

January 30, 2008

Mr. Joe Patterson
Enviro-Systems
1869 South Cobb Industrial Boulevard
Suite 30
Smyrna, Georgia 30082

Subject: **Report of Slick Willie 2 (New and Enhanced) Effects on Concrete**
TEC Job Number: TEC 07-0380
TEC Lab I.D.: 07-380

Dear Mr. Patterson:

Testing, Engineering and Consulting Services (TEC Services) is pleased to present this report of the completed testing on the concrete pumping agent submitted to TEC Services on December 20, 2007. TEC Services prepared three concrete mixtures in our laboratory. The concrete mixes were batched and compressive strength cylinders were made in accordance with ASTM C192-07 *Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory*.

Two of the concrete mixes contained your pumping aid Slick Willie 2 (new and enhanced) at varying dosage rates and the third concrete mix was a control which did not contain SWD. The dosage rates of the Slick Willie 2 (new and enhanced) were 4 ounces per 9 cubic yards of concrete and 12 ounces per 9 cubic yards of concrete. The Slick Willie 2 (new and enhanced) solution was prepared by your representative separately using the concrete batch mixing water and added to the concrete mix after the normal mixing cycle was completed. After your solution was added the concrete was mixed an additional 3 minutes.

The freshly mixed concrete was tested in the plastic state for slump, unit weight, air content, and time of setting. The hardened concrete was tested for compressive strength at an age of 1, 3, 7, and 28 days. The mixture proportions and test results can be found in Table 1 on page two of this report

Test Procedures

- ASTM C 143-05 *Standard Test Method for Slump of Hydraulic-Cement Concrete*
- ASTM C 231-04 *Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method*
- ASTM C 138-01a *Standard Test Method for Density (Unit Weight), Yield, and Air Content of Concrete*
- ASTM C 403-06 *Standard Test Method Time of Setting of Concrete Mixtures by Penetration Resistance*
- ASTM C 39-05 *Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens*

Table 1 – Mix Proportions and Test Results

Mixture Proportions and Fresh Concrete Properties			
Mix I.D.	Control Mix	4 oz / 9yd³ Mix	12 oz / 9yd³ Mix
Material			
Cement (lbs/yd ³)	564	564	564
Water (lbs/yd ³)	316	316	316
Coarse Aggregate - #57 Stone (lbs/yd ³)	1768	1768	1768
Fine Aggregate (lbs/yd ³)	1165	1165	1165
Air Entraining Agent - Darex II (oz/yd ³)	2.5	2.5	2.5
Slick Willie 2 (new and enhanced) Pumping Aid Solution (oz/yd ³)	0	2	6
Plastic Properties			
Water/Cement Ratio	0.56	0.56	0.56
Plastic Slump (inches)	6.00	6.00	6.75
Plastic Air (%)	5.3	5	4.1
Plastic Density (pcf)	140.9	140.9	141.7
Time of Setting			
Initial Set Time (hr:min)	4:40	4:49	4:59
Final Set Time (hr:min)	6:13	6:34	6:21
Average Compressive Strength			
1 Day Strength Average (psi)	950	980	860
3 Day Strength Average (psi)	1,930	1,940	1,840
7 Day Strength Average (psi)	2,510	2,740	2,660
28 Day Strength Average (psi)	3,890	4,390	4,220

We appreciate the opportunity to provide our services to you for this project. If you have any questions, please feel free to call us at your convenience.

Sincerely,

Testing, Engineering, and Consulting Services, Inc.



Shawn P. McCormick
 Lab Manager



Trey McCants
 Staff Chemist