

Specrete Introduces Tremie Concrete Admixture System

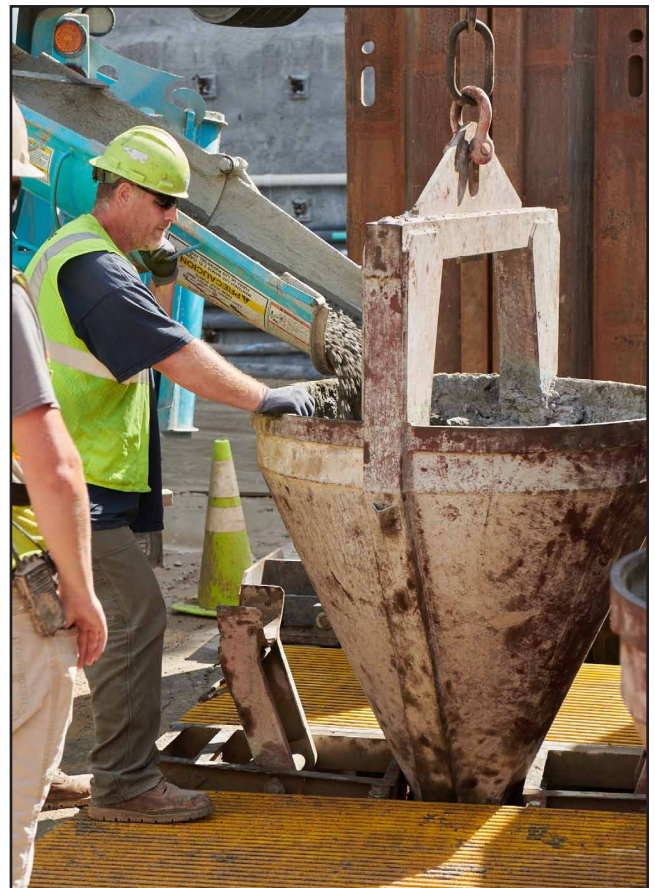
Summer 2020



Specrete introduces a system of admixtures designed to be used together to improve the properties of tremie concrete. Micro-Aid TCA, Flo-Aid HR and Flo-Aid EWT combine to produce a stable mix that is pressure filtration and bleed resistant with an extended working time. This system of products is used to meet the recommendations of the EFFC/DFI Guide to Tremie Concrete for Deep Foundations. In the last couple years, this system was utilized in several projects, including the Westerly Storage Tunnel in Cleveland, OH and the Storm Water Storage Facility along I-35 in Minneapolis, MN.

In 2018 the European Federation of Foundation Contractors (EFFC) and the Deep Foundations Institute (DFI) collaborated to provide a guidebook outlining best practices for tremie concrete. The guide includes recommended ranges or target values for specifiers. In an effort to adhere to the guide's recommendations, Nicholson Construction reached out to Specrete when they determined the concrete suppliers were unable to provide compliant mixes with their standard admixtures.

The EFFC/DFI guide calls for stable concrete that will not segregate during or after placement. Unstable concrete can compromise the quality of the hardened structure. Stability is measured in a variety of ways, but the key test methods are Bleed per ASTM C232 and Pressure Filtration using a Bauer Filter Press. If concrete is prone to bleeding, mix water will migrate to the surface, creating bleed channels in the poured element. In particularly deep foundations, fresh concrete experiences a great deal of pressure. In an unstable concrete with poor water retention, water is squeezed out, causing premature stiffening to occur. Micro-Aid TCA was specifically designed to improve stability in tremie concrete, so it meets the guide's recommendations for Bleed and Pressure Filtration.



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Workability at a low water-to-cement ratio is crucial for tremie concrete. Typically, the initial Slump Flow (ASTM C1611, commonly referred to as the “spread test”) needs to be between 16-20”. In order to meet Workability Retention goals, the upper portion of the range is desirable. A superplasticizer is utilized to keep the water-to-cement ratio low enough to satisfy the strength requirement. Flo-Aid HR provides substantial water reduction without compromising stability. Workability Retention is the concrete’s ability to maintain a minimum flowability over a given time period. Flo-Aid EWT slows hydration of the cement to extend the working time of concrete but has minimal effect on the initial workability. The three products in the Tremie Concrete Admixture System were developed to work together, and dosages can be adjusted to fine-tune the mix to meet specified properties or accommodate the water demands of the aggregate.



The system has been proven effective on many projects in the last couple years, including the Westerly Storage Tunnel in Cleveland, OH and the Storm Water Storage Facility along I-35 in Minneapolis, MN. In each case, Specrete worked with the contractor and concrete supplier to determine the best mix. To start the process, local materials were shipped to Specrete’s lab in Cleveland for preliminary testing. The lab team worked to identify the ideal mix designs and dosage rates to maximize performance and reliability while keeping costs to a minimum. When the mix is ready for approval, Specrete representatives visited the ready-mix plant to conduct large-scale testing. The preliminary lab work ensured predictable results, so only minor adjustments were necessary. Once the mix was approved, the products were packaged according to the established dosage rates for easy batching.

Specrete’s complimentary consultation and lab support is available from start to finish. Call or email a Specrete representative at the beginning of your next tremie concrete project.

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