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Standard Specification for Application of Gypsum Sheathing¹

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1. Scope

1.1 This specification covers the minimum requirements for and methods of application of gypsum sheathing for use as a substrate for exterior wall cladding.

1.2 Details of construction for a specific assembly to achieve the required fire resistance shall be obtained from reports of fire-resistance tests, engineering evaluations, or listings from recognized fire testing laboratories.

1.2.1 This specification shall govern where it is more stringent (size or thickness of framing and size and spacing of fasteners) than the fire-rated construction.

1.3 Where sound control is required for a gypsum sheathing assembly, the details of construction shall be in accordance with the acoustical test report of an assembly that has met the required acoustical value(s).

1.3.1 This specification shall govern where it is more stringent (size or thickness of framing and size and spacing of fasteners) than the sound-rated construction.

1.4 Where resistance to racking loads or shear is required for a gypsum sheathing assembly, the details of construction shall be in accordance with the racking or shear test report of an assembly that has met the required racking or shear value(s).

1.4.1 This specification shall govern where it is more stringent (size or thickness of framing and size and spacing of fasteners) than the racking or shear-tested construction.

1.5 The values stated in inch-pound units are to be regarded as the standard. The SI (metric) values given in parentheses are approximate and are provided for information purposes only.

1.6 The text of this standard references footnotes which provide explanatory material. These footnotes shall not be considered as requirements of the standard.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

¹ This specification is under the jurisdiction of ASTM Committee C-11 on Gypsum and Related Building Materials and Systems and is the direct responsibility of Subcommittee C11.03 on Specifications for Application of Gypsum and Other Products in Assemblies.

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2. Referenced Documents

2.1 *ASTM Standards:*

C 11 Terminology Relating to Gypsum and Related Building Materials and Systems²

C 79/C 79M Specification for Treated Core and Nontreated Core Gypsum Sheathing Board²

C 954 Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness²

C 955 Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases²

C 1002 Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases²

C 1007 Specification for the Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories²

C 1063 Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster²

2.2 *U.S. Department of Commerce Publication:*
PS20 American Softwood Lumber Standard³

3. Terminology

3.1 *Definitions:* Definitions shall be in accordance with Terminology C 11.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *exterior cladding, n*—a permanent material or system that impedes the transmission of environmental elements to the sheathing.

3.2.2 *fastener, n*—nails, staples, or screws used for application of the sheathing.

3.2.3 *framing member, n*—studs, headers, bracing, and blocking that serve to receive the sheathing.

3.2.4 *horizontal application, n*—a synonym for *perpendicular application*.

² *Annual Book of ASTM Standards*, Vol 04.01.

³ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

3.2.5 *parallel application, n*—gypsum sheathing applied with the edges parallel to the framing members; a synonym for *vertical application*.

3.2.6 *perpendicular application, n*—gypsum sheathing applied with the edges at right angles to the framing members; a synonym for *horizontal application*.

3.2.7 *require, v*—to mandate by a force outside this specification, such as a building code, project specification, contract, or purchase order.

3.2.8 *specified, adj*—pertaining to a mandatory requirement of this specification or a referenced requirement.

3.2.9 *specify, v*—to mandate by an obligation of this standard or a referenced document.

3.2.10 *vertical application, n*—synonym for *parallel application*.

3.2.11 *weather resistive barrier, n*—a temporarily exposed protective membrane that is intended to impede the penetration of environmental elements until the installation of a permanent exterior cladding.

4. Exposure After Installation

4.1 *Core-Treated Gypsum Sheathing Board*—Core-treated gypsum sheathing board is a substrate that shall be covered by an exterior cladding or other weather-resistive barrier and is not intended for long-term exposure. It shall not be exposed to the elements for more than 30 days after it has been installed. The core-treated gypsum sheathing shall be covered with a weather-resistive barrier within 30 days if the exposure time will be more than 30 days.

NOTE 1—Some building codes require an additional weather-resistive barrier. The exterior face paper of the sheathing shall be dry prior to application of the additional weather-resistive barrier.

4.2 *Untreated-Core Gypsum Sheathing Board*—Untreated-core gypsum sheathing board shall be covered immediately with a weather-resistive barrier.

5. Materials and Manufacture

5.1 *Gypsum Sheathing*—Specification C 79/C M.

5.1.1 *Core-Treated Gypsum Sheathing*—Gypsum sheathing with a water-resistive material incorporated in the core as defined in Specification C 79/C M.

5.1.2 *Type X (Special Fire-Resistant) Gypsum Sheathing*—Gypsum sheathing that provides a greater degree of fire resistance than regular gypsum sheathing as defined in Specification C 79/C M.

5.2 *Fasteners*—Fasteners shall be as described in 5.2.1 through 5.2.3. The fastener length shall be not less than that specified in Table 1.

5.2.1 *Nails*—Nails shall be not less than 12-gage galvanized, 7/16-in. (11.1-mm) diameter head.

5.2.2 *Screws*:

5.2.2.1 Screws for fastening gypsum sheathing to wood framing members, and to steel framing members less than 0.033 in. (0.84 mm) in thickness, shall meet the requirements of Specification C 1002.

5.2.2.2 Screws for fastening gypsum sheathing to steel framing members from 0.033 to 0.112 in. (0.84 to 2.84 mm) in thickness shall meet the requirements of Specification C 954.

TABLE 1 Minimum Fastener Lengths

| Framing Type | Fastener Type | Sheathing Thickness, in. (mm) | Minimum Fastener Length, in. (mm) |
|--------------|---------------|-------------------------------|-----------------------------------|
| Wood | nails | 1/2 (12.7) | 1 1/2 (38) |
| | | 5/8 (15.9) | 1 3/4 (45) |
| | screws | 1/2 (12.7) | 1 1/4 (32) |
| | | 5/8 (15.9) | 1 1/4 (32) |
| | staples | 1/2 (12.7) | 1 1/2 (38) |
| | | 5/8 (15.9) | 1 3/4 (45) |
| Steel | screws | 1/2 (12.7) | 1 (25) |
| | | 5/8 (15.9) | 1 1/4 (32) |

5.2.3 *Staples*—Staples shall be of galvanized steel, not less than 16-gage, 7/16-in. (11.1-mm) wide crown outside measurement. Legs shall have divergent points.

5.3 *Framing Members*:

5.3.1 *Wood Framing*—Wood framing members shall conform to PS20.

5.3.2 *Steel Framing*—Load-bearing steel framing shall meet the requirements of Specification C 955.

6. Substrate, Surface Preparation

6.1 The maximum spacing for framing members for gypsum sheathing shall be not more than 24 in. (610 mm) on center on walls.

6.1.1 Wood framing shall be straight and true, attached securely following accepted engineering practices and as required for the intended design. The surfaces to which abutting edges or ends of gypsum sheathing are to be attached shall be not less than 1 1/2-in. (38-mm) wide. The bearing surface shall be not less than 3/4 in. (19 mm) for internal corners or angles.

6.1.2 Load-bearing metal framing members shall be of the proper size and design for their intended use and shall be installed in accordance with Specification C 1007.

7. Framing Alignment

7.1 Framing members shall be installed so that the surface will be in an even plane, unless otherwise specified, after the gypsum sheathing has been applied.

8. Cutting and Application of Gypsum Sheathing

8.1 *Cutting Gypsum Sheathing*:

8.1.1 The gypsum sheathing shall be cut by scoring and breaking or by sawing, working from the face side. The face paper shall be cut with a sharp knife or other suitable tool when cutting by scoring. The gypsum sheathing shall be broken by snapping the gypsum sheathing in the reverse direction or by cutting the back paper with a knife or suitable tool.

8.1.2 The cut edges and ends of gypsum sheathing shall be trimmed to obtain neat fitting joints when installed.

8.1.3 Holes for pipes, fixtures, or other small openings shall be scored on the face paper before removing the cutout with a saw or special tool designed for this purpose.

8.1.4 Where gypsum sheathing meets projecting surfaces, the gypsum sheathing shall be scribed and cut neatly.

8.2 *Application of Gypsum Sheathing*:

8.2.1 Gypsum sheathing shall be fitted snugly around all window and door openings.

8.2.1.1 Sheathing joints shall be offset a minimum of 4 in. (100 mm) from the edge of any opening.

8.2.1.2 Gypsum sheathing shall be flashed at openings so that water intrusion will not contact the sheathing.

8.2.2 All vertical end and edge joints shall abut over the centers of framing members and shall be offset a minimum of one framing space between adjacent rows of gypsum sheathing.

8.2.3 Control Joints:

8.2.3.1 Control joints shall be provided in wall runs exceeding 30 ft (9100 mm) in length. The distance between control joints shall be not more than 30 ft (9100 mm).

8.2.3.2 Control joints shall be installed in walls wherever there is a building construction joint or where required.

8.2.3.3 The location of the control joints shall be as required by either the building design or the exterior cladding specified.

8.2.3.4 Control joints, other accessories, and metal plaster base shall be fastened through gypsum sheathing to framing members.

8.2.4 Gypsum sheathing, 4-ft (1220-mm) wide, shall be applied either parallel or perpendicular to framing members.

8.2.4.1 Square edge gypsum sheathing applied perpendicular to framing members shall be covered with a weather-resistant barrier, or horizontal joints shall be sealed.

8.2.5 Tongue and groove gypsum sheathing shall be applied with the long dimension perpendicular to framing members, with the grooved edges down, interlocking the tongue of the panel below without forcing.

8.2.6 Fasteners shall be spaced not more than 8 in. (203 mm) on center along vertical ends or edges and intermediate supports. The length of fasteners shall be as indicated in Table 1.

8.2.6.1 Fasteners shall be located not less than $\frac{3}{8}$ in. (9.5 mm) from the ends and edges of the gypsum sheathing.

8.2.6.2 Gypsum sheathing shall be held tight against the framing when driving fasteners.

8.2.6.3 Fasteners shall be driven so that the heads are at or slightly below the surface of the gypsum sheathing without breaking the face paper or fracturing the core.

8.2.6.4 Screws shall be driven without stripping the framing member around the screw shank.

8.2.6.5 Staples shall be driven with the crown parallel to the framing member.

8.2.7 *Application of Gypsum Sheathing Under Self-Furred Metal Lath*—Where fire resistance or shear resistance is not required, and when metal lath and portland cement plaster are to be applied as the exterior cladding over gypsum sheathing installed over framing members spaced not more than 16 in. (406 mm) on center, and the metal lath shall be installed in accordance with Specification C 1063 within 24 h after the gypsum sheathing, the gypsum sheathing shall be permitted to be applied as specified in 8.2.7.1 and 8.2.7.2, and fastening of the gypsum sheathing shall be completed with the attachment of the self-furred metal lath.

8.2.7.1 For 2-ft (610-mm) wide sheathing installed in accordance with 8.2.5, vertical ends of gypsum sheathing shall be fastened in accordance with 8.2.6. Gypsum sheathing shall be fastened in place at each intermediate stud with a minimum of two fasteners per board spaced not more than 2 in. (50 mm) from opposite edges.

8.2.7.2 For 4-ft (1220-mm) wide sheathing installed in accordance with 8.2.4, vertical ends or edges of gypsum sheathing shall be fastened in accordance with 8.2.6. Gypsum sheathing shall be fastened in place at each intermediate stud with fasteners spaced not more than 24 in. (610 mm) on center.

9. Keywords

9.1 exterior walls; gypsum; sheathing

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