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Commonwealth of Massachusetts
Department of Public Works
F. F. Callahan, Commissioner

U. S. Department of the Interior
Geological Survey
W. E. Wrather, Director

Cooperative Geologic Project

File Report

Geologic Interpretation of Seismic Data

UXBRIDGE

Worcester-Providence Road

Proposed Cut between Stations 52 and 62

by

James E. Maynard, geologist, U. S. Geological Survey

and

Rev. Daniel Linehan, S. J., seismologist, Weston College

2 pages of text
1 plate

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General Statement

In June 1948 a preliminary seismic study was made of a segment of this cut between stations 53+00 and 61. Two profiles were made at this time and a report was submitted by James B. Maynard and Rev. Daniel Linehan (file report of August 1948). That work showed a relatively shallow (5 to 12 feet in depth), undulatory, bedrock surface between stations 55+05 and 60+85. The data indicated that much of the southeast half of the cut will be in bedrock. In order to obtain data on the depths to bedrock along the northwest half of the proposed cut, especially between stations 52+50 and 57, additional seismic traverses were made in November 1948. The present report contains only the results obtained from this later work; the preliminary work of August 1948 requires no modification. The two reports, however, should be considered as a unit.

All work was performed as a part of a cooperative program between the United States Geological Survey and the Massachusetts Department of Public Works.

Seismic Traverses

The layout of the seismic traverses is shown on sheet one. Two traverses, B-C 210 feet long and C_1-D 210 feet long, were run along the

base line between stations 52+57 and 57+01. Shot point B was located at station 52+57, shot point C at station 54+76, and shot point C_1 at station 54+81. Traverse E-F, 165 feet long, intersected the base line at station 56; with shot point F 75 feet to the right (S.W.).

Depths to Bedrock

The calculated depths to bedrock at the shot points are:

B,	7	feet	
C,	15	"	
C_1,	16	"	
D,	3	"	or less
E,	10	"	
F,	6	"	

Geologic Interpretation of Seismic Data

The interpreted portions of the bedrock surfaces along the seismic traverses between the shot points are shown on the geologic sections, sheet one. All sections show a relatively shallow, undulatory, bedrock surface that varies from 3 feet or less to 16 feet in depth. Although the bedrock surface is indicated on the sections by smooth curves, it is probable that many very small ridges, benches or knobs are present, some of which may be at altitude markedly above those represented by the smooth boundary lines.

The seismic velocities show that the till overlying the bedrock is quite loose in texture; it may contain many large boulders, similar to those that are exposed on the surface.

Because the geologic and seismic studies indicate that much of this cut will be in bedrock, it is suggested that the center line be moved a few rods to the southwest in order to avoid cutting through this hill.