

SECTION 05400

COLD-FORMED METAL FRAMING



PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cold-formed metal floor joists, rims and bridging.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry.
- B. Section 07210 - Building Insulation.
- C. Section 09110 - Non-Load Bearing Wall Framing.

1.3 REFERENCES

- A. ASTM A 780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- B. ASTM A 1003 - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
- C. ASTM B 633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
- D. ASTM C 955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.
- E. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
- G. AISC - LRFD Manual of Steel Construction.
- H. AWS D.1.3 - Structural Welding Code - Sheet Steel.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design, engineer, fabricate, and erect cold-form steel floor framing to withstand specified design loads within limits and under conditions required.

1. Design Loads including Dead Load and Live Load: As required by code and as indicated on the Drawings.
2. Deflection: Total load deflection of L/240; live load deflection of L/360.
3. Deflection: Total load deflection of L/240; live load deflection of L/480.
4. Joist Spacing: 12 inches (305 mm) on center.
5. Joist Spacing: 16 inches (406 mm) on center.
6. Joist Spacing: 19.2 inches (487 mm) on center.
7. Joist Spacing: 24 inches (609 mm) on center.
8. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to maximum ambient temperature change (range) of 120 degrees F (67degrees C).

## 1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Submit manufacturer' s product literature, data sheets and installation recommendations for specified products.
- C. Structural Calculations: Submit structural calculations prepared by manufacturer for approval. Submittal shall be sealed by a professional engineer registered in the state of the project.
  1. Description of design criteria.
  2. Engineering analysis depicting stress and deflection (stiffness) requirements for each framing application.
  3. Selection of framing components, accessories and welded connection requirements.
  4. Verification of attachments to structure and adjacent framing components.
- D. Shop Drawings:
  1. Submit shop drawings prepared by the manufacturer showing plans, sections, elevations, layouts, profiles and product component locations, including anchorage, bracing, fasteners, accessories and finishes.
  2. Show connection details with screw types and locations, weld lengths and locations, and other fastener requirements.
  3. Where prefabricated panels are to be provided, provide drawings depicting panel configurations, dimensions and locations.

## 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Fabrication shall be performed by a cold-formed steel truss fabricator with experience designing and fabricating cold-formed steel truss systems equal in material, design, and extent to the systems required for this Project.
- B. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
- C. Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, and manufacturer' s installation instructions.
- D. Welding Standards: Comply with applicable provisions of AWS D1.1 " Structural Welding Code—Steel" and AWS D1.3 " Structural Welding Code—Sheet Steel."
  1. Qualify welding processes and welding operators in accordance with AWS " Standard Qualification Procedure."

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer' s original, unopened, undamaged containers with identification labels intact.
- B. Store materials protected from exposure to rain, snow or other harmful weather conditions, at temperature and humidity conditions.
- C. Protect joists and accessories from corrosion, deformation, damage and deterioration when stored at job site. Keep joists free from dirt and foreign matter.

## 1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. During construction, adequately distribute all loads applied to joists so as not to exceed the carrying capacity of any one joist or other component.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer Aegis Metal Framing LLC; 14515 North Outer 40 Drive, Suite 110, Chesterfield, MO 63017. ASD. Tel: (866) 902-3447 or (314) 851-2200. Fax: (314) 434-5234. [www.aegismetalframing.com](http://www.aegismetalframing.com). Email: [answers@aegismetalframing.com](mailto:answers@aegismetalframing.com).
- B. Superior Truss & Panel, Inc., 2204 W. 159<sup>th</sup> St., Markham, IL. 60426 Tel (708) 339-1200. Fax (708) 339-1248. [www.superior-truss.com](http://www.superior-truss.com) Contact Bryce Welty or Mike Goncher
- C. Substitutions: Not permitted.
- D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

### 2.2 COMPONENTS

- A. Floor Joists with 1-3/4 inches (45 mm) Flange: Cold formed Galvanized Steel C-Joist, TradeReady Floor System:
  1. Size: 7-1/4 inches (184 mm) deep, 4-1/4 by 7 inches (108 by 178 mm) holes.
  2. Size: 8 inches (203 mm) deep, 4-1/4 by 7 inches (108 by 178 mm) holes.
  3. Size: 9-1/4 inches (235 mm) deep, 6-1/4 by 9 inches (159 by 229 mm) holes.
  4. Size: 11-1/4 inches (286 mm) deep, 6-1/4 by 9 inches (159 by 229 mm) holes.
  5. Minimum Delivered Thickness: 18 gage, 0.0428 inch (1.22 mm).
  6. Minimum Delivered Thickness: 16 gage, 0.0538 inch (1.37 mm).
  7. Minimum Delivered Thickness: 14 gage, 0.0677 inch (1.72 mm).
  8. Minimum Delivered Thickness: 12 gage, 0.0966 inch (2.45 mm).
- B. Floor Joists with 2 inches (51 mm) Flange: Cold formed Galvanized Steel C-Joist, TradeReady Floor System:
  1. Size: 10 inches (254 mm) deep, 6-1/4 by 9 inches (159 by 229 mm) holes.
  2. Size: 12 inches (305 mm) deep, 8 inches (203 mm) diameter holes.
  3. Size: 14 inches (356 mm) deep, 10 inches (254 mm) diameter holes.
  4. Minimum Delivered Thickness: 16 gage, 0.0538 inch (1.37 mm).
  5. Minimum Delivered Thickness: 14 gage, 0.0677 inch (1.72 mm).

6. Minimum Delivered Thickness: 12 gage, 0.0966 inch (2.45 mm).
- C. Framing Components: Provide the following components as required for a complete system.
  1. Rim sections with tabs suitable for joist spacing, web sizes and gage suitable for design.
  2. Bridging sections fitting joist spacing, 2-1/2 inch (64 mm) web size, 18 gage, 0.0428 inches (1.22 mm) delivered thickness.
- D. Fasteners: Self-drilling, self-tapping screws; Steel, complying with ASTM C1002; Galvanized coating, plated or oil-phosphate coated complying with ASTM B 633 as needed for required corrosion resistance.
- E. Touch-Up Paint: Zinc rich, containing 95-percent metallic zinc, ZRC 350 as manufactured by ZRC Worldwide, Marshfield, MA.

### 2.3 MATERIALS

- A. Cold-Formed Steel Sheet: Complying with ASTM A 1003/A 1003M; unless indicated otherwise.
- B. Galvanized Coating: G60 coating weight minimum, complying with ASTM C 955.
- C. Galvanized Coating: G90 coating weight minimum, complying with ASTM C 955.

### 2.4 FABRICATION

- A. Fabricate panels square, with components attached in a manner so as to prevent racking or distortion.
- B. Cut all framing components squarely for attachment to fit against abutting members. Hold members positively in place until properly fastened.
- C. Fasteners: Fasten components using self-tapping screws or welding.
- D. Welding: Welding is permitted on 18 gage, 0.0428 inch (1.22 mm) or heavier material only.
  1. Specify welding configuration and size on the Structural Calculation submittal.
  2. Qualify welding operators in accordance with Section 6.0 of AWS D.1.3.
  3. Touch up all welds with zinc-rich paint in compliance with ASTM A 780.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Prior to installation, inspect previous work of all other trades. Verify that all work is complete and accurate to the point where this installation may properly proceed in strict accordance with framing shop drawings.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

### 3.2 INSTALLATION

- A. General Installation Requirements:
  - 1. Install cold formed framing in accordance with requirements of ASTM C1007.
  - 2. Weld in compliance with AWS D.1.3.
  - 3. Install in compliance with applicable sections of the LRFD Manual of Steel Construction.
  
- B. Steel Joists:
  - 1. Locate joists directly over bearing studs or provide a suitable load distribution member at the top track.
  - 2. Provide web stiffeners at reaction points where indicated in drawings.
  - 3. Provide joist bridging as shown in drawings.
  - 4. Provide end blocking where joist ends are not otherwise restrained from rotation.

### 3.3 FIELD QUALITY CONTROL

- A. Inspection: Periodic special inspections are required by local code authorities.
  - 1. Owner will hire and pay inspection agency.
  - 2. Submit schedule showing when the following activities will be performed and resubmit schedule when timing changes.
  - 3. Notify inspection agency not less than 3 days before the start of any of the following activities.
  - 4. Inspections are required during welding operations, screw attachment, bolting, anchoring and other fastening of components within the force resisting structural system, including struts, braces, and hold-downs.

### 3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION