Pre-Construction Planning

**Placement Size.** Areas over 45,000 square feet have been placed; 150’ by 150’ is typical. The only limit is the size a contractor can place in one day using good concreting practices.

**Checkerboard.** Checkerboard placements are not required and there is no requirement to wait three days before placing against a previously placed slab.

**Joint Width.** The joint width is affected by the pour schedule, joint spacing, concrete placement temperature, ambient placement temperature, in-service temperature, and thermal movement. See CTS Joint Width Recommendations for joint width options.

**Length to Width Ratio.** ACI recommends 1½ or 2 to 1 for portland concrete. Type K can be almost any ratio, but closer to square is always best.

**Dowels at Construction Joints.** Any doweling system is acceptable. On thin slabs, plate or diamond dowels work best.

**Sand Layer.** Do not use one. It draws water from the slab.

**Subgrade Slope.** When transitioning to a different slab thickness the minimum slope should be 3:1.

**Footings.** If the Type K slab will be placed over a footing, place one sheet of plastic on the footing first.

**Placement Under Roof.** This is good practice for any concrete, but Type K does not require it.

**Dry Shakes.** Generally, a water/cement ratio of .55 will give the required bleed water.

**Wet Curing.** During wet curing, foot and light traffic can be on the slab 1 day after placement and heavy traffic in 3 days.

**Lead Time.** A minimum of 6 weeks is needed for lab testing of the mix. Delivery is 6 weeks after order is received.

At The Plant

**Ready Mix Plant.** Type K can be done at any ready mix plant. If the plant has limited silo storage capacity a portable silo may be used. For small jobs, bags can be used.

**Mix Design.** Replace 15% of the total cementitious in the mix with Komponent. For instance, if the original mix was 540 pounds of portland and 60 pounds of fly ash; the new mix would be 459 pounds of portland, 51 pounds of fly ash, and 90 pounds of Komponent.

**Fly Ash and Silica Fume.** Can be used to replace a maximum of 10% of the portland cement portion only. The mix should be tested in a lab to verify compatibility.
Type K Concrete Reference Guide

At The Plant (continued)

Portland Cement. The chemistry of portland cements vary. To obtain optimum performance the portland cement to be used on the job should be tested with the Komponent™.

Water/Cementitious Ratio. Generally .45 for interior work and .50 for exterior work.

Admixtures. Admixtures should be tested in a lab for suitability.

Recommended Batching Procedures.
1. Charge the mixer with approximately 80% of the mixing water per the mix design.
2. Weigh the Komponent™ first to avoid cumulative errors, then the portland cement.
3. Feed the Komponent™ and portland cement in with the coarse aggregate and sand with the mixer drum turning at charging speed.
4. Add the remainder of the aggregates, sand, and water.
5. Add admixtures, if any, in the same manner and timing as with portland cement mixes.
6. If using System-K™, add the K-Fiber™.
7. Mix for 70 to 90 revolutions at mixing speed of 14 to 18 revolutions per minute before leaving the plant.
8. Check the slump of the mix.

Slump. Typically 5” ± 1”. Desired slump can be achieved with water reducers.

K-Fiber™. Add the water degradable bags to the ready-mix truck after all the other materials. Then mix for 70 to 90 revolutions at mixing speed of 14 to 18 revolutions per minute prior to leaving the plant. Dosage is 1 bag per cubic yard of concrete, not 1 bag per 90 pounds of Komponent™.

Set Time. Type K generally stiffens about 20 minutes faster than portland. If this is a concern, add a set retarder.

The Job Site On Job Day

Pre-job Meeting. CTS will perform a pre-concrete meeting to explain its recommendations and answer questions. CTS may occasionally visit the jobsite to observe and recommend. CTS does not supervise.

Contractor Qualifications. Any contractor can place Type K concrete. There are very few differences from portland and they should be covered at the pre-concrete meeting.

Placement Differences. Due to a lack of bleed water, a method such as the ¼” deep footprint should be used to judge when to start finishing.

Plastic Sheeting. Type K concrete should be placed directly on a sheet of plastic to help keep the water in the slab.

Subgrade Saturation. If the concrete will not be placed on plastic sheeting, subgrade should be wet, but not saturated. Standing water should be avoided.
Re-entrant Corners.  Two 4’ long, #5 rebars are required at re-entrant corners.

Type K Concrete Reference Guide

The Job Site On Job Day (continued)

**Box Outs.** All that is required for round columns is to wrap them with a half inch of foam to provide isolation. Other columns need round boxouts and foam or some other sort of isolation.

**Placement Temperatures.** As with portland concrete, ambient and concrete temperature extremes should be avoided. And as with portland concrete, best results are obtained when ambient and concrete temperatures are between 50°F and 85°F and when concrete is placed within 1 hour.

**Cold Joints.** On wide pours care must be taken to avoid cold joints by either narrowing the front or retarding the mix.

**Slump Loss from K-Fiber™.** There will be what the fiber industry calls an “apparent slump loss”. That means that the reading in the slump cone test will be lower, but the concrete still places and finishes like the higher slump material without fibers.

**“Hairy” Concrete.** The concrete won’t be hairy. The short monofilament fibers are basically invisible.

**Placing and Finishing.** Other than lack of bleed water, Type K concrete places and finishes the same as portland concrete.

**Tooling Joints:** Tooling construction joints to a slight radius is recommended.

**Moisture Loss from the Surface.** If there is rapid moisture loss from the surface of the slab due to: high ambient temperature, high concrete temperature, high winds, low humidity, placing outdoors in the sun, placing in cold weather because that slows the set and allows more time for water to evaporate, etc.; it is necessary to reduce evaporation. For troweled slabs, apply a fog spray to maintain a sheen until wet curing is started or use an evaporation reducer such as EucoBar or Confilm. For slabs that have been floated and will not be trowel finished, the open surface and higher surface area allow more and faster evaporation. Water may be ponded onto the surface.

**Curing.** Start wet cure as soon as possible and wet cure for at least 7 days. That means continuously wet for at least 7 days. Curing blankets such as UltraCure have been successfully used. Use per manufacturers’ recommendation and in addition saturate the front of the roll as it is being rolled out. Other typical methods are ponding or burlene on top of soaker hoses. For exterior jobs, curing material edges should be weighed down. For placements that are not slabs, consult your local CTS representative.

**Closure Pours.** Type K will reduce cracking dramatically. For best results put two #5 rebars 1 ½” from each edge around the perimeter of the closure pour.

**After Placement**

**Tilt-up Panels.** There are no sawcut joints to be addressed before pouring the panels and the lack of curl means tilt-up panels without waves.
Toppings, Epoxy Coatings, Tile, etc. Can normally be installed after 7 days of wet cure and 7 days of air-drying. Before applying the topping, water transmission testing is recommended.

Type K Concrete Reference Guide

Miscellaneous

Cracks. There are many reasons why concrete cracks. Type K will reduce or eliminate many of them, including drying shrinkage, which is the biggest culprit.

Repair Materials. Standard repair materials may be used. For small repairs use Rapid Set®. For large repairs use Type K.

Repairing Trench Cuts. Type K will reduce the cracking. A #5 rebar should be placed along each long side of the trench about 1 ½” from each trench edge.

Cost. Generally the reduction in joint costs offsets the premium for Type K. If System-K™ is used; the savings from omitting rebar are significant. With System-K™ deletion of rebar may speed up the job.

Bonded Overlays. Work well, particularly with System-K™, however any moving joints and cracks may reflect through.

Unbonded Overlays. Work well at 2” minimum, however moving joints and cracks may reflect through.

Shotcrete. Works well and has low rebound.

Aesthetics

Slab Color. Type K concrete is slightly lighter in color than standard portland concrete.

Integral Color. There is little, if any, difference between Type K and portland concrete.

Color Stain. The color stain may need to sit longer to penetrate due to the lack of bleed water channels in the concrete.

Stamping. No difference from portland concrete.

Mottling. Curing blankets such as UltraCure have been successfully used to minimize mottling.

Liquid Treatment and Polishing Like RetroPlate. Type K slabs often look better than portland slabs and the process can normally be done in 10 to 14 days instead of the 28 days required with portland.

Joint Fillers. As with all concrete, install any joint filler as late as possible.

Type K Concrete

Not New. It has been used successfully in the U.S. since 1963.

Proven. It has been used successfully in the U.S. for hundreds of millions of square feet of concrete slabs; as well as parking garages, water treatment plants, roofs, walls, etc.

I have received this Type K Concrete Reference Guide and it has been discussed with me.