

STRUCTURAL ENGINEERING COMMON TERMS

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Above/Below Finished Floor (AFF/BFF) Above/Below Finished Floor. Serves as datum elevation from which elevations of floors, working points, etc. are measured. Typically the datum is the top of first floor slab. e.g. Third floor elevation = 32'-0" AFF.

ASCE 7 Code from which most structural loads are determined. Building codes such as IBC reference ASCE 7, or replicate its information, often for setting live loads and environmental loads.

CMU Concrete Masonry Unit. Typically 8" tall x 8" deep x 16" long (nominal dimensions) light-weight concrete modular structural block that can be used to construct load-bearing and shear walls.

Exterior building elements that must be designed for higher wind loads

Components & than the MWFRS. As a general rule, the smaller the design element, the

Cladding higher potential wind load it may experience since larger elements benefit from the effect of wind gusts averaging out over larger tributary areas.

Construction Joint A through-joint in a concrete element that allows two portions of one element to be constructed at separate times. Dowels and shear keys are typically included across construction joints to ensure proper transfer of forces across the joint.

Contraction Joint Often referred to as 'Control Joints', these joints are grooves intentionally constructed in concrete slabs/walls to induce surface cracking along those lines, and thus avoid unsightly random cracking patterns, as the concrete cures and later changes volume with temperature variation.

Diaphragm Planar structural elements that serve to distribute load from one part of a structure to another. Floors, roofs and shear walls are all examples of structural diaphragms.
 Ductility: Structural principle by which a loaded structural element deflects noticeably prior to failing. Ductility is desirable because it serves a safety measure to warn those within a structure prior to failure.

Environmental Loads Loading cases included wind load, seismic load, snow load, flood loads, etc.

Grade Beam Reinforced concrete beam that is placed in the soil to distribute structure loads above to footings below. In some cases, grade beams can act as strip footings themselves.

Gravity loads Loading cases that are induced by gravity. These include dead loads, collateral loads, live loads, etc.

HSS Hollow Structural Section. In the past, hollow steel sections consisted of tube steel (square and rectangular sections) and pipes (round sections). Although pipes are still available, HSS designations have largely replaced TS (tube steel) sections. HSS shapes have different dimensional tolerances and available strength grades as compared to the prior section designations.

Moment Frame A lateral-force carrying system that uses the flexural (bending) capacity of beams and columns to transfer lateral load down to the ground. Moment

frames are typically used when a building design cannot accommodate a more cost-effective, but spatially intrusive, braced frame system.

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| MWFRS | Main Wind Force Resisting System: The system of frames, braces, and/or shear walls that provide lateral stability to the building and allow it to resist forces associated with wind loads. NWC/LWC: Normal-Weight / Light-Weight Concrete. Concrete weight is largely determined by the density of the Coarse Aggregate that is used for the mix. |
| Plasticizer | Chemical admixture that is used in concrete mixes to increase slump and thereby make the mix more flowable. |
| Rebar | Steel reinforcement that is placed in concrete to carry tensile loads, typically speaking. Concrete is roughly ten times stronger in compression than in tension, so rebar gives the reinforced concrete element significantly more ductility than it would otherwise possess with concrete alone. |
| TOS | Top of Steel. Typically indicates bottom of deck elevation, from Finished Floor Elevation. |
| Tributary Area | The surface over which a structural element collects area load, e.g. the amount of floor area that a particular beam will carry. |
| Wind Exposure | A characteristic of a particular site, which determines how likely a building is to experience greater wind pressures than if it were surrounded by trees, buildings and other obstructions. |
