

GEOCRES No. 30M12-175

DIST. 4 REGION

W.P. No. 197-77-09

CONT. No.

W. O. No.

STR. SITE No. 10-82-329

HWY. No. 403

LOCATION TRAFALGAR RD
OVERPASS

NO. OF PAGES -

=====

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.

REMARKS:

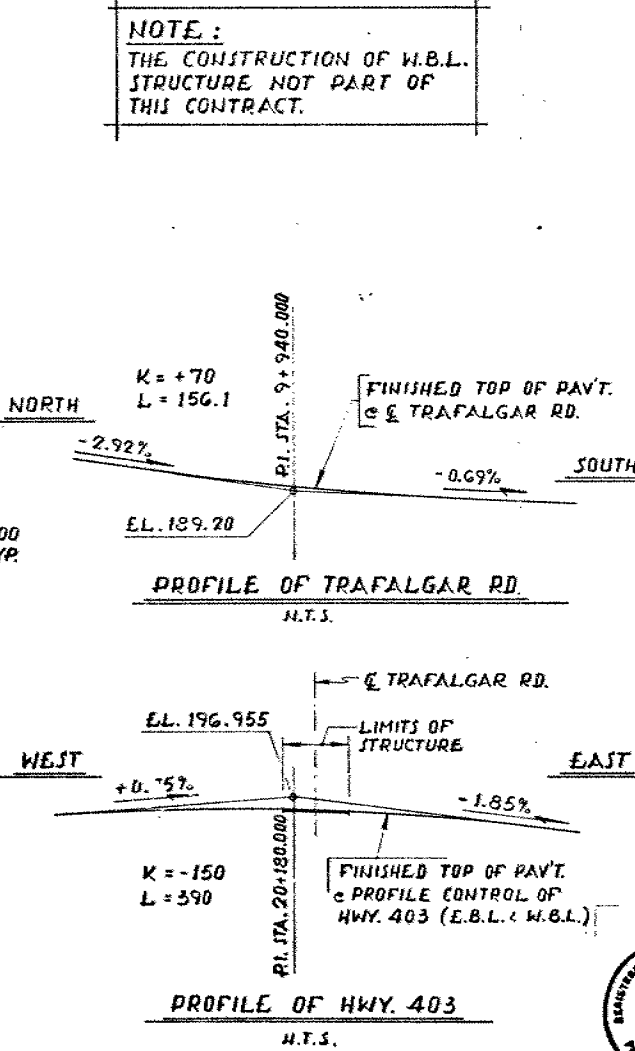
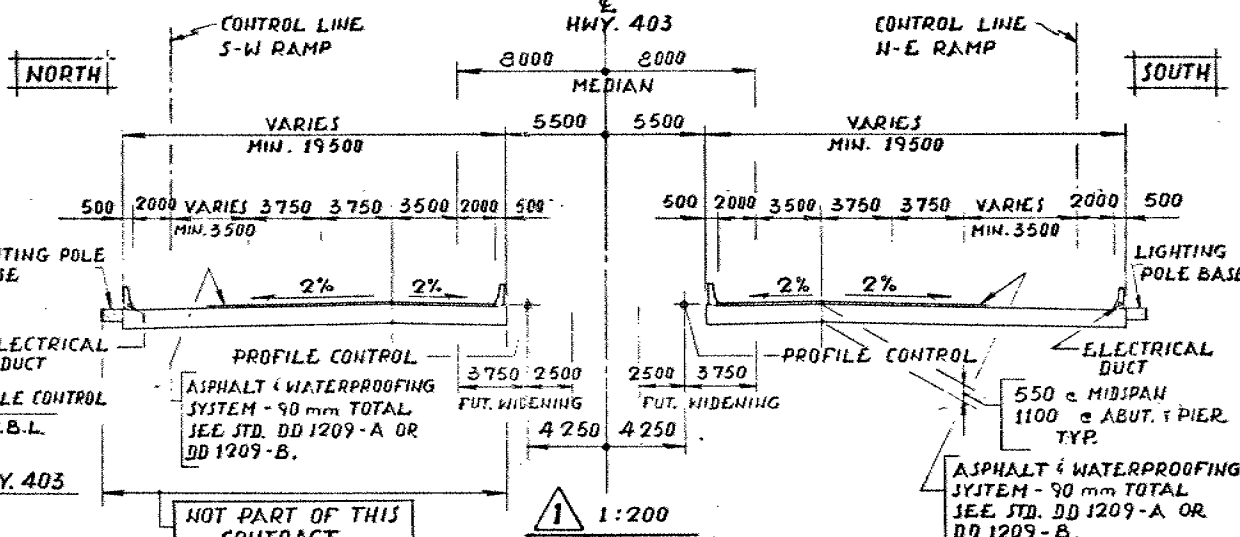
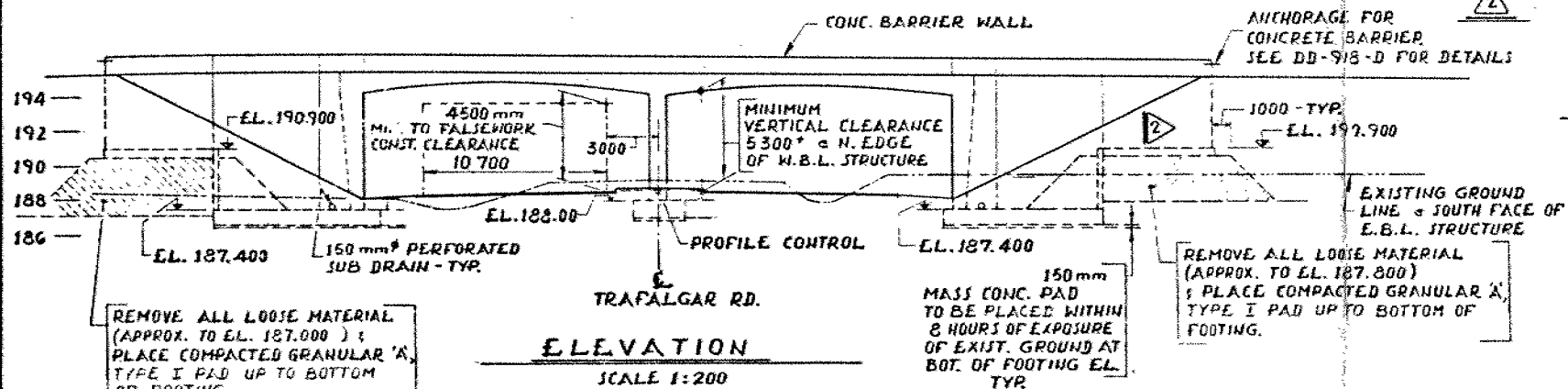
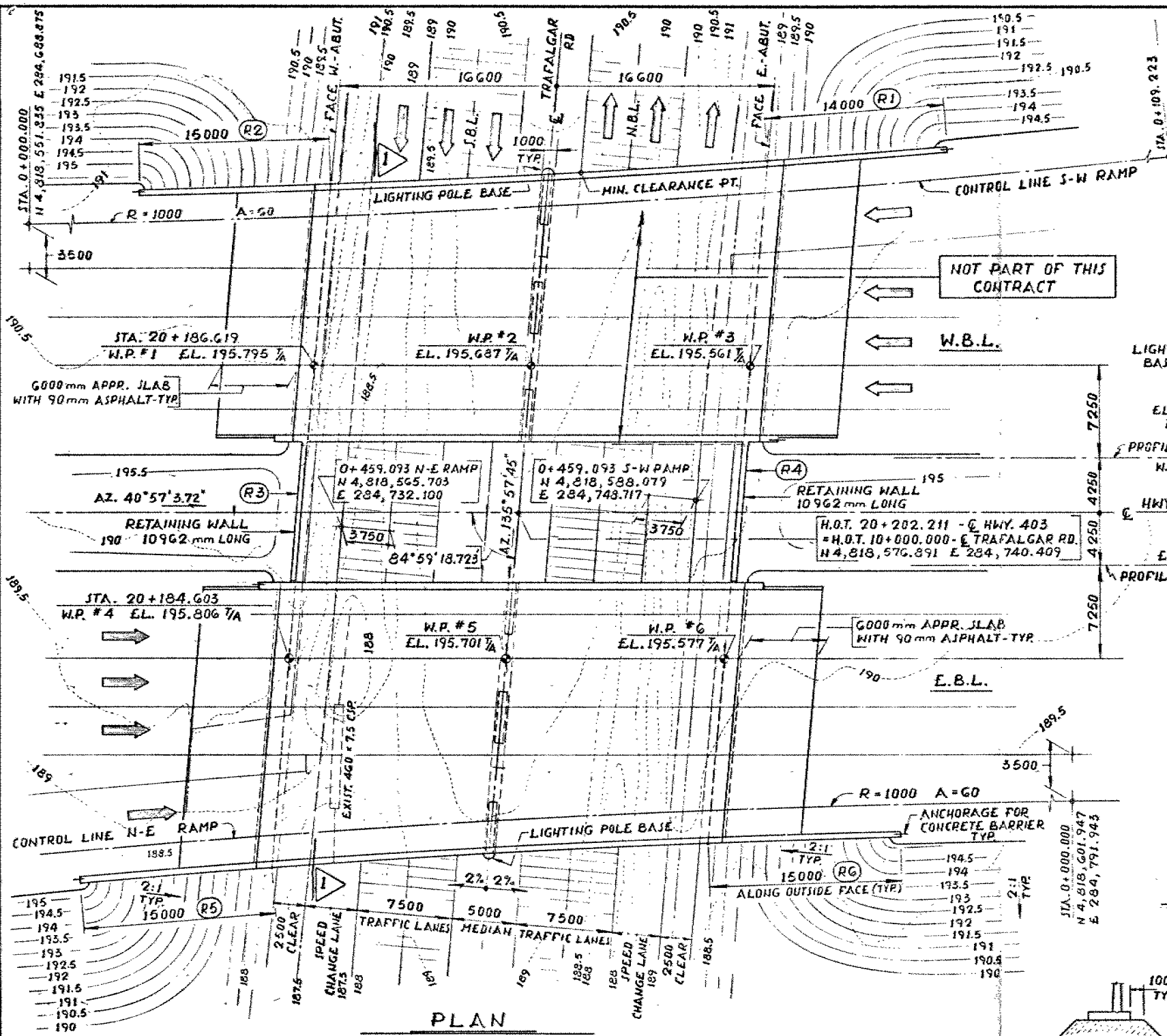
DIST. 4
CONT No
WP No 197-77-09
TRAFALGAR ROAD OVERPASS
GENERAL ARRANGEMENT

SHEET

METRIC

DIMENSIONS ARE IN MILLIMETRES
UNLESS OTHERWISE SHOWN.
ELEVATIONS, COORDINATES, CURVE
AND ALIGNMENT DATA ARE IN METRES.
STATIONS ARE IN KILOMETRES + METRES.

NOTE:
• W.P. DENOTES WORKING POINT.
• T/A DENOTES TOP OF ASPHALT.



GENERAL NOTES

CLASS OF CONCRETE

- FOOTINGS, RETAINING WALLS } 20 MPa
- APPROACH SLABS
- REMAINDER 30 MPa

REINFORCING STEEL

- REINFORCING STEEL SHALL BE GRADE 400 UNLESS OTHERWISE SPECIFIED. BARS MARKED WITH THE SUFFIX 'C' SHALL BE COATED BARS.

CLEAR COVER TO REINFORCING STEEL

- FOOTINGS 100 ± 25 mm
- FRAME LEGS, WINGWALLS 80 ± 20 mm
- RETAINING WALLS & PIERS 70 ± 20 mm
- DECK SLAB TOP 50 ± 10 mm
- BOTTOM 70 ± 20 mm

BARRIER WALLS & APPR. SLABS EXCEPT AS OTHERWISE NOTED

CONSTRUCTION NOTES

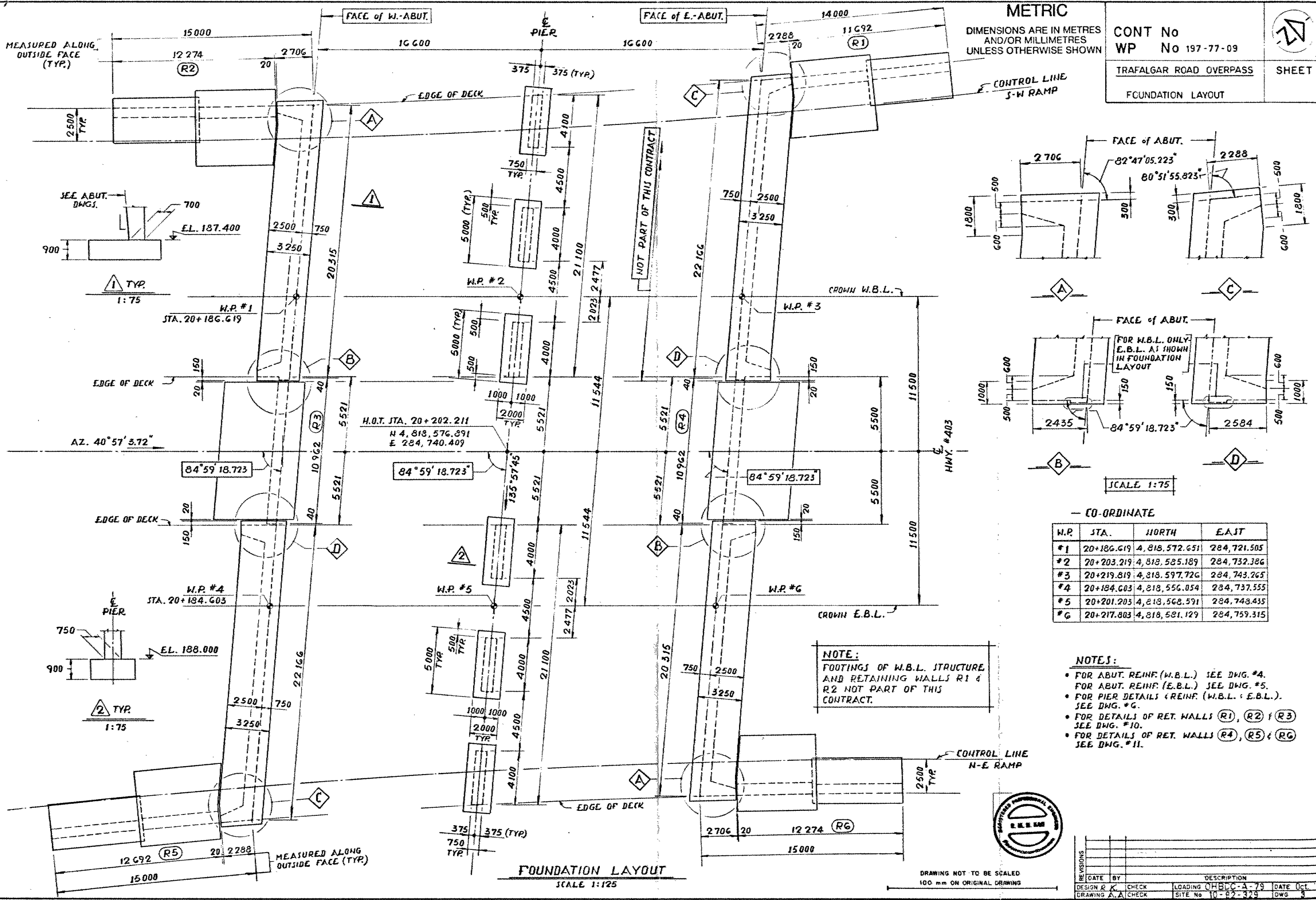
- BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH FRAME LEGS, KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATIONS BE GREATER THAN 500 mm.

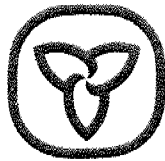
LIST OF DRAWINGS

- GENERAL ARRANGEMENT
- BORE HOLE LOCATIONS & SOIL STRATA
- FOUNDATION LAYOUT
- ABUTMENT REINF. - W.B.L.
- ABUTMENT REINF. - E.B.L.
- PIER DETAILS & REINF. (W.B.L. & E.B.L.)
- DECK DETAILS
- DECK REINF. - W.B.L.
- DECK REINF. - E.B.L.
- RETAINING WALLS 1, 2 & 3
- RETAINING WALLS 4, 5 & 6
- BARRIER WALL - W.B.L.
- BARRIER WALL - E.B.L.
- 6000 mm APPROACH SLAB
- STANDARD DETAILS
- BRIDGE DATA & SITE NUMBER DATA
- AS CONSTRUCTED ELEV. & DIM.
- ELECTRICAL EMBEDDED WORK.
- QUANTITIES - STRUCTURE



REVISIONS	DATE	BY	DESCRIPTION
DESIGN A	CHECK	LOADING	DATE
DRAWING A	CHECK	SITE	DATE





Ontario

Ministry of
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*FILE
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foundation investigation and design report

ENGINEERING MATERIALS OFFICE
PAVEMENT & FOUNDATION DESIGN SECTION

WP 197-77-09

DIST 4

HWY 403

STR SITE 10-82-329

Trafalgar Road Overpass (E.B. and W.B.)

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GEOCRES

30M12-175

DATE

JAN 26 1983

FOUNDATION INVESTIGATION REPORT

For

W.P. 197-77-09; Site 10-82-329

Trafalgar Road Overpass (E.B. and W.B.)

Hwy. #403, District 4, Hamilton

INTRODUCTION:

This report summarizes the results of the foundation investigations required for the proposed structures.

The fieldwork was conducted during the period from 82 11 22-23 utilizing a continuous flight auger machine equipped with 82 mm I.D. hollow-stem augers and an AX core barrel.

This work consisted of 2 sampled boreholes/dynamic cone penetration tests on the west side of Trafalgar Road. No investigation was conducted on the east side of Trafalgar Road due to property clearance problems.

SITE DESCRIPTION

The site is located on Trafalgar Road approximately 8 km south of Hwy. 401.

Physiographically the site lies within the Peel Plain, an area of low local relief composed of glacial till underlain by shale bedrock.

The land adjacent to this site is farmland.

SUBSURFACE CONDITIONS

General

The Record of Borehole Sheets, (Appendix) illustrate the conditions at the borehole locations. The locations and elevations of the boreholes, and stratigraphical profiles based on the borehole data, are shown on Drawing No. 1977709-A.

Overburden

The overburden at this site is generally composed of approximately 14 m (thickness) of silty clay till of low plasticity.

Till

The till is a generally cohesive heterogeneous mixture of silty clay (CL) to silt (ML) containing variable amounts of sand and gravel.

The plasticity index decreases with depth.

The consistency of the material ranges from very stiff to hard.

Physical properties of the material, as determined from field and laboratory tests, are summarized as follows:

	<u>Range</u>	<u>Average</u>	<u>Median</u>
Natural Moisture Content (w)	7.0 - 11.5 %	9.3 %	8.8 %
Liquid Limit (W_L)	15.5 - 26.5 %	19.9 %	18.0 %
Plastic Limit (W_p)	11.5 - 16.0 %	13.6 %	13.5 %
Shear Strength			
- field vane	> 107 kPa	NA	NA
- unconfined compression	91 - 188 kPa	NA	NA

The material did not fail during field vane shear testing, indicating undisturbed shear strengths in excess of 107 kPa. From the results of the unconfined compression test and the standard penetration test, it is estimated that the shear strength of this deposit is generally in excess of 150 kPa.

Figure 1 illustrates a typical grain size distribution for this material.

Bedrock

The bedrock is medium soft red shale. It is overlain by transitional zones grading from silty clay with shaly layers to weathered shale.

Groundwater

At the time of the field investigation, the groundwater elevation was established at 188 m.

DISCUSSION AND RECOMMENDATIONS

It is proposed to construct two 3-span structures to carry Hwy. 403 over Trafalgar Road with probable future widening of the overpass.

This proposal will require fill heights ranging from approximately 4.3 to 5.4 m.

Four alternatives are proposed. The alternative which leads to the least expensive design should be adopted.

General Recommendations (Applicable To All Alternatives)

- Earth pressure acting on abutments and retaining walls should be computed as per Subsection 6.6.1.2.2 of the O.H.B.D.C. assuming a non-yielding foundation with $K_0 = 0.43$ for granular backfill.
- For frost protection, cover should be greater than 1.2 m.
- No stability problems are anticipated for embankments with slopes of 2:1 or flatter.
- For all alternatives differential settlements should not exceed 25 mm.
- Dewatering is not anticipated to be a major problem because of the impermeable nature of the surface soil.

ALTERNATIVE 1 - Spread Footings on Glacial Till

The structures may be supported on spread footings founded on the silty clay till at approximately 1.2 m depth below the existing ground surface.

All loose or soft material and any fill beneath the proposed footing locations should be removed. For the centre pier on the existing Trafalgar Road, it is anticipated that the required material excavation will be in the order of 1.5 to 2.0 m.

For resistance to lateral forces, the adhesion between the base of the footings and the foundation soil = 60 kPa.

Cover the foundation soil with a 15 cm pad of mass concrete within 18 hours of exposure.

The following design values are recommended:

- net safe bearing pressure = 300 kPa
and for purposes of the O.H.B.D.C.:
- Factored Bearing Capacity at U.L.S. = 450 kPa
- Bearing Capacity at S.L.S. Type II = 300 kPa

ALTERNATIVE 2 - Perched Footings on Compacted Fill

The abutments may be supported on perched abutments on compacted granular fill. Refer to the enclosed Figure 2 for design details.

All loose or soft material beneath the approach embankment in the vicinity of the abutment locations should be removed.

For computing sliding resistance between the base of the concrete footing and the compacted fill, the friction coefficient = 0.6.

The following design values are recommended:

- net safe bearing capacity = 340 kPa
and for purposes of the O.H.B.D.C.:
- Factored Bearing Capacity at U.L.S. = 510 kPa
- Bearing Capacity at S.L.S. Type II = 340 kPa

ALTERNATIVE 3 - Steel H-Piles in Overburden

The structures may be supported on steel H-piles equipped with reinforced tips and driven in accordance with MTC Standards SS 103-10 or SS 103-11. For calculation purposes the following values are recommended:

<u>Pile Type</u>	<u>Ultimate Capacity</u>
310 HP 79	2670 kN per pile

Note that the depth to bedrock at this site is in the order of 16 m. However, it is anticipated that the recommended pile capacities will be achieved near elev. 178 m. In any case the piles should be driven below elev. 179 m.

If desired, the abutment footings (supported on Steel H-Piles) may be perched within the embankment fill. In this case, to facilitate pile driving, particle sizes in the fill immediately beneath the pile locations should not exceed 75 mm.

The following design values are recommended:

<u>Pile Type</u>	<u>Safe Capacity</u>
310 HP 79	890 kN per pile

and, for the purposes of the O.H.B.D.C.:

<u>Pile Type</u>	<u>Factored Capacity at U.L.S.</u>	<u>Capacity at S.L.S. Type II</u>
310 HP 79	1335 kN per pile	890 kN per pile

ALTERNATIVE 4 - Combination of Previous Alternatives

The previous alternatives may be combined so that different alternatives are employed at different footing locations.

MISCELLANEOUS

The fieldwork for this project was carried out under the supervision of Mr. J. Hayward, student field technician. The report was written by Mr. D. H. Dundas, Project Foundations Engineer, and reviewed by Mr. K. G. Selby, Senior Foundations Engineer. The equipment used was owned and operated by Master Soil Investigation Ltd.



D. H. Dundas

D. H. Dundas, P. Eng.
Project Foundations Engineer

K. G. Selby

K. G. Selby, P. Eng.
Senior Foundations Engineer

APPENDIX



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RECORD OF BOREHOLE No 1

METRIC

W P 197-77-09 LOCATION Co-ords. N 4 818 546; E 284 747 ORIGINATED BY JH
DIST 4 HWY 403 BOREHOLE TYPE H.S. Auger, AX Core COMPILED BY JH
DATUM Geodetic DATE 82 11 22-23 CHECKED BY DD

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100		
188.6	Ground Surface						SHEAR STRENGTH						
							○ UNCONFINED + FIELD VANE						
							● QUICK TRIAXIAL x LAB VANE						
							WATER CONTENT (%)						
							PLASTIC LIMIT Wp NATURAL MOISTURE CONTENT W LIQUID LIMIT Wl						
							10 20 30						
0.0	Heterogeneous Mixture of Silty Clay (CL) to Silt (ML) with Sand Some/with Gravel (Till) Very Stiff to Hard	A B C D E F G H I J K L M	1	SS	32								5 22 52 21
			2	SS	56								
			3	SS	64								
			4	SS	52								
			5	SS	47								
			6	SS	33								
			7	SS	28								
			8	SS	23								
			9	SS	106								
			10	SS	607	5 cm							
			11	SS	607	8 cm							
			12	SS	857	15 cm							
			13	SS	907	10 cm							
173.7	Weathered Bedrock, Shale Sound	N O P	14	SS	607	1 cm							32 27 32 9
14.9			15	RC									
171.4	End of Borehole												27 44 24 5
17.2													
													19 32 39 10
													13 37 42 8

+3, x5: Numbers refer to
Sensitivity

20
15
10
5 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 2

METRIC

W P 197-77-09 LOCATION Co-ords. N 4 818 581: E 284 712 ORIGINATED BY JH
DIST 4 HWY 403 BOREHOLE TYPE H.S. Auger COMPILED BY JH
DATUM Geodetic DATE 82 11 24 CHECKED BY DD

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 (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES		20 40 60 80 100	100					
190.6	Ground Surface												
0.0			1	SS	49								
			2	SS	57								
			3	SS	80								5 25 54 16
			4	SS	40								
			5	SS	27								
			6	TW	PH							23.6	6 37 47 14
			7	SS	25								
			8	SS	20								
			9	TW	PH							22.9	4 31 49 16
			10	SS	21								
			11	SS	46								
			12	SS	60/	15 cm							
			13	SS	60/	8 cm							
176.9	with shaley layers		14	SS	40/	3 cm							
13.7	End of Borehole												* Cu > 107kPa


Heterogeneous Mixture
of Silty Clay (CL) to
Silt (ML) with Sand
Trace/some Gravel
(Till)
Very Stiff to Hard

OFFICE REPORT ON SOIL EXPLORATION

+3, x5: Numbers refer to
Sensitivity

20
15
10
5 (%) STRAIN AT FAILURE

METRIC

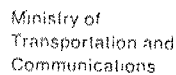
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			SHEAR STRENGTH		W _p	W	W _L		
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE	WATER CONTENT (%)				
189.6 0.0	Ground Surface													
	Heterogeneous mixture of silty clay (CL) some sand trace of gravel (Till)		1	SS	24									
			2	SS	30									
			3	SS	49									
			4	SS	65									
			5	SS	41									
			6	SS	35									
			7	SS	19									
			8	SS	24									
			9	SS	22									
			10	SS	20									
180.8 8.8	End of Borehole		11	SS	16									
*Groundwater level estimated														



METRIC

W P 197-77-09 LOCATION N 4 818 568; E 284 769 ORIGINATED BY CN
DIST 4 HWY 403 BOREHOLE TYPE Solid Stem Auger; Cone Test COMPILED BY CN
DATUM Geodetic DATE 83 05 12 CHECKED BY BD

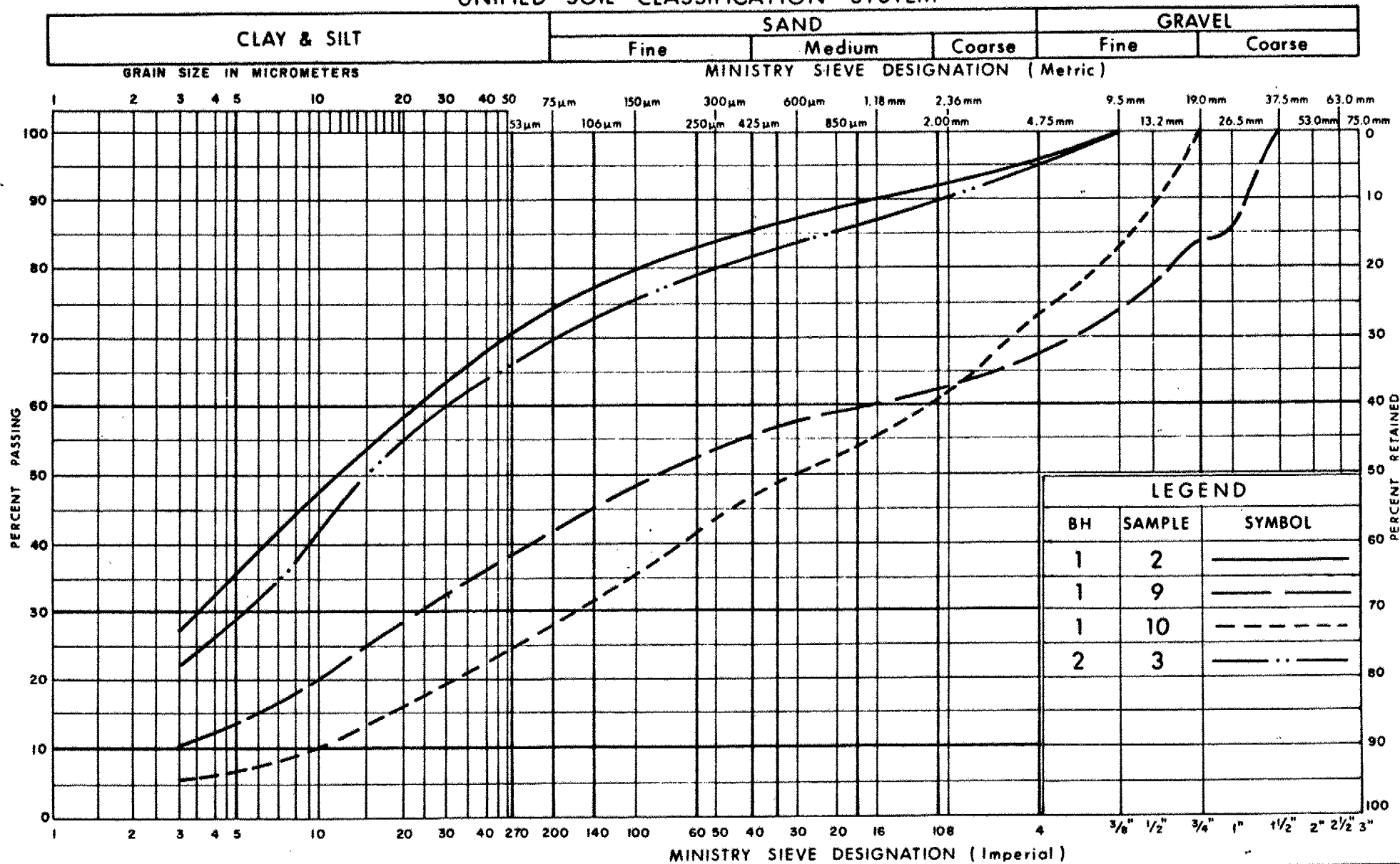
[illegible]



METRIC

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UNIFIED SOIL CLASSIFICATION SYSTEM



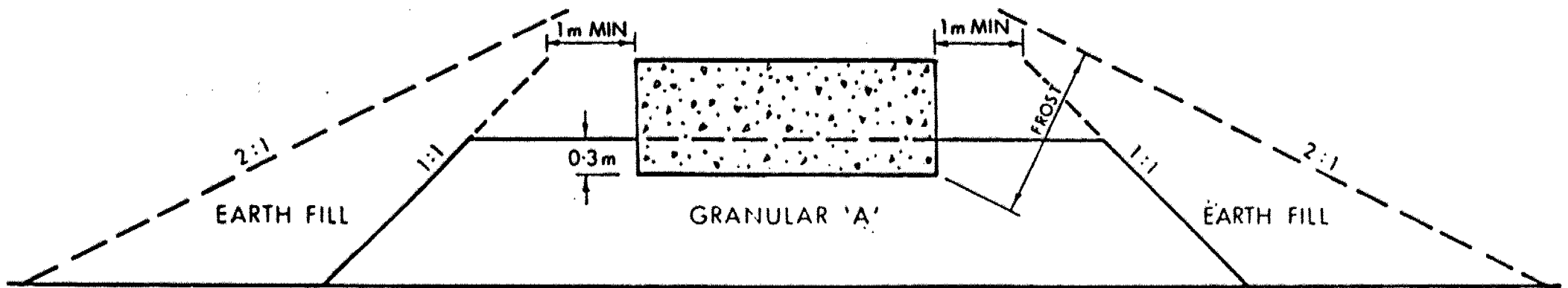
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GRAIN SIZE DISTRIBUTION
HET MIXTURE OF
SILTY CLAY TO SILT (Till)
WITH SAND, TRACE / SOME GRAVEL

FIG No 1

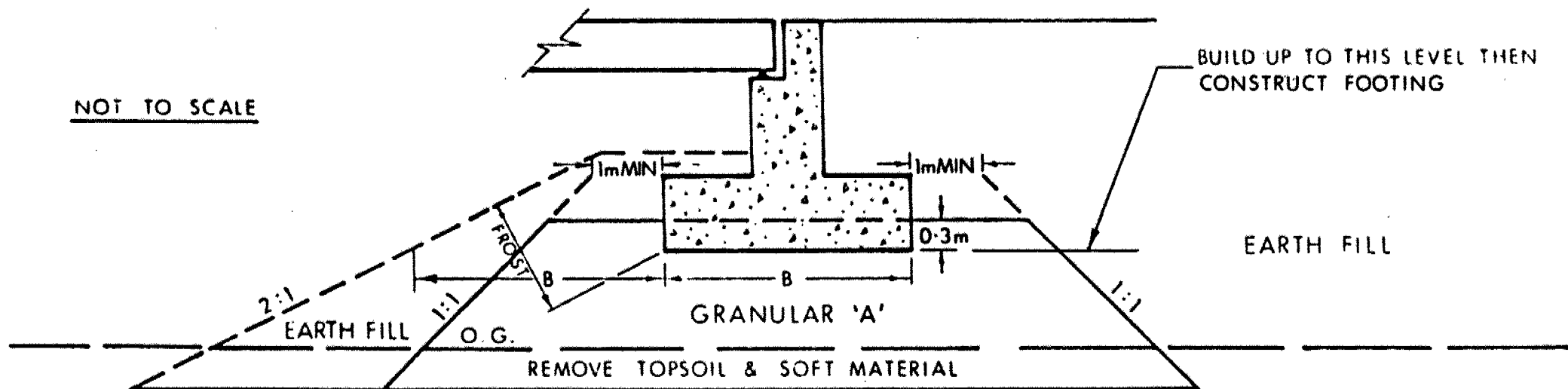
W P 197-77-09

ABUTMENT ON COMPACTED FILL SHOWING GRANULAR 'A' CORE



X SECTION

NOT TO SCALE



LONGITUDINAL SECTION

NOTES:

- 1 - REMOVE TOPSOIL &/OR SOFT SUBSOIL UNDER AREA OF COMPACTED GRANULAR 'A' & EARTH FILL.
- 2 - PLACE GRANULAR 'A' & EARTH FILL TO BOTTOM OF FOOTING LEVEL, COMPACTED ACCORDING TO CURRENT M.T.C. STANDARDS.
- 3 - CONSTRUCT CONCRETE FOOTING
- 4 - PLACE REMAINDER OF GRANULAR 'A' & EARTH FILL AS REQUIRED

EXPLANATION OF TERMS USED IN REPORT

N VALUE: THE STANDARD PENETRATION TEST (SPT) N VALUE IS THE NUMBER OF BLOWS REQUIRED TO CAUSE A STANDARD 51mm O.D. SPLIT BARREL SAMPLER TO PENETRATE 0.3m INTO UNDISTURBED GROUND IN A BOREHOLE WHEN DRIVEN BY A HAMMER WITH A MASS OF 63.5kg, FALLING FREELY A DISTANCE OF 0.76m. FOR PENETRATIONS OF LESS THAN 0.3m N VALUES ARE INDICATED AS THE NUMBER OF BLOWS FOR THE PENETRATION ACHIEVED. AVERAGE N VALUE IS DENOTED THUS \bar{N} .

DYNAMIC CONE PENETRATION TEST: CONTINUOUS PENETRATION OF A CONICAL STEEL POINT (51mm O.D. 60° CONE ANGLE) DRIVEN BY 475 J IMPACT ENERGY ON 'A' SIZE DRILL RODS. THE RESISTANCE TO CONE PENETRATION IS MEASURED AS THE NUMBER OF BLOWS FOR EACH, 0.3m ADVANCE OF THE CONICAL POINT INTO THE UNDISTURBED GROUND.

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

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

c_u (kPa)	0 - 12	12 - 25	25 - 50	50 - 100	100 - 200	> 200
	VERY SOFT	SOFT	FIRM	STIFF	VERY STIFF	HARD

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

N (BLOWS/0.3m)	0 - 5	5 - 10	10 - 30	30 - 50	> 50
	VERY LOOSE	LOOSE	COMPACT	DENSE	VERY DENSE

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 OF THE CORING RUN.

MODIFIED RECOVERY: SUM OF THOSE INTACT CORE PIECES, 100mm+ IN LENGTH EXPRESSED AS A PERCENT OF THE LENGTH OF THE CORING RUN. THE ROCK QUALITY DESIGNATION (R Q D), FOR MODIFIED RECOVERY, IS:

R Q D (%)	0 - 25	25 - 50	50 - 75	75 - 90	90 - 100
	VERY POOR	POOR	FAIR	GOOD	EXCELLENT

JOINTING AND BEDDING:

SPACING	50mm	50 - 300mm	0.3m - 1m	1m - 3m	> 3m
JOINTING	VERY CLOSE	CLOSE	MOD. CLOSE	WIDE	VERY WIDE
BEDDING	VERY THIN	THIN	MEDIUM	THICK	VERY THICK

ABBREVIATIONS AND SYMBOLS

FIELD SAMPLING

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

MECHANICAL PROPERTIES OF SOIL

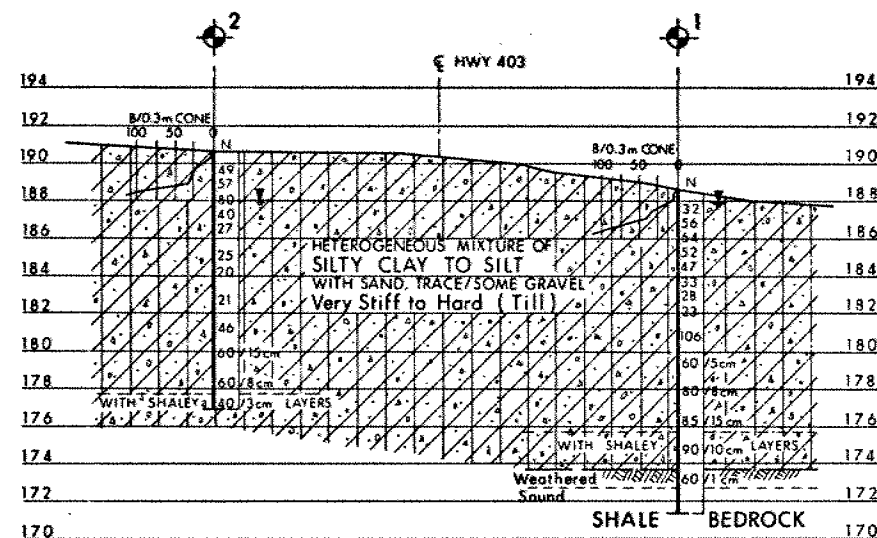
m_v	kPa ⁻¹	COEFFICIENT OF VOLUME CHANGE
C_c	1	COMPRESSION INDEX
C_s	1	SWELLING INDEX
C_α	1	RATE OF SECONDARY CONSOLIDATION
c_v	m ² /s	COEFFICIENT OF CONSOLIDATION
H	m	DRAINAGE PATH
T_v	1	TIME FACTOR
U	%	DEGREE OF CONSOLIDATION
σ'_{vo}	kPa	EFFECTIVE OVERBURDEN PRESSURE
σ'_p	kPa	PRECONSOLIDATION PRESSURE
τ_f	kPa	SHEAR STRENGTH
c'	kPa	EFFECTIVE COHESION INTERCEPT
ϕ'	-°	EFFECTIVE ANGLE OF INTERNAL FRICTION
c_u	kPa	APPARENT COHESION INTERCEPT
ϕ_u	-°	APPARENT ANGLE OF INTERNAL FRICTION
τ_R	kPa	RESIDUAL SHEAR STRENGTH
τ_r	kPa	REMOULDED SHEAR STRENGTH
S_t	1	SENSITIVITY = $\frac{c_u}{\tau_r}$

STRESS AND STRAIN

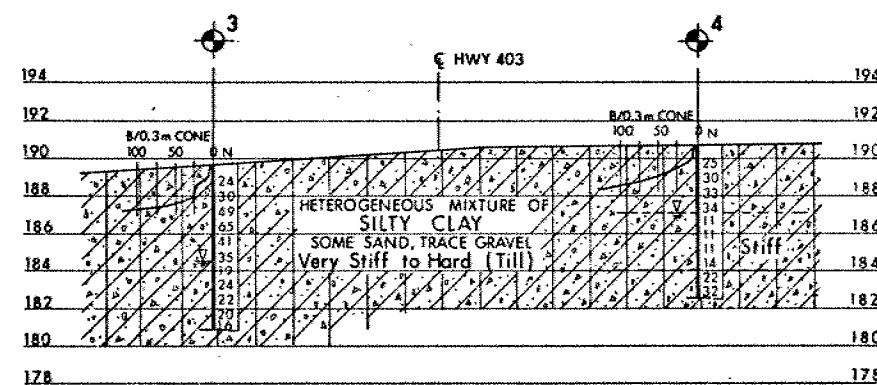
u_w	kPa	PORE WATER PRESSURE
u	1	PORE PRESSURE RATIO
σ	kPa	TOTAL NORMAL STRESS
σ'	kPa	EFFECTIVE NORMAL STRESS
τ	kPa	SHEAR STRESS
$\sigma_1, \sigma_2, \sigma_3$	kPa	PRINCIPAL STRESSES
ϵ	%	LINEAR STRAIN
$\epsilon_1, \epsilon_2, \epsilon_3$	%	PRINCIPAL STRAINS
E	kPa	MODULUS OF LINEAR DEFORMATION
G	kPa	MODULUS OF SHEAR DEFORMATION
μ	1	COEFFICIENT OF FRICTION

PHYSICAL PROPERTIES OF SOIL

ρ_s	kg/m ³	DENSITY OF SOLID PARTICLES	e	1, %	VOID RATIO	e_{min}	1, %	VOID RATIO IN DENSEST STATE
γ_s	kN/m ³	UNIT WEIGHT OF SOLID PARTICLES	n	1, %	POROSITY	I_D	1	DENSITY INDEX = $\frac{e_{max} - e}{e_{max} - e_{min}}$
ρ_w	kg/m ³	DENSITY OF WATER	w	1, %	WATER CONTENT	D	mm	GRAIN DIAMETER
γ_w	kN/m ³	UNIT WEIGHT OF WATER	S_r	%	DEGREE OF SATURATION	D_n	mm	n PERCENT - DIAMETER
ρ	kg/m ³	DENSITY OF SOIL	w_L	%	LIQUID LIMIT	C_u	1	UNIFORMITY COEFFICIENT
γ	kN/m ³	UNIT WEIGHT OF SOIL	w_p	%	PLASTIC LIMIT	h	m	HYDRAULIC HEAD OR POTENTIAL
ρ_d	kg/m ³	DENSITY OF DRY SOIL	w_s	%	SHRINKAGE LIMIT	q	m ³ /s	RATE OF DISCHARGE
γ_d	kN/m ³	UNIT WEIGHT OF DRY SOIL	I_p	%	PLASTICITY INDEX = $w_L - w_p$	v	m/s	DISCHARGE VELOCITY
ρ_{sat}	kg/m ³	DENSITY OF SATURATED SOIL	I_L	1	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$	i	1	HYDRAULIC GRADIENT
γ_{sat}	kN/m ³	UNIT WEIGHT OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$	k	m/s	HYDRAULIC CONDUCTIVITY
ρ'	kg/m ³	DENSITY OF SUBMERGED SOIL	e_{max}	1, %	VOID RATIO IN LOOSEST STATE	j	kN/m ²	SEEPAGE FORCE
γ'	kN/m ³	UNIT WEIGHT OF SUBMERGED SOIL						



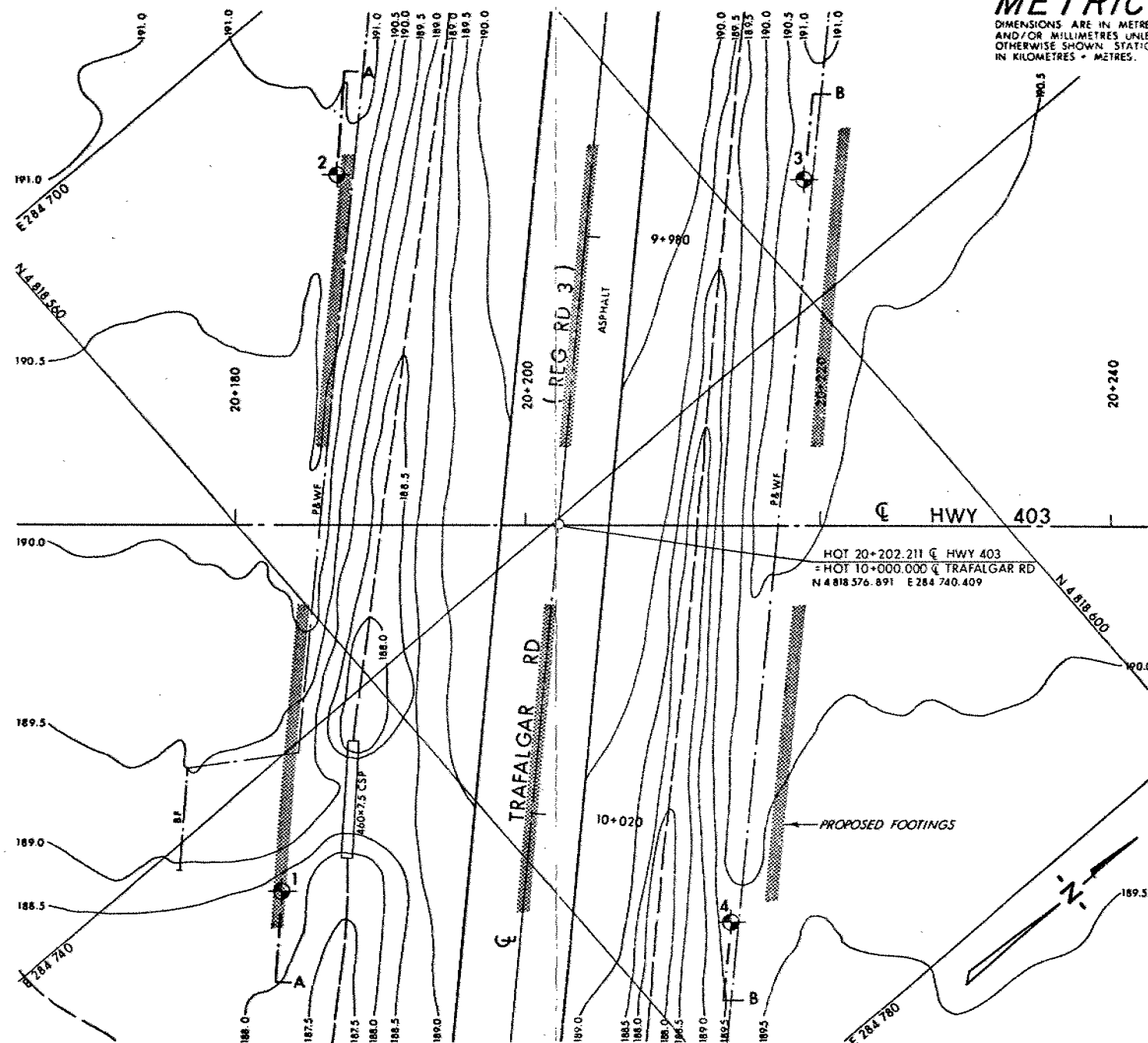
A-A



B-B

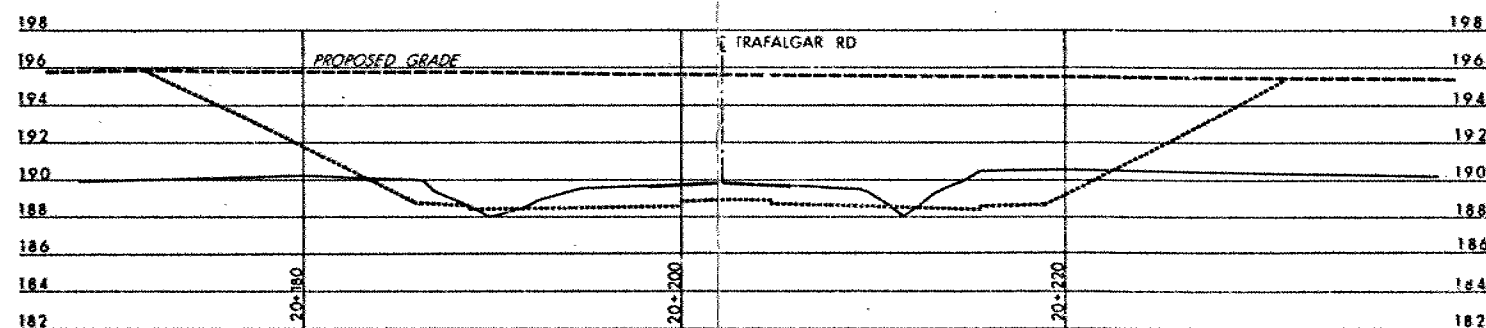
SECTIONS

SCALE
4m 2 0 4m Vert
8m 4 0 8m Horiz



PLAN

SCALE
4m 2 0 4m



PROFILE HWY 403

SCALE
4m 2 0 4m

METRIC

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES - METRES.

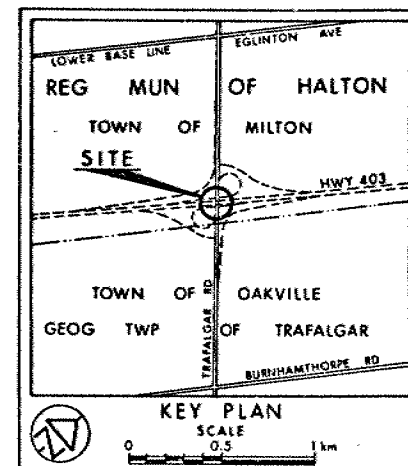
CONT No
WP No 197-77-09

TRAFALGAR ROAD

BORE HOLE LOCATIONS & SOIL STRATA



SHEET



KEY PLAN

SCALE
0 0.5 1 km

LEGEND

- Bore Hole
- ⊕ Dynamic Cone Penetration Test (Cone)
- ⊕ Bore Hole & Cone
- N Blows/0.3m (Srd Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- W L at time of investigation 82 11
- W L estimated 83 05

No	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	188.6	4 818 546.0	284 747.0
2	190.6	4 818 581.0	284 712.0
3	189.6	4 818 610.0	284 733.0
4	190.6	4 818 568.0	284 769.0

NOTE

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

NOTE: The complete foundation investigation and design report for this project and other related documents may be examined at the Engineering Materials Office, Downsview. Information contained in this report and related documents is specifically excluded in accordance with the conditions of Section 102-2 of Form 100.

NO	DATE	BY	SECTION B-B & BORE HOLES 3 & 4 ADDED	DESCRIPTION
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8306	SO	SECTION B-B & BORE HOLES 3 & 4 ADDED		
8306	DD	CHECKED	DATE 83 01 14	SITE 10-82-329
8306	SO	CHECKED	DATE 83 01 14	DWG 1977709-A