R-150

MICHIGAN
STATE HIGHWAY DEPARTMENT
Charles M. Ziegler
State Highway Commissioner

SNOW FENCE MATERIAL INVESTIGATION

By

E. A. Finney

Highway Research Project 36 G-3 (10)

Progress Report No. 1

Research Laboratory
Testing and Research Division
Report No. 150
June 1, 1950

SNOW FENCE MATERIAL INVESTIGATION

At the request of Mr. B. R. Downey, Maintenance Engineer, the Research Laboratory, in cooperation with the Maintenance Division, has made, during the past winter season, a comparative study of several types of snow fence material which have been recommended by their respective manufacturers as a substitute for the common wood slat fence. The specific object of the investigation was to determine the merits of Sisalkraft paper for snow fence purposes. The study was enlarged to include another type of paper material and fabricated cotton mesh.

It is the purpose of this report to describe the scope of the work and to present the results of this current experiment. It is felt that no definite conclusions are warranted from this work because of the unusually wet weather conditions which prevailed throughout the winter. However, in spite of this fact, the experiment has revealed certain weaknesses and performance characteristics of the materials under study which should be quite helpful in the further development and perfection of paper snow fence.

Experimental Installation M-100

The experimental snow fence installation, its location, and the arrangement of materials included are presented in Figure 1. The photograph in Figure 1 shows the installation as it appeared on November 30, 1949 immediately after erection. The snow fence materials are described in order of their installation from North to South.

1. Union Paper with String Reinforcement: furnished by the Union Selling Company, 1012 Citizens Building, Cleveland 14, Ohio. This material consists of two layers of heavy treated paper reinforced by string mesh. The paper was furnished in strips 20 inches wide and 50 feet long. The strips were attached to steel posts placed at 10-foot

intervals, allowing a 4-inch opening between the upper and lower strip. The bottom strip is placed 4 inches from the ground. No cost figures were submitted by the manufacturer.

2. Union Paper with steel wire reinforcement. This material is identical to the above except that small steel wire mesh was substituted for the string reinforcement. No cost figures were submitted by the manufacturer.

3. Fabricated Cotton Mesh. This material, which was furnished by the Camnet Manufacturing Corporation, 66-68 Franklin Street, New York 13, New York is salvage camouflage netting cut into strips 48 inches wide and up to 44 feet long. The material was attached to tops of steel posts set 10 feet apart. Cost 5-1/4 cents per linear foot, 48 inches wide.

4. Wooden Slat Fence. The experiment included a section of common vertical slat snow fence for comparative observations relative to the effect of different material installations on snow drifting.

5. Sisalkraft Paper. This material was furnished by the Sisalkraft Paper Company, Chicago, Illinois in strips 12 inches wide and 50 feet long. It was erected on posts 10 feet apart with 12-inch openings between the strips and between the lower strip and the ground. This material costs approximately 3 cents per linear foot of fence consisting of two sections of 12-inch paper.

General Performance of Materials

An inspection of the snow fence installation was made on December 21, 1949 and January 1, 1950 after prolonged rainy spells. The relative condition of the various materials is shown in Figure 2. The Union paper with string reinforcement was in bad shape, but the other paper materials, aside

from sagging, were for the most part still intact. The cotton mesh was not affected by the rain.

An inspection on January 16, 1950 after another rain and windy spell revealed that the paper sections had suffered considerable damage, as may be seen in Figure 3. The Union paper with string reinforcement was entirely removed except for one 10-foot section, but the Union paper with wire reinforcement was for the most part still intact, but distorted. The cotton mesh was in good condition except for one panel which tore at the stake. However, only 50 feet of the entire Sisalkraft paper installation remained intact.

During late winter, we had an opportunity to observe the relative performance of the various materials in controlling drifting snow. Figure 4 contains photographs of snow drifting characteristics of materials still intact. The Union paper sections were in such poor condition that they had no effect in stopping the moving snow. The performance of the wood slat fence is shown for comparative purposes. The cotton mesh material, although greatly distorted was highly effective in stopping wind borne snow. You will also notice that in spite of saggy condition it has the property of causing snow to drift close to the material on both sides similar to a tight snow barrier.

Comments

Weather conditions which prevailed throughout the 1949-1950 winter season were ideal for this type of experiment because they aggravated material weaknesses of the type which would eventually develop under extreme or abnormal weather conditions. The paper materials displayed their greatest weakness at the supporting posts where the material rapidly fatigued and tore under flexing action of wind, especially where the material was weakened by moisture. This situation can no doubt be corrected to a large

extent by waterproofing and by proper reinforcement and installation practices which, I understand, have already been considered by the Sisalkraft people as a major improvement in their material.

The cotton mesh, although very effective in snow drift control and durability, could no doubt be improved to reduce sagging and sogginess which made it difficult to erect, handle, and store.

The wire reinforced paper appeared to have more stamina than the fiber reinforced material but it too would not be a satisfactory material without considerable improvement in its durability characteristics.