Engineering Tech Tips

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Overview of Siding Materials for Forest Service Facilities

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Many types of siding are available today. Some types of siding require less maintenance than others. This article briefly describes some of the more common types of siding and their relative costs.

Types of Siding

Wood

Wood siding has traditionally been chosen by homeowners and builders. When properly cared for, it can be very durable. Western timber harvests have been curtailed in recent years, increasing the cost of solid wood siding.

Lap—Lap siding is applied horizontally with the top board lapped over the board below (Figure 1). The board is usually beveled, with the bottom edge thicker than the top.

Redwood—Redwood is a durable siding if sealed, stained, or painted at regular intervals. Redwood also has notable natural decay resistance. Reduced timber harvests have increased the cost of redwood siding.

Cedar—When cedar is sealed, stained, or painted, it is as durable

Figure 1—Painted horizontal wooden lap siding.

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as redwood. Wood siding generally requires a new coating of sealer, stain, or paint every 3 to 7 years to remain durable.

Oriented Strand Board—Oriented strand board (OSB) siding is made from wood strands that are oriented in layers under heat and pressure. The top layer is resin impregnated or protected with a sheet of resin-impregnated paper. Some OSB sidings have factory-applied topcoat or primer. The siding can be painted or stained as desired.

Hardboard—The wood fibers in hardboard are oriented at random and bonded with resin under heat and pressure. The result is a dense, tough material that is less stable than plywood. Resins protect the top of each piece and a primer or topcoat is factory applied. This product depends more on proper installation and moisture control than does solid wood. Any uncoated areas must be painted. Avoid panels or boards that have been chipped or cracked, or that are damaged during installation. Hardboard is sometimes called "Masonite," a trade name.

Both OSB and hardboard sidings are among the least-expensive siding options. They perform best when water vapor in a building is controlled through venting and vapor barriers. They resist weather best when painted. These materials are unforgiving of sloppy installation and will not withstand exposure to wet conditions. All horizontal and vertical joints should be weather tight.

Plywood—Plywood siding is inexpensive and easy to install. The veneers in exerior plywood are held together with waterproof glue. Panels usually come in 4- by 8-feet, 4- by 9-foot, or 4- by 10-foot sheets. The better grades have fewer patches replacing knots in the face veneer. Plywood siding is applied vertically. The horizontal seams where the panels meet are covered with a 1- by 4-inch wood trim. A piece of metal flashing is bent to step behind the upper piece and over the lower piece. The panels can also be installed so that the upper piece overlaps the lower one to prevent water penetration. Plywood siding and trim are most durable when they are protected by a heavy-bodied stain or paint. To remain flat and attractive, the panels need to be fastened properly using corrosion-resistant nails.

Metal

Metal siding is made from aluminum or steel sheet and is usually formed to look like wood siding. It has a factory-applied coating. The surface may be smooth or textured. Metal siding is low maintenance, requiring nothing more that periodic cleaning. It is noncorrosive, rot resistant, and pest resistant. If metal siding is properly installed, it can outlast other types of siding. Some communities require that metal siding be grounded as a precaution against electrical shock.

Steel—Steel siding (Figure 2) resists dents better than aluminum. Steel siding is more common than aluminum where severe weather can cause damage, such as the hailstorms that are common in the Midwest. Corrosion may occur if the finish is scratched to the bare metal. Damaged spots must be painted promptly.

Aluminum—Aluminum siding is durable and eliminates the need to paint for many years—20 years or longer, depending on climate and installation. Although the siding's color will fade or dull with time, newer coatings are more durable than those of a few years ago. Aluminum siding is soft and can be damaged by hailstones or careless

Figure 2—MTDC's garage uses vertically arranged steel siding.

Figure 3—An older residence with brick siding.

placement of ladders. The siding can become wavy or buckle during heat if it is not properly installed.

Masonry

Brick—Brick (Figure 3) is one of the more durable exteriors and requires little maintenance. It never needs painting or staining. It won't rot or burn and can result in reduced fire insurance premiums. Brick is energy efficient. Its mass keeps the building cooler in summer and warmer in winter. Brick is a good noise isolator.

Stucco (EIFS)—Most construction that uses stucco or synthetic stucco (EIFS, Exterior Insulation and Finish System) backs an exterior stucco surface with a cement board substrate. Stucco (Figure 4) has most of the same

Figure 4—Stucco siding provides effective protection against the elements.

advantages of a brick exterior. It does require painting periodically. Because the material lends itself to an unlimited variety of shapes and curves, unique architectural forms are possible.

Fiber-Reinforced Cement—This siding usually comes in panels. It can have the appearance of wood and the durability of concrete. It is noncombustible, resists moisture and wind, is immune to damaging ultraviolet rays and salt spray, is lightweight, and is pest resistant. It is dimensionally stable, tough, and flexible. Fiber-reinforced panels have good structural properties and resist impact.

Plastic—Plastic siding (Figure 5) is molded with color throughout. Scratches on the surface are not as apparent as with metal siding. Plastic siding is durable and resists dents better than metal siding. The installed price is slightly less than for metal siding. Plastic siding comes in two types, vinyl and polypropylene. Plastic siding is usually installed with insulation backing board. The backing board gives it added rigidity and strength and increases energy efficiency.

Vinyl—Vinyl is the most widely used plastic siding. It can be made smooth or textured to look like rough-sawn wood siding. Polypropylene is only available molded to resemble cedar shingles. Both types of siding are durable, retain their color, and have improved in quality over the years. Plastic siding can buckle in hot weather if it is installed improperly. It can become brittle and crack in cold weather if it is struck hard. Where hail is common, vinyl may not be the best choice. It can shatter and be severely damaged by hail. If vinyl siding is not properly installed, it will rattle in gusty winds. Textured siding may be harder to clean than smooth siding. Vinyl siding comes in many styles and shapes: clapboard, beaded, D4 profile (two 4-inch-wide horizontal clapboards per single panel), D5 profile (two 5-inch-wide horizontal clapboards per single panel), Dutchlap, shiplap, and a T3 profile (three 3-inch-wide horizontal clapboards per panel).

Table 1 shows the relative costs, maintenance requirements, and typical warranties for different types of siding.

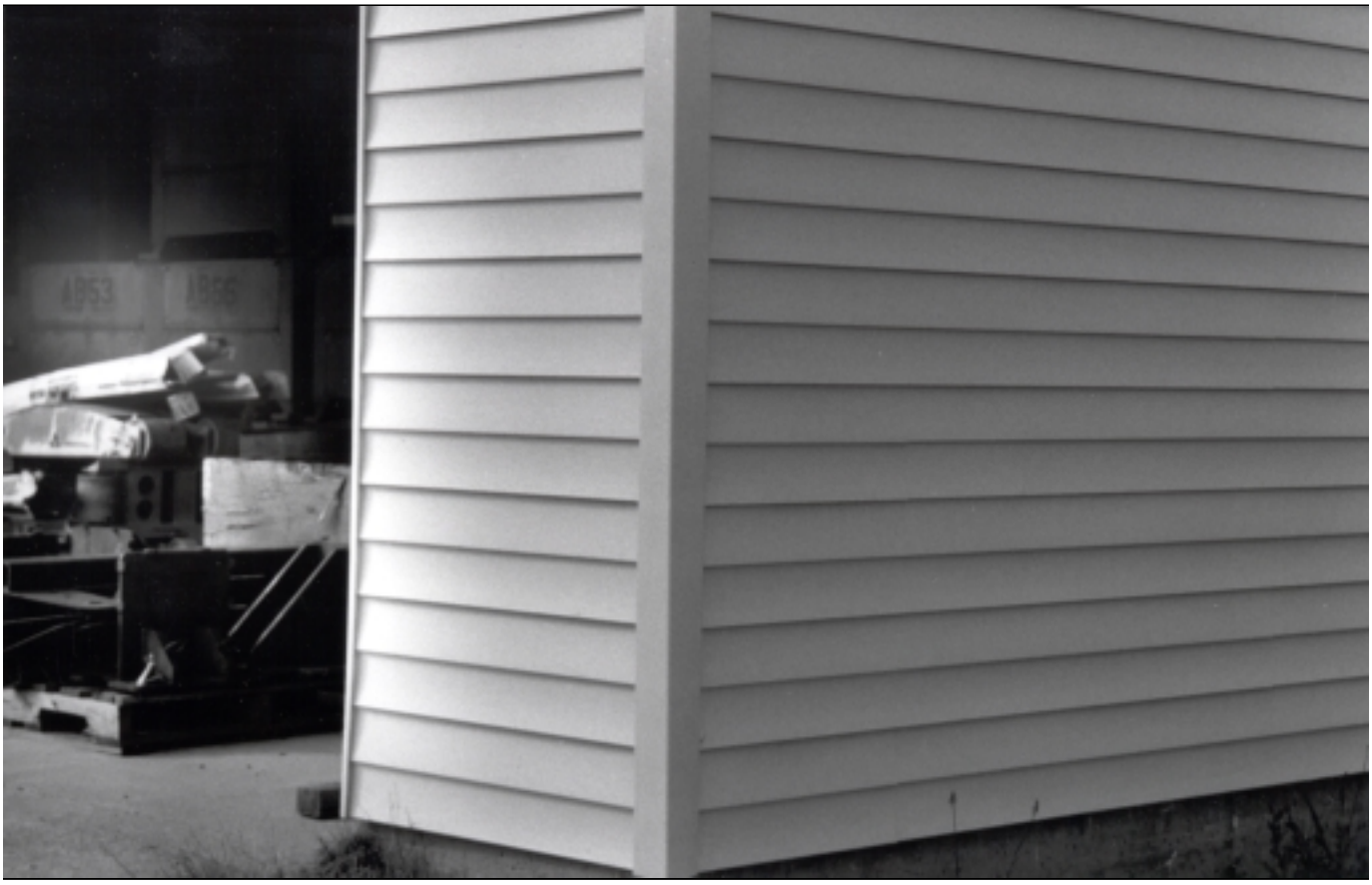

Figure 5—Vinyl siding comes in a variety of textures, colors, and sizes.

Table 1—Siding system costs, maintenance requirements, and typical warranties.

Type of Siding	Estimated Cost of Materials and Labor (per square foot)	Maintenance	Warranty
Brick (4-inch Veneer)	$9.20 to $10.35	Very low	Lifetime.
Synthetic Stucco (EIFS)	$9.00	Medium Paint every 5 to 7 years	10 years limited.
Vinyl Siding	$1.58 to $2.20 ($0.58 to $0.70 + $1.00 to $1.50 labor)	Low	Material's lifetime or 25 years.
Cedar Siding	$2.60 to $3.85 ($1.10 + $1.50 to $2.75 labor)	High Stain or paint every 3 to 7 years	25 years limited.
Steel Siding	$2.45 to $3.95 ($1.20 +$1.25 to $2.75 labor)	Low	Material's lifetime or 25 to 50 years. Finish 15 years.
Aluminum Siding	$2.45 to $3.95 ($1.20 + $1.25 to $2.75 labor)	Low	Material's lifetime or 25 to 50 years. Finish 15 years
Hardboard Siding	$2.15 to $3.95 ($0.90 to $1.20 + $1.25 to $2.75 labor)	Medium Paint every 5 to 7 years	Materials, 25-years limited. Finish 15 years.
Plywood Siding	$1.97 ($0.72 + $1.25 labor)	High Paint every 3 to 7 years	Materials, 5 years limited.
Vertical Steel Sheets	$1.75 ($0.50 + $1.25 labor)	Low	Materials, limited.

Additional Resources

Internet Sites

Certainteed Corporation
Web site: http:// www.certainteed.com
Good information on siding products or system types.

Weyerhaeuser Corporation
Web site: http:// www.weyerhaeuser.com/bmd/ products
Information on current siding and building products.

Sweets Group
Web site: http:// www.sweets.com/index
An index of building material manufacturers.

Architectural Engineering Construction
Web site: http:// www.aecinfo.com/bpl/div07/ 7400.html
Information on siding products.

References

Wood Frame House Construction, Craftsman Book Company
6058 Corte del Cedro
PO Box 6500
Carlsbad, CA 92018.

Super Siding, Popular Mechanics Magazine, 1996.

Organizations

Architectural Sheet Metal Manual
Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
4201 Lafayette Center Drive
Chantilly, VA 20152-1209

American Architectural Manufacturers Association
1540 E. Dundee Road, Suite 310
Palatine, IL 60067
Phone: (847) 202-1350

American Hardboard Association
1210 W. Northwest Highway
Palatine, IL 60067
Phone: (708) 934-8800

Brick Institute of America
11490, Commerce Park Drive
Reston, VA 22091
Phone: (703) 620-0010
Web site: http://www.bia.org

U.S. Gypsum Company
125 S. Franklin Street
Chicago, IL 60606
Phone: (800) 621-9622

Western Wood Products Association
Yeon Building, 522 SW Fifth Ave
Portland, OR 97204
Phone: (503) 224-3930
Web site: http://wwpa.org

Certainteed
750 E. Swedesford Road
Valley Forge, PA 19482
Phone: (800) 233-8990

Vinyl Siding Institute
335 Lexington Avenue
New York, NY 10017
Phone: (212) 351-5400

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Dick Karsky has a bachelor's degree in agricultural engineering from North Dakota State University and a master's degree in agricultural engineering from the University of Minnesota. Dick is a registered Professional Engineer (PE). He worked in industry before coming to the Missoula Technology and Development Center in 1977.

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