54-191

Commonwealth of Massachusetts
Department of Public Works
John A. Volpe, Commissioner

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

Cooperative Geologic Project

SUPPLEMENTARY REPORT

Geologic Interpretation of Seismic Data

Relocation of Route 3 at Route 62

Northwest Ramps and Approach for Route 62

in Bedford, Mass.

by

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

2 pages of text
3 plates

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U. S. GEOLOGICAL SURVEY MASS. DEPT. OF PUBLIC WORKS
COOPERATIVE GEOLOGIC PROGRAM
OPEN FILE REPORT

Boston, Massachusetts
June 1954.

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Seismic Series #_____

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General Statement

Geologic and seismic studies were made at this site in October 1961 primarily for obtaining data that would aid in estimating the quantities of materials to be excavated from the cut required for the construction of Route 3. A report on the geology of the site together with the interpretation of the seismic data that were obtained at this time was submitted by Robert O. Castle and Robert M. Haslewood (file report of October 1961). Additional seismic work was performed at this site in July 1963. This later work was done to obtain information that would help in planning for the construction of the inner and outer loops of the northwest ramp, and the western approach of Route 62 to Route 3. This report contains the geologic interpretation of the supplementary seismic data that were obtained during the July 1963 survey. The work was performed as a part of a cooperative project of the Massachusetts Department of Public Works and the United States Geological Survey.

Mr. M. E. Chandler and Mr. W. L. Carney, Department of Public Works' Engineers, performed all pertinent survey work required for this project, and prepared the essential plans and profiles. Mr. Chandler also operated the seismic equipment and assisted in the preparation of the seismic velocity data.

Seismic Traverses

Twenty-nine seismic traverses were made for this supplementary work. The locations of the shot points and the arrangement of the seismic lines are shown on sheet 1.

Subsurface Interpretation

The geologic sections as interpreted from the surface geology and the seismic data are shown on sheets 2 and 3. All sections show sandy till, sand, or sand and gravel overlying bedrock at very shallow depths, 1 - 10 feet, to moderately shallow depths, 10 - 20 feet, below the surface of the ground; the maximum depth to bedrock, 25 feet, is shown on section L-K. The boundaries between sandy till and sand, or sand and gravel are shown on sections E-F, O-P, and R-S by dotted lines. They represent poorly defined gradational contacts that are concealed by a surface layer of wind-blown fine sand and silt a few inches to a few feet in thickness.

The bedrock surfaces are shown on the geologic sections by smooth curves; the actual bedrock surfaces, however, are probably more irregular than these curves imply for numerous small ridges, knobs or depressions impossible to detect because of the detector spacings, may occur both above and below these lines.

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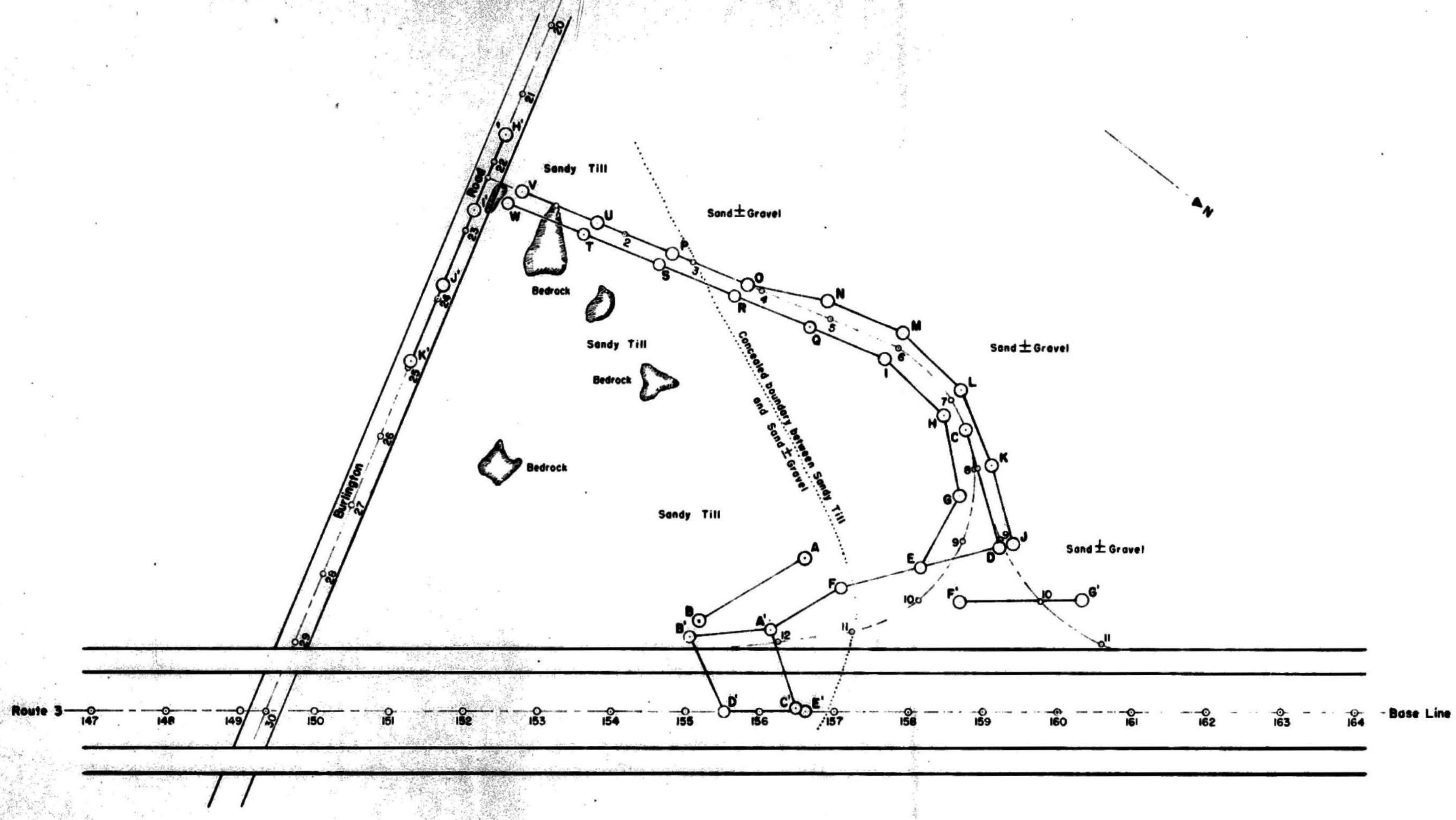

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS U.S. DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY COOPERATIVE GEOLOGIC PROJECT	PLAN OF TRAVERSES SCALE: 1 INCH = 100 FEET Letters refer to shot points at ends of traverses. Numbers refer to D. P. W. stations on baseline.	INTERPRETATIVE GEOLOGIC SECTIONS ALONG SEISMIC TRAVERSES Shot point. V – Apparent seismic velocity(ies) in feet per second. Dotted bedrock lines indicate inconclusive seismic data. Vertical measurements refer to elevations above mean sea level (datum 1929). Numerals at shot points indicate depths to bedrock, as A 21, B 10	GEOLOGY BY: JAMES E. MAYNARD SEISMIC DATA BY: JAMES E. MAYNARD ENGINEERING BY: M. CHANDLER W. CARNEY	BEDFORD — ROUTE NO. 3 N.W. RAMP AT ROUTE 62 SCALE: 1 INCH = 40 FEET — DATE: JUNE 1953 — SHEET 1 OF 3

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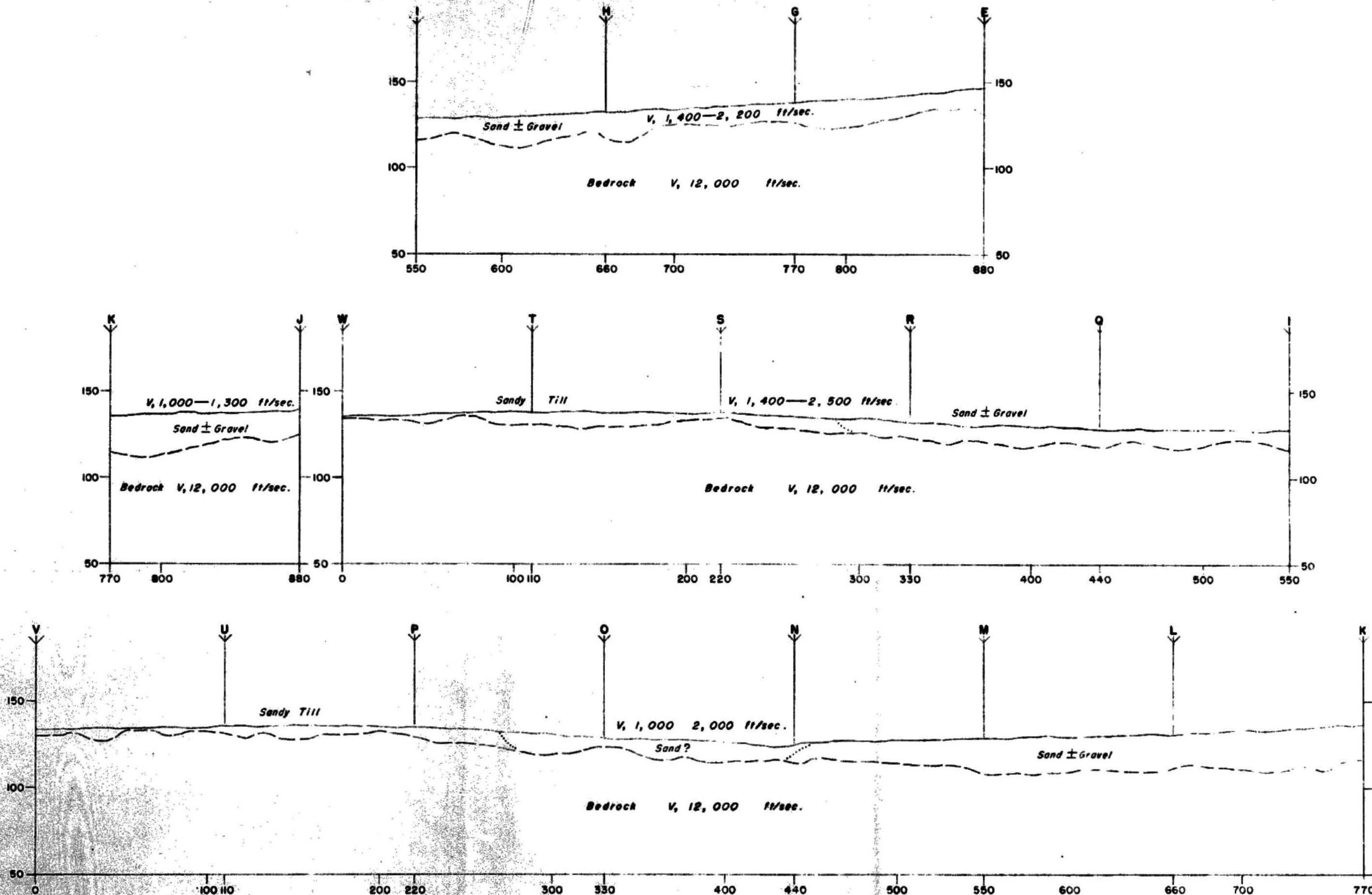

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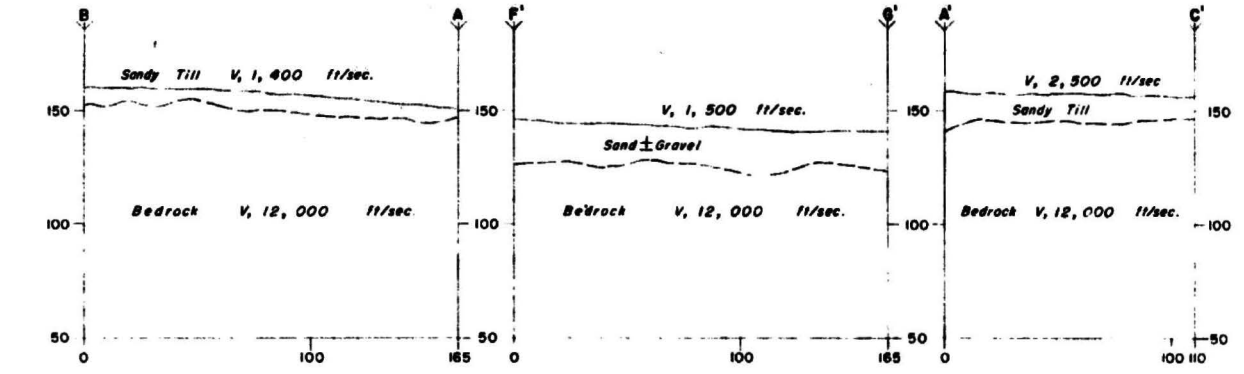

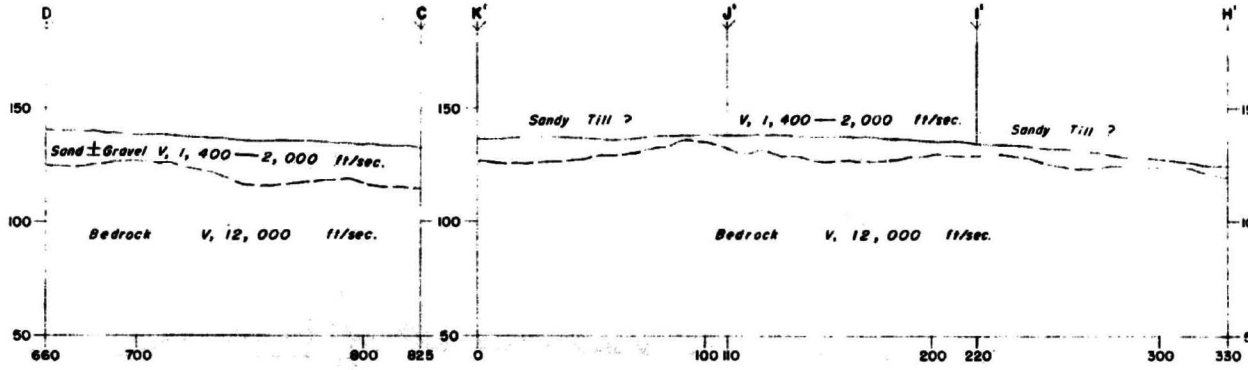

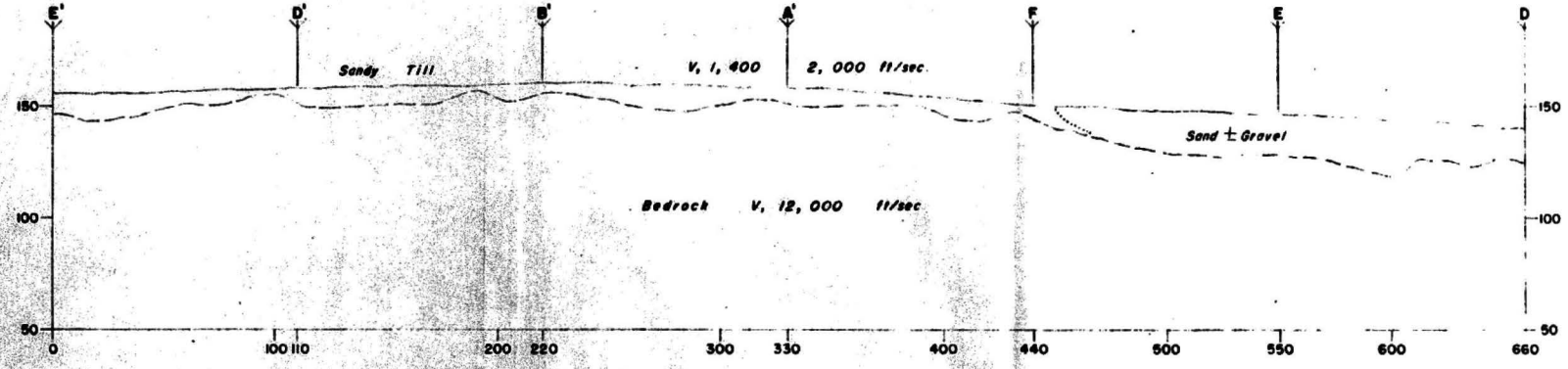

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

COOPERATIVE GEOLOGIC PROJECT

PLAN OF TRAVERSES

SCALE: 1 INCH = 100 FEET

Letters refer to shot points at ends of traverses.

Numbers refer to D. P. W. stations on baseline.

INTERPRETATIVE GEOLOGIC SECTIONS ALONG SEISMIC TRAVERSES

Shot point.

V = Apparent seismic velocities in feet per second.

Dotted bedrock lines indicate inconclusive seismic data.

Vertical exaggerations refer to elevations above mean sea level (datum 1929).

Numerals at shot points indicate depths to bedrock, as

GEOLOGY BY: JAMES E. MAYNARD

SEISMIC DATA BY JAMES E. MAYNARD

ENGINEERING BY: M. CHANDLER—W. CARNEY

BEDFORD

ROUTE NO. 3

N.W. RAMP AT ROUTE 62

SCALE: 1 INCH = 40 FEET

DATE: JUNE 1953

SHEET 3 OF 3