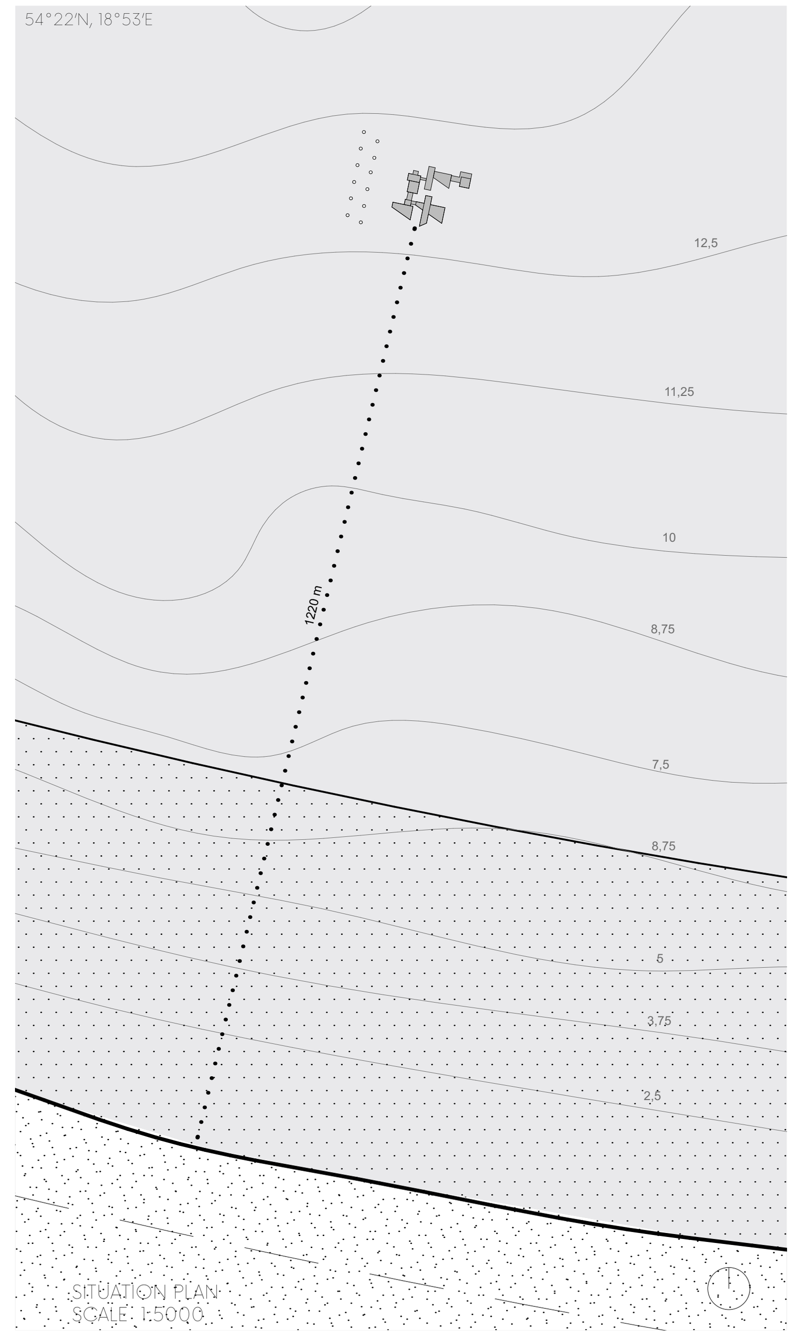
FLOATING RESEARCH AND PURIFICATION CENTER FOR THE GULF OF GDAŃSK

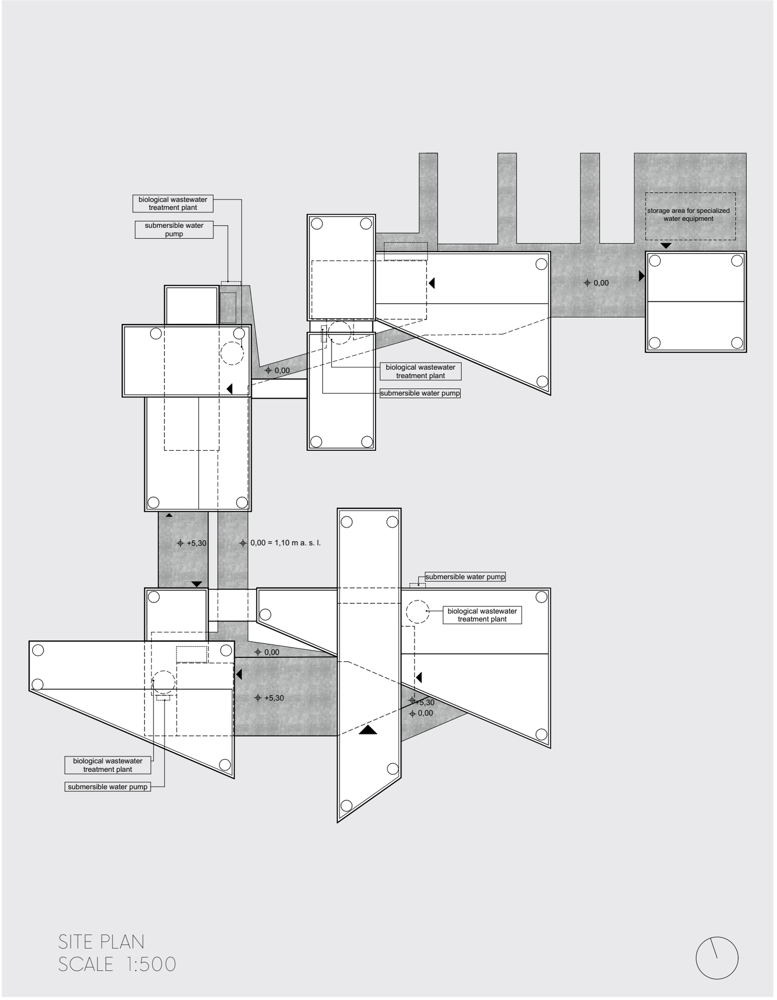
Modern Form of Marine Architecture as a Response to Contemporary Environmental and Climate Challenges.

The Floating Research and Purification Center, located near Sobieszewo Island in Gdańsk, was designed as a response to contemporary climate and environmental challenges. Its primary mission is to locate and recover barrels containing chemical warfare agents sunk in the seas after World War II.

The structure floats on floating foundations and hydraulic piles, which ensure stability even under harsh marine conditions. Thanks to these elements, the building adapts to the water level, and in the case of extreme weather conditions, the entire facility can be elevated by up to 5 meters.

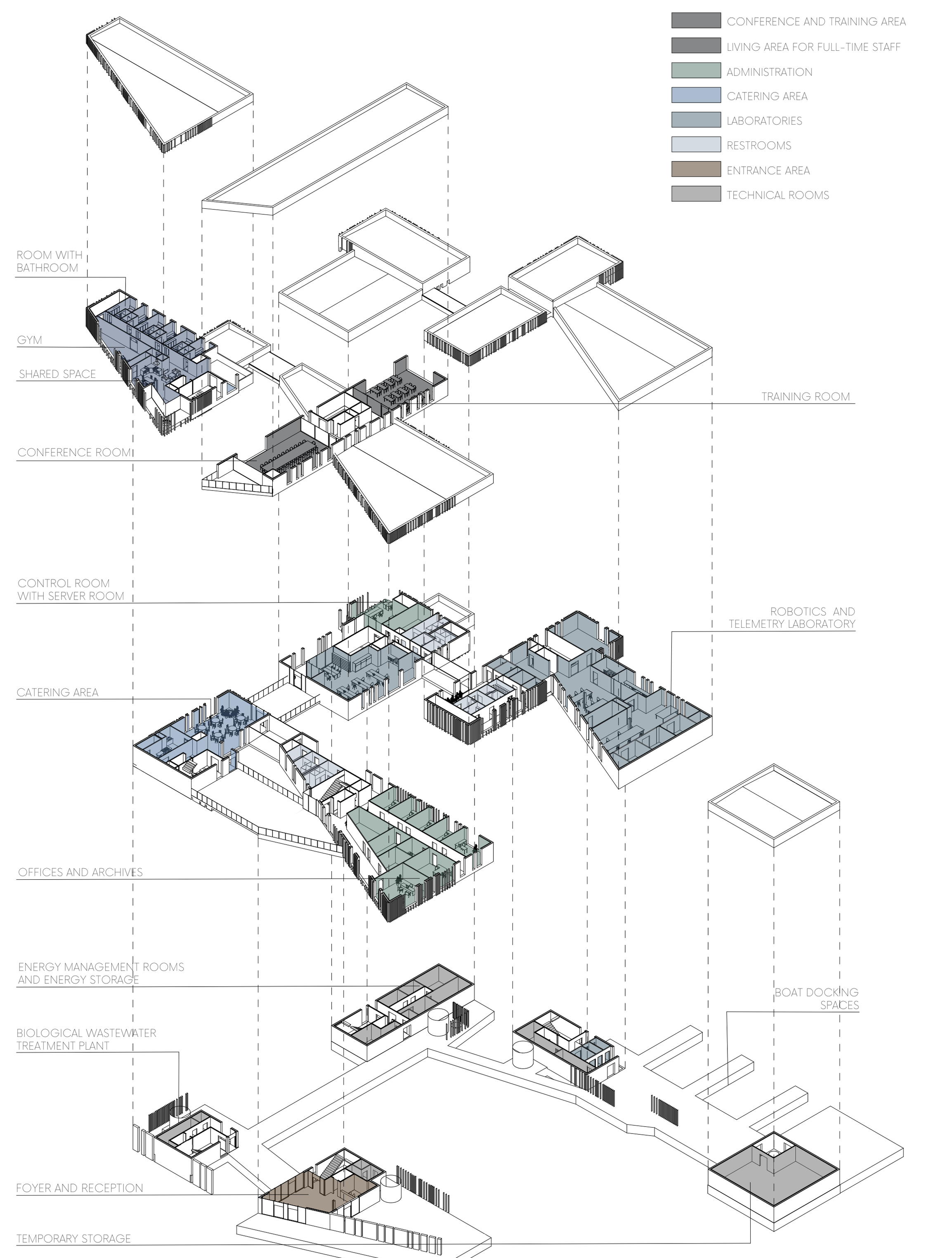
The center is completely self-sufficient — equipped with advanced water treatment systems and sustainable energy sources, including wind turbines and installations harnessing wave and tidal energy. The project combines research, ecological, and technological functions, offering an innovative solution that supports marine environmental protection.



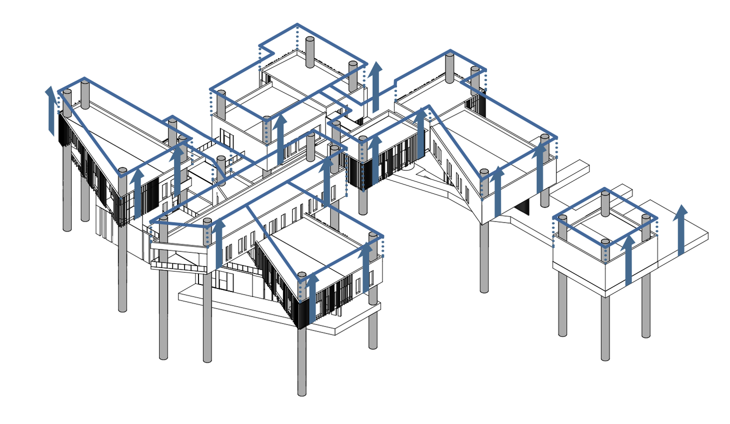


LEGEND:

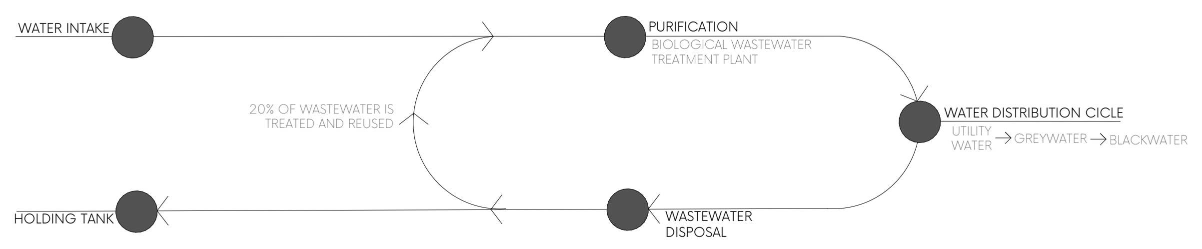
COASTAL PROTECTION ZONE	WATERLINE
MARINE ZONE	PROTECTED ZONE BOUNDARY
SHORELINE	DISTANCE FROM SHORE
PIERS	WIND TURBINE
SEABED CONTOURS	ENTRANCE
VIEW CORRIDORS FROM LOW-RISE BUILDINGS	WASTE STORAGE AREA



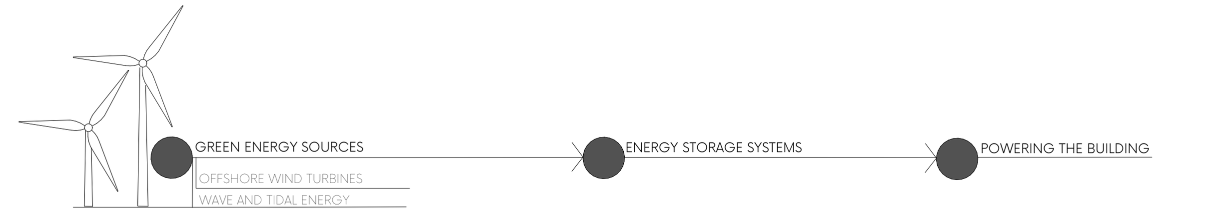
In critical situations, the building utilizes a sophisticated hydraulic system to elevate the entire structure by up to 5 meters. This proactive defense mechanism allows the property to rise above dangerous floodwaters and extreme environmental hazards that would otherwise compromise its structural integrity. By establishing this vertical clearance, the system ensures occupant safety and protects vital infrastructure from water damage. Designed with flexible utility connections, the building maintains full operational functionality and remains a stable, habitable environment even at maximum elevation. Ultimately, this capability transforms the static structure into an adaptive, resilient shield capable of withstanding severe climate events while ensuring long-term continuity of use.

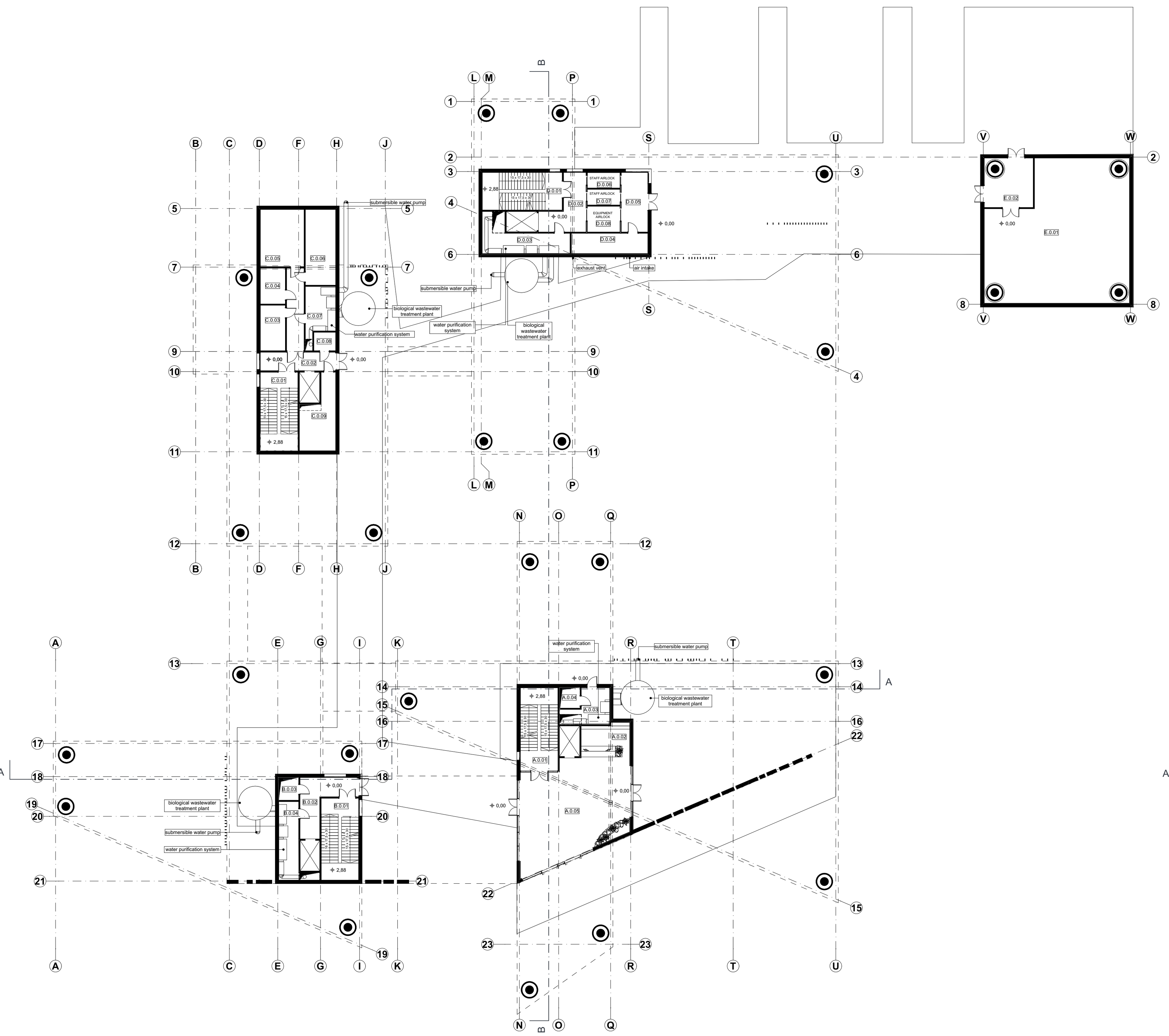


WATER CIRCULATION IN THE BUILDING

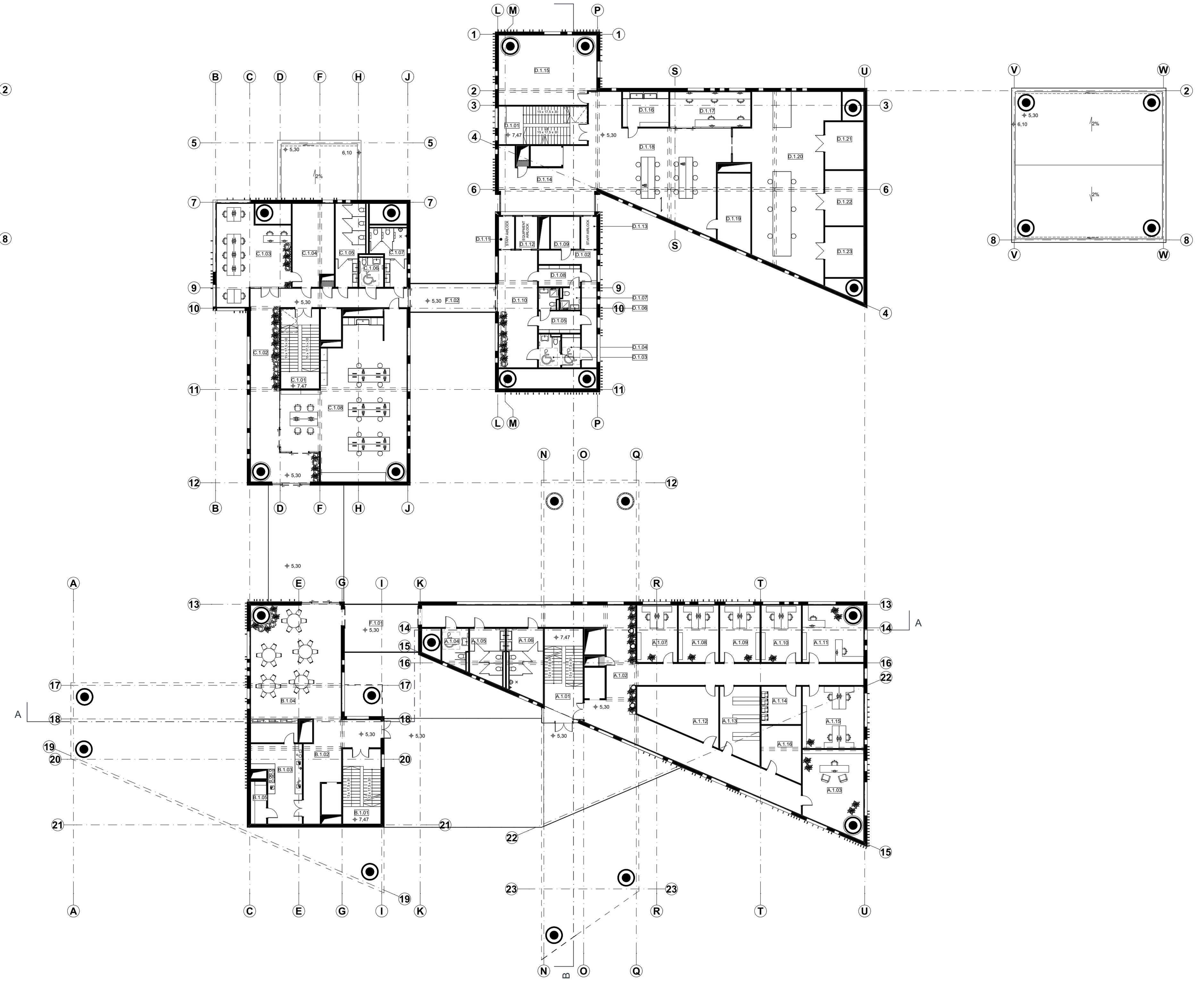


ENERGY PRODUCTION IN THE BUILDING

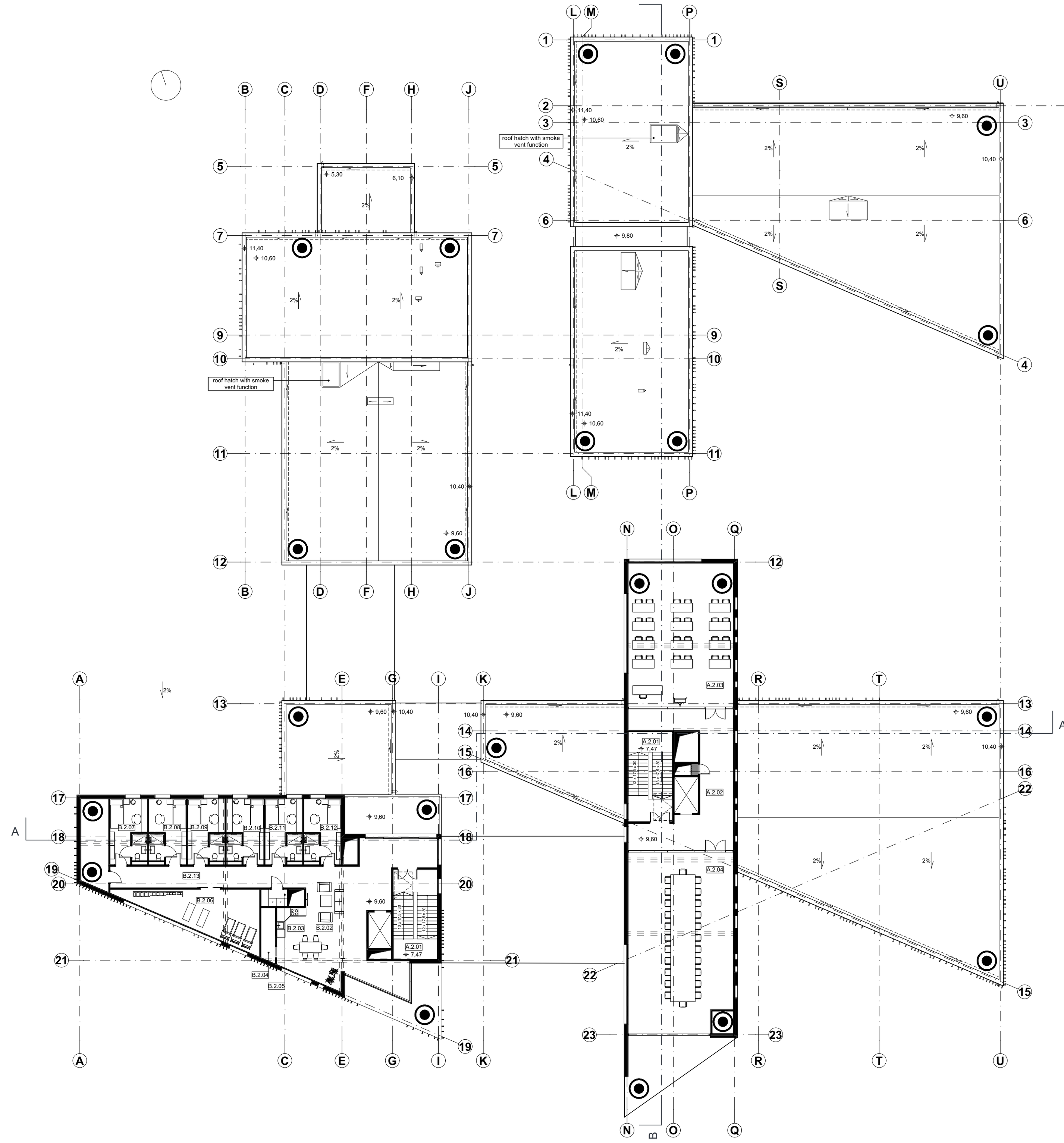




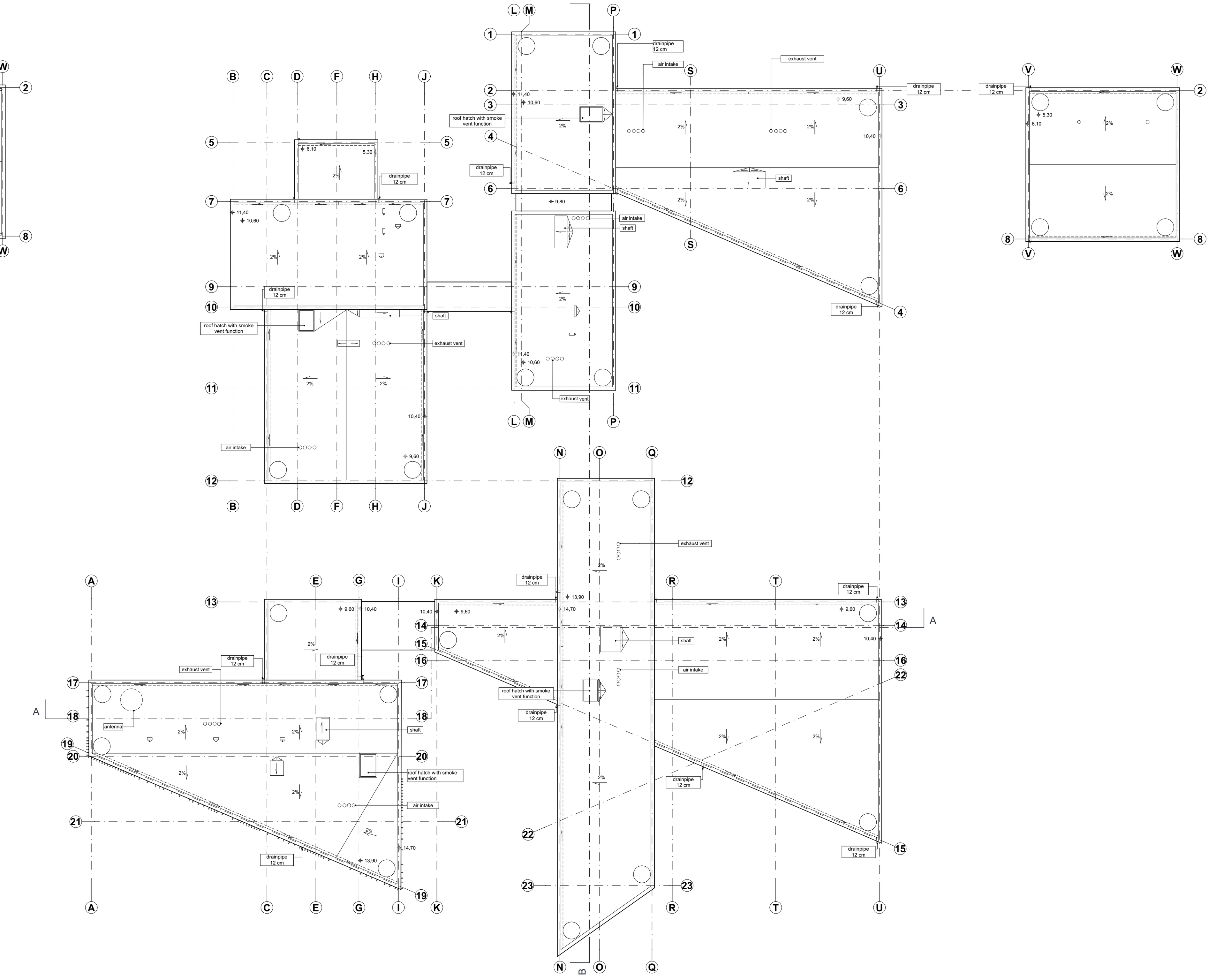
GROUND FLOOR PLAN
SCALE 1:200



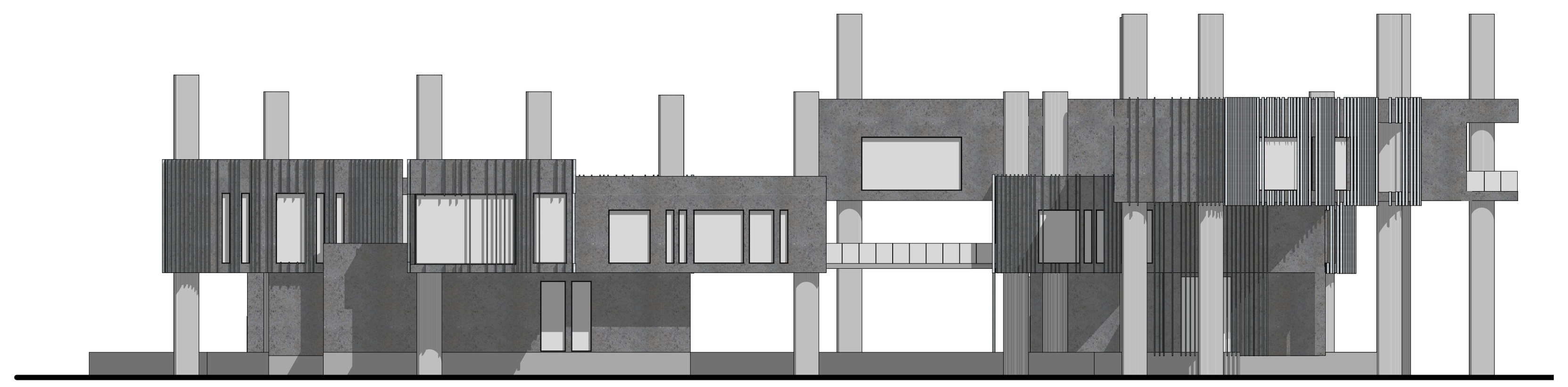
LEVEL +1 FLOOR PLAN
SCALE 1:200



LEVEL +2 FLOOR PLAN
SCALE 1:200

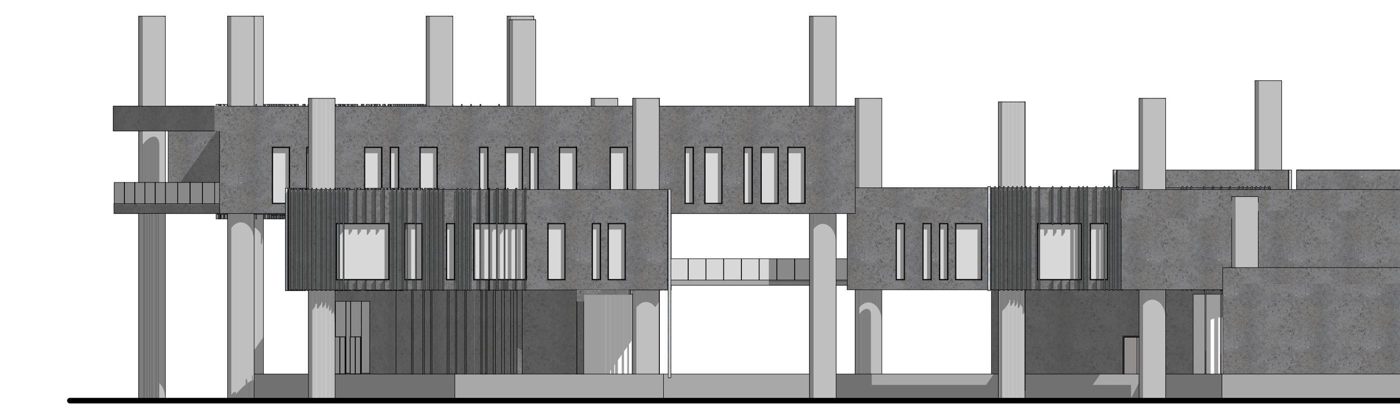


ROOF PLAN
SCALE 1:200

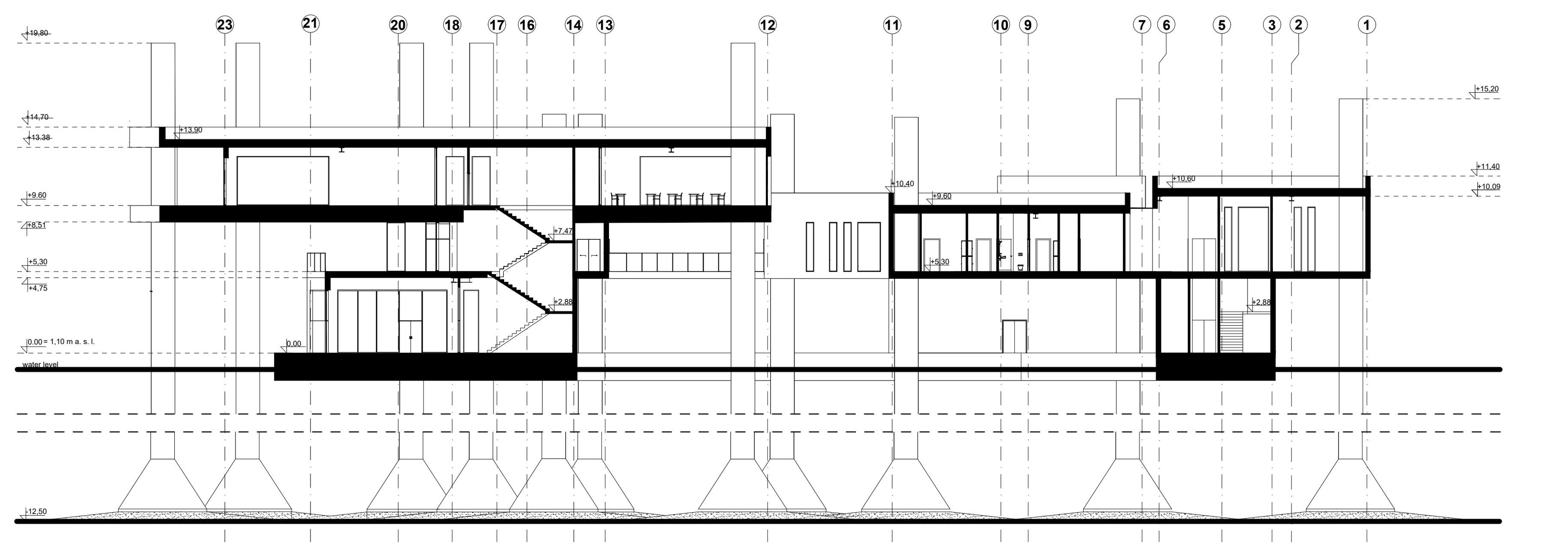


WEST ELEVATION
SCALE 1:200

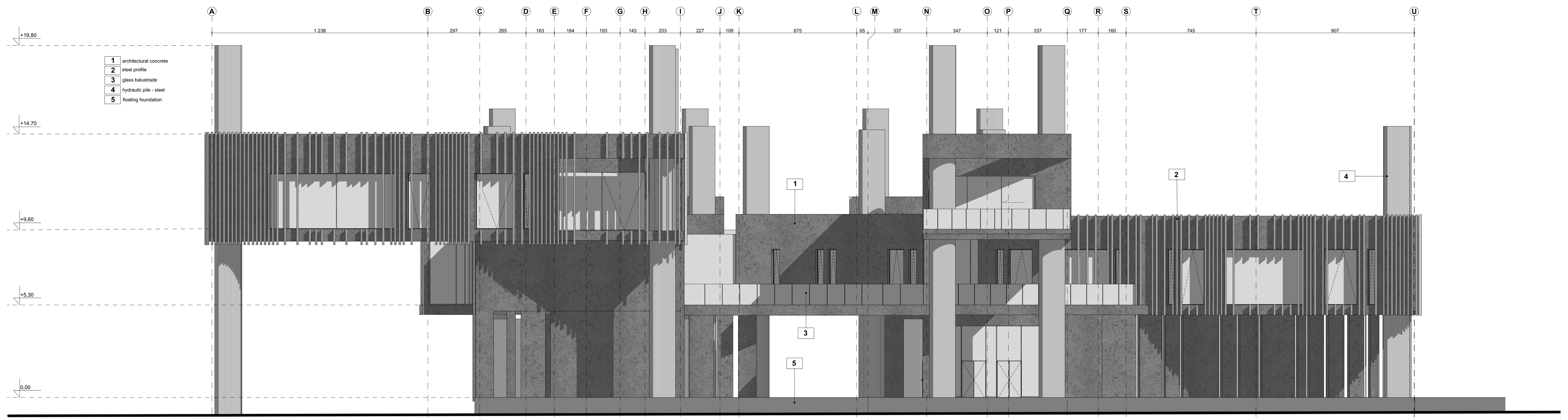
NORTH ELEVATION
SCALE 1:200



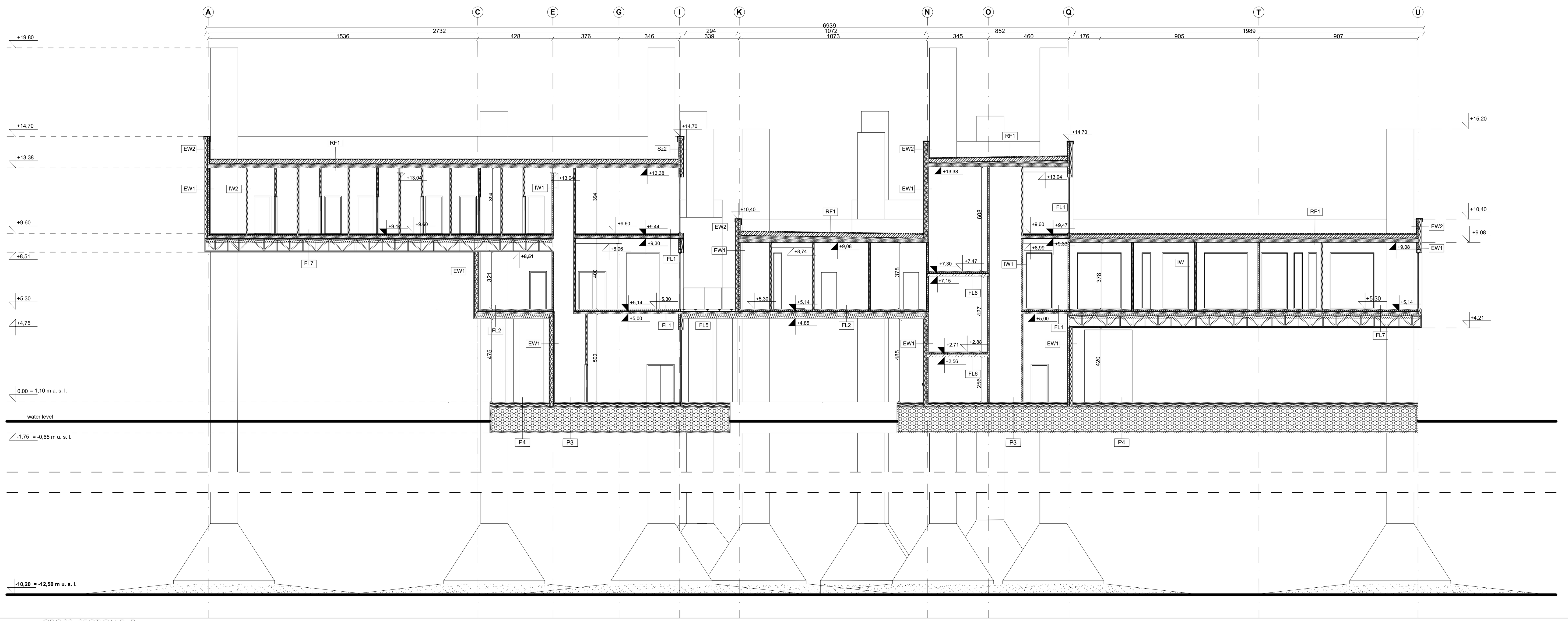
EAST ELEVATION
SCALE 1:200



CROSS-SECTION B-B
SCALE 1:200



SOUTH ELEVATION
SCALE 1:100



CROSS-SECTION B–B
SCALE 1:100

Sz1	
acrylic-silicone render on reinforcing mesh	3 mm
fibre-cement board	1 cm
calcium silicate panels	2 cm
mineral wool	15 cm
steel profiles with 30cm spacing	10 cm
calcium silicate panels	2 cm
fibre-cement board	1 cm
cement-lime plaster	1 cm

Sz2	
acrylic-silicone render on reinforcing mesh	3 mm
fibre-cement board	1 cm
calcium silicate panels	2 cm
mineral wool	15 cm
steel profiles with 30cm spacing	10 cm
calcium silicate panels	2 cm
fibre-cement board	1 cm
PVC membrane	2 mm

Sz3	
tempered glass (ESG)	8 mm
PVB foil	1,5 cm
tempered glass (ESG)	6 mm
PVB foil	1,5 cm
tempered glass (ESG)	8 mm
low-emissivity coating	-

Sw1	
fibre-cement board	1 cm
calcium silicate panels	2 cm
steel profiles with 30cm spacing	10 cm
calcium silicate panels	2 cm
cement-lime plaster	1 cm

Sw2	
cement-lime plaster	1 cm
fibre-cement board	1 cm
mineral wool	10 cm
fibre-cement board	1 cm
cement-lime plaster	1 cm

Sw3	
stainless steel	1 cm
PIR polyurethane foam	12 cm
stainless steel	1 cm

Sw4	
cement-lime plaster	1 cm
water-resistant gypsum board	2 cm
mineral wool	5 cm
steel profiles	1 cm

P1	
flooring	2 cm
concrete screed	7 cm
PE foil	2 mm
mineral wool	8 cm
filigree slab	14 cm
acrylic-silicone render on reinforcing mesh	3 mm

P2	
flooring	2 cm
concrete screed	7 cm
PE foil	2 mm
mineral wool	8 cm
filigree slab	14 cm
XPS boards	25 cm
acrylic-silicone render on reinforcing mesh	3 mm
calcium silicate board	2 cm
fibre-cement board	1 cm
acrylic-silicone render on reinforcing mesh	3 mm

P3	
flooring	2 cm
concrete screed	7 cm
PE foil	2 mm
XPS boards	15 cm
PE foil	2 mm
PVC foil	1 cm
floating foundation: concrete PIR foam concrete	 8 cm 134 cm 8 cm

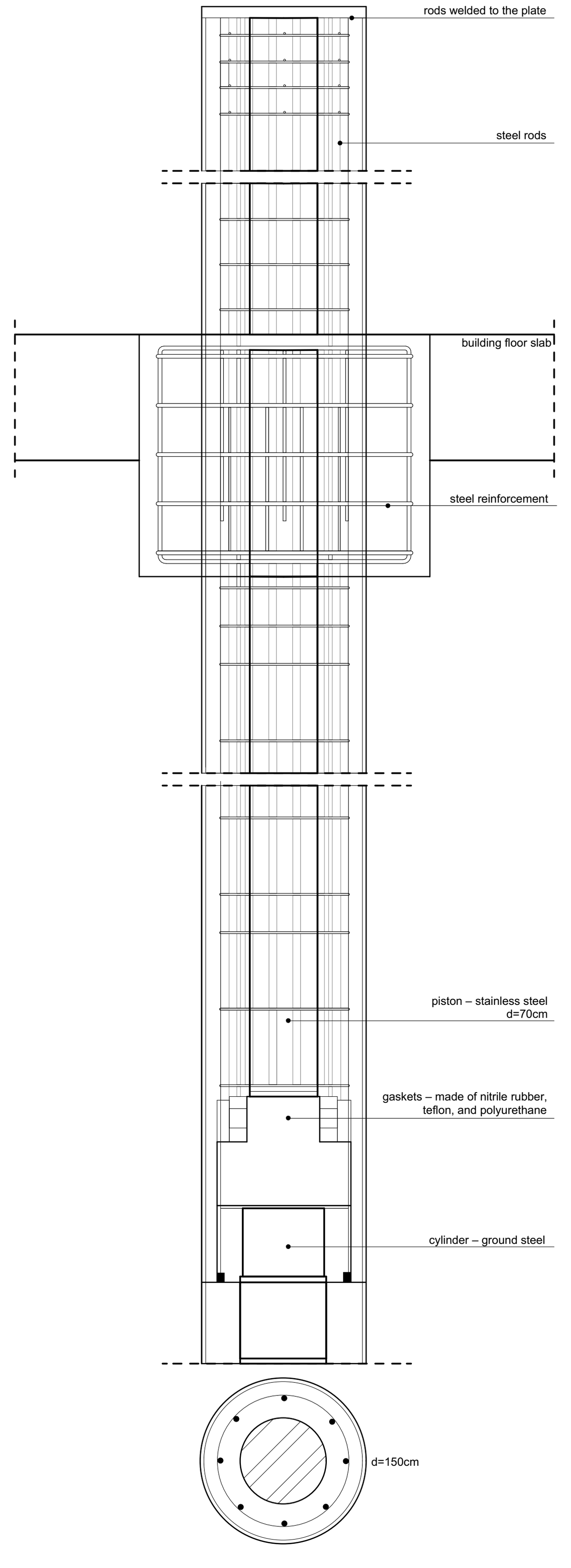
P4	
concrete screed	14 cm
steel reinforcement	
XPS boards	8,5 cm
PE foil	2 mm
PVC foil	1 cm
floating foundation: concrete PIR foam concrete	 8 cm 134 cm 8 cm

P5	
terrace slabs	2 cm
spacer supports	3 cm
PE foil	2 mm
filigree slab	14 cm
PIR foam	15 cm
acrylic-silicone render on reinforcing mesh	3 mm

P6	
flooring	2 cm
reinforced concrete slab	15 cm
cement-lime plaster	1 cm

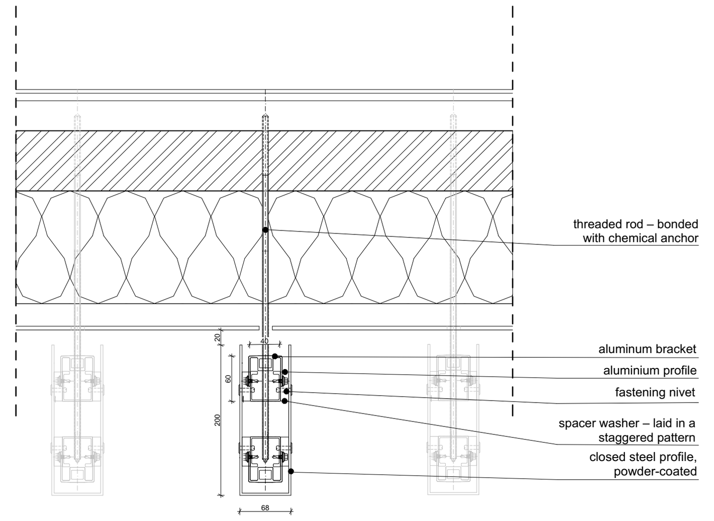
P7	
flooring	2 cm
concrete screed	7 cm
PE foil	2 mm
mineral wool	8 cm
filigree slab	14 cm
PIR foam	25 cm
steel truss	75 cm
calcium silicate board	2 cm
fibre-cement board	1 cm
acrylic-silicone render on reinforcing mesh	3 mm

Std1	
gravel	5 cm
PE foil	2 mm
PIR foam	20 cm
PE foil	2 mm
slope layer concrete	4 cm
filigree slab	14 cm
cement-lime plaster	1 cm

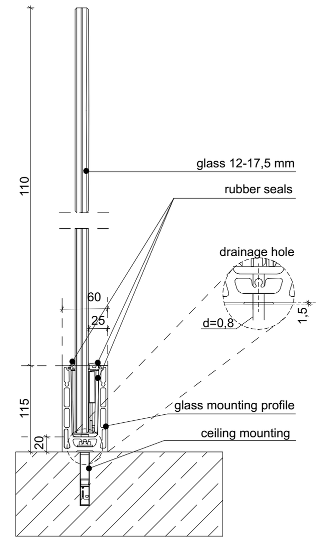


HYDRAULIC PILE DETAIL
SCALE 1:25

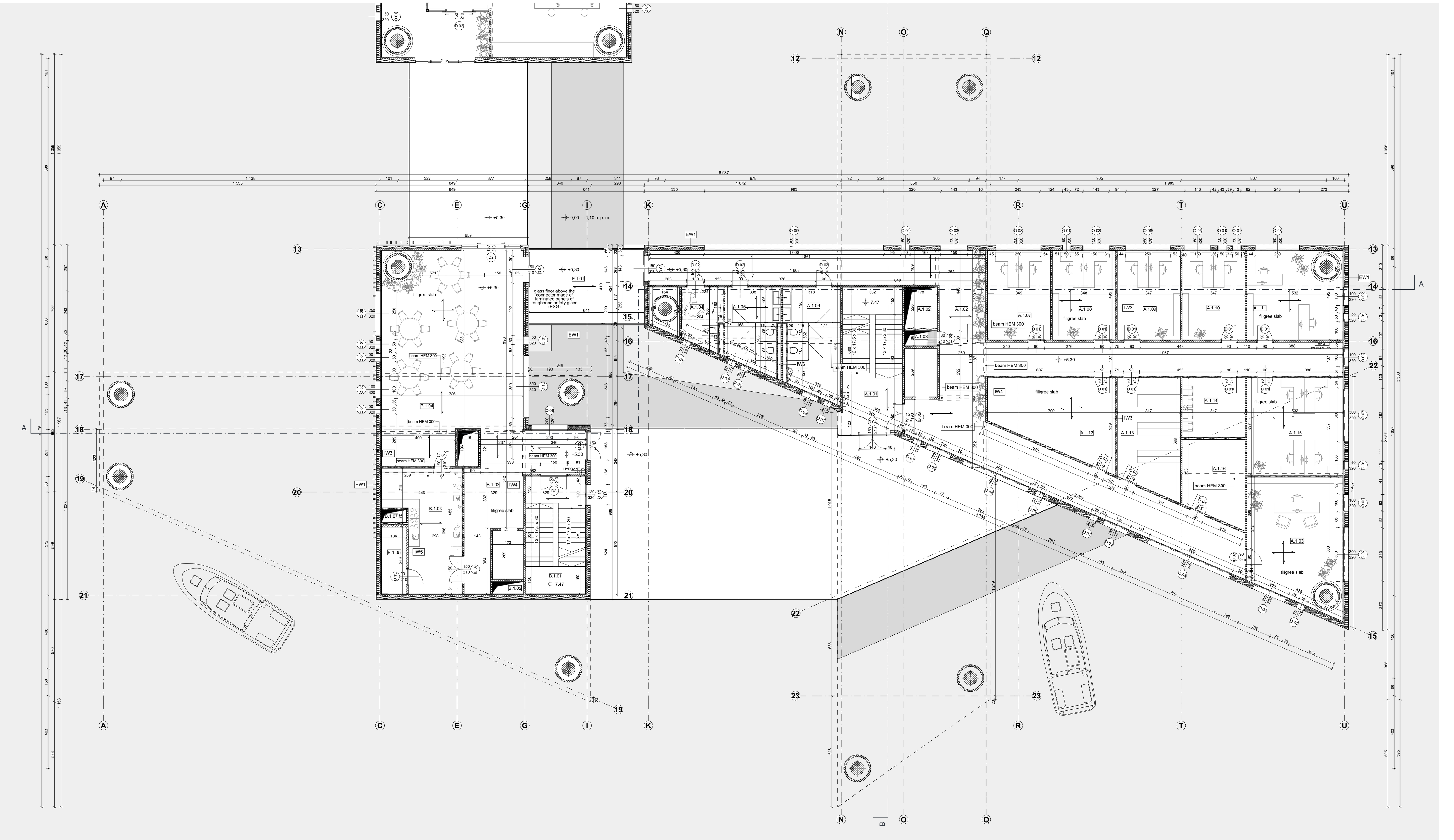
Hydraulic piles respond to the water level and raise the structure accordingly. They can also elevate the entire construction by 5 meters on demand during extreme climatic conditions.



STEEL FACADE PROFILE
SCALE 1:5



BALUSTRADE DETAIL
SCALE 1:5



CONSTRUCTION DRAWING OF PART OF LEVEL +1
SCALE 1:100