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

OKR 49-41-H
U. S. Department of the Interior
Geological Survey
W. H. Brather, Director

Northbridge)
[no. 4]

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Cooperative Geologic Project

File Report

Geologic Interpretation of Seismic Data

NORTHBRIDGE

Worcester-Providence Road, Route 122

Proposed Cut at Stations 335-340

by

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

and

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



2 pages of text

U. S. GEOLOGICAL SURVEY MASS. DEPT. OF PUBLIC WORKS
COOPERATIVE GEOLOGIC PROJECT

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Seismic Series # _____

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General Statement

Construction of the Worcester-Providence Road in Northbridge will require a cut through a sand and gravel ridge between stations 335 and 339+50. The cut may be as deep as 40 feet at station 337. The surface geology of the site indicates that the upper part of this cut will be in coarse cobble gravel. Because the surface geology also suggests that the bedrock surface may rise beneath the ridge and thus come within the limits of the proposed cut, a seismic study was made of the site. The work was done in November 1948 as a part of a cooperative program of the Massachusetts Department of Public Works and the United States Geological Survey.

Seismic Traverses

Three seismic traverses were made at this location; the layout of these traverses is shown on sheet one. Traverse A-B, 215 feet long, and traverse A₁-D, 165 feet long, were run approximately

parallel to the base line; shot point A was located 4 feet west of station 334+74, B at station 336+ 89, A₁, 5 feet west of station 334+70 and D, 13 feet west of station 333+06. Traverse B-C was 124 feet long. Shot point C was 124 feet east of station 336+80.

Depths to Bedrock and Interpretation of Seismic Data

The calculated depths to bedrock at the mirage points (see note) for each of the shot points are:

A,	28 feet
A ₁ ,	22 "
B ₁ ,	34 "
C,	10 "
D,	17 "

The geologic sections along the seismic traverses as interpreted from the surface geology and the seismic data are shown on sheet one. Because the seismic data from which these sections were compiled were somewhat indefinite and confused, the positions of the bedrock surfaces have been indicated by dotted lines. The depth to bedrock at shot point C may be somewhat shallower than the 10 feet shown on the section. Probably no bedrock will be found in this cut above an altitude of 380 feet. If the cut is to extend below this altitude, further seismic study of the site might be made with advantage.

NOTE: Actually, the depth is calculated for a "mirage point", not exactly beneath the shot point, but a very few feet toward the other end of the traverse, the exact distance being a function of the depth to bedrock. This explains why two shots made at a given shot point, but for separate traverses, may indicate different depths, these depths being for points on the bedrock surface that are separated by a few feet horizontally.