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Loads Exerted by Free-Flowing Grain on Bins

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1 Purpose

1.1 This Standard presents methods of predicting the grain pressures within centrally loaded and unloaded bins used to store free-flowing, agricultural whole grain.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies unless noted. For undated references, the latest approved edition of the referenced document (including any amendments) applies.

ACI 313-16, Design Specification for Concrete Silos and Stacking Tubes for Storing Granular Materials and Commentary

ASAE D241, Density, Specific Gravity, and Weight-Moisture Relationships of Grain for Storage

3 Terminology

3.1 Terms used in this Standard are defined as follows:

3.1.1 antidynamic tube: A vertical conduit, generally at the center of a bin, with the bottom of the tube placed directly over an orifice through which grain can be unloaded from the bin.

3.1.2 bin: A container with a height to diameter (or shortest side) ratio greater than 0.5.

3.1.3 flume: A vertical tube attached to the wall of a bin through which grain can flow. Discharge outlets may be placed in the bin wall at any location along the vertical rise of the conduit.

3.1.4 funnel flow: Flow from a bin in which all grain movement occurs through a central core with no movement occurring along the bin wall (see Figure 1).

3.1.5 funnel flow hopper: A hopper in which a flow channel is formed within the stagnant grain (see Figure 2).

