

CONT. 72-119

HAMILTON

ENTRANCE BR.*1

4 HWY. 2

30M5-10

W.O. 71-F-203 c

Geo	30M5-10
GEOL. No.	

HAMILTON ENTRANCE BRIDGE #1
NO. 2 HIGHWAY
WEST BURLINGTON, ONTARIO

W.O. 72-119

Prepared for:

THE DEPARTMENT OF TRANSPORTATION AND COMMUNICATION

WILLIAM TROW ASSOCIATES (HAMILTON) LTD.

Project: H1077
September 16, 1971

1870 Barton Street East
Hamilton, Ontario
Tel: 547-6385

Project: H1077

1870 Barton Street East
Hamilton 31, Ontario
547-6385

**William Trow
Associates**

Soil Mechanics
Consultants

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(Hamilton) Ltd.

C. D. Thompson, M.Sc., M.E.I.C., P.Eng.
Manager

Department of Transportation & Communications
Foundation Section
Room 107, Lab. Building
Highway 401 & Keele Street
Downsview 464, Ontario

September 29, 1971

Attention: Messrs. K. Selby and A. Stermac

Foundation Investigation
W.P. 113-66-01, Site 10-127
Hamilton Entrance Bridge #1
Highway #2, District 4, (Hamilton)

Dear Sirs:

We have completed the foundation investigation for the
above mentioned project, which was authorized by you on June 8, 1971.

The results of the investigation are recorded in the attached
Borehole Logs. We also enclose under separate cover the original
drawings.

We trust this information is satisfactory for your purposes.
If you have any questions about it, please do not hesitate to contact
this office.

Yours very truly,
WILLIAM TROW ASSOCIATES (HAMILTON) LTD.

C. D. Thompson, P. Eng.

CDT/ml
Encl.

Dist: Department of Transportation
& Communications

(13)

BOREHOLE LOG






JOB No. 61077





BOREHOLE No. 1

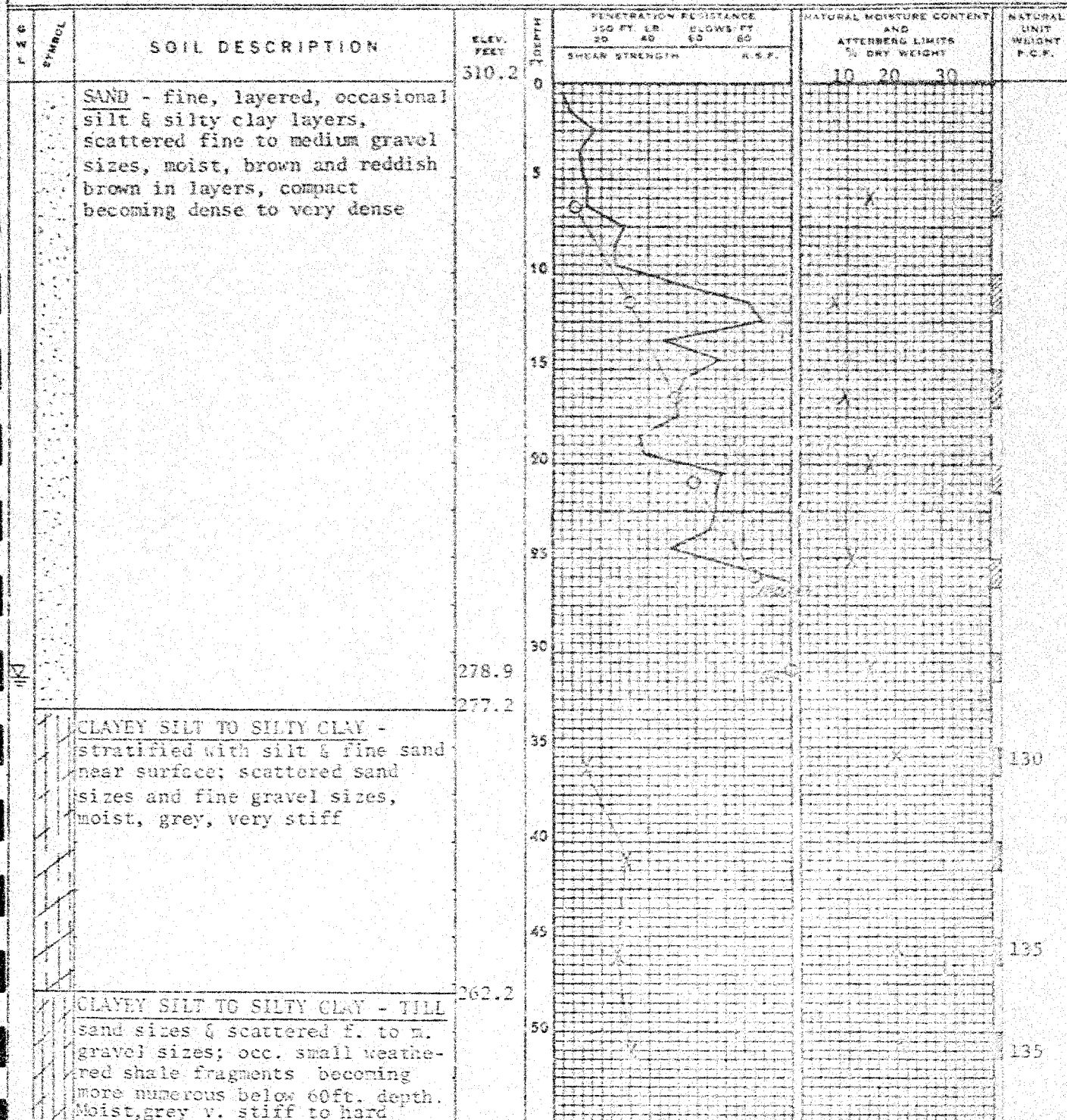
DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 HighwayWest Burlington, Ont.

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S):  + S

NATURAL MOISTURE  X
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 STRAIN AT FAILURE  10



William Trow Associates Ltd.

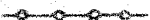



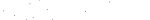
BOREHOLE LOG





JOB No. H1077

BOREHOLE No. 1 (CONTINUED)


DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 HighwayWest Burlington, Ont.

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S)  + 5

NATURAL MOISTURE  X
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 % STRAIN AT FAILURE  15 5 10

HOLE LOCATION AND DATUM SEE DRAWING No. 1

SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE		NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS			NATURAL UNIT WEIGHT P.C.F.	
				100 FT. 15	20	40	60	% DRY WEIGHT		
				SHEAR STRENGTH K.B.F.			10	20	30	
			50							
			55							136
			60							139
		246.2	65							EXL CORE REC/ROD 66/33
	SHALE BEDROCK - fractured & containing some soft shale layers in upper 2.5ft. approx; sound with scattered fractures below 66.5ft. depth, red with green mudstone interbeds	(243.7)	70							98/71
	TERMINATED	238.7	75							
	NOTES:		80							
	1. Borehole cased & advanced by conventional diamond drilling techniques. July 1, 5 & 6, 1971.		85							
	2. Cone Penetration Tests 5 ft. North of Borehole.		90							
	3. Water Level Record on completion of borehole.		95							
Date/Time	W.L. (ft)	H.O.T. (ft)	100							
July 6/1800	53.0	68.0								
July 7/0930	31.2	46.0								
July 8/1000	32.7	44.0								
July 9/1400	32.6	44.0								
July 12/0930	31.6	34.0								
July 13/1330	31.6	34.0								
July 16/1030	31.3	33.6								



BOREHOLE LOG

JOB No. H11177





BOREHOLE No. 2





DRAWING No.


PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ont.



HOLE LOCATION AND DATUM SEE DRAWING No. 1



Casing Sample



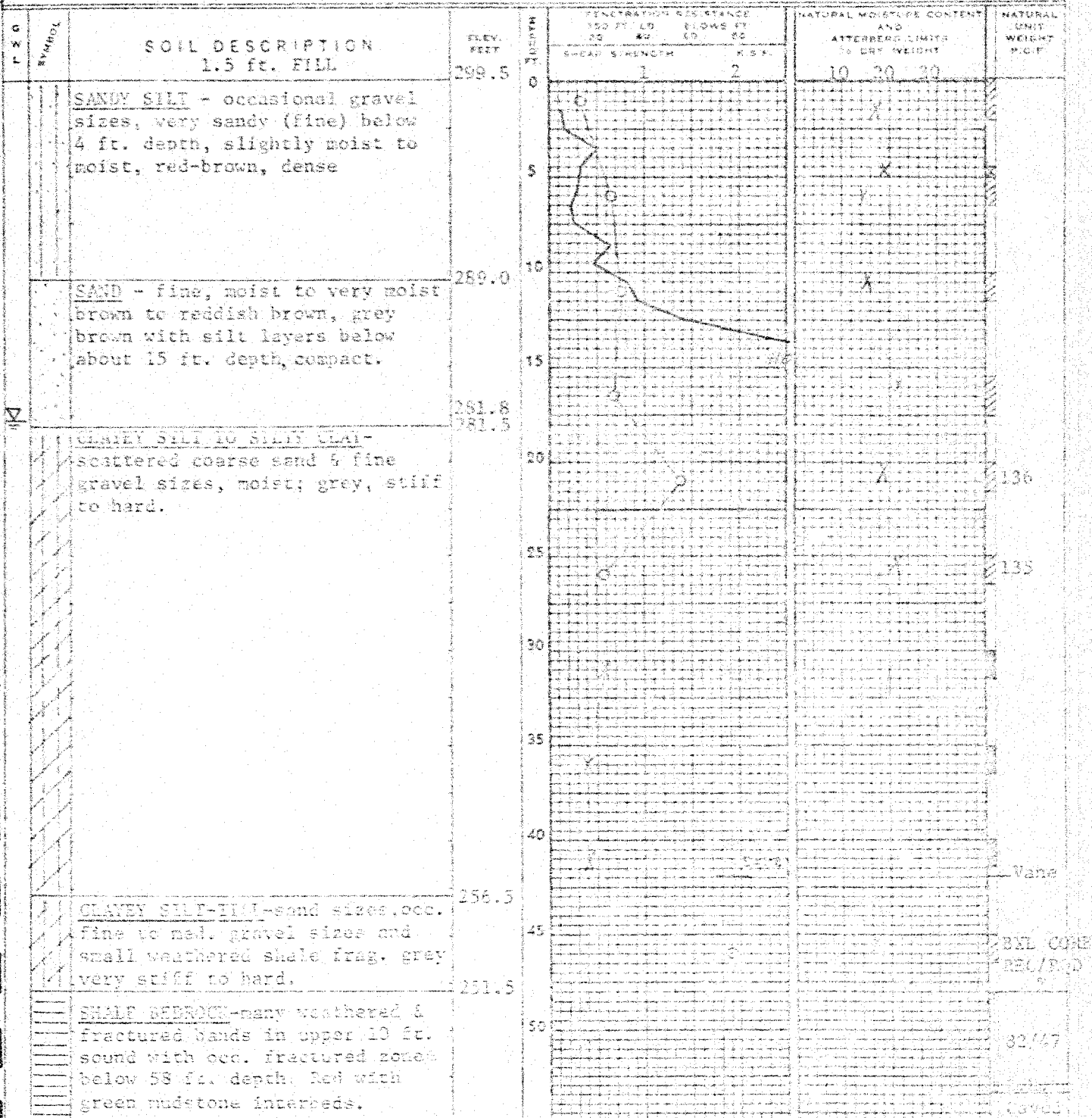
2" O.D. SPLIT TUBE    

2" I.D. SHELBY TUBE    

2" DIA. CONE 

PUSHED  

VANE TEST AND SENSITIVITY (SI)  

NATURAL MOISTURE PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE STRAIN AT FAILURE 
 cont'd...
 William Trow Associates Ltd.

BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 2 continued

DRAWING No.

PROJECT Hamilton Entrance Bridge #1

LOCATION No. 2 Highway,

West Burlington, Ontario

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY 15

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

% STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING No. 1

C W L	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FOOT	PENETRATION RESISTANCE	NATURAL MOISTURE CONTENT AND ATTERED LIMITS % DRY WEIGHT	NATURAL UNIT WEIGHT P.C.F.
					100 FT. LB. 10 20 30 40 50 60 70 80 90 100 SHEAR STRENGTH K.S.F.		
				50			BXL CORE REC/REC
				55			92/47
			(241.5)	60			98/79
				65			97/87
		TERMINATED	232.0	70			
		NOTES:		75			
		1. Borehole cased & advanced by conventional diamond drilling techniques. July 8, 9, 12 & 13, 1971.		80			
		2. Borehole cased to 48 ft. on removal of core barrel following jam on 2nd run. Casing advanced & borehole cleaned out to 53 ft. where 3rd run started.		85			
		3. Cone Penetration Test 3 ft. West of Borehole.		90			
		4. Water Level Record on completion of Borehole.		95			
		Date/Time W.L. (ft) H.O.T. (ft)		100			
		July 13/1100 47.1 62.2					
		July 16/1030 45.6 47.0					
		Sept. 8/1500 17.7 -					







William Trow Associates Ltd.

BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 3

DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ont.2" O.D. SPLIT TUBE 2" I.D. SHELBY TUBE 2" DIA. CONE PUSHED VANE TEST AND SENSITIVITY (S) NATURAL MOISTURE PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE STRAIN AT FAILURE 

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

F & S	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE 100 FT. LB. BLOW/FT		NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT		NATURAL UNIT WEIGHT P.C.F.
					SHEAR STRENGTH K.S.F.		10 20 30		
		SAND - Possibly Fill - fine, occ. red brown clayey silt inclusions, scattered fine to medium gravel sizes, moist, brown, loose	291.3	0					
		SAND - fine, occasional silt inclusions or layers, scattered fine to medium gravel sizes, moist, brown, compact to dense	282.3	10					
		CLAYEY SILT TO SILTY CLAY - scattered sand sizes & fine gravel sizes, moist to very moist light brownish grey; grey below about 20ft. depth, very stiff to hard	276.3	15					
		CLAYEY SILT TO SILTY CLAY TILL sand sizes & scattered fine to medium gravel sizes, occ. small weathered shale fragments; moist, grey, very stiff to hard	263.3	30					134 Vane
		SANDY SILT TILL - gravel sizes & shale fragments, sl. moist, red brown, very dense	250.8 250.1	40					135 135
		SHALE BEDROCK -severely weathered & fractured in upper 4.1'; mainly sound with scattered fractures below 45.3' depth; red with green mudstone interbeds	(246.0)	45					135 135
		TERMINATED	240.3	50					135/76 135/76
		cont'd...							



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 3 (continued)




DRAWING No.



PROJECT Hamilton Entrance Bridge #1


LOCATION No. 2 Highway


West Burlington, Ontario

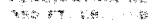
HOLE LOCATION AND DATUM SEE DRAWING No. 1


2" O.D. SPLIT TUBE   


2" I.D. SHELBY TUBE  


2" DIA. CONE 


PUSHED  P

VANE TEST AND SENSITIVITY (SI)  + S

NATURAL MOISTURE  X

PLASTIC AND LIQUID LIMIT 

UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE  15 5

% STRAIN AT FAILURE  10

ELEV. FEET	DEPTH FEET	SOIL DESCRIPTION	PENETRATION RESISTANCE		NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	NATURAL UNIT WEIGHT P.C.F.
			100 FT. LB. 25 40 60	BLOWS FT. K S.F.		
	0					
	5					
	10					
	15					
	20					
	25					
	30					
	35					
	40					
	45					
	50					

NOTES:

1. Borehole cased & advanced by conventional diamond drilling techniques. June 30, July 1 & 5, 1971.

2. Cone Penetration Test 3 ft. South of Borehole.

3. Water Level Record on completion of borehole.

Date/Time W.L.(ft.) H.O.T.(ft.)

July 5/1600 Dry 36.0

July 6/0800 Dry 35.6

July 16/1030 Dry 35.7



BOREHOLE LOG



JOB No. H1077

BOREHOLE No. 4

DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ont.

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE  22" I.D. SHELBY TUBE  3

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (S)  + S

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT  X

UNDRAINED TRIAXIAL AT

OVERBURDEN PRESSURE

STRAIN AT FAILURE  15 10

L.S.	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	CONCENTRATION RESISTANCE 100 LB. 200 LB. 300 LB. 400 LB.				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT			NATURAL UNIT WEIGHT P.C.F.
					SHEAR STRENGTH				10	20	30	
		CLAYEY SILT - occ. sand inclusions & gravel sizes; red brown, moist, compact	299.1	0								
		SAND - layered, fine, occ. silty inclusions or layers, occ. coarse sand sizes, brown, sl. moist to very moist, wet below 15ft. depth compact to very dense	294.1	5								
			282.1	10								
			281.1	15								
		CLAYEY SILT TO SILTY CLAY - scattered sand sizes & fine gravel sizes, moist to very moist, grey, stiff to very stiff		20								135
				25								
				30								
				35								Vane
				40								Vane
				45								134
				50								Vane
		SANDY & CLAYEY SILT - TILL gravel sizes & many shale frag- ments, moist, red	254.1	45								EXL CORE REC'D
			251.5	50								98/75
		SHALE BEDROCK - mainly sound but with scattered zones of minor fractures associated with softer shale layers, red, with occ. green mudstone interbeds		55								93/35

cont'd...



William Yew Associates Ltd.

BOREHOLE LOG


JOB No. H1077


BOREHOLE No. 4 (CONTINUED)


DRAWING No. _____


PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ont.


HOLE LOCATION AND DATUM SEE DRAWING NO. 1

2" O.D. SPLIT TUBE 

2" I.D. SHELBY TUBE 

2" DIA. CONE 

PUSHED  P

VANE TEST AND SENSITIVITY (S)  + S

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE% STRAIN AT FAILURE 

L 2 G	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT		BXL CORE REC/RQD %		
					30 FT. L.D. BLOWS/FT.								
					30	40	50	60					
					SHEAR STRENGTH				K.S.F.				
				50									93/35
				55									98/55
				60									100/100
		TERMINATED	234.6	65									
NOTES:													
1. Borehole cased & advanced by conventional diamond drilling techniques. July 13, 14 & 15, 1971													
2. Cone Penetration Test 1.5 ft. west & 1 ft. south of Borehole.													
3. Water Level Record on completion of borehole.													
Date/Time W.L.(ft.) H.O.T.(ft.)													
July 15/1130 Dry 42.7													
July 16/1030 16.2 29.6													
Sept.8/1500 17.0 -													



BOREHOLE LOG


JOB NO. H1077

BOREHOLE NO. 5

DRAWING NO.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ont.

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

2" O.D. SPLIT TUBE  22" I.D. SHELBY TUBE  2

2" DIA. CONE

PUMPED

VANE TEST AND SENSITIVITY (SI) 4.5

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSUREG STRAIN AT FAILURE 

F.T.D.	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE 250 FT. L.R. BLOWS AT			NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT			NATURAL UNIT WEIGHT P.C.F.
					20	40	60	10	20	30	
		SAND (Possibly Fill) - fine to medium sand with occ. coarse sand sizes & gravel sizes; occ. small topsoil & red silt inclusions; moist, brown, very loose to compact	284.4	0							
		CLAYEY SILT TO SILTY CLAY - scattered coarse sand & fine gravel sizes, moist, light brown very stiff to hard	270.4	15							137
		CLAYEY SILT TO SILTY CLAY - TILL occ. sand sizes and fine to medium gravel sizes, occ. small weathered shale fragments, moist, grey, very stiff to hard	259.4	25							133
		SHALE BEDROCK - severely weathered & fractured, with many soft shale layers in upper 4ft; mainly sound below 38.0' depth, with occ. fractured zones & thin soft shale layers to 44.0ft. depth; sound below 44.0ft. depth; red with green mudstone interbeds	250.4	35							BXL CORE REC/ROD
		TERMINATED	235.2	50							38/0
		cont'd...									55/3
											100/54
											55/31
											100/100



BOREHOLE LOG

JOB No. W1077

BOREHOLE No. 5 continued



DRAWING No.





PROJECT Hamilton Entrance Bridge #1

LOCATION No. 2 Highway

West Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE
 PUSHED
 VANE TEST AND SENSITIVITY (S) $+ \frac{1}{2}$

NATURAL MOISTURE 
 PLASTIC AND LIQUID LIMIT 
 UNGRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 STRAIN AT FAILURE 

C F T	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FT.	PENETRATION TEST RESULTS				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS		NATURAL UNIT WEIGHT P.C.F.
					150 FT. L.V.	600 FT. L.V.	600 FT. L.V.	600 FT. L.V.	%	%	
					SHEAR STRENGTH		A.S.F.				
				0							
				5							
				10							
				15							
				20							
				25							
				30							
				35							
				40							
				45							
				50							

NOTES:

1. Borehole cased & advanced by conventional diamond drilling techniques. July 5, 6 & 7, 1971.

2. Cone Penetration Test 3 ft. West of Borehole.

3. Water Level Record on completion of Borehole.

Date/Time W.L. (ft) E.O.T. (ft)

July 7/1970 Cased at Surface

July 16/1970 Dry 19.0



William Trow Associates Ltd.

BOREHOLE LOG

JOB No. H1077






BOREHOLE No. 1





DRAWING No. 1

PROJECT Hamilton Entrance Bridge #1

LOCATION No. 2 Highway,

West Burlington, Ont.

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE 
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 % STRAIN AT FAILURE 

HOLE LOCATION AND DATUM SEE DRAWING No. 1

SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE 30 FT. LR. 20 40 60 SHEAR STRENGTH K.S.F.			NATURAL MOISTURE CONTENT AND ATTERING LIMITS % DRY WEIGHT			NATURAL UNIT WEIGHT P.C.F.
							10	20	30	
	5" Topsoil	289.6	0							
	SANDY & CLAYEY SILT (Possibly Fill) - occ. fine to medium gravel sizes, slightly moist to moist, brown, loose	284.6	5							
	FINE SAND - some layering, scattered f. to m. gravel sizes, occ. silty layers, sl. moist to moist, brown, compact	281.6	10							
	CLAYEY SILT TO SILTY CLAY - scattered sand sizes & fine gravel sizes, moist to very moist, light brownish grey, grey below about 27.5ft. depth, ve stiff to hard		15							136
			20							
			25							
			30							
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			955							
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			965							
			970							
			975							
			980							
			985							
			990							
			995							
			1000							



BOREHOLE LOG


JOB No. H1077

BOREHOLE No. 6 (continued)

DRAWING No. _____

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ont.

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 2" I.D. SHELBY TUBE 2" DIA. CONE 

PUSHED _____ P

VANE TEST AND SENSITIVITY (SI) +S

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE% STRAIN AT FAILURE 

L.S.	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FT.	PENETRATION RESISTANCE				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	NATURAL UNIT WEIGHT P.C.F.
					300 FT. LB. 20	600 FT. LB. 40	600 FT. LB. 60	600 FT. LB. 80		
					SHEAR STRENGTH K.S.F.					
				50						BXL CORE REC/ROD # 100/75
				55						
				60						100/95
		TERMINATED	230.1	60						
		NOTES:		65						
		1. Borehole cased & advanced by conventional diamond drilling techniques. July 13,14,15&16,1971.		70						
		2. Cone Penetration Test 2 ft. North of Borehole.		75						
		3. Water Level Record on completion of borehole.		80						
		Date/Time W.L. (Ft) H.O.T. (Ft)		85						
		July 16/1630 17.5 36.2		90						
		Sept.8 /1500 35.0 -		95						
				100						








BOREHOLE LOG

JOB No. H1077

BOREHOLE NO. 7

DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No.2 HighwayWest Burlington, Ont.2" O.D. SPLIT TUBE 2" I.D. SHELBY TUBE 4" DIA. CONE PUSHED VANE TEST AND SENSITIVITY (S) NATURAL MOISTURE PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE STRAIN AT FAILURE 

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

G W L	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE BLows/ft		NATURAL MOISTURE CONTENT AND ATTEBERG LIMITS % DRY WEIGHT			NATURAL UNIT WEIGHT P.C.F.
					20	40	10	20	30	
		CLAYEY SILT - TILL - sand sizes occ. gravel sizes & weathered shale fragments; shale fragments becoming more pronounced with depth, moist, becoming sl. moist, reddish brown near surface, becoming red with grey-green inclusions, firm to v. hard	253.3	0						
		SHALE BEDROCK - severely weathered & fractured, with soft shale layers to 10.5ft. depth; mainly sound with occ. fractures below 10.5ft. depth; red with green mudstone interbeds	243.1 (242.8)	10						144 EXL CORR REC/ROD
		TERMINATED	235.5	18						68/29
				15						99/74
				20						
				25						
				30						
				35						
				40						
				45						
				50						

NOTES:

1. Borehole cased & advanced by
conventional diamond drilling
techniques. June 30, 1971.

2. Cone Penetration Test 2 ft.
south & 1 ft. West of Borehole.

3. Water Level Record on
completion of borehole.

Date/Time W.L. (ft) H.C.T. (ft)

June 30/1971 Dry 17.8

July 16/1971 Caved at Surface

Complete loss of water during
drilling.



BOREHOLE LOG

JOB NO. B1077

BOREHOLE NO. 8

DRAWING NO.

PROJECT: Hamilton Entrance Bridge #1
 LOCATION: No. 2 Highway
 West Burlington, Ontario

2" O.D. SPLIT TUBE
 2" I.D. SHELBY TUBE
 2" DIA. CONE
 PUSHED
 VANE TEST AND SENSITIVITY 15

NATURAL MOISTURE
 PLASTIC AND LIQUID LIMIT
 UNDRAINED TRIAXIAL AT
 OVERBURDEN PRESSURE
 % STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

F.T.	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE 100 FT. L.D. BLOWS AT 20 40 60 80 SHEAR STRENGTH K.S.F.	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT 10 20 30	NATURAL UNIT WEIGHT P.C.F.
		5" TOPSOIL	282.1	0			
		SANDY & CLAYEY SILT-occ. gravel sizes, some roots, moist, red-brown compact	277.6	5			
		CLAYEY SILT TO SILTY CLAY- scattered coarse sand & fine gravel sizes, moist, light brown very stiff to hard	272.1	10			135
		CLAYEY SILT TO SILTY CLAY - TILL occ. sand sizes and fine to medium gravel sizes, occ. small weathered shale fragments, moist, grey, very stiff to hard	265.6	15			136
				20			135
		CLAYEY & SANDY SILT-TILL-gravel sizes, shale fragments & slabs, moist to very moist, grey to red brown, hard	257.3	25			NAT. CORN REC/800
			252.1	30			37/0
		SHALE BEDROCK-sound with occ. fractured zones, scattered thin shaley clay layers around 36 ft. depth, red with green mudstone interbeds.		35			100/99
				40			99/62
				45			100/38
			237.6	50			
<p>TERMINATED</p> <p>NOTES:</p> <p>1. Borehole cased & advanced by conventional diamond drilling techniques. July 12 & 13, 1971.</p> <p>2. Cone Penetration Test 2 ft. south & 2 ft. east of Borehole.</p> <p>3. Water Level Record on completion of Borehole.</p> <p>Date/Time W.L. (ft) H.O.T. (ft)</p> <p>July 15/1980 27.3 25.3</p> <p>July 16/1980 Dry 27.6</p> <p>Sept. 8/1980 16.5 -</p>							



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 9

DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 HighwayWest Burlington, Ont.

HOLE LOCATION AND DATUM SEE DRAWING No. 1

Casing sample

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (S) +5

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

% STRAIN AT FAILURE

SOIL DESCRIPTION

ELEV.
FEETDEPTH
FEETPENETRATION RESISTANCE
100 FT. LB. BLOW/FT.
25 50 75 100
SHEAR STRENGTH K S.F.NATURAL MOISTURE CONTENT
AND
ATTERBERG LIMITS
% DRY WEIGHT
10 20 30NATURAL
UNIT
WEIGHT
P.C.F.

CLAYEY SILT - scattered sand & gravel sizes, organic, very moist to wet, red & grey, soft

CLAYEY SILT - TILL - sand sizes & fine to medium gravel sizes with much weathered shale below 9.7ft. depth, moist becoming sl. moist, red-brown, stiff to hard

SHALE BEDROCK - weathered & fractured, with soft shale layers to 13.5ft. depth; fractured from 13.5ft. to 20ft. depth, with possible open fractures at 13.5ft. & 19.8ft. depth; sound below 20ft. depth, red with green mudstone interbeds

TERMINATED

NOTES:

1. Borehole cased & advanced by conventional diamond drilling techniques. June 29, 1971.

2. Cone Penetration Test 2 ft. West & 1 ft. north of Borehole.

3. Water Level Record on completion of borehole.

Date/Time W.L. (ft) H.O.T. (ft)

June 29/1715 4.4 25.3

July 16/1000 5.0 8.4

Sept. 8/1500 5.5 -



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 10






DRAWING No. _____





PROJECT Hamilton Entrance Bridge #1

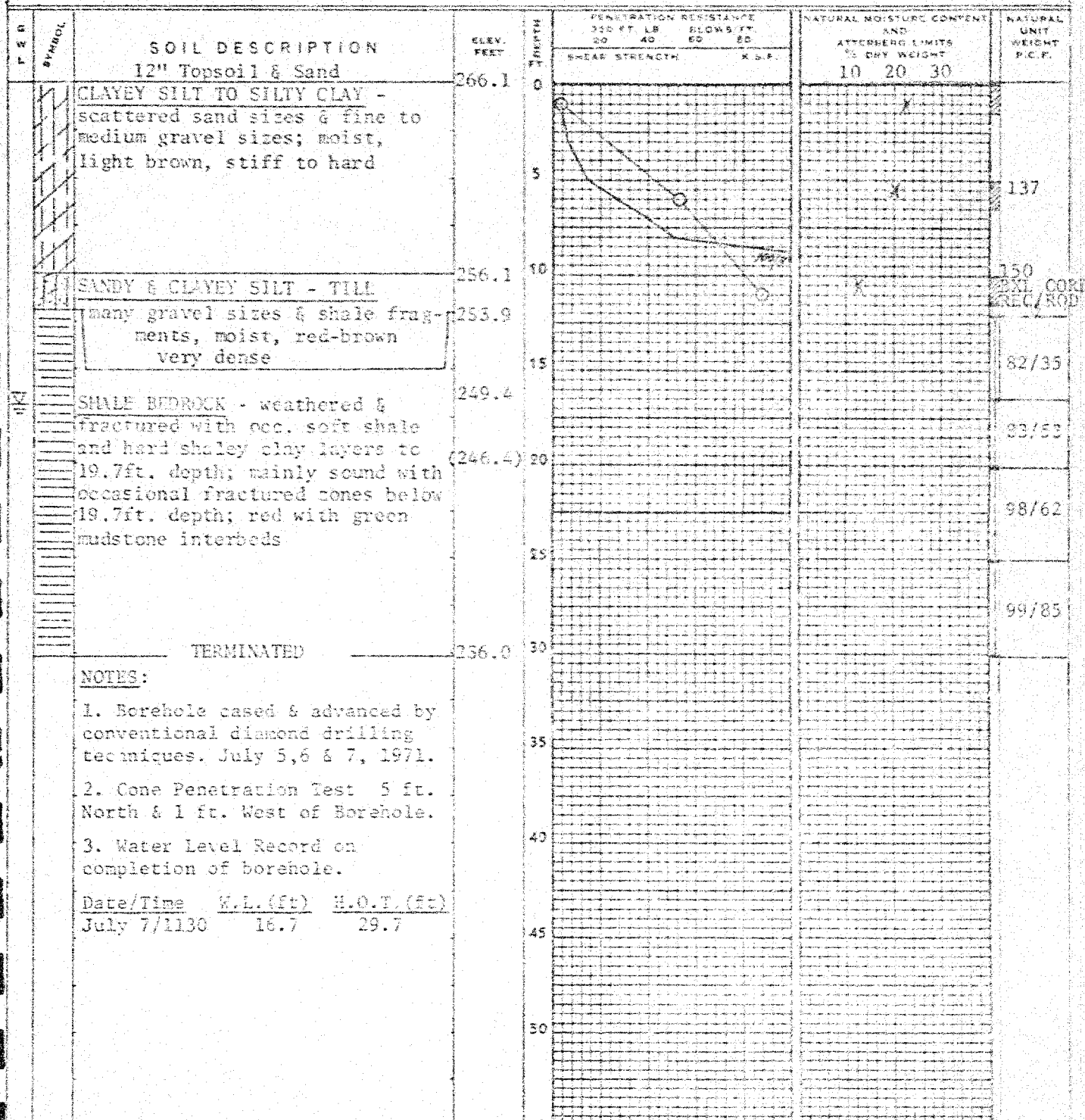
LOCATION No. 2 Highway,

West Burlington, Ont.

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE 
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 % STRAIN AT FAILURE 



BOREHOLE LOG




JOB No. H1077


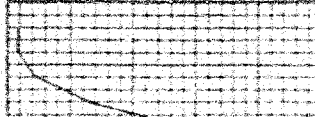

BOREHOLE No. 11

DRAWING No. _____

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ont.

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 2" I.D. SHELBY TUBE 2" DIA. CONE PUSHED VANE TEST AND SENSITIVITY (S) NATURAL MOISTURE PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURESTRAIN AT FAILURE 

F.T.D.	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE 200 FT. L.C. BLOWS FT.				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT			NATURAL UNIT WEIGHT P.C.F.				
					20	40	60	80	10	20	30					
		12" Topsoil	254.7	0	SHEAR STRENGTH K.S.F.											
		SILTY CLAY - product of shale weathering, many shale & mudstone fragments, slightly moist, red, hard	249.7	5												
		SHALE BEDROCK - severely weathered soft shale to shaley clay with fractured shale & mudstone bands to 9.1ft. depth; mainly sound with scattered fractures below 9.1ft. depth; red with green mudstone interbeds	245.6	10												
		TERMINATED	241.6	15												
NOTES:																
1. Borehole cased & advanced by conventional diamond drilling techniques. July 1, 1971.																
2. Cone Penetration Test 2.5 ft. south of Borehole.																
3. Water Level Record on completion of borehole.																
Date/Time W.L. (ft) H.O.T. (ft)																
July 1/1415 8.9 13.0																
July 16/1000 Dry 3.7																

BXL CORE
REC/RID

72/34

99/60



William Trow Associates Ltd.

BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 12

DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ont.

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (S)

NATURAL MOISTURE

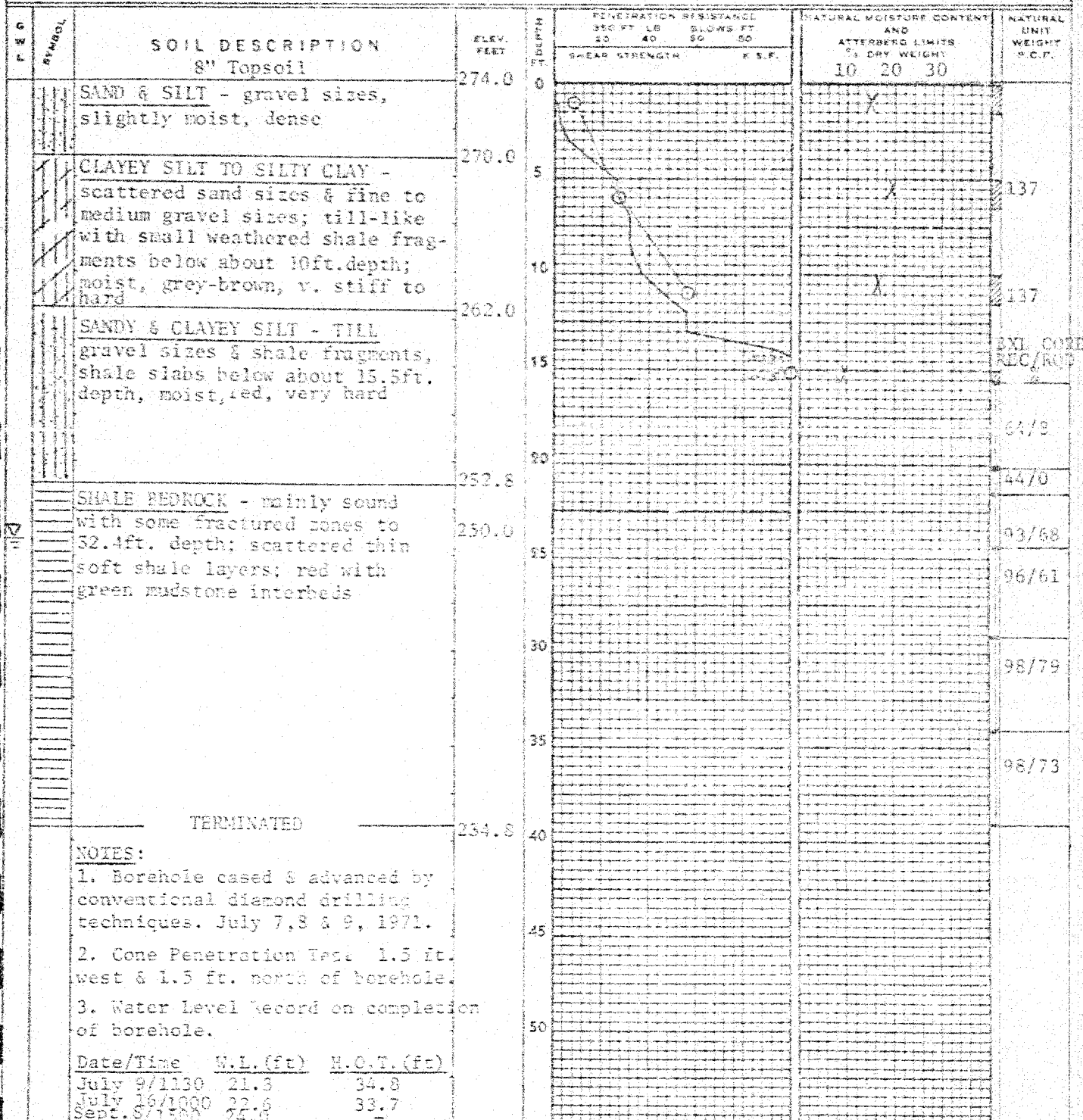
PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT

OVERBURDEN PRESSURE

STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING No. 1



BOREHOLE LOG





JOB No. H1077

BOREHOLE No. 13

DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ont.

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 2" I.D. SHELLEY TUBE 2" DIA. CONE PUSHED VANE TEST AND SENSITIVITY (%S) NATURAL MOISTURE PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE STRAIN AT FAILURE 

SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH	PENETRATION RESISTANCE 550 FT. LB. BLOWS FT. 20 40 60 80	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	NATURAL UNIT WEIGHT P.C.F.
	ORGANIC SILT - some peat bands, occasional small shell fragments, wet, dark brown, very soft	246.3	0	1 2	10 20 30	
			5			
			10			
			15			
	CLAYEY SILT - TILL - sand sizes, & occ. gravel sizes, shale fragments, very moist becoming moist, red with grey inclusions, soft to stiff	230.3	15			
			20			
			25			
	SHALE BEDROCK - mainly sound with scattered fractures; red with green mudstone interbeds	224.1	25			
			30			
			35			
			40			
			45			
	TERMINATED	213.5	45			
			50			
			55			

NOTES:

1. Borehole cased & advanced by conventional diamond drilling techniques. June 28 & 29, 1971.

2. Cone Penetration Test 2 ft. west of Borehole.

3. Water Level Record on completion of Borehole.

Date/Time W.L.(ft) H.O.T.(ft)

June 29/0830 0.5 21.2

July 16/1000 Caved at Surface



William Trow Associates Ltd.

BOREHOLE LOG

JOB NO. H1077

BOREHOLE NO. 14



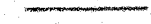
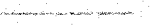

DRAWING NO.

PROJECT Hamilton Entrance Bridge #1

LOCATION No. 2 Highway

West Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

% STRAIN AT FAILURE

X

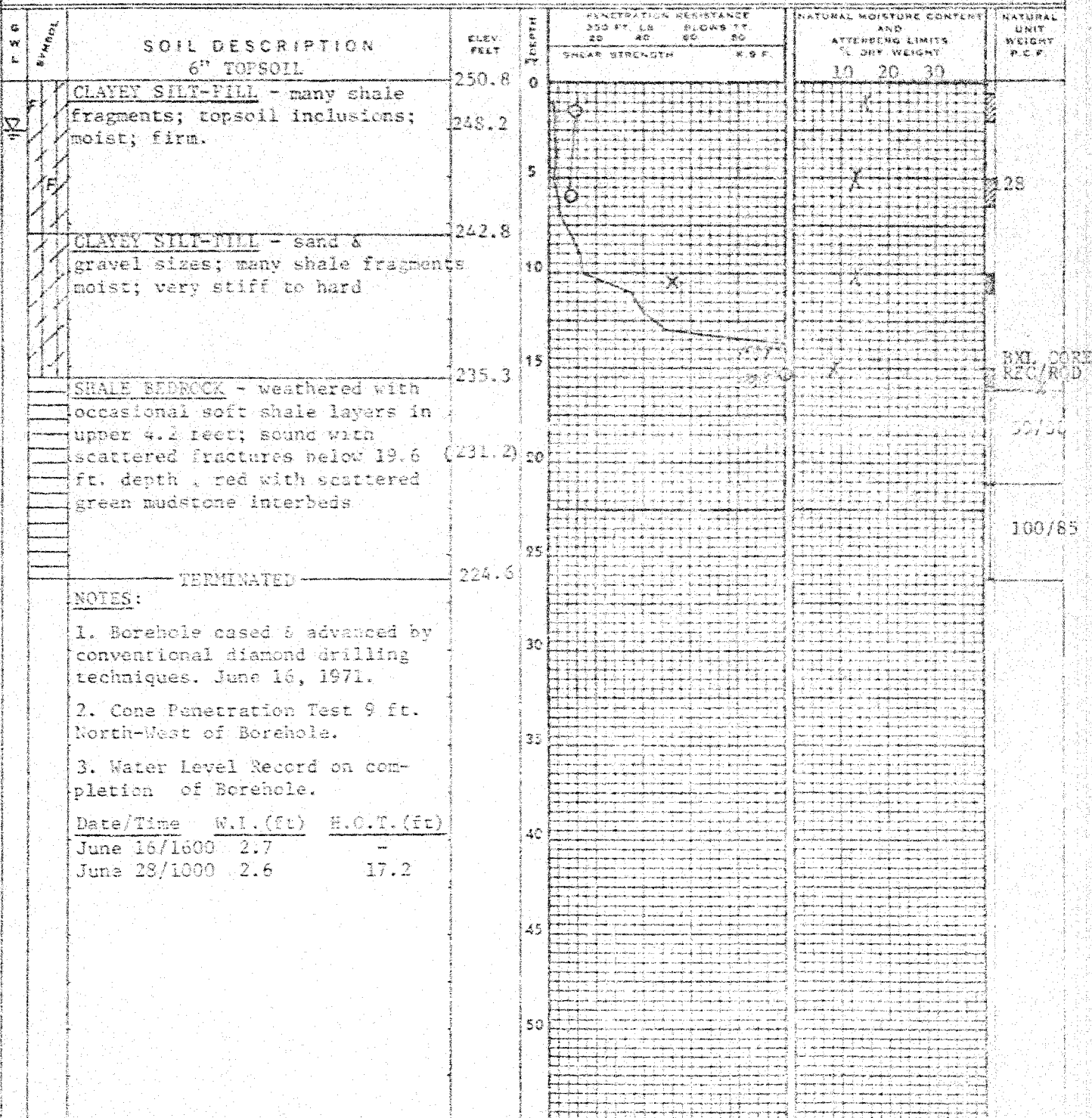
X

0

15

5

10



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 15

DRAWING No. _____

PROJECT Hamilton Entrance Bridge #1

LOCATION No. 2 Highway

West Burlington, Ontario

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (S) +5

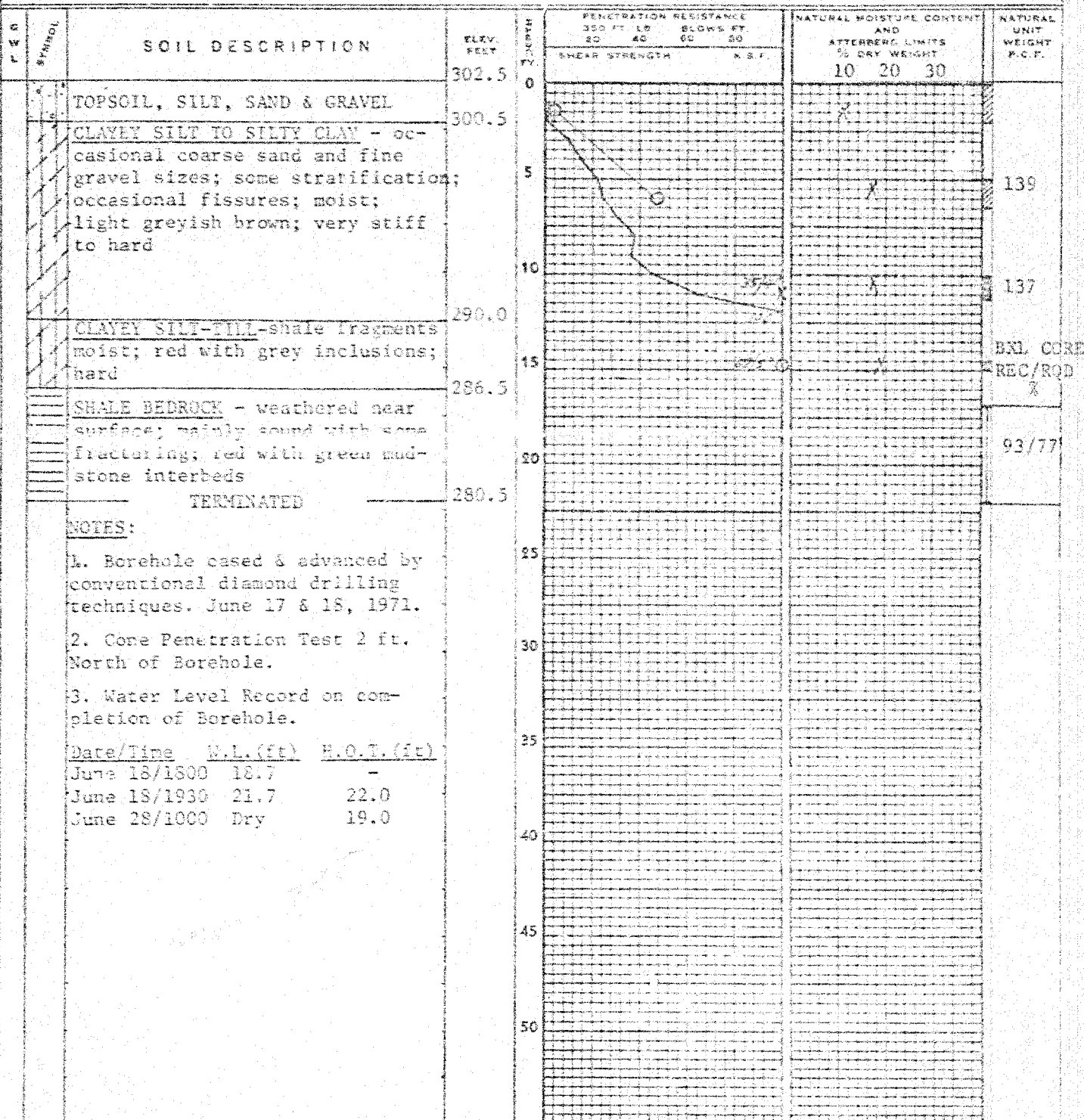
NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

% STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING No. 1



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 16 (see 16A attached)






DRAWING No.





PROJECT Hamilton Entrance Bridge












LOCATION No. 2 Highway

West Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE 
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 STRAIN AT FAILURE 

L.S.	SYMBOL	SOIL DESCRIPTION 10" TOPSOIL	ELEV. FEET	DEPTH FT.	PENETRATION RESISTANCE 300 FT. L.S. BLOWS FT. 20 40 60 80		NATURAL MOISTURE CONTENT AND ATTEBERG LIMITS % DRY WEIGHT			NATURAL UNIT WEIGHT P.C.F.
					SHEAR STRENGTH K.S.F.		10	20	30	
		CLAYEY SILT-FILL-roots near surface; occasional fine to med. gravel sizes; shale fragments moist; red with grey inclusions very stiff to hard	263.9	0						
		SHALE BEDROCK - heavily weathered with some fracturing, & many soft shale & shaley clay layers in upper 11 ft. approx. occasional soft shale layers below 18 ft. depth. Loss of drill water @ 11 ft. depth and @ 18.5 ft. depth core barrel dropped approx. 0.5 ft. in heavily weathered zone between 11.5 ft. and 17.5 ft. depth when chuck adjusted, red shale with occasional green mudstone and shale interbeds & inclusions	256.9	5						78/67
				10						70/31
				15						95/52
				20						
				25						
				30						
				35						
				40						
				45						
				50						

NOTES:

1. Borehole cased & advanced by conventional diamond drilling techniques. June 29, 1971.
2. Borehole 16A, 2 ft. west of Borehole 16, undertaken on July 12 & 13, 1971. Rock bit to 14 ft. followed by coring.
3. Cone Penetration Test 3 ft. east of Borehole 16.
4. Water Level Record on completion of borehole.

Date/Time	W.L. (ft)	H.O.T. (ft)
June 29/1800	17.9	20.2
July 1/1100	Dry	12.4



BOREHOLE LOG

10272 11077

BOREHOLE NO. 101

DRAWING NO.

PROJECT Hamilton Entrance Bridge #1

LOCATION No. 2 Highway

West Burlington, Ontario

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY 15

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

% STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

F.S.D. SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	NATURAL UNIT WEIGHT P.C.F.
				300 FT. LB. 25	45 60	600 FT. 40	80		
	CLAYEY SILT-TILL-roots near surface; occasional fine to med. gravel sizes; shale fragments moist; red with grey inclusions very stiff to hard.	263.9	0						
			5						
	SHALE BEDROCK - Severely weathered & fractured to 14', mainly sound below 14' with occasional fractures, more heavily fractured zones between 18' & 25.4' depth. (249.9)	256.9	10						EXL 322 RIC/RQD
			15						100/100
			20						88/38
			25						95/48
			30						100/90
			35						100/23
	TERMINATED	229.0	35						
	NOTES: 1. Borehole located 2 ft. West of Borehole 16, cased & advanced by conventional diamond drilling techniques. July 12 & 13, 1972. 2. Casing driven to refusal at 7.0 ft. depth. Rock bit used through severely weathered shale to 14 ft. depth.		40						
			45						
			50						



BOREHOLE LOG

JOB No. H1087

BOREHOLE No. 17

DRAWING No.

PROJECT Hamilton Entrance Bridge #1 Casing Sample ☒
 LOCATION No. 2 Highway 2" O.D. SPLIT TUBE ☐ 2" I.D. SHELBY TUBE ☐ 2" DIA. CONE ☐
West Burlington, Ontario PUSHED ☐ VANE TEST AND SENSITIVITY (S) ☐ +5
 HOLE LOCATION AND DATUM SEE DRAWING No. 1

NATURAL MOISTURE ☒
 PLASTIC AND LIQUID LIMIT ☐
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE ☐
 % STRAIN AT FAILURE ☐

ELEV. FEET	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	PENETRATION RESISTANCE		NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT			NATURAL UNIT WEIGHT P.C.F.
				300 FT. LB. 20	BLOWS FT. 60	10	20	30	
270.4		6" TOPSOIL	270.4						
		CLAYEY SILT-FILL - red clayey silt and brown clayey silt to silt, clay, moist, stiff	266.9						
		CLAYEY SILT-FILL - occasional gravel sizes, shale fragments; moist; red; hard	263.4						
		SHALE BEDROCK - weathered & heavily fractured in upper 4 feet becoming more sound with depth scattered fractured bands with softer shale below 12 feet depth, red with occasional green mud- stone interbeds	258.4						
			253.0						
		TERMINATED	248.7						
NOTES:									
1. Borehole cased & advanced by conventional diamond drilling techniques. June 28 & 29, 1971.									
2. Cone Penetration Test 3 ft. North of Borehole.									
3. Water Level Record on com- pletion of Borehole.									
Date/Time W.L. (ft) H.O.T. (ft)									
June 29/1330 15.6 21.1									
June 30/1000 17.4 20.2									



BYE HOLE NO.

10

DRAWING No.

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

2" O.D. SPLIT TUBE

◆ ◆ ◆ ◆ ◆

◆ ◆ ◆ ◆ ◆

2° DIA CONE ~~SECRET~~ - CONFIDENTIAL - PAROLE

PUSHED

NAME TEST AND SENSITIVITY IS: + 5

NATURAL MOISTURE X

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT

OVERSUNSHED: PRODUCE



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 19

DRAWING No.

PROJECT Hamilton Entrance Bridge #1 Casing Sample

LOCATION No. 2 Highway

West Burlington, Ontario

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (SI) +S

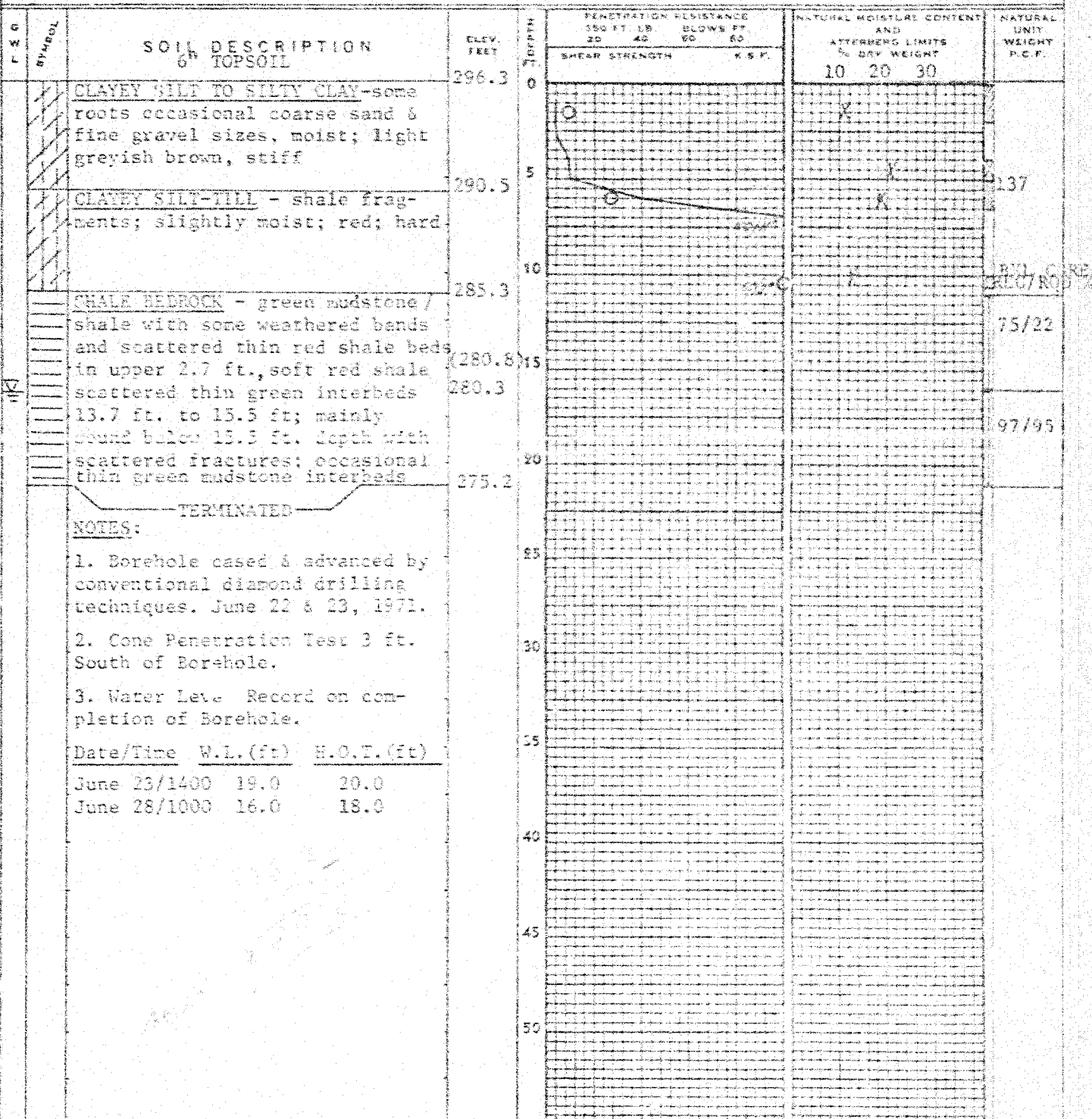
NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

E STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING No. 1



BOREHOLE LOG






JOB No. H1077







BOREHOLE No. 20

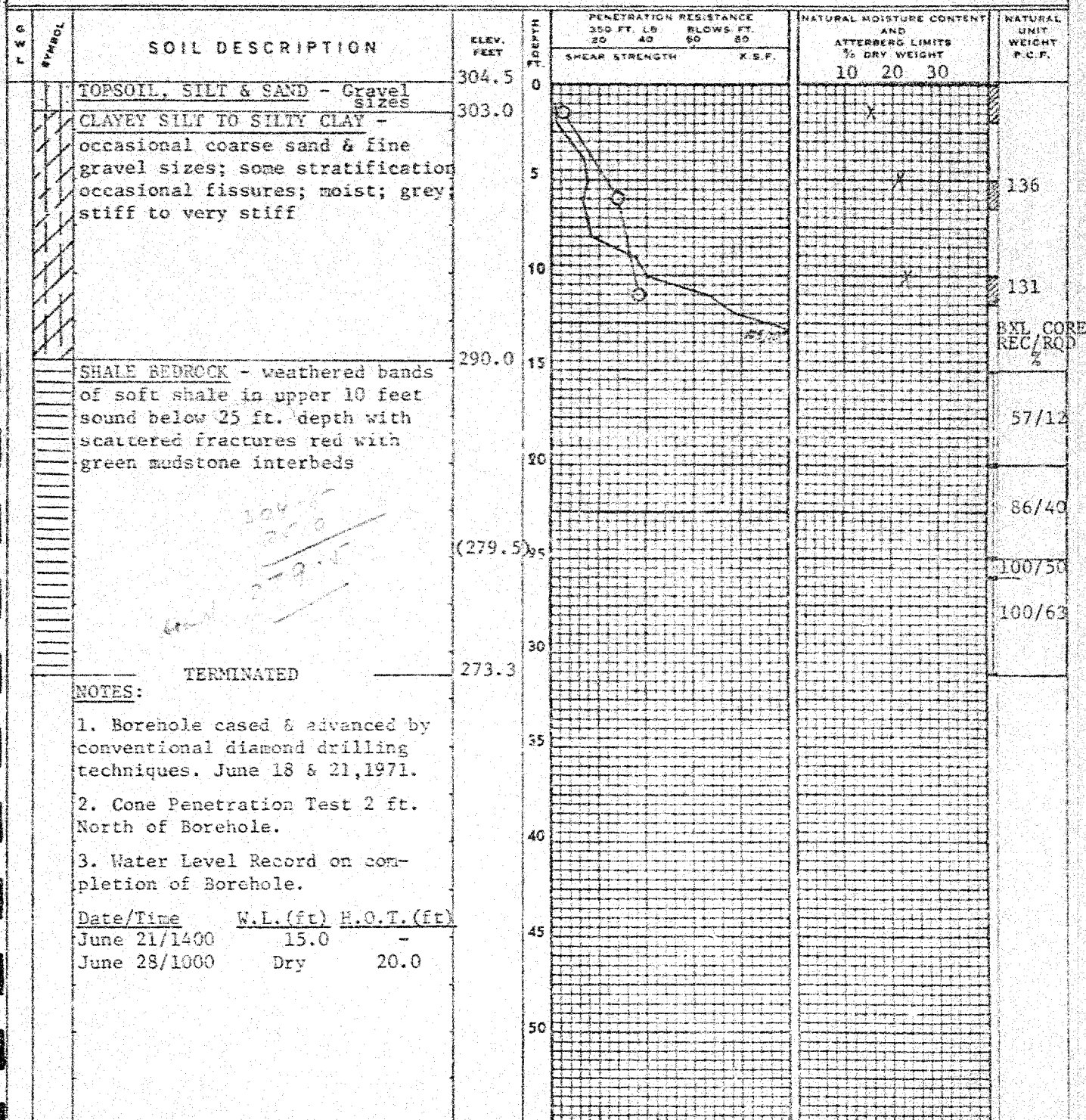
DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 HighwayWest Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE  P
 2" I.D. SHELBY TUBE  P
 2" DIA. CONE  P
 PUSHED  P
 VANE TEST AND SENSITIVITY (S)  + S

NATURAL MOISTURE  X
 PLASTIC AND LIQUID LIMIT   
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE  15 5
 % STRAIN AT FAILURE  10



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 21

DRAWING No.

PROJECT: Hamilton Entrance Bridge #1
 LOCATION: No. 2 Highway
 West Burlington, Ontario

Casing Sample
 2" O.D. SPLIT TUBE
 2" I.D. SHELBY TUBE
 2" DIA. CONE
 PUSHED
 VANE TEST AND SENSITIVITY (S)

NATURAL MOISTURE
 PLASTIC AND LIQUID LIMIT
 UNDRAINED TRIAXIAL AT
 OVERBURDEN PRESSURE
 % STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

L K G	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE 200 FT. LB. BLOWS FT. 20 40 60 80	SHEAR STRENGTH K.S.F.	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT 10 20 30	NATURAL UNIT WEIGHT P.C.F.
		10" TOPSOIL	285.6	0				
		CLAYEY SILT-FILL - red clayey silt and brown clayey silt to silty clay, moist; stiff	280.6	5				
		CLAYEY SILT-FILL - sand & gravel sizes, shale fragments; moist; red; hard	275.6	10				139
		SHALE BEDROCK -severely weathered to 15.5 ft. depth with many soft shale & hard shaley clay bands, sound with scattered fractures; below 15.5 ft. depth red with occ. green mudstone interbeds.	270.0	15				75/12
			268.8					95/80
		TERMINATED	266.1	20				
		NOTES:						
		1. Borehole cased & advanced by conventional diamond drilling techniques. June 24, 1971. Borehole located 1 ft. south of marked position.						
		2. Cone Penetration Test 2 ft. North east of Borehole.						
		3. Water Level Record on completion of Borehole.						
		Date/Time W.L.(ft) H.O.T.(ft)						
		June 24/1800 14.2 19.2						
		June 28/1000 16.8 18.0						



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 22

DRAWING No.

PROJECT Hamilton Entrance Bridge #1 Casing Sample ☒
 LOCATION No. 2 Highway 2" O.D. SPLIT TUBE ☒
West Burlington, Ontario 2" I.D. SHELBY TUBE ☒
 2" DIA. CONE ☒
 PUSHED ☒ P
 VANE TEST AND SENSITIVITY (S) ☒ +S
 NATURAL MOISTURE ☒ X
 PLASTIC AND LIQUID LIMIT ☒ $\frac{10}{10}$
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE ☒ $\frac{15}{10}$
 % STRAIN AT FAILURE ☒ $\frac{10}{10}$

MOLE LOCATION AND DATUM SEE DRAWING No. 1

P.E.R.	SYMBOL	SOIL DESCRIPTION 12" TOPSOIL	ELEV. FEET	DEPTH FT.	PENETRATION RESISTANCE 350 FT. LB. BLOWS FT. 20 40 60 80				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT			NATURAL UNIT WEIGHT P.C.F.
					SHEAR STRENGTH K.S.F.				10	20	30	
		CLAYEY SILT-FILL - red clayey silt and brown clayey silt to silty clay, moist; stiff	294.9	0								
		CLAYEY SILT-FILL - sand & gravel sizes shale fragments, moist; red; hard	289.9	5								
		SHALE BEDROCK - weathered with softer shale layers & some fracturing in upper 2.5 ft. generally sound below 12.5 ft. depth with scattered fractures softer shale band around 17 ft. depth; red with occasional green mudstone interbeds	284.9 (282.4) 278.3	10 15 20								92/52
		TERMINATED	274.6	20								98/74
		NOTES:										
		1. Borehole cased & advanced by conventional diamond drilling techniques. June 23 & 24, 1971. Borehole located 2 ft. West of marked position.										
		2. Cone Penetration Test 2 ft. east of Borehole.										
		3. Water Level Record on completion of Borehole.										
		Date/Time W.L. (ft) H.O.T. (ft)										
		June 24/0930 14.0 19.4										
		June 28/1000 16.6 19.4										



BOREHOLE LOG

JOB No. W1077

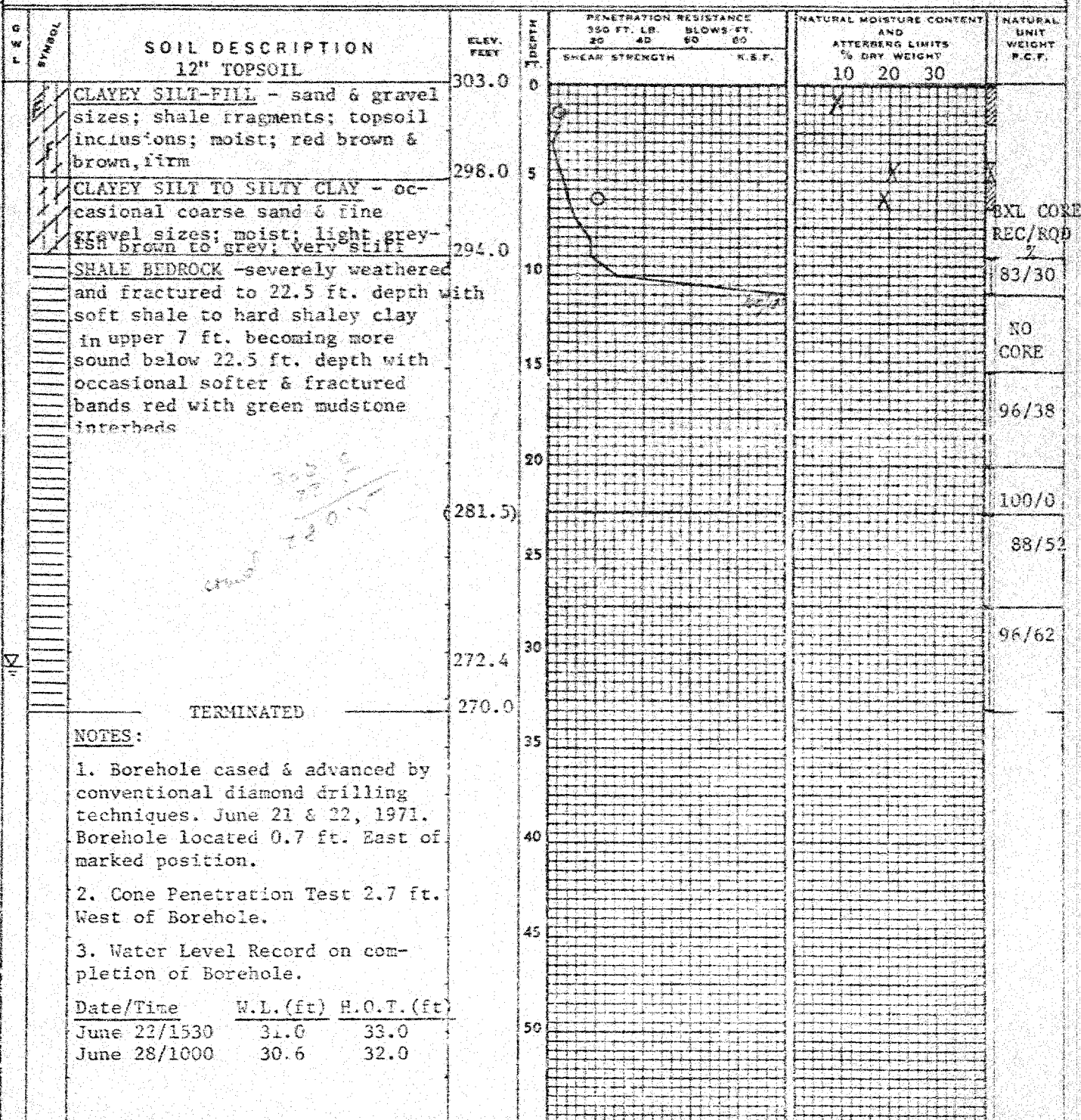
BOREHOLE No. 23

DRAWING No. _____

PROJECT Hamilton Entrance Bridge #1 Casing Sample
 LOCATION No. 2 Highway 2" O.D. SPLIT TUBE
West Burlington, Ontario 2" I.D. SHELVEY TUBE
 2" DIA. CONE
 PUSHED
 VANE TEST AND SENSITIVITY (S) +S

NATURAL MOISTURE X
 PLASTIC AND LIQUID LIMIT —O
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE
 % STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING No. 1



BOREHOLE LOG

JOB NO. H1077

BOREHOLE No. 26

DRAWING NO.

PROJECT Hamilton Entrance Bridge #1

LOCATION No. 2 Highway

West Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

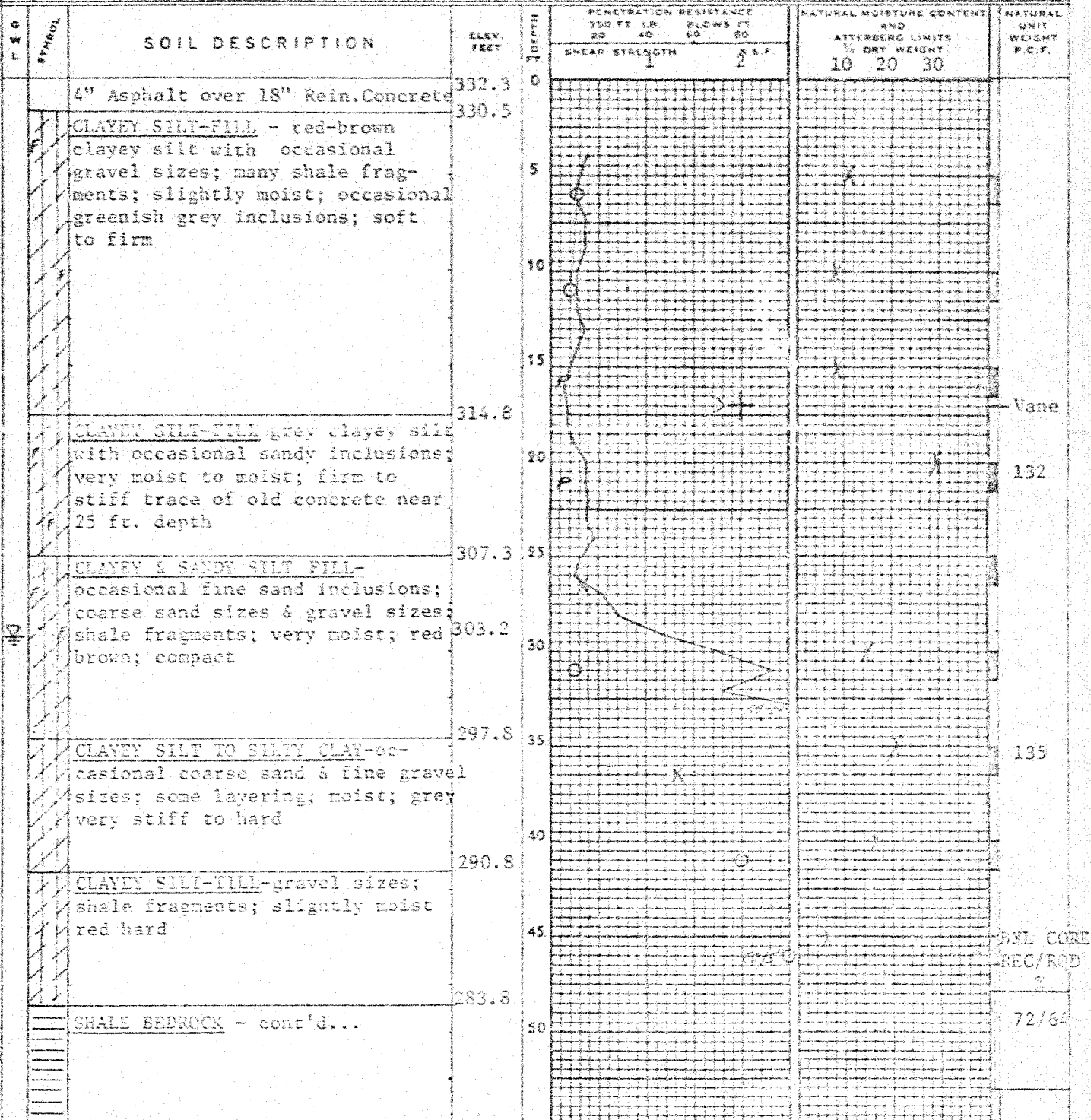
VANE TEST AND SENSITIVITY (S)

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

% STRAIN AT FAILURE



cont'd.....



William Trow Associates Ltd.

BOREHOLE LOG

JOB NO. H1077

BOREHOLE NO. 14 (CONT'D)

DRAWING NO.


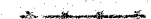



Hamilton Entrance Bridge





PROJECT #1

LOCATION No. 2 Highway

West Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (SI) 

NATURAL MOISTURE 
 PLASTIC AND LIQUID LIMIT 
 UNRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 STRAIN AT FAILURE 

P.C.	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE		NATURAL MOISTURE CONTENT AND ATTERING LIMITS % DRY WEIGHT	NATURAL UNIT WEIGHT P.C.F.
					350 FT. LB	BLOWS FT		
					20	20		
					SHEAR STRENGTH		G.S.F.	
			283.8	30				
		SHALE BEDROCK - mainly sound, slightly fractured, scattered thin softer shale layers in upper levels, red occasional green mudstone interbeds.		35				72/64 SVL CONE REC/RQB
				40				
				45				
				50				97/90
		TERMINATED	273.8	55				
				60				
				65				
				70				
				75				
				80				
				85				
				90				
				95				
				100				
				105				
				110				
				115				
				120				
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				925				
				930				
				935				
				940				
				945				
				950				
				955				
				960				
				965				
				970				
				975				
				980				
				985				
				990				
				995				
				1000				

NOTES:

1. Borehole advanced uncased by continuous flight auger equipment to refusal at 49.0 ft. depth on June 22, 1971. Borehole continued by diamond drilling techniques to completion at 58.5 ft. depth on June 23 & 24, 1971.

2. Cone Penetration Test 9 ft. West of Borehole.

3. Water Level Record on completion of Augered Borehole.

Date/Time W.L. (ft) H.O.T. (ft)

June 24/1030 29.1 46.2

4. Borehole backfilled on completion & concrete placed in upper 1 ft.





William Trow Associates Ltd.



BOREHOLE LOG

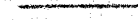
JOB No. 11877BOREHOLE No. 25


DRAWING No. _____


PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 HighwayWest Burlington, Ontario

2" O.D. SPLIT TUBE  

2" I.D. SHELBY TUBE  

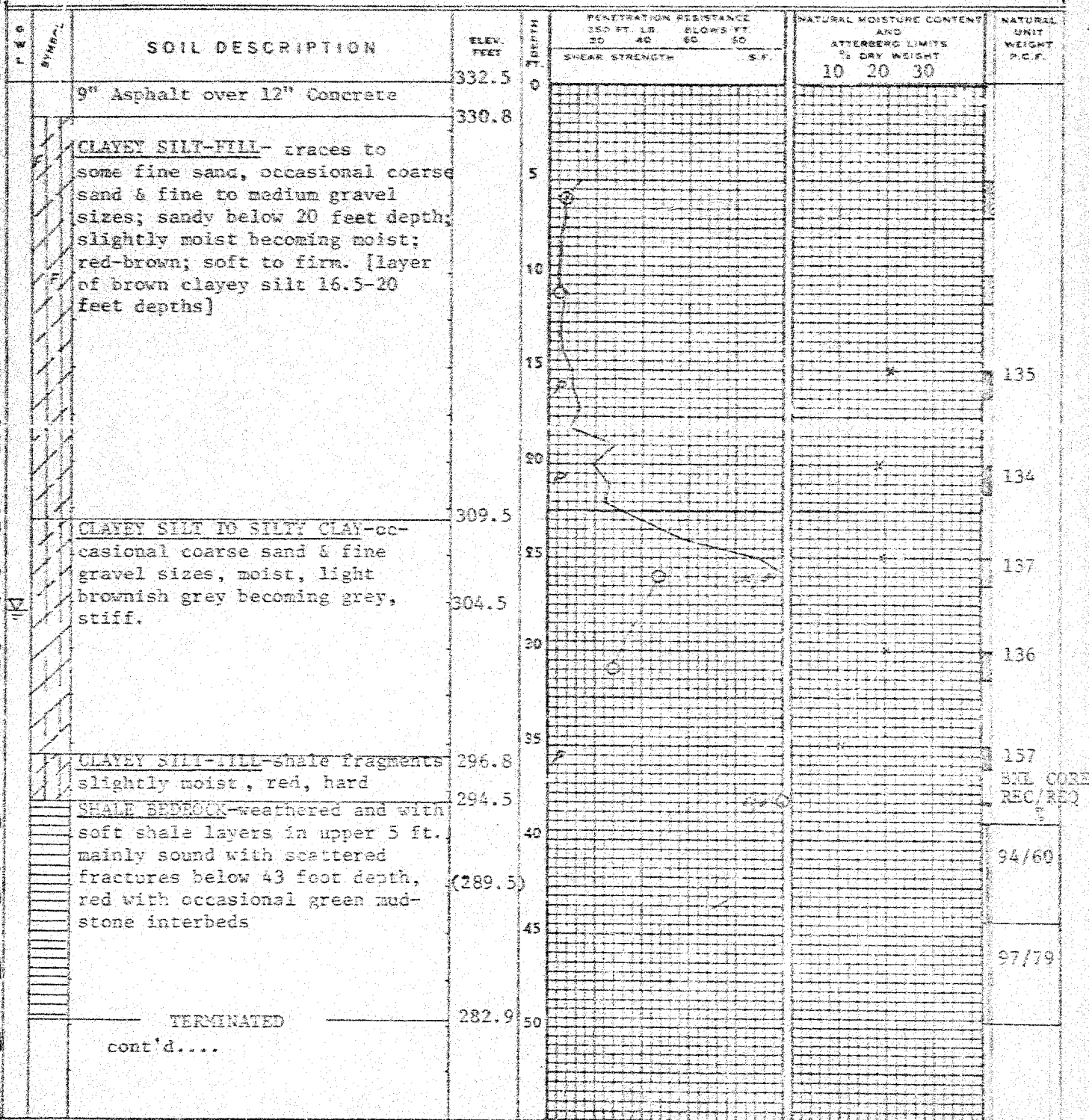
2" DIA. CONE 

PUSHED 

VANE TEST AND SENSITIVITY (S)  + S

NATURAL MOISTURE PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE% STRAIN AT FAILURE 

HOLE LOCATION AND DATUM SEE DRAWING No. 1



BOREHOLE LOG

JOB No. RL077

BOREHOLE No. 25 (cont'd)

DRAWING No.

PROJECT Hamilton Entrance Bridge #1

LOCATION No. 2 Highway

West Burlington, Ontario

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (S)

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING No. 1

L.S.O. BYHOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	NATURAL UNIT WEIGHT P.C.F.
				300 FT. LB. 20	80 60	BLOWS FT. 60	80		
				SHEAR STRENGTH					
				K.S.F.					
	NOTES:								
	1. Borehole advanced uncased by continuous flight auger equipment to refusal at 38.0 ft. depth on June 21 & 22, 1971. Borehole continued by diamond drilling techniques to completion at 49.6 ft. depth on June 23, 1971.								
	2. Cone Penetration Test 10 ft. west of Borehole.								
	3. Water Level at 28.0 ft. depth on completion of augered borehole.								
	4. Borehole backfilled and concrete placed in upper 1 ft. following completion.								



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 26

DRAWING No.

PROJECT Hamilton Entrance Bridge #1

LOCATION No. 2 Highway

West Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (S)

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

% STRAIN AT FAILURE

SOIL DESCRIPTION

ELEV.
FEETDEPTH
FEETPENETRATION RESISTANCE
250 FT. LB. BLOWS/FT.

SHEAR STRENGTH K.S.F.

NATURAL MOISTURE CONTENT
AND
ATTERBERG LIMITS
% DRY WEIGHTNATURAL
UNIT
WEIGHT
P.C.F.

10 20 30

CLAYEY SILT-Fill, sand & gravel
sizes moist red-brown, loose, over-
lying 4" of topsoil.CLAYEY SILT-fill, occ. coarse sand
& fine to med. gravel sizes, moist
red with br. inclusions, compact
Firm to Stiff.SHALE BEDROCK-mainly soft shale
and hard shaley clay with clayey
silt bands, layered, in upper
2 ft; heavily weathered and
fractured shale to approx. 20 ft.
depth; mainly sound with occ.
fractured zones to 28.5 ft. depth
sound below 28.5 ft. depth;
red with occasional green sand-
stone interbeds.

TERMINATED

NOTES:

1. Borehole cased & advanced by conventional diamond drilling techniques. July 7, 8 & 9, 1971.
2. Cone Penetration Test 4 ft. south of borehole, cone deflecting between 7 ft. & 8 ft. depth.
3. Water Level Record on completion of Borehole.

Date/Time W.L. (ft) H.O.T. (ft)

July 9/1630 26.0 34.9

BXL CORE
REC/REQ

64/24

91/16

86/48

91/0

80/53

98/42

98/56

(100/99)

"dropped
cont

BOREHOLE LOG



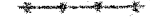




JOB No. H1077





BOREHOLE No. 27

DRAWING No.

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 HighwayWest Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE  
 2" I.D. SHELBY TUBE  
 2" DIA. CONE 
 PUSHED  P
 VANE TEST AND SENSITIVITY (SI)  T S

NATURAL MOISTURE  X
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE  15
 STRAIN AT FAILURE  10

LEG	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE 300 FT. LB 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT 10 20 30	NATURAL UNIT WEIGHT P.C.F.
		CLAYEY SILT FILL - sand & gravel sizes, moist; loose	313.2	0			
		CLAYEY SILT TO SILTY CLAY-TILL - occasional coarse sand & fine gravel sizes; occasional weathered shale fragments; moist, grey, very stiff to hard	309.0	5			141
		CLAYEY SILT-TILL - many shale fragments; moist; red; hard	301.7	10			136
		SHALE BEDROCK - some fracturing to 18.7 ft.; generally sound below 18.7 ft. depth; shaley clay seam from 18.4 to 18.7 ft. depth; occasional softer shale layers below 18.7 ft. red with occasional green mudstone interbeds	299.3	15			EXL CORE REC/ROD
			298.0	20			84/40
			294.5	25			90/89
			287.4	30			10" Core dropped
		NOTES:					
		1. Borehole cased & advanced by conventional diamond drilling techniques. June 18 & 21, 1971.					
		2. Cone Penetration Test 4 ft. North of Borehole.					
		3. Water Level Record on completion of Borehole.					
		Date/Time W.L. (ft) P.O.T. (ft)					
		June 21/1100 13.5 24.4					
		Sept. 8/1500 13.9 -					



BOREHOLE LOG

JEP No. H1077

BOREHOLE No. 28



DRAWING No.



PROJECT Hamilton Entrance Bridge #1

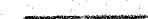
LOCATION No. 2 Highway


West Burlington, Ontario


HOLE LOCATION AND DATUM SEE DRAWING No. 1


2" O.D. SPLIT TUBE  


2" I.D. SHELBY TUBE  


2" DIA. CONE 


PUSHED  P

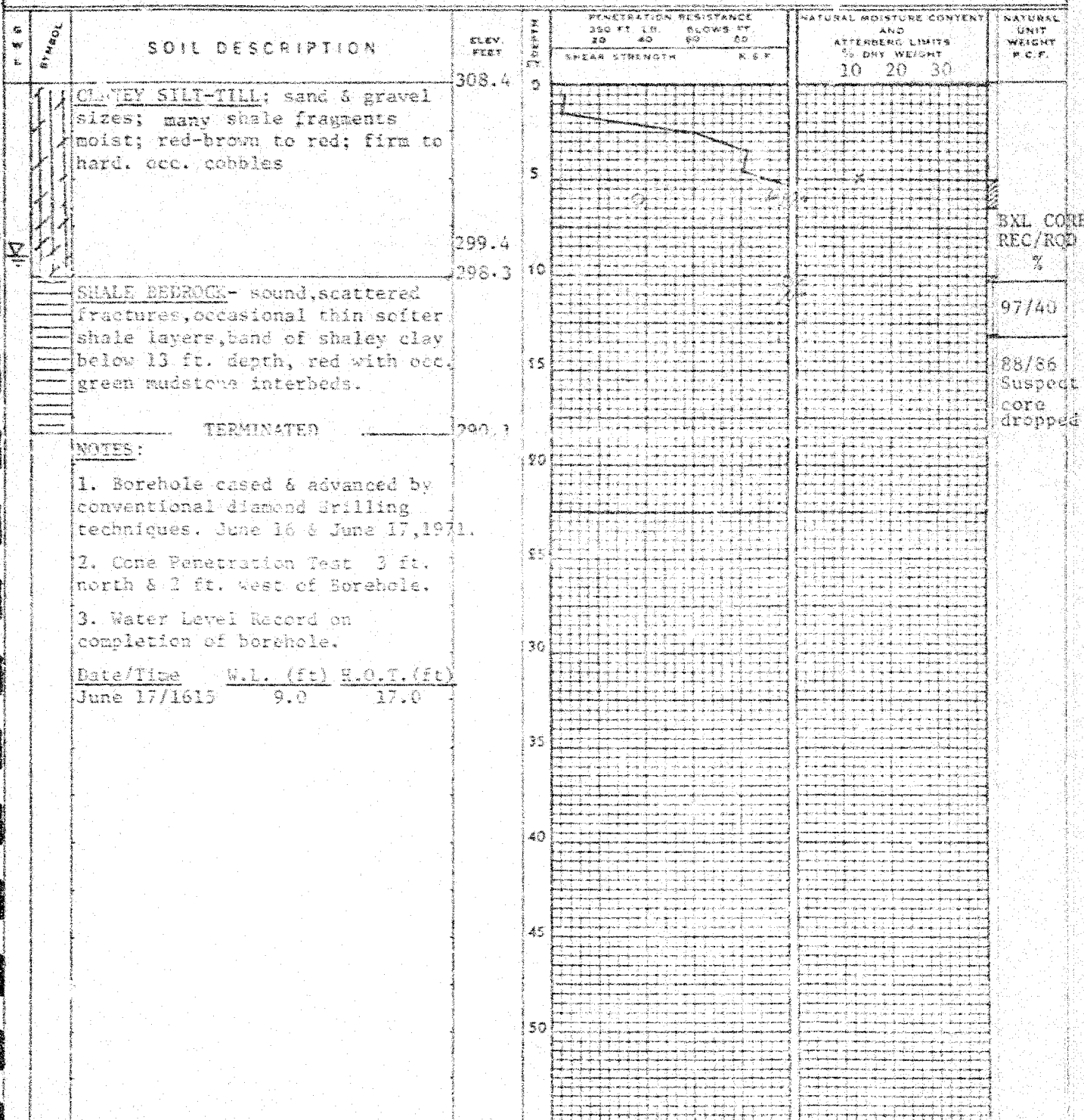
VANE TEST AND SENSITIVITY (S)  + S

NATURAL MOISTURE  X

PLASTIC AND LIQUID LIMIT 

UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE 

% STRAIN AT FAILURE 




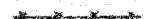

BOREHOLE LOG




JOB No. HL077BOREHOLE No. 29

DRAWING No. _____

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 HighwayWest Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED _____ P
 VANE TEST AND SENSITIVITY (S) +5

NATURAL MOISTURE X
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 STRAIN AT FAILURE 

SOIL DESCRIPTION

ELEV.
FEETDEPTH
FEET

PENETRATION RESISTANCE
 150 FT. LB. 25 40 60 80
 SHEAR STRENGTH K.S.F.

NATURAL MOISTURE CONTENT AND
 ATTERBERG LIMITS
 % DRY WEIGHT
 10 20 30

NATURAL
UNIT
WEIGHT
P.C.F.9" Asphalt over 12" Rein.
Concrete

332.5

330.8

CLAYEY SILT-FILL-red-brown clayey
silt to 2.5 feet depth;
changing to brownish grey clayey
silt, moist to very moist, soft
to firm

315.5

312.0

CLAYEY & SANDY SILT-TILL-with
some gravel sizes and many shale
fragments; mudstone at approx. 24
ft. depth; becoming clayey silt
below 24 ft. depth; moist
water seepage at 18 ft. depth
red-brown, dense to very dense

302.5

297.0

SHALE BEDROCK -severely weathered
in upper 3.5 ft. sound below
35.5 ft. depth with hard shaley
clay layers approx. 0.2 ft. thick
at 40 ft., 41.5 ft & 43.2 ft.
depth; red with occasional green
mudstone interbeds and inclusions.

TERMINATED

NOTES:

1. Borehole advanced uncased
by continuous flight auger equip-
ment to refusal at 35.0 ft. depth
on June 21, 1971. Borehole continued
by diamond drilling techniques to
completion at 45.6 ft. depth on
June 22, 1971.

2. Cone Penetration Test 10 ft.
West of Borehole.

3. Water Level Record on completion of
Augered Borehole.

Date/Time	W.L. (ft)	H.O.T. (ft)
June 21/1600	20.2	30.0
June 22/0900	19.5	26.2

4. Borehole backfilled and concrete placed
in upper 1 ft. following completion.



William Trow Associates Ltd.

BOREHOLE LOG

JOB NO. W1077

BOREHOLE NO. 30

DRAWING NO.

Hamilton Entrance Bridge

PROJECT #1

LOCATION No. 2 Highway

West Burlington, Ontario

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (S)

NATURAL MOISTURE

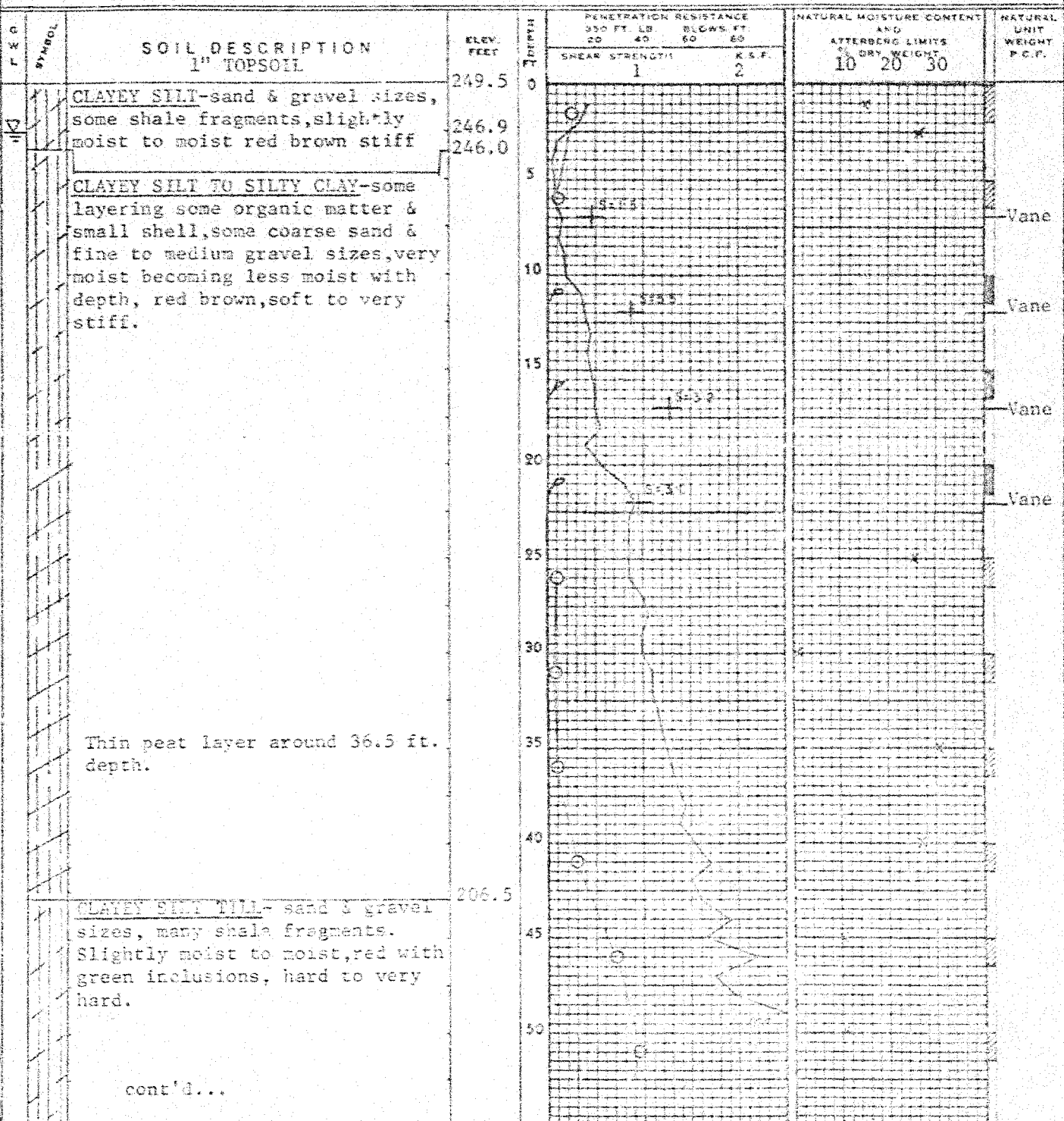
PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT

OVERBURDEN PRESSURE

% STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

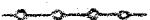





BOREHOLE LOG

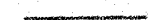
JOB No. AL677BOREHOLE No. 30 (continued)


DRAWING No. _____

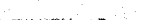
PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 HighwayWest Burlington, Ontario


2" O.D. SPLIT TUBE  



2" I.D. SHELBY TUBE  


2" DIA. CONE 


PUSHED  P

VANE TEST AND SENSITIVITY (S)  + S

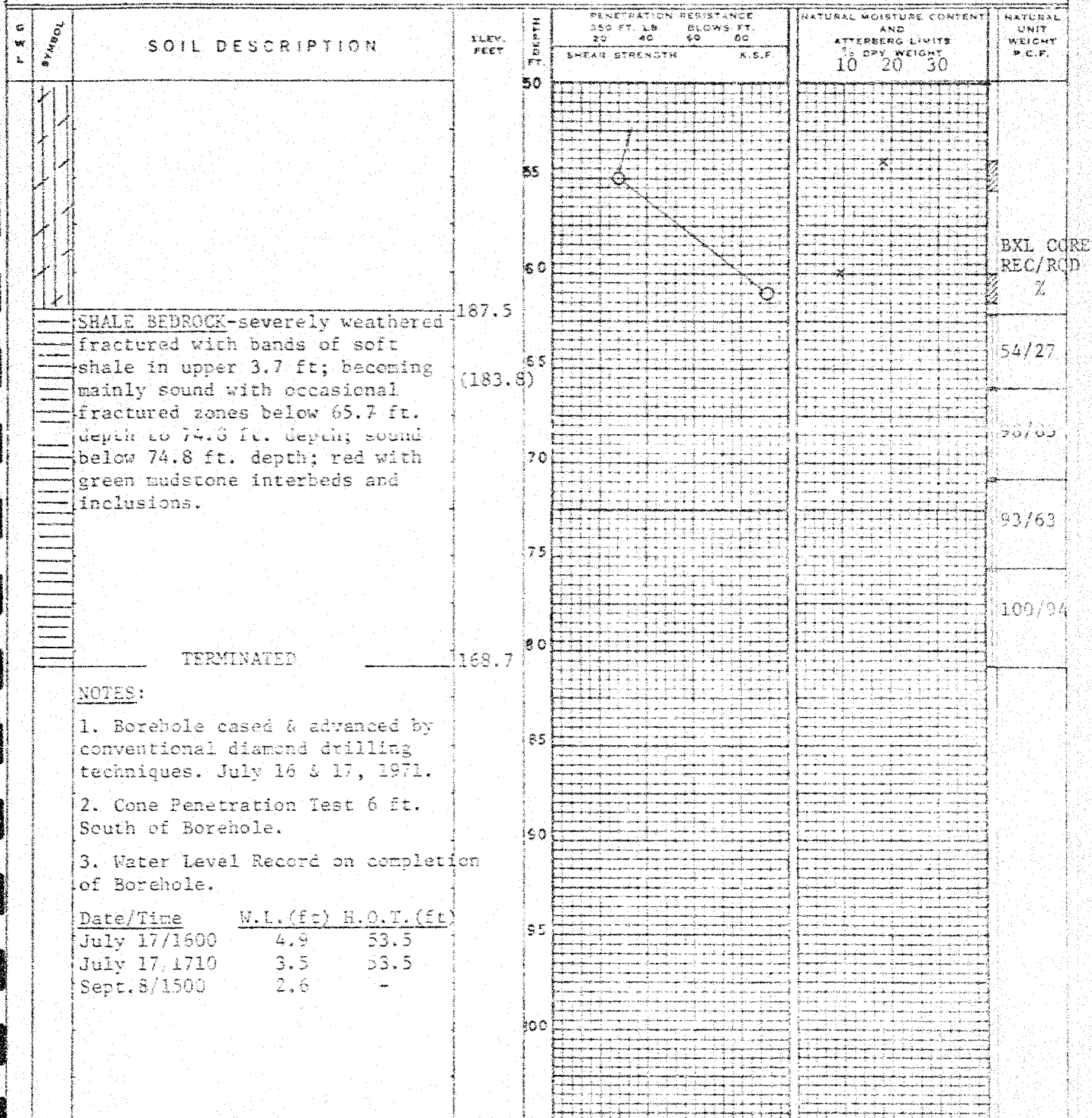
NATURAL MOISTURE  X

PLASTIC AND LIQUID LIMIT  

UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE  15 0 5

STRAIN AT FAILURE  10

HOLE LOCATION AND DATUM SEE DRAWING No. 1



JOE No. H1077

SECRET

DRAWING No. _____

PROJECT #1

LOCATION No. 2 Highway

West Burlington, Ontario

2" O.D. SPLIT TUBE

A- I.D. SHIELDY TUBE *-*-*

2 DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY TO +10

NATURAL MOISTURE X

PLASTIC AND LIQUID LIMIT 

UNDRAINED TRIAXIAL AT
OVERBURDEN PRESSURE

STRAIN AT FAILURE \nearrow 10

HOLE LOCATION AND DATUM SEE DRAWING NO. 1



BOREHOLE LOG

LOG No. H1077

BOREHOLE No. 32





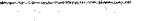
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

Hamilton Entrance Bridge

PROJECT #1

LOCATION No. 2 Highway

West Burlington, Ontario

2" O.D. SPLIT TUBE  2
 2" I.D. SHELBY TUBE  2
 2" DIA. CONE 
 PUSHED  P
 VANE TEST AND SENSITIVITY (S)  + S

NATURAL MOISTURE  X
 PLASTIC AND LIQUID LIMIT  O
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE  0
 STRAIN AT FAILURE  15
 10

HOLE LOCATION AND DATUM SEE DRAWING No. 1

C.W.L.	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FT.	PENETRATION RESISTANCE		NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	NATURAL UNIT WEIGHT P.C.F.
					350 FT. LB	BLOWS FT		
		4" TOPSOIL	250.3	0			10 20 30	
		CLAYEY SILT TO SILTY CLAY-some layering some organic matter & small shells some coarse sand & fine to medium gravel sizes; peat layer 3 10 feet to 11.5 feet depth; becoming sandy at around 15.0 feet depth; moist; red, brown, soft to very stiff.	248.0	2				
			233.3	15				
		CLAYEY SILT-FILL-sand & gravel sizes, many shale fragments. Slightly moist to moist, red with green inclusions, hard to very hard.	217.9	25				
		SHALE BEDROCK-severely weathered with many soft shale bands in upper 7 ft. sound with occasional fract below 39.4 ft. depth, Red with green mudstone interbeds.	210.9	30				
		TERMINATED	198.2	35				
		NOTES:						
		1. Borehole cased & advanced by conventional diamond drilling techniques. July 21 & 22, 71.						
		2. Cone Penetration Test 3 ft. West of Borehole.						
		3. Water Level Record on completion of Borehole.						
		Date/Time W.L. (ft) H.O.T. (ft)						
		July 22/1700 2.3 30.9						



William Trow Associates Ltd.

BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 33

DRAWING No.



Hamilton Entrance Bridge



PROJECT #1


LOCATION No. 2 Highway


West Burlington, Ontario


HOLE LOCATION AND DATUM SEE DRAWING NO. 1


2" O.D. SPLIT TUBE  


2" I.D. SHELBY TUBE  


2" DIA. CONE 


PUSHED  P

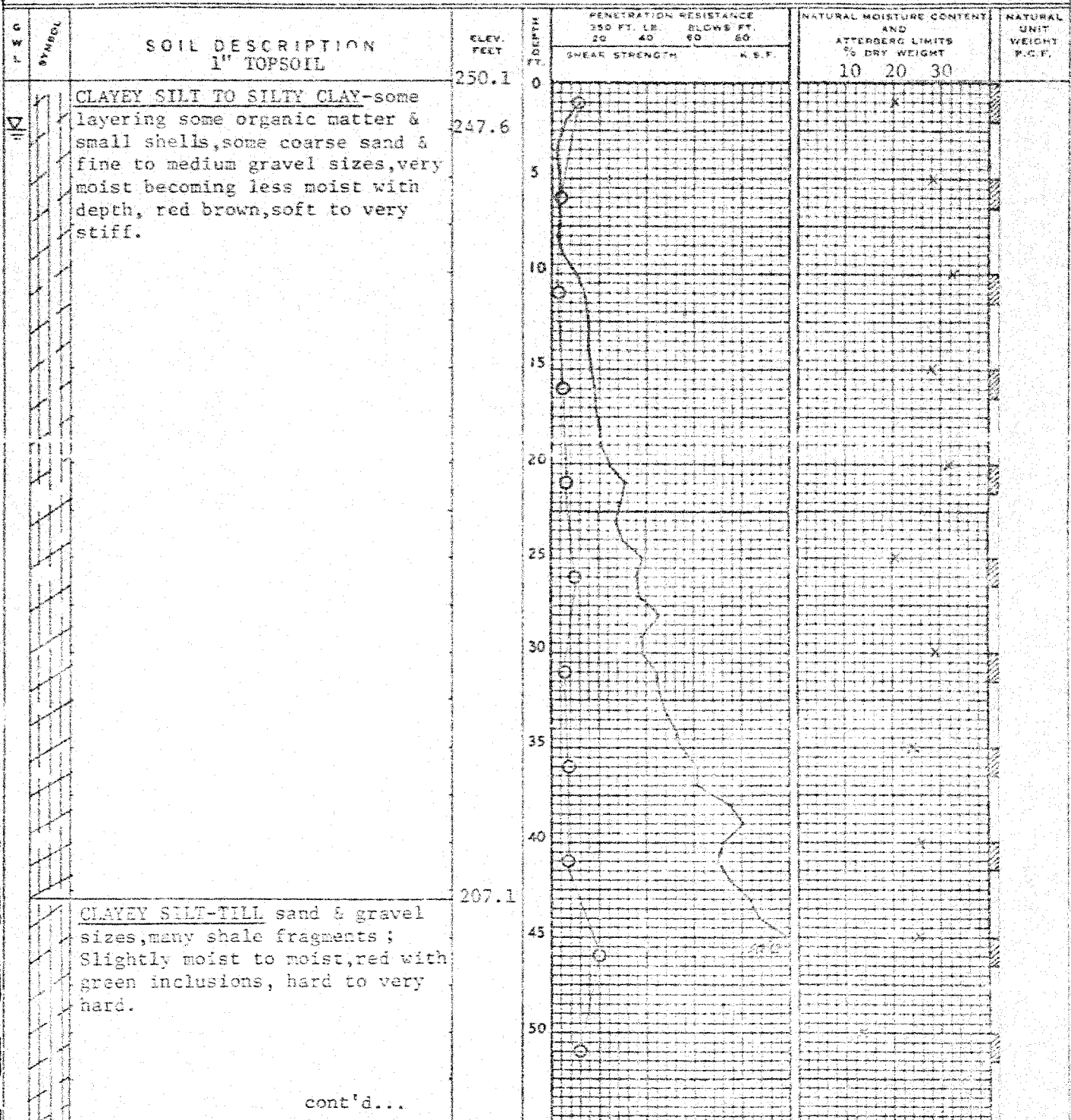
VANE TEST AND SENSITIVITY (S)  + S

NATURAL MOISTURE  X

PLASTIC AND LIQUID LIMIT 

UNDRAINED TRIAXIAL A¹ OVERBURDEN PRESSURE  15 5 10

% STRAIN AT FAILURE 



William Trow Associates Ltd.

BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 33 (continued)

DRAWING No.

Hamilton Entrance Bridge

PROJECT #1

LOCATION No. 2 Highway

West Burlington, Ontario

2" O.D. SPLIT TUBE

2" I.D. SHELLEY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (S)

P

+S

NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT

OVERBURDEN PRESSURE

% STRAIN AT FAILURE

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

LEG SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FT.	PENETRATION RESISTANCE				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT			NATURAL UNIT WEIGHT P.C.F.
				350 FT. LH 20	40	BLOWS FT 50	60	10	20	30	
				SHEAR STRENGTH				R.S.F.			
			30								
		194.3	55								BXL CORE REC/RQD
	SHALE BEDROCK-severely weathered with many soft shale bands & occ. fractures in upper 12.5 ft. Sound with scattered fractures below 68.3 ft. depth; some small inter- connected solution cavities with associated erosion and fracturing around 74.7 feet depth; red with occasional green mudstone inter- beds.		60								76/37
			65								87/53
		(161.8)	70								83/35
			75								100/62
			80								96/83
	TERMINATED	169.9	85								
	NOTES:		90								
	1. Borehole cased & advanced by conventional diamond drilling techniques. July 23, 26, 27 & 28 1971.		95								
	2. Cone Penetration Test 4 ft. west of Borehole.		100								
	3. Water Level Record on com- pletion of Borehole.										
	Date/Time W.L.(ft) H.O.T.(ft)										
	July 28/1430 2.3 55.6										
	Sept. 8/1500 2.5 -										



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 34

DRAWING No.

Hamilton Entrance Bridge

PROJECT #1

LOCATION No. 2 Highway

West Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING No. 1

1" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

2" DIA. CONE

PUSHED

VANE TEST AND SENSITIVITY (S) + S

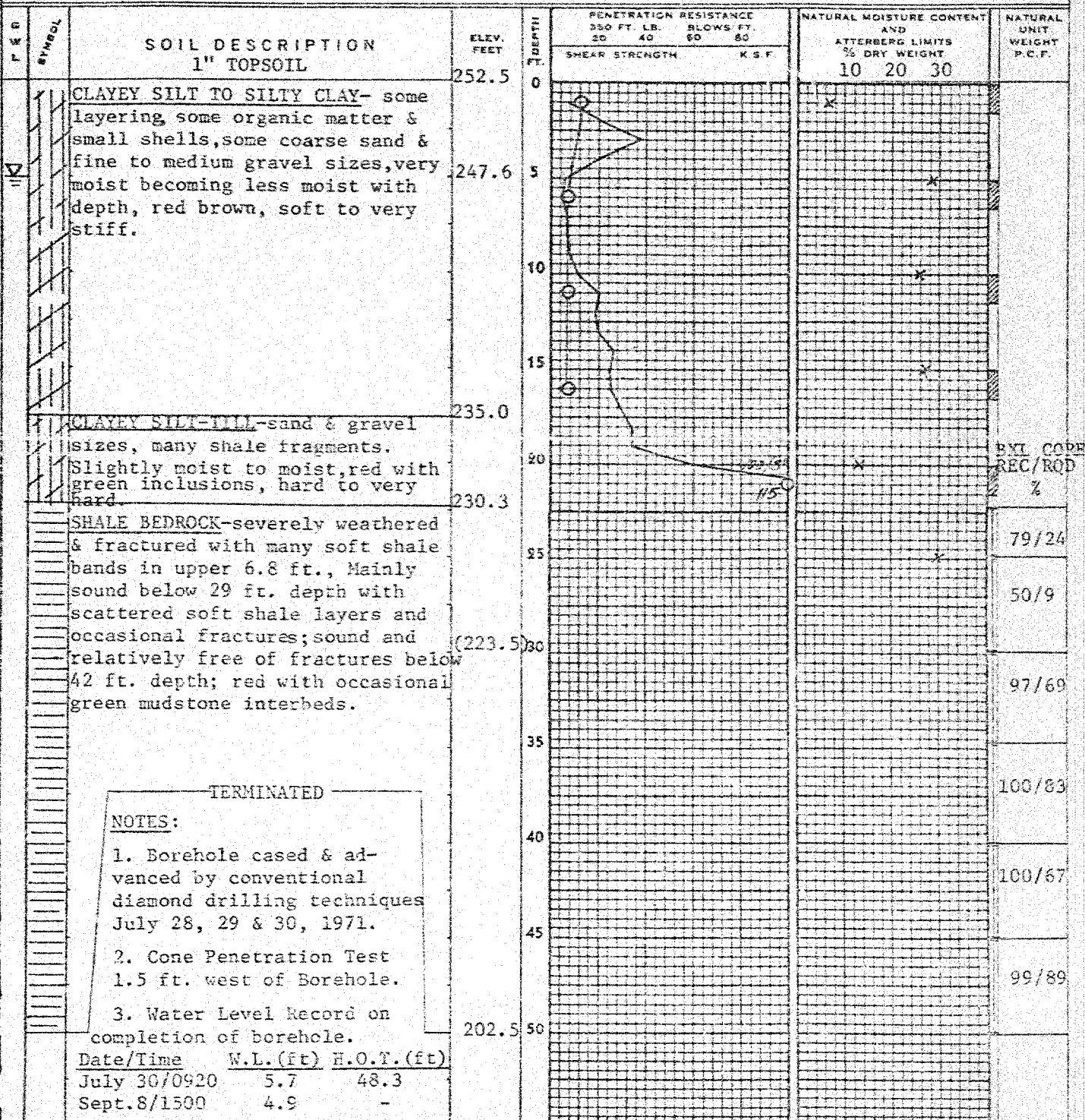
NATURAL MOISTURE

PLASTIC AND LIQUID LIMIT

UNDRAINED TRIAXIAL AT

OVERBURDEN PRESSURE

% STRAIN AT FAILURE





BOREHOLE LOG




JOB No. H1077BOREHOLE No. 35

DRAWING No. _____

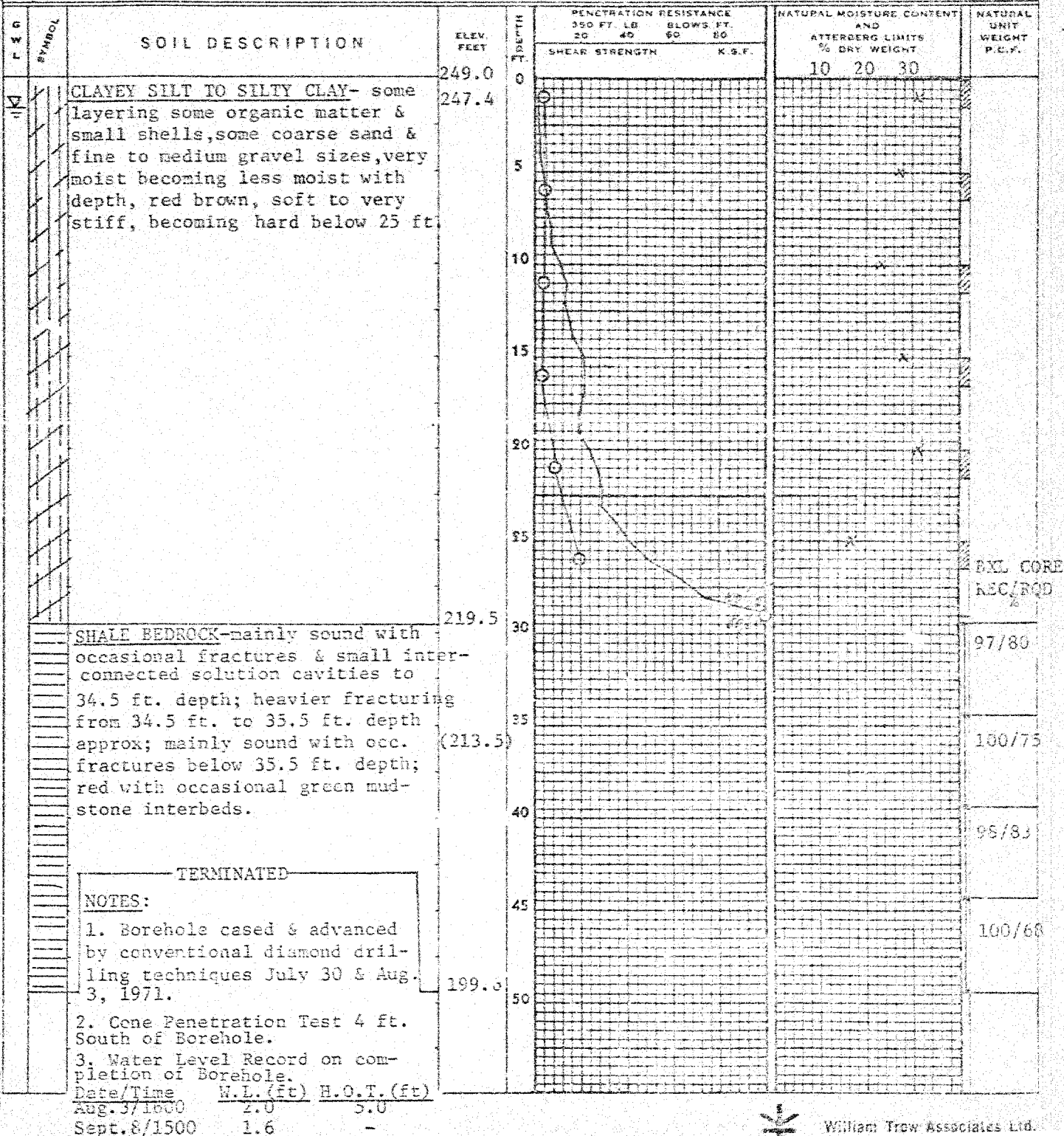
Hamilton Entrance Bridge

PROJECT #1LOCATION No. 2 HighwayWest Burlington, Ontario2" O.D. SPLIT TUBE 2" I.D. SHELBY TUBE 2" DIA. CONE 

PUSHED _____

VANE TEST AND SENSITIVITY (S) +5NATURAL MOISTURE XPLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE % STRAIN AT FAILURE 

HOLE LOCATION AND DATUM SEE DRAWING No. 1



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 36

DRAWING No.






Hamilton Entrance Bridge





PROJECT #1

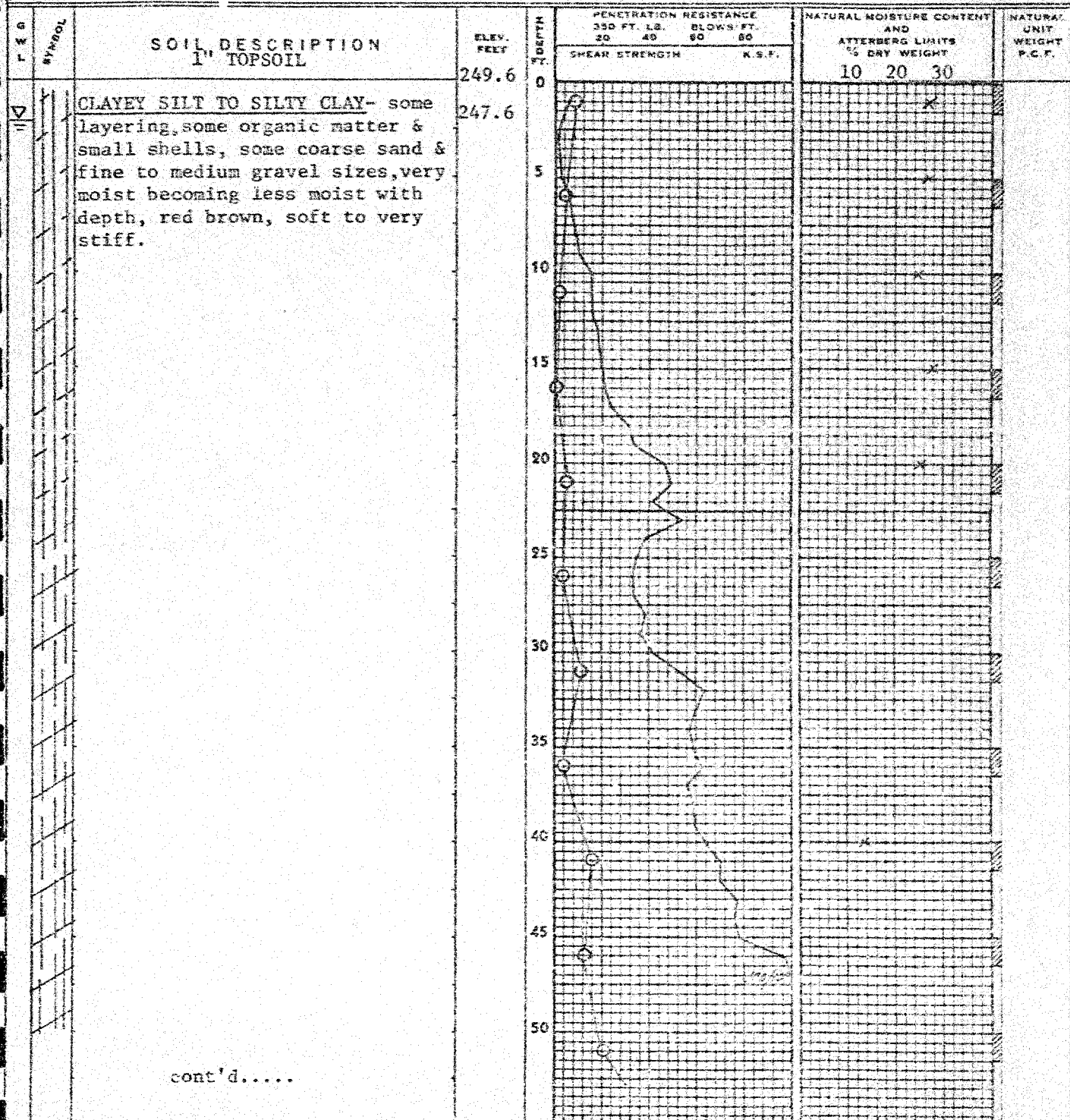
LOCATION No. 2 Highway

West Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE 
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT
 OVERBURDEN PRESSURE 
 % STRAIN AT FAILURE 



William Trow Associates Ltd.

REMARKS: 30 (continued)

COATING NO. _____

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

VANE TEST AND SENSITIVITY TEST + 1/2

7 STRAIN AT FAILURE 10



William Inoué Associates, Inc.



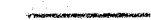

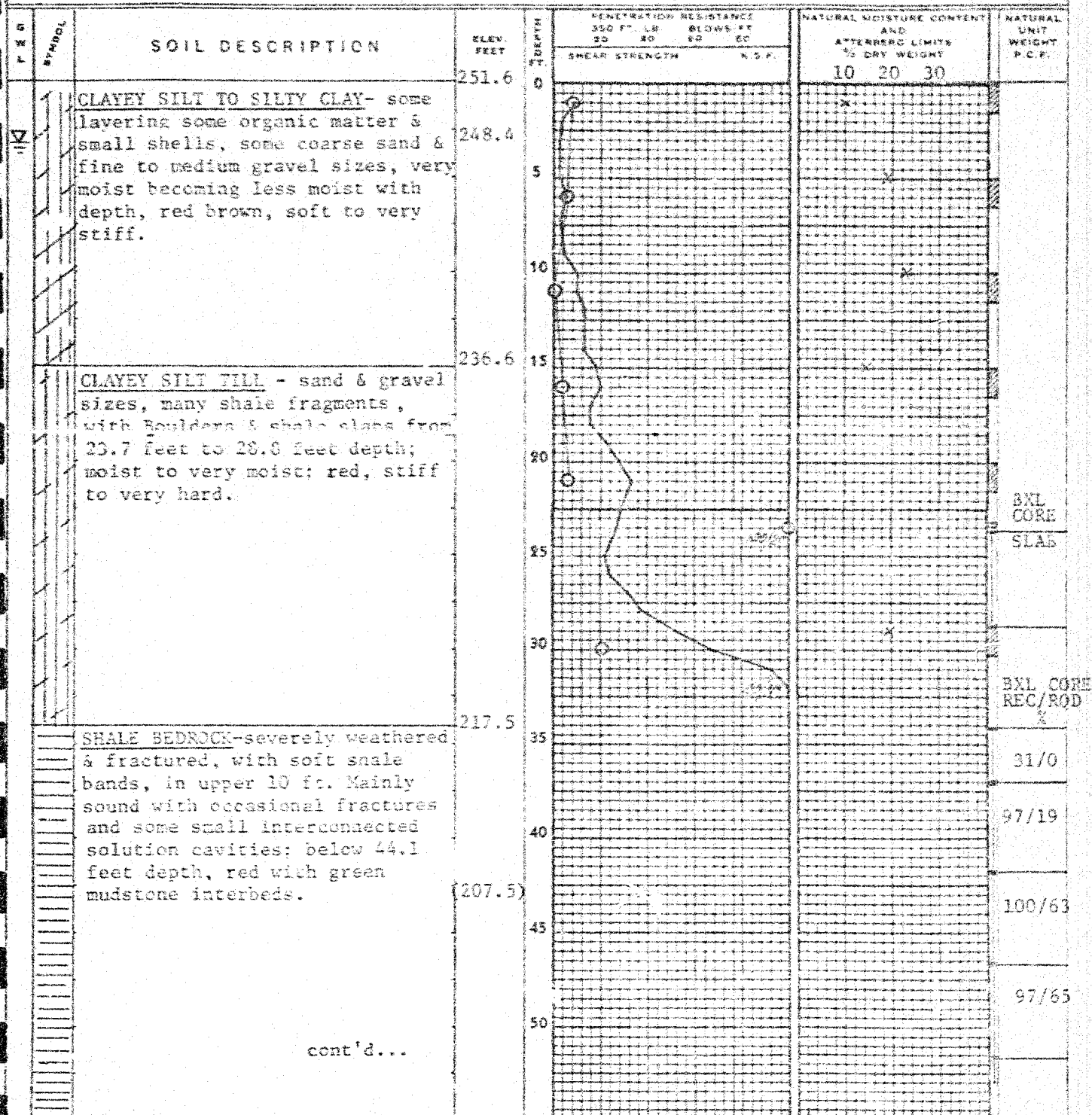
BOREHOLE LOG

JOB No. H1077BOREHOLE No. 37

DRAWING No. _____

PROJECT Hamilton Entrance Bridge #1LOCATION No. 2 Highway,West Burlington, Ontario

MOLE LOCATION AND DATUM SEE DRAWING No. 1

2" O.D. SPLIT TUBE 2" I.D. SHELBY TUBE 2" DIA. CONE PUSHED VANE TEST AND SENSITIVITY (S) NATURAL MOISTURE PLASTIC AND LIQUID LIMIT UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE % STRAIN AT FAILURE 






William Trow Associates Ltd.





BOREHOLE LOG

JOB No. 11077BOREHOLE No. 37 cont'd

DRAWING No. _____

PROJECT Hamilton Entrance Bridge #1
 LOCATION No. 2 Highway,
West Burlington, Ontario

2" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S)  + 5

NATURAL MOISTURE 
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 % STRAIN AT FAILURE 

HOLE LOCATION AND DATUM SEE DRAWING No. 1

C W L	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FT.	PENETRATION RESISTANCE				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	NATURAL UNIT WEIGHT P.C.F.	
					350 FT. LB.		BLOWS FT.				
					20	40	60	80			
					SHEAR STRENGTH				K.S.F.		
				50							97/65
				55							100/62
		TERMINATED									
		NOTES:									
		1. Borehole cased & advanced by conventional diamond drilling techniques. August 5 & 6, 1971.		60							
		2. Cone Penetration Test 3 ft. East & 1 ft. North of borehole.		65							
		3. Water Level Record on completion of Borehole.									
		Date/Time W.L. (ft) H.O.T. (ft)		70							
		Aug. 6/1600 4.3 20.6									
		Sept. 8/1500 3.2 -		75							
				80							
				85							
				90							
				95							
				100							



BOREHOLE LOG

JOB No. H1077

BOREHOLE No. 38

DRAWING No.




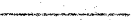

Hamilton Entrance Bridge





PROJECT #1

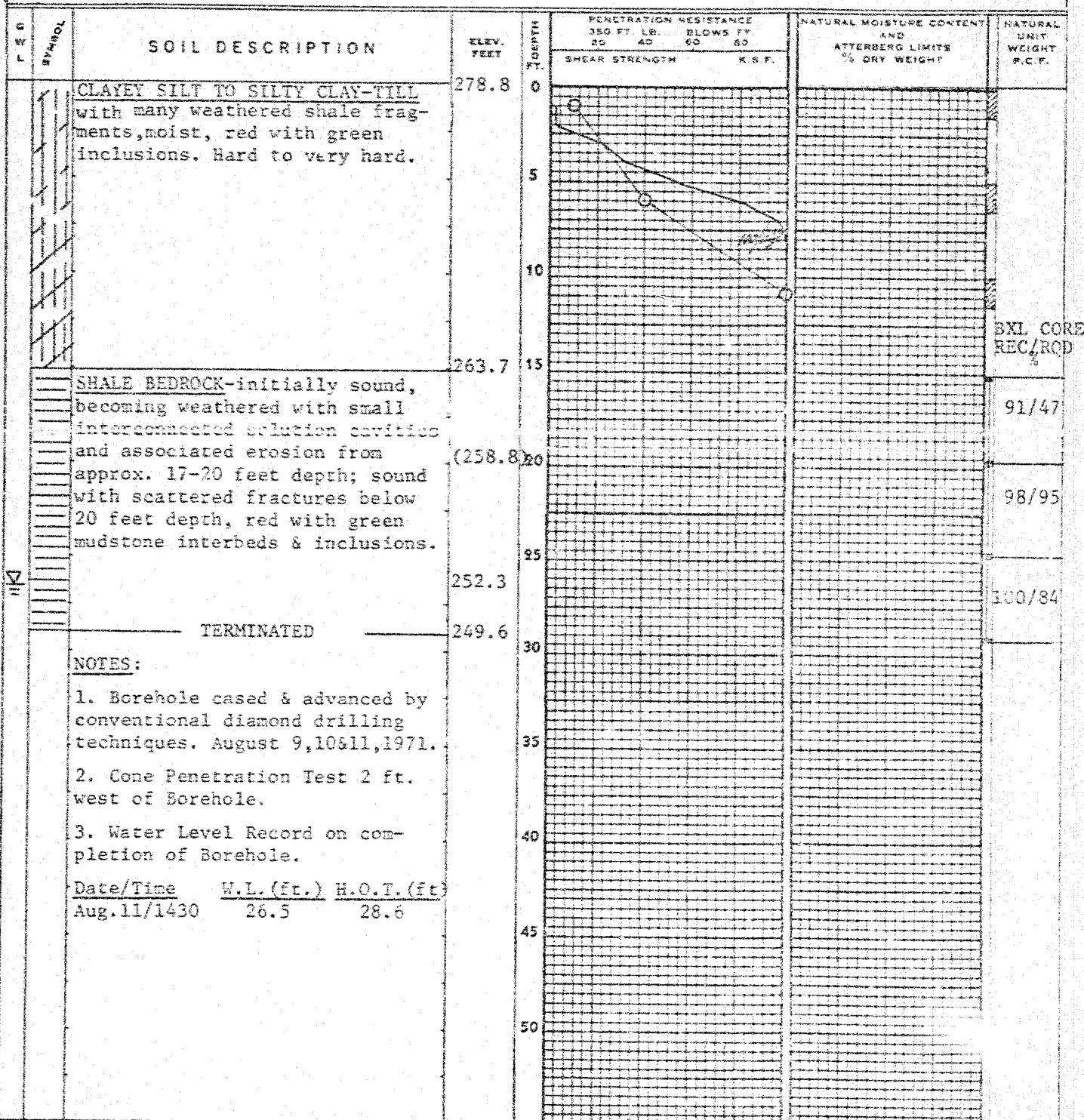
LOCATION No. 2 Highway

West Burlington, Ontario

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

2" O.D. SPLIT TUBE 
 4" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE 
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE 
 % STRAIN AT FAILURE 








BOREHOLE LOG





JOB NO. H1077

BOREHOLE No. 39

DRAWING NO.

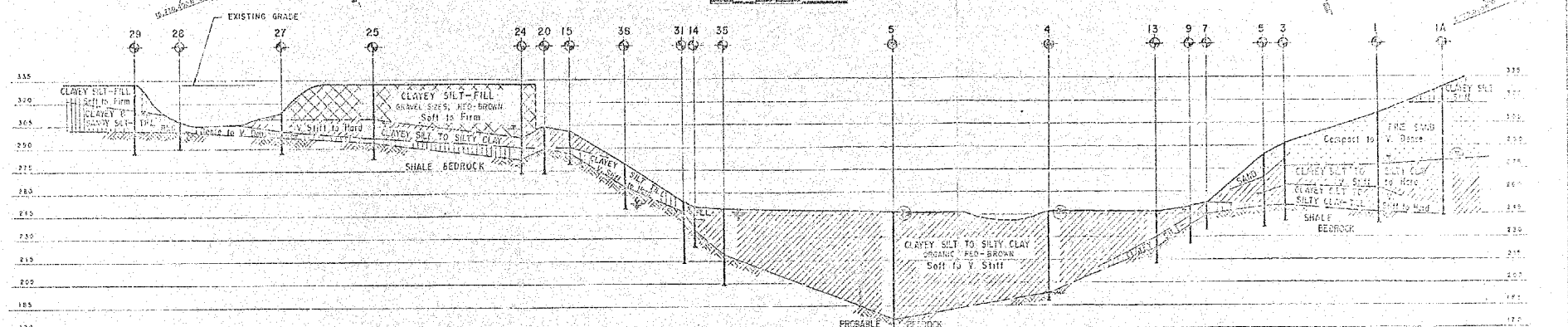
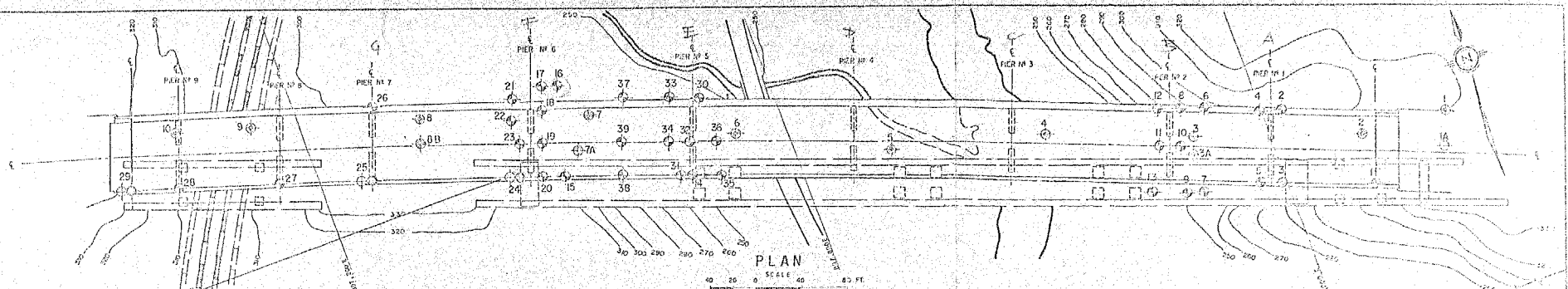
PROJECT Hamilton Entrance Bridge #1
 LOCATION No. 2 Highway
West Burlington, Ontario

5" O.D. SPLIT TUBE 
 2" I.D. SHELBY TUBE 
 2" DIA. CONE 
 PUSHED 
 VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE 
 PLASTIC AND LIQUID LIMIT 
 UNDRAINED TRIAXIAL AT
 OVERBURDEN PRESSURE 
 % STRAIN AT FAILURE 

HOLE LOCATION AND DATUM SEE DRAWING NO. 1

LEG	SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FT.	PENETRATION RESISTANCE				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS		NATURAL UNIT WEIGHT
					350 FT. LB. 20	600 FT. LB. 40	BLOWS FT. 60	80	% DRY WEIGHT	UNITS	
					SHEAR STRENGTH K.S.F.						
		CLAYEY SILT TO SILTY CLAY-FILL with weathered shale & many shale fragments moist, red with green inclusions. Hard to very hard.	263.6	0							
		SHALE BEDROCK-weathered, with soft shale layers in upper 5.3ft. Mainly sound with occasional fractures & fractured zones below 12.0 ft. depth; sound with scattered fractures below 21 ft. depth; red with green mudstone interbeds.	256.9	5							BXL CORE REC/RCD %
			252.0	10							83/57
			(251.6)	15							99/93
				20							92/55
				25							96/40
				30							100/96
		TERMINATED	232.8	35							98/84
		NOTES: 1. Borehole cased & advanced by conventional diamond drilling techniques. August 12 & 13, 1971. 2. Cone Penetration Test 2 ft. East of Borehole. 3. Water Level Record on completion of Borehole. Date/Time W.L. (ft) H.O.T. (ft) Aug. 13/1030 11.6 30.4		40							
				45							
				50							

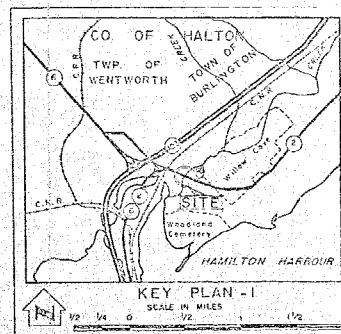


LONGITUDINAL PROFILE AT SOUTH SIDE OF PROPOSED BRIDGE STRUCTURE

VERT. 30 10 0 SCALE 15 60
HORIZ. 40 0 SCALE 15 60 FT

LEGEND

- Bore Hole
- ⊕ Cone Penetration Test
- ⊕ Bore Hole & Cone Test
- ⬇ Water Levels established at time of field investigation, JUNE-SEPTEMBER 1969
- ⊕ Bore Hole & Cone Test by DHO, September 1969
- ⬇ Water Levels established at time of field investigation, September 1969



NOTE:
The boundaries between soil strata have been established on the basis of Bore Hole borings. Geologic data from the boundaries are derived from geological evidence and may be subject to revision in error.

NO.	ELEVATION	GRID REFERENCE	
		Easting	Northing
1	310.9	15,730,170	899,155
1A	315.0	15,730,140	899,142
2	311.0	15,730,175	899,077
3	281.8	15,730,226	897,958
3A	270.7	15,730,210	897,931
4	245.6	15,730,272	897,513
5	247.5	15,730,302	897,463
6	240.5	15,730,379	897,537
7	252.0	15,730,427	897,443
7A	275.6	15,730,400	897,423
8	309.4	15,730,475	897,303
8A	304.7	15,730,454	897,295
9	307.9	15,730,500	897,160
10	305.4	15,730,550	897,030

NO	ELEVATION	GRID REFERENCE	
		WESTING	EASTING
1	310.2	15,730,130	899,073
2	299.5	15,730,222	899,040
3	291.3	15,730,160	897,936
4	299.1	15,730,226	897,908
5	204.4	15,730,167	897,979
6	209.6	15,730,246	897,933
7	253.3	15,730,175	897,527
8	202.1	15,730,258	897,933
9	250.6	15,730,180	897,913
10	265.1	15,730,221	897,922
11	294.7	15,730,228	897,904
12	274.0	15,730,252	897,914
13	245.5	15,730,107	897,589
14	250.8	15,730,147	897,531
15	302.5	15,730,350	897,411
16	263.9	15,730,455	897,427
17	270.4	15,730,425	897,414
18	280.0	15,730,445	897,407
19	296.3	15,730,417	897,397
20	304.6	15,730,389	897,367

NO.	ELEVATION	GRID REFERENCE	
		EASTING	NORTHING
21	265.6	15,730,454	897,395
22	294.9	15,730,455	897,378
23	303.0	15,730,424	897,377
24	332.3	15,730,395	897,368
25	332.5	15,730,438	897,245
26	209.3	15,730,499	897,166
27	313.6	15,730,464	897,167
28	305.4	15,730,494	897,111
29	332.5	15,730,563	897,040
30	249.5	15,730,458	897,538
31	254.1	15,730,350	897,500
32	250.3	15,730,375	897,516
33	250.1	15,730,417	897,544
34	252.5	15,730,391	897,500
35	249.0	15,730,338	897,533
36	249.6	15,730,323	897,539
37	251.6	15,730,431	897,577
38	278.6	15,730,363	897,553
39	263.6	15,730,395	897,563

WILLIAM TROW & ASSOCIATES LTD.
DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
DESIGN SERVICES DIVISION

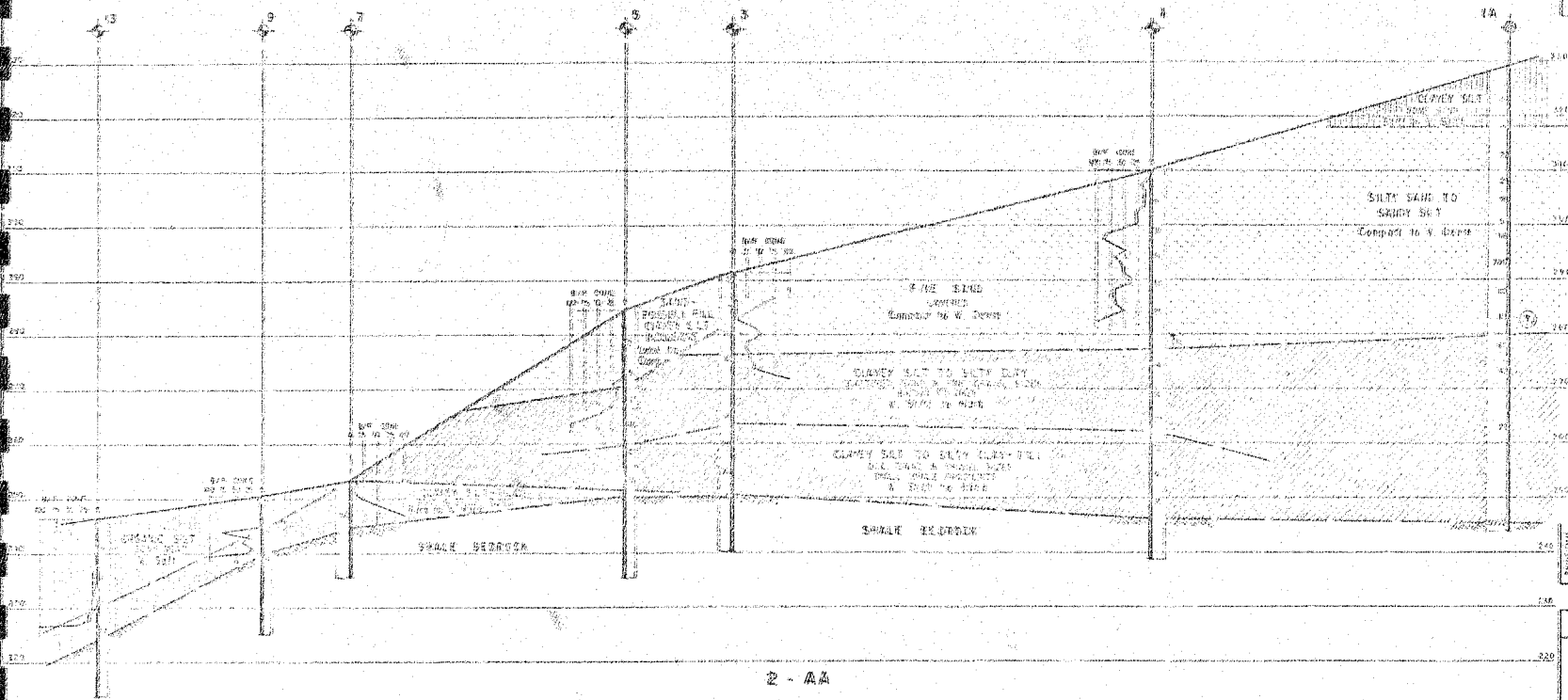
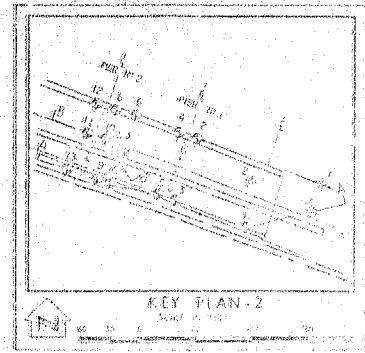
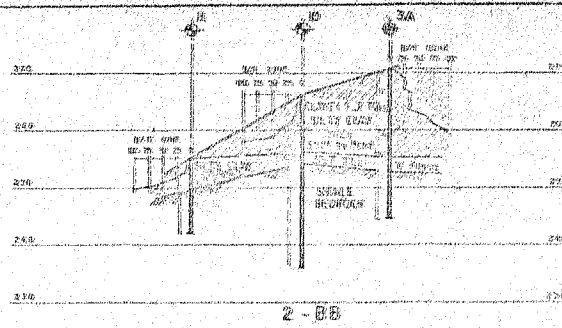
HAMILTON ENTRANCE BRIDGE NO. 1
(FORMERLY BRIDGES NO. 1 & 2)

HIGHWAY NO. 2 DIST. NO. 4
CO. HALTON
TOWN OF BURLINGTON, L012 613 CON. 1

BORE HOLE LOCATIONS & SOIL STRATA

STUDY: CONSULTANTS' REPORT NO. 113-1-1-1
DRAWN BY: CHECKED BY: DATE: 29 SEP 1971
APP'D BY: DATE: 29 SEP 1971
SCALE: 1/4" = 1' 1/2"

PROJECT NO. H 1077/1
INSTRUMENT NO.



LEGEND

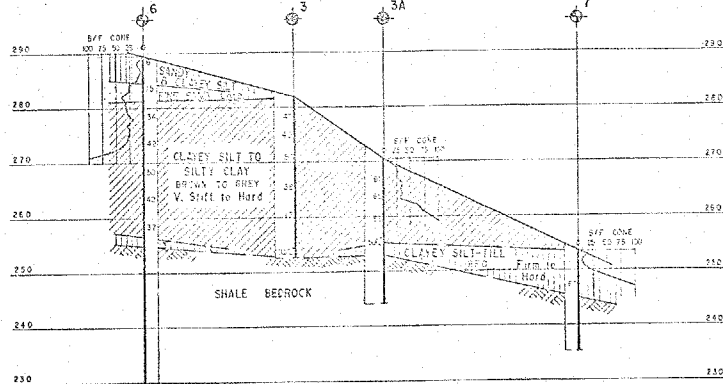
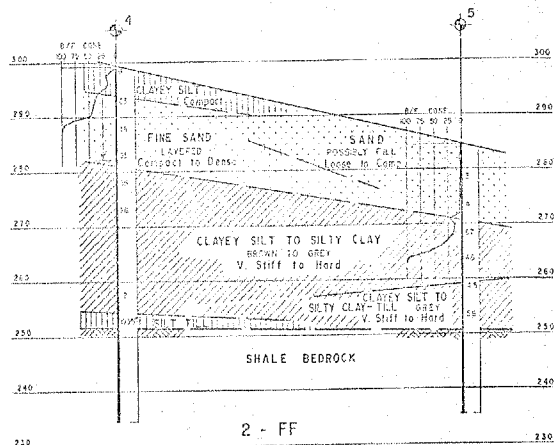
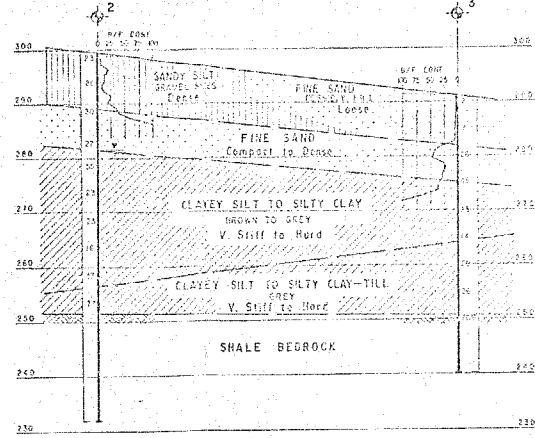
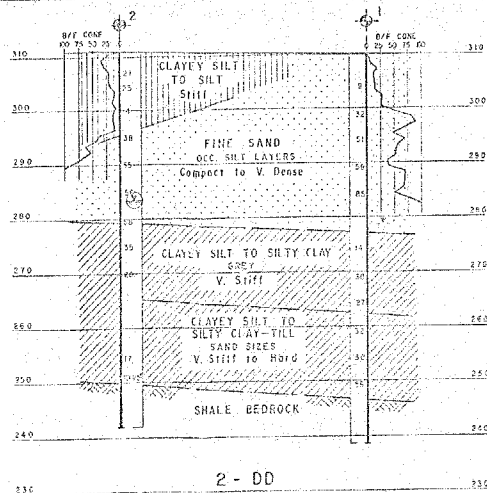
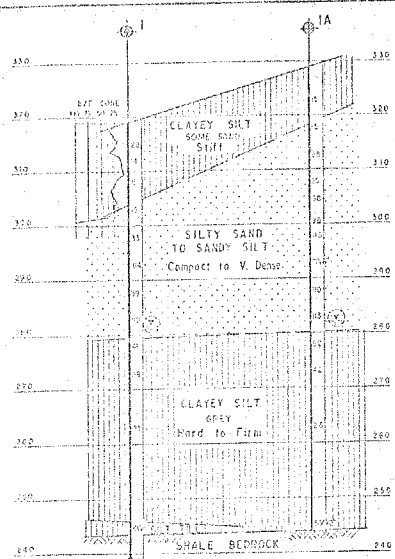
- Borehole & Test Location
- Water mark, approximately at time of last inundation, 1964-1965
- Borehole by Dept. Survey in 1960
- Borehole No. 1 Test by D.C. November 1966
- Water level established at time of last inundation, 1964-1965

NO.	DATE	TEST	TEST	TEST	TEST
1	210.2	10,750.00	107,000		
2	210.2	10,750.00	107,000		
3	210.2	10,750.00	107,000		
4	210.2	10,750.00	107,000		
5	210.2	10,750.00	107,000		
6	210.2	10,750.00	107,000		
7	210.2	10,750.00	107,000		
8	210.2	10,750.00	107,000		
9	210.2	10,750.00	107,000		
10	210.2	10,750.00	107,000		
11	210.2	10,750.00	107,000		
12	210.2	10,750.00	107,000		
13	210.2	10,750.00	107,000		

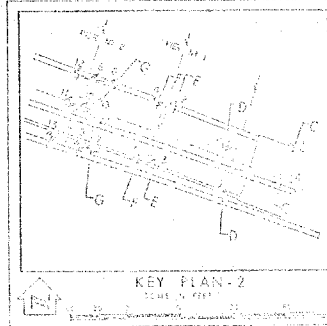
NOTE
The boundaries between soil strata have been established only on the basis of the results of the soil tests. The boundaries between soil strata are not necessarily the same as the boundaries between geological strata.



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 DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
 DESIGN DIVISION
HAMILTON ENTRANCE BRIDGE NO. 1
 (FORMERLY BRIDGES NO. 1 & 2)
 HIGHWAY NO. 2 DIST. NO. 4
 CO. HALTON
 TOWN OF BURLINGTON 1012812 CON. 1
BORE HOLE LOCATIONS & SOIL STRATA
 DRAWN: [] CHECKED: [] DATE: []
 DATE: 26 SEP 1971
 APPROVED: [] DATE: []



SECTIONS
10 5 0 SCALE 10 20 FT



LEGEND				
	Bore Hole & Core Test			
	Water Level (ft) - 100 ft or less			
	Bore Hole to 200 ft			
	Bore Hole to 300 ft			
	Water Level (ft) - 100 ft or less			
NO.	ELEVATION	SOIL	DEPTH	TEST
1	210.0	CLAYEY SILT	0.0	100
2	210.0	CLAYEY SILT	0.0	100
3	210.0	CLAYEY SILT	0.0	100
4	210.0	CLAYEY SILT	0.0	100
5	210.0	CLAYEY SILT	0.0	100
6	210.0	CLAYEY SILT	0.0	100
7	210.0	CLAYEY SILT	0.0	100

The boundaries between the sections are shown only as a guide. The boundaries between the sections are shown only as a guide. The boundaries between the sections are shown only as a guide.

SECTION	NO.	DATE
2-CC	1	1977
2-DD	1	1977
2-EE	1	1977
2-FF	1	1977
2-GG	1	1977

WILLIAM TROW & ASSOCIATES LTD.
DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
DESIGN SERVICES SECTION

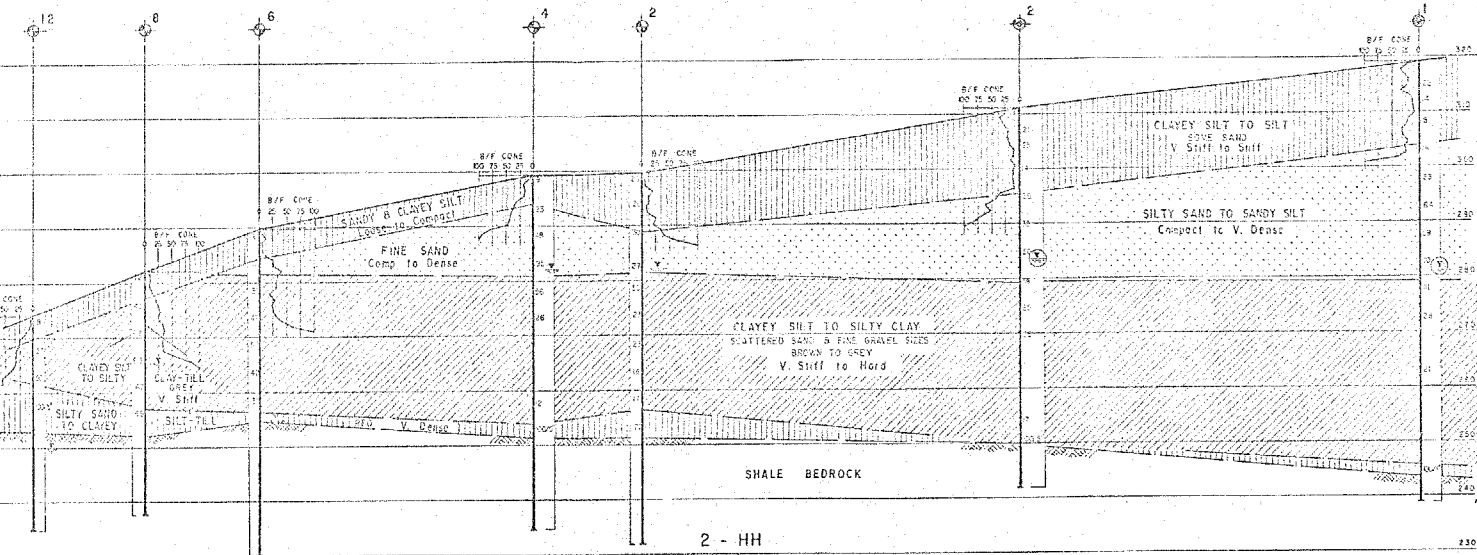
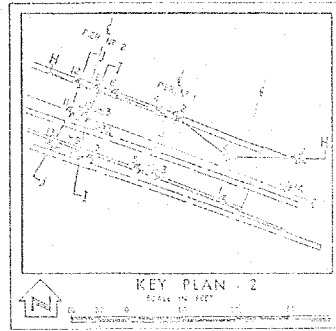
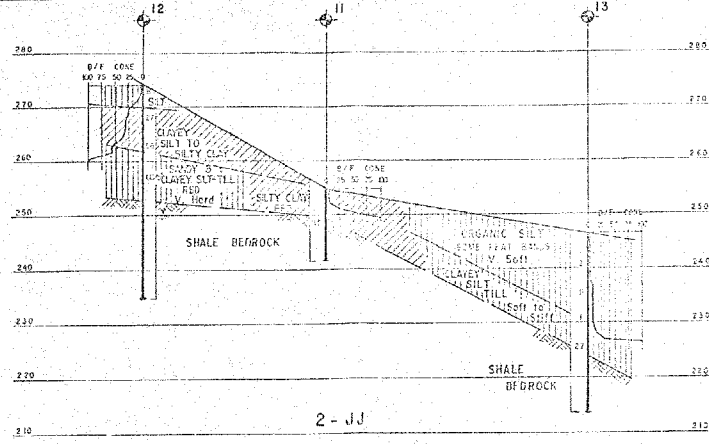
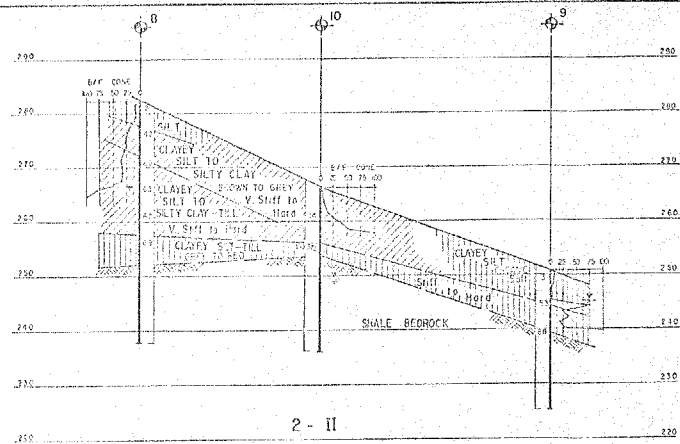
HAMILTON ENTRANCE BRIDGE No 1
(FORMERLY BRIDGES No 1 & 2)

HIGHWAY NO. 2 DIST. NO. 4
CO. HALTON
TOWN OF BURLINGTON, LOT 12 & 13 CON. 1

BORE HOLE LOCATIONS & SOIL STRATA

SHEET NO.	CHECKED BY NO.	DATE	NO.
1	1	1977	1

DATE: 10/10/77
APPROVED: [Signature]
REVISION: [Signature]



SECTIONS
SCALE
0 10 20 FT.

LEGEND

- Bore Hole No. Cone Test
- Water Level Indicated at 1/4 of field investigation (10-10-1969)
- Bore Hole vs. CMC, September 1969
- Bore Hole vs. CMC Test by CMC, September 1969
- Water Level Indicated at 1/4 of field investigation (10-10-1969)

NO.	ELEVATION	SOIL STRATA	DEPTH
1	215.0	CLAYEY SILT TO SILTY CLAY	0-10
2	211.0	CLAYEY SILT TO SILTY CLAY	10-20
3	209.0	CLAYEY SILT TO SILTY CLAY	20-30
4	207.0	CLAYEY SILT TO SILTY CLAY	30-40
5	205.0	CLAYEY SILT TO SILTY CLAY	40-50
6	203.0	CLAYEY SILT TO SILTY CLAY	50-60
7	201.0	CLAYEY SILT TO SILTY CLAY	60-70
8	199.0	CLAYEY SILT TO SILTY CLAY	70-80
9	197.0	CLAYEY SILT TO SILTY CLAY	80-90
10	195.0	CLAYEY SILT TO SILTY CLAY	90-100
11	193.0	CLAYEY SILT TO SILTY CLAY	100-110
12	191.0	CLAYEY SILT TO SILTY CLAY	110-120
13	189.0	CLAYEY SILT TO SILTY CLAY	120-130

NOTE
The boundaries between soil strata have been indicated only at bore hole locations. Between bore holes the boundaries are assumed from geological evidence and may be subject to considerable error.

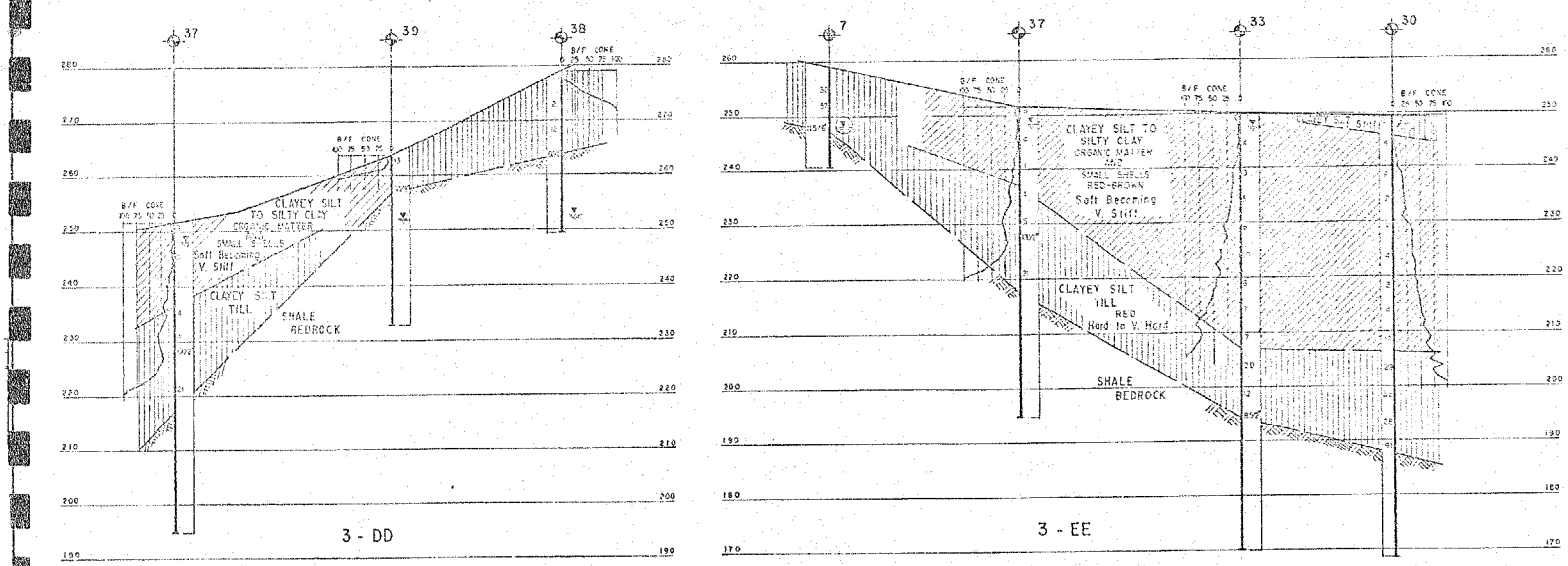
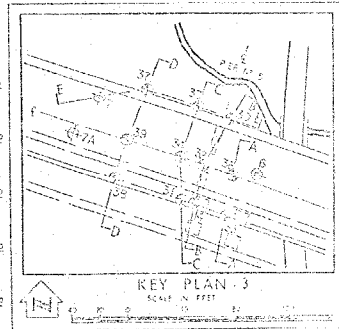
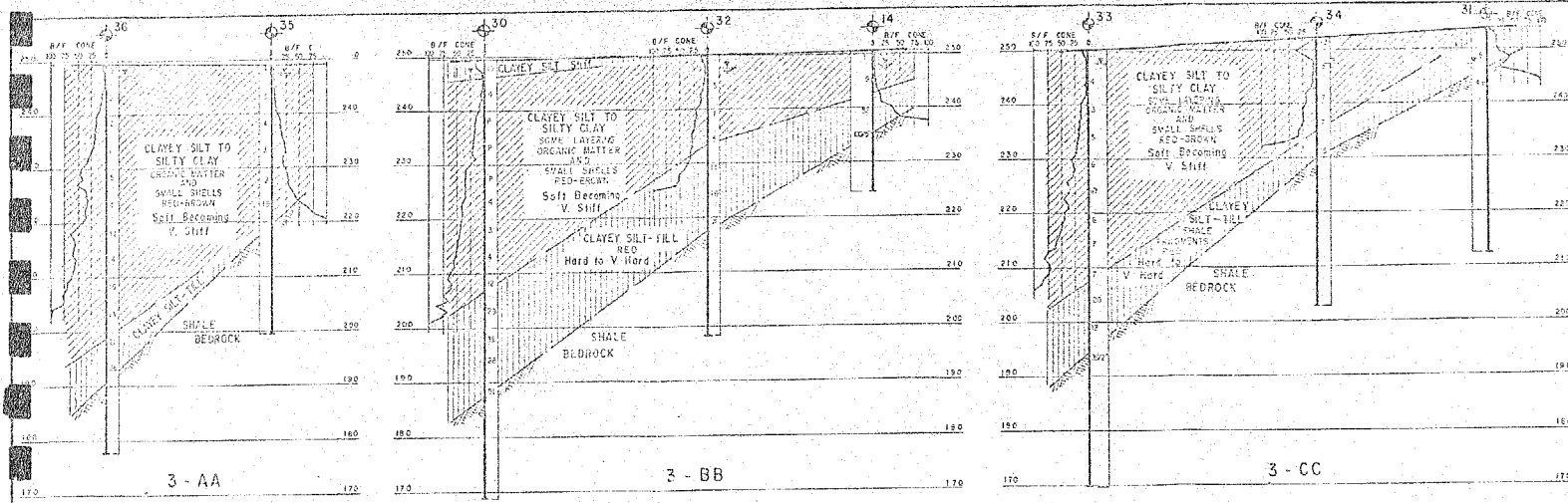
WILLIAM TROW & ASSOCIATES LTD.
DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
REGIONAL SERVICES DIVISION - TORONTO, ONT.

HAMILTON ENTRANCE BRIDGE No. 1
(FORMERLY BRIDGES No. 1 & 2)

HIGHWAY NO. 2 DIST. NO. 4
CO. HALTON
TOWN OF BURLINGTON (1012.012) CON. 1

BORE HOLE LOCATIONS & SOIL STRATA

SUBNO. CHECKED BY NO. 113-10-01
DRAWN T.L. CHECKED BY NO. 113-10-01 H 10774
DATE 20 SEP 1971 SITE NO. 1012.012
APP. NO. 1012.012



LEGEND

- ◆ Bore Hole & Test Log
- Water Levels (Investigation, 1961-1962)
- Bore Hole by DHD, September 1968
- Bore Hole & Core Log by DHD, September 1968
- Water Level (Investigation, 1961-1962)

NO.	ELEVATION	SOIL DESCRIPTION	TEST RESULTS
37	250.0	CLAYEY SILT TO SILTY CLAY	657.4-3
14	250.0	CLAYEY SILT TO SILTY CLAY	657.4-3
30	245.5	CLAYEY SILT TO SILTY CLAY	657.4-3
31	254.1	CLAYEY SILT TO SILTY CLAY	657.4-3
32	250.0	CLAYEY SILT TO SILTY CLAY	657.4-3
33	250.0	CLAYEY SILT TO SILTY CLAY	657.4-3
34	240.5	CLAYEY SILT TO SILTY CLAY	657.4-3
35	240.0	CLAYEY SILT TO SILTY CLAY	657.4-3
36	240.0	CLAYEY SILT TO SILTY CLAY	657.4-3
37	201.6	CLAYEY SILT TO SILTY CLAY	657.4-3
38	218.5	CLAYEY SILT TO SILTY CLAY	657.4-3
39	205.9	CLAYEY SILT TO SILTY CLAY	657.4-3

NOTE

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geologic evidence and may be subject to considerable error.

DATE	10/12/75
BY	W. Trow
CHECKED	
DATE	

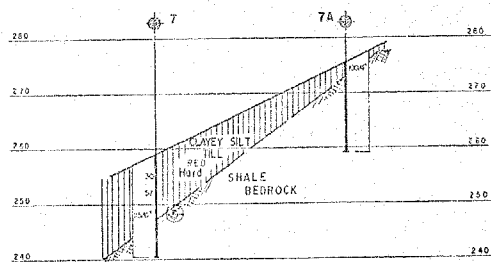
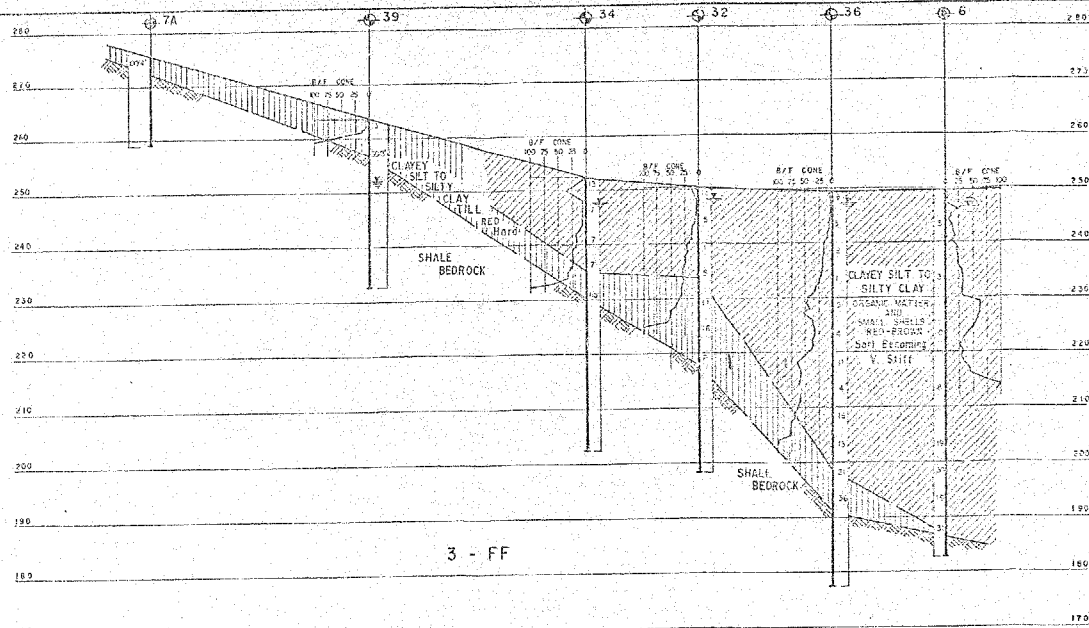
WILLIAM TROW & ASSOCIATES LTD.
 DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
 DESIGN SERVICES BRANCH - CIVIL ENGINEERING

HAMILTON ENTRANCE BRIDGE NO. 1
 (FORMERLY BRIDGES NO. 1 & 2)

HIGHWAY NO. 2 DIST. NO. 4
 CO. HALTON
 TOWN OF BURLINGTON LOT 12, 13, CON. 1

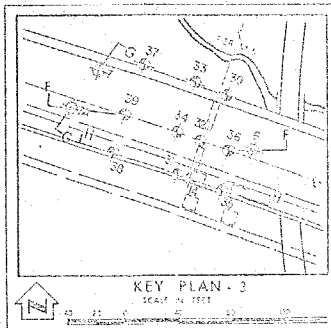
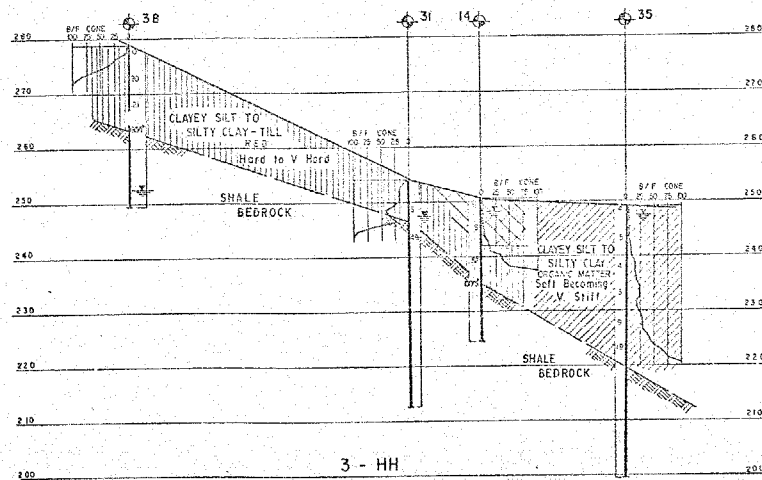
BORE HOLE LOCATIONS & SOIL STRATA

DESIGN	CHECKED	DATE	10-12-75	DATE	10-12-75
DRAWN	CHECKED	DATE	10-12-75	DATE	10-12-75
DATE	27 SEPT 1971	DATE		DATE	
APPROVED		DATE		DATE	



SECTIONS

0 5 0 SCALE 10 20 FT.



LEGEND

- Bore Hole & Core Test
- Water Levels established at time of field investigation, 1972-1973
- Bore Hole by DHO, September 1968
- Bore Hole & Core Test by DHO, September 1968
- Water Levels established at time of field investigation, September 1968

NO	ELEVATION	SL. SAMPLE	DATE
6	249.5	15,720,318	197,557
7	250.0	15,720,427	197,558
7A	270.0	15,720,423	197,559
14	250.0	15,720,347	197,560
31	254.1	15,720,350	197,561
32	250.3	15,720,379	197,562
34	250.5	15,720,331	197,563
35	246.0	15,720,334	197,564
36	249.6	15,720,333	197,565
38	278.8	15,720,323	197,566
39	263.6	15,720,326	197,567

NOTE

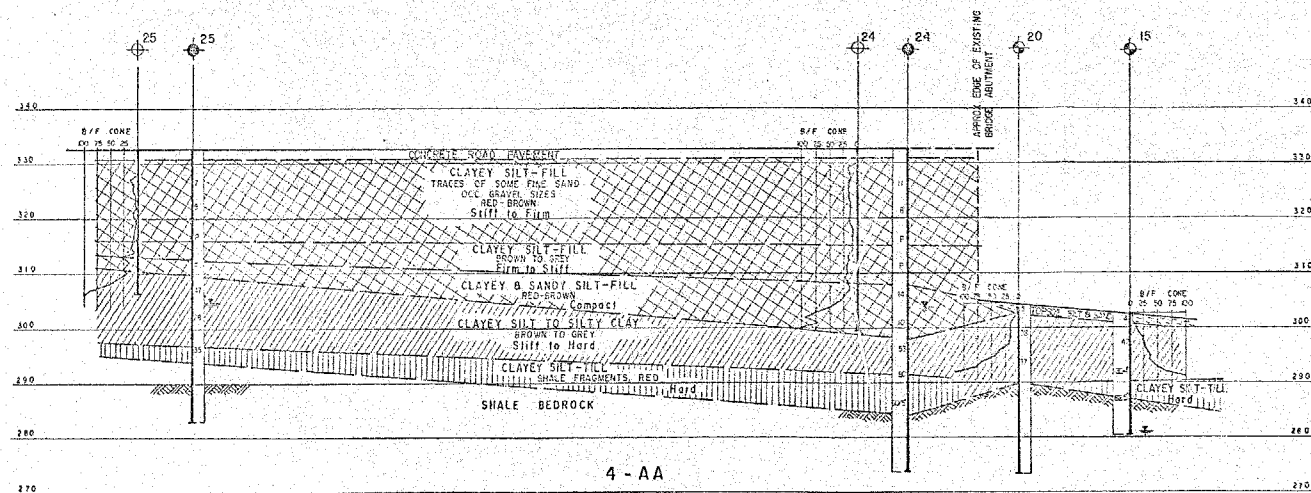
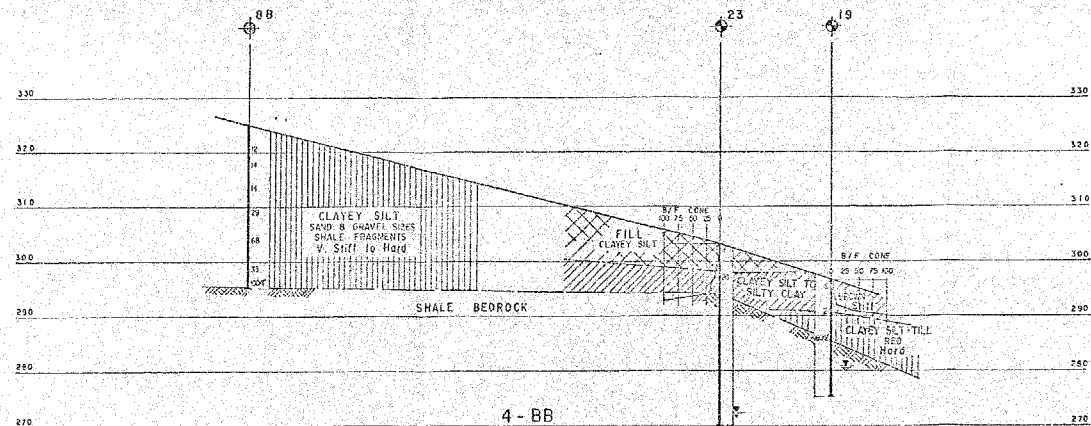
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

REVISIONS	DATE	BY	DESCRIPTION

WILLIAM TROW & ASSOCIATES LTD.
DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
DESIGN SERVICES BRANCH, TRUCKEE, CALIF.

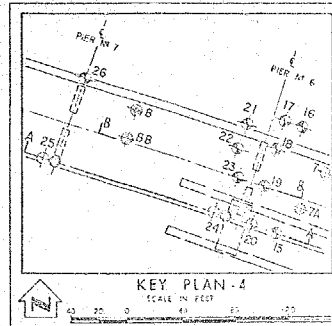
HAMILTON ENTRANCE BRIDGE No 1
(FORMERLY BRIDGES No 1 & 2)

HIGHWAY NO. 2 DIST NO. 4
CO. HALTON
TOWN OF BURLINGTON 10/12/813 CON. 1
BORE HOLE LOCATIONS & SOIL STRATA
SUBNO. CHECKED BY: H.P. NO. 113,363,001 DATE DRAWING NO.
DRAWN BY: CHICAGO 12/28/80 NO. 1077 H 1077/6
DATE 29 SEPT 1971 SHEET NO. 1 OF 2 DRAWING NO.
APPROVED: [Signature] DATE NO.



SECTIONS

10 5 0 SCALE 10 20 FT.



LEGEND			
	Bore Hole		
	Cone Penetration Test		
	Bore Hole & Core Test		
	Water Level, established on line of field investigation (see sheet 10)		
	Bore Hole by DND, September 1969		
	Bore Hole by DND, September 1969		
NO.	ELEVATION	SOIL	REFERENCE
8B	324.7	5,735,475	437,195
15	322.5	5,735,283	337,441
19	320.3	5,735,417	437,357
20	304.5	5,735,388	437,387
23	320.0	5,735,424	437,377
24	332.3	5,735,393	437,363
25	332.5	5,735,438	437,400

NOTE

The boundaries between soil strata have been established only on Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

REVISION	DATE	BY	DESCRIPTION

WILLIAM TROW & ASSOCIATES LTD.

DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS

DESIGN SERVICES BRANCH - FOUNDATION DEPT.

HAMILTON ENTRANCE BRIDGE No. 1

(FORMERLY BRIDGES No. 1 & 2)

CO. HALTON

TOWN OF BURLINGTON 10112 813 CON 1

BORE HOLE LOCATIONS & SOIL STRATA

DESIGNED BY: [] CHECKED BY: [] DATE: 29 SEPT. 1971

APPROVED: []

DATE: 29 SEPT. 1971

SCALE: 1" = 20'

PROJECT NO. H 1077/7

DATE: 29 SEPT. 1971

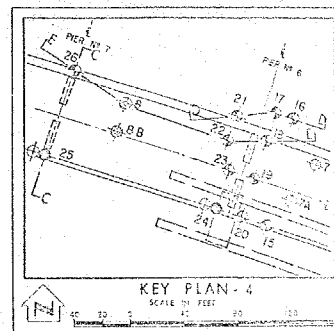
SCALE: 1" = 20'

PROJECT NO. H 1077/7

DATE: 29 SEPT. 1971

SCALE: 1" = 20'

PROJECT NO. H 1077/7



LEGEND				
	Bore Hole			
	Cone Penetration Test			
	Bore Hole & Cone Test			
	Water Level established at time of field investigation (see notes)			
	Bore Hole by DND, September 1989			
	Bore Hole & Cone Test by DND, September 1989			
NO.	ELEVATION	SOIL DEPTH (FEET)	SOIL DEPTH (METERS)	SOIL DEPTH (FEET)
16	328.45	15,730,475	627,313	
17	263.9	15,730,455	627,307	
21	270.4	15,730,455	627,414	
25	263.0	15,730,445	627,417	
26	289.6	15,720,451	627,353	
22	284.9	15,730,445	627,371	
23	232.5	15,730,435	627,345	
24	295.3	15,730,459	627,320	

NOTE
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are deduced from geological evidence and may be subject to considerable error.

DATE	BY	REVISION

WILLIAM TROW & ASSOCIATES LTD.
DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
DESIGN SERVICES BRANCH - ROADWAY DIVISION

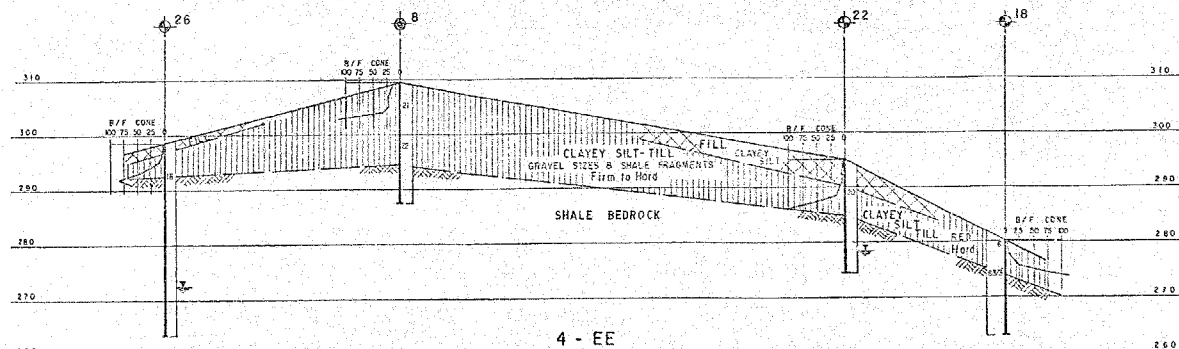
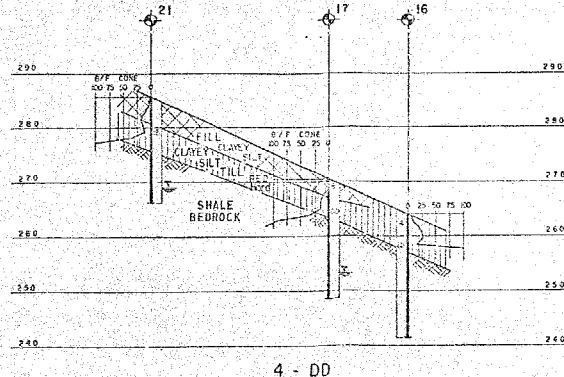
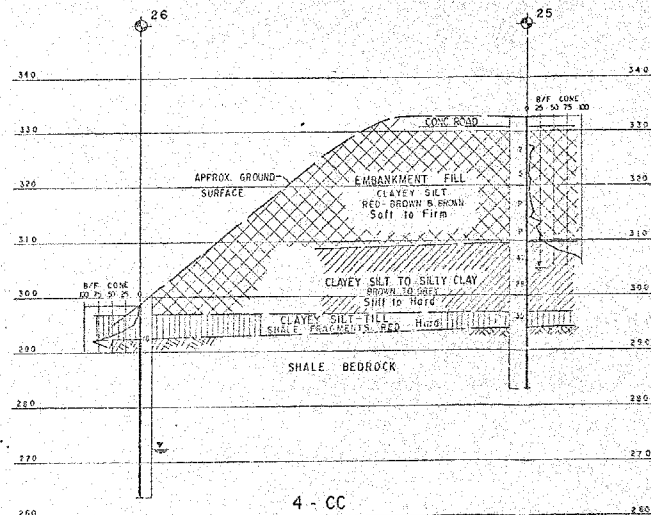
HAMILTON ENTRANCE BRIDGE N° 1
(FORMERLY BRIDGES N° 1 & 2)

HIGHWAY NO. 2 DIST. NO. 4
CO. HALTON
TOWN OF BURLINGTON LOT 12 B.13 CON. 1

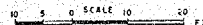
BORE HOLE LOCATIONS & SOIL STRATA

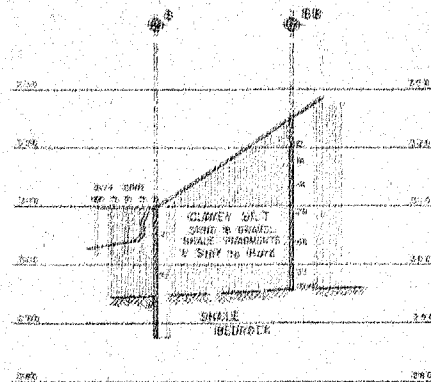
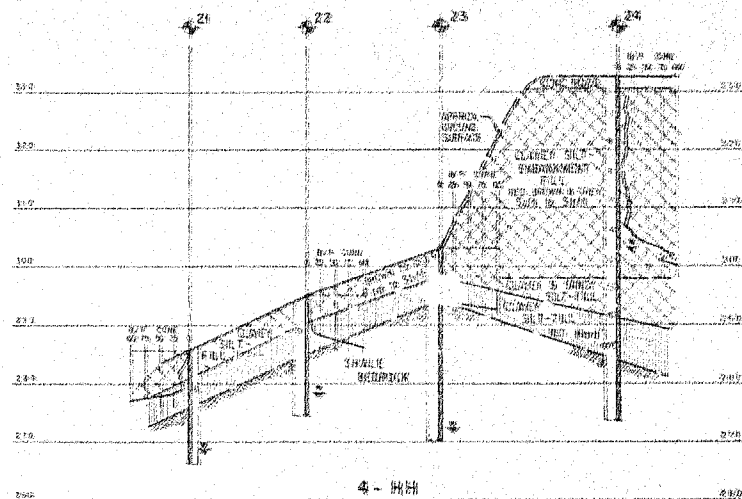
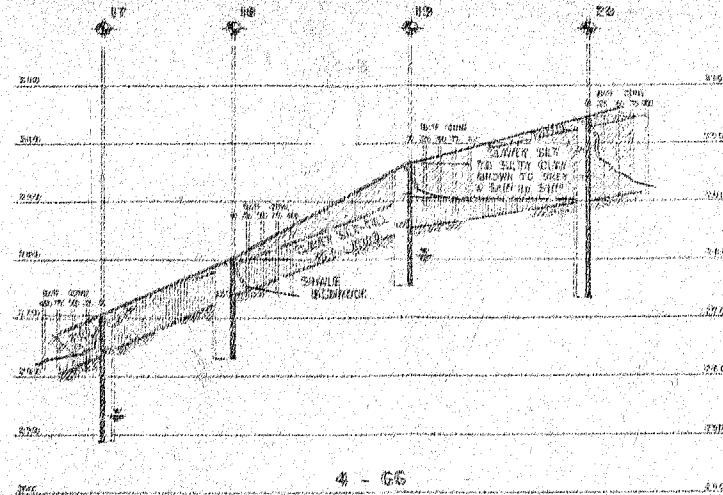
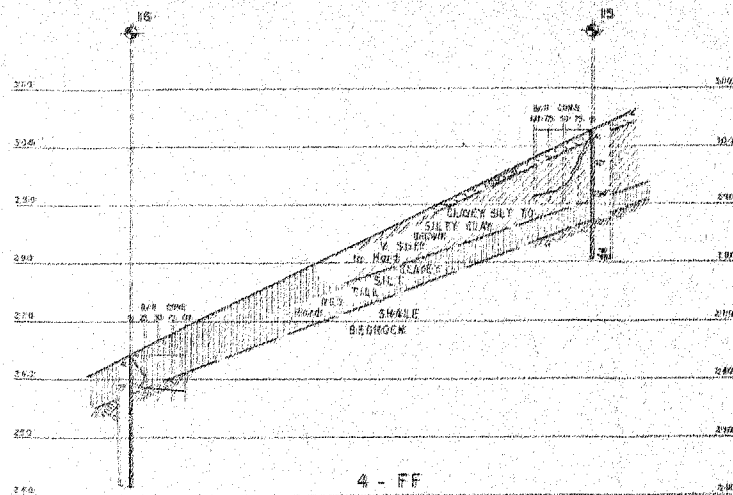
DATE	29 SEPT. 1991	DATE	15-06-01
APPROVED		APPROVED	
DRAWN	P.L.	CHECKED	H.1077
DATE	29 SEPT. 1991	DATE	15-06-01
APPROVED		APPROVED	

PROJECT NO. 1077/8
SCALE 1" = 100'



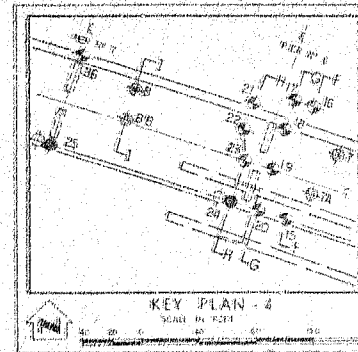
SECTIONS





SECTIONS

0 10 20 30 40 50 60 70 80 90 100



LEGEND			
	Bore Hole		
	Cone Penetration Test		
	Bore Hole & Cone Test		
	Water level established at time of field investigation (1971-1972)		
	Bore Hole to 100' (Summer 1966)		
	Bore Hole to 100' (Test by 1966)		
	Bore Hole to 100' (Test by 1966)		
NO.	ELEVATION	CHD. NO.	CHD. NO.
16	306.4	16	306.4
15	302.5	15	302.5
14	302.5	14	302.5
13	302.5	13	302.5
12	302.5	12	302.5
11	302.5	11	302.5
10	302.5	10	302.5
9	302.5	9	302.5
8	302.5	8	302.5
7	302.5	7	302.5
6	302.5	6	302.5
5	302.5	5	302.5
4	302.5	4	302.5
3	302.5	3	302.5
2	302.5	2	302.5
1	302.5	1	302.5

— NOTE —
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are estimated from geological evidence and may be subject to considerable error.

WILLIAM TROW & ASSOCIATES LTD.
DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
DESIGN, SUPERVISOR, BRIDGE, ROADWAY, AIRPORT

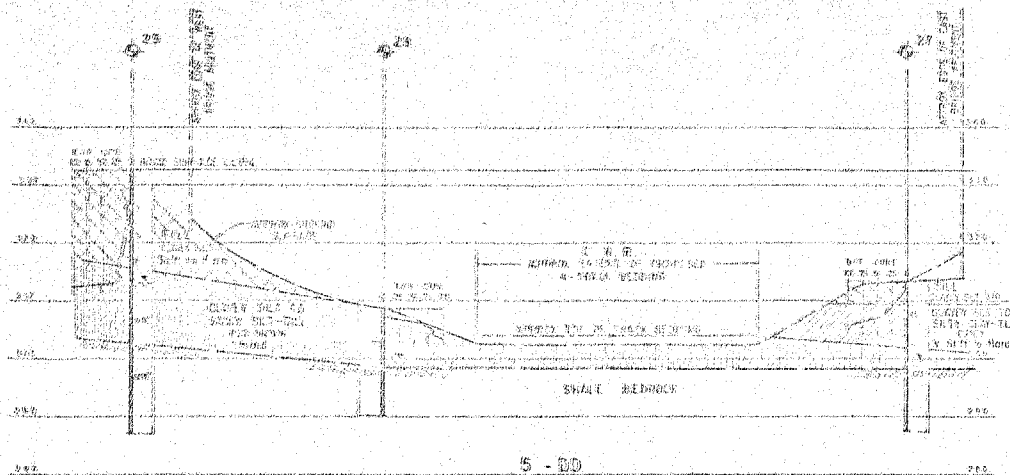
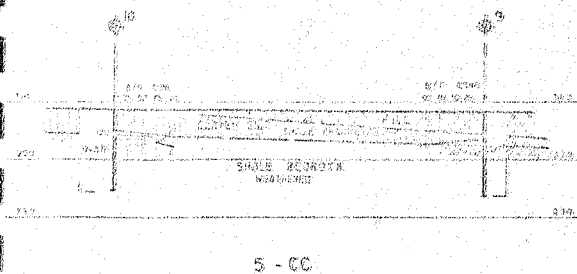
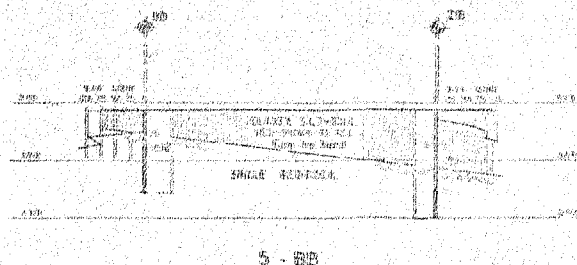
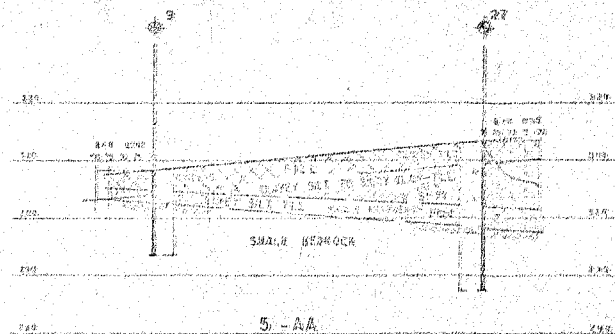
HAMILTON ENTRANCE BRIDGE NO. 1
(FORMERLY BRIDGES NO. 1 & 2)

PROJECT NO. 2 DIST. NO. 4
CO. HALLION
TOWN OF BURLINGTON, 1001213, CON. 1

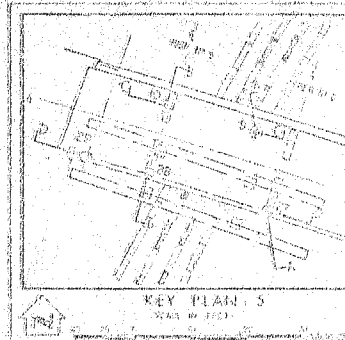
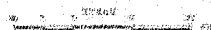
BORE HOLE LOCATIONS & SOIL STRATA

DESIGNED BY: H. T. TROW
CHECKED BY: H. T. TROW
DATE: 10/11/71
APPROVED: H. T. TROW

DRAWING NO. H 1077/9
SHEET NO. 10



SECTIONS



LEGEND			
●	Bore Hole		
○	Cross Section Point		
+	Proposed Road Center Line		
—	Water Depth (estimated) 0 to 10 feet (approximate) 10 to 20 feet (approximate) 20 to 30 feet (approximate)		
—	Proposed Road 10 to 20 feet (approximate) 20 to 30 feet (approximate) 30 to 40 feet (approximate)		
NO.	ELEVATION	DEPTH	REMARKS
27	215.0	1.0	CLAY SHALE
25	213.2	1.0	CLAY SHALE
23	213.4	1.0	CLAY SHALE
10	212.5	1.0	CLAY SHALE

NOTE: The boundaries between soil types have been estimated only at borehole locations. Between boreholes the boundaries are assumed to be geological evidence and are subject to considerable variation.

NO.	ELEVATION	DEPTH	REMARKS
27	215.0	1.0	CLAY SHALE
25	213.2	1.0	CLAY SHALE
23	213.4	1.0	CLAY SHALE
10	212.5	1.0	CLAY SHALE

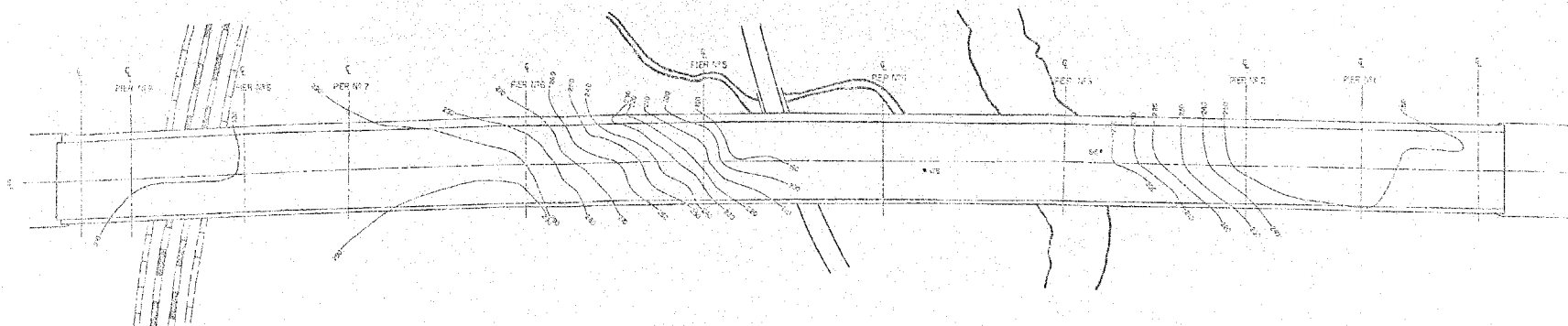
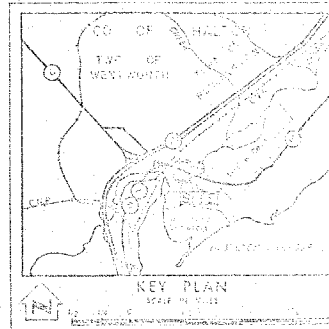
WILLIAM TROW & ASSOCIATES LTD.
 DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
 DESIGN SERVICES DIVISION, OTTAWA

HAMILTON ENTRANCE BRIDGE NO. 1
 (FORMERLY BRIDGES 47 & 21)

HIGHWAY NO. 2 DIST. NO. 4
 CO. HALTON
 TOWN OF PORTLINGTON 10-12-013 CON. 1

BORE HOLE LOCATIONS & SOIL STRATA

SHEET NO. 11-00-01 (11-00-01) (11-00-01)
 DRAWN BY: J. G. G. (11-00-01) (11-00-01) (11-00-01)
 DATE: 29 SEPT 1971 SITE NO. H 1077/10
 PROJECT NO. 11-00-01



INTERPOLATED BEDROCK SURFACE CONTOURS

SCALE 1" = 100 FT.

NOTE

The boundaries between soil areas have been established only at bore hole locations. Between bore holes the boundaries are based on geological evidence and may be subject to considerable error.

LEGEND	
	Bedrock Surface Contours
	Spot Elevation of bedrock surface

PROJECT NO.	101/2 R 13
DATE	10/17/77

WILLIAM TROW & ASSOCIATES LTD.
DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
REGIONAL SERVICES DIVISION, TORONTO, ONTARIO

HAMILTON ENTRANCE BRIDGE NO. 1
(FORMERLY BRIDGES 14 & 2)

HIGHWAY NO. 2
CO. OF HALTON
TOWN OF BURLINGTON 101/2 R 13, CONT. 1

BORE HOLE LOCATIONS & SOIL STRATA

SUBNO. 101/2 R 13, CONT. 1
DRAWN BY: J. TROW
DATE: 10/17/77
SCALE: 1" = 100 FT.

APPROVED: [Signature]
CLIENT NO. 101/2 R 13

Ontario
Department of Transportation and Communications
~~SECRET~~

MEMORANDUM

TO: Mr. E. R. Davis, (2)
Structural Engineer,
Design Services Branch,
West Bldg., Downsview.

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

ATTENTION:

DATE: October 7, 1971.

OUR FILE REF:

IN REPLY TO:

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For
Hamilton Entrance Bridge #1
on Hwy. #2
District #4 (Hamilton)
W.O. 69-11062 -- W.P. 113-66-01

Attached please find Foundation Investigation Report H 1077 by William Trow Associates Ltd. The report contains Borehole Logs Nos. 1-39 and also Drawings Nos. H'077/1 - H'077/11. This work supplements the work originally carried out by us under our project W.O. 69-1106.

We believe you will find the factual information in the report sufficient for your design purposes. If any questions arise, however, please contact this Office.

AGS/ao
Attach.


A. G. Sternac,
PRINCIPAL FOUNDATION ENGINEER.

cc: Messrs. D. W. Farren
G. K. Hunter (2)
C. R. Robertson
G. C. E. Burkhardt
T. J. Kovich
A. Rutka
B. J. Giroux
B. A. Singh

Foundations Files ✓
Documents