

APPENDIX A

DEFINITIONS AND CONVERSION FACTORS

Definitions

Abrasion Resistance of an Aggregate - The ability of an aggregate to resist polishing.

Absolute Volume - The volume of a material, in cubic feet, in a voidless state.

Absorbed Moisture - The moisture within the pores and capillaries of an aggregate.

Accelerator - A chemical, such as Calcium Chloride, used to “speed up” the setting time of concrete.

Acid Water - Water which contains concentrations of hydrochloric, sulfuric, or other common acids.

Aggregate - An inert filler material, such as, crushed stone, gravel and sand which is mixed with cement and water to make concrete.

Air-dry - A condition at which an aggregate particle is dry on the surface but contains some moisture within the pores of the aggregate.

Air Entraining Agent - A material, which when added to concrete, entrains microscopic air voids in the concrete.

Air Entrained Concrete - Concrete which has had an air entraining agent added to entrain minute air bubbles that are distributed uniformly throughout the cement paste.

Alkaline Water - Water which contains concentrations of sodium hydroxide, potassium, or other hydroxide.

Bleeding of Concrete - A condition whereby an excess amount of mixing water accumulates on the surface of plastic concrete. This condition is caused by settlement and consolidation of the plastic concrete.

Cement - The bonding agent used in a concrete mix.

Coarse Aggregate - Aggregate larger than about 1/4 inch in diameter, usually referred to as stone or gravel.

Consistency - A condition of plastic concrete which relates to its cohesion, wetness, or to flow. The consistency is usually measured by the slump test.

Deleterious Substances in Aggregates - Undesirable substances that may be found in aggregates. These harmful substances include organic impurities, silty clay, coal, lignite, and certain lightweight and soft particles.

Dry-Rodded Unit Weight - The weight per unit volume (pcf) of dry aggregate compacted in a container by rodding in three layers.

Durability - The ability of hardened concrete to resist the deterioration caused by weathering (freezing, thawing, heating, cooling, wetting, drying, etc.), chemicals, and abrasions.

False Set - A significant loss of plasticity shortly after the concrete is mixed.

Fine Aggregate - A natural silica or manufactured aggregate smaller than about 1/4" in diameter, normally referred to as sand.

Fineness Modulus - An index to the coarseness or fineness of an aggregate.

Fineness of Cement - The particle size to which a cement is ground. The fineness of cement affects the rate of hydration. As cement fineness increases, the rate of cement hydration increases and causes an acceleration in strength development.

Free Moisture - The moisture on the surface of an aggregate. The amount of free moisture is the difference between the total moisture and the absorbed moisture.

Freeze-Thaw Resistance of an Aggregate - A condition related to an aggregate's porosity, absorption, and pore structure.

Gradation of an Aggregate - The relative amounts of aggregate particles of consecutively larger and smaller sizes.

Harsh Mix - A coarse mix which is difficult to place and finish. This usually indicates that the mix does not contain enough fine aggregate to provide a dense, workable mixture. A harsh mix segregates easily because it is not cohesive (or buttery).

Heat of Hydration - The heat generated when cement and water react.

Set Retarder - A material composed of (1) calcium, sodium, potassium, or ammonium salt of lignosulfonic acid; (2) hydroxylated carboxylic acid or its salt; or (3) carbohydrates, except sucrose, that is used for the purpose of delaying the setting time of concrete. Retarders provide a lubricating effect and may function as a water reducing agent also.

Setting Time - The time that it takes a cement paste to begin hardening.

Sieve Analysis - A process in which an aggregate is separated into its various sizes by passing it through screens of various size openings for the purpose of determining the distribution of the quantities separated.

Soundness of a Hardened Cement Paste - The ability of a hardened cement paste to retain its volume after setting.

Specific Gravity - The ratio of the weight of a given volume of material to the weight of an equal volume of water (both being at the same temperature).

Total Moisture - The sum of the moisture on the surface and the moisture absorbed into the pores and capillaries of an aggregate.

Water - The ingredient in a concrete mix that causes an chemical reaction with cement, called hydration. The water assists in providing the necessary workability for the concrete.

Water Cement Ratio - The ratio of the amount of water to the amount of cement in a concrete mix; preferably stated as a decimal by weight.

Water-Reducing Agent - Material used for the purpose of reducing the quantity of mixing water in concrete. This additive, which provides a lubricating effect, will cause an increase in slump and workability when placed in a concrete mix of a given consistency.

Well-Graded Aggregate - An aggregate which contains a uniform percentage of material retained on each standard sieve. Gradation change is uniform from coarse to fine.

Workability - The property of freshly mixed concrete which is the ease or difficulty in the placing and finishing of concrete. "Good Workability" means that the concrete may be placed or finished with little difficulty and the mass contains a uniform gradation of aggregates.

English Conversion Factors

One cubic foot of water equals 7.5 gallons.

One cubic foot of water equals 62.4 pounds

One gallon of water equals 8.33 pounds.

One cubic yard equals 27 cubic feet.

One bag of cement equals 94 pounds.

One bag of cement equals one cubic foot (loose volume).

One bag of cement equals 0.48 cubic feet (absolute volume).

