

## SUGGESTED SPECIFICATIONS

The following suggested specification is intended to serve as a general guide. It must be modified to suit the conditions of use, with particular attention given to the deletion of inapplicable provisions.

## DIVISION 5 – METALS

## REFERENCE NO. 05400 – COLD FORMED METAL FRAMING

## PART 1 – GENERAL

## Related Work Specified Elsewhere

(Architect Note: List appropriate specifications sections of related work here).

## 1.2 Quality Assurance

(Architect Note: Quality Assurance sections should include provisions for checking shop drawings, controlled on-site inspections, etc).

1.3 Submittals – The following items shall be furnished by the contractor for approval prior to fabrication or delivery of material to the site:

1.3.1 Shop Drawings – Shop drawings shall be documents illustrating materials, shop coatings, steel thickness, details of fabrication, details of attachment to adjoining work, size, location and spacing of fasteners for attaching framing to itself, details of attachment to the structure, accessories and their installation, and critical installation procedures. Drawings may include plans, elevations, sections and details.

1.3.2 Samples – Samples shall be representative pieces of all framing component parts and accessories. Unless otherwise specified, pieces shall be 12" long and tagged with name of part and manufacturer.

1.3.3 Certifications – Certifications shall be statements from the manufacturer certifying that the materials conform to the appropriate requirements as outlined in the contract documents.

1.3.4 Calculations – Engineering calculations or data shall be submitted verifying the framing assembly's ability to meet or exceed design requirements as required by local codes and authorities or by the Architect. These calculations shall include, but not be limited to the following items:

1.3.4.1 Steel Framing used to support rigid materials shall be designed for an allowable deflection of L/360. Steel framing used to support semi-rigid materials shall be designed for an allowable deflection of L/240. (Architect Note: Insert any special criteria such as more stringent deflection, wind loading etc., in this section).

1.3.4.2 All connections (member to member and member to structure) shall be thoroughly examined and designed.

1.3.4.3 Selected exterior and interior walls, as required, shall be designed to provide frame stability and lateral load resistance. If diagonal steel strapping is used to transfer lateral loads to the structure and foundation, additional studs may be required to resist the vertical component of the load from the diagonal bracing.

1.3.4.4 Wall bridging shall be designed to provide resistance to minor axis bending and rotation of wall studs.

1.3.4.5 In accordance with AISI Specifications, rigid collateral facing materials may be considered as adequate support of members against rotation

1.3.5 Descriptive Literature – Manufacturer's literature containing product and installation specifications and details shall be submitted for approval.

## 1.4 Applicable Documents

## 1.4.1 ASTM Standards:

A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process  
A924 Standard Requirements for Steel Sheet, Metallic-Coated by the Hot-Dipped Process

C 840 Standard Specifications for the Application and Finishing of Gypsum Board

C 842 Standard Specification for the Application of Gypsum Veneer Plaster

C926 Standard Specification for the Application of Portland Cement-Based Plaster

C 954 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in to 0.112 in. in Thickness

C 955 Standard Specifications for Load Bearing (Transverse and Axial) Steel Studs, Runners (Track) and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases

C 1007 Standard Specification for the installation of Load-Bearing (Transverse and Axial) Steel Studs and Related Accessories.

## 1.4.2 American Iron and Steel Institute (AISI);

"North American Specification for the Design of Cold-Formed Steel Structural Members", latest edition.

## 1.4.3 American Welding Society (AWS)

Structural Welding code (D1.1) Specifications for Welding Sheet Steel in Structures (E1.3)

## 1.4.4 Military Specification (Mil. Spec):

MIL-P-21035...Paint, High Zinc Dust Content, Galvanizing Repair.

## 1.4.5 Federal Specification (Fed Spec):

FF-P-395...Pin, Drive, Guided and Pin Drive, Power Actuated Fasteners for Power Actuated and Hand Actuated Fastening Tools FF-S-325.Shield, Expansion; Nail, Expansion; and Nail, Drive Screw (Devices, Anchoring Masonry)

## PART 2 – PRODUCTS

## 2.1 Materials

2.1.1 All Materials shall be equal to those manufactured by MarinoWare, 400 Metuchen Road, South Plainfield, NJ, 07080. Phone: 800-627-4661.

2.1.2 All studs and/or joists and accessories shall be of the type, size, steel thickness and spacing shown on the plans. Studs, runners (track), bracing and bridging shall be manufactured per ASTM Specification C 955.

2.1.3 All galvanized studs, joists and accessories, 16ga or heavier, shall be formed from steel that conforms to the requirement of ASTM A653 with a yield of either 50 KSI or 33 KSI as specified.

2.1.4 All galvanized studs, joists and accessories, 18ga and lighter and all track sections shall be formed from steel that conforms to the requirements of ASTM A653, with a yield of 33 KSI minimum.

2.1.5 All galvanized studs, joists and accessories shall have a minimum G-60 coating if required to be in conformance with ASTM C 955. Otherwise G-40 or equivalent we be provided.

2.1.6 Physical properties and allowable load capabilities of members shall be developed in accordance with AISI, "North American Specification for the Design of Cold-Formed Steel Structural Members", latest edition.

## PART 3 – EXECUTION

## 3.1 Storage of Materials

3.1.1 Products shall be protected from conditions that may cause any physical damage.

3.1.2 Materials shall be stored on a flat plane.

3.1.3 It shall be the responsibility of the project architect or engineer or their appointed personnel to determine what material is damaged (e.g. rusted, dented, bent or twisted). Any damaged materials shall be removed from the job site immediately.

## 3.2 Installation General

3.2.1 Methods of construction may be either piece by piece (stick-built), or by fabrication into panels either on or off site.

3.2.2 Connections shall be accomplished with self drilling screws or welding so that the connection meets or exceeds the design loads required at that connection.

3.2.3 Transversely loaded studs need not sit squarely in tracks but must be attached to them with the exception of special slip conditions that must be designed accordingly.

3.2.4 Axially loaded studs shall be installed seated squarely (within 1/16") against the web portion of the top and bottom tracks. Tracks shall rest on a continuous, uniform bearing surface.

3.2.5 Cutting of steel framing members may be accomplished with a saw or shear. Torch cutting of load bearing members is not permitted. Cutting of loaded members is not permitted unless under supervision of the project architect or engineer.

3.2.6 Temporary bracing shall be provided and left in place until work is permanently stabilized.

3.2.7 Bridging shall be of size and type shown on the drawings and as called for in the design calculations.

- 3.2.8 Diaphragm rated sheathing materials may be substituted for bridging, however, it shall be installed prior to loading the wall. If such a material is installed on one side of the wall only, then the other stud flanges shall be bridged with suitable bridging. This bridging may be removed if and when such diaphragm rated sheathing is installed.
- 3.2.9 Install headers in all openings that is larger than the stud spacing in that wall. Form headers as shown on the drawings.
- 3.2.10 Insulation equal to the job requirements shall be placed in all jamb and header type conditions that will be inaccessible after their installation into the wall.
- 3.2.11 Provide jack studs to support each end of headers. These studs shall be securely connected to the header and must seat squarely in the lower track of the wall and be properly attached to it.
- 3.2.12 If by design a header is low in the wall, the less than full-height studs (cripples) that occur over the header shall be designed to carry all imposed loads.
- 3.2.13 Wall track shall not be used to support any load unless specifically designed for that purpose.
- 3.2.14 All axially loaded members shall be aligned vertically, to allow for full transfer of the loads down to the foundation. Vertical alignment shall be maintained at floor/wall intersections or alternate provisions for load transfer may be made.
- 3.2.15 Holes that are field cut into steel framing members shall be within the limitations of the product and its design. Provide reinforcement where holes are cut through load bearing members in accordance with manufacturer's recommendations and as approved by project architect or engineer.
- 3.2.16 Touch up all steel bared by welding using zinc rich paint.
- 3.2.17 Studs shall be spaced to suit the design requirements and limitations of collateral facing materials.
- 3.2.18 Gypsum board shall be attached to steel studs in accordance with ASTM Specification C 840, except that the steel drill screws used (Specification ASTM C 954) shall be spaced not more than 8" on center at the edges and ends, and not more than 12" on center in the field of the board.
- 3.2.19 Metal plaster bases shall be attached in accordance with ASTM Specification C 841, except screw heads shall be of size and type suitable for positive (no movement) attachment.
- 3.2.20 Care should be taken to allow for additional studs at intersections, corners, doors, windows, control joints, etc., and as called for in the shop drawings or design calculations.
- 3.2.21 Provision for structure movement (expansion shall be allowed where indicated and necessary by design or code requirements.
- 3.2.22 Splicing of axially loaded members shall be not permitted.
- 3.2.23 Wire tying of members is not permitted.

### 3.3 Installation: Panelized Construction

- 3.3.1 Panels shall be designed to resist construction and handling loads as well as live loads.
- 3.3.2 Handling and lifting of prefabricated panels shall not cause permanent

distortion in any member or collateral material.

- 3.3.3 Make all stud to track connections prior to hoisting of panel.
- 3.3.4 Where splicing of track is necessary between stud spacing a piece of stud shall be placed in the track fastened with two screws or welds per flange to each piece of track.
- 3.3.5 Complete bearing shall be maintained under tracks to provide for load transfer in axially loaded assemblies. If the erecting contractor is bearing on work set by another trade, it is his responsibility to insure that bearing criteria are met. Any discrepancy shall be brought to the attention of the project architect or engineer.
- 3.3.6 Attachment of the panel to the structure shall be as shown on the shop drawings.
- 3.3.7 Align all panels to provide continuity of any wall/floor surface.

### 3.4 Installation: Stick-Built Construction

- 3.4.1 Align track accurately at supporting structure and fasten to structure as shown on shop drawings.
- 3.4.2 Track intersections shall butt evenly.
- 3.4.3 Studs shall be plumbed, aligned, and securely attached to flanges or webs of upper and lower tracks. Axially loaded studs shall be seated squarely in both top and bottom tracks.
- 3.4.4 Where splicing of track is necessary between stud spacing, a piece of stud shall be placed in the track fastened with two screws or welds per flange to each piece of track.
- 3.4.5 Complete bearing shall be maintained under tracks to provide for load transfer in axially loaded assemblies. If the erecting contractor is bearing on work set by another trade, it is his responsibility to insure that bearing criteria are met. Any discrepancy shall be brought to the attention of the project architect or engineer prior to the commencement of work.

### 3.5 Installation: Joists

- 3.5.1 Joist shall be located directly over bearing studs or a load distribution member shall be provided to transfer loads.
- 3.5.2 Provide web stiffeners where necessary at reaction points, and at points of concentrated loads.
- 3.5.3 Joists shall be installed with their web area perpendicular to the bearing surface.
- 3.5.4 Bridging, either steel strap or solid, shall be provided as shown on the shop design calculations.
- 3.5.5 Provide additional joists under parallel partitions where the partition length exceeds 1/2" of the joist span.
- 3.5.6 Provide additional framing around all floor/roof openings that are larger than the joist spacing.
- 3.5.7 End blocking shall be provided where joist ends are not otherwise restrained from rotation.
- 3.5.8 Joist ends must be built solidly into masonry construction prior to placing any load on the joist.

- 3.5.9 All bridging, bracing, blocking, strapping, web reinforcement, etc., must be in place prior to loading of floors.
- 3.5.10 If the floor is to be of concrete, care must be exercised in its placement.
- 3.5.11 Care must be taken by all trades not to disturb joist placement, alignment, plumbness, etc., prior to the completion of the floor system.
- 3.5.12 Care must be taken not to overload the floor system during construction. Please place heavy loads, materials, equipment, etc., directly over structural supports, bearing walls or as directed by the architect or engineer.

### 3.6 Fastenings and Attachments

- 3.6.1 Anchorage of the tracks to the structure shall be with methods designed for that specific application. Size, penetration, type, and spacing shall be determined by design.
- 3.6.2 Welds shall conform to the requirements of AWS E1.3 AWS D1.3, and AISI Manual. Welds may be butt, fillet, spot or groove type the appropriateness of which shall be determined by and within the design calculations. All welds shall be touched up using zinc rich paint
- 3.6.3 Steel drill screws shall be of the minimum diameter indicated by the design of that particular attachment detail. Penetration through joined materials shall not be less than 3 exposed threads.
- 3.6.4 Screws shall have a protective coating at least equivalent to zinc plating when used in exterior assemblies.

### 3.7 Tolerances

- 3.7.1 Vertical alignment (plumbness) of studs shall be within 1/960<sup>th</sup> (1/8" in 10'-0") of the span.
- 3.7.2 Horizontal alignment (levelness) of walls shall be within 1/960<sup>th</sup> (1/8" in 10'-0") of their respective lengths.
- 3.7.3 Spacing of studs shall not be more than 1/8" +/- from the designed spacing providing that the cumulative error does not exceed the requirements of the finishing materials.
- 3.7.4 Prefabricated panels shall be not more than 1/8" +/- out of square within the length of that panel.

### 3.8 Inspections

- 3.8.1 Inspections by a qualified/independent authority shall be performed in order to assure strict conformance to the shop drawings at all phases of construction.
- 3.8.2 All members shall be checked for bearing, completeness of attachments, reinforcement, etc.
- 3.8.3 All attachments shall be checked for conformance with the shop drawings and/or the design calculations. All welds shall be touched up in accordance with Section 3.6.2.
- 3.8.4 General inspection of structure shall be completed prior to applying loads to those members.
- 3.8.5 Inspections where and as required by local codes shall be controlled inspection.