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These plans do not claim to represent the most current technology or the most recent construction techniques, standards, or codes. For example, over the years there have been changes in the National Design Specifications for Wood Construction, changes in the strengths and types of building materials, and changes in fasteners, among other things. Those changes, along with variations in climate, building codes, and other factors, make it imperative that professional services be utilized for your specific project. Suggested services include, but are not limited to, structural design, assurance of compliance with codes and regulations, site selection, construction supervision, and provision for utilities, waste management, and access. These plans do not replace the need for competent design assistance in developing safe, legal, and well-functioning agricultural buildings and systems.

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**Poly-Tube & Exhaust Fan Vent. System**

**Equipment Specifications & Vent. Rates**

To ensure durable fan performance and operation, all fans should:
1. Be N.M.C.A. rated and certified for required air delivery at 1/10 or 1/8 inch static pressure.
2. Have totally enclosed, ball bearing, thermally protected motors.
3. Have heavy duty welded frame and motor mount, with deep curved venturi.
4. Have welded steel or cast aluminum propeller blade with 1/8" to 1/4" maximum tip clearance in venturi.

**Shutters Should Be:**
1. Heavy aluminum or painted steel frame.
2. Aluminum blades with reinforced or stiffened edges.
3. Nylon or bronze pivot bushes.
4. Tie-rod connected.
5. Balanced for gravity operation, or motorized.

**Thermostats Should Be:**
1. Line voltage, farm duty with dust and humidity rating.
2. Amperage or hp rating to equal or exceed motor amps.

**Heaters Should Be:**
1. Gas or oil with safety vents, or electric.
2. With safety controls.
3. Thermostatically operated to maintain minimum temperature per Table 1 for animals.

**Position All Fans To:**
1. Align with proper ventilation, direction of prevailing winds, and against wind to reduce wind resistance.
2. Not less than 50 ft.

**Table 1: Ventilation Data Guidelines**

<table>
<thead>
<tr>
<th>Animal Type</th>
<th>Winter</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65°-70°</td>
<td>2-3 CPM per pig</td>
<td>85°-90° Max 1 air change per min (40 CPM per pig)</td>
</tr>
<tr>
<td>Farrowing</td>
<td>25 CPM per sow &amp; 75 CPM Max 1 to 1 1/4 min (500-600 CPM per sow)</td>
<td></td>
</tr>
<tr>
<td>50°-60°</td>
<td>120 CPM per calf</td>
<td>10-12 CPM Max 1 to 1 1/4 min (125 CPM per calf)</td>
</tr>
<tr>
<td>Dairy Calves</td>
<td>45°-55°</td>
<td>10-12 CPM per calf</td>
</tr>
<tr>
<td></td>
<td>Max 1 air change per min (125 CPM per calf)</td>
<td></td>
</tr>
<tr>
<td>Shutter Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust Fans with hood and anti-backdraft shutter in side or end wall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pit exhaust vent optional for some type facilities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Equipment Notes**

- Smallest Fan: Sized for "Winter Min." and "Winter Normal" vent rate per Table 1, multi-speed or variable-speed, solid-state controlled to provide proper vent rates (faner on a larger fan not recommended).
- Larger Fans: Maximum total capacity per Table 1, divided among all fans used to give 2 or 3 comparable stages of ventilation rate increase, with thermostat control for automatic operation.
- Shutter: Inlet shutters are to be motorized and sized for 1, 2, or 3 opening per accumulating fan capacity. Shutter inlet fans to be same size as fan-jet and mounted at right angle to fan jets.
- Heater: Same note as at left.
- Insulation: Same note as at left.
Ceiling & Wall Fan Pressurized Vent System

Summer wall fans in one end for buildings up to 50'-40', in both ends for longer buildings up to 90'-100', or if can't put in ends, equally space down sidewall with fans working in groups of two (2)

Wall fans, when used, sized and located to serve length equal 1 to 1 1/2 times building width

Ceiling fan and baffle, 1 fan for length equal 1 to 1 1/2 times building width, baffle turned diagonally

Recommended heater location, with Y-splitter for best distribution, 2nd choice in corner, angled toward opposite corner

Motorized or well balanced gravity outlet shutters in opposite end or side-corner from end-wall fans, same size as fans, or put in sidewall opposite fans, use one more shutter than fans and stagger positions for cross-flow

Louvered gable vent per note at right

Plywood baffle 1 5 x Dia. of fan, suspended 6 x Dia. below ceiling by chain or wire each corner

Eave vents, with 1/4" or 1/2" wire mesh screen

Fan and hood unit with backdraft shutter, mounted as high as possible in wall

Plywood deflector baffle, 45° angle, ends closed, top edge even with fan shaft

Outlet shutter mounted 3'-4" above floor

Plastic or canvas flap-covered winter air outlet, 8" x 16" size at 15' spacing, 3'-4 above floor

Tile for vacuum pumping and pit ventilation

Eave Slot-Baffle Exhaust Vent System

Eave slot-baffle inlets, manually adjusted, not closer than 10' to any fan

Additional fans equally spaced as required

Small multi-speed or variable speed fan for winter vent rates

Recommended heater location with Y-splitter for best distribution, 2nd choice in corner near fans and angled toward corner

1/4" or 1/2" wire mesh screen

Smooth ceiling for first 2'-3" for proper air jet effect

1" x 8" Rigid Insulation Board for baffle, approx 8" to 10" long each

Caulk not use wood or plywood due to "sweat" in winter and warping, etc

3/4" x 2 1/2" wood stiffener

Board rests on 2 x 2 (not nailed) for easy pivot

1/4" dia. cord or small chain for manual adjustment, 2 per baffle, cord holds baffle snug against wall on top of 2 x 2

Enclosed soffit optional. If used, put 6" wide mesh opening for vent air

Equipment Notes

Smallest Fan

Sized for "Winter Min." and Winter Normal" per Table 1. Multi-speed or variable speed, solid-state controller. One on larger fan (not recommended)

Larger Fans

Maximum total capacity per Table 1. Divided among all fans used to give 2 to 3 comparable stages of ventilation rate increase, with thermostatic control for automatic operation

Shutters

Anti-backdraft shutter sized and mounted to match fans

Heater

Same note as at left, Insulation, Same note as at left

General Layout and Data

3 Recommended Fan Ventilation Systems

Based on Univ of Ky Plan No 832-1