

# NAIL-GLUING OF ROOF TRUSSES, FRAMES AND OTHER STRUCTURAL COMPONENTS

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## NAIL-GLUE FOR STRENGTH AND ECONOMY

- Nail-gluing makes possible roof trusses, frames, and other structural components which are very stiff and strong. A glued joint holds two members firmly without slippage.
- In nail-gluing, the adhesive is applied to the structural members and nails or staples are used only to give rigidity to the unit during handling and stacking and to provide pressure while the glue sets. The strength of the finished connection is entirely dependent on the glue bond. Moisture content of lumber for the trusses and frames must be 19% or less.
- The casein glue must meet Federal Specification MMM-A-125, Type I or II. (Type II contains a mold inhibitor.) Mix the glue according to the manufacturer's instructions. Protect the units from rain. After nailing, stack and do not handle again during the curing period.
- Fabricate and cure the units above 50° F. The lumber and plywood likewise should not be below 50° F for nail-gluing. When the temperature is between 50° F and 70° F, a 16-hour minimum curing period is necessary; when the temperature is 70° F or above an 8-hour minimum curing period is needed.
- Nail-gluing should be used only with properly engineered designs. Use designs presented in the Illinois-Purdue instruction sheets for nail-glued trusses and roof-frames.\*

\* Design of Nail-Glued Plywood Gusset Plates, Purdue University Agricultural Experiment Station, Bulletin 613, 1954, Lafayette, Indiana.

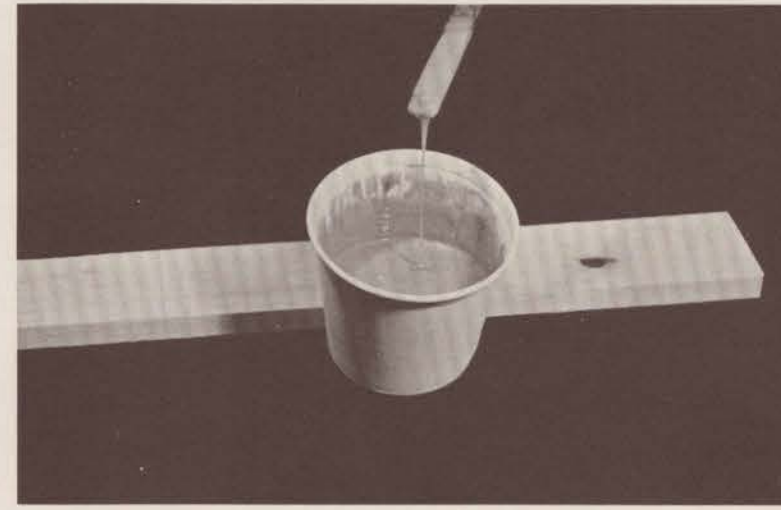
Instruction Sheets, University of Illinois Small Homes Council—Building Research Council, Urbana, Ill. (50¢ each)

#2 — 2/12 Nail-Glued "W" Roof Truss	#7 — 2" x 6" Nail-Glued King-Post Roof Truss	#12 — Reselection of Lumber for Roof Trusses
#3 — 2/12 Nail-Glued "W" Roof Truss	#8 — Staged Ceiling, Plywood Web Roof-Frames	#13 — Variations for Building Nail-Glued "W" Roof Truss
#4 — 4/12 Nail-Glued "W" Roof Truss	#9 — Plywood Web Roof-Frames, 1/12 Slope	#21 — Nail-Glued Header for Wall Panels
#5 — Long-Span Nail-Glued "W" Roof Truss	#10 — Hip-Roof Nail-Glued Trusses	#22 — Nail-Glued Headers for Larger Openings
#6 — 2" x 4" Nail-Glued King-Post Roof Truss		

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## MIX GLUE

Casein glue is recommended. The glue must meet Federal Specifications MMM-A-125, Type I or Type II. (Type II contains a mold inhibitor which is required by some local authorities.) The glue must be mixed according to the manufacturer's instructions. Thin or watery mixtures must be avoided.

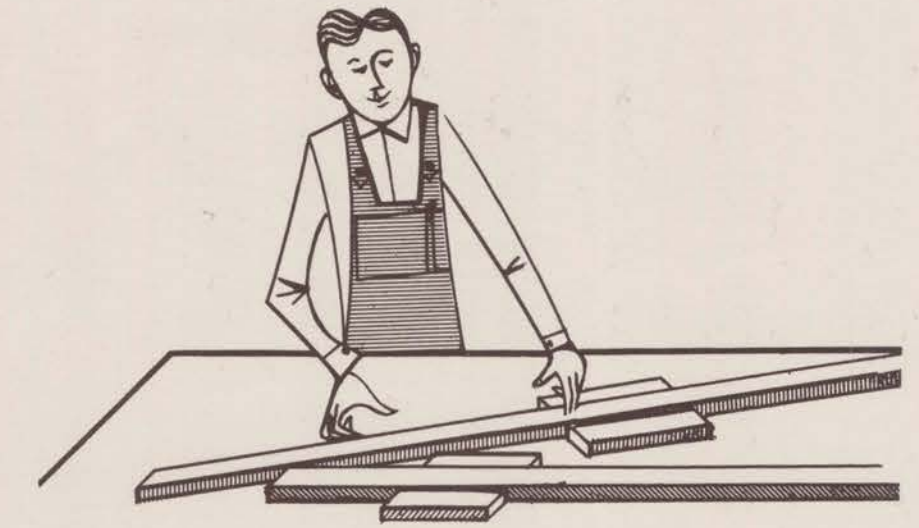


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## LAY OUT STRUCTURAL COMPONENT

Lay out on a flat, sturdy surface (jig, subfloor or slab—not the ground) the truss, roof-frame or other component to be built. The units being constructed should be protected against rain and allowed to cure at temperatures above 50° F.

Do not use second-hand or dirty lumber.

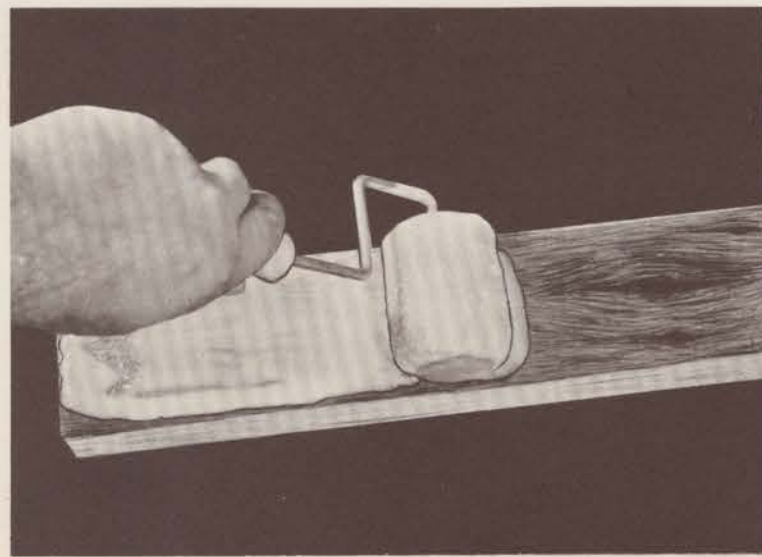


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## APPLY GLUE

Apply glue directly to the lumber members by means of a paint roller, glue brush or mechanical glue spreader.\*

Paint Roller



Glue Brush



\* For information and specifications for mechanical spreader, use "A Spreader for Use in Structural Nail-Gluing," Stanley K. Suddarth, Purdue University, Agricultural Experiment Station Circular 408, 1954, Lafayette, Indiana.

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## USE PLENTY OF GLUE

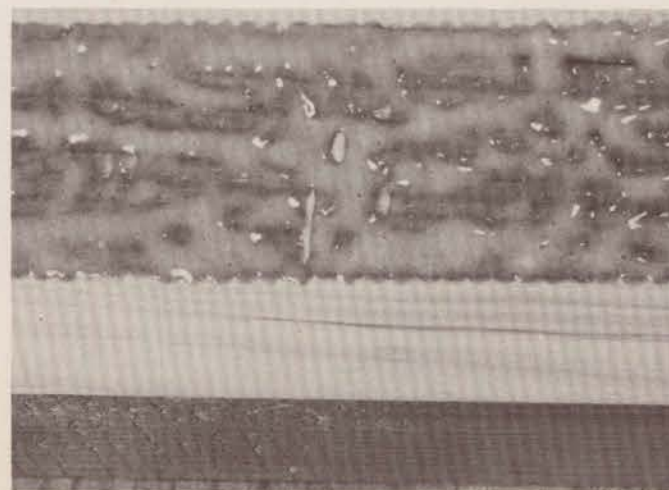
Use plenty of glue on the structural members to cover the entire area of contact. Glue need not be spread on gusset plates.

A correct spread of glue on the wood will look like that shown below.

A glue spread which is too thin, such as shown in second photograph, will not give adequate glue bond.

A more than adequate glue spread, also illustrated, will result in a good glue bond but the practice is wasteful.

Correct Application



Inadequate Application



Wasteful Application



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## PUT PLYWOOD IN POSITION

After the glue has been applied to the lumber members, place the plywood in position on the glue area and fasten.



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## FASTEN PLYWOOD

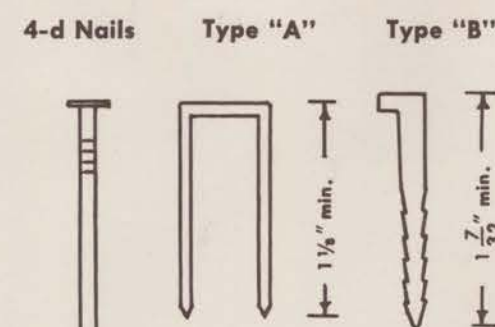
Nail or staple plywood preferably by means of a mechanical fastening device. Drive fasteners hard so that their heads are buried in the plywood. Solid-wood splice plates must be nailed manually with common wire nails.

Mechanical Fastening

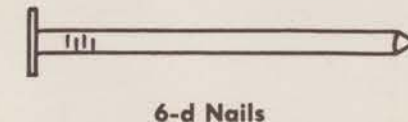


Types of Fasteners Used

For plywood gussets



For solid splice plates

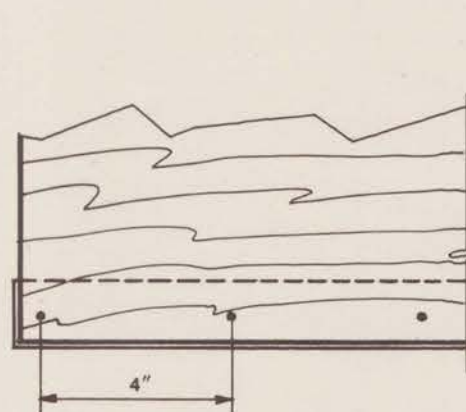


Nail Heads Buried in Plywood

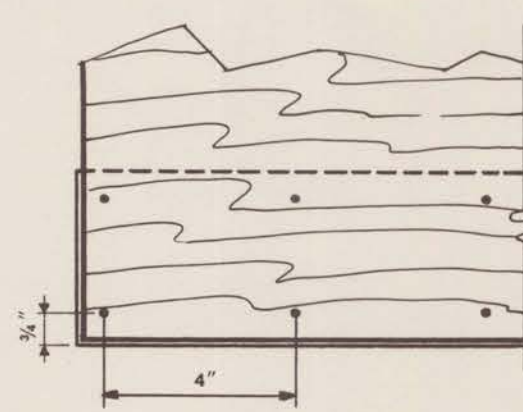


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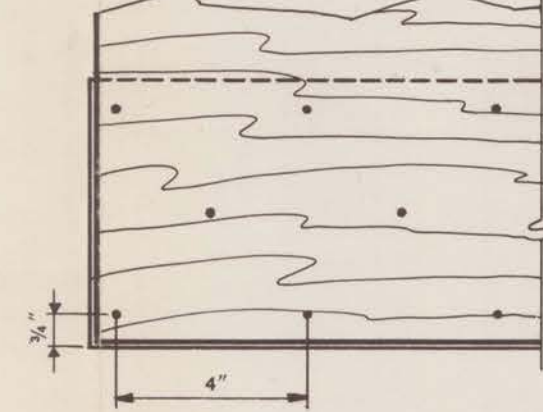
## FASTEN ACCORDING TO PATTERN



For members 1 1/2" wide use one row of fasteners spaced 4" apart.



For members 3" wide, use two rows of fasteners spaced 4" apart.

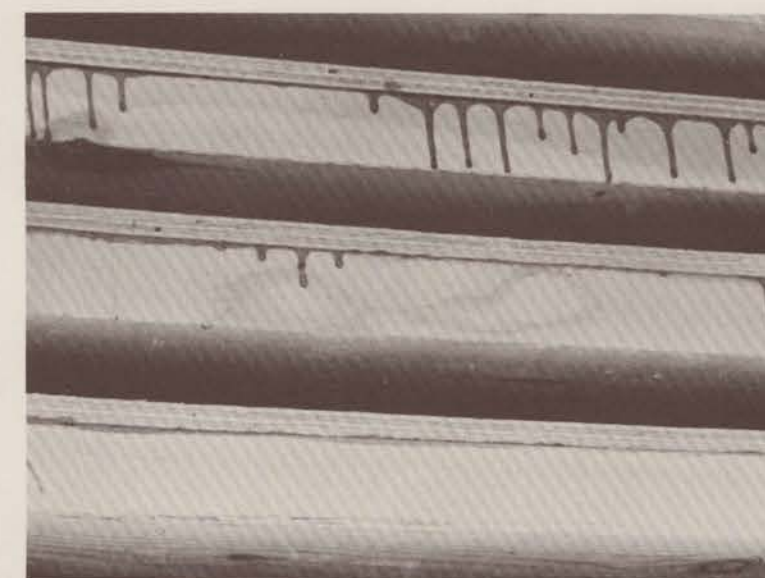


For members 5 1/2" wide use two rows of fasteners spaced 4" apart and stagger a third row down the center of the member.

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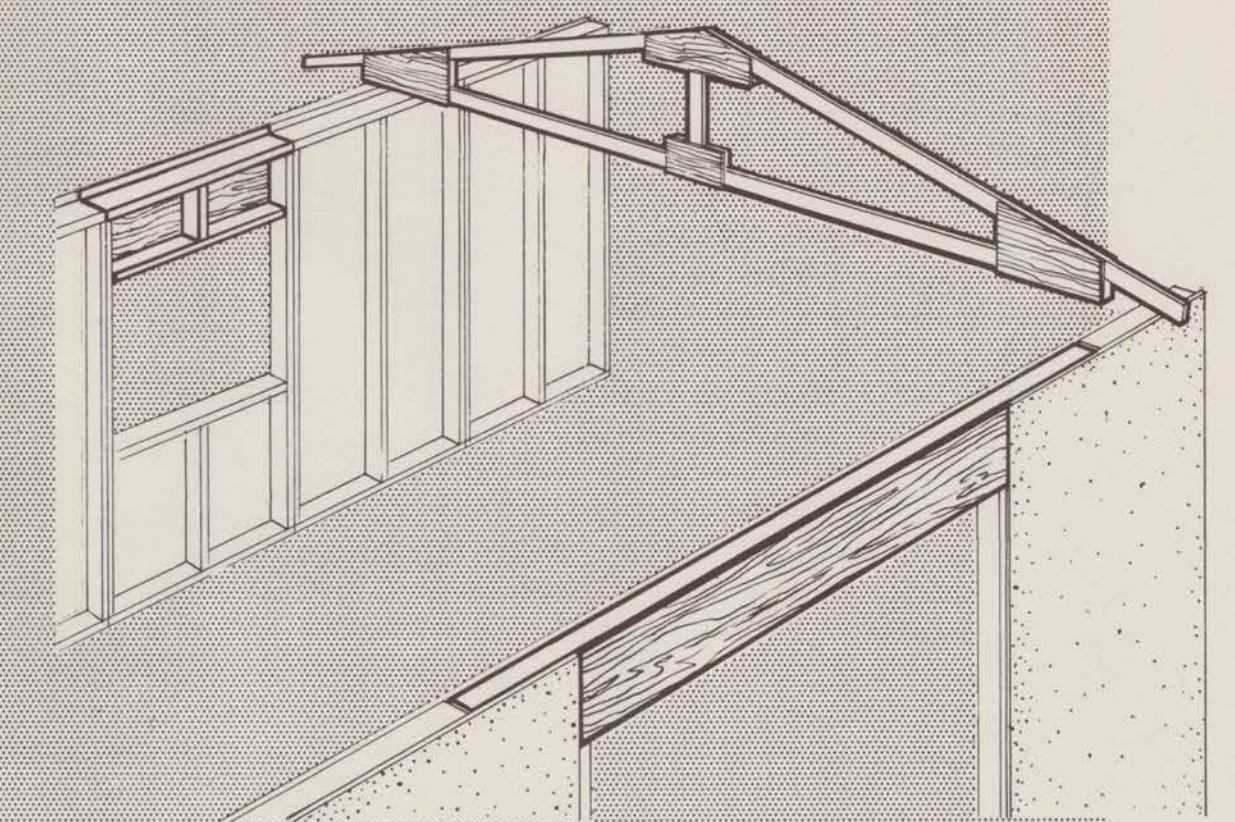
## JUDGE GLUE JOINT BY SQUEEZE-OUT

When two members are fastened together, some of the glue will be squeezed out if the correct amount of glue has been used. This is visual certification of a good glue joint.



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INSTRUCTION SHEET #1



SMALL HOMES COUNCIL—BUILDING RESEARCH COUNCIL  
UNIVERSITY OF ILLINOIS, URBANA, ILLINOIS

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Revised edition of an instruction sheet prepared in 1955 by Hans Granum, Norwegian Building Research Institute, a Fulbright Scholar at the University of Illinois; and Byron M. Redcliffe and Stanley K. Suddarth of the Purdue University Wood Research Laboratory.

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Price: 50 cents

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