

SECTION 09 29 00

GYPSUM BOARD
07/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- ANSI A108.11 (1992) Interior Installation of Cementitious Backer Units
- ANSI A108.1 (1999) Installation of Ceramic Tile; including A108.1A-C, 108.4-.13, 118.1-.10, A136.1

ASTM INTERNATIONAL (ASTM)

- ASTM C 36/C 36M (2003) Gypsum Wallboard
- ASTM C 79/C 79M (2003) Standard Specification for Treated Core and Nontreated Core Gypsum Sheathing Board
- ASTM C 475 (2002) Joint Compound and Joint Tape for Finishing Gypsum Board
- ASTM C 514 (2001) Standard Specification for Nails for the Application of Gypsum Board
- ASTM C 557 (2003) Adhesives for Fastening Gypsum Wallboard to Wood Framing
- ASTM C 630/C 630M (2003) Water-Resistant Gypsum Backing Board
- ASTM C 840 (2003) Application and Finishing of Gypsum Board
- ASTM C 954 (2000) Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
- ASTM C 1002 (2001) Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
- ASTM C 1047 (1999) Accessories for Gypsum Wallboard and Gypsum Veneer Base

ASTM C 1177/C 1177M	(2004) Glass Mat Gypsum Substrate for Use as Sheathing
ASTM C 1396/C 1396M	(2003a) Standard Specification for Gypsum Board
ASTM D 226	(1997a) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D 412	(1998a; R 2002e1) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
ASTM D 624	(2000e2) Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM D 1037	(1999) Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials
ASTM D 1149	(1999) Standard Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber
ASTM D 2394	(1999) Standard Method for Simulated Service Testing of Wood and Wood-Base Finish Flooring
ASTM D 5420	(1998a) Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)
ASTM E 84	(2005) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E 695	(2003) Standard Method for Measure Relative Resistance of Wall, Floor and Roof Construction to Impact Loads

GYPSUM ASSOCIATION (GA)

GA 214	(1996) Recommended Levels of Gypsum Board Finish
GA 216	(2000) Application and Finishing of Gypsum Board
GA 253	(1999) Application of Gypsum Sheathing
GA 600	(2003) Fire Resistance and Sound Control Design Manual

UNDERWRITERS LABORATORIES (UL)

UL Fire Resist Dir

(2004) Fire Resistance Directory

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00
SUBMITTAL PROCEDURES:

SD-03 Product Data

Cementitious backer units

Glass Mat Covered or Reinforced Gypsum Sheathing

Glass Mat Covered or Reinforced Gypsum Sheathing Sealant

Impact Resistant Gypsum Board

Accessories

Submit for each type of gypsum board and for cementitious backer units.

Gypsum Board;

Adhesives;

Joint Treatment Materials

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery

Deliver materials in the original packages, containers, or bundles with each bearing the brand name, applicable standard designation, and name of manufacturer, or supplier.

1.3.2 Storage

Keep materials dry by storing inside a sheltered building. Where necessary to store gypsum board and cementitious backer units outside, store off the ground, properly supported on a level platform, and protected from direct exposure to rain, snow, sunlight, and other extreme weather conditions. Provide adequate ventilation to prevent condensation. Store per manufacturer's recommendations for allowable temperature and humidity range. Do not store panels near materials that may offgas or emit harmful fumes, such as kerosene heaters, fresh paint, or adhesives.

1.3.3 Handling

Neatly stack gypsum board and cementitious backer units flat to prevent sagging or damage to the edges, ends, and surfaces.

1.4 ENVIRONMENTAL CONDITIONS

1.4.1 Temperature

Maintain a uniform temperature of not less than 50 degrees F in the structure for at least 48 hours prior to, during, and following the application of gypsum board, cementitious backer units, and joint treatment materials, or the bonding of adhesives.

1.4.2 Exposure to Weather

Protect gypsum board and cementitious backer unit products from direct exposure to rain, snow, sunlight, and other extreme weather conditions.

PART 2 PRODUCTS

2.1 MATERIALS

Conform to specifications, standards and requirements specified. Provide gypsum board types, gypsum backing board types, cementitious backing units, and joint treating materials manufactured from asbestos free materials only.

Submit Material Safety Data Sheets and manufacturer maintenance instructions for gypsum materials including adhesives.

2.1.1 Gypsum Board

ASTM C 36/C 36M and ASTM C 1396/C 1396M.

2.1.1.1 Regular

48 inch wide, 5/8 inch thick, tapered edges.

2.1.1.2 Type X (Special Fire-Resistant)

48 inch wide, 5/8 inch thick, tapered edges.

2.1.2 Glass Mat Covered or Reinforced Gypsum Sheathing

Exceeds physical properties of ASTM C 79/C 79M and ASTM C 1177/C 1177M. Provide 1/2 inch, gypsum sheathing. Provide gypsum board of with a noncombustible water-resistant core, with glass mat surfaces embedded to the gypsum core or reinforcing embedded throughout the gypsum core. Warrant gypsum sheathing board for at least six months against delamination due to direct weather exposure. Provide continuous, asphalt impregnated, building felt to cover exterior face of sheathing. Seal all joints, seams, and penetrations with compatible sealant.

2.1.2.1 Glass Mat Covered or Reinforced Gypsum Sheathing Sealant

Provide sealant compatible with gypsum sheathing, rubber washers for masonry veneer anchors, and other associated cavity wall components such as anchors and through wall flashing. Provide sealants for gypsum sheathing board edge seams and veneer anchor penetrations recommended by the gypsum sheathing manufacturer and have the following performance requirements:

- a. ASTM D 412: Tensile Strength - 80 psi
- b. ASTM D 412: Ultimate Tensile Strength (maximum elongation) - 170 psi
- c. ASTM D 624: Tear Strength, dieB, - 27 ppi

- d. **ASTM D 1149**: Joint Movement Capability after 14 Days cure - plus or minus 50 percent.

2.1.3 Impact Resistant Gypsum Board

48 inch wide, 5/8 inch thick, tapered edges.

Reinforced gypsum panel with imbedded fiber mesh or lexan backing testing in accordance with the following tests. Provide fasteners that meet manufacturer requirements and specifications stated within this section. Impact resistant gypsum board, when tested in accordance with **ASTM E 84**, have a flame spread rating of 25 or less and a smoke developed rating of 50 or .

2.1.3.1 Structural Failure Test

ASTM E 695 or **ASTM D 2394** for structural failure (drop penetration). **ASTM E 695** using a 60 lb sand filled leather bag, resisting no less than 300 ft. lb. cumulative impact energy before failure or **ASTM D 2394** using 5.5 inch hemispherical projectile resisting no less than 264 ft. lb. before failure. Provide test specimen stud spacing a minimum 16 inch on center.

2.1.3.2 Indentation Test

ASTM D 5420 or **ASTM D 1037** for indentation resistance. **ASTM D 5420** using a 32 oz weight with a 5/8 inch hemispherical impacting head dropped once 3 feet creating not more than 0.137 inch indentation or **ASTM D 1037** using no less than 470 lb weight applied to the 0.438 inch diameter ball to create not more than a 0.0197 inch indentation depth.

2.1.4 Cementitious Backer Units

ANSI A108.1.

2.1.5 Joint Treatment Materials

ASTM C 475.

2.1.5.1 Embedding Compound

Specifically formulated and manufactured for use in embedding tape at gypsum board joints and compatible with tape, substrate and fasteners.

2.1.5.2 Finishing or Topping Compound

Specifically formulated and manufactured for use as a finishing compound.

2.1.5.3 All-Purpose Compound

Specifically formulated and manufactured to serve as both a taping and a finishing compound and compatible with tape, substrate and fasteners.

2.1.5.4 Setting or Hardening Type Compound

Specifically formulated and manufactured for use with fiber glass mesh tape.

2.1.5.5 Joint Tape

Use cross-laminated or tapered edge tape recommended by the manufacturer. Paper and fiberglass joint tape are not permitted.

2.1.6 Fasteners

2.1.6.1 Nails

ASTM C 514.

2.1.6.2 Screws

ASTM C 1002, Type "G", Type "S" or Type "W" steel drill screws for fastening gypsum board to gypsum board, wood framing members and steel framing members less than 0.033 inch thick. ASTM C 954 steel drill screws for fastening gypsum board to steel framing members 0.033 to 0.112 inch thick. Provide cementitious backer unit screws with a polymer coating.

2.1.6.3 Staples

No. 16 USS gage flattened galvanized wire staples with 7/16 inch wide crown outside measurement and divergent point for base ply of two-ply gypsum board application. Use as follows:

<u>Length of Legs (inch)</u>	<u>Thickness of Gypsum Board (inch)</u>
1 1/8	1/2
1 1/4	5/8

2.1.7 Adhesives

Do not use adhesive containing benzene, carbon tetrachloride, or trichloroethylene.

2.1.7.1 Adhesive for Fastening Gypsum Board to Metal Framing

Type recommended by gypsum board manufacturer.

2.1.7.2 Adhesive for Fastening Gypsum Board to Wood Framing

ASTM C 557.

2.1.7.3 Adhesive for Laminating

Adhesive attachment is not permitted for multi-layer gypsum boards. For laminating gypsum studs to face panels, provide adhesive recommended by gypsum board manufacturer.

2.1.8 Accessories

ASTM C 1047. Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges shall be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide prefinished or job decorated materials.

2.1.9 Asphalt Impregnated Building Felt

Provide a 15 lb asphalt moisture barrier over gypsum sheathing. Conforming to ASTM D 226 Type 1 (No. 15) for asphalt impregnated building felt.

2.1.10 Water

Provide clean, fresh, and potable water.

PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 Framing and Furring

Verify that framing and furring are securely attached and of sizes and spacing, and within tolerance to provide a suitable substrate to receive gypsum board and cementitious backer units. Verify that all blocking, headers and supports are in place to support plumbing fixtures and to receive soap dishes, grab bars, towel racks, and similar items. Do not proceed with work until framing and furring are within acceptable tolerances for application of gypsum board and cementitious backer units. Installation tolerances shall conform to specification 05 40 00, "Cold-Formed Metal Framing" paragraph 3.2.4 "Erection Tolerances", subparagraph a. Notify the Contracting Officer immediately if framing is out-of-tolerance. Any Gypsum Board rework as a result of out-of-tolerance construction shall be performed by the Contractor at no additional cost to the Government.

3.1.2 Gypsum Board and Framing

Verify that surfaces of gypsum board and framing to be bonded with an adhesive are free of dust, dirt, grease, and any other foreign matter. Do not proceed with work until surfaces are acceptable for application of gypsum board with adhesive.

3.1.3 Masonry and Concrete Walls

Verify that surfaces of masonry and concrete walls to receive gypsum board applied with adhesive are dry, free of dust, oil, form release agents, protrusions and voids, and any other foreign matter. Do not proceed with work until surfaces are acceptable for application of gypsum board with adhesive.

3.2 APPLICATION OF GYPSUM BOARD

Apply gypsum board to framing and furring members in accordance with ASTM C 840 or GA 216 and the requirements specified. Apply gypsum board with separate panels in moderate contact; do not force in place. Stagger end joints of adjoining panels. Neatly fit abutting end and edge joints. Use gypsum board of maximum practical length; select panel sizes to minimize waste. Cut out gypsum board to make neat, close, and tight joints around openings. In vertical application of gypsum board, provide panels in lengths required to reach full height of vertical surfaces in one continuous piece. Lay out panels to minimize waste; reuse cutoffs whenever feasible. Surfaces of gypsum board and substrate members may be bonded together with an adhesive, except where prohibited by fire rating(s). Treat edges of cutouts for plumbing pipes, screwheads, and joints with water-resistant compound as recommended by the gypsum board manufacturer. Provide type of gypsum board for use in each system specified herein as indicated.

3.2.1 Application of Single-Ply Gypsum Board to Wood Framing

Apply in accordance with [ASTM C 840](#), System I or [GA 216](#).

3.2.2 Application of Two-Ply Gypsum Board to Wood Framing

Apply in accordance with [ASTM C 840](#), System II or [GA 216](#).

3.2.3 Adhesive Nail-On Application to Wood Framing

Apply in accordance with [ASTM C 840](#), System III or [GA 216](#). This method may be used in lieu of [ASTM C 840](#), System I at the option of the Contractor.

3.2.4 Adhesive Application to Interior Masonry or Concrete Walls

Apply in accordance with [ASTM C 840](#), System VI or [GA 216](#).

3.2.5 Application of Gypsum Board to Steel Framing and Furring

Apply in accordance with [ASTM C 840](#), System VIII or [GA 216](#).

3.2.6 Arches and Bending Radii

Apply gypsum board in accordance with [ASTM C 840](#), System IX or [GA 216](#).

3.2.7 Exterior Application

Apply exterior gypsum board (such as at soffits) in accordance with [ASTM C 840](#), System XI or [GA 216](#).

3.2.8 Glass Mat Covered or Fiber Reinforced Gypsum Sheathing

Apply gypsum sheathing in accordance to gypsum association publications [GA 253](#). Follow gypsum sheathing manufacturer's requirements of design details for joints and fasteners and be properly installed to protect the substrate from moisture intrusion. Do not leave exposed surfaces of the gypsum sheathing beyond the manufacturer's recommendation without a weather barrier cladding. Provide continuous asphalt impregnated building felt over sheathing surface in single fashion with edges and ends lapped a minimum of 6 inch. Property flash the openings.

3.2.9 Floating Interior Angles

Minimize framing by floating corners with single studs and drywall clips. Locate the attachment fasteners adjacent to ceiling and wall intersections in accordance with [ASTM C 840](#), System XII or [GA 216](#), for single-ply and two-ply applications of gypsum board to wood framing.

3.2.10 Control Joints

Install expansion and contraction joints in ceilings and walls in accordance with [ASTM C 840](#), System XIII or [GA 216](#). Fill control joints between studs in fire-rated construction with firesafing insulation to match the fire-rating of construction.

3.2.11 Application of Impact Resistant Gypsum Board

Apply in accordance with applicable system of [ASTM C 840](#) as specified or [GA 216](#). Follow manufacturers written instructions on how to cut, drill and

attach board.

3.3 APPLICATION OF CEMENTITIOUS BACKER UNITS

3.3.1 Application

In wet areas (tubs, shower enclosures, saunas, steam rooms, gang shower rooms), apply cementitious backer units in accordance with [ANSI A108.11](#). Place a 15 lb asphalt impregnated, continuous felt paper membrane behind cementitious backer units, between backer units and studs or base layer of gypsum board. Place membrane with a minimum 6 inch overlap of sheets laid shingle style.

3.3.2 Joint Treatment

[ANSI A108.11](#).

3.4 FINISHING OF GYPSUM BOARD

Tape and finish gypsum board in accordance with [ASTM C 840](#), [GA 214](#) and [GA 216](#). Finish plenum areas above ceilings to Level 1 in accordance with [GA 214](#). Finish water resistant gypsum backing board, [ASTM C 630/C 630M](#), to receive ceramic tile to Level 2 in accordance with [GA 214](#). Finish walls and ceilings to receive a heavy-grade wall covering or heave textured finish before painting to Level 3 in accordance with [GA 214](#). Finish walls and ceilings without critical lighting to receive flat paints, light textures, or wall coverings to Level 4 in accordance with [GA 214](#). Finish all gypsum board walls, partitions and ceilings to Level 5 in accordance with [GA 214](#). Provide joint, fastener depression, and corner treatment. Tool joints as smoothly as possible to minimize sanding and dust. Do not use fiber glass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer. Protect workers, building occupants, and HVAC systems from gypsum dust.

3.4.1 Uniform Surface

Wherever gypsum board is to receive eggshell, semigloss or gloss paint finish, or where severe, up or down lighting conditions occur, finish gypsum wall surface in accordance to [GA 214](#) Level 5. In accordance with [GA 214](#) Level 5, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry.

3.5 SEALING

Seal openings around pipes, fixtures, and other items projecting through gypsum board and cementitious backer units as specified in Section 07920 JOINT SEALANTS Apply material with exposed surface flush with gypsum board or cementitious backer units.

3.5.1 Sealing for Glass Mat or Reinforced Gypsum Board Sheathing

Apply silicone sealant in a 3/8 inch bead to all joints and trowel flat. Apply enough of the same sealant to all fasteners penetrating through the glass mat gypsum board surface to completely cover the penetration when troweled flat. Do not place construction and materials behind sheathing until a visual inspection of sealed joints during daylight hours has been

completed by Contracting Officer.

3.6 FIRE-RESISTANT ASSEMBLIES

Wherever fire-rated construction is indicated, provide materials and application methods, including types and spacing of fasteners, wall and ceiling framing in accordance with the specifications contained in **UL Fire Resist Dir** for the Design Number(s) indicated, or **GA 600** for the File Number(s) indicated. Joints of fire-rated gypsum board enclosures shall be closed and sealed in accordance with UL test requirements or GA requirements. Seal penetrations through rated partitions and ceilings tight in accordance with tested systems.

3.7 PATCHING

Patch surface defects in gypsum board to a smooth, uniform appearance, ready to receive finishes.

-- End of Section --