Calculating Grain Bunker Volume and Capacity

Following is an illustration that can assist you in determining how many bushels of grain will fit in a grain bunker or planned flat storage grain area. Note: All volume is in cubic feet. All capacities are in bushels.

\[
\text{Bunker volume} = \frac{(A + B)}{2} \times C \times D
\]

\[
\text{Capacity} = \frac{\text{Volume} \times 0.8}{3}
\]

\[
\sin A = \frac{\text{opp}}{\text{hyp}} = \frac{a}{c}
\]

\[
\cos A = \frac{\text{adj}}{\text{hyp}} = \frac{b}{c}
\]
Calculating Bucket Elevator Spout Length

Dry grain typically flows in a spout at an angle of 45° or more. High moisture grain, sunflowers and ground feed generally require spouts at a minimum angle of 60°. To calculate spout length, the following calculations apply:

For 45° Spouts

\[ \text{Spout length} = A \times 1.412 \]

To have 45° flow, 
\( A \) must equal \( B \)

For 60° Spouts

\[ \text{Spout length} = A \times 2 \]

To have 60° flow, 
\( B \) must equal \( A \times 1.75 \)

Dry grain will typically flow at 45°; high moisture grain, sunflowers and ground feed typically at 60°

Bushels Per Hour to Tons Per Hour Formula

This is the formula you use to convert bushels per hour to tons per hour:

\[ \text{BPH} \times 1.25 = \text{Cubic Feet Per Hour} \]

\[ \text{Cubic Feet Per Hour} \times \text{Pounds Per Cubic Feet} = \text{Pounds Per Hour} \]

\[ \text{Pounds Per Hour} / 2000 = \text{Tons Per Hour} \]

Common Assumed Per Cu Ft Weights:

- Corn = 45 lbs per cubic ft
- Feed = 35 lbs per cubic ft
- Wheat = 48 lbs per cubic ft
- Pellets = 55 to 60 lbs per cubic ft

(I highly recommend you VERIFY the weight of the material you will be conveying)