HEATING AND VENTILATING PLAN

NOTE: 1. ABOVE PLAN FOR 200 PIG CAPACITY BUILDING AS SHOWN ON SHEET 1 OR ALTERNATE PLAN AS SHOWN ON SHEET 2. FOR OTHER LENGTHS OF BUILDING REFER TO INSTRUCTIONS ON SHEET 6.
2. CONSTRUCTION AND DIMENSIONS OF FANS, SHUTTERS, AND HEATER UNITS VARY WITH EACH MANUFACTURER, INSTALL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

SUMMER FAN, SHUTTER, & HOOD DETAILS

(SUMMER FAN & HOOD DETAILS NO SCALE
(REFERENCE MANUFACTURER INSTALLATION RECOMMENDATIONS AND DIMENSIONS))
ELECTRICAL FLOOR PLAN

NOTE: ABOVE PLAN FOR 200 PIG CAPACITY BUILDING AS SHOWN ON SHEET 1. REFER TO ELECTRICAL NOTES IF BUILDING ACCORDING TO SHEET 2. FOR OTHER LENGTHS OF BUILDING REFER TO INSTRUCTIONS ON SHEET 6.

ELECTRICAL EQUIPMENT FOR CONTROL BOARD

ITEM

1. Safety switch box - 2 pole, 30 amp, use dual-element, non-combustible, plug-type fuses. Panel sized at 121/4 of full load (amps) of summer fans.

2. Thermostat - 2 stage, 120 or 240V, dual-fused, frame type. Rated for industrial load of at least 7 years at 150 V, or amperage greater than motor rating. NOTE: If fan motor amperage is greater than 15% over motor rating, use a motor relay in circuit and re-serve as required.

3. Two-stage speed control - "loop set" type for 240V motors. Adjust for low speed or "minimum continuous" winter ventilation rate. This control device and the motor for the winter fans must be paired to work together.

4. Thermostat - low voltage, dual-fused, frame type for heat control.

5. Two-stage speed control - thermostat sensor and range adjust type. This control device and the motor for the winter fans must be paired to work together.

6. Thermostat - to disconnect heater power when heater is not needed.

DESCRIPTIONS OF PLAN NO. 1 AND PLAN NO. 2

Plan 1: Shows a fused disconnect box, with two two-stage thermostats, and a solid-state speed control wired to provide the following heating-ventilation functions in response to indoor temperature: (1) supplemental heat, (2) "minimum continuous" winter ventilation, (3) "high" winter ventilation, (4) first summer ventilation fan, and (5) second summer ventilation fan, or maximum summer ventilation.

Plan 2: Shows a fused disconnect box, one 2-stage thermostat, a single-pole "heat" thermostat, and a solid-state variable speed control to provide the following heating-ventilation functions in response to indoor temperature: (1) supplemental heat, (2) variable winter ventilation, (3) first summer ventilation fan, and (4) second summer ventilation, or maximum summer ventilation.
GENERAL DESCRIPTION

THE NURSERY BUILDING

This nursery building is designed as a facility that may be used to fill the production gap between the farrowing house and the finishing floor. Such a building allows for more intensive use of the farrowing houses, in that the pigs can be moved at an early age to the nursery. In cold weather there is also less stress on young pigs where they can be moved to a nursery rather than an open finishing floor.

The plan shown is for building (24 feet wide and 41 feet 4 inches long) to house 300 pigs from weaning (4 to 6 weeks old) up to 30 or 50 pounds in weight. The building may be increased or decreased in length depending upon the number of pigs to be housed. Two floor plan arrangements of piggies are shown. Also shown are foundation plans for either 6-foot or 10-foot slats.

The building features a total slatted floor over a pit 4 feet deep, concrete block walls, trussed rafters, metal roof, insulated ceiling, waterers, feeders, and fans and circulators for environmental control. A humidification system can be used in the pen arrangement shown on Sheet 1. The pen layout shown on Sheet 2 is meant to allow easy feeding from the center aisle.

The ventilation and heating system is designed to provide automatic winter and summer fan ventilation with supplemental heat for winter. The heating unit is sized to maintain 65°F inside the building for the 3 to 6-week-old pigs when the outside temperature is 35°F. The inside temperature may be adjusted lower for larger pigs.

CAUTION

Lethal gases are produced from the bacterial action that take place in the manure in the pit of this building. These gases are continually released and the amount of gases produced is increased greatly if the pit is agitated while cleaning. Exercise extreme caution if the pit is agitated prior to removal of manure.

The ventilation system is designed so that at least one fan will be operating at all times to provide fresh air and force the gases from the house. If the ventilation system should fail to function for a period of 4 to 6 hours the accumulation of gases could cause death to pigs or the attendant. In such cases all doors should be opened. A power failure alarm system could be a good investment.

THE HEATING AND VENTILATION SYSTEM

A. DESCRIPTION

The heating and ventilation system of the pressure type is that air is forced into the building by fans and air leaves the building through vents, exhaust shutters, or the fans used for the pit.

Parts of the system and their function are as follows:

1. Winter ceiling fans are designed to provide a minimum continuous flow and circulation of fresh air into the building. With air circulation system blown by the heater and forced outside and dangerous pit gases from the building. These fans also draw fresh air from the area of the building to help maintain the temperature. The fans below the fans increase the distribution of any of the air thus assuring draft-free winter ventilation.

2. Summer ventilation fans force air directly into the building for maximum ventilation and cooling effectiveness. Since the winter fans do not operate while the summer fans are running, the summer fans also force air back through the winter openings to help ventilate the attic. Shutters on the summer fans prevent the flow of air into the building in cold weather.

B. THERMAL CAPACITIES

The system provides automatic year around ventilation and heat control through the combined use of infrared thermometers and fuel water systems. Periodic adjustment of fans, baffles, or shutters is necessary.

The system operates as follows:

1. When the inside temperature drops below the minimum, the heat of the fuel will operate to maintain the desired minimum temperature for large pigs. The fans will operate at a minimum rate to remove excess heat, provide fresh air for the building, and remove dangerous pit gases.

2. As the inside temperature rises, the winter fans will maintain the winter fan from the minimum to the normal winter ventilation rate.

3. For further temperature rise on warm days, the summer fans may be turned on to maintain the maximum summer ventilation rate and cooling effectiveness.

C. FAN AND HEATER CAPACITY REQUIREMENTS

Ventilation and heating requirements vary with the size of the nursery building and the number of pigs to be housed. Fan and heater capacities for the nursery building as shown in these plans are indicated on Sheet 4. The length of the building is to be varied use the following table for determining the ventilation and heating requirements.

SUGGESTED FAN AND HEATER CAPACITIES WHERE LENGTH OF NURSERY IS DECORATED OR INCREASED

<table>
<thead>
<tr>
<th>Winter Fans CPM</th>
<th>Building Size</th>
<th>No. Pigs</th>
<th>Min. Cont.</th>
<th>Normal</th>
<th>Summer</th>
<th>Fans</th>
<th>CPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24' x 30' or 12'</td>
<td>250</td>
<td>150</td>
<td>160</td>
<td>560</td>
<td>48,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24' x 48' to 50'</td>
<td>250</td>
<td>150</td>
<td>275</td>
<td>275</td>
<td>95,000</td>
<td></td>
</tr>
</tbody>
</table>

(a) Sizes based on the following design data:
- Floor space = 40 sq. ft. per pig (40-100 lbs.)
- Winter ventilation: 1/2 to 2 CPM per pig minimum continuous and 10 to 12 CPM per pig required
- Summer ventilation: 1 CPM per hour for total CPM

(b) Use one ceiling fan centered in building

(c) Use two ceiling fans equally spaced, each sized for one-half of Winter CPM at 47°F.

(d) Use two single-speed fans in end-wall as shown on plans.

(e) Equipment per hour output by unit heater

D. THERMOSTAT SETTINGS

The thermostats are located on a ventilation control board as shown on Sheet 3 of the plans. The table below shows how they should be adjusted depending upon the age of the pigs.

SUGGESTED THERMOSTAT SETTINGS

<table>
<thead>
<tr>
<th>Age of Pigs</th>
<th>Thermostat</th>
<th>Summer Fans</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-5</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>45</td>
<td>50</td>
</tr>
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<td>8</td>
<td>50</td>
<td>60</td>
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<td>10</td>
<td>60</td>
<td>70</td>
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