

# Cold-formed Steel Framing Introductory Glossary

A handy reference guide to lock down the basics of cold-formed steel framing, from A to Z, built from the *ANSI 200-12 North American Standard For Cold-Formed Steel Framing – General Provisions 2012 Edition*.

## ADJUSTED SHEAR RESISTANCE

In Type II shear walls, the unadjusted shear resistance multiplied by the shear resistance adjustment factor.

## AMPLIFIED SEISMIC LOAD

Load determined in accordance with the applicable building code seismic load combinations that includes the system overstrength factor,  $\Omega_o$ , for strength design (LRFD) or for allowable strength design (ASD). [USA and Mexico]

## ASD (ALLOWABLE STRENGTH DESIGN)

Method of proportioning structural components such that the allowable strength equals or exceeds the required strength of the component under the action of the ASD load combinations. [USA and Mexico]

## ASD LOAD COMBINATION

Load combination in the applicable building code intended for allowable stress design (allowable strength design). [USA and Mexico]

## ALLOWABLE STRENGTH

Nominal strength divided by the safety factor  $R_n/\Omega$ . [USA and Mexico]

## APPLICABLE BUILDING CODE

The building code under which the building is designed.

## APPROVED

Approved by the authority having jurisdiction or design professional.

## AVAILABLE STRENGTH

Design strength or allowable strength, as appropriate. [USA and Mexico]

## AVERAGE GRADE

The average elevation of the finished ground level adjoining the building at all exterior walls.

## BASE STEEL THICKNESS

The thickness of bare steel exclusive of all coatings.

## BEARING STIFFENER

Additional material that is attached to the web to strengthen the member against web crippling. Also called web stiffener.

## BLOCKING

C-shaped member, break shape, flat strap material, or component assemblies attached to structural members, flat strap or sheathing panels to transfer shear forces or stabilize members.

## BOUNDARY MEMBER

Diaphragm and shear wall boundary member to which the diaphragm transfers forces. Boundary members include chords and drag struts at diaphragm and shear wall perimeters, interior openings, discontinuities and re-entrant corners.

## BRACED WALL LINE

A wall that is constructed to resist racking from seismic or wind forces and that contains a series of Type I braced wall panels or Type II braced walls.

## **BRACING**

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Structural elements that are installed to provide restraint or support (or both) to other framing members so that the complete assembly forms a stable structure.

## **CAPACITY BASED DESIGN**

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Method for designing a seismic force resisting system in which a) specific elements or mechanisms are designed to dissipate energy; b) all other elements are sufficiently strong for this energy dissipation to be achieved; c) structural integrity is maintained; d) elements and connections in the horizontal and vertical load paths are designed to resist these seismic loads and correspond principal and companion loads as defined by the NBCC; e) diaphragms and collector elements are capable of transmitting the loads developed at each level to the vertical seismic force resisting system; and f) these loads are transmitted to the foundation. [Canada]

## **CEILING JOIST**

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A horizontal structural member that supports ceiling components and which may be subject to attic loads.

## **CHORD**

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Member of a shear wall or diaphragm that forms the perimeter, interior opening, discontinuity or re-entrant corner.

## **CHORD MEMBER**

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A structural member that forms the top or bottom component of a truss.

## **CHORD SPLICE**

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The connection region between two truss chord members where there is no change in slope.

## **CHORD STUD**

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Axial load-bearing studs located at the ends of Type I braced wall panels or Type II braced walls

## **CLIP ANGLE**

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An L-shaped short piece of steel (normally with a 90-degree bend) typically used for connections.

## **COLD-FORMED SHEET STEEL**

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Sheet steel or strip steel that is manufactured by (1) press braking blanks sheared from sheets or cut length of coils or plates, or by (2) continuous roll forming of cold- or hot-rolled coils of sheet steel; both forming operations are performed at ambient room temperature, that is, without any addition of heat such as would be required for hot forming.

## **COLD-FORMED STEEL**

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See Cold-Formed Sheet Steel.

## **COLLECTOR**

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Also known as a drag strut, a member that serves to transfer forces between diaphragms and members of the lateral force resisting system.

## **COMPONENT**

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See structural component.

## **CONNECTION**

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Combination of structural elements and joints used to transmit forces between two or more members.

## **CRIPPLE STUD**

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A stud that is placed between a header and a window or door head track, a header and wall top track, or a window sill and a bottom track to provide a backing to attach finishing and sheathing material.

## **C-SHAPE**

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A cold-formed steel shape used for structural and nonstructural members consisting of a web, two (2) flanges and two (2) lips (edge stiffeners).

## **CURTAIN WALL**

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A wall that transfers transverse (out of plane) loads and is limited to a superimposed vertical load, exclusive of sheathing materials, of not more than 100lb/ft (1.46 kN/m), or a superimposed vertical load of not more than 200 lbs (0.890 kN).

### **DEFLECTION TRACK**

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A track manufactured with extended flanges and used at the top of a wall to provide for vertical movement of the structure, independent of the wall stud.

### **DESIGN LOAD**

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Applied load determined in accordance with either LRFD load combinations or ASD load combinations, whichever is applicable. [USA and Mexico]

### **DESIGN PROFESSIONAL**

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An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the state, province or territory in which the project is to be constructed.

### **DESIGN STRENGTH**

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Resistance Factor multiplied by the nominal strength,  $\phi R_n$ . [USA and Mexico]

### **DESIGN THICKNESS**

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The steel thickness used in design.

### **DESIGNATION THICKNESS**

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The minimum base steel thickness expressed in mils and rounded to a whole number.

### **DIAPHRAGM**

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Roof, floor or other membrane or bracing system that transfers in-plane forces to the lateral force resisting system.

### **EAVE OVERHANG**

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The horizontal projection of the roof measured from the outside face of exterior wall framing to the outside edge of the roof.

### **EDGE STIFFENER**

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See Lip.

### **FACTORED LOAD**

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Product of a specified load and appropriate load factor. [Canada]

### **FACTORED RESISTANCE**

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Product of nominal resistance and appropriate resistance factor. [Canada]

### **FIBERBOARD**

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A fibrous, homogeneous panel made from lignocellulosic fibers (usually wood or cane) and having a density of less than 31 pounds per cubic foot (pcf) (497 kg/m<sup>3</sup>) but more than 10 pcf (160 kg/m<sup>3</sup>).

### **FLANGE**

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For a C-shape, U-shape or track, that portion of the framing member that is perpendicular to the web. For a furring channel, that portion of the framing member that connects the webs.

### **FLOOR JOIST**

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A horizontal structural member that supports floor loads and superimposed vertical loads.

### **GIRT**

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Horizontal structural member that supports wall panels and is primarily subjected to bending under horizontal loads, such as wind load.

### **GRADE**

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The designation of the minimum yield strength.

### **GUSSET PLATE**

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A structural member used to facilitate the connection of truss chord or web members at a heel, ridge, other pitch break, or panel point.

### **HAT-SHAPE**

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A singly-symmetric shape consisting of at least two vertical webs and a horizontal stiffened flange which is used as a chord member in a truss.

### **HEEL**

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The connection region between the top and bottom truss chords of a non-parallel chord truss.

## **HEADER**

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A horizontal structural framing member used over floor, roof or wall openings to transfer loads around the opening to supporting structural framing members.

## **HOLD-DOWN (TIE-DOWN)**

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A device used to resist overturning forces in a shear wall. Or uplift forces in a cold-formed steel framing member.

## **JACK STUD**

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A stud that does not span the full height of the wall and provides bearing for headers.

## **JOIST**

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A structural member primarily used in floor and ceiling framing.

## **KING STUD**

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A stud, adjacent to a jack stud, that spans the full height of the wall and supports vertical and lateral loads.

## **LIGHT FRAME CONSTRUCTION**

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Construction where the vertical and horizontal structural elements are primarily formed by a system of repetitive cold-formed steel or wood framing members.

## **LIMIT STATES**

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Those conditions in which a structural member ceases to fulfill the function for which it was designed. Those states concerning safety are called the ultimate limit states. The ultimate limit state for strength is the maximum load-carrying capacity. Limit states that restrict the intended use of a member for reasons other than safety, such as deflection and vibration, are called serviceability limit states. [Canada]

## **LSD (LIMIT STATES DESIGN)**

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Method of proportioning structural components (members, connectors, connecting elements and assemblages) such that no applicable limit state is exceeded when the structure is subjected to all appropriate load combinations. [Canada]

## **LIP**

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That part of a framing member that extends from the flange as a stiffening element.

## **LOAD**

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Force or other action that results from the weight of building materials, occupants and their possessions, environmental effects, differential movement, or restrained dimensional changes.

## **LOAD EFFECT**

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Forces, stresses, and deformations produced in a structural component by the applied loads.

## **LOAD FACTOR**

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Factor that accounts for deviations of the actual load from the nominal load, for uncertainties in the analysis that transforms the load into a load effect, and for the probability that more than one extreme load will occur simultaneously. [USA and Mexico]

## **LFRD (LOAD AND RESISTANCE FACTOR DESIGN)**

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Method of proportioning structural components such that the design strength equals or exceeds the required strength of the component under the action of the LRFD load combinations. [USA and Mexico]

## **LRFD LOAD COMBINATION**

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Load combination in the applicable building code intended for Strength Design (Load and Resistance Factor Design). [USA and Mexico]

## **MEAN ROOF HEIGHT**

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The average of the roof eave height and the height to the highest point on the roof surface, except that eave height shall be used for roof angles less than or equal to 10 degrees (0.18 rad).

## **MIL**

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A unit of measurement equal to 1/1000 inch.

## **MULTIPLE SPAN**

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Than span made by a continuous member having intermediate supports.

### **NOMINAL LOAD**

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Magnitude of the load specified by the applicable building code. [USA and Mexico]

### **NOMINAL RESISTANCE**

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Capacity of a structure or component (without the resistance factor or safety factor) to resist the load effects, as determined in accordance with this standard. [USA and Mexico]

### **NOMINAL STRENGTH**

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Strength of a structure or component (without the resistance factor or safety factor) to resist the load effects, as determined in accordance with this standard. [USA and Mexico]

### **NONSTRUCTURAL MEMBER**

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A member in a steel-framed system that is not a part of the gravity load resisting system, lateral force resisting system or building envelope.

### **PANEL POINT**

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The connection region between a web and chord member.

### **PITCH BREAK**

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The connection region between two truss chord members where there is a change in slope, excluding the heel.

### **PLAN ASPECT RATIO**

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The ratio of the length (longer dimension) to the width (shorter dimension of the building).

### **PUNCHOUT**

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A hole made during the manufacturing process in the web of steel framing member.

### **PURLIN**

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Horizontal structural member that supports roof deck and is primarily subjected to bending under vertical loads such as snow, wind, or dead loads.

### **RAKE OVERHANG**

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The horizontal projection of the roof measured from the outside face of a gable endwall to the outside edge of the roof.

### **REPETITIVE FRAMING**

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A framing system where the wall, floor and roof structural members are spaced no greater than 24 inches (610 mm) on center. Larger spaces are permitted at openings where the structural loads are transferred to headers or lintels and supporting studs, joists or rafters.

### **REQUIRED STRENGTH**

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Forces, stresses, and deformations produced in a structural component, determined by either structural analysis of the LRFD or ASD load combinations, as appropriate, or as specified by this standard. [USA and Mexico]

### **RESISTANCE FACTOR ( $\phi$ )**

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Factor that accounts for unavoidable deviations of the actual strength from the nominal strength [nominal value] and for the manner and consequences of failure.

### **RIDGE**

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The horizontal line formed by the joining of the top edges of two upward sloping roof surfaces.

### **RIM TRACK**

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A horizontal structural member that is connected to the end of a floor joist.

### **ROOF RAFTER**

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A horizontal or sloped, structural member that supports roof loads.

### **SAFETY FACTOR (SAFETY FACTOR ( $\Omega$ ))**

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Factor that accounts for the desired level of safety, including deviations of the actual load from the nominal load and uncertainties in the analysis that transforms the load in to a load effect, in determining the nominal strength and for the manner and consequences of failure. [USA and Mexico]

### **SEISMIC DESIGN CATEGORY (SDC)**

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Classification assigned to a building based upon its importance and the severity of the design earthquake ground motion at the building site as given in the applicable building code.

### **SEISMIC FORCE RESISTING SYSTEM**

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That part of the structural system that has been considered in the design to provide the required resistance to the earth quake forces and effects. [Canada]

### **SHEAR WALL**

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Wall that provides resistance to lateral loads in the plane of the wall and provides stability for the structural system.

### **SINGLE SPAN**

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The span made by one continuous structural member without any intermediate supports.

### **SPAN**

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The clear horizontal distance between bearing supports.

### **SPECIFIED LOAD**

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Magnitude of the load specified by the applicable building code, not including load factors. [Canada]

### **STATIC LOAD**

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A load or series of loads that are supported by or are applied to a structure so gradually that forces caused by change in momentum of the load and structural elements can be neglected an all parts of the system at any instant are essentially in equilibrium.

### **STEEL SHEET**

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A thin steel panel used in lieu of structural sheathing for wall bracing applications.

### **STRAP**

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Flat or coil sheet steel material typically used for bracing and blocking, which transfers loads, by tension and/or shear.

### **STRAP BRACING**

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Steel straps, applied diagonally to form a vertical truss as part of the lateral force resisting system.

### **STRENGTH DESIGN**

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Also known as load and resistance factor design, an outdated term used in some reference documents. [USA and Mexico]

### **STRUCTURAL COMPONENT**

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Member, connector, connecting element or assemblage.

### **STRUCTURAL MEMBER**

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A member that resists design loads [factored loads] as required by the applicable building ode, except when defined as a nonstructural member.

### **STRUCTURAL SHEATHING**

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The covering used directly over structural members that is capable of disturbing loads, bracing embers, and generally strengthening the assembly.

### **STUD**

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A vertical framing member in a wall system or assembly.

### **TRACK**

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A framing member consisting of only a web and two (2) flanges. Track web depth measurements are taken to the inside of the flanges.

### **TRUSS**

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A coplanar system of structural members joined together at their ends, usually to construct a series of triangles that form a stable beam-like framework.

### **TRUSS DESIGN ENGINEER**

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Person who is licensed to practice engineering as defined by the legal requirements of the jurisdiction on which the building is to be constructed and who supervises the preparation of the truss design drawings.

### **TRUSS DESIGNER**

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Person responsible for the preparation of the truss design drawings.

### **TRUSS DESIGN DRAWING**

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Written, graphic and pictorial depiction of an individual truss.

### **TRUSS MANUFACTURER**

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An individual or organization engaged in the manufacturing of site-built or in-plant trusses.

### **TRUSS MEMBER**

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A chord member or web member of a truss.

### **TYPE I BRACED WALL PANEL**

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Type I braced wall panels are sheathed for the full height of the wall with wood structural sheathing panels or steel sheet on one side, have no openings, and have continuous sheathing between hold-down anchors.

### **TYPE I SHEAR WALL**

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Wall designed to resist in-plane lateral forces that is fully sheathed and that is provide with hold-down anchors at each end of the wall segment. Type I shear walls are only permitted to have openings where detailing for force transfer around the openings is provided.

### **TYPE II BRACED WALL**

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Type II braced walls are fully sheathed for the full height of the wall with wood structural sheathing panels or steel sheet on one side, and are permitted to have openings between hold-down anchors.

### **TYPE II SHEAR WALL**

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Wall designed to resist in-plane lateral forces that is sheathed with wood structural panels or sheet steel that contains openings, but which has not been specifically designed and detailed for force transfer around wall openings. Hold-down anchors for Type II shear walls are only required at the ends of the wall.

### **TYPE II SHEAR WALL SEGMENT**

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Section of shear wall (within a Type II shear wall) with full-height sheathing (i.e., with no openings) and which meets specific aspect ratio limits.

### **WEB**

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That portion of a framing member that connects the flanges.

### **WEB MEMBER**

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A structural member in a truss that is connected to the top and bottom chords, but is not a chord member.

### **WIND EXPOSURE**

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Wind exposure in accordance with the applicable building code.

### **YIELD STRENGTH**

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Stress at which a material exhibits a specified limiting deviation from the proportionality of stress to strain as defined by ASTM.

### **Z-SHAPE**

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A point-symmetric or non-symmetric section that is used as a chord member in a truss.

## **About Build Steel**

BuildSteel provides valuable resources, education, and complimentary project assistance related to the use of cold-formed steel framing in low and mid-rise and multi-family construction projects.

As a centralized source for information, BuildSteel offers resources to help move your next cold-formed steel framing project forward efficiently and effectively.



25 Massachusetts Avenue, NW  
Suite 800  
Washington, DC 20001  
**202.452.7100**