SECTION 092216 - NON-STRUCTURAL METAL FRAMING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Non-load-bearing steel framing systems for interior partitions.

Suspension systems for interior ceilings and soffits.

Grid suspension systems for gypsum board ceilings.

* + - * 1. Related Requirements:

Retain subparagraph below to cross-reference requirements Contractor might expect to find in this Section but are specified in another Section.

Section 054000 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; and roof rafters and ceiling joists.

* + - 1. DEFINITIONS
         1. Sheet Steel Gages: US Standard.
      2. SUBMITTALS
         1. General: Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of product.

Request samples below for large projects only.

* + - * 1. Samples:

Steel Framing: 12 inches long, each type specified.

Fasteners: 10 each type specified.

Clips and other accessories: 1 each type specified.

USE PARAGRAPH BELOW WITH EPD REQUIREMENT WHEN PROJECT ESTIMATE IS $1M OR MORE.

* + - * 1. Submit an Environmental Product Declaration (EPD) from the manufacturer for framing members and channels within this specification section, if available. A statement of the contractor’s good faith effort to obtain the EPD shall be provided if not available.

Manufacturer-provided EPDs must be Product Specific Type III (Third-Party Reviewed), in adherence with ISO 14025 *Environmental labels and declarations*, ISO 14044 *Environmental management – Life cycle assessment*, and ISO 21930 *Core rules for environmental product declarations of construction products and services.*

Retain "Product Certificates" paragraph below to require submittal of product certificates from manufacturers.

* + - * 1. Product Certificates: For each type of code-compliance certification for studs and tracks.
        2. Evaluation Reports: For [**embossed, high-strength steel studs and tracks**] [**firestop tracks**] [**post-installed anchors**] [**and**] [**power-actuated fasteners**], from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
      1. QUALITY ASSURANCE

Retain "Code-Compliance Certification of Studs and Tracks" paragraph below for third-party verification that products meet the requirements of model codes and industry standards. Coordinate retained certification program(s) with the member companies in manufacturer lists below. See "Code-Compliance Certification Programs" Article in the Evaluations.

* + - * 1. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association, the Steel Framing Industry Association, or the Steel Stud Manufacturers Association.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and Masterworks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PERFORMANCE REQUIREMENTS

Retain "Fire-Test-Response Characteristics" paragraph below if framing is part of fire-resistance-rated assemblies. Indicate design designations of specific assemblies on Drawings.

* + - * 1. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 by an independent testing agency.

Retain "STC-Rated Assemblies" paragraph below if framing is part of STC-rated assemblies. Indicate design designations of specific assemblies on Drawings. The NYSBC requires ASTM E90 testing, and Gypsum Association's GA-600 uses ASTM E90 testing for its STC-rated assemblies.

* + - * 1. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.
        2. Suspension System Design Requirements:

The furring system shall support the weight of the ceiling system (including finish) plus the weight of the lighting system. Additional intermediate supports (struts) and hangers shall be included as required to support the required weights.

Delete below for single contract projects.

The actual fixture weights and locations will be furnished by the Electric Work Contractor (thru the Director's Representative).

* + - 1. FRAMING SYSTEMS
         1. Framing Members, General: Comply with ASTM C754 for conditions indicated.

Steel Sheet Components: Comply with ASTM C645 requirements for steel unless otherwise indicated.

See "Corrosion Protection of Steel Framing" and "Code-Compliance Certification Programs" articles in the Evaluations for a discussion of corrosion-resistant coatings on components and their certification.

Protective Coating: [**ASTM A653, G40**] [**ASTM A653, G60**], hot-dip galvanized unless otherwise indicated.

Retain option in "Studs and Tracks" paragraph, and retain both "Steel Studs and Tracks" and "Embossed, High-Strength Steel Studs and Tracks" subparagraphs below to allow Contractor to choose type of steel studs and tracks.

* + - * 1. Studs and Tracks: ASTM C645.[**Use either conventional steel studs and tracks or embossed, high-strength steel studs and tracks.**]

Steel Studs and Tracks:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12028) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ClarkDietrich](http://www.specagent.com/Lookup?uid=123457149800).

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457149795).

[Telling Industries](http://www.specagent.com/Lookup?uid=123457149790).

Approved equivalent.

Retain second option in "Minimum Base-Steel Thickness" subparagraph below if retaining "Horizontal Deflection" paragraph in "Performance Requirements" Article.

Minimum Base-Steel Thickness: 0.0179 inch (25 ga) .

Depth: As indicated on Drawings.

See "Embossed, High-Strength Steel Studs and Tracks" Article in the Evaluations for information about embossed, high-strength steel studs and tracks.

Embossed, High Strength Steel Studs and Tracks: Roll-formed and embossed with surface deformations to stiffen the framing members so that they are structurally comparable to conventional ASTM C645 steel studs and tracks.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12029) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ClarkDietrich](http://www.specagent.com/Lookup?uid=123457149807).

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457149806).

[Telling Industries](http://www.specagent.com/Lookup?uid=123457149805).

Approved equivalent.

Minimum Base-Steel Thickness: [**As indicated on Drawings**] [**As required by horizontal deflection performance requirements**] [**0.0155 inch**].

Depth: As indicated on Drawings.

For slip joint at stud and top-track interface (head joint) that avoids axial loading of partition by overhead structure, retain "Slip-Type Head Joints" paragraph below and one or all of the following types of head joints. See "Crack Control" Article in the Evaluations.

Gypsum board surfaces will crack if non-loadbearing assemblies are subjected to structural movements. Retain paragraph below for slip joint at stud and top-track interface to avoid loading of partition.

* + - * 1. Slip-Type Head Joints: Where indicated, provide one of the following:

If retaining "Clip System" subparagraph below, indicate depth of tracks on Drawings or insert requirements. Clips can be used with tracks with standard legs and long legs.

Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to tracks while allowing [**1-1/2-inch**] [**2-inch**] [**2-1/2-inch**] [**3-inch**] minimum vertical movement.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12031) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ClarkDietrich](http://www.specagent.com/Lookup?uid=123457149812); Fast Top Clip.

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457149817); Deflex-Clip.

[Telling Industries](http://www.specagent.com/Lookup?uid=123457149805); Verticlip.

Approved equivalent.

If retaining "Single Long-Leg Track System" subparagraph below, indicate type of bridging required on Drawings or by inserts. Strap and 1-1/2-inch cold-rolled steel channel are commonly used.

Single Long-Leg Track System: ASTM C645 top track with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.

If retaining "Double-Track System" subparagraph below and if deflection might be great, evaluate the lateral stability of the outer-track's flanges; consider using steel channels for tracks instead of non-structural tracks.

Double-Track System: ASTM C645 top outer tracks, inside track with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.

Deflection Track: Steel sheet top track 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.

[Products:](http://www.specagent.com/Lookup?ulid=12032) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[ClarkDietrich](http://www.specagent.com/Lookup?uid=123457149821); MaxTrak Slotted Deflection Track.

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457149830); Slotted Track.

[Telling Industries](http://www.specagent.com/Lookup?uid=123457149828); True-Action Slotted Track.

Approved equivalent.

Retain "Flat Strap and Backing Plate" paragraph below for flat-strap blocking and bracing for fixture attachment. Indicate locations, lengths, and widths on Drawings. Insert requirements for proprietary blocking products if needed.

* + - * 1. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12034) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ClarkDietrich](http://www.specagent.com/Lookup?uid=123457149844).

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457149846).

Telling Industries.

Approved equivalent.

Minimum Base-Steel Thickness: 0.0179 inch (25 ga) .

Retain "Cold-Rolled Channel Bridging" paragraph below for channel bridging for fixture attachment or lateral bracing. Indicate locations and details of installation on Drawings.

* + - * 1. Cold-Rolled Channel Bridging: Steel, 0.0538-inch (16 ga) minimum base-steel thickness, with minimum 1/2-inch- wide flanges.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12035) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ClarkDietrich](http://www.specagent.com/Lookup?uid=123457149849).

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457149852).

Telling Industries.

Approved equivalent.

Depth: [**As indicated on Drawings**] [**1-1/2 inches**].

Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch (14 ga) - thick, galvanized steel.

* + - * 1. Hat-Shaped, Rigid Furring Channels: ASTM C645.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12036) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ClarkDietrich](http://www.specagent.com/Lookup?uid=123457149855).

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457149858).

Telling Industries.

Approved equivalent.

Minimum Base-Steel Thickness: 0.0179 inch (25 ga ) .

Depth: [**As indicated on Drawings**] [**7/8 inch**] [**1-1/2 inches**].

* + - * 1. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12040) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ClarkDietrich](http://www.specagent.com/Lookup?uid=123457149869).

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457149872).

Telling Industries.

Approved equivalent.

Configuration: Asymmetrical or hat shaped.

* + - * 1. Cold-Rolled Furring Channels: 0.053-inch (16 ga) uncoated-steel thickness, with minimum 1/2-inch- wide flanges.

Depth: [**As indicated on Drawings**] [**3/4 inch**].

Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch (20 ga).

Tie Wire: ASTM A641, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.

Z-shaped furring is available in 1-, 1-1/2-, 2-, 2-1/2-, and 3-inch depths. Coordinate Z-shaped furring requirements with insulation specified in Section 072100 "Thermal Insulation."

* + - * 1. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-steel thickness of 0.0179 inch (16 ga) , and depth required to fit insulation thickness indicated.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12037) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ClarkDietrich](http://www.specagent.com/Lookup?uid=123457149862).

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457149864).

Telling Industries.

Approved equivalent.

* + - 1. SUSPENSION SYSTEMS

Retain this article for suspended or furred ceilings or soffits and for grid suspended ceilings.

* + - * 1. Tie Wire: ASTM A641, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
        2. Hanger Attachments to Concrete:

ICC-ES AC01 and AC193 are for expansion anchors in masonry and mechanical anchors in concrete, respectively, and AC58 and AC308 are for adhesive anchors in masonry and concrete. Do not use expansion-type anchors where expansion can cause damage to the substrate material. Verify with Project's structural engineer, and insert specific load requirements and names of acceptable products if required.

Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES [**AC01**] [**AC193**] [**AC58**] [**or**] [**AC308**] as appropriate for the substrate.

Uses: Securing hangers to structure.

Retain "Type" subparagraph below to restrict type of anchor if required.

Type: Torque-controlled, expansion anchor, torque-controlled, adhesive anchor, or adhesive anchor.

Material in "Material for Interior Locations" subparagraph below protects against corrosion in an indoor atmosphere.

Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.

Alloy Group 1 (A1) refers to Type 304 and similar alloys, and Alloy Group 2 (A4) refers to Type 316 and similar alloys.

Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy [**Group 1**] [**Group 2**] stainless-steel bolts, ASTM F593, and nuts, ASTM F594.

Retain "Power-Actuated Anchors" subparagraph below if power-actuated fasteners are acceptable. Verify with Project's structural engineer, and insert specific load requirements and names of acceptable products if required.

Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

Retain "Wire Hangers" or "Flat Hangers" paragraph below, or insert requirements to suit Project. Verify requirements of authorities having jurisdiction. If more than one type of hanger is required, indicate locations of each on Drawings.

* + - * 1. Wire Hangers: ASTM A641, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
        2. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.

Retain "Carrying Channels (Main Runners)" paragraph below for conventional ceiling suspension framing; delete if only grid suspension ceilings are required.

* + - * 1. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-steel thickness of 0.0538 inch (16 ga) and minimum 1/2-inch- wide flanges.

Depth: [**As indicated on Drawings**] [**2-1/2 inches**] [**2 inches**] [**1-1/2 inches**].

* + - * 1. Furring Channels (Furring Members):

Retain one type of furring member below or, if more than one is required, indicate locations of each on Drawings.

Cold-Rolled Channels: 0.0538-inch (16 ga) uncoated-steel thickness, with minimum 1/2-inch- wide flanges, 3/4 inch deep.

Steel Studs and Tracks: ASTM C645.

Minimum Base-Steel Thickness: 0.0179 inch.

Depth: As indicated on Drawings.

See "Embossed, High-Strength Steel Studs and Tracks" Article in the Evaluations for information about embossed, high-strength steel studs and tracks.

Embossed, High-Strength Steel Studs and Tracks: ASTM C645.

Minimum Base-Steel Thickness: 0.0155 inch 0.0190 inch.

Depth: As indicated on Drawings.

Hat-Shaped, Rigid Furring Channels: ASTM C645, 7/8 inch deep.

Minimum Base-Steel Thickness: 0.0179 inch (16 ga).

Resilient Furring Channels: 1/2-inch- deep members designed to reduce sound transmission.

Configuration: Asymmetrical or hat shaped.

Grid suspension systems are suitable for use with gypsum board. They might be unacceptable for gypsum veneer plaster; consult gypsum veneer plaster and grid suspension system manufacturers.

* + - * 1. Grid Suspension System for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of main beams and cross-furring members that interlock.

[Products:](http://www.specagent.com/Lookup?ulid=12039) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Armstrong Ceiling & Wall Solutions](http://www.specagent.com/Lookup?uid=123457173897); Drywall Grid Systems.

[Rockfon (Rockwool International)](http://www.specagent.com/Lookup?uid=123457149875); Chicago Metallic Drywall Grid.

[USG Corporation](http://www.specagent.com/Lookup?uid=123457149876); Drywall Suspension System.

Approved equivalent.

* + - 1. AUXILIARY MATERIALS
         1. General: Provide auxiliary materials that comply with referenced installation standards.

Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

* + - * 1. Isolation Strip at Exterior Walls: Provide[**one of**] the following:

Retain "Asphalt-Saturated Organic Felt" and "Foam Gasket" subparagraphs below and option in "Isolation Strip at Exterior Walls" paragraph above to allow Contractor to choose type of isolation strip.

Asphalt-Saturated Organic Felt: ASTM D226, Type I (No. 15 asphalt felt), nonperforated.

Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

Insert additional auxiliary materials, such as partition and outlet box isolation pads to maintain acoustic isolation, here.

1. EXECUTION
   * + 1. EXAMINATION
          1. 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 of the Work.
          2. Proceed with installation only after unsatisfactory conditions have been corrected.
       2. PREPARATION

Delete "Suspended Assemblies" paragraph below if only postinstalled anchors are used for installing suspended assemblies.

* + - * 1. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

* + - * 1. Coordination with Sprayed Fire-Resistive Materials:

Indicate requirements on Drawings for attaching steel framing to construction protected by sprayed fire-resistive materials.

Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.

After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

* + - 1. INSTALLATION, GENERAL
         1. Installation Standard: ASTM C754.

Standards listed in "Gypsum Plaster Assemblies," "Portland Cement Plaster Assemblies," "Gypsum Veneer Plaster Assemblies," and "Gypsum Board Assemblies" subparagraphs below include framing installation requirements not in ASTM C754. Retain applicable subparagraphs to suit Project.

Gypsum Plaster Assemblies: Also comply with requirements in ASTM C841 that apply to framing installation.

Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C1063 that apply to framing installation.

Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C844 that apply to framing installation.

Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.

* + - * 1. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
        2. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
        3. Install bracing at terminations in assemblies.

Indicate control and expansion joints on Drawings.

* + - * 1. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
      1. INSTALLING FRAMED ASSEMBLIES
         1. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

Retain first paragraph below if studs abut dissimilar metals at exterior walls or exterior masonry walls that may become damp.

* + - * 1. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
        2. Install studs so flanges within framing system point in same direction.
        3. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.

Indicate locations and details of slip-type and fire-rated head joints on Drawings. See "Crack Control" Article in the Evaluations.

Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.

Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.

Usually retain first subparagraph below. Design framing for doors more than 48 inches wide, for double doors, and for extra-heavy doors to meet loading conditions.

Where solid core wood doors, double doors, or doors weighing more than 50 lb are scheduled, install two studs at each jamb and one additional stud not more than 6 inches from jamb studs.

Retain first subparagraph below if one-piece control joints are required at heads of doors.

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 in finished assembly.

Retain first subparagraph below if suspended ceilings cannot withstand forces generated by opening and closing doors.

Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

Retain "Other Framed Openings" subparagraph below for framed openings other than doors, or revise to suit Project. Fully indicate framing for large openings on Drawings.

Other Framed Openings: 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.

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.

Secure tracks as recommended by the framing manufacturer for the floor and ceiling construction involved, except do not exceed 24 inches oc spacing for powder-driven fasteners, or 16 inches oc for other types of attachment. Provide fasteners approximately 2 inches from corners and ends of tracks.

Space studs 16 inches on center, unless otherwise indicated on the Drawings.

Use full length studs between tracks wherever possible. If necessary, splice studs with a minimum 8 inch nested lap and fasten with two screws per stud flange.

Install additional studs to support inside corners at partition intersections and corners, and to support outside corners, terminations of partitions, and both sides of control joints (if any).

Brace chase wall framing horizontally to opposite studs with 12 inch wide gypsum board gussets or metal framing braces, spaced vertically not more than 4 feet on center.

Attach gypsum board gussets with a minimum 3 screws per stud flange.

Attach metal framing braces with a minimum 2 screws per stud flange.

Where wall mounted door bumpers are scheduled, provide horizontal reinforcement consisting of 2 pieces of framing installed back-to- back, flush with the face of adjacent stud flanges.

Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

Curved Partitions:

Bend track to uniform curve and locate straight lengths so they are tangent to arcs.

Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches o.c.

* + - * 1. Direct Furring:

Screw to wood framing.

Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

* + - * 1. Z-Shaped Furring Members:

Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches o.c.

Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

* + - * 1. Resilient Furring Channel Installation: Where indicated as “resilient”, install resilient furring channels. Install furring at right angles to supports, spaced not more than 24 inches oc and not more than 6 inches from interior corners. Attach furring at each support and to corner framing with screws in accordance with manufacturer’s instructions.

"Installation Tolerance" paragraph below is based on recommendation in GA-216 for wood framing and in ASTM C840 for steel framing.

* + - * 1. 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.
      1. INSTALLING CEILING SUSPENSION SYSTEMS
         1. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

Generally, indicate suspension system component spacing on Drawings and delete "Hangers," "Carrying Channels (Main Runners)," and "Furring Channels (Furring Members)" subparagraphs below. ASTM C754 includes tabulations of suspension system component size and spacing based on supported ceiling area at a uniform load of 4 lbf/sq. ft.

Hangers: 48 inches o.c.

Retain "Carrying Channels (Main Runners)" subparagraph below for conventional ceiling suspension framing; delete if only grid suspension ceilings are required.

Carrying Channels (Main Runners): 48 inches o.c.

Furring Channels (Furring Members): 16 inches o.c.

* + - * 1. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
        2. Suspend hangers from building structure as follows:

Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

Wire Hangers: Secure 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 hangers to deteriorate or otherwise fail.

Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.

Retain applicable construction types below.

Do not attach hangers to steel roof deck.

Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.

Do not connect or suspend steel framing from ducts, pipes, or conduit.

Furring channels must be wire tied to supports in most fire-resistance-rated assemblies. Verify requirements of fire-resistance-rated assemblies and revise "Fire-Resistance-Rated Assemblies" paragraph below to suit Project.

* + - * 1. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

Retain "Seismic Bracing" paragraph below for seismic bracing and revise to include specific provisions to suit Project.

* + - * 1. Seismic Bracing: Sway-brace suspension systems with hangers used for support.

Grid suspension systems are suitable for use with gypsum board. They might be acceptable for gypsum veneer plaster; consult gypsum veneer plaster and grid suspension system manufacturers.

* + - * 1. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

Example tolerance in "Installation Tolerances" paragraph below is based on ASTM C636 for acoustical ceilings.

* + - * 1. 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.

END OF SECTION 092216