

CONT. 73-75

HWY. 31 & 43

TOWNSHIP OF

WINCHESTER

31G - 138

MEMORANDUM

TO: Mr. E. R. Saint, (2)
Regional Materials Engineer,
Eastern Region,
Kingston, Ontario.

FROM: Foundations Office,
Design Services Branch,
West Bldg., Downsview.

ATTENTION:

DATE: July 20, 1972.

OUR FILE REF.

IN REPLY TO

JUL 26 1972

SUBJECT:

31G-138

GEOCRE No.

FOUNDATION INVESTIGATION REPORT
For
Proposed Dome - M.T.C. Patrol Yard
Hwy. #31 & 43 (Town of Winchester)
Township of Winchester
County of Dundas
District No. 9 (Ottawa)
W.O. 72-11084 *CONT. 73-75*

Attached we are forwarding to you our detailed foundation investigation report on the subsoil conditions existing at the above-mentioned site.

We believe that the factual data and recommendations contained therein will prove adequate for your design requirements. Should additional information be required, please do not hesitate to contact our Office.

AGS/ao
Atch.

cc: Messrs. D. W. Farren

B. R. Davis
A. Rutka
S. J. Markiewicz
J. E. Callaghan
B. J. Giroux
T. C. Kingsland
G. A. Wrong
B. A. Singh

A. G. Stermac
for A. G. Stermac,
PRINCIPAL FOUNDATIONS ENGINEER.

Foundations Files ✓
Documents

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FOUNDATION INVESTIGATION REPORT
For
Proposed Dome - M.T.C. Patrol Yard
Hwy. #31 & 43 (Town of Winchester)
Township of Winchester
County of Dundas
District No. 9 (Ottawa)
W.O. 72-11084

I. INTRODUCTION:

The Foundations Office was requested to carry out an investigation to determine foundation conditions for a proposed dome at the above site. The request was made verbally by Mr. E.R. Saint, Materials Engineer, Eastern Region Materials Section. An investigation was subsequently carried out by the Foundations Office to determine the subsoil, bedrock and groundwater conditions at the site.

This report presents all the factual information obtained in the investigation, together with recommendations pertaining to the foundation of the proposed dome, as well as the stability and settlement considerations associated with the stockpile to be housed within the dome.

2. DESCRIPTION OF THE SITE AND GEOLOGY:

The site is the existing M.T.C. Winchester Patrol Yard. It is located on the north side of Hwy. #43, 1 mile south-east of the Town of Winchester and 0.5 miles east of the intersection of Hwy. #43 and Hwy. #31.

A flat, rectangular asphalt pavement pad has been laid at the east end of the patrol yard in preparation for the proposed stockpile and dome. This pad will underly both the stockpile and dome ring foundation

to provide, primarily, a working surface for the stockpile loading machinery.

Physiographically, the site is located within the "Winchester Clay Plain". In general, the predominant stratum in this area is composed of a sensitive marine clay deposited in the past, by the Champlain Sea. The clay, which is encountered at a relatively shallow depth below ground surface, varies from 10 to 40 feet in thickness. It, in turn, is underlain by competent glacial till deposits.

It should be noted that the area is one of considerable geologic complexity. In many places, the underlying till protrudes to ground surface and in a few cases there are areas of shallow soil overlying bedrock. The overburden is underlain by St. Martin minor shale bedrock of the Chazy formation, Ordovician period.

3. SUBSURFACE CONDITIONS:

3.1) General:

The field work consisted of putting down one sampled borehole. This borehole was advanced by means of a conventional diamond drill rig adapted for soil sampling purposes. All soil samples were recovered in a 2" O.D. split-spoon sampler, which was driven in accordance with the specifications for the Standard Penetration Test.

Three additional hand-dug holes, one at each of three sides of the existing rectangular asphalt pad, were put down by District #9 (Ottawa) personnel. The subsoil conditions encountered at each of these holes corroborate with the stratigraphical sequence found in our investigation.

The groundwater conditions at the site were determined by taking readings in the open borehole during the course of the investigation.

The location of the borehole was tied-in by personnel from the Foundations Office, and is shown on Drawing No. 72-11084A. The ground level elevation of the borehole was assumed at 100.0 feet.

All samples were subjected to careful visual examination, both in the field and in the laboratory.

The results of this investigation are summarized and plotted on the Record of Borelog sheet contained in the Appendix of this report. A brief description of the deposits encountered at the site is presented in the following sub-sections.

3.2) Sand and Gravel (Fill):

A 4-inch pad of asphalt pavement is underlain by a 1½ foot thick layer of brown sand and gravel fill material. A Standard Penetration Test in the fill gave an 'N' value of 20 blows/ft., indicating the fill is in a relatively compact state.

3.3) Topsoil:

The granular fill material is underlain by a 1 foot layer of brown topsoil which had been the original surficial deposit at the site prior to the dumping of the fill and the laying of the asphalt pad.

3.4) Glacial Till:

The topsoil deposit is underlain by a very dense granular glacial till with a thickness of 2 feet. The glacial till is composed of sand with some silt, clay and gravel.

3.5) Shale Bedrock:

The granular glacial till stratum is underlain by bedrock. The

bedrock was proven in the borehole by obtaining 5 feet of rock core. The bedrock surface was encountered at about elevation 95, which corresponds to a depth of approximately 5 feet below the ground surface. The bedrock is composed of a grey to black shale which is sound as evidenced by the high percentage of core recovered.

4. GROUNDWATER CONDITIONS:

Observations of the water level in the open borehole were made during the course of the investigation. This is noted on the Borelog sheet in the Appendix. The groundwater level was found to be at a depth of 3 feet below ground surface.

5. DISCUSSION AND RECOMMENDATIONS:

It is proposed to construct a dome to house a stockpile at the M.T.C. Winchester Patrol Yard, located on Hwy. #43, 1 mile south-east of the Town of Winchester.

The dome, which will be of light frame construction, is 100 feet in diameter at the base and 51 feet in height. The structure will be founded on a ring footing, 23 inches wide and 16 inches high. The footing will be placed on top of the existing asphalt pad which is supported by the previously mentioned $1\frac{1}{2}$ feet of granular fill. This footing may be designed using an allowable bearing pressure of up to 3 t.s.f.

It is understood that the dome will house a stockpile of sand and/or salt for winter maintenance of all roads and highways within the Winchester patrol yard area.


As discussed previously, the stockpile within the dome will be underlain by shallow depths of fill and parent glacial till. In view of this, the stockpile may be placed to heights of up to 33 feet at side slopes of $1\frac{1}{2} - 1$, without any stability problems. Settlement of the subsoil, due to the stockpile loadings, is expected to be negligible.

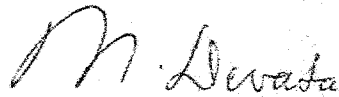
6. MISCELLANEOUS:

The field work, performed on June 26, 1972, was carried out under the supervision of Mr. E.C. Ballinger, Student Technician (Field), under the general supervision of Mr. B.T. Darch, Senior Foundations Engineer.

The equipment used was owned and operated by the F.E. Johnston Drilling Co. Ltd., Ottawa.

This report was written by Mr. E.C. Ballinger, Student Technician (Field), and reviewed by Mr. M. Devata, Supervising Foundations Engineer.


E.C. Ballinger


M. Devata, P. Eng.

ECB/ht

July 17, 1972

APPENDIX I

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 1

JOB 72-11084

LOCATION M.T.C. Patrol Yard - Winchester

ORIGINATED BY E.C.B.

W.P. 335-65

BORING DATE June 26, 1972

COMPILED BY E.C.B.

DATUM Assumed

BOREHOLE TYPE Washboring & Tricone
With NX Casing

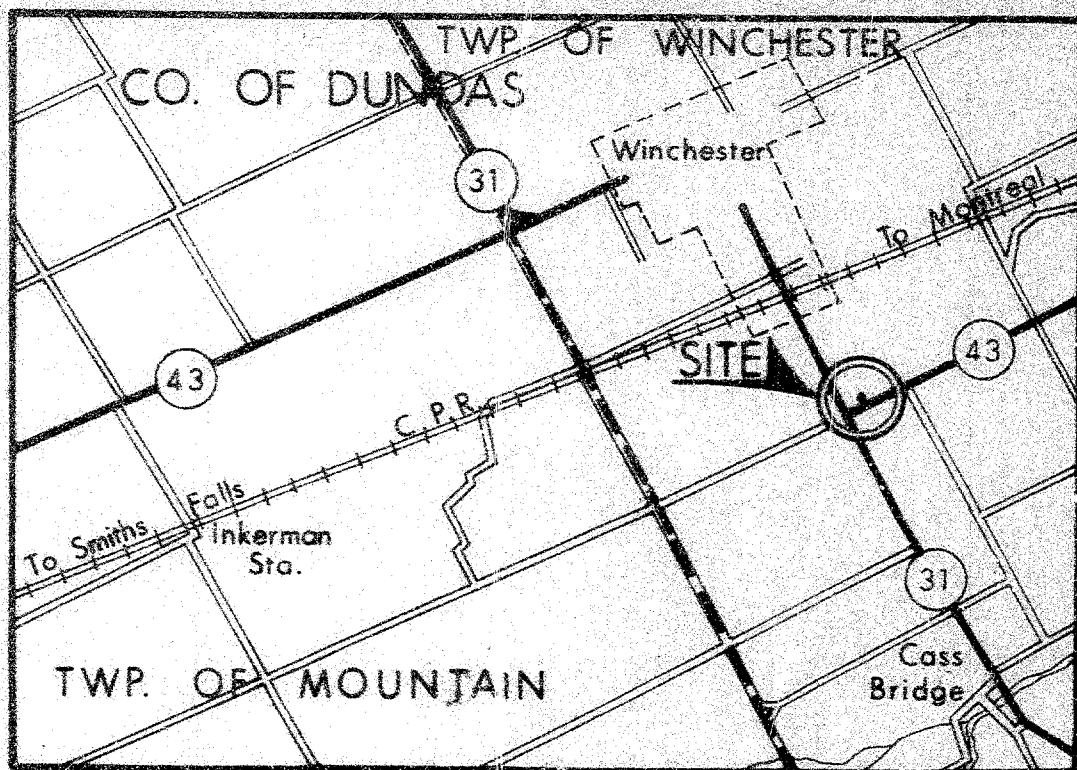
CHECKED BY E.C.B.

| SOIL PROFILE | | | SAMPLES | | | ELEV. SCALE | DYNAMIC PENETRATION RESISTANCE | | LIQUID LIMIT W_L | | BULK DENSITY | REMARKS |
|--------------|--|-------------|---------|----------|--------------|-------------|--------------------------------|--|---------------------|-------------------|--------------|---------|
| ELEV. DEPTH | DESCRIPTION | STRAT. PLOT | NUMBER | TYPE | BLOWS/FOOT | | BLOWS / FOOT | | PLASTIC LIMIT W_P | WATER CONTENT W | | |
| 100.0 | Ground level. | | | | | | | | | | | |
| 99.7 | Asphalt | | | | | | | | | | | |
| 0.3 | Sand and gravel. (Fill) | | | | | | | | | | | |
| 98.0 | Compact | | 1 | SS | 20 | | | | | | | |
| 2.0 | Topsoil | | | | | | | | | | | |
| 97.0 | | | | | | | | | | | | |
| 3.0 | Sand, some clay, some silt (and gravel below 4'6" from surface) Glacial Till | | 2 | SS | 87 | | | | | | | |
| 94.8 | Very dense. | | 3 | SS | 180/7" | | | | | | | |
| 5.2 | Bedrock. (Sound) | | 4 | BX RC | Rec. 100% | | | | | | | |
| 89.7 | | | | | | | | | | | | |
| 10.3 | End of borehole. | | | | | | | | | | | |

W.L.

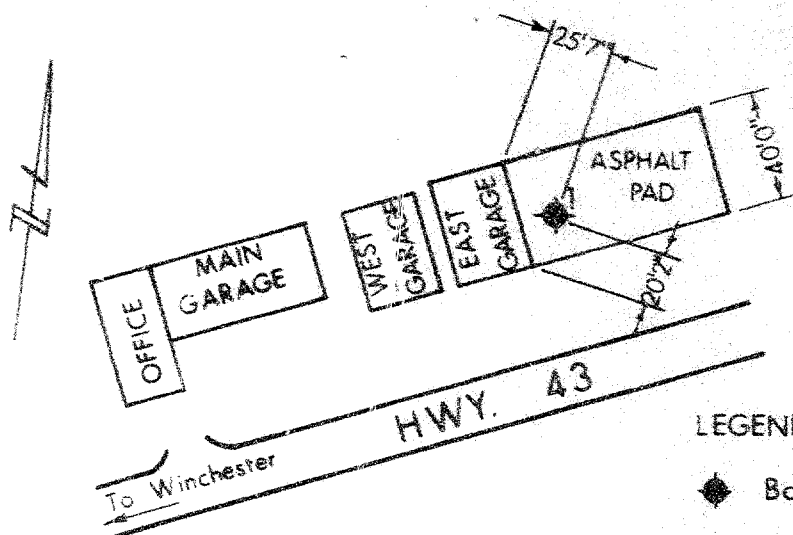
2'9" below
surface

June 26/72



KEY PLAN

SCALE



LEGEND:

◆ Borehole

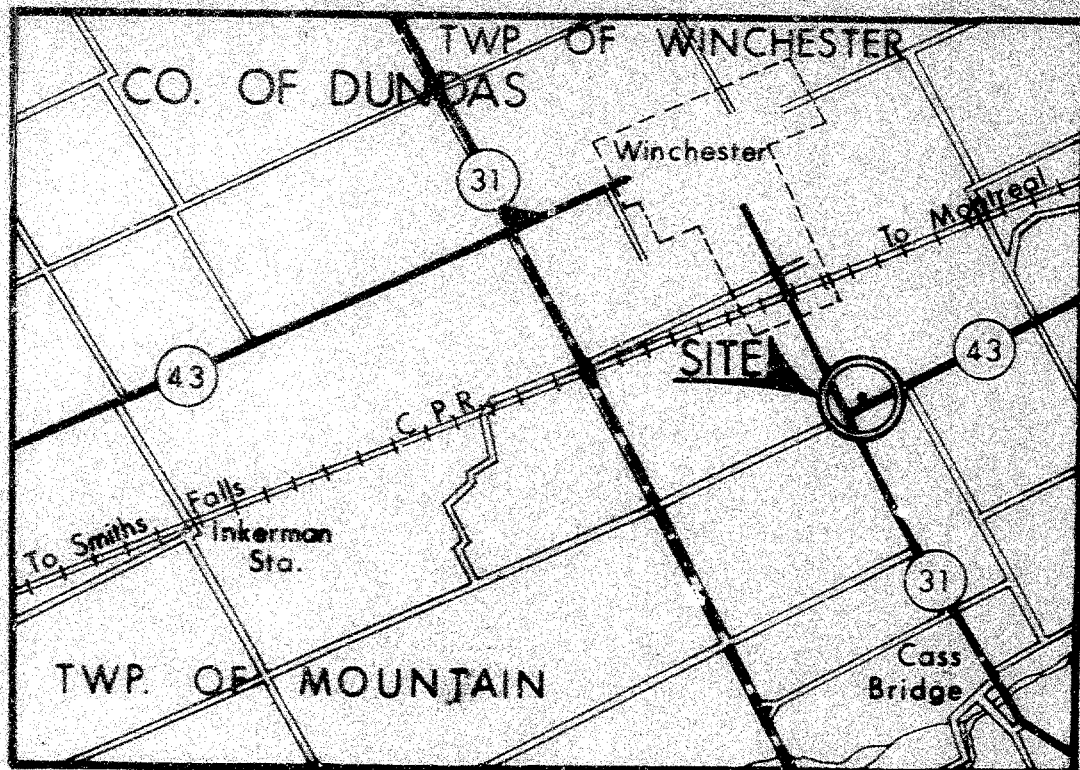
SITE PLAN — PATROL YARD

NOT TO SCALE

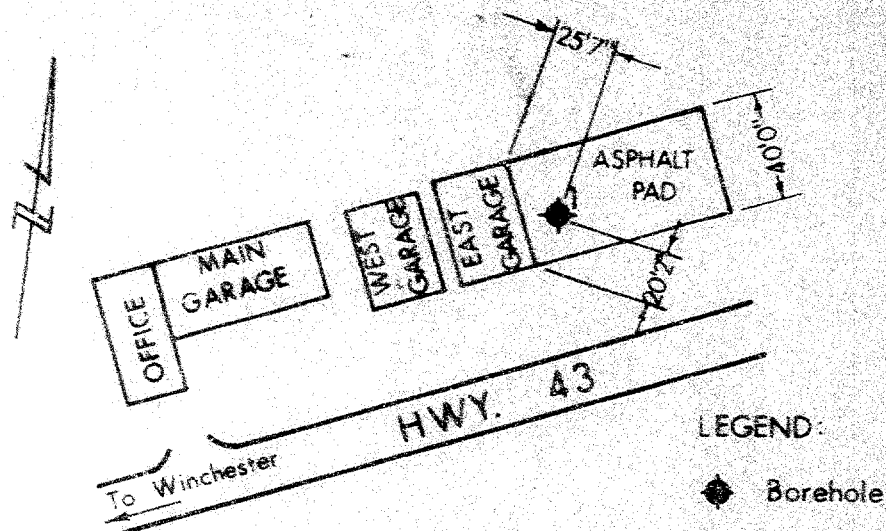
DWG. N° 72 - 11084A

W.O. 72 - 11084

W.P. 335 - 65



KEY PLAN SCALE



LEGEND:



SITE PLAN — PATROL YARD

NOT TO SCALE

DWG. N° 72-11084A

W.O. 72-11084

W.P. 335-65