North Carolina Department of Environment and Natural Resources
Division of Environmental Health

Beverly Eaves Perdue
Governor

Terry L. Pierce
Director

Dee Freeman
Secretary

July 24, 2009

Mr. Hugh Stone
Advanced Fiber Solutions, Inc
403 Powderhorn Rd
Laurens, SC 29360

Subject: Approval to use Advanced Fiber Solutions Ultimax Structural Fibers in Precast Concrete Tanks

Dear Mr. Stone:

The On-Site Water Protection Section has reviewed your request to use Advanced Fiber Solutions Ultimax structural fibers as an alternative reinforcement schedule to six-inch by six-inch No. 10 gage wire for precast concrete tanks approved in North Carolina. This review was completed pursuant to the provisions of Rule 15A NCAC 18A .1954(c). It appears that the Advanced Fiber Solutions Ultimax structural fibers will be capable of meeting these requirements and are hereby approved for use in precast concrete tanks based on the following information:

a. June 26, 2009, letter to Randy Reed with ABC Polymer Industries, LLC, from Ramon Carrasquillo, PE, with Carrasquillo Associates specifying the minimum fiber length;
b. February 29, 2008, testing results to Mark Haas with ABC Polymer Industries, LLC, from Thaddeaus Harnois, PE, and Thomas Kolden, PE, with Stork Twin City Testing Corporation specifying a minimum average residual strength of 175 psi using 4 pounds of Ultimax in a 4,000 psi concrete design mix at 28 days when tested in accordance with ASTM C-1399; and
c. The product information flyer "Specification Data Sheet for Concrete Fibers-Ultimax" which specifies the fiber mixing requirements

Tanks utilizing Advanced Fiber Solutions Ultimax are to be manufactured with concrete having at least 4,000 psi compressive strength and a minimum of 4 lb/cubic yard concrete mix of Advanced Fiber Solutions Ultimax structural fibers.

Individual tank manufacturers who propose to utilize Advanced Fiber Solutions Ultimax structural fibers in place of six-inch by six-inch No. 10 gage wire must submit the following information to the On-Site Water Protection Section:

a. Tanks to be modified using the macro-fibers;
b. Approved fiber(s) proposed to be used;
c. Method to be used to mix the fibers evenly throughout the concrete;
d. Signature indicating they have read and agree to follow the fiber manufacturers guidelines;
e. Minimum strength of the tanks using fibers shall be 4000 psi at 28 days;
f. Tanks utilizing macro-fibers for reinforcement may be removed from the yard at 4000 psi;
g. Results of initial vacuum test using macro-fibers and tank manufacturers concrete design mix. This includes:
    i. Names of all present to witness testing, including one approved third-party person and one OSWP Section or county health department staff member present;

ii. The largest tank that can be made from each form shall be tested initially. (Two of each tank shall be manufactured and both shall be tested); and
iii. Documentation showing that a vacuum of five (5) inches of mercury was pulled on the tanks and that the five inches was held for two minutes, without a loss of > 0.5 inch mercury. Deflection must not be greater than L/240 as measured during the vacuum testing. During the test, the tank manufacturer or their representative can seal the tank if it is found to be leaking. (Leaking that can be patched includes around the mid-seam of a tank, the top seam of a tank, around the riser, or around the pipe penetration seal. Leaks that can not be patched include cracks in the walls, top, or bottom of the tank that produce a lack of vacuum.) The tank must be brought back up to 5 inches of mercury and held for two minutes.

Please note that this applies only to tanks constructed in accordance with previously approved plans and specifications plus these approved modifications. If any approved tank is found in noncompliance and can not be brought into compliance with their state-approved plans or state sewage rules (15A NCAC 18A .1900, et seq.), an Operation Permit will not be issued for the installed wastewater system and such tanks may be permanently identified as being unacceptable for use in North Carolina on-site wastewater systems. In accordance with Rule .1954(e), the State shall suspend or revoke product approval upon a finding as follows:

1. The information submitted in the application is falsified,
2. The product has been subsequently altered, or
3. Subsequent experience with fiber reinforced tanks results in altered conclusions about tank performance or design.

Additionally, all tank manufacturers having North Carolina state approval of septic or pump tanks are subject to periodic, unannounced inspections of their tanks by state and local environmental health officials.

Please feel free to contact me at (919) 715-3272 if you have any questions or if we can be of further assistance to you.

Sincerely,

Tricia Angoli, PE
On-Site Wastewater Engineering