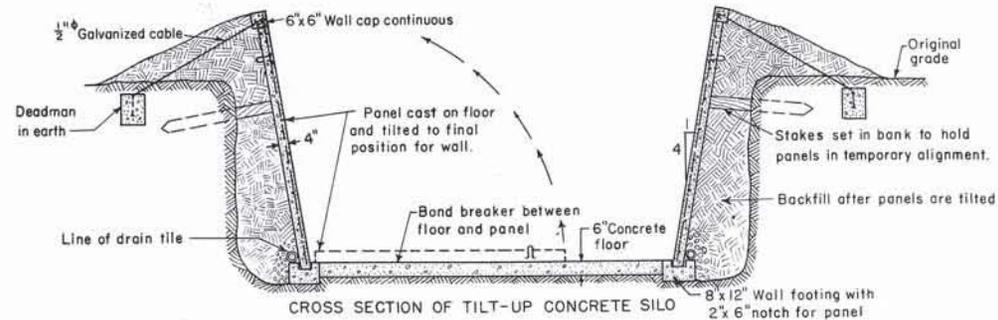
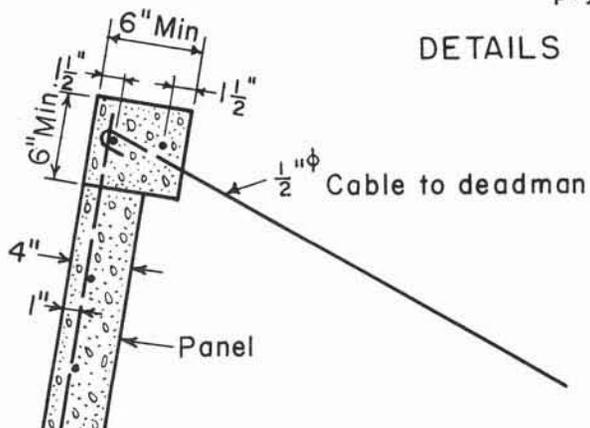


DETAILS OF PANEL



ESTIMATE OF MATERIALS

For 16' long silo section, 8' deep and 12' wide.

Concrete : *

For Floor and footings Cu. yd. ----- 4 1/4
 For Walls ----- 3 3/4

Steel :

48 - 3/8" φ	7'-6" Long	=	135 Lb.
16 - 1/2" φ	8'-0" "	=	48 "
4 - 1/2" φ	17'-0" "	=	26 "
8 - 3/8" φ	2'-0" "	=	6 "
			Total = 215 Lb.

* Allowance of 10% has been added to concrete quantities for wastage.

NOTE - SEE INSTRUCTIONS ON BACK

TILT-UP CONCRETE LINING FOR SILOS

COOPERATIVE EXTENSION SERVICE
 UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE,
 U. S. DEPARTMENT OF AGRICULTURE, AND
 COUNTY GOVERNMENTS COOPERATING

COOPERATIVE EXTENSION SERVICE
University of Arkansas Division of Agriculture,
United States Department of Agriculture, and
County Governments Cooperating

TILT-UP CONCRETE LINING

The excavation is made at least 16 in. wider than the desired inside silo width. Rough excavation is sufficiently accurate as any over-excavation can later be back-filled.

A footing 8 in. deep and 1 ft. wide is needed for the wall panels. The center-to-center distance between footings should be the inside silo width plus 4 in.

Forms for the footing are set at the same elevation across the silo width since the top of the footings will later be used in striking off the concrete floor.

A 2-in. deep, 6-in. wide slot is cast in the footing to receive the concrete wall panel. See cross section. This slot is easily constructed by placing a 2 x 6 in the top of the footing and removing it before the concrete hardens.

When the footings have hardened, side forms are removed and the concrete floor is placed. The floor in this silo must be level from side to side to serve as the bottom form for the concrete wall panels. A bond-breaking material must be used to prevent the new concrete from adhering to the floor. A wide variety of materials such as oils,* building papers, canvas and plastic or plywood sheets have been used successfully.

If the silo bottom is at least twice as wide as the wall panels are high, both rows of wall panels can be cast on the floor at one time. In a narrower silo, one row of panels is cast at a time. The second row can be cast on top of the first, if desired, by placing a bond-breaking material between the panel layers.

The 2 x 4 edge forms are set on the floor and braced to prevent movement. The longitudinal forms can usually be braced against the sides of the earth trench. Pieces of 2 x 4 crosswise between longitudinal forms divide the concrete into the size panels desired. The panel size to use depends on the type of lifting equipment available. An 8-ft. long panel, 8 ft. high and 4 in. thick, weighs 3200 lb. and is about the maximum size that can be conveniently handled with farm equipment.

After the forms are set and the bond breaker is applied to the floor, a 1-in. layer of concrete is placed in the forms. The reinforcing steel is then placed on top of this concrete. Steel consists of a mat of 3/8-in. round reinforcing rods spaced at 12-in. centers in both directions. Alternate bars should extend from the edge of the panel, which will be the top after panels are tilted. This can be accomplished by boring holes in the edge form at 24-in. centers.

Handles for raising the panels are made from 2-ft. long pieces of 3/8-in. round rod. The shape of the handles is shown in detail. The handles are hooked under the mat of reinforcing bars and are placed 12 in. from the top of the panel and 12 in. from each side.

*It is understood that patents have been issued relating primarily to the use of certain liquid materials for bond prevention.

The wall panels must be moist-cured for at least a week before tilting them into position. Curing is necessary to develop maximum strength of the concrete so that panels can be handled without breakage. Curing can be done by placing straw, sand, or earth over the concrete as soon as possible without marring, and keeping the cover material continually wet. Another method of curing is to apply waterproof paper or curing compound over the panels as soon as possible after they are cast. These waterproof materials hold the mixing water in the concrete. This water is needed for complete hydration of the cement.

Bars or jacks are usually needed to loosen the panels before tilting begins. A lip to help pry the panels loose can be cast by placing 1 x 1-in. wood blocks about 4 in. long in one edge of the panels.

The plans enclosed show some of the tilting methods and equipment that have been used successfully to raise concrete panels. The panels are tilted against stakes driven in the earth bank and are aligned at the correct slope. When all panels are up and aligned, a 6 x 6-in. concrete cap is placed on top of each wall for the entire silo length. Two 3/8-in. round reinforcing rods are placed continuously in the concrete cap; they are spaced 1 1/2 in. from the inside and outside face of the cap.

A line of drain tile is placed behind the wall, and back-filling is done carefully to prevent pushing the panels inward. Joints between panels are filled with mortar to make the silo more airtight.

The concrete cap is anchored with a 1/2-in. cable to deadmen spaced at 8-ft. centers in the earth bank. The deadmen should be a minimum of 1 ft. square and be buried at least 2 ft. below the ground surface.

Disclaimer

This site makes available conceptual plans that can be helpful in developing building layouts and selecting equipment for various agricultural applications. These plans may be outdated and do not necessarily represent the most current technology, construction codes, or agricultural practices. They are not construction plans and do not replace the need for competent design assistance in developing safe, legal and well-functioning agricultural building system. The University of Arkansas Cooperative Extension Service, the United States Department of Agriculture and none of the cooperating land-grant universities warranty these plans.