

BRIDGE DESIGN MANUAL GLOSSARY

<i>Accelerated curing</i>	Curing of concrete, mortar, grout or neat cement paste at an elevated temperature using live steam or radiant heat.
<i>Active earth pressure</i>	Lateral pressure resulting from the earth being retained by a structure or component, which is tending to move away from the soil mass.
<i>Active earth wedge</i>	Wedge of earth with a tendency to move if not retained by a structure or component.
<i>Adjacent box beams</i>	Precast, prestressed concrete box beams that are set side-by-side.
<i>Admixture</i>	A material other than water, aggregates, hydraulic cement and fiber reinforcement, used as an ingredient of concrete or mortar and added to the batch immediately before or during its mixing.
<i>Aeroelastic vibration</i>	Periodic, elastic response of a structure to wind pressure.
<i>Agency</i>	A public entity that issues design/construction specifications. Usually the federal government or a state, county or municipal government or entity created by legislation such as a tollroad, through-way or port authority.
<i>Alkali-aggregate reaction</i>	Chemical reaction in either mortar or concrete between alkalis (sodium and potassium) from portland cement or other sources and certain constituents of some aggregates; under certain conditions, deleterious expansion of concrete or mortar may result.
<i>Allowable stress</i>	In working stress design, the maximum stress permitted for a specified condition.
<i>Analysis</i>	A mathematical process by which structural deformations, forces and stresses are determined.
<i>Anchorage</i>	In post-tensioning, a mechanical device used to anchor the stressed tendon to the concrete; in pretensioning, a device used to anchor the tendon until the concrete has reached a predetermined strength and the prestressing force has been transferred to the concrete; for reinforcing bars, a length of reinforcement, or a mechanical anchor or hook, or combination thereof, at the end of a bar needed to transfer the force carried by the bar into the concrete.
<i>Anchorage blister</i>	A built-out area in the web, flange or flange-web junction for the incorporation of tendon anchorage fittings.
<i>Anchorage seating</i>	Deformation of anchorage or seating of tendons in anchorage device when prestressing force is transferred from jack to anchorage device.
<i>Anchorage zone</i>	The portion of the structure in which the prestressing force is transferred from the anchorage device onto the local zone of the concrete, and then distributed more widely into the general zone of the structure.
<i>Aspect ratio</i>	Ratio between length and width of a rectangle.
<i>At Jacking</i>	See Jacking.
<i>At loading</i>	See Loading.
<i>At transfer</i>	See Transfer.
<i>Axle unit</i>	Single axle or tandem axle.
<i>Beam</i>	A longitudinal stringer used primarily for relatively short spans; used interchangeably with stringer or girder.
<i>Berm</i>	An earthwork used to redirect or slow down impinging vehicles or vessels; also used to stabilize fill, embankment or soft ground and cut slopes.
<i>Blanketing</i>	See Debonding.
<i>Bleeding</i>	The autogenous flow of mixing water within, or its emergence from, newly placed concrete or mortar, caused by the settlement of the solid materials within the mass.
<i>Bonded tendon</i>	Prestressing tendon that is bonded to concrete either directly or through grouting.

BRIDGE DESIGN MANUAL GLOSSARY

<i>Bracket (or Corbel)</i>	Short (haunched) cantilever that projects from the face of a column or wall to support a concentrated load or beam reaction.
<i>Bridle strand (lead strand)</i>	In a production plant, prestressing strand which is not embedded in a precast concrete member but extends from near the end of the member(s), through the end of the casting bed. It is reused for each cast by splicing it to the end of the “production” strand, which is embedded in, and extends a short distance out of the member.
<i>Bursting force</i>	Tensile forces in the concrete in the vicinity of post-tensioning anchorages caused by the transfer of prestressing forces.
<i>Cast-in-place concrete</i>	Concrete placed in its final location in the structure while still in a plastic state.
<i>Cementitious materials</i>	Materials having cementing properties such as portland cement, blast furnace slag, fly ash, silica fume, and metakaolin.
<i>Centrifugal force</i>	A lateral force resulting from a change in direction of the movement of a vehicle.
<i>Closely spaced anchorages</i>	Anchorage devices are defined as closely spaced if their center-to-center spacing does not exceed 1.5 times the width of the anchorage devices in the direction considered.
<i>Closure</i>	A placement of cast-in-place concrete used to connect two or more previously cast portions of a structure.
<i>Coating</i>	Material used to protect prestressing tendons against corrosion, to reduce friction between tendon and duct, or to debond prestressing tendons.
<i>Coefficient of thermal expansion</i>	Increase or decrease in linear dimension per unit length or increase or decrease in volume per unit volume per degree of temperature increase or decrease, respectively.
<i>Composite construction</i>	Concrete components or concrete and steel components interconnected to respond to force effects as a unit.
<i>Compressive strength of concrete (f'_c)</i>	Specified compressive strength of concrete in pounds per square inch, psi.
<i>Concrete cover</i>	The specified distance between the surface of the reinforcing bars, strands, post-tensioning ducts, anchorages or other embedded items, and the surface of the concrete.
<i>Concrete, structural lightweight</i>	A concrete containing lightweight aggregate having an air-dry unit weight as determined by “Method of Test for Unit Weight of Structural Lightweight Concrete” (ASTM C 567), not exceeding 115 pcf. In this specification, a lightweight concrete without natural sand is termed “all-lightweight concrete” and one in which all fine aggregate consists of normal weight sand is termed “sand-lightweight concrete.”
<i>Confinement</i>	A condition where the disintegration of the concrete under compression is prevented by lateral and/or circumferential reinforcement.
<i>Confinement, anchorage</i>	Anchorage for a post-tensioning tendon that functions on the basis of containment of the concrete in the local anchorage zone by special reinforcement.
<i>Corbel</i>	see Bracket.
<i>Couplers (couplings)</i>	Means by which prestressing force is transmitted from one partial-length prestressing tendon to another.
<i>Creep of concrete</i>	Time-dependent deformation of concrete under sustained load.
<i>Curvature friction</i>	Friction resulting from the tendon moving against the duct when tensioning, due to bends or curves in the specified prestressing tendon profile.
<i>Debonding (blanketing)</i>	Wrapping, sheathing, or coating prestressing strand to prevent bond between strand and surrounding concrete.
<i>Deck</i>	A component of a bridge superstructure, with or without wearing surface.
<i>Deck slab</i>	A solid concrete slab, resisting and distributing wheel loads to the supporting components.

BRIDGE DESIGN MANUAL GLOSSARY

<i>Decompression</i>	The stage at which the compressive stresses, induced by prestress, are overcome by the tensile stresses.
<i>Deep component</i>	Components in which the distance from the point of 0.0 shear to the face of the support is less than $2d$, or components in which a load causing more than one-third of the shear at a support is closer than $2d$ from the face of the support.
<i>Deep draft waterways</i>	A navigable waterway used by merchant ships with loaded drafts of 14-60 ft.
<i>Deformed reinforcement</i>	Deformed reinforcing bars, deformed wire, welded smooth wire fabric, and welded deformed wire fabric.
<i>Design lane</i>	A notional traffic lane positioned transversely on the roadway.
<i>Design load</i>	All applicable loads and forces or their related internal moments and forces used to proportion members. For design by SERVICE LOAD DESIGN, design load refers to loads without load factors. For design by STRENGTH DESIGN METHOD, design load refers to loads multiplied by appropriate load factors.
<i>Design strength</i>	Nominal strength multiplied by a strength reduction factor, ϕ .
<i>Design water depth</i>	Depth of water at mean high water.
<i>Development length</i>	Length of embedded reinforcement required to develop the design strength of the reinforcement at a critical section.
<i>Deviation saddle</i>	A concrete block built-out in a web, flange or web-flange junction, cast monolithically with the segment, to control the geometry of, or to provide a means for changing direction of external tendons.
<i>Distortion</i>	Change in structural geometry.
<i>Dolphin</i>	Protective object, which may have its own fender system, usually circular in plan, and structurally independent from the bridge.
<i>Duct</i>	Hole or void formed in a prestressed concrete member to accommodate a tendon for post-tensioning.
<i>Durability</i>	The ability of concrete to resist weathering action, chemical attack, abrasion and other conditions of service.
<i>Dynamic load allowance</i>	An increase in the applied static force effects to account for the dynamic interaction between the bridge and moving vehicles.
<i>Edge distance</i>	The minimum distance between the centerline of reinforcement or other embedded elements and the edge of the concrete.
<i>Effective depth</i>	The depth of a component effective in resisting flexural or shear forces; as for d and d_v .
<i>Effective prestress</i>	Stress remaining in concrete due to prestressing after all calculated losses have been deducted, excluding effects of superimposed loads and weight of member; stress remaining in prestressing tendons after all losses have occurred excluding effects of dead load and superimposed load.
<i>Elastic shortening of concrete</i>	Shortening of member caused by application of forces induced by prestressing.
<i>Embedment</i>	An object, usually metal, plastic or wood, intentionally cast into concrete and used to lift the member, provide a hole or sleeve in the member, or to make a welded or bolted attachment to the member.
<i>Embedment length</i>	The length of reinforcement or anchorage provided beyond a critical section over which transfer of force between concrete and reinforcement may occur.
<i>End anchorage</i>	Length of reinforcement, or mechanical anchor, or hook, or combination thereof, beyond point of zero stress in reinforcement; mechanical device to transmit prestressing force to concrete in a post-tensioned member.
<i>End block</i>	Enlarged end section of a member designed to reduce anchorage stresses.

BRIDGE DESIGN MANUAL GLOSSARY

<i>Equivalent fluid</i>	A notional substance whose density is such that it would exert the same pressure as the soil it is seen to replace for computational purposes.
<i>Exposed</i>	A condition in which a portion of a bridge's substructure or superstructure is subject to physical contact by any portion of a colliding vessel's bow, deckhouse or mast.
<i>External tendon</i>	A post-tensioning tendon placed outside of the body of concrete, usually inside a box girder.
<i>Extreme</i>	A maximum or a minimum.
<i>Factored load</i>	Load, multiplied by appropriate load factors, used to proportion members by the strength design method.
<i>Fatigue strength</i>	The greatest stress which can be sustained for a given number of stress cycles without failure.
<i>Fender</i>	Protection hardware attached to the structural component to be protected, or used to delineate channels or to redirect aberrant vessels.
<i>Fiber reinforced plastic reinforcement</i>	Reinforcement made with a resin matrix containing continuous fibers that work together as a single element.
<i>Finite element method</i>	A method of analysis in which a structure is discretized into elements connected at nodes, the shape of the element displacement field is assumed, partial or complete compatibility is maintained among the element interfaces, and nodal displacements are determined by using energy variational principles or equilibrium methods.
<i>Flexible duct</i>	A loosely interlocked duct which can be coiled into a 4.0 ft diameter without damage.
<i>Fly ash</i>	The finely divided residue resulting from the combustion of ground or powdered coal and which is transported from the firebox through the boiler by flue gases.
<i>Force effects</i>	A deformation or a stress resultant, i.e., thrust, shear, torque and/or moment, caused by applied loads, imposed deformations or volumetric changes.
<i>Form</i>	A mold into which fresh concrete is placed to fabricate a specified shape.
<i>Frazil ice</i>	Ice resulting from turbulent water flow.
<i>Friction (post-tensioning)</i>	Surface resistance between tendon and duct in contact during tensioning (also, see Curvature friction).
<i>General zone</i>	Region adjacent to a post-tensioning anchorage within which the prestressing force spreads out to an essentially linear stress distribution over the cross-section of the component.
<i>Girder</i>	The main longitudinal superstructural element. The term is used primarily for I- and box-section bridges of relatively long span; used interchangeably with stringer or beam.
<i>Global</i>	Pertinent to the entire superstructure or to the whole bridge.
<i>Grillage analysis method</i>	A method of analysis in which all or part of the superstructure is discretized into orthotropic components that represent the characteristics of the structure.
<i>Grout</i>	A mixture of cementitious material and water, with or without aggregate, proportioned to produce a consistency without segregation of the constituents. The consistency may range from that required for pouring to that required for dry packing.
<i>Grout opening (vent)</i>	Inlet, outlet, vent, or drain in post-tensioning duct for grout, water, or air.
<i>Heat of hydration</i>	Heat evolved by chemical reactions with water, such as that evolved during the setting and hardening of portland cement, or the difference between the heat of solution of dry cement and that of partially hydrated cement.
<i>High performance concrete</i>	Concrete that meets special performance and uniformity requirements including: ease of placement and consolidation without affecting strength; long-term mechanical properties; early high strength; toughness; volume stability; and, longer life in severe environments.

BRIDGE DESIGN MANUAL GLOSSARY

<i>Honeycomb</i>	Voided or unsound area of concrete resembling the cellular structure of a honeycomb. May exist at the face of formed surfaces or internally and is caused by incomplete vibration or consolidation often in combination with restrictions to the placement of concrete caused by the close spacing of reinforcement or other obstructions.
<i>Influence surface</i>	A continuous or discretized function over a bridge deck whose value at a point, multiplied by a load acting normal to the deck at that point, yields the force effect being sought.
<i>Intermediate anchorage</i>	Anchorage not located at the end surface of a member or segment for tendons that do not extend over the entire length of the member or segment; usually in the form of embedded anchors, blisters, ribs, or recess pockets.
<i>Internal tendon</i>	A post-tensioning tendon placed within the body of concrete.
<i>Isotropic reinforcement</i>	An arrangement of reinforcement in which the bars are orthogonal and the reinforcement ratios in the two directions are equal.
<i>Jacking (at jacking)</i>	Tensioning of the prestressing tendons; at the time of tensioning.
<i>Jacking force</i>	The force exerted by the device, which introduces tension into the prestressing tendons.
<i>Knot</i>	A velocity of 1.1508 mph.
<i>Lane live load</i>	The combination of tandem axle and uniformly distributed loads, or the combination of the design truck and design uniformly distributed load.
<i>Launching bearing</i>	Temporary bearings with low friction characteristics used for construction of bridges by the segmental launching method.
<i>Launching nose</i>	Temporary steel assembly attached to the front of an incrementally launched bridge to reduce superstructure force effects during launching.
<i>Lever rule</i>	The statical summation of moments about one point to calculate the reaction at a second point.
<i>Lightweight concrete</i>	Concrete containing lightweight aggregate and having an air-dry unit weight not exceeding 135 pcf, as determined by ASTM C-567.
<i>Liquefaction</i>	The loss of shear strength in a saturated soil due to excess hydrostatic pressure. In saturated, cohesionless soils, such a strength loss can result from loads that are applied instantaneously or cyclically, particularly in loose fine to medium sands that are uniformly graded.
<i>Load</i>	The effect of acceleration, including that due to gravity, imposed deformation or volumetric change.
<i>Load factor</i>	A coefficient expressing the probability of variations in the nominal load for the expected service life of the bridge.
<i>Loading (at loading)</i>	The time when loads are applied. Such loads include prestressing forces and permanent loads, but generally not live loads; refers to the maturity of the concrete at the time of loading.
<i>Local</i>	Pertinent to a component or subassembly or components.
<i>Local zone</i>	The volume of concrete surrounding and immediately ahead of the anchorage device, subjected to high compressive stresses.
<i>Loss of prestress</i>	Reduction in prestressing force resulting from combined effects of strains in concrete and steel, including effects of elastic shortening, creep and shrinkage of concrete, relaxation of steel stress, and for post-tensioned members, friction and anchorage seating.
<i>Low-relaxation steel</i>	Prestressing strand in which the steel relaxation losses have been substantially reduced by stretching at an elevated temperature during manufacture.
<i>Method of analysis</i>	A mathematical process by which structural deformations, forces and stresses are determined.

BRIDGE DESIGN MANUAL GLOSSARY

<i>Mode of vibration</i>	A shape of dynamic deformation associated with a frequency of vibration.
<i>Modulus of elasticity</i>	The ratio of uniaxial normal stress to corresponding strain for tensile or compressive stress below the proportional limit of a material.
<i>Modulus of rupture</i>	A measure of the ultimate load-carrying capacity of a plain concrete beam and sometimes referred to as rupture modulus or rupture strength. It is calculated as the apparent tensile stress in the extreme fiber of a test specimen under the load which produces rupture.
<i>Multi-beam bridge deck</i>	A bridge constructed with precast, prestressed concrete beams that are placed side-by-side on the supports.
<i>Navigable waterway</i>	A waterway, determined by the U.S. Coast Guard as being suitable for interstate or foreign commerce, as described in 33CFR205-25.
<i>Node</i>	A point where finite elements or grid components meet; in conjunction with finite differences, a point where the governing differential equations are satisfied.
<i>Nominal load</i>	An arbitrarily selected design load level.
<i>Nominal strength</i>	Strength of a member or cross-section calculated in accordance with provisions and assumptions of the STRENGTH DESIGN METHOD before application of any strength reduction factors.
<i>Normally consolidated soil</i>	A soil for which the current overburden pressure is the greatest that has been experienced.
<i>Normal-weight concrete</i>	Concrete having a weight between 135 and 160 pcf.
<i>Orthotropic</i>	Perpendicular to each other; having physical properties which differ in two or more orthogonal directions.
<i>Overconsolidated soil</i>	A soil which has been under greater overburden pressure than currently exists.
<i>Overconsolidation ratio</i>	OCR equals Maximum Preconsolidation Pressure divided by Overburden Pressure.
<i>Overlay</i>	A layer of portland cement or asphaltic concrete placed on a new or existing bridge deck or roadway and used as a wearing or leveling course or both. Portland cement concrete overlays may be non-composite or bonded to the underlying deck, with or without connecting reinforcement, to increase the structural depth and capacity of the section.
<i>Partially debonded strand</i>	A prestressing strand that is bonded for a portion of its length and intentionally debonded elsewhere through the use of mechanical or chemical means. Also called shielded or blanketed strand.
<i>Partially prestressed concrete</i>	Concrete with a combination of tensioned prestressing strands and reinforcing bars.
<i>Passive earth pressure</i>	Lateral pressure resulting from the earth resisting the lateral movement of a structure or component into the soil mass.
<i>Permanent loads</i>	Loads and forces which are, or assumed to be, constant upon completion of construction.
<i>Permeability</i>	The ability of concrete to resist penetration of liquids and gases.
<i>Permit vehicle</i>	Any vehicle whose right to travel is administratively restricted in any way due to its weight or size.
<i>Plain reinforcement</i>	Reinforcement that does not conform to the definition of deformed reinforcement.
<i>Post-tensioning</i>	A method of prestressing concrete whereby the tendon is kept from bonding to the plastic (wet) concrete, then elongated and anchored directly against the hardened concrete, imparting stresses through end bearing.
<i>Post-tensioning duct</i>	A form device used to provide a path for post-tensioning tendons or bars in hardened concrete. The following types are in general use: see flexible, rigid, semi-rigid duct.

BRIDGE DESIGN MANUAL GLOSSARY

<i>Pozzolan</i>	A siliceous or siliceous and aluminous material, which in itself possesses little or no cementitious value in finely divided form and in the presence of moisture, chemically reacts with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties.
<i>Precast members</i>	Concrete elements cast in a location other than their final position.
<i>Precompressed zone</i>	Portion of flexural member cross-section compressed by prestressing force.
<i>Prestressed concrete</i>	Reinforced concrete in which internal stresses have been introduced to reduce potential tensile stresses in concrete resulting from loads.
<i>Prestressing steel</i>	High strength steel used to prestress concrete and consisting of seven-wire strands, single wires, bars, rods, or groups of wires or strands.
<i>Pretensioning</i>	A method of prestressing concrete whereby the tendons are elongated, anchored while the concrete in the member is cast, and released when the concrete is strong enough to receive the forces from the tendon through bond.
<i>Quality assurance</i>	Actions taken by an owner or his representative to provide assurance that what is being done and what is being provided are in accordance with the applicable standards of good practice for the work.
<i>Quality control</i>	Actions taken by a manufacturer or contractor to provide control over what is being done and what is being provided so that the applicable standards of good practice for the work are followed.
<i>Radiant heat curing</i>	Curing of concrete, mortar, grout or neat cement paste at an elevated temperature using heat applied by means of pipes circulating steam, oil or hot water, by electric blankets or heating elements or by circulating warm air.
<i>Reinforcement</i>	Bats, wires, strands, or other slender members, which are embedded in concrete in such a manner that they and the concrete act together in resisting forces.
<i>Relaxation (of tendon stress)</i>	Time-dependent reduction of stress in prestressing tendon at constant strain.
<i>Release strength (prestress release, prestress release strength)</i>	The strength of concrete when the strands are “detensioned” in pretensioned members.
<i>Reliability index</i>	A quantitative assessment of safety expressed as the ratio of the difference between the mean resistance and mean force effect to the combined standard deviation of resistance and force effect.
<i>Required strength</i>	Strength of a member or cross-section required to resist factored loads or related internal moments and forces in such combinations as are stipulated in Article 3.22.
<i>Rigid duct (post-tensioning)</i>	Seamless tubing stiff enough to limit the deflection of a 20.0 ft length supported at its ends to not more than 1.0 in.
<i>Roadway width</i>	Clear space between barriers and/or curbs.
<i>Sand-lightweight concrete</i>	A class of lightweight concrete containing lightweight coarse aggregate and natural sand fine aggregate.
<i>Segmental component</i>	A component made up of individual elements, either precast or cast-in-place and post-tensioned together to act as a monolithic unit under loads.
<i>Semi-rigid duct (post-tensioning)</i>	A corrugated duct of metal or plastic sufficiently stiff to be regarded as not coilable into conventional shipping coils without damage.
<i>Service load</i>	Loads without load factors.
<i>Setting temperature</i>	An average temperature for the structure used to determine the dimensions of a structure when a component is added or set in place.
<i>Shallow draft waterways</i>	A navigable waterway used primarily by barge vessels with loaded drafts of less than 9-10 ft.

BRIDGE DESIGN MANUAL GLOSSARY

<i>Shear friction</i>	A recognized concept used in the design of areas with shear forces that achieves ductility by placing reinforcement across an anticipated crack so that the tension developed by the reinforcing bars will provide a force normal to the crack. This normal force in combination with “friction” at the crack interface provides the shear resistance.
<i>Shear lag</i>	Nonuniform distribution of stress over the cross-section.
<i>Shrinkage of concrete</i>	Time-dependent deformation of concrete caused by drying and chemical changes (hydration process).
<i>Skew angle</i>	Smaller angle between the centerline of a support and a line normal to the roadway centerline.
<i>Slab</i>	A component having a width of at least four times its effective depth.
<i>Spacing of beams</i>	The center-to-center distance between beams.
<i>Special anchorage device</i>	Anchorage device whose adequacy should be proven in a standardized acceptance test. Most multi-plane anchorages and all bond anchorages are Special Anchorage Devices.
<i>Specified strength of concrete</i>	The nominal compressive strength of concrete specified for the work and assumed for design and analysis of new structures.
<i>Splice</i>	Connection of one reinforcing bar to another by lapping, welding, mechanical couplers or other means; connection of welded wire reinforcement by lapping; connection of a length of prestressing strand to another using special chucks; connection of piles by mechanical couplers.
<i>Spiral reinforcement</i>	Continuously wound reinforcement in the form of a cylindrical or rectangular helix.
<i>Splitting tensile strength</i>	The tensile strength of concrete, determined by a splitting test made in accordance with ASTM C496.
<i>Spread box beams</i>	Precast, prestressed concrete box beams that are placed on the substructure with a space between them that requires a formed structural topping (deck slab).
<i>Steam curing</i>	Curing of concrete, mortar, grout or neat-cement paste in water vapor at atmospheric pressure and at a maximum temperature between about 100 F and 200 F.
<i>Stirrups or ties</i>	Lateral reinforcement formed of individual units, open or closed, or of continuously wound reinforcement. The term “stirrups” is usually applied to lateral reinforcement in horizontal members and the term “ties” to those in vertical members.
<i>Stress range</i>	The algebraic difference between the maximum and minimum stresses due to transient loads.
<i>Stringer</i>	A bridge superstructure element which is repeated in the superstructure, primarily in the longitudinal direction but occasionally in the transverse direction; used interchangeably with beam or girder.
<i>Structural mass concrete</i>	Any large volume of concrete where special materials or procedures are required to cope with the generation of heat of hydration and attendant volume change to minimize cracking or concrete degradation.
<i>Structurally continuous barrier</i>	A barrier, or any part thereof, which is interrupted only at deck points.
<i>Strut-and-tie model</i>	A model used principally in regions of concentrated forces and geometric discontinuities to determine concrete proportions and reinforcement quantities and patterns based on assumed compression struts in the concrete, tensile ties in the reinforcement and the geometry of nodes at their points of intersection.
<i>Substructure</i>	Structural parts of the bridge, which support the horizontal span.
<i>Sulfate attack</i>	Either a chemical or a physical reaction or both between sulfates usually in soil or ground water and concrete or mortar; the chemical reaction is primarily with calcium aluminate hydrates in the cement-paste matrix, often causing deterioration.
<i>Superstructure</i>	Structural parts of the bridge, which provide the horizontal span.

BRIDGE DESIGN MANUAL GLOSSARY

<i>Surcharge</i>	A load used to model the weight of earth fill or other loads applied to the top of the retained material.
<i>Tandem</i>	Two closely spaced axles usually connected to the same under-carriage which enhances the equalization of load between the axles.
<i>Temperature Gradient</i>	Variation of temperature of the concrete throughout the cross-section.
<i>Tendon</i>	A tensioned element, generally high-strength steel wires, strands, or bars, used to impart prestress to the concrete. In post-tensioned concrete, the complete assembly of prestressing steel, anchorages and sheathing, when required, is also called a tendon.
<i>Tension tie member</i>	Member having an axial tensile force sufficient to create tension over the entire cross-section and having limited concrete cover on all sides. Examples include: arch ties, hangers carrying load to an overhead supporting structure, and main tension elements in a truss.
<i>Thermal expansion</i>	See Coefficient of thermal expansion.
<i>Ties</i>	See Stirrups.
<i>Ton (short)</i>	2,000 lb (U.S. measure).
<i>Tonne (metric)</i>	2,205 lb.
<i>Transfer (at transfer)</i>	Act of transferring stress in prestressing tendons from jacks or pretensioning bed to concrete member; immediately after the transfer of prestressing force to the concrete.
<i>Transfer length</i>	Length over which prestressing force is transferred to concrete by bond in pretensioned members.
<i>Transverse reinforcement</i>	Reinforcement used to resist shear, torsion, and lateral forces or provide confinement of concrete in a structural member. The terms “stirrups” and “web reinforcement” are usually applied to transverse reinforcement in flexural members and the terms “ties”, “hoops” and “spirals” are applied to transverse reinforcement in compression members.
<i>Type A joints</i>	Cast-in-place joints of wet concrete and/or epoxy between precast units.
<i>Type B joints</i>	Dry joints between precast units.
<i>Vent</i>	See Grout opening.
<i>Wall friction angle</i>	An angle whose arctangent represents the apparent friction between a wall and a soil mass.
<i>Water-cement ratio</i>	The ratio of the amount of water, exclusive only of that absorbed by the aggregates, to the amount of cement in a concrete, mortar, grout, or cement paste mixture; preferably stated as a decimal by mass and abbreviated w/c.
<i>Water-cementitious materials ratio</i>	The ratio of the amount of water, exclusive only of that absorbed by the aggregate, to the amount of cementitious materials in a concrete or mortar mixture.
<i>Welded wire reinforcement</i>	A series of longitudinal and transverse wires arranged substantially at right angles to each other and welded together at all points of intersection.
<i>Wheel</i>	Single or dual tire at one end of an axle.
<i>Wheel line</i>	A transverse or longitudinal grouping of wheels.
<i>Wheel load</i>	One-half of a specified design axle load.
<i>Wobble friction</i>	Friction caused by unintended deviation of prestressing sheath or duct from its specified profile or alignment.
<i>Workability</i>	That property of freshly mixed concrete or mortar which determines the ease with which it can be mixed, placed, consolidated and finished.
<i>Wrapping or sheathing</i>	Enclosure around a prestressing tendon to avoid temporary or permanent bond between prestressing tendon and surrounding concrete.
<i>Yield strength</i>	The specified yield strength of reinforcement.