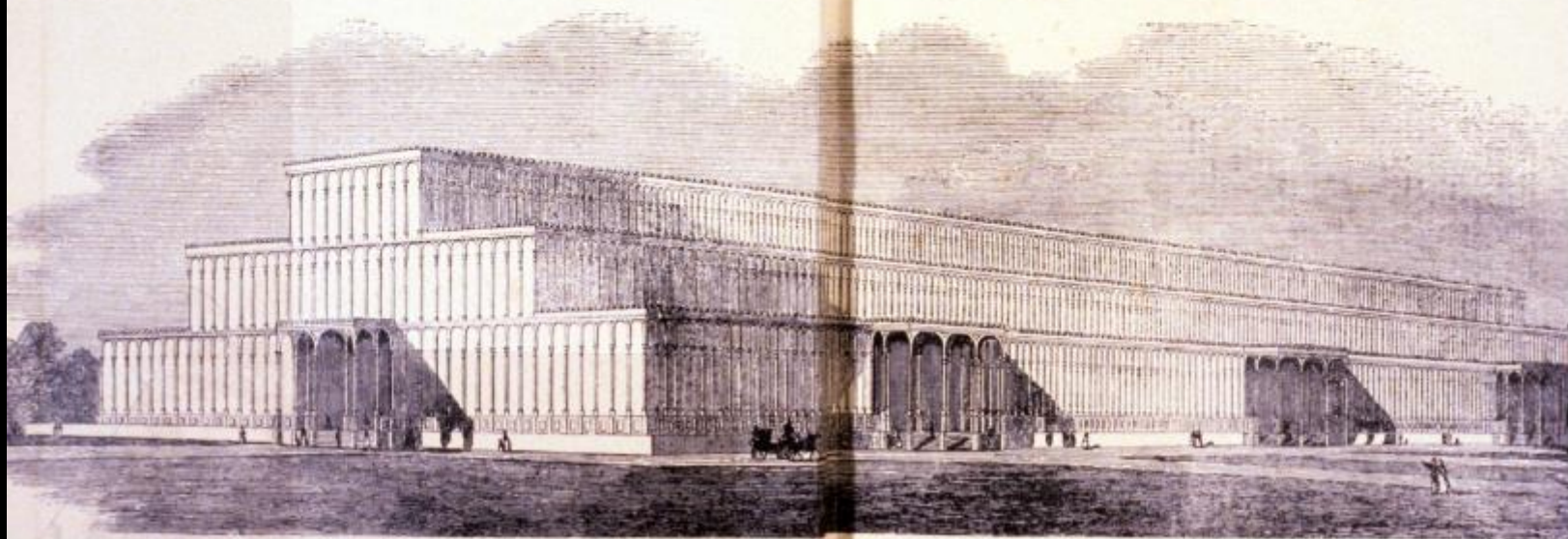


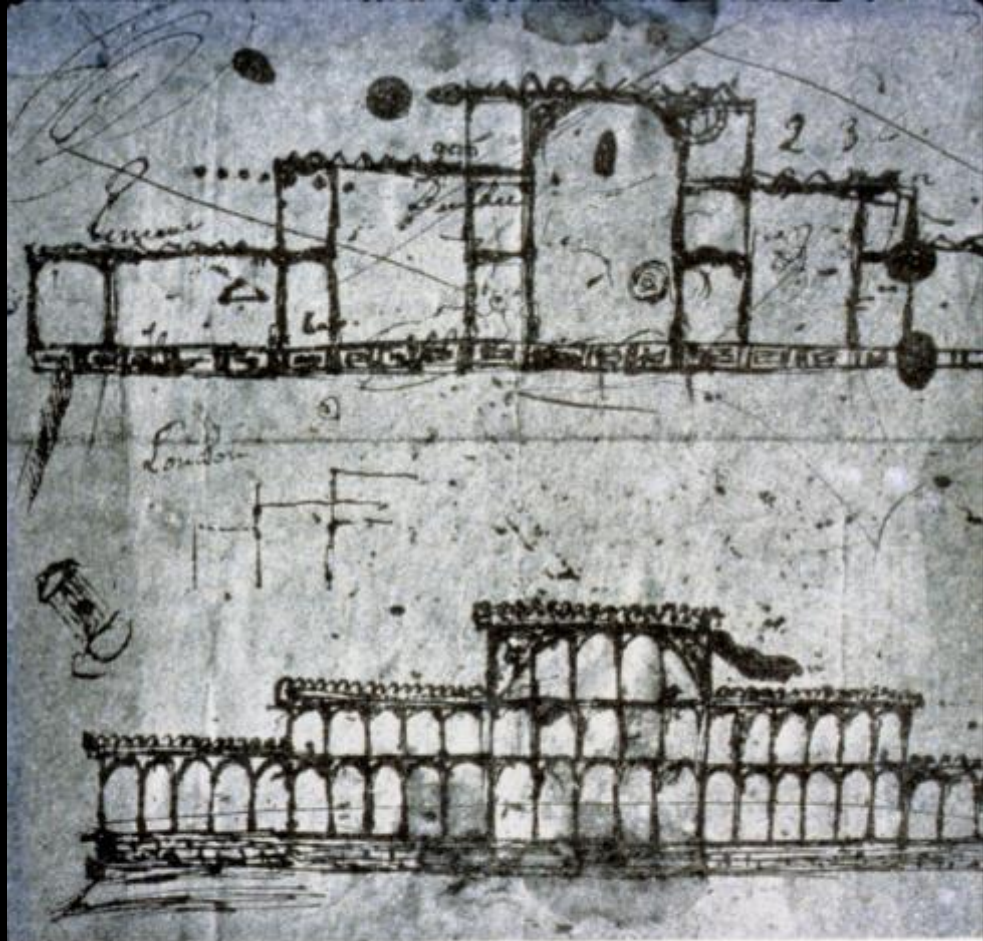
HIGH TECH ARCHITECTURE
The Origins of Detailing and Expression
in
Architecturally Exposed Structural Steel
(AESS)



THE OFFICIAL DESIGN.

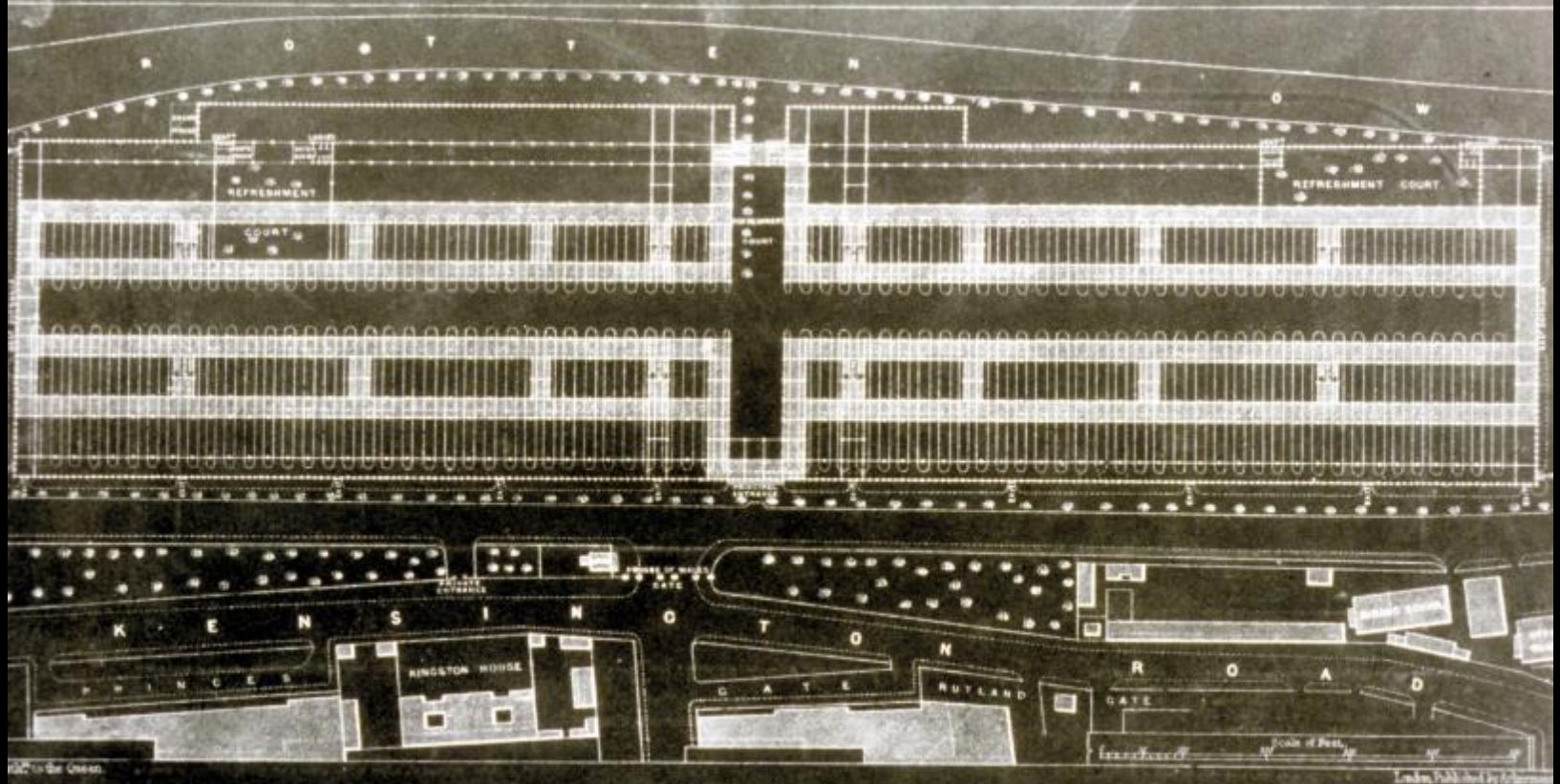


FAXTON'S DESIGN.



JOSEPH PAXTON'S ORIGINAL DESIGN ON
BLOTTING PAPER.

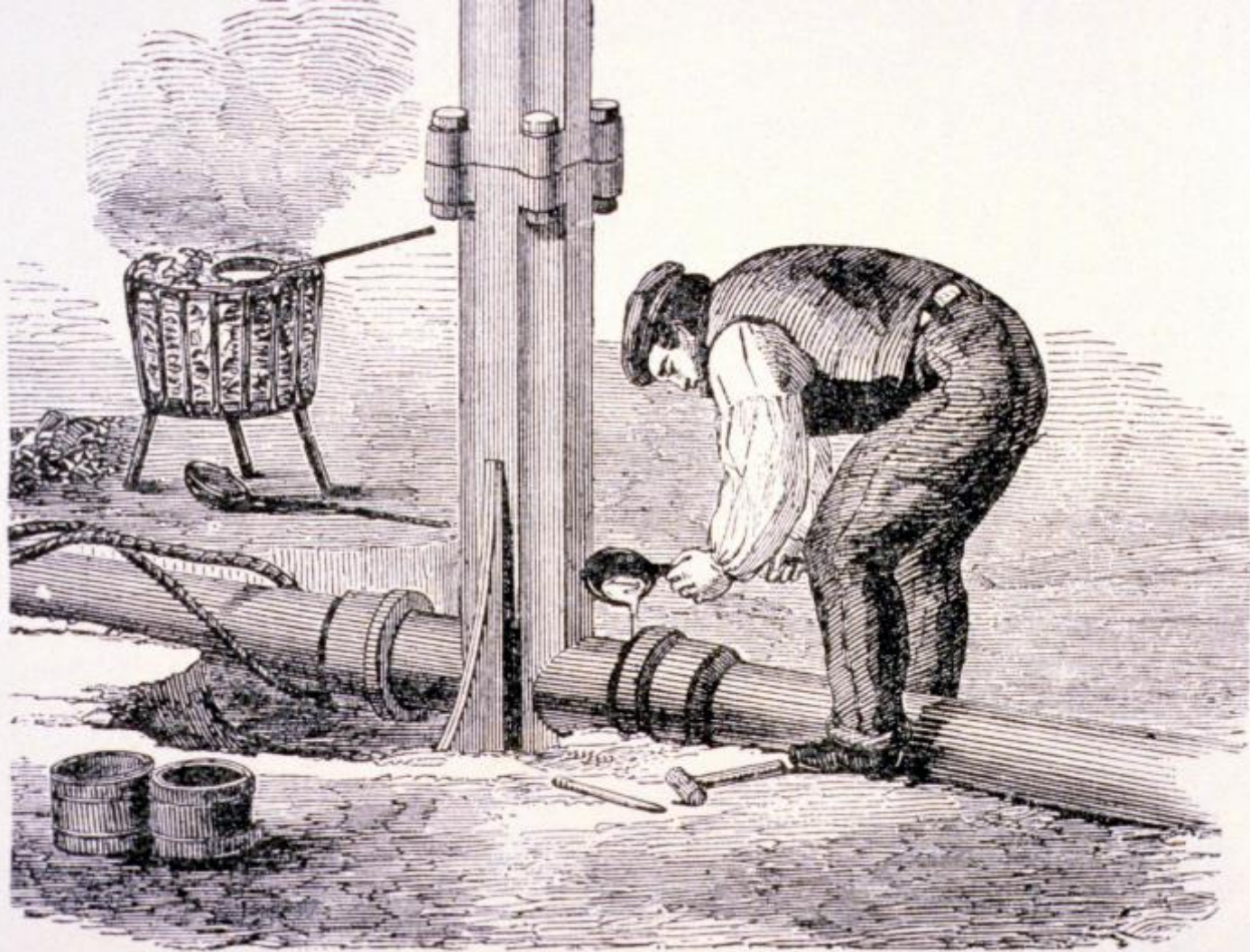
Reproduced by kind permission of Miss Violet Markham, C.H.

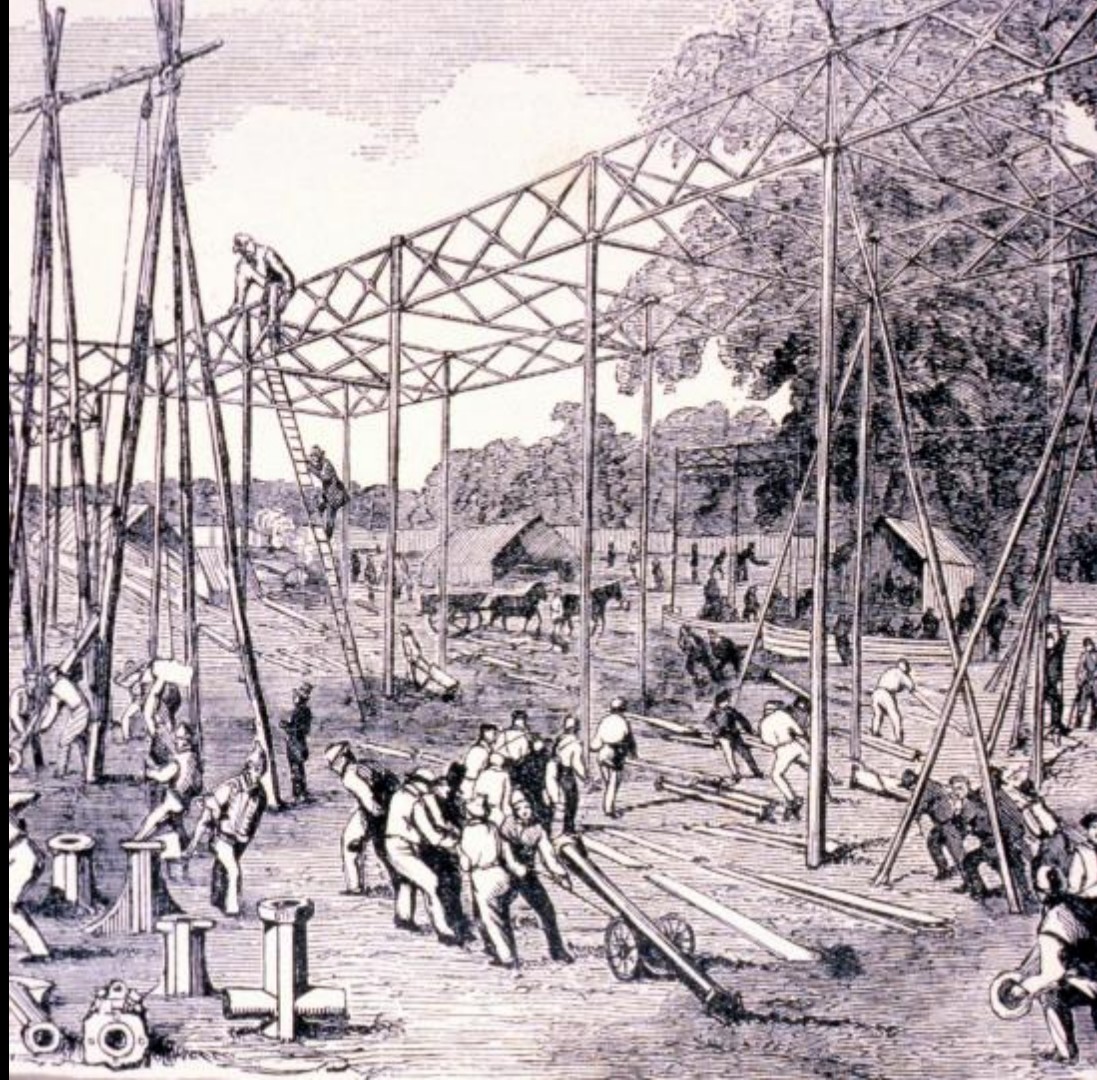


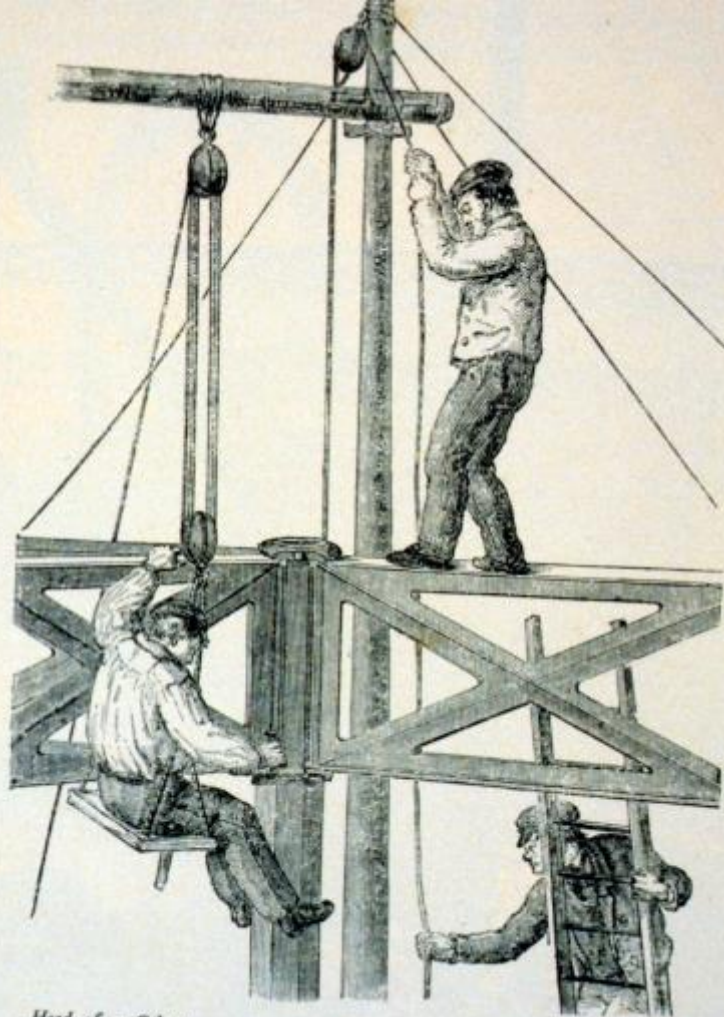
PLAN OF THE BUILDING IN HYDE PARK
FOR THE EXHIBITION OF 1851.



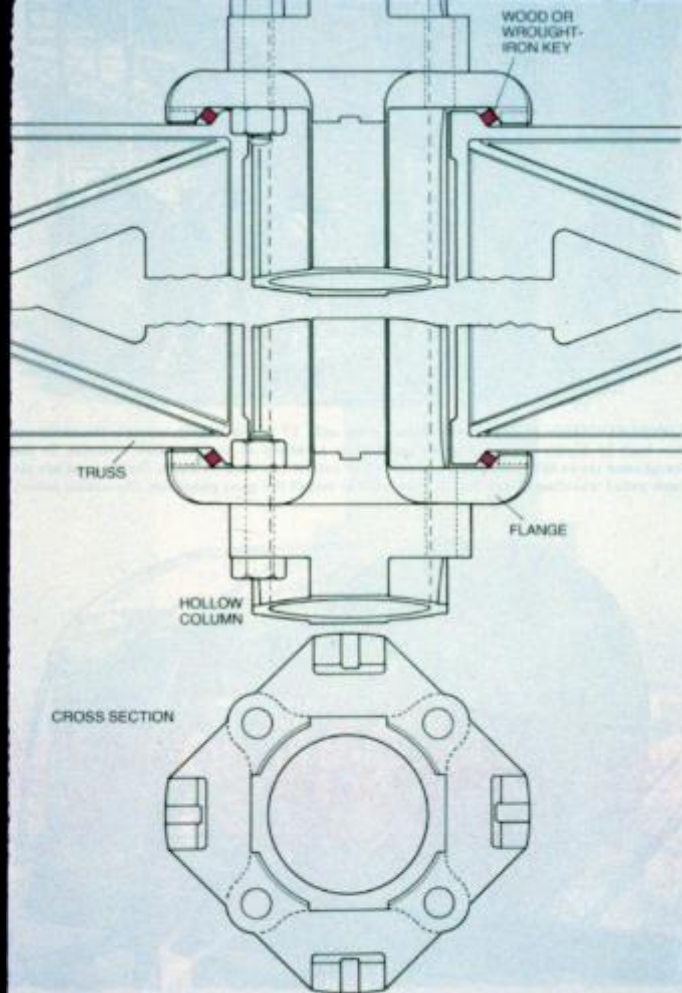
Note. Illustrations in this chapter are reproduced by the kind permission of the "Illustrated London News."





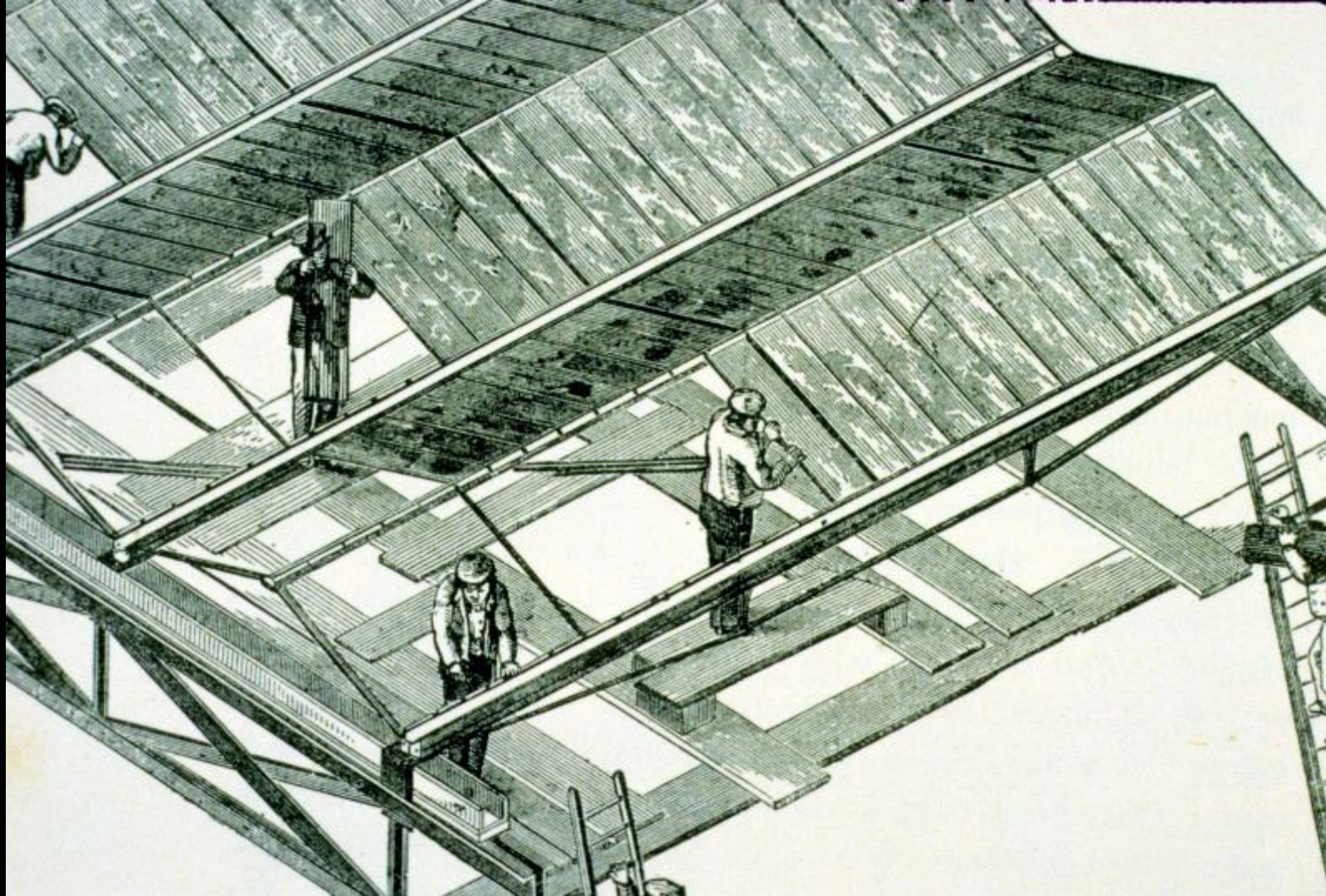


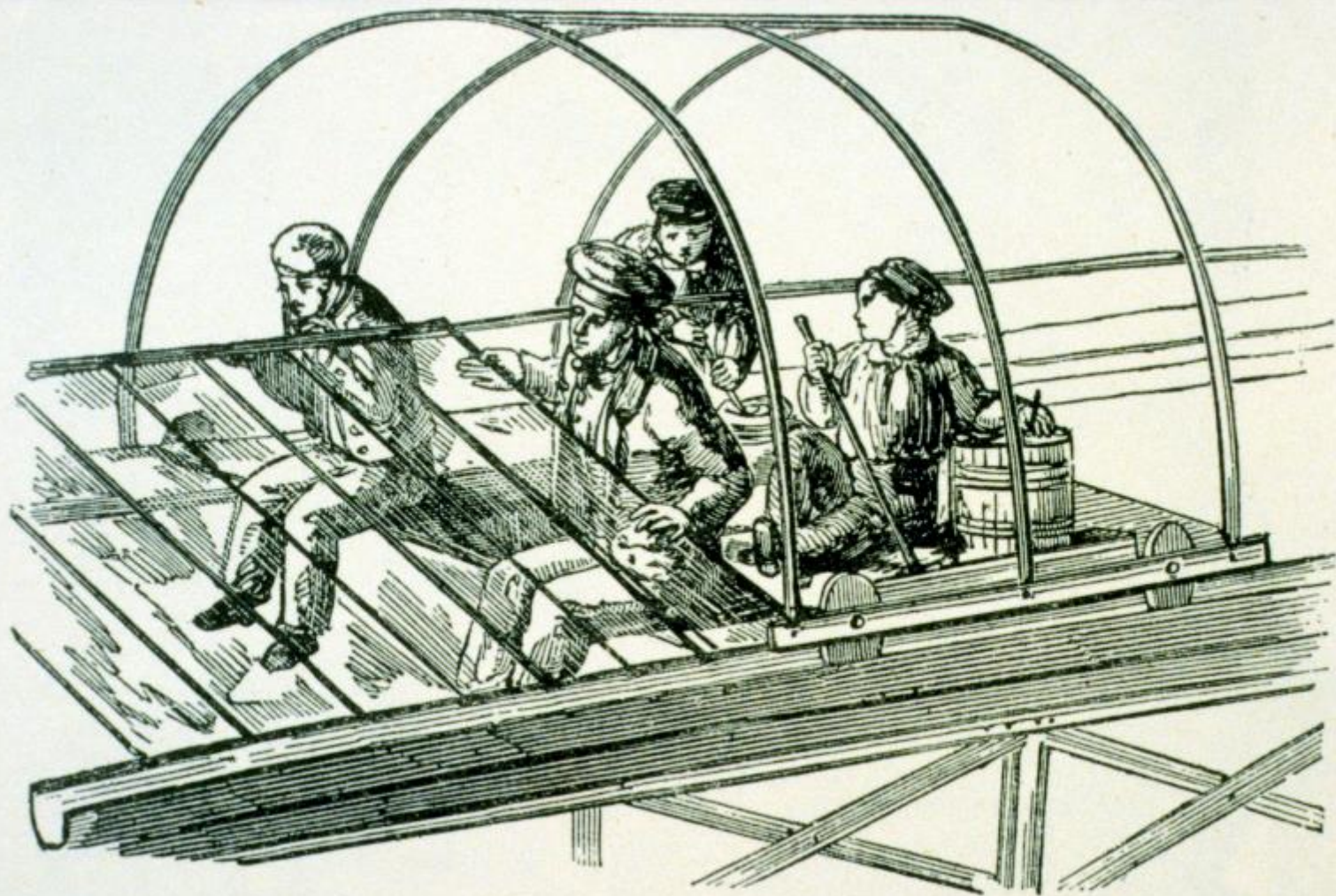
Head of a Column.



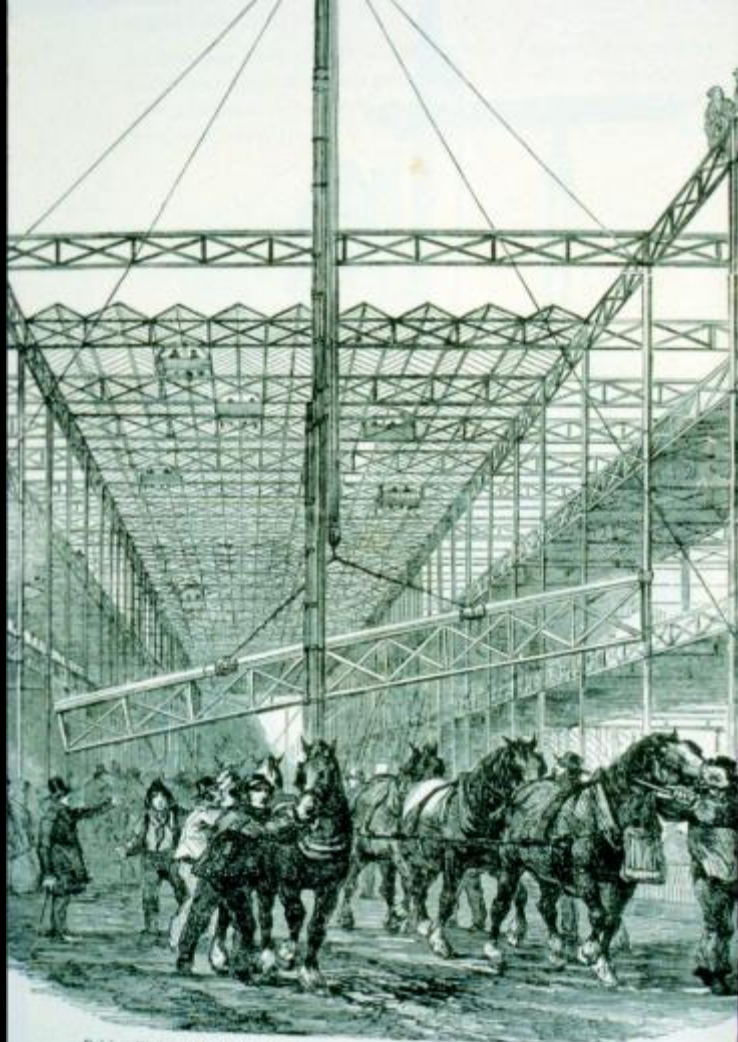
CAST-IRON CONNECTING PIECES attached trusses (see bottom illustration on opposite page) to columns. Joints were designed for rapid construction. Flared ends of trusses fitted into flanges and were held in place by wrought-iron or wood keys, which could be driven in quickly.



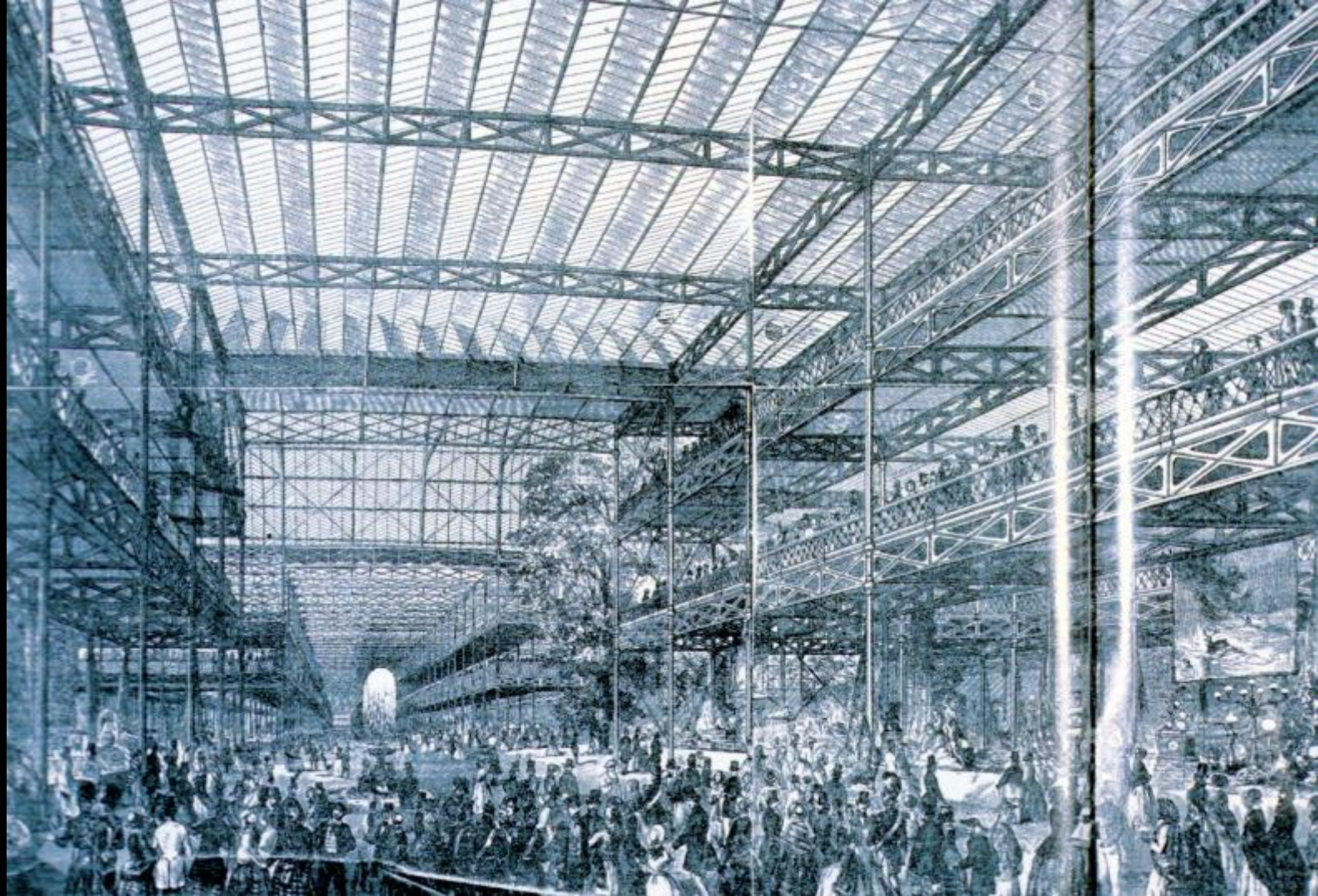




Glazing Waggon.

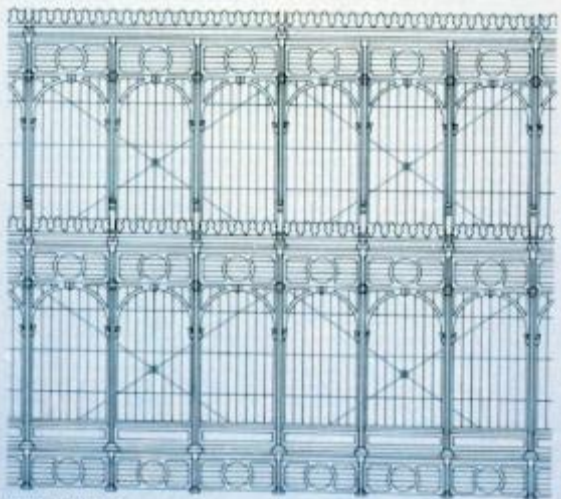


Raising Girders of the Central Aisle.

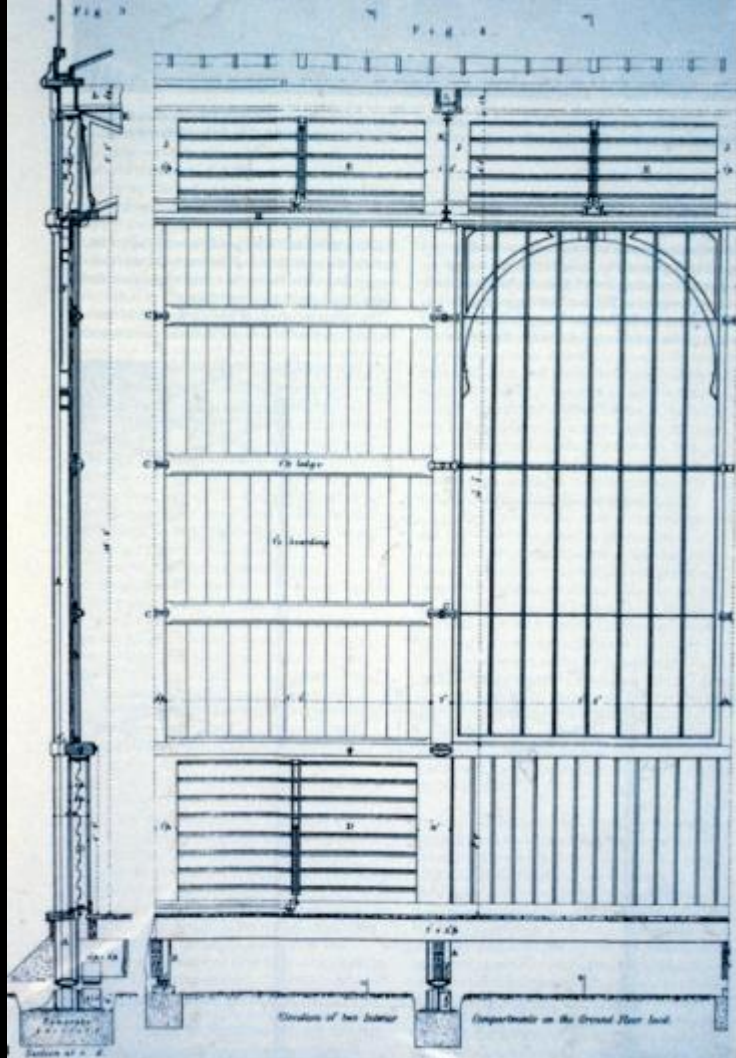


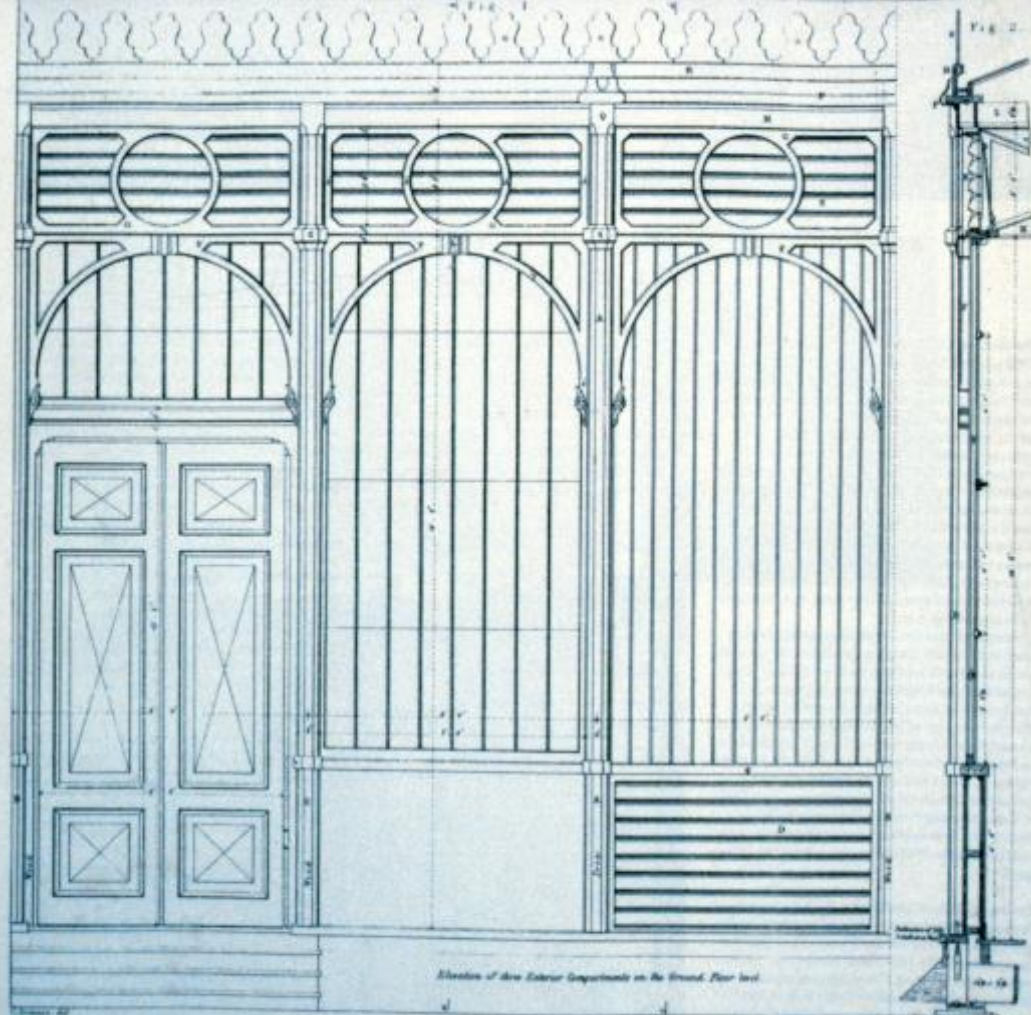


WROUGHT-IRON RODS provided a rigid support for the exterior walls of the Crystal Palace, which had no internal walls to stiffen it. Visible from inside and out (the interior view is shown here), these cross braces added to the building's strikingly contemporary appearance.

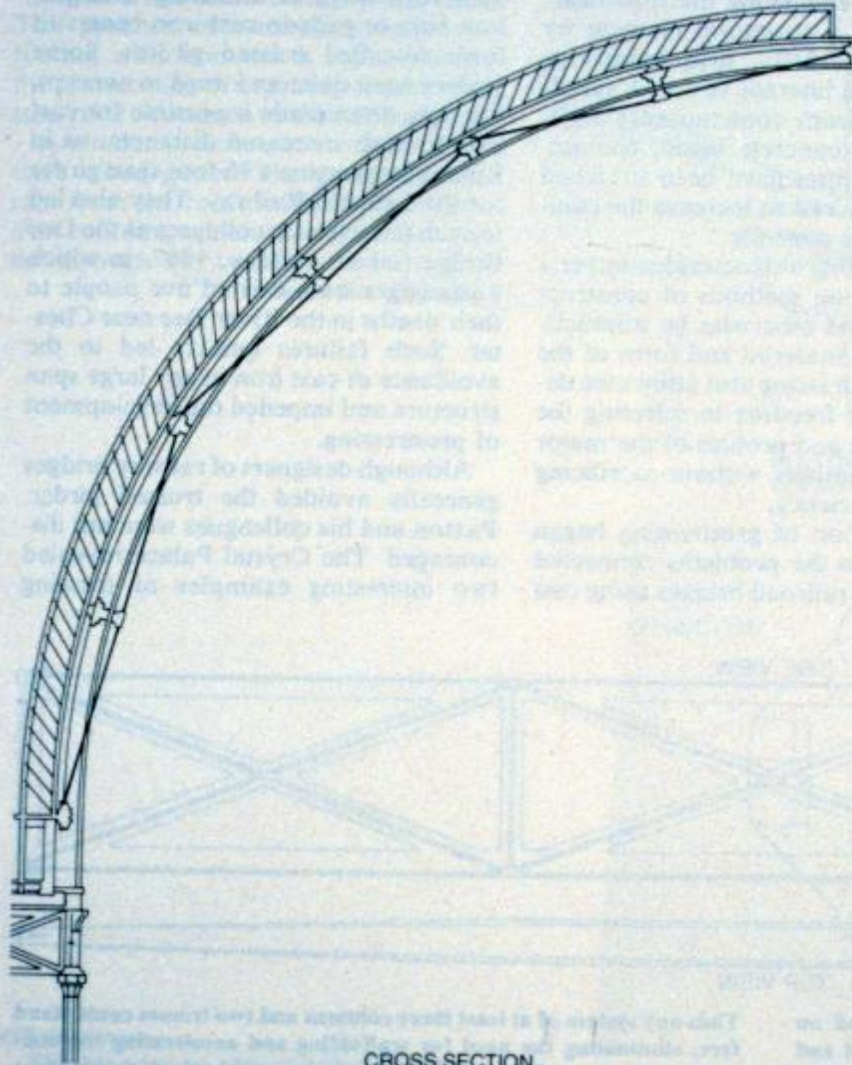


INTERIOR WALLS

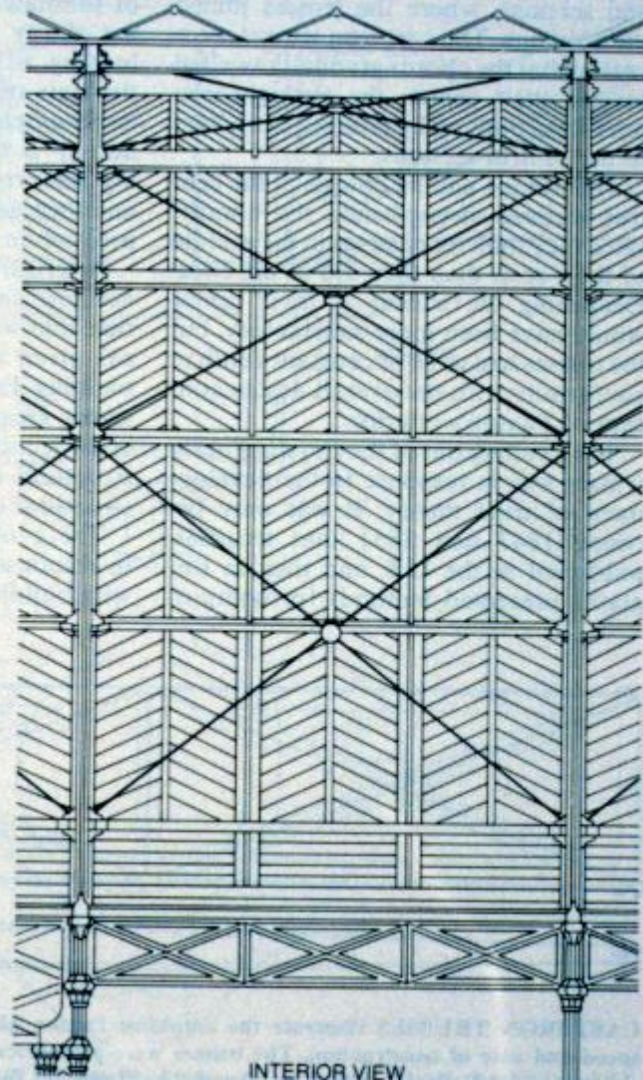




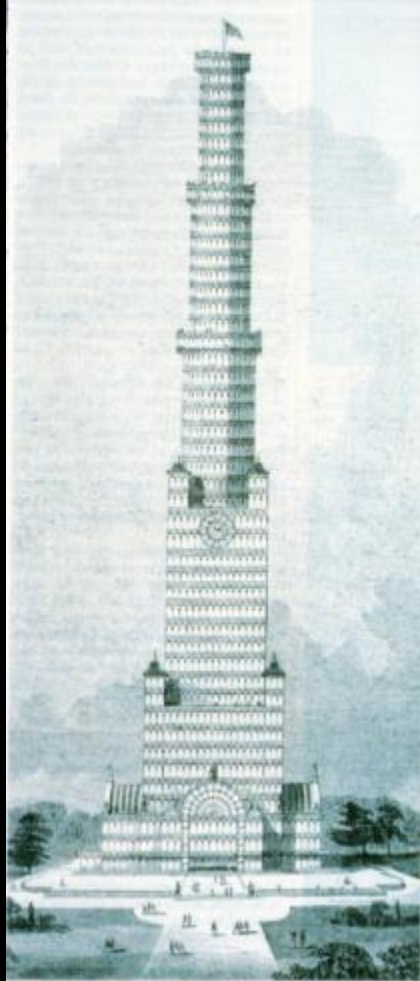
Elevation of three Exterior Compartments on the Ground Floor level



CROSS SECTION



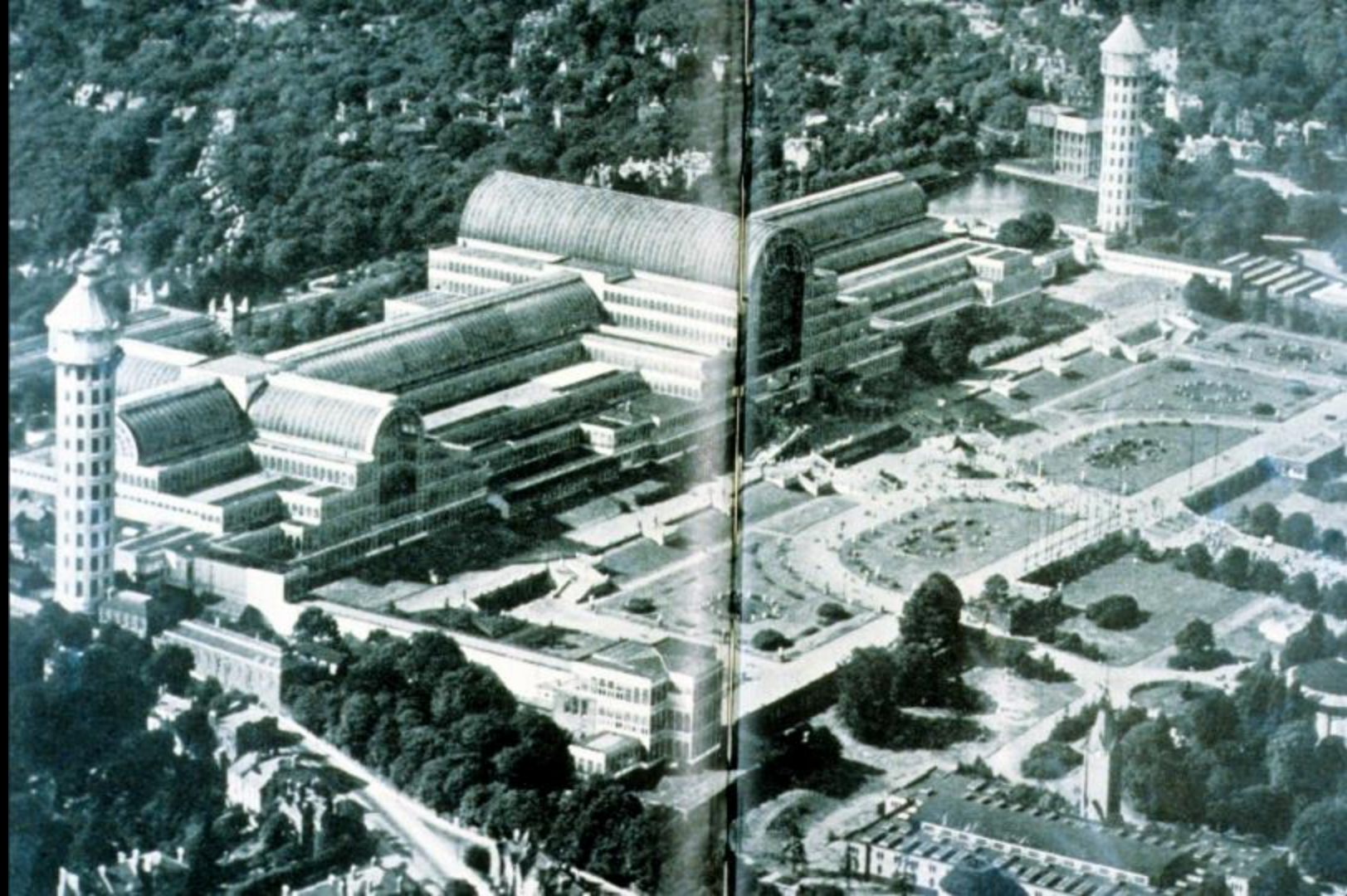
INTERIOR VIEW

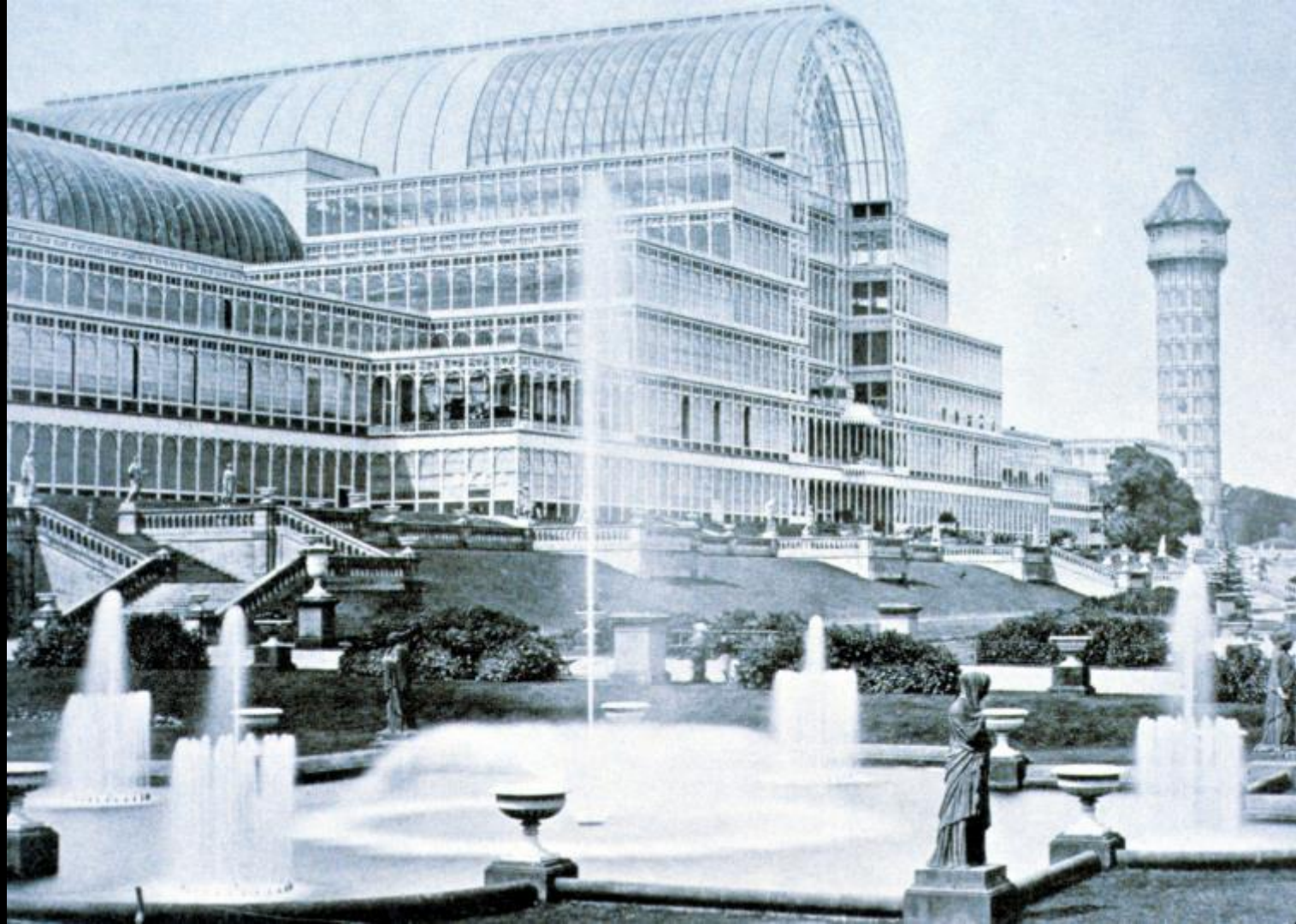


MODULAR CONSTRUCTION of the Crystal Palace prompted a contemporary of Paxton's to suggest that the modular units of the building be rearranged to form a 1,000-foot tower (left). A vertical



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



Designed by Eames about flexibility of frame, every area of rectangular blocks of pattern

The sparkling construction shown on these pages happens to be the place where one of America's foremost young designers and his wife are living the close 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?

LOCATIONS: Santa Monica, Calif.
CHARLES EAMES, Designer
RAYMORT, CAROL SHERIDAN, INC., General Contractor



The sixty living room (toppled) faces north-west. Eames-designed upholstery at left is useful in opening a terrace and, standing up, to define public domain.

Part of main level and of 2nd floor (left) is made without 1/2" x 2" retaining wall. Later in 2003, time, reserved for late visit to building history.

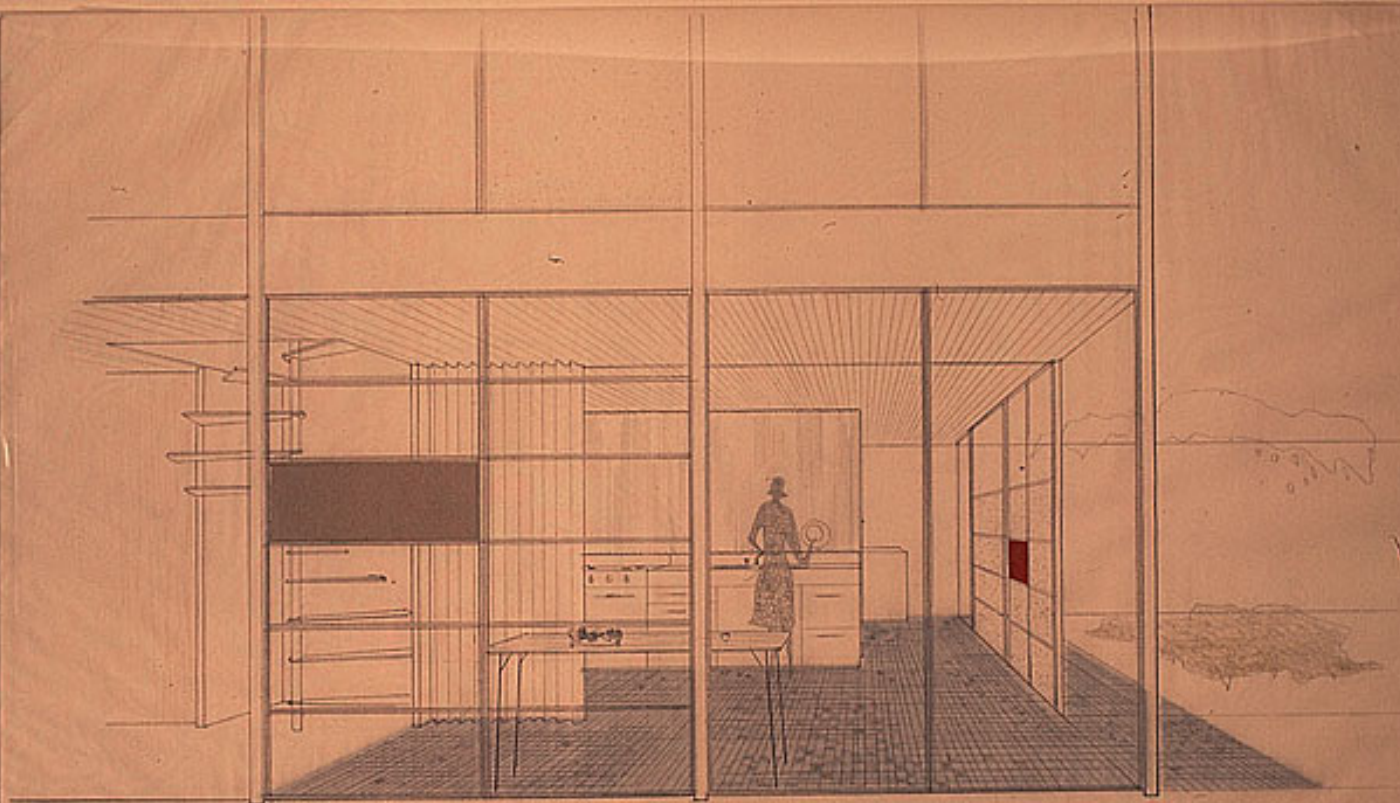
Designed and built by the Eames Office. House picture of the magazine "The Art of Architecture". Photo by 1959 (Copyright by G. J. Jones, Berkeley)



Case Study House No. 9
Charles and Ray Eames



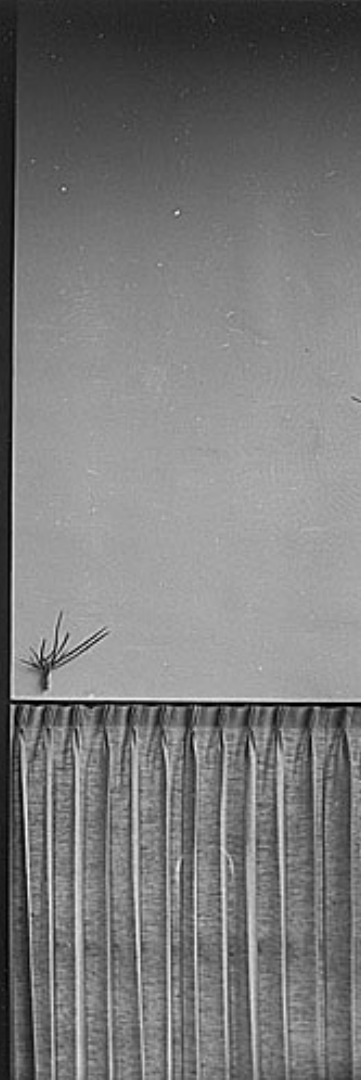
Bottom Paso 9




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
EXTERIOR.











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 GEFÜHRTE
HIMMEL
GETEILTE
HIMMEL

IM
WEISSEN







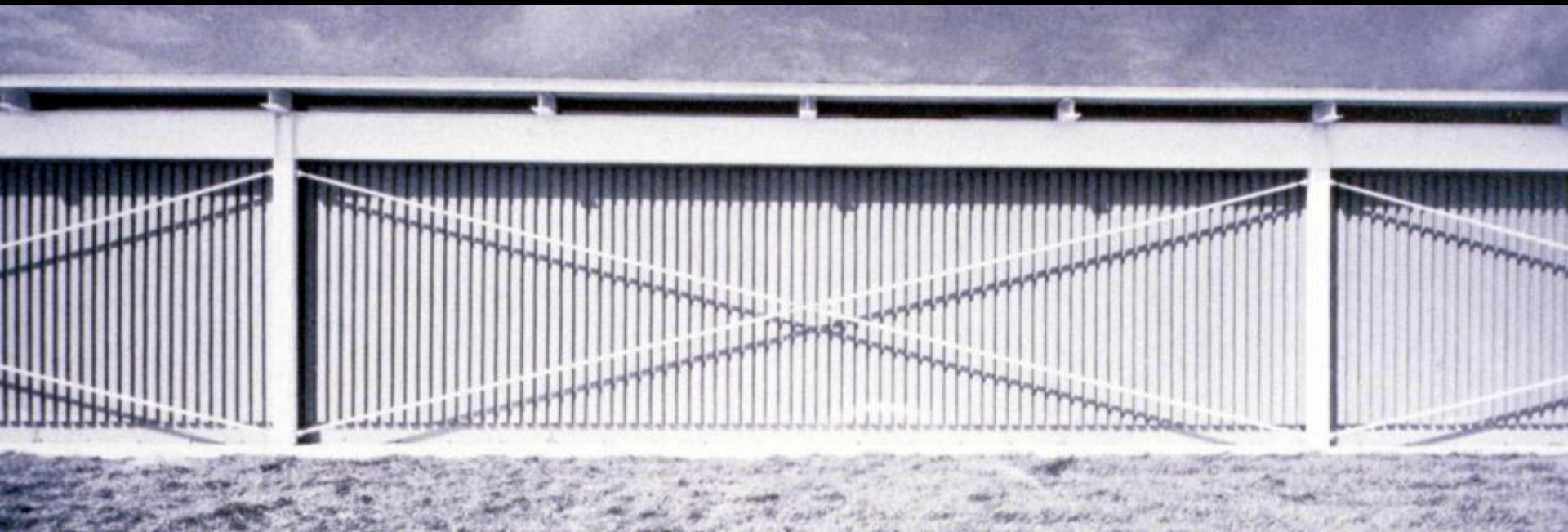








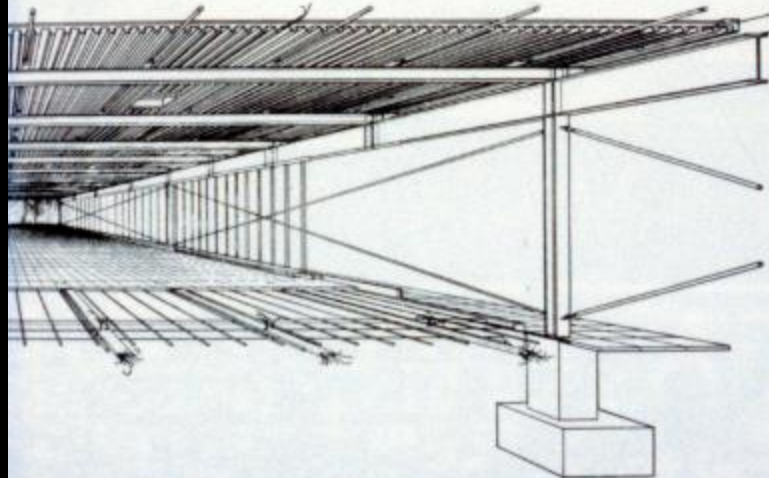
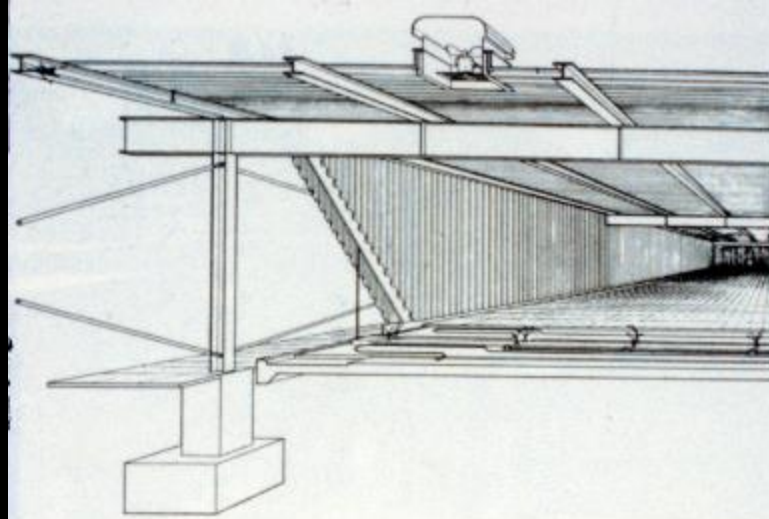
The High-Tech Movement



Reliance Controls Factory
Swindon, England
1966

Team 4 (Richard and Sue Rogers, Norman and Wendy Foster)

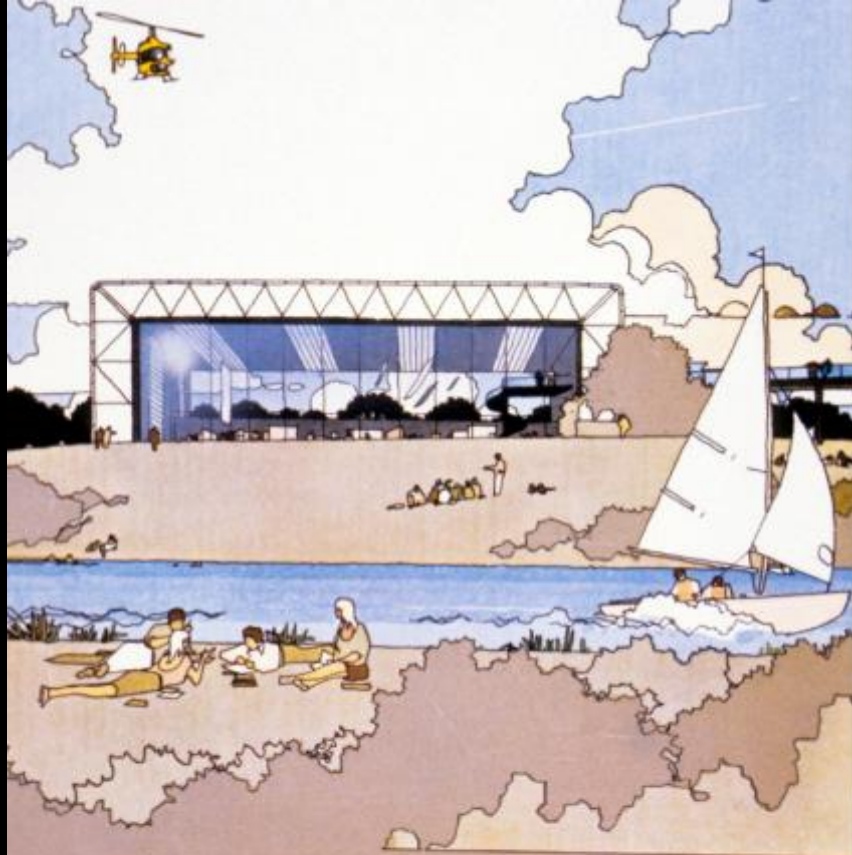
Historian Reyner
Banham called these
buildings "serviced
sheds"



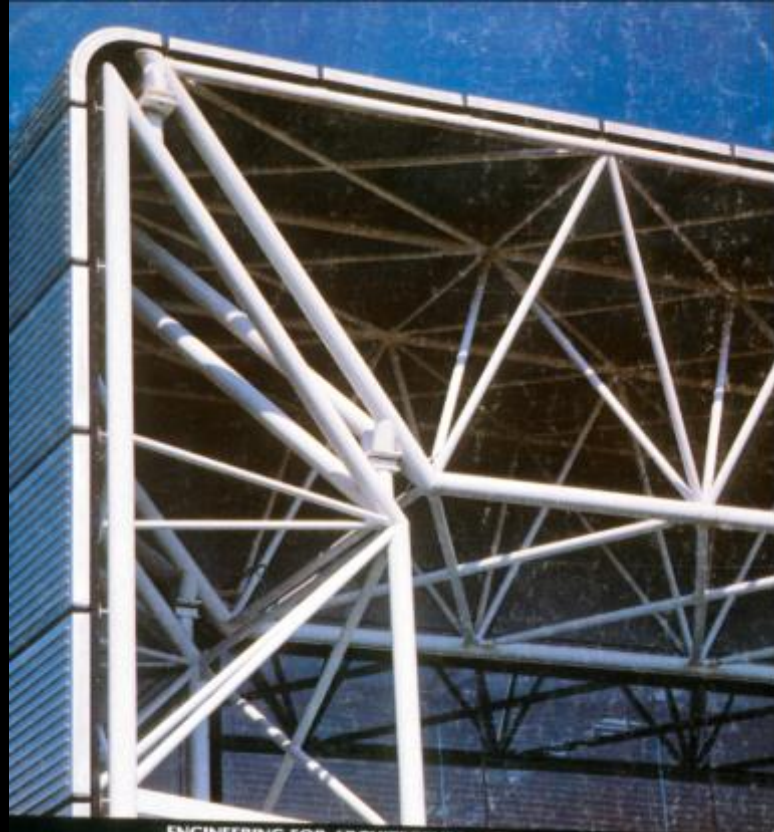
2 Team 4, Reliance Controls Factory, Swindon, 1966



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

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THE BUILDING AS SERVICING MECHANISM (TECHNOLOGY)



Given the progressive highly serviced and technological 'Sheddy' that has tended to be associated with Foster Associates' buildings in the past, the Laboratory Centre can either be seen as a special case (as a laboratory case building) or alternatively making a change in emphasis of Foster's use of advanced technology. The diagrammatic concept shows around a concrete to exploit the 2.1m deep, spectacula, 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 deleted).

This case - that on one side with the glazed, solid (insulating) or louvre cladding system, and on the other, internally, with adjustable perforated aluminium louvres - is able to dynamically manage the environmental conditions within the building, by filtering or generating light, introducing and extracting air, and alternatively buffering or absorbing sound. It houses service rooms at ground level and provides outside access across the roof to the lighting system and roof panels. Rather than the commonplace of decentralised servicing of Wills Faber, which is displayed as part of the building yet justified by its efficiency, the servicing of the Laboratory Centre, decentralised in a similar manner, is deliberately low key - optimised by the established network service lines in the external elevation, internally the service entrances are similarly disguised as part of the overall consistent louvre interval 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 recently favoured architects in the 20th century. The Centre's visible response to the changing external environment brings the building close to re-asserting the Constructivist ideal of an objective architecture of technical function; bearing a striking, if pragmatic, similarity to Makiy Nagai's vision of a 'light architecture'.¹⁹

Foster's container for outdoor conditions its internal environmental discipline, as a 'sensitively controlled box' - its camera and security system revealed into perforated walls. This stress on security, it could be argued, has had a not insignificant influence both on the siting and organisation of the building (the security system extends into the university grounds). The 'living' area for the collection site atop a concrete retained, excavated basement, whose presence speaks of the immense facility of the infrastructure. Foster, talking of his visit to Louisiana museum outside Copenhagen (with the Laboratory 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 flat place - when you was also very exciting were the displays, which were not over-prominent, were really enjoyed...'.²⁰ While enjoying the relaxed atmosphere, he deplores the lack of attention to servicing and security:

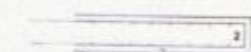
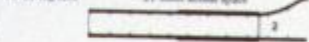
... their negative facilities - it was almost none, you really felt that with a screw driver you could have opened the whole place up and taken whatever was in storage away... if they had a Japanese exhibition which was due to come that week, and they were in a terrible state, they were going to have a container truck outside in the street and they were wondering how to get security between the street and this particular display how in such a way they can move their position across from the container into the building itself!²¹

The Laboratory Centre solves the dilemma by taking underground its service entrance for moving

ing is sensed rather than visible - magically responding to changing light levels

Key to plans and sections

- 1 Access road
- 2 Ramp
- 3 Loading bay
- 4 High level walkway
- 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 Service common study room
- 16 Study area
- 17 WC's
- 18 Plant
- 19 Storage
- 20 Workshop
- 21 Roof access space

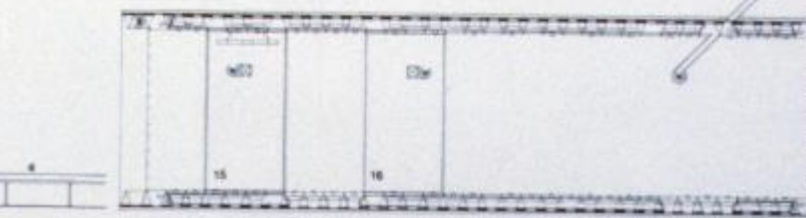
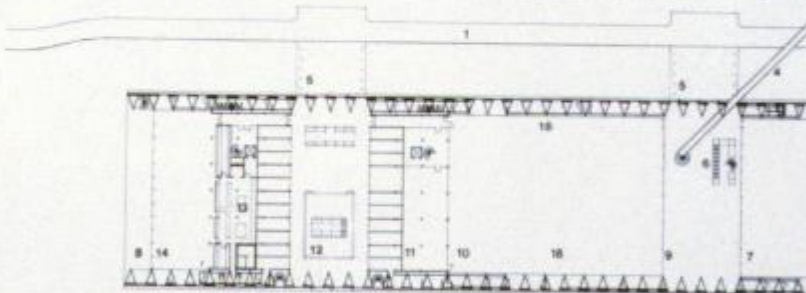
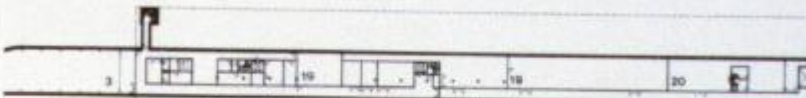
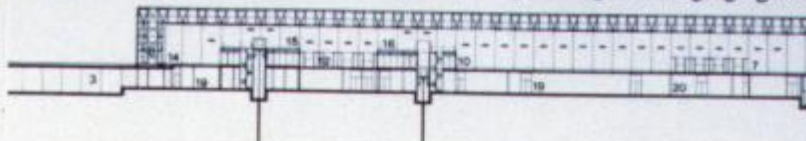
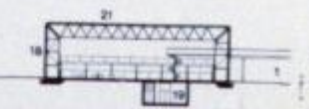


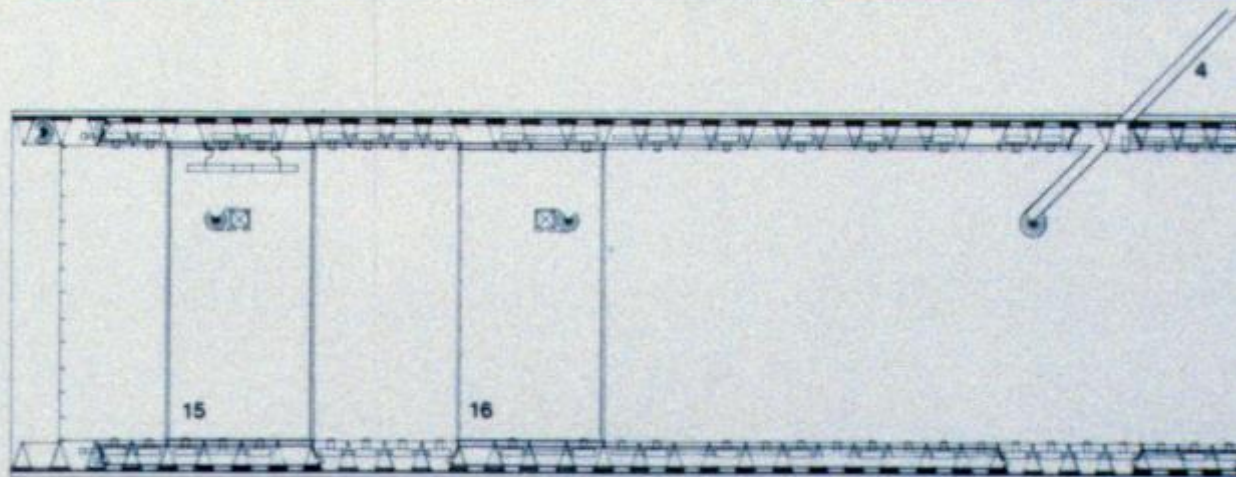
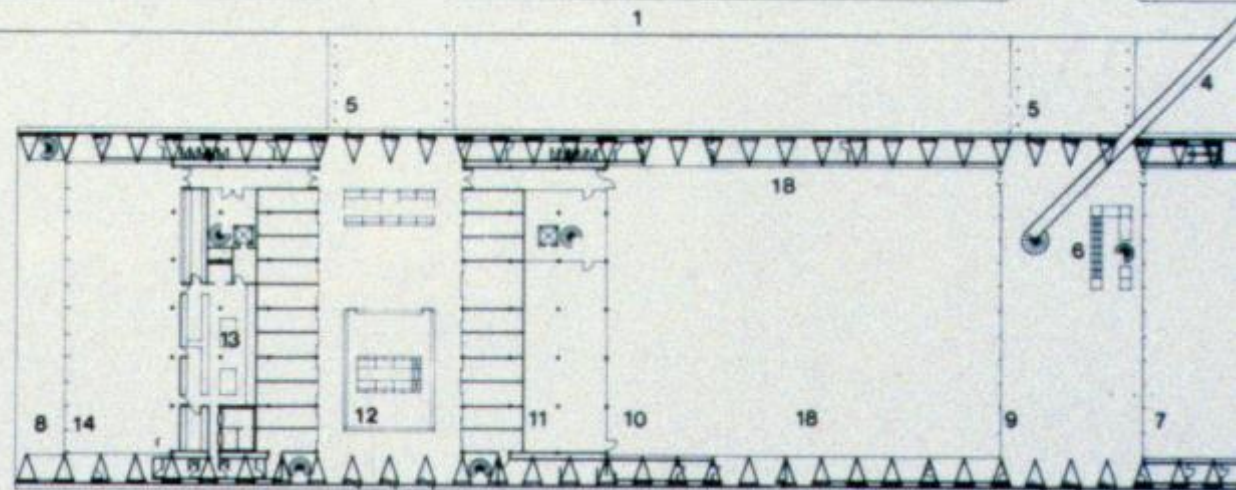
Dimensions

| | |
|-----------------|--------|
| External length | 121.4m |
| Internal length | 122.4m |
| External width | 35.6m |
| Internal width | 29.0m |
| External height | 10.2m |
| Internal height | 7.2m |

| | |
|----------------------|----------------------|
| Ground floor area | 3550.0m ² |
| Mezzanine floor area | 830.0m ² |
| Basement floor area | 1064.0m ² |
| Service core area | 735.0m ² |

| | |
|------------|----------------------|
| Total area | 6186.0m ² |
|------------|----------------------|



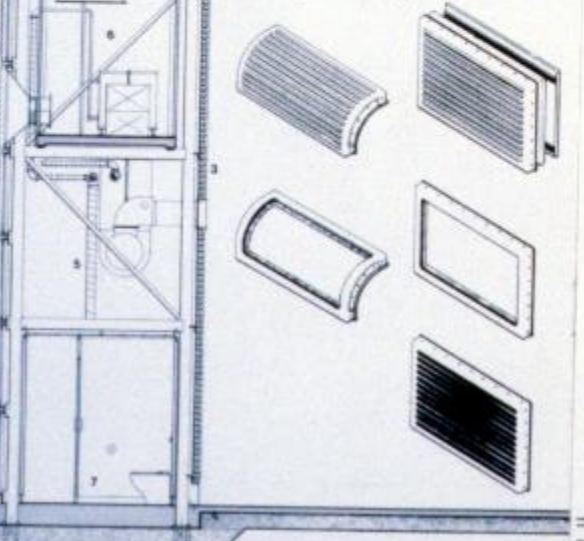
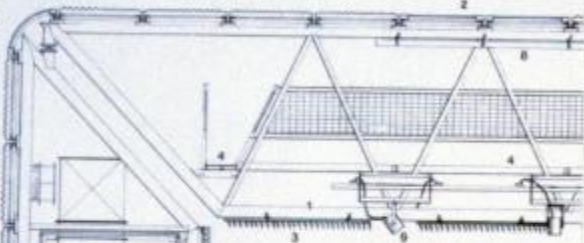
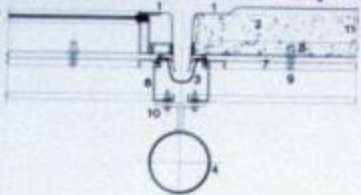


strained by an insistence on strictly hidden services in the spirit of a living room environment rather than a climate controlled vault for works of art

...ing exhibitions and deliveries. From the end a special extension is cut into the ground away from the building, and ramped down to the basement. Lined with proper landing systems, does have many of the characteristics of a modern building - indeed with £3 million this is not strictly a trivial comparison - built up against a half-level landing deck only in front of the works down. Behind, the basement, suitable, capable of being cut off by a wall along its length, provides access to the works of art, to a hydraulic lift at the end of the building (concealed as part of the temporary exhibition space). The basement is linked to the world above by transport lifts and linked to the street. However it functions quite as a security device ensuring the safe storage of valuable works of art - it is not intended for long-term storage, as the items are to be shown in the exhibition area are kept in the main exhibition area in the building. The main exhibition area is kept as a museum gallery in the adjacent study, which is only a security screen, perhaps a screen of the security camera in the 'living room' area. The domestic part of this space is highly efficient physical organization and security that are linked into the building. The main entrance level the main service building is the restaurant kitchen located in the rear. It is the one major vertical span of the building, at the rear, with a view of the building. Efficiency is achieved in terms of its somewhat restricted and interconnected plan (compared with the apartment complex) provided on the roof of Faber is apparently constrained by an entrance location serving the building as a whole, however, the plan of a living room environment in a climate controlled vault for works of art is substituted, and relies on the engineering of the ventilation system, the control of light angles, and the use of screens, reflective and highly insulated building materials.

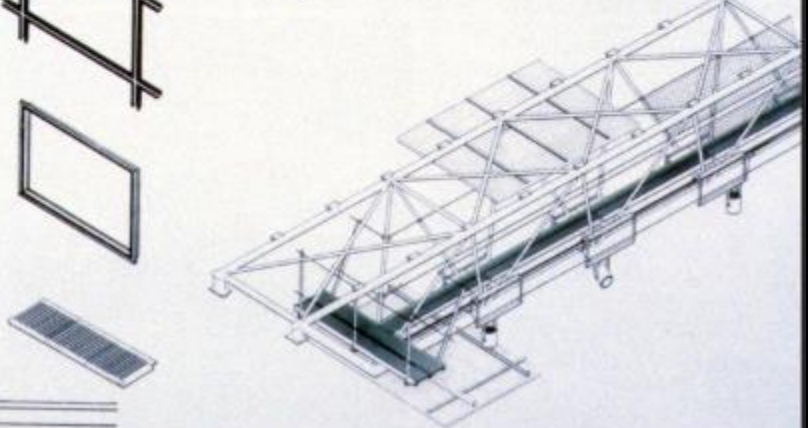
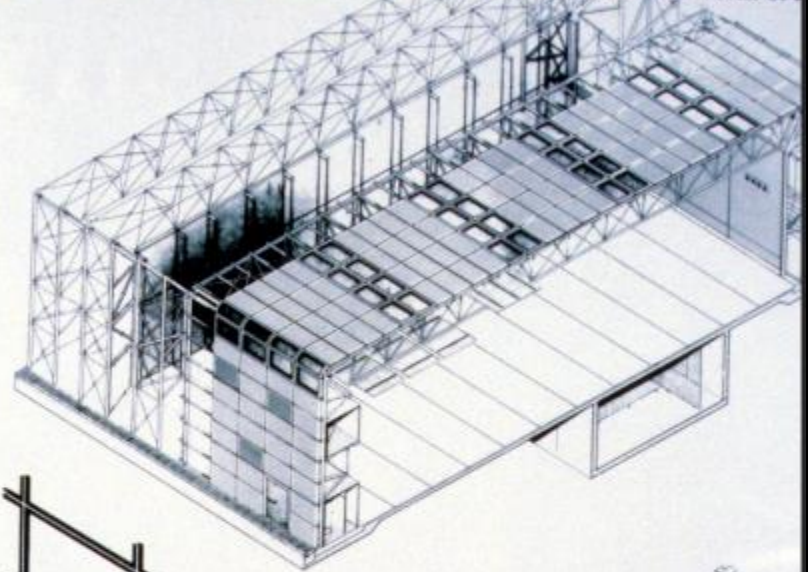
...a limitation of efficient and separate of deliveries and security, achieved by a technically rigorous land survey on environment, the location appears as a natural environmental modification of the space viewed through the glazed end of the main exhibition environment of the building. It is open to modification and change for the building, but the building has to take account of the organization and use of the building.

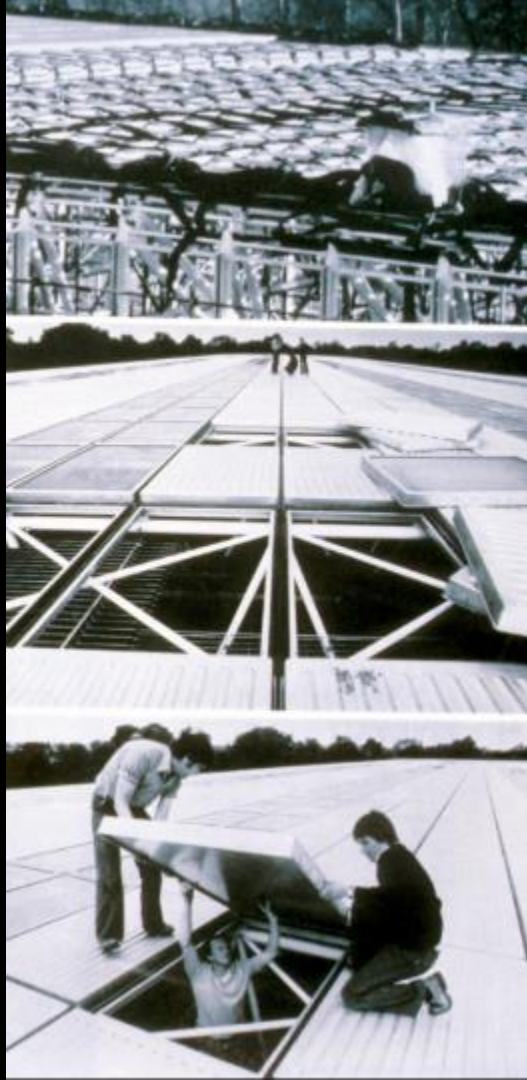
- Typical cladding panel key:
- 1 Aluminium outer skin
 - 2 Insulation foam
 - 3 Suspense ladder gasket
 - 4 Tubular steel frame
 - 5 Laminated glass
 - 6 Extruded extruded aluminium substrate
 - 7 Aluminium inner skin
 - 8 Nut and bolt fixing
 - 9 Stainless steel screws
 - 10 Stainless steel nuts and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



- 1 Floor
- 2 All services, plant, ductrooms, WC's, stairs, etc.
- 3 Solar controlled aluminium louvers
- 4 Combined artificial and natural top light
- 5 Cast aluminium grille
- 6 Gutter
- 7 Display screens
- 8 Display cases

ing room environment rather than a climate controlled vault for works of art





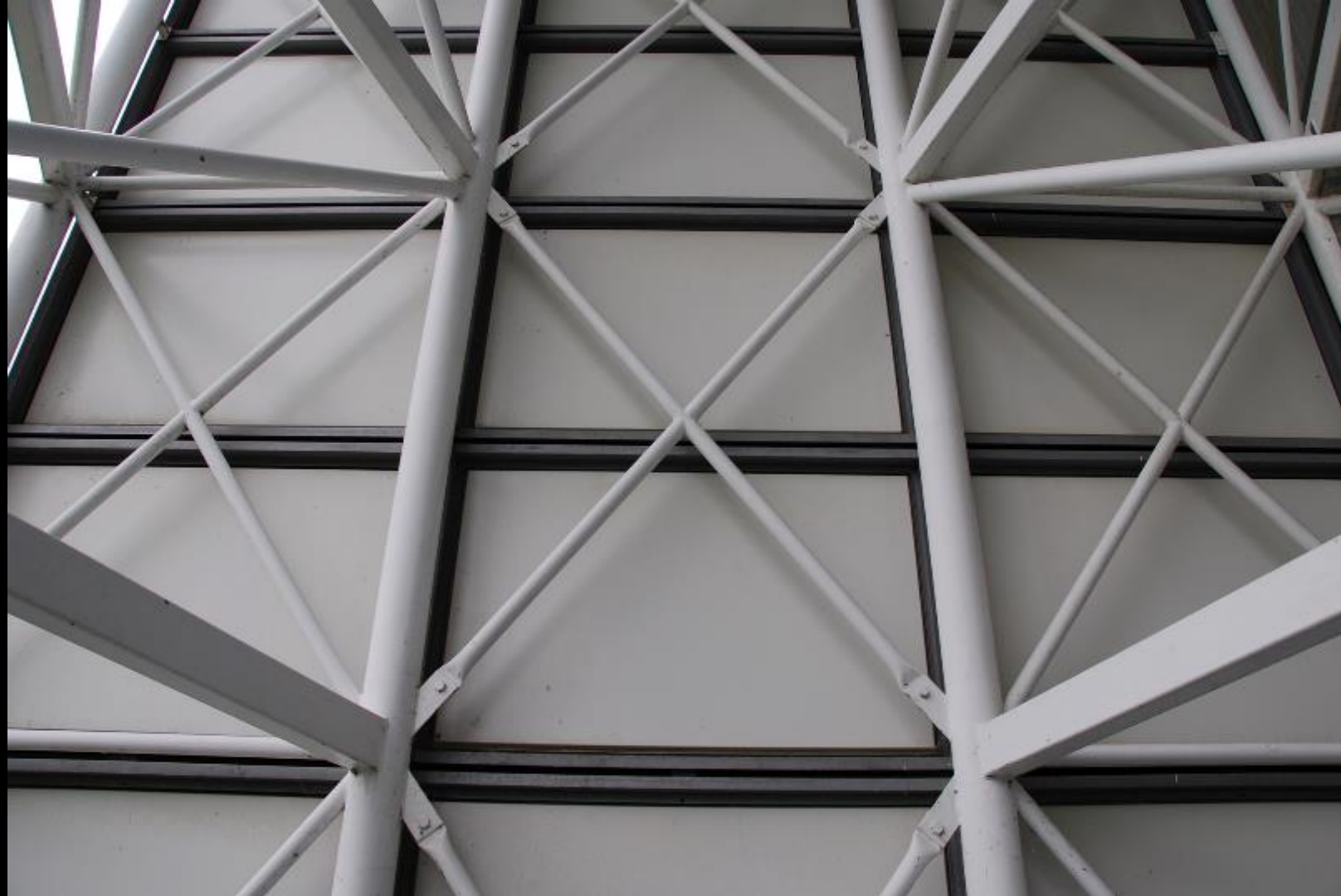


























Margaret Mellis
A Life in Colour

For more information continue downstairs →

Mapping Norfolk
The Art of Creation



Maret Mellis

in Colour

true downstairs →

ng Norfolk

g...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













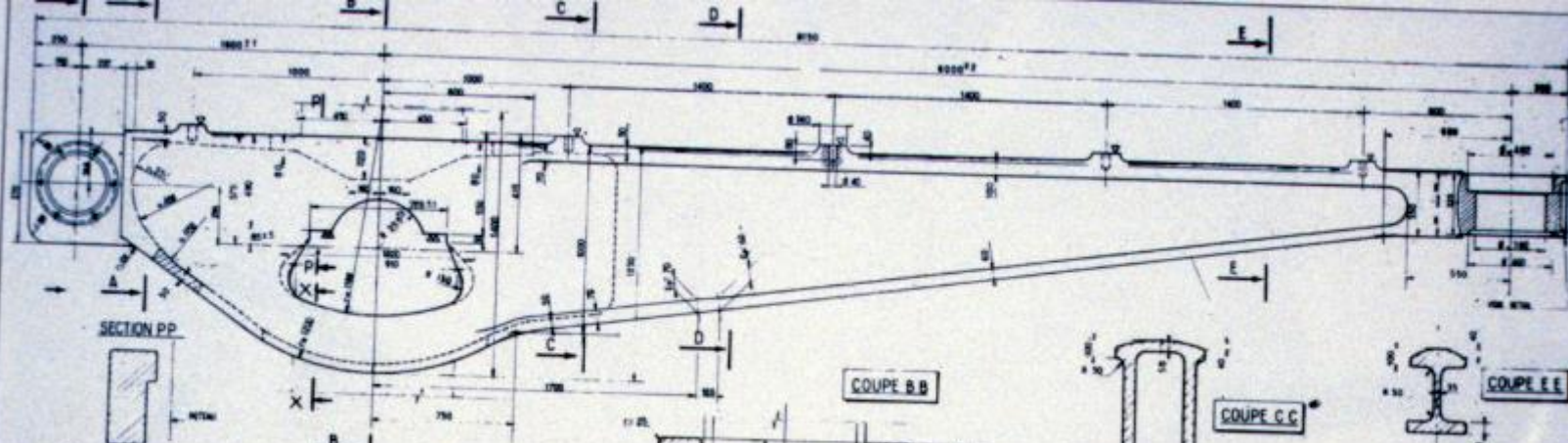












SECTION PP



NOTA

MATIERE
 AVOIR MODELÉ SUIVANT CARRES DES CHARGES
 LIMITE DE RUPTURE MIN. 32.500/CM²
 LIMITE ELASTIQUE MIN. 14.500/CM²

TOLERANCES
 SAUF INDICATION CONTRAIRE POUR
 LES DIMENSIONS LES TOLERANCES
 SERONT CONFORMES AUX NORMES
 ET A 30000 CLASSE A

LA TOLERANCE DE RECTITUDE DE L'AXE (DISTANCE A-D)
 SERA DE 0.10MM

REFERENCES PLANS N° 14.10.22
 TYPE A
 TYPE B

NOTA (suite)

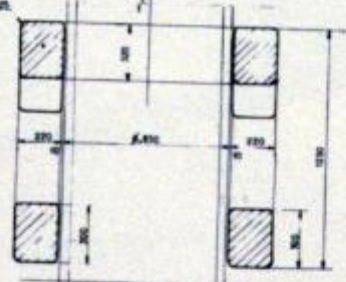
INDICATIONS D'USURE CONFORMES
 A LA NORME NF 104.01

APRES MISE EN PLACE DES APPUIS
 LES ESPACES LIBRES SERONT REMPLIS
 DE COUPELLE SERRÉE

COÛT APPROXIMATIF : 6.5 TONNES

Centre des Moteurs S. G. B.
Technique Industrielle Moteurs

COUPE B.B



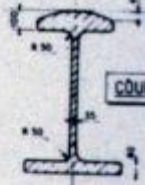
COUPE C.C



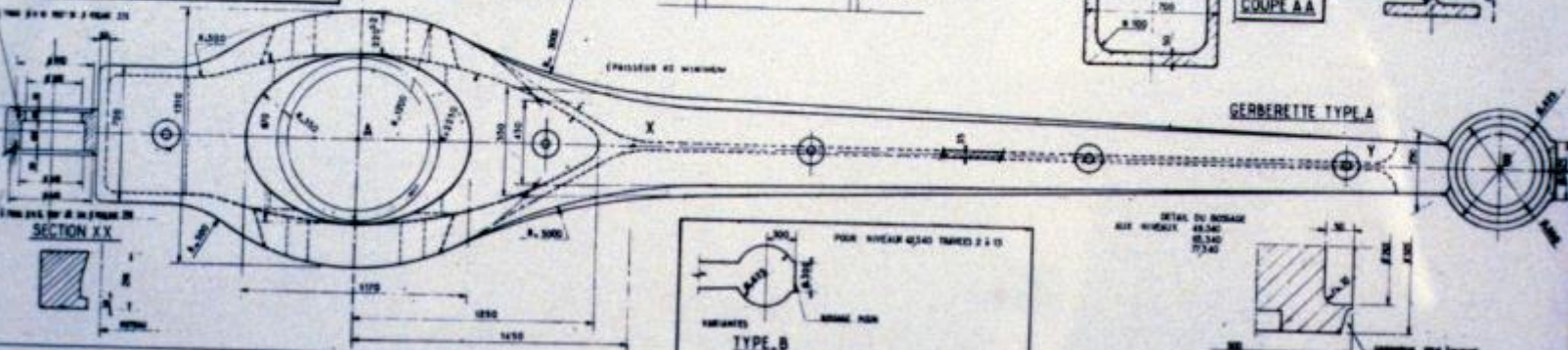
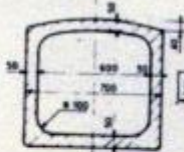
COUPE E.E



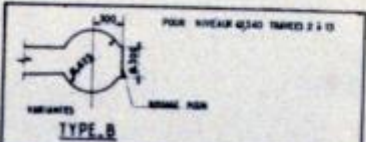
COUPE D.D



COUPE A.A



SECTION X.X

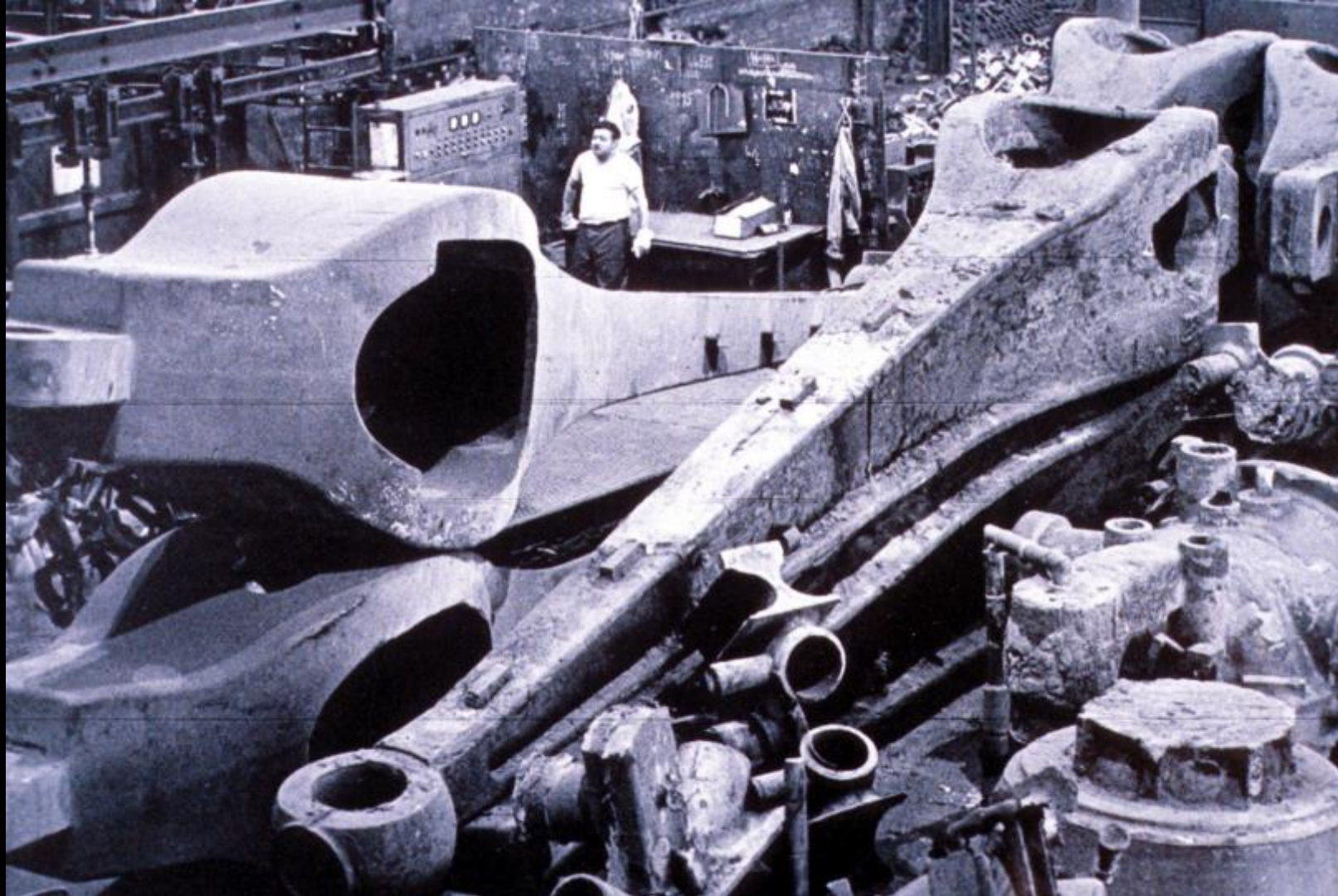


TYPE B

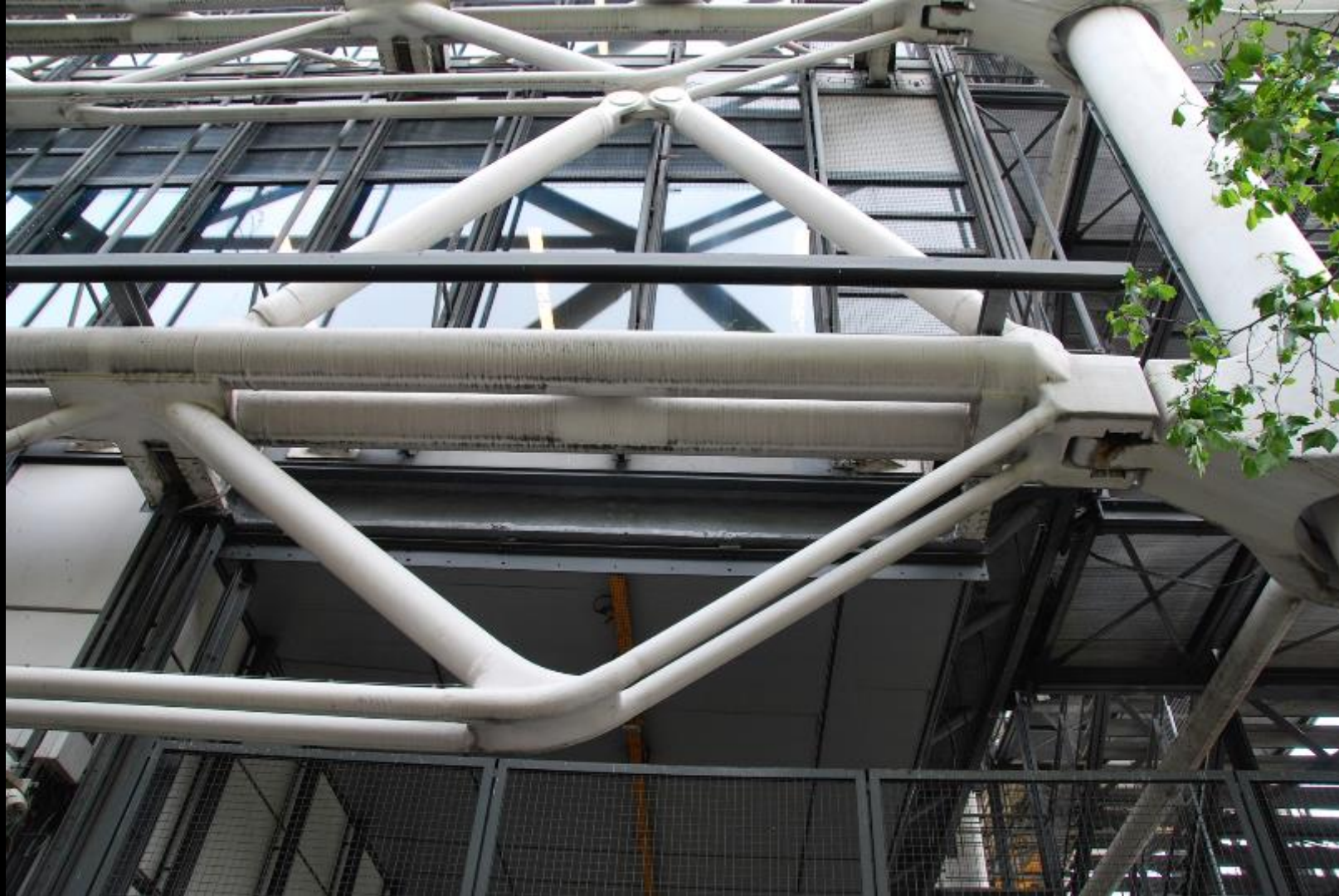
GERBERETTE TYPE A

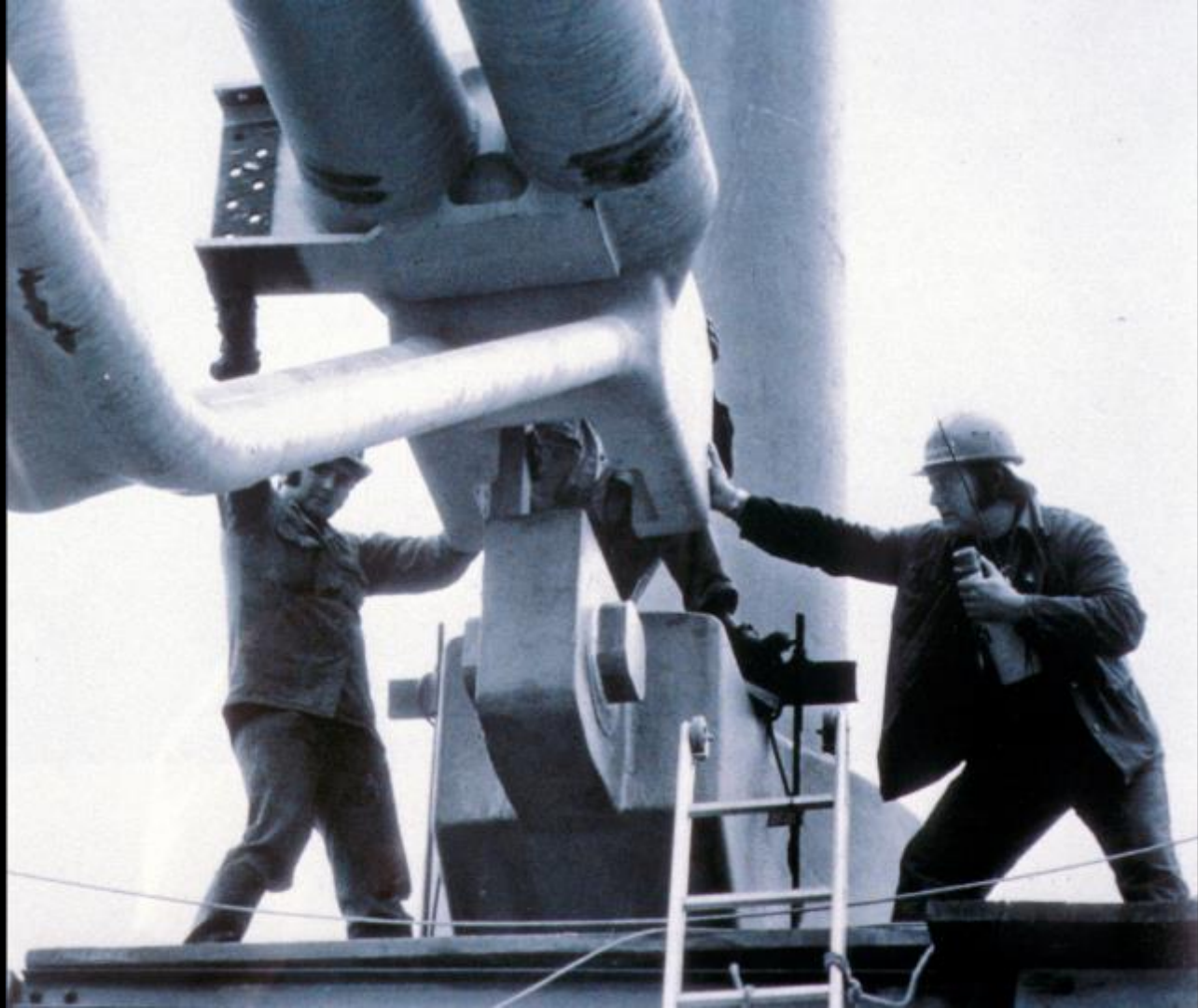
DETAIL DU BORDAGE
 AUX NIVEAUX 10.340
 10.340
 10.340

















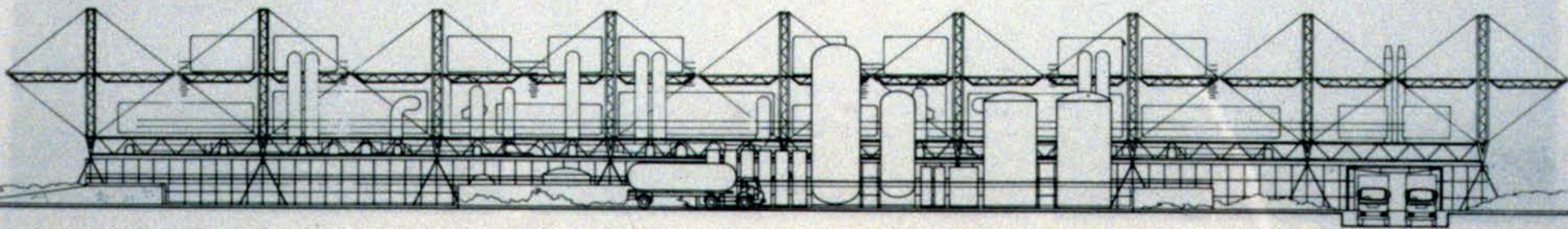
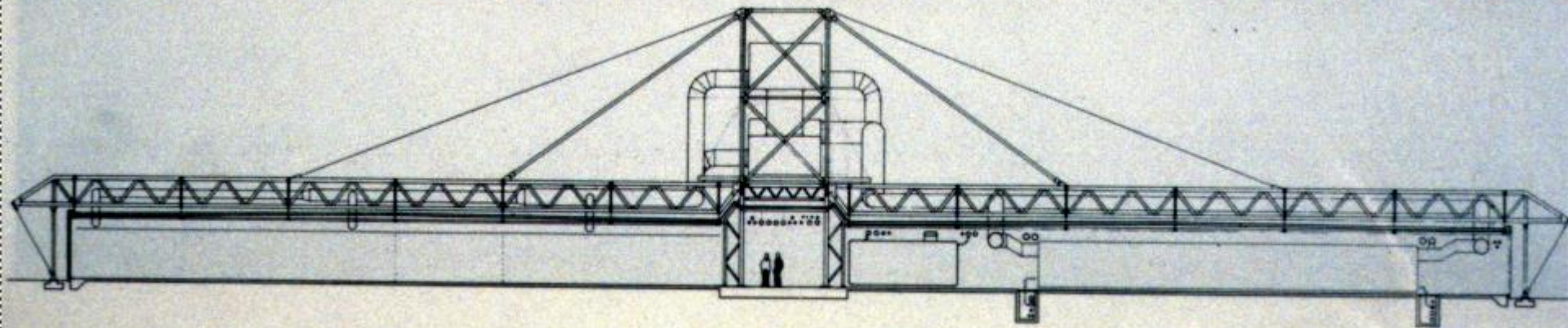


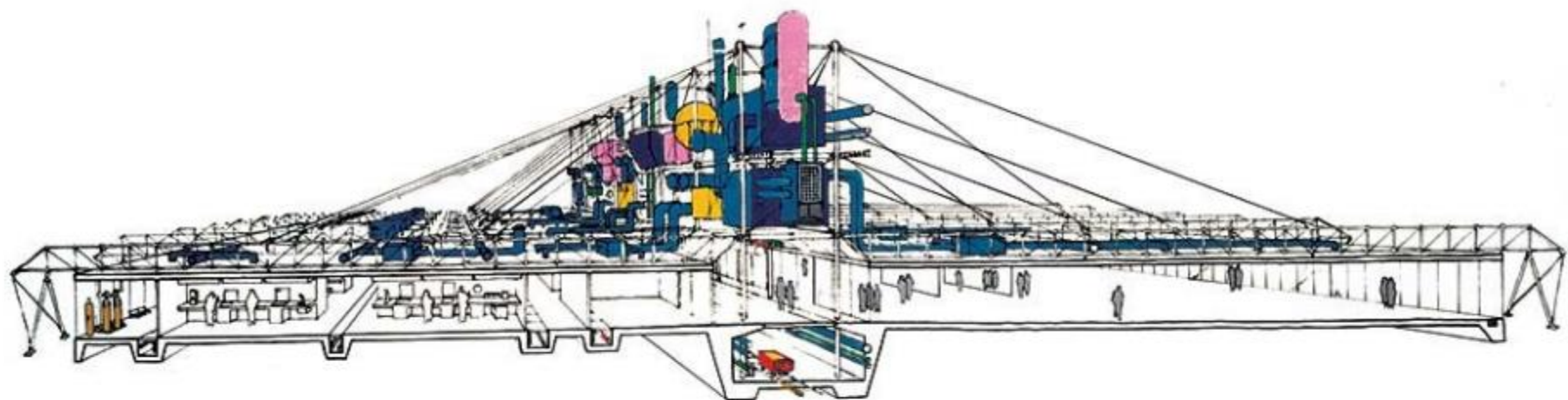


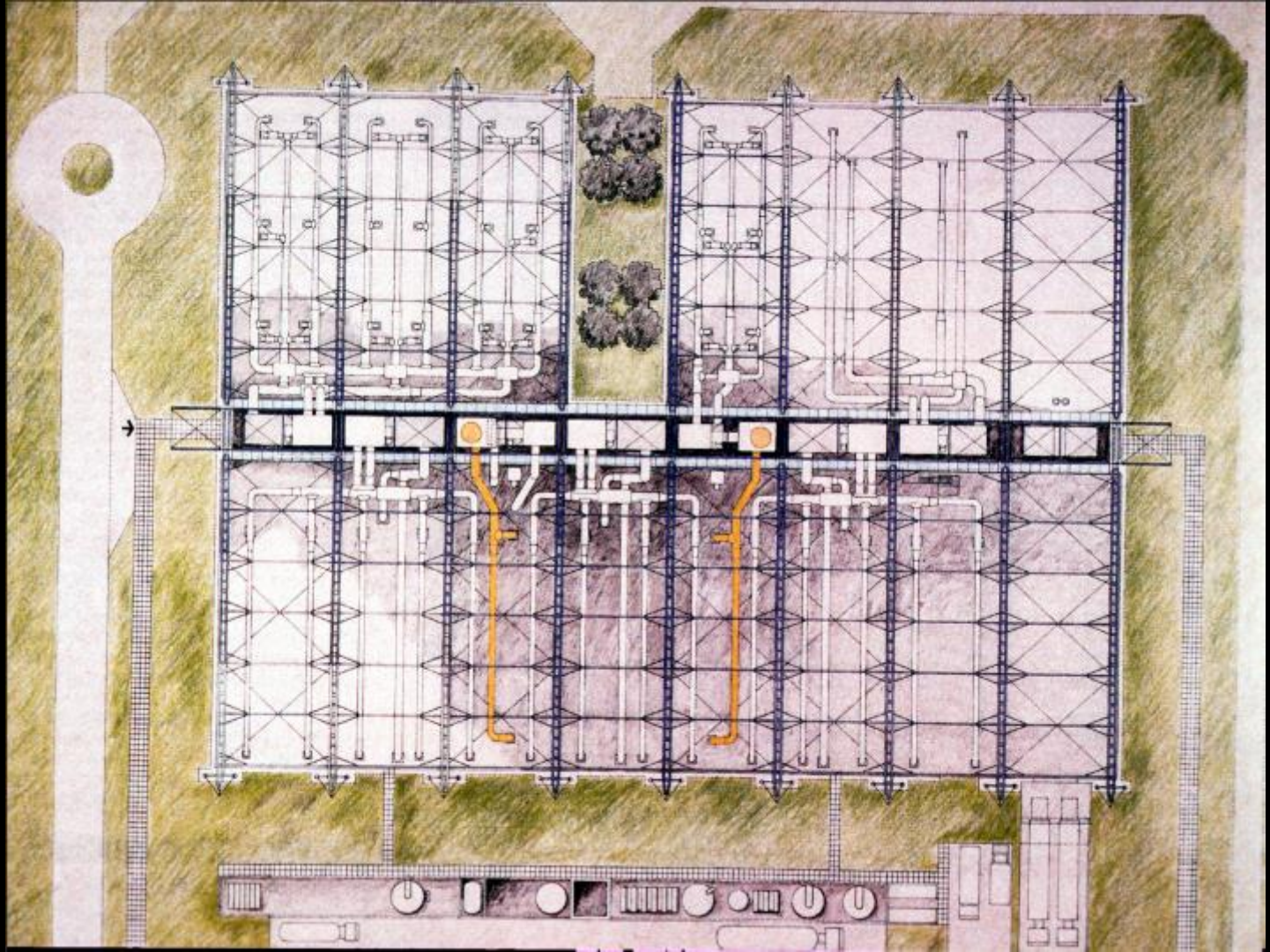


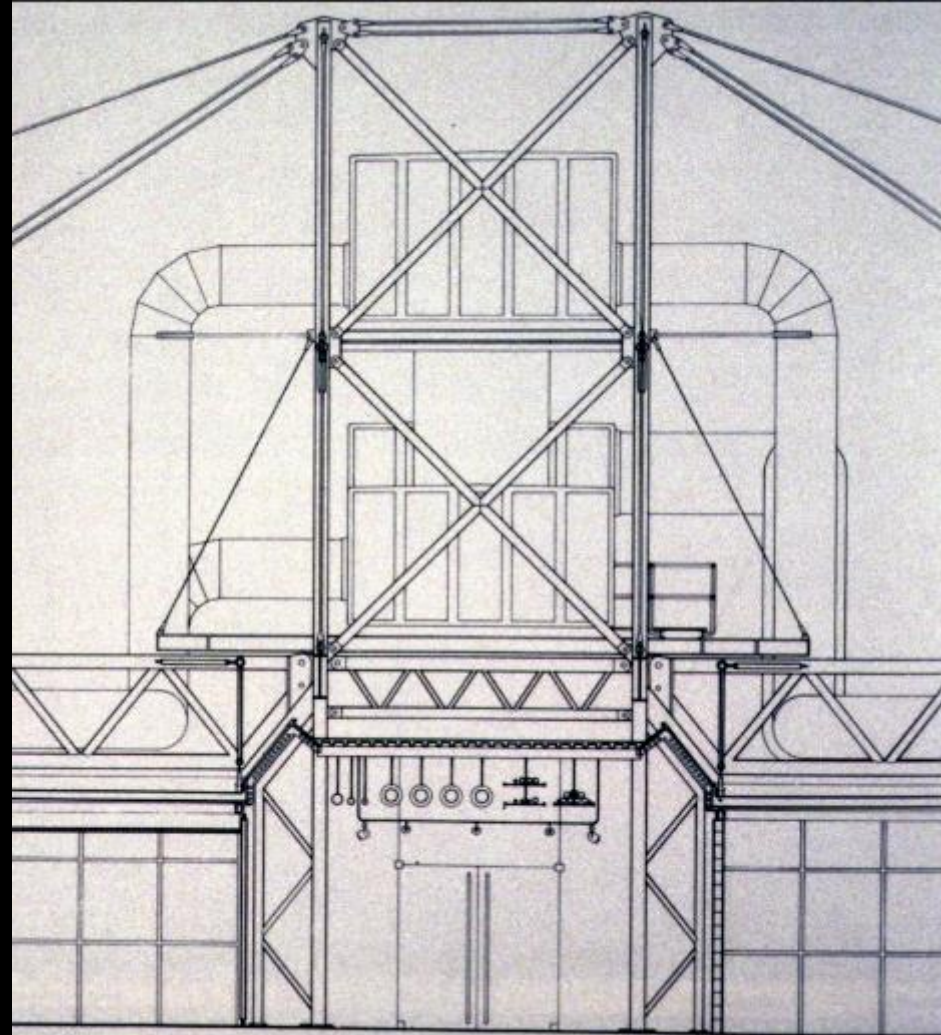


Inmos Technology
Newport, Wales
Richard Rogers
1982

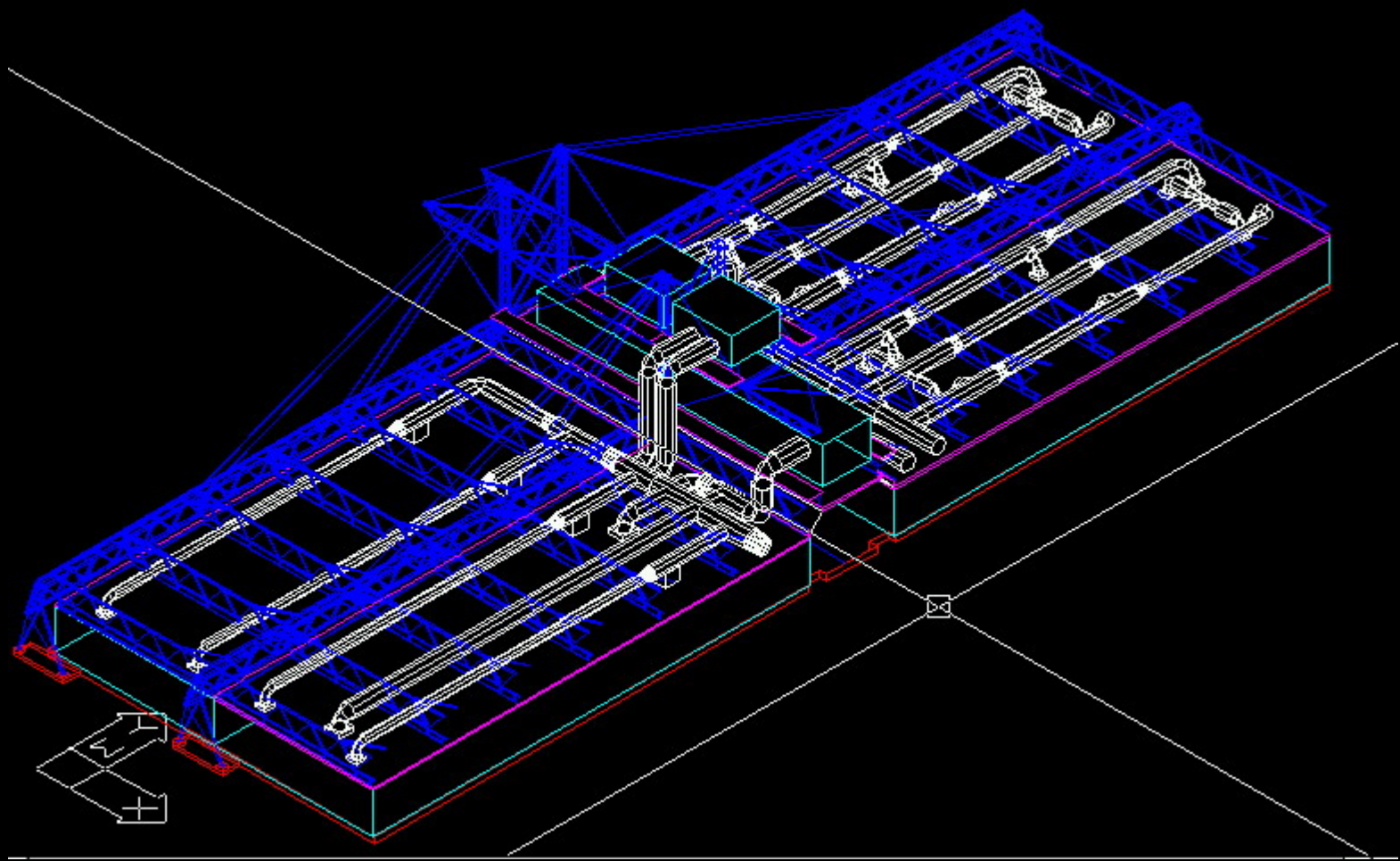


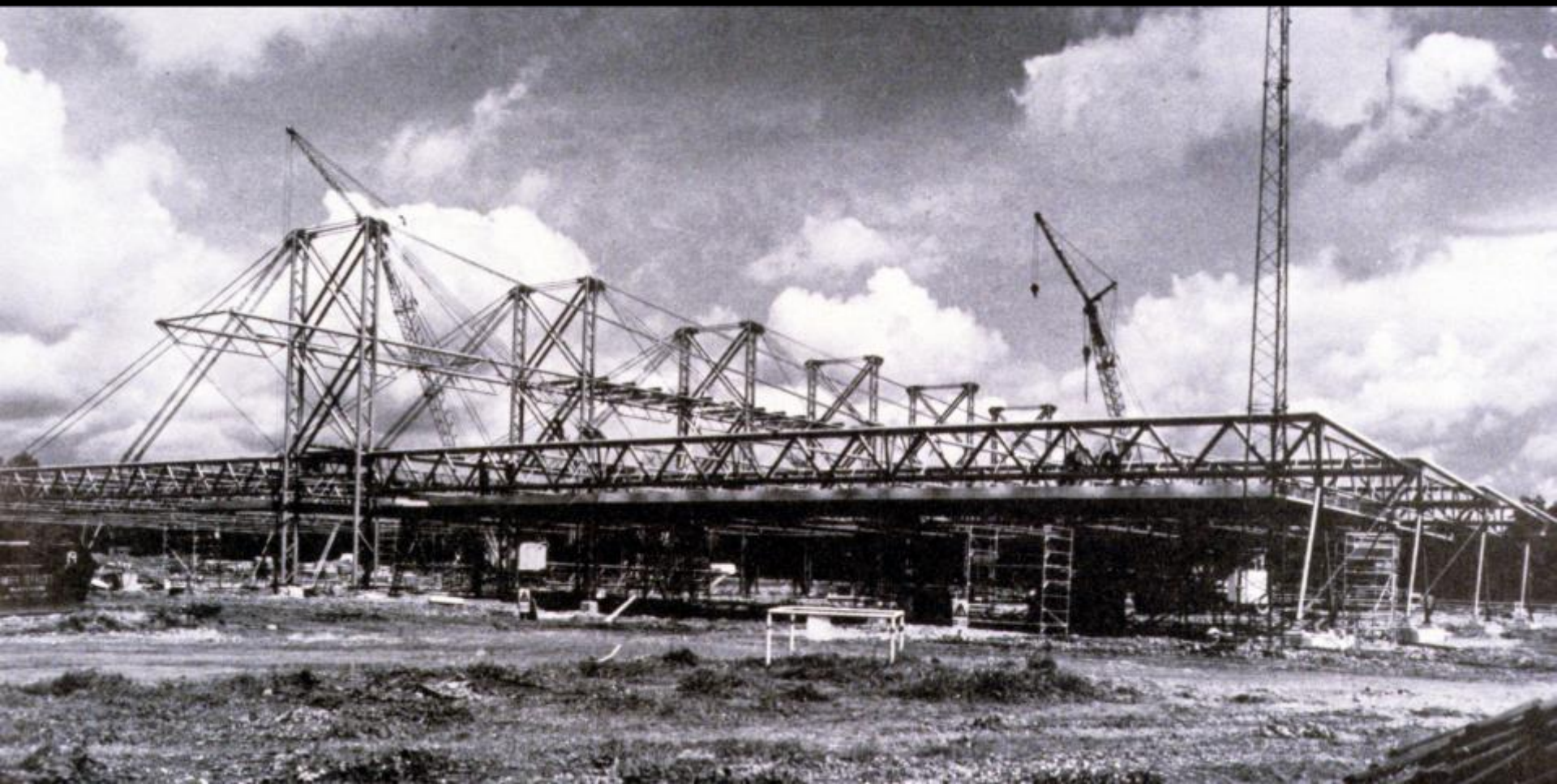






Detail of elevation



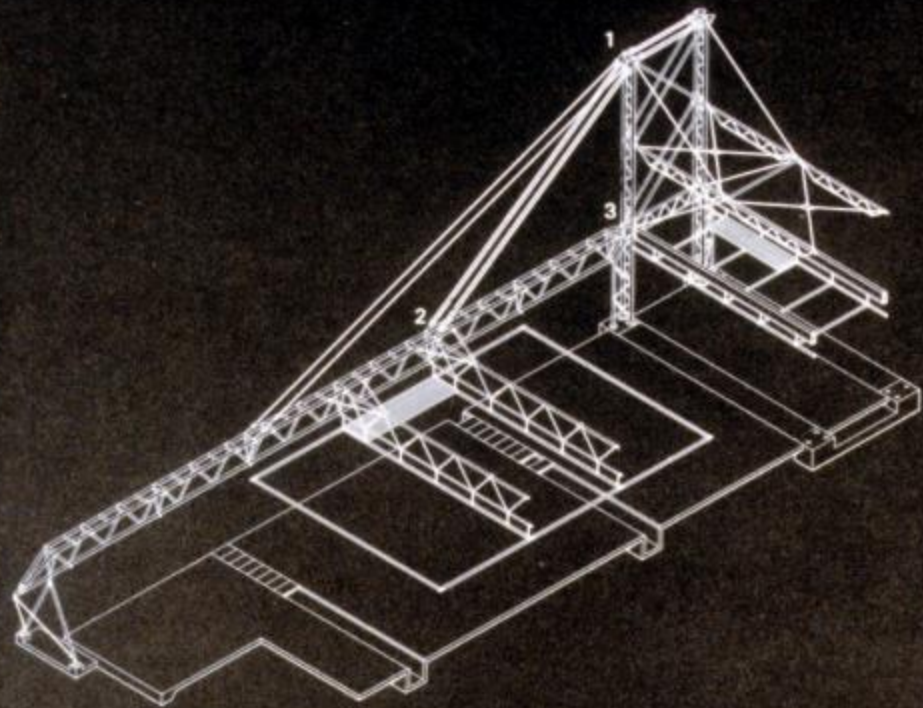




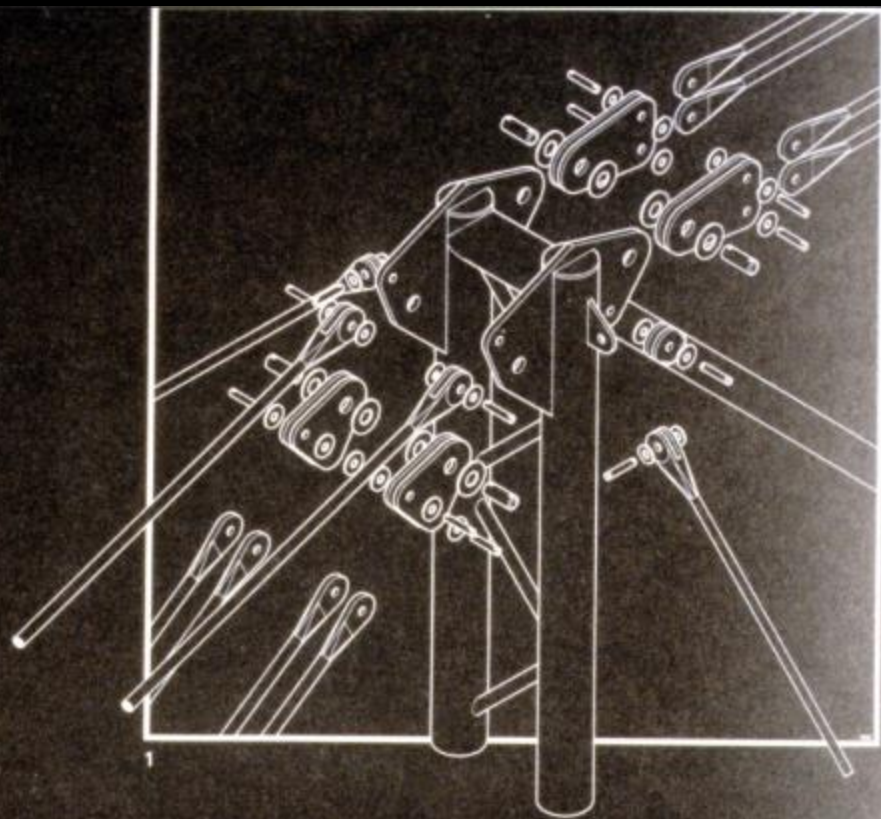
CONSTRUCTION SEQUENCE

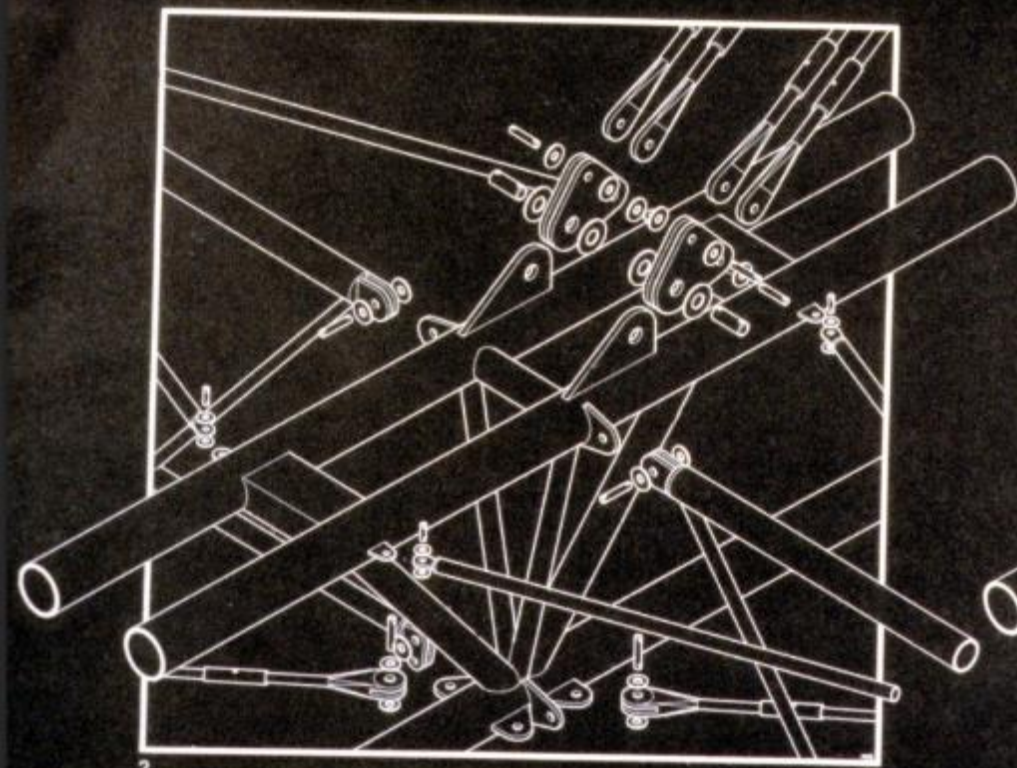




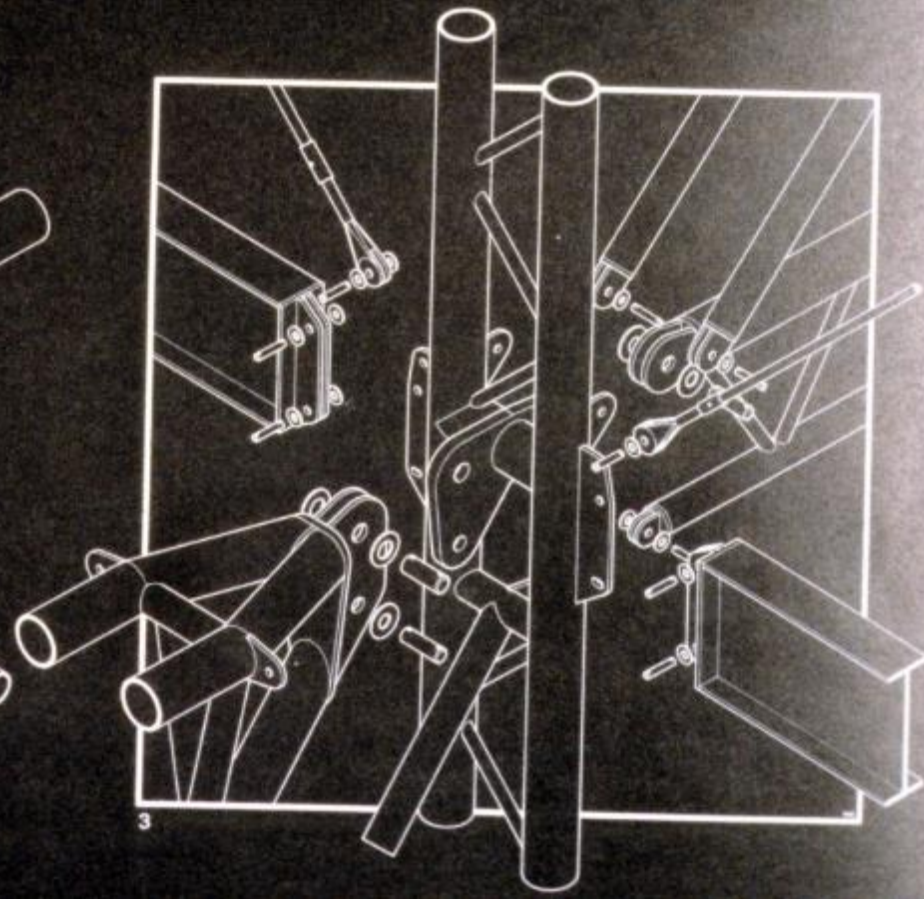


Structural axonometric with junction details

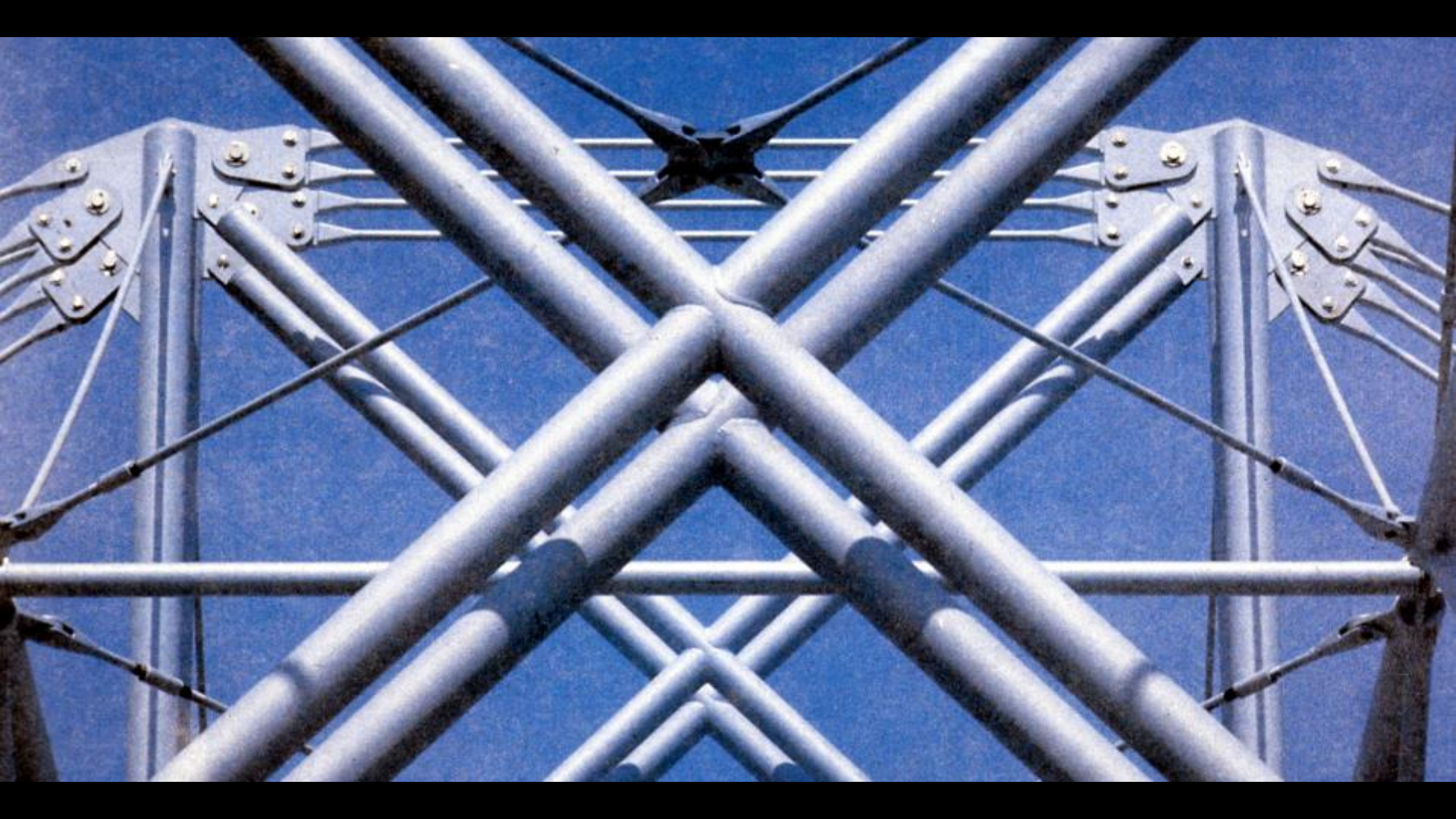




2



3







HIGH-TECH?

TECH-BLINDS!

TECHNICAL BLINDS LTD.

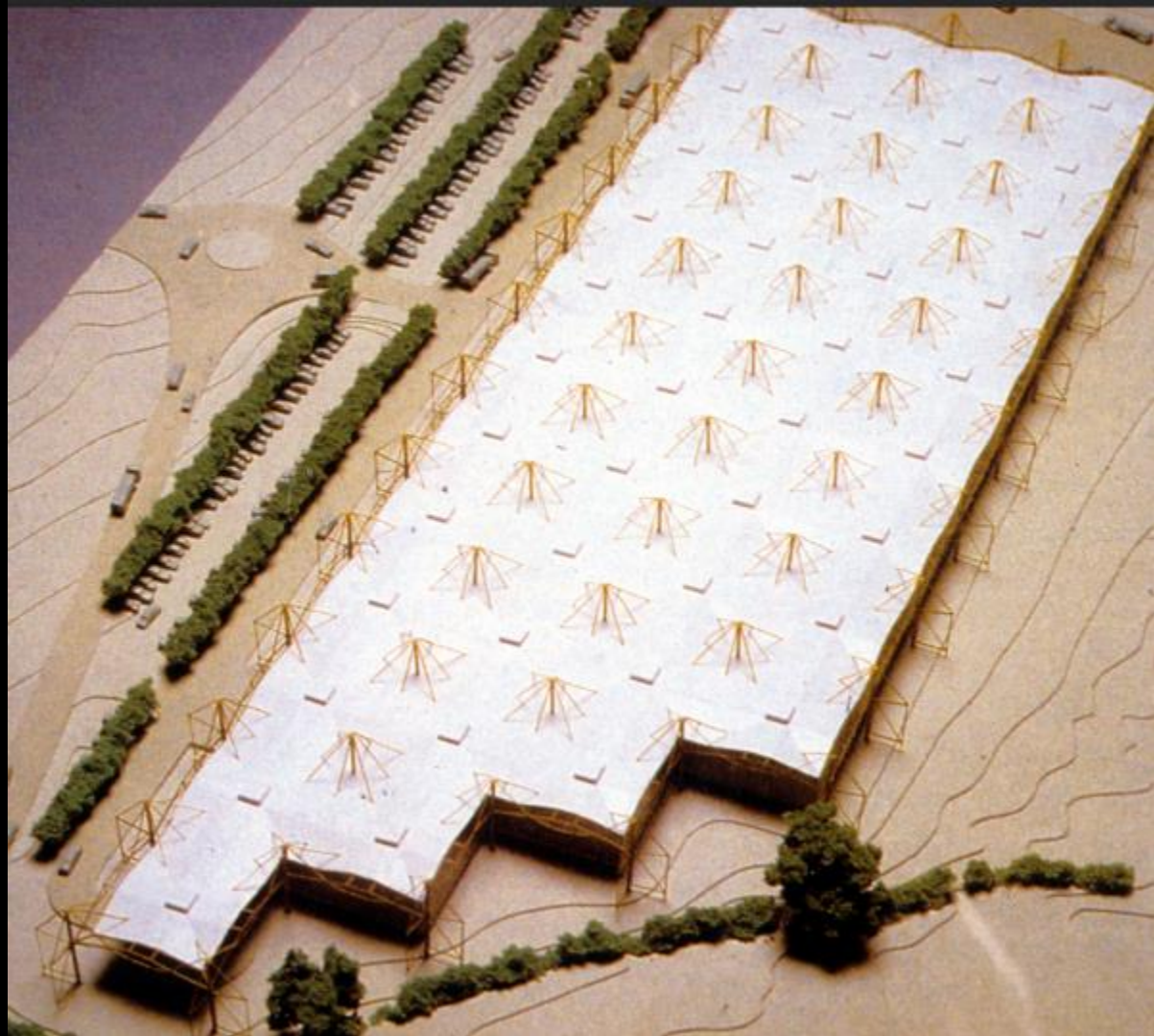
Innovators of solar shading systems

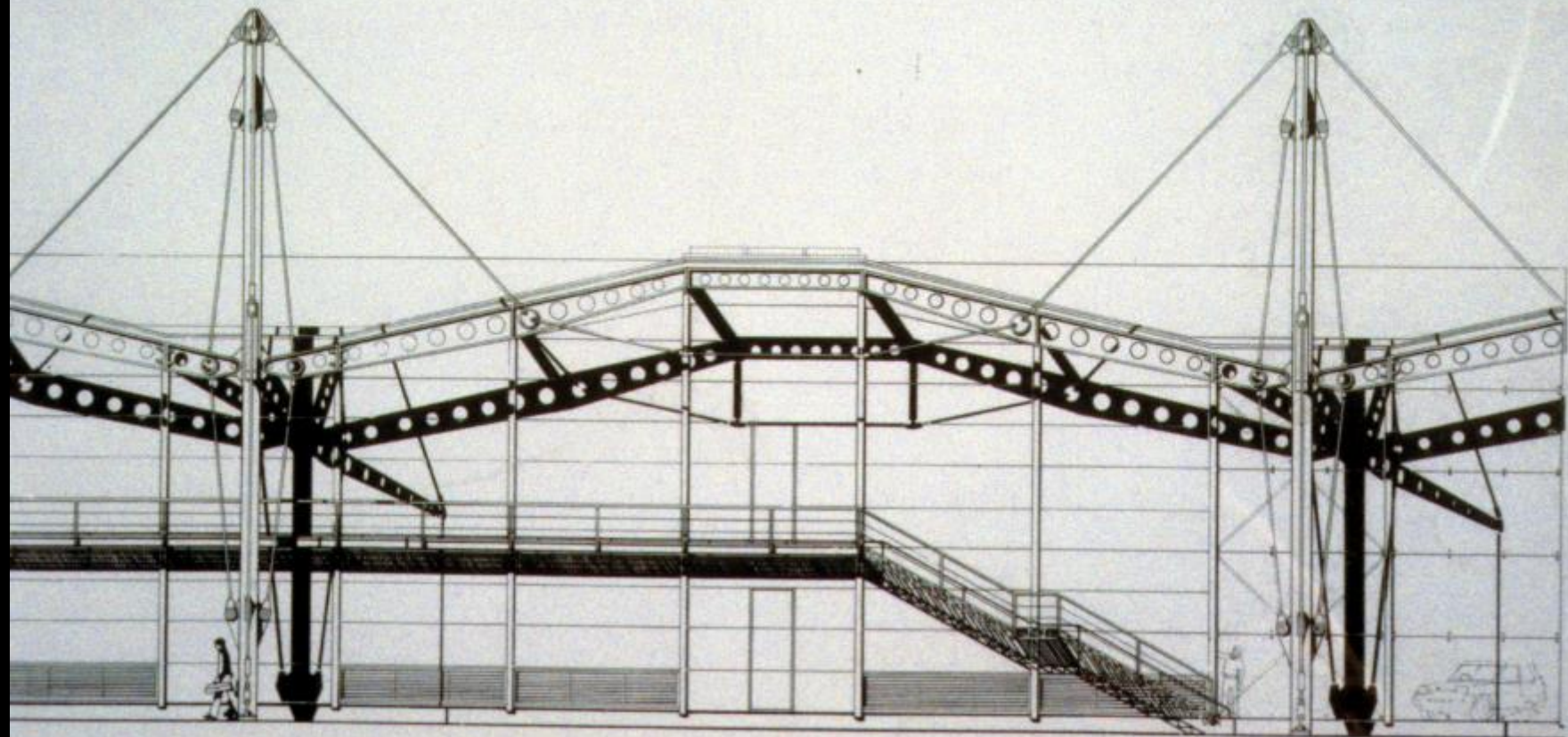
Woburn Town, High Wycombe, Bucks. (06295) 2431

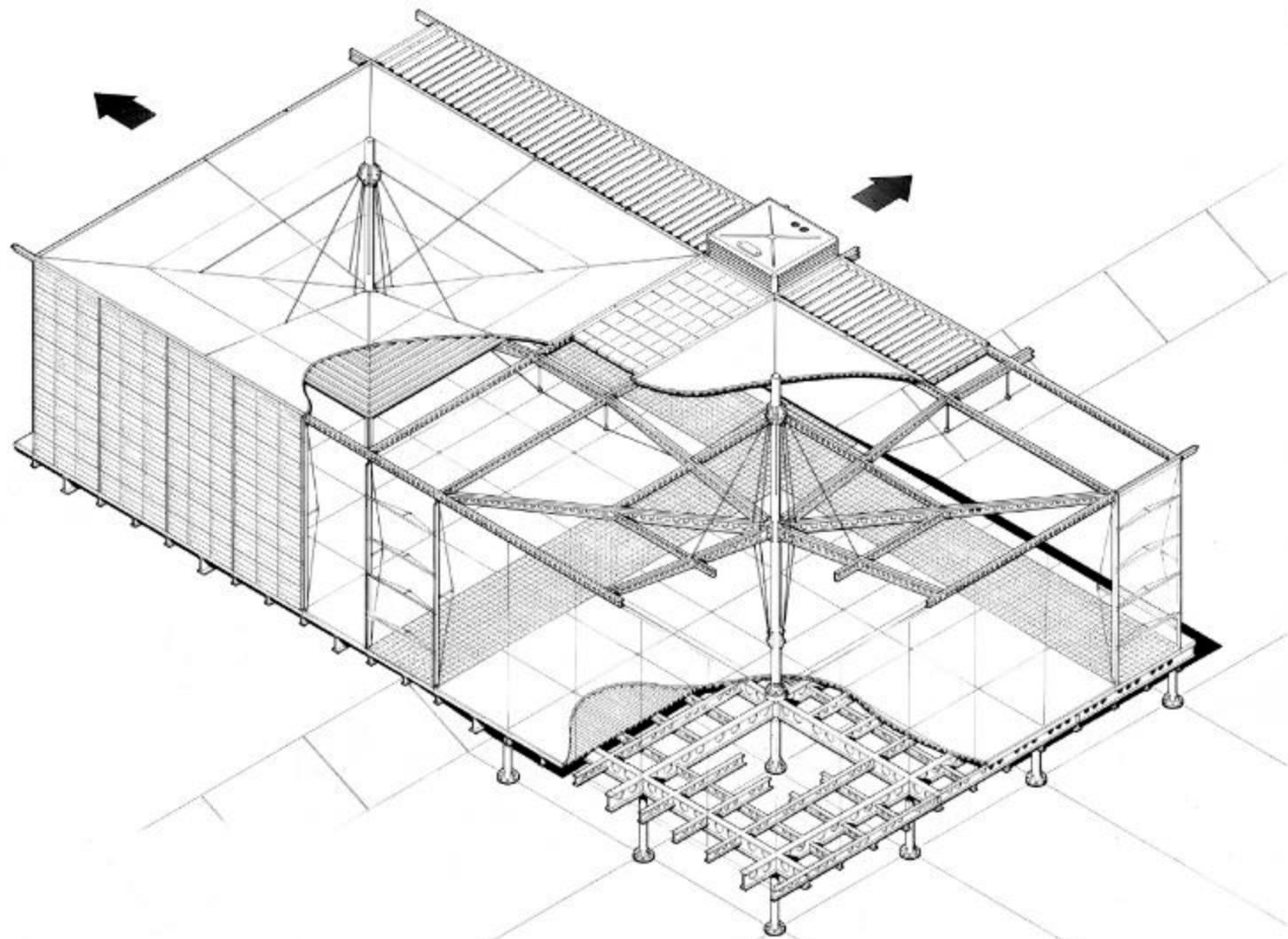
Renault Centre
Swindon, UK
Foster Associates

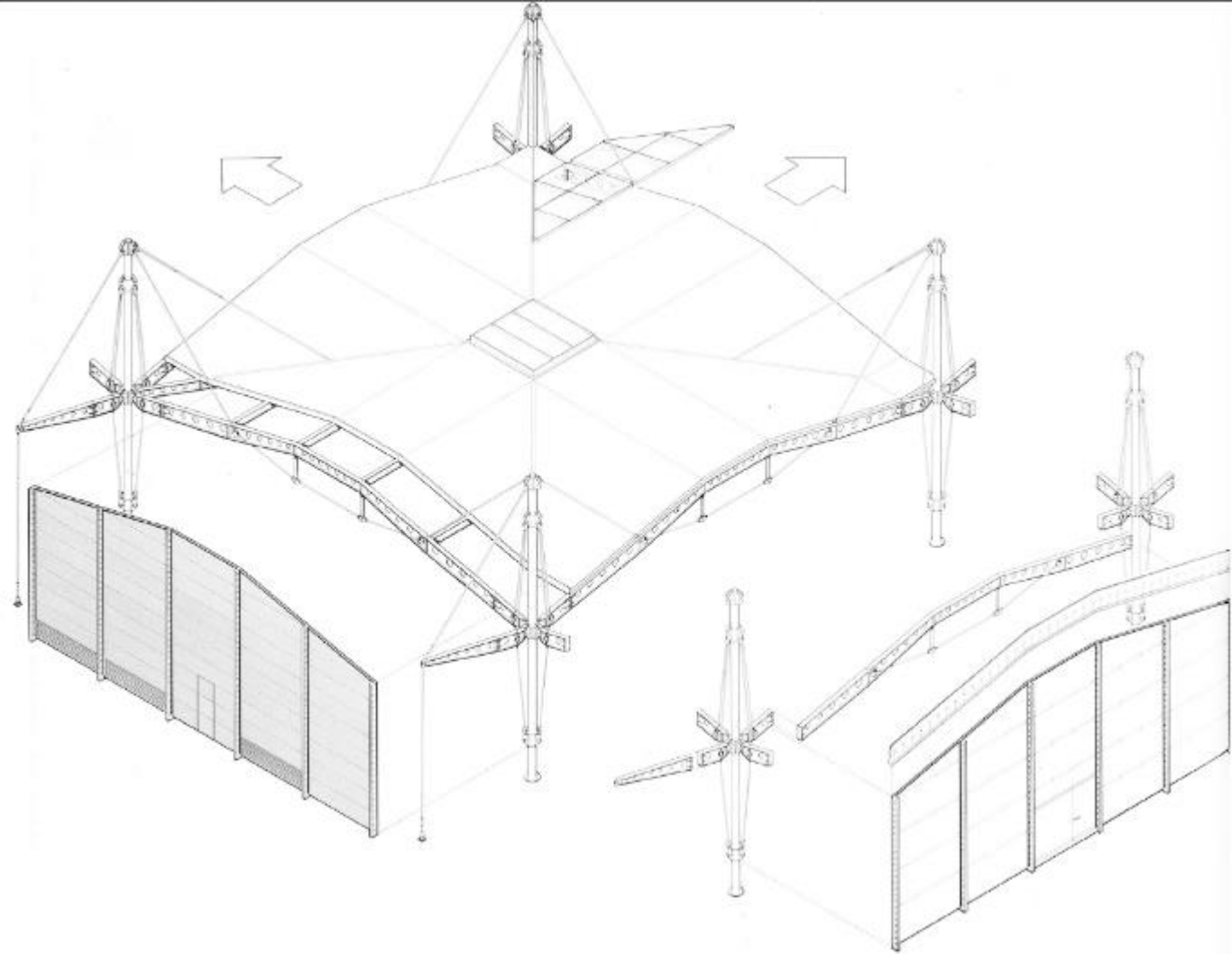
Renault Centre, Swindon.

Architects: Foster Associates.









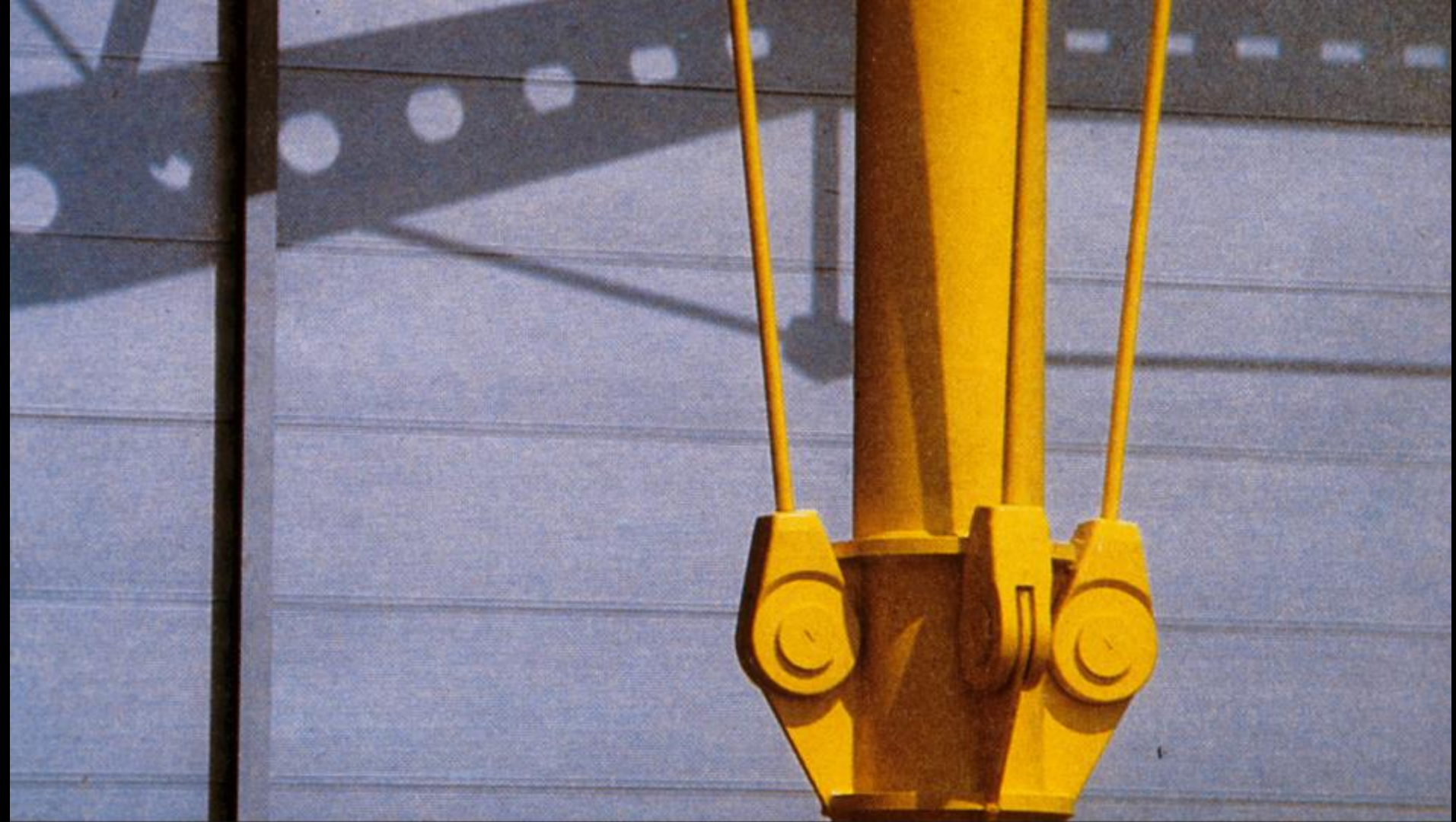












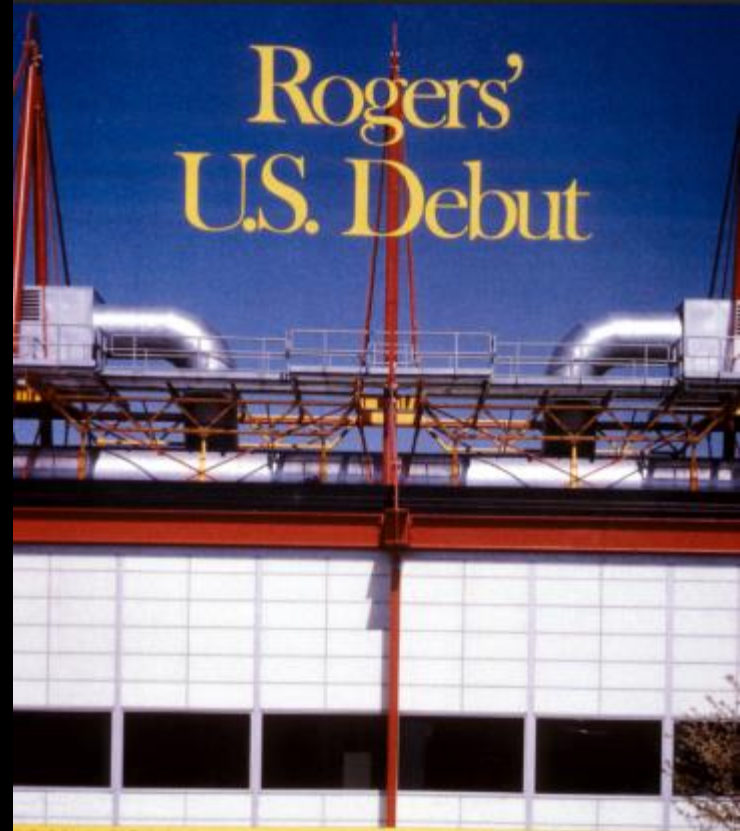
Progressive Architecture

AUGUST 1988



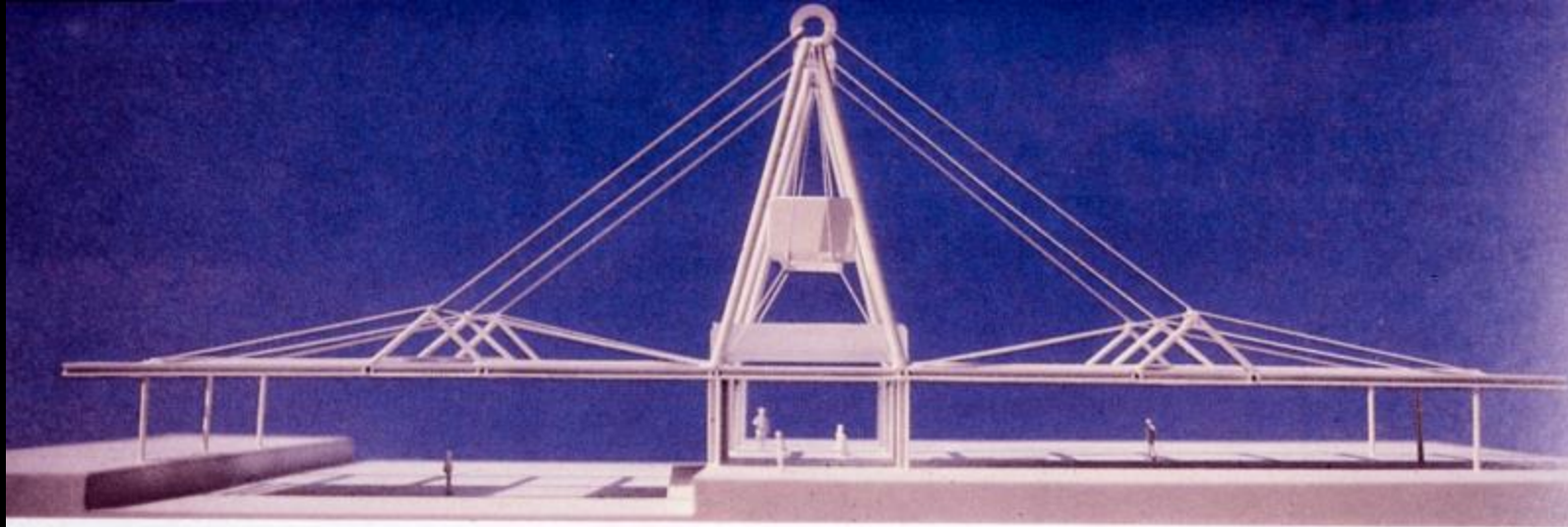
PA Technology
Hightstown, NJ
Richard Rogers
1985

Rogers' U.S. Debut

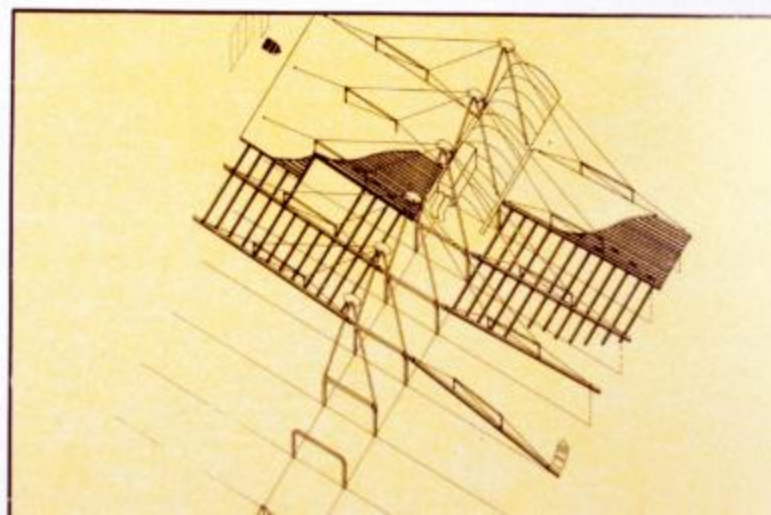


Partial elevation, PA Technology Center.

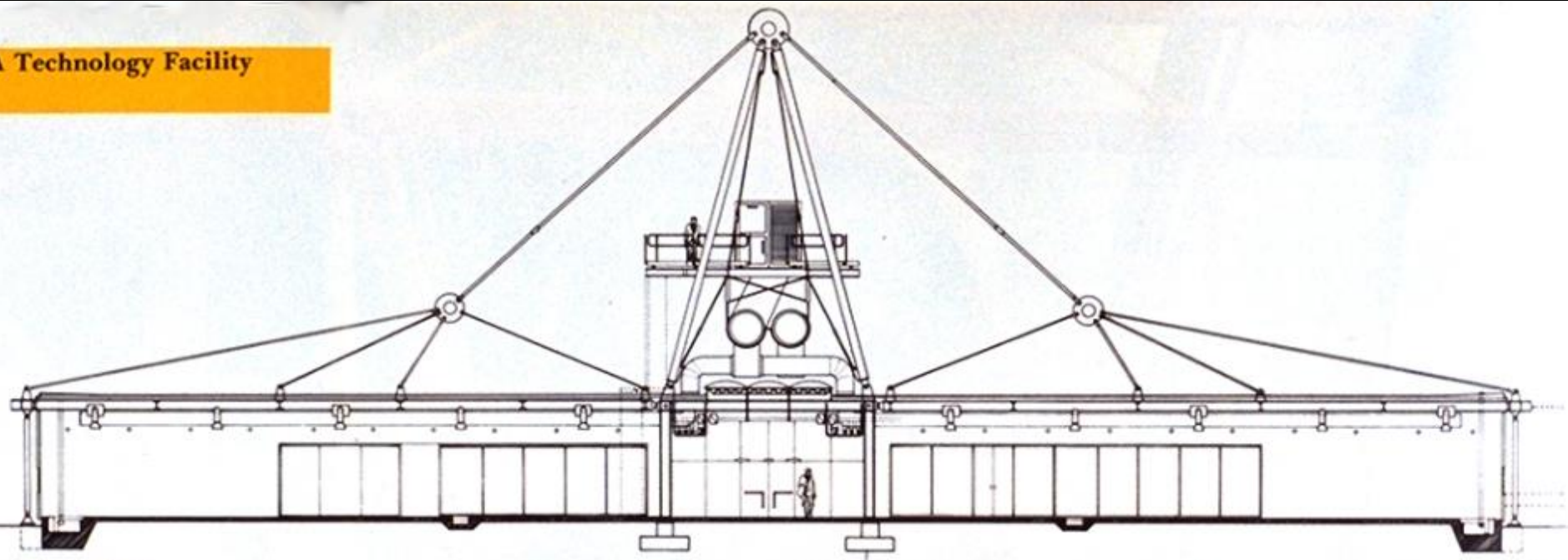
The PA Technology Facility in Hightstown, N.J. is the first work in the U.S. by British architect Richard Rogers, with Kelbaugh & Lee of Princeton, N.J.



Model of structure

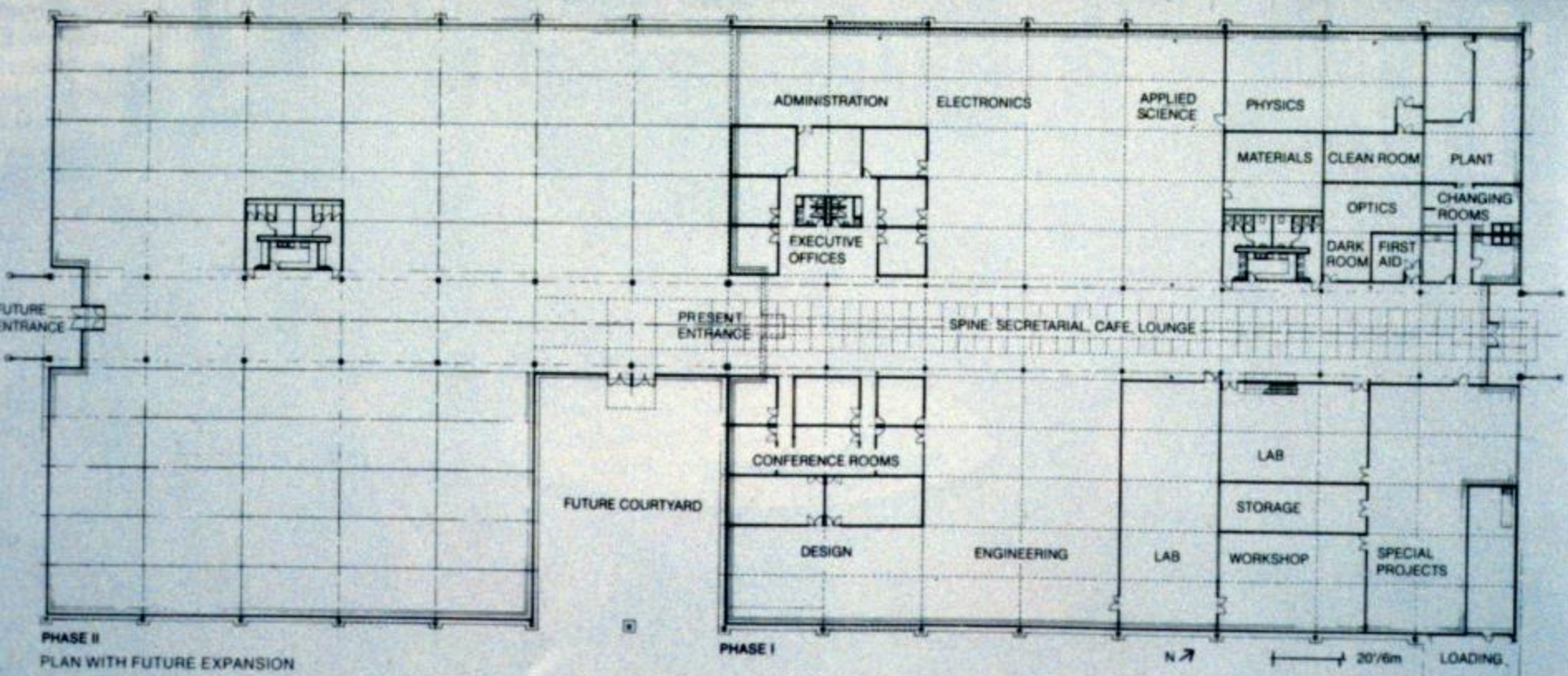


PA Technology Facility



CROSS SECTION

40'10"



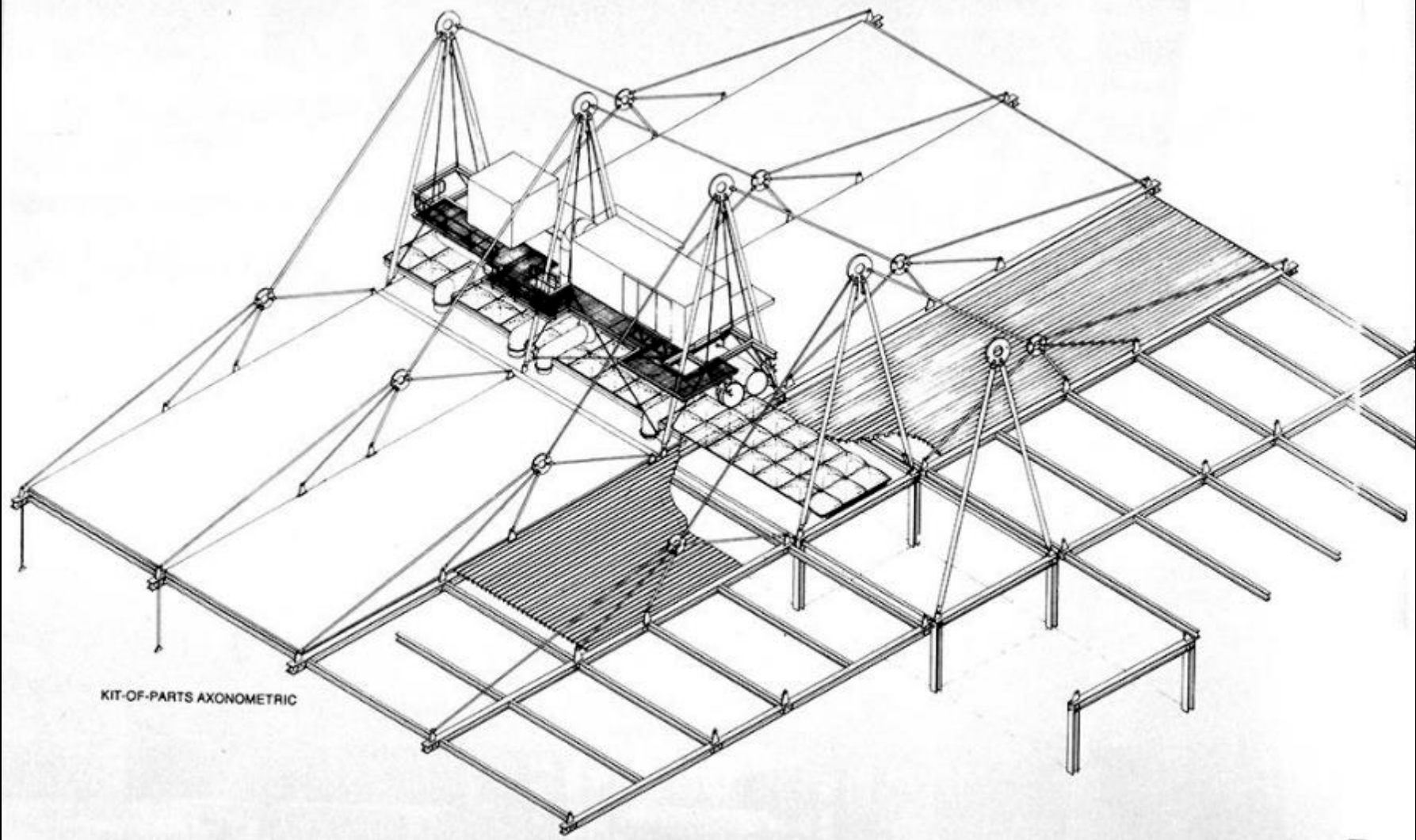
PHASE II
PLAN WITH FUTURE EXPANSION

PHASE I

N ↗

20'6m

LOADING



KIT-OF-PARTS AXONOMETRIC

Hightstown, NJ

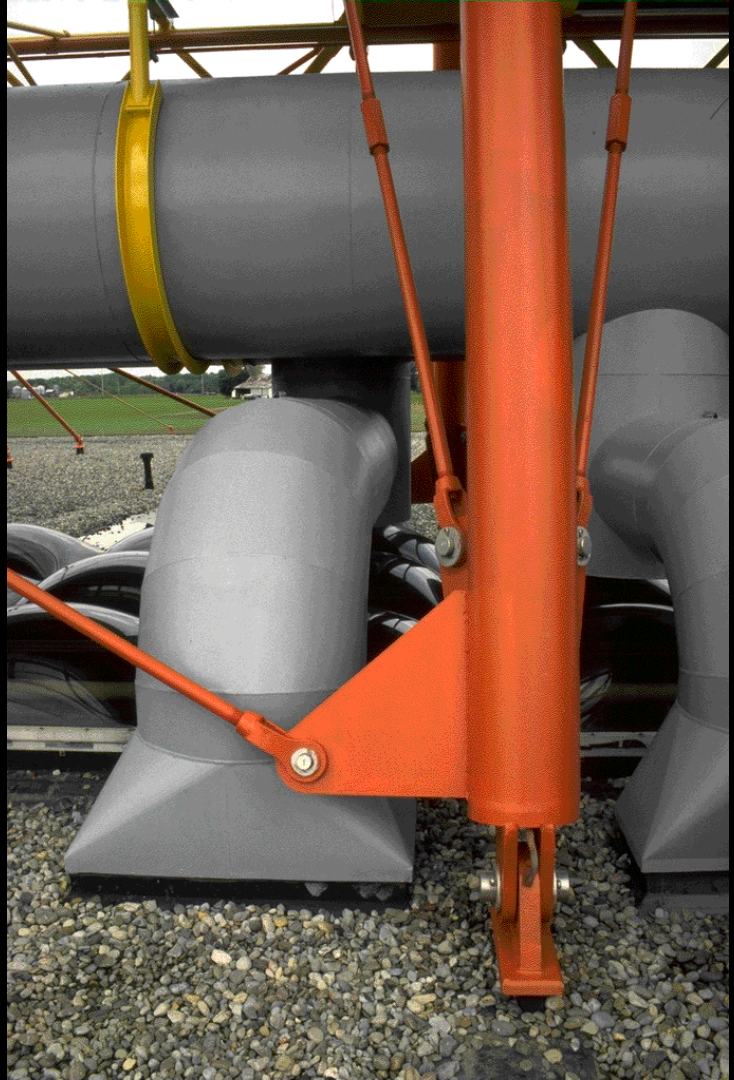
Building a structure that served as the headquarters of a Federal Reserve Bank, the architecture firm of Skidmore, OWINGS & Merrill LLP, in partnership with the local architectural firm of Skidmore, OWINGS & Merrill LLP, designed a structure that is a celebration of modern materials, and a tribute to the past. The crisp steel and glass structure is a celebration of the architecture of the Federal Reserve Bank of New York and the surrounding area.

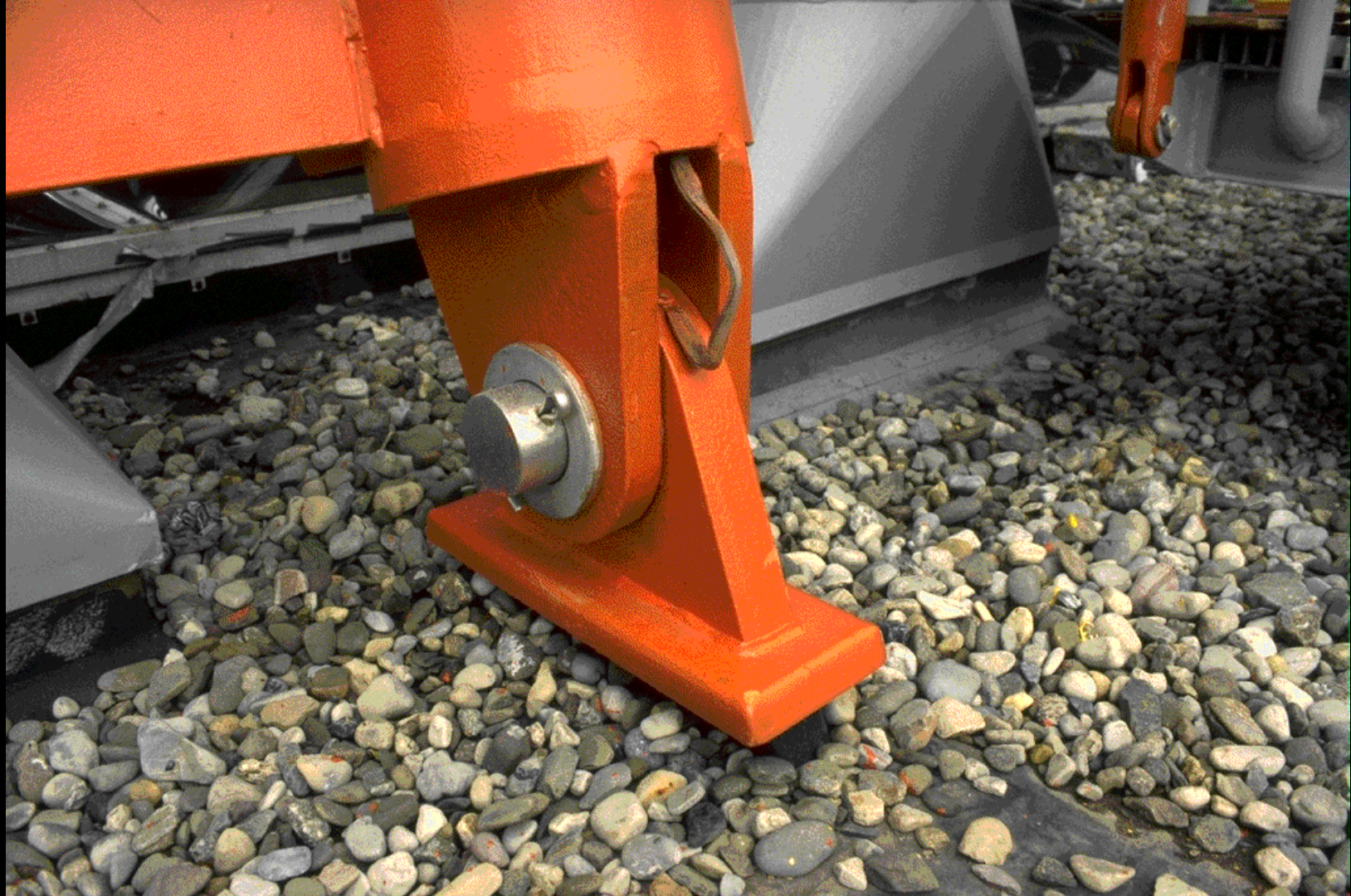










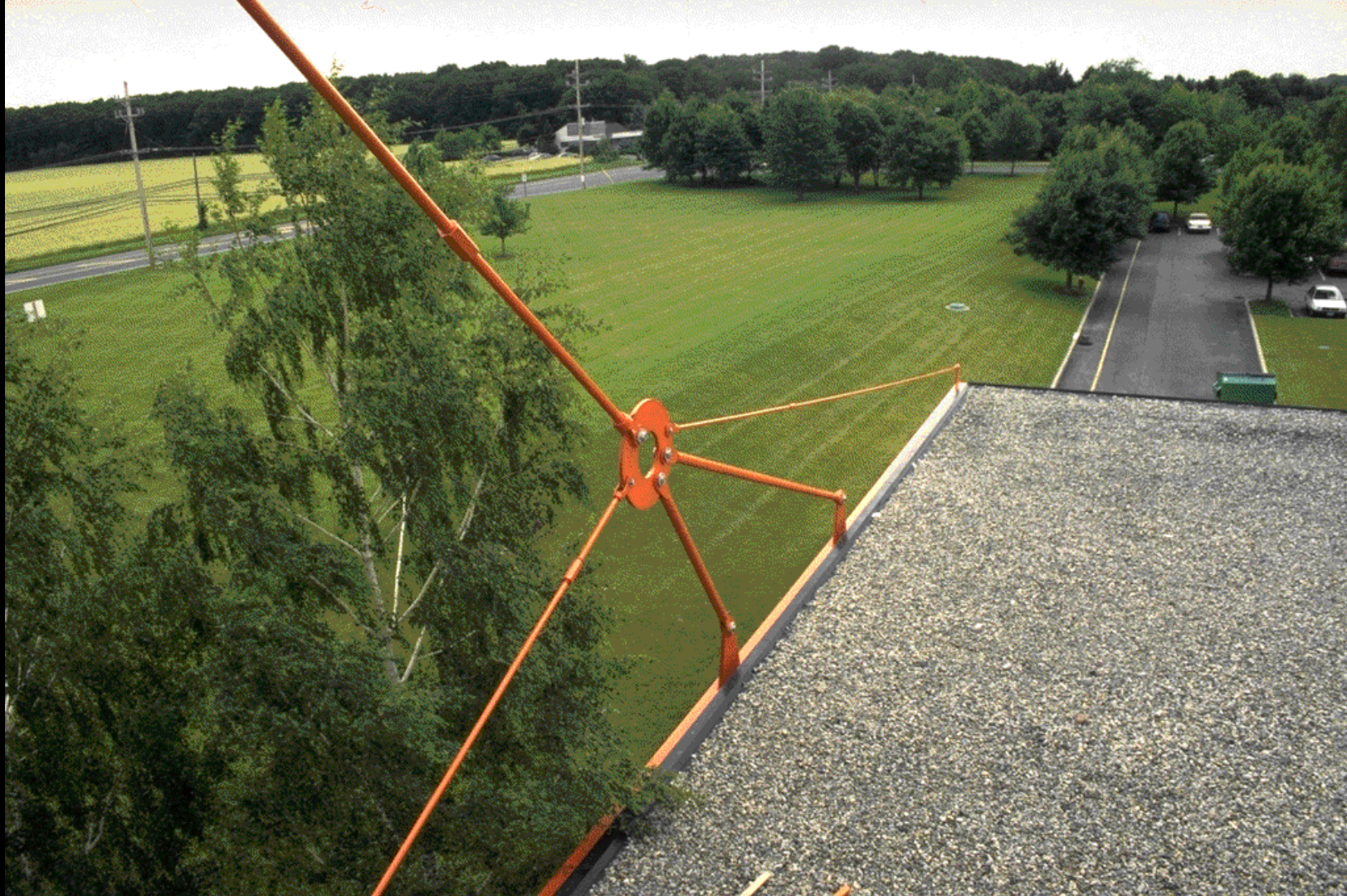




























Oxford Ice Rink
Oxford, England
Grimshaw Architects
1984









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























Waterloo Station
London, UK
Grimshaw and Associates





