

SECTION 092216 - NON-STRUCTURAL METAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes non-load-bearing steel framing members for the following applications:
 - 1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).
 - 2. Interior suspension systems (e.g., supports for ceilings, suspended soffits, etc.).
 - 3. Specialty interior suspension systems for creating curving bulkheads.
- B. Related Sections include the following:
 - 1. Division 07 Section "Fire-Resistive Joint Systems" for head-of-wall joint systems installed with non-load-bearing steel framing.
 - 2. Division 09 Section "Gypsum Board" for wall panel products intended for installation on non-structural metal framed construction.
 - 3. Division 09 Section "Gypsum Board Shaft Wall Assemblies" for non-load-bearing metal shaft-wall framing, gypsum panels, and other components of shaft-wall assemblies.
 - 4. Division 06 Sections "Interior Finish Carpentry" and "Interior Architectural Woodwork" for equipment requiring supplementary metal backing.

1.3 PERFORMANCE REQUIREMENTS

- A. General: All interior wall studs shall be designed to support 5 psf lateral load. All bulkhead and ceiling framing shall be designed to support minimum 10 psf live load in addition to the combined dead loads of the structure and all equipment and appurtenances to be supported.
- B. Limiting Height of Assemblies: Apart from and in addition to the requirements for fire-resistance-rated assemblies specified below, provide non-structural metal framing within partition and ceiling assemblies to withstand lateral loading and limit deflection in accordance with the following:
 - 1. Maximum Lateral Deflection:

- a. Stud Partitions: L/240 when subjected to lateral loading of 7.5 (psf) pounds per square foot.
 - b. Suspended Furring Member and Steel Stud Ceilings: L/240 when subjected to lateral loading of 5.0 (psf) pounds per square foot.
- C. Where conditions suggest that proposed design(s) of partition and ceiling assemblies may not be adequate to achieve deflection limit criterion specified above, augment metal framing, as required, by reference to metal component manufacturer's published composite limiting height and limiting span tables.
- 1. Augmentation may include increases in the gauge of framing members, width of members and their spacing; number and spacing of screws for attaching panel products, and lateral bracing.
 - 2. Refer to Section 3.3 – “Augmenting Strength of Framed Wall Assemblies” in this specification.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE

- A. 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 E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 - 2. Protective Coating: ASTM C645/C645M, G40 (Z120) or equivalent corrosion resistance coating.

2.2 SUSPENSION SYSTEM COMPONENTS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
- B. Attachment Devices: Size for at least four times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. Anchors For Use in Concrete-Filled Metal Decks: Anchors of type and material designed for casting into the underside of concrete decks after being fastened to the flutes of metal deck forms; with threaded sleeves for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to four times that imposed by ceiling construction, as determined by testing per ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Type: Compression spring, expansion anchor, metal deck insert with multi-thread sleeve to accommodate hanging threaded rods; "Blue Banger Hanger Metal Deck Insert" by Simpson Strong-tie Anchor Systems.
 - b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
 - 2. Direct attachment to non-concrete filled steel roof decks is strictly prohibited. Install an intermediate grid support system for the purpose instead, attached to the bottom flanges of structural steel framing members and complying with the following.
 - a. Channel support 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 by ASTM E 1190, conducted by a qualified design and inspecting agency.
- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
- D. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch (4.12-mm) diameter.
- E. Flat Hangers: Steel sheet, 1 by 3/16 inch (25.4 by 4.76 mm).
- F. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch (1.37 mm) and minimum 1/2-inch- (12.7-mm-) wide flanges.
 - 1. Depth: 2-1/2 inches (64 mm), 2 inches (51 mm), or 1-1/2 inches (38 mm).
- G. Furring Channels (Furring Members):

1. Cold-Rolled Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges, 3/4 inch (19.1 mm) deep.
 2. Steel Studs: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.0179 inch (0.45 mm).
 - b. Depth: 1-5/8 inches (41.3 mm), 2-1/2 inches (63.5 mm), or 3-5/8 inches (92.1 mm).
 3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22.2 mm) deep.
 - a. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm).
 4. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical or hat shaped.
- H. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation; SpanFast Drywall Furring System.
 - c. USG Corporation; Drywall Suspension System.

2.3 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Steel Studs and Runners: ASTM C 645.
1. Minimum Base-Metal Thickness:
 - a. Partitions to Underside of Structure Above: 0.0312 inches (0.792 mm), (20 DW gauge).
 - b. Partitions to Suspended Ceilings and Bulkheads: 0.0188 Inches (0.478 mm), (25 gauge).
 - c. Partitions terminating just above Suspended Ceilings: 0.0188 Inches (0.478 mm), (25 gauge).
 2. Depth: 3-5/8 inches (92.1 mm), 6 inches (152.4 mm), 2-1/2 inches (63.5 mm) and 1-5/8 inches (41.3 mm), where indicated on drawings.
- B. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fire Trak Corp.; Fire Trak [attached to studs with Fire Trak Slip Clip].
 - b. Metal-Lite, Inc.; The System.
 - c. Dietrich Metal Framing Corp.; SLP-TRK slotted track.

- C. Flat Strap Backing for Hanging Light Load Accessories: Steel sheet for blocking and bracing in lengths and widths required.
 1. Minimum Base-Metal Thickness: 0.0188 inch (0.48 mm).

- D. Clipped Track Backing: For Hanging Heavy Load Accessories: Steel runner, notched to fit flush around studs, in lengths required for blocking.
 1. Minimum Base-Metal Thickness: 0.0346 inch (0.88 mm).

- E. Cold-Rolled Channel Bridging: 0.057-inch (1.44-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.
 1. Depth: 1-1/2 inches (38.1 mm).
 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38.1 by 38.1 mm), 0.057-inch- (1.44-mm-) thick, galvanized steel.

- F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 1. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm).
 2. Depth: 7/8 inch (22.2 mm), where indicated on drawings.

- G. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep, steel sheet members designed to reduce sound transmission.
 1. Configuration: Asymmetrical or hat shaped.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

- B. Isolation Strip at Exterior Walls: Provide one of the following:
 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

2.5 INTERMEDIATE GRID SUPPORT SYSTEM

- A. Slotted Channels, fittings and Accessories: Where required to install ceiling below and independent of steel roof decking, provide support framing where required to support ceiling below and independent of steel roof decks, consisting of steel channels clamped to flanges of steel beams.
1. Slotted Channel Framing: 12 Gauge cold roll-formed carbon steel conforming to ASTM 570 GR 33 and A446 GRA.
 2. Fittings – angles, splice plates, beam clamps, side beam brackets: Punch pressed hot rolled steel plate, strip or coil conforming to ASTM A 575, A 576, A 635 and A 636.
 3. Hardware – channel nuts, bolts, screws: Press formed, machined and hardened steel conforming to ASTM A 576, A 675, and A 108.
 4. Finish: Electro-plated zinc (EG) conforming to ASTM B 633 SC1.
- B. UL Listed Systems:
1. B-Line Systems Inc's B-22 (1-5/8 x 1-5/8 inches), B-12 (1-5/8 x 2-7/16 inches), B-11 (1-5/8 x 3-1/4 inches).
 2. Caddy/Erico Product, Inc's A12 (1-5/8 x 1-5/8 inches), D12 (1-5/8 x 2-7/16 inches), E12 (1-5/8 x 3-1/4 inches).
 3. Grinnells Corp.'s Allied Power-Strut PS 200 (1-5/8 x 1-5/8 inches), PS 150 (1-5/8 x 2-7/16 inches), PS 100 (1-5/8 x 3-1/4 inches).
 4. Kindorf's B-900 (1-1/2 x 1-1/2 inches), B-901 (1-1/2 x 1-7/8 inches), B-902 (1-1/2 inches x 3 inches).
 5. Unistrut Corp.'s P-3000 (1-3/8 x 1-5/8 inches), P-5500 (1-5/8 x 2-7/16 inches), P-5000 (1-5/8 inches x 3-1/4 inches).
 6. Versabar Corp.'s VA-1 (1-5/8 x 1-5/8 inches), VA-2 (1-5/8 x 2-1/2 inches).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

1. Furnish concrete-filled steel deck inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
2. Do not attempt any direct anchorage from non-concrete-filled steel decks. Ceiling hangers are to be supported, instead, from structural steel frame or an independent gridwork, itself supported from structural steel framing.

B. Coordination with Sprayed Fire-Resistive Materials:

1. Before sprayed fire-resistive materials are applied, attach; all require beam clamps for slotted channels, offset anchor plates or ceiling runners (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 (600 mm) o.c.
2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing and suspension systems. Do not reduce thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 AUGMENTING STRENGTH OF FRAMED WALL ASSEMBLIES

A. In evaluating strength of specified interior, non-load bearing, metal framing wall systems use the following tables:

1. Assuming lateral loading equal to 7.5 psf, with deflection limit of L/240, and the contribution of ½" gypsum wallboard on both sides, the composite limiting height for various interior non-load bearing, metal stud framing systems is as follows:

- a. Minimum Base-Metal Thickness: 0.0188 inches (0.478 mm), (25 gauge), (18 mils); $F_y = 33$ ksi:

Stud Width	Spacing (inches)	Limiting Height
3 5/8	24	11'-0"
	16	12'-5"
	12	13'-3"
4	24	12'-1"
	16	13'-4"
	12	14'-4"
6	24	13'-5"
	16	16'-2"
	12	18'-7"

- b. Minimum Base-Metal Thickness: 0.312 inches (0.792 mm), (20 DW gauge), (30 mils); $F_y = 33$ ksi:

Stud Width	Spacing (inches)	Limiting Height
3 5/8	24	12'-0"
	16	13'-7"
	12	14'-10"
4	24	13'-5"
	16	15'-2"
	12	16'-6"
6	24	17'-8"
	16	20'-3"
	12	22'-3"

3.4 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.5 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components in sizes and spacings specified, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. 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 locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards, but to result in a deflection of not more than L/240.
 3. 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.
 4. 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.
 5. Do not attach hangers to steel roof deck. Attach hangers to structural steel frame members or to intermediate gridwork, such as specified above, supported from structural steel frame members only.
 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms, such as specified above.
 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- F. 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.
- G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.6 INSTALLING FRAMED ASSEMBLIES

- A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

- B. Install studs so flanges within framing system point in same direction.
1. Space studs as follows:
 - a. Single-Layer Application: 16 inches (406 mm) and 24 inches (610 mm) o.c., as indicated on Drawings.
 - b. Multilayer Application: 16 inches (406 mm) and 24 inches (610 mm) o.c., as indicated on Drawings.
 - c. Tile backing panels: 16 inches (406 mm) o.c., unless otherwise indicated.
- C. Install tracks (runners) 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 penetrating partitions above ceiling.
1. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb, unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 2. 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.
 3. 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.
 - a. Firestop Track: Install in all head-of-wall conditions to maintain continuity of fire-resistance-rated assemblies.
 4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- D. Direct Furring:
1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
- E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION 092216