

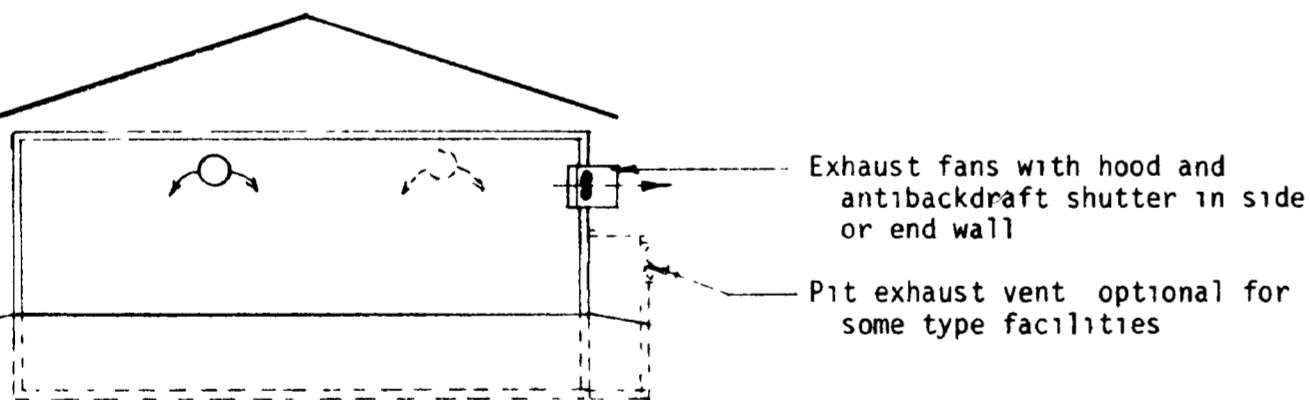
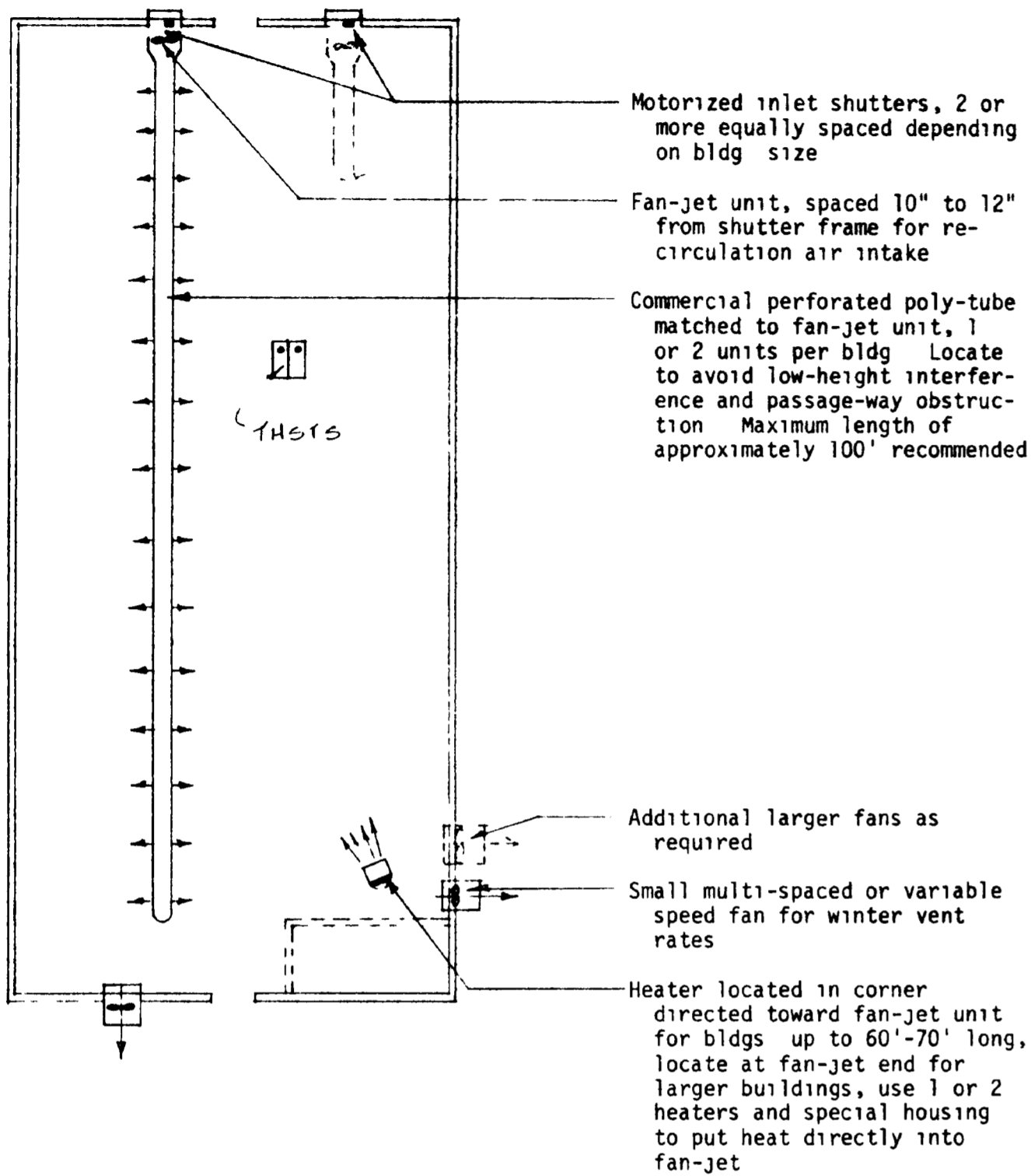
Important: Warranty Disclaimer for Plans

For the convenience of our clientele, this website makes available conceptual plans that can be helpful in planning buildings, facilities, or other structures. They were developed over many years by engineers at Land Grant universities through the former USDA Cooperative Farm Buildings Plan Exchange. *Regardless of the original intent, these are older plans that provide conceptual information only, and are not to be considered or used as construction plans.*

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 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 (timer 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 thermostatic control for automatic operation
- Shutters** Inlet shutters to be motorized and sized for 1 sq. ft. opening per 800 CFM fan capacity. Shutter opposite fan-jet to be same size as fan-jet. Hood over inlet shutters optional but recommended. Antbackdraft shutter on exhaust fans sized and mounted to match fans
- Heater** Same note as at left
- Insulation** Same note as at left

EQUIPMENT SPECIFICATIONS & VENT. RATES

To ensure dependable fan performance and operation, all fans should

- 1 Be A.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 bushings,
- 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:

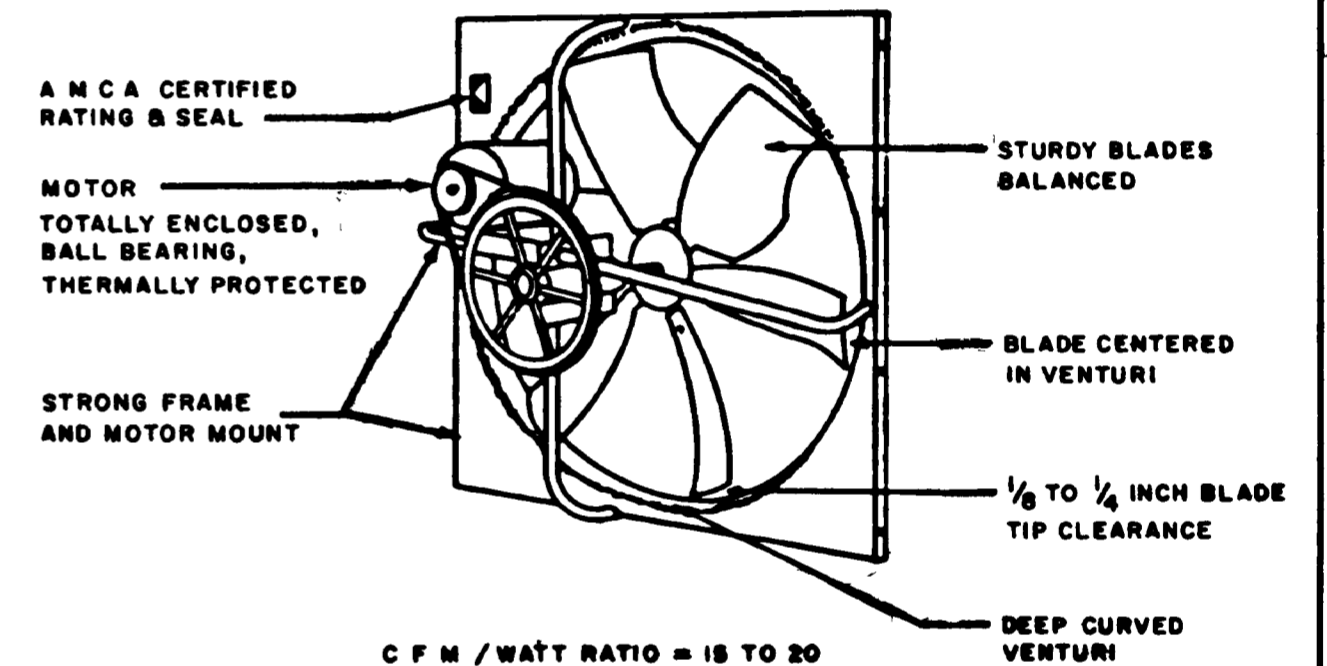
- 1 Gas or oil with safety vents, or electric,
- 2 With safety controls,
- 3 Thermostatic operated to maintain minimum temperature per Table 1 for animals

POSITION ALL FANS TO TAKE AIR into and through building with direction of prevailing winds (not against)

TABLE 1 VENTILATION DATA GUIDELINES

Animal Type	Winter		Summer		
	Temp	"Min" Rate	"Norm" Rate	Temp	Rate
Swine					
Farrowing	50°-60° with floor Ht., 70° for slatted floor	25 CFM per sow & litter	75 CFM	80°-85° Max	1 to 1 1/4 air change per minute (500- 600 CFM per sow)
Nursery	65°-70°	2-3 CFM per pig	8-10 CFM per pig	85°-90° Max	1 air change per min (40 CFM per pig)
Dairy					
Calves	45°-55° Repl Heifers (1 to 6 wks)	5-8 CFM per calf	10-12 CFM per calf	80°-85° Max	1 air change per min (125 CFM per calf)
	60°-70° Veal Calves (1-14 wks)	Same	Same	Same	1 to 1 1/4 air change per min (150 CFM per calf)

10 POINTS OF A GOOD FAN



CEILING & WALL FAN PRESSURIZED VENT SYSTEM

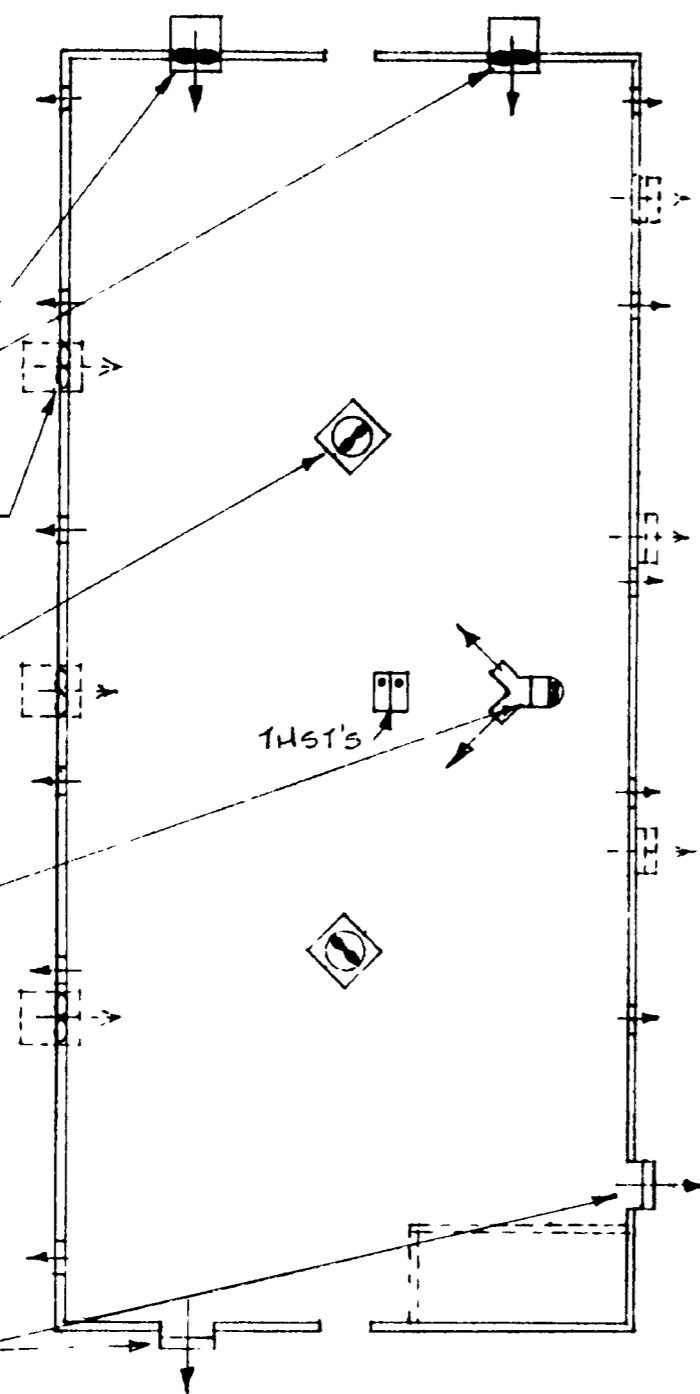
Summer Wall fans in one end for Buildings up to 50'-60', in both ends for longer buildings up to 90'-100', or if can't put in ends, equally space down sidewall with fans working in groups of two (2)

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

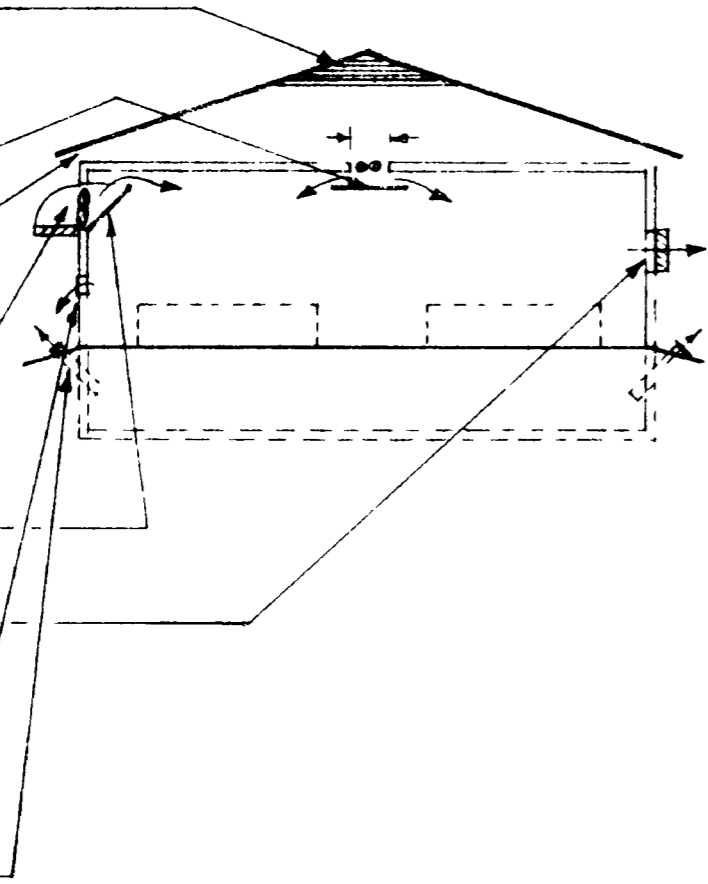
Fan and hood unit with backdraft shutter, mounted as high as possible in wall

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

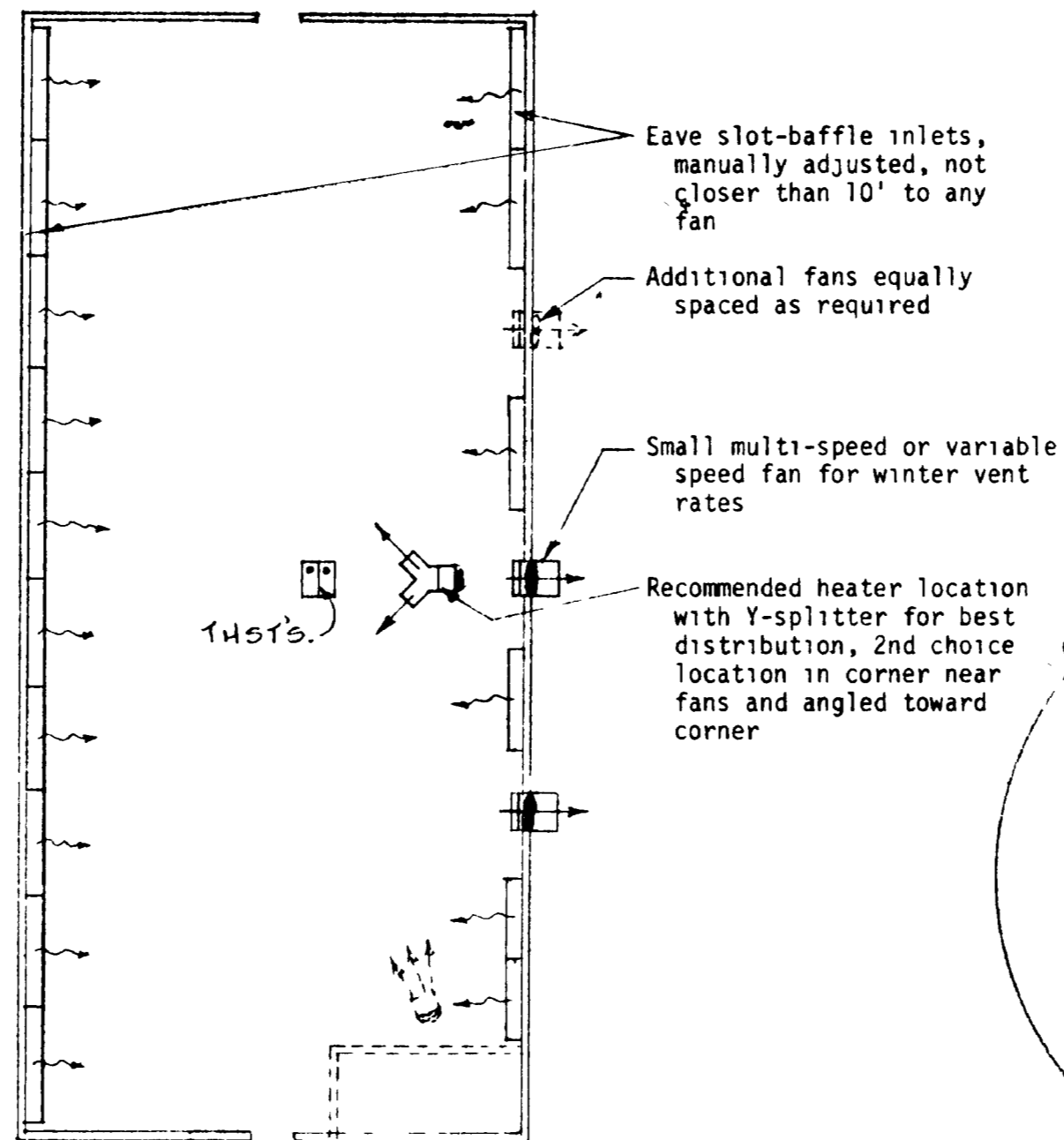
Outlet shutter mounted 3'-4' above floor

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

Tile for vacuum pumping and pit ventilation



EAVE SLOT-BAFFLE EXHAUST VENT. SYSTEM

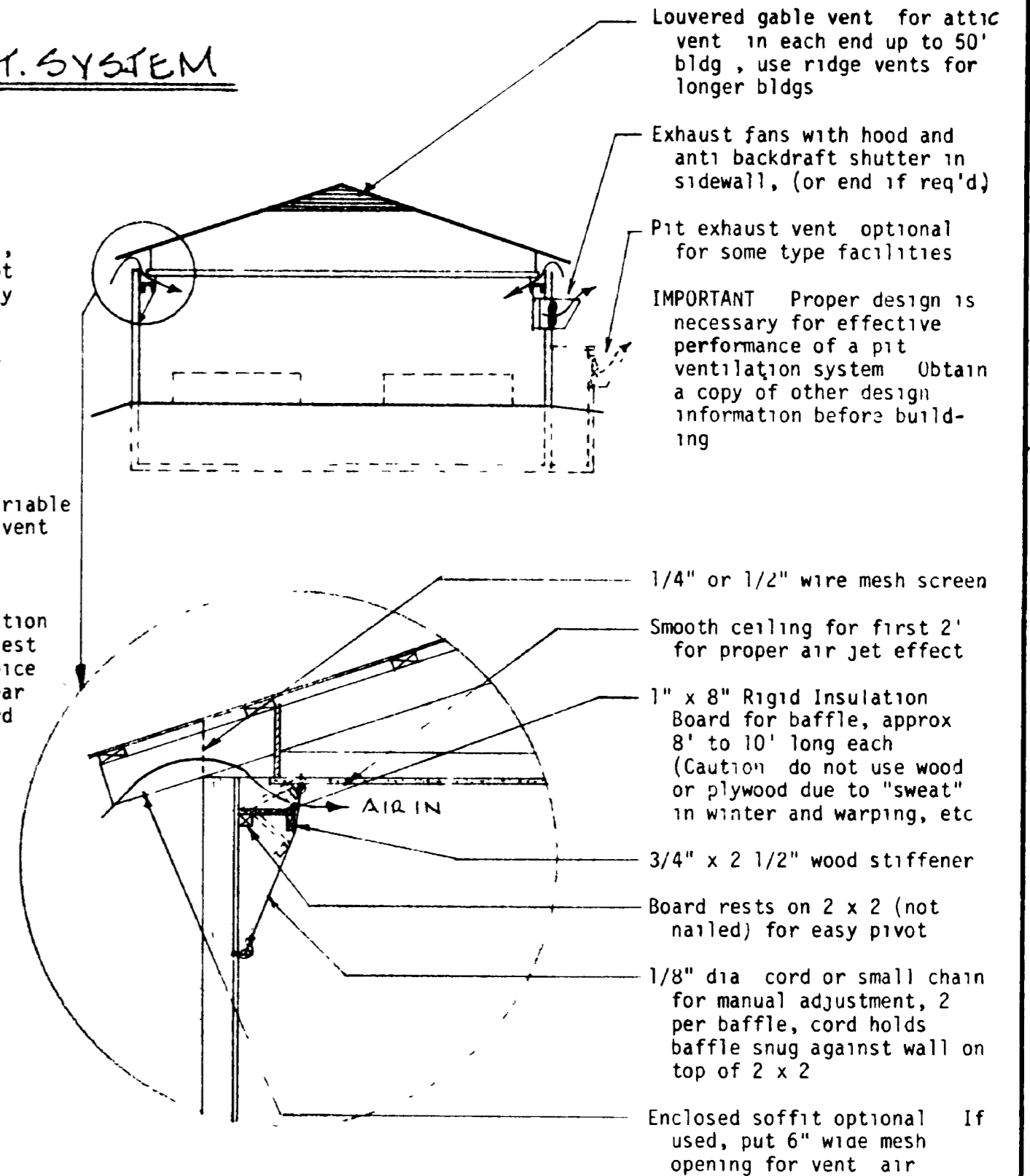


Eave slot-baffle inlets, manually adjusted, not closer than 10' to any fan

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 location in corner near fans and angled toward corner



Louvered gable vent for attic vent in each end up to 50' bldg, use ridge vents for longer bldgs

Exhaust fans with hood and anti backdraft shutter in sidewall, (or end if req'd)

Pit exhaust vent optional for some type facilities

IMPORTANT Proper design is necessary for effective performance of a pit ventilation system Obtain a copy of other design information before building

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

Smooth ceiling for first 2' for proper air jet effect

1" x 8" Rigid Insulation Board for baffle, approx 8' to 10' long each (Caution do 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

1/8" 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

CEILING FANS

Lowest Rate = "Winter Min", Table 1, equally divided among fans, lowest rate obtained by proper solid-state speed control to match fan

Highest Rate = "Winter Normal", Table 1, with thermostat control to switch from lowest to highest rate

WALL FANS

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

OUTLET SHUTTERS

Same size as above fans

HEATER

Sized by proper calculations for amount of insulation, temperature desired, and minimum rate of ventilation

INSULATION

"R" factor and moisture resistance per other literature for type of building and animals housed

EQUIPMENT NOTES

Smallest Fan

Sized for "Winter Min" and "Winter Normal" per Table 1, multi-speed or variable speed, solid-state controller (Timer on 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 thermostatic control for automatic operation

Shutters. Antibackdraft 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

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS DEPARTMENT OF AGRICULTURAL ENGINEERING COLLEGE OF AGRICULTURE UNIVERSITY OF KENTUCKY AND UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING		
FAN VENTILATION SYSTEMS FOR ANIMAL FACILITIES		
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