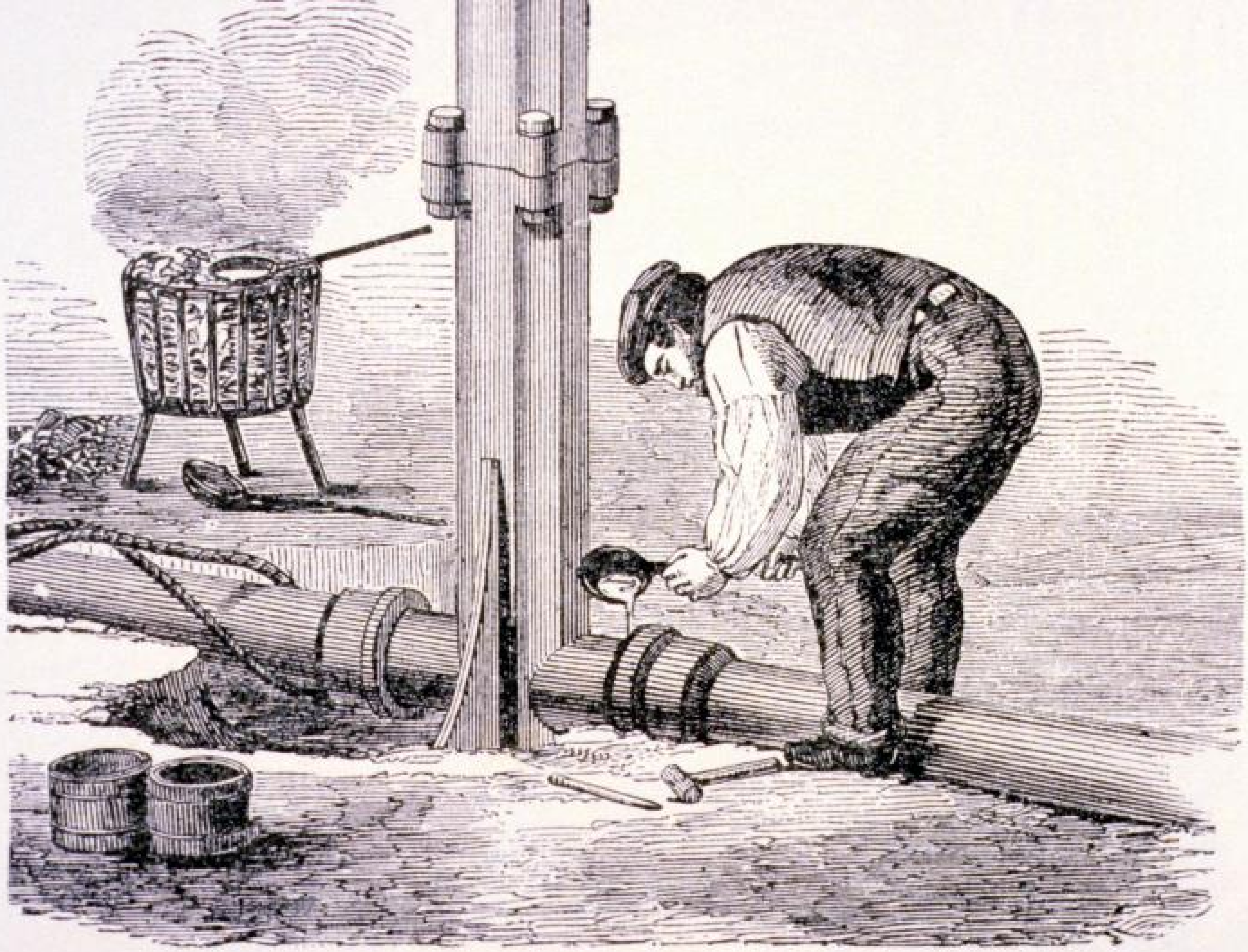
JOSEPH PAXTON'S ORIGINAL DESIGN ON BLOTTING PAPER.

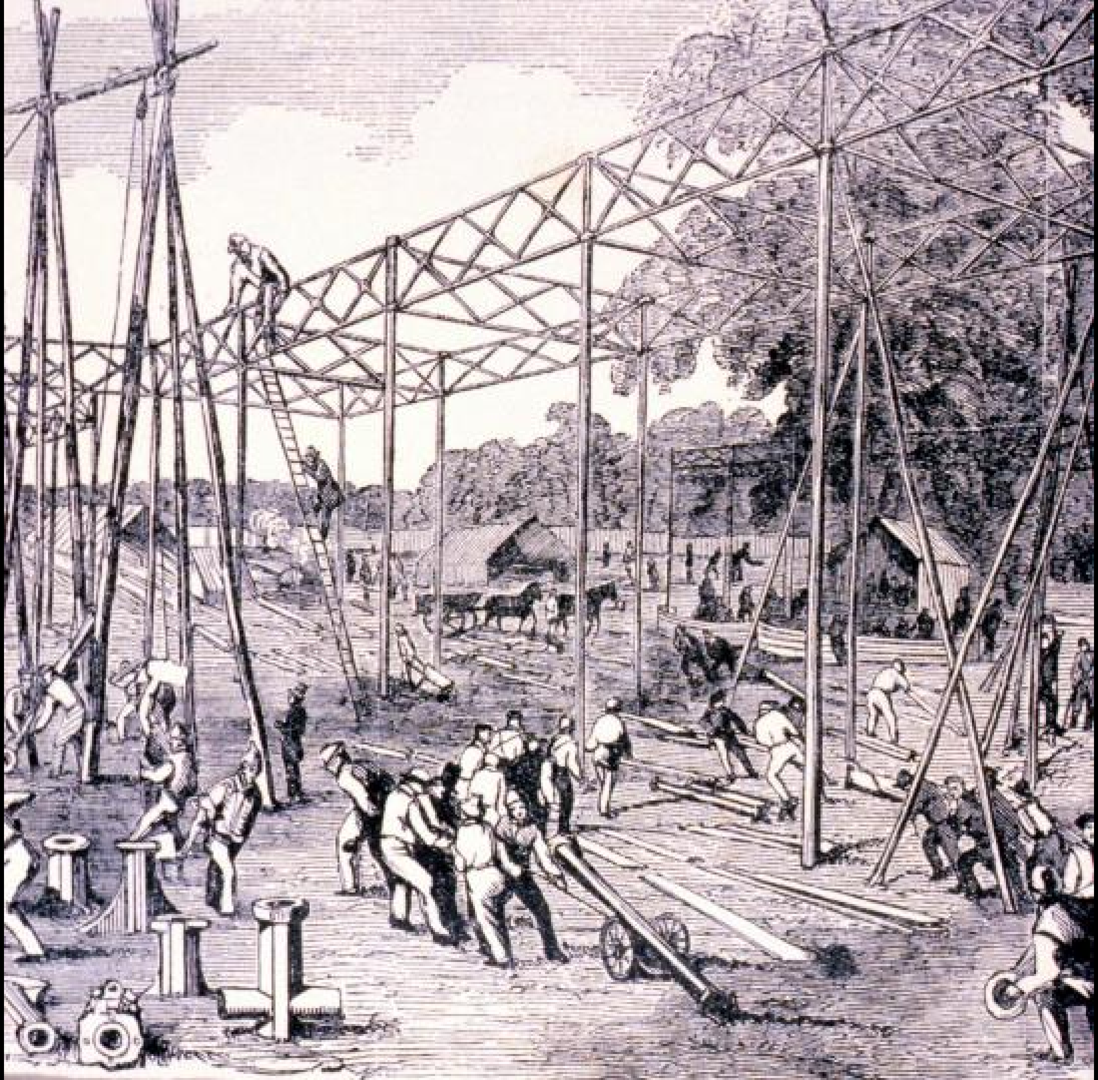
Reproduced by kind permission of Miss Violet Markham, C.H.

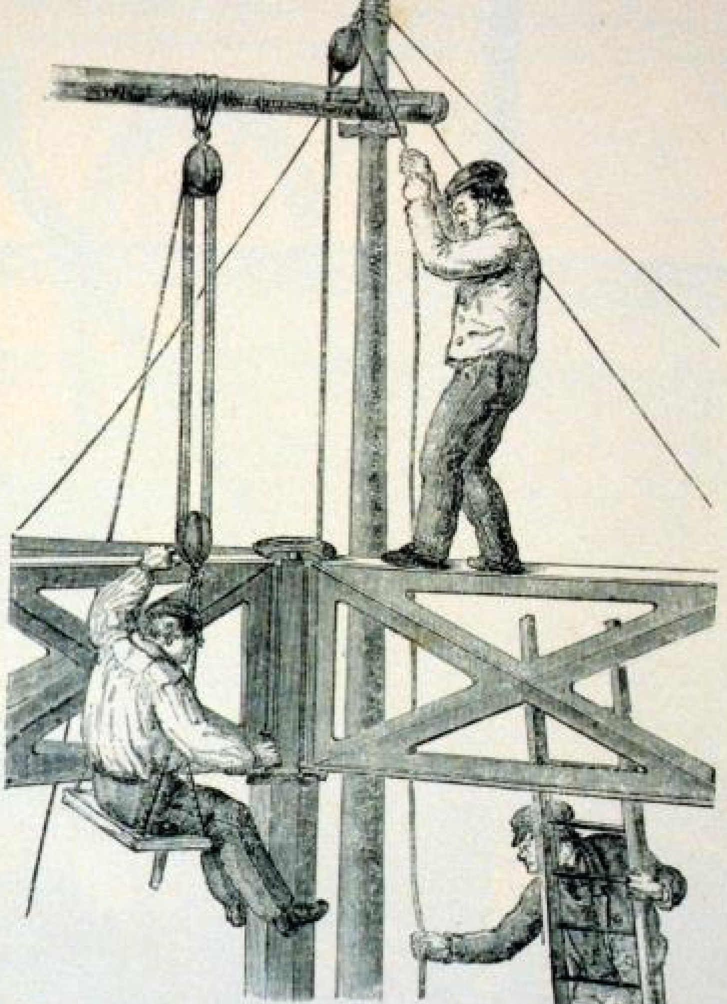


PLAN OF THE BUILDING IN HYDE PARK
FOR THE EXHIBITION OF 1851.

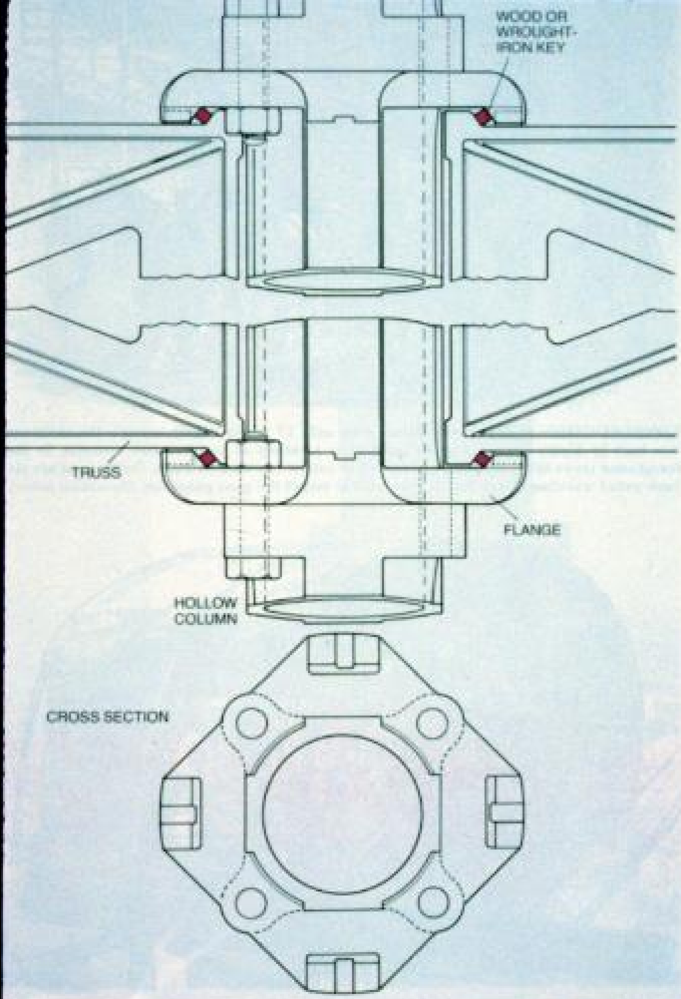
Note. Illustrations in this chapter are reproduced by the kind permission of the "Illustrated London News."



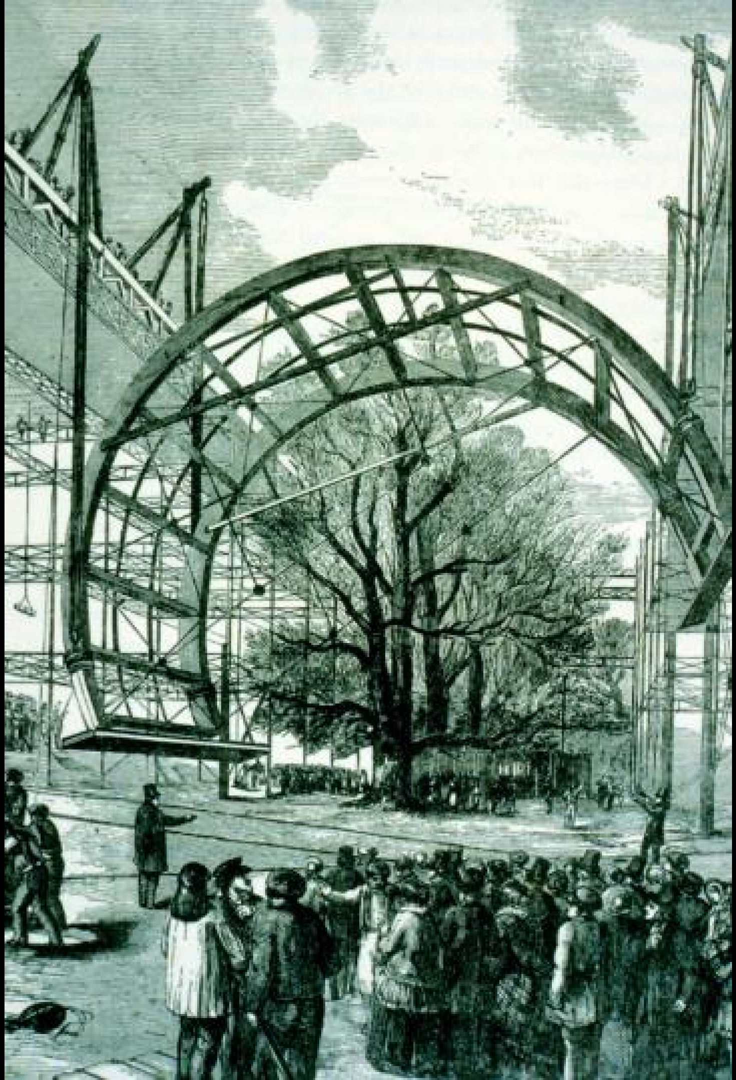


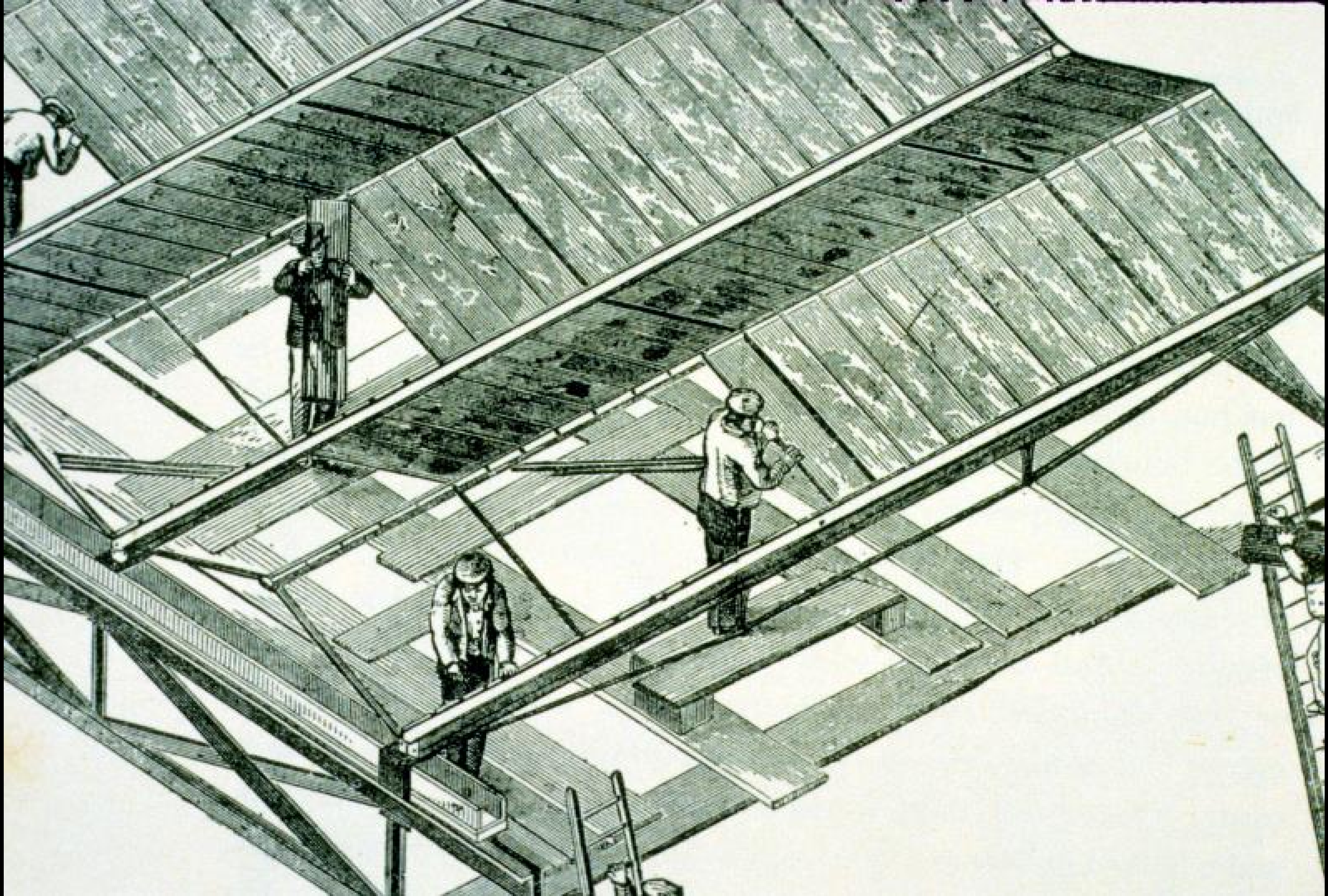


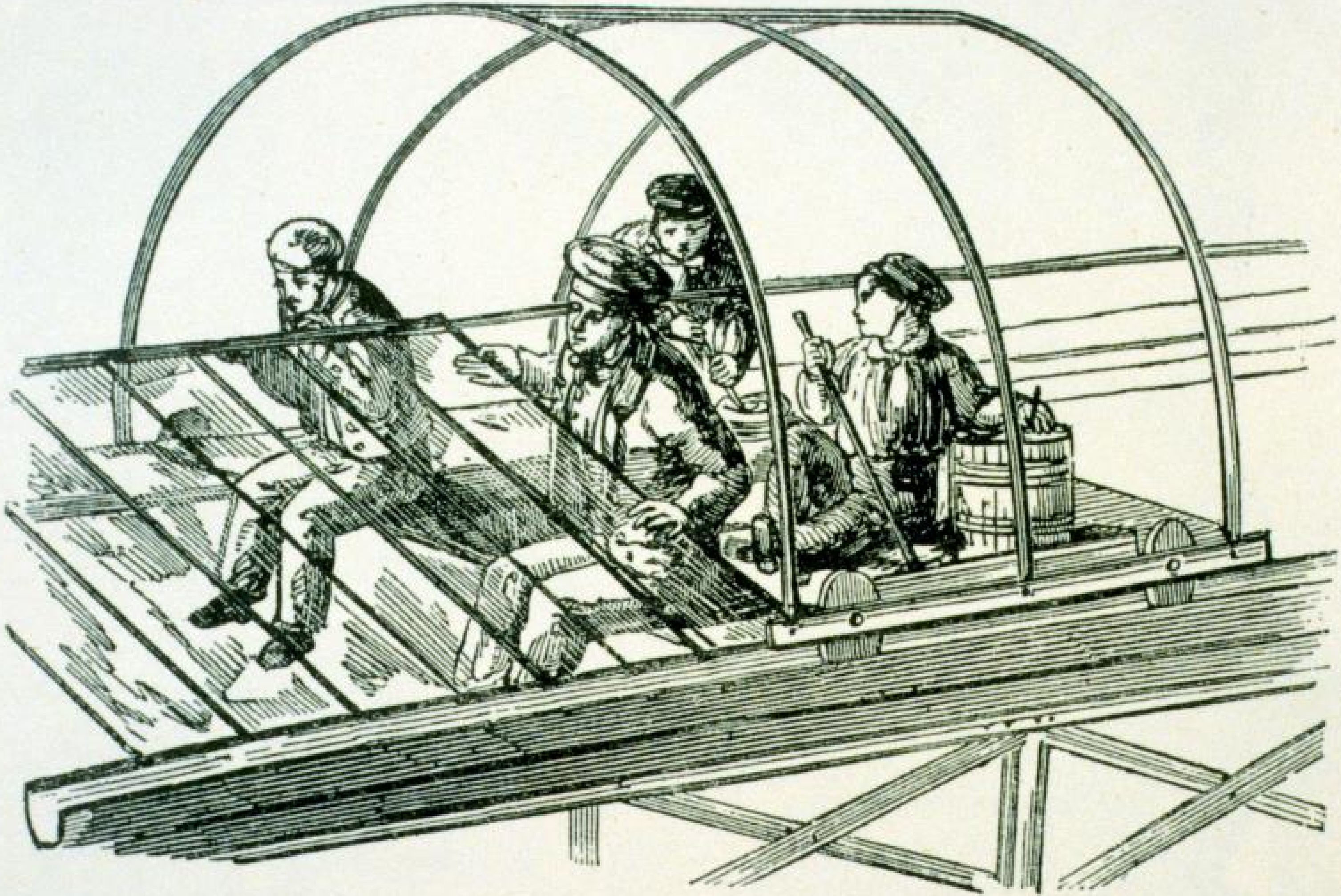
Head of a Column.



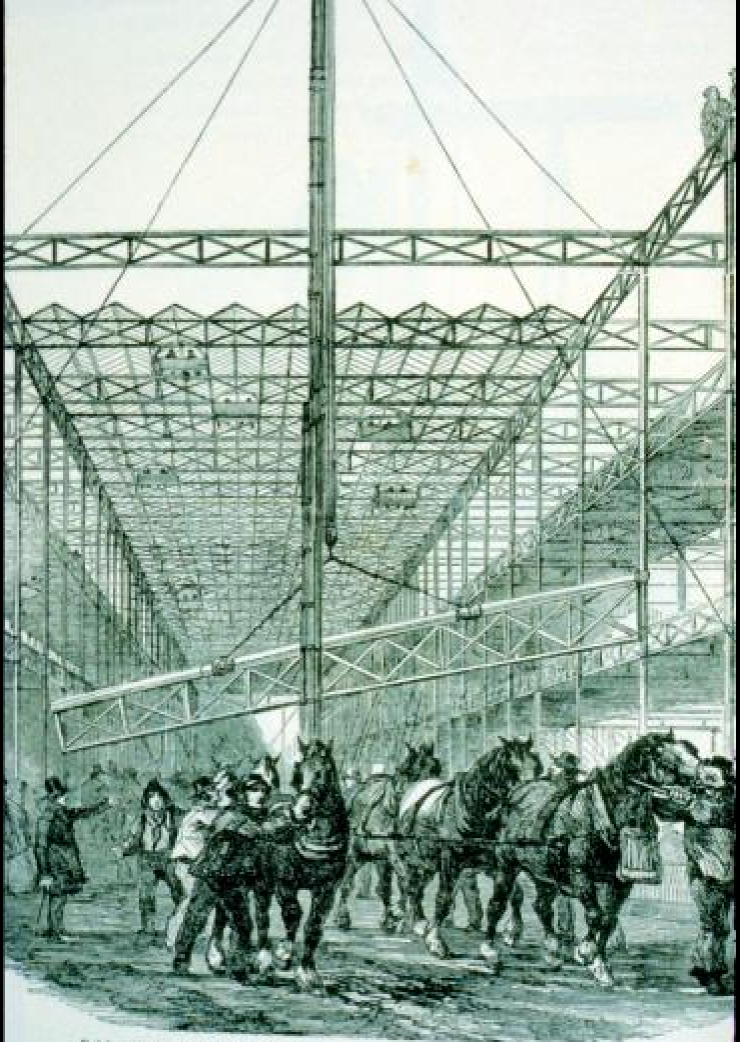
CAST-IRON CONNECTING PIECES attached trusses (*see bottom illustration on opposite page*) to columns. Joints were designed for rapid construction. Flared ends of trusses fitted into flanges and were held in place by wrought-iron or wood keys, which could be driven in quickly.



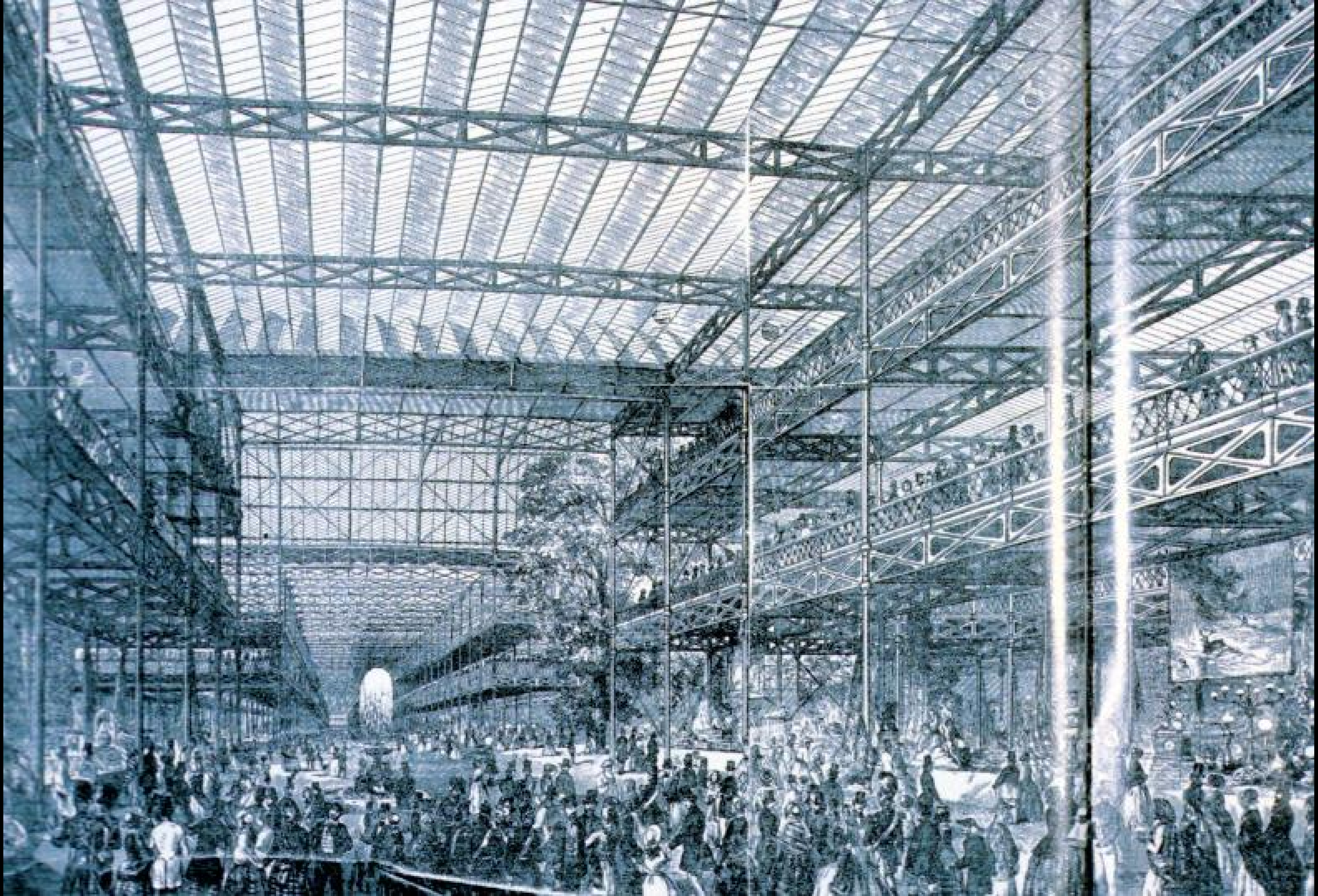


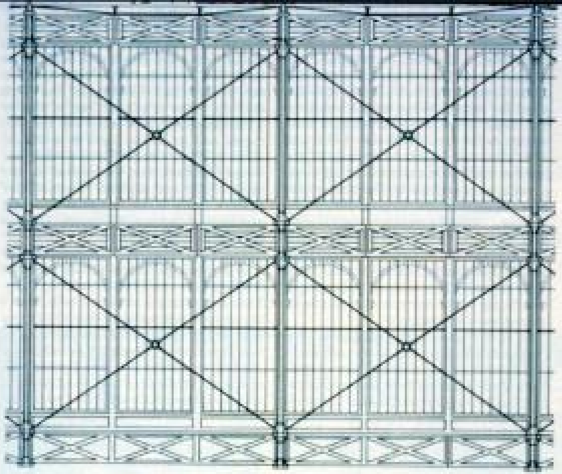


Glazing Waggon.

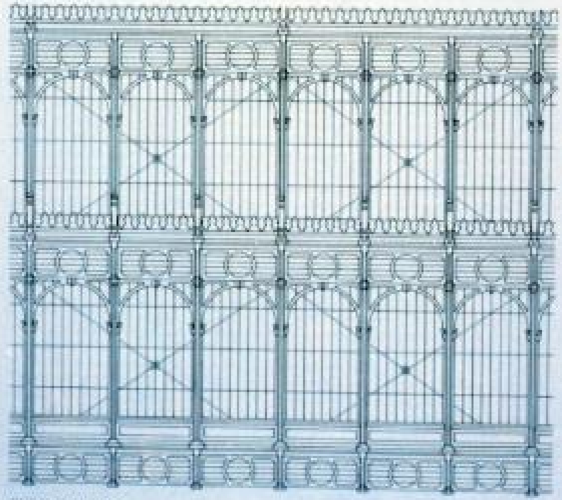


Raising Girders of the Central Aisle.

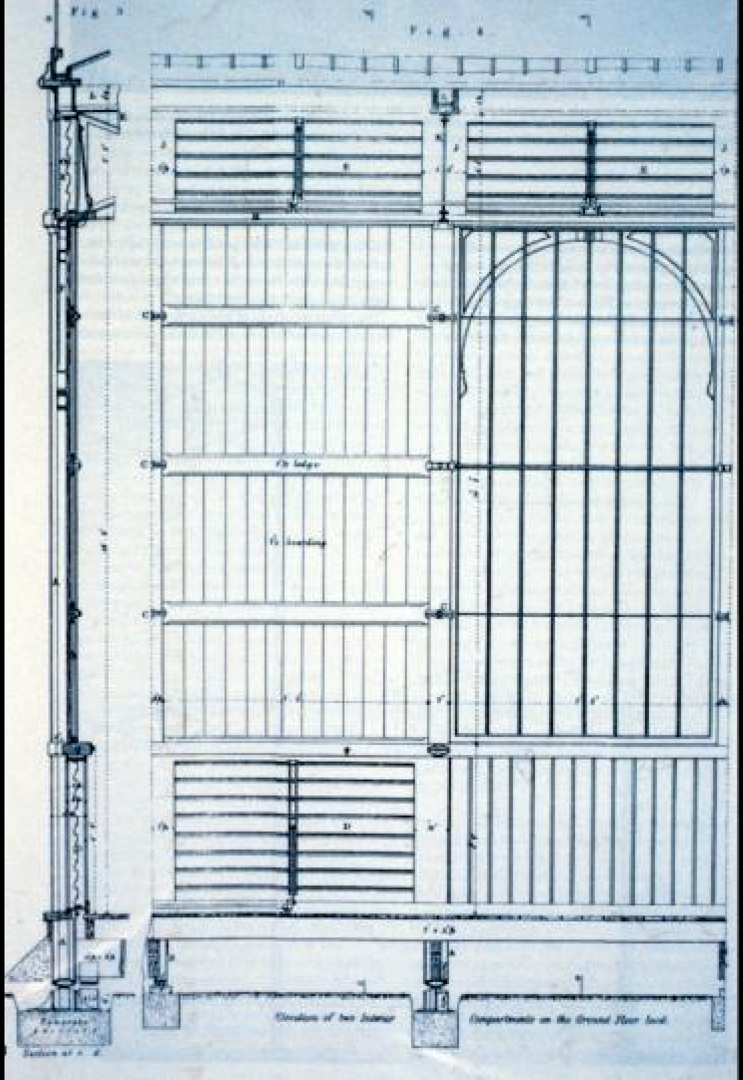


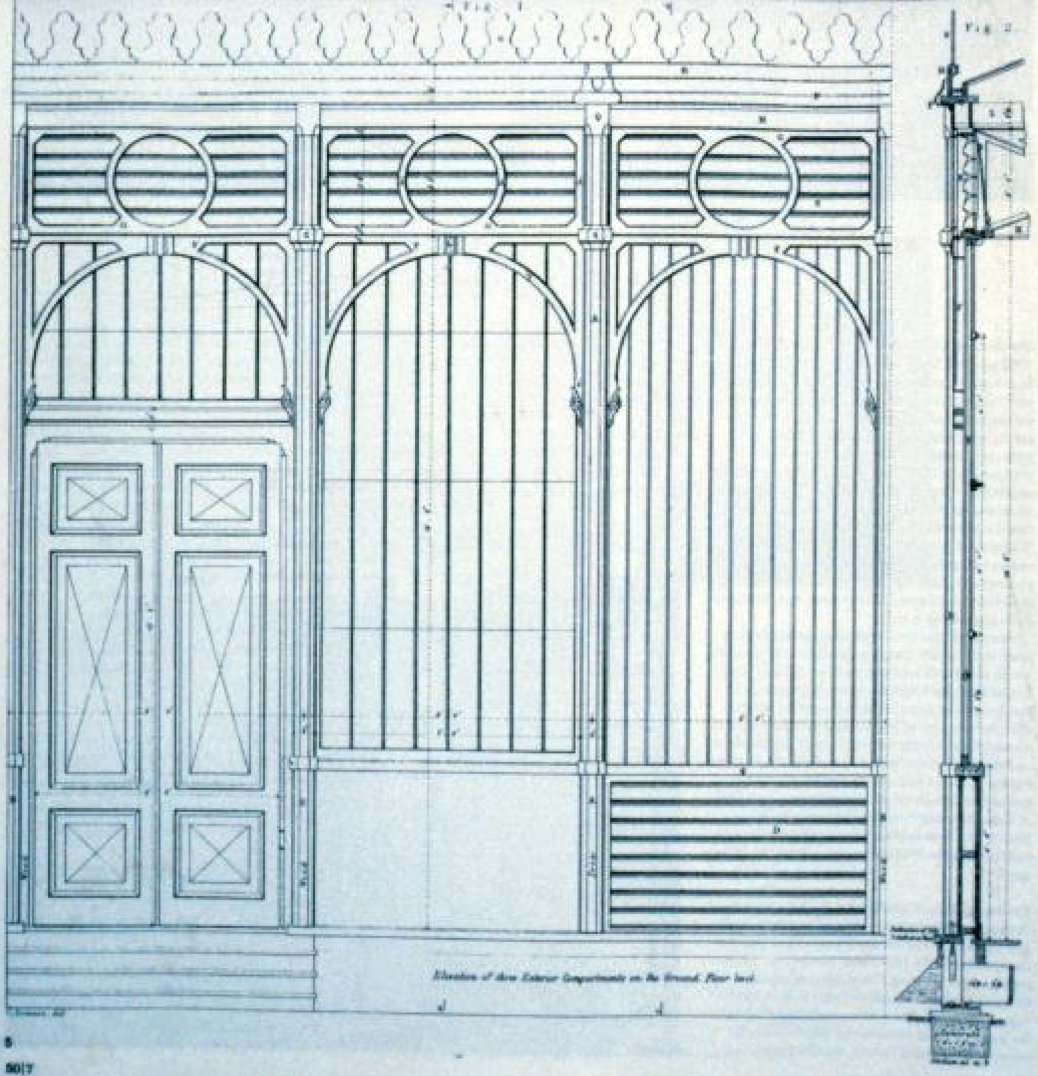


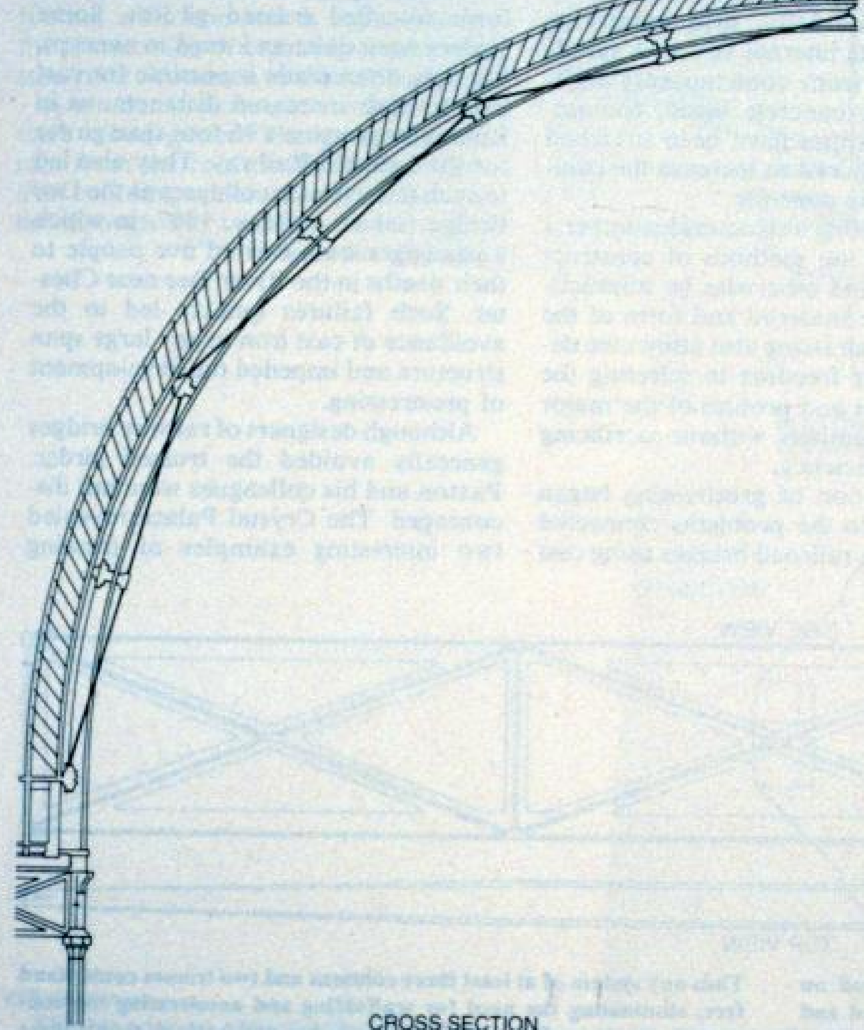
WROUGHT-IRON RODS provided a rigid support for the exterior walls of the Crystal Palace, which had no internal walls to stiffen it. Visible from inside and out (the interior view is shown here), these cross braces added to the building's strikingly contemporary appearance.



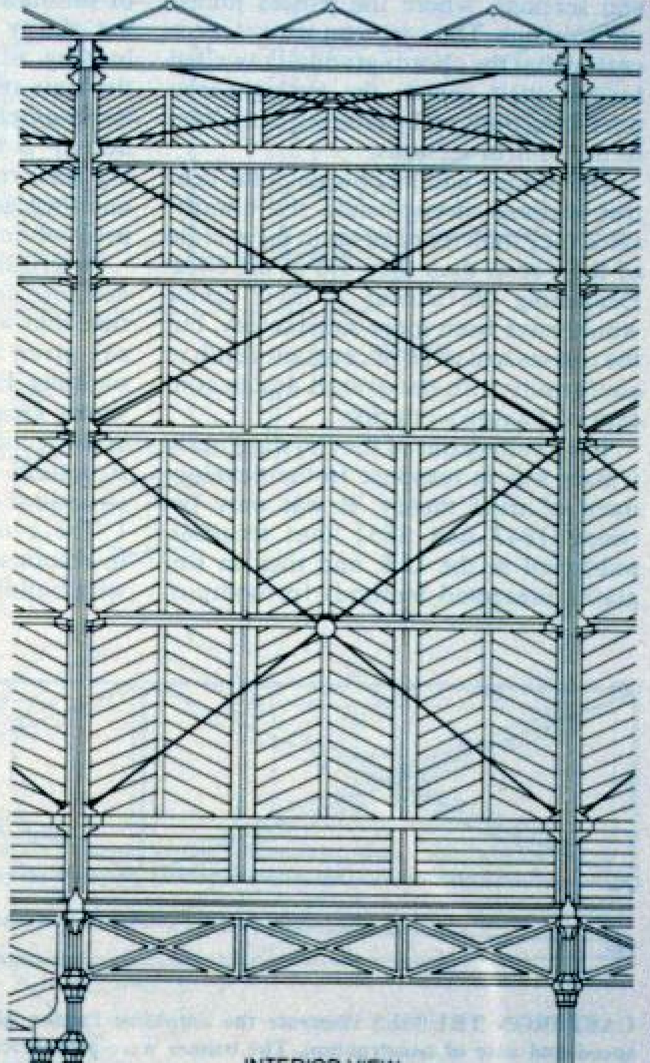
CURTAIN WALLS



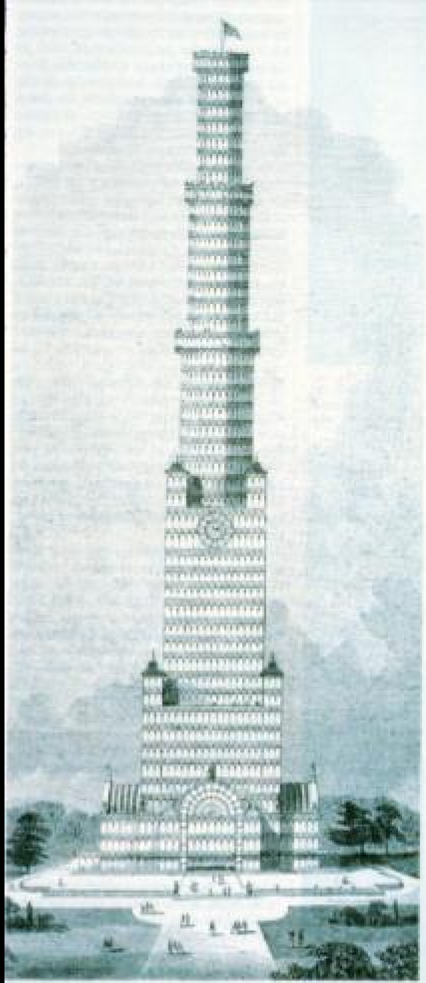

Elevation of three Exterior Compartments on the Ground-Floor level.



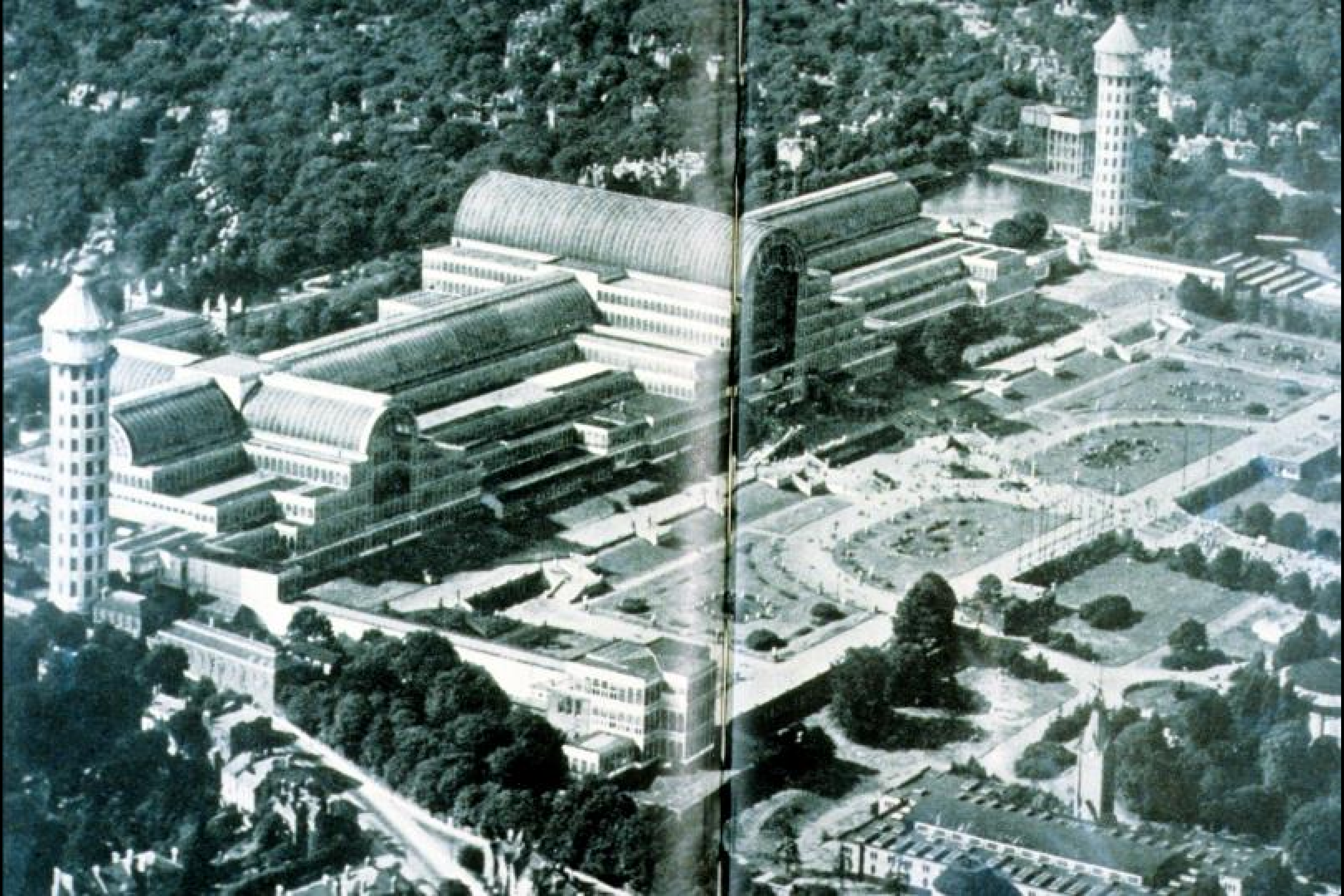
CROSS SECTION

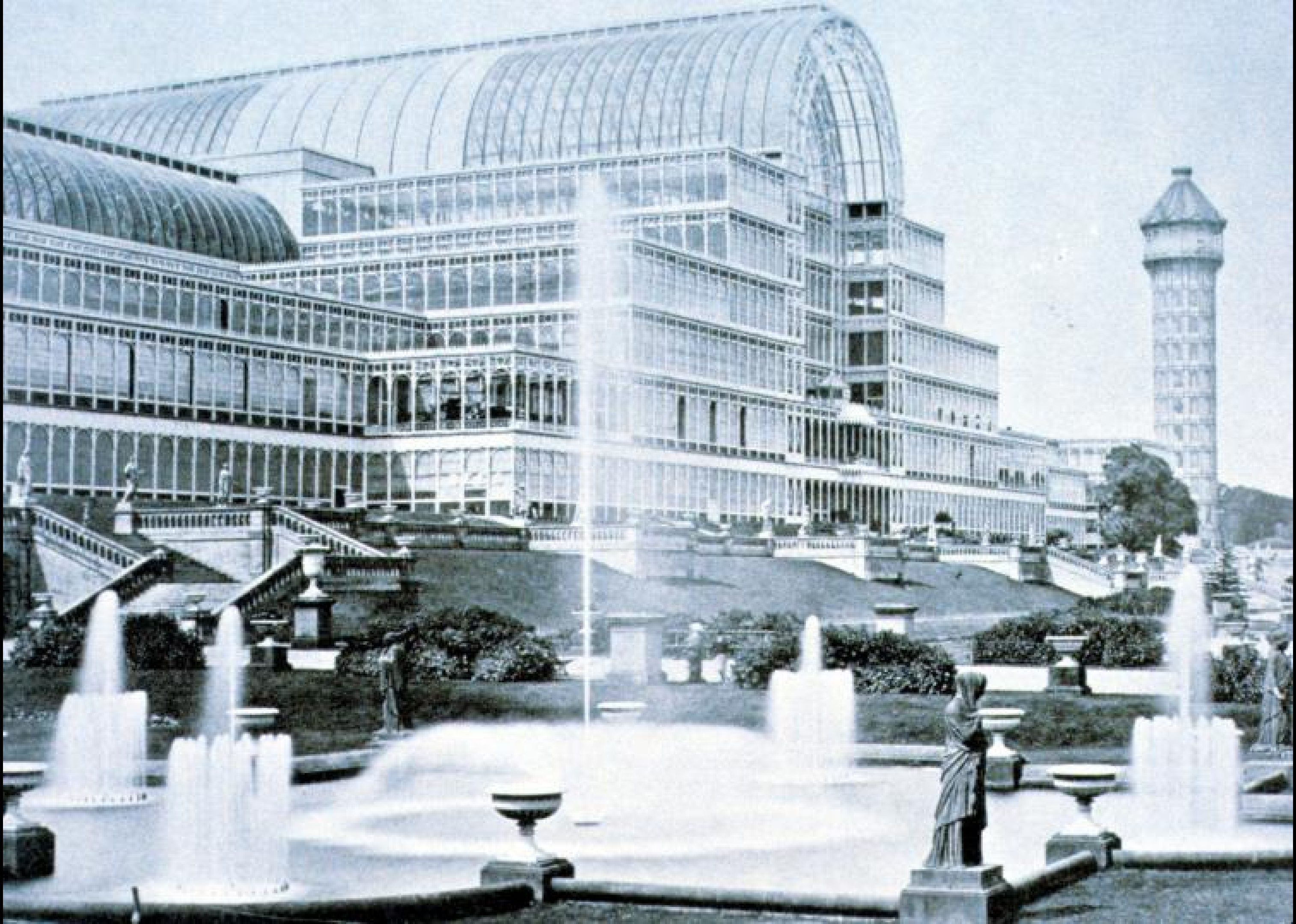


INTERIOR VIEW

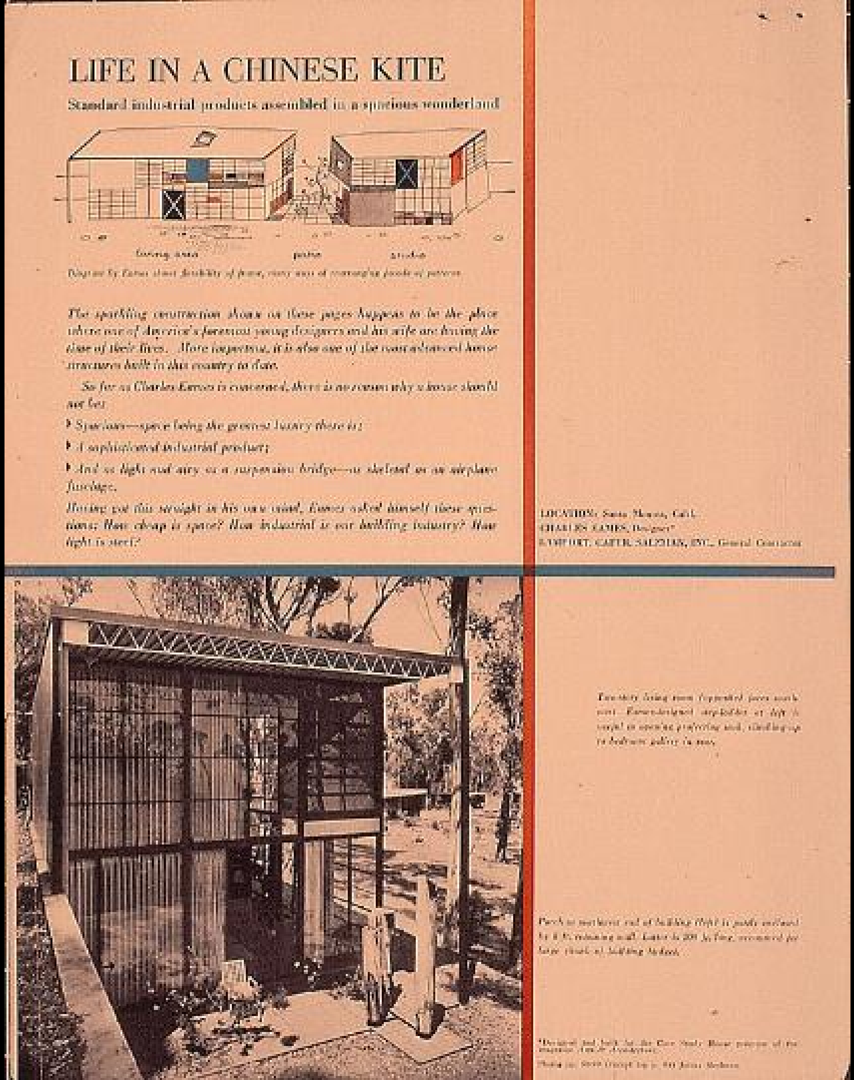


MODULAR CONSTRUCTION of the Crystal Palace prompted a contemporary of Paxton's to suggest that the modular units of the building be rearranged to form a 1,000-foot tower (*left*). A vertical Crystal Palace would have been too heavy for its cast-iron columns; now steel beams make such buildings possible. At right is Skidmore, Owings & Merrill's Sears Tower, built out of stacked modular units.





"custom" vs "off-the-shelf"
repeated elements



LIFE IN A CHINESE KITE

Standard industrial products assembled in a spacious wonderland

The sparkling construction shown on these pages happens to be the place where one of America's foremost young designers and his wife are having the time of their lives. More important, it is also one of the most advanced house structures built in this country to date.

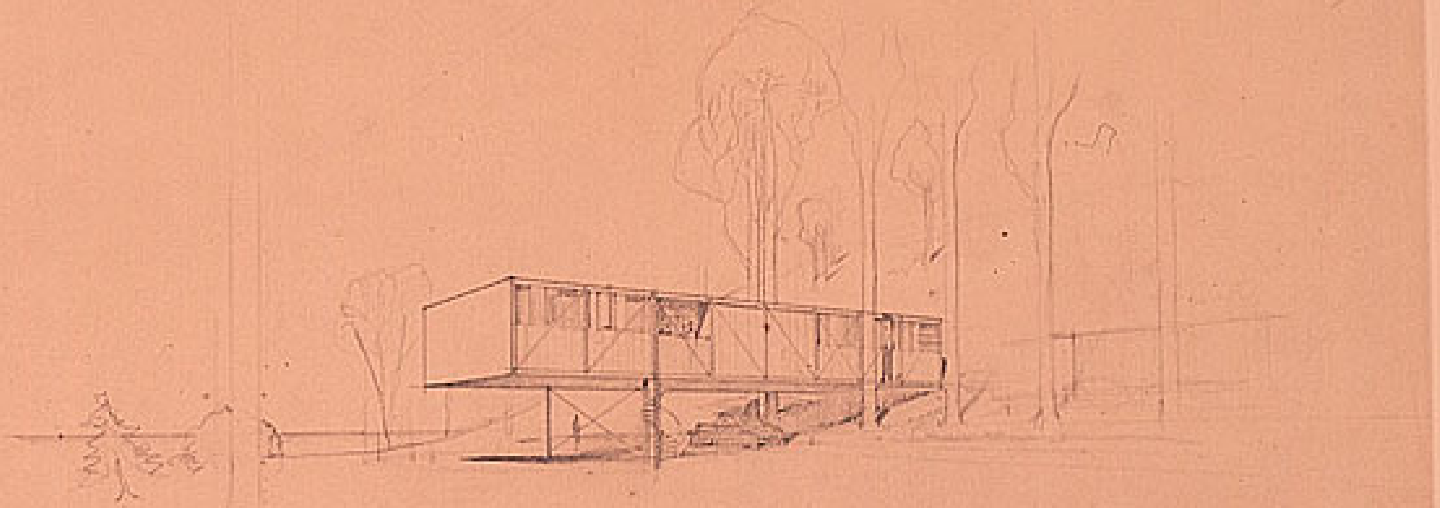
So far as Charles Eames is concerned, there is no reason why a house should not be:

- *Spacious—space being the greatest luxury there is;*
- *A sophisticated industrial product;*
- *And as light and airy as a suspension bridge—as skeletal as an airplane fuselage.*

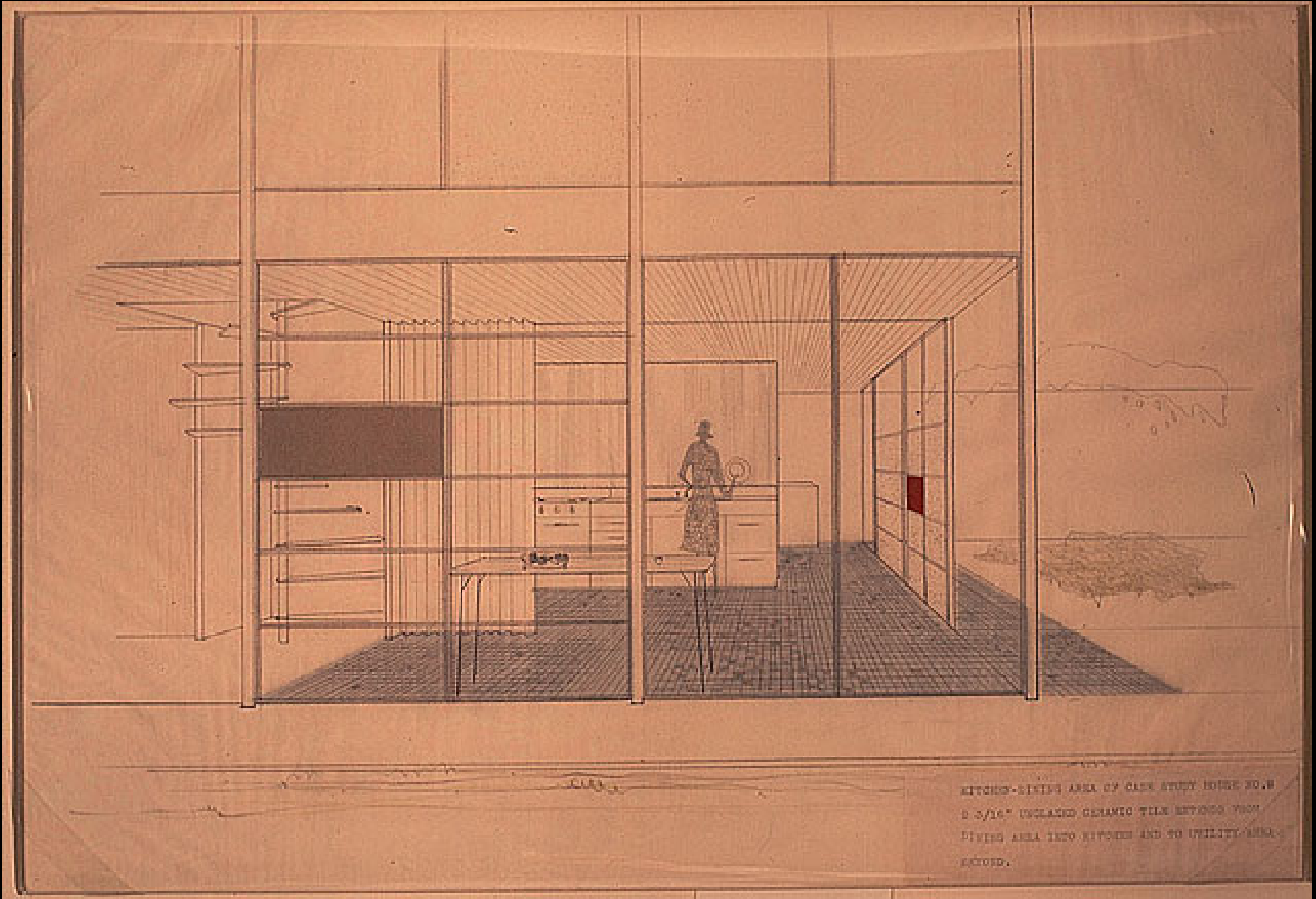
Having got this straight in his own mind, Eames asked himself these questions: How cheap is space? How industrial is our building industry? How light is steel?

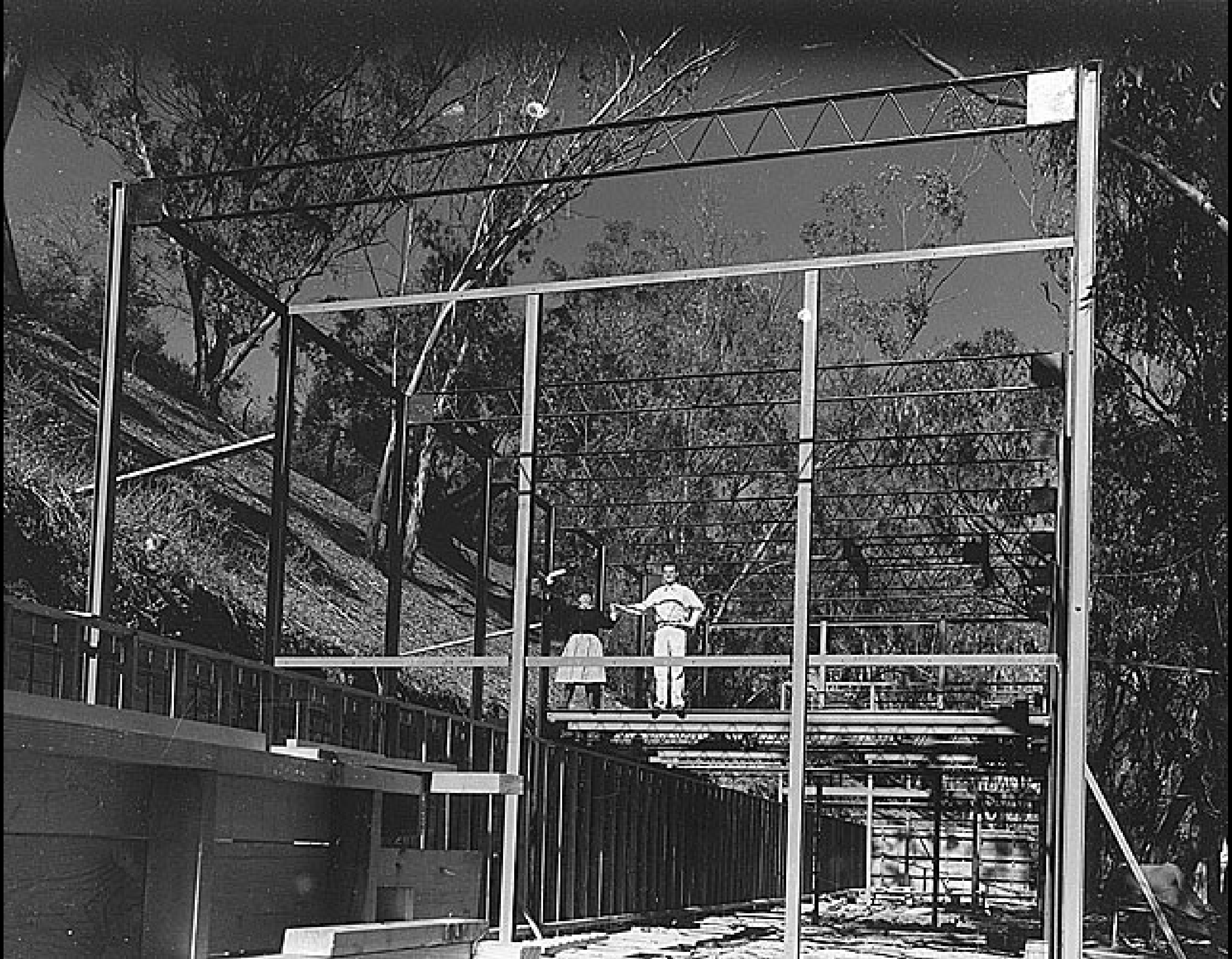
LOCATION: Santa Monica, Calif.
CHARLES EAMES, Designer*

Case Study House No. 9
Charles and Ray Eames



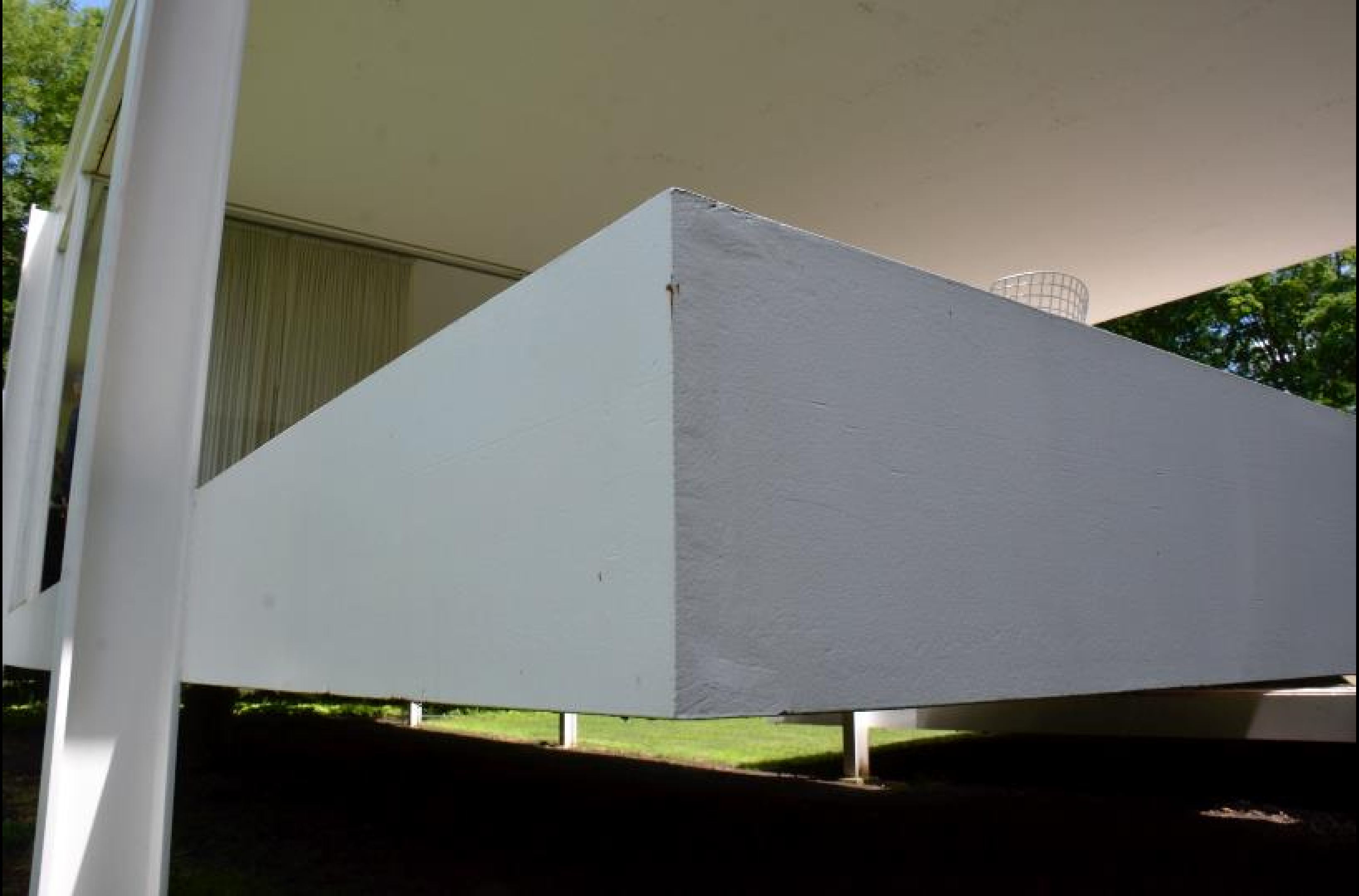
Bottom Page 9


KITCHEN-DINING AREA OF CASE STUDY HOUSE NO.8
2 3/16" UNGLAZED CERAMIC TILE EXTENDS FROM
DINING AREA INTO KITCHEN AND TO UTILITY AREA
BEYOND.



Lakeshore Drive Apartments
Chicago, Illinois
Mies van der Rohe

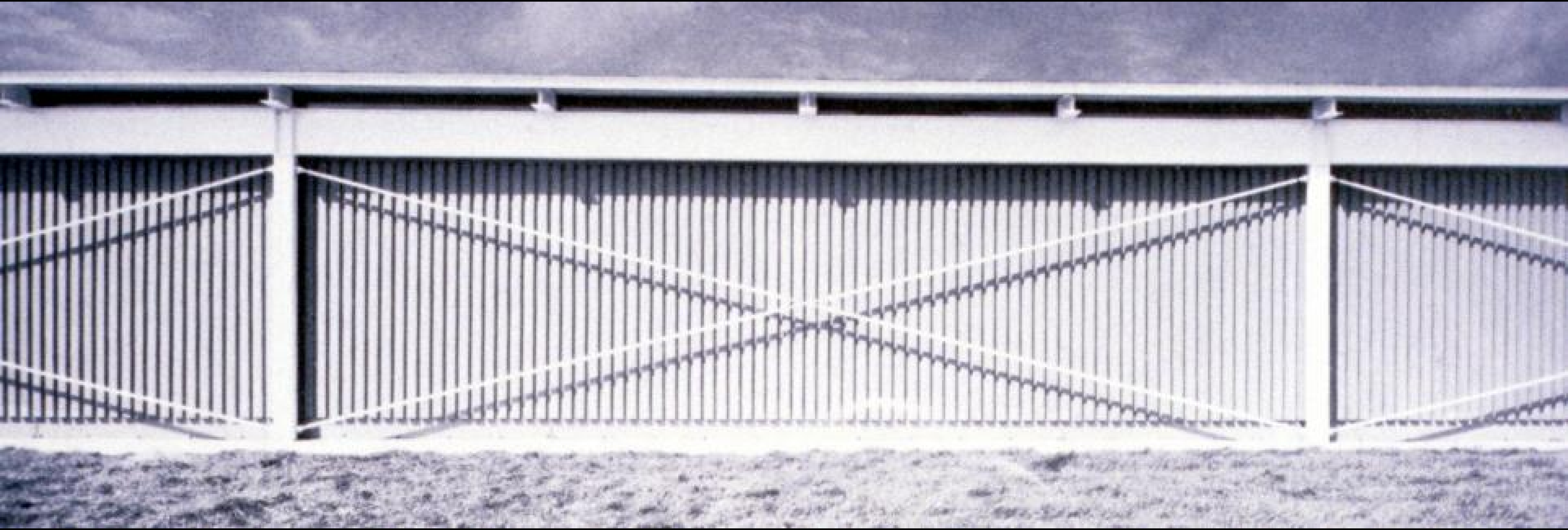

Farnsworth House
Plano, Illinois
Mies van der Rohe



New Art Gallery
Berlin, Germany
Mies van der Rohe

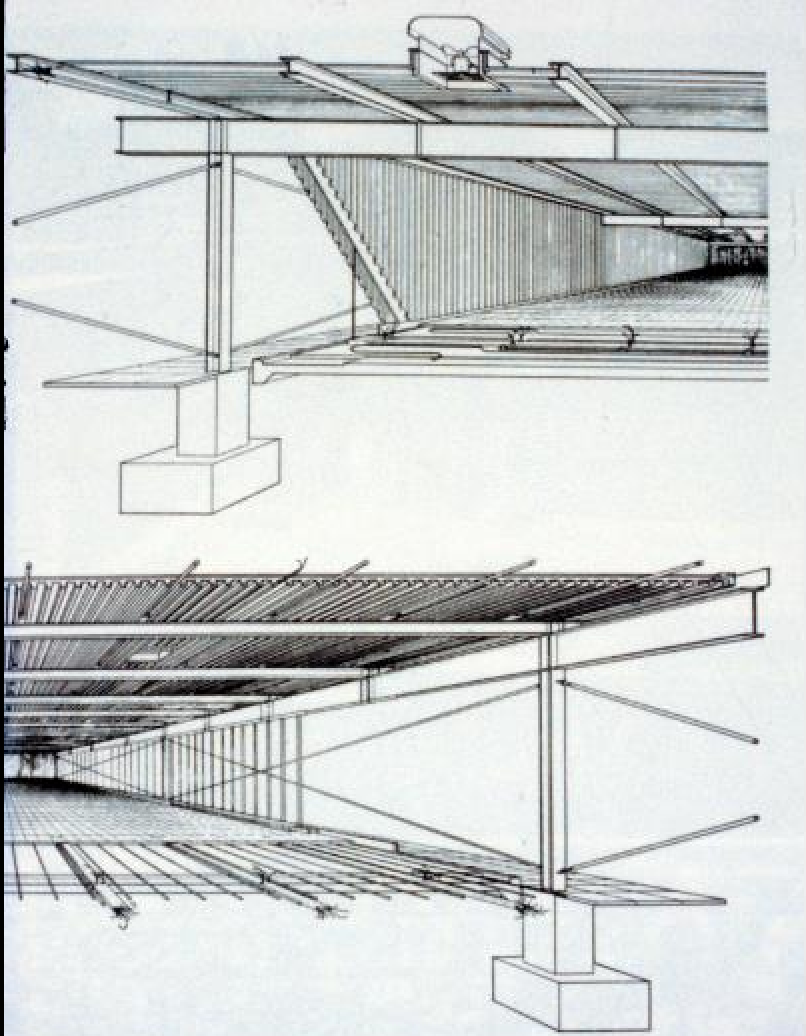

DER
GETEILTE
HIMMEL
IM
WEISSEN

The High-Tech Movement



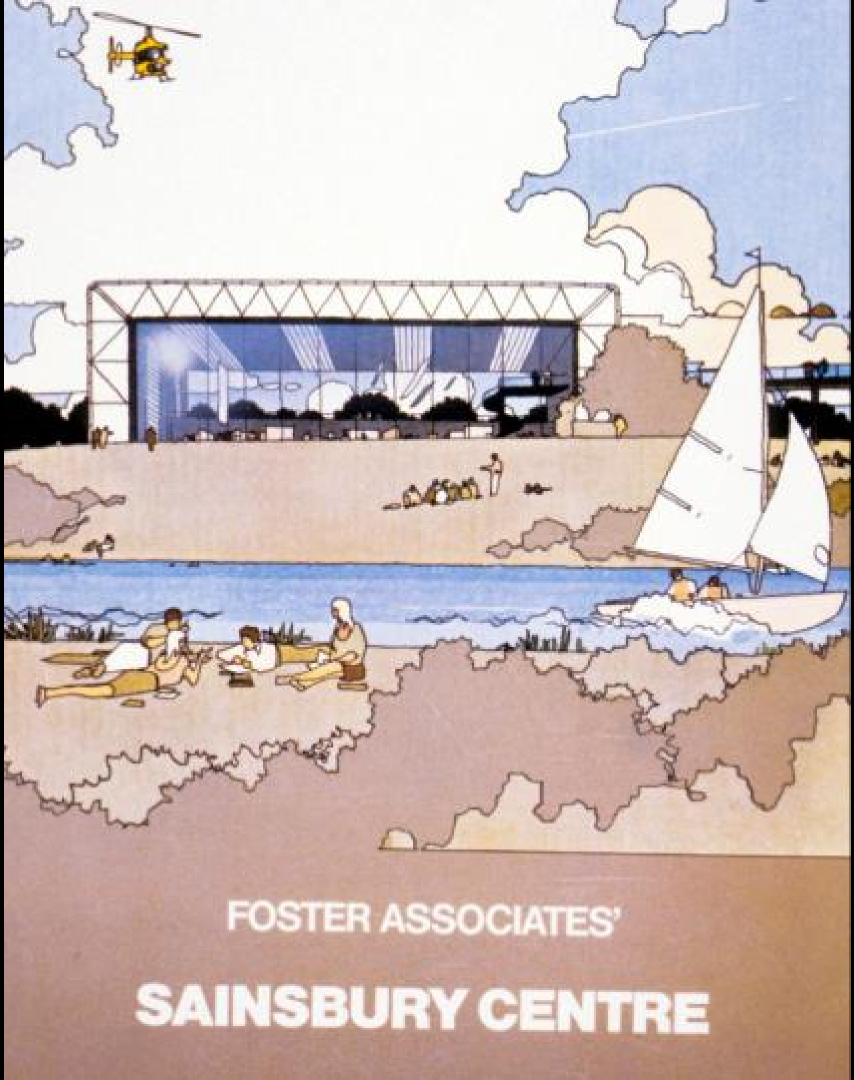
Reliance Controls Factory
Swindon, England
1966
Team 4 (Richard and Sue Rogers, Norman and Wendy Foster)

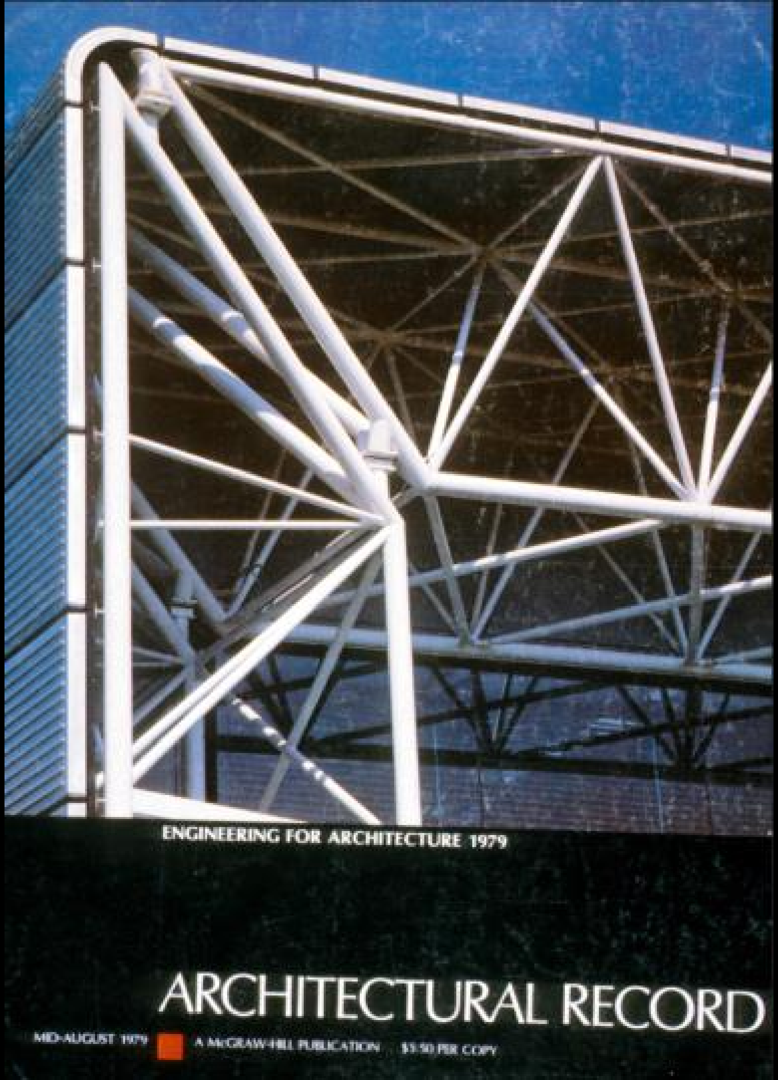
Historian Reyner Banham called these buildings "serviced sheds"



12 Team 4, Reliance Controls Factory, Swindon, 1966

Sainsbury Centre for the Arts
England
Foster and Partners
1977


FOSTER ASSOCIATES'
SAINSBURY CENTRE


ENGINEERING FOR ARCHITECTURE 1979
ARCHITECTURAL RECORD
MID-AUGUST 1979
A McGRAW-HILL PUBLICATION
$3.50 PER COPY

Internally the services are disguised and the servici ng is sensed rather than visible – magically responding to changing light le

THE BUILDING AS SERVICING ECHANISM CHNOLOGY)

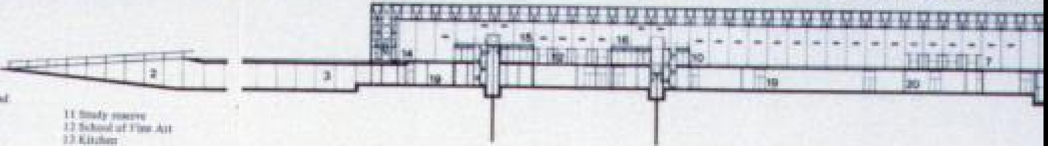
Given the progressive highly serviced and technological 'display' that has tended to be associated with Foster Associates' buildings in the past, the Sainsbury Centre can either be seen as a special case (as a university arts building) or alternatively making a change in emphasis of Foster's use of advanced technology. The diagrammatic concept clicks around a concern to exploit the 2.1m deep, spectacular, free-spanning structural system eventually chosen, as a consistent service zone around the entire envelope of the building (since the original proposal to expose the structure externally was shelved).

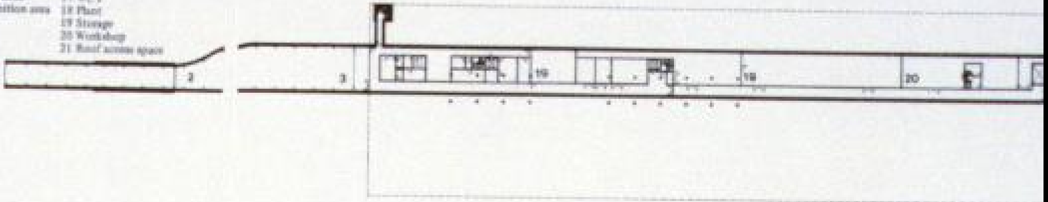
This zone – clad on one side with the glazed, solid (insulating) or louvred cladding system, and on the other, internally, with adjustable perforated aluminium louvres – is able to variously temper the environmental conditions within the building, by filtering or preventing light, introducing and extracting air, and alternatively baffling or absorbing sound. It houses service rooms at ground level and provides catwalk access across the roof to the lighting system and roof panels. Rather than the conspicuous if decentralised servicing of Willis Faber, which is displayed as part of the building yet justified by its efficiency, the servicing of the Sainsbury Centre, decentralised in a similar manner, is deliberately low key – epitomised by the concealed mirrored service doors in the external elevation. Internally the service entrances are similarly disguised as part of the overall consistent louvred internal finish. As Foster notes, the servicing is sensed rather than visible – magically responding to the changing light levels.[18]

The concept of the building as machine has variously haunted architects in the 20th century. The Centre's visible response to the changing external environment brings the building close to re-enacting the Constructivist ideal of an objective architecture of technical function; bearing a striking, if pragmatic, similarity to Moholy Nagy's vision of a 'light architecture'.[19]

Foster's container for culture conditions its internal environment discreetly, as a 'sensitively controlled box' – its cameras and security system recessed into perforated walls. This stress on security, it could be argued, has had a not inconsiderable influence both on the siting and organisation of the building (the security system extends into the university grounds). The 'living' area for the collection sits atop a concrete retained, excavated basement, whose presence speaks of the immense fallibility of the collection. Foster, talking of his visit to Louisiana museum outside Copenhagen (with the Sainsburys while researching the project), was impressed by the 'social ingredient' of the place: 'everybody was there, everybody was enjoying it, the kids were there, the old age pensioners were there, it was a great fun place – what was also very exciting were the displays, which were not over-protected, were really respected . . .' While enjoying the relaxed atmosphere, he deplores the lack of attention to servicing and security: '. . . *their reception facilities . . . It was almost naive, you really felt that with a screw driver you could have opened the whole place up and taken whatever was in storage away . . . If they had a Japanese exhibition which was due to come that week, and they were in a terrible state, they were going to have a container truck outside in the street and they were wondering how to get security between the street and this particular entrance here in such a way they can move these priceless objects from the container into the building itself.*'[20]

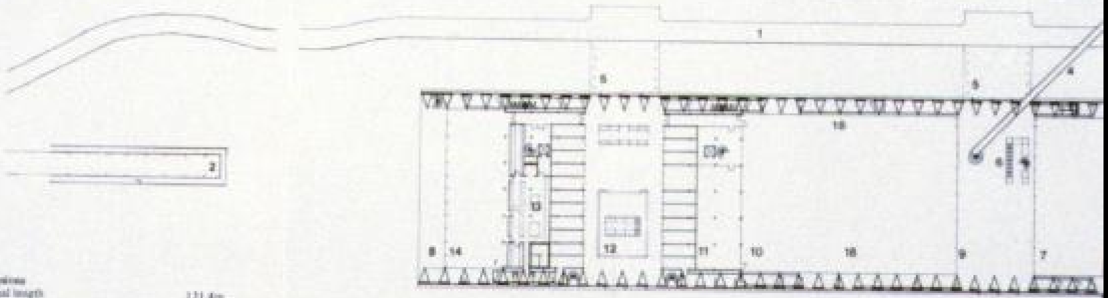
The Sainsbury Centre solves the dilemma by hiding underground its service entrance for receiving





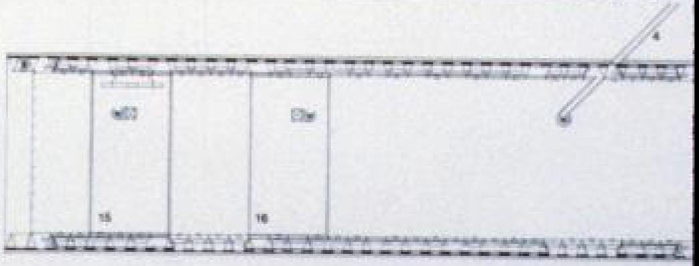
Key to plans and sections

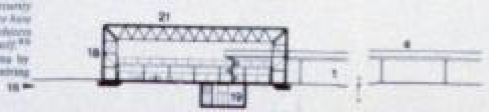
1 Access road
2 Ramp
3 Loading bay
4 High level walkway link
5 Entrance
6 Information desk
7 Special exhibition area
8 Terrace
9 Coffee area
10 'Living area'
11 Study reserve
12 School of Fine Art
13 Kitchen
14 Restaurant
15 Senior common study room
16 Study area
17 WC's
18 Plant
19 Storage
20 Workshop
21 Roof access space

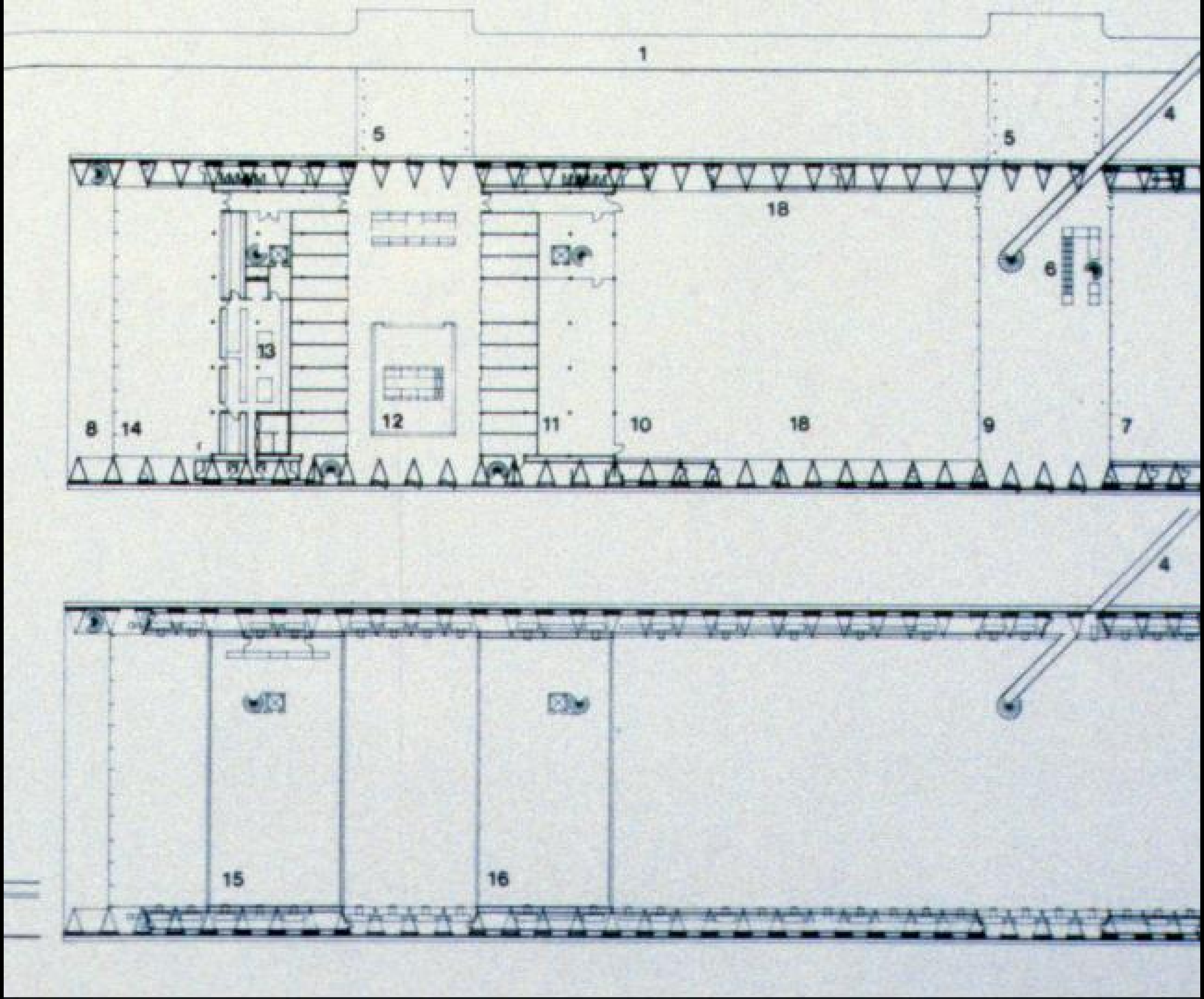


Dimensions

External length	131.4m
Internal length	122.4m
External width	35.0m
Internal width	29.0m
External height	10.3m
Internal height	7.3m
Ground floor area	3550.0m²
Mezzanine floor area	835.0m²
Basement floor area	1066.0m²
Service zone area	735.0m²
Total area	6186.0m²







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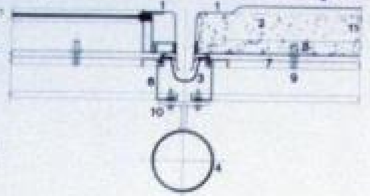
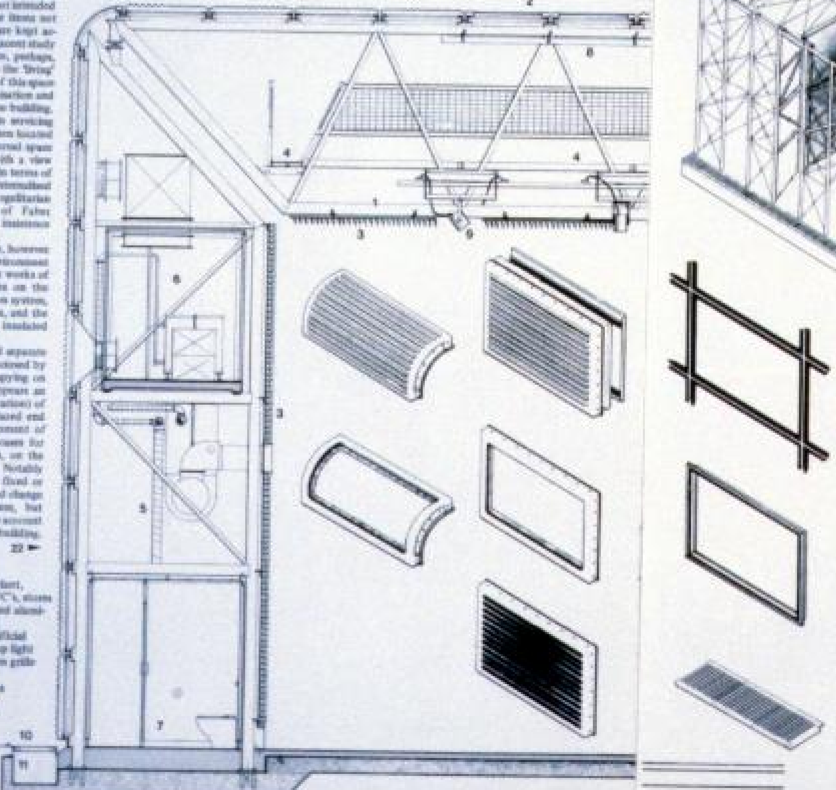
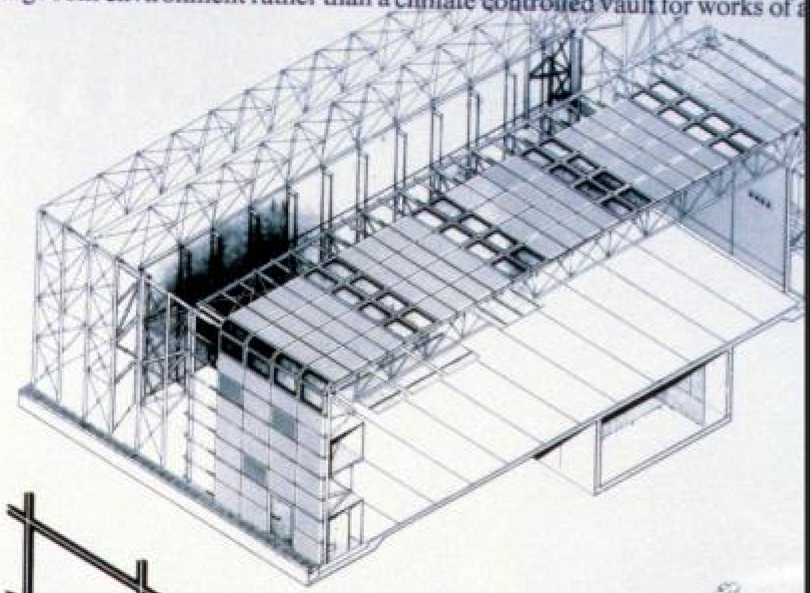
16

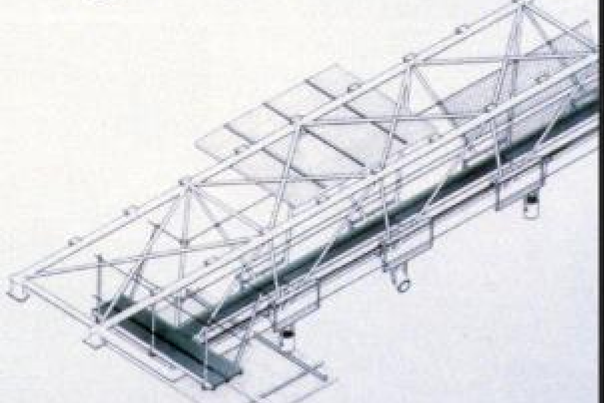
…strained by an insistence on discreetly hidden services in the spirit of a living room environment rather than a climate controlled vault for works of a…

Typical cladding panel key:
1 Aluminium outer skin
2 Insulation core
3 Neoprene ladder gasket
4 Tubular steel frame
5 Laminated glass
6 Unenamelled extruded aluminium subframe
7 Aluminium inner skin
8 Nut and bolt fixing
9 Stainless steel screws
10 Stainless steel nuts and bolts
11 Aluminium channel stiffener



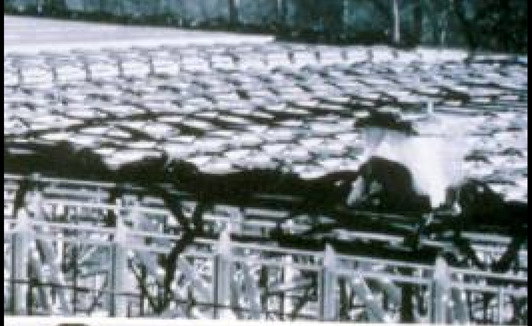


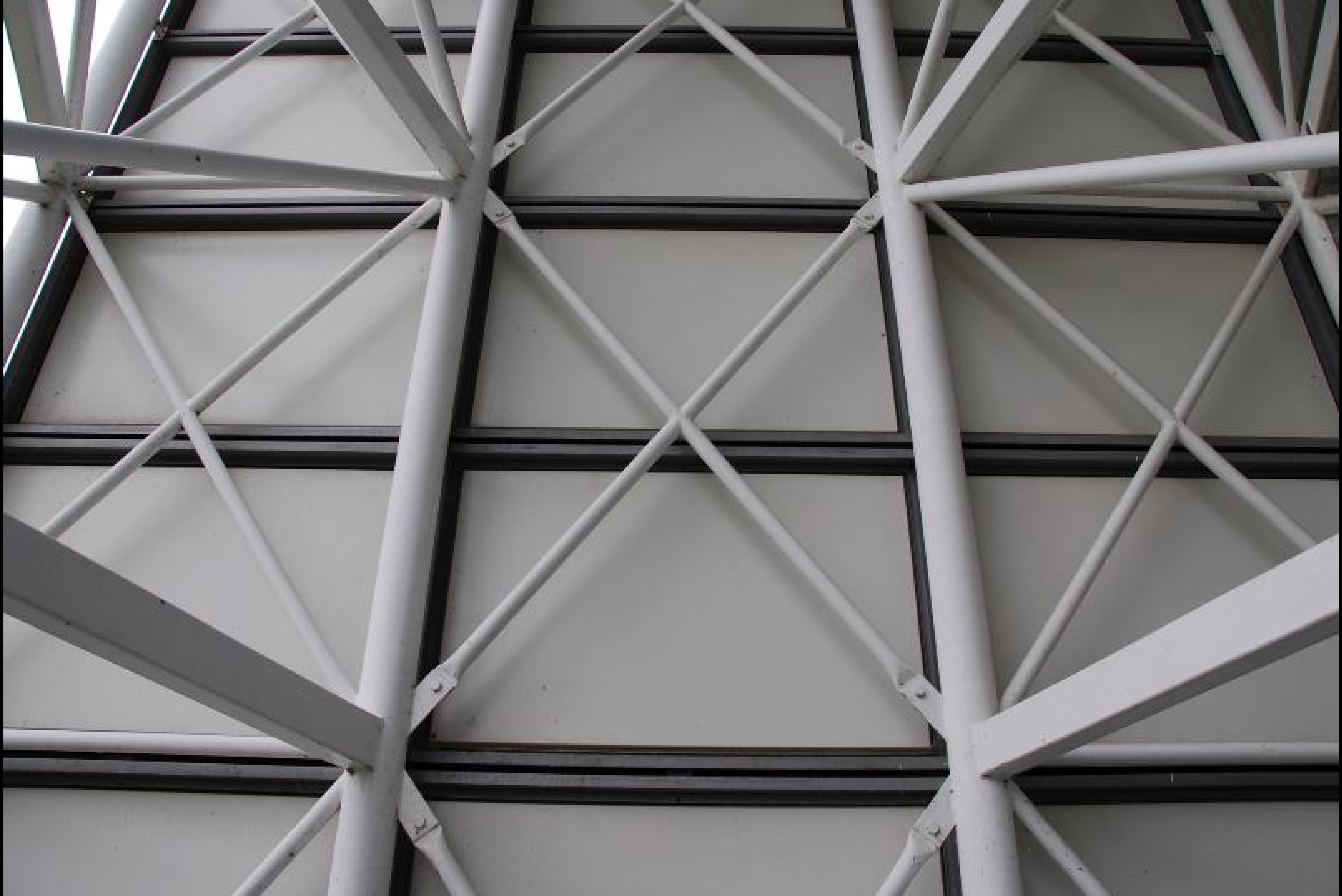




22 ►

6 Plant
7 All services: plant, darkrooms, WC's, stores
8 Solar controlled aluminium louvres
9 Combined artificial and natural top light
10 Cast aluminium grille
11 Gutter
12 Display screens
13 Display cases






Margaret Mellis
A Life in Colour
Mapping Norfolk


aret Mellis
in Colour
ng Norfolk
...The Art of Creation

Characterized by components that express their forces

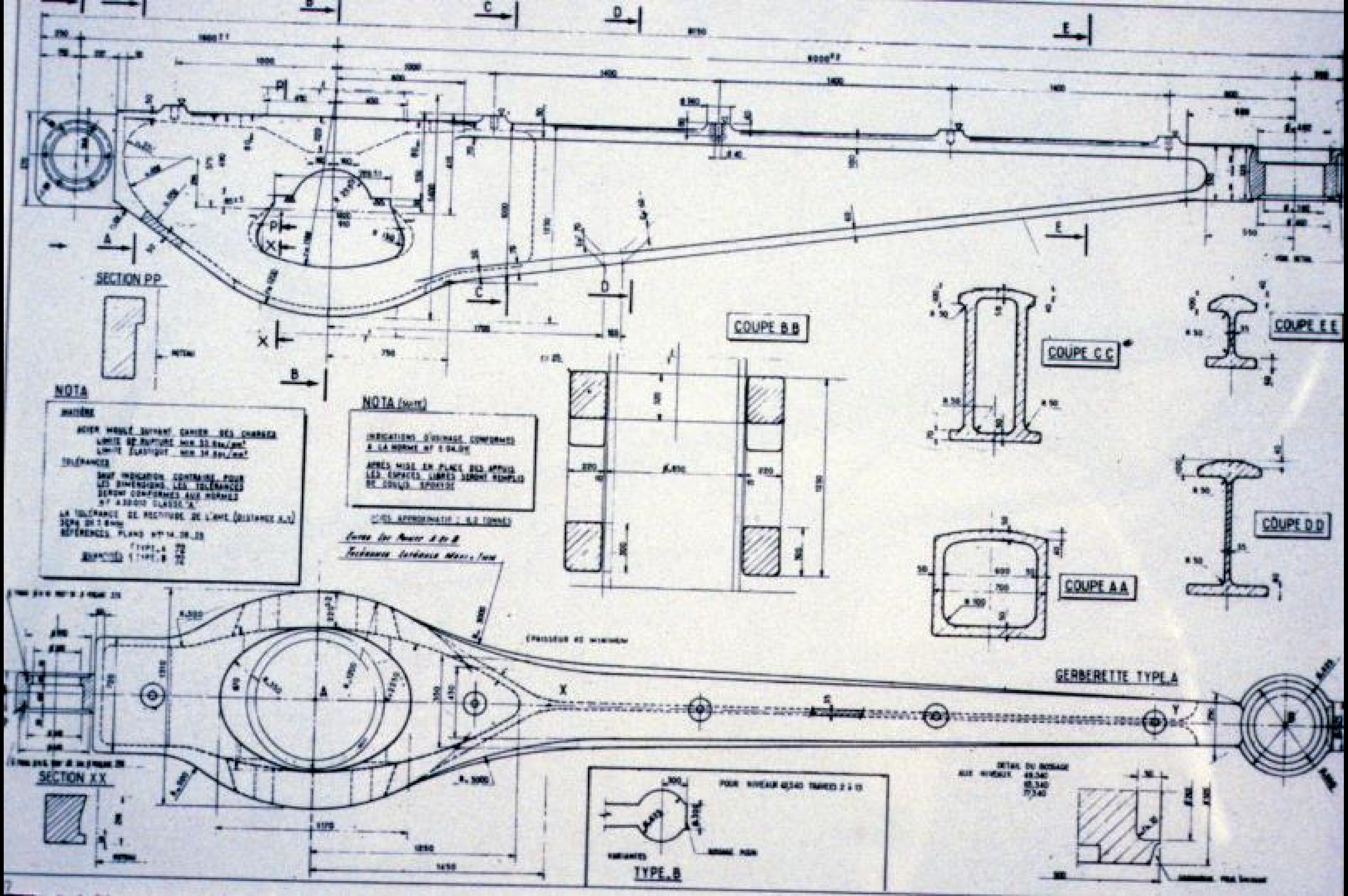
–

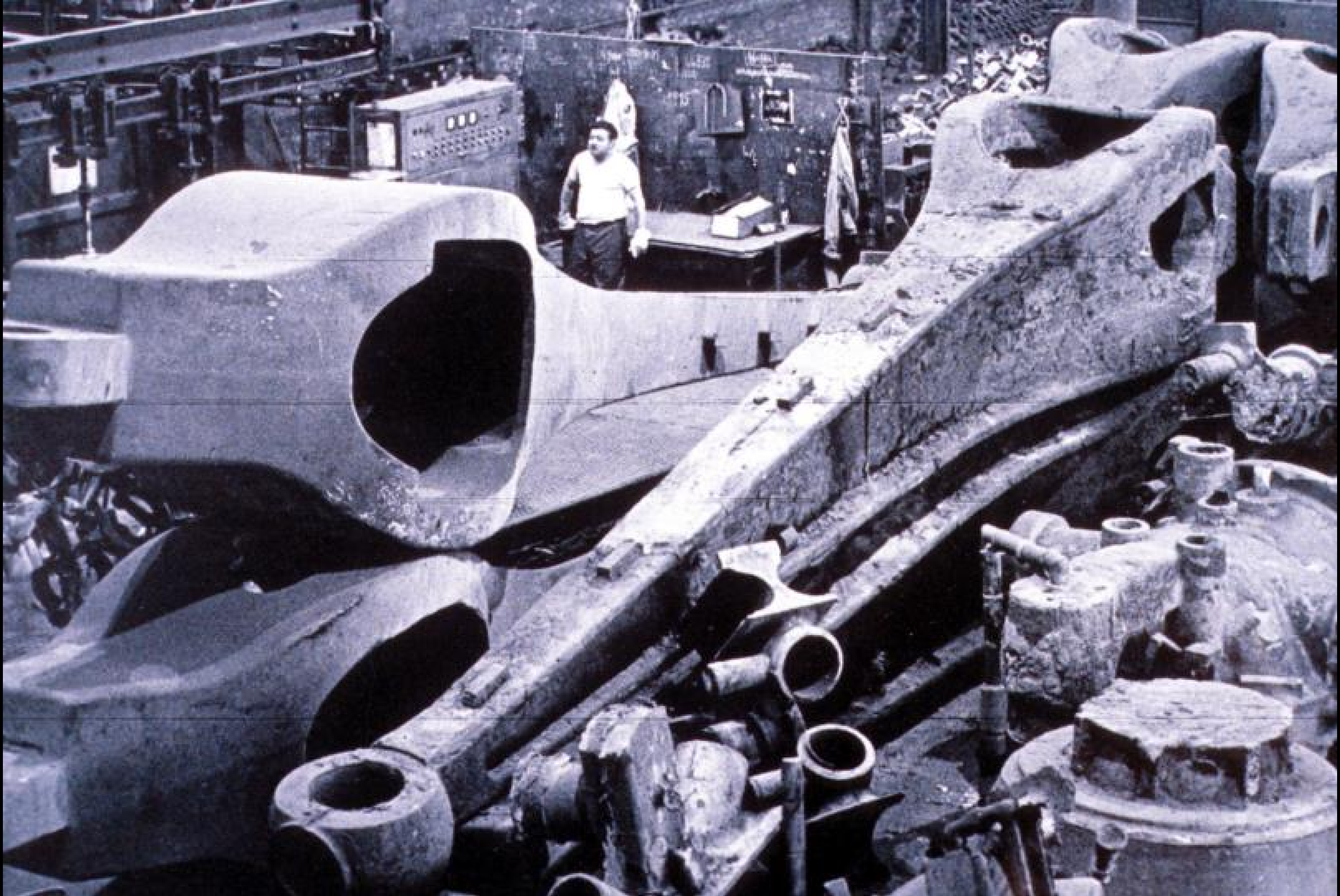
Tension vs Compression

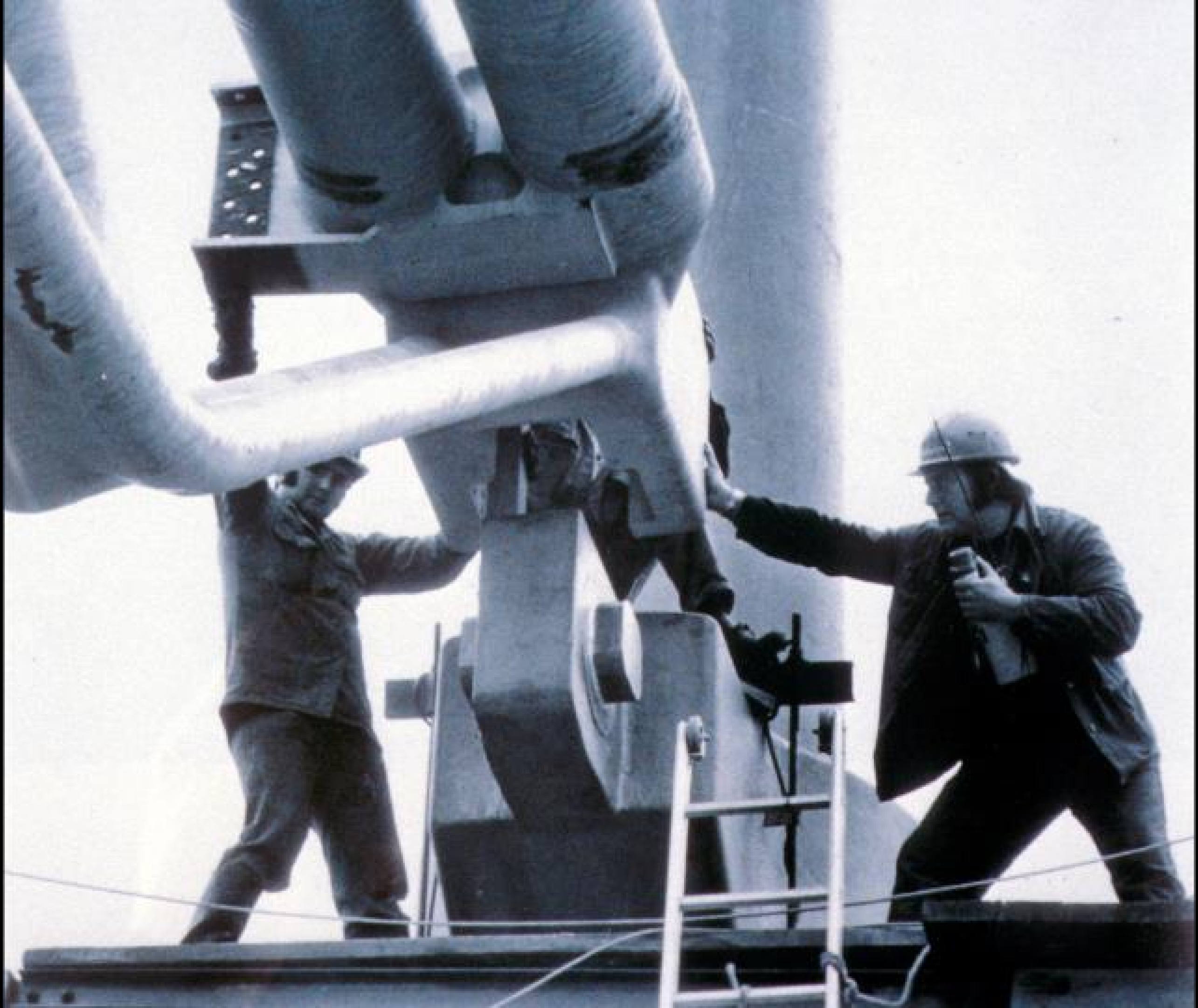
–

Skinny vs Fat

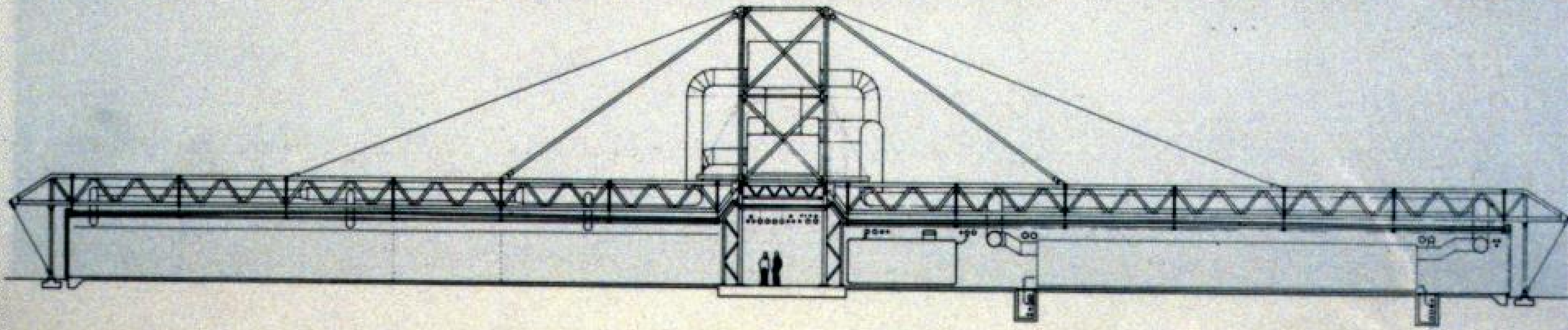
Pompidou Centre
Paris, France
Piano and Rogers
1977

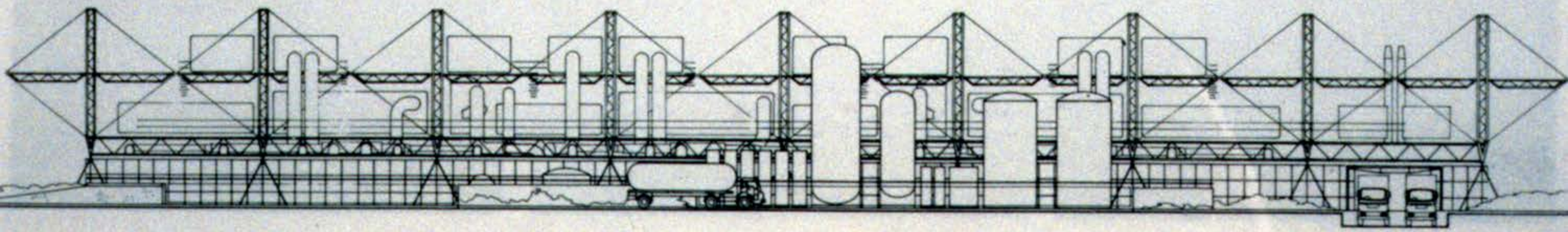

SECTION PP
NOTA
NOTA (suite)
COUPE B.B
COUPE C.C
COUPE E.E
COUPE D.D
COUPE A.A
GERBERETTE TYPE A
SECTION XX
TYPE B

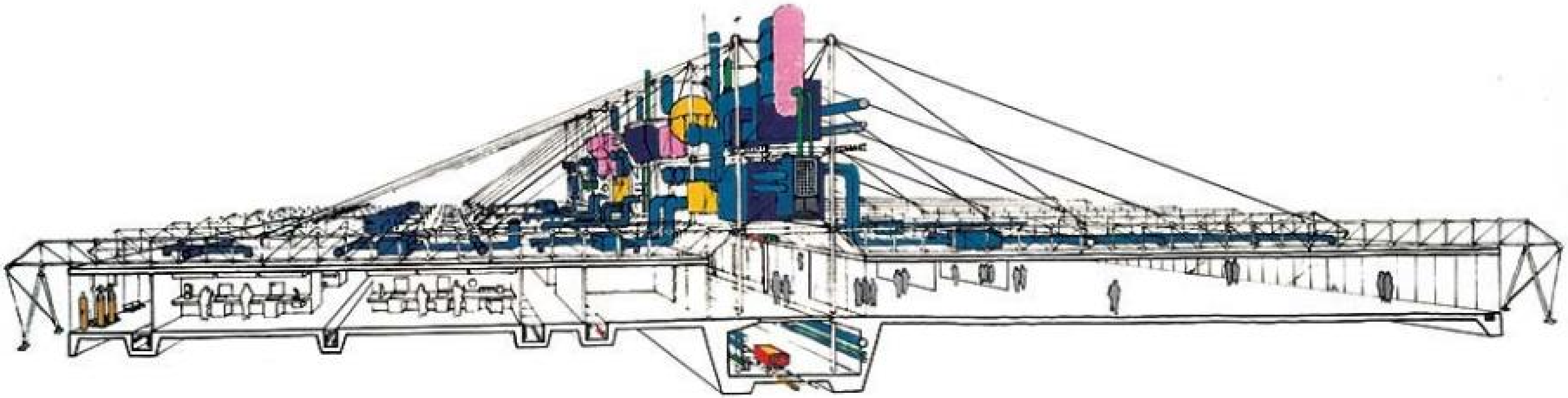


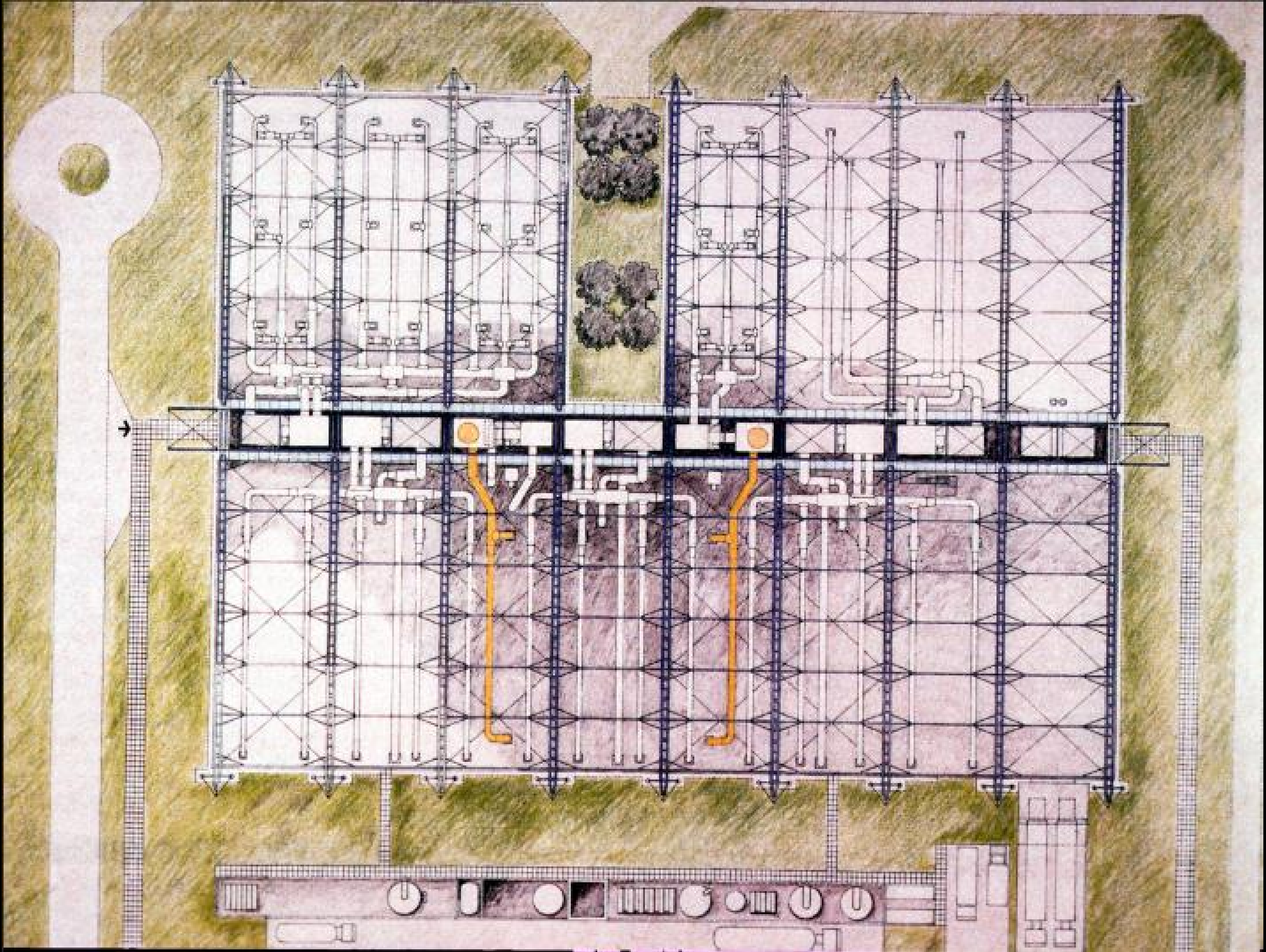


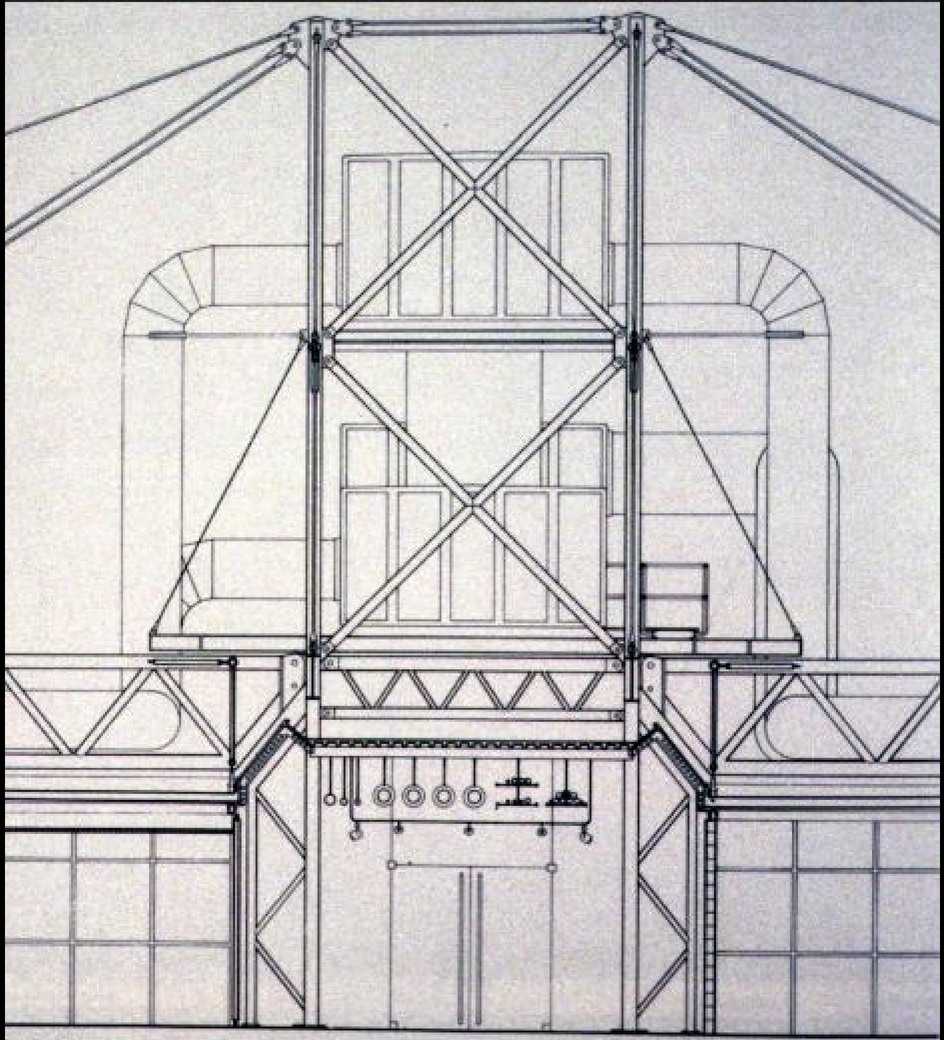
Inmos Technology
Newport, Wales
Richard Rogers
1982



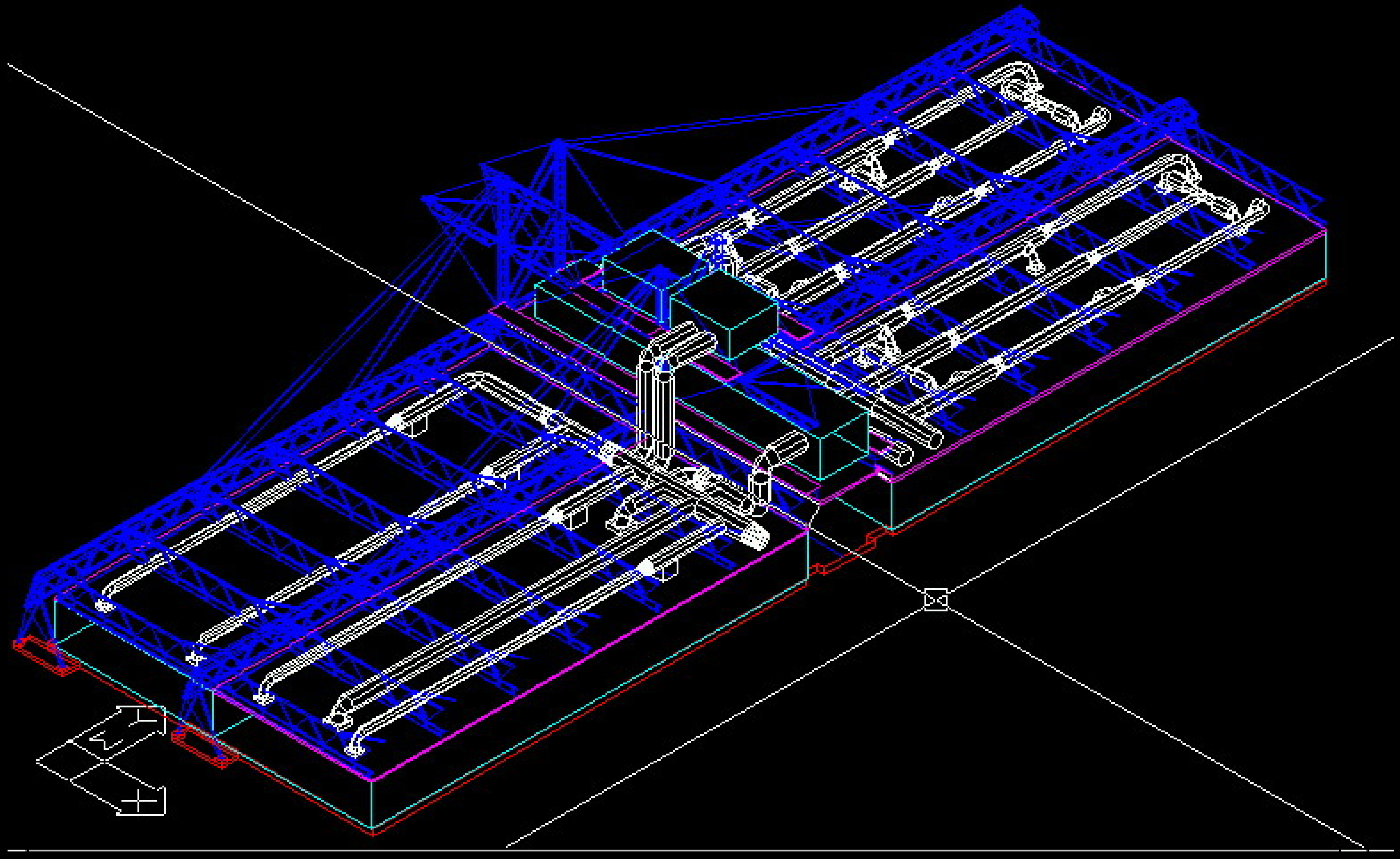


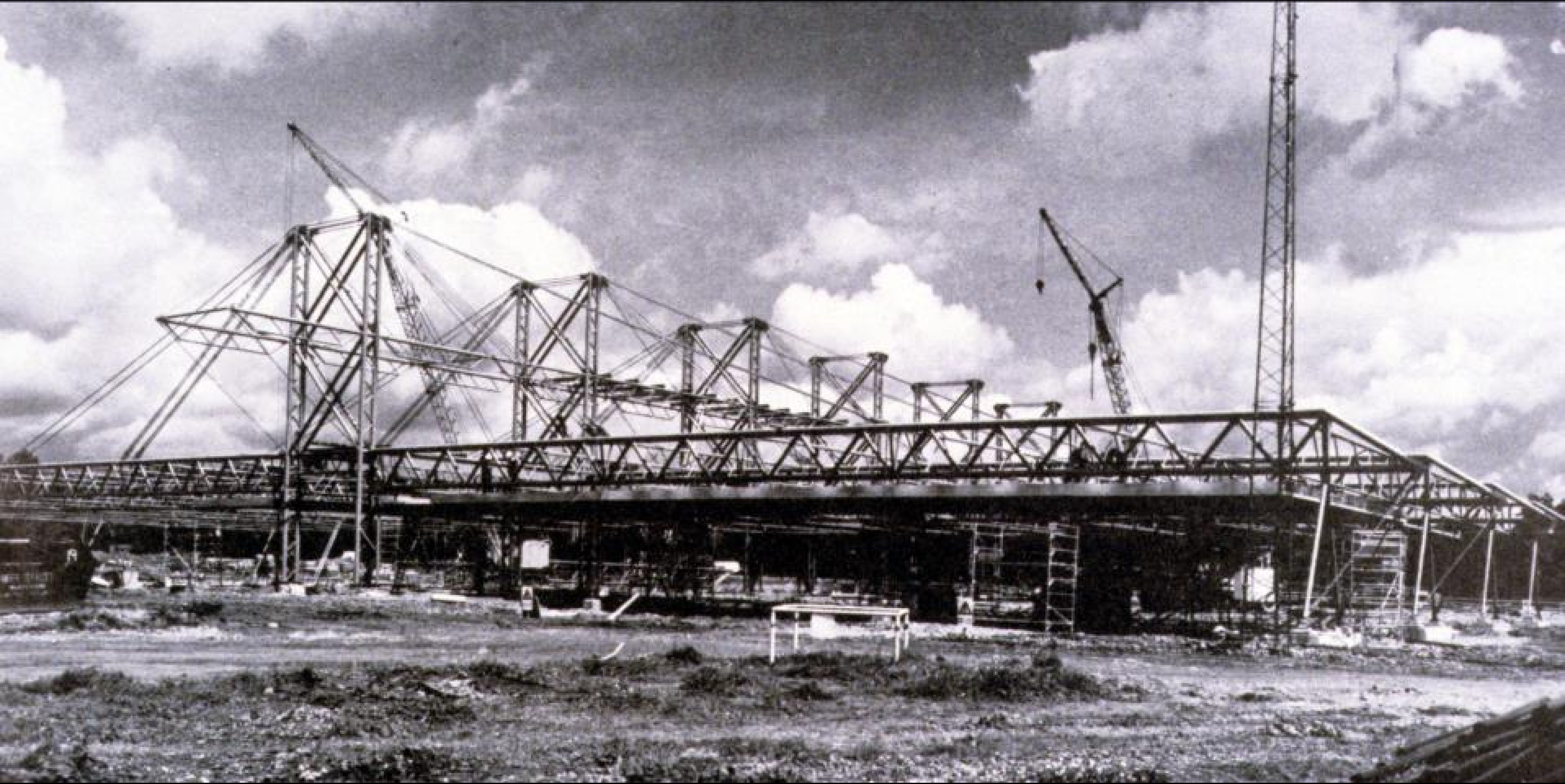






Detail of elevation



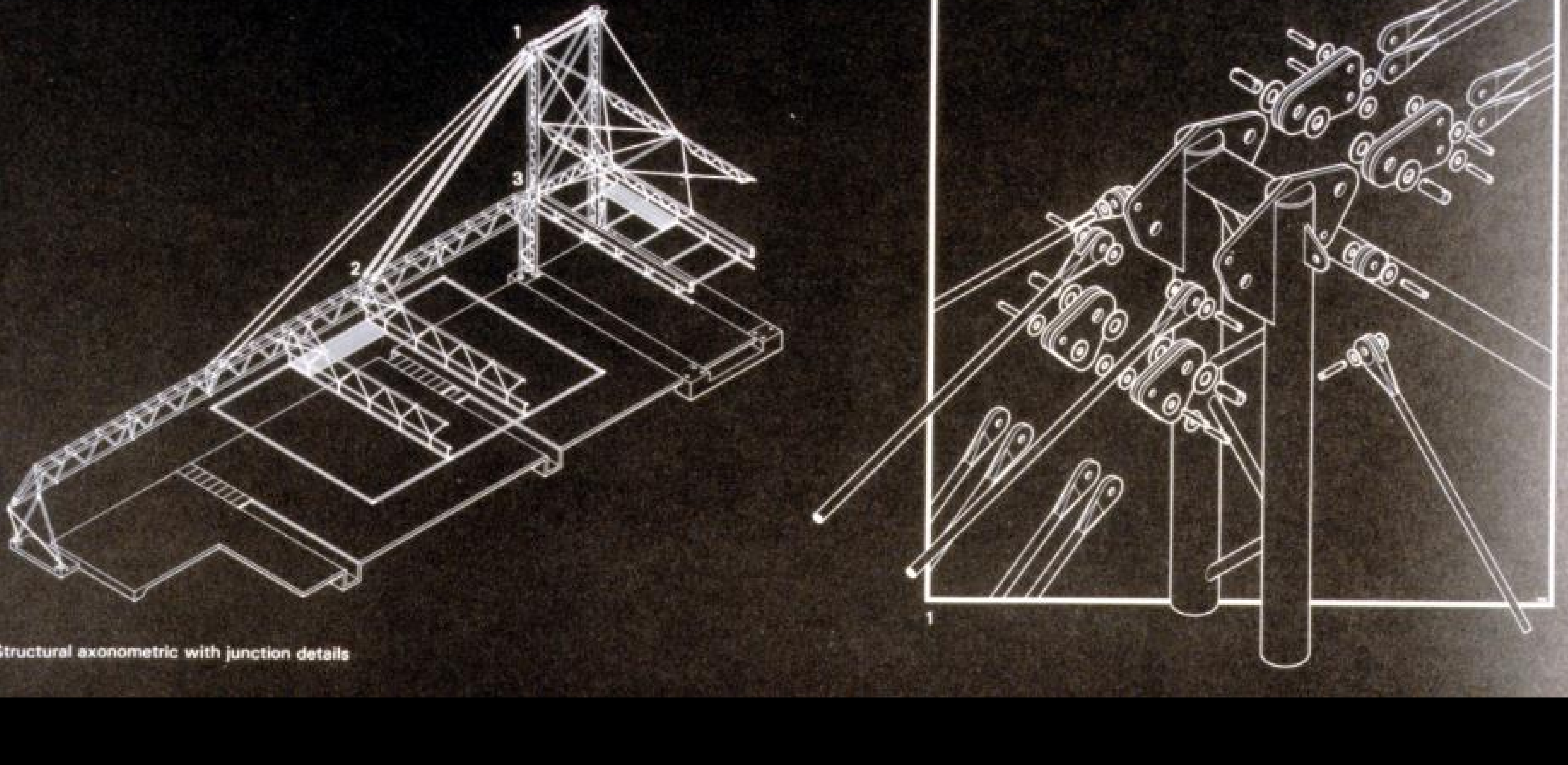


CONSTRUCTION SEQUENCE

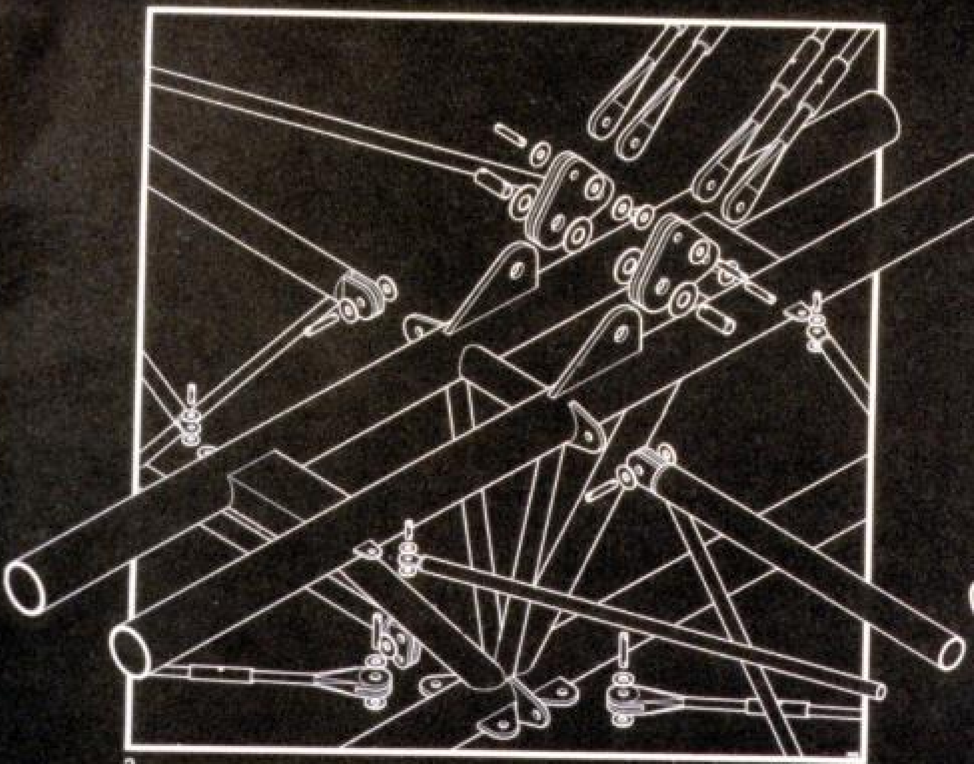





42



Structural axonometric with junction details



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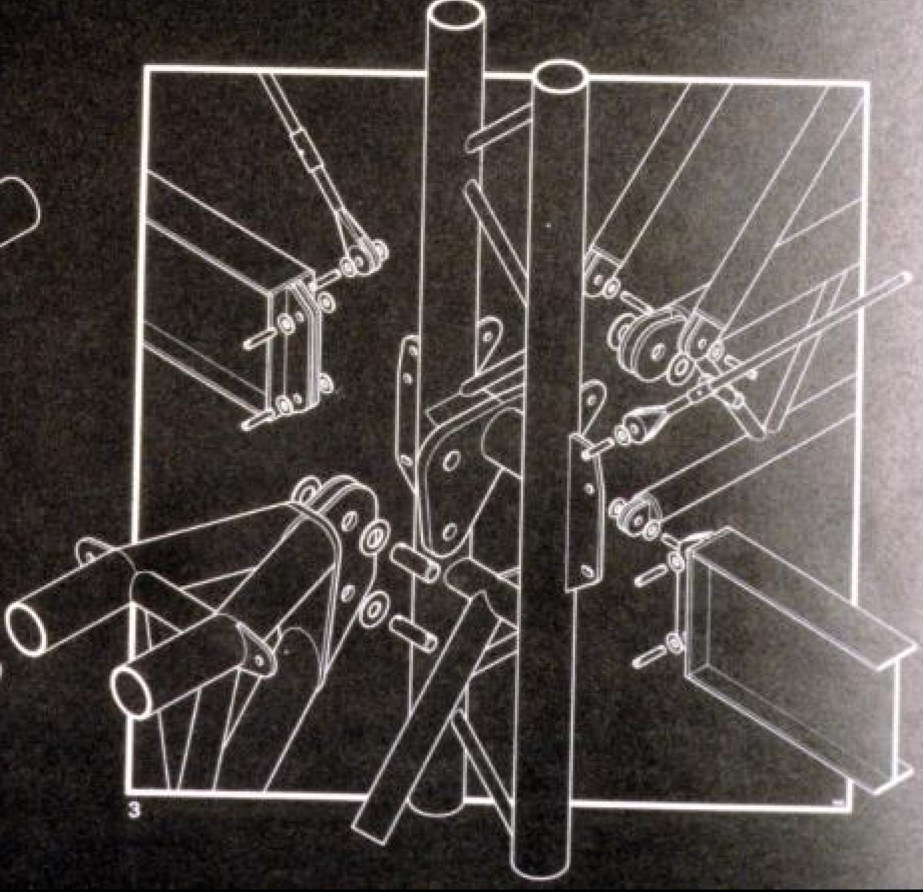

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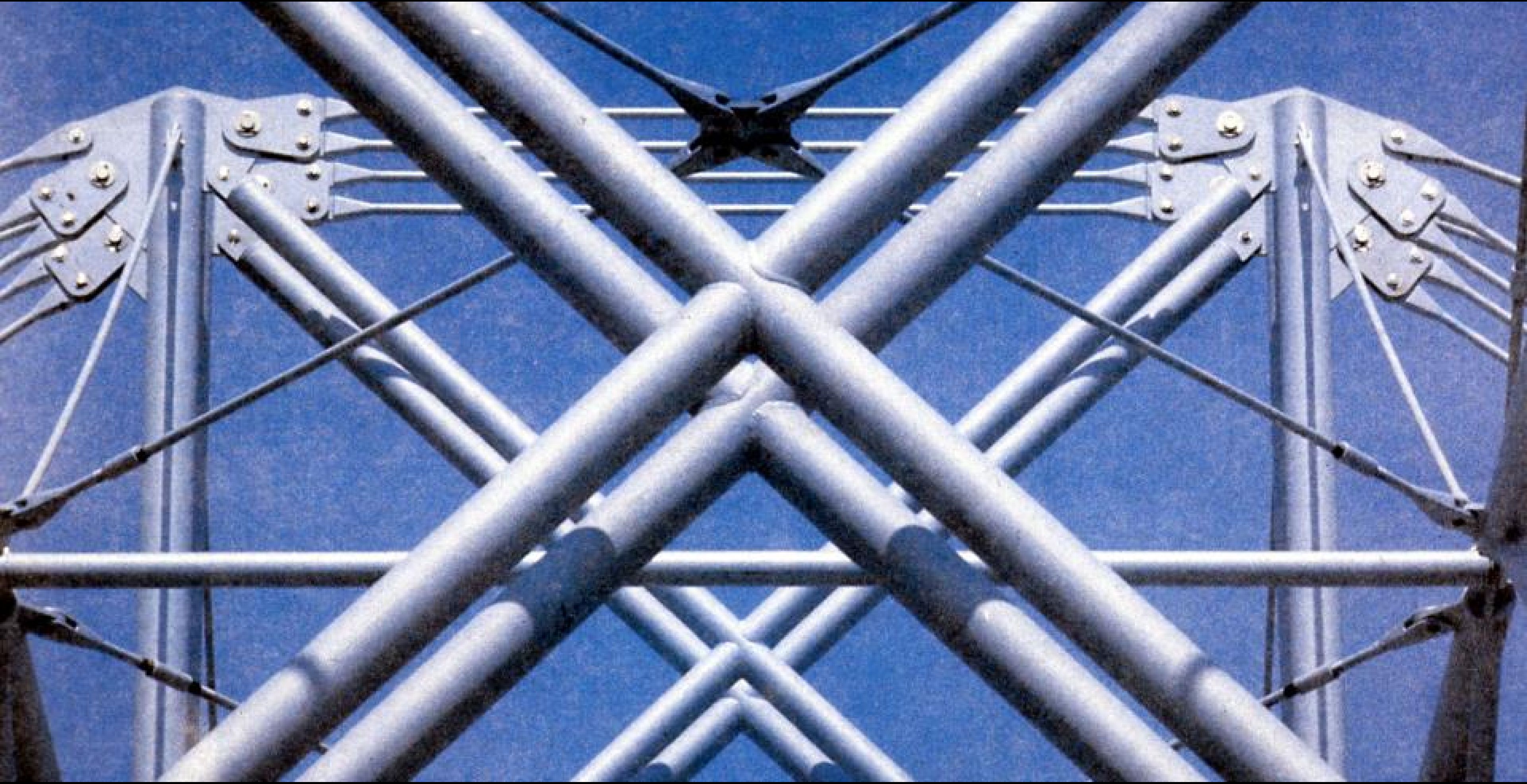
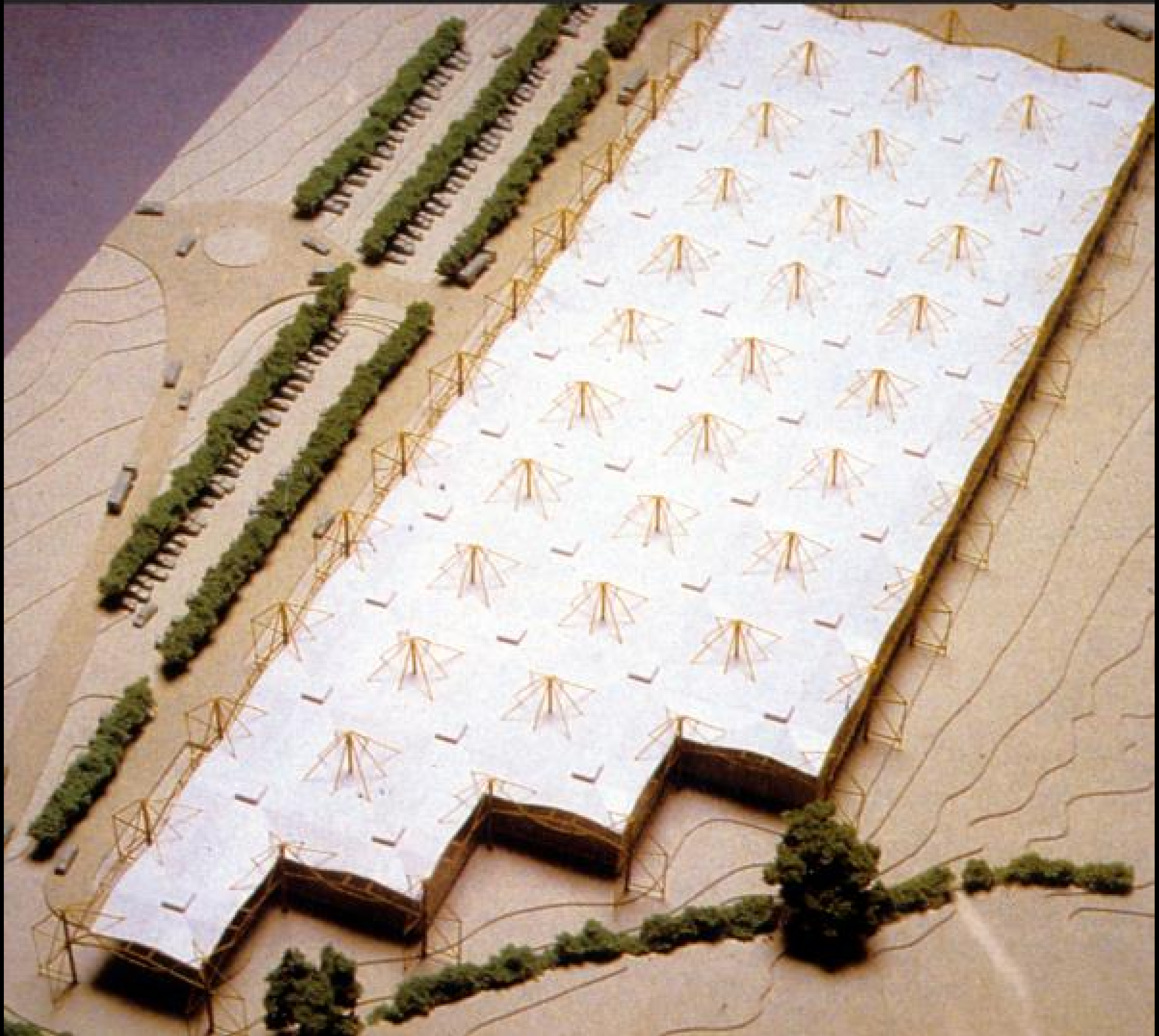
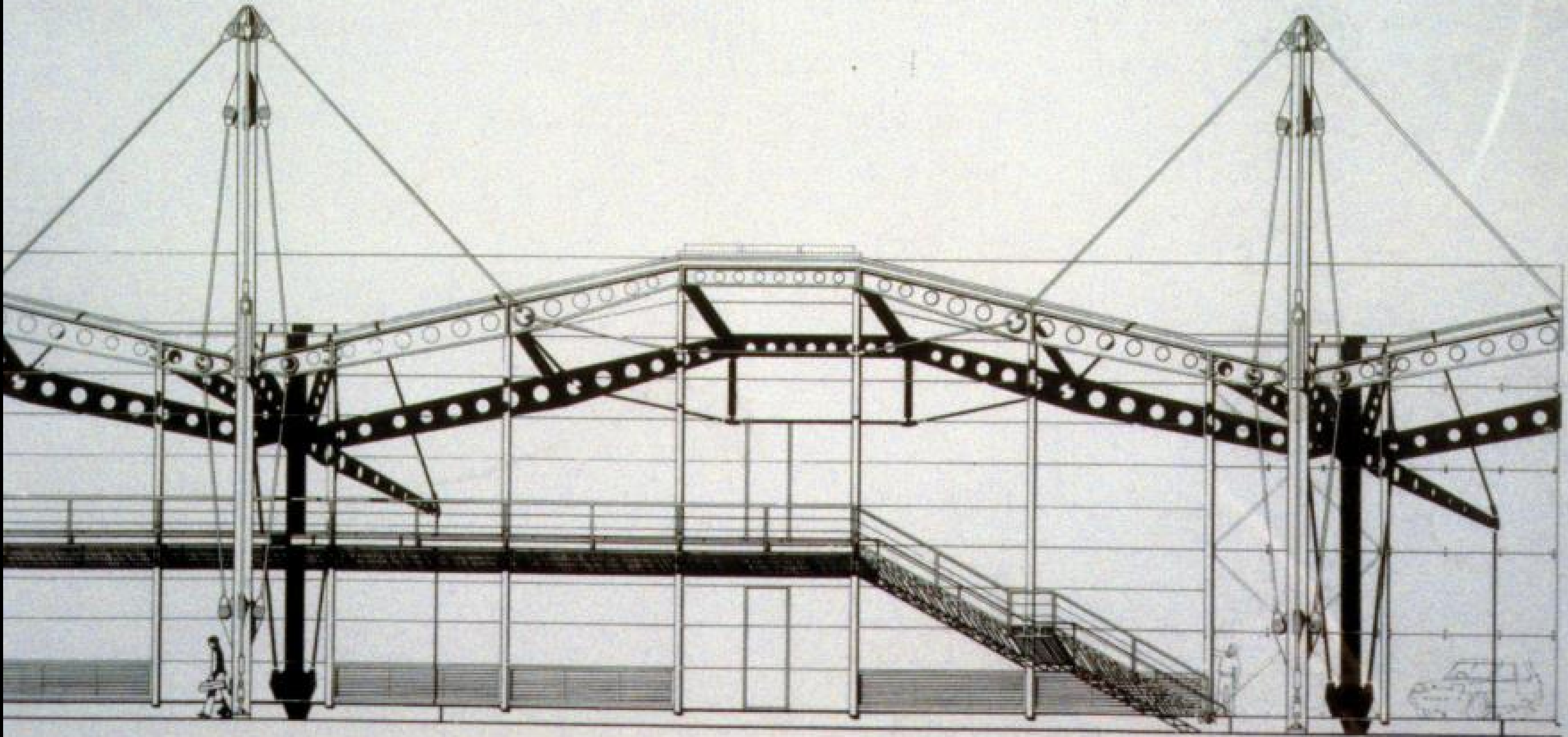
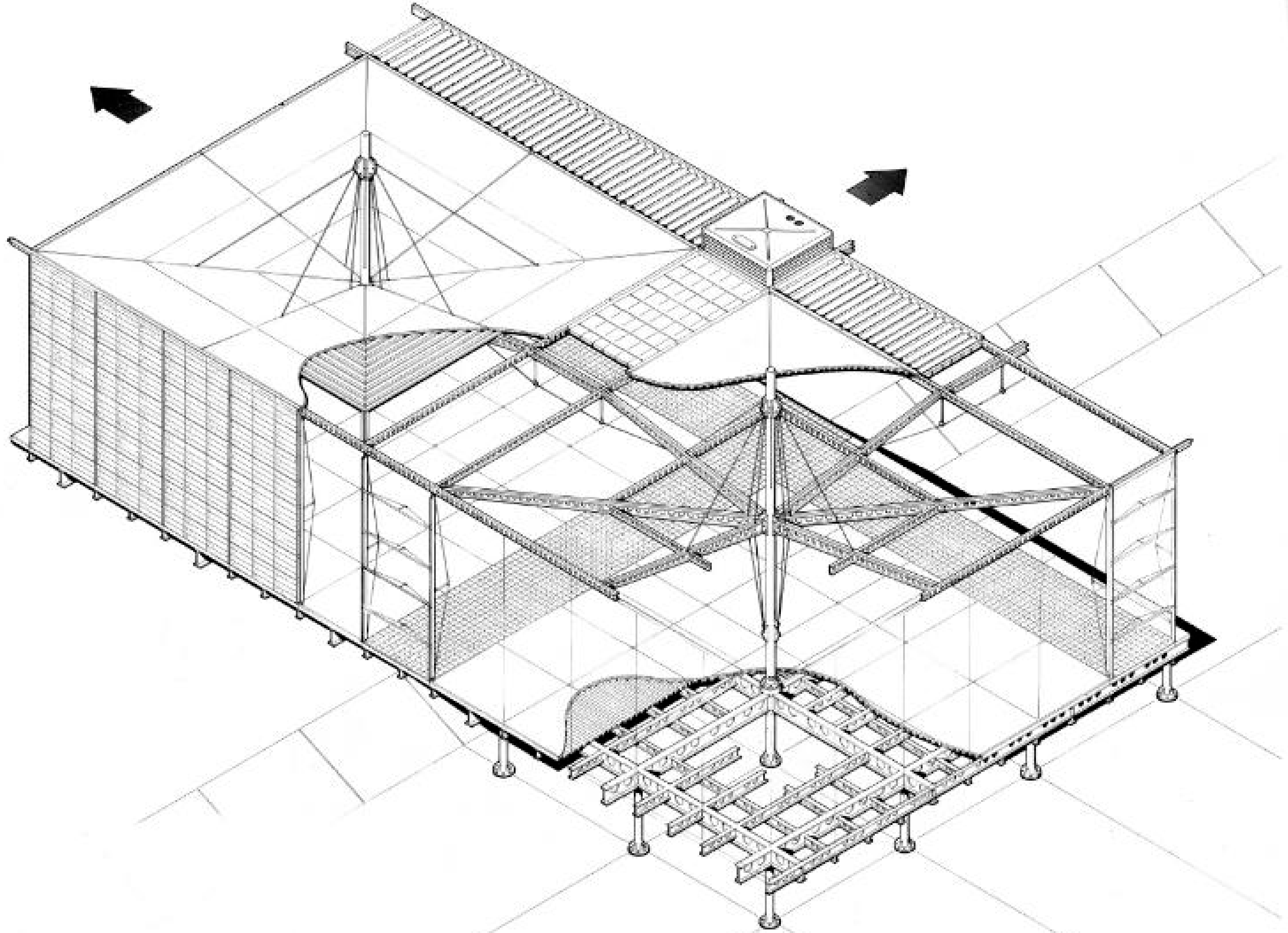
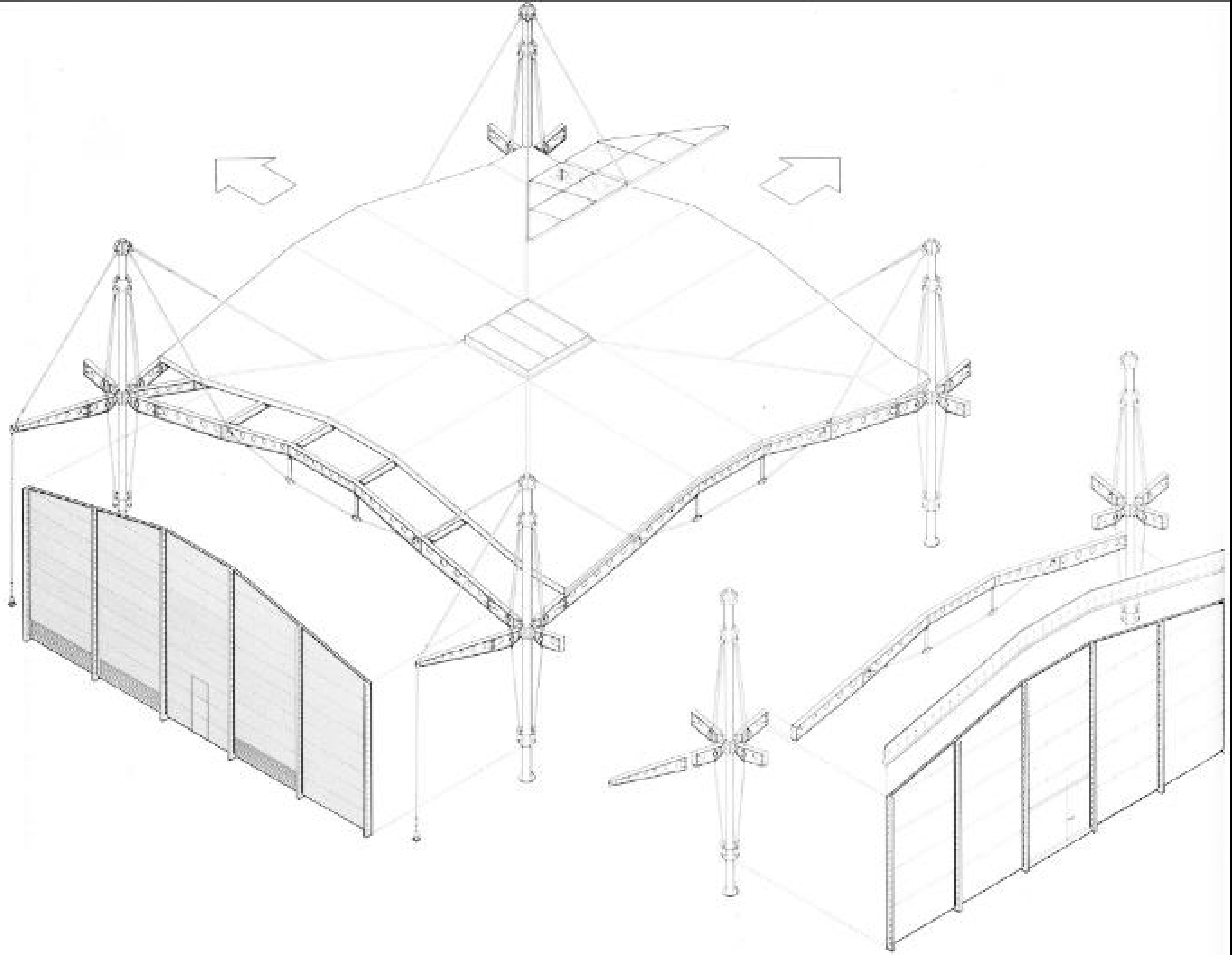


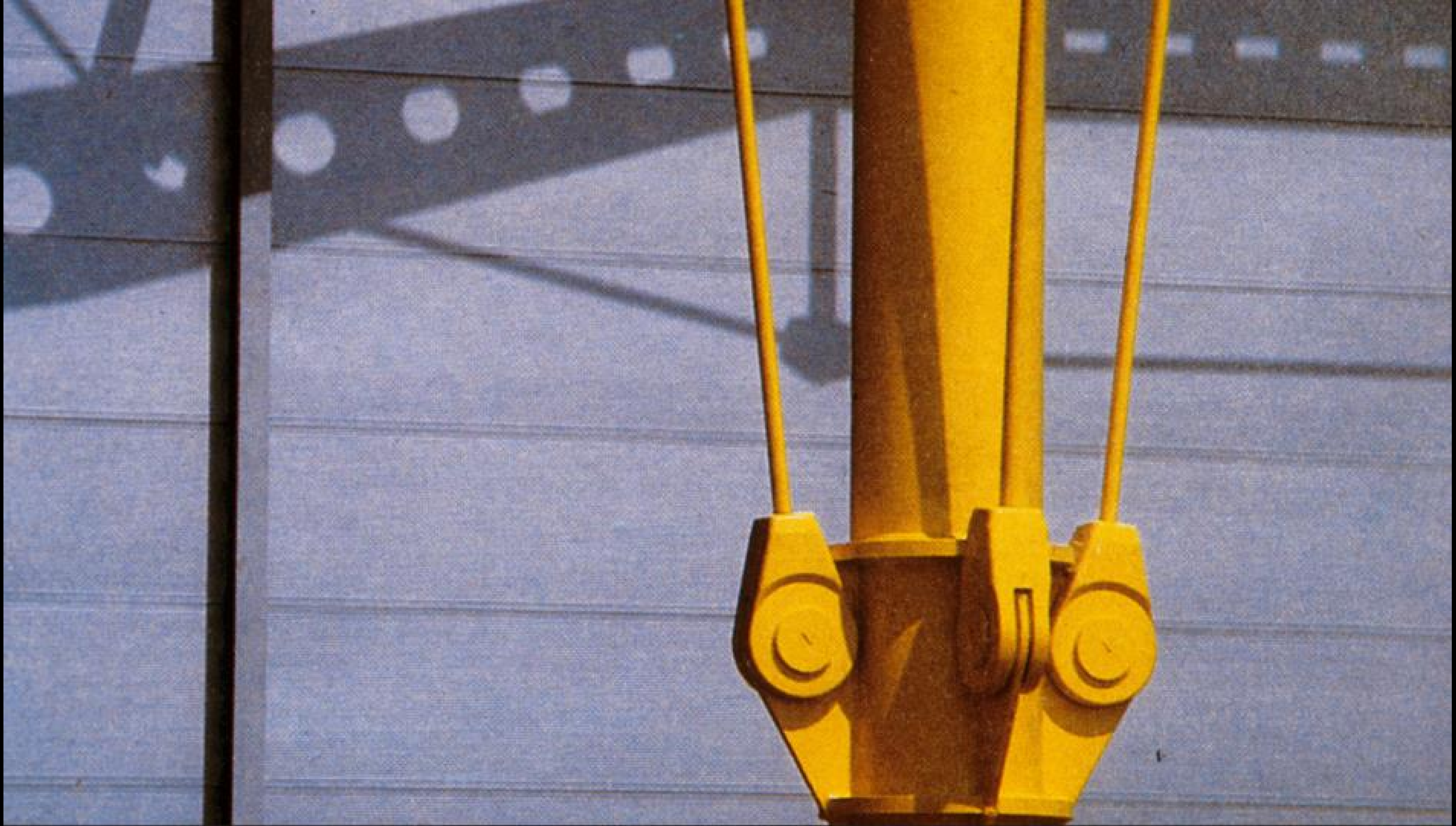

Renault Centre
Swindon, UK
Foster Associates

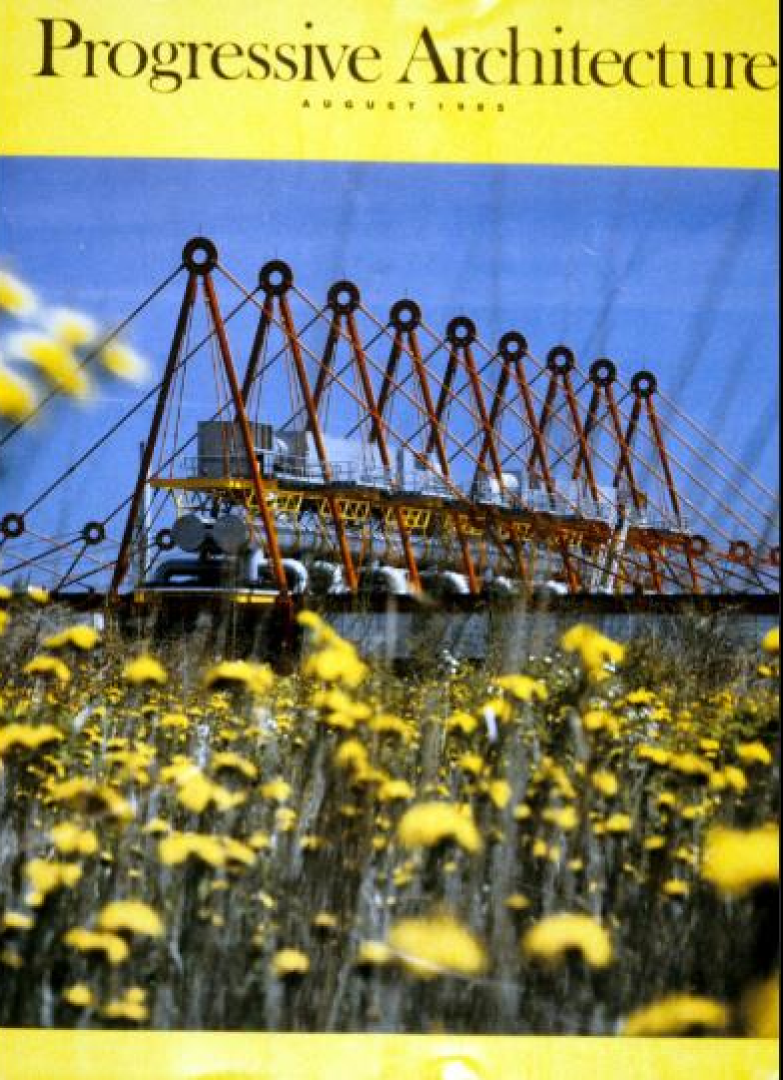




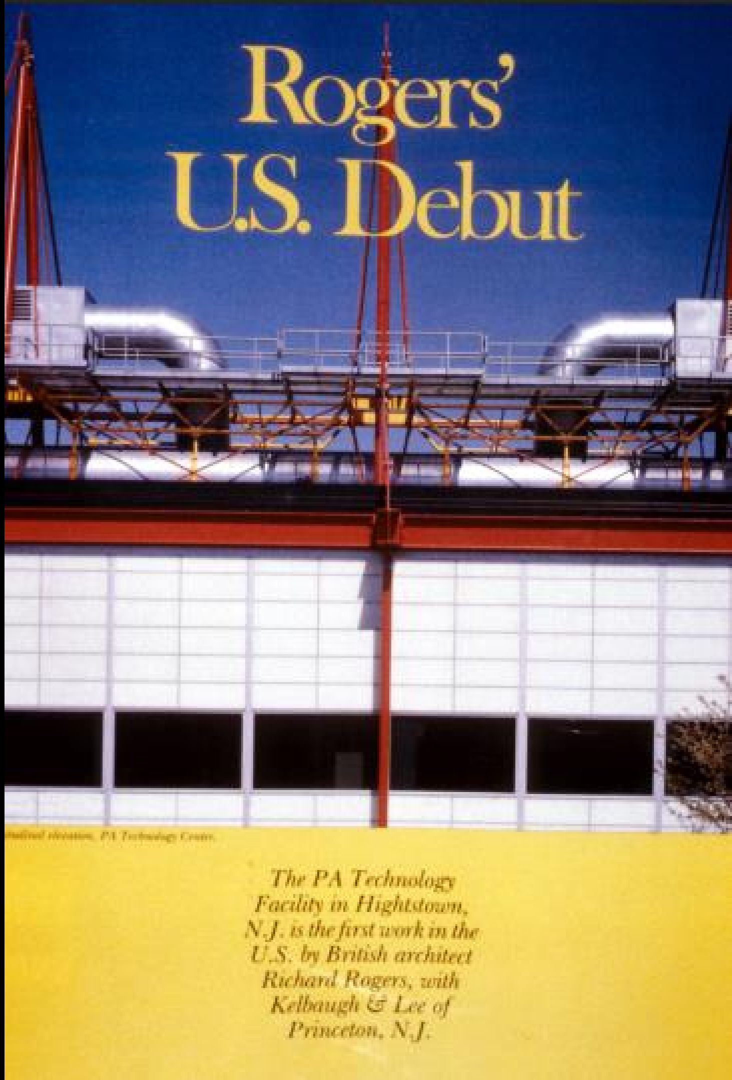


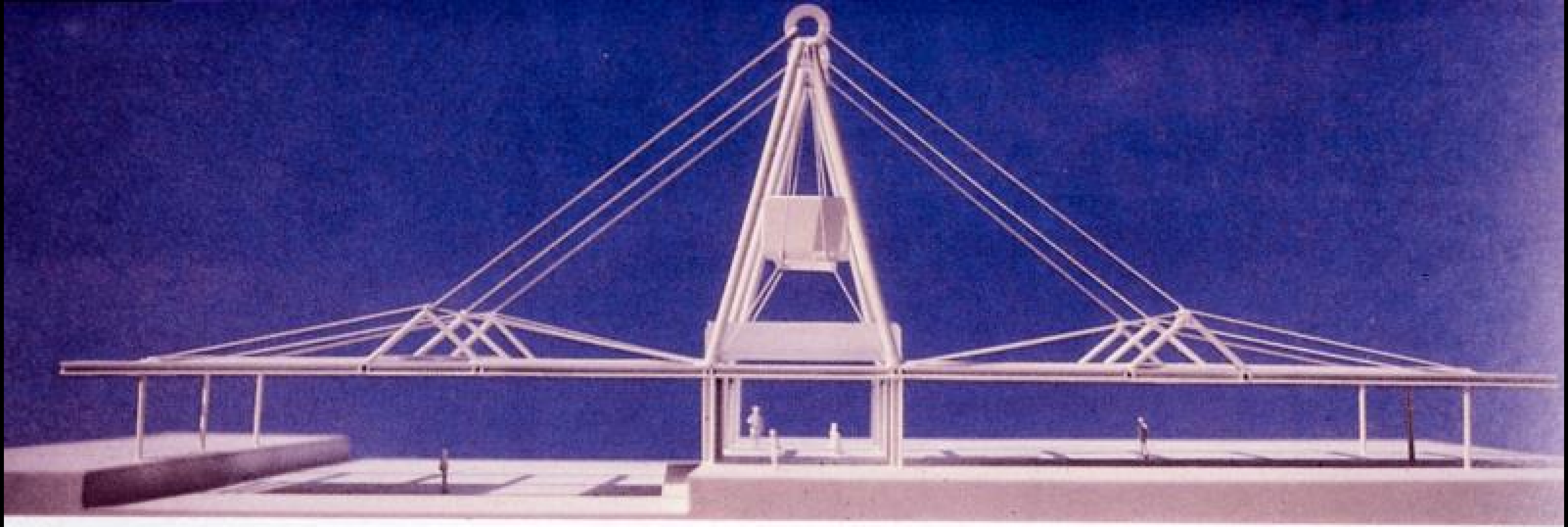




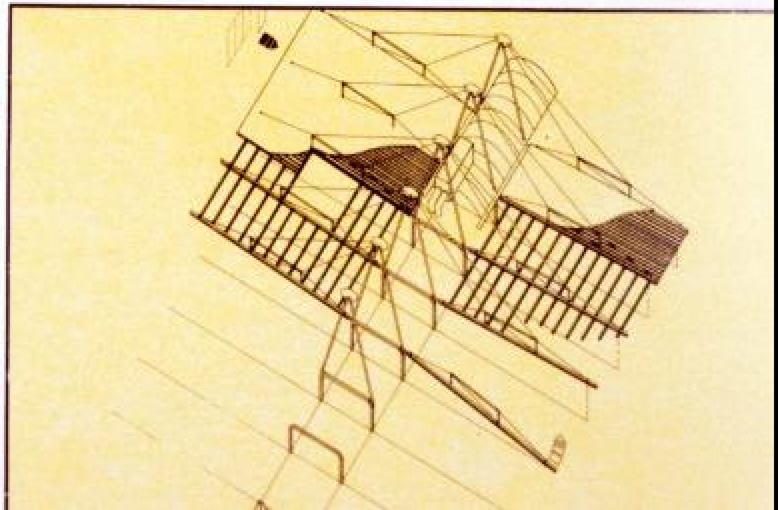


PA Technology
Hightstown, NJ
Richard Rogers
1985

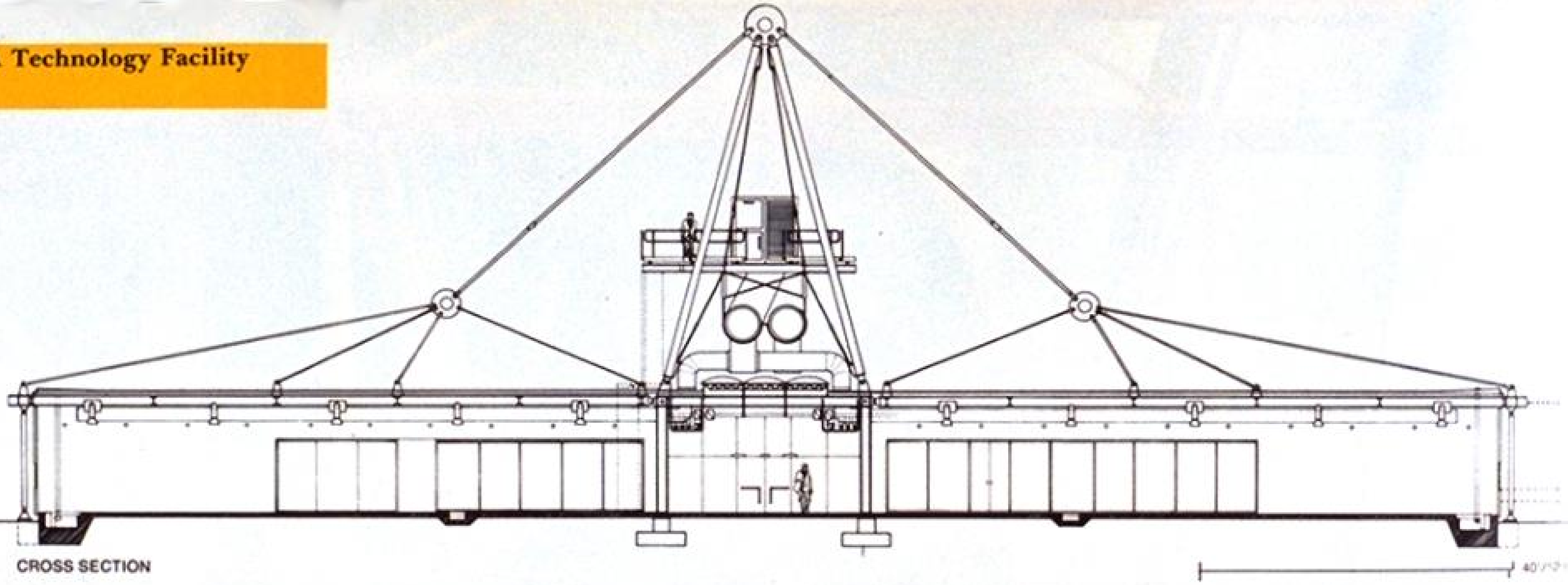


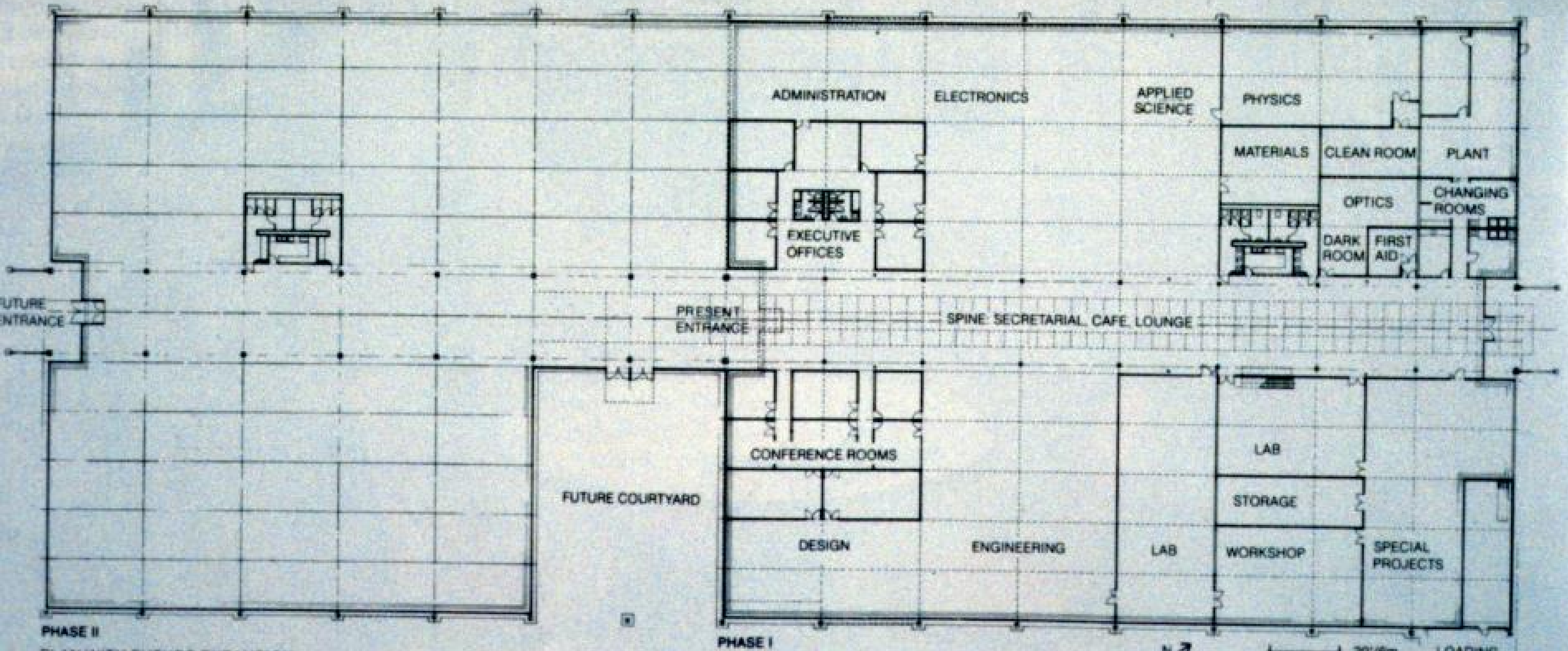


del of structure

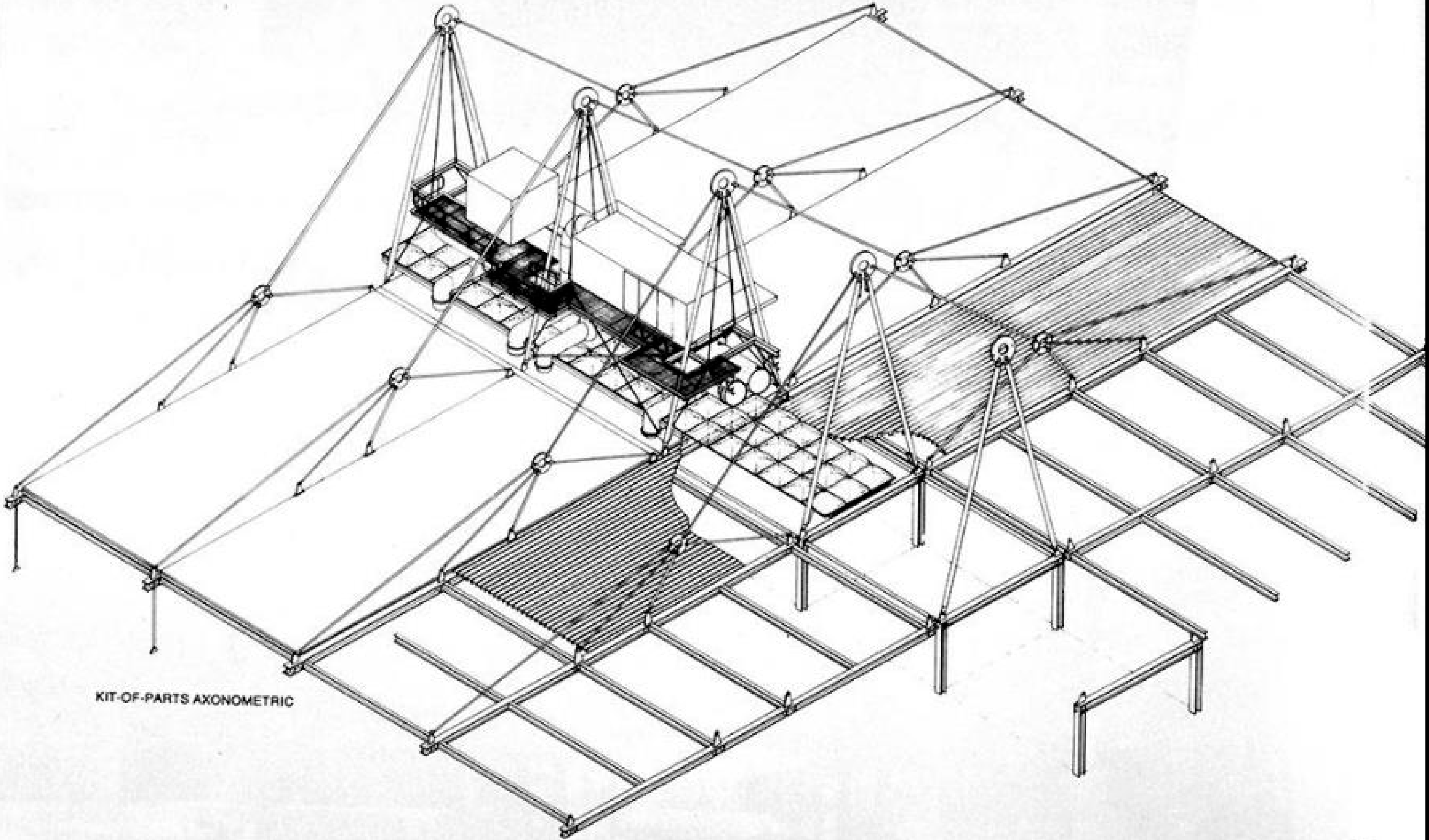


PA Technology Facility



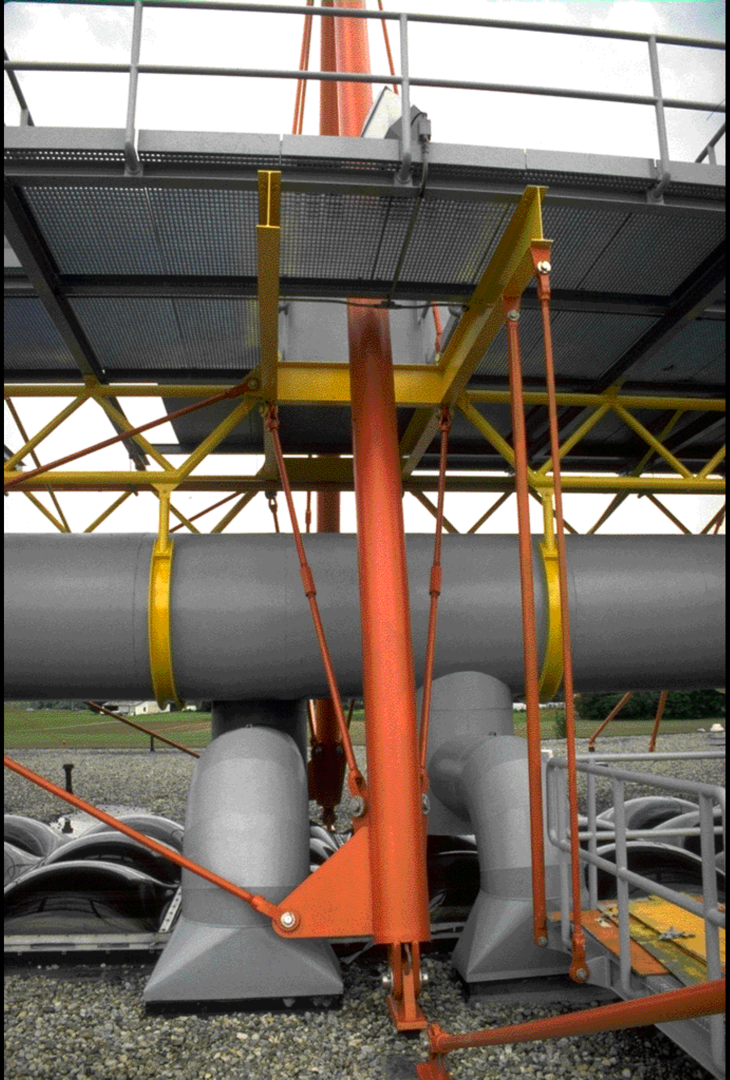
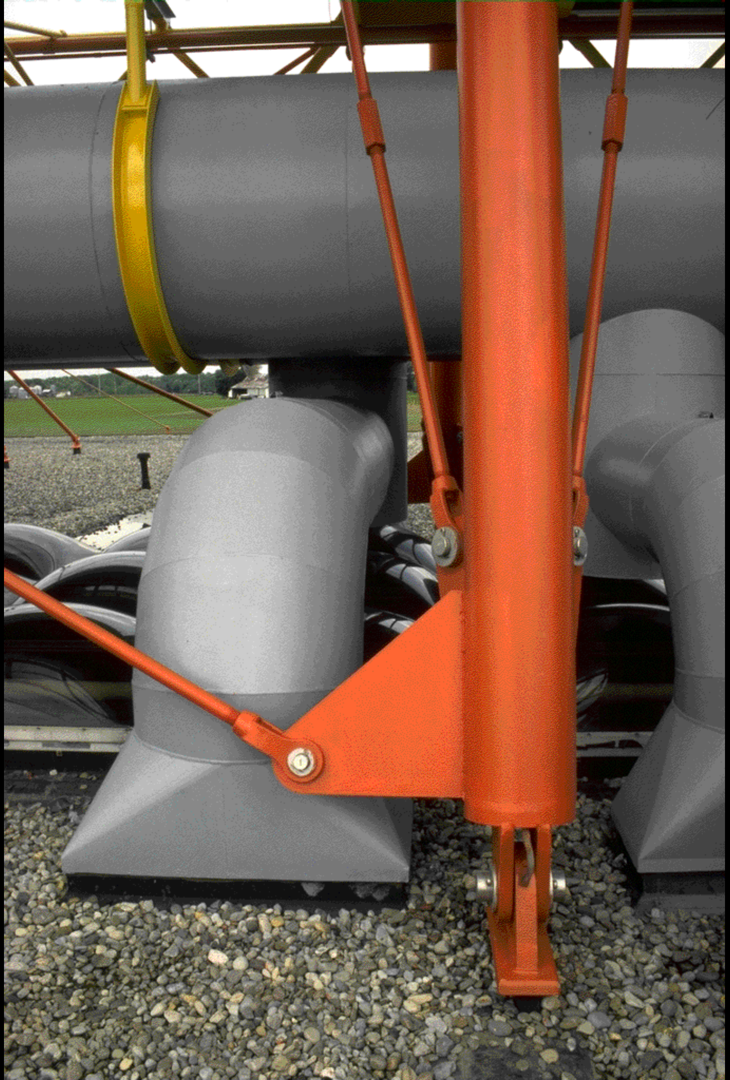


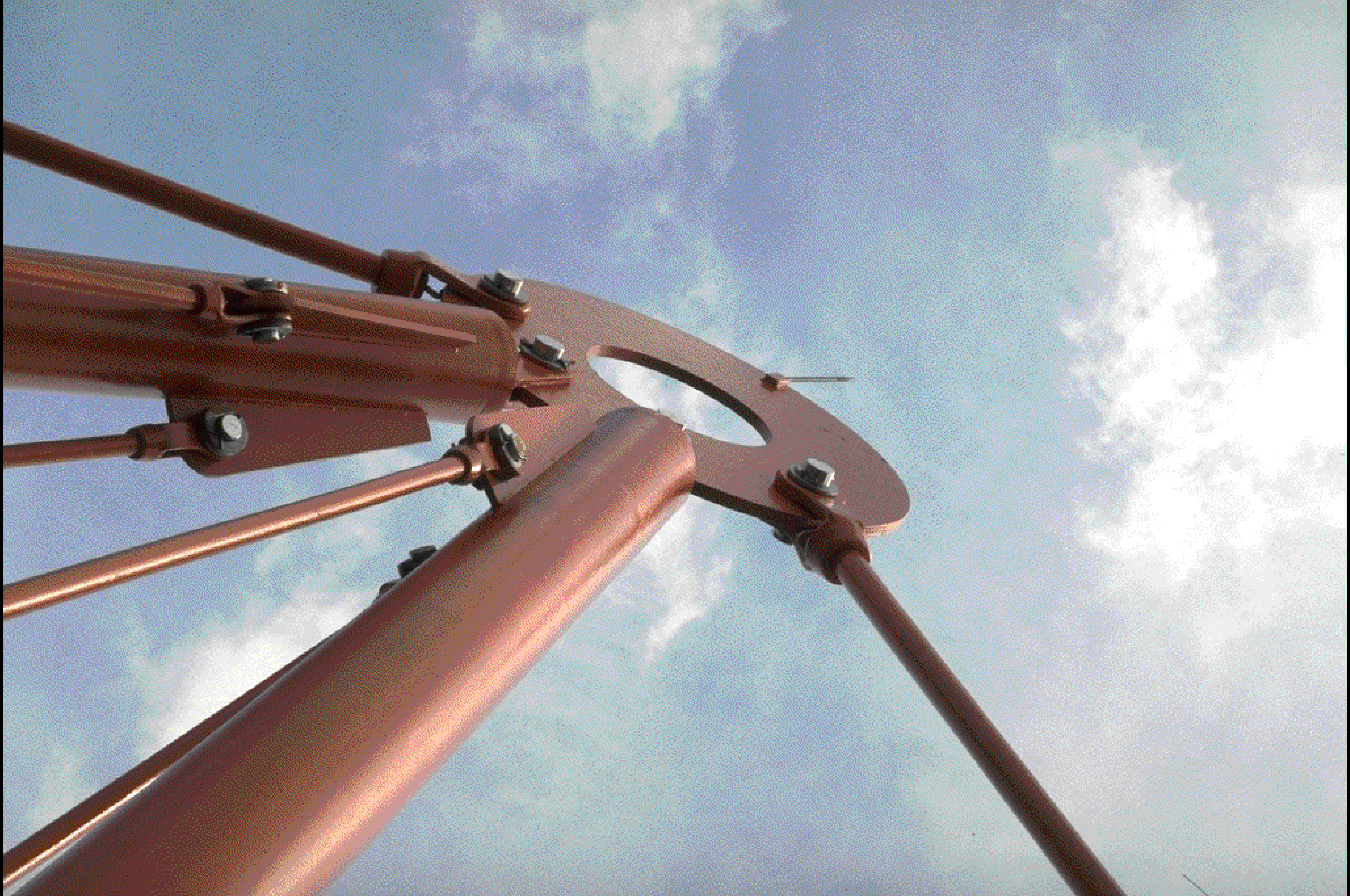
PLAN WITH FUTURE EXPANSION

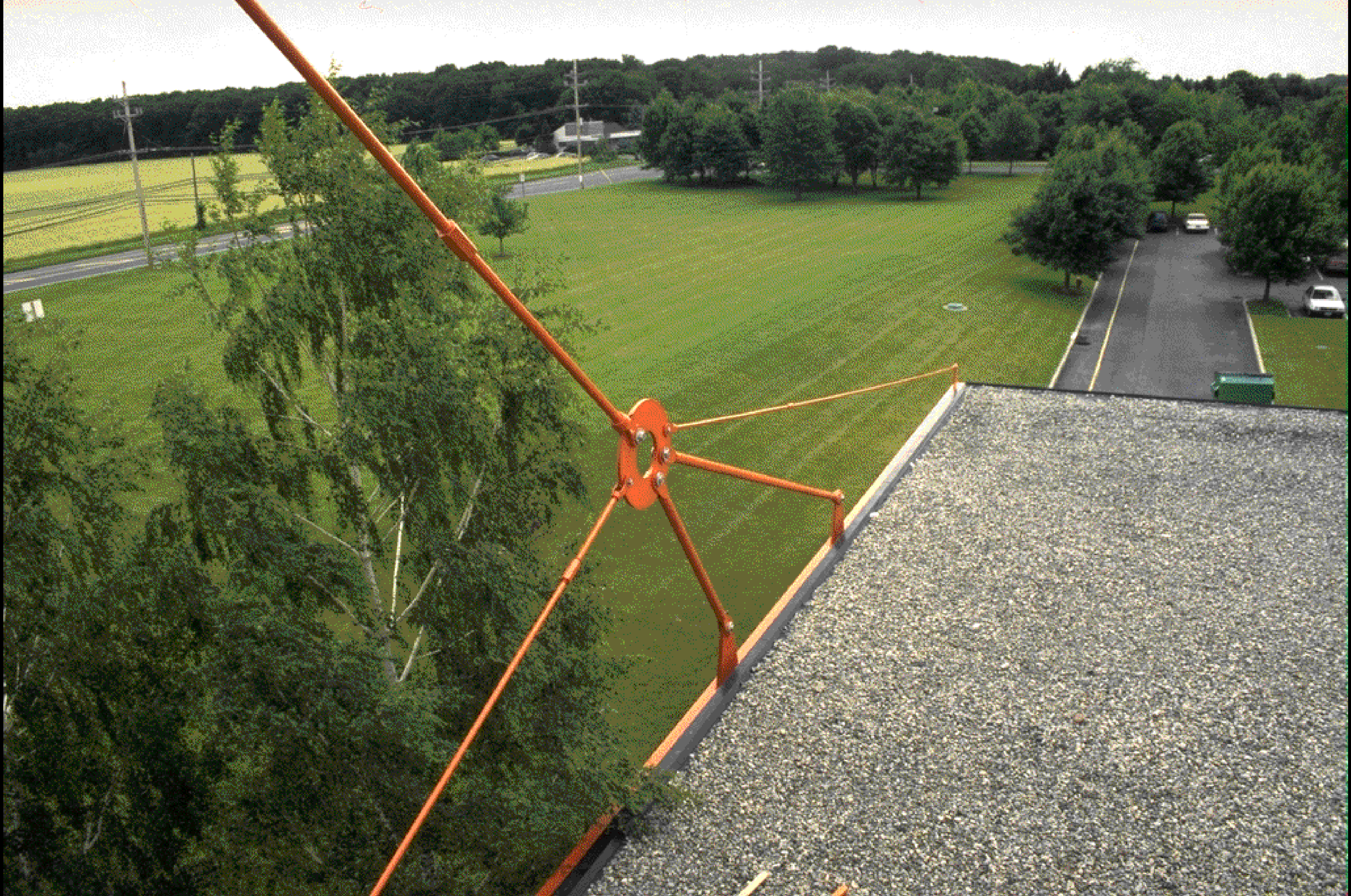


KIT-OF-PARTS AXONOMETRIC

Hightstown, N.J.





Oxford Ice Rink
Oxford, England
Grimshaw Architects
1984

Parc de la Villette
Paris, France
Bernard Tschumi
1982-1998




GAULOIS

Waterloo Station
London, UK
Grimshaw and Associates


urostar
Waterloo International