



SECTION 05 40 00

COLD FORMED METAL FRAMING

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**\*\* NOTE TO SPECIFIER \*\* Steeler Inc.; products.**

This section is based on the products of Steeler Inc., which is located at:  
10023 Martin Luther King Jr. Way S.  
Seattle, WA 98178  
Toll Free Tel: 800-275-2279  
Tel: 206-725-2500  
Fax: 206-725-1700

Email: [request info \(sales@steeler.com\)](mailto:request info (sales@steeler.com))

Web: [www.steeler.com](http://www.steeler.com)

[ [Click Here](#) ] for additional information.

Created in 1974 by Founder and President Matt Surowiecki in Seattle, Washington. Steeler is the only continuously operated Steel Stud manufacturer that has been in business in the U.S.A. since 1974 without being sold or declaring bankruptcy. Steeler steel framing products are engineered from prime-grade steel to meet the maximum seismic ratings and to comply with the International Building Code and the related ASTM code requirements for each product.

Steeler, Inc., products are engineered to meet the AISI publication "Specifications for the Design of Cold Formed Steel Structural Members".

Exclusive manufacturer of Steeler-Designed, high-quality construction screws. Steeler screws meet or exceed all the specifications as stated in ASTM C1002 and ASTM C954. Manufacturer of steel studs, track, joists, custom brake shapes (up to 32 ft.), Steeler Engineered Slide Clips, ShaftWall Studs, CRC/DWC, Resilient Channel, Black Track, Slip Track, Deflection Track, Corner Bead and Hanger Wire.

Distributor of drywall products including gypsum wallboard, drywall mud, cornerbeads, finishing products and many other accessories. Steeler also carries the highest quality tools and replacement parts in the industry. Uniquely organized to provide 12 product lines to the Drywall Industry. Customer-Focused Service has expanded Steeler to multiple locations in the Western United States and Canada. Capable of producing ten million pounds of custom steel framing monthly.

PART 1 GENERAL

1.1 SECTION INCLUDES

**\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.**

- A. Exterior load-bearing wall framing.
- B. Interior load-bearing wall framing.
- C. Exterior non-load-bearing wall framing.

- D. Floor joist framing.
- E. Roof rafter framing.
- F. Ceiling joist framing.
- G. Shear wall framing.

## 1.2 RELATED SECTIONS

**\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.**

- A. Section 05 31 13 - Steel Floor Decking.
- B. Section 05 31 00 - Steel Decking.
- C. Section 05 50 00 - Metal Fabrications.
- D. Section 06 11 00 - Wood Framing.
- E. Section 06 11 00 - Wood Framing.
- F. Section 07 21 26 - Blown Insulation.
- G. Section 07 26 00 - Vapor Retarders
- H. Section 07 27 26 - Fluid-Applied Membrane Air Barriers .
- I. Section 07 84 53 - Building Perimeter Firestopping .
- J. Section 09 22 16.13 - Non-Structural Metal Stud Framing.
- K. Section 09 22 16.13 - Non-Structural Metal Stud Framing.
- L. Section 09 21 16.23 - Gypsum Board Shaft Wall Assemblies.

## 1.3 REFERENCES

**\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.**

- A. AISI, North American Specification for the Design of Cold-Formed Steel Structural Members.
  1. AISI S200 - AISI North American Standard for Cold-Formed Steel Framing - General Provisions
  2. AISI S201 - AISI North American Standard for Cold-Formed Steel Framing - Product Data
  3. AISI S210 - AISI North American Standard for Cold-Formed Steel Framing - Floor and Roof System Design
  4. AISI S211 w/S1-12 - AISI North American Standard for Cold-Formed Steel Framing - Wall Stud Design, with Supplement 1
  5. AISI S212 - AISI North American Standard for Cold-Formed Steel Framing - Header Design,
  6. AISI S213 w/S1-09 - AISI North American Standard for Cold-Formed Steel Framing - Lateral Design, with Supplement 1
  7. AISI S214 - AISI North American Standard for Cold-Formed Steel Framing - Truss Design,
  8. AISI S230 w/S3-12 - AISI North American Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings with

### Supplement 3

- B. ASTM A 36 - Standard Specification for Carbon Structural Steel
- C. ASTM A 123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- D. ASTM A 153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- E. ASTM A 307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength
- F. ASTM A 653/A 653M - Sheet Steel, Zinc-Coated (galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
- G. ASTM A 1003/A1003M - Standard Specification for Sheet Steel, Carbon, Metallic and Non-Metallic Coated for Cold- Formed Framing Members.
- H. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members.
- I. ASTM C 955 - Standard Specification for Load Bearing (Transverse and Axial) Steel Studs, Runner (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.
- J. AWS D1.1 - Structural Welding Code - Steel.
- K. AWS D1.3 - Structural Welding Code - Sheet Steel.
- L. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- M. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials
- N. ASTM E 413 - Classification for Rating Sound Insulation
- O. ASTM E 488 - Standard Test Methods for Strength of Anchors in Concrete Elements.
- P. ASTM E 1190 - Standard Test Methods for Strength of Power-Actuated Fasteners Installed in Structural Members
- Q. ASTM C 1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related accessories.

#### 1.4 DESIGN / PERFORMANCE REQUIREMENTS

**\*\* NOTE TO SPECIFIER \*\* Delete references from paragraphs below that are not actually required; add others as required. All structural framing components and related accessories shall be as published by STEELER technical literature, code requirements and load and span tables. Load carrying applications are design dependent and should be reviewed by a design professional familiar with the system and the requirements of the project.**

- A. Design steel in accordance with AISI, North American Specification for the Design of Cold-Formed Steel Structural Members.
  - 1. AISI S200 - AISI North American Standard for Cold-Formed Steel Framing - General Provisions.

2. AISI S201 - AISI North American Standard for Cold-Formed Steel Framing - Product Data.
3. AISI S210 - AISI North American Standard for Cold-Formed Steel Framing - Floor and Roof System Design.
4. AISI S211 w/S1-12 - AISI North American Standard for Cold-Formed Steel Framing - Wall Stud Design, with Supplement 1.
5. AISI S212 - AISI North American Standard for Cold-Formed Steel Framing - Header Design.
6. AISI S213 w/S1-09 - AISI North American Standard for Cold-Formed Steel Framing - Lateral Design.
7. AISI S214 - AISI North American Standard for Cold-Formed Steel Framing - Truss Design.
8. AISI S230 w/S3-12 - AISI North American Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings.

B. Structural Performance: Engineer, fabricate, and erect cold-formed metal framing to withstand design loads within limits and under conditions as follows:

**\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if not required for the project. Show design loads of the Drawings or insert below.**

1. Design Loads: Provide as indicated on Drawings.
2. Design Loads: Provide as follows:
  - a. Dead Loads: Weights of materials and construction.
  - b. Live Loads: \_\_\_\_\_.
  - c. Roof Loads: \_\_\_\_\_.
  - d. Snow Loads: \_\_\_\_\_.
  - e. Wind Loads: \_\_\_\_\_.
  - f. Seismic Loads: \_\_\_\_\_.

C. Design framing systems to withstand design loads indicated on the Drawings without deflections greater than the following:

**\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.**

1. Exterior Load-Bearing Walls:
  - a. Lateral deflection of: L/240 of the wall height.
  - b. Lateral deflection of: L/360 of the wall height.
  - c. Lateral deflection of: L/600 of the wall height.
  - d. Lateral deflection of: L/720 of the wall height.
2. Interior Load Bearing Walls:
  - a. Lateral deflection of: L/240 of the wall height.
  - b. Lateral deflection of: L/360 of the wall height.
  - c. Lateral deflection of: L/600 of the wall height.
3. Exterior Non-Load Bearing Walls:
  - a. Lateral deflection of: L/240 of the wall height.
  - b. Lateral deflection of: L/360 of the wall height.
  - c. Lateral deflection of: L/600 of the wall height.
  - d. Lateral deflection of: L/720 of the wall height.
4. Floor Joists:
  - a. Vertical deflection of L/240 of the span .
  - b. Vertical deflection of L/360 of the span.
  - c. Vertical deflection of L/480 of the span.
5. Roof Rafter:
  - a. Vertical deflection of L/180 of the span.
  - b. Vertical deflection of L/240 of the span.
  - c. Vertical deflection of L/360 of the span.
6. Ceiling Joist:
  - a. Vertical deflection of L/180 of the span
  - b. Vertical deflection of L/240 of the span.

- c. Vertical deflection of L/360 of the span.
- D. Design framing system to accommodate deflection of primary building structure and construction tolerances.

**\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if not required for the project.**

- E. Design exterior non-load-bearing curtain wall framing to accommodate lateral deflection without regard to contribution of sheathing materials.

**\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if not required for the project.**

- F. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with local code.

**\*\* NOTE TO SPECIFIER \*\* Retain paragraph below where framing is part of STC-rated assemblies. Indicate design designations of specific assemblies on Drawings.**

- G. 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.

## 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Data sheets on each product to be used, including:
  - 1. Description of each material and finish, product criteria and limitations.
  - 2. Preparation instructions and recommendations.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation methods and instructions.
- C. Shop Drawings:
  - 1. Submit shop drawings prepared by the cold-formed metal framing manufacturer showing plans, sections, elevations, layouts, profiles and product component locations, including framed openings, bearing, anchorage, loading, welds, bracing, fasteners, accessories and finishes.
  - 2. Show connection details with screw types and locations and other fastener requirements.
  - 3. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation and who is legally qualified to practice in jurisdiction where Project is located.

**\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if LEED is not applicable. Steeler products are manufactured at two locations, Seattle, WA and Newark, CA.**

- D. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
  - 1. Product Data for Credit MR 2 (1-2 points): For products being recycled, documentation of total weight of project waste diverted from landfill.
  - 2. Product Data for Credit MR 4 (1-2 points): For products having recycled content, documentation including percentages by weight of post consumer and pre-consumer recycled content
    - a. Include statement indicating costs for each product having recycled content.
  - 3. Product Data for Credit MR 5 (1-2 points): Submit data, including location and distance from Project of material manufacturer and point of extraction, harvest or recovery for main raw material.
    - a. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.

- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product and finish.
- F. Evaluation Reports: Submit evaluation reports certified under an independent third party inspection program administered by an agency accredited by International Accreditation Service (IAS). ICC-ESESR-2054 is applicable.
- G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- 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. Design structural elements under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

**\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.**

- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.
- E. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- F. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- G. Contractor shall provide effective, full time quality control over all fabrication and erection complying with the pertinent codes and regulations of government agencies having jurisdiction.
- H. Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, and manufacturer's installation instructions.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's unopened packaging.
- B. Protect and store products in manufacturer's unopened packaging until ready for installation per requirements of AISI's "Code of Standard Practice".
- C. Store framing off the ground and at a slight angle with a ventilated, waterproof covering.

#### 1.8 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## 1.9 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.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Steeler Inc., which is located at: 10023 Martin Luther King Jr. Way S. ; Seattle, WA 98178; Toll Free Tel: 800-275-2279; Tel: 206-725-2500; Fax: 206-725-1700; Email: [request info \(sales@steeler.com\)](mailto:request info (sales@steeler.com)); Web: [www.steeler.com](http://www.steeler.com)

**\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.**

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

### 2.2 MATERIALS

- A. Load bearing (structural) cold-formed steel members shall be manufactured from structural quality steel having minimum yield strength of 33 ksi, having a minimum protective coating equal to G-60 galvanized finish, and conforming to the following standards: ASTM A 653, ASTM A 1003, and ASTM C 955.
- B. Non-load bearing (non-structural) cold-formed steel members shall have a minimum protective coating equal to G-40 galvanized finish and shall conform to ASTM A 653, ASTM A 1003, and ASTM C 645.
- C. Corrosion Protection: Products shall have protective coatings as follows:
  1. Material thicknesses from 16 to 30 mils provided with minimum G-40 galvanized coating.
  2. Material thicknesses from 33 mils to 118 mils provided with minimum G-60 galvanized coating.

**\*\* NOTE TO SPECIFIER \*\* Select from the following optional paragraph as required for the project and delete if not applicable. G-90 galvanized coatings are a special order and is available for some material thicknesses. G90 coatings are typically used for coastal of high humidity locations. Contact the manufacturer for availability.**

3. Provide G-90 galvanized coating for locations indicated on the Drawings
- D. Load bearing cold-formed steel member shall have engineering properties calculated in accordance with the AISI "Specification for the Design of Cold-Formed Steel Structural Members" and have minimum properties as published by STEELER.

**\*\* NOTE TO SPECIFIER \*\* Edit the following to include only the framing components required for the project. Delete the paragraphs for components not required.**

### 2.3 FRAMING COMPONENTS

- A. Wall Framing: load bearing (structural) cold-formed steel wall components. Provide wall framing materials, such as studs, tracks, bracing, clip angles, straps, headers

and other related accessories.

1. Steel Studs: Steeler Structural Studs, S-Members are standard C-shaped steel studs of web depth indicated, with lipped flanges, and complying with the following:

- a. Minimum Uncoated Base-Metal Thickness:

**\*\*NOTE TO SPECIFIER\*\* Delete thickness not required.**

- 1) As indicated on Drawings.
- 2) 0.0329 inches (0.84 mm).
- 3) 0.0428 inches (1.09 mm).
- 4) 0.0538 inches (1.37 mm).
- 5) 0.0677 inches (1.72 mm).
- 6) 0.0966 inches (2.45 mm).
- 7) 0.1180 inches (2.99 mm).

- b. Web Depth:

**\*NOTE TO SPECIFIER\*\* Delete depths not required.**

- 1) As indicated on Drawings.
- 2) 1-5/8 inches (41 mm).
- 3) 2-1/2 inches (63.5 mm).
- 4) 3-1/2 inches (88.9 mm).
- 5) 3-5/8 inches (92.1 mm).
- 6) 4 inches (101.6 mm).
- 7) 5-1/2 inches (139.7 mm).
- 8) 6 inches (152.4 mm).
- 9) 8 inches (203.2 mm).
- 10) 10 inches (254 mm).
- 11) 12 inches (304.8 mm).
- 12) 14 inches (355.6 mm).
- 13) 16 inches (406.4 mm).

- c. Flange Length:

**\*NOTE TO SPECIFIER\*\* Delete lengths not required.**

- 1) As indicated on Drawings.
- 2) 1-1/4 inches (31.75 mm).
- 3) 1-3/8 inches (34.9 mm).
- 4) 1-7/16 inches (36.5 mm).
- 5) 1-5/8 inches (41.3 mm).
- 6) 2 inches (50.8 mm).

- d. Web:

**\*\* NOTE TO SPECIFIER \*\* Select one the following paragraphs and delete the ones not required.**

- 1) Punched
- 2) Unpunched

2. Steel Track: Steeler Cold-formed steel T-Members are standard U-shaped steel track, unpunched, of web depths indicated, with straight flanges, and complying with the following:

- a. Minimum Uncoated Base-Metal Thickness: Matching steel studs.

- b. Flange Length: Manufacturer's standard deep flange where indicated, standard flange elsewhere.

3. Steel Track: Steeler J Track Members are standard J-shaped steel track, unpunched, of web depths indicated, with straight flanges, and complying with the following:

- a. Minimum Uncoated Base-Metal Thickness: Matching steel studs.

- b. Flange Length: Manufacturer's standard deep flange where indicated, standard flange elsewhere.

**\*\* NOTE TO SPECIFIER \*\* STEELER Slotted Stud™ and Track - Provides a positive attachment for overall strength and allows for vertical movement caused by normal head-**



**of-wall and floor extension or compression. Select the designation and criteria information based upon the shape and size component required for the project. If more than one, identify the application or location where used or verify the designation and size is indicated on the Drawings. For firewall applications conform to the STEELER UL Head of Wall System for the Classification and Rating required.**

4. Slotted Deflection Studs: STEELER Slotted Stud; cold-formed galvanized steel in conformance with AISI's Specifications for Design of Cold-formed Steel Members. U.L. Classified for both the United States and Canada as Light Gauge Framing in various U.L. Head-Of-Wall Joint Systems.
- a. Flange Length:

**\*\*NOTE TO SPECIFIER\*\* Delete paragraph not required.**

- 1) As indicated on Drawings.  
2) 1-5/8 inches (41 mm).

- b. Web Depth:

**\*\*NOTE TO SPECIFIER\*\* Delete depths not required.**

- 1) As indicated on Drawings.  
2) 2-1/2 inches (64 mm).  
3) 3-1/2 inches (89 mm).  
4) 3-5/8 inches (92 mm).  
5) 4 inches (102 mm).  
6) 5-1/2 inches (140 mm).  
7) 6 inches (152 mm).

- c. Minimum Uncoated Base-Metal Thickness:

**\*\*NOTE TO SPECIFIER\*\* Delete thickness not required.**

- 1) As indicated on Drawings.  
2) 0.0428 inches (1.09 mm).  
3) 0.0538 inches (1.37 mm).  
4) 0.0677 inches (1.72 mm).  
5) 0.0966 inches (2.45 mm).  
6) 0.1180 inches (2.99 mm).

- d. Standard Track Leg

**\*\*NOTE TO SPECIFIER\*\* Delete size not required.**

- 1) 2 inches (51 mm).  
2) 2-1/2 inches (64 mm).  
3) 3 inches (76 mm).

**\*\*NOTE TO SPECIFIER\*\* Delete slot not required.**

- e. Vertical Slot: Length as required by structure deflection, one in each flange, at the head of the stud.  
f. Vertical Slot: 2-1/4 inches (57 mm). One slot in each flange, at the head of the stud.

**\*\* NOTE TO SPECIFIER \*\* Delete paragraph not required.**

- g. Minimum yield strength: As indicated on Drawings.  
h. Minimum yield strength of 33 ksi.

5. Slotted Deflection Track: STEELER Slotted Track; cold-formed galvanized steel in conformance with AISI's Specifications for Design of Cold-formed Steel Members. U.L. Classified for both the United States and Canada as Light Gauge Framing in various U.L. Head-Of- Wall Joint Systems.

- a. Flange Length:

**\*\*NOTE TO SPECIFIER\*\* Delete paragraph not required.**

- 1) As indicated on Drawings.  
2) 2-1/2 inches (64 mm) with 1-1/2 inch (38 mm) slots every 1 inch (25 mm) o.c.

- b. Web Depth:

**\*\*NOTE TO SPECIFIER\*\* Delete depths not required.**

- 1) As indicated on the Drawings.
- 2) 2-1/2 inches (64 mm).
- 3) 3-1/2 inches (89 mm).
- 4) 3-5/8 inches (92 mm).
- 5) 4 inches (102 mm).
- 6) 5-1/2 inches (140 mm).
- 7) 6 inches (152 mm).

c. Minimum Uncoated Base-Metal Thickness:

**\*\*NOTE TO SPECIFIER\*\* Delete thickness not required.**

- 1) As indicated on Drawings.
- 2) 0.0428 inches (1.09 mm).
- 3) 0.0538 inches (1.37 mm).
- 4) 0.0677 inches (1.72 mm).
- 5) 0.0966 inches (2.45 mm).
- 6) 0.1180 inches (2.99 mm).

**\*\* NOTE TO SPECIFIER \*\* Delete paragraph not required.**

- d. Minimum yield strength: As indicated on Drawings.
- e. Minimum yield strength of 33 ksi.

B. Floor Framing: Steeler load bearing (structural) cold formed floor components. Provide floor framing materials, including joists, tracks, web stiffeners, bracing, clip angles, straps, rim tracks, and other related accessories.

1. Steeler Floor Joists: Manufacturer's floor joists of web depths indicated, with lipped flanges complying with the following:

a. Minimum Uncoated Base-Metal Thickness:

**\*\*NOTE TO SPECIFIER\*\* Delete thickness not required.**

- 1) As indicated on Drawings.
- 2) 0.0428 inches (1.1 mm).
- 3) 0.0538 inches (1.4 mm).
- 4) 0.0677 inches (1.7 mm).
- 5) 0.0966 inches (2.5 mm).

b. Flange Length:

**\*NOTE TO SPECIFIER\*\* Delete length paragraph not required.**

- 1) As indicated on Drawings.
- 2) 2 inches (51 mm).

c. Web:

**\*\* NOTE TO SPECIFIER \*\* Select one the following paragraphs and delete the ones not required.**

- 1) Punched
- 2) Unpunched

2. Steel Joist Track: Manufacturer's standard U-shaped steel joist track, unpunched, of web depths indicated, with straight flanges, and complying with the following:

a. Minimum Uncoated Base-Metal Thickness: Matching steel joists or as per design.

b. Flange Length:

**\*NOTE TO SPECIFIER\*\* Delete length paragraph not required.**

- 1) As indicated on Drawings.
- 2) 1-1/2 inches (38.1 mm).
- 3) 2 inches (51 mm).
- 4) 2-1/2 inches (63 mm).
- 5) 3 inches (76.2 mm).
- 6) 3-1/2 inches (88.9 mm).

C. Roof Rafter Framing: Steeler standard C-shaped steel sections, of web depths

indicated, unpunched, with stiffened flanges. Provide roof framing materials, including web stiffeners, bracing, clip angles, straps, and other related accessories.

1. Steel Rafters: Manufacturer's standard C-shaped steel sections of web depths indicated, with stiffening flanges complying with the following:
  - a. Minimum Uncoated Base-Metal Thickness:

**\*\*NOTE TO SPECIFIER\*\* Delete thickness not required.**

- 1) As indicated on Drawings.
- 2) 0.0329 inch (0.84 mm).
- 3) 0.0428 inches (1.1 mm).
- 4) 0.0538 inches (1.4 mm).
- 5) 0.0677 inches (1.7 mm).
- 6) 0.0966 inches (2.5 mm).

- b. Flange Length:

**\*\*NOTE TO SPECIFIER\*\* Delete length paragraph not required.**

- 1) As indicated on Drawings.
- 2) 1-1/4 inches (32 mm).
- 3) 1-5/8 inches (41 mm).
- 4) 2 inches (51 mm).
- 5) 2-1/2 inches (63 mm).

- D. Ceiling Joist Framing: Steeler load bearing (structural) cold formed ceiling components. Provide framing materials, including joists, tracks, web stiffeners, bracing, clip angles, straps, rim tracks, and other related accessories.

1. Steel Joists: Manufacturer's standard C-shaped steel joists of web depths indicated, with stiffening flanges complying with the following:
  - a. Minimum Uncoated Base-Metal Thickness:

**\*\*NOTE TO SPECIFIER\*\* Delete thickness not required.**

- 1) 0.0329 inches (0.84 mm).
- 2) 0.0428 inches (1.1 mm).
- 3) 0.0538 inches (1.4 mm).
- 4) 0.0677 inches (1.7 mm).
- 5) 0.0966 inches (2.5 mm).

- b. Flange Length:

**\*\*NOTE TO SPECIFIER\*\* Delete length paragraph not required.**

- 1) 1-1/4 inches (32 mm).
- 2) 1-3/8 inches (35 mm).
- 3) 1-5/8 inches (41 mm).
- 4) 2 inches (51 mm).
- 5) 2-1/2 inches (63 mm).

- c. Web:

**\*\* NOTE TO SPECIFIER \*\* Select one the following paragraphs and delete the ones not required.**

- 1) Punched.
- 2) Unpunched.

## 2.4 FRAMING ACCESSORIES:

- A. Fabricate steel framing accessories of the same material and finish used for framing members, with a minimum yield strength of 33 ksi (230 MPa).
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
  1. Supplementary framing.
  2. Bracing, bridging, and solid blocking.
  3. Web stiffeners.

4. Gusset plates.
5. Deflection track and vertical slide clips.
6. Stud kickers and girts.
7. Joist hangers and end closures.
8. Reinforcement plates.

## 2.5 ANCHORS, CLIPS, AND FASTENERS:

- A. Steel Shapes and Clips: ASTM A 36, zinc coated by the hot-dip process according to ASTM A 123.
- B. Cast-in-Place Anchor Bolts and Studs: ASTM A 307, Grade A, zinc coated by the hot-dip process according to ASTM A 153.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times the design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times the design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- E. Mechanical Fasteners: Corrosion-resistant coated, self-drilling, self-threading steel drill screws. Low-profile head beneath sheathing, manufacturer's standard elsewhere.

## 2.6 FABRICATION

- A. Framing components may be preassembled into panels. Panels shall be square with components attached.
- B. Cut framing components squarely or as required for attachment. Cut framing members by sawing or shearing; do not torch cut.
- C. Hold members in place until fastened.
- D. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
  1. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
  2. Locate mechanical fasteners and install according to cold-formed metal framing manufacturer's instructions with screw penetrating joined members by not less than 3 exposed screw threads.
- E. Where required, provide specified insulation in double header members and double jamb studs which will not be accessible after erection.
- F. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
  1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
  2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Do not begin installation until substrates have been properly prepared.
- C. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

**\*\* NOTE TO SPECIFIER \*\* Edit the following to include only the framing components required for the project. Delete the paragraphs for components not required.**

### 3.3 INSTALLATION

- A. General Erection Requirements:
  - 1. Install cold-formed framing in accordance with requirements of ASTM C 1007.

**\*\* NOTE TO SPECIFIER \*\* Delete references to welding connections when framing components are lighter than 16 gauge.**

- 2. Weld in compliance with AWS D.1.3.
  - 3. Install in compliance with applicable sections of the AISI's Standard for Cold-Formed Steel Framing General Provisions.
- B. Wall Framing: Install, bridge, and brace load-bearing (structural) walls in accordance with the approved shop drawings.
  - 1. Cold-formed structural framing may be shop or field fabricated into panelized wall assemblies, prior to erection, or stick built in the field.
  - 2. Provide temporary bracing to hold walls straight and plumb and in safe condition until permanent bracing has been installed.
  - 3. Stud size and spacing shall be in accordance with the approved shop drawings.
  - 4. Fasten wall framing members by screws, power actuated fasteners, welding, or a combination of methods in accordance with the approved shop drawings.
  - 5. Fabricate, handle, and erect members and assemblies in a manner to prevent damage or distortion of the framing.
  - 6. Cut ends of framing members squarely by shearing or sawing. Install plumb, square, true to line and securely fastened.
  - 7. Construct corners using minimum three studs. Provide double stud wall openings at door jambs, and window jambs where indicated on shop drawings.
  - 8. Erect load bearing studs one piece full length. Splicing of studs or cutting of flange or lips is not permitted.
  - 9. Track shall have web contact with a uniform and level bearing surface and securely anchored with fasteners, sized and spaced in accordance with the approved connection details.
  - 10. Erect load bearing studs, brace, and reinforce to develop full strength, to achieve design requirements.
  - 11. Fully seat axial loaded studs in receiving tracks (maximum 1/8 inch (3.2 mm) gap between stud and track web is acceptable).
  - 12. Align load bearing studs with joists or trusses or use a load distribution member to transfer loads to other structural components or foundations.

13. Provide slip connections where required allowing for vertical movements of the structure without imposing vertical loads on the wall framing.
14. Coordinate placement of insulation in multiple stud spaces after erection. Provide suitable insulation where wall framing assemblies will form voids, that will not be accessible after completion of framing.
15. Install intermediate studs above and below openings to align with wall stud spacing.
16. Provide structural framing shear walls where indicated or required in accordance with the shop drawings.
17. Attach strapping or blocking to studs for attachment of fixtures anchored to walls.
18. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

**\*\* NOTE TO SPECIFIER \*\* Delete from the following paragraphs references to floor framing components that are not used on the project.**

- C. Floor Framing: Install, bridge, and brace load-bearing (structural) floors as indicated and in accordance with the approved shop drawings.
1. Cold-formed structural framing may be shop or field fabricated into floor assemblies, prior to erection, or stick built in the field.
  2. Provide temporary bracing to hold supporting walls straight and plumb and in safe condition until permanent bracing has been installed.
  3. Floor framing components size and spacing shall be in accordance with the approved shop drawings.
  4. Fasten floor framing members by screws, power actuated fasteners, welding, or a combination of methods in accordance with the approved shop drawings.
  5. Fabricate, handle, and erect members and assemblies in a manner to prevent damage or distortion of the framing.
  6. Cut ends of framing members squarely by shearing or sawing. Install plumb, square, true to line and securely fastened.
  7. Structural joists shall be supported by foundation walls, joist hangers, load distribution members, or line up over vertical supports as indicated on the drawings.
  8. Structural framing joists shall have minimum 1-1/2 inch (38 mm) bearing support and a minimum 10 inches (254 mm) of unpunched web from any bearing support.
  9. Provide joist web stiffeners as required.
  10. Provide additional support under bearing walls that run parallel to the joists and the wall length exceeds one-half the length of the joist span.
  11. Provide end blocking where joist ends are not restrained against rotation.
  12. Floor diaphragms and connections shall be in accordance with the approved shop drawings.
  13. Align joists with load bearing studs or use a load distribution member to transfer loads to other structural components or foundations
  14. Coordinate placement of insulation in multiple framing spaces after erection.
  15. Install framing between joists for attachment of mechanical and electrical items, and to prevent joist rotation.

**\*\* NOTE TO SPECIFIER \*\* Delete from the following paragraphs references to framing components that are not used on the project.**

- D. Roof Rafter Erection: Install as indicated and in accordance with the approved shop drawings.
1. Make provisions for erection loads. Install temporary bracing to maintain alignment, until permanent bracing and attachments are installed.
  2. Framing size and spacing shall be in accordance with the approved shop drawings.

3. Fasten by screws, power actuated fasteners, welding, or a combination of methods in accordance with the approved shop drawings.
4. Fabricate, handle, and erect in a manner to prevent damage or distortion of the framing.
5. Do not alter, cut or remove any members or components without advance approval in writing from the Architect.
6. Support rafters by load bearing metal stud walls, foundation walls, hangers, load distribution members, or line up over vertical supports as indicated on the drawings.
7. Provide a minimum 1-1/2 inch bearing support.
8. Provide additional support under bearing walls that run parallel to the rafters and the wall length exceeds one-half the length of the joist span.
9. Provide end blocking where ends are not restrained against rotation.
10. Floor or roof diaphragms and connections shall be in accordance with the approved shop drawings.
11. Align rafters with load bearing studs or use a load distribution member to transfer loads to other structural components or foundations
12. Coordinate placement of insulation in multiple framing spaces after erection.
13. Install framing between rafters for attachment of mechanical and electrical items, and to prevent truss rotation.
14. Repair or replace damaged members only as directed in writing by the Manufacturer.
15. Do not overload during construction.

#### 3.4 ERECTION TOLERANCES

- A. Members shall be level, and true to line of 1/8 inch (3 mm) in 10 feet (254 mm) (1:960).
- B. Spacing: Space individual members no more than plus or minus 1/8 inch (3mm) from location indicated. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
- C. Wall Squareness: Fabricate walls to a maximum out-of-square tolerance of 1/8 inch (3mm).
- D. Floor Squareness: Fabricate each cold-formed steel floor to a maximum out-of-square tolerance of 1/8 inch (3mm).

#### 3.5 ADJUSTING AND CLEANING

- A. Touch up welds with zinc rich primer.
- B. Repair or replace damaged installed products in accordance with manufacturer's instructions before owner's acceptance.
- C. Remove from project site and legally dispose of construction debris associated with this work.

#### 3.6 PROTECTION

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

#### 3.7 SCHEDULES

**\*\* NOTE TO SPECIFIER \*\* Retain Paragraph below if required to suit project requirements.**

Identify products by name on the Drawings or use this paragraph to define the location of each type of material to be used. The following are some examples of schedule references. Edit as required to suit project or delete and identify products on the Drawings.

A. :

B. :

END OF SECTION