

OFFICE MEMORANDUM



MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

287
October 19, 1973

To: L. T. Oehler
Engineer of Research

From: F. J. Bashore

Subject: Aluminum-Coated Chain Link Fence
Research Project 61 NM-33 (60 G-102(1)). Research Report No.
R-891.

A field installation of aluminum-coated steel chain link fence was recommended by the New Materials Committee at their February 21, 1961 meeting.

The United States Steel Corporation arranged with the contractor to have 100 ft of its Cyclone brand aluminum-coated fencing installed on a construction project in the Detroit area. This replaced a part of the specified zinc coated material. The installation was made the week of December 3, 1961 on the northeast corner of the intersection of the Southfield Freeway and Plymouth Rd (Fig. 1).

Two small sections of Cyclone fencing, one coated with aluminum and the other with zinc, were previously installed on an outdoor exposure rack on the roof of Olds Hall at Michigan State University on April 20, 1961. These were moved to the roof of the Motor Wheel Building in 1962.

It was claimed by U. S. Steel that for equivalent coating thicknesses, aluminum would outlast zinc 3 to 5 times. It was pointed out that the corrosion products of zinc are watersoluble while aluminum forms a tightly adhering oxide film. Our subsequent observations of both the field installation and the samples exposed to weathering on the roof of the Laboratory confirmed these claims qualitatively. After approximately 12 years exposure to weathering, the zinc coating has eroded from about 90 percent of the area, while there is no apparent rusting of the aluminum coated material. This is true for both exposures (Fig. 2).

Our observations show that the zinc coating quickly changes from a bright silver color to a duller but smooth light blue gray, and retains this appearance throughout its service life with little dirt pick up. This is no doubt due to the smooth surface combined with the water solubility of the corrosion products. Between seven and eight years, very slight rusting began to appear. This progressed to 50 percent rust after 10 years and to 90 percent rust after 12 years.



Figure 1. Field installation at Southfield Freeway and Plymouth Rd six months after installation. Aluminum coated fencing in background and zinc-coated in foreground.

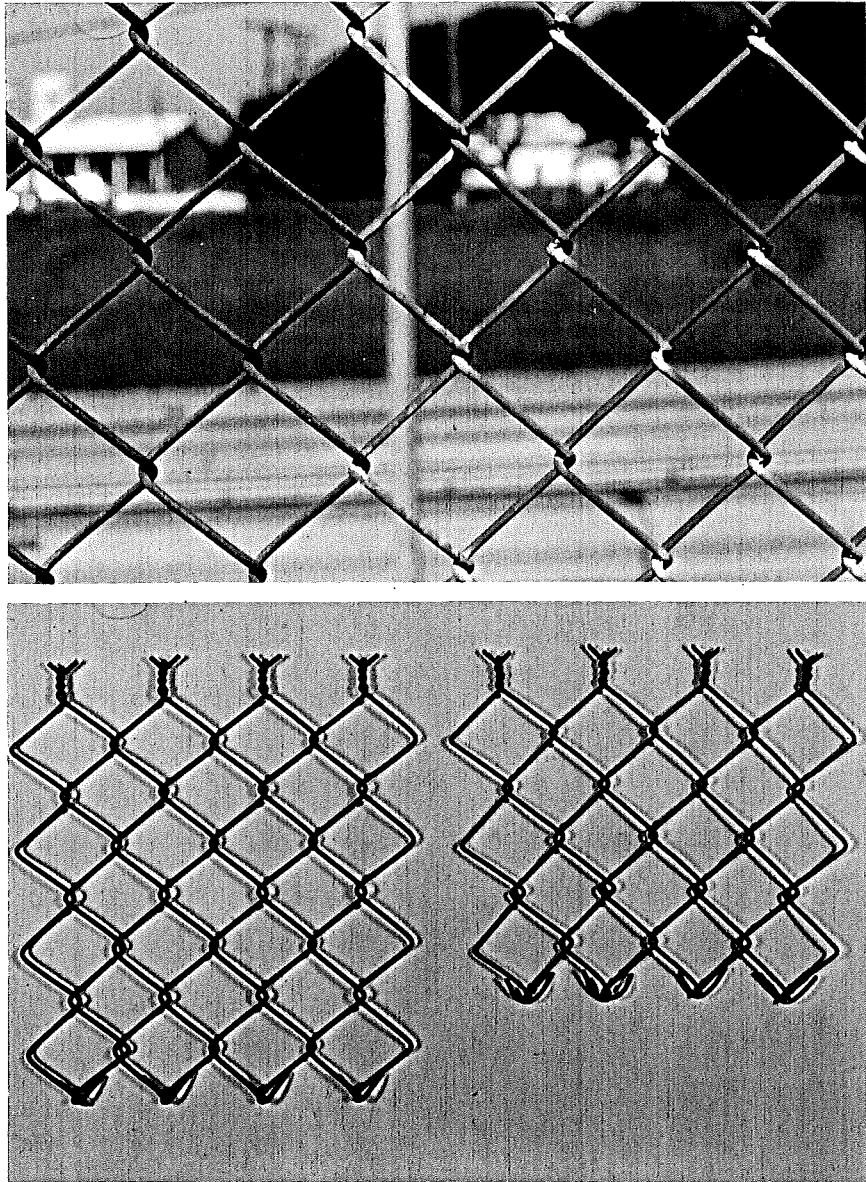


Figure 2. Field service exposed (top) and roof exposed (bottom) aluminum and zinc-coated chain link fencing after 12 years weathering. The aluminum coated material is on the left in each photo. (Regrettably the bottom color photo does not duplicate the rusting shown in the slide from which it was made.)