SMALL HOMES COUNCIL'S WALL-PANEL FRAMING SYSTEM USING DOUBLE CONTINUOUS HEADER

PANEL SYSTEM

● Wall panels have been developed for use in the construction of almost any house of modular design. The houses may be built on a floor slab or over a crawl space or basement.

These panels are essentially a stud-wall framework covered with sheathing and siding. The basic panels are 4 feet wide and 8 feet high. They are tied together into walls by a double continuous header which is supported every 4 feet around the entire house. The panels can be adapted to the use of either a double 2″ x 4″ or a double 2″ x 6″ continuous header. Panels have been designed for windows and doors. Window heights can be adjusted to suit the particular type of window, the manufacturer's window details, overhang details, and the location of windows with relation to the rooms.

The wall-panel framing system can be varied by use of nail-glued headers on the door and window panels. When nail-glued headers are used, the double continuous header is eliminated. See Small Homes Council Instruction Sheet #21, NAIL-GLUED HEADER FOR SMALL HOMES COUNCIL'S WALL-PANEL SYSTEM.

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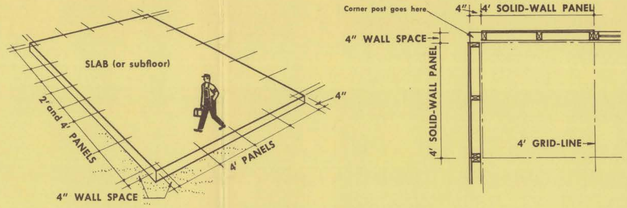

HOUSE LAYOUT FOR PANEL CONSTRUCTION

To use the panel system, a house must be designed so its exterior dimensions are the sum of the widths of the panels to be used plus 8 inches. This allows a 4-inch strip around the perimeter of the house for the erection of the panels. Place panels as shown, starting 4″ from any corner of the house.

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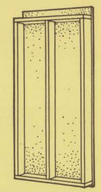
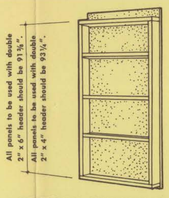


VERTICAL SOLID-WALL PANEL



HORIZONTAL SOLID-WALL PANEL

HALF PANEL

WINDOW PANEL

DOOR PANEL

Five types of panels are used in this framing system. All are 4′ x 8′ except the half panel.

1. Vertical solid-wall panel for use with all types of siding.
2. Horizontal solid-wall panel for use with vertical siding only.
3. Half panel, 2′ x 8′. (This panel, which can be either a vertical or horizontal solid-wall panel, is used only when dimensions of a house make it necessary.)
4. Window panel. Sill height of window varies with window selection.
5. Door panel. Door can be centered in panel or set off-center to the right or left. Select width of door to suit house design.

(Members above door and window panels are not lintels — but are nailers only.)

This sheet gives instructions for the 4′ x 8′ solid-wall vertical panel having a 24-inch stud spacing. Builders can adjust opening sizes and positions for various windows and doors.

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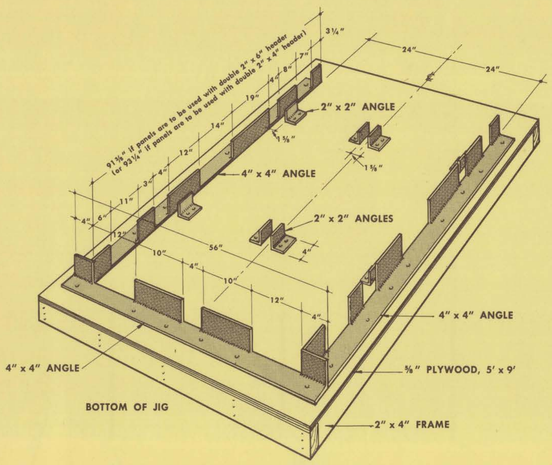

JIG DETAIL

The panels are assembled in a jig. With minor adjustments of the inside guides, this jig is suitable for building all panels shown in Figure 3. It will accommodate window panels using casement, double-hung, fixed, awning and hopper types of windows.

The base of the jig is a sheet of plywood reinforced with 2 x 4's. Guides for the outer edges of the panels are 4″ x 4″ steel angles. Inside guide angles are 2″ x 2″. The top of the jig is left open for ease in removing the panels.

Material required for the jig includes:

One sheet of	⅝″ x 5′ x 9′ plywood.
Five	2″ x 4″ x 8′-8¼″.
Two	2″ x 4″ x 5′-0″.
Three	4″ x 4″ structural steel angles as shown on drawing.
Twelve	4-inch lengths of 2″ x 2″ structural steel angles.

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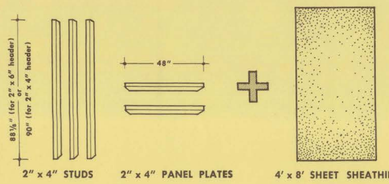

2″ x 4″ STUDS — 2″ x 4″ PANEL PLATES — 4′ x 8′ SHEET SHEATHING — 4′ x 8′ SHEET SIDING — 4′ SOLID-WALL PANEL

MATERIAL FOR VERTICAL SOLID-WALL PANEL

Basic framework: Three 2″ x 4″ x 88″ studs. (Add one stud if 16″ spacing is required.) Two 2″ x 4″ x 48″ panel plates.

Sheathing: One 4′ x 8′ sheet of 25/32″ fiberboard or ⅜″ plywood or ½″ gypsum board. If 16-inch stud spacing is used, plywood sheathing may be 5/16″ fiberboard ½″

Use of sheet materials of these specifications for sheathing eliminates the need for let-in corner bracing in walls built with these panels.

Sheathing may be omitted if ⅜″ exterior plywood is used for siding.

Siding: One 4′ x 8′ sheet of ⅜″ cement asbestos board or ¼″ plywood or ⅛″ tempered hardboard.

Sidings other than sheet material which can be used include all types of horizontal siding. If plywood sheathing is used, vertical board-and-batten and vertical V-notched tongue-and-groove boards can be applied; however, the horizontal panel is especially designed for vertical siding.

ARCHITECTURAL NOTES ON DOUBLE 2″ x 4″ HEADER

By using 1900f stress grade lumber, a double 2″ x 4″ continuous header may be used instead of a double 2″ x 6″ header. Panel studs should be lengthened to 90 inches. Roof framing should be placed over studs. Advantages of using 2″ x 4″ headers include:

1) shorter lag screws can be used;
2) less lumber is needed;
3) headers are lighter in weight and thus easier to assemble and erect.

This construction fulfills structural performance requirements,[1] but may not be acceptable to building codes in your locality. Check code restrictions before proceeding with it.

[1] "Tests on Exterior Wall-Panels," Small Homes Council Research Report 57-1.

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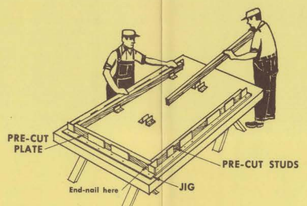
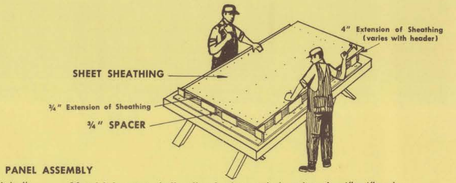


Pre-cut all studs and panel plates. Using these, assemble panel framework in jig. End-nail all members with two 16d common nails in each connection.

To obtain the specified ⅜-inch extension of the sheathing at the bottom of the panel (Fig. 5), slide the framework of the panel to the top and insert a ⅜-inch board against the bottom outer angle guide. Push the panel frame down against the ⅜-inch spacer. Place a 4′ x 8′ sheet of sheathing material directly on top of the framework.



PANEL ASSEMBLY

Material is automatically aligned when pushed against the 4″ x 4″ angles.

If sheet siding is used, install immediately after sheathing is nailed. Siding should extend 1¼ inches below bottom member of panel frame.

Install windows before removing window panels from jig. Do not install door frames until walls are erected.

For maximum efficiency, all like panels should be assembled at one time.

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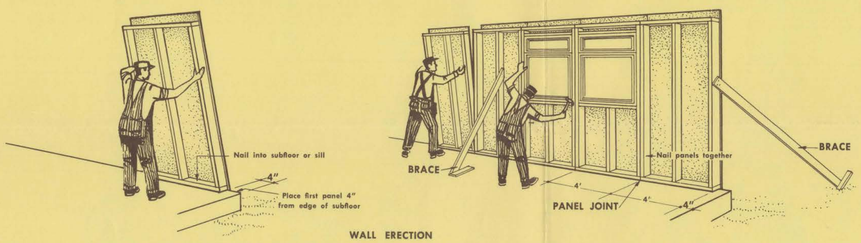

WALL ERECTION

To erect wall, start at one corner of house (four inches from exterior edge of the subfloor) and erect the panels in sequence. The panels should be plumbed and braced. Since a 4′ x 8′ solid-wall panel weighs 120 pounds, a crew of only two men is needed.

As the panels are put in place, nail the edge studs of two panels together with 16d common nails. Nail every 16 inches and from alternate sides. Nail panels into subfloor or sill. Braces for walls should not be more than 20 feet apart.

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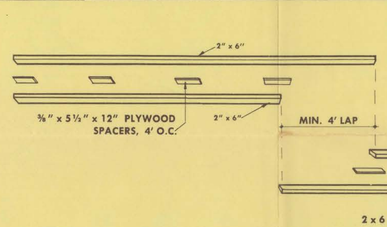

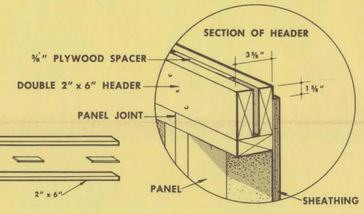

2 x 6 HEADER CONSTRUCTION

Header acts as a continuous lintel all around the house and also ties the walls of the house together.

Lay out a double 2″ x 6″ header so that the joints occur over double studs at panel connections. Inside and outside header joints should not occur at the same point. Header lengths should not be more than 20 feet so that two men can put them on the wall.

From ⅜″ plywood, cut 5½″x 12″ spacers. Locate spacers in headers over double studs.

Nail headers together using 16d common nails. Use three nails from each side at each spacer block. At splices, double the number of nails and center spacer block on joint.

Construction for a double 2″ x 4″ continuous header is similar to that of a 2″ x 6″ header.

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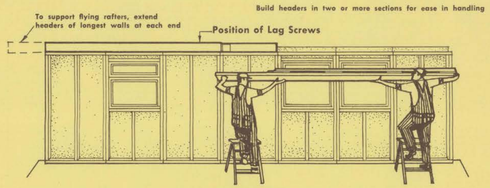

HEADER ERECTION

Place one length of header on top of panels and toenail into position.

Insert ⅜″ x 7″ lag screws (⅜″ x 6″ for double 2″ x 4″ header) with washer in slot in header, approximately 12 inches to left or right of double stud. Start lag screw with hammer; turn down with wrench.

Erect succeeding sections of header; nail splices together; toenail into place; install lag screws.

After header erection is complete, fasten sheathing to header with normal nailing procedure.

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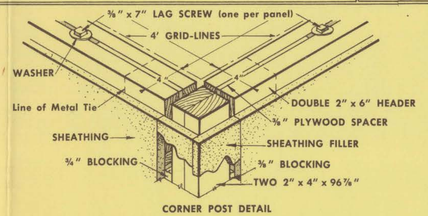

CORNER POST DETAIL

Built-up corner posts are needed to complete corners. For each corner post, cut two two-by-four's 96⅛″ long. (If header is to be extended beyond the corner for support of flying rafters, cut the two-by-four's 91⅜″ long (93⅛″ for 2″ x 4″ header). Nail together.

Install these posts at corners, using appropriate blocking to align with studs in panel. Nail into place.

After corner posts are secured, fill in corner with sheathing material. Apply siding if desired. Corner boards can also be used.

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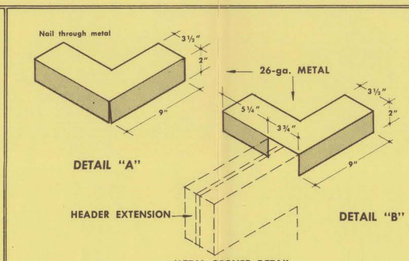

METAL CORNER DETAIL

Install metal corners of 26-gauge galvanized steel as shown in Detail "A."

If header is to be extended over corner posts, install metal corner-pieces as in Detail "B." Use 20 nails for each metal corner-piece.

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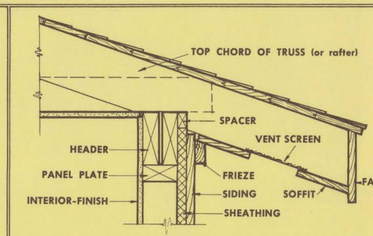

CORNICE DETAILS

Install 1″ x 2″ strip along top of outside edge of header. Trusses should be made so that the distance between the vertical edges of the heel-notches is 9½ inches greater than the total width of the panels in the end-walls. Sloping or flat soffits may be used. The length of the overhang can be varied to suit design and structural details.

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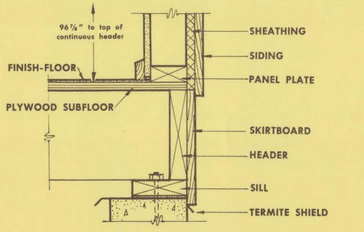
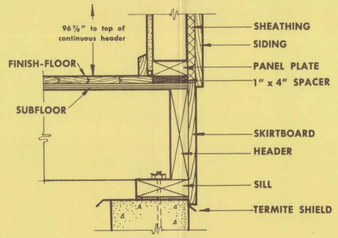
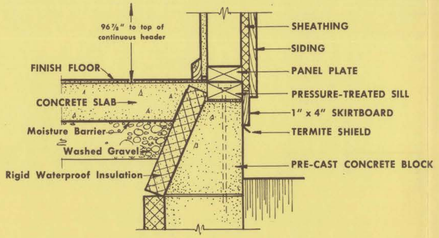


Installation of panels on plywood subfloor, with finish-flooring of materials other than wood: Rest panels directly on subflooring. Cover box sill with a skirtboard inserted under the extension of the siding in the same plane as the sheathing.



FLOOR DETAILS

Installation of panels on subfloor, with finish-flooring of wood: Rest panels on 1″ x 4″ spacer directly on top of subfloor. Apply skirtboard as previously noted.



Installation of panels on slab floor: Rest panels directly on top of pressure-treated sill. Use 1″ x 4″ skirtboard to cover joint between solid block and pressure-treated sill.

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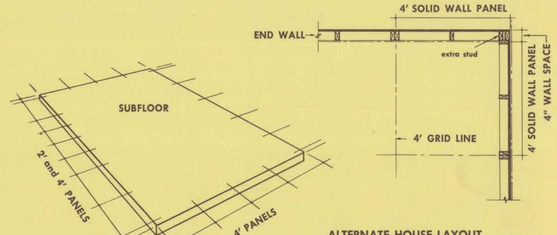


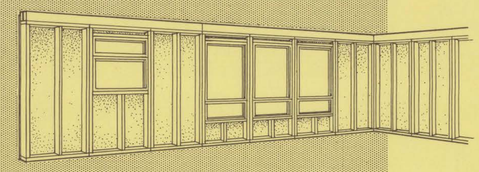
ALTERNATE HOUSE LAYOUT

For greater economy, the end wall dimensions may be reduced to the sum of the width of the panels only. In this way, corner posts are eliminated. (Windows cannot be used in end wall corner panels.)

WALL PANEL CONSTRUCTION

USING DOUBLE CONTINUOUS HEADER

INSTRUCTION SHEET #20



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