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From: J.P. Staub

To: 760 Ocean AVE Design Team

Subj: GLUE-NAILED PLYWOOD BOX HEADER

Ref: (1) Cost-Effective Home Building A Design and Construction Handbook, NAHB Research Center

App: (A) Reference 1 Excerpt

1. In order to maximize wall insulation it is desirable to use glue-nailed plywood box headers as described in reference 1.
2. The second story headers for the south windows were designed in accordance with guidelines delineated in reference 1.
3. An excerpt from reference 1 is included as appendix A to show detailed construction and design details.

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Glue-Nailed Plywood Box Headers

A structural header may also be formed by glue-nailing a plywood skin to framing members above the openings in a load-bearing wall. Plywood box headers use less material than conventional lumber headers and do not shrink as lumber headers often do. In addition, they are an energy saver because the cavity may be filled with insulation.

Figure 5.6 shows typical glue-nailed plywood headers. A single top plate is shown; this may be doubled, but at least one member must be continuous across the span. Jack studs are not normally required for spans of 4 feet (1.22 m) or less. The vertical "stiffeners" should be spaced the same as the studs (similar to cripple studs). The web may be installed to the inside and/or outside face with the face grain oriented horizontally. Table 5.2 provides allowable loads for different glue-nailed plywood headers. Additional information is available in *NAHB Research Report No. 5: Plywood Headers for Residential Construction*.¹

The plywood thickness for either design should be a minimum of 1/2-inch (13 mm) and should be selected to blend with other wall covering materials. The plywood skins may be treated as sheathing or finished as an accent panel on the exterior, or they may be taped and spackled to blend with the drywall on the interior. A water-resistant structural adhesive should be used for gluing the plywood.

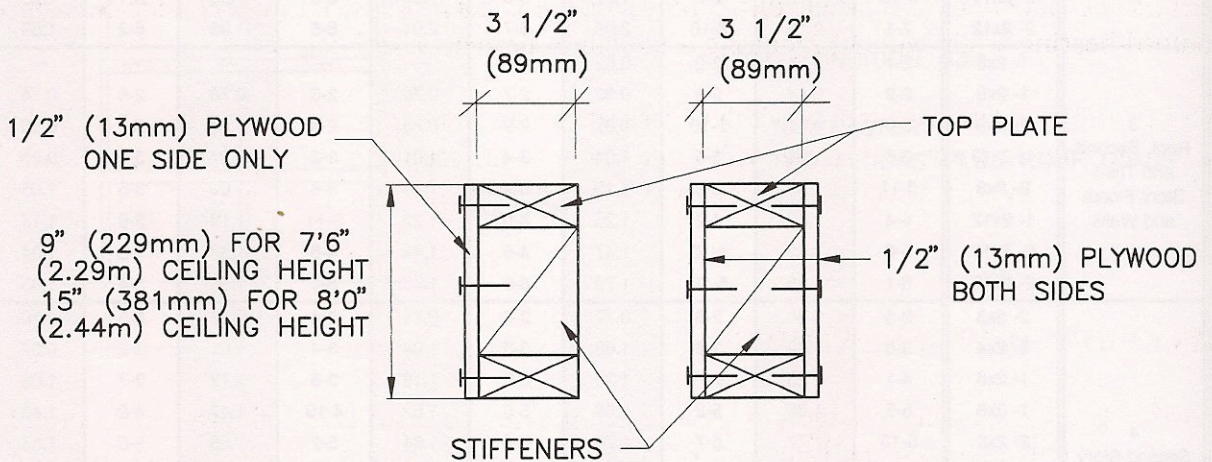


FIGURE 5.6 Glue-Nailed Box Headers

¹NAHB Research Report No. 5, *Plywood Headers for Residential Construction*. NAHB Research Center. Prepared for the National Association of Home Builders, Washington, DC. 1983.

TABLE 5.2
Allowable Loads for Glue-Nailed Plywood Box Headers

HEADER TYPE	HEADER DEPTH		HEADER SPAN											
			3 ft.	0.91 m	4 ft.	1.22 m	5 ft.	1.52 m	6 ft.	1.83 m	7 ft.	2.13 m	8 ft.	2.44 m
	inches	mm	lb/ft	kN/m	lb/ft	kN/m	lb/ft	kN/m	lb/ft	kN/m	lb/ft	kN/m	lb/ft	kN/m
Plywood Both Sides	9	229	940	13.7	880	12.8	820	12.0	760	11.1	680	9.9	500	7.3
	15	381	1090	15.9	1040	15.2	990	14.4	940	13.7	860	12.6	740	10.8
Plywood on One Side	9	229	840	12.3	750	10.9	640	9.3	540	7.9	420	6.1	250	3.6
	15	381	900	13.1	810	11.8	720	10.5	650	9.5	580	8.5	520	7.6

- Notes:
1. Jack studs not required for spans of 4 feet (1.22 m) or less.
 2. 2x4 minimum framing size, maximum stud spacing 24 inches (610 mm) on center.
 3. Plywood webs must be single piece with face grain parallel to span, minimum 1/2-inch (13 mm) structural rated plywood.
 4. Stiffener spacing is the same as basic stud spacing.
 5. Apply 1/4-inch (6 mm) bead 3M wood adhesive (No. 5230) or equivalent to all framing under plywood webs, including stiffeners. Nail with 8d common wire nails spaced 6 inches (152 mm) on center on all framing. Insulate before enclosing.

Ref: *NAHB Research Report No. 5, Plywood Headers for Residential Construction*. NAHB Research Center. Prepared for the National Association of Home Builders, Washington, DC. 1983.

Window Opening Between Studs

Where compatible with architectural design, the use of nominal 22-1/2- or 14-1/2-inch-wide (572 or 368 mm) windows can simplify construction when such windows are located between regular studs. Blocks are installed at the proper heights for the head and sill and thus form the opening. Because no studs are displaced, this type of opening may be used in either load-bearing or nonload-bearing walls without requiring a structural header or jack studs.

Where a more expansive window width is desired, two or more adjacent stud spaces may be used in this manner to form a multiple-width opening. In this application, regular studs remain in place between individual units to function as load-bearing mullions (see Figure 5.7).

EXTERIOR SIDING/SHEATHING

A wide variety of siding products is available. Where used, structural siding panels installed directly to studs combine the functions of siding, sheathing, and structural bracing in a single layer. However, most siding products require some type of sheathing material for back-up support. The sheathing may also provide the required structural bracing for resisting wind and earthquake loads (check your local code).

Three-eighths-inch-thick (10 mm) wood structural panel sheathing provides good bracing strength in conventional construction as well as back-up for siding. Medium-density 1/2-inch-thick (13 mm) fiberboard sheathing also serves these functions. Other sheathing products rated for wall bracing are available. In combination with the gypsum drywall, these panels provide a rigid "system," however, in high wind and seismic areas the sheathing systems need to be properly designed.