

LATEST ACHIEVEMENTS IN ENGINEERING, ECOLOGY AND ARCHITECTURE

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As you know, water plays an important role in our life. It surrounds us alongside earth and wind, accompanying and surrounding throughout life.

While the idea of living on water is far from new, underwater architecture has recently become a professional focus due to groundbreaking technology.

After years of construction, the world's first underwater hotel was completed in the Maldives. It's called The Muraka and connected by a long jetty to the Hilton's Conrad Maldives Rangali Island resort.

The project was created by YYA - Yuji Yamazaki Architecture, a Tokyo design firm. The construction of The Muraka was both innovative and environmentally-conscious. The entire lower suite was built on land in Singapore, fittingly made of acrylic from Japan's premiere aquarium manufacturer Nippura Co., and sealed with Shin Etsu Marine sealant. Then the 600-ton structure was carefully transported to the Maldives on a specialized ship, before being nestled 16.5 feet under sea level and held firmly in place by 10 concrete piles.

The sturdy pylons ensure that the 'villa' will not shift or downright float away in the midst of high tides or rough waves.

The building itself has two levels. The upper level is made of glass walls that offer wonderful view of the ocean, a private jetty, infinity pool, and secluded decks. Guests can either take an elevator or follow a spiral staircase down. There the curved ceiling and wide windows, which overlooking underwater world on 180 degrees.

However, there are many other examples of underwater architecture.

Europe's first underwater and the world's largest restaurant was opened on March 20th, 2019. It's located at the Norway's southern coast, in the village of Baly.

This restaurant is called "Under" and Designed by the Norwegian architecture firm [Snøhetta](#).

Half-sunken into the sea, the building breaks the surface of the water to rest directly on the seabed five meters below.

It takes the form of a monolithic "concrete tube" that is an eleven-meter-wide and 3.4-meter-tall.

The walls are slightly curved and half-a-metre thick, providing optimal resistance against the forces of waves and water pressure.

The focal point of the restaurant is its panoramic acrylic window, which can be seen from each level within the building. It measures 11 by three metres,

spanning the length of the restaurant wall. A large vertical window also punctures a wall in the champagne bar, extending down to the restaurant to give visitors a view of the sea level, while letting through daylight.

The restaurant has three levels including a foyer and cloakroom, champagne bar, and main restaurant on the lower floor. They are joined by a giant oak staircase. The restaurant seats 35-40 dinner guests every night, in a dining.

Through its architecture it is also intended to inform the public about the biodiversity of the sea. Cameras and other measurement tools have been installed outside the restaurant. Without doubts, it will also serve as a lab for marine biologists to study fish behaviour to help researchers learn about the population, behavior, and diversity of the species living in this part of the North Atlantic.

We believe that in future underwater architecture will develop as a particular branch/industry that will allow take its opportunities to a new level in the sphere of the residential construction, where there is lack of territories.

ANALYSIS OF EXISTING RESPONSIBILITY DISTRIBUTION METHODS FOR THE SPREADING OF THE STRENGTH SYMMETRY IN THE GENERAL CONNECTION POSITION

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As it is known, the consumption and transmission of electric energy of reduced quality causes additional power losses, heating the equipment, its damage, improper operatio and technological process disorder. As a result, it leads to additional financial losses for both suppliers and consumers of electricity. Among all voltage distortions one of the most negative influences is characterized by voltage asymmetry. Its assessment is based on two indicators of the quality of electric energy. These are the factors of voltage asymmetry in reverse and zero sequences:

$$K_{2U} = \frac{U_2}{U_1} \cdot 100\%; \quad (1)$$

$$K_{0U} = \frac{U_2}{U_1} \cdot 100\%, \quad (2)$$

where U_2 - reciprocating voltage module; U_0 - zero voltage sequence module; U_1 - reverse sequence voltage module.

One of the main issues concerning the quality of electric energy is the task of distributing responsibility for distortion of voltage symmetry and, accordingly, for financial losses at the point of general accession .