Tech Bulletin #1
Sigma DG

SCC Concrete & Sigma Ties

Our fiberglass form ties are used in many different types of applications. We are the ONLY fiberglass tie system used in heavy duty forming up to 45,000 lbs Safe Working Load (SWL). So when we run across something that starts occurring often in the field we feel you should be made aware of it.

Many forming projects are calling for Self Consolidating Concrete (SCC) , a mix utilizing super plasticizers for enhanced flowability, or other chemical additions which delay concrete stiffening (water proofing agents for example) - especially in cooler weather.

When a SCC or super plasticizer mix is utilized, the setup time should be provided by the batch plant based on the given mix design. Often, this is well over the traditional 1 hour window that is typically specified by ACI form pressure calculations. Additionally, these mixes can be pumped at much higher placing rates. We have seen 40' per hour (10' high in 15 minutes on short length walls and columns) since the concrete is not required to be vibrated. This impacts tie and formwork pressures greatly.

In addition, SCC will start to stiffen once it comes to rest. Any type of vibration (internal or external - think large construction equipment driving by) can quickly re-liquify the mix putting an additional load on the formwork that isn't anticipated. This will occur until the mix has achieved sufficient stiffness. Further, pouring these types of mixes in staged lifts only works when spaced out at 24 hours minimum. If this is not possible, the full liquid head pressure should be assumed until sufficient data says otherwise. The stiffness of these types of mixes is not sufficient after 1 hour to reduce the load on the bottom of the formwork and form ties. The stiffness curve is much more gradual than traditional slump concrete and varies from mix design to mix design. Weather also plays a large factor in the setup time – colder obviously takes much longer.

Formwork engineers need to adjust tie spacings and/or adjust the performance of the ***SYSTEM*** accordingly when using SCC concrete or other additives in the concrete. To this end, we are recommending a **SAFETY FACTOR OF 0.8** on our Sigma Ties safe working loads. When using SCC concrete – especially in cooler weather – please take into consideration higher loading factors and set up time of the concrete.

www.sigmadg.com 360.859.3170 Vancouver, Washington