

"Those who live by the sea can hardly form a single thought of which the sea would not be part."
- Hermann Broch

Wave One

F△△B

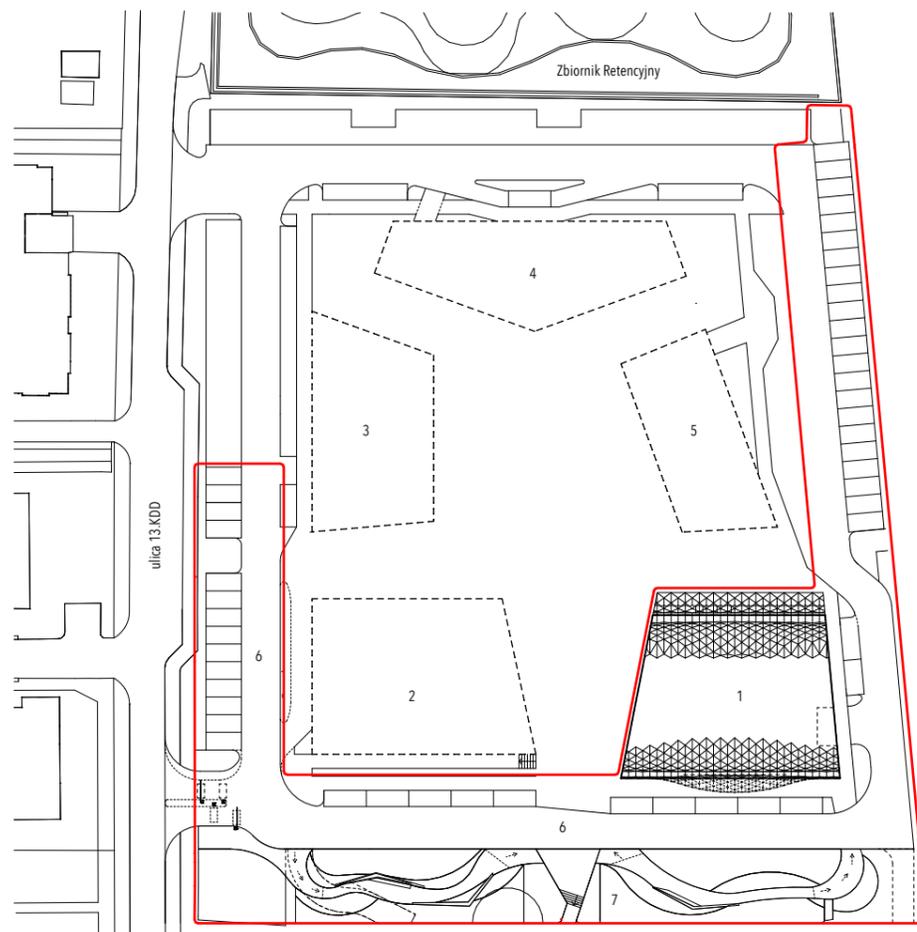


Location and history.

The building is located in Sopot, a city in the northern part of Poland, on the Bay of Gdańsk. The oldest traces of human presence in Sopot and its vicinity date from around 9,000 BC, from the Stone Age. This place also played a role in the times of the Roman Empire, when there was lively trade with the south of Europe, in connection with the so-called amber route. Today Sopot is one of the most famous health resorts in Poland. The beginnings of this maybe from 1823, when Jan Haffner, a former physician in Napoleon Bonaparte's army, erected a bathing facility. In the following years, more spa buildings were built, and the town itself began to transform into a health and summer resort.

The area on which the building was erected is in the part called Dolny Sopot or Lower Sopot - just 400 meters (a quarter mile) from the beach. From the South, it opens onto a large park system, called Błonia Sopockie (Sopot Meadows). From the North, it is adjacent to a landscape storage reservoir. This reservoir is an element of the city's hydrological safety system.

Difficult construction conditions, including high groundwater levels and the presence of non-bearing soil, meant that the plot on which the building was built remained undeveloped for years. This condition led to the progressive degradation of the area. Discarded furniture and construction rubbish was abandoned there.



Zagospodarowaniu Terenu
Site Plan
1:1000

- | | |
|---------------------------------------|---|
| 1 Fala 1 - laboratoria, administracja | 1 Wave 1 - laboratories, administration |
| 2 Fala 2 - w trakcie budowy | 2 Wave 2 - under construction |
| 3 Fala 3 - projektowane | 3 Wave 3 - design phase |
| 4 Fala 4 - w trakcie budowy | 4 Wave 4 - under construction |
| 5 Fala 5 - w trakcie budowy | 5 Wave 5 - under construction |
| 6 droga wewnętrzna | 6 internal road (private) |
| 7 park wstęgowy | 7 ribbon park |

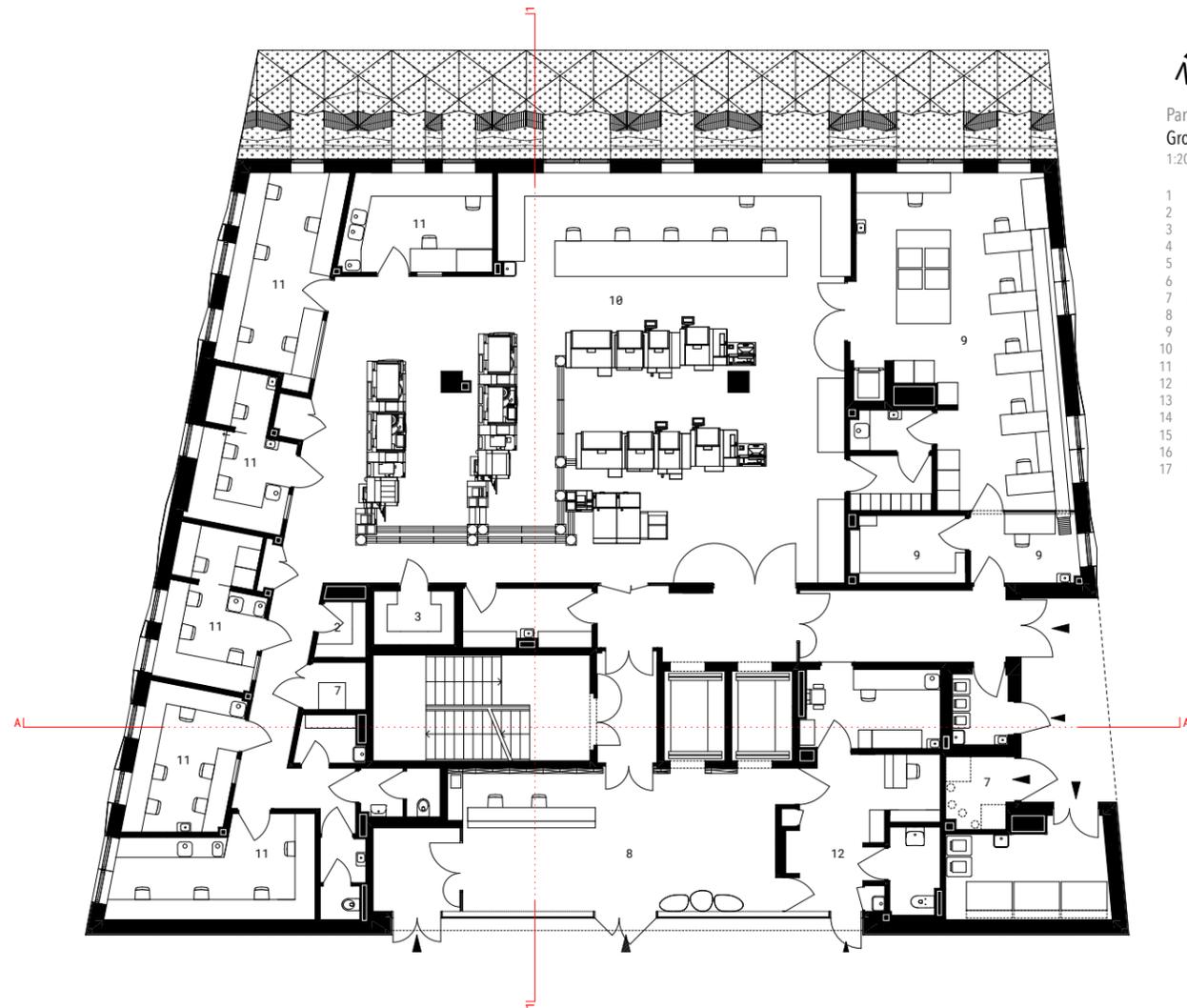
ECR Group

Wave One is the first of five buildings planned for construction. Together they will form the ECR Group - a complex of health care facilities. By design, the functions located in the individual buildings will complement each other.

In Wave 2, an outpatient hospital with an operating theatre, treatment unit and an IVF laboratory are planned. Wave 2 will also include an imaging diagnostics laboratory (computed tomography, magnetic resonance and X-ray imaging), a specialist clinic and a pharmacy.

Wave 3 is a specialist inpatient hospital with a gynecology and obstetrics profile. Wave 3 will include a treatment and delivery unit, neonatal unit and patient rooms.

Patients after treatments and hospitalisation in Wave 2 and Wave 3 will be able to continue treatment in the residential zones, located in Wave 4 and Wave 5. There, medical personnel will be able to provide patients with continued and attentive supervision. Additionally, in Wave 4, a rehabilitation pool is planned, which will enable easier and faster recovery. In Wave 5, a rehabilitation complex is appropriated among 3 floors. There, among other kinds of therapies, it will be possible to conduct cold therapy via a Cryo chamber. In turn, in the hyperbaric chamber, oxygen therapy will be carried out in order to accelerate the post-operative treatment.



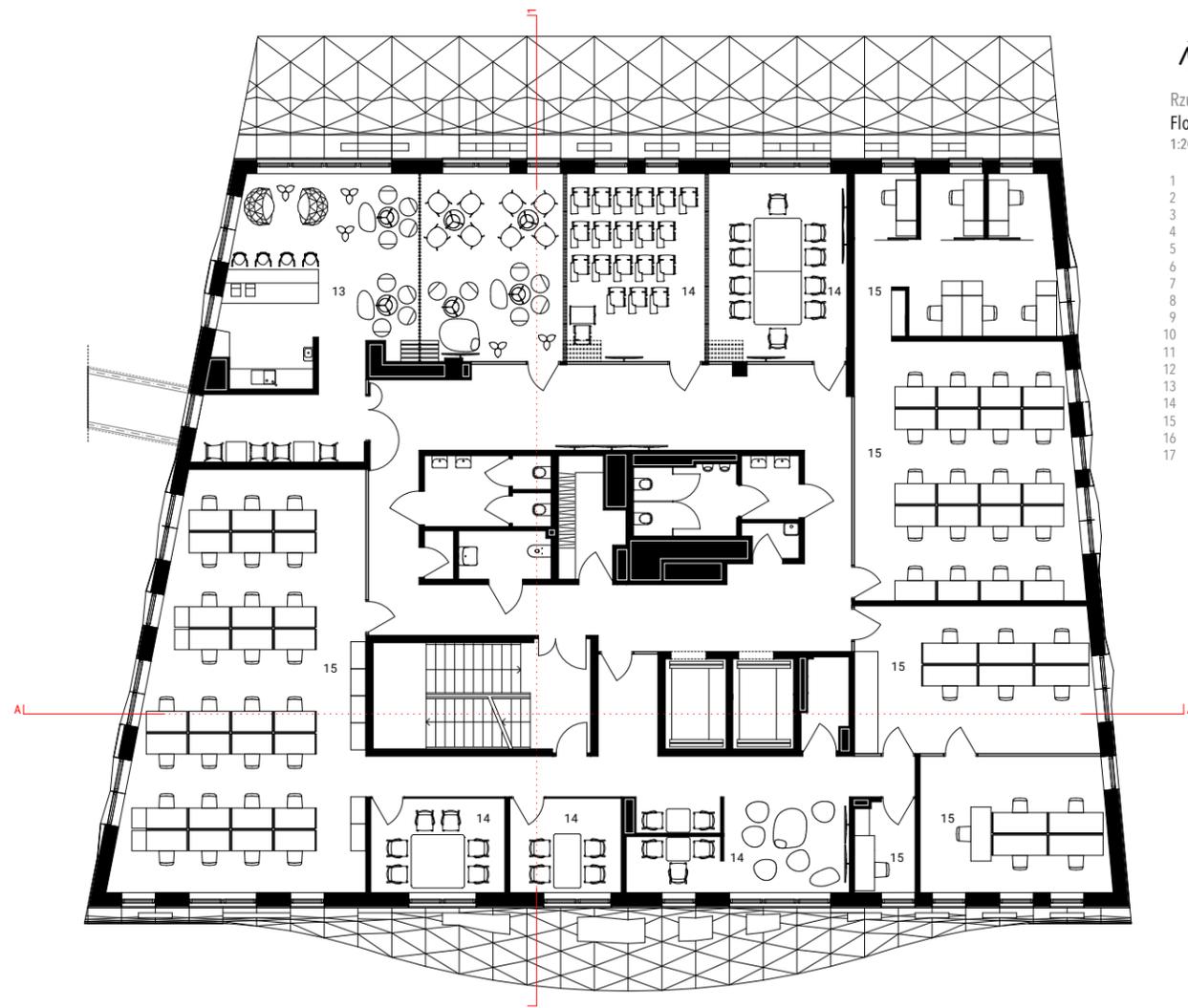
Parter - rzut aranżacji pomieszczeń
Ground floor plan
1:200

- | | |
|---------------------------------------|-------------------------------|
| 1 serwerownia | 1 data center |
| 2 magazyn - środki medyczne | 2 dry storage - medical |
| 3 chłodnia - środki medyczne | 3 cool storage - medical |
| 4 szatnia | 4 changing room |
| 5 magazyn | 5 storage |
| 6 archiwum | 6 archive |
| 7 pom. techniczne | 7 technical room |
| 8 hol wejściowy | 8 entrance hall |
| 9 pom. przyjęcia materiału | 9 laboratory logistic room |
| 10 główna hala sprzętowa laboratorium | 10 laboratory main room |
| 11 pracownia laboratoryjna | 11 laboratory individual room |
| 12 punkt pobrań | 12 collection point |
| 13 wewnętrzna kawiarnia | 13 internal cafeteria |
| 14 sala konferencyjna | 14 conference room |
| 15 pokój biurowy | 15 office |
| 16 taras techniczny | 16 technical terrace |
| 17 taras rekreacyjny | 17 recreational terrace |

Wave One.

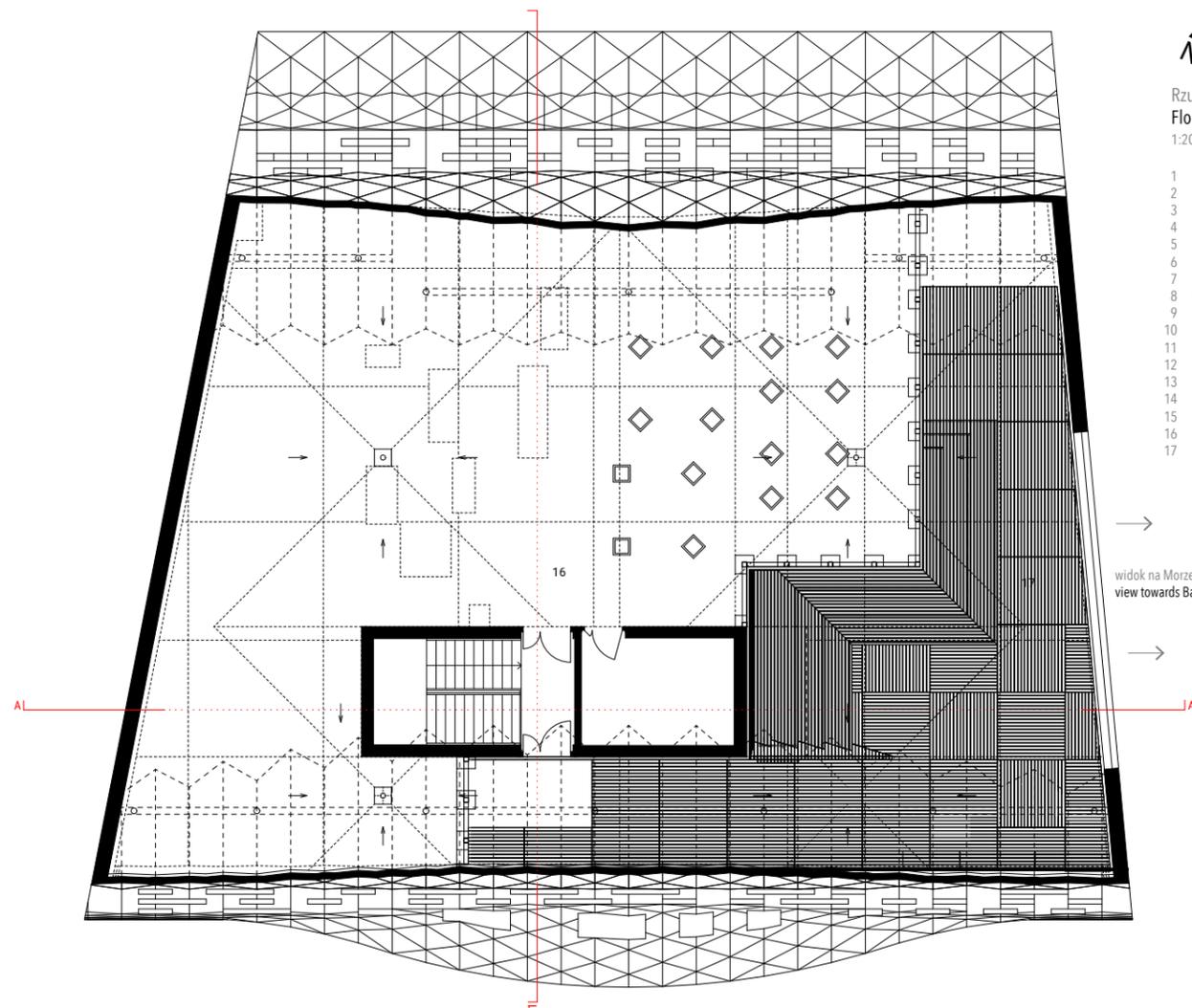
Wave One, implemented as the first, is a diagnostic, research and development center. On level minus 1, cold stores and reagent stores, server room and technical rooms are provided. There is a medical analytical laboratory on the ground floor. Most of the laboratory tests are performed on fully automated medical laboratory equipment based on robotics sorting lines of samples designated for tested.

On the first floor there is a molecular biology laboratory carrying out research in the field of genetics. Next to it there is a cytology, cytogenetics and virological laboratory. The second floor is occupied by a research and development center. This center also creates specialised software to streamline implementation and increase accessibility of medical procedures. The software is based on the technology of artificial intelligence and machine learning. Office space has been provided on the third floor, including offices intended for the development of research projects. The roof of Wave One is divided into two parts. In the western part, devices supporting internal systems were placed. These devices are located on many levels, on specially designed steel structures. This, consecutively, made it possible to use the eastern part of the roof as a recreational terrace, available to all employees. An acoustically insulating wall was designed between the two parts.



Rzut aranżacji poziom 2
 Floor plan level 2
 1:200

- | | |
|---------------------------------------|-------------------------------|
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| 16 taras techniczny | 16 technical terrace |
| 17 taras rekreacyjny | 17 recreational terrace |

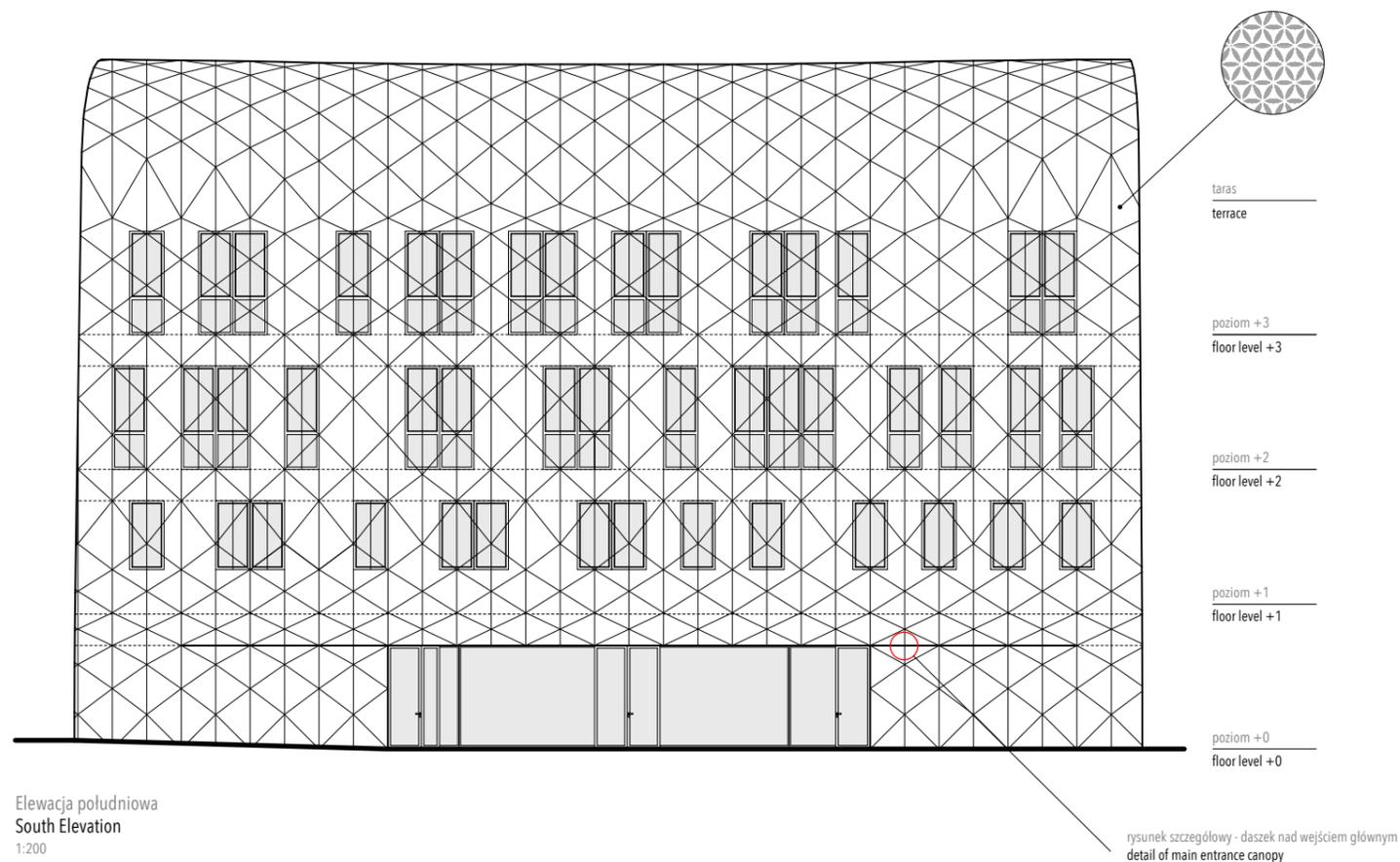


Rzut taras
Floor plan terrace
1:200

- | | |
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| 1 serwerownia | 1 data center |
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→
wiodok na Morze Bałtyckie
view towards Baltic Sea



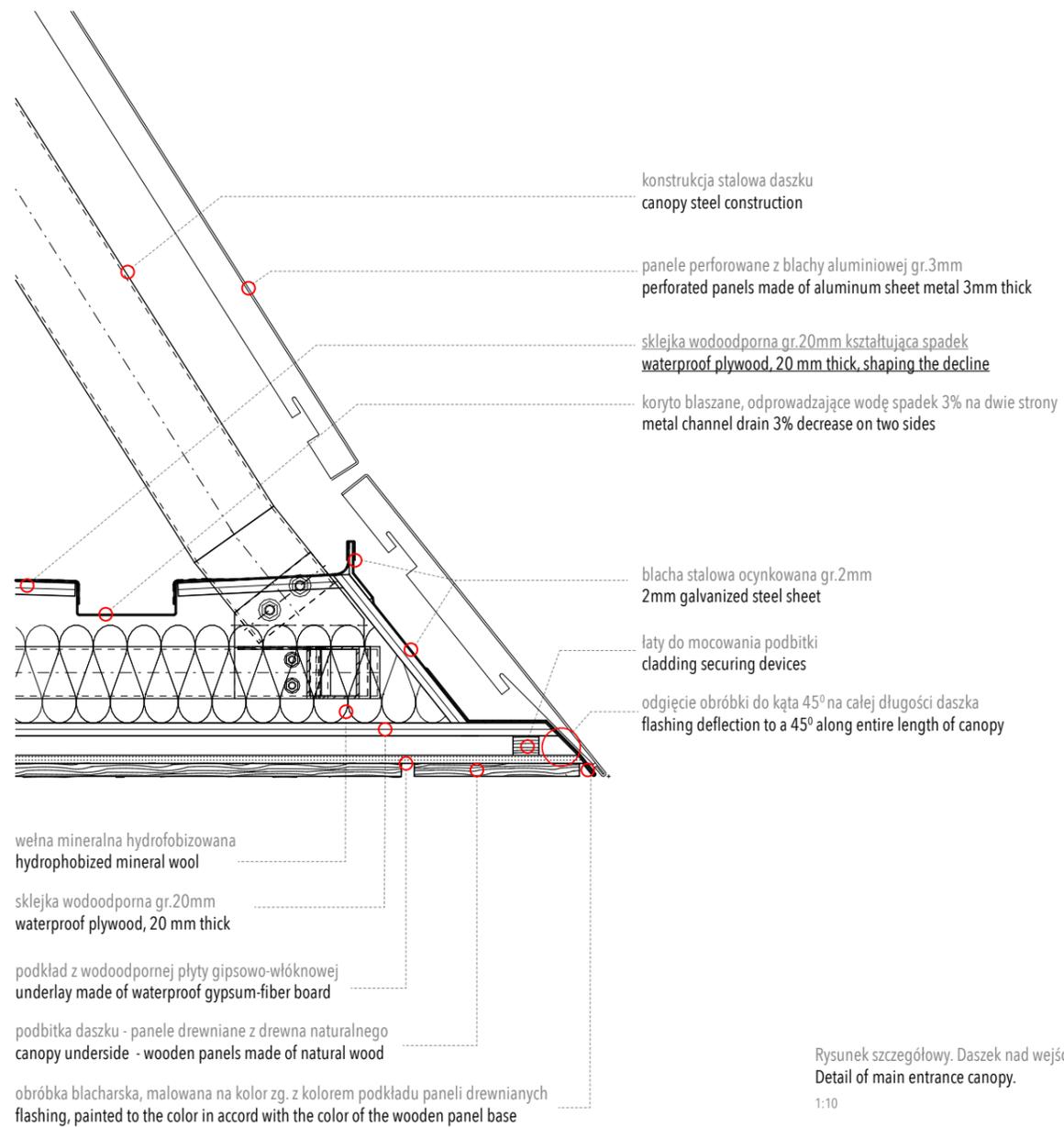


Form and façade, inspiration and architecture.

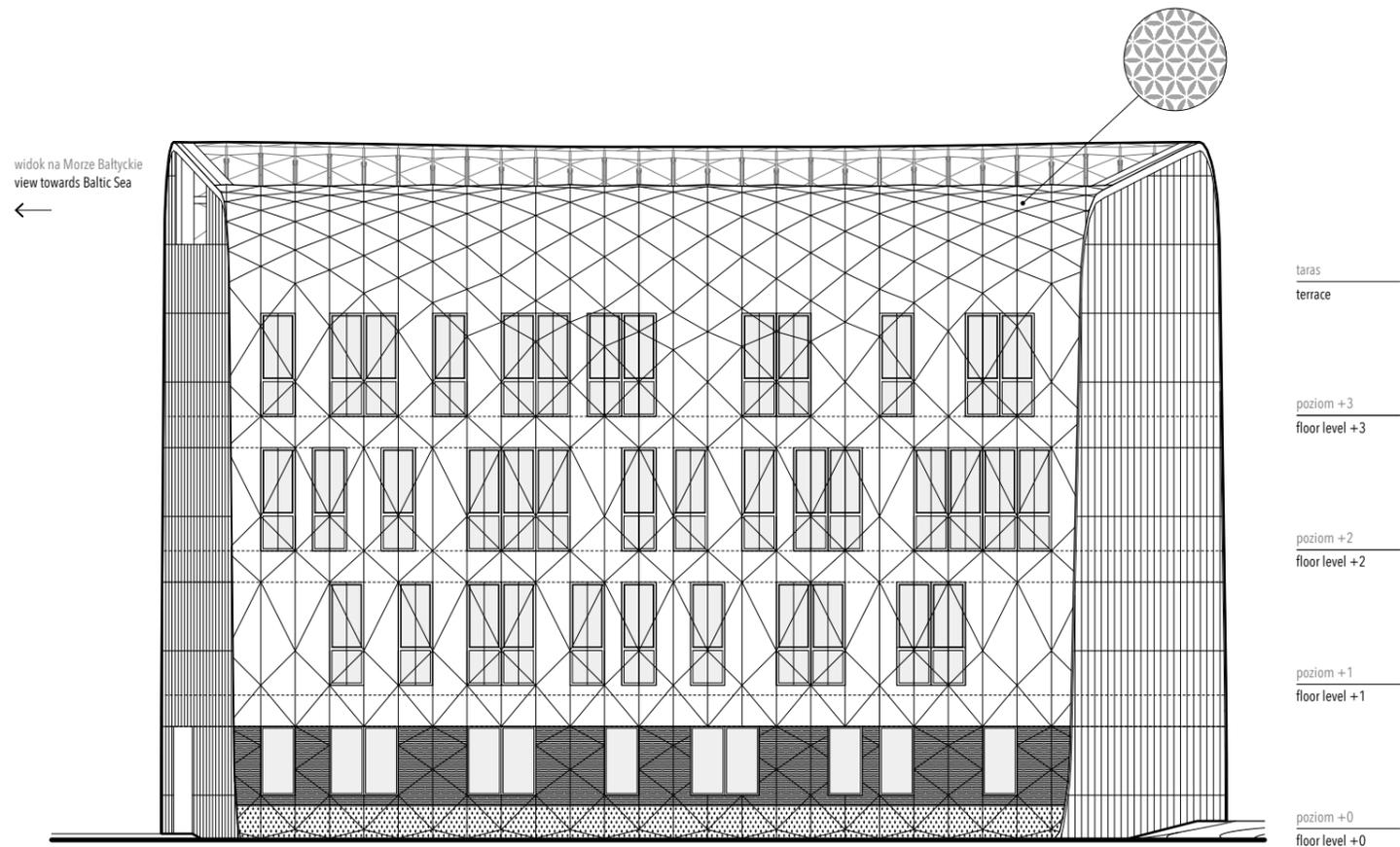
The form of the building and the facade were inspired by the series of AquaViva photographs taken by Pierre Carreau. FAAB architects were fascinated by the geometric variety and the complexity of the sea waves, captured by the photographer. The photos show arched three-dimensional forms frozen in time, which can be compared to sculpted ice blocks. Yet, at the same time, the waves are charged with energy and appear airy and light, merging with the sky. An extensive study of the photos enabled FAAB to notice a legion of small divisions on a seemingly homogeneous and smooth plane of the wave. Likewise, the visible play of light and shadow revealed an additional plasticity to the sea wave and a natural precariousness.

All these observations were translated into an architectural language and helped to develop the final form of the building's mass and facade. The building, with closed shutters, forms a continuous, homogeneous plane along the south-north axis. Alongside the length, the surface of the façade begins to bend at the top to form the "crest" of the wave. The ridge is not straight, but has a slight depression in the middle.

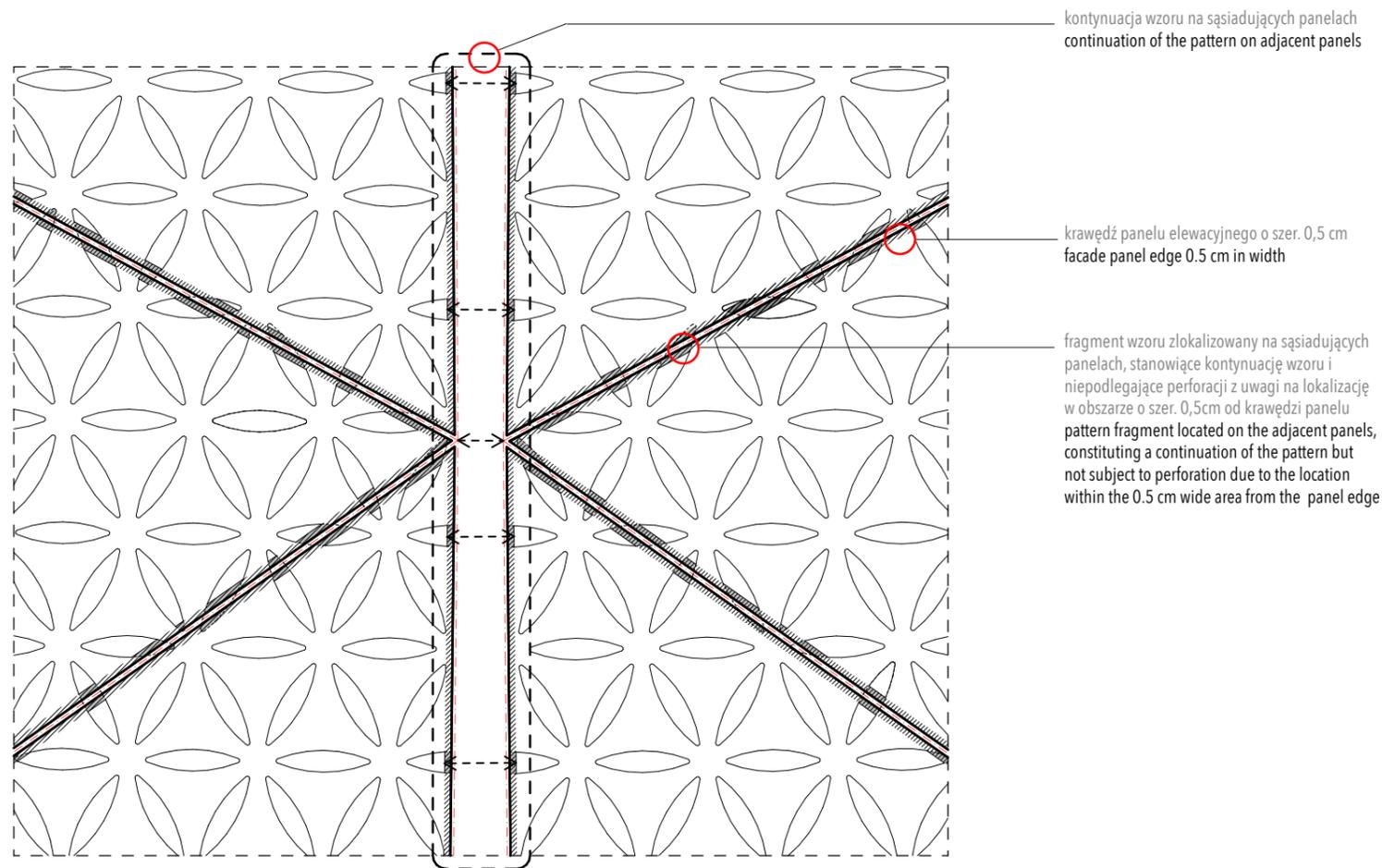
The mass is divided into triangular panels, formed by lines, cutting fixed and moving parts. From the east and west, the sun's movements brings out beams and reflections from the three-dimensional façade, finished with a light-reflecting material. On sunny summer days, reflections are also transferred to the pavement, creating a fleeting and transient detail, thus enlivening the immediate surroundings of the building.



Rysunek szczegółowy. Daszek nad wejściem głównym.
 Detail of main entrance canopy.
 1:10



Elewacja północna
North Elevation
1:200



Detal perforacji paneli elewacyjnych z blachy perforowanej
Fragment paneli elewacyjnych - detal perforacji sąsiadujących paneli
Detail of perforation of facade panels made of perforated sheet
Fragment of facade panels - detail of perforation of adjacent panels
1:10

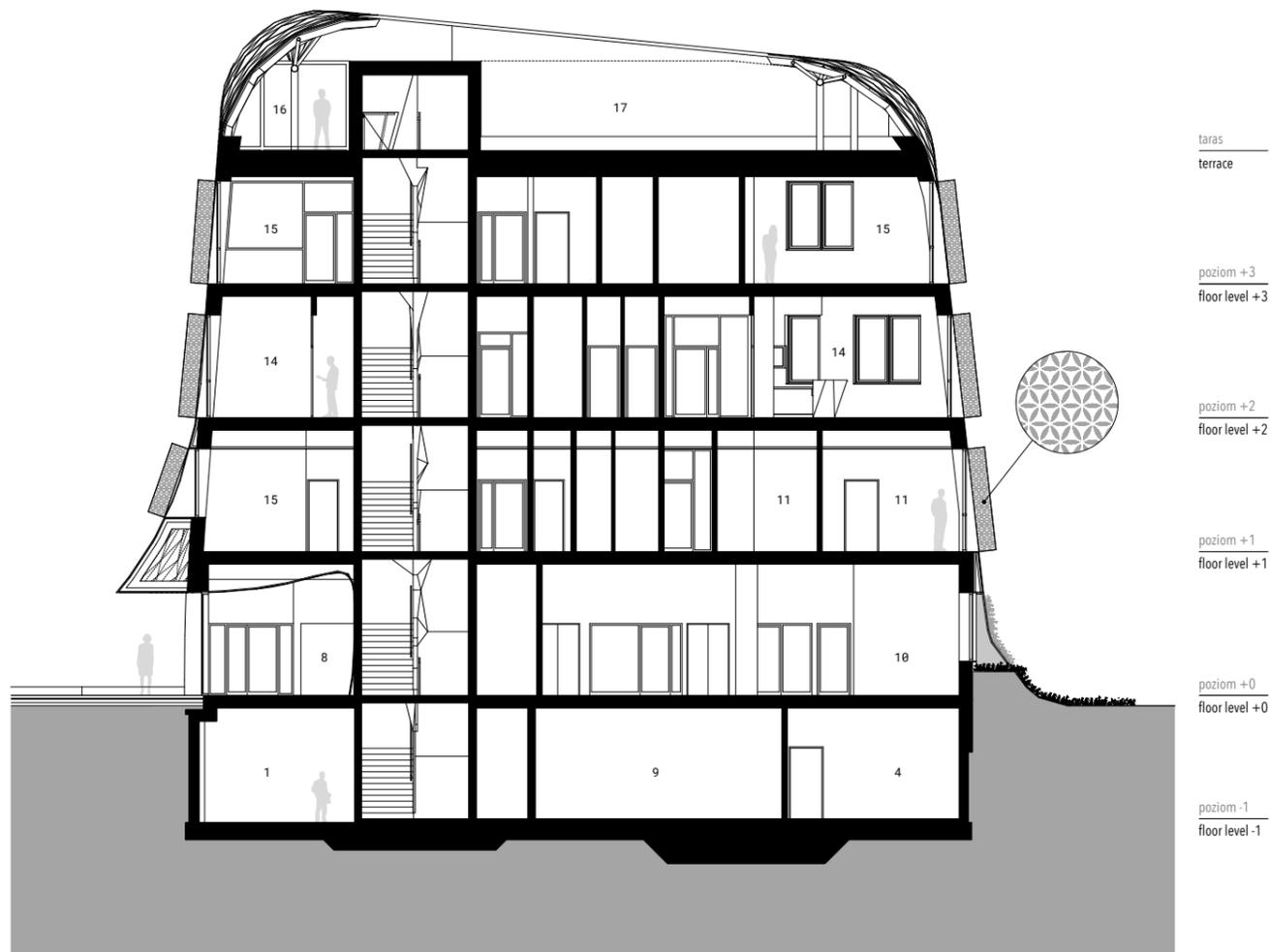
Elevation. The local building tradition and the specificity of the investment.

A characteristic element of Sopot's architecture are ornaments carved in wood, decorating objects from the turn of the 19th and 20th centuries. Details, giving airiness to the buildings, were installed in their gables and used to decorate windows, verandas and protruding elements of the wooden structure. The ornaments were based on symmetrical plant or animal motifs native to Tyrol¹ and laubzekin (Żuławy Wiślane) ornamental motifs.

The implementation of a pattern on the aluminum panels applied to the south and north elevations, is in reference to the local tradition of placing an ornament on the building's facade. Due to the function of the investment, it was decided to base the perforated pattern on the flower of life symbol. An ancient motif credited with healing powers, befitting the healthcare function of the investment.

The use of perforated panels, particularly in the upper part of the facade, made it possible to bring about an airiness and dissipation of the building in space, especially visible on cloudy days.

¹ Architects designing buildings in Sopot used templates issued at that time in Germany, hence so many analogies to the architecture of alpine spas, source: BKZ Sopot, Aleksandra Narczewska.

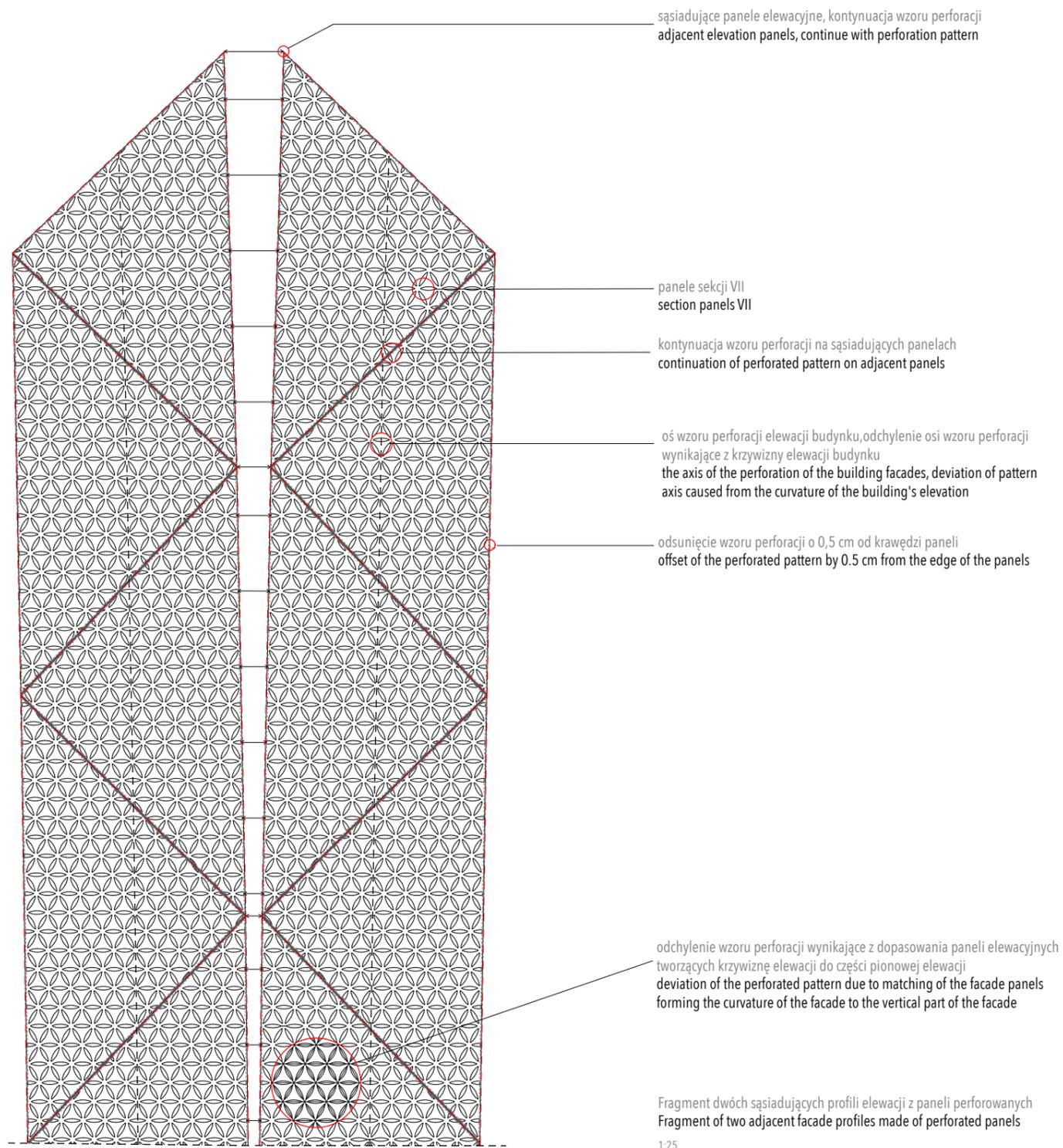


Przekrój 1-1
Section 1-1
1:200

- | | |
|---------------------------------------|-------------------------------|
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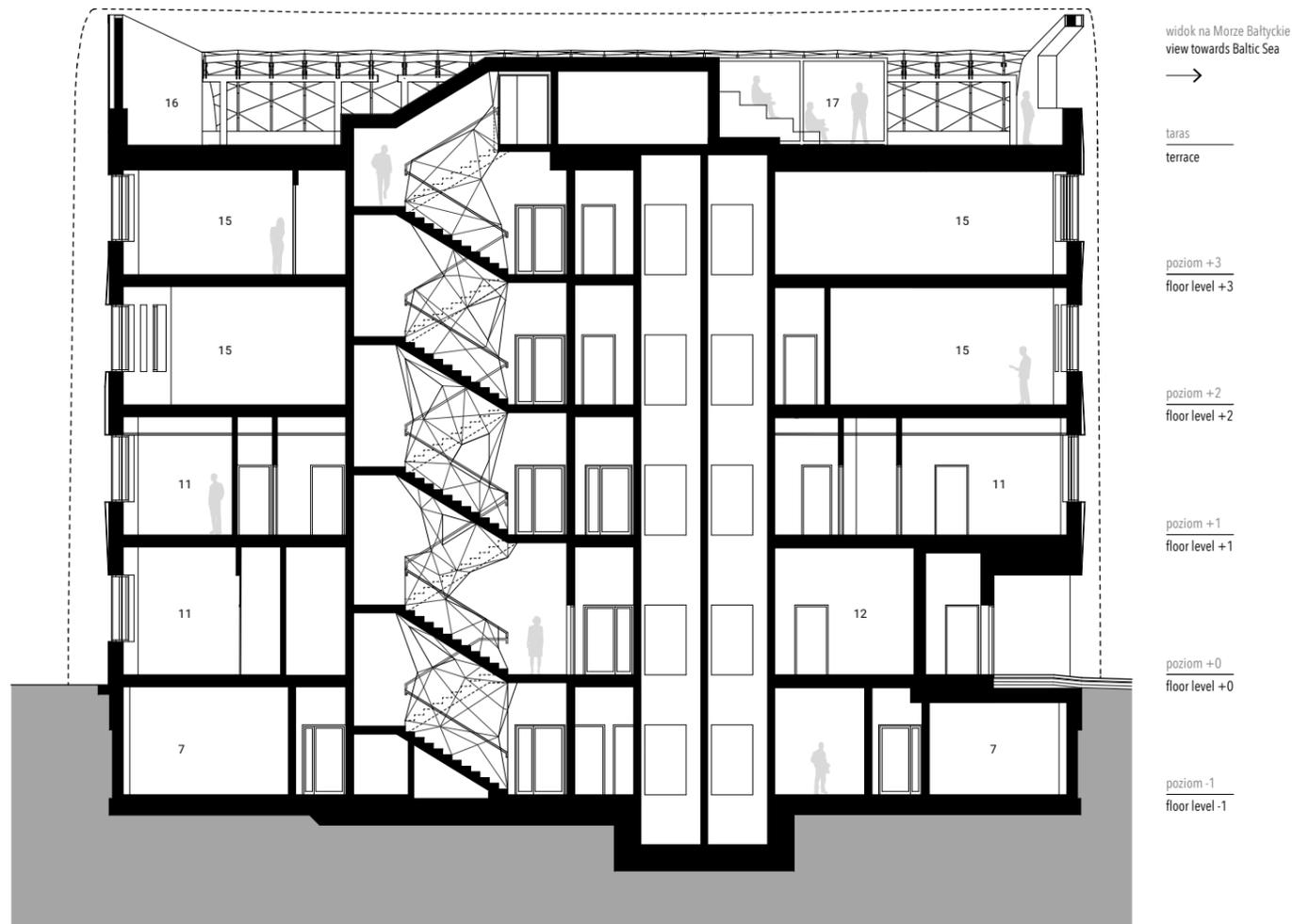
Building mass and elevation. Process.

The process of giving shape to the facade, began with the geometry of the structure, including reinforced concrete and steel structure. In the case of reinforced concrete structure, the upper part of the building, on the south and north sides, is divided into fields. These fields corresponded to the final division and spatial arrangement of the perforated sheet panels composing the external facade finish. Steel structure is the base for the portion of the façade crowning the building, the shape of which follows the two curves of the "outer skin" of the façade. Curvature and deviation from the vertical, go along the longer axis of the facade. Equally, curvature as a reference to the concavity of a sea wave, was the inspiration at this stage of shaping the body of the building. The shape of the canopy over the south-side building entrance was developed in a similar way. The geometry of the reinforced concrete and steel structure, modelled and coordinated by FAAB, was then submitted for further development to the contractors who prepared detailed workshop design.



Building mass and elevation. Process.

It was determined from the conceptual design stage, that the panels on the North and South façades, had to be perforated so that the pattern would flow smoothly from one panel to the next. In this case, the difficulty was the spatial variability of the façade, built in some of its parts, based on two curves and the presence of openable shutters. First, tests were performed in the form of mock-up panels of different translucencies - perforations of larger or smaller dimensions. The panel that potentially guaranteed the best effect in terms of pattern fluidity was selected. A model of a section of the façade was built on the construction site to check whether the proposed solutions would work in practice. Effectively, the mock-up made it possible to start preparing workshop drawings of the perforated facade panels. The northern and southern elevations were divided into 55 vertical fields. Each field in turn divided into a sum of the 1,362 panels that was drawn at 1:1 scale by the architects. Using the digital version of the drawings as a template, the pattern was then cut into the aluminum sheet using high speed water jets. The adjacent sections of the facade were then verified, folded, painted, and transported to the construction site for assembly.

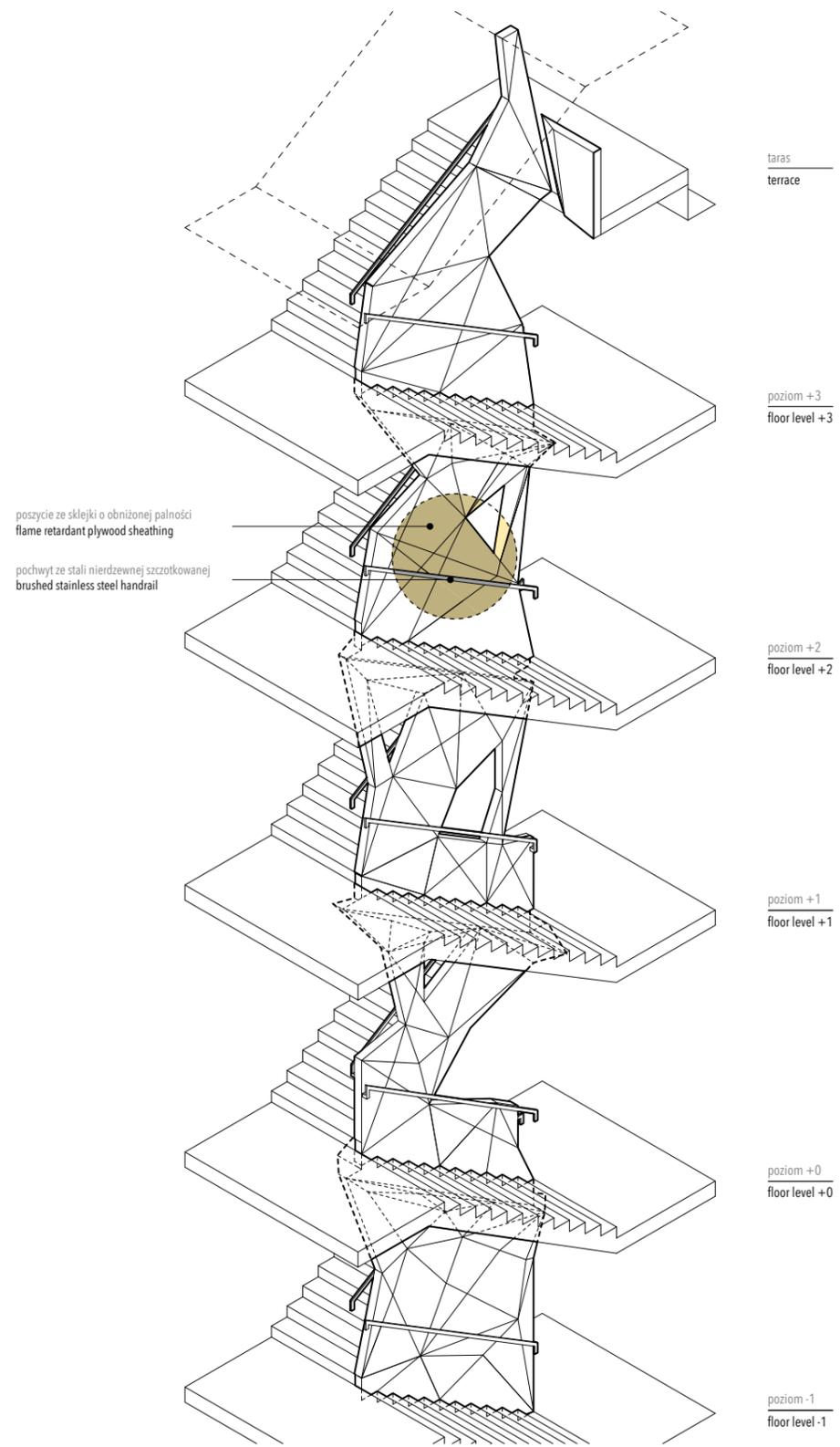


Przekrój A-A
Section A-A
1:200

- | | |
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Building mass and elevation. Process.

The eastern and western façades, finished with sintered ceramics, also required accuracy during assembly. In the case of both façades, the design envisaged the implementation of a three-dimensional form, intended to fracture and reflect sunlight. These elements are made of triangular, butt-joined panels. The panels are mounted with a specialised glue to steel consoles, the length of which is adjusted to the three-dimensional geometry of the façade. In order to maintain the uniformity of the façade material, the external window sills and the finish of the external window frames are also made of sintered ceramic.

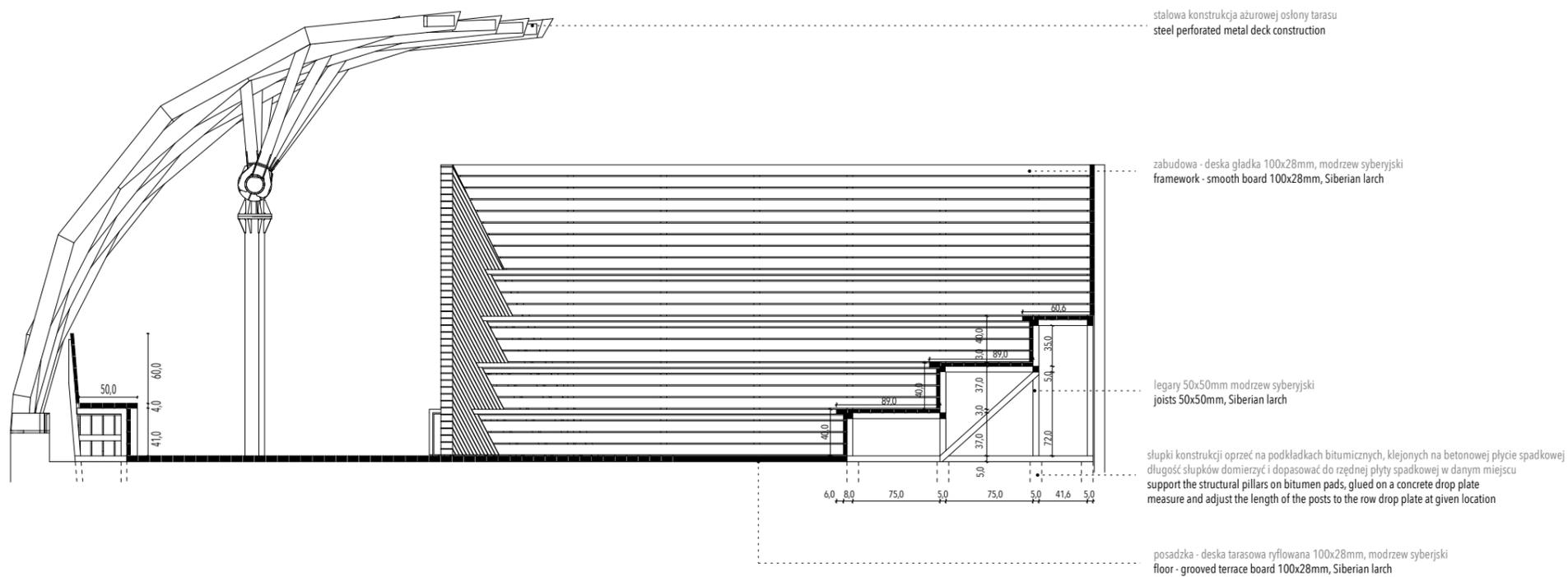


Detal barierki klatki schodowej - aksonometria
 Staircase railing detail - axonometry
 1:100

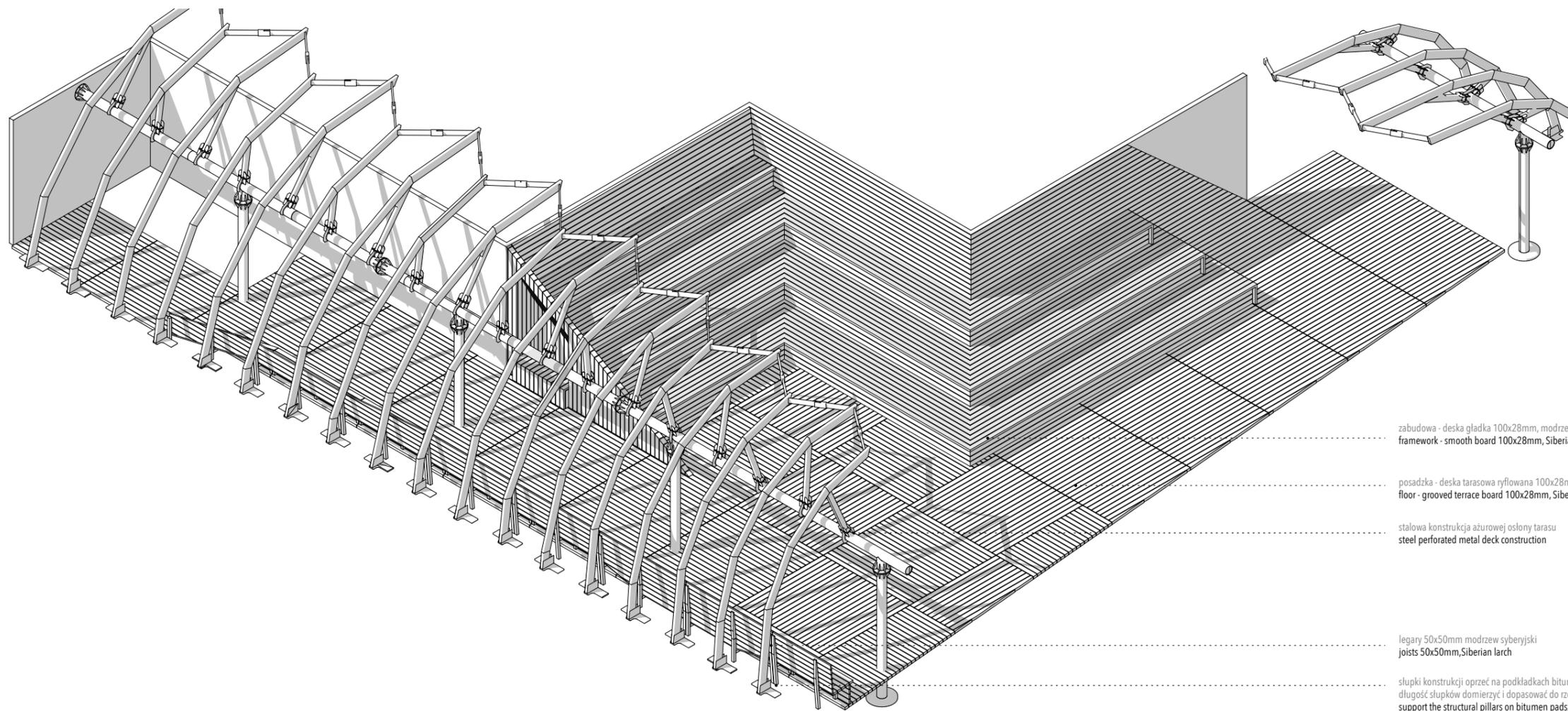
Interiors. Inspiration and character.

Wood is the material that creates accents in the interior space. Selected because both its structure and colour depict the seaside location of the building.

Waterproof plywood, which is a traditional boatbuilding material, is present on the undersurface of canopy above the main entrance and penetrates into the internal main hall. It extends and continues the façade divisions and then bends in a soft arch at the wall behind the reception desk. Plywood is also present in the interior staircase. With it, a three-dimensional form was shaped that fills the soul of the stairwell. This form begins on the minus 1 level and extends upward to the roof terrace. It is divided into triangular fields and carved openings that enable users to perceive each other from both sides of the stairs. It recedes and grows, creating a sense of movement. On the roof, next to the technical terrace, which houses the technological heart of the building, a recreational terrace has been created. Thanks to a large opening in the eastern wall, this terrace ensures visual contact with the Bay of Gdańsk. The floor, seating steps and reclining benches are finished with larch wood. It was presumed that the wood should be left unfinished, without any impregnating agents. Knowingly, the material will turn grey over time under the influence of the weather. Then it will be similar in colour to the colour of one of the symbols of Sopot, a walking pier extending 458 meters into the Bay of Gdańsk.



Zabudowa tarasu - przekrój
Terrace - section
1:50



zabudowa - deska gładka 100x28mm, modrzew syberyjski
 framework - smooth board 100x28mm, Siberian larch

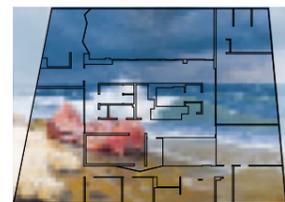
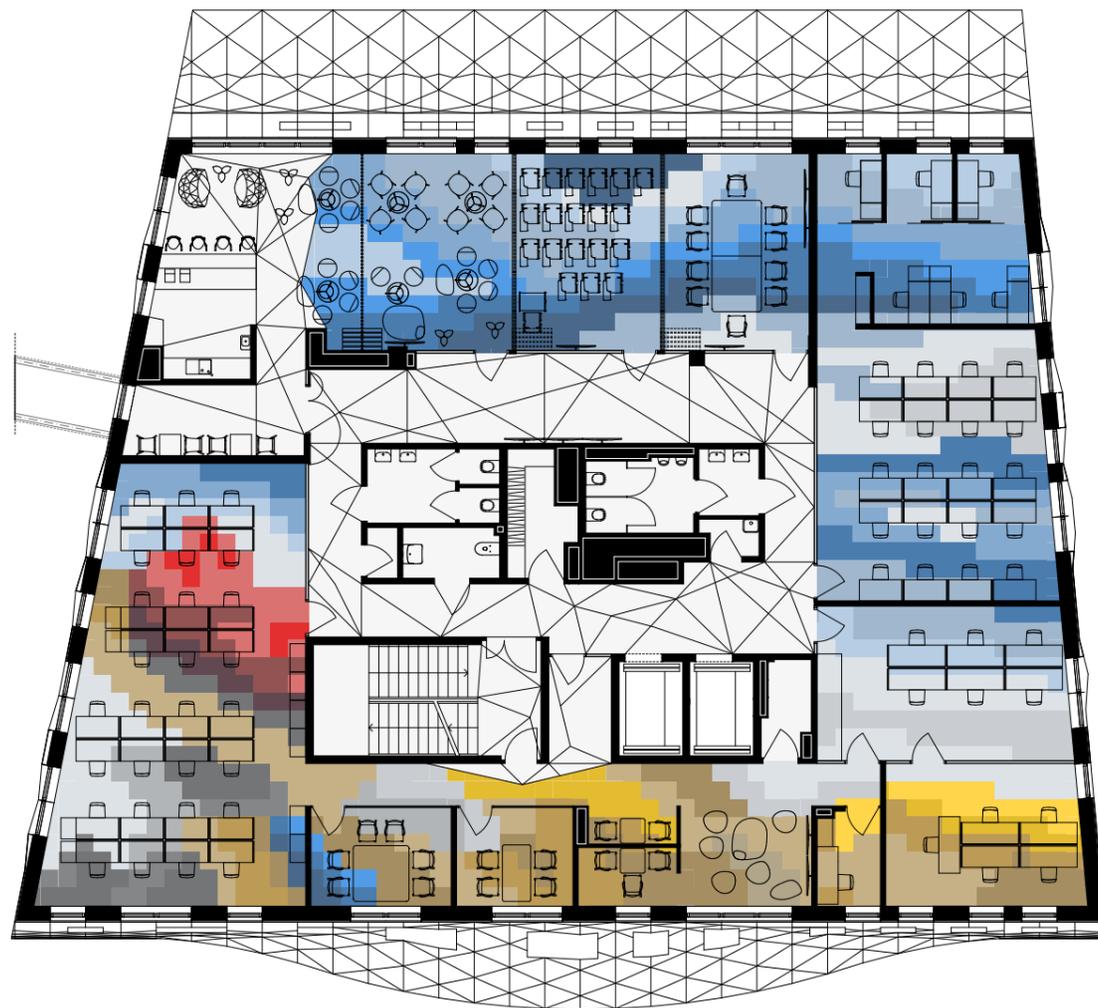
posadzka - deska tarasowa ryflowana 100x28mm, modrzew syberyjski
 floor - grooved terrace board 100x28mm, Siberian larch

stalowa konstrukcja ażurowej osłony tarasu
 steel perforated metal deck construction

legary 50x50mm modrzew syberyjski
 joists 50x50mm, Siberian larch

slupki konstrukcji oprzeć na podkładkach bitumicznych, klejonych na betonowej płycie spadkowej
 długość słupków domierzyć i dopasować do rzędnej płyty spadkowej w danym miejscu
 support the structural pillars on bitumen pads, glued on a concrete drop plate
 measure and adjust the length of the posts to the row drop plate at given location

Zabudowa tarasu - aksonometria całość z konstrukcją
 Terrace - axonometry
 1:100



Interiors. Inspiration and character.

The floor layout of two office levels, finished with a carpet tiles, is inspired by maritime theme. In each level, the basis for the composition is a painting with a marine accent. The image was converted into large pixels (50x50cm) and became an abstract colour composition that enlivens the space. A total of 24 colours were used to create a depiction of 3 works depicting the coast adjacent to Sopot. The painting "Hel-boat", 1930, by Soter Jaxa-Malachowski, helped to create the composition on the first floor. "Bałtyk", 1938, author Soter Jaxa-Malachowski, on the 2nd floor. The painting "Waves", 1934, by Soter Jaxa-Malachowski, was the basis for the third floor carpet composition.



Rzut aranżacji poziom 2 - wykładzina
Floor plan level 2 - finish floor
1:200

- | | |
|---|---|
| 1 original Soter Jaxa-Malachowski painting titled „Bałtyk”, 1938 | 1 original Soter Jaxa-Malachowski painting titled „Bałtyk”, 1938 |
| 2 pixelation of colors and overlay of floor plan | 2 pixelation of colors and overlay of floor plan |
| 3 transformation of pixels into 50x50cm color carpet tiles, total 24 colors | 3 transformation of pixels into 50x50cm color carpet tiles, total 24 colors |



Flexibility and adaptation to function.

Many aspects were taken into account in the design of Wave One interiors, in particular the rooms intended for laboratory work.

In the rooms where laboratory tests are being performed inside closed automated lab devices, it was decided not to cover the ceiling installation systems. All partition walls in laboratories are built in a way to ease their dismantling. The resin floor is easy to repair and supplement if the room arrangement is changed. The structure of the building allows for the implementation of new installation shafts, and in those already made, there is a reserve for new installations. A reserve was also left for the installation of new systems on the technical terrace.

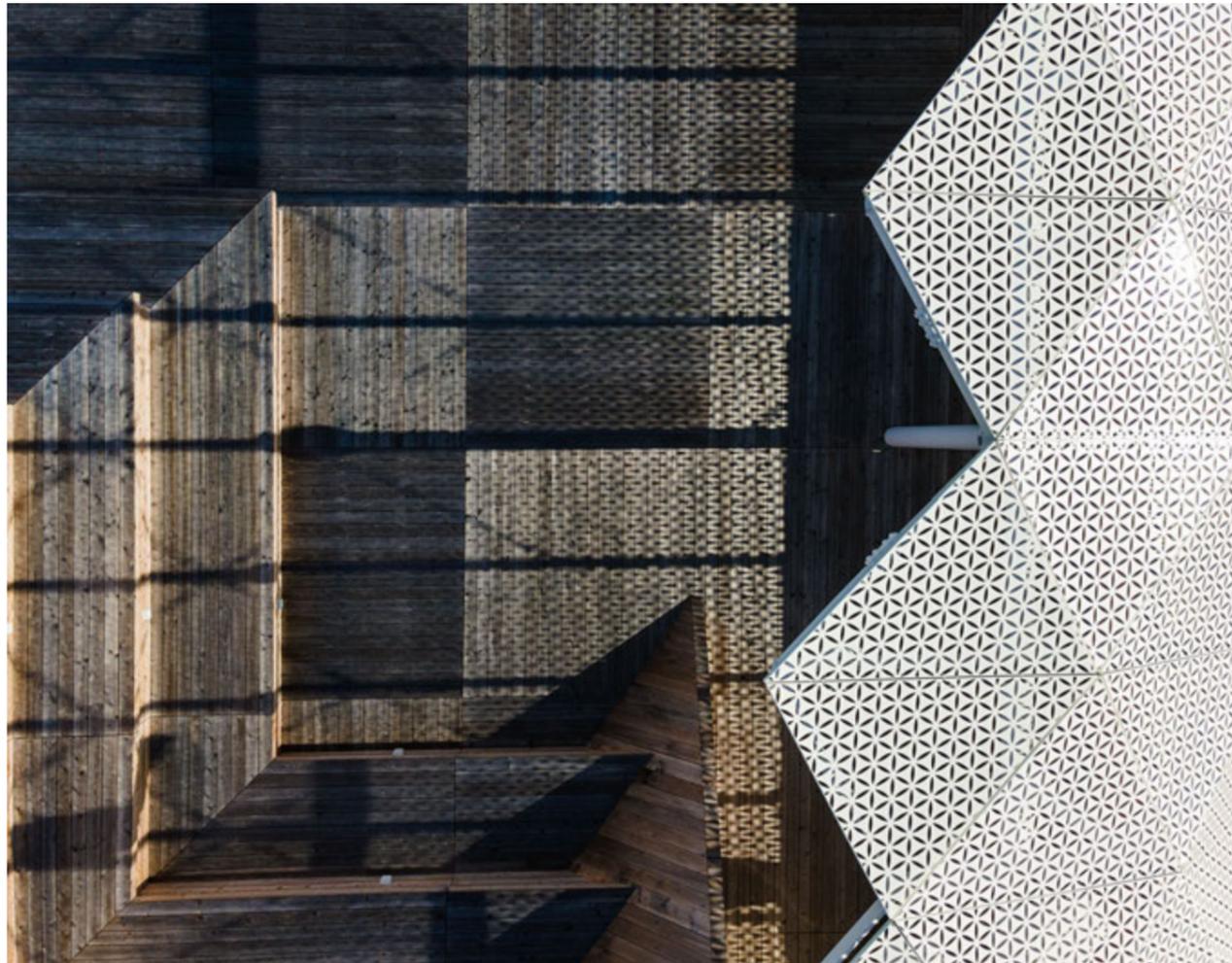
All these procedures will significantly reduce the time needed to install new laboratory equipment that will inevitably be introduced in the future due frequent technological advances in this field.



Heat management.

In a facility with such a high saturation of technological equipment, many of which have to work 24 hours a day, it is very important to protect the rooms from overheating. Too high temperatures inside the building not only is a cause for discomfort, but it can also trigger a sudden shutdown of laboratory equipment. This, in turn, usually leads to the discontinuity of the analysis cycle and the loss of the precious research material.

In order to avoid such threats and at the same time to prevent enlarging the cooling systems, a number of passive solutions have been provided. First of all, the architects resigned from large glass surfaces. Instead, the surface area of the windows designed, provides the optimal natural lighting conditions for the laboratory rooms. The largest room, in which the technological line generates the greatest amounts of heat was placed, was located on the North side. Further, the building façade is built of two layers. The white screen reflecting the sun's rays protects the exterior wall from heating up. The screen, thanks to the openable/closable window shutters, can, if necessary, create a continuous protective barrier over the building. This barrier also has a positive effect on the surroundings. It prevents the urban heat island phenomenon. Additionally, the building makes use of excess heat. It was determined that the heat recovered from the server room would be used for the production of warm usable water.



Rainwater management. Protection against flooding.

Lower Sopot, where the building is located, is a hydrologically difficult place. The differences in height can reach even 140 meters, and the 12 streams flowing through Dolny Sopot and flowing directly into the sea are mountainous or sub-mountainous. An additional element that increases the risk is the so-called cofka, i.e. seawater flowing into the municipal sewage system. Increased rainfall repeatedly resulted in flooding in this part of the city.

Rainwater management and protection against flooding was one of the most important aspects of the project. A passive solution in this respect was elevating the ground floor of Wave 1 above the surrounding terrain by 30 cm (70 cm in relation to the original level of the existing ground). The implementation of an extensive rainwater retention system with a total capacity of 530,000 liters was planned. A buffer tank is provided in the immediate vicinity of the building. The water collection from the tank is used to flush the toilets. Thus limiting the use of water from the municipal center for this purpose.

Another step was also taken to minimize rainwater contamination. Wooden external elements are made of a type of wood that does not require protection against weather conditions. Thus, the possibility of contamination of widely used rainwater with the use of chemicals used to impregnate the wood was eliminated.



Recent history-Covid.

Due to the difficult situation in 2020 (lack of availability of testing facilities) a decision was made during construction, to convert part of the space into a SARS-CoV-2 diagnostics lab. A laboratory dedicated to testing for the presence of the SARS-CoV-2 virus was created. In the initial period of the pandemic in Poland, some of the offices in the building temporarily performed other functions. Swab kits were completed in conference rooms. In this case, the medical students played a major role and were fully committed to helping. The research was started before the completion of the external skin of the façade and parts of the interior finishing. The virological laboratory was implemented in such a way that it was possible to perform 40-60 thousand tests daily. In addition, to help the local community, a temporary vaccination point was organised in the building, which was used by the inhabitants of Sopot. Due to the emergence of new mutations of the virus, specialised tests are now being carried out in Wave One to determine the type of mutation, in addition to testing for the presence of the virus itself.