

## SECTION 092950 - GYPSUM BOARD ASSEMBLIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Interior gypsum wallboard.
  - 2. Non-load-bearing steel framing.
  - 3. Interior suspension systems.
  - 4. Gypsum board shaft wall assemblies.
  - 5. Acoustical insulation in metal-framed assemblies.
  - 6. Acoustical sealants.
  - 7. Firestopping at wall and partition perimeters of fire-rated construction.
  - 8. Sealing at wall and partition perimeters of smoke wall construction.
  - 9. Coordination with radiant heat installation to insure framing fasteners do not penetrate tubing.
  - 10. Coordination with vapor retarder installation for continuous barrier where interior partitions meet exterior walls.
- B. Related Sections include the following:
  - 1. Division 05 Section "Cold-Formed Metal Framing" for non-load-bearing steel framing and glass-mat gypsum sheathing.
  - 2. Division 06 Section "Rough Carpentry" for concealed wood blocking in gypsum board assembly walls.
  - 3. Division 07 Section "Building Insulation" for thermal insulation and vapor retarders installed in gypsum board assemblies and for metal Z- and J-furring supporting rigid thermal insulation.
  - 4. Division 07 Section "Spray-In-Place Rigid Urethane Foam Insulation" for spray foam installed at exterior walls and in voids of cold-formed metal framing.
  - 5. Division 07 Section "Penetration Firestopping" for systems installed in openings in walls and floors with and without penetrating items.
  - 6. Division 07 Section "Fire-Resistive Joint Systems" for fire-resistive joints not covered by work of this Section.
  - 7. Division 07 Section "Joint Sealants" for sealants not covered by work of this Section.
  - 8. Division 09 Section "Painting" for coordination/inspection requirements with painting contractor and primers applied to gypsum board surfaces.

#### 1.3 DEFINITIONS

- A. Gypsum Board Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

#### 1.4 SUBMITTALS

- A. General: Submit in accordance with Division 01 Section "Submittal Procedures."

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- B. Product Data: For each type of product indicated. Include documentation for the following:
  - 1. VOC Content of Sealants: For sealants used inside the weatherproofing system, include a printed statement of the VOC content.
- C. Shop Drawings: Show locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other units of Work.
  - 1. Submit marked up floor plans with location of all control joints in gypsum board walls and ceilings.
  - 2. Firestopping: For each joint condition where fire-rated walls and partitions interface other walls, floors, structural members or other building structure, provide UL firestop system description and drawing. Show each kind of construction condition and relationships to adjoining construction. Indicate which firestop materials will be used where and thickness for different hourly ratings. Include UL firestop design designation that evidences compliance with requirements for each condition.

1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Fire-Resistance-Rated Assemblies: Indicated by design designations from UL's "Fire Resistance Directory," GA-600, "Fire Resistance Design Manual," or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.
  - 2. Deflection Firestop Track: Top runner indicated in fire-resistance-rated assemblies shall be labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Source Limitations for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single source from a single manufacturer.
- C. Source Limitations for Panel Products: Obtain each type of gypsum board and other panel products from a single source from a single manufacturer.
- D. Source Limitations for Finishing Materials: Obtain finishing materials from either manufacturer supplying gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.
- E. Gypsum Board Finish Mockups: Before finishing gypsum board assemblies, install mockups using room designated by Architect to demonstrate aesthetic effects and qualities of materials and execution.
  - 1. Install mockups for surfaces indicated to receive nontextured paint finishes.
  - 2. Simulate finished lighting conditions for review of mockups.
  - 3. Mockup will be painted under Division 09 Section "Painting" to provide finished condition for viewing.
  - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

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1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- C. Stack gypsum panels flat on leveled supports off floor or slab to prevent sagging.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
- D. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F. Do not exceed 95 deg F when using temporary heat sources.
- E. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

1.8 COORDINATION

- A. Coordinate installation of framing tracks needing to be attached to structural components prior to application of spray-applied fire-resistive materials.
- B. Coordinate the requirements and installation of smoke seals, sound seals and fire resistive joint systems with the application of spray-applied fire-resistive materials.
- C. Coordinate installation of fasteners into overhead floor deck to insure radiant heat tubing is not damaged.
- D. Coordinate installation of interior partitions with vapor retarder installation for continuous barrier where interior partitions meet exterior walls.
- E. Coordinate attachment of runner tracks with radiant heat installation to insure framing fasteners do not penetrate tubing.

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PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.
  2. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
  2. Protective Coating: ASTM A 653, G40, hot-dip galvanized, unless otherwise indicated.

2.3 STEEL SUSPENDED CEILING AND SOFFIT FRAMING

- A. Manufacturers:
1. Clark Dietrich Building Systems.
  2. Super Stud Building Products, Inc.
- B. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0625-inch-diameter (8-gage) wire, or double strand of not less than 0.099-inch-diameter (12-gage) wire.
- C. Hanger Attachments to Concrete: As follows:
1. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by a qualified independent testing agency.
- D. Hangers: As follows:
1. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch diameter (8-gage).
- E. Carrying Channels: Cold-rolled, commercial-steel sheet with a base metal thickness of 0.0538 inch, a minimum 1/2-inch-wide flange, with ASTM A 653/A 653M, G40, hot-dip galvanized zinc coating.
1. Depth: 2 inches, unless indicated otherwise.
- F. Furring Channels (Furring Members): Commercial-steel sheet with ASTM A 653/A 653M, G40, hot-dip galvanized zinc coating.
1. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep; where indicated.
    - a. Minimum Base Metal Thickness: 0.0312 inch (22 gage).
- G. Hand-Formable Radius Tracks: Factory fabricated runner track, providing smooth, non-segmented continuous one-piece shape; 0.0329 inch thick, 20 gage; size as indicated.
1. Products: Provide the following products by Radius Track Corporation, (888) 872-3487:
    - a. Hand-Formable Ready-Track.

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- H. Grid Suspension System for Interior Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock, heavy-duty.
  - 1. Products:
    - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
    - b. Chicago Metallic Corporation; 640-C Drywall Furring System.
    - c. USG Interiors, Inc.; Drywall Suspension System.
    - d. Provide comparable system where fire-rated ceilings are indicated.

#### 2.4 STEEL PARTITION AND SOFFIT FRAMING

- A. Manufacturers:
  - 1. Clark Dietrich Building Systems.
  - 2. Super Stud Building Products, Inc.
- B. Steel Studs and Runners: ASTM C 645.
  - 1. Minimum Base Metal Thickness, Standard Framing: 0.027 inch (22gage) minimum, unless otherwise indicated.
    - a. Provide studs with 0.0329 inch (20 gage) minimum thickness at the following locations:
      - 1) For 6 inch and greater framing.
      - 2) For framing over 12 feet high.
      - 3) For door jamb framing.
      - 4) Where indicated.
  - 2. Gauge Equivalent Drywall Framing: For all studs locations, Minimum Design Thickness 0,023inches.
    - a. Clark Dietrich ProSTUD 20.
    - b. Super Stud The Edge Super 20.
  - 3. Depth: As indicated.
  - 4. Maximum Allowable Deflection: Increase metal thickness where required to meet the following:
    - a. Maximum Allowable Deflection for Drywall Assemblies:  $L/240$  calculated using a 5 pound per square uniform load perpendicular to studs and based on stud properties alone.
- C. Deep-Leg Deflection Track: ASTM C 645 top runner with flanges to allow for 3/4-inch deflection at floors and 1-1/2 inch at roofs.
- D. Firestop Deflection Track: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs. Provide deflection track with flanges to allow for 3/4-inch deflection at floors and 1-1/2 inch at roofs.
  - 1. Product: Fire Trak Corp.; Fire Trak attached to studs with Fire Trak Slip Clip.
- E. Radius Track: Factory fabricated runner track, providing smooth, non-segmented continuous one-piece shape.
  - 1. Product: Radius Track Corporation, (888) 872-3487.
- F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
  - 1. Minimum Base Metal Thickness: 0.0598 inch (16 gage), unless indicated otherwise.

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- G. Cold-Rolled Channel Bridging: 0.0538-inch (16 gage) minimum bare steel thickness, with minimum 1/2-inch- wide flange.
  - 1. Depth: 1-1/2 inches.
  - 2. Clip Angle: 1-1/2 by 1-1/2 inch, 0.068-inch- thick, galvanized steel.
- H. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
  - 1. Minimum Base Metal Thickness: 0.0312 inch (20 gage).
  - 2. Depth: 7/8 inch, unless otherwise indicated.
- I. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.
  - 1. Configuration: Asymmetrical.
- J. Furring Brackets: Serrated-arm type, adjustable, fabricated from corrosion-resistant steel sheet complying with ASTM C 645, 20 gauge, .0329 inch, designed for screw attachment to steel studs and steel rigid furring channels used for furring.
- K. Deflection Brackets:
  - 1. Construction: Slotted galvanized steel angle with step bushing to prevent over tightening of fasteners.
  - 2. Vertical Deflection: 1-1/2 inch total travel.
  - 3. Product: VertiClip; Signature Industries, (919) 844-0789.
    - a. Series: SL, SDL, SLB, and SLS as required by attachment condition.
- L. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

## 2.5 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
- B. Manufacturers:
  - 1. G-P Gypsum Corporation.
  - 2. National Gypsum Company.
  - 3. United States Gypsum Company.

## 2.6 INTERIOR GYPSUM WALLBOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
- B. Type X, GWB:
  - 1. Thickness: 5/8 inch.
  - 2. Long Edges: Tapered.
  - 3. Face Sheets: 100 percent post-consumer recycled content.
  - 4. Location: All locations, except as indicated otherwise.
- C. Moisture- and Mold-Resistant Type, GWB-MR: ASTM C 1396/C 1396M with moisture- and mold-resistant core and surfaces.
  - 1. Core: 5/8 inch, Type X.

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2. Long Edges: Tapered.
3. Mold-Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
4. Face Sheets: 100 percent post-consumer recycled content.
5. Location: Interior face of all exterior walls; walls and ceilings of bathrooms, spa, soiled linens, and janitor closets; and where indicated.
6. Products:
  - a. G-P Gypsum Corp.; Toughrock Mold-Guard Gypsum Board.
  - b. National Gypsum Co.; Gold Bond Brand XP Gypsum Board.
  - c. United States Gypsum Co.; Mold Tough Panels.

## 2.7 GYPSUM BOARD SHAFT-WALL ASSEMBLIES

- A. General: Provide assemblies constructed of proprietary gypsum liner panels inserted between steel tracks at each end of studs; with specially shaped steel studs engaged in tracks and fitted between gypsum liner panels; and with gypsum board on finished side or sides applied to studs in the number of layers, thicknesses and arrangement indicated.
- B. Manufacturers:
  1. G-P Gypsum Corporation.
  2. National Gypsum Company.
  3. United States Gypsum Company.
- C. Fire-Resistance Rating: As indicated.
- D. Framing Members: Comply with ASTM C 754 for conditions indicated; steel sheet components complying with ASTM C 645; manufacturer's standard stud profile for repetitive members, corner and end members, and for fire-resistance-rated assembly indicated.
  1. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized, unless otherwise indicated.
  2. Depth: As indicated.
  3. Minimum Base Metal Thickness: Manufacturer's standard thicknesses that comply with structural performance requirements for stud depth indicated, but not less than 0.0359 inch (20 gage).
  4. Runner Track: Manufacturer's standard J-profile track with long-leg length as standard with manufacturer, but at least 2 inches, in depth and gage matching studs.
  5. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft-wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
    - a. Powder-Actuated Fasteners: Provide powder-actuated fasteners with capability to sustain, without failure, a load equal to 10 times that imposed by shaft-wall assemblies, as determined by testing conducted by a qualified independent testing agency according to ASTM E 1190.
- E. Gypsum Liner Panels: Comply with ASTM C 442/C 442M.
  1. Type X: Manufacturer's proprietary liner panels with moisture-resistant paper faces.
    - a. Core: 1 inch thick.
    - b. Long Edges: Double bevel.
- F. Room-Side, Gypsum Panels for Shaft Wall Partitions: As indicated; see panel products in Interior Gypsum Wallboard Article above.
- G. Finishes:
  1. Room-Side: As indicated.

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2. Shaft Side: Provide only where finish is indicated on shaft side as well as room side, otherwise leave liner panel exposed.

## 2.8 TRIM ACCESSORIES

- A. Interior Metal Trim: ASTM C 1047, galvanized steel.
  1. Shapes:
    - a. Cornerbead: 1-1/4 inch x 1-1/4 inch external corner with 1/8-inch nose bead. Use at outside corners, unless otherwise indicated.
    - b. LC-Bead (Casing): J-shaped casing with 1/16-inch nose bead ground, not less than 30 gage; exposed long flange receives joint compound; use at exposed panel edges.
    - c. Expansion (Control) Joint: One-piece control joint formed with V-shaped slot and removable strip covering slot opening.
    - d. Curved-Edge Cornerbead: With notched or flexible flanges; use at curved openings.
  2. Accessories for Curved Edges: Corner bead formed of metal, plastic, or metal combined with plastic, with either notched or flexible flanges that are bendable to curvature radius.

## 2.9 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape:
  1. Interior Gypsum Wallboard: Paper reinforcing tape. Fiberglass tape not permitted.
- C. Setting-Type Joint Compound: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
  1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
- D. Drying-Type Joint Compound: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
  1. Ready-Mixed Formulation: Factory-mixed product.
- E. Type of Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
  1. Prefilling: At open joints, beveled panel edges, and damaged surface areas, use setting-type taping compound.
  2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound or drying-type, all-purpose compound.
  3. Fill Coat: For second coat, use setting-type, sandable topping compound or drying-type, all-purpose compound.
  4. Finish Coat: For third coat, use setting-type, sandable topping compound or drying-type, all-purpose compound.

## 2.10 ACOUSTICAL SEALANT

- A. Products:
  1. Acoustical Sealant for Exposed and Concealed Joints:
    - a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
    - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.



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2. Acoustical Sealant for Concealed Joints:
  - a. Ohio Sealants, Inc.; Pro-Series SC-175 Acoustical Sound Sealant.
  - b. Pecora Corp.; AIS-919.
  - c. Tremco, Inc.; Tremco Acoustical Sealant.
- B. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
- C. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), recommended for sealing interior concealed joints to reduce airborne sound transmission.

#### 2.11 SEALANTS FOR FIRE-RESISTANCE-RATED CONSTRUCTION

- A. General: Provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. VOC Content of Fire-Resistance-Rated Sealants: Shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Joints in or between Fire-Resistance-Rated Construction: Materials shall comply with Division 07 Section "Fire-Resistive Joint Systems" and submitted UL assemblies.
  1. Provide firestopping where fire rated gypsum board assemblies butt masonry, steel deck, joists, beams, and structural members as part of the gypsum board assembly work.
  2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.
  3. Joints shall be sealed with fire-resistance-rated sealants; use of joint compound for sealing of joints is not permitted.
- D. Exposed Fire-Resistive Joint Sealants: Exposed sealants shall be paintable.

#### 2.12 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
  1. Fastening gypsum board to steel members: Type S bugle head.
  2. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- C. Sound Attenuation Blankets (Acoustical Insulation), SAB: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
  1. Fire-Resistance-Rated Assemblies: Comply with requirements of UL assemblies indicated.

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2. Products:
  - a. Certaineed Corporation; Noise Reducer Sound Attenuation Batts.
  - b. Owens Corning; Sound Attenuation Batt Insulation.
  - c. Johns Manville; Fiberglass Sound Control Batts.
  - d. Knauf Insulation; Quiet Therm Acoustical/Thermal Batt Insulation.
- D. Thermal Insulation: As specified in Division 07 Section "Building Insulation."
- E. Vapor Retarder: As specified in Division 07 Section "Building Insulation."
- F. Insulation Support Anchors: Continuous, galvanized metal support strip, 25 gage, with pre-punched tabs at 8 inches on center.
  1. Product: Insul-hold; Insul-Hold Co., Inc.; phone (207) 465-9066.
- G. Firestopping:
  1. Provide firestopping where fire rated gypsum board assemblies butt masonry, steel deck, joists, beams, and structural members as part of the gypsum board assembly work. See Division 07 Section "Fire-Resistive Joint Systems."
  2. Penetrations through fire-resistant rated and smoke walls and partitions by Divisions 21, 22, 23, 26, 27, and 28 work, including both empty openings and openings containing cables, pipes, ducts and conduits are specified as part of the Divisions 21, 22, 23, 26, 27, and 28 work. Sealing of penetrations shall be in accordance with Division 07 Section "Through-Penetration Firestop Systems."

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Post-Installation Inspection: Inspect walls for dents and imperfections, with Installer and painter present, prior to painting. Verify exposed joints are finished up to required heights (to above acoustical ceilings). Inspect wall again after primer and first coat of paint applied, with Installer and painter present. Installer shall touch-up as follows:
  1. Touch-up visible gypsum board imperfections before priming of walls.
  2. Touch-up imperfections found in field of boards and joints made visible from painting after first finish coat applied.
  3. Joint compound touch-up shall be primed and painted and viewed for acceptability before final coat is applied.

#### 3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building

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structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

- B. Coordinate installation of ceiling runners (tracks) with the installation of the spray-applied urethane foam insulation.

### 3.3 STEEL FRAMING INSTALLATION, GENERAL

- A. Installation Standards: ASTM C 754, and ASTM C 840 requirements that apply to framing installation.
- B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with gypsum board manufacturer's written recommendations or, if none available, with United States Gypsum's "Gypsum Construction Handbook."
- C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement. Comply with details shown on Drawings.
  - 1. Isolate ceiling assemblies where they abut or are penetrated by building structure.
  - 2. Isolate partition framing and wall furring where it abuts structure, except at floor. Install slip-type joints at head of assemblies that avoid axial loading of assembly and laterally support assembly.
    - a. Allow for 3/4-inch deflection at floors and 1 inch at roofs.
    - b. Install deflection track top runner or deflection brackets to attain lateral support and avoid axial loading.
    - c. Install deflection firestop track top runner at fire-resistance-rated assemblies.
      - 1) Attach jamb studs at openings to tracks using manufacturer's standard stud clip.
- D. Installation interior partitions that intersect exterior walls to permit vapor retarder installation to run continuous past ends of partitions.
- E. Do not bridge building control and expansion joints with steel framing or furring members. Frame both sides of joints independently.

### 3.4 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components in sizes and spacings indicated on Drawings, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend ceiling hangers from building structure as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in

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form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

3. Wire Hangers: Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.
4. Do not attach hangers to steel roof deck. Do not attach fasteners to underside of floor deck that will penetrate radiant heat tubing.
5. Do not attach hangers to permanent metal forms. Attach hangers to structural members.
6. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck. Attach hangers to structural members.
7. Do not connect or suspend steel framing from ducts, pipes, or conduit. Attach hangers to structural members.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

F. Sway-brace suspended steel framing with hangers used for support.

G. Wire-tie furring channels to supports, as required to comply with requirements for assemblies indicated.

H. Install suspended steel framing components in sizes and spacings indicated, but not less than that required by the referenced steel framing and installation standards.

1. Hangers: 48 inches o.c.
2. Carrying Channels (Main Runners): 48 inches o.c.
3. Furring Channels (Furring Members): 16 inches o.c.

I. Grid Suspension System: Attach perimeter wall track or angle where grid suspension system meets vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

### 3.5 INSTALLING STEEL PARTITION AND SOFFIT FRAMING

A. Install tracks (runners) at floors, ceilings, and structural walls and columns where gypsum board assemblies abut other construction.

1. Coordination with radiant heat installation to insure framing fasteners do not penetrate tubing.

B. Installation Tolerance: Install each steel framing and furring member so fastening surfaces vary not more than 1/8 inch from the plane formed by the faces of adjacent framing.

C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.

1. Cut studs 1/2 inch short of full height to provide perimeter relief. Do not fasten studs to top track to allow independent movement of studs and track.

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2. For fire-resistance-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid-structure surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed to support gypsum board closures and to make partitions continuous from floor to underside of solid structure.
  3. Do not attach fasteners to underside of floor deck that will penetrate radiant heat tubing.
- D. Install steel studs and furring at 16 inches o.c., unless otherwise indicated.
- E. Install steel studs so flanges point in the same direction and leading edge or end of each panel can be attached to open (unsupported) edges of stud flanges first.
1. Attach both flanges to floor runner track with screws.
- F. Curved Partitions, Ceilings and Soffits:
1. Cut top and bottom track (runners) through leg and web at 2-inch intervals for arc length. In cutting lengths of track, allow for uncut straight lengths of not less than 12 inches at ends of arcs.
  2. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
  3. Support outside (cut) leg of track by clinching steel sheet strip, 1-inch- high-by-thickness of track metal, to inside of cut legs using metal lock fasteners.
  4. Begin and end each arc with a stud, and space intermediate studs equally along arcs at stud spacing recommended in writing by gypsum board manufacturer for radii indicated. Attach studs to bottom runners with 3/8-inch- long pan head framing screws into both flanges. On straight lengths of not less than 2 studs at ends of arcs, place studs 6 inches o.c.
  5. Premanufactured Runner Option: Provide pre-manufactured radius runners to uniform curve of radius indicated and locate straight lengths so they are tangent to arcs.
- G. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
1. Install two studs at each jamb, unless otherwise indicated.
  2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint.
  3. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above, even when partitions are not full height. Provide diagonal bracing at tall partitions to stop deflection and vibration of studs when doors are slammed shut.
  4. Extend jamb studs one-piece full height.
- H. Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- I. Installation Tolerance: Framing members shall be within the following limits:
1. Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing, a total variation of 1/4 inch in 8 feet from a true plane.
  2. Layout of Walls and Partitions: 1/4 inch from intended position.
  3. Plates and Runners: 1/4 inch in 10 feet from a straight line.
  4. Studs: 1/4 inch in 10 feet out of plumb, not cumulative.
  5. Headers and Sills of Openings: 1/8 inch from level across width of opening.

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6. Soffits: 1/4 inch in 10 feet from level straight line.
7. Spacing of Framing Members: Comply with requirements of ASTM C 754.

- J. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure. Install framing around structural and other members extending below floor/roof slabs and decks, as needed to support gypsum board closures and to make partitions continuous from floor to underside of solid structure.
  1. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

### 3.6 INSTALLATION OF ACOUSTICAL INSULATION

- A. Install sound attenuation blankets (acoustical insulation) at locations indicated before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement. Install insulation in voids as framing is installed that that would be inaccessible after completion of framing.
- B. Install a single layer of insulation of required thickness to fill the full depth of cavity, unless otherwise shown. Where cavity requires insulation that is thicker than standard size, install next larger size and compress into cavity.
- C. Hold batt insulation in place with insulation support anchors located at 5 feet on center full height of wall, starting at the top of each stud space.
- D. Stuff glass fiber loose fill insulation into miscellaneous voids and cavity spaces. Fill box headers, and voids while framing is being erected that will be inaccessible for installation later. Compact to approximately 40 percent of normal maximum volume (to a density of approximately 2.5 pcf).

### 3.7 INSTALLATION OF GYPSUM BOARD SHAFT-WALL ASSEMBLIES

- A. General: Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and ASTM C 754 for installing steel framing.
- B. Do not bridge building expansion joints with shaft-wall assemblies; frame both sides of joints with furring and other support.
- C. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.
  1. At elevator hoistway door frames, provide jamb struts on each side of door frame.
- D. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
  1. See Division 07 Section "Through-Penetration Firestop Systems" for treatment of space around perimeter of penetration.

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- E. Isolate gypsum finish panels from building structure to prevent cracking of finish panels while maintaining continuity of fire-rated construction.
- F. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect, while maintaining fire-resistance rating of gypsum board shaft-wall assemblies.
- G. Seal gypsum board shaft walls with rated acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain an airtight and smoke-tight seal; and comply with ASTM C 919 requirements or with manufacturer's written instructions or ASTM C 919, whichever is more stringent.
- H. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.8 APPLYING AND FINISHING PANELS, GENERAL

- A. Gypsum Board Application and Finishing Standards: ASTM C 840 and GA-216, except as specified otherwise.
- B. Install acoustical insulation, where indicated, before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.
- C. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- E. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- F. Attachment to Steel Framing: Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- G. Attach gypsum panels to framing provided at openings and cutouts.
- H. Form control and expansion joints with space between edges of adjoining gypsum panels.
  - 1. Where control joints are not shown, provide control joints at a maximum spacing of 30 feet; review proposed locations with Architect prior to commencement of work.
- I. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
  - 1. Unless concealed application is indicated or required for fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.
  - 3. Where partitions intersect beams, joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by beams, joists, and other structural members; allow 1/4- to 3/8-inch- wide joints to install

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sealant. Caulk smoke partitions with acoustical sealant on both sides of wall to prevent the passage of smoke. Use fire-rated acoustical sealant for fire-rated walls. Run board to within 1/4 inch of floor slabs to provide full support of resilient base.

- J. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with casing bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
  - 1. Use fire-rated acoustical sealant for fire-rated walls.
- K. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
  - 1. Space screws a maximum of 12 inches o.c. for vertical applications.
- L. Remove screws that do not hit studs, supports, or blocking and repair hole left by screw removal.

### 3.9 PANEL APPLICATION METHODS

- A. Single-Layer Application:
  - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
  - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
  - 3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- B. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Curved Partitions, Ceilings and Soffits:
  - 1. Install panels horizontally (perpendicular to supports) and unbroken, to the extent possible, across curved surface plus 12-inch-long straight sections at ends of curves and tangent to them.
  - 2. Wet gypsum panels on surfaces that will become compressed where curve radius prevents using dry panels. Comply with gypsum board manufacturer's written recommendations for curve radii, wetting methods, stacking panels after wetting, and other preparations that precede installing wetted gypsum panels.
  - 3. On convex sides of partitions, begin installation at one end of curved surface and fasten gypsum panels to studs as they are wrapped around curve. On concave side, start fastening panels to stud at center of curve and work outward to panel ends. Fasten panels to framing with screws spaced 12 inches o.c.
  - 4. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.
  - 5. Allow wetted gypsum panels to dry before applying joint treatment.

### 3.10 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.



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- B. Install corner bead at external corners.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.
  - 1. Install LC-bead (casing bead) where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
  - 2. Install U-bead where indicated.
  - 3. Curved-Edge Cornerbead: Use at curved openings.
- D. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

### 3.11 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Treat gypsum board joints, interior angles, flanges of corner bead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, beveled edges, and damaged surface areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints and to flanges of trim accessories, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
  - 1. Level 1: At ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
  - 2. Level 2: At ceiling plenum areas, concealed areas, and where indicated, for fire-resistance-rated assemblies, and smoke assemblies.
  - 3. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
- E. Where Level 1 gypsum board finish is indicated, embed tape in joint compound. Surface shall be free of excess joint compound.
- F. Where Level 2 gypsum board finish is indicated, fill fastener heads, embed tape in joint compound and apply thin coat of joint compound over all joints and interior angles.
- G. For Level 4 gypsum board finish, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and accessories. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects and ready for decoration.
  - 1. At tapered edge joints, draw compound down to a level plane, leaving a monolithic surface that is flush with paper face. Finish coat shall be feathered a minimum of 8 inches beyond both sides of center of joint tape.
  - 2. At end-to-end butt joints, draw compound down to minimize hump created by joint tape application. Finish coat shall be feathered a minimum of 16 inches beyond both sides of center of joint tape.
  - 3. End product shall be a surface that appears level without telegraphing joint locations as high spots when viewed down wall after painting.
  - 4. Finish board to within 1/4 inch of floor, providing full support for resilient wall base without telegraphing joint.

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3.12 FIELD QUALITY CONTROL

- A. Above-Ceiling Observation: Before Contractor installs gypsum board ceilings, Architect will conduct an above-ceiling observation and report deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.
  - 1. Notify Architect seven days in advance of date and time when Project, or part of Project, will be ready for above-ceiling observation.
  - 2. Before notifying Architect, complete the following in areas to receive gypsum board ceilings:
    - a. Installation of 80 percent of lighting fixtures, powered for operation.
    - b. Installation, insulation, and leak and pressure testing of water piping systems.
    - c. Installation of air-duct systems.
    - d. Installation of air devices.
    - e. Installation of mechanical system control-air tubing.
    - f. Installation of above ceiling automatic fire suppression piping, including leak and pressure testing.
    - g. Installation of ceiling support framing.

3.13 CLEANING

- A. Promptly remove any residual joint compound from adjacent surfaces.

3.14 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092950