Triangle Tech Tips
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Placing Your Order For Ready Mixed Concrete

What is ready mixed concrete?

A concrete mix consists of cement, water, and coarse and fine aggregates — such as crushed stone and sand. Many people mistakenly think that cement and concrete are the same thing. They are not. Cement is a powdered ingredient that, when mixed with water, provides the glue that binds the aggregates.

Concrete mixes are blended to gain required properties like workability and strength for a given application. Concrete must have the right consistency — called ***slump*** —to facilitate handling and placement. It must also have adequate strength and durability to withstand applicable loads when cured.

Ready-mixed concrete is delivered in its freshly mixed, unhardened state. The plasticity of this concrete mix lasts several hours depending on the type of mixture and conditions during placement. Normally, concrete sets within two to twelve hours of being mixed. It continues to strengthen for months or even years afterward if it is properly cured during the first few days.

Some basics to keep in mind when ordering ready mixed concrete:

The key to placing an order for ready mixed concrete is to provide all the basic details and keep requirements as simple and relevant as possible. The concrete producer has several mix designs available for various uses, and can assist with choosing the required mixture.

Size of coarse aggregate

It is important to know the nominal maximum size of coarse aggregate, which should be smaller than the narrowest dimension through which concrete is to flow. For example, the thickness of the section and the spacing of the reinforcing steel, if any, are important. For most applications, the nominal maximum size of coarse aggregate is 3/4 or 1 inch.

Slump

Indicate the desired slump of the concrete. A stiffer mixture will have a low slump value. Typical slump range for most applications is 3 to 5 inches. For example, for slip-form construction, a maximum slump of 2 inches is required. A higher slump to a maximum of 7 inches is typical for basement walls. The tolerance on the slump as delivered is ±1 to 1-1/2 inch. Addition of water at the jobsite to increase slump is permitted, provided it is not excessive enough to cause segregation and reduce strength and durability.

Entrained air

When concrete will be exposed to freezing temperatures, air-entrained concrete should be used. In many locations air-entrained concrete is the default option. Clearly state to the concrete producer if you want **non-air-entrained** concrete. Target air content depends on the size of the coarse aggregate. Typical range is 4 to 6% of the concrete volume. Tolerance on air content as delivered is ±1.5%. The concrete supplier is permitted to make an adjustment for air content at the jobsite if, when tested it is lower than the required amount.

Quality level required

The preferred method for ordering concrete is to specify its performance requirements. This generally means the concrete's required strength. When necessary, other performance characteristics may be specified, such as permeability, shrinkage, or durability. Make the producer aware of anticipated exposure and service conditions of the structure. The concrete producer best knows how to proportion, mix, and furnish concrete to meet the desired performance requirements. A minimum strength of 3,500 to 4,000 psi is common.

Another option is to order concrete by specifying it's prescriptive requirements. This is when the purchaser specifies limits on the ingredients in the mixture. In these cases, the purchaser normally accepts responsibility for the concrete's strength and performance. This approach does not allow the concrete producer to have much flexibility on the mixture. Nor does it allow them to accommodate changes that may affect concrete's performance.

Quantity of concrete

Concrete is sold by volume, in cubic yards. The delivered volume is calculated from the measured concrete density or unit weight. One cubic yard of concrete weighs about 4000 pounds. The typical capacity of a truck mixer is 8 to 12 cubic yards.

Order about 4% – 10% more concrete than is estimated from a volumetric calculation of the plan dimensions. This will allow for waste or spillage, over-excavation, spreading of forms, loss of entrained air during placement, settlement of a wet mixture, truck mixer hold-back and change in volume. Hardened concrete volume is 1% to 2% ***less*** than that of the fresh concrete. Re-evaluate these needs during placement, and communicate any changes to the concrete supplier.

Disposal of returned concrete has environmental and economical implications to the ready mixed concrete producer. Make a good estimate of concrete required for the job before placing an order.

Additional Items

A variety of options are available from the concrete producer. Chemical admixtures can accelerate or retard the setting characteristics of concrete to aid in placing and finishing during hot or cold weather. Water reducing admixtures are used to increase slump without adding water to the concrete. Synthetic fibers can reduce the potential for plastic shrinkage cracking. Color additives or special aggregates are also often available.

Scheduling delivery

Schedule the delivery of concrete to accommodate the construction schedule. Inform the producer of the correct address, location, nature of the pour, and an estimated delivery time. Call the ready mixed concrete producer well in advance of the required delivery date. Concrete is a perishable product and the construction crew should be ready for concrete placement when the truck arrives. Notify the producer of any schedule changes or work stoppage immediately.

Ensure that the truck mixer has proper access to the placement location. The concrete truck weighs in excess of 60,000 lbs. and may not be able to maneuver well in certain jobsite conditions.

Responsibilities

Responsibilities of parties involved in the construction process should be addressed at a pre-construction meeting. Key items include:

- The concrete producer is responsible for the concrete slump as specified for a period of 30 minutes after the requested time or the time the truck arrives at the placement site, whichever is later.
- The concrete producer is required to deliver concrete at the requested slump and air content, within the accepted tolerances addressed above, as measured at the point of discharge from the transportation unit.
- When placing procedures can potentially alter the characteristics of the fresh concrete, it is the responsibility of the purchaser to inform the producer of changes to the mixture requirements to accommodate these effects. (***E.g.*** pumping concrete in place.)
- When a job uses more than one type of concrete mixture, it is the purchaser's responsibility to verify the mixture delivered and direct it to the correct placement location.
- The purchaser should check and sign the delivery ticket and document any special occurrences on the ticket.
- The concrete producer cannot be responsible for the quality of concrete when any modification or additions are made to the mixture at the jobsite. These include addition of excessive water, admixtures, fibers or special products, or if the truck has to wait for an extended period before discharging the concrete.
- When strength tests are used for acceptance of concrete, the samples should be obtained at the point of discharge from the transportation unit. The purchaser or his representative should ensure that proper facilities are available for testing at the jobsite and that standard practices are followed. Certified personnel should conduct the tests. Test reports should be forwarded to the producer in a timely manner to ensure that any needed changes are addressed.

CAUTION

Fresh concrete can cause severe chemical burns to skin and eyes. Keep fresh concrete off your skin. When working with concrete use rubber work-boots, gloves, protective eyeglasses, clothing and knee-boards. Do not let concrete or other cement products soak into clothing or rub against your skin. Wash your skin promptly after contact with fresh concrete with clean water. If fresh concrete gets into your eyes, flush immediately and repeatedly with water and consult a doctor immediately. Keep children away from dry cement powder and all freshly mixed concrete.