

Cautions in the Use of Interstices

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Abstract - In silo groups, the space where four silos share common walls is called an interstice. This star shaped space is routinely used for storage of material. Traditionally, engineers and owners alike considered this as “free space” and used these interstices for storage.

Based on experience and analysis, it has been learned that these interstices cause vastly higher stresses in silo structures than originally assumed. It is understood that, if engineers considered these interstices in their design, their assumptions of how the walls act structurally are incorrect. As a result, the forces on the curved walls can lead to overstress which in turn leads to the need for significant repairs and in worst case failure.

This presentation will give basics of silo structure and show the general principles of silo design. Further, it will be shown that if an interstice wall is reinforced solely to resist uniform tension in a nearby round silo, that wall can easily overstress due to the forces exerted on it from material in the adjacent interstice.

As interstices are formed of inner walls of a silo group, evidence of damage may be masked for some time. The presentation will also stress the need for inspection, as well as show different manifestations of the overstress in damage to the silo group walls, roof support beams.