

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 30M12-126

DIST. 6 REGION Central

W.P. No. 146-75-06

CONT. No. 79-25

W. O. No. \_\_\_\_\_

STR. SITE No. 10-81

HWY. No. 401

LOCATION East Oakville Creek  
Culvert Extension

OVERSEER COMMENTS TO BE INCLUDED WITH THE REPORT. 1

REMARKS: documents to be unfolded  
before microfilming

FOUNDATION INVESTIGATION REPORT  
For  
East Oakville Creek Culvert Extension  
W.P. 146-75-06, Site 10-81  
Hwy. 401, District 6, Toronto

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## INTRODUCTION

This report contains the results of a foundation investigation carried out for the above project. Fieldwork consisted of 2 boreholes advanced July 22, 1977, utilizing a C.M.E. 55 auger machine mounted on a tracked vehicle. Hollow stem augers were employed to avoid caving problems associated with open boreholes. Locations and elevations of the borings, as well as the inferred subsoil stratigraphy are shown in Drawing No. 1467506-A.

## SITE DESCRIPTION

The site is located on Hwy. 401 a quarter of a mile east of Trafalgar Road. At this location East Oakville Creek flows in a steep sided valley cut into the gently rolling plain which slopes to the south and west toward the Niagara Escarpment. Land use in the area is agricultural.

Hwy. 401 crosses East Oakville Creek over twin 21' x 12' box culverts. It is intended that these culverts be extended to the north of the highway.

## SUBSURFACE CONDITIONS

### Subsoil

Subsoil in the area of the culvert extension consists of silt with increasing quantities of fine sand with depth until it changes to a silty sand at depths between 15 and 20 feet. The deposit also contains a trace of clay but is noncohesive. Grain size distribution is shown as an envelope in Fig. 1.

The upper 5 feet of the deposit is loose to compact with Standard Penetration 'N' values varying from 4 to 30 blows per foot. Below this depth Standard Penetration 'N' values vary between 30 and 100 blows per foot indicating a dense to very dense deposit. The looser material at the surface probably results from scour and redeposition during high flow periods. Moisture content of the soil varies from 18 to 21 percent.

### Groundwater


Groundwater rose in the open boreholes to approximate elevation 648 and corresponds to the creek water level at the time of the investigation.

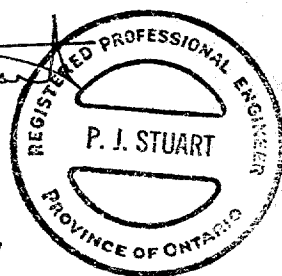
DISCUSSION AND RECOMMENDATIONS

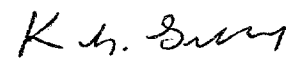
Subsoil in the area of the proposed culvert extension is silt to silty sand. Below elevation 647 it will support design loads of up to 3 tons per square foot. A dewatering scheme will be required to maintain the stability of the soil in the base of excavations extending below the groundwater level in this silt soil which is highly susceptible to boiling under an unbalanced hydrostatic head.

The floor slab for the culvert extension should correspond in elevation to that of the existing structure and should be placed on a layer of compacted granular 'A' a minimum of 12 inches in thickness.

Footings for the new wingwalls may be designed with loads of up to 3 tons per square foot. They should be provided with 4 feet of cover for frost protection purposes. A dewatering scheme will be required during the construction of these footings to insure the stability of the underlying soil.

  
P. Stuart, P. Eng.  
Project Engineer



  
K.G. Selby, P. Eng.  
Supervising Engineer

KGS/PS/gs  
August, 1977

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 1

WP 146-75-06 LOCATION Sta. 288+73; 0/5 1' Lt. of Traverse Line ORIGINATED BY R.N.O.  
 DIST 6 HWY 401 BORING DATE July 22, 1977 COMPILED BY R.N.O.  
 DATUM Geodetic BOREHOLE TYPE Hollow Stem augers CHECKED BY RS

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	LIQUID LIMIT $w_L$ PLASTIC LIMIT $w_p$ WATER CONTENT $w$ $w_p - w - w_L$ WATER CONTENT % 10 20 30	UNIT WEIGHT $\gamma$	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES					
649.1	Ground Level		1	SS	15					
0.0	Silt to Silty Sand trace of clay Compact to Very Dense		2	SS	32					0 3 92 5
			3	SS	47					
			4	SS	47					
			5	SS	35					
			6	SS	54					0 0 94 6
			7	SS	54					
			8	SS	49					1 15 75 9
			9	SS	94					1 81 (18)
627.6	End of Borehole									
21.5										

## HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

## RECORD OF BOREHOLE NO 2

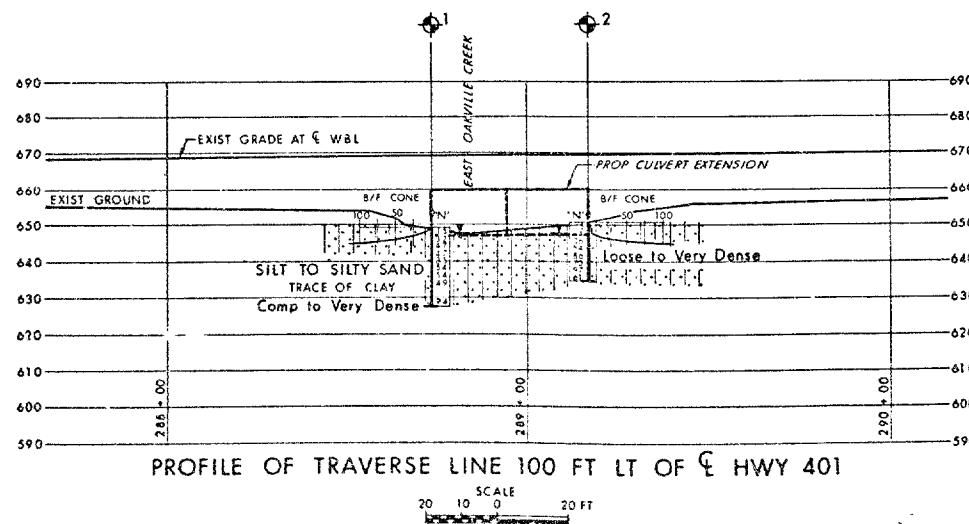
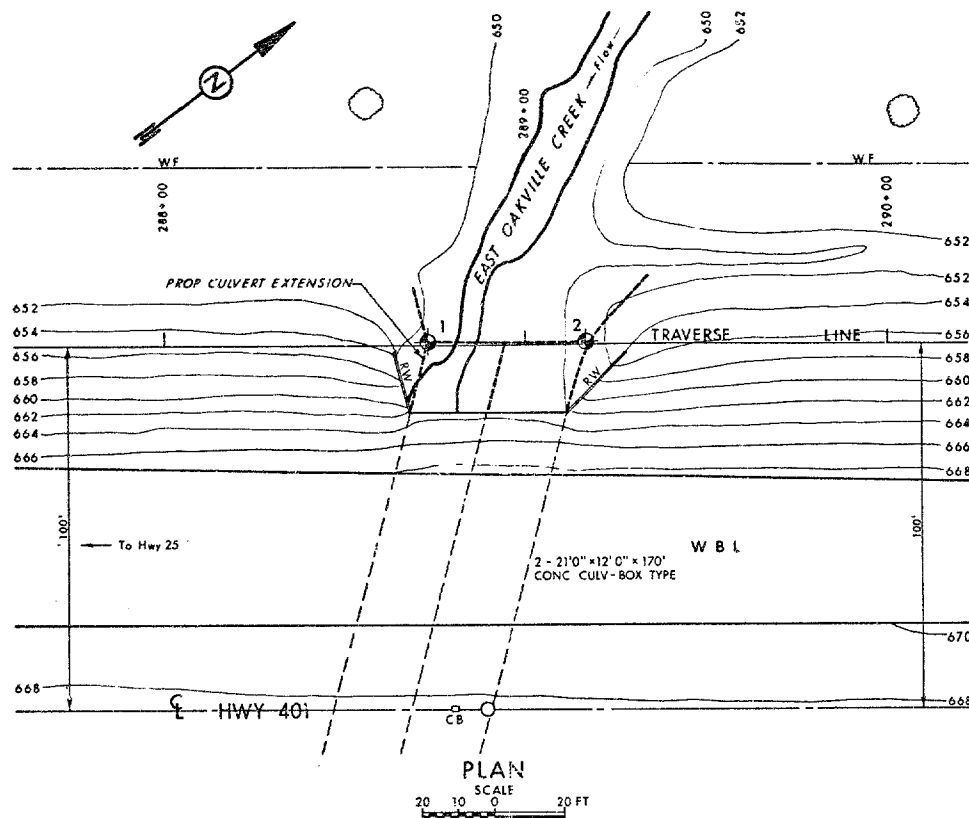
WP 146-75-06 LOCATION Sta. 289+17; 0/S 1' Lt of Traverse Line ORIGINATED BY R.N.O.  
 DIST 6 HWY 401 BORING DATE July 22, 1977 COMPILED BY R.N.O.  
 DATUM Geodetic BOREHOLE TYPE Hollow Stem augers CHECKED BY RSC

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	LIQUID LIMIT $w_L$ PLASTIC LIMIT $w_p$ WATER CONTENT $w$ $w_p$ — $w$ — $w_L$ WATER CONTENT %	UNIT WEIGHT $\gamma$	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES					
650.8	Ground Level		1	SS	5	650				
0.0	Silt to Silty Sand trace of clay Loose to Very Dense		2	SS	4					0 2 89 9
			3	SS	36					0 1 92 7
			4	SS	54					0 61 35 4
			5	SS	86					
			6	SS	70	640				
			7	SS	97					
634.8			8	SS	61					
16.0	End of Borehole									



GRAIN SIZE DISTRIBUTION  
SILT TO SILTY SAND  
TRACE OF CLAY

W P 146-75-06



LEGEND

- ◆ Bore Hole
- ⊕ Dynamic Cone Penetration Test (Cone)
- ◆ Bore Hole & Cone
- N' Blows/ft (Std Pen Test 350 ft lbs energy)
- CONE Blows/ft (60° Cone, 350 ft lbs energy)
- ↓ WL at time of investigation July 1977

No	ELEVATION	STATION	OFFSET TRAVERSE LINE
1	649.1	288 + 73	1' LT
2	650.8	289 + 17	1' LT

NOTE  
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Mr. C.S. Grebaki,  
Head, Central Section,  
Structural Office,  
West Bldg., Downsview

G.C.E. Burkhardt,  
Structural Section,  
Central Region.

1978-07-20

RE: Culvert East of Trafalgar Road, Hwy. 401  
W.P. 146-75-03, Site 10-81  
District 6, Toronto

This culvert is to be extended at both ends. You have already prepared originals of the north extension, but they have been returned to you to make the change to metric bars.

The south extension was added only a week ago when I delivered the necessary data to you.

Since roadway protection will be required during construction of these extensions, a proposed system must be shown on the drawings. Completion date is rushed - 1978-10-15.

FIH:pp  
Attach.

F.I. Hewson,  
Senior Structural Engineer,  
for:  
G.C.E. Burkhardt,  
Head, Structural Section.

c.c. C. Mirza  
D. MacDonald





INVESTIGATION

GEOCRE No. 30 H 12- 126

DIST. 6 REGION CENTRAL

W.P. No. 196-75-06

CONT. No. 79-25

W. O. No.

STR. SITE No. 16-81

HWY. No. 481

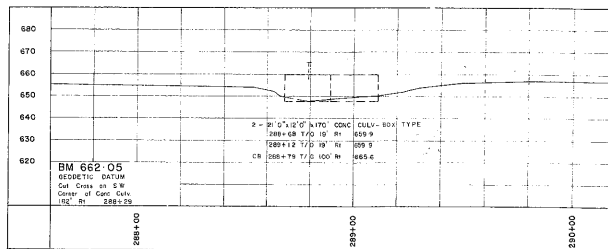
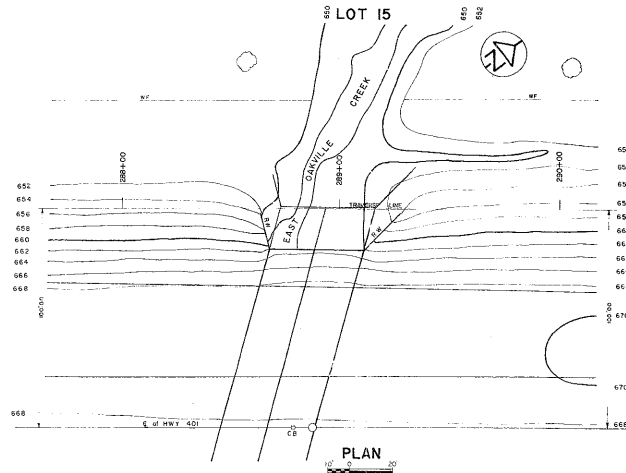
LOCATION EAST OAKVILLE CREEK

CULVERT EXTENSION

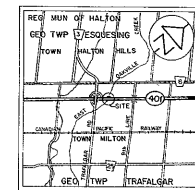
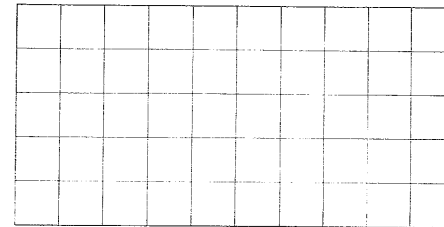
OVERFLOW DETENTION BASIN

REMARKS

REG MUN HALTON  
GEO TWP TRAFALGAR  
CON 8  
LOT 15



DHO PBM 4-66  
EL 666.316  
Elevation is set for in the S face  
of the W pier just N of the  
Highway line and 2'6" above ground  
72' Lx 277'±62



30412-126 E 55

DATE	REVISIONS & ADDITIONS

MINISTRY OF TRANSPORTATION & COMMUNICATIONS  
ENGINEERING AND RIGHT OF WAY OFFICE  
SURVEYS AND PLANS SECTION

**BRIDGE SITE PLAN**

PROPOSED CROSSING  
FOR CULVERT EXTENSION  
EAST OAKVILLE CREEK  
AND  
KINGS HIGHWAY 401

LOT 15  
GEO TWP TRAFALGAR  
TOWN OF HALTON HILLS

CON 8  
REGIONAL MUNICIPALITY  
OF HALTON

SCALE  
AS SHOWN

DISTRICT  
4 - HAMILTON

REGION  
CENTRAL

WP / WD  
146 - 75-06

B - 82-68

C - 82-401-1

Date of Plan  
Nov 1976

Date of Plan  
June 1977

SITE ID-61

Drawn By: E. Fadden

Traced By: A. De Curtis

PLAN E-5446-1