

EVALUATION OF 'ENKAMAT' AS AN
AID TO STABILIZING A CUT SLOPE

Final Report



**TESTING AND RESEARCH DIVISION
RESEARCH LABORATORY SECTION**

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Research Laboratory Section
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Michigan Transportation Commission
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Summary

The surface of a newly constructed cut slope was stabilized with "Enkamat," a flexible matting made from fused nylon monofilaments. This experimental section was constructed in order to evaluate Enkamat as a means of preventing slope erosion and as an aid in establishing new turf.

Installation of the Enkamat test section was observed by Research Laboratory personnel and inspected periodically throughout a seven-month evaluation period. No erosion, washout or slippage occurred and seeded turf was well established by the end of the evaluation in April 1983.

Introduction

Field evaluation of Enkamat was requested by the Engineer of Design after consideration by the New Materials Committee in June 1980. The purpose of this study was to evaluate the effectiveness of this product as a slope stabilization aid to prevent soil erosion and to assist in the establishment of turf. The study was done in accordance with FHWA Work Plan No. 80.

Soil erosion and sod slippage occur frequently on highway cut slopes requiring expensive repair. Construction of flatter slopes to prevent such problems would often require additional right-of-way which may not be readily available, especially in urban areas.

Research Procedure

A 300 ft long test section of Enkamat was installed in September 1982, on a cut slope (1 on 2) along Pelham Rd as part of the reconstruction of I 94 in Wayne County (82021-18643C1) (Fig. 1). The test section involved approximately 840 sqyd of Enkamat. Construction procedures were observed and the slope inspected periodically after construction for signs of erosion, washout, slippage, or other problems. An adjacent section of the same slope surface stabilized conventionally, with excelsior mulch anchored with nylon netting, was used for comparison.

Construction of the test section is illustrated in Figure 2 which shows the slope prepared for Enkamat and placement and anchorage of Enkamat.

Results

Seven months after installation, in September 1982, the Enkamat stabilized slope has well established turf and shows no signs of erosion, slippage or failure of any type (Fig. 3). The adjacent section stabilized with

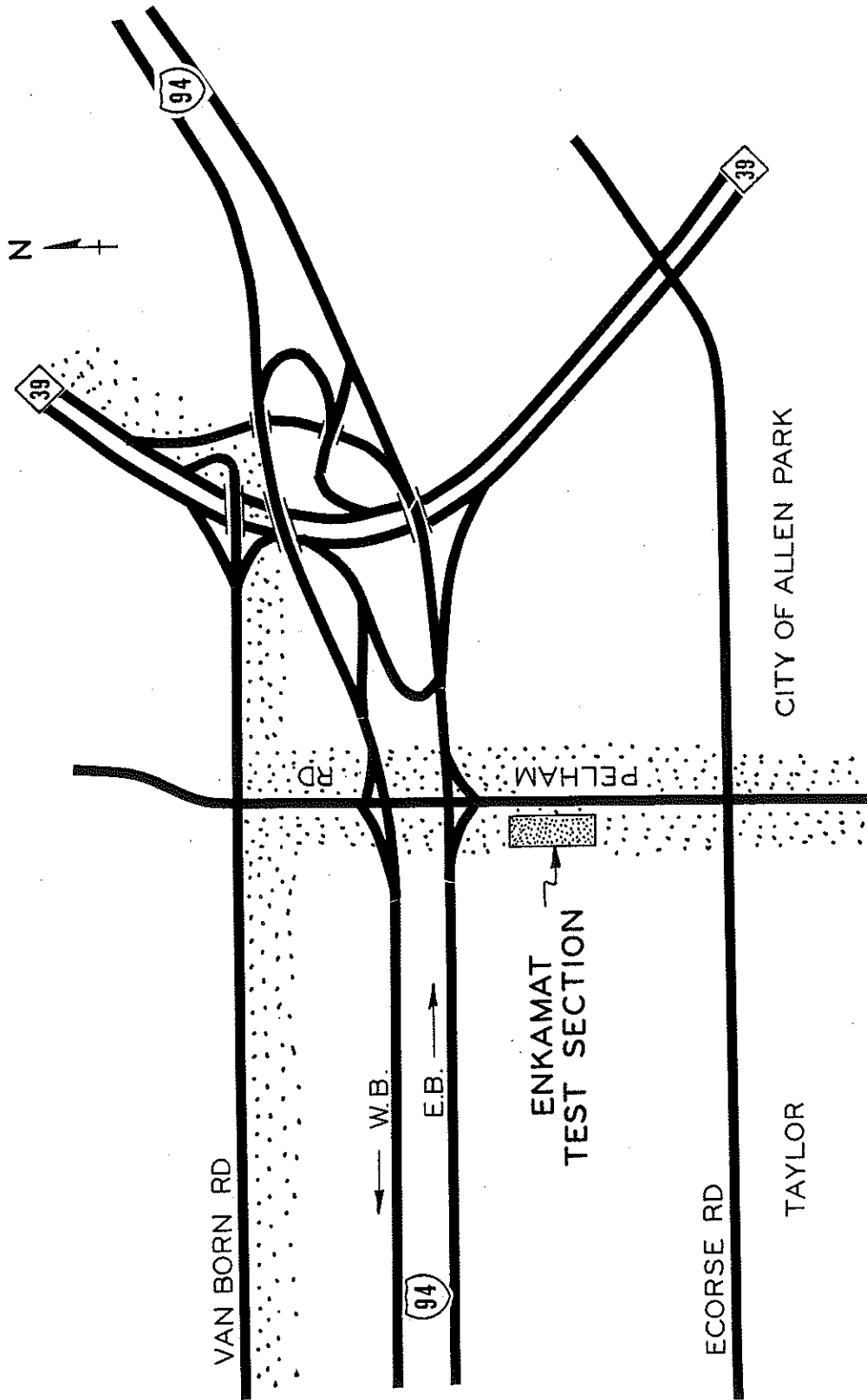


Figure 1. Location of Enkamat test section in Wayne County.

excelsior and nylon netting is performing well, although the grass growth seems to be somewhat more uniform in density and height than in the Enkammat section. Shear failures have occurred in other excelsior treated slopes in this same area; Figure 4 shows a shear failure on the slope directly opposite the test section along Pelham Rd.

Conclusions

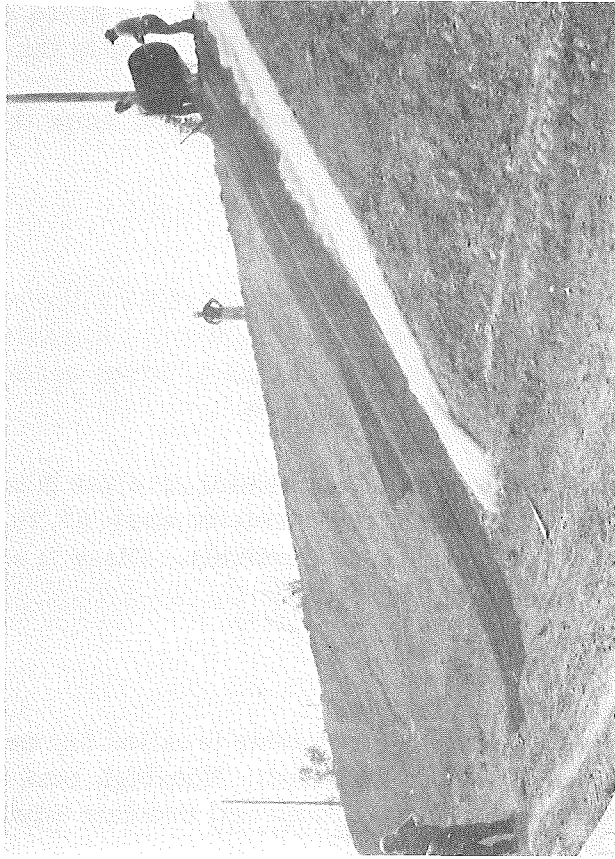
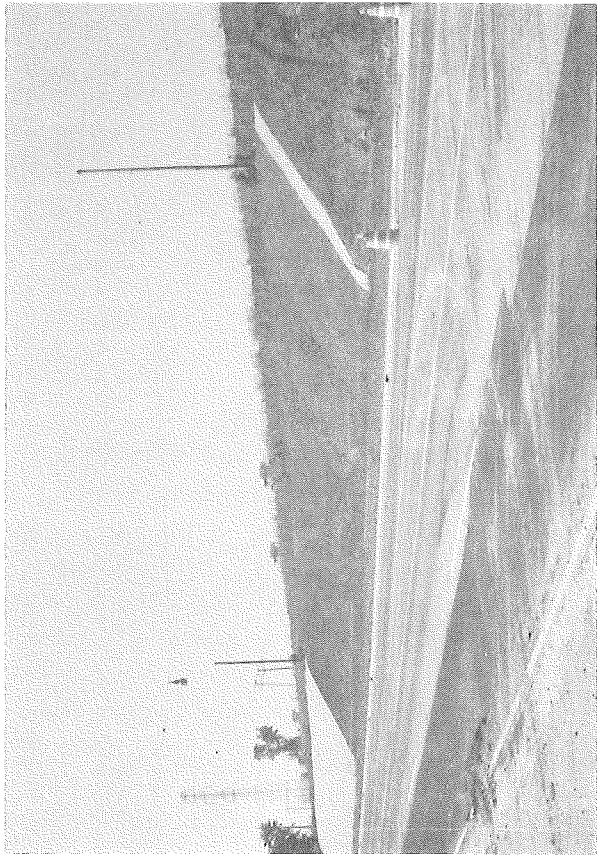
Enkammat was as effective as the excelsior for preventing the erosion of soil from the slopes. Neither Enkammat nor excelsior, however, can prevent shear failures, such as that shown in Figure 4, which occur when stresses exceed the strength of the soil in the slope.

Enkammat was more expensive than either excelsior or class B sodding on this project. Unit prices for Enkammat and excelsior were \$7.25/sq yd (848 sq yd) and \$0.85/sq yd (11,800 sq yd), respectively. Class B sodding was priced at \$1.75/sq yd and involved 4,500 sq yd.

Recommendations

Enkammat could be permitted wherever excelsior is called for and perhaps in certain situations where sod is required. The high cost of the Enkammat would probably restrict application to special problem situations.

▼ Slope dressed with topsoil prior to Enkamat.
Conventional excelsior mulch on slope at far
left.



▼ Unrolling Enkamat.

▼ Anchoring Enkamat.

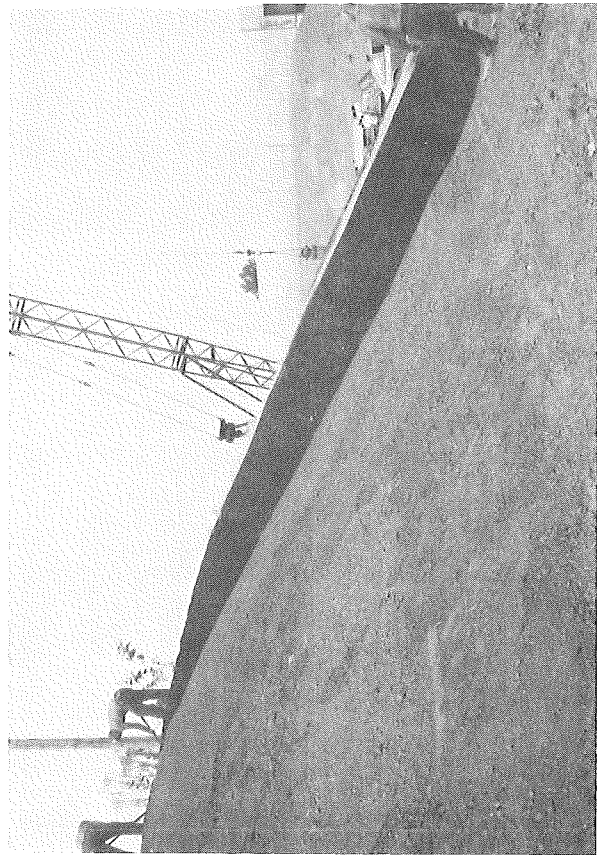


Figure 2. Construction of Enkamat test section,
September 1982.

Condition of Enkamat slope. Excelsior-stabilized slope at far left.



Enkamat stabilized slope shows no sign of failure despite water seepage.

Figure 3. Condition of stabilized slopes in April 1983, seven months after construction.



Figure 4. Shear type failure on a slope treated with excelsior and nylon netting.