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INGEMAR AND BOATING WITHOUT THE SEA

THE SWISS VISION OF THE MARINA REDESIGNS THE SHORES OF LAKE MAGGIORE

In Alto Verbano, an entire stretch of coastline has been revitalised by the construction of a new marina with suspended artificial seabeds that looks like something out of science fiction.

Milan, January 29, 2026. Switzerland once again demonstrates that a passion for sailing does not require an ocean. A nation that has produced America's Cup champions has long cultivated a vibrant nautical culture on its Alpine lakes, supported by a dense network of marinas and yacht clubs. The northern part of Lake Maggiore, in the canton of Ticino, is famous for its charming towns and impressive natural surroundings: the Brissago Islands are a botanical paradise where palm trees, bamboo and exotic plants from all over the world grow.
The right bank of the lake offers a comprehensive network of facilities for boaters: the tourist marinas of Mappo and Muralto, the Regional Port of Locarno, the Patriziale Port of Ascona and the Ressiga Port of Brissago are public and private initiatives, in addition to numerous other marinas and yacht clubs.
Until now, however, there has been a lack of equipped and protected facilities on the short stretch of the Swiss left bank, which is more picturesque but less inhabited and characterised by particularly inaccessible and poorly protected coastlines. The conditions were therefore even more complex than those on the opposite shore, where special mooring systems had already been developed for the breakwater piers to overcome the difficulties of deep waters and the need to protect the port areas.

The construction of the Port of Gambarogno addressed conditions even more complex than those faced on the opposite shore, where special mooring solutions had already been developed for deep waters. Here, engineers were required to rethink conventional harbour design entirely.
However, the construction of the port was only the last stage of a long and challenging process undertaken by the Swiss municipality in 2016 and supported by a total budget of 19 million Swiss Francs to realise a 'visionary' project in the recreational boating sector, which now that the work is complete looks incredible. The involvement of several companies specialising in complementary contracts led first to the construction of the false steel seabed, consisting of enormous three-dimensional structures submerged and hinged near the shore, equipped with vertical poles for anchoring the piers, and subsequently the installation of an imposing floating breakwater barrier measuring approximately 480m about 130m from the shore and jetties with fingers for mooring boats.

The construction of the new port, designed by *Studio Sciarini* in *Vira Gambarogno*, involved the full collaboration of *Consorzio Officine Ghidoni* and *Implenia Svizzera* for the submerged steel structures, *Matteo Muttoni Costruzioni* for the floating wave breakers, *Ingemar* for the piers and floating jetties, and *Comar* for the assembly of the underwater structures and the installation of the floating piers.

The new port facility, located in the *'Sass di Sciatt - San Nazzaro'* area, also includes parking spaces and accommodation and service facilities on land, which are currently being finalised, as well as a public promenade and a series of stairs, ramps, walkways and piers that form and complete the pedestrian connections between the different parts of the port and the usable spaces.
The layout of the new facility provides for the mooring of 280 boats between 8 and 20 metres in length on Ingemar floating structures: a total of 440 metres of 3-metre-wide pontoons, a 96-metre-long and 4.50-metre-wide pier and 137 mooring fingers.
The modules are of the discontinuous floating type and finished in tropical wood to minimise the impact on the environment and ensure the necessary circulation of water at the surface level of the basin.
The structures are made of hot-dip galvanised steel, while the floating units are made of concrete with an expanded polystyrene core, ensuring buoyancy and great stability.
The extraordinary large distance between anchoring points (approximately 40 metres), the curved geometry of the pontoons, and lake-level variations of up to 6 metres required bespoke structural solutions. The resulting relative planimetric movement between the floating pier, dam and side arms influenced the shape and size of the access and connection walkways of the floating complex.
A 24-metre aluminium access gangway with a wooden deck connects the central pier to the shore, while sliding and curved walkways allow controlled relative movement between the floating pier, breakwater and side arms.

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The ***Mayor of Gambarogno, Gianluigi Della Santa***, commented on the creation of the new prestigious development*: "In Gambarogno, the vision of a large marina was born in the mid-1980s and went through decades of political debate, appeals and redesigns, until the forward-thinking decision was taken by the municipality to relaunch the project with determination. The work will be completed in early 2027: the Port of Gambarogno will offer around 280 berths in a modern facility, complete with shore-side services and a restaurant overlooking the lake, becoming a new international benchmark for sustainable, high-quality nautical tourism on Lake Maggiore. The project, made possible thanks to the high level of professionalism of the technical and commercial partners - including Ingemar, responsible for the supply and installation of floating pontoons and mooring fingers - represents the first important step in a wider programme of municipal investments to enhance and make public shores more accessible.*

The ***Sciarini engineering firm in Vira Gambarogno***, responsible for the design and construction management, provided this more detailed technical description of the project:
- The design of the new Gambarogno Port has resolved the considerable complexities of the site with special technical solutions and has led to the creation of a unique structure.
The protected basin is bordered by a system of floating breakwaters made of empty reinforced concrete caissons connected by an internal pre-stressing system. There are three elements: the main breakwater, approximately 340 metres long, and two side breakwaters, approximately 60 metres and 80 metres long respectively. They are composed of a total of 44 modules more than 10 m long, 4 m wide, 3 m high and weighing approximately 80 tonnes each, with an average height above water of approximately 1 m. The modules were built on land, launched individually and then assembled in the water. The caissons are equipped with chain wells through which they are connected to the anchoring system. There is one chain well approximately every 40 metres. Inside the protected basin are the piers for mooring boats. The internal piers are made of floating elements fixed to the anchoring system at intervals of approximately 40 metres.
However, the most distinctive feature of the project is the anchoring system for the lake elements. The site where the harbour was built is characterised by (1) a steep lake bed slope, (2) large variations in the minimum and maximum lake levels (from 192 m to 198 m above sea level) and (3) a distance of approximately 130 m between the breakwater jetty and the shore (the depth of the lake bed at this distance is approximately 60 m, assuming a descent angle of 30°, the depth reaches approximately 100 m). For the above reasons, it was not possible to anchor with dead weights, as the depth would have been excessive. In addition, one of the client's requirements was to avoid a manual adjustment system for the mooring devices on the lake bed, which meant that systems with chains or elastic ropes had to be ruled out.
Therefore, the only viable option is to create a false lake bed on which to fix the anchoring system. The latter requires the internal pontoons to be anchored to vertical poles by means of collars and the breakwater to be connected to oscillating arms, which are in turn part of the false seabed. As the lake level changes, due to buoyancy, the internal pontoons are raised by sliding the collar around the vertical pole and raising the breakwater, which in turn causes the swing arm to rotate relative to its base hinge.
The false lake bed anchoring system was constructed using nine steel lattice elements (one at each swing arm transverse to the breakwater). These are bracket-type elements anchored to the ground at three points, two towards the lake and one towards the shore. A total of approximately 1,000 tonnes of steel were laid in the water, of which only the vertical piles for mooring the internal pontoons are visible.
The foundation system was constructed using micropiles driven into the water, with a total of approximately 1,300 metres drilled to create more than 50 micropiles.