NEW YORK WORLD'S FAIR 64/65

THE AUSTRIAN PAVILION

INSTITUTE OF ECONOMICAL DEVELOPMENT OF THE AUSTRIAN FEDERAL ECONOMIC CHAMBER, HOHER MARKT 3, VIENNA 1

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Electrical Engineers:	Henry J. WALD, New York Arthur L. ZIGAS, New York
General Coordinator:	THE DISPLAYERS, INC. New York, Belmont CORN Jr.
General Contractor:	HEGEMANN & HARRIS, New York Messrs. SCHLEUSSNER, Mödling/Austria Friedrich LEHR Messrs. WIESNER-HAGER, Altheim/Austria Engineer Max HOCHREINER
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NEW YORK WORLD'S FAIR 1964—1965 CORPORATION

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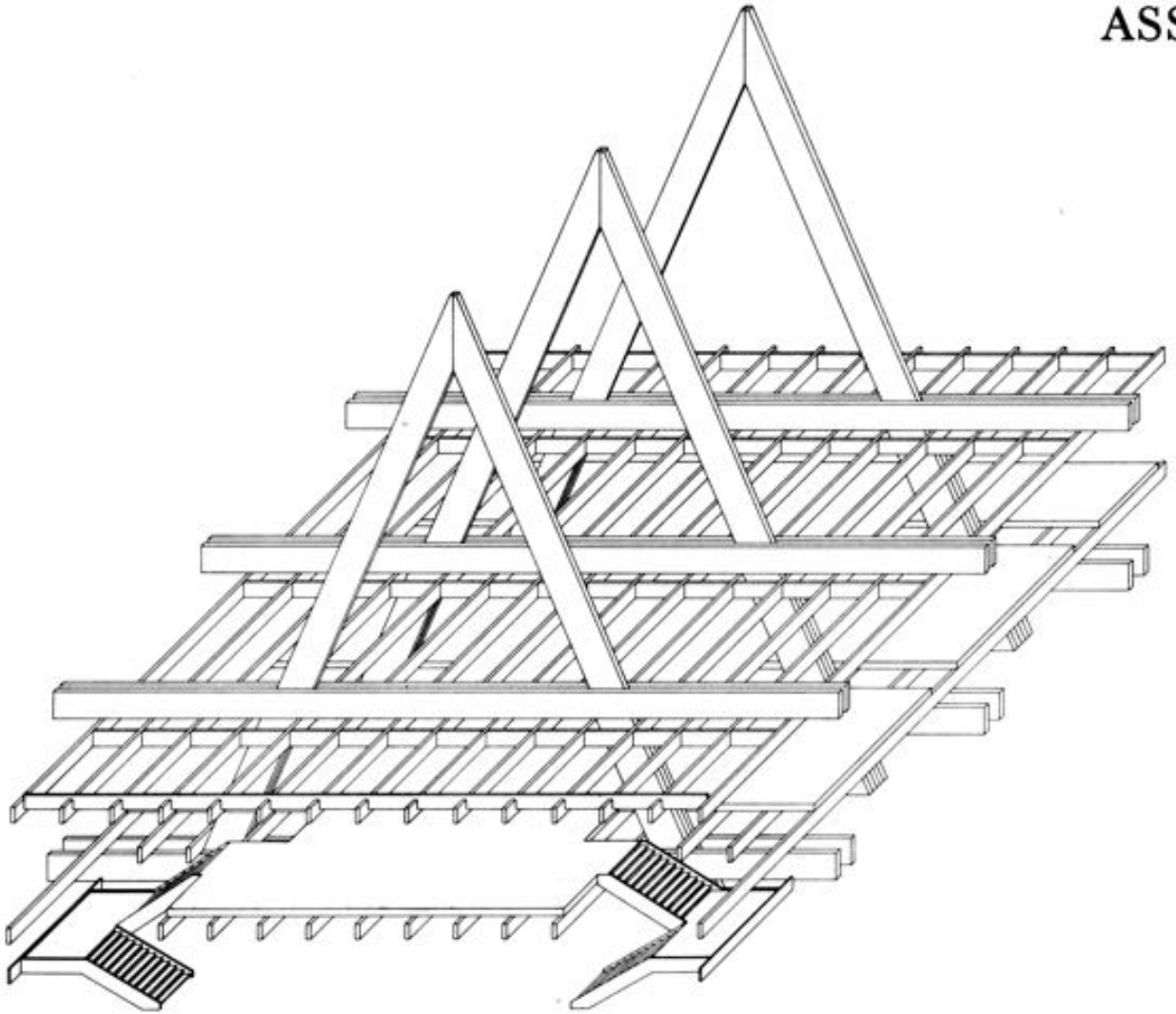
ASSEMBLING MANUAL



AUSTRIA

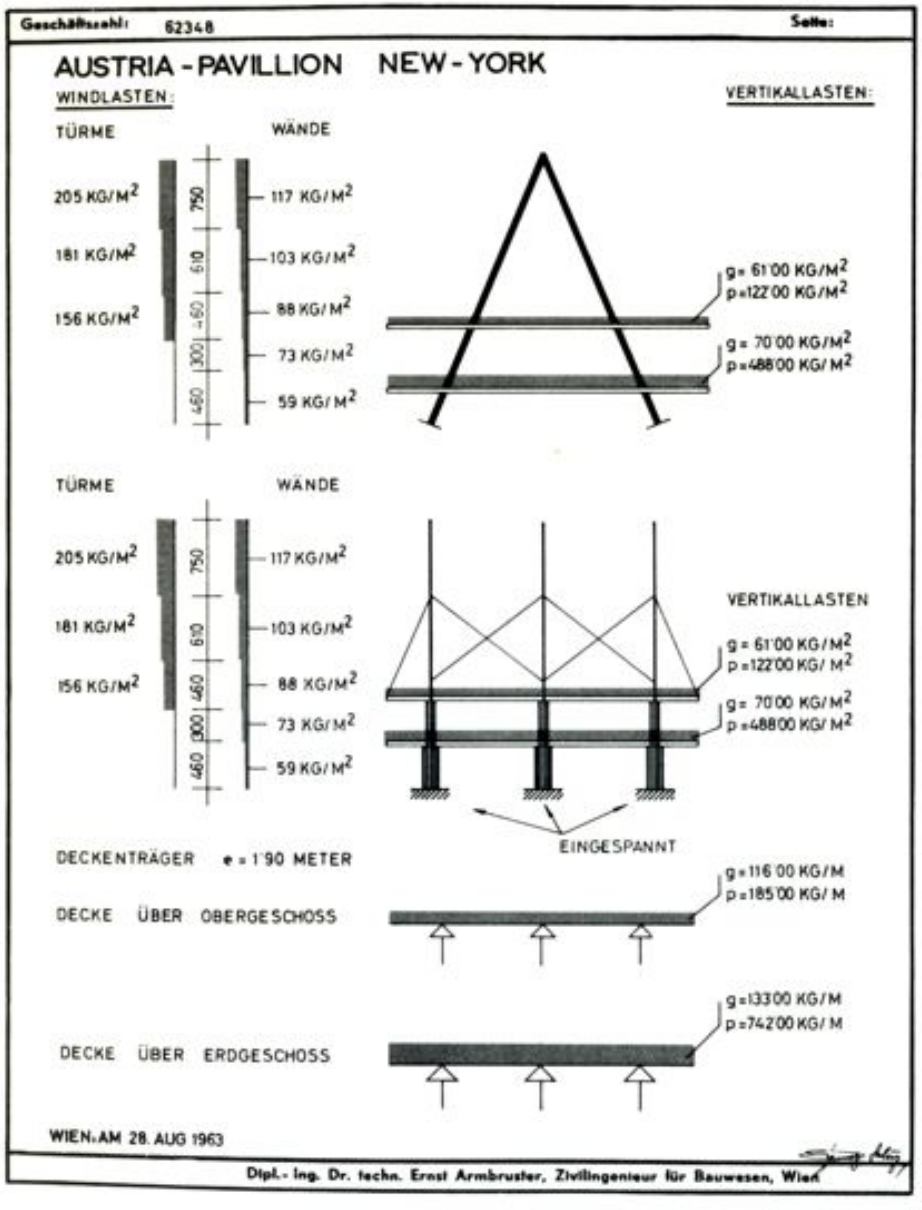
TECHNICAL REPORT

The Austrian Pavilion has been conceived and designed as a unit-composed structure of glued wood. Connections are by simple bolts and easily disconnected. The edifice is built on the basis of a system of 6 ft 3 in square. The Exhibition Area is 87 ft long, 94 ft deep and 14 ft 9 in high; it is suspended 13 ft 8 in above the terrain.

The main supporting structures are formed by three A-shaped frames at an axial distance of 31 ft 3 in. Height measured from floor to apex is 84 ft. At the floor and roof levels the frames are braced by ties acting as main girders. The frame legs penetrate the exhibition area.

The whole structure is made up of simple rectangular elements, all load-bearing parts being arranged as glued beams. The 4 in thick wall panels are independent from the supporting structure and attached to each other, as well as to the floor and roof levels, by means of fastening devices. The "A" frames, as well as the ties (main girders) which brace them and bear the secondary beams, are glued according to the Kämpf ridge method from hollow-box sections. This system combines glued faces of boards, whose angles of grain are staggered by 8 to 12 degrees, into ridges. At the points of attachment and in areas of increased transversal stress, the ridges are re-enforced or lined in accordance with the mechanical flux. The secondary beams, which are laid at distances of 6 ft 3 in, have been designed as laminates. The beams of the floor level have a cross-section of $6^1/_2$ by $24^1/_2$ in, those of the roof level, $6^1/_2$ by 22 in. The secondary floor beams rest on the main girders, while those of the roof level are suspended from and bolted to the upper ties. The secondary beams are of the continuous type, with two spans of 31 ft 3 in each and ends projecting 17 ft 6 in at either side. Their total length is 97 ft 6 in.

The main ties, measuring 10 by $47^1/_2$ in and 12 by $47^1/_2$ in respectively, rest directly on the "A" frames. This necessitated some staggering of the cross section of the "A" legs, which form five-part hollow-box sections from the foundations to the supports of the lower main girder, three-part sections at the level of the exhibition area—which support the upper ties with their considerably lower load—and single sections from there to the apex. The lower main girder is composed of five parts in its central span, with the second and fourth parts not resting directly on the frame legs but rather doweled to the parts of the frame resting on or running through them. The upper main girder, because of its lower load, forms a two-part section. The vertical components are led directly into the frame legs by the bearing surfaces. This permits simple connections, as only horizontal components and displacement forces due to cases of asymmetric load have to be transmitted by bolted connections.



For all construction elements spruce (picea excelsa), grade I, was used. Glueing was effected by a blending process with a resorcin formaldehyde glue. All metal parts and connections are galvanized. All wooden parts and elements are fireproof and weatherproof according to the pertinent codes.

Calculations were based on the Building Code, New York World's Fair 1964—1965, Wood Structural Design, as well as on the relevant Austrian Standards.

Statically, the system of frames with their double bracing by the main girders is comparable to a collar roof with strut. All cases of symmetrical load feature solely longitudinal forces within the frame; whereas asymmetric load will cause bending moments. This static system, which is basically doubly indeterminate, was calculated by the method of load rearrangement, i. e. by separation into symmetrical and antisymmetrical loads, which results in considerable simplification of calculations. The main ties, which act as stiffeners, are simple girders with projections at either side. The secondary beams have been calculated as continuous beams with projections at either side.

Longitudinal bracing of the structure, i. e. at right angles with the "A" frames, is effected by restraining the frame columns in the concrete foundations. The connecting forces are transmitted from the frame legs into the concrete foundations by means of adjustable anchor plates.

The unfavorable soil necessitated a foundation by means of groups of wooden poles. The horizontal forces of the frames are taken up by means of low-lying ties of re-enforced concrete.

For receiving the wind forces acting on the free part of the "A", bracings have been provided which conduct these forces into the plane of the roof and thence into the main girders and frames. Bracing is effected by guy wires with coupling nuts, so that their tension can be adjusted both initially and subsequently. For the distribution of the bracing forces, glued distribution beams have been arranged on the projecting faces of the secondary beams to ensure the co-operation of all secondary beams. Calculations were based on a girder grillage layout, with grouping of girders for clarity and simplification of calculations.

Dr. Ernst Armbruster


AUSTRIA

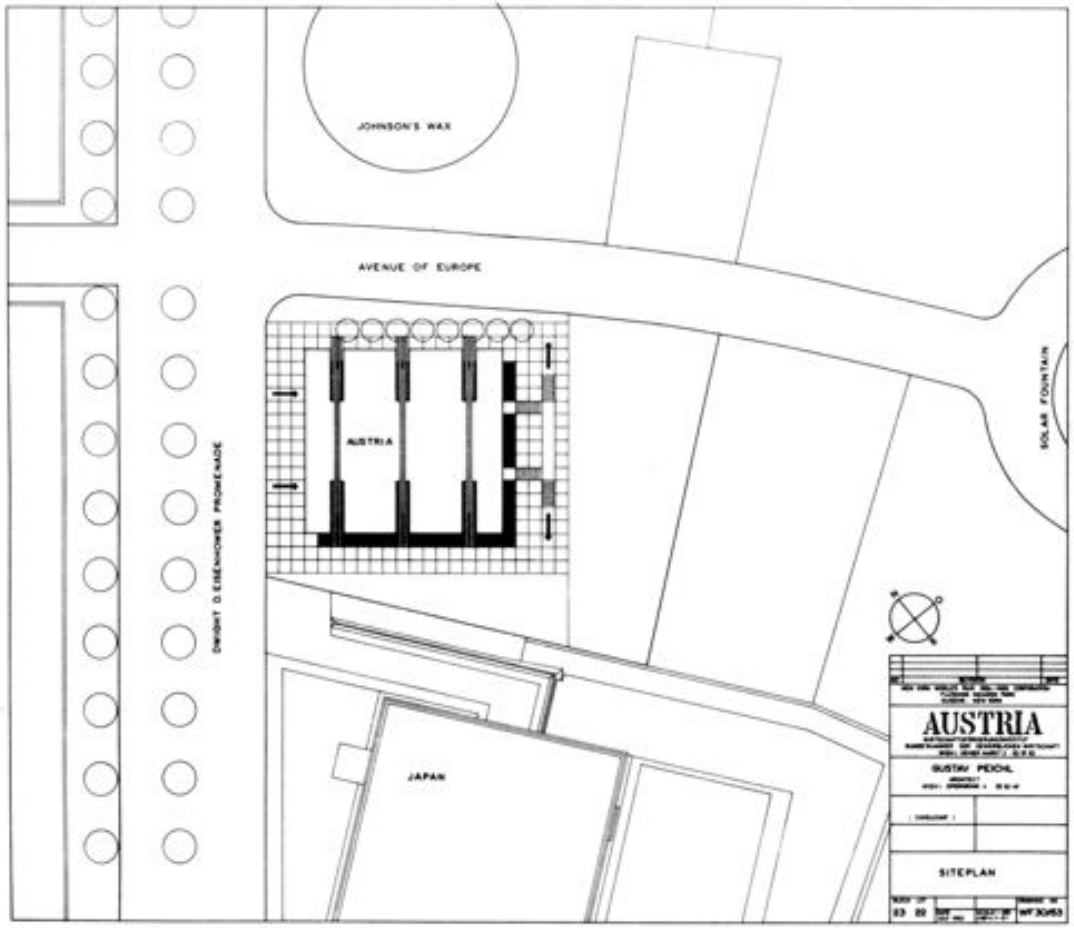
AUSTRIAN PAVILION

PREFABRICATED WOODEN STRUCTURE ON CONCRETE FOUNDATIONS

Total area	1,916.00 m²	20,616.60 sq. ft.
Built-up area	671.46 m²	7,227.53 sq. ft.

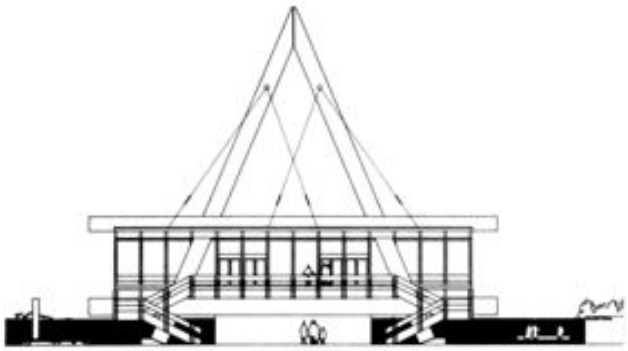
EXHIBITION AREA:

Open-air area	1,198.14 m²	12,891.98 sq. ft.
Roofed-in area (outside)	637.30 m²	6,857.35 sq. ft.
Exhibition hall	434.02 m²	4,671.75 sq. ft.
Auxiliary rooms	100.50 m²	1,081.38 sq. ft.

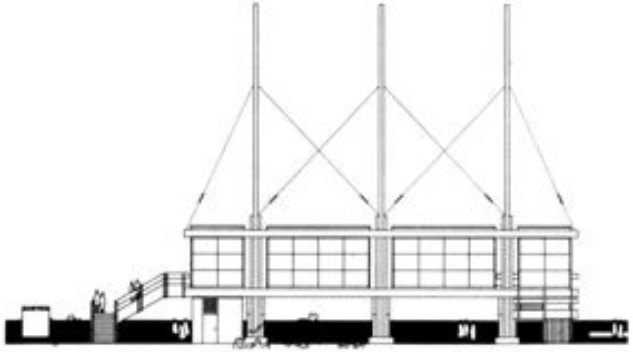


SITE PLAN

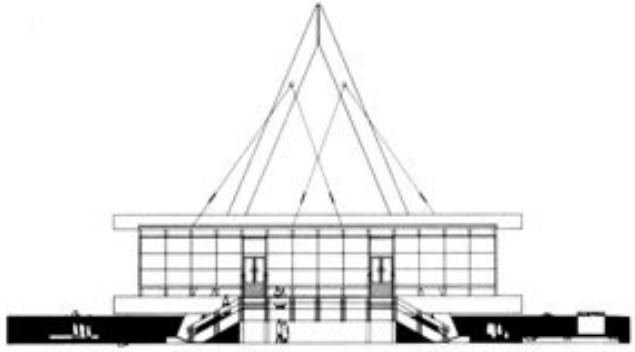
Metric Scale: 1 : 1000
Approximate English Scale: 3/256" — 1'—0"



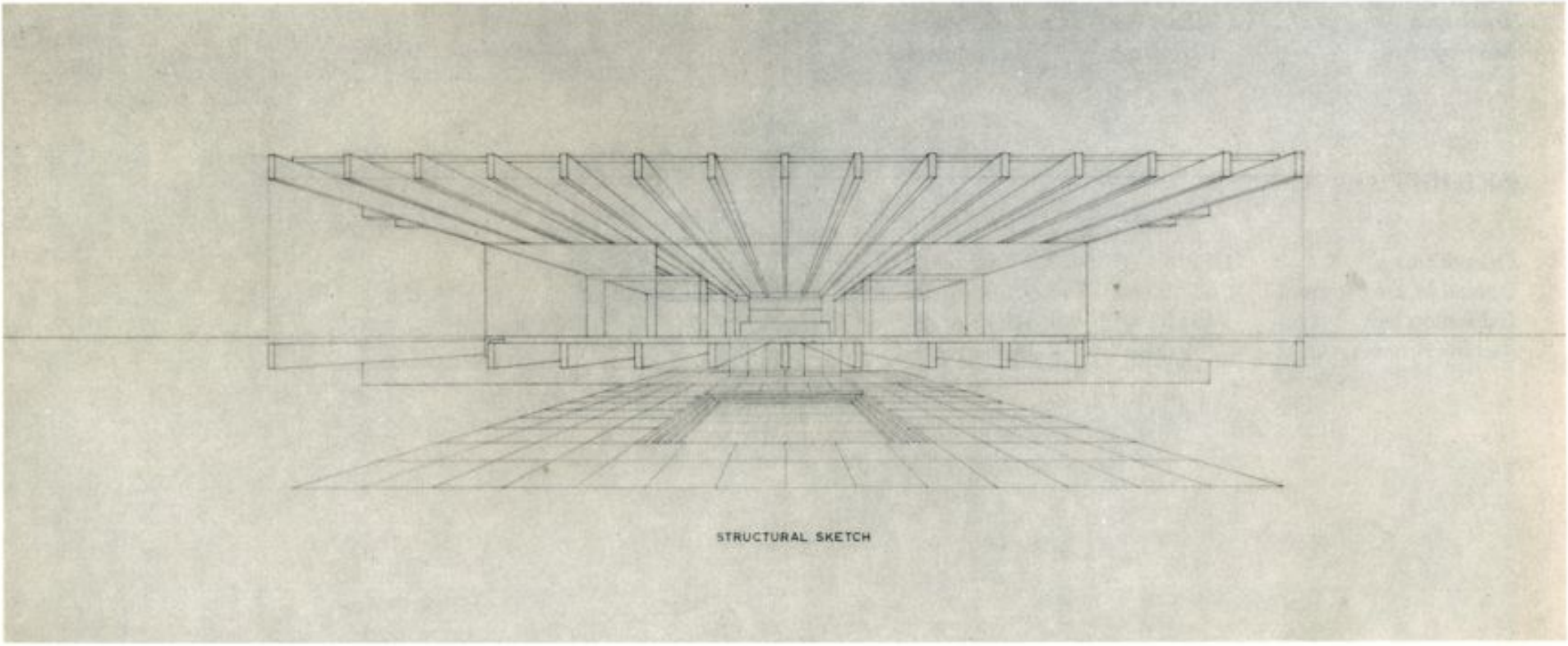
NORTH-WEST



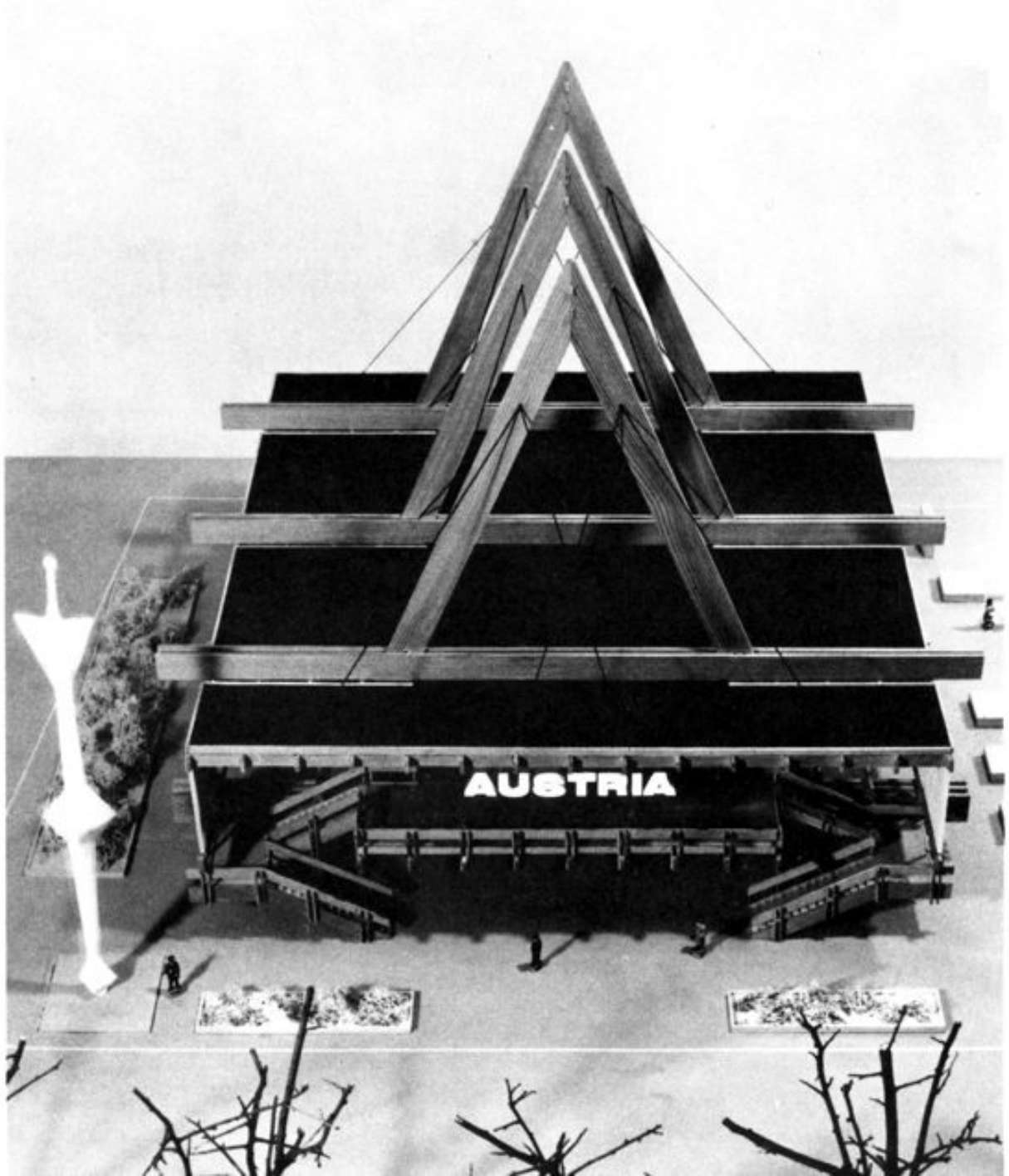
NORTH-EAST



SOUTH-EAST



STRUCTURAL SKETCH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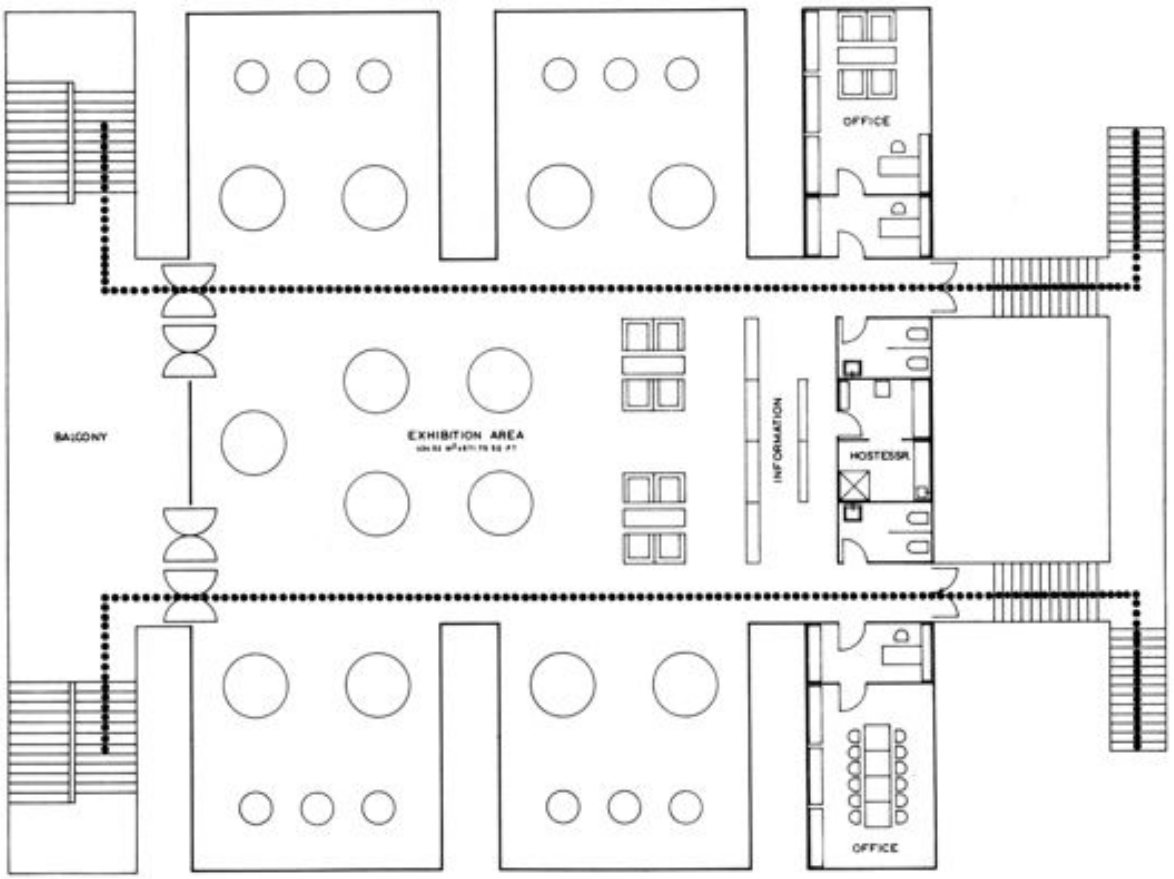
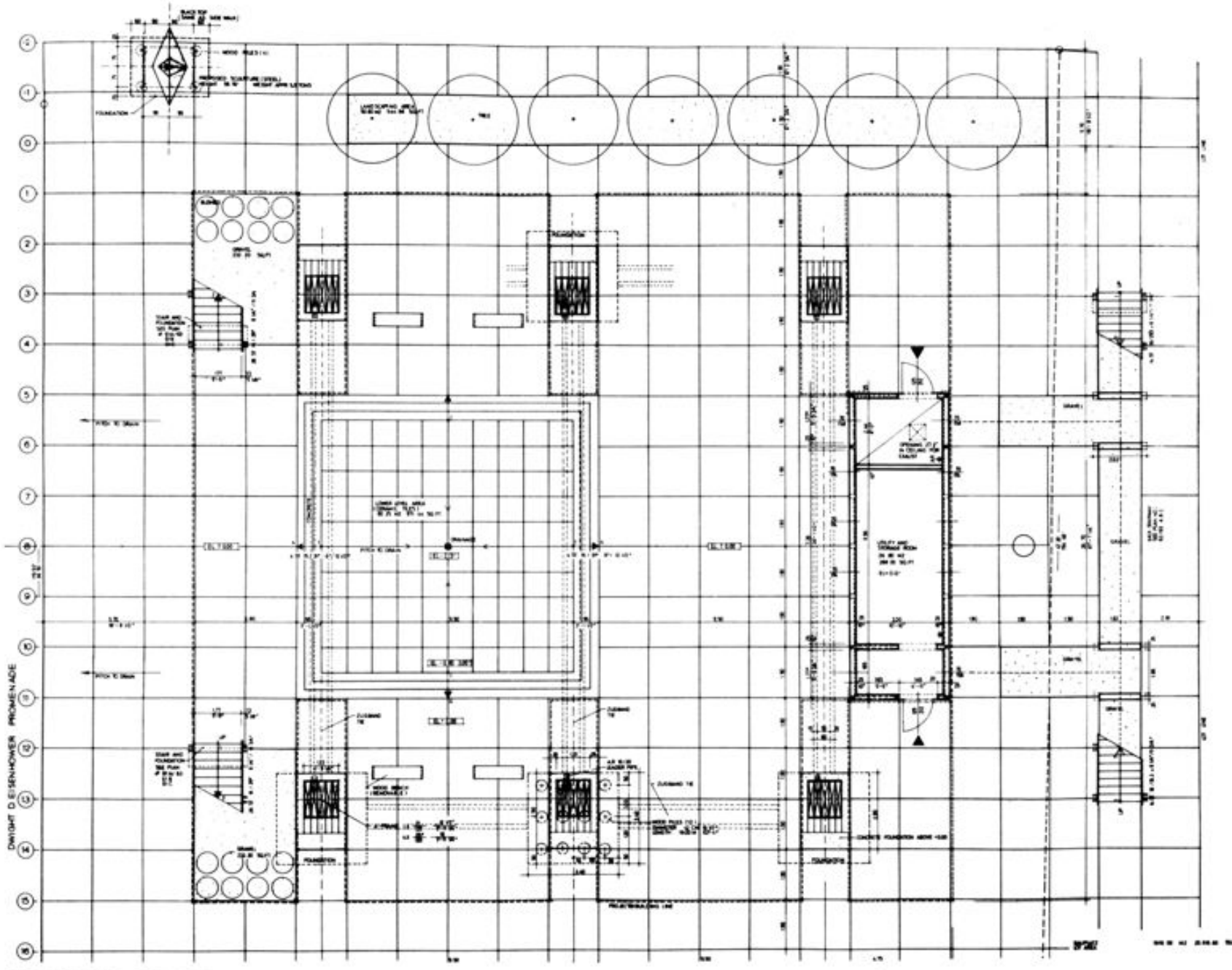


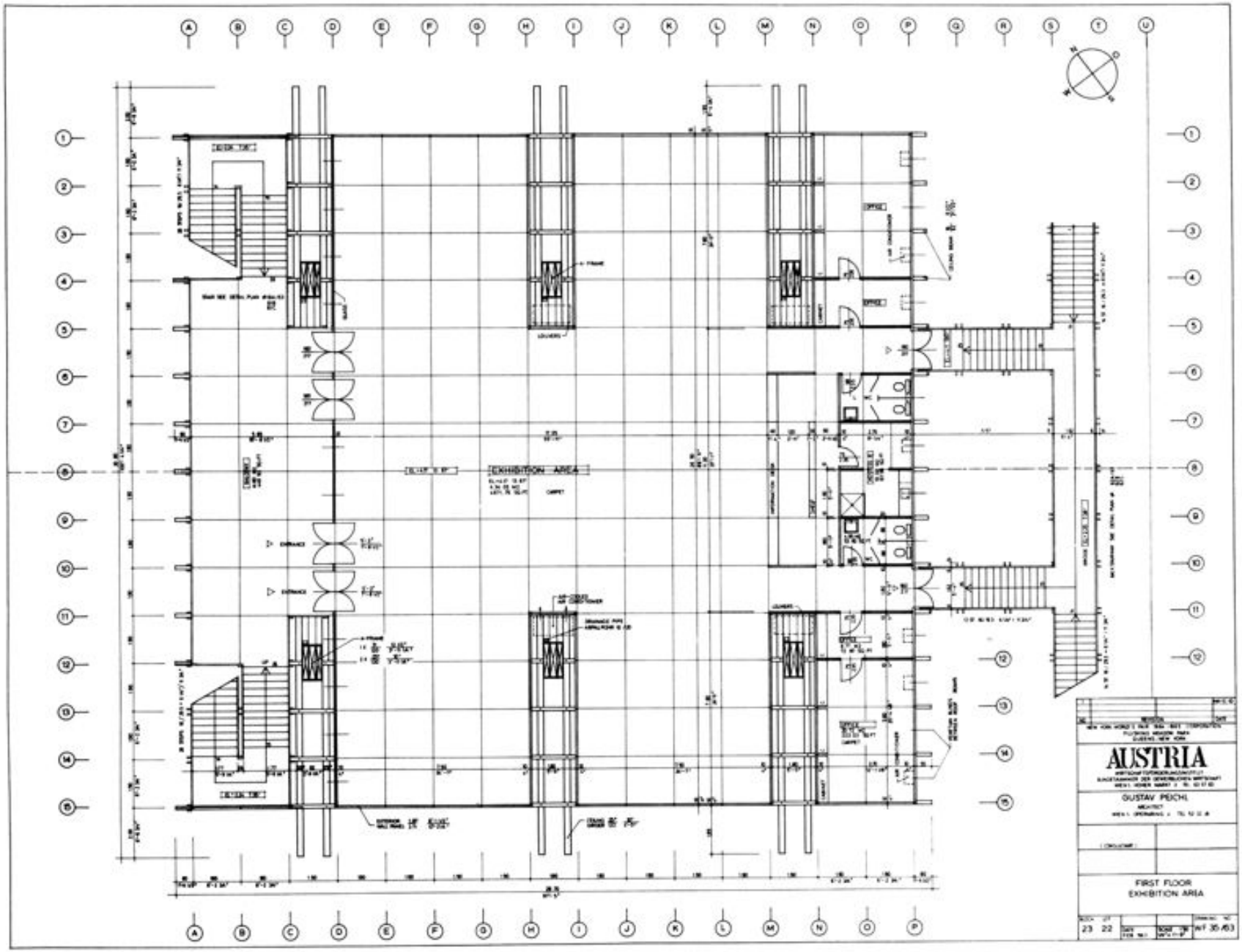
PLAN OF FLOOR TRAFFIC

Metric Scale: 1 : 200
Approximate English Scale: 1/16" — 1'—0"



GROUND PLAN

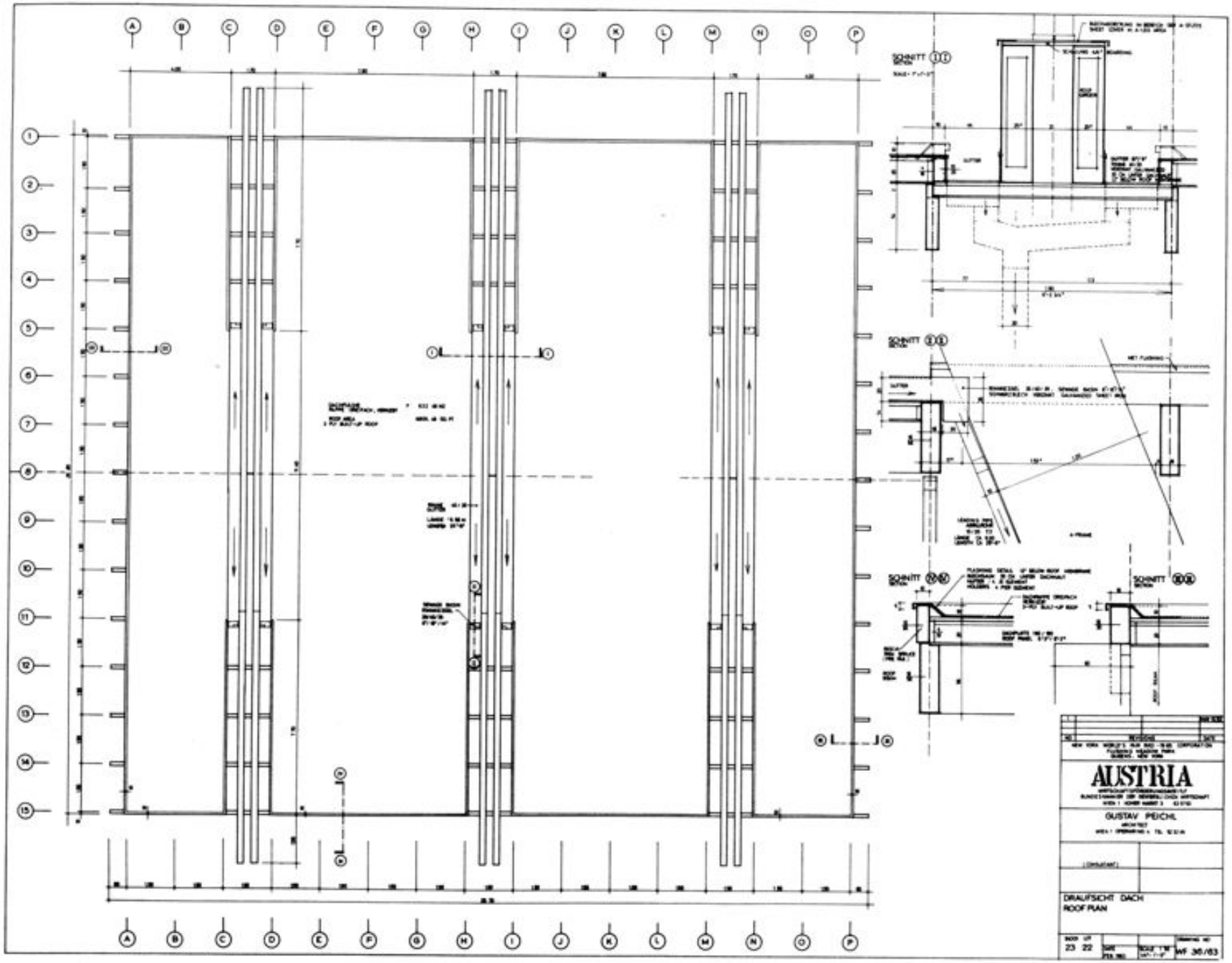
Metric Scale: 1 : 200
Approximate English Scale: 1/16" — 1'—0"



FIRST FLOOR

Metric Scale: 1 : 200

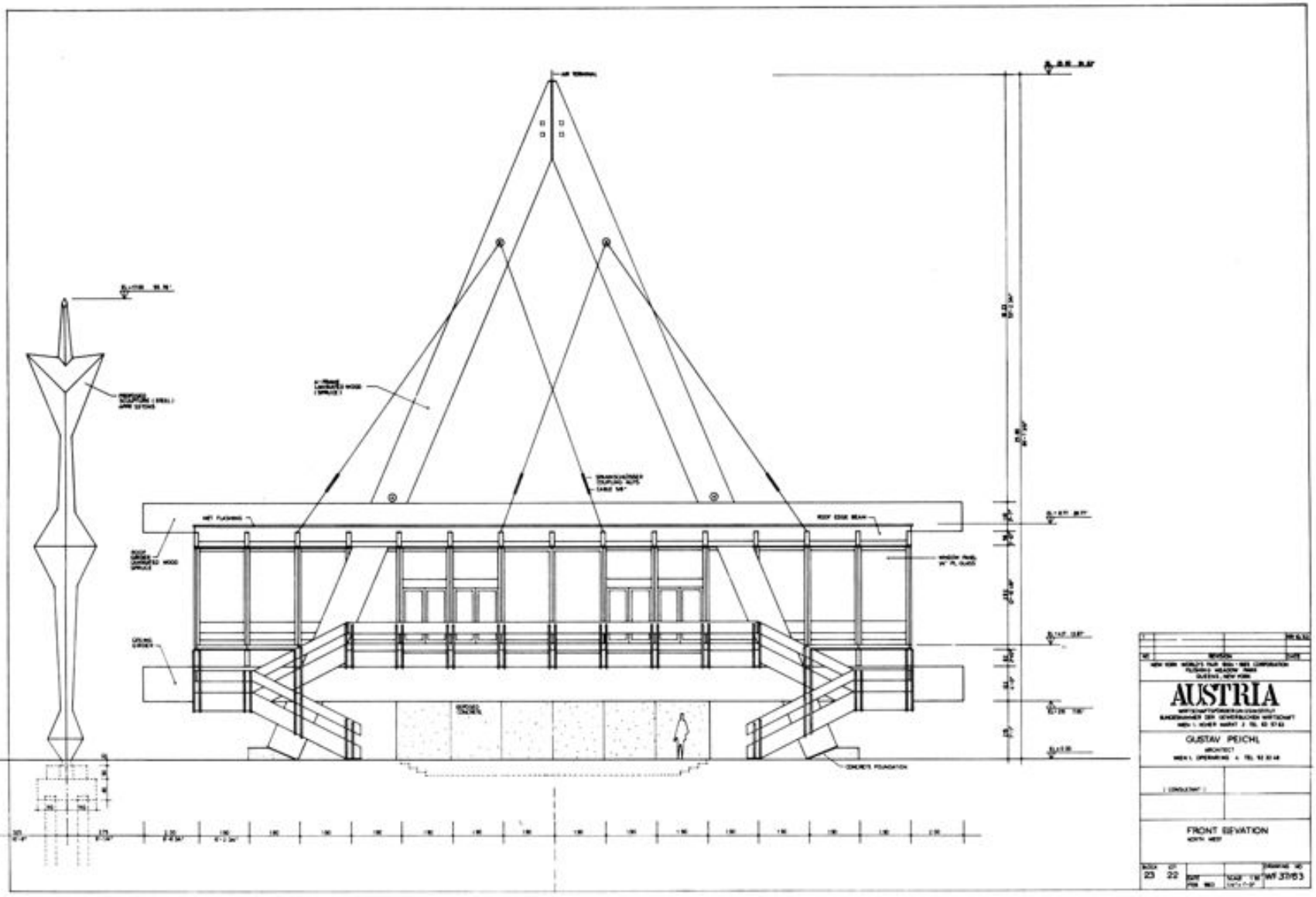
Approximate English Scale: 1/16" — 1'—0"



ROOF PLAN

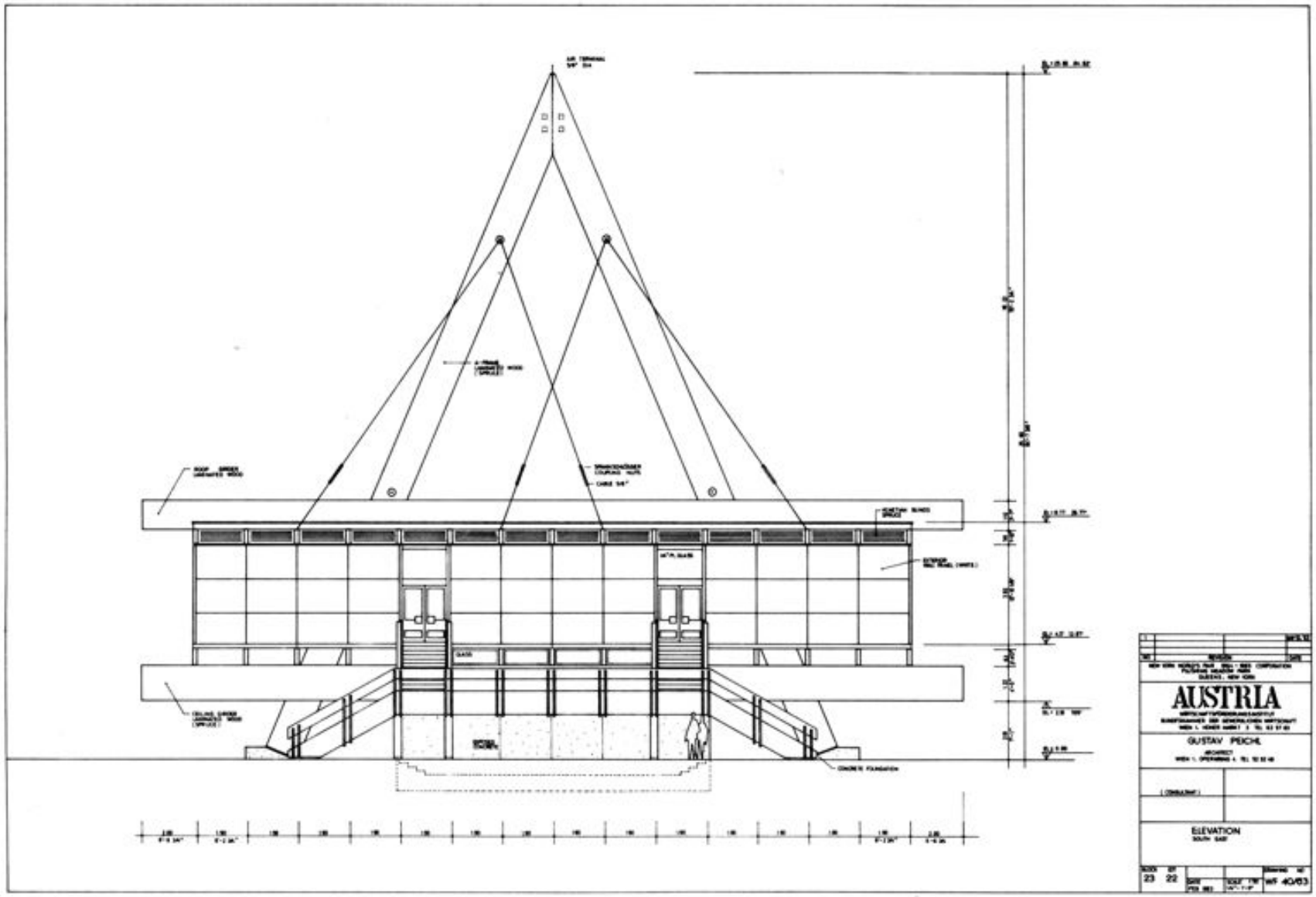
Metric Scale: 1 : 200

Approximate English Scale: 1/16" = 1'—0"



NORTH-WEST

Metric Scale: 1 : 200
Approximate English Scale: 1/16" — 1'—0"



SOUTH-WEST

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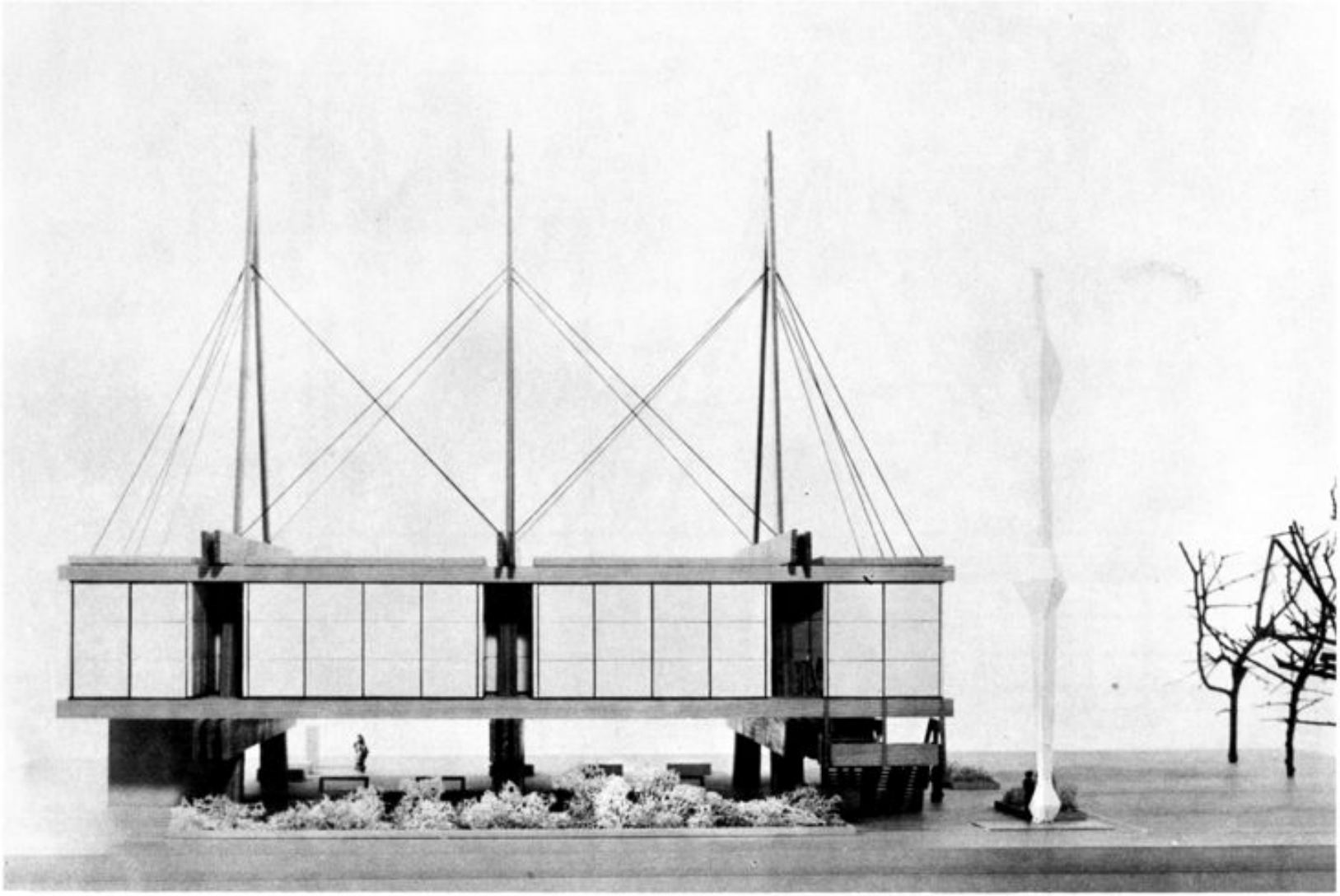

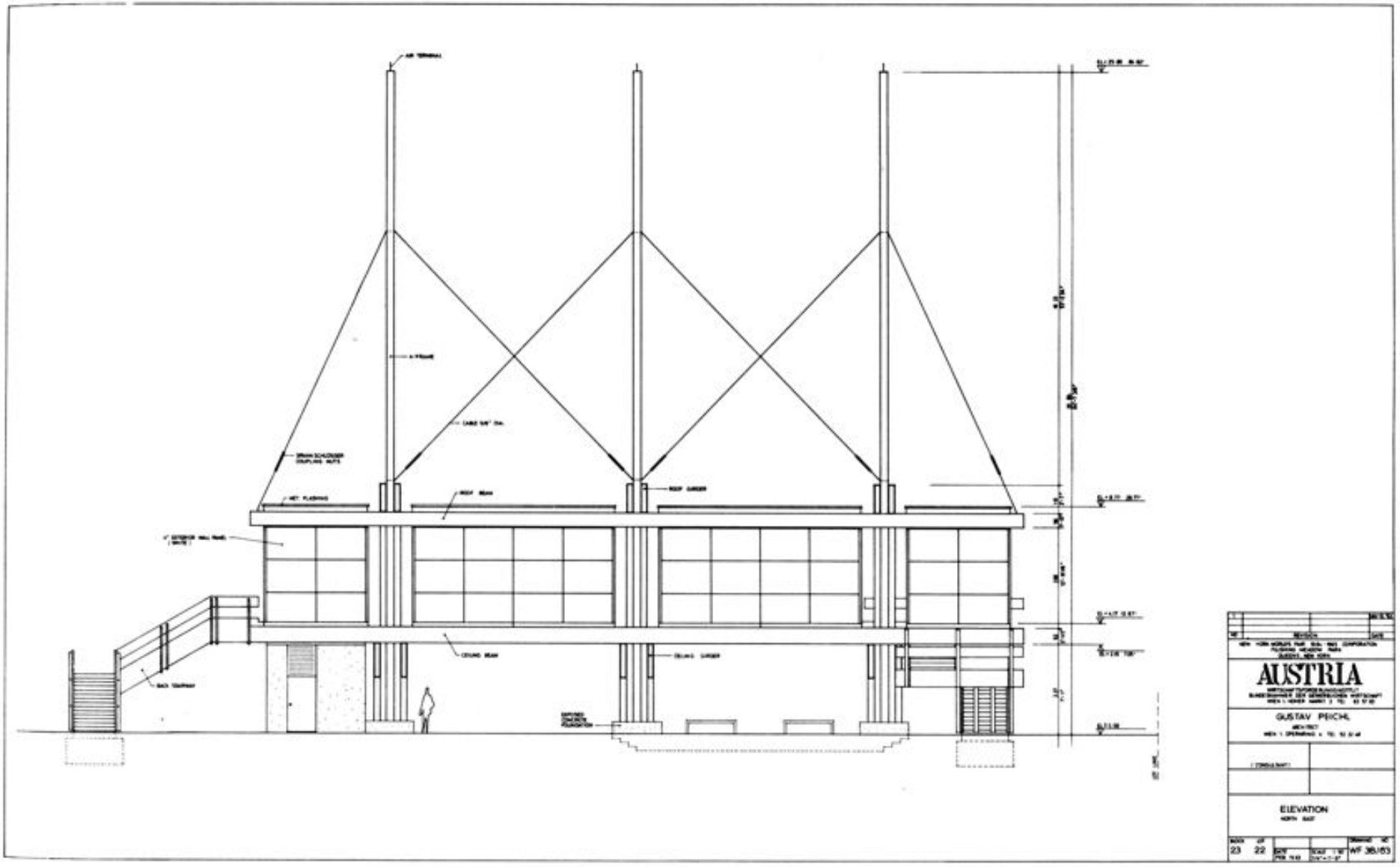

NORTH-EAST

Metric Scale: 1 : 200
Approximate English Scale: 1/16" — 1'—0"

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