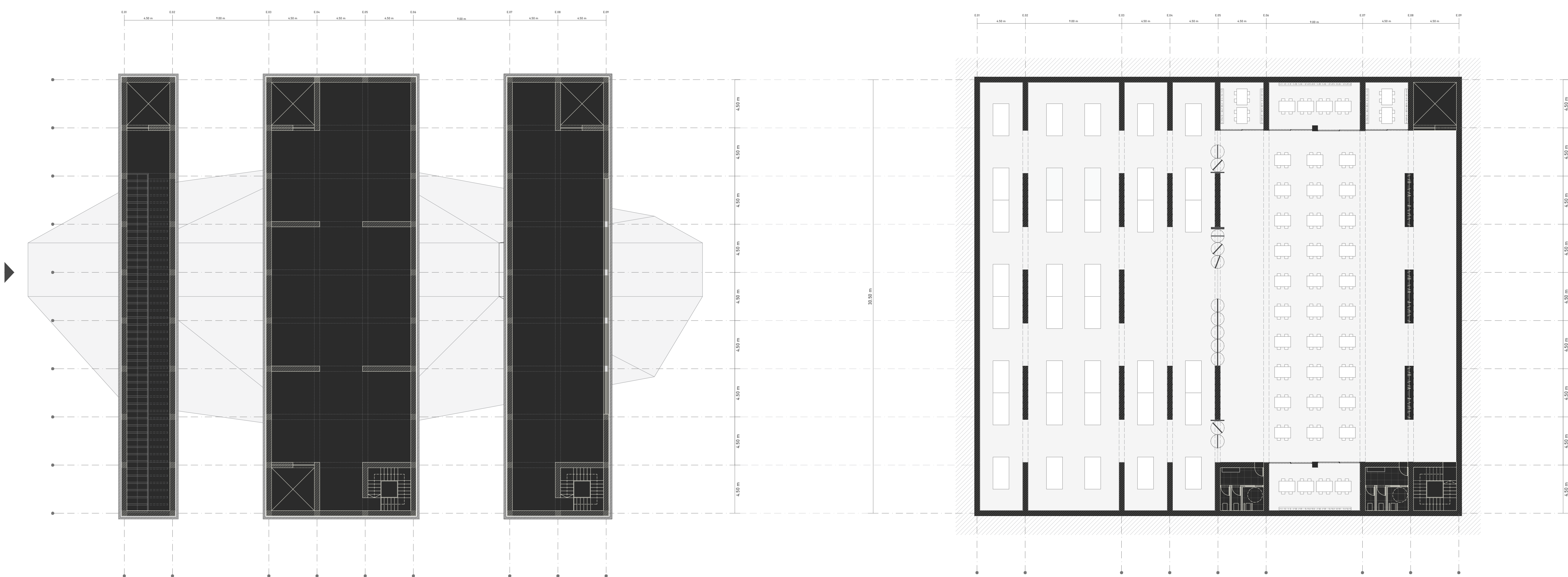
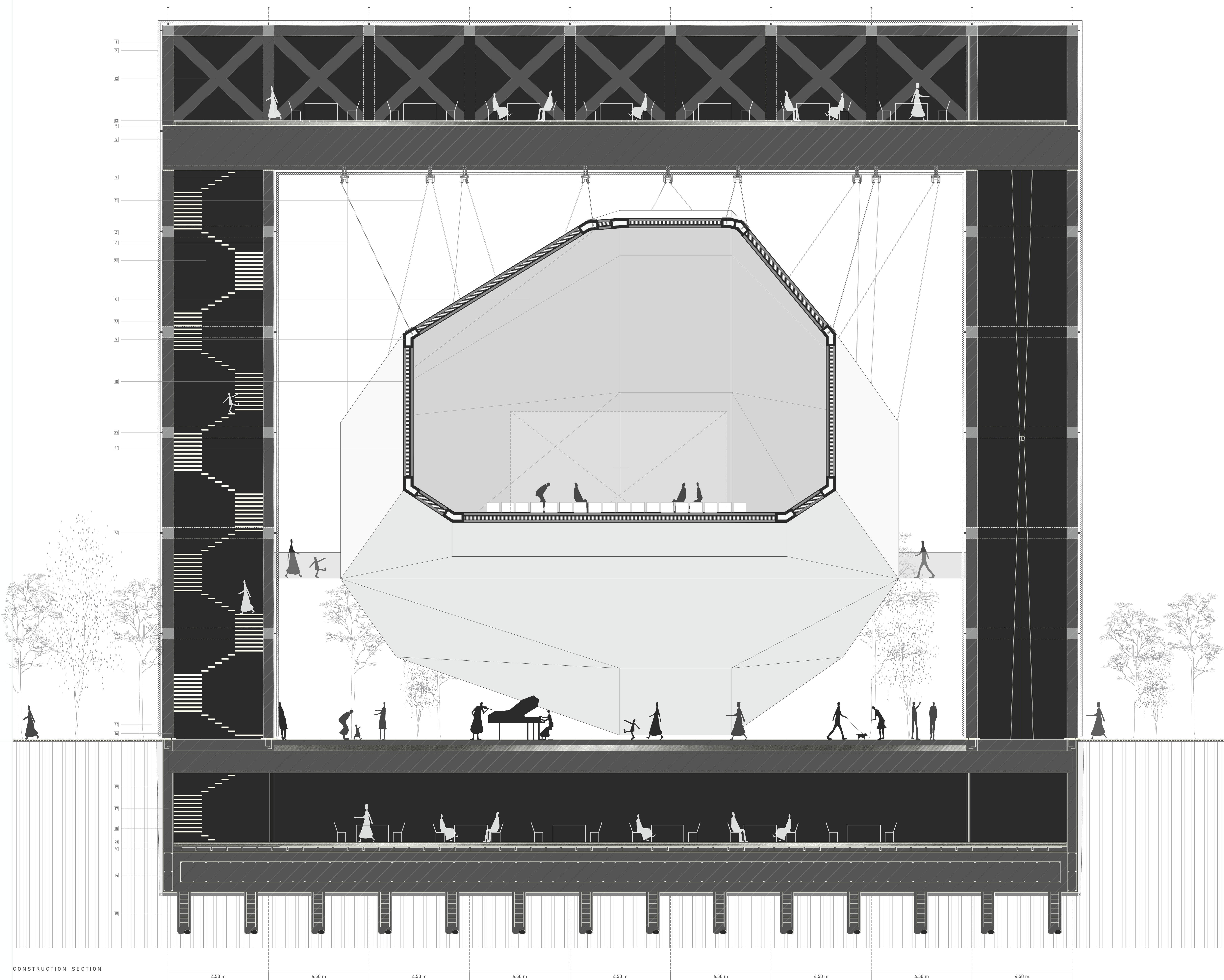


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HABITABLE ARCHIVE OF ART AND CIVIC CENTRE IN VENICE
ALEJANDRO OBREGON DIAZ – REY JUAN CARLOS UNIVERSITY (URJC)



CONSTRUCTION SECTION



CONSTRUCTION SECTION GRAPHIC SCALE

Primary structural system formed by steel truss portal frames made of HEB500 sections, arranged in a continuous modular grid along the building, acting as the main load-bearing system that collects and transfers vertical, horizontal and accidental loads to the deep foundation system, ensuring global three-dimensional stability.

Steel trusses are wrapped by a continuous metal mesh envelope that does not interfere with structural behavior, allowing ventilation and partial visibility of the framework while providing protection against impacts, environmental agents and accidental actions.

Long-span deep steel beam of approximately 2.00 m depth, placed longitudinally between truss frames, acting as the main tying element that redistributes forces, absorbs large bending moments and stabilizes the structure against differential deformations.

4

Truss-to-beam connections are solved through rigid steel nodes composed of high-strength plates, internal stiffeners and full-penetration welds, ensuring the transfer of axial, shear, bending and torsional forces without discontinuities or stress concentrations.

5 High-capacity anchorage system fixed to the deep beam through rigid base plates and gusset reinforcements, designed to receive tensile forces from the suspended system and transmit them efficiently to the primary structure.

6 High-strength galvanized steel cable system working exclusively in tension, arranged linearly between the main beam and lower suspended elements, forming a controlled structural suspension system without intermediate supports.

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Cable connection hardware in precision-machined steel, including spherical joints, tensioning devices and safety pins, allowing installation control, pretension adjustment and accommodation of structural movements.

8 Suspended volume formed by longitudinal polygonal steel ring frames, each acting as a primary structural unit that resists tension, bending and deformation induced by suspension, wind and dynamic actions.

9 Polygonal ring system made of structural steel profiles interconnected by radial, diagonal and diaphragm elements, ensuring global cooperation, uniform stress distribution and geometric stability against out-of-plane deformation.

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10
Lightweight multilayer envelope applied over the suspended ring system, composed of secondary steel substructure, thermal insulation, vapor barrier, waterproofing layer and external protective finish against environmental

Global suspension system based on prestressed steel cables anchored to the deep beam, working purely in tension and transferring gravitational loads directly to the main structural system without intermediate supports.

12

Global bracing system composed of steel diagonals, cross bracing and triangulated elements, ensuring structural stability against horizontal loads, vibrations, dynamic effects and potential instability phenomena.

Habitable floor integrated within the truss system using secondary steel profiles and composite slab with reinforced concrete topping (HA-25 with B500S), acting as a load-bearing diaphragm for circulation and installations.

Reinforced concrete raft foundation designed as a load distribution element that receives forces from the steel structure and transmits them uniformly to the micropile system, minimizing differential settlements.

15 Micropile foundation system executed in situ by drilling, steel reinforcement insertion and pressure grouting, connected to the raft through rigid pile caps that transfer loads to deep competent soil layers.

Base support system for trusses composed of rigid steel base plates anchored to the raft with high-strength bolts, ensuring safe transmission of axial, shear and bending forces to the foundation system.

17 Reinforced concrete basement retaining walls designed to resist earth pressures and hydrostatic loads, ensuring stability of the underground volume under permanent and variable conditions.

18 External waterproofing system for basement walls composed of continuous membrane, protection layer and drainage board, preventing water ingress and protecting the structure from soil moisture.

Perimeter drainage system using perforated pipes wrapped in geotextile filter fabric, placed at foundation level and connected to evacuation networks to reduce hydrostatic pressure.

Intermediate floor system using prestressed joists and hollow blocks with reinforced concrete topping (HA-25 with B500S), acting as a rigid diaphragm for load distribution and structural stabilization.

21 Interior flooring base formed by self-leveling mortar over a separation membrane, ensuring surface regularity, acoustic decoupling and preparation for final finishes and installations.

22

Exterior raised paving system using adjustable pedestal supports, creating a ventilated cavity that allows drainage, moisture control, maintenance access and improved hygrothermal performance.

Global load transfer system where forces are progressively transmitted from the suspended ring structure through cables, anchors, deep beam and trusses to the micropile foundation, ensuring structural continuity.

24 High-strength bolted connection system between steel elements using preloaded bolts, enabling modular assembly of trusses, beams and secondary components without loss of structural performance.

25

Deformation control system based on adjustable cable tensioning devices, allowing geometric correction, deflection control and long-term stabilization of the suspended structure.

Corrosion protection system for steel elements using hot-dip galvanization and intumescent coating, ensuring durability and compliance with fire resistance and environmental exposure requirements.

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