SECTION 09110

NON-LOAD-BEARING WALL FRAMING

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing light-gauge non-load bearing wall framing systems, including metal studs, wall furring, and backing plates.

B. Related Sections:

1. Ceiling suspension systems are specified in Section 09120.
2. Open grid suspension system is specified in Section 09132.
3. Gypsum board is specified in Section 09250.
4. Acoustical ceilings are specified in Section 09510.
5. Acoustical insulation and sealants are specified in Section 09820.

1.02 REFERENCE STANDARDS

A. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC).

1. LEED – NC v2.2 Reference Guide, first edition, dated December 2006.

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. General: Where stud gauge is not indicated, engineer non-load-bearing wall framing to comply with the following requirements.

B. Stud Systems: Select steel studs in accordance with manufacturer's load tables and the following deflection criteria, based on stud depth and spacing indicated and partition height required.

1. Deflection Criteria: L/240.

1.04 SUBMITTALS

A. Refer to Section 01352 – LEED Requirements for LEED related submittal requirements.

B. Product Data: Manufacturer's specifications and installation instructions for each type of metal support system, including provisions for fixture and equipment anchorage.

1. Recycled Content: Furnish product data on post-consumer recycled content and post-industrial recycled content as a percentage of the full product composite.
2. Regional Materials: Furnish product data or letter stating the location (closest city, state) where product was manufactured (final processing or assembly) and, if available, the location where raw materials were harvested, extracted or recovered (mine, quarry, plantation, forest, recycling recovery center, etc.).

C. Shop Drawings: Show provision for fixture and equipment anchorage to stud systems different from typical systems or details indicated.

1.05 QUALITY ASSURANCE

A. Tolerances: Provide metal studs and furring installations that are plumb, true, straight, and rigid.

B. Welder's Qualifications: AWS D1.1 and 1.3 as applicable.

1.06 ENVIRONMENTAL QUALITY ASSURANCE

A. Environmental Requirements: Metal studs, runners, and furring channels shall have a minimum 25-percent recycled content.

B. Applicable LEED Credits – Refer to Section 01352:

1. Credit MRc4 – Recycled Content.

2. Credit MRc5 – Regional Materials.

3. Credit EQc4.1 – Adhesives and Sealants.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

A. American Studco, Inc., Angeles Metal Systems, California Metal Systems, Inc., Design Shapes in Steel, Knorr Steel Framing Systems, Scafco Corporation, United Construction Supply, Western Metal Lath & Steel Framing Systems or approved equal.

2.02 MATERIALS

A. Metal Studs:

1. Material: Mill-certified galvanized steel conforming to ASTM A653, G40 coating, minimum yield strength 33,000-psi.

2. Construction: Formed C-channel section conforming to ASTM C645.

3. Stud Depth: As indicated.

4. Metal Thickness: As required for specified deflection criteria based on stud depth and spacing indicated and partition height required.

B. Runner Tracks:

1. Material: Mill-certified galvanized steel conforming to ASTM A653, G40 coating, minimum yield strength 33,000-psi.

2. Construction: Formed channel section conforming to ATM C645.

3. Size: Minimum 1-inch flange width; web depth matching studs.

4. Thickness: Same as studs.

5. Provide deflection track at top of partitions to accommodate floor slab or roof deck deflection.

C. Metal Channels: Mill-certified galvanized steel conforming to ASTM C653, G40 coating, minimum yield strength 33,000-psi.

1. Framing, Furring, and Stiffening:

Size, Inches	Pounds per 1,000 Lineal Feet
3/4 cold rolled	300
1-1/2 cold rolled	475
2 cold rolled	590

2. Furring Channels: Minimum 26-gauge galvanized steel with knurled faces; hat-shaped or Z-section as required.

D. Tie Wire: No. 16-gauge, galvanized, single-strand annealed steel or No. 18-gauge, galvanized, double-strand annealed steel.

E. Screws: ASTM C1002, Type S, pan head sheet metal screws, minimum 1/2-inch length.

F. Runner Track Fasteners: Tempered-steel pins with corrosive resistant plating or coating, 9/64-inch diameter, minimum 1-1/8-inch penetration, ICBO allowable shear value of 225-pounds.

G. Backing Plates: As detailed.

H. Compression or Isolation Strips: Fiberglass, 1/2-inch nominal thickness, width equal to width of tracks or studs where used; density such that material will compress to one-half or less of loose thickness.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION

A. Verify that conditions are satisfactory for the installation of metal support systems. Do not commence the installation until unsatisfactory conditions have been corrected.

B. Coordinate installation of metal support systems with the installers of other related work. Review areas of potential interference and conflicts, and coordinate layout and support provisions for interfacing work.

3.02 GENERAL INSTALLATION REQUIREMENTS

A. Install non-load-bearing steel framing members in accordance with ASTM C754, and as specified.

B. Cutting:

1. General: Cut framing components squarely or on angle as required to fit tightly with proper bearing against abutting members.

2. Cutting Studs: If stud web is cut more than 50-percent, or stud flanges are cut, restore stud to original strength by wire-tying, or welding on steel reinforcement.

C. When studs extend to the underside of structural floor or roof slabs, secure at top with a slip connection to accommodate slab deflection.

3.03 NON-LOAD-BEARING VERTICAL METAL FRAMING

A. Runner Tracks: Align at floor and ceiling with partition layouts. Secure to structure with specified fasteners located 2-inches from each end and spaced not to exceed 24-inches on center.

1. Coordinate installation of continuous isolation strips or acoustical sealant at acoustical partitions with installation of top and bottom runner tracks.

2. Where partition comes to underside of profile metal deck, create an acoustic seal to fill the profile. Use either metal plate or fiberglass and acoustic sealant, as indicated.

3. Provide deflection track at underside of floor slab or roof deck construction to accommodate structural deflection.

B. Installation of Metal Studs:

1. Install studs spaced 16-inches on center unless otherwise indicated. Screw-fasten framing connections using a minimum of 2 screws for each connection.

2. At partition corners and intersections, provide a minimum of 3 studs.

3. Splice studs where required, by nesting with a minimum lap of 8-inches; fasten laps with 2 screws through each flange.

4. Unless otherwise indicated, frame door openings with double 16-gauge vertical studs securely attached to each jamb of door frame.

   a. At head, install runner track; cut flanges at ends, bend web 90-degrees and screw attach to jamb studs.

   b. Install jack studs over door opening, spaced same as full-height studs.

   c. Where control joints extend upward from door jambs, install a jack stud spaced 1/2-inch from each jamb stud. Space next full-height stud not more than 6-inches from each jamb stud.

   d. Attach jamb studs to metal door frames with metal clips, each with 2 screws into jamb stud.

   e. Attach jamb studs to wood door frames with pairs of wood screws, spaced 24-inches on center.

5. Frame openings other than door openings in the same manner as for doors, and install framing below sills of openings to match framing required above door heads.

6. Frame both sides of expansion and control joints with a separate stud; do not bridge the joint with framing components.

7. Install continuous horizontal stiffeners in partitions where recommended by stud manufacturer for partition height, stud gauge, stud spacing, number of layers of gypsum board used, and anticipated stud deflection.

8. Stiffen openings with horizontal channels. Provide one channel continuous across head of openings extending to third stud beyond on each side. Provide one channel at each frame anchor extending to third stud beyond. Wire-tie or weld horizontal channels to each stud.

C. Chase-Wall Framing:

1. Align two parallel rows of floor and ceiling runners according to partition layout.

2. Position steel studs vertically in runners with flanges in same direction, with studs on opposite sides of chase directly across from each other. Anchor to runners in accordance with manufacturer's instructions.

3. Cross brace chase studs with 12-inch gypsum wallboard gussets or minimum 2-1/2-inch steel studs. Attach web-to-web with screws. If chase wall studs are not opposite, brace with horizontal runners and braces.

D. Wall Furring, Direct Attachment:

1. Attach hat-shaped metal furring channels either vertically or horizontally. For furring positioned horizontally, attach a furring member not more than 4-inches from both the floor and ceiling. Secure with fasteners placed on alternate channel flanges, spaced on 24-inch centers.

2. Attach Z-shaped metal channels vertically, spaced 24-inches on center unless otherwise indicated, with fasteners spaced 24-inches on center.

3.04 BACKING PLATES

A. Install as indicated and where indicated or required for support of wall-hung cabinets, toilet partitions and accessories, equipment, and other items to be mounted on vertical surfaces.

B. Welding shall comply with AWS D1.3.

C. Paint welds with a rust-inhibitive paint.

3.05 SOUND CONTROL WORK

A. Specified requirements apply to framing for interior partitions indicated as sound partitions.

B. Isolate top and bottom runners from direct contact with structure by installing over either:

1. Continuous isolation strips as specified, or

2. Two continuous 1/4-inch beads of acoustical sealant specified in Section 09820 applied at quarter points of track width.

C. Studs at terminal ends of partitions abutting intersecting walls or partitions, and studs that would otherwise contact intermediate structural columns shall be similarly installed over strips or sealant.

3.06 INSTALLATION TOLERANCES

A. Variation from Plumb: Maximum 1/8-inch in 10-feet.

B. Variation from Level: Maximum 1/8-inch in 10-feet.

C. Variation from True Plane: Maximum 1/8-inch in 10-feet.

D. Variation from True Position: Maximum 1/4-inch.

E. Variation of Member from Plane: Maximum 1/8-inch.

3.07 WASTE MANAGEMENT

A. Separate and recycle waste materials to the maximum extent possible.

END OF SECTION

SECTION 09120

CEILING SUSPENSION

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing ceiling suspension systems, including suspended system for gypsum board and ceilings and portland cement plaster soffits.

B. Related Sections:

1. Suspended open grid ceiling system is specified in Section 09130.
2. Metal lath and accessories are specified in Section 09207.
3. Portland cement plaster is specified in Section 09220.
4. Gypsum board is specified in Section 09250.
5. Suspension system for acoustical ceilings is specified in Section 09510.

1.02 REFERENCE STANDARDS

A. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC).

1. LEED – NC v2.2 Reference Guide, first edition, dated December 2006.

1.03 SUBMITTALS

A. Refer to Section 01352 – LEED Requirements for LEED related submittal requirements.

B. Product Data: Manufacturer's specifications and installation instructions for each type of suspension system, including provisions for fixture and equipment anchorage.

1. Include ICBO test reports showing proposed hanger and bracing wire fasteners are capable of supporting specified loads.
2. Recycled Content: Furnish product data on post-consumer recycled content and post-industrial recycled content as a percentage of the full product composite.
3. Regional Materials: Furnish product data or letter stating the location (closest city, state) where product was manufactured (final processing or assembly) and, if available, the location where raw materials were harvested, extracted or recovered (mine, quarry, plantation, forest, recycling recovery center, etc.).

1.04 QUALITY ASSURANCE

A. Ceiling-support system shall limit deflection of finished ceilings to less than L/360.

1.05 ENVIRONMENTAL QUALITY ASSURANCE

A. Environmental Requirements: Metal ceiling suspension components shall have a minimum 25-percent recycled content.

B. Applicable LEED Credits – Refer to Section 01352:

1. Credit MRc4 – Recycled Content.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver products in the original unopened packages, containers, or bundles with manufacturer's label intact and legible.

B. Remove products delivered in broken, damaged, rusted, or unlabeled condition from Project site immediately.

C. Protect products from rusting and other sources of damage.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Metal Channels: ASTM C645, galvanized in accordance with ASTM A525, G60 coating designation.

1. Framing, Furring, and Stiffening:

Size, Inches	Pounds per 1,000 Lineal Feet
3/4 cold rolled	300
1-1/2 cold rolled	475
2 cold rolled	590

2. Furring Channels: Minimum 26-gauge galvanized steel with knurled faces; hat-shaped or Z-section as required.

B. Hanger Wire: Galvanized, soft, mild annealed steel; 8-gauge, unless otherwise indicated.

C. Diagonal Bracing Wire: Galvanized, soft, mild annealed steel; 12-gauge, unless otherwise indicated.

D. Tie Wire: No. 16-gauge, galvanized, single-strand annealed steel or No. 18-gauge, galvanized, double-strand annealed steel.

E. Screws:

1. General: ASTM C646, corrosion resistant, for attachment to metal framing 25-gauge and lighter; ASTM C954 for attachment to metal framing 20-gauge and heavier.

2. Thread and head designs and lengths as recommended by manufacturer for uses and materials involved.

F. Hanger and Bracing Wire Fasteners:

1. Hanger Wires: Connection device capable of carrying not less than 100-pounds.

2. Bracing Wires: Connection device capable of carrying not less than 200-pounds or the actual design load, whichever is greater, with a safety factor of 2 without yielding.

G. Furring Channel Clips: Fabricated from galvanized wire, for attaching furring channels to cold-rolled channels.

H. Compression Struts: As indicated.

PART 3 - EXECUTION

3.01 SUSPENDED CEILING SUSPENSION FRAMING

A. Space 8-gauge hanger wires 48-inches on center along carrying channels and within 8-inches of ends of carrying channels.

B. Install 1-1/2-inch cold rolled carrying channels 48-inches on center and within 8-inches of walls. At splices, interlock flanges, overlap ends 12-inches, and wire-tie with double loops of No. 16-gauge wire.

C. Install 3/4-inch cold rolled channels at right angles to carrying channels, spaced 24-inches on center and within 6-inches of walls. Provide one-inch clearance between furring channels and abutting walls and partitions. Attach to carrying channels by saddle-tying around carrying channels with one strand of No. 16 or two strands of No. 18-gauge tie wire. At splices, nest furring channels with a minimum 8-inch overlap and wire-tie each end with double loops of No. 16-gauge wire. In lieu of cold-rolled channels, furring channels with clips may be used at gypsum board ceilings.

D. Install 4-way 45-degree diagonal bracing wires at 12'-0" x 12'-0" within 6-inches of walls. Diagonal bracing wires shall be located at the intersection of main runner and cross-furring member. Provide connection between diagonal wires and main runner so as to prevent slipping for a 200-pound approximate seismic load.

E. Install hanger and bracing wire anchors so the direction of the wire aligns as closely as possible with the direction of the forces acting on the wire.

F. Separate ceiling hanging and bracing wires at least 6-inches from unbraced ducts, pipes, and conduit.

G. Fasten hanger wires with not less than 3 tight turns; fasten bracing wires with not less than 4 tight turns. Make all tight turns within a distance of 1-1/2-inches.

H. Install compression struts for each 144-square feet of ceiling, as indicated.

I. At control joints, provide discontinuous lap in main runners occurring over joints. Do not bridge joints with cross furring where joints run perpendicular to furring. Where joints run parallel to furring, provide furring to support each side of joint.

J. Provide recesses and openings where indicated for lighting fixtures, registers, access panels, and other items to be installed in ceilings; provide additional furring channels where required by opening.

K. Recessed or drop-in light fixtures shall be supported directly by main runners or by supplemental framing supported by main runners.

L. Surface mounted fixtures shall be attached to a main runner with a positive clamping device made of material with a minimum of 14-gauge. Rotational spring catches are not acceptable.

3.02 WASTE MANAGEMENT

A. Separate and recycle waste materials to the maximum extent possible.

END OF SECTION

SECTION 09130

OPEN GRID SUSPENSION SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing open grid suspension system.

B. Related Sections:

1. Suspension system for gypsum board ceilings and portland cement soffits are specified in Section 09120.

2. Suspension system for acoustical ceilings is specified in Section 09510.

1.02 REFERENCE STANDARDS

A. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC).

1. LEED – NC v2.2 Reference Guide, first edition, dated December 2006.

1.03 SUBMITTALS

A. Refer to Section 01352 – LEED Requirements for LEED related submittal requirements.

B. Shop Drawings:

1. Indicate ceiling-system layouts and general and atypical conditions and details.

2. Include details of bracing, special features and joints, perimeters, relationship to adjacent construction, and anchorage and connections to structures.

C. Product Data: Manufacturer's descriptive and technical data and illustrations, marked to identify product materials, types, and variations.

1. Recycled Content: Furnish product data on post-consumer recycled content and post-industrial recycled content as a percentage of the full product composite.

2. Regional Materials: Furnish product data or letter stating the location (closest city, state) where product was manufactured (final processing or assembly) and, if available, the location where raw materials were harvested, extracted or recovered (mine, quarry, plantation, forest, recycling recovery center, etc.).

D. Material Samples: Duplicate sets of 10-inch-long pieces of grid system and perimeter trim members with one end as factory fabricated, and connection and fastening accessories and devices.

1.04 QUALITY ASSURANCE

A. Installer's Qualifications: Regularly providing installation of assemblies of the types required for not less than 5-years prior to work under this Contract.

B. Suspension systems shall be designed, fabricated, and installed to meet requirements of ASTM C635 and ASTM C636.

1.05 ENVIRONMENTAL QUALITY ASSURANCE

A. Environmental Requirements: Acoustical suspension systems shall have a minimum 25-percent recycled content.

PART 2 - PRODUCTS

2.01 OPEN GRID SUSPENSION SYSTEM

A. Approved Manufacturers: Armstrong "Silhouette XL", USG Interiors, Inc. "Donn Fineline DXF System" or approved equal.

B. Main and Cross Runners: 9/16-inch flange with ¼-inch wide reveal, 1-1/2-inch high web.

C. Wall Angle, Reveals, and Miscellaneous Trim: Roll-formed from electro-galvanized steel strip to profiles indicated.

D. Finish: Factory-applied low gloss enamel, color as selected by the Architect.

E. Structural Classification: Heavy duty meeting the requirements of ASTM C635.

2.02 SUSPENSION MATERIALS AND FASTENINGS

A. Wire:

1. General: ASTM A641, galvanized steel, regular coating, soft temper; factory pre-straightened units.

2. Hanger and Safety Wires: 12-gauge.

B. Wire Connections to Overhead Structures:

1. Hanger Wires: Connection device capable of carrying not less than 100-pounds.

2. Bracing Wires: Connection device capable of carrying not less than 200-pounds or the actual design load, whichever is greater, with a safety factor of 2 without yielding.

C. Fastenings for Accessories:

1. Bolts or screws of adequate size, in types appropriate for conditions and materials involved, made of corrosion-resistant materials or coated as approved.

2. Concealed only, unless otherwise indicated or approved.

PART 3 - EXECUTION

3.01 INSTALLATION REQUIREMENTS

A. Installations shall be in accordance with manufacturers' instructions and reviewed shop drawings.

B. Anchor hanger and bracing wire anchors so that the direction of the wire aligns as closely as possible with the direction of the forces acting on the wire.

C. Provide 12-gauge hanger wires at the ends of all main and cross runners within 8-inches from the support or within 1/4 of the length of the end tee, whichever is least, for the perimeter of the ceiling area.

D. Provide trapeze or other supplementary support members at obstructions to main hanger spacing. Provide additional hangers, struts or braces as required at all ceiling breaks, soffits or discontinuous areas. Hanger wires more than 1 in 6 out of plumb shall have counter-sloping wires.

E. Ceiling grid members shall be attached to not more than 2 adjacent walls. Ceiling grid members shall be at least 1/2-inch free of other walls.

F. At the perimeter of the ceiling area where main or cross runners are not connected to the adjacent wall, provide interconnection between the runners at the free end to prevent lateral spreading.

G. Provide sets of four 12-gauge splayed bracing wires oriented 90-degrees from each other at the following spaces:

1. Place sets of bracing wires at a spacing not more than 12-feet by 12-feet on center.

2. Provide bracing wires at locations not more than 1/2 the specified spacing from each perimeter wall and at the edge of vertical ceiling offsets.

3. The slope of these wires shall not exceed 45-degrees from the plane of the ceiling and shall be taut without causing the ceiling to lift. Splices in bracing wires are not permitted.

H. Fasten hanger wires with not less than 3 tight turns; fasten bracing wires with 4 tight turns. Make tight turns within a distance of 1-1/2-inches.

I. Support of Light Fixtures and Air Terminals:

1. Ceiling suspension systems that support light fixtures, air-ventilation grilles or partitions shall have a classification of heavy-duty.

2. Recessed or drop-in light fixtures and grilles shall be supported directly from the fixture housing to the structure above with a minimum of two 12-gauge wires located at diagonally opposite corners. Fixture support wires may be slightly loose to allow the fixture to seat in the grid system.

3. Fixture shall not be supported from main runners or cross runners if the weight of the fixtures causes the total dead load to exceed the deflection capability of the ceiling suspension system.

J. Installation Tolerances:

1. Bottom surface plane of each assembly shall be within plus or minus 1/8-inch of ceiling-height level required.

2. Bottom surface plane of each assembly shall be level and true to plane within 1/8-inch in 12-feet.

3.02 PERIMETER TRIM

A. Provide in longest lengths available and combinations of lengths to minimize number of joints required.

B. Do not use pieces shorter than 48-inches.

C. Miter joints at corners.

D. Install to neatly close with adjoining vertical surfaces.

3.03 COMPLETION

A. Adjust hangers as required. Addition of kinks or bends in hanger are not acceptable; take up in ties only.

B. When complete, grid members of each assembly shall be mutually parallel/square, accurately aligned, with joints neatly formed and closely fitted and aligned flush; each assembly shall be securely anchored and braced to structure to prevent movement.

C. Exposed surfaces of grids shall be clean and free from scratches, dents, tool marks, stains, discoloration, fingerprints, and other defects and damage.

3.04 WASTE MANAGEMENT

A. Separate and recycle waste materials to the maximum extent possible.

END OF SECTION