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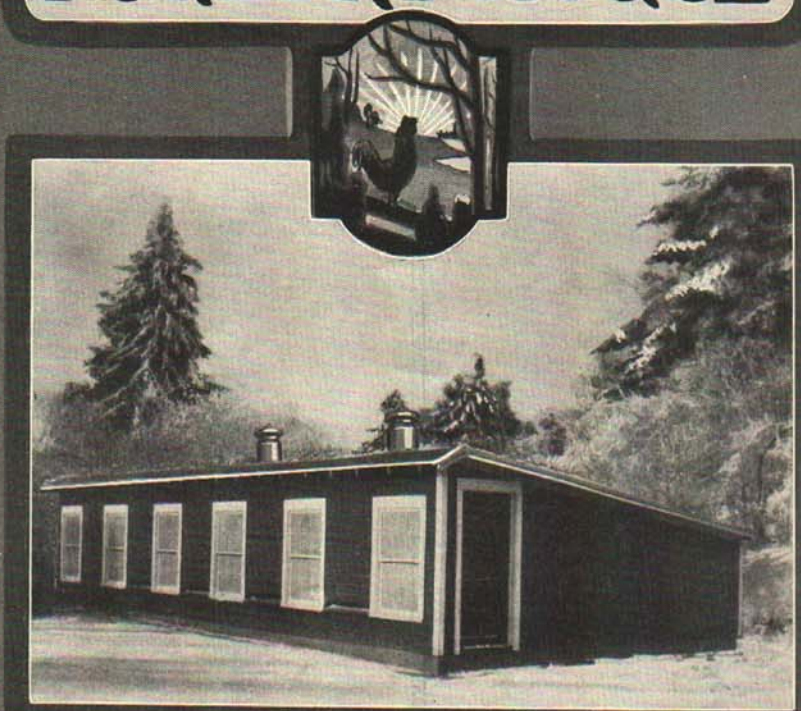
MICHIGAN SHED TYPE POULTRY HOUSE



MICHIGAN STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE
EXTENSION DIVISION
R. J. BALDWIN, Director

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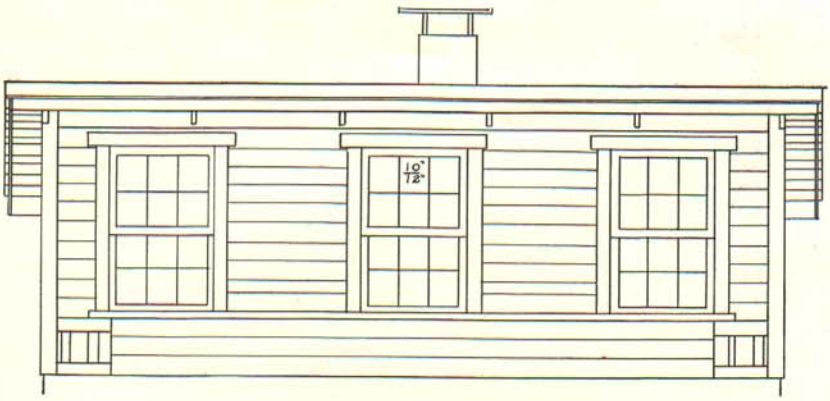
MICHIGAN SHED TYPE POULTRY HOUSE

GEORGE AMUNDSON* and E. R. HANCOCK**

Housing facilities are important factors which influence the success of poultry production. Proper housing is necessary to secure maximum production and to maintain the health and vigor of the laying flock.

The idea that hens can be kept in almost any kind of farm building in this State is decidedly wrong. Due to extreme variations in daily temperature and to seasonal changes in Michigan, poultry houses should be built to counteract the conditions which are not desirable for health and good egg production. If poultry keeping is considered as an important farm enterprise, the construction of a good poultry house is a profitable investment.



FRONT ELEVATION
Fig. 1.

There is no one best type of poultry house, because the essential requirements can be secured in more than one way. It is the purpose of this bulletin to suggest a laying house which is economical and practical and which, with Michigan's climatic conditions, should give good results if the hens are well bred, properly fed, and receive proper care.

The essentials which must be provided for in a good house, in view of our present knowledge of poultry keeping, are ventilation, insulation, sanitation, location, light, dryness, and size.

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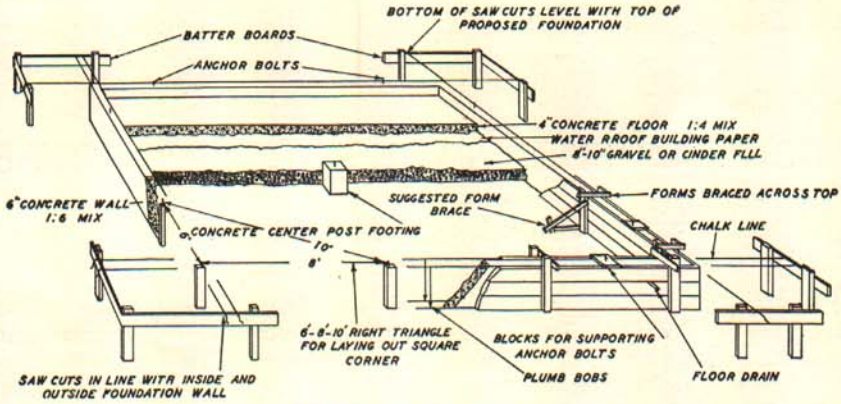
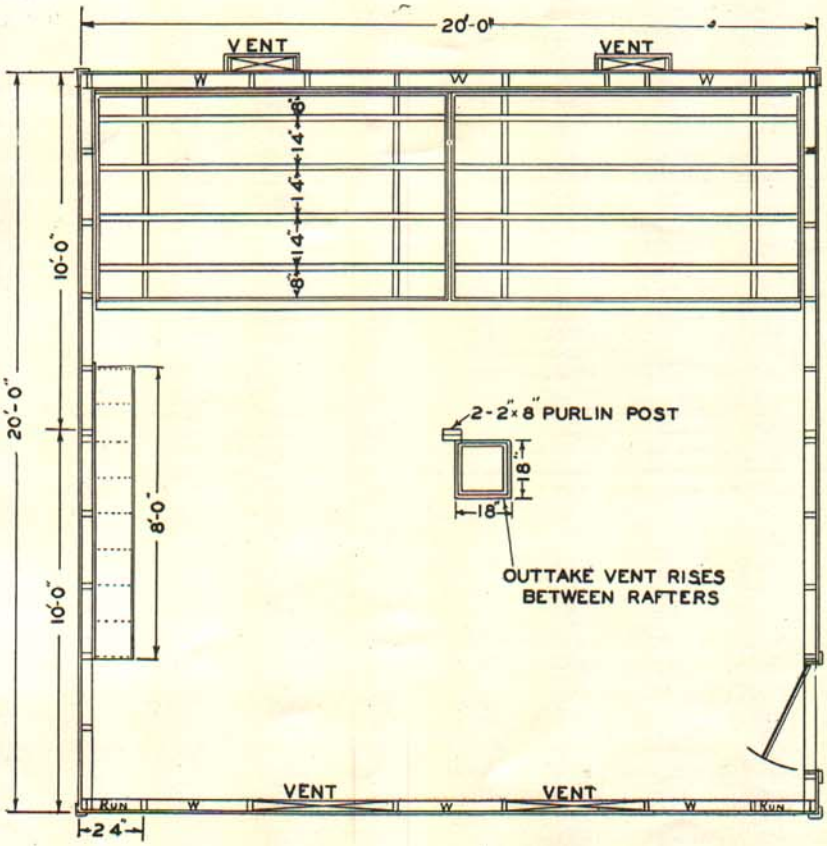


PERSPECTIVE VIEW

Fig. 2.



FLOOR PLAN

Fig. 3.

Ventilation:

Fresh air which is supplied by an adequate system of ventilation that operates throughout the entire year is desirable. A poorly ventilated house is damp and unhealthy for poultry.

The ventilation system of the Michigan shed type house consists of four intake flues, two in the front and two in the rear of the building, and one large central outlet flue. See Figure 4.

The intake flues in the front of the house are built in the wall between the windows. The fresh air enters the flue from the outside near the ground, rises, and is admitted into the room through an adjustable opening provided with a hinged door. See Figure 5A and C.

The rear intakes take air into the room at the center of the house by means of a flue which is built outside of the house and which is connected with the flues inclosed between the rafters. See Figure 5C. This arrangement prevents a direct draft into the house. Conditions within the house should be regulated by adjusting the opening at the point where the air enters the room and a damper should also be built in the outlet.

The outlet flue for foul air is located near the center of the house. The bottom of the flue is about 16 inches above the floor and the flue extends well beyond the highest point of the roof. A door in the flue, near the roof on the inside of the house, can be opened in summer, and allows the warmer air to pass out. Additional ventilation can be secured by opening the windows as shown in Figure 5B.

Insulation:

The insulation of poultry houses directly affects the dryness and warmth of the house. Much of the dampness in hen houses may be caused by condensation of moist air, especially when birds are confined.

Warm air, coming in contact with the colder walls and roof of the building, causes the condensation of moisture which either clings to the roof as frost or falls into the litter and makes it damp. Proper insulation aids in preventing this condensation.

Sanitation:

Houses which are properly planned and built are reasonably easy to clean. Houses should be constructed with concrete floors and removable equipment.

Clean houses and equipment cannot be over emphasized. The possibilities of diseases entering the flock are much less when a rigid cleaning program is followed.

Location:

When building a poultry house, the location of the house and yards should be considered, especially in reference to other buildings. Too many times, good houses do not give maximum results because the surrounding conditions are unsatisfactory.

The house should be as far away from other farm buildings as possible, with access to good range, and not be inconvenient for the care-

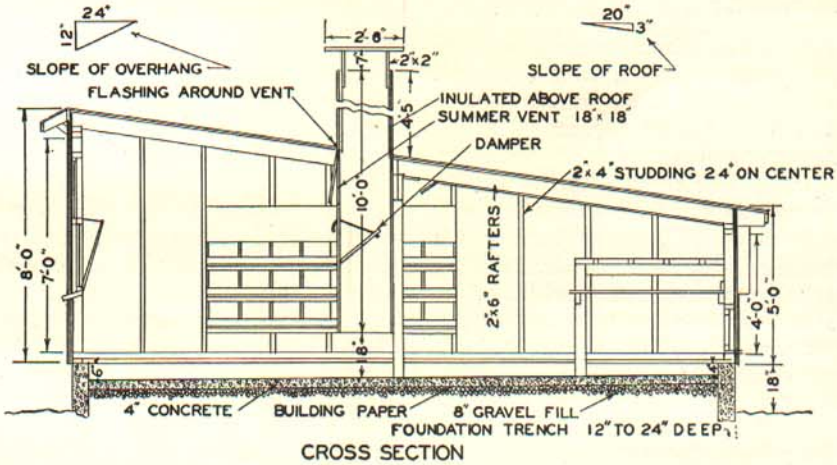

24"
12"
SLOPE OF OVERHANG
FLASHING AROUND VENT
2'-6"
2"x2"
20°
3"
SLOPE OF ROOF
INULATED ABOVE ROOF
SUMMER VENT 18"x 18"
DAMPER
2"x 4" STUDDING 24" ON CENTER
2"x6" RAFTERS
8'-0"
7'-0"
10'-0"
4'-0"
5'-0"
18"
4" CONCRETE
BUILDING PAPER
8" GRAVEL FILL
FOUNDATION TRENCH 12" TO 24" DEEP
CROSS SECTION

Fig. 4.

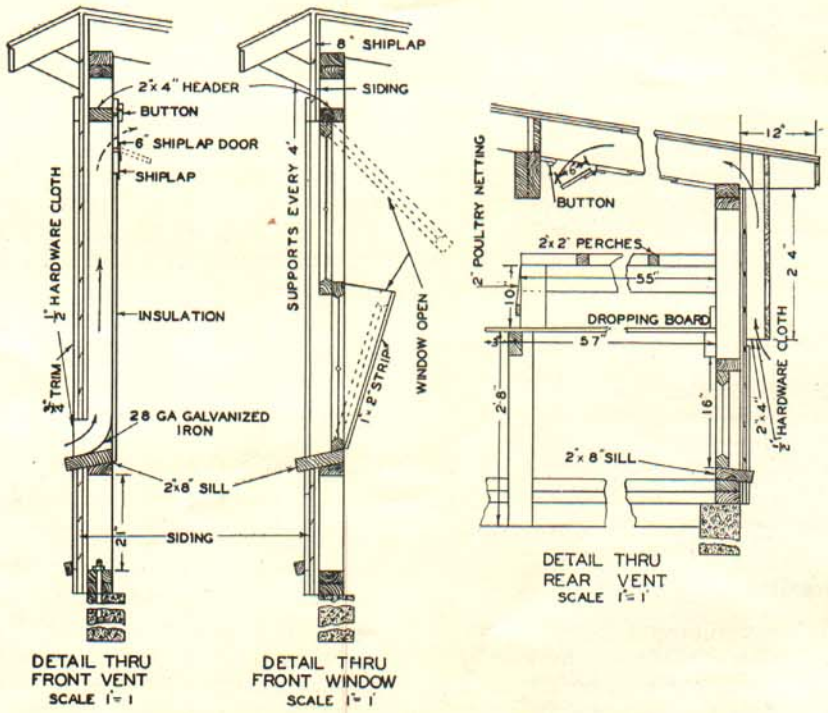

8" SHIPLAP
2"x 4" HEADER
SIDING
BUTTON
6" SHIPLAP DOOR
SHIPLAP
1½" HARDWARE CLOTH
INSULATION
SUPPORTS EVERY 4'
WINDOW OPEN
1"x 2" STRIP
¾" TRIM
28 GA GALVANIZED IRON
2"x8" SILL
2"
SIDING
DETAIL THRU FRONT VENT
SCALE 1"= 1'
DETAIL THRU FRONT WINDOW
SCALE 1"= 1'
A
B
12"
6"
BUTTON
2" POULTRY NETTING
2"x 2" PERCHES
10"
55"
DROPPING BOARD
57"
2'-8"
16"
2'-4"
2'-4"
1½" HARDWARE CLOTH
2"x 8" SILL
DETAIL THRU REAR VENT
SCALE 1"= 1'
C

Fig. 5.

taker. A southern or eastern slope is desirable, with protection from winds and rains as well as ample air and water drainage. Avoid air pockets and poorly drained soil. Ventilation in the house is largely dependent on the movement of air outside the house.

Light:

Light in the house encourages activity when birds are confined. Every possible foot of floor space should be touched by the sun's rays. Direct sunlight induces greater food consumption and aids hens to assimilate minerals, especially during the winter months. The Mich-

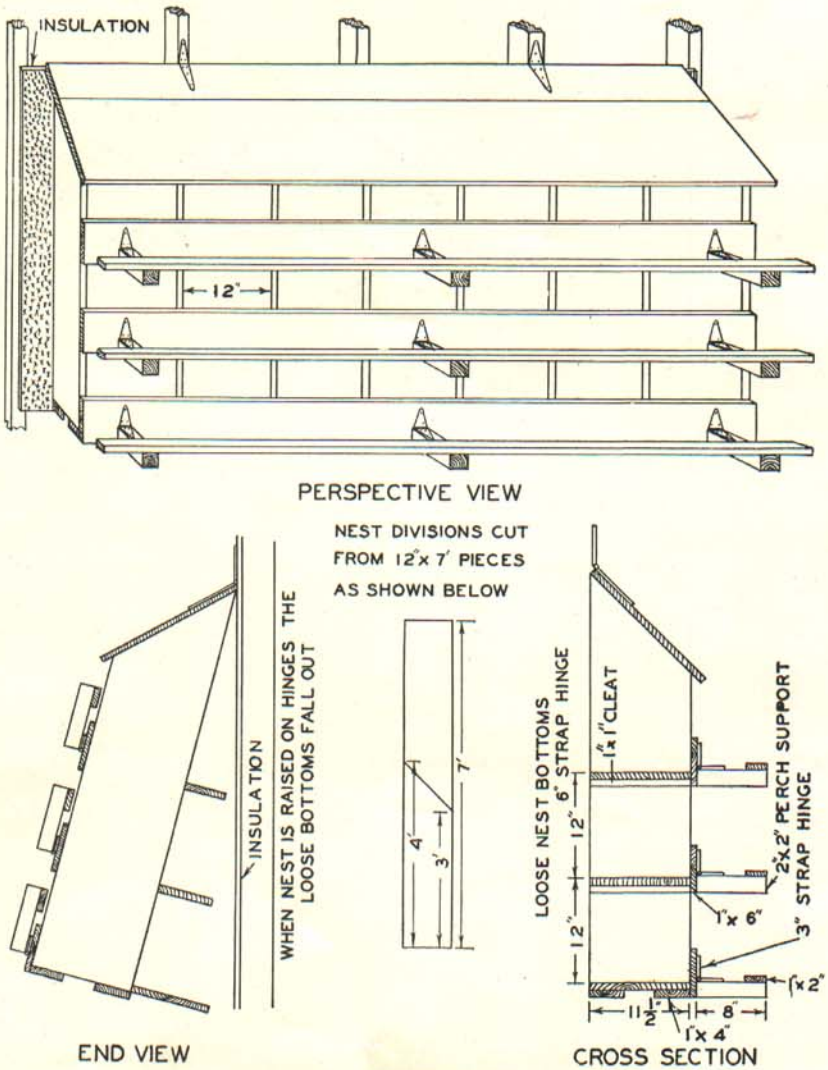
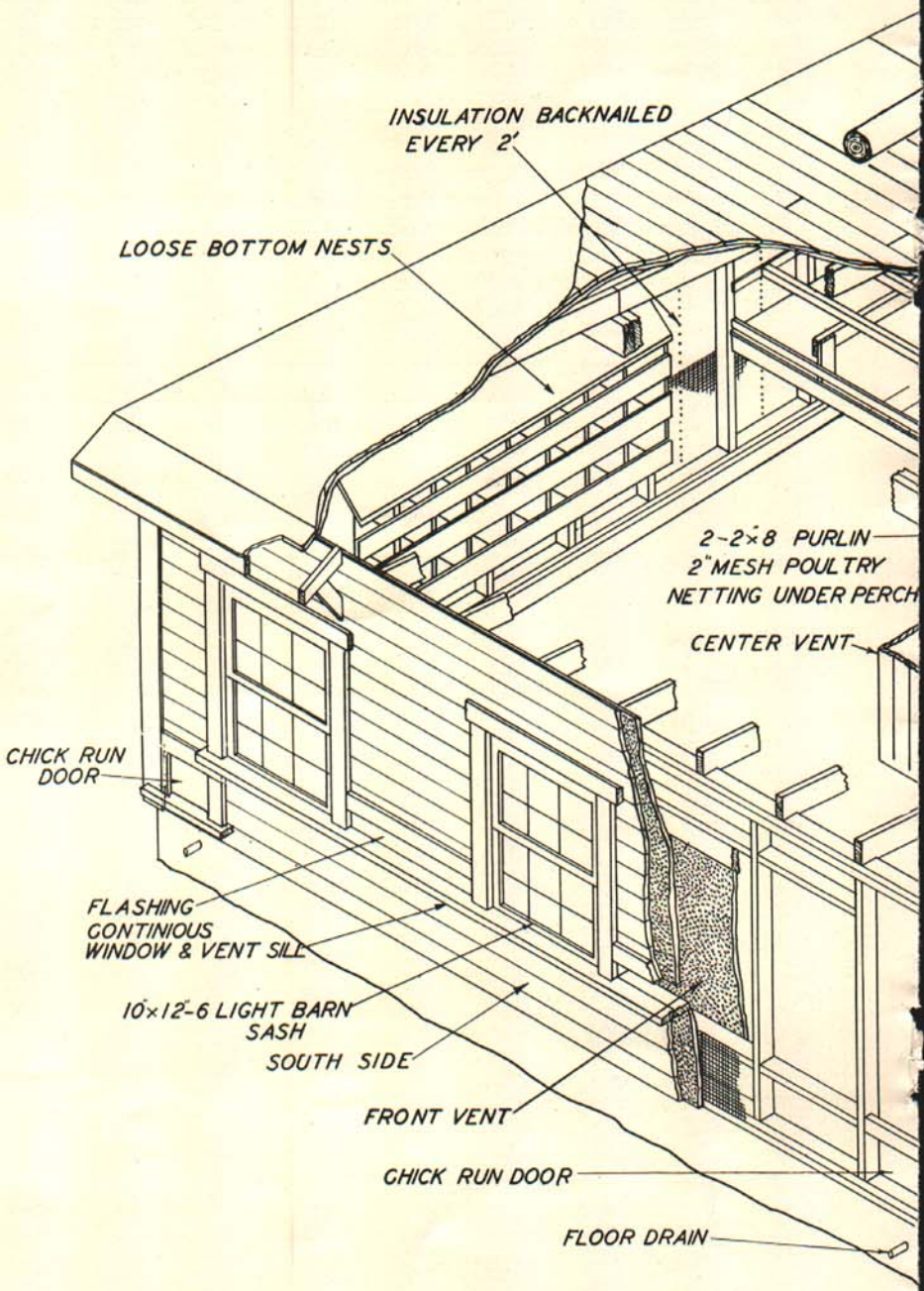


Fig. 6.


INSULATION BACKNAILED EVERY 2'
LOOSE BOTTOM NESTS
2-2×8 PURLIN
2" MESH POULTRY NETTING UNDER PERCH
CENTER VENT
CHICK RUN DOOR
FLASHING CONTINIOUS WINDOW & VENT SILL
10×12-6 LIGHT BARN SASH
SOUTH SIDE
FRONT VENT
CHICK RUN DOOR
FLOOR DRAIN

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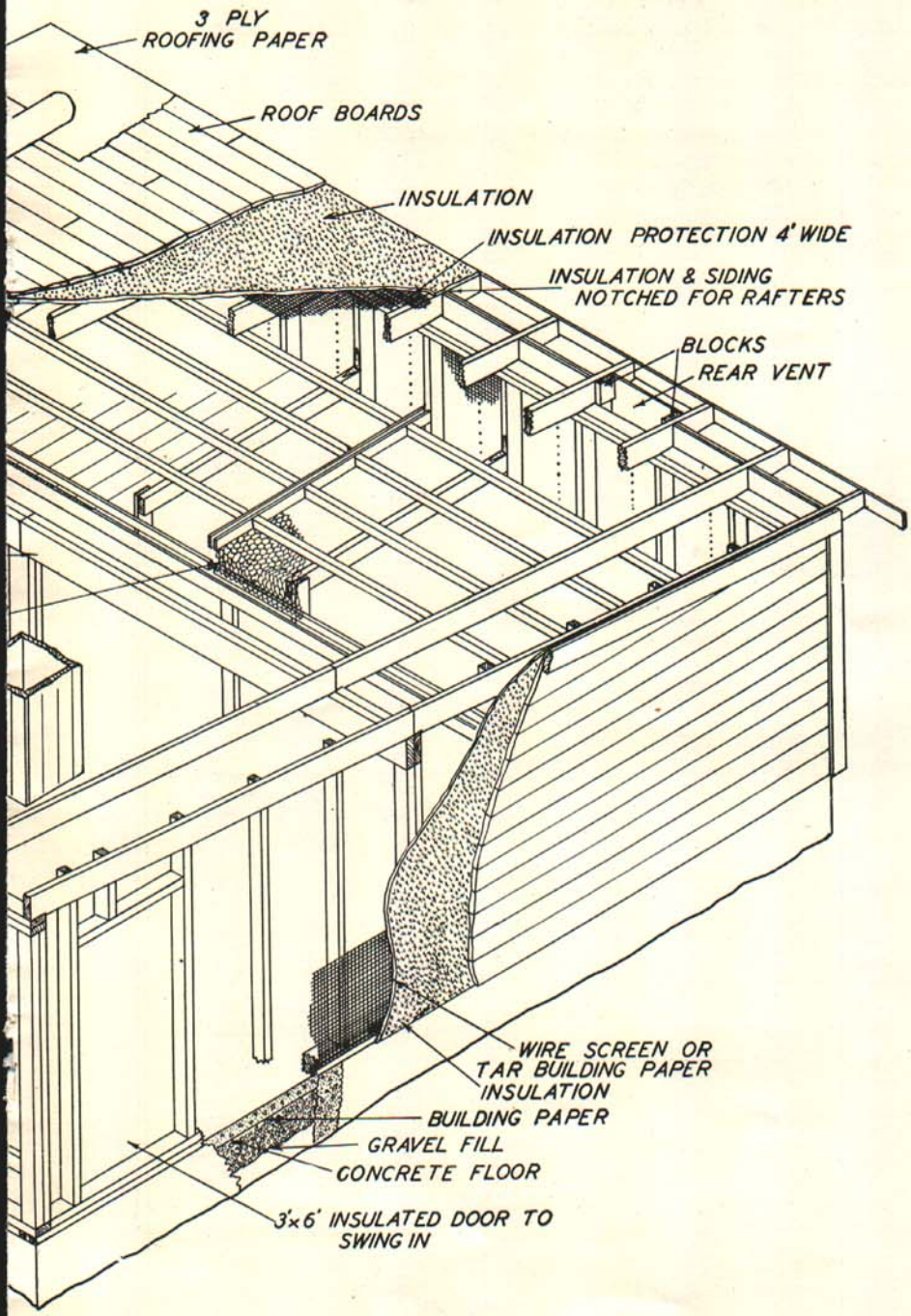
3 PLY
ROOFING PAPER
ROOF BOARDS
INSULATION
INSULATION PROTECTION 4' WIDE
INSULATION & SIDING
NOTCHED FOR RAFTERS
BLOCKS
REAR VENT
WIRE SCREEN OR
TAR BUILDING PAPER
INSULATION
BUILDING PAPER
GRAVEL FILL
CONCRETE FLOOR
3'x6' INSULATED DOOR TO
SWING IN

TRIC VIEW

g. 7.

igan shed roof type house is furnished with front and rear windows to give an even distribution of light on the floor.

Artificial lighting of hen houses in winter is a common practice and lengthens the hen's working day to 12 or 13 hours.

Common window glass is used in this house because it is practical and is the most economical.

Dryness:

Dryness inside the poultry house is dependent upon the location of the house, soil drainage, proper ventilation, number of birds in the house, floor construction, sudden changes in temperature within the house, and the amount of sunlight admitted into the house.

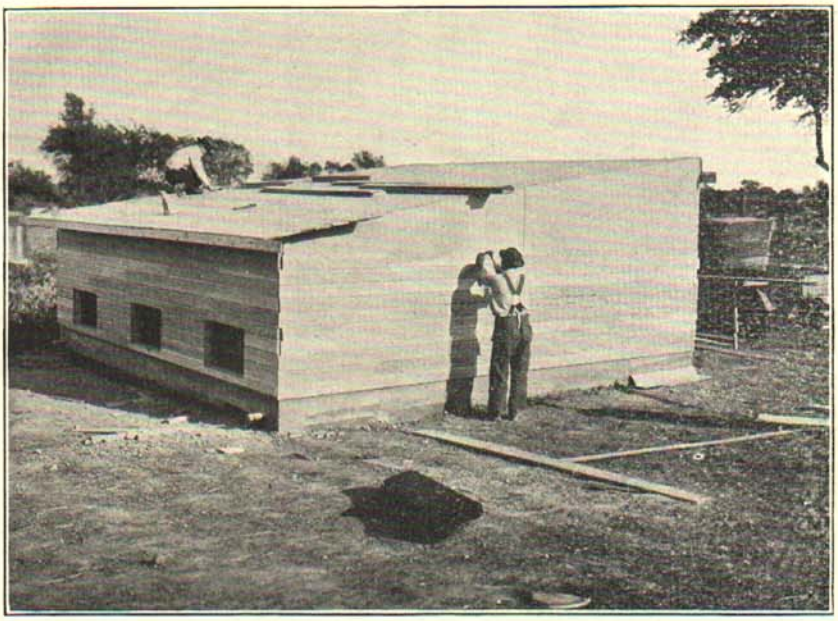

Fig. 8.—Insulated poultry house. Note insulation on outside of rafters and studs, and application of siding and roof boards direct to insulation.

Size:

The size of house is determined by the number of birds to be kept. Ample floor space is provided by allowing four square feet per bird and by placing all equipment above the floor. This eliminates needless obstructions and helps to provide cleaner feeds and proper sanitation. A unit 20 by 20 feet should comfortably care for 100 to 125 birds.

Details of Construction

The south elevation, Figure 1, shows the general appearance of the house when completed. Notice the continuous sill used for the front

windows and intake vents. The eaves over-hang about 12 inches on all sides.

Figure 2 illustrates a convenient method for securing square corners in laying out the foundation. One corner is first squared by using the 6, 8, 10 right triangle shown in the lower left corner; from this corner the other corner stakes are located. The batter boards are then placed three or four feet back of the corners and chalk lines are used to project line of stakes to saw marks on the batter boards. These saw marks are just deep enough to bring the chalk lines on a level with the top of the proposed foundation wall and, after they are located, the stakes may be removed, the trench dug, forms placed, and concrete

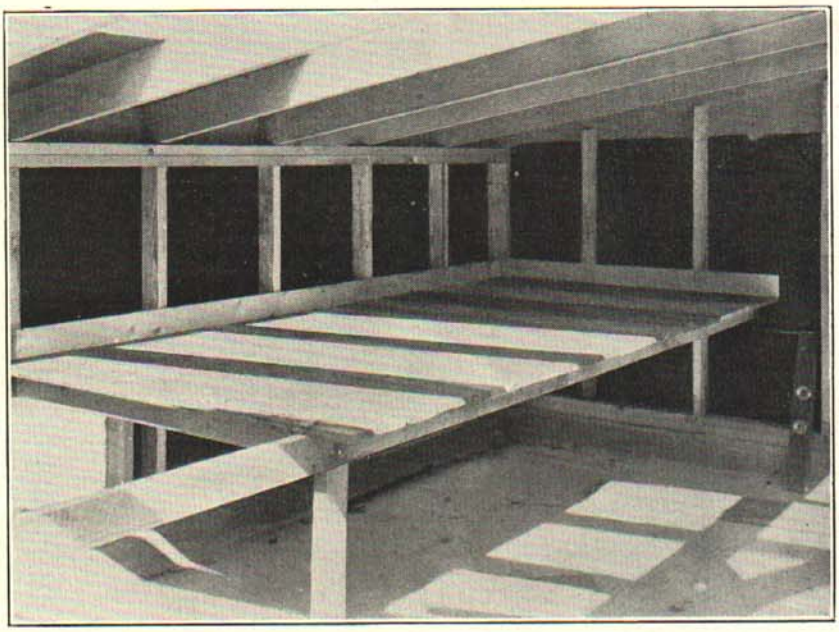

Fig. 9.—Showing tar paper, as protection to insulation material.

poured with the chalk lines used as guides. The central post footing is usually poured at the same time as the foundation wall. Wall forms may be removed after the wall has cured a week and the floor is then poured. Notice slope of floor, location of anchor bolts, and floor drain shown in Figures 3, 4, and 7.

Floor Plan

Figure 3 shows the location of ventilation flues, windows, doors, nests, and perches. No window dimensions are given because of local variations in window sizes. Studding in the front wall are placed to fit the windows. In the rear wall, headers are put in around windows and the studding is kept 24 inches on center above them to fit the four foot width of insulation.

Cross Section

The general dimensions of house, slope of rafters, and section through floor are shown in Figure 4. The details and dimensions of outtake flues are shown for the 10 foot length flue. Where the building is surrounded by trees, or high buildings, a 12 or 14 foot flue should be used.

Details Through Windows and Ventilation, Figure 5

The front windows swing in for summer ventilation and the intake flue doors may be used to regulate the incoming air in the winter time; the arrows on the detail show the travel of air in the flues.

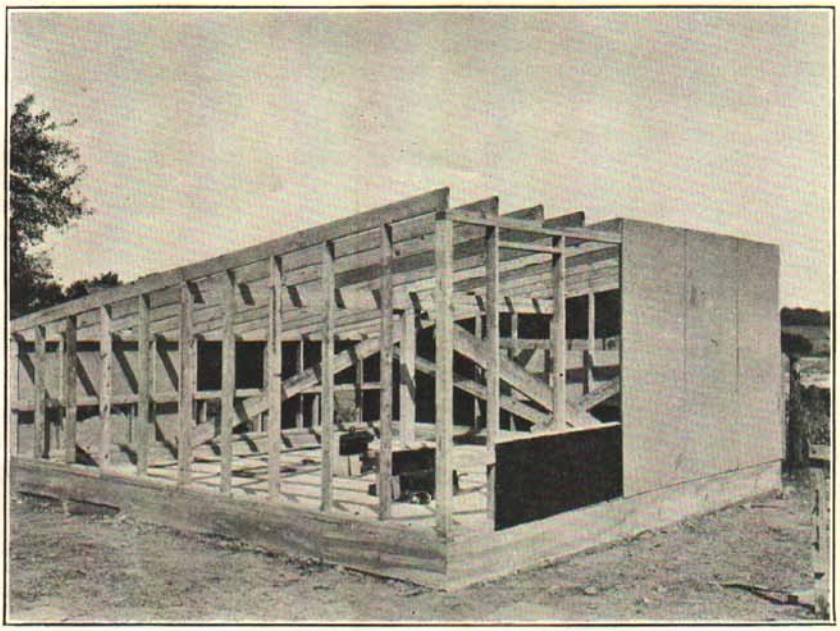

Fig. 10.—Showing framing, tar paper for protection of insulation board, and method of putting on insulation board.

The outside part of the rear intakes is made by nailing 2 x 4's to outside of siding under the rafters, over-hang and boxing in the two foot width opening with siding. One-half inch hardware cloth is nailed over the intake and outtake openings to prevent the entrance of birds. The dimensions and arrangements of dropping boards and perches are shown in detail C, Figure 5, and in Figures 3, 4, 7, and 9. Note also the use of poultry netting under the perches.

The isometric view, Figure 7, shows the general relation of all parts of the house. Notice how insulation protection, insulation, siding, and roof boards are applied outside of studding and over rafters. The insulation is back nailed to the siding and roof boards. The insulation

and siding come to the top of the rafters all around the building, being notched for the rafters in the rear and cut out over the plate for the rear intake ventilators. One door only is used and it should be at the east end if possible.

Loose Bottom Nests, Figure 6

The construction and bill of material for the Michigan type, loose bottom nests are shown. The bottom of the nests and the litter drop out when the nests are tilted as shown in the lower left view. The insulation is nailed to the studding and not to the back of the nests. The height of the lower row should be from 12 to 18 inches above the floor.

Construction Materials

Gravel for the concrete floor should be free from clay and loam and should be graded so that all the gravel to be used will pass through a one inch mesh screen and approximately two-thirds will be retained on a one-fourth inch mesh screen. A mix of 1-6 may be used for the wall and 1-4 for the floor. Plank for the purlin should be carefully selected for strength and should be straight and free from long diagonal cracks. The window and door sills should be made of clear edge-grained material that will withstand exposure to the weather; badly warped plank should not be used. Plank for rafters should be selected for strength and for freedom from wind and warping. The dimension stuff for sills and plate should be selected for straightness but, since two 2 x 4's are used together, some straightening may be done on the job; most difficulty results when home sawed material is used for either sill or plate because such material varies in thickness. However, by carefully selecting the pieces, the home sawed lumber may be used. The material for studding and framing need not be selected for strength but should be sound and present a good nailing base. Shiplap for the roof may be of common grades or better. Material for trim should be of good grade, free from defects, and of a variety not subject to warping. Siding should be full three-fourth inch thickness to permit the back nailing of insulation. Flooring for the dropping boards should be edge-grained to prevent warping and to permit easy cleaning. Material for trim and nests should be of a variety that does not warp easily, preferably white pine.

Bill of Material for 20 × 20 foot Laying House Michigan Shed Type

FOUNDATION AND FLOOR

Amount	Description	Use
12 cubic yards	Broken stone, gravel or cinders	Fill under floor
5 squares	Water proof building paper	Between fill and floor
9 cubic yards	Gravel	Foundation and floor
12 barrels	Portland cement	Foundation and floor
2 pieces	2" x 12" pipe with cap	Floor drain
8	½" x 8" carriage bolts	Anchor bolts

DETAILED LUMBER BILL

Material as Bought			Material as Used		
Pieces	Size	Length	Pieces	Cut to	Use Made of Piece
4	2″ x 8″	10′	4	10′0″	Purlin
3	2″ x 8″	12′	8	fit	Windows, Intake and Door Sills
23	2″ x 6″	12′	24	fit	Rafters and Purlin Posts
8	2″ x 4″	10′	..	fit	Dropping Board, Perch Frame
5	2″ x 4″	12′	13	4′0″	Rear Studding
10	2″ x 4″	12′	20	fit	End Studding and End Posts
4	2″ x 4″	14′	..	fit	Door and Window Headers
6	2″ x 4″	14′	11	7′0″	Front Studding
8	2″ x 4″	14′	..	fit	Sills and Plates
8	2″ x 4″	16′	..	fit	Sills and Plates
8	2″ x 2″	10′	8	9′ 6″	Perches
6	1″ x 8″	10′	..	fit	Shiplap—Frieze and Vents
40	1″ x 8″	10′	40	10′ 0″	Shiplap—Roofboards
40	1″ x 8″	12′	80	3, 9, 5, and 7′	Shiplap—Roof Boards
1	1″ x 8″	12′	..	fit	Window—Cheek Boards
1	1″ x 6″	12′	..	fit	Intake Doors
65	1″ x 6″	12′	..	fit	Siding, Full ¾″ Thickness
65	1″ x 6″	8′	..	fit	Siding, Full ¾″ Thickness
24	1″ x 6″	10′	48	5′ 0″	Flooring, Dropping Boards
14	1″ x 6″	10′	14	10′ 0″	Flooring, Outtake Flue
4	1″ x 6″	12′	8	6′ 0″	Flooring, Door
17	1″ x 4″	10′	..	fit	Cornice and Trim Window
17	1″ x 4″	12′	..	fit	Cornice, Door Casing

Add material for nests given in separate Bill of Material.

BILL OF MATERIAL FOR LOOSE BOTTOM NESTS

Material as Bought				Material as Used	
Pieces	Size	Length	Description	Cut to	Used as
2	1″ x 12″	14′	Trim	See Sketch	Nest Divisions
2	1″ x 6″	16′	Trim	7′—6″	Front and Top
2	1″ x 12″	16′	Trim	1—7′–6″	Top
				21—11″	Nest Bottoms
1	1″ x 4″	16′	Trim	7′—6″	Bottoms
3	1″ x 2″	8′	Trim	8′	Perches
2	1″ x 1″	14′	Strips	11″	Cleats
1	2″ x 2″	8′	Plank	8″	Perch Support

5 Pair 3″ Hinges (Strap) 1 Pair 6″ Hinges (Strap)

INSULATION, ROOFING AND WIRE NETTING

Pieces	Size	Description and Use	Sq. Ft.
6	4′ x 8′	Insulation Board, Front Wall and Nest	192
17	4′ x 10′	Insulation Board, Roof, Walls and Vents	680
5	4′ x 12′	Insulation Board, Roof	240
3	Squares	Pearl Screen or Tarred Paper—Insulation Protection	300
6	Rolls	3 Ply Roofing for Roof	600
2	6′ x 10′	2″ Mesh Poultry Netting for Perches	120
4	6″ x 2′ 6″	Valley Tin, Ventilator Flashing	5
1	2′ 6″ x 4′	½″ Mesh Hardware Cloth—Intake Openings	10

WINDOWS

Number	Size	Description	Use
6	6 light 10″ x 12″	Barn Sashes	Front Windows
3	3 light 10″ x 12″	Cellar Sashes	Rear Windows

HINGES AND LOCK

Number	Size	Description	Use
1 Pair	5″	T Hinges	Heavy Door
3 Pair	3″	T Hinges	Upper Front Windows
5 Pair	3″	Strap Hinges	Ventilator Doors
2 Pair	4″	Strap Hinges	Perches
1		Door Latch with Padlock Plate	

Hinges for Nests on separate Bill of Material.

NAILS

Pounds	Size	Description	Use
10	16d	Common Nails	For Framing
20	8d	Common Nails	For Roof Boards and Framing
20	8d	Box Nails	For Siding and Trim
5	6d	Box Nails	For Windows and Door Framing
12	1-½″	3/8″ Head Galvanized Nails	For Insulation to Frame
5	1″	3/8″ Head Galvanized Nails	For Insulation to Siding
1	1″	Galvanized Poultry NettingStaples	For Perches and Intakes

It is important to get the lengths specified to avoid waste. Where these lengths cannot be secured, follow the bill of material to get the lengths to which the material is cut.