

SECTION 09 29 00

GYPSUM BOARD

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.

ASTM INTERNATIONAL (ASTM)

ASTM E84	(2023) Standard Test Method for Surface Burning Characteristics of Building Materials
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GYPSUM BOARD ASSOCIATION OF JAPAN

GRAM	Gypsum Board Application Manual
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JAPAN ADHESIVE INDUSTRY ASSOCIATION (JAIA)

JAIA 4VOC	Voluntary VOC Regulating Rule for Indoor Air Pollution Control
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JAPANESE STANDARDS ASSOCIATION (JSA)

JIS A 1408	(2017) Test Methods of Bending and Impact for Building Boards
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JIS A 1453	(2017) Abrasion Test Method for Building Materials and Building Components (Abrasive Paper Method)
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JIS A 1901	(2015) Determination of the Emission of Volatile Organic Compounds and Aldehydes by Building Products - Small Chamber Test Method
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JIS A 5430	(2018) Fiber Reinforced Cement Boards
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JIS A 5508	(2019) Nails
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JIS A 6005	(2005) Asphalt Roofing Felts
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JIS A 6901	(2019) Gypsum Boards
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JIS A 6914	(2017) Jointing Materials for Gypsum Plasterboards
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JIS B 1125	(2020) Self Drilling Tapping Screws
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JIS Z 2911	(2018) Methods of Test for Fungus Resistance
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UNDERWRITERS LABORATORIES (UL)

UL Fire Resistance

(2014) 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.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-08 Manufacturer's Instructions

Safety Data Sheets

SD-10 Operation and Maintenance Data

Manufacturer Maintenance Instructions

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 gypsum wallboard with materials which have high emissions of volatile organic compounds (VOCs) or other contaminants, including [\_\_\_\_]. Do not store panels near materials that may off gas or emit harmful fumes, such as kerosene heaters, fresh paint, or adhesives. Do not use materials that have visible moisture or biological growth.

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 QUALIFICATIONS

Furnish type of gypsum board work specialized by the installer with a minimum of [3] [\_\_\_\_] years of documented successful experience.

1.5 SCHEDULING

[The gypsum wallboard must be taped, finished and primed before the

installation of the highly emitting materials, including [\_\_\_\_].] [The gypsum wallboard must be installed after the installation and ventilation period of the highly emitting materials, including [\_\_\_\_].]

Commence application only after the area scheduled for gypsum board work is completely weathertight. The heating, ventilating, and air-conditioning systems must be complete and in operation prior to application of the gypsum board. If the mechanical system cannot be activated before gypsum board is begun, the gypsum board work may proceed in accordance with an approved plan to maintain the environmental conditions specified below. Apply gypsum board prior to the installation of finish flooring and acoustic ceiling.

## 1.6 ENVIRONMENTAL REQUIREMENTS

Do not expose the gypsum board to excessive sunlight prior to gypsum board application. Maintain a continuous uniform temperature of not less than 10 degrees C and not more than 27 degrees C for at least one week prior to the application of gypsum board work, while the gypsum board application is being done, and for at least one week after the gypsum board is set. Shield air supply and distribution devices to prevent any uneven flow of air across the plastered surfaces. Provide ventilation to exhaust moist air to the outside during gypsum board application, set, and until gypsum board jointing is dry. In glazed areas, keep windows open top and bottom or side to side 75 to 100 mm. Reduce openings in cold weather to prevent freezing of joint compound when applied. For enclosed areas lacking natural ventilation, provide temporary mechanical means for ventilation. In unglazed areas subjected to hot, dry winds or temperature differentials from day to night of 10 degrees C or more, screen openings with cheesecloth or similar materials. Avoid rapid drying. During periods of low indoor humidity, provide minimum air circulation following gypsum boarding and until gypsum board jointing complete and is dry.

## [1.7 FIRE RESISTIVE CONSTRUCTION

Comply with specified fire-rated assemblies for design numbers indicated.

## ]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 Safety Data Sheets and manufacturer maintenance instructions for gypsum materials including adhesives.

#### 2.1.1 Gypsum Board

JIS A 6901.

##### 2.1.1.1 Regular

900 mm wide, [12.5] [15] mm thick, [tapered][, tapered and featured] edges. [Provide tapered and featured edge gypsum board [in Rooms [\_\_\_\_]] [as indicated].]

2.1.1.2 Foil-Backed

900 mm wide, [12.5] [15] mm thick, square, [tapered] [tapered and featured] edges.

2.1.1.3 Type X or Type Z (Special Fire-Resistant)

900 mm wide, [12.5] [15] mm thick, [tapered] [tapered and featured] edges.

2.1.1.4 Mold Resistant / Anti-Microbial Gypsum

JIS Z 2911. 900 mm wide, [12.5] [15] mm thick, square, tapered or beveled edges.

2.1.2 Gypsum Backing Board

JIS A 6901, gypsum backing board must be used as a base in a multilayer system.

2.1.2.1 Regular

900 mm wide, [12.5] [15] mm thick, square, tapered or beveled edges.

2.1.2.2 Type Z (Special Fire-Resistant)

1200 mm wide, [12.5] [15] mm thick, square or tapered edges.

2.1.3 Regular Water-Resistant Gypsum Backing Board

2.1.3.1 Regular

900 mm wide, [12.5] [15] mm thick, tapered or beveled edges.

2.1.3.2 Type X or Type Z (Special Fire-Resistant)

900 mm wide, [12.5] [15] mm thick, tapered or beveled edges.

2.1.4 Glass Mat Water-Resistant Gypsum Tile Backing Board

Water absorption rate of less than 5 percent.

2.1.4.1 Regular

1200 mm wide, [12.5] [15] mm thick, square, tapered or beveled edges.

2.1.4.2 Type Z (Special Fire-Resistant)

900 mm wide, [12.5] [15] mm thick, square, tapered or beveled edges.

2.1.5 Abuse Resistant Gypsum Board

900 mm wide, [15] mm thick, tapered edges. Reinforced gypsum panel with imbedded fiber mesh or lexan backing tested in accordance with the following tests. Hard body impact test must attain a maximum indentation depth of 2.5 mm in accordance with JIS A 1408. Provide fasteners that meet manufacturer requirements and specifications stated within this section. Abuse resistant gypsum board, when tested in accordance with ASTM E84, have [a flame spread rating of 25 or less and a smoke developed rating of 50 or less for [\_\_\_\_\_]] [and] [a flame spread rating of 75 or

less and a smoke developed rating of 100 or less for [\_\_\_\_]].

#### 2.1.5.1 Hard Body Impact Test

Comply with hard body impact test in accordance with JIS A 1408 with a maximum indentation depth of 2.5 mm.

#### 2.1.5.2 Surface Abrasion Test

Comply with test surface abrasion test in accordance with JIS A 1453.

#### 2.1.5.3 Indentation Test

JIS A 1408 for indentation resistance.

#### 2.1.6 Cementitious Backer Units

In accordance with JIS A 5430.

#### 2.1.7 Joint Treatment Materials

JIS A 6914. Product must be low emitting VOC types with VOC limits not exceeding 50 g/L. Provide data identifying VOC content of joint compound. [Use all-purpose joint and texturing compound containing inert fillers and natural binders, including lime compound. Pre-mixed compounds must be free of antifreeze, vinyl adhesives, preservatives, biocides and other slow releasing compounds.]

##### 2.1.7.1 Embedding Compound

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

##### 2.1.7.2 Finishing or Topping Compound

Specifically formulated and manufactured for use as a finishing compound.

##### 2.1.7.3 All-Purpose Compound

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

##### 2.1.7.4 Setting or Hardening Type Compound

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

##### 2.1.7.5 Joint Tape

Use cross-laminated, tapered edge, reinforced paper, or fiber glass mesh tape recommended by the manufacturer.

#### 2.1.8 Fasteners

##### 2.1.8.1 Nails

JIS A 5508.

#### 2.1.8.2 Screws

JIS B 1125 steel drill screws for fastening gypsum board to gypsum board, wood framing members and steel framing members less than 0.84 mm thick. JIS B 1125 steel drill screws for fastening gypsum board to steel framing members 0.84 to 2.84 mm thick. Provide cementitious backer unit screws with a polymer coating.

#### 2.1.8.3 Staples

1.5 mm thick flattened galvanized wire staples with 11.1 mm wide crown outside measurement and divergent point for base ply of two-ply gypsum board application. Use as follows:

<u>Length of Legs</u>	<u>Thickness of Gypsum Board</u>
28.6 mm	12.5 mm
31.8 mm	15 mm

#### 2.1.9 Adhesives

Provide non-aerosol adhesive products used on the interior of the building (defined as inside of the weatherproofing system) meeting either emissions requirements of UL 2818(Greenguard) Gold, SCS Global Services Indoor ADvantage Gold, or F 4-Star and JAIA 4VOC . Provide aerosol adhesive products used on the interior of the building (defined as inside of the weatherproofing system) meeting either emissions requirements of JIS A 1901 (limit requirements for either office or classroom spaces regardless of space type. Provide certification or validation of indoor air quality for non-aerosol adhesives applied on the interior of the building (inside of the weatherproofing system). Provide certification or validation of indoor air quality for aerosol adhesives used on the interior of the building (inside of the weatherproofing system).

##### 2.1.9.1 Adhesive for Laminating

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

#### 2.1.10 Gypsum Studs

Provide 25 mm minimum thickness and 150 mm minimum width. Studs may be of 25 mm thick gypsum board or multilayers fastened to required thickness. Conform to JIS A 6901 for material and Gypsum Board Application Manual (GRAM) for installation.

#### 2.1.11 Shaftwall Liner Panel

Conform to the UL Fire Resistance or MLIT for the Design Numbers(s) indicated for shaftwall liner panels. Manufacture liner panel for cavity shaftwall system, with water-resistant paper faces, bevel edges, single lengths to fit required conditions, as indicated.

#### 2.1.12 Accessories

Fabricate from [corrosion protected steel][ or ][plastic] designed for

intended use. Accessories manufactured with paper flanges are not acceptable. Flanges must be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide prefinished or job decorated materials.

#### 2.1.13 Asphalt Impregnated Building Felt

Provide a 6.7 kg asphalt moisture barrier over glass mat covered or reinforced gypsum sheathing. Conforming to JIS A 6005 for asphalt impregnated building felt.

#### 2.1.14 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 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 acceptable for application of gypsum board and cementitious backer units.

##### 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.

##### 3.1.4 Building Construction Materials

Do not install building construction materials that show visual evidence of biological growth.

#### 3.2 APPLICATION OF GYPSUM BOARD

Apply gypsum board to framing and furring members in accordance with Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturers instructions 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 [not ]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. Minimize framing by floating corners with single studs and drywall clips. [Install [16 mm][\_\_\_\_\_] gypsum or [13 mm][\_\_\_\_\_] ceiling board over framing at [610 mm][\_\_\_\_\_] on center.] 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 Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions.

#### 3.2.2 Application of Two-Ply Gypsum Board to Wood Framing

Apply in accordance with Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions.

#### 3.2.3 Adhesive Application to Interior Masonry or Concrete Walls

Apply in accordance with Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions.

#### 3.2.4 Application of Gypsum Board to Steel Framing and Furring

Apply in accordance with Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions.

#### 3.2.5 Arches and Bending Radii

Apply in accordance with Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions.

#### 3.2.6 Gypsum Board for Wall Tile or Tile Base Applied with Adhesive

In dry areas (areas other than tubs, shower enclosures, saunas, steam rooms, gang shower rooms), apply glass mat water-resistant gypsum tile backing board [or water-resistant gypsum backing board] in accordance with Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions.

#### 3.2.7 Exterior Application

Apply exterior gypsum board (such as at soffits) in accordance with Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions.

#### 3.2.8 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 Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions, for [single-ply] [and] [two-ply] applications of gypsum board to wood framing.



### 3.2.9 Control Joints

Install expansion and contraction joints in ceilings and walls in accordance with Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions. Fill control joints between studs in fire-rated construction with firesafing insulation to match the fire-rating of construction.

### 3.2.10 Application of Abuse Resistant Gypsum Board

Apply in accordance with applicable system of Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions. 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. Place a 7.6 kg 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 150 mm overlap of sheets laid shingle style.

### 3.3.2 Joint Treatment

Gypsum Board Application Manual (GRAM), Gypsum Board Association of Japan or Manufacturer's Instructions.

## 3.4 FINISHING OF GYPSUM BOARD

Finish plenum areas above ceilings to Level 1. Finish water resistant gypsum backing board to receive ceramic tile to Level 2. Finish walls and ceilings to receive a heavy-grade wall covering or heave textured finish before painting to Level 3. Finish walls and ceilings without critical lighting to receive flat paints, light textures, or wall coverings to Level 4. Unless otherwise specified, finish all gypsum board walls, partitions and ceilings to Level 5. Provide joint, fastener depression, and corner treatment. Tool joints as smoothly as possible to minimize sanding and dust. Do not use self-adhering 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 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.

### 3.4.2 Gypsum Board Finish Levels

#### 3.4.2.1 Level 1

All joints and interior angles shall have tape set in joint compound.

Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.

#### 3.4.2.2 Level 2

All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.

#### 3.4.2.3 Level 3

All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. One additional coat of joint compound shall be applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a drywall primer prior to the application of final finishes.

#### 3.4.2.4 Level 4

All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied overall flat joints and one separate coat of joint compound shall be applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a drywall primer prior to the application of final finishes.

#### 3.4.2.5 Level 5

All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied over all flat joints and one separate coat of joint compound shall be applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. A thin skim coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied in accordance with manufacturer's recommendations, applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.

Note: It is recommended that the prepared surface be coated with a drywall primer prior to the application of finish paint.

### 3.5 SEALING

Seal openings around pipes, fixtures, and other items projecting through gypsum board and cementitious backer units as specified in Section 07 92 00 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 9.5 mm 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 Resistance for the Design Number(s) indicated] or [GA 600 for the File Number(s) indicated]. 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.

#### 3.8 SHAFTWALL FRAMING

Install the shaftwall system in accordance with the system manufacturer's published instructions. Coordinate bucks, anchors, blocking and other items placed in or behind shaftwall framing with electrical and mechanical work. Patch or replace fireproofing materials which are damaged or removed during shaftwall construction.

-- End of Section --