

ABOUT THE CONCEPTUAL PROJECT: THE SEA INTELLECTUAL COMPLEX OF NETANYA

Kozlov Alexandr

M-r. Ashdod, Israel

Email: kavkas@ukr.net тел.: +(972)535320164

Kozlov Michail

Ph.D. Director of the Institute of integration and professional adaptation, Netanya, Israel

E-mail: 19mike19k@gmail.com tel.: +(972)527052460

Abstract. On the basis of the basic concept of the development of the coastal zone of Israel, the formation of a local conceptual project of a marine complex of intellectual constructions with regard to the needs and conditions of the resort city of Netanya has been considered.

Key words: Foresight project, transport and logistics system, sea pool, beach, marina, surfing, intellectual artificial island.

In [1,2], measures were considered that allow the development of the Mediterranean coastal zone of Israel. One of the most important components of these measures was the need to form a long-term concept based on the foresight project, and a conceptual project was proposed to create a multi-disciplinary industrial complex in the coastal zone of the Mediterranean coast of Israel.

Within the framework of this project, taking into account the peculiarities of Netanya, the development of a conceptual project on the arrangement of its coastal zone has begun. Netanya is a resort city and obviously the conceptual project should first of all be aimed at creating along the whole of its coast a health resort complex as comfortable as possible for its visitors.

The coastal zone of the city of Netanya has many undeniable natural advantages and, consequently, a great potential for attracting both Israelis and numerous tourists for recreation and rehabilitation.

However, there are a number of factors that reduce the attractiveness of the coast and even negatively affect the development possibilities of the coastal zone.

These factors include:

1. Sea waves constantly destroy the shore and limit the possibility of building along it.
2. Dangerous currents and waves limit the possibility of recreation on the water.
3. Jellyfish, which appear in summer in the sea for almost on a month, make swimming difficult.
4. Big congestion of people on the beaches.
5. Constant water pollution in the bathing area. At the same time, the breakwaters on urban beaches do not sufficiently dampen the waves, but and lead to the fact that with a large number of bathing people, sea basins are polluted.
6. The risk of spreading epidemiological diseases through water in bathing areas.
7. Insufficient water temperature for swimming in winter.

All this reduces the efficiency of the use of the coastal zone of Netanya to attract tourists, limiting the duration of the swimming season and the quality of rest.

The world has experience in increasing the comfort of the coastal zone. Thus, at the Algarrobo resort in Chile, the company "Crystal Lagoons Technology" created a unique artificial San Alfonso del Mar swimming pool on the Pacific coast with a length of 1013 meters and an area of 8 hectares. The water on the Chilean Pacific coast is cold and dangerous for swimming. Considering this, according to the project of engineer Fernando Fishman, an isolated lagoon-shaped swimming pool was built in which water from the ocean is collected and filtered and the

temperature maintained 9 degrees higher in summer than in the ocean. As a result, this big lagoon has become a favorite vacation spot for both Chileans and tourists from all over the world. The resort has built hotels, the guests who have the opportunity to swim and enjoy water sports in a safe and clean environment and warm waters. The company that built the pool is ready to replicate them. On the fig.1, taken from [3], shows an image of the San Alfonso del Mar Basin in the Algarrobo resort in Chile.



Fig.1. Artificial pool in the resort of Algarrobo in Chile

Taking into account the need to protect the coast of Netanya and the need for the comprehensive development of the resort and recreation complex as a center for recreation, rehabilitation, sports and sea tourism and adhering to the concept proposed in [1.2] for the entire Mediterranean coast of Israel, is proposed a local conceptual design of the complex marine facilities for the coastal zone of Netanya.

The resort component of the complex can be based on the idea of the “sea river” considered in [4]. It is formed along the entire coast and is separated from the sea by a damping dam protecting the water area of the “sea river” from the waves, dangerous currents and jellyfish. The “sea river” system with devices for regulating water current and debris removal should be divided into sections containing sea basins. These pools are part of the water area of the separated from three sides of the sea, and adjacent to the beach.

The considered local project of a complex of sea constructions, is schematically shown in fig.2.

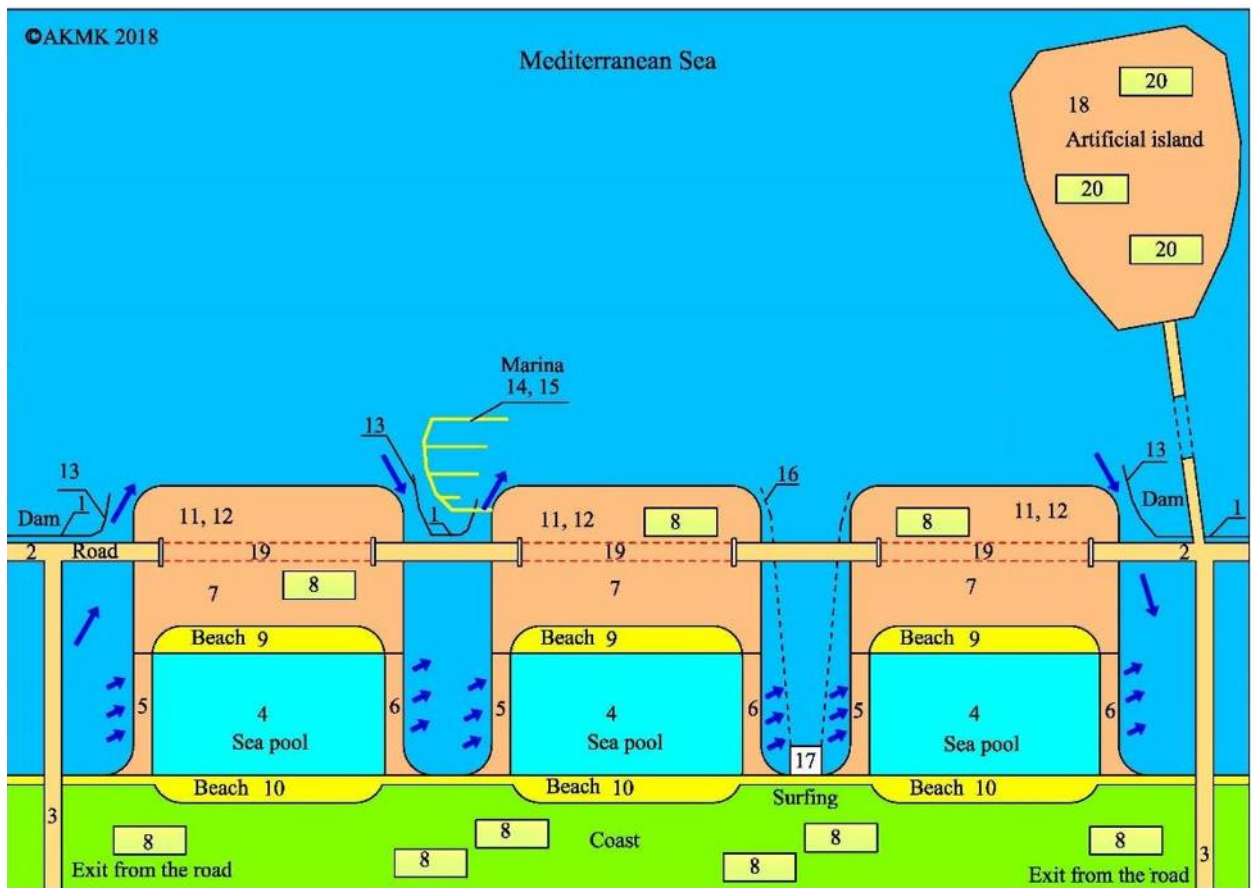


Fig.2. The complex of marine structures along the coast of Netanya

In fig. 2. A complex hydrotechnical structure (1) is shown along the entire coast of the city, which for 14 km protects the coast from erosion of the coast and allows you to create a transport and logistics system (2) along the coast. This transport and logistics system can become part of the transport and logistics system considered in [1,2] along the entire coast of Israel. In fig. 2 digits (3) denote road exits.

The complex of structures includes a chain of sea basins with running water (4), each 1500 meters long and with a maximum width of up to 250 meters. Taking into account the characteristics of the Mediterranean Sea, the basic conceptual design [1,2] and the possibilities of new technologies, the design of the pools will differ from the above-considered basin [3]. As a basis of the project for the construction of a marine basin, can serve the variant with flowing sea water considered in [4], which presented in Fig.3

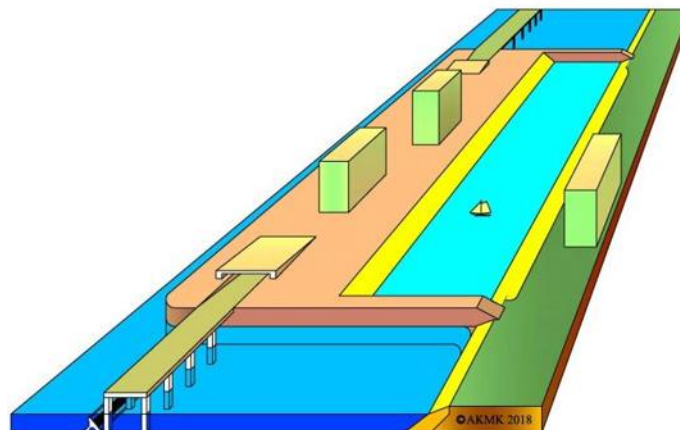


Fig.3. Basin with flowing sea water

The flow of sea water in the basins (4) is formed from their left end in the device (5). On the right side of the basins, water is treated through a cleaning device (6), which also collects and removes debris. The size of the basin allows you to swim on it in pleasure boats and water bikes. The seawater supply and heating systems will allow year-round swimming in the sea basin in clean and warm water.

For the formation of flowing sea water in the pool, it is advisable to use the energy of sea waves. At the same time, enhanced cleaning of pools can be performed at night due to intensive pumping of seawater through it.

A hydrotechnical structure (1) can be implemented according to the type of self-regulating intellectual dam considered in [2]. This dam along the sea will not be integral and the road (2) between the artificial islands (7) adjacent to the sea basins goes on the bridge on the piles. The road (2) near the pools passes in the tunnels (19) under the surface of artificial islands (7). On artificial islands (7), also as on the coast, hotels and sanatoriums (8) can be built, as well as disposed other tourist facilities and greenery planted. Under the surface of artificial islands (7), in addition to the tunnels for the road, parking lots for vehicles, office space and technological systems will be located.

Recreation areas on artificial islands (7) on the side of the sea basins have sandy beaches (9), the same as those on the sea basins on the side of the coast (10). This allows you to increase the possible area of beaches of the resort twice. And if we consider that from the side of the open sea recreation areas will have walking paths along the sea (11), places for entertainment, recreation and enjoying the healing sea air, fishing grounds (12), then the real space for sea recreation can increase three times.

On both sides of the sea basin, rescue stations operating in automatic mode of monitoring the water situation will be located on beaches 9 and 10, which will improve the safety of water recreation.

As can be seen from fig. 2, the construction of an intellectual dam (1) has wings (13), which provides passageways to the sea. The wings of the dam (13) are designed to direct the sea current so that it allows the flow of water to clean up the space between the dam and the shore and create water pressure for the sea basins. Outside the intellectual dam, with the help of wings (13), a space is formed that can be used for marinas (14) and berths of sea-going vessels (15). If necessary, the wings of the dam (13) can change their position by the system of regulation of the intellectual dam (1).

For sports surfing, it is desirable to have parts of the coast with a high wave height and the possibility of long-term maintenance of this state. For these purposes, it is possible to install in the chain of the complex, proposed in [4], wave energy concentrators (16), providing increases in wave height at a separate part for surfing (17). It is desirable in the design of wave energy concentrators to provide for the possibility of controlling the height of the waves. To increase the efficiency of the concentration of wave energy, it can occur in three-dimensional space, from two sides and from the bottom.

On the artificial islands (18) shown in Fig. 2, various energy systems, security provision services of coast, and other necessary services (20) that should be placed in the sea.

Energy supply of all technological needs of the systems of the complex can be autonomous due to the transformation of the energy of the sun, wind, thermal energy of the sea and sea waves. The energy of sea waves can be converted to other forms of energy. So, for example, in [5] considered the original solution in the form of a combination of a protective breakwater and power generating system. As mentioned in [4], wave energy concentrators can be used to increase the efficiency of wave power plants.

With enough electricity generated, it can be supplied to external customers.

The systems of the complex must operate automatically and adapt to all changes in the environment. At the same time, the structure, and control systems and controls of artificial islands should ensure their protection against tsunamis, due to adaptive regulation of the height of the island's surface. Various technical solutions are possible here.

Considering the diversity and complexity of the functions performed by the technological systems of the complex, working at the level of intellectual technologies, such a multi-profile system can be considered as a marine intellectual complex (MIC). In this case, some decentralization in managing such spatially distributed components of the complex as artificial islands is appropriate, whose operation should take into account many influencing factors, which are often difficult to predict, and thus work under uncertainty. Based on this, such a MIC can be technologically considered as a kind of team of local systems with artificial intelligence (intelligent agents). And the islands can be called intellectual artificial islands (IAI). To this we can add that the functioning of the IAI should also provide the entire infrastructure to support the comfortable existence of its inhabitants.

To protect the IAI from large waves, tsunamis and earthquakes, they can be floating. And with the use of intelligent systems of control, stabilization and control, the resistance of the IAI to external influences and the reliability of the entire infrastructure, as well as the safety of their inhabitants, will be ensured.

To be able to form and implement local projects for the development of coastal zones of individual regions, an approved national concept of the development of the coastal zone of Israel is needed. Having such a concept, it will be possible to implement local projects in parallel and independently from other places. This will accelerate the development of the entire coastal zone on the basis of a common foresight project that is adapted in the implementation process over the chain of feedbacks.

The creation of such a MIC will allow holidaymakers to swim safely in clean, flowing sea water all year round, and also improve the ecology of the sea and thus significantly increase the attractiveness of the city of Netanya for tourists, including, which practicing water sports. It will also provide an opportunity to create international rehabilitation centers in the coastal zone of Netanya, expanding the possibilities of medical tourism and greatly enhancing the effect of introducing digital health care that is of economic importance to Israel [6]. This will create additional high-paying jobs for the residents of Netanya and improve conditions for a comfortable life.

In conclusion, it should be noted that the formation of local projects requires a common strategy for the development of the coastal zone of the Mediterranean coast of Israel. In [2] were considered the reasons why for many years projects for the creation of artificial islands in the territorial sea of Israel failed. Such attempts are repeated constantly and now. In 2016, the municipality of Herzliya was going to announce a tender for the construction of two islands opposite the city with the placement of residential houses and the airport on them [7]. In 2018, it was announced the intention to build an airport on an artificial island near Tel Aviv [8]. In January 2019, the creation of an artificial island opposite Bat Yam for residential buildings and some elements of the city's infrastructure is already being discussed [9].

The need to develop the coastal zone is obvious. But without a systematic approach, the implementation of the proposed projects will be slowed down and, moreover, their implementation may further become an obstacle to the harmonious development of this part of the Israeli maritime space. Therefore, this article focuses on linking the project of the Netanya's marine intellectual complex to the general concept of coastal zone development, based on the need to align it with the concept by a many factors. The presence of such a concept for the entire coastal zone will allow linking all local projects into one single project and greatly facilitate their development and implementation.

BIBLIOGRAPHY

1. Gurevich V., Kozlov A., Kozlov M. Concept of development the Mediterranean coastal territory of Israel. Journal "Scientific Israel - Technological Advantages" Vol.20, № 2, 2018. P.39-46.

2. Kozlov A., Kozlov M., Kharitonov M. On the conceptual approach to the development of the territorial sea of Israel. The Bulletin of Academy. Israeli Independent Academy of Development of Science. Haifa, Israel, 2018. Vol.10, №2. Pp. 82 - 95.
3. Brennan L. World's largest pool which holds 66m gallons is so big you can even sail boats on it. The Daily Mail. 21 May 2012.
4. Kozlov M. The possibility of creating a comfortable recreation complex along the Mediterranean coast of Israel. Proceedings Interdisciplinary scientific conference "Multifactor approaches to the formation of a comfortable environment". Netanya, Israel. 2017. Publishing firm Print ABC. Pp. 77-84.
5. The energy of the waves will be collected by the underwater "Parthenon" - EcoTechnique. 10.12.2015. <https://ecotechnica.com.ua>
6. Cabinet Approves National Plan for Digital Health as a National Growth Engine. 25/03/2018. mfa.gov.il/.../Cabinet-approves-national-plan-for-digital-heal...
7. Hedy Cohen. Herzliya to issue tender for two islands. Globes. 31 May, 2016.
8. Ferziger J. Netanyahu Backs Artificial Island for New Tel Aviv Airport. Bloomberg. 30.07.2018.
9. Shlomit Tsur. Gov't reviews plans for Bat Yam artificial island. Globes 24 Jan, 2019.