

G.I.-30 SEPT. 1976

GEOCRES No. 30M12-137DIST. 6 REGION W.P. No. 127-66-61CONT. No. 80-37W. O. No. STR. SITE No. 24-371HWY. No. 403LOCATION Central Parkway East
OverpassNo. of PAGES -

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. REMARKS:

CONT 80-37
ENGINEERING MATERIALS OFFICE
SOIL MECHANICS SECTION

WP 127-66-61 DIST 6
HWY 403 STR SITE 24-371
Central Parkway East Overpass

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SAMPLE DISPOSITION NOTICE		
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TUBES	—	—
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FOUNDATION INVESTIGATION REPORT

For

Central Parkway East Overpass
W.P. 127-66-61, Site 24-371
Hwy. 403, District 6, Toronto

INTRODUCTION

This report contains the results of a foundation investigation carried out at the above mentioned location. The fieldwork was done during November 14-16, 1978 utilizing an auger machine equipped with 3½ inch hollow stem and solid stem continuous flight augers. The boreholes ranged in depth from 14.0 to 29.0 feet below the ground surface.

SITE DESCRIPTION AND GEOLOGY

The site is located about 0.6 miles east of Hwy. 10 between Eglinton Avenue and Burnhamthorpe Road in the City of Mississauga, Regional Municipality of Peel. The land is flat to undulating and is primarily used for farming purposes.

The physiographic region of the area is known as the "Peel Plain". The characteristic deposit in this area is composed of a cohesive glacial till underlain by shale bedrock of the Meaford-Dundas formation, Ordovician Period.

SUBSOIL CONDITIONS

General

The predominant stratum across the site is a deposit of glacial till composed of a heterogeneous mixture of hard clayey silt, sand and gravel. This cohesive glacial till deposit is underlain by shale bedrock at a depth of 6.5 to 19.5 feet below ground surface.

The boundaries of the overburden and underlying shale bedrock as determined in the boreholes, are shown on the attached Record of Borehole Sheets. The stratigraphical sections shown on Drawing

No. 1276661-A have been inferred from this data. From ground surface downward, the various soil types encountered are as follows.

Heterogeneous Mixture of Clayey Silt,
Sand and Gravel (Glacial Till)

The predominant stratum across the site is a deposit of glacial till which is heterogeneous in composition. In general, the glacial till is cohesive in nature composed of a heterogeneous mixture of clayey silt, sand and gravel. This deposit was proven to its full depth in all the boreholes and the thickness varies from 6.5 feet (B.H. 6) to 19.5 feet (B.H. 1).

Grain size distribution curves for samples obtained with a 2" O.D. split spoon sampler from this cohesive deposit are shown on Figure 2 in the Appendix. Atterberg Limit Tests were also performed on samples of the glacial till. The results, which are shown on the Record of Borehole Sheets and on the Plasticity Chart (Figure 1), are tabulated below.

		<u>Range</u>
Liquid Limit	(W _L) %	23-34
Plastic Limit	(W _p) %	15-22
Natural Moisture Content	(w) %	7-17

Based on the above values it may be concluded that the cohesive glacial till is inorganic and of low plasticity.

The results of Standard Penetration Tests carried out within the glacial till gave 'N' values ranging from 14 to over 100 blows per foot, generally increasing with depth. Based on these results it is estimated that the consistency of the cohesive glacial till varies from stiff to hard, being generally hard.

Shale Bedrock

The shale bedrock was proven in all the boreholes by taking BXL core samples. The surface of the bedrock was found to vary from elevations 459.8 to 463.7. The bedrock is composed of dark grey shale with occasional layers of limestone. In certain locations the upper 3 to

4.5 feet of the bedrock was found to be weathered. Below this weathered zone or elsewhere the bedrock is sound.

Groundwater Conditions

No groundwater was encountered in the boreholes during the time of field investigations (November, 1978). However, it is believed that the groundwater in this vicinity is controlled by the adjacent ravine which forms a branch of the Cooksville Creek. The water level in the Creek during the period of investigation was at about elevation 468.5. It is, therefore, inferred that the groundwater level within the boreholes will reach the creek water level if observed for a considerable length of time.

DISCUSSION AND RECOMMENDATIONS

General

It is proposed to construct a single span overpass structure at the crossing of new Hwy. 403 and proposed Central Parkway East in the City of Mississauga. The new structure will be 63 feet wide and 168 feet long to accommodate future four lane traffic for Central Parkway East and also eight lane traffic for Hwy. 403. The proposed profile grade of Hwy. 403 at this crossing is at elevation 492.0 while that of Central Parkway East is at elevation 471.5 at the south end and at elevation 472.5 at the north end. To achieve these grades approach embankments up to 22 feet in height and cuts up to 10 feet in depth will be necessary.

The subsoil at the site consists of a cohesive glacial till varying in thickness from 6.5 to 19.5 feet underlain by shale bedrock.

Foundation Considerations

The subsoil is competent and it is, therefore, recommended that the closed type abutment footings can be supported on spread footings located within the hard cohesive glacial till stratum at or below elevation 468.0. At this elevation an allowable bearing pressure up to 4 tsf may be used in designing the footings. In order to fulfill the frost protection requirements, the underside of the footings should be at least 4 feet below the finished grade. In computing the lateral resistance of the footings, an adhesion value of 2000 p.s.f. may be used between the rough concrete surface and glacial till.

The excavations for the footings will be carried out within the cohesive glacial till. In view of the relatively impervious nature of the glacial till, no major dewatering problems are anticipated. Any minor seepage or surface runoff into the excavations could be controlled by pumping from sumps.

The cohesive glacial till subsoil will settle due to the imposed foundation loading. Due to the nature of the subsoil, the settlement will be of a recompression nature and will not exceed half an inch, provided the subsoil is not softened by groundwater seepage

or uncontrolled surface runoff. It may be advantageous to protect the cohesive glacial till at the founding level by covering it with a lean concrete working slab immediately after the completion of the excavation.

Other Considerations

Backfill material behind the abutment walls should be of a free draining granular type of material. In addition, proper drainage measures consisting of weep holes and perforated pipes should be provided in order to prevent build-up of hydrostatic head behind the abutment walls.

In computing the lateral earth pressure exerted on the abutment walls by the granular backfill, a coefficient of earth pressure at rest, $K_0=0.5$, should be used for rigid type abutments. If some movement of the abutment walls is permitted, then a coefficient of active earth pressure, $K_a=0.35$, should be used.

Approaches

The maximum 22 foot approach fill on the east side of the structure can be constructed safely with standard 2:1 side slopes. Prior to placing the fills, the topsoil or any pockets of soft organic material should be subexcavated to the full width and at least for a distance of 50 feet behind the abutments and replaced with suitable fill material according to MTC standards.


The 10 foot cut on the west side of the structure can be constructed with 2:1 slopes. To insure adequate drainage at the site, the excavation of the drainage ditches should be carried out in advance of cut operations.


MISCELLANEOUS

The fieldwork was carried out during November 14-16, 1978 under the supervision of Mr. V. Korlu, Project Engineer, who also prepared this report.

The drilling equipment was owned and operated by Dominion Soil Investigation Ltd. of Toronto.

This report was reviewed by Mr. M. Devata, Supervising Engineer


V. Korlu, P. Eng.
Project Engineer


M. Devata, P. Eng.
Supervising Engineer

January, 1979

APPENDIX



RECORD OF BOREHOLE No 1

W P 127-66-61 LOCATION Coords. N 15 845 572; E 936 651 ORIGINATED BY V.K.
DIST 6 HWY 403 BOREHOLE TYPE 3 1/2" H.S.M.V. COMPILED BY V.K.
DATUM Geodetic DATE November 15, 1978 CHECKED BY *ef*

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20 40 60 80 100							WATER CONTENT (%) 10 20 30
								SHEAR STRENGTH							
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE							
483.2	Ground Level														
0.0	Topsoil														
463.7	Heterogeneous Mixture of Clayey Silt, Sand and Gravel Glacial Till		1	SS	37		480							1 29 55 15	
			2	SS	35										
			3	SS	37										
			4	SS	32		470							17 23 41 19	
			5	SS	168										
			6	SS	123										
19.5	Weathered														
	Sound		7	BXL	100%		460								
454.2	Shale Bedrock														
29.0	End of Borehole														



RECORD OF BOREHOLE No 2

W P 127-66-61 LOCATION Coords. N 15 845 012; E 936 712 ORIGINATED BY V.K.
 DIST 6 HWY 403 BOREHOLE TYPE 3 1/2" H.S.M.V. COMPILED BY V.K.
 DATUM Geodetic DATE November 16, 1978 CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE						
481.1	Ground Level													
0.0	Topsoil													
	Heterogeneous Mixture of Clayey Silt, Sand and Gravel Glacial Till — Brown Grey		1	SS	49									
			2	SS	45									
			3	SS	43									
			4	SS	40									
			5	SS	68									
462.1	Hard													
19.0	Shale Bedrock		6	BXL	100% Rec									
457.1														
24.0	End of Borehole													

OFFICE REPORT ON SOIL EXPLORATION



RECORD OF BOREHOLE No 3

W P 127-66-61 LOCATION Coords. N 15 844 954; E 936 773 ORIGINATED BY V.K.
DIST 6 HWY 403 BOREHOLE TYPE 3 1/2" H.S.M.V. COMPILED BY V.K.
DATUM Geodetic DATE November 16, 1978 CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES								
478.4	Ground Level												
0.0	Topsoil												
	Heterogeneous Mixture of Clayey Silt, Sand and Gravel Glacial Till		1	SS	31		470						19 22 43 16
			2	SS	35								
			3	SS	42								
	Brown		4	SS	22								
	Grey		5	SS	126		460						20 18 46 16
462.4	Very Stiff to Hard		6	BXL	100% Rec								
16.0	Weathered												
	Sound												
454.4	Shale Bedrock												
24.0	End of Borehole						450						



RECORD OF BOREHOLE No 4

W P 127-66-61 LOCATION Coords. N 15 845 120; E 936 690 ORIGINATED BY V.K.
DIST 6 HWY 403 BOREHOLE TYPE 3 1/2" H.S.M.V. COMPILED BY V.K.
DATUM Geodetic DATE November 14, 1978 CHECKED BY *W.J.*

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT Y	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20 40 60 80 100	SHEAR STRENGTH	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L		
472.3	Ground Level													
0.0	Topsoil													
	Heterogeneous Mixture of Clayey Silt, Sand and Gravel		1	SS	14		470							5 24 44 25
	Brown		2	SS	38									
	Grey		3	SS	92									
459.8	Glacial Till		4	SS	100/	2"	460							34 19 36 11
12.5	Stiff to Hard													
	Weathered													
	Sound		5	BXL	100% Rec									
452.3	Shale Bedrock													
20.0	End of Borehole						450							

OFFICE REPORT ON SOIL EXPLORATION



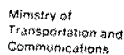
RECORD OF BOREHOLE No 5

W P 127-66-61 LOCATION Coords. N 15 845 063; E 936 750 ORIGINATED BY V.K.
DIST 6 HWY 403 BOREHOLE TYPE 3 1/2" H.S.M.V. COMPILED BY V.K.
DATUM Geodetic DATE November 14, 1978 CHECKED BY W.J.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
471.6	Ground Level																
0.0	Topsoil																
	Heterogeneous Mixture of Clayey Silt, Sand and Gravel Glacial Till		1	SS	18		470										
			2	SS	50												
462.1	Very Stiff to Hard		3	SS	100/3"												
9.5	Weathered		4	BXL	75%		460										
457.6	Sound, Shale Bedrock																
14.0	End of Borehole																

+3, x5: Numbers refer to
Sensitivity

20
15-5 (%) STRAIN AT FAILURE
10



RECORD OF BOREHOLE No 6

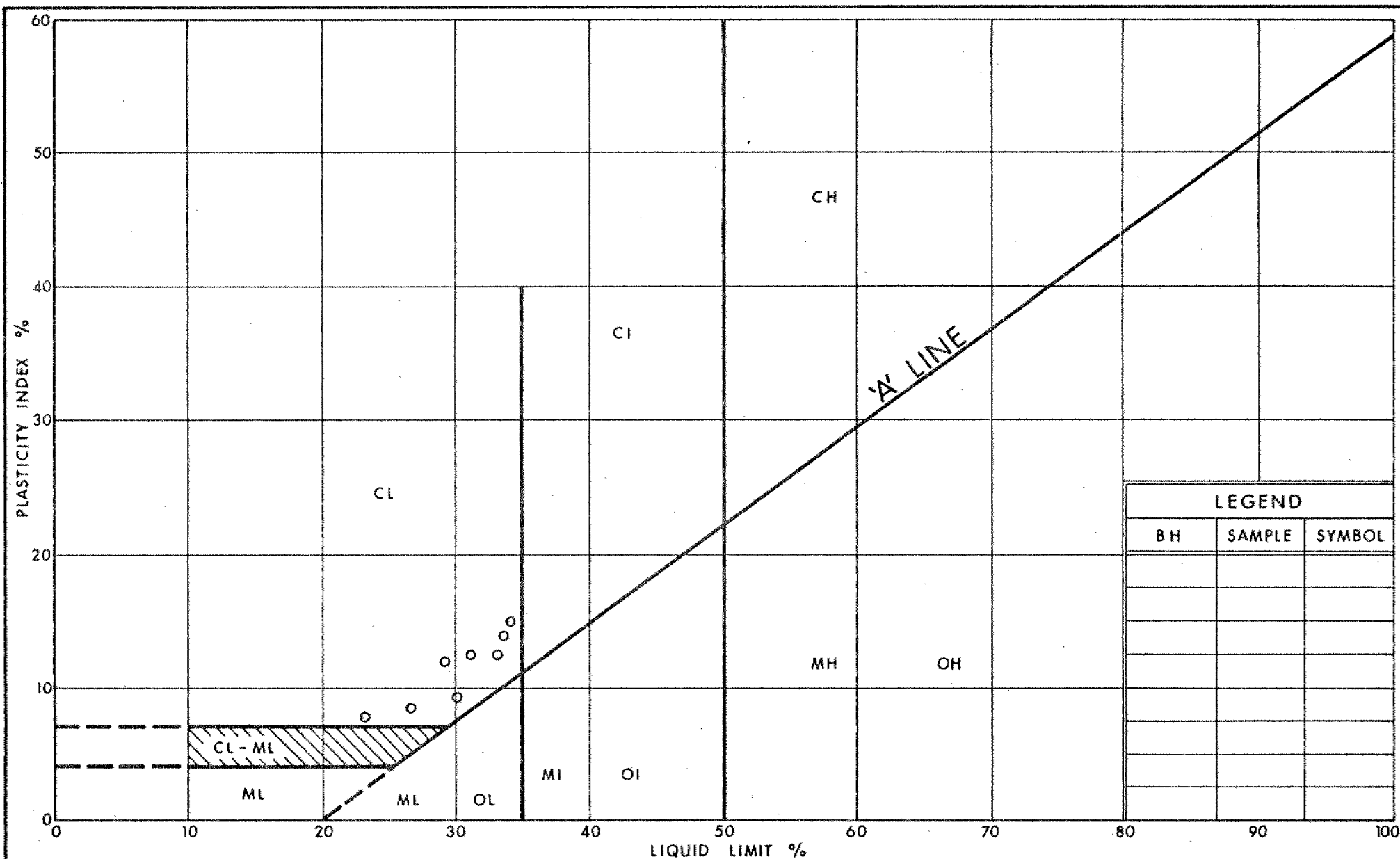
W P 127-66-61 LOCATION Coords. N 15 845 004; E 936 810 ORIGINATED BY V.K.
DIST 6 HWY 403 BOREHOLE TYPE 3 1/2" H.S.M.V. COMPILED BY V.K.
DATUM Geodetic DATE November 14, 1978 CHECKED BY wpf

[illegible]

+3, x5: Numbers refer to Sensitivity

15 \pm 5 (%) STRAIN AT FAILURE

OFFICE REPORT ON SOIL EXPLORATION

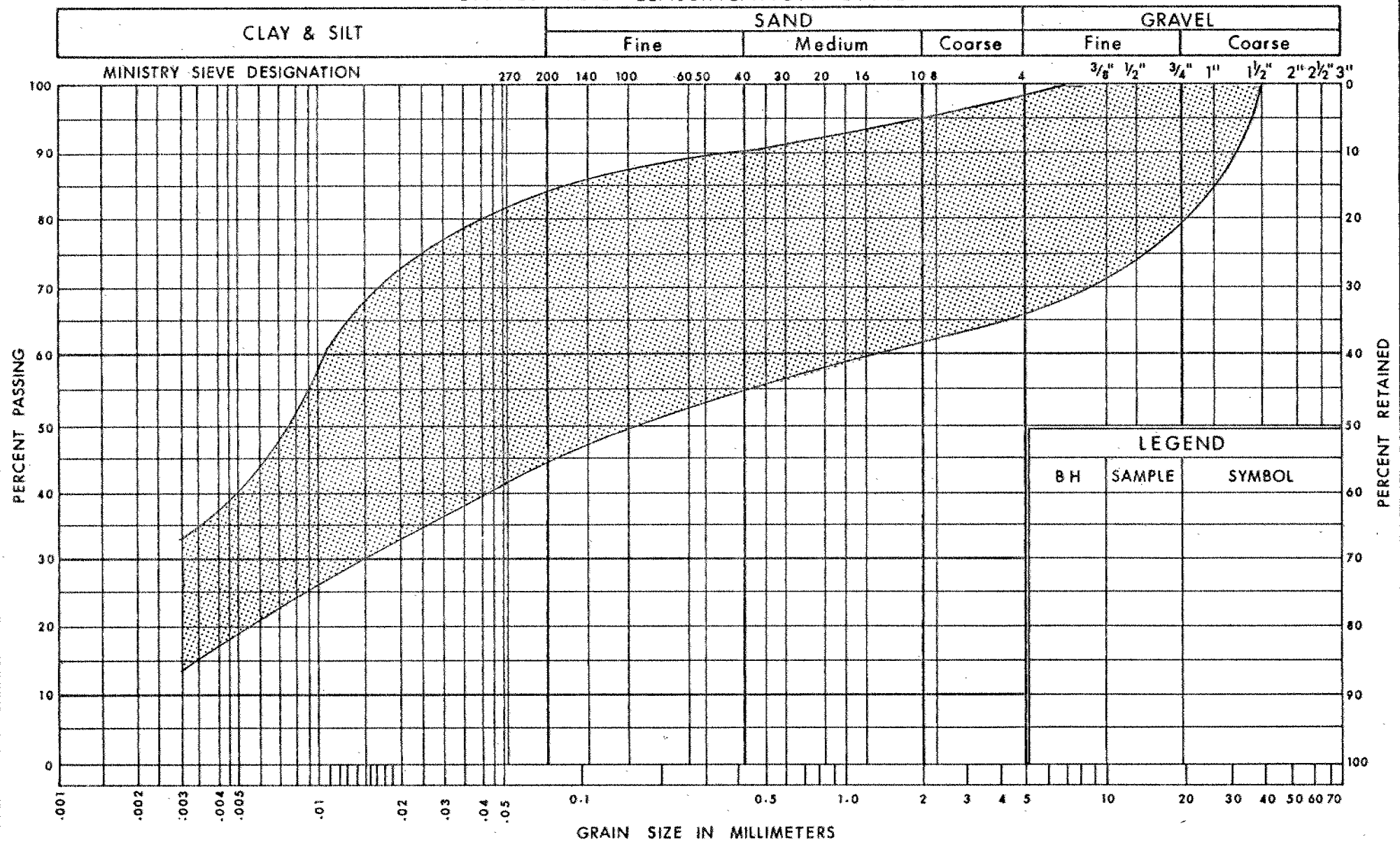


Ministry of
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Ontario
ENGINEERING SERVICES BRANCH

PLASTICITY CHART GLACIAL TILL HET MIX OF CLAYEY SILT SAND & GRAVEL

FIG No 1
W P 127-66-61

UNIFIED SOIL CLASSIFICATION SYSTEM



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Communications
Ontario
ENGINEERING SERVICES BRANCH

GRAIN SIZE DISTRIBUTION
GLACIAL TILL
HET MIX OF CLAYEY SILT SAND & GRAVEL

FIG No 2

W P 127-66-61

EXPLANATION OF TERMS USED IN REPORT

'N' VALUE: AN INDICATOR OF SUBSOIL QUALITY. IT IS OBTAINED FROM THE STANDARD PENETRATION TEST (CSA STD. A119.1). SPT 'N' VALUE IS THE NUMBER OF BLOWS REQUIRED TO CAUSE A STANDARD 2 INCH O.D. SPLIT-BARREL SAMPLER TO PENETRATE 12 INCHES INTO UNDISTURBED GROUND IN A BOREHOLE WHEN DRIVEN BY A HAMMER WEIGHING 140 POUNDS, FALLING FREELY A DISTANCE OF 30 INCHES. FOR PENETRATIONS OF LESS THAN 12 INCHES 'N' VALUES ARE INDICATED AS THE NUMBER OF BLOWS FOR THE PENETRATION ACHIEVED. 'N' VALUES CORRECTED FOR OVERBURDEN PRESSURE ARE DENOTED THUS N_c .

DYNAMIC CONE PENETRATION TEST (CSA STD. A119.3): CONTINUOUS PENETRATION OF A CONICAL STEEL POINT (2" O.D. 60 CONE ANGLE) DRIVEN BY 350 FT-LB IMPACTS ON "A" SIZE DRILL RODS. THE RESISTANCE TO CONE PENETRATION IS MEASURED AS THE NUMBER OF BLOWS FOR EACH 12 INCH ADVANCE OF THE CONICAL POINT INTO THE UNDISTURBED GROUND.

SOIL QUALITY: SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSITY.

CONSISTENCY: COHESIVE SOILS ARE DESCRIBED ON THE BASIS OF THEIR UNDRAINED SHEAR STRENGTH AS FOLLOWS:

S_u (PSF)	0 - 250	250 - 500	500 - 1000	1000 - 2000	2000 - 4000	> 4000
	VERY SOFT	SOFT	MEDIUM	STIFF	VERY STIFF	HARD

DENSENESS: COHESIONLESS SOILS ARE DESCRIBED ON THE BASIS OF SPT 'N' VALUES AS FOLLOWS:

'N' (BLOW/FT)	0 - 5	5 - 10	10 - 30	30 - 50	> 50
	VERY LOOSE	LOOSE	COMPACT	DENSE	VERY DENSE

ROCK QUALITY: ROCKS ARE DESCRIBED BY THEIR COMPOSITION AND STRUCTURAL FEATURES AND/OR STRENGTH.

RECOVERY: SUM OF ALL RECOVERED ROCK CORE PIECES FROM A CORING RUN EXPRESSED AS A PERCENT OF THE TOTAL LENGTH DRILLED IN THAT CORING RUN.

MODIFIED RECOVERY: SUM OF THOSE NATURALLY FRACTURED CORE PIECES, 4" IN LENGTH EXPRESSED AS A PERCENT OF THE LENGTH OF THE CORING RUN. THE ROCK QUALITY DESIGNATION (RQD), FOR MODIFIED RECOVERY, IS:

RQD (%)	0 - 25	25 - 50	50 - 75	75 - 90	90 - 100
	VERY POOR	POOR	FAIR	GOOD	EXCELLENT

JOINTING AND BEDDING:

SPACING	2"	2" - 12"	1' - 3'	3' - 10'	> 10'
JOINTING	VERY CLOSE	CLOSE	MOD. CLOSE	WIDE	VERY WIDE
BEDDING	VERY THIN	THIN	MEDIUM	THICK	VERY THICK

ABBREVIATIONS & SYMBOLS

LABORATORY TESTING

TRIAXIAL TESTS ARE DESCRIBED IN TERMS OF WHETHER THEY ARE CONSOLIDATED (C) OR NOT (U) ISOTROPICALLY (I) OR NOT (A) AND SHEARED DRAINED (D) OR UNDRAINED (U) WITH PORE PRESSURE MEASUREMENTS (BAR OVER SYMBOLS) EG. \bar{C}_{IU} = CONSOLIDATED ISOTROPIC UNDRAINED TRIAXIAL WITH PORE PRESSURE MEASUREMENT UNLESS OTHERWISE SPECIFIED IN REPORT ALL TESTS ARE IN COMPRESSION

FIELD SAMPLING

S S SPLIT SPOON
W S WASH SAMPLE
S T SLOTTED TUBE SAMPLE
B S BLOCK SAMPLE
C S CHUNK SAMPLE
T W THINWALL OPEN
T P THINWALL PISTON
O S OSTERBERG SAMPLE
F S FOIL SAMPLE
R C ROCK CORE
F H T.W. ADVANCED HYDRAULICALLY
P M T.W. ADVANCED MANUALLY

EARTH PRESSURE TERMS

μ COEFFICIENT OF FRICTION
 δ ANGLE OF WALL FRICTION
 k_o COEFFICIENT OF EARTH PRESSURE AT REST
 k_A COEFFICIENT OF ACTIVE EARTH PRESSURE
 k_P COEFFICIENT OF PASSIVE EARTH PRESSURE
 i ANGLE OF INCLINATION OF SURCHARGE
 w SLOPE ANGLE-BACKFACE OF WALL
 β ANGLE OF SLOPE
 N_q, N_c, N_u BEARING CAPACITY FACTORS
 D_f DEPTH OF FOOTING
 B, L FOOTING DIMENSIONS

INDEX PROPERTIES

γ UNIT WEIGHT OF SOIL (BULK DENSITY)
 γ_w UNIT WEIGHT OF WATER
 γ_d UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
 γ' UNIT WEIGHT OF SUBMERGED SOIL
 G_s SPECIFIC GRAVITY OF SOLIDS
 e VOIDS RATIO
 e_o INITIAL VOIDS RATIO
 e_{max} e IN LOOSEST STATE
 e_{min} e IN DENSEST STATE
 D_r RELATIVE DENSITY = $\frac{e_{max} - e}{e_{max} - e_{min}}$
 n POROSITY
 w WATER CONTENT
 w_L LIQUID LIMIT
 w_P PLASTIC LIMIT
 w_S SHRINKAGE LIMIT
 I_P PLASTICITY INDEX = $w_L - w_P$
 I_L LIQUIDITY INDEX = $\frac{w - w_P}{I_P}$
 I_c CONSISTENCY INDEX = $\frac{w_L - w}{I_P}$
 A_c ACTIVITY = $\frac{I_P \text{ of soil}}{I_P \text{ of 2.0 } \mu m \text{ Soil fraction}}$
 O_m ORGANIC MATTER CONTENT
 S_r DEGREE OF SATURATION
 S SENSITIVITY = $\frac{S_u \text{ (undisturbed)}}{S_u \text{ (remoulded)}}$

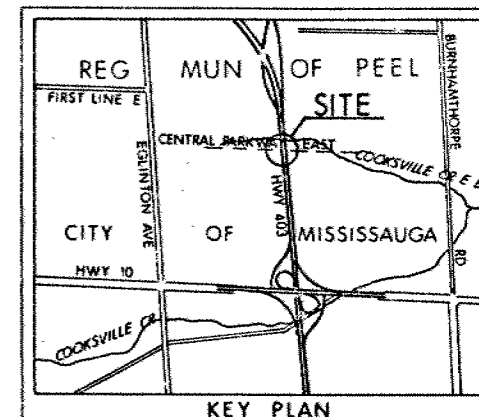
STRENGTH PARAMETERS

ϕ ANGLE OF SHEARING RESISTANCE
 τ_f PEAK SHEAR STRENGTH
 τ_R RESIDUAL SHEAR STRENGTH
 c COHESION INTERCEPT
 $\sigma_1, \sigma_2, \sigma_3$ NORMAL PRINCIPAL STRESSES
 u PORE WATER PRESSURE
 u_o EXCESS u
 r_u PORE PRESSURE RATIO
 q_u UNCONFINED COMPRESSIVE STRENGTH
 s_u UNDRAINED SHEAR STRENGTH
 ϵ LINEAR STRAIN
 γ SHEAR STRAIN
 ν POISSON'S RATIO
 E MODULUS OF ELASTICITY
 G MODULUS OF SHEAR DEFORMATION
 k_s MODULUS OF SUBGRADE REACTION
 m, n STABILITY COEFFICIENTS
 A, B PORE PRESSURE COEFFICIENTS

NOTE: EFFECTIVE STRESS PARAMETERS ARE DENOTED BY USE OF APOSTROPHE ABOVE THE SYMBOL, THUS:
 σ' = EFFECTIVE ANGLE OF SHEARING RESISTANCE;
 σ'_1 = EFFECTIVE NORMAL STRESS

HYDRAULIC TERMS

h HYDRAULIC HEAD OR POTENTIAL
 q RATE OF DISCHARGE
 v VELOCITY OF FLOW
 i HYDRAULIC GRADIENT
 j SEEPAGE FORCE PPS UNIT VOLUME
 η COEFFICIENT OF VISCOSITY
 k COEFFICIENT OF HYDRAULIC CONDUCTIVITY
 k_h k IN HORIZONTAL DIRECTION
 k_v k IN VERTICAL DIRECTION
 α_v COEFFICIENT OF VOLUME CHANGE
 α_v COEFFICIENT OF CONSOLIDATION
 C_c COMPRESSION INDEX
 C_r RECOMPRESSION INDEX
 d DRAINAGE PATH DISTANCE
 T_v TIME FACTOR
 U DEGREE OF CONSOLIDATION
 U_v OVERCONSOLIDATION RATIO (OCR)



LEGEND

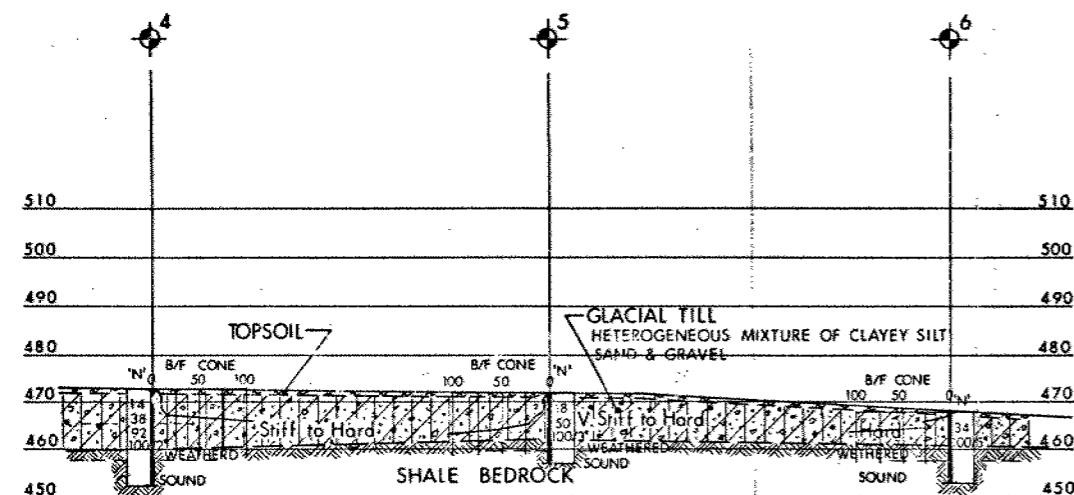
- Bore Hole
- ⊕ Dynamic Cone Penetration Test (Cone)
- ⊕ Bore Hole & Cone
- 'N' Blows/ft (Std Pen Test 350 ft lbs energy)
- CONE Blows/ft (60° Cone, 350 ft lbs energy)
- ↓ WL at time of investigation
NO WL encountered NOV 1978

No	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	483.2	15 845 572	936 651
2	481.1	15 845 012	936 712
3	478.4	15 844 954	936 773
4	472.3	15 845 120	936 690
5	471.6	15 845 663	936 750
6	467.9	15 845 004	936 810

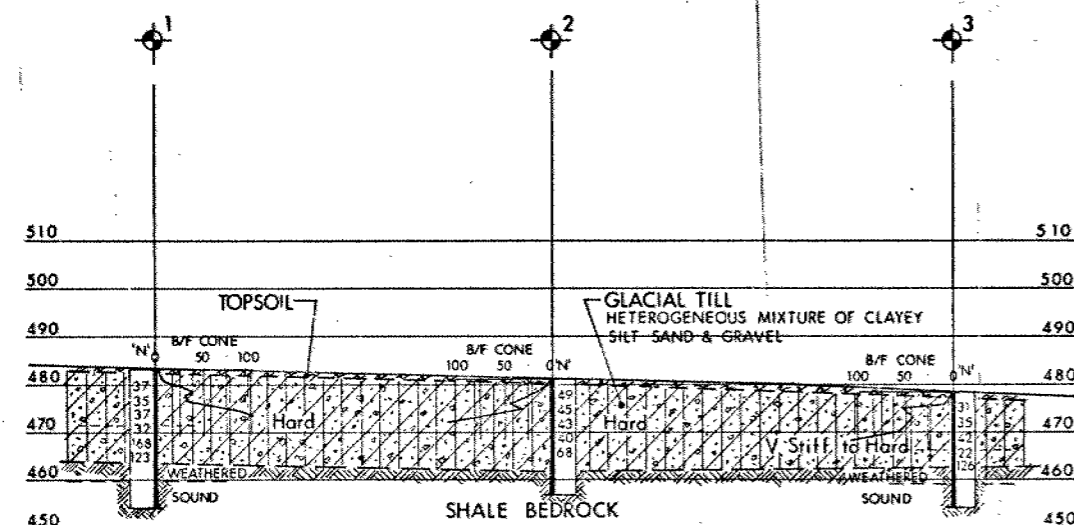
NOTE

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

DATE	BY	DESCRIPTION

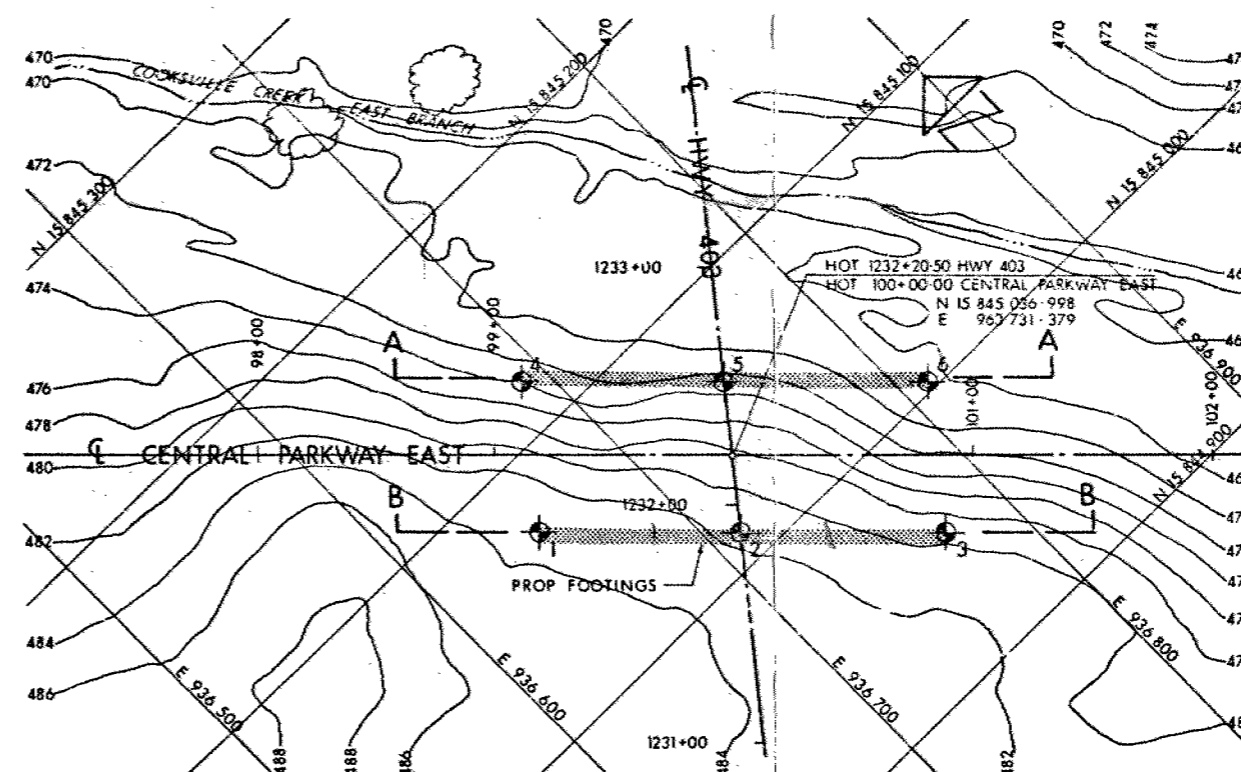


A-A



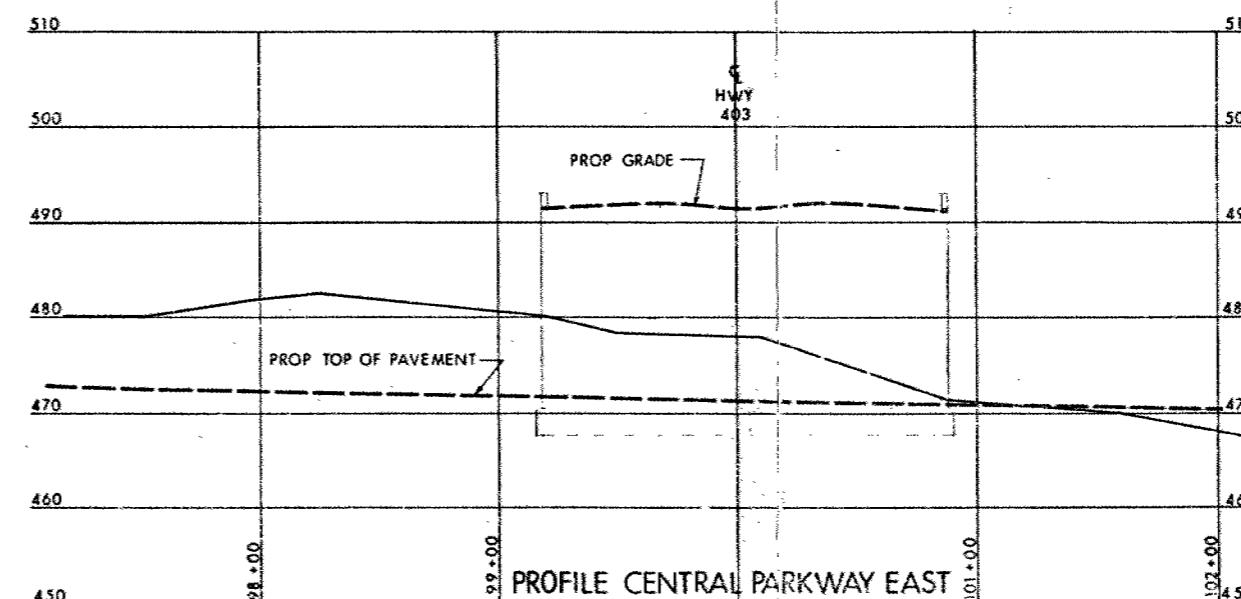
B-B
SECTIONS

SCALE
20 10 0 20 FT



PLAN

SCALE
40 20 0 40 FT



SCALE
HOR 40 20 0 40 FT
VERT 10 5 0 10 FT

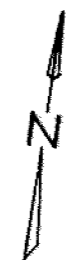
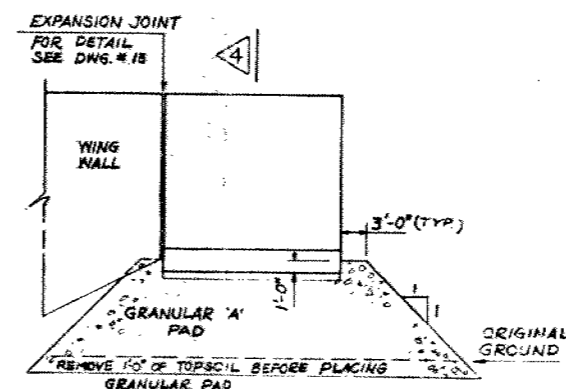


Diagram illustrating a roof assembly with a central vertical pipe and two side sections, each labeled 5'-0". The roof surface is labeled GRANULAR. A 1:12 pitch is indicated on the right side.

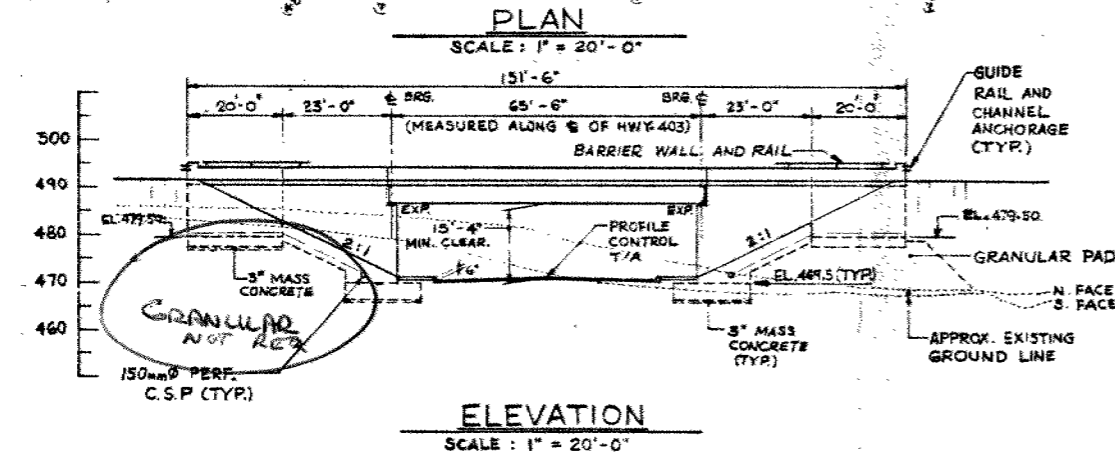
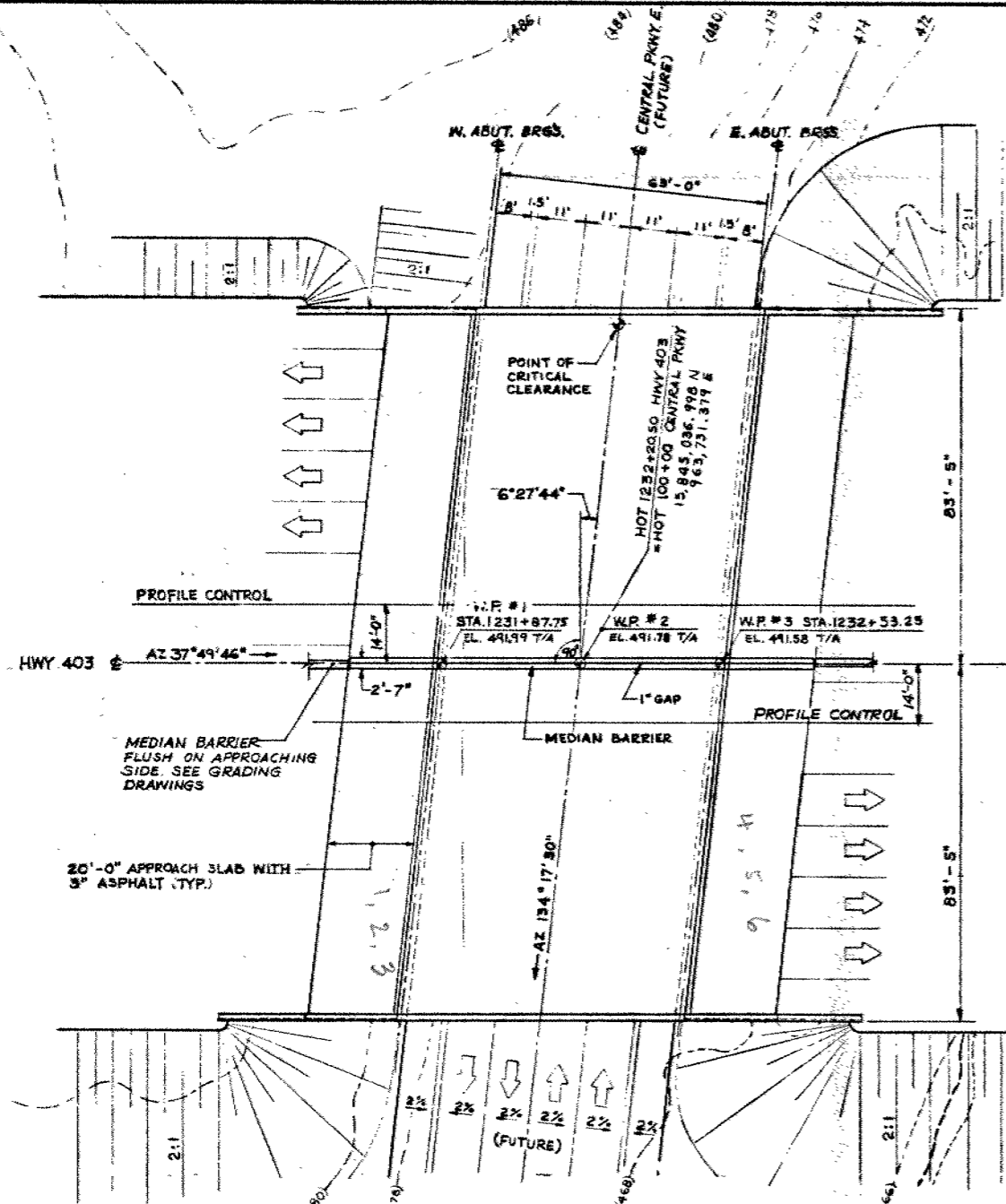


USE SCALE BELOW

0 1 2

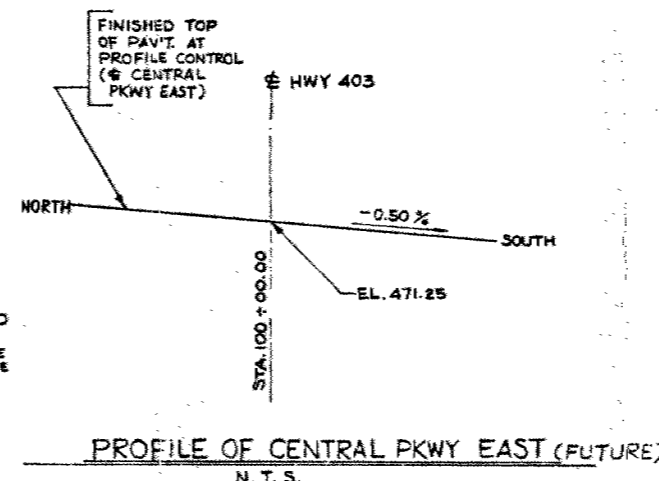
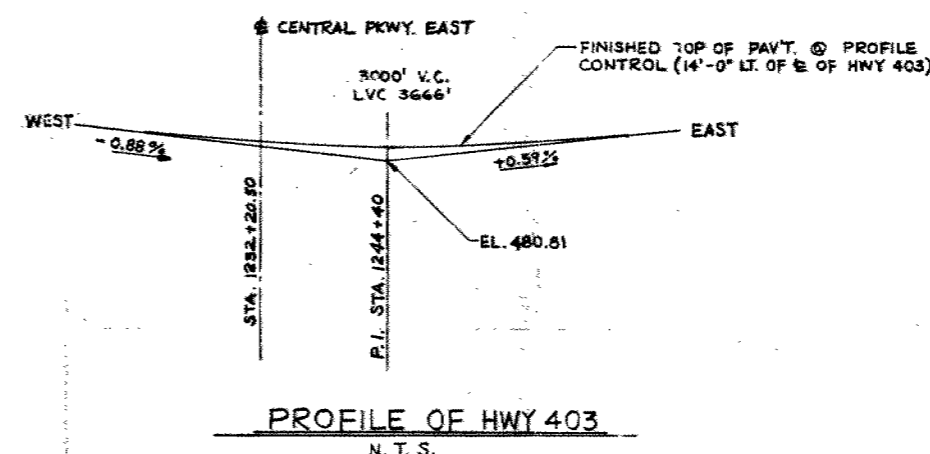
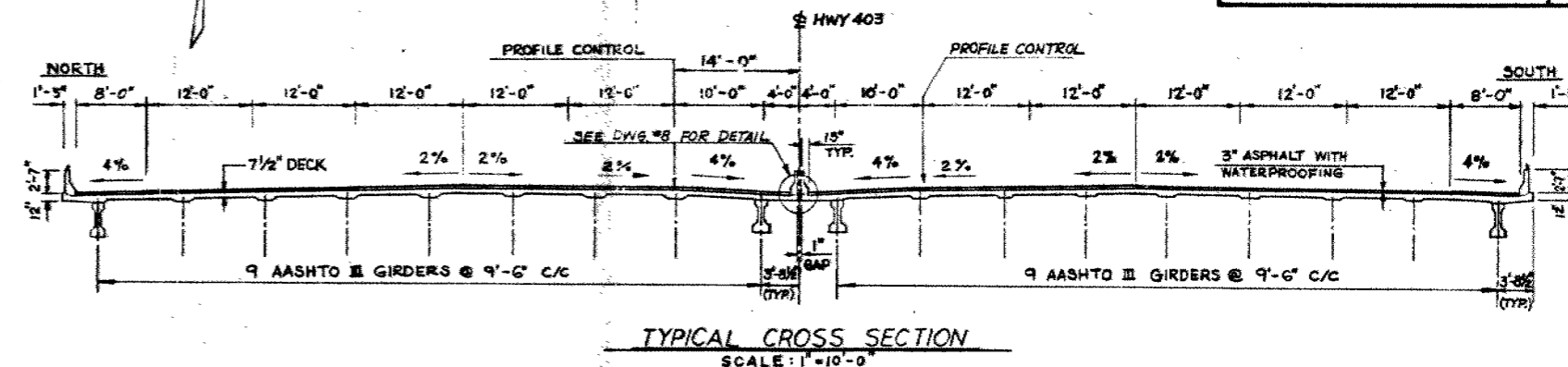
3 INCHES ON ORIGINAL PLAN

DE 75-1000-100-11-20



BM EL 488.86
 TOP RIGHT BOLT ON SOUTH WEST CORNER
 OF SOUTH FACE OF FOURTH HYDRO TOWER
 (SOUTH LINE) EAST OF HWY 10 (FIFTH
 TOWER WEST OF CANTHRA RD) 372'
 LEFT OF STA. 1228+80.

NOTE:
 W.P. = WORKING POINT
 T/A = TOP OF FINISHED ASPHALT
 WEARING SURFACE



NOTES

CLASS OF CONCRETE

PRESTRESSED GIRDERS	40 MPa
DECK, DIAPHRAGMS, BARRIER WALLS	30 MPa
REMAINDER	20 MPa

CLEAR COVER TO REINF. STEEL

FOOTINGS	3"
ABUTMENTS	3"
DECK	2" TOP, 1 1/2" BOTTOM
BARRIER WALLS	1 1/2"
APPROACH SLABS	2"
OR AS NOTED ON THE DRAWINGS.	

CONSTRUCTION NOTES

THE CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BEARING SEATS DEAD LEVEL TO THE SPECIFIED ELEVATIONS WITH A TOLERANCE OF $\pm 1/8"$. NO CONCRETE SHALL BE PLACED ABOVE THE ABUTMENT BEARING SEATS UNTIL CONCRETE IN THE DECK HAS BEEN PLACED.

REINFORCING STEEL

GRADE 400 REINFORCING BARS WITH THE DESIGNATION 'C' AT THE END OF BAR MARKS SHALL BE COATED BARS.

*TO ACHIEVE THE MINIMUM CLEAR COVER OF 2" SPECIFIED THE TOP LAYER DECK REINFORCING SHALL BE PLACED PRIOR TO CONCRETING WITH A CLEAR COVER OF $2 1/2" \pm 1/2"$ TOLERANCE

LIST OF DRAWINGS

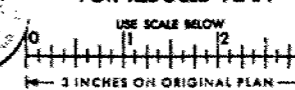
- 24-371-1 GENERAL PLAN
- 2 BOREHOLE LOCATIONS & SOILS STRATA
- 3 FOOTING LAYOUT & REINFORCEMENT
- 4 ABUTMENTS - DIMENSIONS & REINF.
- 5 ABUTMENTS - DIMENSIONS & REINF.
- 6 WING WALLS & RETAINING WALLS
- 7 PRESTRESSED GIRDERS & BEARINGS
- 8 DECKS - REINFORCEMENT
- 9 BARRIER WALLS
- 10 MEDIAN BARRIER
- 11 RAILING FOR BARRIER WALLS
- 12 20 FT. APPROACH SLABS
- 13 AS CONSTRUCTED ELEV. & DIMENSIONS
- 14 STANDARD DETAILS I
- 15 STANDARD DETAILS II

CONCRETE QUANTITIES (FOR LUMP SUM CONCRETE ITEMS)

1. CONCRETE IN ABUTMENTS, WING WALLS & RETAINING WALLS - 983 C.Y.
2. CONCRETE IN DECK & DIAPHRAGMS - 321 C.Y.
3. CONCRETE IN BARRIER WALLS - 40 C.Y.
4. CONCRETE IN APPROACH SLABS - 204 C.Y.



FOR REDUCED PLAN



REVISIONS	DATE	BY	DESCRIPTION

DESIGN ALL CHECK
 DRAWING ALL CHECK
 LOADING HS 20-44
 SITE No 24-371
 DATE SEP. 79
 DWG 1



Memorandum

To: Mr. C.S. Grebski,
Head, Central Section,
Structural Office,
West Building.

Attention: Mr. W. Lim

Our File Ref.

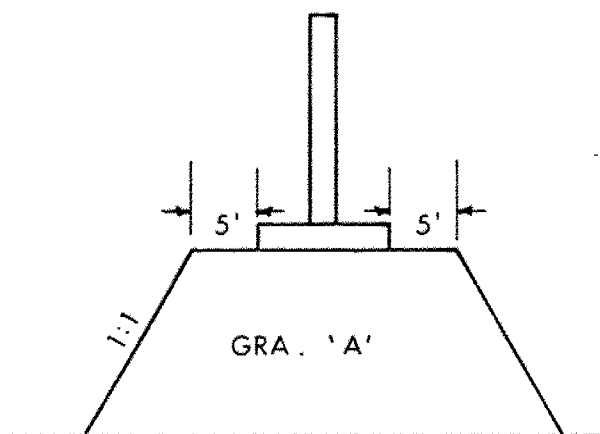
From: Soils Mechanics Section,
Engineering Materials Office,
Room 315, Central Building.

Date: 79-05-03

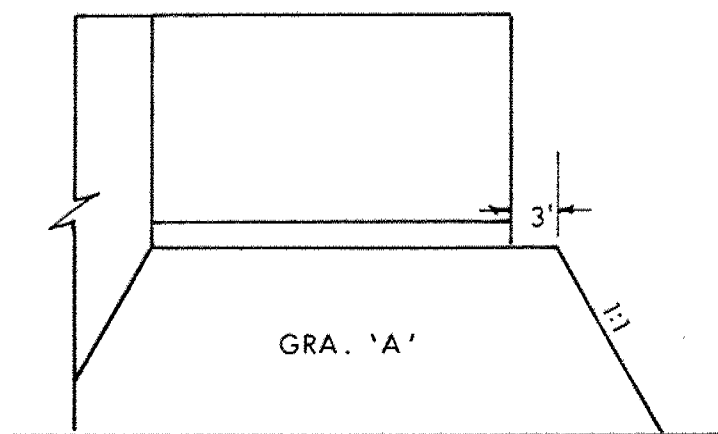
In Reply to

Subject: Central Parkway E. Overpass,
W.P. 127-66-61, Site 24-371,
District 6

We have reviewed the Preliminary Bridge Plan Drawing 24-371-P1. The footing design appears to be satisfactory. The dimensions of the granular pad for the east abutment wing walls should be as shown below.



CROSS-SECTION TYP.



SIDE VIEW TYP.

B. Ly
B. Ly,
Senior Engineer.

For: M. Devata,
Supervising Engineer.

c.c.: G.C.E. Burkhardt
D.A. MacDonald
M.R. Ernesaks