SECTION 09 29 00

GYPSUM BOARD

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing the following:

1. Gypsum board and associated accessories.

B. Related Sections:

1. Gypsum sheathing is specified in Section 06 16 43.

2. Firestopping is specified in Section 07 84 00.

3. Acoustical joint sealants are specified in Section 07 92 19.

4. Non-structural metal framing is specified in Section 09 22 16.

5. Metal suspension systems are specified in Section 09 22 26.23.

6. Gypsum board shaft wall assemblies are specified in Section 09 21 16.23.

7. Cementitious backing boards are specified in Section 09 28 13.

8. Acoustic insulation is specified in Section 09 81 00.

9. Painting is specified in Section 09 91 00.

1.02 SUBMITTALS

A. Product Data: Manufacturer's specifications and installation instructions for each type of gypsum board and accessory required.

B. Shop Drawings: Furnish layout drawing showing proposed location of control joints.

C. LEED Submittals:

1. Credit MR 4: Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.

a. Furnish the LEED Online Credit Template declaring that the credit requirements have been met and list the recycled content products used.

b. List total cost of all materials for the Project.

c. Required Audit Documentation:

1) Manufacturer product data sheets, literature or letters highlighting the overall post-consumer and/or post-industrial recycled content percentages (by weight) of each product listed on the template.

2) Materials invoices showing costs for each product listed on the template.

2. Credit IEQ 4.1: Product data for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subpart D.

a. Furnish LEED Online Credit Template listing the adhesives and sealants used in the building and declaring that they meet the specified LEED requirements.

b. Required Audit Documentation:

1) Product data sheets and MSDS for each adhesive/sealant used on the interior, with the VOC content in g/L circled and indicating VOC content of each product used.

2) Summary table comparing credit VOC requirements and actual VOC levels for each product.

1.03 QUALITY ASSURANCE

A. Manufacturer: Gypsum board, including accessories and fasteners, shall be the products of the same manufacturer.

B. Gypsum board work shall comply with ASTM C840 and California Building Code (CBC) Section 2508.

C. Installation and finishing of gypsum board shall comply with GA-216. Installation of fire-rated gypsum board shall comply with their listing descriptions.

D. Fire-Resistance Ratings: Where gypsum board systems with fire-resistance ratings are required, provide materials and installations identical with those of applicable assemblies tested in accordance with ASTM E119 by fire testing laboratories acceptable to authorities having jurisdiction.

E. Allowable Tolerances:

0. Gypsum board surfaces shall have no measurable variation in any 2-foot direction and a maximum variation of 1/8-inch in 10-feet when a straightedge is laid on the surface in any direction. Specified tolerances apply to both plumbness of walls and levelness of ceilings.

1. Shim work as required to comply with specified tolerances.

2. Do not exceed 1/16-inch offset between planes of abutting sheets at edges or ends.

1.04 ENVIRONMENTAL QUALITY ASSURANCE

A. Credit MR 4: Provide building materials with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of 10-percent of cost of materials used for the Project.

1. The cost of post-consumer content of an item shall be determined by dividing the weight of post-consumer recycled content in the item by the total weight of the item and multiplying by the cost of the item.

2. The cost of post consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing the weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by the total weight of the item and multiplying by the cost of the item.

3. Mechanical, electrical and plumbing components and specialty items such as elevators shall not be included in this calculation. Only include materials permanently installed in the Project.

B. Credit IEQ 4.1: Adhesives and sealants used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the requirements of the following reference standards:

1. Adhesives, Sealants and Sealant Primers: Comply with South Coast Air Quality Management District (SCAQMD) Rule #1168. VOC limits as follows:

Architectural Applications	VOC Limit g/L less water	Specialty Applications	VOC Limit g/L less water
Indoor Carpet Adhesives	50	PVC welding	510
Carpet pad adhesives	50	CPVC welding	490
Wood flooring adhesives	100	ABS welding	325
Rubber floor adhesives	60	Plastic cement welding	250
Subfloor adhesives	50	Adhesive primer for plastic	550
Ceramic tile adhesives	65	Contact adhesive	80
VCT and asphalt adhesives	50	Special purpose contact adhesive	250
Drywall and panel adhesives	50	Structural wood member adhesive	140
Cove base adhesives	50	Sheet applied rubber lining operations	850
Multipurpose construction adhesives	70	Top and trim adhesive	250
Structural glazing adhesives	100		
Substrate Specific Applications	VOC Limit g/L less water	Sealants	VOC Limit g/L less water
Metal to Metal	30	Architectural	250
Plastic foams	50	Nonmembrane roof	300
Porous material (except wood)	50	Roadway	250
Wood	30	Single-ply roof membrane	450
Fiberglass	80	Other	420
Sealant Primers	VOC Limit (g/L less water)		
Architectural, nonporous	250		
Architectural, porous	775		
Other	750		

2. Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36 requirements in effect on October 19, 2000.

Aerosol Adhesives	VOC Limit
General purpose mist spray	65% VOCs by weight
General purpose web spray	55% VOCs by weight
Special purpose aerosol adhesives (all types)	70% VOCs by weight

C. Applicable LEED Credits:

1. Credit MR 4 – Recycled Content.

2. Credit IEQ 4.1 – Low-Emitting Materials - Adhesives and Sealants.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Deliver materials to the Project site in original package containers or bundles with manufacturer's labels intact and legible.

2. Deliver fire-rated materials bearing the testing agency's label and classification identification.

B. Storage:

1. Store materials indoors in a dry area, under cover, and stacked flat off the floor.

2. Stack gypsum boards so that long lengths are not over short lengths.

C. Handle gypsum board to avoid damaging face and edges of sheets.

D. Protect metal corner beads and trim from being bent or damaged.

1.06 PROJECT CONDITIONS

A. Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C840 and with gypsum board manufacturer's recommendations.

B. Minimum Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40-deg. F. For adhesive attachment and finishing of gypsum board, maintain not less than 50-deg. F. for 48-hours prior to application and continuously thereafter until drying is complete.

C. Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

D. Provide for continuous ventilation during installation, using as close to 100-percent outside air as possible.

E. Protect workers and HVAC system from gypsum dust.

F. Remove and replace all gypsum board products that are exposed to water and display mold and mildew. Removal shall occur as soon as possible after exposure to water.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

A. United States Gypsum, Domtar, Inc., Georgia Pacific, National Gypsum Company or approved equal.

2.02 GYPSUM BOARD

A. Gypsum Board: United States Gypsum " SHEETROCK SW" or approved equal with tapered rounded edge to minimize ridging or beading and other joint imperfections.

1. ASTM C1396, regular type except where Type X fire-resistant type is required to meet UL assembly types.

2. Thickness: 5/8-inch.

3. Provide Firecode C core panels where required for fire-rated assemblies in Gypsum Association Fire Resistance Design Manual.

B. Mold- and Moisture-Resistant Gypsum Board: United States Gypsum " SHEETROCK Mold Tough" or approved equal noncombustible, moisture- and mold-resistant gypsum core encased in moisture- and mold-resistant, 100-percent recycled face and back papers. Panels shall have a tapered long edge.

1. ASTM C1396, regular type except where Type X fire-resistant type is required to meet UL assembly types.

2. Thickness: 5/8-inch.

3. Provide Firecode C core panels where required for fire-rated assemblies in Gypsum Association Fire Resistance Design Manual.

2.03 GYPSUM BOARD ACCESSORIES

A. Screws: ASTM C954 or ASTM C1002.

1. Use Type S screws for gypsum board attachment to light steel framing.

2. Use Type S-12 screws for gypsum board attachment to 20-gauge and heavier steel framing.

3. Use Type G screws for gypsum board attachment to gypsum board.

4. Use Type W screws for gypsum board attachment to wood framing.

B. Metal Trim: Galvanized steel, 26-gauge minimum.

1. Corner Beads: United States Gypsum " Dur-A-Bead" or approved equal.

2. Casing Beads: United States Gypsum or approved equal.

3. Control Joints: Roll-formed zinc with perforated flanges, 1-3/4-inch wide with 1/4-inch wide center channel with removable tape strip over channel.

C. Reveals: Extruded aluminum alloy 6063-T5, finish as selected by the County' s Representative.

D. Joint-Treatment Materials: ASTM C475.

1. Drying-type (ready mixed): United States Gypsum " SHEETROCK" all-purpose joint compound or approved equal.

2. Setting-type (chemically hardening): United States Gypsum " SHEETROCK" setting-type joint compound or approved equal.

3. Low-Dust Emission Type: United States Gypsum " SHEETROCK" Plus 3 ready-mixed lightweight all purpose joint compound with dust control or approved equal.

E. Reinforcing Joint Tape: ASTM C475, 2-inch nominal width.

F. Acoustical Sheet Sealant Pad: Harry A. Lowry & Associates, 3M or approved equal.

G. Resilient Channels: Unimast " RC Deluxe" , Cemco " RC-1" , Dale/Incor RFC-1" , Dietrich " RCSN" or approved equal.

H. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that conditions are satisfactory for the installation of gypsum board and accessories.

1. Check framing for accurate spacing, alignment, plumbness, and levelness. Verify that both new and existing framing members will result in gypsum board surfaces complying with specified tolerances.

2. Verify spacing of installed framing does not exceed maximum allowable for thickness of board to be used.

3. Verify door frames are set for thickness of board to be used.

4. Repair protrusions of framing, twisted framing members, or unaligned members before installation of gypsum board commences.

B. Do not commence the installation until unsatisfactory conditions have been corrected.

3.02 APPLICATION OF GYPSUM BOARD

A. Apply materials in conformance with ASTM C840 and the manufacturer's instructions.

B. When gypsum board is to be applied to both walls and ceilings, apply to ceilings first.

C. Resilient Framing:

1. Partitions: Apply resilient channels at right angles to framing. Position bottom channel with resilient channel attachment flange either up or down; position other channels with resilient channel attachment flanges down. Attach with 1-1/4-inch screws. Locate resilient channels 2-inches from floor, within 6-inches of ceiling, and not more than 24-inches on center.

2. Ceilings: Apply resilient channels at right angles to framing. Attach with 1-1/4-inch screws driven through channel attachment flange. For fire-rated, double-layer assembly, apply channels over base layer and attach with 1-7/8-inch screws driven through channel flange and base layer into joist. Fasten channels to joists at each intersection.

D. For partitions, apply full height sheets with long dimension parallel to framing members with abutting edges over supports. Where ceiling heights exceed 10'-0" and where required by fire resistive ratings, apply sheets with long dimension perpendicular to framing members. For ceilings, apply sheets with long dimension either perpendicular or parallel to framing members to result in fewest joints. For fire-rated assemblies, apply gypsum board in accordance with CBC Tables 720.1(2) and 720.1(3) as applicable.

E. Use sheets of maximum lengths to minimize end joints.

F. Neatly fit and stagger end joints.

G. Locate joints on different studs at opposite sides of partition.

H. Cut and fit neatly around outlets and switches. Back-to-back wall penetrations shall be at least two stud spaces apart for acoustic isolation.

I. Double-Layer Application:

1. Apply base layer with long dimension perpendicular to and centered on framing; apply face layer parallel to framing. Apply base layer parallel to framing where required by fire-resistive ratings.

2. Stagger sheets of each layer so that joints of each layer are 16-inches apart.

J. Isolation of Gypsum Board from Other Construction:

1. Provide perimeter relief where gypsum board abuts structural decks, ceilings, vertical structural elements, or window sections.

2. Finish gypsum board edge with corner bead.

3. Seal space between casing bead and structure with continuous sealant bead.

4. Seal around electrical boxes and conduit and pipe penetrations.

5. Seal at base of gypsum board sheets.

K. Acoustic Control Requirements for Sound Walls:

1. Leave a 1/8- to 1/4-inch space between gypsum board and adjacent construction to provide a space for acoustical sealant.

2. Seal airtight with acoustical sealant material specified in Section 07 92 19.

3. Seal penetrations through walls, or cuts in one face of walls, with a full bead of sealant at perimeter; this includes provisions for electrical outlet and switch boxes, pipes, ducts, and similar items.

4. Seal electrical boxes at the back with specified sheet sealant pad. Where wires enter the boxes, seal the openings airtight around the wires and knockout openings.

5. Install mild steel sleeves where required, fiberglass packing between sleeve or framing, service and cover plates. Seal on both sides to render airtight.

6. Tolerance: 1/8-inch between wall boarding and sleeve, 3/8- to 5/8-inch between sleeve and service.

L. Installation of Fasteners:

1. Do not locate fasteners less than 3/8-inch from edges or ends of sheets. Do not locate fasteners less than one-inch from edges or ends in horizontal applications.

2. Fire-Rated Partitions: Install fasteners in accordance with the more restrictive of either CBC Table 720.1(2) or the Underwriters' Laboratories assemblies as denoted on partition schedule.

3. Non-Fire-Rated Partitions: Install fasteners in accordance with GA-216 and ASTM C840.

4. Fire-Rated Ceilings: Install fasteners in accordance with CBC Table 720.1(3).

5. Non-Fire-Rated Ceilings: Install fasteners spaced not more than 12-inches on center.

6. Install screws using powered screw guns with adjustable screw-depth control head. Drive shank perpendicular to gypsum board surface. Do not hammer screws.

7. Set fastener heads slightly below surface of gypsum board, but do not break or strip paper face around fastener.

8. Stagger fasteners opposite each other on adjacent ends and edges.

9. Omit fasteners at edges where metal edge trim will be installed.

M. Installation of Accessories:

1. Install corner trim at vertical and horizontal external corners and angles, and edge trim at junctions of gypsum board and other materials and at exposed edges.

2. Control Joints:

a. Ceilings: Maximum area for ceilings with perimeter relief shall be 2,500-sq. ft.; maximum area for ceilings without perimeter relief shall be 900-sq. ft. Do not exceed 50-feet between control joints in ceilings with perimeter relief; 30-feet between control joints in ceilings without perimeter relief.

b. Walls and Partitions: Maximum spacing between control joints shall not exceed 30-feet.

3.03 TAPING AND FINISHING

A. Finish Levels: Provide levels of gypsum board finish for locations as follows, in accordance with Gypsum Association GA 214 " Recommended Specification: Levels of Gypsum Board Finish" .

1. Level 0: In areas of temporary construction, no taping or accessories are required.

2. Level 1: Ceiling plenum areas and concealed areas. Provide higher level of finish as required to comply with fire-resistance ratings and acoustical ratings.

3. Level 2: Gypsum board substrate at tile, except remove tool marks and ridges.

4. Level 3: Gypsum board surfaces, where textured finishes or heavy wall coverings will be used.

5. Level 4: Gypsum board surfaces, except where another finish level is specified.

6. Level 5: Gypsum board surfaces to receive eggshell, semigloss, or gloss paints, and surfaces subject to severe or critical natural or artificial side lighting.

B. Interior Gypsum Board Finishing:

1. Taping (Level 1):

a. Use taping or all purpose compound.

b. Butter taping compound into inside corners and joints.

c. Center tape over joints and press down into fresh compound.

d. Remove excess compound. Tape joints of gypsum board above suspended ceilings.

2. First Coat (Level 2):

a. Use taping or all-purpose drying-type compound or setting-type joint compound.

b. Immediately after bedding tape, apply skim coat of compound over body of tape and allow to dry completely in accordance with manufacturer' s instructions.

c. Apply first coat of compound over flanges of trim and accessories, and over exposed fastener heads and finish level with board surface.

3. Second Coat (Level 3):

a. Use all purpose or topping drying type joint compound.

b. After first coat treatments is dried, apply second coat of compound over tape and trim, feathering compound 2-inches beyond edge of first coat.

4. Third Coat (Level 4):

a. Use all purpose or topping drying type joint compound.

b. After second coat has dried, sand surface lightly and apply thin finish coat to joints, fasteners and trim, feathering compound 2-inches beyond edge of second coat.

c. Allow third coat to dry. Apply additional compound, and touch-up and sand, to provide surface free of visual defects, tool marks, and ridges, ready for application of finish.

5. Skim Coat (Level 5):

a. Apply skim coat of all-purpose drying-type compound over exposed surfaces of gypsum board.

b. After skim coat has dried, touch-up and sand to provide surface free of visual defects, tool marks, and ridges, and ready for application of finish.

C. Cut edges and openings around pipes and fixtures shall be caulked flush with sanitary sealant as specified in Section 07 92 00.

D. In the completed installation, gypsum board shall have plumb and straight surfaces with no waves or buckles. Joints, fastener heads, and trim flanges shall be invisible after finishing. Surfaces shall be uniformly smooth and ready for painting or other decoration.

3.04 PROTECTION OF FINISHED WORK

A. Maintain temperature and humidity conditions as required to protect the installation.

B. Protect completed gypsum board from damage or deterioration until final acceptance of the work.

3.05 WASTE MANAGEMENT

A. General: Comply with Section 01 74 19.

B. Separate clean waste gypsum products from contaminants for recycling. Do not include wood, plastic, metal, asphalt impregnated gypsum board or any gypsum board coated with glass fiber vinyl, decorative paper, paint or other finish. Place in designated area and protect from moisture and contamination. Protect scraps and pulverized material from moisture and contamination.

C. Clean, unpainted waste gypsum products may be recycled by:

1. Returning to gypsum board manufacturer in lieu of landfill.

2. Hauling to alternative use manufacturer in lieu of landfill.

D. Separate metal waste and place in designated areas for recycling or reuse.

END OF SECTION