



# PRODUCT & ENGINEERING MANUAL

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### BASIC TERMS AND DESCRIPTIONS

The following terminology is commonly used in the Metal Building Systems industry and is used throughout this text.

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## A

**Accessory** - An extra building product which supplements a basic solid sheeted building such as a door, window, skylight, ventilator, etc.

**ACI** - American Concrete Institute. ([ACI Website](#))

**AISI** - American Iron and Steel Institute. ([AISI Website](#))

**AISC** - American Institute of Steel Construction. ([AISC Website](#))

**AIST** - Association of Iron and Steel Technology. ([AIST Website](#))

**Aluminized** - Coated with aluminum for corrosion protection.

**ANSI** - American National Standards Institute. ([ANSI Website](#))

**Anchor Bolts** - Bolts used to anchor structural members to a foundation or other support. Usually refers to the bolts at the bottom of columns and door jambs. Nucor does not supply anchor bolts with a building order.

**Anchor Bolt Plan** - A plan view showing the size, location, and projection of all anchor bolts for the metal building, the length and width of the foundation (which may vary from the nominal metal building size). Column reactions (magnitude and direction), and maximum base plate dimensions may also be included.

**Approval Drawings** - Approval drawings may include framing drawings, elevations and sections through the building as furnished by the manufacturer for approval of the buyer. Approval by the buyer affirms that the manufacturer has correctly interpreted the overall contract requirements for the metal building system and its accessories, and the exact location of accessories in the building.

**Architectural Drawing** - A drawing which shows the plan view and/or elevations of the finished building for the purpose of showing the general appearance of the building, indicating all accessory locations.

**ASCE** - American Society of Civil Engineers. ([ASCE Website](#))

**ASD** - Allowable Stress Design.



**Astragal** - A closure between the two leaves of a double swing or double slide door to close the joint.

**Automatic Welding** - A welding operation utilizing a machine to make a continuous, unbroken weld.

**Auxiliary Loads** - All specified loads other than the basic design loads which the building must safely withstand, such as cranes, material handling systems, machinery, elevators, vehicles, and impact loads.

**Awning Window** - A window in which the vent or vents pivot outward about the top edge giving an awning effect.

**AWS** - American Welding Society. ([AWS Website](#))

## **B**

**Bar Joist** - A name commonly used for “open web steel joists”.

**Base Angle** - An angle secured to the perimeter of the foundation to support and close wall panels.

**Base Plate** - A plate attached to the base of a column which rests on the foundation or other support, usually secured by anchor bolts.

**Bay** - The space between frame center lines or primary supporting members in the longitudinal direction of the building.

**Beam** - A primary member, usually horizontal, that is subjected to bending loads. There are three types: simple, continuous, and cantilever.

**Beam and Column** - A primary structural system consisting of a series of rafter beams supported by columns. Often used as the end frame of a metal building system.

**Bearing Plate** - A steel plate that is set on the top of a masonry support on which a beam or purlin can rest.

**Bent** - The primary member of a structural system.



**Bill of Materials** - A list of items or components used for fabrication, shipping, receiving, and accounting purposes. Can also be called Tally Sheet or Shipping List.

**Bird Screen** - Wire mesh used to prevent birds from entering the building through ventilators and louvers.

**Blind Rivet (pop rivet)** - A small headed pin with expandable shank for joining light gauge metal. Typically used to attach flashing, gutter, etc.

**Block or Board Thermal Insulation** - Rigid or semi-rigid thermal insulation preformed into rectangular units.

**Bonded Roof** - A roof which carries a written warranty with respect to weather-tightness for a stipulated number of years.

**Brace Rods** - Rods or cables used in roof and walls to transfer loads, such as wind loads, and seismic and crane thrusts to the foundation. (Also often used to plumb buildings but not designed to replace erection cables.)

**Bracket** - A structural support projecting from a wall or column on which to fasten another structural member. Examples are canopy brackets, lean-to brackets, and crane runway brackets.

**Bridge Crane** - A load lifting system consisting of a hoist which moves laterally on a beam, girder, or bridge which in turn moves longitudinally on a runway made of beams and rails. Loads can be moved to any point within a rectangle formed by the bridge span and runway length. Bridge cranes may be top running or underhung.

**Bridging** - Bracing systems of bracing used between structural members to provide lateral stability.

**British Thermal Unit (BTU)** - That amount of heat required to raise the temperature of one pound (2.2 kg) of water by 1°F. (0.56°C.).

**Building Aisle** - A space defined by the length of the building and the space between columns.



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**Builder/Contractor** - A general contractor or sub-contractor responsible for providing and erecting metal building systems.

**Building Code** - Regulations established by a recognized agency describing design loads, procedures, and construction details for structures. Usually applying to designated political jurisdiction (city, county, state, etc.).

**Building Length** - Endwall steel line to endwall steel line.

**Building Width** - Sidewall steel line to sidewall steel line.

**Built-up Roofing** - A roof covering made up of alternating layers of tar and asphaltic materials.

**Built-up Section** - A structural member, usually an "I" section, made from individual flat plates welded together.

**Butt Plate** - The end plate of a structural member usually used against a like plate of another member in forming a connection. Sometimes called a split plate or bolted end plate.

**Bypass Girt** - See "Exterior Framed".

## C

**"C" Section** - A member formed from steel sheet in the shape of a block "C", which may be used either singularly or back to back.

**Cab-Operated Crane** - A crane controlled by an operator in a cab support on the bridge or trolley.

**Camber** - A predetermined curvature in the plane of its web designed into a flexural member to offset the anticipated deflection when loads are supplied.

**Canopy** - Any overhanging or projecting roof structure with the extreme end usually unsupported.

**Cantilever Beam** - A projecting beam that is supported and restrained at one end only.



**Capillary Action** - That action which causes movement of liquids when in contact with two adjacent surfaces such as panel sidelaps.

**Cap Plate** - A plate located at the top of a column or end of a beam for capping the exposed end of a member.

**Caulk** - To seal and make weather-tight the joints, seams, or voids by filling them with a waterproofing compound or material.

**Channel-Hot Rolled** - A C-shaped member formed while in a semi-molten state at the steel mill to a shape having standard dimensions and properties.

**Clip** - A plate or angle used to fasten two or more members together.

**Cladding** - See "Covering".

**Closure Strip** - A resilient strip, formed to the contour of ribbed panels used to close openings created by joining metal panels and flashing.

**Cold Forming** - The process of using press brakes or rolling mills to shape steel into desired cross sections at room temperature.

**Collateral Load** - All specified additional dead loads other than the metal building framing, such as sprinklers, mechanical and electrical systems, and ceilings.

**Column** - A primary member used in a vertical position on a building to transfer loads from main roof beams, trusses, or rafters to the foundation.

**Component** - A part used in a Metal Building System.

**Continuity** - The terminology given to a structural system denoting the transfer of loads and stresses from member to member, as if there were no connections.

**Contract Documents** - The documents that define the material and work to be provided by a Contractor or the General Contractor for a Construction Project.

**Contractor** - See Builder.

**Covering** - The exterior roof and wall covering for a metal building system.

**Crane** - A machine designed to move material by means of a hoist.



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**Crane Rail** - A track supporting and guiding the wheels of a bridge crane or trolley system.

**Crane Runway Beam** - The member that supports a crane rail and is supported by columns or rafters depending on the type of crane system. On underhung bridge cranes, a runway beam also acts as a crane rail.

**CSA** – Canadian Standards Association. ([CSA Website](#))

**Curb** - A raised edge on a concrete floor slab or skylight.

**Curtain Wall** - Perimeter wall panels which carry only their own weight and wind load.

## D

**Damper** - A baffle used to open or close the throat of ventilators.

**Dead Load** - The dead load of a building is the weight of all permanent construction, such as floor, roof, framing, and covering members.

**Deflection** - The displacement of a structural member or system under load.

**Design Loads** - Those loads specified in building codes published by Federal, State, County, or City agencies, or in owner's specifications to be used in the design of a building.

**Design Professional** - The Architect or Engineer responsible for the design of a Construction Project.

**Diagonal Bracing** - See Brace Rods.

**Diaphragm Action** - The resistance to racking generally offered by the covering system, fasteners, and secondary framing.

**Door Guide** - An angle or channel guide used to stabilize or keep plum a sliding or rolling door during its operation.

**Downspout** - A conduit used to carry water from the gutter of a building to the ground or storm drain.



**Drift Pin** - A tapered pin used during erection to align holes in steel members to be connected by bolting.

## E

**Eave** - The line along the sidewall formed by the intersection of the planes of the roof and wall.

**Eave Height** - The vertical dimension from the finished floor to the top of the eave strut.

**Eave Strut** - A structural member at the eave to support roof panels and wall panels. It may also transmit wind forces from roof bracing to wall bracing.

**Elastic Design** - A design concept utilizing the proportional behavior of materials when all stresses are limited to specified allowable values in the elastic range.

**End Bay Dimension** - Endwall steel line to centerline of first interior frame.

**End Frame** - A frame at the endwall of a building to support the roof load from one-half the end bay.

**Engineer/Architect of Record** - The engineer or architect who is responsible for overall design of the building project.

**Erection** - The on-site assembling of fabricated components to form a complete structure.

**Erection Drawings** - See Framing Drawings.

**Expansion Joint** - A break or space in construction to allow for thermal expansion and contraction of the materials used in the structure.

## E

**Fabrication** - The manufacturing process performed in a plant to convert raw material into finished metal building components. The main operations are cold-forming, cutting, punching, welding, cleaning, and painting.



**Fascia** - A decorative trim or panel projecting from the face of a wall.

**Fenestration**- Design and position of windows and doors in a building.

**Field** - The “job site,” “building site,” or general market area.

**Filler Strip** - See Closure Strip.

**Finish Floor Elevation** - The defined elevation from which building eave height is measured.

**Fixed Base** - A column base that is designated to resist rotation as well as horizontal or vertical movement.

**Flange** - The projecting edge of a structural member.

**Flange Brace** - A bracing member used to provide lateral support to the flange of a beam, girder, or column.

**Flashing (Flash)** - A sheet metal closure which functions primarily to provide weather-tightness in a structure and secondarily to enhance appearance.

**Floor Live Load** - Those loads induced on the floor system by the use and occupancy of the building.

**Footing** - A pad or mat, usually concrete, located under a column, wall, or other structural member, that is used to distribute the loads from that member into the supporting soil.

**Force** - The action of one body on another body which changes or tends to change its state of rest or motion. A force may be expressed in pounds (Newtons), kips, or other similar units and may act in any one of the following ways:

- a. Compression force: A force acting on a body tending to compress the body. (Pushing action)
- b. Shear force: A force acting on a body which tends to slide one portion of the body against the other portion of the body. (Sliding action)
- c. Tension force: A force acting on a body tending to elongate the body (Pulling)
- d. Torsion force: A force acting on a body which tends to twist the body.



**Foundation** - The substructure that supports a building or other structure.

**Frameline** - The centerline location of primary frames.

**Framed Opening** - Frame work (headers and jambs) and flashing which surround an opening in the wall or roof of a building; usually for field installed accessories such as overhead doors or powered roof exhausters.

**Framing** - The primary and secondary structural members (columns, rafters, girts, purlins, brace rods, etc.) which go together to make up the skeleton of a structure to which the covering can be supplied.

**Framing Drawings** - Plans and erection instruction which identify all individual parts in sufficient detail to permit the proper erection and installation of all parts of the metal building system furnished by the seller (also known as Erection Drawings).

## G

**Gable** - A triangular portion of the endwall of a building directly under the sloping roof and above the eave line.

**Gable Roof** - A roof which consists of two sloping sides that form the ridge and a gable at each end.

**Galvanized** - Coated with zinc for corrosion resistance.

**Girder** - A main horizontal or near horizontal structural member that supports vertical loads. It may consist of several pieces.

**Girt** - A secondary horizontal structural member attached to sidewall or endwall columns to which wall covering is attached and supported horizontally.

**Glaze or Glazing** - The process of installing glass in windows and doors.

**Grade** - The term used when referring to the ground elevation around a building.

**Grade Beam** - A concrete beam around the perimeter of a building carrying an exterior wall.



**Grid Line** - The centerline location of endwall column locations.

**Grout** - A mixture of cement, sand, and water used to fill cracks and cavities. Often used under base plates or leveling plates to obtain uniform bearing surfaces.

**Gutter** - A channel member installed at the eave of the roof for the purpose of carrying water from the roof to the drains or downspouts.

**Gusset Plate** - A steel plate used to reinforce or connect structural elements.

## H

**“H” Section** - A steel member with an H cross section.

**Haunch** - The deepened portion of a column or rafter, designed to accommodate the higher bending moments at such points. (Usually occurs at connection of column and rafter.)

**Header** - A horizontal framing structural member over a door, window, or other framed opening.

**High Strength Bolts** - Any bolt made from steel having a tensile strength in excess of 100,000 pounds per square inch.

**High Strength Steel** - Structural steel having a yield stress in excess of 36,000 pounds per square inch.

**Hinged Base** - See Pin Connection.

**Hip** - The line where two adjacent sloping sides of a roof meet.

**Hip Roof** - A roof that rises by inclined planes from all four sides of a building.

**Hoist** - A mechanical lifting device usually attached to a trolley that travels along a bridge, monorail, or jib crane. May be chain or electric operated.

**Hood (Door)** - The metal flashing used over exterior slide door track along the full length of the door header to protect the tracks from weather and to conceal them for aesthetic purposes.



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**Hot-Rolled Shapes** - Steel sections (angles, channels, "I"-beams, "H" shapes, "W" shapes, etc.) which are formed by rolling mills while the steel is in a semi-molten state.

I

**IAS** – International Accreditation Service, Inc. ([IAS Website](#))

**IBC** - *International Building Code* ([IBC Website](#))

**Ice Dam** - A buildup of ice which forms a dam on the roof covering along the eave of the building.

**Impact Load** - An assumed dynamic load resulting from the motion of machinery, elevators, crane ways, vehicles, and other similar moving forces.

**Impact Wrench** - An electric or pneumatic device used to tighten nuts on bolts.

**Importance Factor** - A factor that accounts for the degree of hazard to human life and damage to property.

**Insulation** - Any material used in building construction to reduce heat transfer.

**Internal Pressure** - Pressure inside a building which is a function of wind velocity, and number and location of openings.

J

**Jack Beam** - A beam used to support another beam or truss and eliminate a column support.

**Jack Truss** - A truss used to support another truss or beam and eliminate a column support.

**Jamb** - The vertical framing members located at the sides of an opening.

**Jib Crane** - A cantilevered boom or horizontal beam with hoist and trolley. This lifting machine may pick up loads in all or part of a circle around the column to which it is attached.



**Jig** - A device used to hold pieces of material in a certain position during fabrication.

## **K**

**Kick-Out (Elbow) - (Turn-Out)** A lower downspout section used to direct water away from a wall.

**Kip** - A unit of measure equal to 1,000 pounds (4.4 kN).

**Knee** - The connecting area of a column and rafter of a structural frame such as a rigid frame.

## **L**

**Lean-To** - A structure such as a shed, having only one slope or pitch and depending upon another structure for partial support.

**Length** - The dimension of the building measured perpendicular to the main framing from endwall to endwall.

**Leveling Plate** - A steel plate used on top of a foundation or other support on which a structural column can rest.

**Liner Panel** - A metal panel attached to the inside flange of the girts or inside of a wall panel.

**Live Load** - Live load means all loads, including snow, exerted on a roof except dead, wind, and lateral loads.

**Load Indicator Washer** - A washer for high strength bolts in which pre-tension load can be measured as a function of amount of compression on raised portions of the washer.

**Loads** - Anything that causes a force to be exerted on a structural member. Examples of different types are:

- |                   |                    |
|-------------------|--------------------|
| A) Dead Load      | E) Wind Load       |
| B) Impact Load    | F) Crane Load      |
| C) Roof Live Load | G) Collateral Load |
| D) Seismic Load   | H) Auxiliary Load  |



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**Longitudinal** - The direction parallel to the ridge or sidewall.

**Louver** - An opening provided with fixed or movable, slanted fins to allow flow of air.

**Low Rise Building** - A description of a class of buildings usually less than 60' eave height. Commonly, they are single story, but do not exceed 4 stories.

**LRFD** - Load Resistance Factor Design.

**LSD** – Limit States Design.

## **M**

**Main Frame** - See "Bent".

**Main Framing** - The main load carrying members of a structural system.

**Manufacturer** - A party who designs and fabricates a Metal Building System.

**Masonry** - Anything constructed of materials such as bricks, concrete blocks, ceramic blocks, and concrete.

**Mastic** - Caulk or sealant normally used in sealing roof panel laps.

**MBCEA** – Metal Building Contractors & Erectors Association. ([MBCEA Website](#))

**MBMA** - Metal Building Manufacturers Association. ([MBMA Website](#))

**Mean Roof Height** - Average height of roof above ground.

**Metal Building Fiberglass Insulation** - A grade of fiberglass insulation blanket specifically manufactured for lamination to a vapor retarder.

**Metal Building System** - A complete integrated set of mutually dependent components and assemblies that form a building including primary and secondary framing, covering and accessories, and are manufactured to permit inspection on site prior to assembly or erection.

**Mezzanine** - An intermediate level between floor and ceiling occupying a partial area of the floor space.



**Moment** - The tendency of a force to cause rotation about a point or axis.

**Moment Connection** - A connection between two members which transfers the moment from one side of the connection to the other side, and maintains under application of load the same angle between the connected members that exist prior to the loading. Also, a connection that maintains continuity.

**Moment of Inertia** - A physical property of a member, which helps define strength and deflection characteristics.

**Monorail** - A single rail support for a material handling system. Normally a standard hot-rolled "I" -beam.

**Monorail (Crane)** - A crane that travels on a single runway beam, usually an "S" or "W" beam.

**Multi-Span Building** - Buildings consisting of more than one span across the width of the building. Multiple gable buildings and single gable buildings with interior posts are examples.

## N

**NBC** – National Building Code of Canada. (See NRC)

**Nibblers** - Sheet metal cutting tool.

**Newton** - SI unit of measure for force (N).

**NRC** – National Research Council of Canada. ([NRC Website](#))

## O

**Oil-Canning** - The bumpiness or bending found in light gage flashing parts.

**Order Documents** - The documents normally required by the manufacturer in the ordinary course of entering and processing an order.

**Overhead Doors** - See "Sectional Overhead Doors".



## P

**Panels** - See Roof Covering or Wall Covering.

**Parapet** - That portion of the vertical wall of a building which extends above the roof line at the intersection of the wall and roof.

**Pascal** - SI unit of measure for force per unit area ( $N/m^2$ ).

**Peak** - The uppermost point of a gable.

**Peak Sign** - A sign attached to the peak of that building at the endwall showing the building manufacturer.

**Pendant-Operated Crane** - Crane operated from a pendant control unit suspended from the crane.

**Piece Mark** - A number given to each separate part of the building for erection identification.

Also called mark number and part number.

**Pier** - A concrete structure designed to transfer load from the base of a column to a footing.

**Pig Spout** - A sheet metal flashing designed to direct the flow of water out through the face of the gutter rather than through a downspout.

**Pilaster** - A reinforced or enlarged portion of a masonry wall to provide support for roof loads or lateral loads on the wall.

**Pin Connection** - In structural analysis; a member connection to a foundation; another member or structure is designed in such a way that free rotation is assumed.

**Plastic Design** - A design concept based on multiplying the actual loads by a suitable load factor and using the yield stress as the maximum stress in any member.

**Plastic Roof or Wall Panels** - Panels used to admit light. They are normally of the same configuration as the metal roof or wall panels, and installed in the same plane.



**Ponding** - The gathering of water at low or irregular areas on a roof

**Pop Rivet** - See Blind Rivet.

**Portal Frame** - A rigid frame structure so designed that it offers rigidity and stability in its plane. It is used to resist longitudinal loads where diagonal bracing is not permitted.

**Post (End Post)** - A secondary column at the end of a building to support the girts and in a beam-and-column endwall frame, to additionally support the rafter.

**Pre-Painted Coil** - Coil steel which receives a paint coating prior to the forming operation.

**Press Brake** - A machine used in cold-forming metal sheet or strip into desired cross sections.

**Prestressed Concrete** - Concrete in which the reinforcing cables, wires, or rods in the concrete are tensioned before there is load on the member, holding the concrete in compression for greater strength.

**Primary Members** - The main load carrying members of a structural system, including the columns, endwall posts, rafters, or other main support members.

**Primer Paint** - This is the initial coat of paint applied in the shop to the structural framing of a building for protection against the elements during shipping and erection.

**Prismatic beam** - A beam having both flanges parallel about its longitudinal axis.

**Purlin** - A secondary horizontal structural member attached to the primary frame which transfers the roof loads from the roof covering to the primary members.

**Q**

**R**

**Rafter** - A primary beam supporting the roof system.



**Rails (Door)** - The horizontal stiffening members of framed and paneled doors.

**Rails (Crane)** - The rail supported by the runway beams on which the crane bridge travels.

**Rake** - The intersection of the plane of the roof and the plane of the gable. (As opposed to endwalls meeting hip roofs.)

**Rake Angle** - Angle fastened to purlins at rake for attachment of endwall panels.

**Rake Trim** - A flashing designed to close the opening between the roof and endwall panels.

**Rated Capacity (Crane)** - The maximum load (usually in tons) which the crane is designed to support safely.

**Reactions** - The resisting forces at the column bases of a frame, holding the frame in equilibrium under a given loading condition.

**Reinforcing Steel** - The steel placed in concrete to help carry the tension, compression, and shear stresses.

**Ridge** - Highest point on the roof of the building which describes a horizontal line running the length of the building.

**Ridge Cap** - A transition of the roofing materials along the ridge of a roof. Sometimes called ridge roll or ridge flashing.

**Rigid Connection** - See "Moment Connection".

**Rigid Frame** - A structural frame consisting of members joined together with rigid (or moment) connections so as to render the frame stable with respect to imposed loads, without the need for bracing in its plane.

**Roof Covering** - The exposed exterior roof skin consisting of panels or sheets, attachments, and joint sealants.

**Roof Live Load** - Loads that are produced (1) during maintenance by workers, equipment, and materials and (2) during the life of the structure by movable objects and do not include wind, snow, seismic, or dead loads.



**Roof Overhang** - A roof extension beyond the endwall/sidewall of a building.

**Roof Pitch** - Ratio of rise to total width.

**Roof Slope** - The angle that a roof surface makes with the horizontal. Usually expressed in units of vertical rise to 12 units of horizontal run.

**Roof Snow Load** - That load induced by the weight of snow on the roof of the structure.

**Rolling Doors** - Doors that are supported on wheels which run on a track.

## S

**Sag Rod** - A tension member used to limit the deflection of a girt or purlin in the direction of the weak axis.

**Sag Strap or Sag Angle** - See Sag Rod.

**Sandwich Panel** - A panel assembly used as covering; consists of an insulating core material with inner and outer skins.

**Screeding** - The process of striking off the excess concrete to bring the top surface of the concrete to proper finish and elevation.

**Sealant** - Any material that is used to close up cracks or joints to protect against leaks.

**Secondary Members** - Members that carry loads to the primary members. In metal building systems, this term includes purlins, girts, struts, diagonal bracing, wind bents, flange, and knee braces, headers, jambs, sag members, and other miscellaneous framing.

**Section Modulus** - A physical property of a structural member. It is used in design and basically describes the bending strength of a member.

**Sectional Overhead Doors** - Doors constructed in horizontally hinged sections. They are equipped with springs, tracks, counter balancers, and other hardware which roll the sections into an overhead position, clear of the opening.



**Seismic Load** - Seismic load is the assumed lateral load acting in any horizontal direction on the structural system due to the action of earthquakes.

**Self-Drilling Screw** - A fastener that combines the functions of drilling and tapping. It is used for attaching panels to purlins and girts and for connecting trim and flashing.

**Self-Tapping Screw** - A fastener that taps its own threads in a predrilled hole. It is used for attaching panels to purlins and girts and for connecting trim and flashing.

**Shear** - The force tending to make two contacting parts slide upon each other in opposite directions parallel to their plane of contact.

**Shear Diaphragms** - See Diaphragm.

**Sheet Groove (Reglet)** - A notch or block out formed along the outside edge of the foundation to provide support for the wall panels and serve as a closure along their bottom edge.

**Shim** - A piece of steel used to level base plates or square beams.

**Shipping List** - A list that enumerates by part number or description each piece of material or assembly to be shipped. Also called tally sheet and bill of materials.

**Shoulder Bolt** - A fastener used to attach wall and roof paneling to structural frame. It consists of a large diameter shank and a small diameter stud. The shank provides support for the panel rib.

**Shot Pin** - A device for fastening items by the utilization of a patented device that uses a powdered charge to imbed the item in the concrete and/or steel.

**SI** - The international symbol for the metric unit used by the United States (Le Systeme International d'Unites).

**Side Lap Fastener** - A fastener used to connect panels together at the side lap.

**Sill** - The bottom horizontal framing member of an opening such as a window or door.



**Sill Angle** - See Base Angle.

**Simple Span** - The term used in structural analysis to describe a support condition for a beam, girt, purlin, etc., which offers no resistance to rotation at the supports.

**Single Slope** - A sloping roof with one surface. The slope is from one wall to the opposite wall in a rectangular building.

**Single Span** - A building or structural member without intermediate support.

**Siphon Break** - A small groove to arrest the capillary action of two adjacent surfaces.

**Slide Door** - A single or double leaf door which opens horizontally by means of overhead trolleys.

**Soffit** - The underside covering of any exterior portion of a metal building system.

**Soil Pressure** - The load per unit area a structure will exert through its foundation on the soil.

**Span** - The distance between supports of beam, girders, or trusses.

**Specifications** - A statement of particulars of a given job, as to size of building, quality, and performance of men and materials to be used, and the terms of the contract. The most common specification found in the metal building systems industry is the "Recommended Guide Specifications for Metal Building Systems" published by the MBMA.

**Skylight** - A roof accessory to admit light, normally mounted on a curbed, framed opening.

**Splice** - A connection in a structural member.

**Square** - The term used for an area of 100 square feet (9.29 M<sub>2</sub>).

**Stainless Steel** - An alloy of steel that contains a high percentage of chromium. Also may contain nickel or copper. Has excellent resistance to corrosion.

**Steel Line** - The plane created at the outermost point of the secondary structural members. Typically this point is the outside face of wall girts and the outside/top face of roof purlins.



**Stiffener**- A member used to strengthen a plate against lateral or local buckling. Usually a flat bar welded perpendicular to the longitudinal axis of the member. Large concentrated loads, such as crane loads, usually require stiffeners at the point of connection.

**Stiles** - The vertical side members of framed and paneled doors.

**Strain** - A change in length per unit length. It is the deformation of a body that is acted upon by forces.

**Stress** - A measure of the load on a structural member in terms of force per unit area (kips per sq. in.) (MPA).

**Structural Steel Members** - Load carrying members. May be hot-rolled sections, cold formed shapes, or built-up shapes.

**Strut** - A brace fitted into a frame work to resist forces parallel to its length.

**Stud** - A vertical wall member to which exterior or interior covering or collateral material may be attached. May be either load or non-load bearing.

**Suction** - A partial vacuum resulting from wind loads on a building which cause a load in the outward direction.

## I

**Tapered Member** - A built-up plate member consisting of flanges welded to a variable depth web.

**Temperature Reinforcing** - Light-weight deformed steel rods or wire mesh placed in concrete to resist possible cracks from thermal expansion or contraction.

**Tensile Strength** - The longitudinal pulling stress a material can bear without tearing apart.

**Thermal Block** - A spacer of low thermal conductance material.

**Thermal Conductance (C)** - The rate of heat flow, in BTU's per hour, through a square foot of material or a combination of materials whose surfaces have a temperature differential of 1°F.



**Thermal Conductivity (k)** - The rate of heat flow, in BTU's per hour, through a square foot of material exactly one inch thick whose surfaces have a temperature differential of 1<sup>0</sup>F.

**Thermal Resistance (R)** - Resistance to heat flow. The reciprocal of conductance (C).

**Thermal Transmittance (U)** - The rate of heat flow per square foot under steady conditions from the air on the warm side of a barrier to the air on the cold side, for 1<sup>0</sup>F of temperature difference between the two. (BTU/Ft<sup>2</sup> - hr - 1<sup>0</sup> F)

**Thrust** - The horizontal component of a reaction usually at the column base.

**Tie** - A structural member that is loaded in tension.

**Ton** - 2,000 pounds.

**Torque Wrench** - A wrench containing an adjustable mechanism for measuring and controlling the amount of torque or turning force to be exerted - often used in tightening nuts or bolts.

**Track** - A metal way for wheeled components; specifically one or more lines of ways, with fastenings, ties, etc., for a crane way, monorail, or slide door.

**Translucent Panels** - See Plastic Roof or Wall Panels.

**Transverse** - The direction parallel to the main frames.

**Tributary Area** - The area that contributes load to a specific structural component.

**Trim** - The light gauge metal used in the finish of a building, especially around openings and at intersections of surfaces. Often referred to as flashing.

**Truss** - A structure made up of three or more members, with each member designed to carry a tension or compression force. The entire structure in turn acts as a beam.

**TrussFrame** – A hybrid metal building rigid frame system consisting of typical three-plate built-up columns with solid webs and open-web rafters. The open-web rafters consist of two-plate built-up tees assembled into trusses, using web angles.



**Turn-of-the-Nut Method** - A method for pre-tensioning high strength bolts. The nut is turned from the snug-tight position, corresponding to a few blows of an impact wrench or the full effort of a man using an ordinary spud wrench.

**Turnout** - See Kickout.

## U

**Uplift** - Wind load on a building that causes a load in the upward direction.

## V

**Valley Gutter** - A channel used to carry off water from the “V” of roof of multi-gabled buildings.

**Vapor Barrier** - Material used to retard the flow of vapor or moisture to prevent condensation from forming on a surface.

**Ventilator** - An accessory usually used on the roof that allows air to pass through.

## W

**Wainscot** - Wall material used in the lower portion of a wall that is different from the material in the rest of the wall.

**Web** - That portion of a structural member between the flanges.

**Web Member** - A secondary structural member interposed between the top and bottom chords of a truss.

**Web Stiffener** - See “Stiffener”.

**Wind Bent** - See Portal Frame.

**Wind Column** - A vertical member supporting a wall system designed to withstand horizontal wind loads.

**Wind Load** - A load caused by the wind blowing from any horizontal direction.



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## X

**X Bracing** - See "Brace Rods, Angles and Cables".

## Y

## Z

**"Z" Section** - A member cold formed from steel sheet in the shape of a block "Z".