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EC66-756 New Building Technique for Swine Housing : Insulated Concrete Tilt-Up

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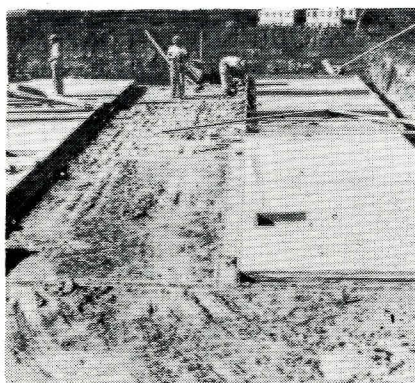
New Building Technique for Swine Housing

Insulated Concrete Tilt-Up

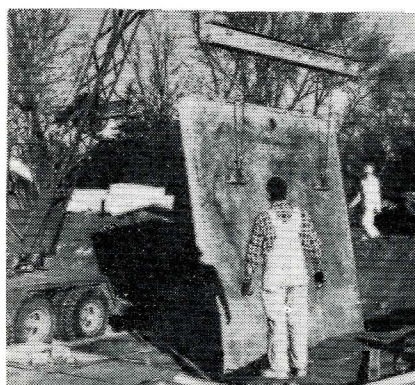
By E. A. Olson

Professor, Agricultural Engineering

The lower layer of reinforced concrete has been poured and foamed plastic insulation has been laid on the concrete. The top layer of concrete with reinforcing will be placed, finished and cured.



The sandwich insulated concrete wall panels for the James Voight swine finishing building near Davenport have been cast on the floor of the building. Forms for casting end-wall panels are being built on the side panels.



The finished and cured concrete wall panels are tilted and lifted into position with a crane. Here, the first wall panel on the Voight finishing house is being positioned. With an experienced crew, panels are quickly tilted up. Panels must be well braced to prevent the wind from blowing them down.

Swine by nature are destructive and when confined to buildings or pens can damage walls or partitions. In confinement housing with controlled environment, the manure gas fumes combine with humid air in the building to cause corrosion or rusting to develop rapidly on unprotected exposed metals.

Most swine producers are looking for a building of durable materials that will resist the sharp teeth of the hog as well as damage from corrosion. They also find that to overcome wet walls due to sweating condensation in a closed building, both the walls and ceiling must be insulated.

Farm concrete tilt-up construction which has been accepted widely in the state, is also giving excellent results in swine housing. The development of a concrete insulated wall panel which has been used for swine housing has given excellent results. This has a real potential for the Nebraska swine producer. A building with the sandwich insulated concrete panels has proven to be durable, "hog-proof", low in cost, maintenance free, and easy to clean.

Proven on the Farm

There are two swine buildings with sandwich insulated concrete wall panels that have been in use for the past three years. One of the

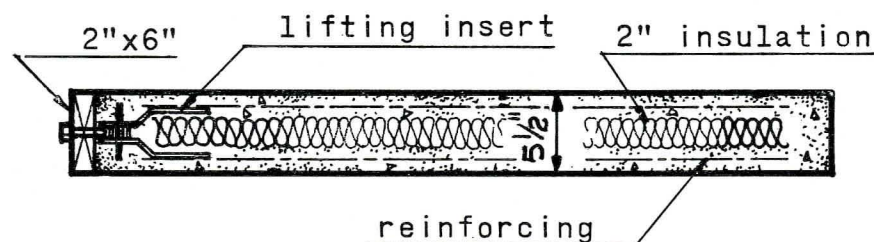
first to try this idea was Edwin Spradlin of Cozad, in his farrow to finish building. Here are some of Mr. Spradlin's comments: "My building was built during the summer of 1962 and the concrete walls are standing up very well. No cracks have developed inside or out. The styrofoam insulation does a good job of keeping the walls free of frost and moisture.

"I think another point for concrete is the upkeep value. Having to paint a building every few years runs into money and time. Also other types of material have to be protected from the hogs or they soon tear it up. Considering the extra cost of painting and covering with something for protection, I feel concrete costs very little more, if any. Another point is the rodent proof building you get with this wall. Mice and rats like an insulated wall with plenty of feed and water handy which they are unable to obtain in concrete. Other benefits are the moisture and fire proof characteristics of cement."

Gilbert Lundgren of Lexington, another Dawson County swine producer, used the same type of construction for a farrowing house in 1962. He comments as follows: "Regarding the building, I can honestly say that there has been no condensation of moisture on the interior walls of our concrete sandwich

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TILT-UP CONCRETE SANDWICH WALL PANEL



University of Nebraska College of Agriculture and Home Economics
Extension Service

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

Tilt-Up Housing

(continued from page 3)

walled constructed farrowing house. This I believe to be due to the insulation within the walls and the ventilation system."

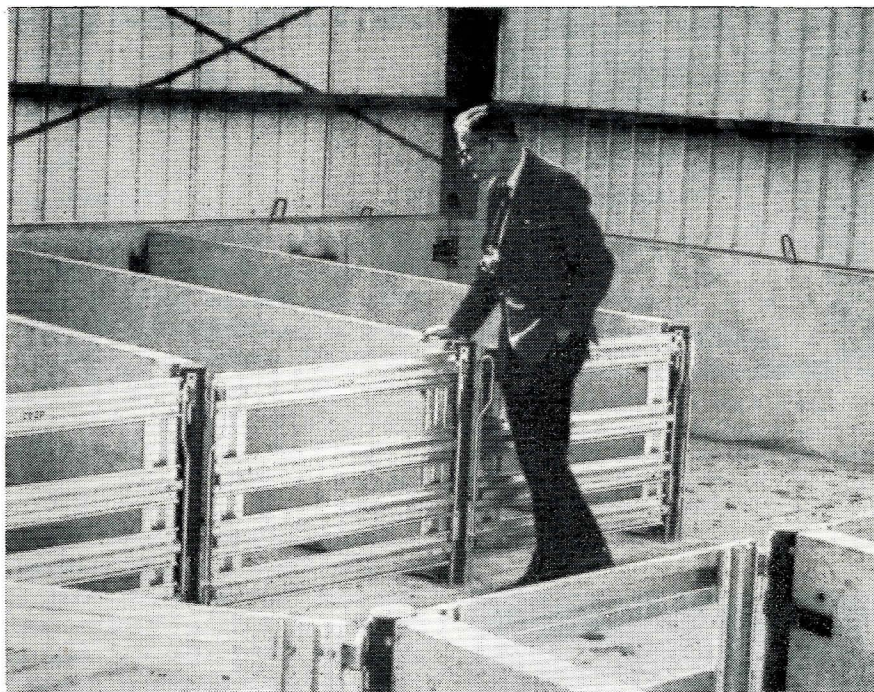
"The next comment I could truly make is that, as yet there is absolutely no maintenance problem inside or outside the walls. The walls have not cracked or leaked, and seem to withstand what little abuse we give them on the inside."

Several other swine producers have shown interest in the concrete sandwich wall panels, including James Voigt of Davenport who has just completed a new 32 x 64' swine finishing unit with controlled environment.

His primary reason for choosing concrete tilt-up is durability. This building will cost slightly more than a prefabricated unit that he had considered, however, the prefabricated building was not as well insulated as the sandwich insulated concrete wall.

Concrete a Natural

Concrete for construction in Nebraska is a natural. The state has a good supply of sand-gravel, and local factories produce cement. These native materials combine with the know how of local labor to provide economical and durable tilt-up buildings for farm or urban use. As farmers, builders, and contractors become acquainted with



Interior of the uncompleted Swine Station near Clarkson, Nebraska. The lower part of the walls are concrete sandwich panels. Pen partitions are reinforced concrete. The interior of the wall above the concrete will be insulated and protected with a metal liner.

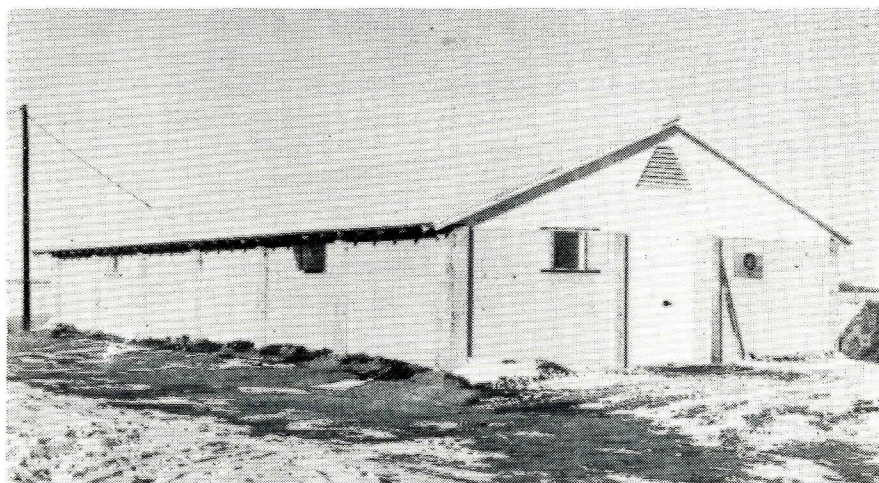
and see the possibilities of this type of construction, we can expect to see many more concrete tilt-up buildings used for several different purposes.

Insulated concrete wall panels are quite simple to make. Panels are cast on the job with simple 2 x 6" forms placed in the concrete floor or sand bed. First, a layer of concrete with reinforcing is poured, then 2" of foam plastic insulation

and finally the top layer of concrete with reinforcing.

Since the top surface of the panel will be the outside wall surface, a finish, as desired, can be used. A wood float or a broom finish produces an attractive textured surface. When desired, walls can be painted to match other buildings by using a cement base paint. For swine housing a white or light color is advantageous since this will keep the building cooler during the warm sunny months.

Swine producers planning new systems might well consider the multi-advantages of this proven type of construction. This is a job for a builder or a contractor since many farmers do not have equipment for tilting large heavy wall panels into place. There are a few important details that must be observed to help assure success; these are shown in a new plan developed by the Agricultural Engineering Department. Copies of plan No. 10726-33 are available from the Agricultural Engineering Extension Office, College of Agriculture, University of Nebraska, Lincoln for \$1.00.



The sandwich concrete tilt-up farrowing unit on the Gilbert Lundgren farm built in 1962. According to Lundgren there has been no condensation on the inside of these walls.