OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

June 3, 1969

To: L. T. Oehler, Engineer of Research
Research Laboratory Section

From: J. L. McKenna - F. J. Bashore

Subject: Permafused Vinyl Coated Chain Link Fence. Research Project 69 NM-228. Research Report No. R-701.

Specifications used by the States of New York, Ohio, and Maryland for vinyl-coated chain link fence and Federal Specification RR-F-00191c for fencing, including the vinyl coated material, were reviewed. Specifications and a confidential research report were requested from New Jersey. The research report has been received but the specifications have not.

The New Jersey report covered laboratory evaluations, field evaluations, and economic factors. Their laboratory evaluations which covered chemical resistance and weatherometer exposure were still in progress. Data from a study done by Foster D. Snell, Inc., consultants, showed that the fusion-bonded vinyl fabric had the best chemical resistance, abrasion resistance, salt fog resistance, and resistance to accelerated weathering. The other types compared in the Snell study were: extrusion-coated vinyl, galvanized, and aluminum coated. Based on the above tests, these materials are rated in the following order: (1) Fusion-bonded vinyl, (2) Extrusion-coated vinyl, (3) Aluminum coated and (4) Galvanized.

New Jersey evaluated the following types of chain link fence in the field:

1. Galvanized
2. Aluminum Coated
3. Stainless Steel
4. Solid Aluminum
5. Vinyl
   (a) Fusion-Bonded
   (b) Extrusion Coated

Unfortunately many installation dates were unknown and in no case were the different types installed in the same location for direct comparisons. None of the vinyls had been in service more than three years and all those properly installed were in good condition. Little vandalism damage was noted on the extrusion-coated vinyl and none on the fusion-bonded vinyl.

The principal disadvantage of the solid aluminum and extrusion-coated vinyl is their lower strength which allows them to be more easily damaged. A smaller steel wire is used in extrusion-coated vinyl fence since the coating is thicker than for the fusion-bonded type.

The author of the report recommends that galvanized fence no longer be installed because it "is highly susceptible to rusting" although the field data in the report do not support or refute this recommendation. Only a few installations were examined and installation dates for these were evidently not known. General guidelines were set up for selecting the type of fence to be specified based on environment (Industrial, Marine, and Rural or Residential) and other factors. The table giving these recommendations is attached.

Since no long-term field data are available to show expected service life of fusion-bonded vinyl coated chain link fence, only the laboratory test results can be considered. The laboratory work indicates that the subject material would maintain a clean attractive appearance much longer than the other types and would be at least equivalent in service life to the aluminum coated steel.

The relative costs for the different materials are as follows:

(5 ft high, per lin ft)

Aluminum Coated Steel	Galvanized Steel	Vinyl Extrusion Coated	Vinyl Fusion-Bonded	Solid Aluminum	Stainless Steel
$2.73-2.90	$2.73-2.90	$3.00-3.19	$2.73-2.90	$3.92-4.32	$5.46-5.80

Since no comprehensive field data are available, it is recommended that the Department install both fusion-bonded vinyl and galvanized on a single project if maintenance replacement of old fencing is contemplated. If such a project is not available, we suggest that installation of both types be specified on a new construction project. In this way both materials may be studied under exactly the same conditions.

TESTING AND RESEARCH DIVISION

J. L. McKenna

J. L. McKenna, Chemist
Coatings, Sealers & Plastics

F. J. Bashore

F. J. Bashore, Supervisor
Coatings, Sealers & Plastics

JLM/FJB:sjt

TABLE E. GUIDE LINES FOR FABRIC SELECTION

Environment Type	Material Preference	Comments
A. Industrial	1. Vinyl coated/ stainless steel	Vinyl coated (both types) fabrics are recommended in all but the most severe sulphuric acid environments, in which case the stainless steel fabric may be used.
	2. Aluminum coated steel	Recommended for security application; use along rural and interstate highways. Not recommended for use in chemical environments where vandalism to the fence is a problem.
	3. Solid Aluminum	Recommended for use only in non-security application where resistance to rust and corrosion is more important than resistance to vandalism and higher cost. e.g. on bridges and overpasses and along rural state and interstate highways.
B. Marine	1. Vinyl Coated (both types)*	Suitable for use along boardwalks and recreational areas. Fusion bonded fabric is preferred where extreme vandalism is a problem.
	2. Stainless Steel (optional)	Stainless steel may be considered in marine chemical environments.
	3. Solid Aluminum	No rusting but does pit and corrode. May be used in some instances where vandalism is not a problem.
C. Rural and Residental	1. Vinyl coated (both types)*	Recommended for use in all applications. Prolonged good appearances (no dulling) is an important feature.
	2. Aluminum coated steel	May be used interchangeable with vinyl coated fabric to rust landscaping requirements.
	3. Solid Aluminum	May be used changeably with the above types, listed third because of its higher cost and lower strength.

* Fusion-Bonded & Extrusion-Bonded