

“How to Properly Address Engulfment Hazards”

by **Wayne Bauer**

Director of Safety & Security at Star of the West Milling Co.

Frankenmuth, MI

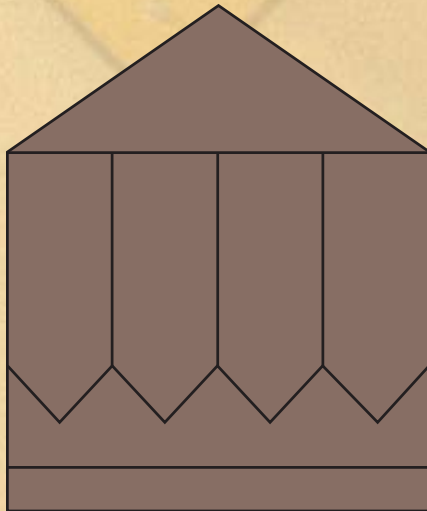
Grain Entrapment Prevention
With Better Training and Design Parameters

*Presented by Wayne Bauer,
Director of Safety & Security at Star of the West Milling Co.*

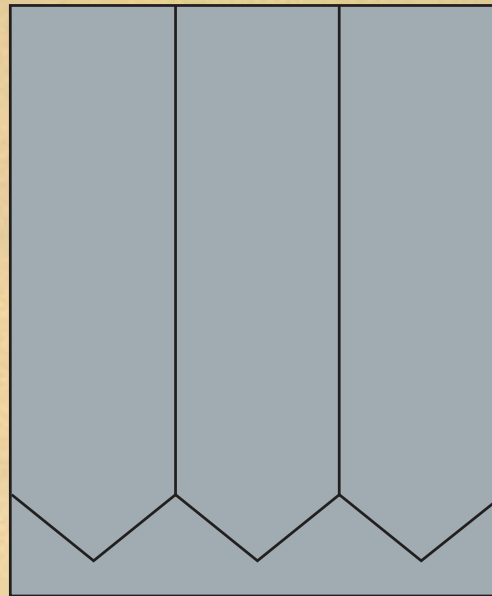


Transformation of Bin Designs

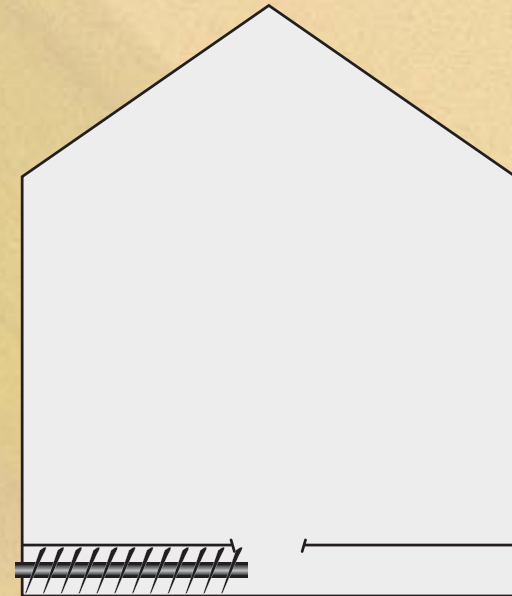
Wood



Concrete

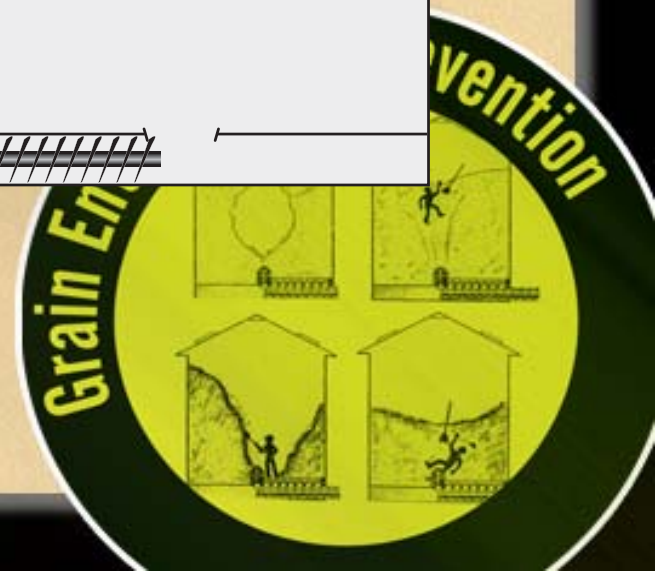


Steel



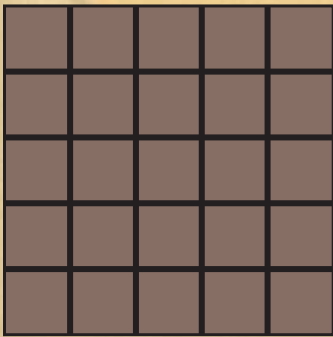
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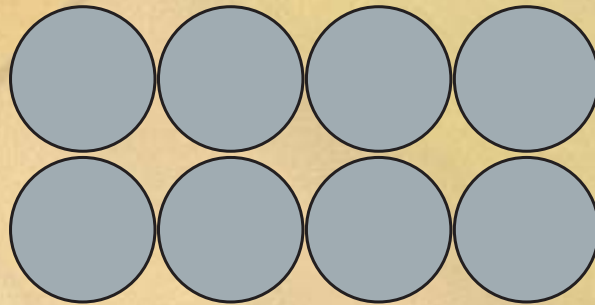


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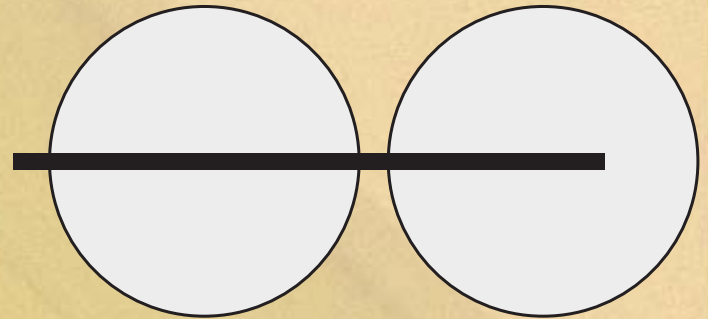
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Concrete



Steel



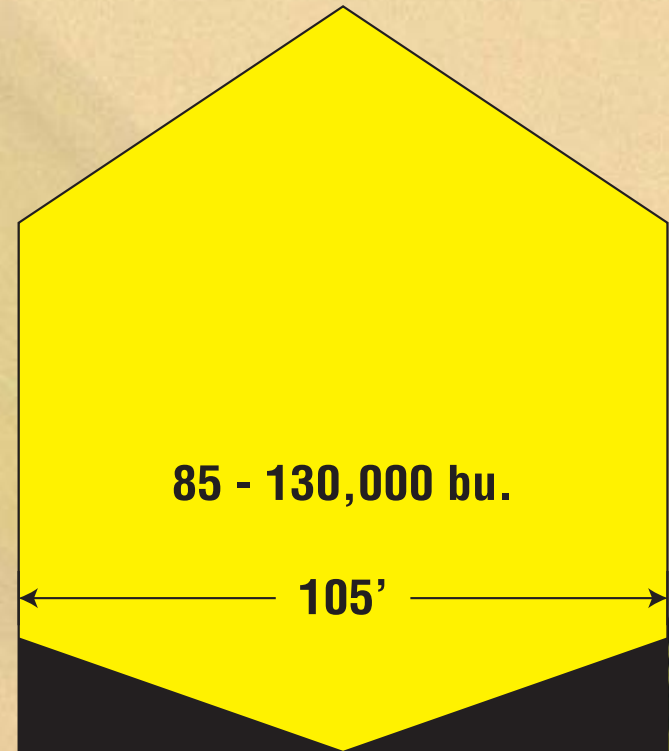
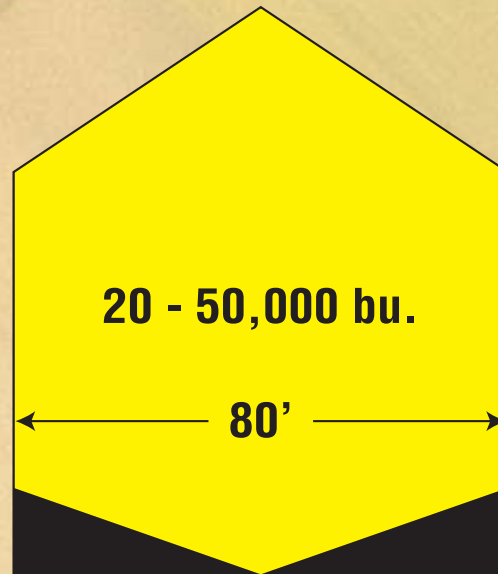
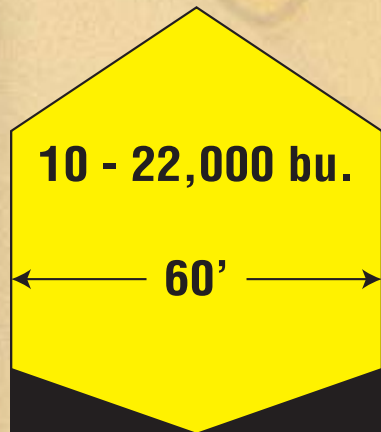
How does the – **(R) Factor** and resultant **Convection Currents** in the structures above compare?

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Residual or Non-Reclaim Grain



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When Are We Going to Get Our Arms Around This Problem of Grain Entrapment?

	Industry Entrapments (Farm & Off-Farm)		Deaths	
	<u>"Reported" Entrapment</u>	<u>Total number of Deaths</u>	<u>Off Farm</u>	<u>On Farms</u>
2010	?	?	?	?
2009	38	16	est. 6	est. 10
2008	34	-	10	-
2007			9	-
2006	20	-	7	-

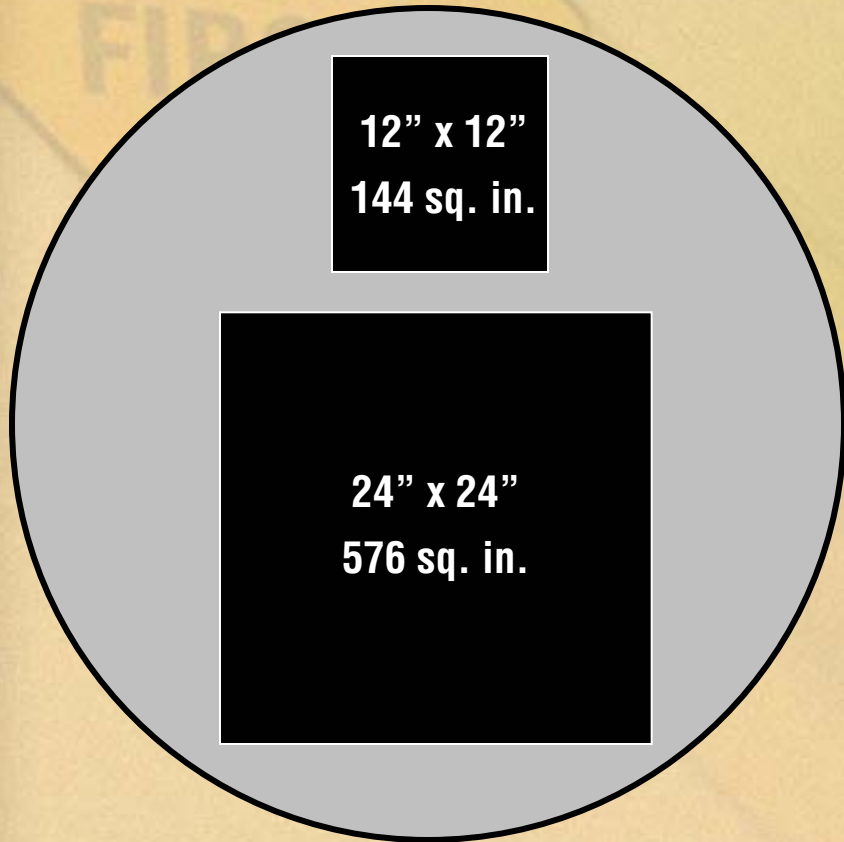
Source: Bill Field, Purdue University

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Discharge Sump Holes



What would it cost to increase the size of your discharge sump hole by 4 times?

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Questions I Hear Frequently

1. How should we get started with a **REAL** program?
2. What kind of **RESCUE** equipment should I buy?
3. How much **MONEY**
4. How do I form a **RESCUE TEAM**

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SA
FI

Meets all ANSI, OSHA standards and CSA construction requirements for Class III Harness.

75 - 90



1 "D" Fall Protection Harness

1 "D" with Positioning Rings

**Industrial 1 'D'
Full Body Harness**

Meets all ANSI, OSHA standards and CSA construction requirements for Class III Harness.

90 - 120



3 "D" Fall Protection Harness

3 "D" with Positioning Rings

**Industrial 3 'D'
Full Body Harness**



#320



Technical Rescue Harness

#205



Heavy Rescue Harness

Prevention

Grain



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Where should your money go? What are the priorities?

1. \$80-\$150/person – **ANNUAL** on training
2. \$250-\$325 – Good Class III Harness with four D-Rings
3. \$375 – Bin entry kit
4. \$475-\$3,900 – Cofferdam
5. \$200 – Atmosphere testing equipment for oxygen at minimum (Real threat vs. perceived threat)
6. \$4,000+ – Rescue equipment for (6) person response team

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Forming New Best Management Practices / Consensus Standards & Design Parameters for New Construction

We need a paradigm shift in our way of thinking.

Following the practices and designs
of the 1970's will not work in the future.

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Best Management Practices

1. Offer employees **“on-the-job”** training (Have employees learned proper usage of equipment?)
2. Do you have **classes booked for 2011?** (Lock in qualified instructors and start promoting early)
3. Does this training involve local **emergency response teams** and 911?
4. **Progressive discipline.** What are the consequences if an employee ignores the safety procedures?

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What Should New Design Parameters Address

1. **Reclaim Systems**
 - a) Size and spacing of discharge sump holes
 - b) Service tunnels
 - c) Sweep augers
2. **Access Doors**
 - a) Top of bin roofs
 - b) Side doors
3. **Ladders and Work Platforms**
4. **Restraint Systems**
 - a) Overhead anchorage point
 - b) Secure and control life-lines

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SAFETY

Top Access Holes

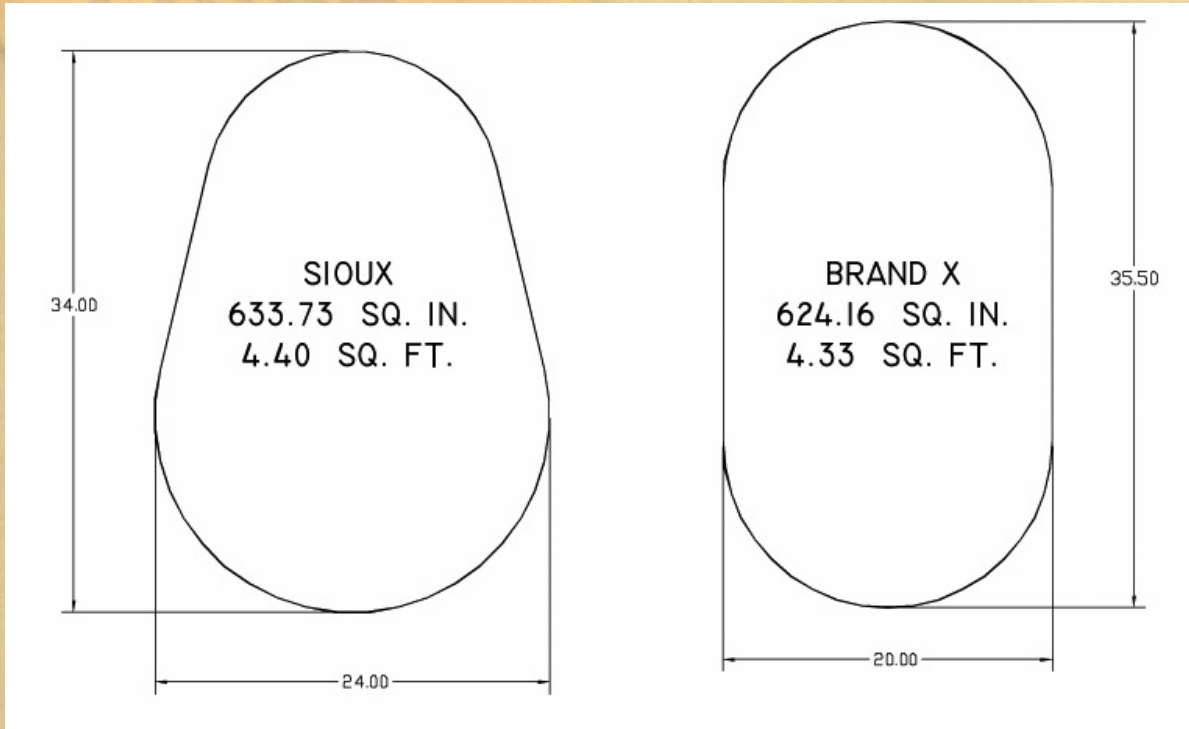


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Top Bin Entry Doors



Sketches furnished by Sioux Steel Company

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SAFETY

Top Entry Doors



Consider moving doors for rescue purposes.

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Side Access Doors



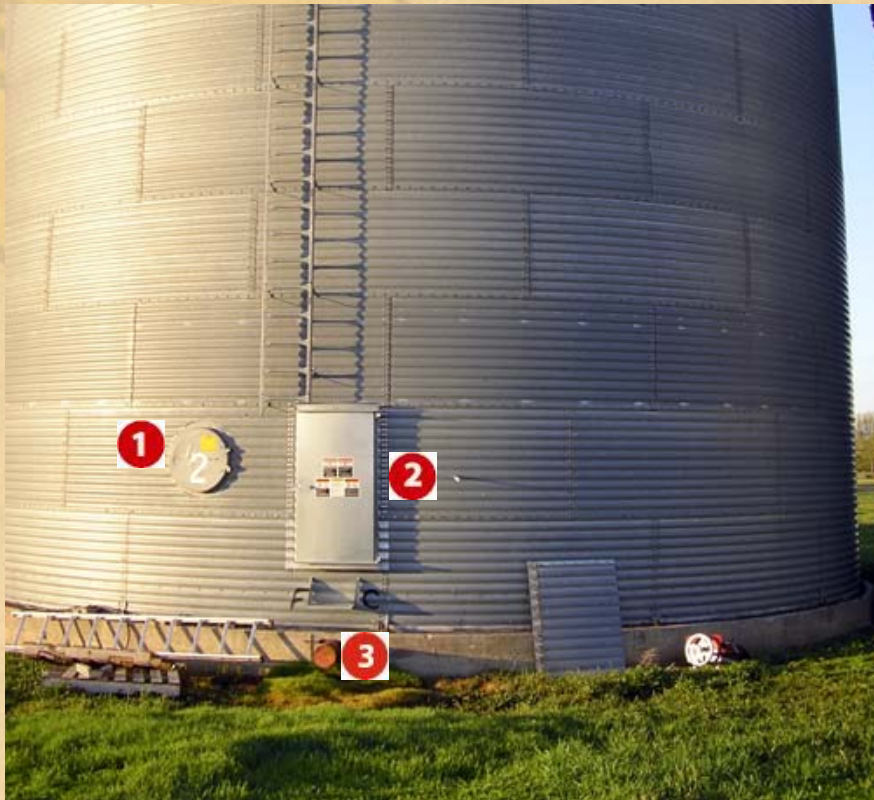
- 1 Use Minimum 5' Door**
- 2 18" Step NOT Acceptable**
- 3 Use minimum 3' x 3' work platform with handrails**

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Side Access Doors



- 1 Avoid Use of 24" Round
- 2 Use Minimum 5' Door
- 3 Recommended Access Door is offset from unloading auger

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SAFETY

Bin Entry Kits



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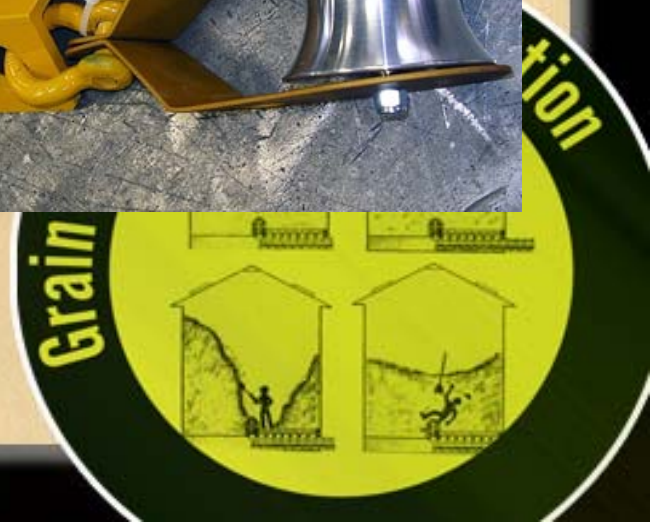


Passing Pulley in a 48' dia. Tank



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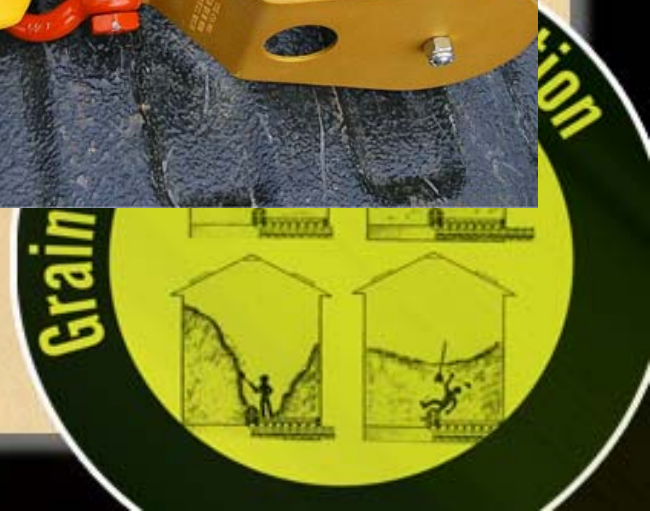


Passing Pulley in a 72' dia. Tank



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Fall Restraint System

"Top Guard" - for use in 105' commercial bins



**Not Fall
Protection**



*Photos courtesy of
GSI Group*

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Grain Entrapment Prevention Conference/Symposium

Join us in March, 2011 for a more in depth discussion of these issues.

- **Where:** GSI training center in Assumption, IL
- : March 22-23 ... Steel Bin Manufacturing Firms.
March 24-25 ... Grain Industry, Insurance and academics

(Limited to 80 in each group)

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