

FOUNDATION INVESTIGATION
OF
GREATER WINNIPEG SUBSOILS

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BY
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ABSTRACT

The subsoil of Greater Winnipeg generally consists of lacustrine and fluvial deposits of clay and silty clay materials. Because of the highly active nature of these materials, foundation and soil conditions have been noted for their unusual severity. The purpose of this thesis is to acquaint the engineer with the results of past experience and recently completed soil investigations in relation to the local foundation problems.

More than 350 boring records were collected, including approximately 100 for which the physical properties had been determined. These properties were studied and condensed to permit an investigation into the foundation problems of the Greater Winnipeg area.

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INTRODUCTION

Foundation and soil conditions in the Greater Winnipeg area have been noted for their unusual severity. Foundation failures, including the major failure of the Transcona Grain Elevator and many others of lesser magnitude have not too infrequently occurred. It is the purpose of this thesis to acquaint the engineer with the results of past experience and recently completed soil investigations in relation to foundation problems. The following problems merit attention.

1. Adequate bearing capacity
2. Total settlements
3. Differential movements including settlements and heave
4. Effects of lateral earth pressures
5. Frost
6. River bank stability and subsidence
7. Chemical deterioration of concrete

For this study, a large number of available boring records were collected. More than 350 boring records were obtained including approximately 100 from the University of Manitoba for which the physical properties of the materials had been determined. These properties were studied and are presented in a condensed form in the following chapters. This information is supplemented with a brief discussion of the pertinent geology of the area.

Records of past experience, including the work of the Winnipeg Branch of the Engineering Institute of Canada (1) and others have been reviewed (2-10).

EXTENT OF THE AREA

The extent of the Greater Winnipeg area included in this study is shown in Figure 1. The Greater Winnipeg area includes the City of Winnipeg, the City of St. Boniface, the Town of Tuxedo, the Rural Municipalities of Fort Garry, St. Vital, East Kildonan, North Kildonan, West Kildonan, Rosser, St. James, and the Village of Brooklands.

The predominant natural feature of this area is that it is divided into three sections by the north flowing Red River and the east flowing Assiniboine River. This feature has influenced the layout of the streets which run north and south from the Assiniboine River and east and west from the Red River. The main thoroughfares tend to run radially from Portage Avenue and Main Street.

The ground surface of the area is generally flat and is about 760 feet above sea level. The elevation of the ground surface in the western portion of the area reaches 771 feet while in the central area, near the Redwood Bridge, the elevation is only 748 feet. The City of Winnipeg datum, elevation 0.00 feet, corresponds to the Geodetic elevation of 727.57 feet.



SCALE
1000' 2000' 3000' 4000'

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No. 14 Highway
To United States

No. 314 - West