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EC65-750 Gain Bin Floors and Foundations

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GRAIN BIN FLOORS & FOUNDATIONS

PRELIMINARY

AGRICULTURAL ENGINEERS' DIGEST

OCT 10 1972
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The information in this digest is for the smaller government grain bins that are being sold as used bins. For a new bin, follow the manufacturer's instructions. For the large government bins, write the manufacturers of the bin for installation instructions.

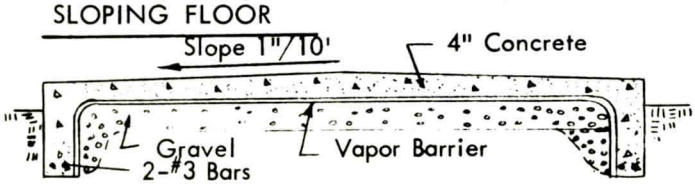
INTRODUCTION

The foundation and floor for a new or used grain bin must protect the grain from moisture and rodents, and anchor the bin. A method for removing the grain must be provided.

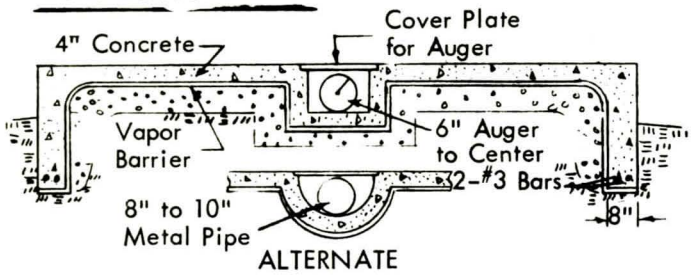
A vapor barrier of 4 mil polyethylene, or equivalent, should be placed under the floor to prevent moisture from coming through the concrete.

FLOOR TYPES

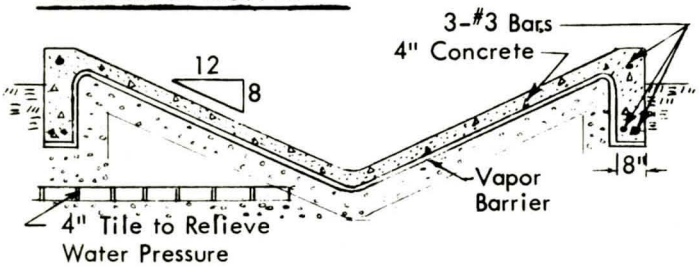
SLOPING FLOOR



FLAT BOTTOM



CONCRETE HOPPER



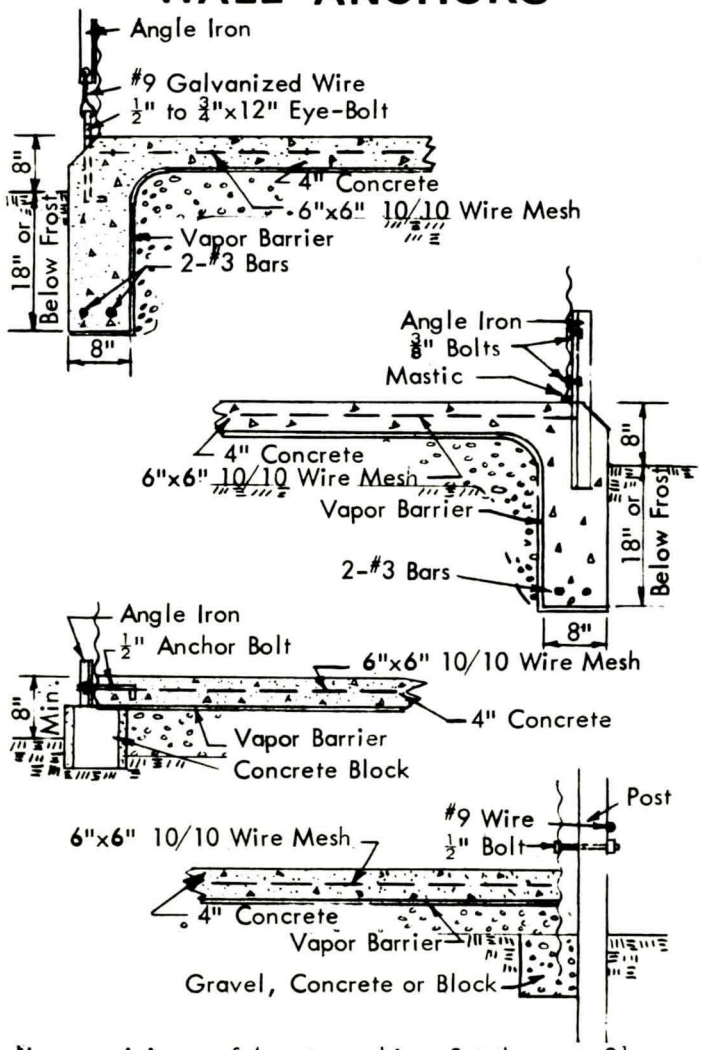
LOCATION

Bins should be located in or near the farmstead. The site should be well drained, free from surface water, and away from any possible flooding. An area protected from snow drifts and mud holes is desirable. Provide an easy access route for convenient filling and emptying.

FILLING

Before placing any grain on the floor, allow the concrete to cure and dry for 30 days. If you must place and store the grain during the 30 days curing time, cover the floor with 4 mil polyethylene.

WALL ANCHORS



Have a minimum of 4 posts per bin. Set the posts 2½ to 3 ft. in the ground and extend 4 ft. above the ground. Place #9 wire around the bin near the top and bottom of the posts and stretch tightly. Fasten the posts to the bin with ½ in. bolts near the top and bottom of each post.

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and U. S. Department of Agriculture Cooperating
E. F. Frolik, Dean J. L. Adams, Director

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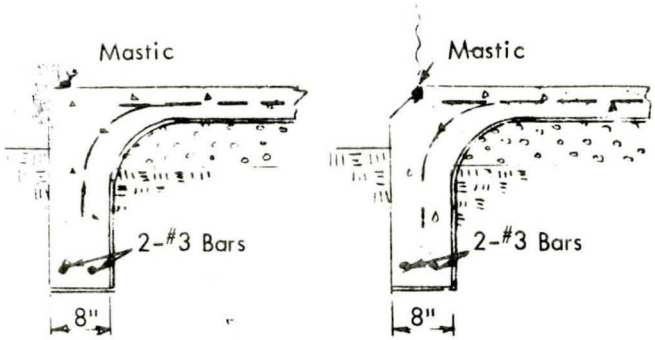
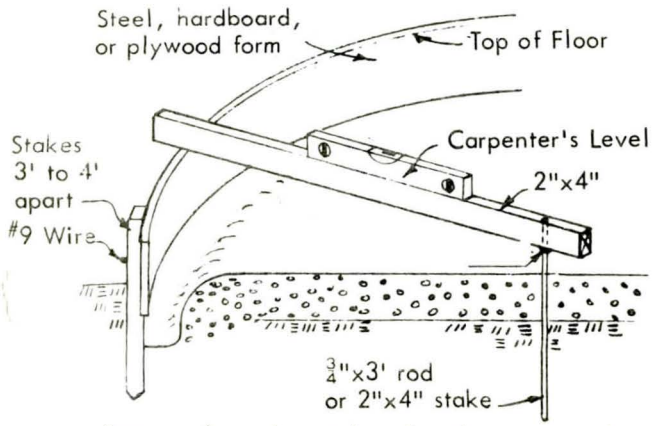
BIN WALL SEALS



Place mastic or sealing compound on both sides of the bin wall. Check each year and replace damaged sealer.

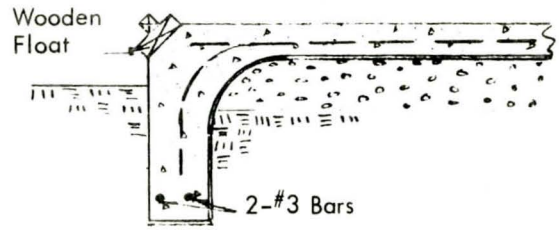
FORMING



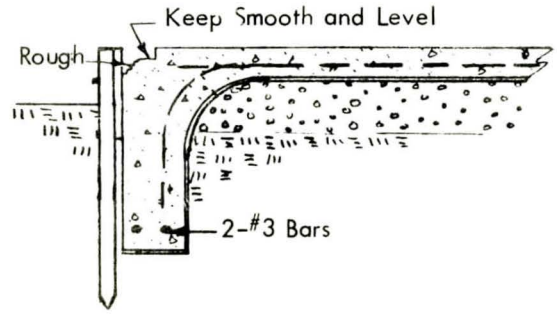
Remove the rod or stake after the concrete has set and fill the hole with concrete grout.

Several methods have been suggested for forming the ledge shown on page 1.

Method 1. As soon as the concrete is firm, remove the concrete around the edge with a steel trowel. Then float with a wooden float.



Method 2. After the concrete is firm, use a tiling spade and trowel to remove the edge. Make the ledge smooth and level. The rest of the surface can be left rough as roughness will give a better surface for grouting. After the bin has been placed on the ledge, grout in a concrete seal.



CONCRETE USAGE

Do not change the water-cement ratio.

The forms should be rigid and well braced. Oil the forms before placing the concrete. Spade or vibrate next to forms to prevent honeycombs.

Level the concrete, float when the water sheen disappears, then use a steel trowel for the final finish. Smooth concrete makes unloading the bin much easier.

Keep the surface of the concrete damp at least 5 days. Leave the forms in place at least 5 days.

Do not place concrete over frozen ground. In cold weather, use Type III portland cement., or Type I with calcium chloride dissolved in the mixing water at the rate of 2 lb. per bag of cement. Heat the mixing water (not over 180°) and the aggregates if necessary so the mix will be 50° to 70°. Keep the concrete at 50° for 7 days for Type I cement, or 4 days for Type III. This is usually done by covering the concrete, and insulating it with 6" to 12" of straw or hay.

Max. size aggregate	Gal. of water added for each sack of cement, using:			Suggested mixture for 1-sack trial batches[4]			READY-MIX Sacks Cement Per Yard[6]
	Damp[1] sand	Wet[2] (average) Sand	Very Wet[3] Sand	Cement,[5] sacks (cu. ft.)	Aggregates Fine, cu. ft.	Aggregates Coarse cu. ft.	
1"	5½	5	4½	1	2¼	3	6¼
1½"	5½	5	4½	1	2½	3½	6

1 Damp sand will fall apart after being squeezed in the palm of the hand.
2 Wet sand will ball in the hand when squeezed, but leaves no moisture on the palm.
3 Very wet sand has been recently rained on or pumped.
4 Mix proportions will vary slightly depending on gradation of aggregates.
5 Use air-entrained portland cement in concrete.
6 Medium consistency (3" slump) Order air-entrained concrete.