

INSTALLATION OF PREFABRICATED  
UNDERDRAINS ON RT. 82 EXTENSION  
Haddam, Connecticut

Report #5

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## Introduction

In 1970 construction was begun on the Rt. 82 extension connecting Rt. 9-A in Tylerville to new Route 9. Just west of Rt. 9-A it was necessary to cut 80 feet into the side of a 40 foot high slope. During the cutting, numerous springs appeared and it was decided by the highway engineers to install two lines approximately 500 feet long of mineral aggregate underdrain to intercept the groundwater, in order to prevent future sloughing of the slope. A map of the area and a cross-section of the slope is shown in figure (1). The slope material is a silty sand with numerous boulders, and bedrock is near the surface at the north-eastern end of the slope. Underdrains, made with 6" perforated corrugated pipe covered by concrete sand in a 5 foot trench were installed during the cutting of the slope and the slope was dressed to a 1 on 2 angle (26.5°).

In the spring of 1971 two sections of the slope, indicated by area A and B in figure (1), sloughed due to groundwater seeping out the face. After a discussion between Profs. Healy and Long of the University of Connecticut and Messrs. Foley and Stephens from the District 2 Office of the Bureau of Highways, it was decided to install a 300 foot length of prefabricated underdrain in order to prevent further sloughing. This report describes the installation of the prefabricated underdrains.

## Installation

300 feet of 5 foot high prefabricated underdrain was installed June 16, 1971 where indicated on the map in figure (1). A cutaway view of the underdrain fabrication is shown in figure (2). The underdrain was installed by cutting a berm with a bulldozer (D-6) and then placing

and connecting 5 foot long sections of the drain against the back face of the berm. The drain sections were stockpiled on the top of the slope and carried down the slope by hand. The actual placing and connection of 300 feet of the drain took 3 men 3 hours. This included fine grading and placing 3-4 inches of earth against the pipe at the bottom as a cushion. The drain was then covered by a dragline, operating from the top of the slope, pulling the earth excavated by the bulldozer back up against the drains. The slope was then dressed with a bulldozer. A series of photographs show the slope and installation.

A number of observations were made during the installation:

1. When the berm was cut, the flow of groundwater was concentrated in 2 spots. In one spot the sand filter of the original underdrain was exposed and the groundwater flowed along the top of this sand for 10-15 feet before it was absorbed. The sand appeared clean and a sample was taken for a permeability test. The permeability measured was  $5 \times 10^{-3}$  feet/min. which was apparently not high enough to absorb the concentrated flow of water.
2. The man hole at the end of the drain allows measurement of the flow out of the drains. When the prefabricated drain had been installed, its flow was 0.7 gpm. The flow from the longer original drain was 0.4 gpm.

3. When the water started to flow from the prefabricated drain it was muddy but cleared up within an hour.
4. One wet area indicated by Area B on the map was above the new drain. It may be necessary to install an additional short length of drain along this area in order to prevent sloughing during spring.

#### Cost

The installation was made by the on site contractor on a cost plus basis. The total cost was \$2,600.00. \$1,050.00 of this was the cost of the prefabricated drain sections.

#### Summary

The installation of the prefabricated underdrain went very smoothly and the drain appears to be operating satisfactorily. An additional short section may have to be placed to drain one small area. Regular measurements and observations will be made of the installation in order to evaluate the performance.

PHOTOGRAPHS OF INSTALLATION



1. Slope April 1971, Note  
Wet Areas & Manholes



2. Berm Cut by Bulldozer, Note  
Grey Sand of Original Underdrain



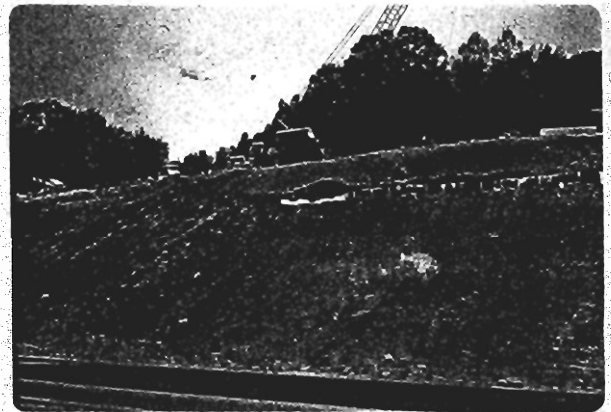
3. Prefabricated Underdrain Being Placed



4. Dragline Backfilling Underdrain



5. Bulldozer Dressing Slope



6. Partially Backfilled  
Prefabricated Underdrain