

Subsurface Exploration Report

for

Bridge Location

Sheppard Ave. at Highway #400

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Project F-54-13

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Introduction

A subsurface investigation has been undertaken by the Materials Section, in connection with the proposed rigid frame bridge to be located at the junction of Highway No. 400 and Sheppard Avenue.

The purpose of the investigation was to discover the nature of the subsurface soil strata, and the maximum safe bearing capacity of the soil.

Procedure

The bridge site was investigated between September 14 and September 30, 1954. Two boreholes and four dynamic cone penetrations were driven.

The location of boreholes, penetration holes, and the encountered strata, are shown in Plan No. F-54-13A and Appendix A.

Description of Sampling and Testing Procedure

Borehole #1

The first 3 feet consists of peat, the next 27 feet of clay of variable consistency.

Samples were obtained for determination of the shear properties of the soil.

From 31 feet below present ground level to 49 feet below, where the limestone bedrock commences, there are layers of sand & shaly rock.

Borehole #2

Clay till of varying consistency is found to a depth of 37 feet, directly overlying the limestone bedrock.

Water Conditions

At Borehole 1 and 3 the water table was observed at elevation 476.37' and 473.63' respectively.

Analysis and Recommendations

The bridge foundations have been designed for a load of 3000 pounds per square foot. The proposed elevation of the bottom of the footing is at elevation 480.50.

The footings at both West and East sides are founded on clay. The bearing capacity of the clay bed in shear is about 0.75 tons per square foot for the width and location of the proposed footings.

Results of consolidation tests indicate that a rigid frame structure could not safely be founded on this site, because the expected differential settlement is too great.

We suggest that treated wooden piles about 22 feet long be used. From the strength characteristics of the soil, a one foot diameter pile is estimated to carry a load of 15 tons. Piles should be not less than 3 feet apart center to center. At 3 foot centers sufficient piles can be placed under the footing to carry the designed combined live and dead load of the bridge.

Conclusions:

The exploration and soil tests indicate that the proposed spread footings are unsafe both in consideration of shear failure and also in consideration of differential settlement, critical in this type of structure.

We suggest using one foot diameter treated wooden piles about 22 feet long, at 3 foot centers and each having a load capacity of 15 tons.

The soil will develop the capacity of 15 tons per pile by skin friction and end bearing.

The estimated pile load of 15 tons should be checked by an actual load test performed on a pile prior to construction.

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For:


(O. Parantatos)

APPENDIX I

54-F-13

**Hwy. # 400 AT
SHEPPARD AVE.**



