

Glossary of terms for



Wheeler

*Committed to
performance
since 1892*

Steel Fabrication Division



A36 - ASTM designation for non-*weathering* plate and shapes

A500 - ASTM designation for non-*weathering* tube steel. Comes in grades B, B/C, and C. Grade B equal 36 KSI. Grade B/C is grade B material that tests out equal to grade C material. Grade C is equal to 50 KSI.

A588 - ASTM designation for *weathering* plate and shapes

A847 - ASTM designation for *weathering* tube steel

AASHTO - American Association of State Highway and Transportation Officials. AASHTO is a nonprofit, nonpartisan association representing highway and transportation departments in the 50 states, the District of Columbia and Puerto Rico. It represents all five transportation modes: air, highways, public transportation, rail and water. Its primary goal is to foster the development, operation and maintenance of an integrated national transportation system.

Abutment - The *substructure* upon which the *superstructure* bears. Typically made of *concrete*, wood, or steel.

ACQ - Alkaline Copper Quaternary. A newer water-borne preservative which is one of the standard replacements for CCA.

ACZA - Ammoniacal Copper Zinc Arsenate. The water-borne preservative used to treat Douglas Fir-Larch.

ADA - American Disabilities Act. Regulates many design properties relating to wheelchair access.

AISC - American Institute of Steel Construction. AISC is a non-profit trade association and technical institute established in 1921 to serve the structural steel industry in the U.S. AISC's purpose is to promote the use of structural steel through research activities, market development, education, codes and specifications, technical assistance, quality certification and standardization.

Anchor Bolt - Used to attach the *superstructure* to the *substructure*. Typically a *galvanized* threaded rod, sometimes stainless steel, along with *epoxy* grout for *concrete* substructures. A *galvanized* lag bolt is used for timber *substructures*.

Approach Rail - A section of *safety railing* that is typically a separate entity of the bridge, and attached to the *substructure* at one or both ends of the bridge.

Architectural - Typically refers to a non-structural member which is used for aesthetic purposes only. Usually, but not limited to, a *diagonal web*.

ASTM - American Society for Testing and Materials. Founded in 1898, ASTM International is a non-profit organization that provides a global forum for the development and publication of voluntary consensus standards for materials, products, systems, and services. ASTM standards serve as the basis for manufacturing, procurement, and regulatory activities. Formerly known as the American Society for Testing and Materials, ASTM International provides standards that are accepted and used in research and development, product testing, quality systems, and commercial transactions around the globe.

AWPA - American Wood Preserver's Association. A non-profit organization which is responsible for promulgating voluntary wood preservation standards. AWPA Standards are developed by its technical committees in an open, consensus-based process that involves individuals from all facets of wood preservation: Producers of preservatives and preservative components; producers of treated and untreated wood products; end users of treated wood; engineers, architects and building code officials; government entities, academia, and other groups with a general interest in wood preservation. AWPA's Standards are universally specified for wood preservation in the USA, and are recognized worldwide.

AWS - American Welding Society. The American Welding Society was founded in 1919 as a nonprofit organization with a goal to advance the science, technology and application of welding and related joining disciplines. Develops and maintains the Structural Welding Codes D1.1, which is used for plate and open shapes and D1.5, which is used for tube steel.

Backwall - The portion of an *abutment* that extends vertically from the *bearing seat* to the top of *deck* and essentially caps the end of the bridge. The height is a critical dimension that must match the bridge, not the same dimension as *structure depth*.

Backer Bar - Typically a piece of flat bar placed behind two adjoining members where a full penetration weld is required. A common situation is a *shop splice* of a chord.

Bar Grating - A type of *decking* consisting of steel flat bars set on edge with round bars welded across the top achieving a grate-like appearance. Typically made of A36 steel, it can be *galvanized* or made of *weathering steel*. The spacing of the bars is critical for ADA specified *decks*.

Bay - The space or area between two *vertical* members. I.E.: A five *bay* truss would have six *vertical* members.

Bearing Pad - In most cases, this refers to the grout pad that the *superstructure* will bear on. Can be confused with the *bearing plate* or *seat*.

Bearing Plate - This plate is welded directly to the bottom of the *end post* and has a piece of mirrored finished, 10 gage stainless steel welded to the bottom side. It is the mating surface to the *Teflon* on the *leveling plate*. There are three types of bearing plates varying only in size.

Bearing Seat - The horizontal surface upon which the bridge is anchored.

Bent Plate - A piece of flat bar or sheet steel that has been partially folded by a machine called a Brake. Creates a rounded corner at the fold unlike a sharp corner on angle.

Bottom Chord - The lowest longitudinal member of a truss.

Bow String - A style of truss where the *top chord* curves down from the center of the truss and intersects with the *bottom chord* at the ends of the bridge. This style of bridge has no *diagonals*. See *Tied Arch*.

Bow Truss - A style of truss where the *top chord* curves down from the center of the truss and intersects with the *bottom chord* at the ends of the bridge. This style of bridge has *diagonals* and is the style we commonly use. Also referred as a *Truss Arch*.

Box Truss - See *Portal*.

Butt Weld - A type of weld that joins two members in line with each other, usually consisting of the same material. No additional preparation like beveling is done for this weld.

Button Crimp - A method of fastening metal *deck* pans to each other. A large plier like tool is used to crimp two pieces together.

Camber - To add a slight arch in the middle. All bridges have *camber*. How much is determined by the dead load deflection and how much residual *camber* is specified or requested.

Cap Plate - Any small piece of plate used to cover the end of a tube. Typically a 1/4" thick.

Cap Rail - The member that runs along the top of a vertical *picket safety rail*. Typically an angle or tube. Sometimes referred as a *Top Rail*, do not use this term.

CCA - Chromated Copper Arsenate. A very common water-borne preservative that is now banned for residential use. AKA - Green Treat.

Center Tie Down - An angle welded to the nearest center stringer, flush to the top of the *stringer*, used to bolt down timber *decking*. Typically but not limited to one bolt per board.

Centerline - A line drawn directly through the center of an object. Typically illustrated as a line-dash-line. Sometimes noted as CL.

Clear Span - The distance between the faces of the *substructures*, not between centerlines of bearing surfaces.

Clear Walkway - The width of useable space between the trusses. Depending on how it is specified, it typically is the horizontal distance between the safety railing.

Composite Deck - The steel *deck* pan used to form the bottom of a *concrete deck*. See *Deck Pan*.

Concrete - The substance created when combining sand, aggregate, water, and cement. A primary material used for substructures and *decking*.

Concrete - Light Weight - The same as *concrete* but with an alternate, lighter aggregate.

Contech - A construction products company. The "parent" company of Continental and Steadfast bridge.

Cope - To notch a member to accept another.

Copper Naphthenate - CuNap - The oil-borne preservative that our treating plant in Whitewood, South Dakota uses.

Cor-Ten - US Steel's brand name for *weathering steel*.

Cover Angle - The angle that spans and covers the gap between the bridge and the *backwall*. A 4"x4"x3/8" angle is used for bridges with timber *decks* and a 7"x4"x3/8" (LLV) angle for *concrete decks*.

Cover Plate - The plate that spans and covers the gap between the bridge and the *backwall*. This is an old detail but is sometimes used instead of an angle when the situation calls for it. A 1/4"x6" plate is used for a 1 1/2" gap, and a 3/8"x8" plate is used to cover a 2" gap.

Cross Slope - Typically referring to the levelness of the *deck* surface. A sloped *deck*, where as the direction of the slope is perpendicular to the walkway. This term incidates either a *crowned* or *super elevated deck*.

Crown - A *deck* surface in which there is a *cross slope* in both directions from a peak at the centerline of the walkway. Typically referring to a *concrete deck*.

D1.1 - AWS Structural Welding Code for Tubular and non-Tubular steel structures.

D1.5 - AWS Structural Welding Code for open shaped steel structures.

Deck - The surface upon which a pedestrian or vehicle uses for travel.

Deck Pan - The *galvanized* steel form, laid across the *floor beams*, upon which *concrete* is poured to create the *deck*. Made of 18 gage steel with 2" to 3" tall ribs running longitudinally. Comes in 3'-0" wide by 32' or 36' long sections.

Deck Plank - Referring to a piece of timber used for *deck*.

DFL - Abbreviation for Douglas Fir-Larch. A timber species used for *deck*. Typically supplied in a 3"x12" nominal size and treated with ACZA.

Diagonal - See *Diagonal Web*

Diagonal Web - A vertical member that is placed between two *verticals*, running diagonally from the *top chord* to the *bottom chord*.

Disclaimer - A note on the front page of a drawing set disavowing any responsibility for anything other than the *superstructure* itself.

Double Drop Stretch Trailer - A freight trailer having a *deck* with no enclosed sides or roof. The *deck* runs over the front and back wheels at the ends, dropping below both front and back wheels in the middle. This center *bay* has the capability of stretching from 30' to 51' long. Maximum size of load is limited to 12' high by 50' long by 16' wide, or 8' high by 100'+ long by 16' wide, pending weight.

Double Drop Trailer - See Double Drop Stretch Trailer.

Double Miter - When two saw cuts are required to shape the end of a member to fit.

DTI Washer - Direct Tension Indicating Washer. A type of washer that is used at the main member field splices. ASTM designation is F959. Made of *weathering steel*. There are bumps on one side. As tension is applied the bumps will flatten, and with a feeler gage, the gap is checked. When the proper gap is achieved, the tension is then correct.

Dunnage - Blocking that is use to shore up the structure on the truck trailer or in storage. The blocking can be either timber or steel.

Durometer - An instrument used for measuring the degree of hardness.

E4E - Ease Four Edges. Referring to the finish of a timber member. The four corners of the *plank* running length-wise will be rounded, not sharp or straight cut, to approximately an 1/8" radius.

Elastomeric Bearing Pad - A bearing pad used in place of the standard stainless steel and *Teflon*. Constructed from an elastomer (typically neoprene or rubber), which is a material with the capability of regaining its shape after it has been deflected. It is sometimes reinforced by laminating a series of steel plates in layers.

End Cap - A steel plate covering the end of an open tube member. Typically 1/4" thick capping the top of an *end post*.

End Dam - A steel plate welded to the end of the bridge acting as the form for the end of a *concrete* deck.

End Floor Beam - The member at the end of the bridge which supports the end of the *decking* system between the trusses.

End Post - The vertical member at the end of each truss. Typically true and plumb with the horizon.

Epoxy - A two part chemical adhesive used to secure the *anchor bolt* into a *concrete* abutment.

Expansion End - The end of the *superstructure* that allows longitudinal movement for contraction and expansion. Most Wheeler bridges are designed with expansion at both ends. This minimizes the length of travel as it is divided into each end.

Fab Drawings - The set of drawings drafted after the *submittals* have been approved. These drawings detail each individual part and include a final bill of materials with an accurate weight.

Fence Cable Systems - A system utilizing wire rope of various materials and finishes, acting such as *safety rails*, and meeting AASHTO requirements.

Fence Types - Varies greatly. Fence will be defined as anything other than horizontal *safety rail* or vertical *pickets*. Chain link, cable, etc.

Field Splice - Occurs when the length of a single *span* exceeds that of which can be shipped. A connection made in a location other than the fabricating facility. Typically a bolted connection performed at the job site.

Filler Block - A part of the field splice. A section of material placed between two adjoining members at a *field splice*. The material will match the members in size and is 7 3/4" long. Fills the *gap* between the two members after the *field splice* has been bolted.

Fillet Weld - A type of weld. Used where two flat pieces of steel adjoin perpendicular to each other. Cannot be use at a radiused corner.

Fixed End - The end of the *superstructure* that does not allow longitudinal movement for contraction and expansion. A bridge with a fixed end must also have an *expansion end*.

Flange - The horizontal surface of a W shape, channel, or WT member.

Flare Weld - A weld at which the adjoining members have matched edges and one edge is radiused.

Flat Bed Trailer - A freight trailer having a deck with no enclosed sides or roof. The *deck* runs continuous over the front and back wheels. Maximum size of load is limited to 8' high by 100' long by 16' wide, pending weight.

Floor Beam - A closed or open shaped member perpendicular and connected to the trusses, used to carry the decking system.

FOB - Abbreviation for Free On Board. Without charge to the purchaser for delivery on board or into a carrier at a specified point or location. Deliver to the site but does not include unloading.

Fracture Critical Member- A member of the bridge which, upon failure, would cause a partial collapse of the structure.

Full Pen Weld - Abbr., Full penetration weld. A weld in which the weld material has fully penetrated the base material.

Gage - A form of measurement for the thickness of thin steel sheets. (Nothing over a 1/4" thick.): A form of measurement locating a hole in an open shape from one edge of an angle or from the center of a beam flange.

Galvanize - To coat steel with zinc, which extends the life of the material. One method is called *hot-dipped*, where the entire structure is lowered into a tank of molten zinc. Most bolts are done this way also. Another is called *mechanically*, where electricity is used to bond powdered zinc to the steel, typically used for *Minnesota DOT* bolts on painted bridges.

Gap - The space or dimension between two objects. The dimension between the end of a *diagonal* member and a *vertical* member. The space between the *backwall* and the *superstructure*.

Girder Filler - *Galvanized* steel form, used in conjunction with *deck pan*, upon which *concrete* is poured to create the *deck*. Required when the standard widths of a *deck pan* does not cover the full area. To cover a 10'-0" wide *deck*, use three *deck pans* and two 6" girder fillers. Made of various gage steel with one small connecting rib running longitudinally. Comes in 3", 6" & 9" wide by 10' long pieces.

Gusset - See *Stiffener Plate*. Do not use this term.

Hammer Capsule - A brand of epoxy used for placing anchor bolts.

Hand Rail - A hand hold for pedestrians. Must have 1 1/2" clearance of all connecting hardware to allow a smooth and continuous grip. 34" to 36" above *deck* surface. Material varies from steel pipe, tube or timber. Sometimes confused with *rub rail*, the height and clearance determines this.

Hanger - A vertical or inclined truss web member in a *Warren Truss* that supports a *floor beam*. When *hangers* are identical to the *vertical* web members, the term *hanger* will not be used.

Hold Down - An angle 2 1/2"x2 1/2"x3/16"xcontinuous that is placed on top of a timber deck at the sides. A carriage bolt is placed through the angle and timber and into the *tie down* angle below. This assembly acts as a clamping system to hold down the timber *deck*.

Hot Dipped - A method of *galvanizing*. After a cleaning process, the material is lowered into a tank of molten zinc and removed, thus completely coating the product.

H-Truss - A style of bridge structure where the *floor beam* is located such that the bottom of the floor beam is higher than the bottom of the *bottom chord*. When looking at the end of the bridge, an "H" shape may be seen, formed from the two trusses and floor beam.

Internal Stiffener - A piece of tube steel placed on end, located inside the *filler block*. Strengthens the block to prevent it from crushing when the bolts are torqued. A steel plate, crush plate, located inside of, to prevent deformation from outside forces.

Ipe - (ee'-pay) (Tabebuia Spp-Lapacho Group) A species of naturally durable tropical hardwood used for *decking* and railing. A very heavy and dense timber, typically sinks in water. Reddish-brown in color with varying grains. No preservatives or chemical treatment required. Also called Brazilian Walnut or Bethabarra. Though incorrect, it is sometimes pronounced "ip'-ee".

Iron Wood - A brand name of naturally durable tropical hardwood. See *Ipe*.

J Weld - A weld not applicable to our work, see *Flare Weld*.

Kick Plate - Do not use this term. See *Toe Rail*.

Kip - A unit of measurement equal to one thousand pounds.

KSI - A unit of measurement. *Kips* per square inch.

Laminated Bearing Pad - An *elastomeric bearing pad* with layers of steel.

Lap - To extend over or onto. *Deck lap*. *Rebar lap*. The non-bearing side of *deck pan*.

Legal Height - The maximum height of cargo that can travel on our roadways. The maximum, 13'-6" is measured from the roadway surface to the highest point of the load.

Leveling Plate - The lower plate of the bearing detail. This plate will have round holes as opposed to slotted as it will remain stationary. It also is the plate upon which the *Teflon* pad is tack welded to. It is the mating surface to the stainless on the *bearing plate*. The leveling plate is temporarily mounted to the *bearing plate* for shipment and is broke loose upon arrival at the site. There are three types of leveling plates varying only in size.

Lifting Weight - The weight of the superstructure as it arrives on site. This weight does not include items such as, but not limited to, concrete and reinforcement which will be placed after the bridge has been set. This weight is used to determine crane size.

Liquid Roc - A brand of epoxy used for placing anchor bolts.

LLV - Abbr., *Long Leg Vertical*. Describing the orientation of an angle shape.

Loading Requirements - Information used for design, E.I.; live load, wind load, snow load, seismic, etc.

Long Leg Vertical - Describing the orientation of an angle shape. Abbr. - *LLV*

Longitudinal - A description of direction. Parallel with the walkway and trusses. The "long way".

Low Steel - Typically referring to the *bottom chord* or, in the instance of an *underhung floor beam*, the *floor beam*, at which a vertical clearance must be maintained.

Mag Particle - Magnetic Particle. A test using a colored powder and magnetics to determine the quality of a welded joint.

Mechanically Galvanized - A method of *galvanizing*. In this process electricity is used to bond the zinc to the base material resulting in a finish that is more consistent than *hot dip*.

Miscellaneous Steel - Any small steel item that may not be counted during the bid process. I.e.; clips, tabs angles, spacers, etc.

Miter Cut - A shop cut that is anything but 90 degrees.

MN DOT - Abbr., Minnesota Department of Transportation.

MN DOT Name Plate - A descriptive plaque in addition to the *name plate*, that includes the Minnesota Department of Transportation's bridge number.

Name Plate - A descriptive plaque that bears the manufacture's name and the load limit of the bridge.

Overhead Bracing - *Horizontal* and *wind* bracing members located above the *deck* surface. Typically used with a *portal* or *box* truss.

Paint Types - Though there are too many to describe, every paint system we use will have a primer first coat, and one or two additional mid or finish coats. The project's specifications will indicate the system and types to be used.

Pan - See *Deck Pan*

Panel Point - The location where the *vertical* and/or *diagonal* members meet at the *top* or *bottom chords*.

Partial Pen Weld - Abbr., Partial penetration weld. A weld in which the weld material has only partially penetrated the base material.

Penta - Pentachlorophenol. An oil-borne preservative use for timber bridges. Not recommended for decking materials.

Picket - Vertical *safety rail*. Typically made of angle shapes or in some cases, tube steel. Also typically spaced to contain a 4" sphere.

Pier - A *substructure* item upon which a multiple span bridge bears between the *abutments*.

Plank - See *Deck Plank*.

Plumb Verticals to Horizon - A request typically noted in the *specifications* or design plans requiring that all of the *vertical* members are to be *miter cut* as such to achieve a 90 degree angle to the horizon, no matter what slope or *camber* there is on the *superstructure* itself, as are the *end posts*.

Portal Bridge- A bridge which includes upper *horizontal* members and *wind braces* serving to transfer wind loads from the upper parts of the trusses to an abutment or pier. A *Box Truss*.

Portal Member - The upper horizontal member at the ends of the bridge that connects the tops of the end posts together.

Pratt Truss - A truss style where the diagonal members are place in such a way that they are in tension.

Project Notes - An electronic Word document where all conversations and any pertinent information is logged. There is a separate file for every order. All involved is expected to review, use, and maintain this file.

Rail Post - A vertical railing member that "caps- off" the free end of a rail segment, and is not anchored at the bottom. Typically used at the ends of a bridge with a *picket* railing system.

Rail Splice Tube - A vertical tube steel member used for field splicing rail systems between bridge sections. Typically runs from the *top rail* to the *toe rail*, located near the adjacent *vertical* of the adjoining section. This member ties all of the loose railing elements together minimizing field splicing labor.

Rebar - Concrete reinforcement. Steel, deformed, round bar. Sometimes coated with epoxy for protection. Typically supplied by others.

Reinforcing - To strengthen by adding extra support or material, a device designed to provide additional strength. I.e.; *gusset* plates, *rebar*, spacers, tabs, etc.

Rolling - To mechanically curve a piece of material. To add a radius to a straight piece of material.

Rub Rail - The steel or timber member, being of a different shape than the *safety rail*, running the full length of the rail. Typically located at 42" above the deck. This member acts as a "bumper" as would say a chair rail. Do not confuse with a *hand rail*.

S1S1E - Surface One Side One Edge. Referring to the finish of a timber member. The surfaced sides will be smooth to the touch.

S4S4E - See *S4S E4E*. Do not use this term.

S4S E4E - Surface four sides and ease four edges. Referring to the finish of a timber member. The surfaced sides will be smooth to the touch, and the edges will be radiused to approximately 1/8".

Safety Rail - The horizontal or vertical members that will refrain pedestrians, vehicles and the like from falling off of the superstructure. The spacing of these members can vary, review the *specifications* for direction. When vertical safety rails are used, use the term "*picket*".

Sandblast - A method of cleaning steel. The action of throwing an abrasive material such as sand, steel shot, glass beads, etc. by forced air to remove any mill scale, rust, grease and oil, mill markings and the like.

Sandblast Codes - There are varying degrees of finishes, from a brush-off blast to a white blast, each designated by a number. As follows in order of lesser to greater degrees; SP-7 Brush-off, SP-6 Commercial Blast, SP-10 Near White, SP-5 White.

Section - 1. A piece of a spliced span. A single spliced bridge will have two sections, a two splice bridge will have three sections. 2. A detail of the structure or members in which you are looking at a cut through view.

Shim Kit - A series of galvanized pieces of steel, 2"x2" in shape, in varying thicknesses from a 1/2" to 1/16", placed under the *leveling plates*, to bring the bottom of the *cover angle* level with the top of the *abutment*. Four kits are sent with each *span*.

Shim Plate - See *Shim Kit*.

Shop Splice - Occurs when a length of material is not as long as required and is connected to another piece of identical material to meet the required length. This connection is made at the fabricating facility and typically requires a *full pen weld*.

Side Dam - The member that runs across the *floor beams* at each side of the walkway, acting as the side forms for a *concrete* deck. The material is typically a channel and is usually shimmed a 1/2" away from the truss.

Single Drop Trailer - A freight trailer having a *deck* with no enclosed sides or roof. The *deck* runs over the front wheels then drops below both front and continues over the back wheels. Maximum size of load is limited to 10' high by 60' long by 16' wide, pending weight.

Single Truss Weight - The physical weight of one side or truss of a bridge. This is limited to the truss members themselves and the railing system.

Skew - Angled; not perpendicular; the end of the bridge is skewed.

Skewed Bearing - When the *substructure* is not perpendicular to the *superstructure*.

Sloped Bridge - When one *abutment* is higher in elevation than the other.

Soil Report - Geotechnical information derived from soil borings taken at the site. Used to design abutments.

Sophisticated Paint Endorsement - An *AISC* certification, indicating that the certified vendor meets *AISC*'s requirements for a commercial painting facility.

Span - The particular length of *superstructure* between two adjacent *substructures*.

Specifications - A book or manual for any given project, state, municipality, etc. that describes all construction requirements.

Splice Plate - A steel plate designed to connect two members of the same size together in the field. This plate will have holes for bolting. May be welded to one of the members in the shop.

Spread Footing - The most lowest portion of an abutment, acting as a base to sit on. Made of concrete and is wider than the abutment base.

SSPC-SP - SSPC was founded in 1950 as the Steel Structures Painting Council, a non-profit professional society concerned with the use of coatings to protect industrial steel structures. In 1997, the name of the association was changed to The Society for Protective Coatings to better reflect the changing nature of coatings technology and the ever-expanding types of construction materials. SSPC is the only non-profit association that is focused on the protection and preservation of concrete, steel and other industrial and marine structures and surfaces through the use of high-performance industrial coatings. SSPC is the leading source of information on surface preparation, coating selection, coating application, environmental regulations, and health and safety issues that affect the protective coatings industry. The SP stands for Surface Preparation.

Stainless Steel - A type of steel alloyed with at least 10 percent chromium that is resistant to corrosion or rusting associated with exposure to water and moist air.

Stiffener Plate - A steel plate, usually triangular in shape, used to strengthen members or connections. Commonly used at the connection of end post and portal members.

Stringer - The members that run across the *floorbeams* upon which timber *decking* bears.

Structural Steel - All steel members that are directly related to the structure's performance.

Structure Depth - The distance from the top of *deck* to the bottom of the *bottom chord* or low steel. Not the same dimension as the *backwall*.

Submittal Drawings - The first set of plans that are sent out to be approved.

Substructure - Any structure that the *superstructure* bears on.

Super Elevated - A sloped *deck* perpendicular to the walkway, from side to side. One side of the *deck* is higher than the other.

Superstructure - That of which sits on top of a foundation. A term for the bridge structure itself, not including the *abutments*.

SYP - The abbreviation for Southern Yellow Pine, a species of timber use for rails, *decking*, and *wear course*. Though inexpensive, it has some undesirable qualities such as less resistance to warping, cupping, and twisting, and dimensionally more inconsistent and others.

Teflon - A manufactured bearing surface incorporated into our standard bearing assemblies at all expansion ends.

Tied Arch - A style of truss where the *top chord* curves down from the center of the truss and intersects with the *bottom chord* at the ends of the bridge. This style of bridge has no *diagonals*. See *Bow String*.

Tie Down - An angle 2 1/2x2 1/2x3/16xcontinuous welded to the outside *stringers* and sometimes to the nearest center *stringer* that the carriage bolts go through to attach the timber decking. At the outside stringers, it is used in conjunction with the *hold down* angles.

Toe Plate - See *Toe Rail*. Do not use this term.

Toe Rail - The lowest member of a railing system. Usually located 2" above the *deck*. Though the material can be tube, or even timber, it typically is a channel.

Top Chord - The upper most *longitudinal* member of the truss.

Top Rail - An upper railing member that is not a *hand rail*, *rub rail*, or *safety rail*.

Traffic Barrier - A horizontal rail, most often a TS 8x4x1/4, designed to conform to a specified vehicular impact loading. Usually located vertically around the bumper height of a design vehicle.

Transverse - Across or perpendicular to, as opposed to *longitudinal*.

Trex - A brand name of composite *decking*. Mainly used for *hand* or *rub rail*, rarely for *decking*. Composed of wood fibers and plastic, it's not very strong so it requires more support. Virtually will last forever.

Truss Arch - See *Bow Truss*.

TYP - Abbr. Typical.

Type 3 - Referring to steel type of bolts, nuts, and washers, meaning *weathering* steel.

Ultra-Sonic - A type of weld test in which sound is used to determine the quality of a welded joint.

Under Hung - A style of bridge where the *floor beam* is welded to the bottom of the *bottom chord*.

Upper Horizontal - A horizontal member used in a *portal* bridge, located at the *panel points*, perpendicular between the *top chords*.

Upper Wind Brace - A horizontal member used in a *portal* bridge, running diagonally between *panel points* along the *top chords*.

UT - Abbr. *Ultra-sonic* testing

Vertical Web - A vertical member used in most styles of trusses. Located at *panel points*, running perpendicular to the *top* and *bottom chords*.

Vulcraft - A brand name. Manufacturers of steel roof and floor deck pans, along with bar joists and trusses.

Warren Truss - A truss style in which the *diagonals* are the main load bearing members as opposed to the *verticals*.

Wear Course - An additional layer of *decking* material whose intent is to take the brunt of high traffic wear and can be easily replaced in the future. This layer is typically laid *transversely* to the lower *decking* material and is made of cheaper timber such as *Southern Yellow Pine*. Mostly used for snowmobile traffic.

Weathering Steel - High- strength, low- alloy steel with improved atmospheric corrosion resistance. ASTM designations are as follows; A847 for tubing, and A588, A606, A242 for plates and shapes.

Web - Any member in a truss located between the *top* and *bottom chords* and *end posts*. The vertical surface of a W shape, channel, or WT member.

Wind Brace - A horizontal member running diagonally between *panel points* along the *bottom chords*. These members carry wind loads.

WPS - Abbr. Weld Procedures. Directions for welding. A separate procedure is written for each position.