ERRATA:
Subsurface Investigations for Highways and Structures

Note: The following errata and additions apply to the paper by H.A. Mohr which appeared in the October, 1964, issue of the *Journal* and are published at the request of Mr. Mohr.

1. The Editor's note should be changed to read as follows:

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2. The following should be inserted prior to Part I:

FOREWORD

During the past several years, the writer and engineers of the Massachusetts Department of Public Works have been developing procedures and specifications for sub-surface investigations. Adequacy and economy have been the ultimate objectives.

A planning procedure has been developed for highways and their accompanying structures. Its provisions can, with minor changes, be adapted to the planning of sub-surface investigations for other structures. The technical provisions for the types of borings identified in the specifications apply to any soil investigation for foundation purposes. Application of these provisions requires the close attention of the engineer as the work progresses.

The procedures and specifications have been divided as follows:

Part I, entitled "DEFINITIONS AND PROCEDURES TO BE FOLLOWED ON SUB-SURFACE INVESTIGATIONS FOR HIGHWAYS AND STRUCTURES," is for the guidance of the engineer when planning the investigation. It is not issued to the bidders or to the boring contractor, and, therefore, is not included in the contract documents.

Appended to Part I are two examples of actual boring operations:

a) Fig. I shows the locations at which Control* and Complementary* borings were planned at one site, and Fig. 1A, the logs of results obtained from typical borings of each type. From his study of the Control boring results, the Engineer effected a major saving in the footage of Complementary borings at no detriment to an understanding of the foundation problem.

b) Fig. II shows the locations at which borings of both types were to be made at another site, and Fig. IIA, the logs of the Control borings that showed

* See Text for definitions.

the greatest difference. In this instance, because of the inconsistency in results, all Complementary borings were made to refusal with no saving in footage of borehole.

Part II, entitled "SPECIFICATIONS FOR SUB-SURFACE EXPLORATIONS" outlines the provisions governing the boring and sampling operations. These provisions become part of the bid and contract documents. They will be included in the revised Massachusetts Standard Specifications for Highways and Bridges.

This separation into "Definitions . . ." and "Specifications . . ." accounts for some unavoidable repetition.

In the development of these procedures and specifications, the writer acknowledges with thanks the cooperation and help of John F. McGovern, Bridge Engineer, Charles E. Tuck, Robert J. McDonagh, Daniel J. Guilfoyle and Harold B. Frye of the Bridge Division and Carlisle N. Levine of the Highway Division, all of the Massachusetts Department of Public Works, and of the engineers of the United States Bureau of Public Roads.

3. The following provisions were adopted after the original paper was prepared and should be inserted in the proper locations.

a. Page 335, after 2. *Structures* insert:

3. *Ground Water Observation Wellpoint*

Ground water level as reported during a soil-test-boring operation is seldom accurate. When a study of the Pilot or Control borings indicates that an excavation in granular soil must be made below ground-water-level, observation wellpoints shall be installed. Not more than one observation wellpoint shall be installed at a bridge site except with prior approval of the Bridge Engineer. Observation wellpoints shall be located outside footing areas with the bottom of the point approximately 10 feet below the proposed bottom of footing.

District personnel will measure and report water levels monthly to the Bridge Engineer with a copy to the Design Engineer. These data are to be tabulated on the Construction Drawings with the following notation:

"The water levels recorded in the table are those measured on the dates given and do not necessarily represent ground-water level at time of construction."

b. Page 352, Present item "K" change to "L." Insert new item "K" *Ground Water Observation Wellpoint.*

K. *Ground Water Observation Wellpoint*

2½″ casing shall be advanced by loosening the soil at the bottom with a chopping bit and washing the loosened soil out with water. When the bottom of the casing has reached the elevation specified for the tip of the wellpoint it shall be purged to its full depth with clean water.

The wellpoint shall have ample clearance so that it may be lowered freely in the 2½″ casing. The screen shall be 60-mesh. The riser, rigidly fastened to the wellpoint, shall be 1¼″ pipe. A pipe plug or cap shall be furnished to close the top of the riser.

After the wellpoint has been lowered to the specified elevation the annular space between the wellpoint and riser pipe and the 2½″ casing shall be filled with clean, screened, dry sand. This sand shall be retained on a 50-mesh and shall pass a 30-mesh sieve. It shall be poured in slowly to fill the annular space as the casing is pulled.

During the pulling of the casing the wellpoint shall not be raised from its original position.

At completion, the top of the riser pipe shall be closed wrench tight with a pipe plug or cap.

For the above described work complete, including the materials left in place, the Contractor will be paid at the contract unit price per foot measured from the tip of the wellpoint to the top of the riser pipe but not to more than one foot above the ground surface.

c. Page 353, Insert Payment Item.

Ground Water Observation Wellpoint . . . . Lineal Feet.