CONCRETE CORROSION STUDY

(Summarized)

A "Concrete Corrosion Study", authored by Dr. Gary Hall, Sauereisen Cements, was presented to the Steel Structures Painting Council (SSPC) on October 10, 1991 in Pittsburgh, Pennsylvania. The following is a summary of that presentation:

* All concrete begins to deteriorate after approximately 185 days. He stated that portland cement made since 1975 is of inferior quality compared to pre-existing mixes, due to two factors:

    1. Use of lower kiln temperature, and

    2. Resulting excess alkalies.

* Prior to 1975, the materials that comprised portland were heated to about 2900 degrees F to cause the materials to become partially fused (initial fusion occurs just above 2600 degrees F). The material emerging from the kiln, known as clinker, was then allowed to cool and later was ground into portland powder.

* When the Oil Shocks of the mid 1970's came, it caused a tremendous increase in fuel costs. To lower the cost of production for portland, the cement firms reduced the kiln heating temperature to about 2600 degrees F. This drop in temperature caused the clinker to have unconverted alkalies in it. Unconverted alkalies (i.e. mostly calcium) cause the portland cement to deteriorate when it comes in contact with most environmental elements.

* Cement manufacturers tried to remove and dispose of these alkalies but were prevented from doing so by the EPA which classified the alkalies as Hazardous Waste.

Dr. Hall's opinion is that all concrete should be coated. He also recommends that reinforcement rods be coated prior to use.