



Technical Article

Silo Problems

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This article tries to prove that silo design is the most difficult of all subjects in the field of civil engineering. The major errors in silo design are discussed and examples are given of silo deformations, fractures and collapses. This article is dedicated to Dr. Otto F. Theimer in recognition of his work and publications on the subject of silos. When, in 1971, I read his article ' Failures of Reinforced Concrete Grain Silos ' [2], I was able to confirm how complex the design and calculation of silos is. At that time I was in charge of the structural calculation of 90 silo installations, of which 30 had suffered serious problems and one had collapsed. Generally, when a silo installation produces problems, the causes are multiple and varied – and it is the total sum of these which results in failure.

Of significance is a comment made by Otto Theimer during his speech at the Meeting on Grain Milling Technology at Detmold, Germany in 1963: "In no other field of advanced constructional engineering are there so many dangers and risks as in the field of silo construction".

In 1978 I published a book dealing solely with problems in silos, which contained 48 specific problems together with more than 165 photographs, all of which I had encountered in twelve years of experience in this complex but exciting field of science.