SECTION 09250

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing and furring for gypsum board assemblies.
2. Gypsum board assemblies attached to steel framing and furring.
3. Water-resistant gypsum board.
4. Sound attenuation insulation in partition stud spaces.
5. Joint treatment materials.
6. Acoustical sealant.
7. Fasteners.
8. Partition identification (stenciling fire-rated walls).

B. Related Sections:

1. Section 05400 - Cold Formed Metal Framing: Steel studs and "C" shaped steel joists for structural framing constructed of 18 gauge or heavier material.
2. Section 07210 -Building Insulation: Thermal batt insulation.
3. Section 07840 – Firestopping.
4. Section 09255 - Exterior Sheathing: Sheathing installed on exterior walls.
5. Section 09265 - Gypsum Board Shaft Wall: Gypsum board shaft wall systems.
6. Section 09310 - Ceramic Tile: Cementitious backer units for application of tile.
7. Section 09910 – Painting: Painting of gypsum Board walls.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product specifications and installation recommendations for each product proposed.

B. Shop Drawings: Show Control joint locations.

C. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

1.3 QUALITY ASSURANCE

A. Reference Standards: Comply with applicable requirements of ASTM C 754 (Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board) and ASTM C 840 (Application and Finishing of Gypsum Board), both as supplemented by this Section.

B. Sound Transmission Characteristics: For gypsum board assemblies indicated to have STC ratings, provide materials and construction identical to those of assemblies whose STC ratings were determined per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing agency.

C. **Fire-Resistance Ratings:** Where indicated, provide materials and construction identical to assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

1. Provide indicated fire-resistance rated assemblies identified in UL "Fire Resistance Directory" or other testing and inspecting agency acceptable to authorities having jurisdiction.

D. **Single-Source Responsibility for Finishing Materials:** Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

1.4 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. Neatly stack gypsum panels flat to prevent sagging.

C. **Handle gypsum board** to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.5 PROJECT CONDITIONS

A. **Environmental Conditions, General:** Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.

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 attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources. Avoid conditions that result in gypsum veneer plaster drying too rapidly

E. **Protection:** Protect gypsum board products from direct exposure to rain, snow, sunlight, or other excessive weather conditions.

F. **Ventilation:** Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering acceptable products include, but are not limited to, the following:

1. Steel Framing and Furring:
   a. ALABAMA METAL INDUSTRIES CORP.
   b. METALPRO INC
   c. CLARK STEEL FRAMING
   d. DALE/INCOR INDUSTRIES, INC.
   e. MARINO INDUSTRIES CORP.
   f. GOLD BOND BUILDING PRODUCTS DIV., NATIONAL GYPSUM CO.
   g. UNIMAST INC.
2. Grid Suspension Assemblies:
   a. CHICAGO METALLIC CORP.
   b. ARMSTONG.
   c. NATIONAL ROLLING MILLS CO.
   d. USG INTERIORS, INC.
3. Gypsum Board and Related Products:
   a. UNITED STATES GYPSUM CO.
   b. DOMTAR GYPSUM.
   c. GEORGIA-PACIFIC CORP.
   d. NATIONAL GYPSUM CO.

2.2 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS

A. General: Provide components of sizes indicated but not less than that required to comply with ASTM C 754 for conditions indicated.

B. Cast-In-Place and Post-installed Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials, with holes or loops for attaching hanger wires, and with capability to sustain, without failure, a load equal to 5 times that imposed by ceiling construction, as determined from testing per ASTM E 488 conducted by a qualified independent testing agency.

1. Cast-in-place type designed for attachment to concrete forms.
2. Chemical anchor.
3. Expansion anchor.

C. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

D. Wire Ties: ASTM A 641, Class 1 zinc coating, soft temper, minimum 0.062 inch (1.6 mm) thick.

E. Wire Hangers: ASTM A 641, Class 1 zinc coating, soft temper, minimum 0.162 inch (4.1 mm) thick.

F. **Channels:** Cold-rolled steel, 0.0598-inch (1.5-mm) minimum thickness of base (uncoated) metal and 7/16-inch (11.1-mm) wide flanges, with ASTM A 653, G 60 (ASTM A 653M, Z 180) hot-dip galvanized coating:
   1. Carrying Channels: 1-1/2 inches (38.1 mm) deep, 475 lb/1000 feet (70 kg/100 m), unless otherwise indicated.
   2. Furring Channels: 3/4 inch (19.1 mm) deep, 300 lb/1000 feet (45 kg/100 m), unless otherwise indicated.

G. **Steel Studs for Furring:** ASTM C 645, with flange edges bent back 90 deg and doubled over to form 3/16 inch minimum lip (return). Use for primary suspension members where indicated.
   1. Minimum Base Metal Thickness:
      a. 0.0329 inch for studs less than 4 inches in depth.
      b. 0.0283 inch for studs 4 inches or greater in depth.
   2. Depth as indicated.
   3. Protective Coating: ASTM A 653, G 40 (ASTM A 653M, Z 90) hot-dip galvanized coating.

H. **Steel Rigid Furring Channels:** ASTM C 645, hat-shaped, and minimum thickness of base (uncoated) metal 0.0179 inch (nominal 25 ga.) unless otherwise indicated. Use for secondary suspension members where indicated.
   1. Depth - 7/8 inch.
   2. Protective Coating: ASTM A 653, G 40 (ASTM A 653M, Z 90) hot-dip galvanized coating.

I. **Steel Resilient Furring Channels (If Required):** Manufacturer's standard product designed to reduce sound transmission, fabricated from steel sheet complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M) to form 1/2-inch- (12.7-mm-) deep channel of the following configuration:
   1. Single or Double-Leg Configuration: Asymmetric-shaped channel with face connected to a single flange by a single-slotted leg (web) or hat-shaped channel, with 1-1/2-inch- (38.1-mm-) wide face connected to flanges by double-slotted or expanded-metal legs (webs).

J. **Drywall Grid Suspension System for Interior Ceilings:** Manufacturer's standard direct-hung grid suspension system complying with ASTM C 645 and composed of main beams and cross furring members that interlock to form a modular supporting network. Provide one of the following or Architect-approved substitute system:
   1. Chicago Metallic Corp. 630 (630 "Fire Front" where required to be fire-resistant rated).
   2. Armstrong Drywall suspension grid
   3. National Rolling Mills, Inc. DFS Series (DFR Series where required to be fire-resistant rated).
   4. USG Interiors, Inc. Donn Rigid X Drywall Suspension System.

2.3 STEEL FRAMING FOR WALLS AND PARTITIONS

A. **General:** Provide steel framing members complying with the following requirements:
   1. Component Sizes and Spacings: As indicated but not less than that required to comply with ASTM C 754 for maximum deflection of L/360 at 5 lbs. per sq. ft. lateral loading.
   2. Protective Coating: ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized.

B. Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch-wide minimum lip (return) and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:

1. Nominal 20 gauge minimum unless otherwise indicated on Drawings.
2. Nominal 20 gauge minimum at walls receiving ceramic tile finish.
3. Nominal 16 gauge minimum at door jambs (two studs at each jamb)
4. Depth: As indicated on drawings.

C. Vertical Deflection: Unless otherwise indicated on Drawings, all interior non-load-bearing light gauge steel framing which extends to the structure above shall be designed to accommodate a minimum of 1/2" vertical deflection using minimum 2" extended leg ceiling runners and deflection slide clips.

1. Deflection Clip: Flex-C 3 Legged Dog
2. Approved equal.

D. Deflection and Firestop Track (for fire-rated partitions): Top runner shall be designed to allow partition heads to expand and contract with movement of structure above while maintaining continuity of the fire-rated assembly. Comply with requirements of ASTM C 645 except configuration, of thickness indicated for studs and width to accommodate depth of studs indicated with flanges offset at midpoint to accommodate gypsum board thickness.

1. Provide for minimum vertical deflection specified above.
2. Refer to drawings for details. If not detailed, provide manufacturer's standard offset configuration.

E. Steel Rigid Furring Channels: ASTM C 645, hat-shaped, 7/8-inch depth and 0.0179-inch (nominal 25 ga.) minimum thickness of base (uncoated) metal.

F. Steel Channel Bridging: Cold-rolled steel, 0.0598-inch (1.5-mm) minimum thickness of base (uncoated) metal and 7/16-inch- (11.1-mm-) wide flanges, 1-1/2 inches (38.1 mm) deep, 475 lb/1000 feet (45 kg/100 m), unless otherwise indicated.

G. Steel Flat Strap and Backing Plate (If Required): Steel sheet for blocking and bracing complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M), length and width as indicated, and with a minimum base metal (uncoated) thickness as follows:

1. Thickness: 0.027 inch (0.7 mm) unless otherwise indicated or otherwise required by manufacturer of items being installed.

H. Z-Clips: At underside of steel beams to receive fireproofing provide and securely fasten z-clips to anchor deflection tracks. Spacing and gauge shall match that of stud below.

I. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

2.4 GYPSUM BOARD PRODUCTS

A. General: Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end butt joints. Provide 5/8 inch thickness unless otherwise indicated.

1. Widths: 48 inches (1219 mm).

B. Gypsum Board: 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, 5/8 inch thick or as otherwise indicated on drawings.

1. Type: Type "X" at all locations.
2. Edges: Tapered and featured (rounded or beveled) for prefilling.

C. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M or ASTM C 1396/C 1396M, 5/8 inch thick, and as follows:

1. Type X at all locations.

2.5 TRIM ACCESSORIES

A. Accessories for Interior Installation: Provide corner beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

Material:

1. Formed sheet steel zinc coated by hot-dip process, or rolled zinc.
2. Shapes as indicated by reference to designations in ASTM C 1047:
   a. Cornerbead on outside corners, unless otherwise indicated.
   b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.
   c. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening.

B. Accessory for Curved Edges: Cornerbead formed of metal, plastic, or metal combined with plastic, with either notched or flexible flanges that are bendable to curvature radius.

C. Reveal Moldings: Reveal moldings are indicated on the Drawings. Where model numbers are not indicated, Architect shall select molding. Provide manufacturer's standard extruded aluminum accessories of sizes indicated, with paintable protective coating. Finish shall be selected by Architect.

1. All trim shall consist of a fin, tapered, grooved and pre-punched for screw attachments and to accept bonding agents. The surface shall be coated with a protective film compatible with plaster, latex, polyurethane epoxy, enamel, etc. Trims are extruded aluminum, alloy 6063, temper T-5 tensile strength 31 KSI.
2. Available Manufacturers: Subject to compliance with requirements, provide one of the following:
   a. Fry Reglet Corp.
   b. Gordon, Inc.
   c. Pittcon Industries Inc.

2.6 JOINT TREATMENT MATERIALS

A. General: Provide materials complying with ASTM C 475/C 475M and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

1. For filling joints and treating fasteners of water-resistant gypsum backing board for application of ceramic tile, use materials recommended by the board manufacturer for this purpose.

B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.

C. Joint Tape for Cementitious Backer Units: Polymer-coated, open glass-fiber mesh.

D. **Setting-Type Joint Compounds for High Impact Gypsum Board:** Factory-packaged, job-mixed, chemical-hardening powder products formulated for prefilling gypsum board joints.

E. **Setting-Type Joint Compounds for Gypsum Board:** Factory-packaged, job-mixed, chemical-hardening powder products formulated for prefilling gypsum board joints.

F. **Drying-Type Joint Compounds for Gypsum Board:** Factory-packaged vinyl-based products formulated for both taping and topping compounds.

G. **Joint Compound for Cementitious Backer Unit:** Material recommended by cementitious backer unit manufacturer.

2.7 ACOUSTICAL SEALANT

A. **Acoustical Sealant (for Exposed or Concealed Joints):** Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and having flame-spread and smoke-developed ratings of less than 25 per ASTM E 84.

1. PL Acoustical Sealant; ChemRex, Inc.; Contech Brands.
2. AC-20 FTR Acoustical and Insulation Sealant; Pecora Corp.
3. SHEETROCK Acoustical Sealant; United States Gypsum Co.

B. **Acoustical Sealant (for Concealed Joints):** Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound. Acceptable products include the following:

1. BA-98, Pecora Corp.
2. Tremco Acoustical Sealant, Tremco, Inc.
3. Ohio Sealants, Inc.; Pro-Series SC-170 Rubber Base Sound Sealant.

2.8 SOUND ATTENUATION MATERIAL

A. **Sound Attenuation Blankets:** Unfaced mineral-fiber blanket insulation produced by combining mineral fibers with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing). Provide insulation with maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E 84.

1. Thickness: Minimum 3 1/2" thick or as required to achieve required sound rating.

2.9 MISCELLANEOUS MATERIALS

A. **General:** Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

B. **Screw Fasteners:**

1. Steel drill screws complying with ASTM C 1002 for the following applications:
   a. Fastening gypsum board to steel members less than 0.03-inch thick.
   b. Fastening gypsum board to wood members.
   c. Fastening gypsum board to gypsum board.
2. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch thick.
3. Corrosion-resistant-coated steel drill screws of size and type recommended by board manufacturer for fastening cementitious backer units.

4. Gypsum board nails: ASTM C 514.

PART 3 - EXECUTION

3.1 EXAMINATION

A. **Project Conditions:** Verify that installation conditions specified in PART 1 - GENERAL have been achieved and can be maintained.

B. **Protection:** Provide and maintain temporary protection of gypsum board from direct exposure to rain, snow, sunlight, or other excessive weather conditions.

C. **Damaged Gypsum Board:** Gypsum board products that have become exposed to rain or water ponding at the floor line shall be replaced at the discretion of the Architect to an appropriate level, but not less than 4' - 0" above the finished floor line.

D. **Related Work:** Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing for installation tolerances and other conditions affecting installation and performance of gypsum board assemblies.

E. **Acceptance:** Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. **Ceiling Anchorages:** Coordinate ceiling suspension systems with overhead structural assemblies to ensure that provisions to receive ceiling hangers will develop their full strength and are at spacing required to support ceilings.
   1. Furnish concrete inserts and similar devices to other trades well in advance of time needed for installation.

B. **Fireproofing:** Before sprayed-on fireproofing is applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed-on fireproofing. Where offset anchor plates are required, provide continuous units fastened to building structure not more than 24 inches o.c.
   1. After sprayed-on fireproofing has been applied, remove only as much fireproofing as necessary to complete installation of gypsum board assemblies without reducing thickness of fireproofing below that required to obtain fire-resistive rating indicated.
   2. Protect remaining fireproofing from damage.

3.3 INSTALLING STEEL FRAMING, GENERAL

A. **Installation Standard:** Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.

B. **Supplemental Framing:** Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies and to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with "Gypsum Construction Handbook" published by USG Co.

C. **Structural Isolation:** Isolate steel framing from building to prevent transfer of loading imposed by structural movement. Provide isolation at the following locations:
   1. Where building structure abuts ceiling perimeter or penetrates ceiling.

2. Where partition framing and wall furring abut structure except at floor.
   a. Provide deflection tracks, slip-joint or cushioned-type joints as necessary to attain lateral support and avoid axial loading.
3. Where fire-rated partitions extend to underside of structure. Provide deflection and firestop track top runner at fire-rated assemblies.

D. Expansion Joints: Do not bridge building expansion and control joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.

E. Frame around existing ductwork where ductwork penetrates wall. Frame and brace to underside of structure with kickers where top of wall meets underside of ductwork. Ductwork shall not be used as supporting member for drywall assembly.

3.4 INSTALLING STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

A. General: At the option of the Installer, any of the following framing methods may be used, unless a specific method is called for by the Drawings.

1. Main runners (carrying channels or metal studs) suspended from overhead structure and cross furring (rigid furring channels).
2. Steel studs, suspended or attached to adjoining wall/partition structure. Unless otherwise indicated or required, use 3-5/8" studs, maximum 16" o.c., for spans up to 8'-0".
3. Proprietary grid suspension system.

B. Coordination: Coordinate layout and installation of ceiling suspension system with other work above, supported by and penetrating ceilings.

C. Hangers: Suspend ceiling hangers from building structural members and 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 form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye screws, 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 due to age, corrosion, or elevated temperatures.
4. Do not support ceilings directly from permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
5. Do not attach hangers to steel deck tabs.
6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
7. Do not connect or suspend steel framing from ducts, pipes or conduit.

D. Installation Tolerances: Install steel framing components for suspended ceilings so that cross furring members or grid suspension members are level to within ⅛ inch in 12 ft. as measured both lengthwise on each member and transversely between parallel members.

E. **Suspended Framing:** Provide hangers not closer than 6 inches to ends of primary members.
   1. Locate both primary and secondary members not more than 6inches from walls and partitions which interrupt ceilings.
   2. Provide 1" clearance between ends of framing members and abutting walls and partitions.
   3. Sway-brace suspended steel framing with hangers used for support.

F. **Non-Proprietary Suspension System:** Install components in sizes and at spacings indicated but not less than that required by referenced steel framing installation standard.
   1. Wire Hangers: 0.1620-inch diameter (8 gage), 4 feet on center maximum.
   2. Primary Members (main runners): Carrying channels or steel studs, 4 feet on center, maximum.
   3. Secondary members (cross furring): Hat-shaped channels, 24 inches on center, maximum.
   4. Wire-tie or clip furring members to main runners and to other structural supports as indicated.

G. **Drywall 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. Comply with system manufacturer's instructions.

3.5 INSTALLING STEEL FRAMING FOR WALLS AND PARTITIONS

A. **General:** Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.
   1. Space studs and furring members 16" o.c. unless otherwise indicated.
   2. Where studs are installed directly against exterior walls, install asphalt felt strips between studs and wall.
   3. Install steel studs and furring in sizes and at spacings indicated but not less than that required to comply with maximum deflection and minimum loading requirements specified in this Section.

B. **Installation Tolerances:** Install each steel framing and furring member so that fastening surfaces do not vary more than ⅛ inch from the plane formed by the faces of adjacent framing.

C. **Full Height Partitions:** Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Cut studs ½ inch short of full height to avoid deflection transfer to studs. Install studs and top deflection track and/or firestop tracks in accordance with manufacturer’s instructions. Provide extended leg ceiling runners.
   1. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
   2. Extend partitions to the underside of floor/roof slabs and decks or other continuous solid structural surfaces. Install framing around structural and other members extending below floor/roof slabs and decks, as needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.

D. **Steel Framing for Curved Partitions:** Cut top and bottom runners through leg and web at 2-inch intervals for arc length. In cutting lengths of runners allow for uncut straight lengths of not less than 12 inches at ends of arcs.

1. Bend runners to uniform curve of radius indicated and locate straight lengths so they are tangent to arcs.
2. Support outside (cut) leg of runners by clinching a 1-inch high by 0.0209-inch (25 gage) thick sheet steel strip to inside of cut legs using metal lock fasteners.
3. Attach runners to structural elements at floor and ceiling with fasteners located 2 inches from ends and spaced 24 inches o.c.
4. Attach runners to suspended ceilings with toggle bolts or hollow wall anchors located 2 inches from ends and spaced 16 inches o.c. in between where attached to suspended ceilings.
5. Begin and end each arc with a stud and space intermediate studs equally along arcs at stud spacing recommended by gypsum board manufacturer for radiuses indicated. Attach studs to runners with 3/8-inch long pan head framing screws. On straight lengths at ends of arcs, place studs 6 inches o.c. with last stud left free standing.

E. **Steel Framing at Door Openings:** Frame door openings with two minimum 16 gauge studs at each jamb to comply with details indicated and with applicable published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws to runner tracks and to jamb anchor clips on door frames. Install runner track section (for cripple studs) at head and secure to jamb studs.

1. At each door, brace jamb studs (hinge and strike jambs) from door head to underside of structure.

F. **Frame openings other than door openings** in same manner as required for door openings. Install framing below sills of openings to match framing required above door heads.

G. **Wall Furring:** Space furring members 16 inches on centers unless otherwise indicated. Attach with 2-inch cut nails driven into masonry joints or with power-driven fasteners. Space fasteners 24 inches apart, staggered from flange to flange.

1. Install furring members around openings, ducts, structural members, and other penetrations as needed to support gypsum board.
2. Position furring members to provide support for all gypsum board edges (for vertical board application) or ends (for horizontal board application).

H. **Clips, Supports, and Brackets:** Install clips, supports, brackets, runners, etc. that attach to structural steel or deck receiving fireproofing prior to the application of fireproofing. Repair fireproofing damaged by installation of balance of framing.

I. **Backings for wall mounted accessories and furniture:** Provide sheet metal, studs, blocking as necessary and recommended by manufacturer of items being installed for solid anchorage to wall.

3.6 APPLYING AND FINISHING GYPSUM BOARD

A. **General Standards:** Install and finish gypsum panels to comply with ASTM C 840 and gypsum board manufacturer's recommendations.

1. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. 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.

2. Locate either edge or end joints over supports. Position boards so that tapered edges abut tapered edges and mill-cut or field-cut ends abut mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends.
3. Locate exposed end-butt joints as far from centers of walls and ceilings as possible, and stagger not less than 24 inches in alternate courses of board.
4. Fit gypsum board neatly around ducts, pipes, conduits, and other penetrating items, and around openings for electrical devices, fixtures, accessories and similar recessed items.
5. Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.
6. Form reveals, control joints and expansion joints at locations indicated, with space between edges of boards, prepared to receive trim accessories.
   a. Install control joints between dissimilar wall materials, as shown on drawings, and minimally every 30 feet horizontally or vertically.
7. Where gypsum board intersects beams, joists, columns and other structural components, cut gypsum board to fit profile of component and allow 1/4 to ½ inch wide joint for sealant.

B. Ceilings: Install ceiling boards across supports in the manner which minimizes the number of end-butt joints, and which avoids end joints in the central area of each ceiling. Stagger end joints at least 24 inches.

C. Walls and Partitions: Install wall/partition boards with 1/4-inch gap at floor and in manner, which avoids end-butt joints entirely where possible.

1. At walls more than 12 feet high, install boards horizontally with end joints staggered over studs.
2. Stagger gypsum board joints over different studs on opposite faces of partitions.
3. Cover both faces of partition framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls.
4. Attach gypsum board to steel studs so that leading edge or end of each board is attached to open (unsupported) edge of stud flange first.
5. Isolate perimeter of non-load-bearing partitions at structural abutments. Provide 1/4 inch to ½ inch space, and where exposed in the completed construction, trim edge with edge trim. Seal joints with acoustical sealant, except at fire-rated partitions joints shall be firestopped as specified in “Section 07840 - Firestopping”

3.7 PARTITION IDENTIFICATION

A. Stenciling: Stencil the wall rating on each side of wall above the ceiling. Letters shall be minimum 2" high and labeled at 20 foot centers.

1. Label as “FIRE”, “SMOKE”, and “No. of hours”.
2. Non-rated walls, which extend to deck shall be labeled “NO WALL RATING REQUIRED”.

3.8 SOUND-RATED CONSTRUCTION

A. Sound Attenuation Blankets: Install sound attenuation blankets where indicated, in coordination with framing erection. Install blankets after framing is complete and piping, conduit, ducts and other penetrating items are complete and tested. At partitions install blankets from open side before second gypsum board face is installed. Cut and fit insulation around penetrating items to fill the area with a continuous insulating barrier. Remove and replace with new material insulation, which becomes displaced, torn, wet and otherwise damaged before it is enclosed.

B. Acoustical Sealants: Where sound-rated construction is indicated, seal construction at perimeters, control and expansion joints, openings and penetrations with continuous sealant including a bead at both faces of partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

1. Except where fire-rated gypsum board construction is required, provide acoustical sealant as specified in this Section.
2. Where fire-rated gypsum board construction is required, firestopping sealant shall be provided as specified in “Section 07840 - Firestopping”.

3.9 GYPSUM BOARD APPLICATION METHODS

A. General: Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

B. Single-Layer Application: Install gypsum board as follows:

1. On ceilings, apply gypsum board prior to wall/partition board application to the greatest extent possible and at right angles to supports, unless otherwise indicated. Provide lengths that will avoid or minimize end joints.
2. On partitions/walls, apply gypsum board vertically (parallel to supports), unless otherwise indicated, and provide panel lengths that will avoid or minimize end joints. Stagger joints on opposite sides of partitions.
3. On furring members, apply gypsum board vertically (parallel to supports) with no end joints. Locate edge joints over furring members.

C. Wall Tile Substrates: For substrates indicated to receive thin-set ceramic tile and similar rigid applied wall finishes, install cementitious backer units in accordance with “Section 09310 - Ceramic Tile”.

D. Double-Layer Application: Install gypsum backing board for base layers and special-purpose gypsum wallboard for face layers.

1. On partitions/walls, apply base layers and face layers vertically (parallel to supports) with joints of base layers located over stud or furring member and face layer joints offset at least one stud or furring member from base layer joints. Stagger joints on opposite sides of partitions.

E. Single-Layer Fastening Methods: Apply gypsum panels to steel framing with screws.

F. Double-Layer Fastening Methods: Apply base layer of gypsum panels and face layer to base layer as follows:

1. Fasten base layers with screws and gypsum board face layer with adhesive and supplementary fasteners.
2. Fasten special-purpose board face layers with adhesive only. Assure flush surface alignment of the two types of boards at juncture by building-up adhesive thickness under the thinner board. Install special-purpose boards with snug, flush, butt joints.

G. Curved Partitions and Ceilings: Install gypsum panels as follows:

1. Select gypsum panel lengths and cut them as required to produce one unbroken panel covering each 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 when panels are installed over a curve and where the radius of the curve prevents using dry panels. Comply with gypsum board manufacturer's recommendations relative to

curve radiuses, wetting methods, stacking panels after wetting, and other preparations that precede installing wetted gypsum panels.

3. Apply gypsum panels horizontally with wrapped edges perpendicular to studs. On convex sides of partitions, begin installation at one end of curved surface and fasten gypsum panels to studs as they are wrapped around the curve. On concave side, start fastening panels to stud at center of curve and work outwards to panel ends. Fasten panels to framing with screws spaced 12 inches o.c.
4. For double-layer construction, apply gypsum board base layer horizontally and fasten to studs with screws spaced 16 inches o.c. Center gypsum board face layers 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 WALL PRIORITY

A. **Wall Intersections:** Intersections of walls shall be installed in accordance with a priority of the highest to lowest. The highest priority wall shall continue uninterrupted (IE. gypsum board layers required on each side of wall shall continue through wall intersection) while the lower priority wall shall abut the other wall.

B. **Schedule:**

WALL	PRIORITY
Two-hour shaftwall:	1 (highest)
Two-hour wall:	2
One-hour shaftwall:	3
One-hour wall:	4
Non-rated wall to deck:	5
Non-rated wall to above ceiling:	6 (lowest)

3.11 INSTALLING TRIM ACCESSORIES

A. **General:** For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners. Provide trim as follows.

1. Install corner beads at all external corners.
2. Install edge trim where edge of gypsum panels would otherwise be exposed and where gypsum panels are tightly abutted to other construction. Provide edge trim type with face flange formed to receive joint compound except where other types are indicated.
3. Install aluminum reveal trim and other accessories where indicated. Comply with manufacturer's instructions.

B. **Control Joints:** Install control joints at locations indicated, and where not indicated in locations approved by Architect for visual effect according to the following requirements:

1. In ceilings: Not more than 50 feet apart in any direction, and wherever support framing or furring changes direction.
2. In walls/partitions: Not more than 30 feet apart, and wherever a control joint occurs in an exterior wall which services as a base for gypsum board finish. Wall or partition height door frames may be considered control joints.

3.12 FINISHING GYPSUM BOARD ASSEMBLIES

A. **General:** Treat gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads and surface defects; and elsewhere as required to prepare gypsum board surfaces for decoration and levels of gypsum board finish indicated.
   1. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
   2. Apply joint tape over gypsum board joints and to face flanges of aluminum reveal trim and coves as recommended by trim accessory manufacturer to prevent cracks from developing in joint compound at flange edges.

B. **Levels of Gypsum Board Finish:** Provide the following levels of gypsum board finish per GA-214.
   1. Level 1: Use for ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistive-rated assemblies and sound-rated assemblies.
   2. Level 2: Not used.
   3. Level 3: Not used.
   4. Level 4 (Typical Default Finish): Use for surfaces receiving flat or eggshell paints over light textured finish or backed wallcoverings.
   5. Level 5: Use on all curved walls/ceilings and on gypsum board surfaces indicated to receive gloss and semi-gloss enamels, and non-textured flat paints.

C. **Level 1 Finish:** Where level 1 gypsum board finish is indicated, apply joint compound specified for embedding coat.

D. **Level 4 Finish:** For level 4 gypsum board finish, embed tape in finishing compound plus two separate coats applied over joints, angles, fastener heads, and trim accessories using the following joint compounds (not including prefill), and sand between coats and after last coat:
   1. Embedding and First Coat: Ready-mixed, drying-type, all-purpose or taping compound.
   2. Fill (Second) Coat: Ready-mixed, drying-type, all-purpose or topping compound.
   3. Finish (Third) Coat: Ready-mixed, drying-type, all-purpose or topping compound.

E. **Level 5 Finish:** Where level 5 gypsum board finish is required, provide finish specified for level 4 plus a thin, uniform skim coat of joint compound over entire surface. Use joint compound specified for the finish (third coat). Produce surfaces free of tool marks and ridges ready for decoration of type indicated.

F. **Base for Ceramic Tile:** Finish cementitious backer units to comply with unit manufacturer's directions.

G. **Control Joint Finishing:** At all control joints and at all joints between high impact wall panels use manufacturer’s recommended setting compound manufacturers recommended tape.

H. **Existing Surfaces:** Repair existing surfaces to provide uniform finished surfaces, which are not evident as patches. Include surfaces, which are defective, damaged or defaced as a result of selective removal, previous occupancy, or deficient workmanship. Skim coat overall if necessary to repair defects and provide uniform smooth surface, using adhesive compound recommended by the compound manufacturer. At repairs of limited extent, feather out compound over existing smooth surfaces to avoid obvious patched appearance.

3.13 PARTITION IDENTIFICATION

A. Stenciling: Stencil the wall rating on each side of wall above the ceiling. Letters shall be minimum 2" high and labeled at 20 foot centers.

1. Label as "FIRE", "SMOKE", and "No. of hours".
2. Non-rated walls, which extend to deck shall be labeled "NO WALL RATING REQUIRED".

3.14 CLEANING AND PROTECTION

A. Cleaning: Promptly remove any residual joint compound from adjacent surfaces.

B. Protection: Provide final protection and maintain conditions that ensure gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION