AISI S202-20

American Iron and Steel Institute

AISI STANDARD

Code of Standard Practice for Cold-Formed Steel Structural Framing

2020 Edition

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DISCLAIMER

The material contained herein has been developed by the American Iron and Steel Institute (AISI) Committee on Framing Standards. The Committee has made a diligent effort to present accurate, reliable, and useful information on trade practices for fabrication and installation of cold-formed steel structural framing. The Committee acknowledges and is grateful for the contributions of the numerous engineers, manufacturers, contractors, and others who have contributed to the body of knowledge on the subject. Specific references are included in the *Code of Standard Practice* document.

With anticipated improvements in understanding of the behavior of cold-formed steel framing and the continuing development of new technology, this material will become dated. It is anticipated that AISI will publish updates of this material as new information becomes available, but this cannot be guaranteed.

No conflict between this *Code of Standard Practice* and any legal building regulation is intended. This *Code of Standard Practice* is intended only to supplement and amplify such legal building regulations and laws.

The materials set forth herein are for general purposes only. They are not a substitute for competent professional advice. Application of this information to a specific project, particularly if included as part of a contract, should be reviewed by competent legal counsel. Anyone making use of the information set forth herein does so at their own risk and assumes any and all liability arising therefrom.

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PREFACE

The American Iron and Steel Institute Committee on Framing Standards has developed this *Code of Standard Practice for Cold-Formed Steel Structural Framing* (*Code of Standard Practice*) to address trade practices for design, fabrication, and installation of *cold-formed steel structural framing* products.

This *Code of Standard Practice* is intended to serve as a state-of-the-art guide as well as a voluntary model for establishing contractual relationships between various parties in a construction project where *cold-formed steel* structural materials, components, or assemblies are used. It is not intended to take precedence over the *contract, construction documents*, or the use of good judgment for specific construction projects and conditions. However, these provisions are considered suitable for reference or inclusion in *contracts* or *construction documents* and serve as a model for that purpose.

This *Code of Standard Practice* is not applicable to *nonstructural members*, including but not limited to interior drywall framing, which is addressed by AISI S220, ASTM C645, and ASTM C754, or *structural steel*, structural steel joists, steel deck, *metal building systems*, or rack structures, which are addressed by *AISC*, *SJI*, *SDI*, *MBMA*, and *RMI*, respectively.

The purpose of the Commentary is to provide a record of the reasoning behind and the justification for the various provisions of this *Code of Standard Practice*. The Commentary is included as non-mandatory background to provide a series of explanations, illustrations, and interpretations for the *owner's representatives*, *registered design professionals*, *contractors*, *suppliers*, *manufacturers*, *installers*, and others.

The readers who wish to have more complete information, or who may have questions which are not answered by the abbreviated presentation of the Commentary, should refer to the Referenced Documents listed in Section A3.

The Committee acknowledges and is grateful for the numerous engineers, manufacturers, contractors, and others who have contributed to the body of knowledge on the subject.

The first edition of this *Code of Standard Practice* was published in 2005. In this edition, the following major changes are included:

- The language throughout the *Code of Standard Practice* was generalized to address contracts that utilize drawings, models, or drawings and models in combination.
- *Building designer*'s responsibility in cladding systems with *CFS* framing is clarified in the Commentary under Section A4.2.
- Commentary is added in Section A5.1 to coordinate and prioritize fire, thermal, and acoustic requirements.
- All the referenced standards are updated to the newest edition in Section A3.
- Section A4, Responsibility for Identifying Construction Documents, is added. In addition, relevant terms are added in Section A2. Further information is also added in Commentary Section D1.
- Commentary language is added under Section G1.1 related to industry certification programs.

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FOR COLD-FORMED STEEL STRUCTURAL FRAMING

CODE OF STANDARD PRACTICE FOR COLD-FORMED STEEL STRUCTURAL FRAMING

A. GENERAL

A1 Scope

The practices in this *Code of Standard Practice* are a model to address the design, fabrication, and installation of *cold-formed steel* (*CFS*) *structural framing*.

When adopted wholly or in part by a *contract* or *construction documents*, the trade practices that are defined in this *Code of Standard Practice* shall govern the design, fabrication, and installation of *CFS structural framing*.

In addition to the requirements in Chapters A through H and J, Chapter I of this Standard shall apply to *CFS component assemblies*.

Commentary:
The practices defined in this *Code of Standard Practice* are the commonly accepted standards of custom and usage for the fabrication and installation of *CFS structural framing*, which generally represent the most efficient approach. This *Code of Standard Practice* is not intended to define a professional standard of care for the *owner's representatives* and *building designer* or change the duties and responsibilities of the *owner*, *contractor*, *registered design professional* (e.g., architect or structural engineer-of-record) from those set forth in the *contract* or *construction documents*. Nor does it assign to the *owner* or *registered design professionals* any duty or authority to undertake responsibility inconsistent with the provisions of the *contract* or *construction documents*.

This *Code of Standard Practice* is not applicable to *nonstructural members*, including but not limited to interior drywall framing, which is addressed by AISI S220, ASTM C645, and ASTM C754, or *structural steel*, structural steel joists, steel deck, *metal building systems*, or rack structures, which are addressed by *AISC*, *SJI*, *SDI*, *MBMA*, and *RMI*, respectively. An extended list of non-applicable items is given in Section B2.

A2 Definitions

Where terms appear in this Standard in italics, such terms shall have meaning as defined in AISI S240 unless as defined herein. Terms included in square brackets are specific to *LSD* terminology. Terms not italicized shall have ordinary accepted meaning in the context for which they are intended.

AISC. American Institute of Steel Construction.

AISI. American Iron and Steel Institute.

Approved. Acceptable to the code official or *authority having jurisdiction*.

Bracing. Structural elements that are installed to provide restraint or support or both to other framing members so that the complete assemblies form a stable structure.

Building Design Model. A 3D digital model prepared by the *building designer* to define the desired construction.

Building Designer. *Owner* of the building or the person that *contracts* with the *owner* for the design of the framing structural system or who is responsible for the preparation of the *construction documents*. When mandated by the legal requirements, the *building designer* shall be a *registered design professional* (e.g., architect or structural engineer-of-record). Also referred to as owner's representative for design, but hereinafter will be referred to as *building designer*.

CASE. Council of American Structural Engineers.

CFS. Cold-formed steel.

CFS Component Assembly. A fabricated assemblage which consists primarily of *CFS structural members* that is manufactured by the *CFS component manufacturer*.

CFS Component Design Documents. The *CFS component design drawings*, or where the parties have agreed in the *contract* to provide 3D digital model(s), the *CFS component design model*. A combination of drawings and 3D digital models also may be provided.

CFS Component Design Drawing. The written, graphic and pictorial definition of an individual *CFS component assembly*, which may include engineering design data. Also referred to as *truss design drawing* for *truss* construction.

CFS Component Design Model. A 3D digital model of a *CFS component assembly*, which may include engineering design data.

CFS Component Designer. The individual or organization responsible for the engineering design of *CFS component assemblies*. Also referred to as *truss design engineer* on projects involving *trusses*, but hereinafter will be referred to as *CFS Component Designer*.

CFS Component Manufacturer. The individual or organization responsible for the manufacturing of *CFS component assemblies* for the project. Also referred to as *truss manufacturer* on projects involving *trusses* and *wall panel manufacturer* on projects involving *wall panels*, but hereinafter will be referred to as *CFS Component Manufacturer*.

CFS Component Placement Diagram. The illustration (i.e., drawing or 3D digital model) identifying the location of each of the *CFS component assemblies*.

CFS Structural Framing. The elements of the structural frame, as given in Section B1 of this *Code of Standard Practice*.

Clarification. An interpretation of the *construction documents* that have been *released for construction*, providing an explanation that neither revises the information that has been *released for construction* nor alters the cost or schedule of performance of the work.

Construction Documents. Written, graphic and pictorial documents prepared or assembled for describing the design (including the framing structural system), location and physical characteristics of the elements of a building necessary to obtain a building permit and construct a building. *Construction documents* include the *specifications* and *plans*, or where the parties have agreed in the *contract* to provide 3D digital model(s), the *building design model*. A combination of drawings and 3D digital models also may be provided.

Commentary:
The term "framing structural system" is commonly understood to mean a completed combination of structural elements, trusses, connections and other systems which serve to support the self-weight of the building and the specified loads. The definition for *Building Designer* in this Standard is in line with other industry standards.

Contract. The legally recognized agreement between two parties which defines, among other items, the responsibilities of the parties involved in bidding, purchasing, designing, supplying, and installing *CFS structural framing*.

Contractor. Owner of the building, or the person that *contracts* with the *owner*, who constructs or manages the construction of the building in accordance with the *construction documents.* Also referred to as owner's representative for construction, but hereinafter will be referred to as *contractor*.

Discrepancy. Any conflicts within the *construction documents*, or conflicts between the *construction documents* and *applicable building codes*.

Embedded Anchor. A structural anchor or device (bolt, strap, plate, etc.) intended for fastening *CFS structural framing* to masonry or concrete that is installed prior to hardening of the grout or concrete.

Framing Contractor. See *Installer*.

Framing Material. Steel products, including but not limited to *structural members* and *CFS component assemblies*, ordered expressly for the requirements of the project.

General Contractor. See *Contractor*.

Installation Documents. The *installation drawings*, or where the parties have agreed in the *contract* to provide 3D digital model(s), the *installation model*. A combination of drawings and 3D digital models also may be provided.

Installation Drawings. Drawings that show the location and installation of the *CFS structural framing*. Also referred to as *truss placement diagram* for *truss* construction and *wall panel placement diagram* for panelized wall construction.

Installation Models. A 3D digital model produced to convey the information necessary to install the *CFS structural framing*. Although not required, this may be the same 3D digital model as the *truss placement diagram* for *truss* construction and *wall panel placement diagram* for panelized wall construction.

Installer. Party responsible for the installation of *CFS* products.

Commentary:
While this *Code of Standard Practice* was patterned after a similar document by the *AISC*, care was taken to use terminology to avoid confusion between material suppliers, fabricators, and trades. Therefore, the term *installer* is used in reference to *CFS structural framing* versus the term erector typically used in reference to *structural steel*.

Lateral Force-Resisting System. The structural elements and connections required to resist racking and overturning due to wind forces or seismic forces, or both, imposed upon the structure in accordance with the *applicable building code*.

Material Supplier. An individual or entity responsible for furnishing *framing materials* for the project.

Commentary:
See definition of *Steel Deck Supplier* for furnishing of *steel deck*.

MBMA. Metal Building Manufacturers Association.

Metal Building System. A complete integrated set of mutually dependent components and assemblies that form a building. As defined by the *MBMA*, a *metal building system* includes the primary and secondary framing, covering, and accessories, all of which are manufactured to permit inspection on site prior to assembly or installation.

Overframing. Truss or rafter framing components used to frame the shape of dormers, intersecting roof planes, or other items required to complete the exterior profile of the roof.

Owner. The individual or entity organizing and financing the design and construction of the project.

Owner's Representative. The *owner* or individual designated contractually to act for the *owner*. Referred to as *building designer* when referencing owner's representative for design. Referred to as *contractor* when referencing owner's representative for construction.

Plans. Also referred to as construction drawings. Drawings prepared by the *building designer* for the *owner* of the project. These drawings include but are not limited to floor plans, framing plans, elevations, sections, details and schedules as necessary to define the desired construction.

Post-Installed Anchor. A structural anchor or device (bolt, clip, angle, bracket, etc.) intended for fastening *CFS structural framing* to hardened masonry or concrete. For anchorage to concrete, these anchors are installed after the concrete has achieved sufficient stiffness to be sawn or drilled.

Receiving Entity. The individual or entity responsible to the *contractor* for accepting or rejecting furnished *framing material* and proper storage of received *framing material*s on the job site.

Registered Design Professional. Architect or engineer who is licensed to practice their respective design profession as defined by the legal requirements of the jurisdiction in which the building is to be constructed.

Released for Construction. The term that describes the status of *construction documents* that are in such a condition that the *CFS component manufacturer* and the *installer* can rely upon them for the performance of their work, including the ordering of material and the preparation of *CFS component design documents* and *installation documents*.

Revision. An instruction or directive providing information that differs from information that has been *released for construction*. A *revision* may, but does not always, impact the cost or schedule of performance of the work.

RFI. Request for Information. A written request for information or *clarification* generated during the bidding, design or construction phases of the project.

RMI. Rack Manufacturers Institute.

SDI. Steel Deck Institute.

Specialty Designer. The *registered design professional*, individual or organization having responsibility for the design of the specialty items. This responsibility shall be in accordance with the state's, province's or territory's statutes and regulations governing the professional registration and certification of architects or engineers. Also referred to as *CFS component designer*, specialty engineer, delegated engineer, design engineer, registered engineer, and engineer, but hereinafter will be referred to as *Specialty Designer*. The requirement for a *Specialty Designer* is typically called out in the *specifications* or structural general notes. The *Specialty Designer* is typically not the *building designer*.

Specifications. Written instructions, which, with the *plans* or *building design model*, define the materials, standards, design of the products, and workmanship expected on a construction project.

SJI. Steel Joist Institute.

Standard Cold-Formed Steel Structural Shapes. *CFS structural members* that meet the requirements of AISI S240, *North American Standard for Cold-Formed Steel Structural Framing*.

Steel Deck. Profiled steel panels installed on support framing.

Commentary:

Steel deck is typically covered by a weather-resistant membrane, or by structural or insulating concrete.

Steel Deck Submittal Package. Package consisting of, but not limited to, *steel deck* profiles with section properties, bill of materials, layout/placement documents (i.e., drawing or 3D digital model) over support framing, and *steel deck* attachment patterns derived from information provided by the *building designer*.

Steel Deck Supplier. The entity responsible for furnishing *steel deck* for the project.

Commentary:
The *steel deck supplier* in most instances is also the manufacturer, but may be another entity, such as a broker.

Structural Steel. The elements of the structural frame defined as *structural steel* by *AISC* in the *Code of Standard Practice for Steel Buildings and Bridges*.

Sub-Contractor. The individual or organization with whom a *contractor* has contracted to furnish or install all or a portion of the project.

Submittals. Items required by the *construction documents* or *contract* to be submitted by the *contractor* or *sub-contractor*. These include but are not limited to *CFS component design documents*.

Truss Design Drawing. Written, graphic and pictorial depiction of an individual *truss*.

Truss Design Engineer. Person who is licensed to practice engineering as defined by the legal requirements of the jurisdiction in which the building is to be constructed and who supervises the preparation of the *truss design drawing*s.

Truss Designer. Person responsible for preparation of the *truss design drawings*.

Truss Member. A *chord member* or *web member* of a *truss*.

Truss Placement Diagram. The illustration (i.e., drawing) identifying the location of each *truss*.

Truss Placement Model. The 3D digital model representing the spatial relationship of the individual *trusses* in a *truss* system.

Truss Submittal Package. Package consisting of each individual *truss design drawing*, and, as applicable, the *truss placement diagram*, the cover/truss index sheet, permanent individual *truss member* restraint/bracing details designed in accordance with generally accepted engineering practice, applicable permanent individual *truss member* restraint/bracing details, and any other structural details germane to the *trusses*.

Wall Panel. A fabricated assemblage of individual *CFS structural members* into a *CFS component assembly* primarily for vertical framing applications.

Wall Panel Detailer. Person responsible for preparation of the *wall panel fabrication documents*.

Wall Panel Fabrication Documents. The *wall panel fabrication drawings*, or where the parties have agreed in the *contract* to provide 3D digital model(s), the *wall panel fabrication model*. A combination of drawings and 3D digital models also may be provided.

Wall Panel Fabrication Drawing. Written, graphic and pictorial depiction of an individual *wall panel*.

Wall Panel Fabrication Model. A 3D digital model of an individual *wall panel*.

Wall Panel Installer. Party responsible for the installation of *wall panels*.

Wall Panel Manufacturer. The individual or organization responsible for the manufacturing of *CFS wall panels* for the project.

Wall Panel Member. An individual *CFS structural member* in a *wall panel* assembly.

Wall Panel Placement Diagram. The illustration (i.e., drawing or 3D digital model) identifying the location of each *wall panel*.

Wall Panel Submittal Package. Documents consisting of the *wall panel fabrication documents*, and, as applicable, the *wall panel placement diagram*, and the cover/*wall panel* index sheet.

A3 Referenced Documents

The following documents or portions thereof are referenced within this *Code of Standard Practice* and shall be considered part of the requirements of this document.

1. American Institute of Architects, Washington, DC:
   AIA 201-2017, *General Conditions of the Contract for Construction*
2. American Iron and Steel Institute, Washington, DC:
   AISI S220-20, *North American Standard for Cold-Formed Steel Nonstructural Framing*
   AISI S240-20, *North American Standard for Cold-Formed Steel Structural Framing*
3. ASTM International, West Conshohocken, PA:
   ASTM A780/A780M-09(2015), *Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings*
   ASTM A1003/A1003M-15, *Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members*
   ASTM C645-18, *Standard Specification for Nonstructural Steel Framing Members*
   ASTM C754-18, *Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products*
   ASTM C955-18e1, *Standard Specification for Cold-Formed Steel Structural Framing Members*
4. Steel Deck Institute, Glenshaw, PA:
   SDI C-2017, *Standard for Composite Steel Floor Deck-Slabs*
   SDI NC-2017, *Standard for Non-Composite Steel Floor Deck*
   SDI RD-2017, *Standard for Steel Roof Deck*
   SDI COSP-2017, *Code of Standard Practice*

Commentary:
Additionally, the following dated versions of documents are referenced in the Commentary on this *Code of Standard Practice*:
(1) AIA Document E202—2008 Building Information Modeling Protocol Exhibit
(2) AIA Document E203—2013 Building Information Modeling and Digital Data Exhibit
(3) AIA Document G201—2013 Project Digital Data Protocol Form
(4) AIA Document G202—2013 Project Building Information Modeling Protocol Form
(5) BIMFORUM 2019 Level of Development Specification.
(6) Consensus Docs 301—2013 BIM Addendum.

A4 Responsibility for Identifying Construction Documents

A4.1 The *contract* shall define whether drawings, 3D digital models or both are to be used on the project. When *plans* and a *building design model* are both provided, the *contract* shall specify which document is the controlling *construction document*. The *contract* shall establish the procedures for communicating changes to the *construction documents*, permitted use of *building design models* and other 3D digital models, and restrictions on the release of these 3D digital models to other parties.

Commentary:
There can be many combinations of drawings and 3D digital models used as part of the *construction documents*, and to transfer information between the many entities in the design and construction processes. The communication of design information to the *component manufacturer* or *installer* through the *building design model* is permitted in this *Code of Standard Practice*. This *Code of Standard Practice* does not designate which of these possible documents takes precedence because of the variation in current practice. The document hierarchy is specified in the *contract* and communicated through the *contract*.

The *contractor* must provide guidance as to which information is to be considered to have precedence if conflicts exist.

A5 Responsibility for Design

Commentary:
Prior to this *Code of Standard Practice*, design responsibilities for *component assemblies* were defined in several overlapping industry documents, which included AISI S214, *North American Standard for Cold-Formed Steel Framing – Truss Design*, LGSEA Technical Note 551f on *Specifying Trusses*, and STCA *Standard Practices and Recommended Guidelines on Responsibilities for Construction Using Cold-Formed Steel Trusses and Components*. Where AISI S214, *North American Standard for Cold-Formed Steel Framing – Truss Design* is referenced by the *applicable building code*, those responsibilities would be legally binding unless modified. However, design responsibilities for other types of *CFS structural framing* were only partially defined in several *CASE* documents, which included the *National Practice Guidelines for Structural Engineer of Record* and *National Practice Guidelines for Specialty Structural Engineers*.

A key point of this *Code of Standard Practice* and the documents used in its development is that although design may be delegated, the *building designer* is responsible for the overall stability and integrity of the structure when completed.

A5.1 The *building designer* is responsible for the overall design of the building as required by the *applicable building code*. The *building designer* or the *owner* is permitted to solicit designs, *plans*, *building design models*, *specifications* and data for the *CFS structural framing* or *CFS component assemblies*, or *steel deck* from the *CFS component manufacturer*, *installer, specialty designer*, or *steel deck supplier*. However, the responsibility for specifying the requirements of the design, including the *applicable building codes* and standards, remains with the *building designer*.

Commentary:
Where projects (such as military and industrial new construction, or a renovation) have additional design requirements (such as blast resistance and progressive collapse resistance), *construction documents* should include a statement that the building should be designed in accordance with these requirements. When the design for blast resistance or progressive collapse resistance is to be performed by a *specialty designer* or *CFS component designer*, the *building designer* must specify the following data:
(1) Reference standard or criteria;
(2) Threat parameters sufficient to determine design loads and building components affected by the threat;
(3) Level of protection or acceptable damage level; and
(4) Any special requirements for the design of the members or connections transferring the force.

In mitigating conflicts between structural, fire, thermal, acoustic, and other issues, life safety should take precedence for consideration by the *building designer*. Structural and fire details are considered to be life safety as opposed to serviceability details such as thermal and acoustic.

A5.2 If the *construction documents* or *contract* specify *CFS component assemblies* or *steel deck,* the *construction documents* or *contract* shall define the responsibility for design of the *CFS component assemblies* or *steel deck* in accordance with Sections I1 and I2, and Chapter J, as applicable, and shall state clearly and precisely the exact requirements, including all *applicable building codes* and design criteria. The *building designer* assumes the responsibility for specifying the appropriate design criteria and shall confirm that the *specialty designer's* work conforms to the intent of the *construction documents*. The *building designer* shall be responsible for reviewing submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building. This review shall, at minimum, address the forces

and reactions as identified by the *specialty designer* that are transmitted to those elements of the structure that are not designed by the *specialty designer* as well as coordinate the various structural-related submittals with each other to ensure compatibility with the main building structure.

Commentary:
For *lateral force-resisting systems*, the design responsibilities of the *building designer* include but are not limited to design of roof/floor diaphragms, lateral load transferring elements (sometimes referred to as shear walls or shear transfer bracing), main lateral force-resisting elements, and foundations, as well as compliance of the overall structure with *applicable building codes*.

When the design of lateral load transferring elements is to be performed by a *specialty designer* or *CFS component designer*, the *building designer* must specify the following:
(1) Magnitude of lateral load to be transferred;
(2) Load path (i.e., where loads originate and where they are to be transferred);
(3) Bearing material and conditions; and
(4) Any special requirements for the design of the transferring elements; including any horizontal, vertical, or other deflection requirements due to vertical or lateral loads or both.

For cladding systems with *CFS* framing, the building designer is responsible for determining the need for, and specifying the following:
(1) The location of building expansion joints, and the amount of movement the joints are required to accommodate.
(2) The amount of upward and downward vertical structural deflection that the *CFS* framing is required to accommodate. If a single value is given, it is assumed that this is the value to be used at all levels.
(3) The magnitude of the horizontal drift required to be accommodated by the *CFS* framing between each story level. For seismic design, both elastic and inelastic values are to be specified.
(4) Special conditions in the architectural finishing systems that would affect the configuration of the *CFS* framing.

The *building designer* must also provide for the following in the design and detailing of the building:
(1) Horizontal and vertical deflection compatibility between all elements of the structure; and
(2) Support and anchorage accommodating horizontal and vertical reactions due to lateral loads.

A5.3 If the *owner* chooses not to hire a *registered design professional*, the *owner* is responsible for the suitability, adequacy, and legality of all aspects of design in the *plans*, *building design models* and *specifications*. In this case, the *owner* is responsible for the review and approval of *submittals*.

A5.4 The *contractor* or *sub-contractor* shall not be required to provide professional services which constitute the practice of architecture or engineering unless such services are specifically required by the *construction documents* or *contract* for a portion of the work or unless the *contractor* or *sub-contractor* needs to provide such services in order to carry out the *contractor's* or *sub-contractor's* responsibilities for construction means, methods, techniques, sequences, and procedures.

Commentary:
The provisions of Section A5.4 were based on AIA 201 Section 2.12.10; however, references to the *contractor* were expanded to include both the *contractor* and *sub-contractor*.

B. CLASSIFICATION OF MATERIALS

B1 Definition of Cold-Formed Steel Structural Framing

CFS structural framing shall consist of the elements of the structural frame that are shown in the *construction documents* essential to support the design loads and described as:

- *CFS structural members,*
- *CFS component assemblies,*
- *Bracing* and *blocking* necessary for the *CFS structural framing* or to provide stability for *CFS structural members,*
- Connection methods, hardware (fasteners, connectors, and *post-installed anchors*), and processes necessary for the installation of *CFS structural framing,*
- *Lateral force-resisting system,* and
- Welding materials and processes related to the fabrication or installation of *CFS structural framing.*

Commentary:
The items listed in Section B1 are normally fabricated or installed by the *CFS component manufacturer* or *installer*, and thereby define the scope of this *Code of Standard Practice.*

B2 Other Items

CFS structural framing shall not include other items that are not generally described in Section B1, even where such items are shown in the structural *plans* or the *building design model* or are attached to the *CFS structural framing* unless specifically identified by item in the *contract* or *construction documents,* or both. Other items include but are not limited to:

- Awnings
- Blocking for other attachments, such as door, window, cabinet, handrail, plumbing, awnings, storefront, glazing, and other systems
- Building cleaning equipment and equipment anchor support
- Cables for permanent *bracing* or suspension systems
- *CFS* concrete form decking
- *CFS* floor decking
- *CFS nonstructural members*
- *CFS* roof decking
- *CFS* wall sheathing, except as part of a *lateral force-resisting system*
- Chimney support framing
- Concrete slab edge forms
- Drywall and plaster trims and accessories
- Eave struts deployed as a component of a *metal building system*
- Edge angles, plates, embeds, and *structural steel* supports necessary for the support of suspended *CFS structural framing*
- *Embedded anchors*
- Expansion and control joints
- Fastening systems for ceiling, wall, floor, and roof sheathing materials
- Fire, smoke, and draft stopping
- Flagpole support framing
- Girts deployed as a component of a *metal building system*
- Handrails and handrail support members
- Insulation products

- Interior drywall (nonstructural) framing
- Mechanical equipment support framing
- *Metal building systems*
- Metal panels deployed as a component of a *metal building system*
- Miscellaneous metal
- Opening framing, if made from other than *standard CFS structural shapes*
- Open-web steel joists
- Plaster lathing, except where included with a *prefabricated structural assembly*
- Purlins deployed as a component of a *metal building system*
- Sheathing, unless part of a *prefabricated structural assembly*
- Stairs, stair landings, and stair railings
- Stair component support framing
- *Structural steel* framing
- *Structural steel* lintels, if jobsite installed
- *Structural steel* plate
- Support framing for cables
- Support framing for sign structures
- Suspended ceiling systems, proprietary or pre-engineered
- Window washing supports

Commentary:
The items listed in Section B2 are normally not fabricated or installed by the *CFS component manufacturer* or *installer*. When such items are contracted to be provided by the *CFS component manufacturer* or *installer*, coordination will normally be required between the *CFS component manufacturer* or *installer* and other material suppliers and trades.

C. CONSTRUCTION DOCUMENTS

Commentary:
Construction documents vary greatly in complexity. Nonetheless, the *CFS component manufacturer* and *installer* must be able to rely upon the accuracy and completeness of the *construction documents*. This allows the *CFS component manufacturer* and *installer* to provide the *owner* with bids that are adequate and complete.

One of the *contractor's* responsibilities is to ensure proper communication of all facts throughout the construction phases of the project between all parties involved. The *construction documents* (i.e., *plans*, *building design model*, *specifications*, and structural notes) are the primary method of communication. It is the *building designer's* responsibility to properly define the scope of work. When the *contractor* releases *plans*, the *building design model* or *specifications* for construction, the *CFS component manufacturer* and *installer* rely on the fact that these are the *owner's* requirements for the project.

Critical requirements that are necessary to protect the *owner's* interests which affect the integrity of the structure or that are necessary for the *CFS component manufacturer* or *installer* to proceed with their work must be included in the *construction documents*. In some cases, however, the *owner* can benefit when reasonable latitude is allowed in the *construction documents* or *contract* for alternatives that can reduce cost without compromising quality.

C1 Responsibilities

C1.1 The *owner* or *contractor* shall furnish to the *CFS component manufacturer* and *installer* a set of *construction documents* of current issue including addenda showing the type of support supplied, method of attachment, correct dimensions, and required minimum or maximum sizes and spacings.

C1.2 If *construction documents* are not available, the *building designer* shall provide complete information as specified in Section A5.2.

C1.3 The *construction documents* or *contract* may require the *CFS component manufacturer* or *installer* to submit a complete design for *approval* or review prior to the commencement of construction. In the process of this submittal, the *CFS component manufacturer* or *installer* shall bring to the attention of the *building designer* any *discrepancy* within the *construction documents*. The *building designer* must present clear instructions to the *CFS component manufacturer* or *installer* on how to resolve each *discrepancy*. Changes resulting from such *discrepancies* shall be handled in accordance with Sections H5 through H9.

C1.4 Architectural *plans* and *building design models* shall be legible, shall indicate the design intent of *CFS structural framing*, and shall include at a minimum the location of *CFS structural framing*, constraints on member size (e.g., web depth), wall and other assembly types, non-standard spacing, and location requirements.

C1.5 Structural *plans* and *building design models* shall show the *structural member* locations, sizes, reinforcing, and connections in sufficient scale and detail to enable the construction of the building in a reasonable sequence by a competent *contractor* experienced in the techniques of construction for the specified materials. Structural *plans* may refer to architectural *plans* for dimensions, where appropriate. Elevations, sections, and details should be of appropriate scale, number, and extent to clearly portray the relationship of members to each other and their interconnection(s). Care should be taken to determine that details noted "typical" are applicable to the project or condition being portrayed.

C2 Limit of Responsibility

The *construction documents* are assumed to be correct in all details, and the *CFS component manufacturer's* and *installer's* responsibilities are limited to furnishing products in accordance with

these documents and this *Code of Standard Practice*. Any change to these *construction documents* must be authorized in writing by the *building designer*.

Commentary:
It should not be the responsibility of the *CFS component manufacturer* or the *installer* to compare the *construction documents* (i.e., plans, the *building design model*, *specifications,* and structural notes) against each other in order to verify consistency. This is typically the responsibility of the *building designer*.

C3 Jurisdiction

The *construction documents* shall specify the required building codes and *authorities having jurisdiction*.

C4 Discrepancies or Omissions

When a *discrepancy* or omission is discovered in the *construction documents* in the course of work by the *contractor*, *CFS component manufacturer*, *installer*, or any other parties involved with the construction, the entity finding the *discrepancy* or omission shall promptly notify the *contractor* so that the *discrepancy* or omission can be resolved by the *building designer*. Such resolutions shall be timely so as not to affect the work of the *CFS component manufacturer* or *installer*. Changes resulting from such *discrepancies* or omissions shall be handled in accordance with Sections H5 through H9 as appropriate.

Commentary:
While it is the responsibility of the *CFS component manufacturer* or *installer* to report any *discrepancies* or omissions that are discovered in the *construction documents*, it is not the responsibility of the *CFS component manufacturer* or *installer* to discover *discrepancies* or omissions, including those that are associated with the coordination of the various disciplines. The quality of the *construction documents* is the responsibility of the entities that produce those documents.

C5 Revisions

Revisions to the *construction documents* shall be made either by issuing new *construction documents*, by reissuing the existing *construction documents,* or by the *RFI* process. In all cases, *revisions*, including *revisions* that are communicated through responses to *RFIs* (see Section H5) or the review process (see Section D3), shall be clearly and individually indicated on such documents. If new *construction documents* are issued due to *revisions*, the parties issuing the new *construction documents* shall submit them to the *contractor* for distribution. The *construction documents* shall be dated and identified by *revision* number. Revised *construction documents* shall be identified by the same number throughout the duration of the project, regardless of the *revision*. See also Sections H5 through H9 as appropriate.

When revisions are communicated using *building design models*, revisions shall be made evident in the revised *building design model* by identifying within the *building design model* which items are changed. Alternatively, the changes shall be submitted with a written document describing in explicit detail the items that are changed. A historic tracking of changes shall either be present in the revised *building design model* or maintained in the written record of changes.

The party or entity that is contractually assigned responsibility for managing the *building design model* shall maintain accurate accounting and tracking records of the most current *building design model*, as well as previously superseded *building design models*, and shall facilitate a tracking mechanism so that all contracted parties are aware of and have access to the most current *building design model*.

Commentary:

Revisions to the *construction documents* can be made by issuing sketches and supplemental information separately from the *construction documents*. These sketches and supplemental information become amendments to the *construction documents* and are considered new *construction documents*. All sketches and supplemental information must be uniquely identified with a number and date as the latest instructions until such time as they may be superseded by new information. When *revisions* are made by revising and reissuing the existing *construction documents*, a unique revision number and date must be added to those documents to identify that information as the latest instructions until such time as they may be superseded by new information. The same unique drawing number must identify each drawing throughout the duration of the project so that *revisions* can be properly tracked, thus avoiding confusion and miscommunication among the various entities involved in the project. When *revisions* are communicated through the annotation of *submittals*, such changes must be confirmed in writing by one of the aforementioned methods. This written confirmation is imperative to maintain control of the cost and schedule of a project and to avoid potential errors in fabrication and installation.

When *building design models* are used, a similar unique method of identifying each revision must be used. This method can vary in various 3D digital modeling software, but the same level of notation of changes must be present in the revised *building design model* as would be used on *plans*.

D. INSTALLATION DOCUMENTS

D1 Owner Responsibility

D1.1 When the project is *released for construction*, the *owner* or *contractor* shall provide complete *construction documents* and relevant information (including addenda and other related documents such as window shop drawings and architectural metal panel drawings) in a timely manner for the installation of *CFS structural framing* and, if required, for the preparation of *CFS component design documents* and *installation documents*. A scope of work for items required, having been agreed upon at the time of the *contract*, shall also be incorporated with these documents. This scope shall include and indicate all items that are to be fabricated and installed.

D1.2 If the *owner* or *contractor* requests that *submittals* be prepared before the timely submittal of any other required documents, such as window shop drawings or architectural metal panel drawings, any changes required due to the differences between these documents and the assumptions made in preparation of the *submittals* must be the responsibility of the *building designer*. Delays in obtaining such required information can extend the schedule agreed to at time of *contract*.

Commentary:

When the *owner* issues *plans*, *building design models* and *specifications* that are *released for construction*, the *CFS component manufacturer* and the *installer* rely on the fact that these are the *owner's* requirements for the project. This release is required by the *CFS component manufacturer* and the *installer* prior to the ordering of material and the preparation and completion of the *CFS component design documents* and *installation documents*.

To ensure the orderly flow of material procurement, *CFS component assembly* design, *CFS component assembly* manufacturing, and installation activities, on phased construction projects, it is essential that designs are not continuously revised after they have been *released for construction*. In essence, once a portion of a design is *released for construction*, the essential elements of that design should be "frozen" to ensure adherence to the *contract* price and construction schedule. Alternatively, all parties should reach a common understanding of the effects of future changes, if any, as they affect scheduled deliveries and added costs.

A pre-detailing conference, held after the *contract* is awarded, can benefit the project. Typical attendees may include the *contractor*, the *building designer*, the *CFS component manufacturer*, the *specialty designer*, and the *installer*. Topics of the meeting should relate to the specifics of the project and might include:

- *Construction document* review and general project overview, including clarifications of scope of work, tolerances, layouts and sequences, and special considerations.
- Detailing and coordination needs, such as bolting, welding, and connection considerations, constructability considerations, Occupational Safety and Health Administration (OSHA) requirements, coordination with other trades, and the advanced bill of materials.
- The project communication system, including distribution of *contact* information for relevant parties to the *contract*, identification of the primary and alternate contacts in the general contractor's office, and the *RFI* system to be used on the project.
- The *submittal* schedule, including the method of submitting (electronic or hard copy); for hard copy, how many copies of documents are required; connection submittals; and identification of schedule-critical areas of the project, if any.
- If 3D digital models will be used as part of the delivery method for the *construction documents*, the parties should determine and convey the levels of development (LOD), the 3D digital model types that will be furnished, the authorized uses of such 3D digital models, the transmission of 3D digital models to prevent the loss or alteration of data, interoperability, and methods of review and approval. The term "levels of development" (LOD) refers to the level of completeness of elements within the 3D digital model (see the BIMFORUM Level of Development Specification). The term

"authorized uses" refers to the permitted uses of the 3D digital model(s) and the digital data associated with the 3D digital model(s). Such authorized uses may include the right to: (1) store and view the 3D digital model(s) for informational purposes only, (2) rely upon, store and view the 3D digital model(s) to carry out the work on the project, (3) reproduce and distribute the 3D digital model(s) for informational purposes only, (4) rely upon, reproduce and distribute the 3D digital model(s) to carry out the work, (5) incorporate additional digital data into the 3D digital model(s) without modifying the data received to carry out the work on the project, (6) modify the 3D digital model(s) as required to carry out the work on the project, (7) produce the 3D digital model(s) in an archival format for the *owner* to use as a reference for as-built construction data and/or for the operation of the project after completion, and/or (8) other authorized uses specified in the *construction documents*.

- Review of quality and inspection requirements, including the approvals process for corrective work.
- A record of the meeting should be distributed to all parties. Subsequent meetings to discuss progress and issues that arise during construction also can be helpful, particularly when they are held on a regular schedule.

D2 Component Manufacturer and Installer Responsibility

D2.1 The *CFS component manufacturer* or *installer* shall submit *submittals* (including provisions per Chapter I) when required by and per the *construction documents* or *contract*, on a schedule formulated and agreed to at time of *contract*.

Commentary:

The *CFS component manufacturer* or *installer* should be permitted to use the services of a *specialty designer* or independent detailer to produce shop drawings for the production of individual *CFS component assemblies* for the project or *installation documents* and to perform other support services.

When the *CFS component manufacturer* or *installer* provides a schedule for *submittals*, it must be recognized that this schedule may be affected by *revisions*, response time to *RFI*(s), and resolution of *discrepancies* or omissions.

D2.2 Requests for supplemental structural support elements, such as miscellaneous structural steel or embedded items not specified in the *construction documents* or *contract*, shall be submitted by the *CFS component manufacturer* or *installer* and handled in accordance with Sections H5 through H9. Delays in obtaining confirmation of such requests can extend the schedule agreed to at time of *contract*.

D3 Review Process

Commentary:

Upon receipt of documents from different trades, the *owner* or *contractor* must review each *submittal*, as well as forward it, as appropriate, to the *building designer* for review in order to assure continuity and completeness. The different trade *submittals* must be reviewed to ensure conformity and identify conflicts or "gray" areas not covered by any trade but necessary to integrate the different trades.

D3.1 The *owner* or *contractor* shall forward the *submittals* to the *building designer* for review. The *building designer* shall return the *submittals* indicating one of the following: reviewed (no exception taken), reviewed as noted (resubmittal not required), revise and resubmit, or rejected.

D3.2 The *owner* or *contractor* shall return to the *CFS component manufacturer* or *installer* one set of the *submittals* indicating one of the following: approved (no exception taken), approved as noted (resubmittal not required), revise and resubmit, or rejected.

D3.3 If modifications are required, the *CFS component manufacturer* or *installer* and *specialty designer*, if retained by the *CFS component manufacturer* or *installer*, shall have at least fourteen

(14) calendar days for incorporating the required changes.

D3.4 If modifications with the resubmittal are required, the *submittals* shall be resubmitted to the *contractor* for construction for review and approval in accordance with Sections D3.1 and D3.2 after all required modifications and corrections have been executed.

Commentary:
If such modifications involve a single item or minor changes, only those items need to be revised and resubmitted. These *revisions* may be appended to the original *submittals*. For example, if one *CFS component design document* among several designs is incorrect, that design should be revised and resubmitted. However, if the design criteria have been revised, all the *CFS component design documents* based on that criteria must be revised and resubmitted. *Revisions* to the *CFS component design documents* can be made by issuing sketches and supplemental information separately from the *CFS component design documents*.

D3.5 Should modifications be required which were not part of the agreed to scope of work, the *CFS component manufacturer* or *installer* shall submit in writing an appropriate modification to the contract price for this modification (including but not limited to engineering, material, labor, overhead, and profit) for approval by the *owner* or *contractor*.

D3.6 The *CFS component manufacturer* or *installer* shall not proceed with any portion of work until all modifications and extra charges for that portion of work are resolved.

Commentary:
The intent of this section is to protect all parties from potential risks and costs associated with proceeding prior to the resolution of issues.

D3.7 It is the responsibility of the *owner* or the *contractor* to ensure that the above *submittal* process is coordinated with the project schedule.

D4 General Responsibility

D4.1 The *owner* or *contractor* is responsible for approval of the *submittals* prepared by the *CFS component manufacturer* or *installer* that have been reviewed by the *building designer.* This approval and review indicate that the *CFS component manufacturer* or *installer* has correctly interpreted the *construction documents* and *contract* requirements and is released to start fabrication and installation.

D4.2 Approval by the *owner* or *contractor* and review by the *building designer* of *submittals* does not relieve the *CFS component manufacturer* or *installer* of the responsibility for compliance with the *construction documents*, accuracy of quantities and dimensions on *submittals*, the general fit-up of parts to be assembled in the field, or for providing acceptable workmanship.

Commentary:
When the *CFS component manufacturer* or *installer* intends to make a submission of an alternate to what is shown in the *construction documents*, the *CFS component manufacturer* or *installer* must notify the *owner, contractor*, or the *building designer* in advance. This will allow the parties involved to schedule the review of the alternate for impact on cost, schedule and benefits. This evaluation may result in the rejection of the alternate. However, if alternate *submittals* are reviewed and approved, this constitutes acceptance by the *owner, contractor,* or *building designer* of materials, criteria or designs that may differ from those required by the *contract documents*.

E. MATERIALS

E1 Structural Members

E1.1 Use of steel of a higher-than-specified grade, *base steel thickness*, or coating is permitted to substitute the grade, *base steel thickness*, or coating as specified, unless specifically prohibited in the *construction documents* or *contract*.

E1.2 Changes in size or shape of *structural members* shall require the consent of the *building designer*.

E1.3 *Structural members* shall comply with the manufacturing tolerances listed in AISI S240 Chapter A or ASTM C955.

E1.4 *CFS component assemblies* shall have *structural members* that are cut and assembled in accordance with the tolerances prescribed in AISI S240 Chapter C. *Trusses* shall have *structural members* that are cut and assembled in accordance with the additional requirements of AISI S240 Chapter E.

E2 Fasteners and Connection Hardware

E2.1 Use of a larger-than-specified fastener is permitted, provided that the minimum spacing and edge distance requirements of the larger fastener are met, and the strength requirements of the specified fastener are met.

E2.2 Connection hardware (i.e., connectors and *post-installed anchors*) shall be as specified in the *approved* design, except for substitutions accepted by the *building designer*.

E3 Preparation of Material

E3.1 Proper methods of cutting in accordance with AISI S240 Chapter C are to be selected by the *installer*, unless otherwise specified in the *construction documents* or *contract*.

E3.2 In the manufacture of *structural members* and connection hardware, mechanical braking, bending, or forming is permitted.

E4 Member Identification

Structural members shall be identified in accordance with the product identification requirements for framing members defined in AISI S240 Chapter A.

E5 Special Marking

CFS component assemblies shall be marked as necessary to document such items as proper orientation, special bearing conditions and permanent *bracing* requirements. Alternatively, it shall be acceptable for the *specialty designer* to provide this information to the *installer* by means of indications on the *CFS component placement diagrams*.

E6 Camber

CFS component assemblies will only be provided with camber if specified by the *building designer*.

F. INSTALLATION

F1 Scope

Items of *CFS* to be installed shall be enumerated in the *contract*.

F2 Site Conditions

Commentary:
This section is deemed important for the safety and efficiency of the *installer* and the *installer's* crew, as well as for the protection of the people, property, etc., which may be present at the site at the time of installation.

F2.1 The *installer* shall be permitted to use the most efficient and economical method and sequence of installation or assembly available consistent with the *construction documents*. When the *owner* or *contractor* contracts separately with a *CFS component manufacturer* and *installer*, the *owner* or *contractor* is responsible for coordinating work between these two parties.

F2.2 The *installer* shall examine areas and conditions under which *framing materials* are to be installed. Work shall not proceed until unsatisfactory conditions have been corrected by those responsible.

F2.3 The *contractor* shall provide and maintain adequate access necessary for equipment and *framing materials* to be installed. The *contractor* shall provide the *installer* level, convenient, and adequate space to safely use the necessary equipment and install the *framing materials*.

F2.4 The *contractor* shall coordinate *installation documents*, resolution of dimensional problems, compatibility of various trades and installation.

F3 Delivery, Handling and Storage of Materials

F3.1 It is the *receiving entity's* responsibility to verify that *framing materials* arrive in good condition. If *framing materials* arrive at a destination in a damaged condition, the *receiving entity* shall promptly notify the *material supplier* or *CFS component manufacturer* prior to unloading the *framing material*, or promptly upon discovery and prior to installation.

F3.2 It is the *contractor's* or the *installer's* responsibility to verify that the *framing material*s are not damaged and meet the project *specifications* or *approved submittals* before installation. The *material supplier* or *CFS component manufacturer* shall be responsible solely for the replacement of damaged material or material that does not meet the project *specifications* or *approved submittals* or both. If the *contractor* or the *installer* installs damaged material, then that party assumes the cost of repairing or installing new materials. At no time will the consequential costs to be assumed by the *material supplier* or *CFS component manufacturer* exceed the selling price of the particular material in question.

F3.3 Damage caused by improper storage or handling of *framing materials* on the job site is not the responsibility of the *material supplier* or *CFS component manufacturer*.

F3.4 Proper storage of *framing materials* on the job site is the responsibility of the *receiving entity*, and requires that *framing materials* not be in direct contact with the ground and be protected from the elements. Adequate drainage and ventilation shall be provided to minimize the formation of "wet storage stain" or "white rust."

F3.5 Proper handling of *framing materials* on the job site is the responsibility of the *contractor* and *installer*, and requires that care be exercised to not cause significant damage to the metallic coating. Bare steel exposed at minor scuffs and scratches is generally protected by the zinc's ability to provide cathodic protection and does not require any repair; however, significant damage to the metallic coating, such as is caused by field welding, must be repaired in

accordance with Section F4.

F4 Field Modifications and Repairs

F4.1 Any modifications or repairs shall be in accordance with Section F4 and the provisions of Chapter I, as applicable.

F4.2 If the *contractor*, *sub-contractor* or any others modify or damage *framing materials*, that party is responsible for all costs necessary to analyze and, when necessary, correct the situation.

F4.3 Installation of holes in the *webs* of *structural members* is limited to the size, configuration, and location as specified in the *approved* design or recognized design standard. Any *webs* of *structural members* with holes violating the above requirements must be evaluated by the *building designer*. The *building designer* may request that the *specialty designer* provide recommendations on such holes, with final acceptance by the *building designer*.

F4.4 Field repairs to damaged *structural members* shall be made in accordance with the *building designer's* recommendation. The *building designer* may request that the *specialty designer* provide recommendations on field repairs, with final acceptance by the *building designer*.

F4.5 Repairs to the metallic coating, when required, shall be in accordance with ASTM A780.

F4.6 Change orders resulting from field modifications or repairs shall be handled in accordance with Sections H5 through H9.

F5 Installation Tolerances

F5.1 *Structural members* and *CFS component assemblies* shall be installed in accordance with the tolerances prescribed in AISI S240 Chapter C.

F5.2 *Trusses* shall be installed in accordance with the additional requirements of AISI S240 Chapter E.

F6 Temporary Bracing

The *installer* shall determine, furnish, and install all temporary *bracing* required for the *cold-formed steel structural framing*. This temporary *bracing* shall secure the framing against loads that are expected to be encountered during installation.

Commentary:

Examples of temporary *bracing* conditions are:

(1) Lateral *bracing* of top flange of *floor joists* before full installation or attachment of flooring material,

(2) In-plane *bracing* of wall panels before installation of shear panels or sheathing material,

(3) Out-of-plane *bracing* of wall panels before being connected to perpendicular walls or other parts of the structure, and

(4) Top *chord members*, *web members* and bottom chord plane *bracing* of roof and floor *trusses* before installation of permanent sheathing or *bracing*.

Loads that are expected to be encountered during installation include, but are not limited to, loads due to wind and snow, and loads that result from installation operations. The *installer* is not expected to consider loads during installation that result from the performance of work by other trades that are not identified on the *construction documents* or coordinated with the *contractor* and these trades. ASCE 37 Standard (2019) may be used as a reference to determine construction loads for the design of temporary *bracing*. CFSC-SBCA (2019) may also be used as a best practice guide for bracing of *cold-formed steel trusses.*

References:

ASCE/SEI 37-14 (R2019), *Design Loads on Structures During Construction*, American Society of Civil Engineers, Reston, VA.

CFSC-SBCA (2019), *Cold-Formed Steel Building Component Safety Information (CFSBCSI) Guide to Good Practice for Handling, Installing, Restraining & Bracing of Cold-Formed Steel Trusses (2019)*, published by Cold-Formed Steel Council (CFSC) of the Structural Building Components Association (SBCA), Madison, WI.

G. QUALITY CONTROL

G1 General

G1.1 *Material suppliers* and *CFS component manufacturers* shall maintain a properly documented *quality control program* to ensure that their work is performed in accordance with this *Code of Standard Practice*, AISI S240 Chapter D, and relevant ASTM standards and in accordance with the *applicable building code*.

Commentary:
Section G1.1 requires a properly documented *quality control program* for *material suppliers* and *CFS component manufacturers*. To assist in verification of an adequate *quality control program*, some *CFS structural framing* manufacturers and their associations have developed voluntary industry certification programs to ensure a consistent level of quality documentation and material production. It is up to the *authority having jurisdiction* to determine acceptance of the industry certification program.

If the *CFS component manufacturer* or *installer* produces *structural members* using on-site mechanical braking, bending, or forming, they have in effect assumed the role of the *material supplier* and these provisions would apply.

G1.2 The *contractor* shall maintain a *quality control program* so that the work performed by the *installer* can be completed in accordance with this *Code of Standard Practice*, the *contract*, *construction documents*, and *submittals*.

Commentary:
Items under the *contractor's quality control* that may affect the *installer's* performance include but are not limited to the following:

- Tolerances and quality of work by other trades that precede the *installer's* work.
- Placement of *embedded anchors* or bearing plates.
- Clean and unobstructed work areas.
- Timeliness and completeness of work by other trades.

G1.3 The *installer* shall maintain a *quality control program* so that the work is performed in accordance with this *Code of Standard Practice*, the *contract, construction documents*, and *submittals*. The *installer* shall be capable of performing the necessary installation or assembly and provide the equipment, personnel and management for the scope, magnitude and required quality of each project. The *installer* shall employ sufficient qualified personnel to properly complete the work required by the *contract, construction documents*, and *submittals*.

G2 Material Inspection

G2.1 The *receiving entity* shall verify that the *framing materials* delivered meet the requirements of the *contract*, *construction documents*, and *submittals*.

G2.2 The *receiving entity* shall check the *framing materials* to verify that the *framing materials* have been properly labeled as required by Section E4.

H. CONTRACTUAL RELATIONS

H1 Construction Documents and Contracts

This Standard is not intended to take precedence over the *construction documents* where a *contract* between parties exists and incorporates by reference those *construction documents*.

This Standard is not intended to take precedence over a *contract.* A *contract* shall be permitted to contain provisions that take precedence over the Standard and the *construction documents*. A party shall not exclude in a *contract* a responsibility established by this Standard or in accordance with the *construction documents* unless that responsibility is assigned to a qualified party and that party agrees to that assignment. A party may exclude a responsibility assigned in the *construction documents* that is not established by this Standard.

A *contract* shall be permitted to incorporate this chapter of the Standard to establish the responsibilities of the parties to such *contract*.

H2 Presentation of Proposals

All proposals for furnishing *framing material* shall be made on a sales *contract* form. After acceptance by the *owner*, these proposals must be accepted or executed by a qualified official of the *CFS component manufacturer* or *installer*. Upon such acceptance, the proposal becomes a *contract*.

H3 Acceptance of Proposals

All proposals shall have a specified term of acceptance. If the proposal is not accepted within this term, the proposal becomes invalid.

H4 Terms of Payment

The terms of payment for the work to be completed shall be specified in the *contract*.

H5 The RFI Process

When *RFIs* are issued, the process shall include the maintenance of a written record of inquiries and responses related to interpretation and implementation of the *construction documents*, including the *clarifications* and *revisions* to the *construction documents* that may result. *RFIs* shall not be used for the incremental release of *construction documents*. When *RFIs* involve *discrepancies,* omissions, or *revisions*, refer to Sections C4 and C5.

Commentary:
The *RFI* process is most commonly used during the detailing process, but can also be used to forward inquiries by the *CFS component manufacturer* or *installer* or to inform the *owner's representatives* in the event of a *CFS component manufacturer* or *installer* error and to develop corrective measures to resolve such errors. The *RFI* process is intended to provide a written record of inquiries and associated responses, but not to replace all verbal communication between the parties on the project. *RFIs* should be prepared and responded to in a timely fashion so as not to delay the work of the *CFS component manufacturer* or *installer*. Discussion of the *RFI* issues and possible solutions between the *CFS component manufacturer* or *installer* and *owner's representatives* often can facilitate timely and practical resolution. Unlike *CFS component design document* and *installation document submittals* in Section D2, *RFI* response time can vary depending on the urgency of the issue, the amount of work required by the *owner's representatives* to develop a complete response, and other circumstances such as building official approval. *RFIs* should be prepared in a standardized format, including *RFI* number and date, identity of the author, reference to a specific location(s) within the *plans*, *building design model* or *specification* section, the needed response date, a description of a suggested solution (graphic depictions are recommended for more complex issues), and

an indication of possible schedule and cost impacts. *RFIs* should be limited to one question each (unless multiple questions are interrelated to the same issue) to facilitate the resolution and minimize response time. Questions and proposed solutions presented in *RFIs* should be clear and complete. *RFI* responses should be equally clear and complete in the depictions of the solutions, and signed and dated by the responding party.

Unless otherwise noted, the *CFS component manufacturer* or *installer* can assume that a response to an *RFI* constitutes a new set of documents *released for construction*.

H6 Revisions to the Construction Documents and Contract

Revisions to the *construction documents* or *contract* shall be confirmed by change order, in accordance with Section H7. Unless otherwise noted, the issuance of a *revision* to the *construction documents* shall constitute authorization by the *owner's representative* that the *revision* is *released for construction*.

H7 Change Orders

The *contractor* shall review the change order within fourteen (14) days, or sooner if the decision delays the project schedule, and issue a formal response. The *contractor's* compensation of the *CFS component manufacturer* or *installer* or both for conflicts, *discrepancies*, omissions, and *approved* field modifications and repairs shall not be delayed due to the *contractor's* negotiations with the *sub-contractor* determined to be at fault.

Commentary:
These change orders may be necessitated by any conflicts, in accordance with Section C1; *discrepancies* or omissions, in accordance with Section C4; *revisions*, in accordance with Section C5; delivery, handling and storage of materials, in accordance with Section F3; or field modifications and repairs, in accordance with Section F4.

H8 Contract Price Adjustment

When the scope of work and responsibilities of the *CFS component manufacturer* or *installer* are changed from those previously established in the *contract*, an appropriate modification of the *contract* price shall be made. In computing the *contract* price adjustment, the *CFS component manufacturer* or *installer* shall consider the quantity of work that is added or deleted, the modifications in the character of the work and the timeliness of the change with respect to the status of material ordering, detailing, fabrication and installation operations.

Requests for *contract* price adjustments shall be presented by the *CFS component manufacturer* or *installer* in a timely manner and shall be accompanied by a description of the change that is sufficient to permit evaluation and timely approval by the *contractor*.

H9 Scheduling

The *contract* schedule shall state:

- When the *construction documents* will be *released for construction.*
- When the job site will be ready, free from obstructions and accessible to the *installer*, so that installation can start at the designated time and continue without interference or delay caused by the *contractor* or other trades.

The *CFS component manufacturer* or *installer* shall advise the *owner*, *building designer* or *contractor*, in a timely manner, of the effect any *revision* has on the *contract* schedule.

If the fabrication or installation is significantly delayed due to *revisions* to the requirements of the *contract*, or for reasons that are the responsibility of others, the *CFS component manufacturer* or *installer* or both shall be compensated for the additional costs incurred.

I. PRACTICES SPECIFIC TO CFS COMPONENT ASSEMBLIES

In addition to Chapters A through H, this chapter provides standard practices specific to *CFS component assemblies* as applicable.

I1 Truss Responsibilities

I1.1 Design of Trusses

Trusses shall be designed in accordance with one of the following methods:

(a) **Designed by a Design Professional**. If the *building designer* or a delegated *registered design professional* designs the *trusses*, all design criteria, details, and specifications with respect to the *trusses* shall be indicated on the *construction documents* or *contract* as required by the *applicable building code*.

(b) **Designed by a *Truss Design Engineer* or *Truss Designer***. *Truss* design shall be in accordance with Sections I1.2.1, I1.2.2 and I1.2.3.

I1.2 Responsibilities of Truss Design Engineer/Truss Designer

I1.2.1 Preparation of Truss Design Drawings

I1.2.1.1 Truss Design Engineer

The *truss design engineer* shall supervise the preparation of the *truss design drawings* based on the *truss* design criteria and requirements set forth in the *construction documents*, or as otherwise set forth in writing by the *building designer*, as supplied to the *truss design engineer* by the *contract* or through the *truss manufacturer*.

I1.2.1.2 Truss Designer

The *truss designer* shall be responsible for the individual *truss* component design and the preparation of the *truss design drawings* based on the *truss* design criteria and requirements set forth in the *construction documents,* or as otherwise set forth in writing by the *building designer* as supplied to the *truss designer* by the *truss manufacturer*.

I1.2.2 Truss Design Criteria, Assumptions and Calculations

The *truss designer* shall make available as part of the *truss submittal package*, upon request by the *owner's representative* or building official, design calculations, including the following:

(a) Loads and load combinations considered,

(b) Axial forces, moments, and shears resulting from the applied loads and load combinations, and

(c) Design assumptions.

I1.2.3 Truss Design Drawings

The *truss design drawings* shall consist of the individual *truss design drawings* and referenced details, if any. The *truss design drawings* shall be part of the *truss submittal package* and include, at a minimum, the information specified below:

(1) *Applicable building code* used for design, unless specified on a cover/truss index sheet,

(2) Slope or depth, span, and spacing,

(3) Number of plies if greater than one,

(4) Bearing locations and minimum bearing lengths,
(5) Design loading(s) as applicable, including:
  (a) Top chord roof or floor live load,
  (b) Top chord roof snow load,
  (c) Top chord dead load,
  (d) Bottom chord live load,
  (e) Bottom chord dead load,
  (f) Additional loads and locations,
  (g) Environmental design loads (e.g., wind and snow) and all applicable factors as required to calculate the *truss* loads, and
  (h) Other lateral loads, including drag strut loads.
(6) Reaction forces and direction, including maximum downward, lateral and uplift reaction forces, where applicable, based on *nominal* [*specified*] *loads*,
(7) Location of all *truss member* connections,
(8) *Gusset plate* locations, sizes, and material specifications,
(9) Fastening type, size, quantities, and locations,
(10) Shape and material specification for each *truss member*,
(11) Maximum axial compressive and tension forces in all *truss members* based on *nominal* [*specified*] *loads*,
(12) *Truss*-to-*truss* connection and *truss* field assembly requirements,
(13) Calculated span-to-deflection ratio or maximum vertical and horizontal deflection for *nominal* [*specified*] live and total *load*, as applicable,
(14) Locations of required permanent individual *truss member* restraint in accordance with Section I1.6(a) or I1.6(c), if required, and
(15) Design and details for individual *truss member* reinforcement in accordance with Section I1.6(b), if required.

I1.2.4 Truss Design Drawings Seal and Signature

Where required by the *building designer* or the *authority having jurisdiction*, each individual *truss design drawing* shall bear the seal and signature of the *truss design engineer*. When an individual *truss design drawing* has multiple pages, only the first page shall be required to be signed and sealed by the *truss design engineer*. When a cover/truss index sheet is used, it shall be the only document required to be signed and sealed by the *truss design engineer*.

I1.3 Responsibilities of Truss Manufacturer

I1.3.1 Truss Design Criteria and Requirements

The *truss manufacturer* shall obtain the *truss* design criteria and requirements from the *construction documents*.

I1.3.2 Communication to Truss Design Engineer

The *truss manufacturer* shall communicate the *truss* design criteria and requirements to the *truss design engineer* or *truss designer*, as applicable.

I1.3.3 Truss Placement Diagram or Model

Where required by the *construction documents* or *contract*, the *truss manufacturer* shall prepare the *truss placement diagram* or, where the parties have agreed in the *contract* to provide 3D digital model(s), the *truss placement model* that identifies the assumed location for each individually designated *truss* and references the corresponding *truss design drawing*. The *truss placement diagram* shall be permitted to include identifying marks for other products, including structural elements, so that they may be more easily identified by the *contractor* during field installation. When the *truss placement diagram* or *truss placement model* serves only as a guide for *truss* installation and requires no engineering input, it does not require the seal of any *truss design engineer* or *registered design professional*.

I1.3.4 Truss Submittal Package

Where required by the *construction documents*, *contract* or the building official, the *truss manufacturer* shall provide the appropriate *truss submittal package* for review or approval to one or more of the following: *building designer,* building official or *contractor* in accordance with Section D3.

I1.3.5 Reliance on Construction Documents

The *truss manufacturer* shall be permitted to rely on the accuracy and completeness of information furnished in the *construction documents* or otherwise furnished in writing by the *building designer* or *contractor*.

I1.4 Responsibilities of Building Designer

I1.4.1 Preparation of Construction Documents

The *construction documents* shall be prepared by the *building designer* and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed in accordance with the *applicable building code*.

I1.4.2 Deferred Submittals

The *building designer* shall list the deferred submittals on the *construction documents*. The *building designer* shall review deferred submittals in accordance with Section I1.4.3.

I1.4.3 Review Submittal Packages

The *building designer* shall review the *truss submittal package*. All such submittals shall include a notation indicating that they have been reviewed.

I1.4.4 Required Information in Construction Documents

The *building designer*, through the *construction documents*, shall provide information sufficiently accurate and reliable to be used for facilitating the supply of the structural elements and other information for developing the design of the *trusses* for the building, and shall provide the following:

(1) Conceptual *truss* and structural element orientations and locations,

Commentary:
Conceptual *truss* and structural element drawings are provided by the *building designer* to indicate general configurations showing assumed member directions and supporting walls, beams, columns, or other members. Specific orientations and configurations may be modified on the final *truss design drawings* in coordination with the *building designer*. Any changes from the original specification, including support locations and load magnitudes in the final *truss design drawings* and the final *truss placement diagram,* must be approved by the *building designer*. Should the *building designer* want all of or part of the conceptual truss framing plan adhered to without change, the *building designer* should clearly state that intent.

(2) Information to fully determine or derive *truss* profiles,

(3) *Truss* support locations and bearing conditions,

(4) The location, direction, and magnitude of all dead, live, and lateral loads applicable to each *truss* including, but not limited to, loads attributable to: roof, floor, partition, mechanical, fire sprinkler, attic storage, rain and ponding, wind, snow (including snow drift and unbalanced snow), seismic, and any other loads on the *truss*;

Commentary:
Uniform loads and general load descriptions are acceptable, providing that the *truss designer* can readily determine applicable loads for each *truss*.

(5) *Truss* anchorage required to resist uplift, gravity, and lateral loads by specifying either:

(a) Pre-engineered anchors or fasteners, or

(b) Methods designed by a *registered design professional*;

Commentary:
Due to the proprietary nature of many of the products within the *cold-formed steel truss* industry, it may be necessary for the *truss manufacturer* to recommend a specific connection of the *truss* to the bearing. In such case, the *building designer* should approve the connector and confirm or specify the fastening of the connector to the bearing.

(6) *Truss*-to-structural element connections, but not *truss*-to-*truss* connections, by specifying either:

(a) Pre-engineered anchors or fasteners, or

(b) Methods designed by a *registered design professional*;

Commentary:
Due to the proprietary nature of the *cold-formed steel truss* industry, it may be necessary for the *truss manufacturer* to recommend a specific connection of the *truss* to a structural element. In such case, the *building designer* should approve the connector and confirm or specify the fastening of the connector to the structural element.

(7) Permanent building stability *bracing*, including *truss* anchorage connections to the permanent building stability *bracing*,

(8) Criteria related to serviceability issues, including:

(a) Allowable vertical, horizontal or other required deflection criteria,

(b) Any dead load and live load deflection criteria for flat roofs subject to ponding loads,

(c) Any differential deflection criteria from *truss*-to-*truss* or *truss*-to-adjacent structural member,

(d) Any deflection and vibration criteria for floor *trusses*, including any strongback bridging requirements or any dead load and live load deflection criteria for floor *trusses* supporting stone or ceramic tile finishes, and

(e) Anticipated moisture, temperature, corrosive chemicals and gases expected to affect the trusses and requirements for any additional corrosion protection.

I1.4.5 Permanent Individual Truss Member Restraint/Bracing

The *building designer* shall be permitted to specify the method of the permanent individual *truss member* restraint/bracing in accordance with Section I1.6.

I1.5 Responsibilities of Contractor

I1.5.1 Information Provided to Truss Manufacturer

The *contractor* shall provide to the *truss manufacturer* a copy of all *construction documents* pertinent to the framing structural system and the design of the *trusses* (i.e., framing plans, specifications, details, structural notes) and the name of the *building designer* if not noted on the *construction documents*.

Amended *construction documents*, upon approval through the plan review/permitting process, shall be immediately communicated to the *truss manufacturer*.

I1.5.2 Information Provided to Building Designer

The *contractor*, after approving the *truss submittal package*, shall forward the *truss submittal package* for review by the *building designer*.

I1.5.3 Truss Submittal Package Review

The *contractor* shall not proceed with the *truss* installation until the *truss submittal package* has been reviewed by the *building designer*.

I1.5.4 Means and Methods

The *contractor* is responsible for the construction means, methods, techniques, sequences, procedures, programs, and safety in connection with the receipt, storage, handling, installation, restraining, and bracing of the *trusses*.

I1.5.5 Truss Installation

The *contractor* shall ensure that the building support conditions are of sufficient strength and stability to accommodate the loads applied during the *truss* installation process. *Truss* installation shall comply with installation tolerances shown in the standard industry details. Permanent individual *truss member* restraint/bracing for the completed building in accordance with Section I1.6 and any other construction work related directly or indirectly to the *trusses* shall be installed by the *contractor*.

I1.5.6 Alterations to Trusses

Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written concurrence and acceptance of any *registered design professional*. Alterations resulting in the addition of loads to any member (i.e., HVAC equipment, piping, additional roofing or insulation, etc.) shall not be permitted without verification by the *truss design engineer* or *truss designer* that the *truss* is capable of supporting such additional loading.

I1.6 Design of Permanent Individual Truss Member Restraint/Bracing

Where permanent individual *truss member* restraint/bracing is required, it shall be accomplished by one of the following methods:

(a) **Standard Industry Details.** Standard industry permanent individual *truss member* restraint/bracing details supplied in accordance with I1.3.4.

Commentary:
For standard industry permanent individual *truss member* restraint/bracing details, refer to CFSC-SBCA (2019).

References:
CFSC-SBCA (2019), *Cold-Formed Steel Building Component Safety Information (CFSBCSI) Guide to Good Practice for Handling, Installing, Restraining & Bracing of Cold-Formed Steel Trusses (2019)*, Cold-Formed Steel Council (CFSC) of the Structural Building Components Association (SBCA), Madison, WI.

(b) **Substitution with Reinforcement.** *Truss member* reinforcement designed by the *truss design engineer* or *truss designer* to eliminate the need for permanent individual *truss member* restraint/bracing. The permanent individual *truss member* reinforcement design and details shall be noted/shown on the *truss design drawings* or on supplemental *truss member* buckling reinforcement details provided by the *truss design engineer* or *truss designer*.

(c) **Project-Specific Design.** A project-specific permanent individual *truss member* restraint /bracing design by any *registered design professional*, as specified in the *contracts* or *construction documents*, and supplied in accordance with I1.3.4.

I2 Wall Panel Responsibilities

I2.1 Responsibilities of Wall Panel Detailer

The w*all panel detailer* shall be responsible for the preparation of the *wall panel fabrication documents* and the *wall panel placement diagram* based on the requirements set forth in the *construction documents,* or as otherwise set forth in writing by the *building designer* as supplied by the *wall panel manufacturer*.

Commentary:
The information required for a panelized installation is the same as is required for a *contractor* field framing the structure. Information including, but not limited to, *CFS* member sizes as well as connections must be provided to the *wall panel detailer*.

I2.1.1 Wall Panel Fabrication Documents

The *wall panel fabrication documents* shall consist of the individual *wall panel* elevations and referenced details, if any. The *wall panel fabrication documents* shall be part of the *wall panel submittal package*, if required, and include, at a minimum, the applicable information specified below:

(1) *Wall panel member* sizes and profile including depth, thickness and length, coating thickness and yield strength,

Commentary:
Wall panel member information listed above can be listed on each sheet of the *wall panel fabrication documents*, or at a minimum, be listed in a key in one location in the *wall panel submittal package* with reference on each sheet to the appropriate members in the key as required.

(2) Quantity of *wall panel members*,
(3) Identification of each *wall panel* that corresponds to a panel placement diagram noted under Section I2.3,
(4) Any special coordination notes and details,
(5) All field coordination notes and details,
(6) Location of *wall panel member* connections showing number of fasteners and connection hardware, and
(7) Details for individual *wall panel member* reinforcement, if required.

I2.1.2 Wall Panel Placement Diagram

The *wall panel manufacturer* shall prepare the *wall panel placement diagram* that identifies the location for each individually designated *wall panel* and references to the corresponding *wall panel fabrication document*. The *wall panel placement diagram* is permitted to include identifying marks for other products, including structural elements, so that they may be more easily identified by the *contractor* during field installation.

Commentary:
The *wall panel placement diagram* serves as a guide for *wall panel* installation and requires no engineering input. It does not require the seal of any *wall panel* designer or *registered design professional*.

I2.1.3 Reliance on Construction Documents

The *wall panel detailer* is permitted to rely on the accuracy and completeness of information furnished in the *construction documents* or otherwise furnished in writing by the *building designer* or *contractor*.

I2.2 Responsibilities of Wall Panel Manufacturer

I2.2.1 Coordination with Wall Panel Detailer and Wall Panel Installer

The *wall panel manufacturer* shall communicate the *wall panel* requirements and installation information to the *wall panel detailer* and *wall panel installer*.

I2.2.2 Wall Panel Submittal Package

Where required by the *construction documents*, or *contract*, the *wall panel manufacturer* shall provide the appropriate *wall panel submittal package* for review or approval to one or more of the following: *building designer,* building official or *contractor* in accordance with Section D3.

I2.2.3 Reliance on Construction Documents

The *wall panel manufacturer* is permitted to rely on the accuracy and completeness of information furnished in the *construction documents* or otherwise furnished in writing by the *building designer* or *contractor*.

I2.3 Responsibilities of Wall Panel Installer

The *wall panel installer* shall ensure that the w*all panels* are placed in locations identified in the *wall panel placement diagram*. *Wall panel* installation shall comply with the connection requirements set forth in the *construction documents*. *Wall panel* installation shall comply with installation tolerances shown in the standard industry details.

Commentary:
For standard industry details and installation tolerances, refer to AISI S240, industry manufacturer association standard published details for wall construction, SBCA-CFSC (2009), and ASTM C1007 (2000).

References:
SBCA-CFSC (2009), *Guide For Handling and Installing Cold-Formed Steel Wall Panels*, SBC Association-Cold-Formed Steel Council, Madison, WI.

ASTM C1007-20, *Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories*, ASTM International, West Conshohocken, PA.

I2.4 Responsibilities of Contractor

I2.4.1 Information Provided to Wall Panel Manufacturer

The *contractor* shall provide to the w*all panel manufacturer* a copy of all *construction documents* pertinent to the framing structural system and the design of the *wall panels* (i.e., framing plans, specifications, details, structural notes) and the name of the *building designer* if not noted on the *construction documents*. Amended *construction documents*, upon approval through the plan review or permitting process, shall be immediately provided to the w*all panel manufacturer*.

I2.4.2 Means and Methods

The *contractor* shall be responsible for the construction means, methods, techniques, sequences, procedures, programs, and safety in connection with the receipt, storage, handling, installation, restraining, and temporary bracing of the *wall panels*.

I2.4.3 Wall Panel Installation

The *contractor* shall ensure that the building support conditions are of sufficient strength and stability to accommodate the loads applied during the *wall panel* installation process. *Wall panel* installation shall comply with installation tolerances shown in the standard industry details. Any other construction work related directly or indirectly to the *wall panels* shall be installed by the *contractor*.

Commentary:
For standard industry details and installation tolerances, refer to AISI S240, industry manufacturer association standard published details for wall construction, SBCA-CFSC (2009), and ASTM C1007 (2000).

References:
SBCA-CFSC (2009), *Guide For Handling and Installing Cold-Formed Steel Wall Panels*, SBC Association-Cold-Formed Steel Council, Madison, WI.

ASTM C1007-20, *Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories*, ASTM International, West Conshohocken, PA.

I2.4.4 Alterations to Wall Panels

I2.4.4.1 *Wall panel members* and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written approval of any *registered design professional*.

I2.4.4.2 Alterations resulting in the addition of loads to any member (i.e., HVAC equipment, piping, additional roofing or insulation, etc.) shall not be permitted without verification by the b*uilding designer* that the w*all panel members* are capable of supporting such additional loading.

J. PRACTICES SPECIFIC TO COORDINATION OF CFS STRUCTURAL FRAMING WITH OTHER TRADES AND MATERIALS

In addition to Chapters A through I, this chapter provides standard practices specific to coordination of *CFS structural framing* with other trades and materials.

J1 Steel Floor and Roof Deck

J1.1 Responsibility of Building Designer

J1.1.1 Design Responsibility

The *building designer* shall be responsible for the design and specification of the *steel deck* to resist the design loads, both out-of-plane and in-plane. The design and specification shall include, as applicable, the following:

(1) *Steel deck* layout, including *steel deck* direction,
(2) *Steel deck* profile(s) and minimum base steel thicknesses of the *steel deck*,
(3) Minimum required *steel deck* bearing widths on support framing,
(4) *Steel deck* attachment type and pattern, including support, sidelap, boundary, and collector attachment requirements,
(5) Minimum support member base steel thickness, yield and tensile strengths,
(6) Required support framing at hips, valleys, ridges, eaves, penetrations, and other locations to support deck edges and resist design loads,
(7) *Chords*, *collectors*, shear transfer framing, *blocking*, and other items as required to develop a complete diaphragm system, and
(8) Integration of *steel deck* with *overframing*.

J1.1.2 Required Information in Construction Documents

The *building designer*, through the *construction documents*, shall provide information for the supply and installation of the *steel deck* and other structural elements and shall provide the applicable information listed in Section J.1.1.1 within the construction documents.

Commentary:
The *building designer* is responsible for design of the *steel deck* as part of a complete system for gravity, uplift, and *diaphragm* loads in accordance with the applicable standards ANSI/SDI RD, ANSI/SDI NC, and ANSI /SDI C.

In complying with these responsibilities, the *building designer* should consider the following:

(1) Minimum required bearing widths for the *steel deck*, including locations where the *steel deck* may need to be butted rather than continuous or lapped;
(2) Minimum *CFS structural framing* or *truss* top *chord member* thickness for development of *diaphragm* forces and fastener pullout;
(3) Limits on the number of fasteners that can be installed within a single *steel deck* rib;
(4) The design for deck support at locations where the *steel deck* changes direction and at unsupported *steel deck* edges, such as at valleys, hips, eaves, ridges, penetrations and openings; and
(5) The design of a complete *diaphragm* system, including shear *blocking* and other shear transfer devices.

When the design of the *steel deck* is to be performed by a *specialty designer*, the *building designer* must specify the following:

(1) Extent of *steel deck* and direction of span;
(2) Magnitude, type, and location of all loads to be supported by the *steel deck*;
(3) Magnitude and type of lateral load to be transferred;
(4) Load path (i.e., where loads originate and where they are to be transferred);
(5) Bearing material and conditions; and
(6) Any special requirements for the design of the gravity, uplift, or lateral load transferring elements.

J1.1.3 Review Steel Deck Submittal Packages

The *building designer* shall review the *steel deck submittal package*. All such *submittals* shall provide for a notation indicating review status.

J1.2 Responsibility of Steel Deck Support Framing Designers

J1.2.1 The *trusses* shall be designed in accordance with Section I1.

J1.2.2 The *CFS structural framing* shall be designed in accordance with Chapters A through H.

J1.3 Responsibility of Steel Deck Supplier

The *steel deck supplier* shall supply *steel deck* in accordance with the requirements of the *construction documents*, and a *steel deck submittal package* when required by the *construction documents*.

Commentary:
The requirements of the *steel deck submittal package* are covered in SDI COSP, *Code of Standard Practice*.

J1.4 Responsibility of Contractor

The *contractor* shall review proposed construction operations to determine if construction loads will exceed those specified in SDI-RD, SDI-NC, and SDI-C, as applicable, and notify the *building designer* prior to submission of the *steel deck submittal* if those loads are to be exceeded.

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