

## PROJECT BRIEF

## Strengthening of Structurally Deficient Cement Silo with the TYFO® Fibrwrap® System



Taichung, Taiwan  
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Located in Taichung, Taiwan, this Cement Silo has a cylindrical, reinforced concrete structure that is 25 m in diameter and 45 m tall.

During routine maintenance inspection, the owner's structural engineers discovered vertical cracks spaced at regular intervals along the silo's outer walls. After conducting a more in-depth structural investigation, it was determined that the hoop reinforcement provided in the original design was inadequate to handle the high horizontal pressure exerted on the outer wall, in turn resulting in the vertical cracking seen at the outer tension face of the wall. Furthermore, due to the silo's proximity to the sea, corrosive elements such as salt and moisture from sea spray only worsened the situation.



A strengthening scheme using the TYFO® Fibrwrap® System was adopted to confine the entire structure, as the system was designed to replace the missing hoop reinforcement using a composite jacket of 1.3mm to 2.6mm thickness on the outer surface of the silo wall. The primary direction of the composite was applied in the circumferential direction with varying thickness in the vertical direction to cater to the change in horizontal forces acting on the silo wall with depth. As an added bonus, the composite jacket also contributed further to the protection of the existing concrete structure by providing an impermeable barrier to the corrosive environmental elements. The entire project from was successfully completed in about 3-and-half months' time.

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