SECTION 09 2116

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

A. Work of this Section consists of gypsum board, and includes but is not limited to the following:

1. Steel suspension systems for ceilings and soffits.
2. Screwable steel stud framing.
3. Metallic blockings and backers.
4. Gypsum wallboard finishing.
5. Metal trim and accessories: Reveals, casing trim, corner beads, resilient furring channels.
6. Acoustical sealing and acoustical insulation.

B. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. Other Documents and Sections that directly relate to work of this Section include, but are not limited to:

1. General provisions of the Contract, including General and Supplementary Conditions, and Division 01 General Requirements Specification Sections.
2. Section 06 1000 - ROUGH CARPENTRY.
3. Section 07 2100 - THERMAL INSULATION.
4. Section 07 8400 - FIRESTOPPING.
5. Section 07 9200 - JOINT SEALANTS.
6. Section 09 3000 - TILING.
7. Section 09 9100 - PAINTING.

1.2 SUBMITTALS

A. Product and System Data: Manufacturer's product literature, test reports and installation instructions.

B. Shop Drawings: Furnish complete shop drawings of all Work of this Section to Architect for approval, showing all pertinent details of construction and installation, and sizes, gauges, configurations, and connections of all components including locations of light fixtures, sprinkler heads, mechanical grilles, access doors, specialty items, control joints, framing at doors and other items indicated. Confirm on shop drawings that deflection will not exceed limitations specified.

C. Quality Assurance Submittals:

1. Test Reports: Submit certified test results by a recognized testing laboratory in accordance with specified test methods for each product and/or system indicating physical, chemical and performance characteristics.
2. Certificates: Submit with manufacturer’s signature certifying that each product and/or system meets the requirements of the performance characteristics, physical criteria, and applicable standards specified.
3. Manufacturer’s Instructions: Installation of fire rated systems.
4. Qualification Statements: Submit a letter, on printed letterhead and signed by an officer of the firm, for each listed quality assurance qualification listed, attesting to meeting each requirement called out.

1.3 QUALITY ASSURANCE

A. Reference Standards: Conform to governing laws, building code and manufacturer's printed standards.

B. Qualifications:

1. Manufacturer Qualifications: A firm experienced a minimum five (5) years in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
2. Installer Qualifications: Perform installation with skilled, experienced and trained workmen supervised by trained personnel who shall have at least three (3) years successful experience in installations of similar size and scope.

C. Fire Resistance Rated Assemblies: Where indicated, provide materials and construction identical to those tested in accordance to ASTM E119 and UL 263 by an independent testing and inspection agency acceptable to AHJ.

1. Fire Resistance Ratings: Indicated by design designations from UL “Fire Resistance Directory.

D. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

E. Source Limitations: Obtain light gauge metal framing through one source from a single manufacturer.

F. Benchmarks: Provide benchmark installations to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install benchmark installations for each unit type in the Work as noted below as or directed by the Architect.
2. Approved benchmark installations may be incorporated into the Work if accepted without exception by the Architect.
    a. Provide example of Level 5 finish at Locked Storage Room 1027. Perform benchmark under lighting conditions simulating final conditions.

1.4 COORDINATION

A. Work of this Section shall be coordinated with the Work of other Sections to assure the steady progress of all the Work. Obtain complete information regarding wall and ceiling mounted fixtures, grilles, registers, equipment, accessories, etc. to be used on the Work from other trades. In no case shall Work of other Sections be concealed until it has been inspected.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver all manufactured materials to site in original packages, containers, or bundles bearing the manufacturer's name and brand names, type of material, and contents.

B. Store materials in interior spaces, above floors, under cover, away from sweating walls and other damp surfaces, and with good ventilation.

C. Handle gypsum boards to prevent damage to edges, ends, or surfaces. Protect metal corner beads, casing beads, and trim from being bent or damaged.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Metal Framing and Suspension Systems: Provide materials, products, and systems from one of the following manufacturers that meet or exceed specified requirements:

1. Dietrich Industries, Inc.
2. Gold Bond Building Products Div., National Gypsum Co.
3. Incor, Inc.
4. Marino Industries Corp.

B. Gypsum Boards and Related Products: Provide materials, products, and systems from one of the following manufacturers that meet or exceed specified requirements:

1. Cemco.
2. Domtar Gypsum Co.
3. Georgia-Pacific Corp.
4. Gold Bond Building Products Div., National Gypsum Co.
5. Serious Materials, Inc.
6. United States Gypsum Co.

2.2 METAL FRAMING SYSTEMS FOR SUSPENDED AND FURRED CEILINGS

A. General: Provide components that conform to ASTM C754 for materials and sizes, unless indicated otherwise. Provide all metal runners, hangers, studs, and channels hot-dip galvanized conforming to ASTM A525, G40, unless noted otherwise.

B. Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft temper, 12 gage minimum.

C. Hanger Rods: Where required for loading or by local authorities, provide mild-steel rods, sized as required, hot-dip galvanized.

D. Flat Hangers: Where required for loading or by local authorities, provide mild-steel flat hangers, sized as required, hot-dip galvanized.

E. Angle-Type Hangers: Provide steel angles with legs not less than 7/8 in. wide, formed from 0.0635 in thick galvanized steel sheet conforming to ASTM A446, G 90, with bolted connections.

F. Channels: Provide cold-rolled steel channels, minimum 16 gauge with 7/16 in. wide flanges, protected with corrosion-resistant coating, and as follows:

1. Carrying Channels: 1-1/2 in. deep, 475 lb. per 1,000 lin. ft., hot-dip galvanized.
2. Furring Channels: Minimum 25 gage electro-galvanized, screwable, pressed steel furring channels, 7/8 in. thick, hat section.
3. Steel Studs for Furring Channels: ASTM C645, minimum 25 gage, hot-dip galvanized, with flange edges bent back 90 degrees and doubled over to form minimum 3/16 in. lip, depth as required.
4. Clips for attachment of steel furring channels to steel carrying channels shall be proprietary clips as recommended by manufacturer.

G. Ceiling Suspension System: Provide a complete, mechanical suspension system conforming to ASTM C645, consisting of cold-rolled steel channel main runners, screwable steel furring channels hangers and anchors and all required clips and other components, required for complete installation.

2.3 METAL FRAMING SYSTEMS FOR WALLS AND PARTITIONS

A. Unless otherwise indicated, steel stud system for walls and partitions shall be a complete proprietary framing system consisting of prefabricated, non-load bearing, screwable steel studs, steel track, anchors, and related items, conforming to ASTM C645. Provide all metal runners, hangers, studs, and channels hot-dip galvanized conforming to ASTM A653, G40, unless noted otherwise.

1. Provide minimum 20 gauge steel studs at partitions greater than 8 ft. in height, at jambs of door and fixed glass frames, at open partition ends, and where the partition is to receive wall-mounted shelves, heavy fixtures, etc.
2. Metal framing used to support Sure-Board panels shall be C-shaped, with a minimum 1-58 inch flange and 1/2 inch lip. Steel track shall have a minimum 1-1/4 inch flange.

B. Screwable Steel Wall Furring Channels: Minimum 25 ga. hot-dip galvanized, screwable, pressed steel furring channels, 7/8 inch thick, hat section.

C. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare-metal thickness of 0.0179 inch, and depths required to fit conditions indicated on Drawings.

D. Resilient Hangers: USG Interiors RC-1, Dietrich “RCSS” or “RCSN”, or approved equal.

E. Slip-Type Joints: Where indicated, provide one of the following:

1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

2.4 GYPSUM BOARD AND RELATED MATERIAL

A. Standard Gypsum Board:

1. Furnish standard gypsum board conforming to ASTM C1396.
2. Provide Type X boards, 5/8 inch by 48 inches wide by length required to minimize cross joints where required for Code.

B. Moisture Resistant Gypsum Board: ASTM C1177/C1177M, glass mat reinforced, silicone treated core gypsum board, ASTM D3273 with a rating of 10, no mold growth after 4 weeks exposure, Permeance of < 1.2 ng/(Pa•s•m•) or Perms (with no tile or coating) according to ASTM E96.

1. Size: Size: 5/8 inch by 48 inches by 12 feet.
2. Provide Type X gypsum panels for all work.
3. Locations:

C. Glass Mat Gypsum Board: ASTM C1178, paperless, moisture resistant gypsum core with coated glass mat facing.

1. Basis-of-Design: Georgia Pacific / DensArmor Plus.

2. Mold Resistant: ASTM D3273.
3. Size: Size: 5/8 inch by 48 inches by 12 feet.
4. Provide Type X glass mat gypsum panels for all work.

D. Cementitious Backer Units (CBU): ANSI A118.9, backer board composed of stable portland cement, aggregates, and reinforcements with ability to remain unaffected by prolonged exposure to moisture.

1. Size: 5/8 inch by manufacturer's standard sheet.

E. Fasteners:

1. Screws: ASTM C1002, drywall screws, corrosion resistant. Provide types as recommended by manufacturer for each application.
   a. Steel Framing and Furring Members to Other Steel Members: Self-drilling, Type S, pan head, size and length as recommended by framing manufacturer.
   b. Wallboard to Metal Framing: Minimum 1 inch, Type S.
   c. Wall board to Wood Framing: Minimum 1-1/4 inch, Type W bugle head.
   d. Wall board to Wallboard: Type G.
   e. Cementitious backer units: Screws of type and size recommended by panel manufacturer.

F. Accessories: ASTM C1047.

1. Corner Bead: Formed galvanized steel angle, min. base steel 0.014 inch thick.
2. Metal Trim (Casing Beads): Depth to match gypsum-board thickness.
3. Control Joint: Zinc, V-shaped control joint.

G. Finishing Materials: ASTM C475.

1. Joint Tape: Provide type as recommended by panel manufacturer.
   a. Alkali-resistant fiberglass mesh.
2. Joint Compound:
   a. Drying type pre-mixed compound.
   b. Drying type topping compound, pre-mixed.
   c. Drying type taping compound, pre-mixed.
   d. Setting type job mixed chemical-hardening compound.

H. Preformed Reglets and, Shapes, and Corners for gypsum wallboard partitions.

1. Basis of Design Manufacturer / Product: Softforms Commercial Grade Standard Extrusions, manufactured by Softforms Division, Pittcon Industries, Inc., or an Architect acceptable equivalent subject to compliance with requirements from one of the following manufacturers:
   a. Gordon Architectural Aluminum Specialties.
   b. Frye Reglet.
   c. Architect acceptable equivalent.
2. Metal: Extruded 6063-T5 aluminum alloy.
3. Thickness: Minimum 1/8 inch, profile areas.
4. Fire Resistance Rating: Class A.
5. Provide manufacturer's standard prefabricated 4-way and 3-way at intersections of reglets.
6. Provide each required shape and radius indicated, clip, fasteners and other items as necessary to complete the Work.

2.5 ACOUSTICAL MATERIALS

A. Acoustic Insulation

1. Sound Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
   a. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
   b. Recycled Content: Provide blankets with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of 50 percent by weight.

B. Sealants:

1. Acoustical Sealant for Concealed Applications: Provide "BA-98 Permanently non-hardening Acoustical Sealant", manufactured by Pecora Chemical Corp., equivalent product manufactured by U.S. Gypsum Co., National Gypsum Co., or approved equal.
2. Acoustical Sealant for Exposed Applications: Provide paintable "AC-20 Acrylic Latex Caulk", manufactured by Pecora Chemical Corp., equivalent product manufactured by DAP or Gibson Homans Co., or approved equal.

PART 3 EXECUTION

3.1 INSPECTION AND COORDINATION

A. Inspect job conditions and related Work and report to Architect in writing, all conditions interfering with the proper installation of Work of this Section. Commencement of Work in any given area shall constitute acceptance of conditions in that area as acceptable to receive Work of this Section.

B. Change and adjust Work of this Section to accommodate Work of other Sections, providing cutting and patching until it has been inspected.

3.2 GENERAL REQUIREMENTS

A. Provide Work conforming to published specifications and installation instructions of each manufacturer, the approved shop drawings, above-referenced quality assurance standards, the governing laws and code. Refer to Drawings to determine location of fire-resistive, fire-protective, and acoustically-rated Work, and construct this Work to conform to the specifications and installation instructions of UL or other testing agency(ies). Also refer to the Drawings to determine the number of layers of gypsum board, thickness of board, etc., for each of the installations.

B. Erect gypsum drywall Work, rigidly supported, and securely fastened in place, in such a manner that plumb, level, and true finished lines and surfaces will result in the finished Work in accordance with the requirements of ASTM C754 and ASTM C840.

1. Framing Tolerances: Shim steel framing to achieve no more than 1/8 inch in 10 feet deviation from true plane, plumb, level, and proper relation to adjacent surfaces in finished Work.

C. Construct gypsum drywall Work only after all windows and door openings are enclosed and a temperature of not less than 55 Deg F is maintained during and up to completion of the drywall Work.

3.3 FIRE-RATED GYPSUM ASSEMBLIES

A. Where fire-rated construction is indicated, provide materials and application methods, including

types and spacing of fasteners, wall and ceiling framing in accordance with the specifications contained in UL Fire Resist Dir for the Design Number(s) indicated by authorities having jurisdiction (AHJ).

1. Refer to Drawings to determine location of fire-resistive, fire-protective, and acoustically-rated Work, and construct this Work to conform to the specifications and installation instructions of UL or other testing agency(ies).
2. Refer to the Drawings to determine the number of layers of gypsum board, thickness of board, etc., for each of the installations.
3. Joints of fire-rated gypsum board enclosures shall be closed and sealed in accordance with UL test requirements or GA requirements.
4. Seal penetrations through rated partitions and ceilings tight in accordance with tested systems.

3.4 ACOUSTICAL CEILING FRAMING AND ACOUSTIC PANEL FURRING

A. Suspended Ceilings: Install complete suspended steel ceiling framing system in accordance with ASTM C754, and the following:

1. Install hangers at ends of, and 48 inch on center along lengths of main runners, securing to ceiling structure above with appropriate anchors. Provide all additional secondary framing as required to provide support by primary framing members or structural ceiling deck above. Do not anchor hangers to pipes, ducts, or other overhead non-structural elements.
2. Install steel runner channels 48 inch on center maximum and within 6 inch of walls.
3. Install screwable steel furring channels perpendicular to main runners and spaced maximum 48 inch on center along length of, and within 6 inch of walls without wall angles, and within 8 inch of ends of panels and clipped to, the main runners.
4. Entire installation shall be level and true, with maximum variation from level 1/8-inch when measured with a 10 foot straightedge, and with accumulation of variation of level not to exceed 1/2-inch per room or area.

3.5 STEEL WALL FRAMING AND FURRING

A. Screwable Steel Stud Partitions: Install complete stud partition system in conformance to ASTM C754.

B. Installation of Partition Track: Align standard steel track at floors and ceiling construction according to partition layouts and secure with suitable fasteners to the floor and ceiling construction at a spacing not to exceed 24 inch o.c. Carry all walls and partitions full height above suspended ceilings to underside of floor and roof decks above except where otherwise specifically called for on Drawings.

1. Fill voids above track, such as steel deck flutes, solidly with packing wool or fiberglass insulation at non-fire rated partitions. Fill voids with mineral wool fire-safing insulation at fire rated partitions for smoke and firestopping purposes to assure the rated performance at fire-rated assemblies.

C. Installation of Steel Studs: Provide one-piece steel studs without splices installed at spacing not to exceed 24 inch o.c. (16 inch o.c. at walls to receive tile, and other spacings indicated) and located at abutting construction and at the internal apex of corners. Provide additional studs at corner conditions, frame jambs, etc., as called for on the Drawings and specified herein.

1. Secure Doors: Provide double 18 gauge studs from floor to ceiling at jambs and head

D. Position steel studs vertically engaging both floor and top runners. Anchor studs located adjacent

to door and fixed glass frames, partition intersections, corners, and open partition ends, to the floor and ceiling runner flanges by positive screw engagement with 3/8-inch Type S pan head screws or by locking the studs with metal lock fasteners and to the ceiling runner flanges by screw engagement. Allow for relief of 1/2-inch roof or ceiling deflection at tops of all partitions by screwing through slotted holes.

E. Install double stud at door and fixed glass frame jambs and securely attach to the frame anchors with at least two screws per anchor. Over steel door and fixed glass frames, install steel track header and install studs above, with back-to-back pair, centered over the door to secure control joints. Run continuous length of cold-rolled steel channel through the stud cores, overlapping at least one stud beyond jamb studs at each end. Frame out for recessed cabinets, accessories, grilles, duct, and plumbing piping rack penetrations, etc., as recommended by the manufacturer for each of the project conditions.

F. Steel Furring: Install screwable steel furring channels over faces of concrete or masonry walls to receive gypsum wallboard finishes, continuously along tops and bottoms of walls and in continuous vertical rows spaced 16 inch o.c. Securely anchor at maximum spacing of 16 inch o.c. along full length of each furring member, through alternate flanges.

G. Resilient Furring Channels: Where indicated on Drawings connect gypsum ceiling panels to ceiling surfaces with 7/8-inch deep, single legged lightweight steel, 25 gauge, resilient furring channels. Hat channels or single legged channels of heavier gauge are not acceptable. Attach furring channels to ceilings with the open side up. Direct mount acoustic ceiling panels with screws and washers at 3 foot o.c. maximum. Attachment with nails will not be accepted. Space furring channels per manufacturer's instructions, normally 24 inch o.c., perpendicular to the studs or joists. Never apply resilient channels between layers of board.

H. Fixture Attachments: Before any wallboard is installed, a complete survey of all fixtures, accessories, cabinet Work, shelves, rail brackets, door stops, or other items to be attached to the finished Work of this Section shall be made and gauge metal blocking or other attachments shall be installed within the steel framing and furring Work to receive the loads. Blockings or other attachments for the various loads shall be as recommended by the manufacturer and shall be described on the shop drawings. All such fixture attachments shall be observed by the Architect before commencing installation of wallboard. All such blockings and attachments shall be provided as Work of this Section.

1. Gauge metal blocking by studs shall span three studs minimum, otherwise use metal plate.
2. Provide appropriate gauge to support intended fastening and loads.

I. Miscellaneous Framing and Furring: Construct all special miscellaneous screwable steel stud framing and furring, such as at ceiling edgings, soffits, column and beam enclosures, skylight wells, etc., as detailed and as required to achieve the shapes and profiles indicated and other miscellaneous framing indicated and/or reasonably required for the thorough completion of the Project.

1. Thoroughly fasten together, anchor, and brace to provide absolutely rigid structural conditions fully capable of supporting the loads to be applied with factor of safety not less than 2-1/2 to 1. Carry out the Work generally as detailed, strictly following instructions of the manufacturer for steel and stud structural framing use. Screw all connections with self-tapping metal screws or other appropriate fasteners and provide all additional reinforcement required to assure the required performance.

3.6 ACOUSTICAL INSULATION

A. Install acoustical insulation where indicated. Provide materials and construction methods identical

to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

3.7 ACOUSTICAL GYPSUM PANEL INSTALLATION

A. Install acoustical gypsum panels where indicated in accordance with manufacturer's recommendations for "Bulkhead" installation.

B. Furnish manufacturer's proprietary mitered strips to provide a complete installation.

C. Finish panel joints smooth with paintable caulk to provide an invisible joint.

D. Paint Finish: Non-Bridging paint as per Section 09 9100 - PAINTING.

3.8 GYPSUM BOARD AND RELATED MATERIALS INSTALLATION

A. Examination

1. Verify that framing and furring are securely attached and of sizes and spacing to provide a suitable substrate to receive gypsum board and cementitious backer units.
2. Proceed with Work only after framing and furring are acceptable for application of gypsum board and cementitious backer units.

B. Gypsum panels that are wet, damaged by moisture or exhibit mold damage shall be rejected for use.

C. Gypsum Wall Board: Install according to the most current versions of Gypsum Association Publication GA-216-2004 "Application and Finishing of Gypsum Panel Products" and ASTM C840, "Standard Specification for Application and Finishing of Gypsum Board for Non-Fire Rated Construction."

3.9 FINISHING OF GYPSUM BOARD

A. Tape and finish gypsum board in accordance with ASTM C840 and GA-214.

1. Provide joint, fastener depression, and corner treatment.
2. Tool joints as smoothly as possible to minimize sanding and dust.
3. Protect workers, building occupants, and HVAC systems from gypsum dust.

B. Finish each concealed joint in wallboard above ceiling finishes flush with tape and a minimum of two coats of compound to provide a continuous, uninterrupted plane for acoustical and fire-resistive performance. Concealed joints may be left in rough condition without finish sanding.

C. Apply gypsum board finish in accordance with manufacturer's published instructions and GA-214 Finish Levels.

1. Level 0: Not used.
2. Level 1: Not sed.
3. Level 2: Under ceramic tile finish in non-wet areas indicated for gypsum board.
4. Level 3: Non-occupied areas.
5. Level 4: Not used
6. Level 5 finish is required for and shall not be reduced for all spaces accessbile to residents and the public

END OF SECTION

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