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M.M. S.R.L. a socio unico
Fiberglass Reinforced Polymer Gratings and Structures

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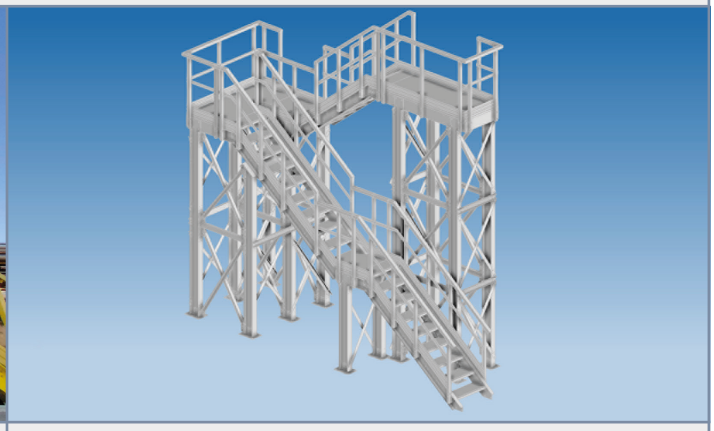
MULTI-STOREY STAIRCASE FOR ACCESS TO TANKS

CLIENT	COMPANY SPECIALIZED IN DESIGN, CONSTRUCTION, MAINTENANCE AND MANAGEMENT OF URBAN AND INDUSTRIAL WASTE WATER TREATMENT PLANTS
LOCATION	ITALY
USE	WASTE WATER TREATMENT PLANT
PRODUCT	FRP STRUCTURE
SERVICE	DETAIL AND STRUCTURAL DESIGN



OBJECTIVE

The goal was to build a **chemical resistant** structure to access a couple of tanks, in an aggressive environment subjected to corrosion, caused both by the specific use (in a waste water treatment plant) as well as by the site itself (brackish environment).

The requirements were:

- **stand-alone** installation (while excluding the possibility to fasten the structure to the existing metal tanks, as these weren't designed to withstand additional forces);
- **wind** resistance;
- resistance to the **design loads**;
- compliance with **specific clearances** related to the installation inside a storage basin (concrete tank for possible leakage containment).

The Client also clarified the need of easily recognisable elements as safety devices.

On top of the above-mentioned requirements, the compliance with UNI EN ISO 14122 has been requested.

SOLUTIONS

In order to identify the ideal solution, the design team in M.M. analysed the geometrical constraints represented in the Client's layout drawings, initially developed for a galvanized steel proposal. Additionally, the vertical and horizontal **load combinations** (such as pedestrian load and wind load) were calculated. The maximum load values resulting from the aforementioned combinations were considered as input data for the **design of profiles**, **connections** and stainless-steel base plates. While for staircases the standard M.M. profiles were used, the supporting structures of resting platforms required stronger H-shaped sections as well as various bracing systems, in order to comply with the deformation limits required by the Technical Construction Standards in force (Chapter 4). Parapets and steps front plates were realized in yellow colour, in order to ensure the best visibility in all weather conditions. All the cutting, drilling and cuts sealing operations were made at M.M. workshops. The structure was delivered at site in easily movable **prefabricated modules**. Therefore, the installation only required the mechanical connection of the components and fastening at the base by means of standard screws and anchor bolts.

The supply was completed by **technical notes**, **installation drawings and instructions** provided by the design team at M.M.. Such additional documents ensured the most accurate completion of the works and the perfect installation of the FRP structure.