



# Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories<sup>1</sup>

This standard is issued under the fixed designation C 1007; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope\*

1.1 This specification covers the installation and erection requirements for load bearing (transverse and axial) steel studs and related accessories 0.0329 in. (0.836 mm) to 0.1120 in. (2.845 mm) thick.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

- C 11 Terminology Relating to Gypsum and Related Building Materials and Systems
- C 841 Specification for Installation of Interior Lathing and Furring
- C 954 Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
- C 955 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
- C 1063 Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee C11 on Gypsum and Related Building Materials and Systems and is the direct responsibility of Subcommittee C11.03 on Specifications for the Application of Gypsum and Other Products in Assemblies.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

2.2 *American Iron and Steel Institute Publication (AISI): Cold-Formed Steel Design Manual: Specifications for the Design of Cold-Formed Steel Structural Members, 1986 Revision and 1989 addendum*<sup>3</sup>

2.3 *American Welding Society Documents (AWS):*

D1.3 Specification for Welding Sheet Steel in Structures<sup>4</sup>

2.4 *Military Specification:*

MIL-P-21035 Paint, High Zinc Dust Content, Galvanizing Repair<sup>5</sup>

2.5 *Federal Specification:*

FF-P-395 Pin, Drive, Guided and Pin Drive, Power Actuated Fasteners for Power Actuated and Hand Actuated Fastening Tools<sup>5</sup>

## 3. Terminology

3.1 Definitions shall be in accordance with Terminology C 11.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *axial loads, n*—those loads applied to a member in the same plane as its major centroidal axis.

3.2.2 *cripple studs, n*—less than full height studs above a header or below a sill.

3.2.3 *framing members, n*—studs joist, runners (tracks), bridging and bracing and related accessories.

3.2.4 *header, n*—the stud assembly or the track assembly, or both, placed at a right angle to supporting studs that creates the top of a framed opening.

3.2.5 *jack stud, n*—a framing member which provides support at the end of a header.

3.2.6 *panelized construction, n*—fabrication of framing members into an assembly prior to erection.

3.2.7 *sill, n*—the stud assembly or the track assembly, or both, placed at a right angle to supporting studs that creates the bottom of a framed opening.

<sup>3</sup> Available from American Iron and Steel Institute (AISI), 1140 Connecticut Ave., NW, Suite 705, Washington, DC 20036, <http://www.steel.org>.

<sup>4</sup> Available from American Welding Society (AWS), 550 NW LeJeune Rd., Miami, FL 33126, <http://www.aws.org>.

<sup>5</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

\*A Summary of Changes section appears at the end of this standard.

3.2.8 *transverse loads, n*—those loads applied to a member in a plane perpendicular to its major centroidal axis.

#### 4. Storage of Materials

4.1 Products shall be protected from adverse weather and job site conditions that will cause any physical damage.

4.2 Materials shall be stored on a flat plane.

4.3 Any damaged materials shall be removed from the job site immediately.

#### 5. Materials

5.1 *Framing members*—Specification **C 955**.

5.2 *Zinc-rich paint*—**MIL-P-21035**.

5.3 *Steel drill screws*—Specification **C 954**. Screws shall have rust inhibitive coating suitable for the intended installation.

5.4 *Power actuated drive pins*—**FF-P-395**.

#### 6. Fastenings and Attachments

6.1 Anchorage of the tracks to the structure shall be with methods designed for the specific application of sheet steel to that surface. Size, penetration, type, and spacing shall be determined by design.

6.2 Welds shall conform to the requirements of **AWS D1.3**, and **AISI Manual**, section E 2. Welds shall 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.

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 three exposed threads.

6.4 Wire tying in structural applications shall not be permitted.

#### 7. Tolerances

7.1 Vertical alignment (plumbness) of studs shall be within 1/960 (1/8 in. in 10 ft 0 in.) of the span.

7.2 Horizontal alignment (levelness) of walls shall be within 1/960 (1/8 in. in 10 ft 0 in.) of their respective lengths.

7.3 Spacing of the framing members shall not be more than  $\pm 1/8$  in. (3 mm) from the designed spacing, provided that the cumulative error does not exceed the requirements of the finishing materials.

7.4 Squareness of the prefabricated panels shall be not more than 1/8 in. (3 mm) out of square within the length of that panel.

### INSTALLATION

#### 8. General Installation

8.1 Methods of construction shall be either stickbuilt or panelized.

8.2 Stud to track connections shall be designed to meet or exceed the design loads required.

8.3 Allowance for vertical deflection of the structure shall be as required by the designer.

8.4 Transversely loaded studs shall not be required to sit squarely in tracks, but shall be attached to the tracks.

8.5 Axially loaded studs shall be fabricated with the studs seated squarely within 1/8 in. (3 mm) of the web portion of the top and bottom tracks and shall be attached to the tracks.

8.6 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.

8.7 Bearing shall be provided under tracks to provide for load transfer in axially loaded assemblies.

8.8 Additional corrosion protection shall not be required on edges of metallic coated steel framing members, shop or field cut, punched or drilled.

8.9 *Cutting and Splicing of Members:*

8.9.1 Cutting of steel framing members shall be accomplished with a saw or shear.

8.9.2 Torch cutting of framing members shall not be permitted.

8.9.3 Splicing of axially loaded framing members shall not be permitted.

8.9.4 Cutting of flanges in stud and joist framing members shall not be permitted.

8.9.5 Cutting of additional holes other than those provided by the manufacturer in framing members shall not be permitted.

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

8.11 Bridging shall be of the size and type shown on the shop drawings and as called for in the design calculations. For further description of the shop drawings see **Annex A3**.

8.12 *Header and Jack Stud Installation:*

8.12.1 Headers shall be installed in all openings in axially loaded walls that are larger than the stud spacing in that wall.

8.12.1.1 Headers shall be installed so that they lie wholly within the width of the stud wall.

8.12.1.2 Insulation (equal to the job requirements) shall be placed in all jamb and header type conditions that will be in accessible after their installation into the wall.

8.12.2 Jack studs shall be securely connected to the header and must seat squarely in the lower track of the wall in accordance with **8.4**.

8.12.3 If the header is designed to be installed immediately above the wall opening the cripple studs that occur over the header shall be designed to carry all superimposed loads.

8.13 Wall track (runners) shall not be used to support any load unless specifically designed for that purpose.

#### 9. Panelized Construction

9.1 Panels shall be designed to resist all construction and handling loads as well as live loads.

9.2 Handling and lifting of prefabricated panels shall not cause permanent distortion in any member or collateral material.

9.3 All stud-to-track connections shall be installed prior to hoisting the panel.

9.4 Where splicing of the track is necessary between stud spacings, a piece of stud not less than 12 in. (305 mm) long shall be placed in the track fastened with not less than two screws per flange to each piece of track or welds shall be provided as required.

NOTE 1—Claddings may be permitted to be attached prior to panel installation.

9.5 Attachment of the panel to the structure shall be as shown on the design drawings.

9.6 All panels shall be aligned to provide continuity of any wall/floor surface.

### 10. Stick Built (Non-Panelized) Members

10.1 Tracks shall be aligned accurately at supporting structure and shall be fastened to the structure.

10.2 Track intersections shall butt evenly.

10.3 Doors, windows, and other items installed in the wall shall be securely anchored to the wall by means of clips, angles, screws, bolts, etc.

### 11. Keywords

11.1 axial; loadbearing; runners; steel; studs; tracks; transverse

## ANNEXES

### (Mandatory Information)

#### A1. DESIGN REQUIREMENTS

A1.1 Physical properties and allowable load capabilities of materials shall be developed in accordance with AISI Design Manual, as provided by Specification **C 955**.

A1.2 Studs shall be spaced to suit the design requirements and limitations of collateral materials.

A1.3 All applicable loads, strains, deflections, shear and web crippling, and bending of all sections shall be examined.

A1.4 All connections (member-to-member and member-to-structure) shall be examined taking into account all relevant

physical strengths and properties.

A1.5 Selected walls shall be designed to provide frame stability and lateral load resistance. Diagonal steel strapping or other engineered methods shall be used to provide frame stability and lateral load resistance. Diagonal steel strapping shall be used to transfer lateral loads to the structure and foundation. Additional studs shall be provided to resist the vertical component of the loads from the diagonal bracing.

A1.6 Wall bridging shall be designed to provide resistance to minor axis bending and rotation of wall studs.

#### A2. INSTALLATION REQUIREMENTS

A2.1 Gypsum board shall be attached to the steel studs in accordance with the appropriate specification.

A2.2 Metal plaster bases shall be attached in accordance with Specification **C 841** or Specification **C 1063**, except screw heads shall be of a size and type suitable for positive (no movement) attachment.

A2.3 When diaphragm rated components are substituted for bridging, they shall be installed prior to loading of the wall. If components are installed on one side of the wall only, then the other stud flanges shall be bridged with suitable bridging. Bridging is not required to be removed when diaphragm rated

components are installed.

A2.4 Care shall be taken to allow for additional studs at panel intersections, corners, doors, window, control joints, etc.

A2.5 Provision for structure movement shall be provided as indicated and necessary by design or code requirements.

A2.6 Properly designed splices, cutting of flanges, and holes other than those provided by the manufacturer shall be approved in writing by the engineer of record.

A2.7 Care shall be taken to properly distribute construction materials so that they do not exceed the project design loads.

#### A3. SUBMITTALS

A3.1 The following items shall be considered for approval prior to delivery of materials to the site:

A3.1.1 *Shop Drawings*—Drawings shall illustrate materials; shop coatings; steel thickness; details of fabrication; details of attachment to adjoining work; size, location, spacing of

fasteners for attaching framing to itself; details of attachment to the structure; accessories and their installation; and critical installation procedures. Drawings shall include plans, elevations, sections and details.

A3.1.2 *Samples*—Samples shall be representative pieces of all framing component parts and accessories.

A3.1.3 *Certification*—Certification shall be a statement from the manufacturer certifying that the materials conform to the appropriate requirements as outlined in the contract documents.

A3.1.4 *Calculations*—Engineering calculations shall be prepared verifying the assembly's ability to meet or exceed design requirements as required by local codes and authorities.

A3.1.5 *Descriptive Literature*—Manufacturer's literature shall contain product and installation specifications and details.

## SUMMARY OF CHANGES

Committee C11 has identified the location of selected changes to this specification since the last issue, C 1007 – 08, that may impact the use of this specification. (Approved November 1, 2008)

(I) Revised **6.2**.

Committee C11 has identified the location of selected changes to this specification since the last issue, C 1007 – 04, that may impact the use of this specification. (Approved September 1, 2008)

(I) Revised **8.8**.

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