

GOLDER

Materials and Research Division.

August 28, 1962.

H. C. Golder & Associates,
2444 Bloor Street West,
Toronto, Ontario.

Attention: Mr. R. Milligan.

WP 223-60

Re: W.P. 223-60, Hwy. #401, Hwy. #400 Interchange,
9 Structure Sites, District #5, Toronto.

Dear Sir:-

Please consider this your authority to carry out foundation investigations at the above sites. Plans and profiles will be provided by the Bridge Design Consultants, De Louw, Cather, who will also specify the extent of the investigation required.

It is understood that a qualified Soils Engineer will be in charge of the field work at all times.

Fourteen copies of the completed foundation reports should be submitted to the Foundation Section prior to October 15, 1962.

Charges for the work performed will be in accordance with your Schedule of Rates, dated September 10, 1960, and invoice to be addressed to the attention of the undersigned.

NDS/MSR

Yours very truly,

cc: Messrs. S. McCombie
C. K. Hunter
C. Fraser
I. J. Kovich
M. E. Smith (2)
Mrs. I. Tate
Foundations Office
Gen. Files (2)

gr
A. Rutka,
MATERIALS & RESEARCH ENGINEER

H. Q. GOLDER & ASSOCIATES LTD.

CONSULTING CIVIL ENGINEERS

H. Q. GOLDER
V. MILLIGAN
L. G. SODERMAN

2444 BLOOR STREET WEST
TORONTO 9, ONTARIO
767-9201
763-4103

October 25, 1962

De Leuw, Cather & Company of Canada Limited,
1491 Yonge Street,
TORONTO 7, Ontario.

Attention: Mr. H. van Bodegom, P. Eng.

WP 234-60

RE: SOIL INVESTIGATION
PROPOSED ALTERATIONS,
HIGHWAY 400-401 INTERCHANGE,
TORONTO, ONTARIO.

Dear Sirs:

We enclose one copy each of the preliminary boring logs for boreholes 12, 13 and 14 put down for the above project. These borings are located near the south ends of structures 8S and 9S and midway between structures 8S and 11S, respectively.

As discussed by phone with your Mr. R. J. Walker and Mr. A. G. Stermac of the Department of Highways, Ontario on October 12th, 1962 the presently completed 14 borings give all the information required at this time. To summarize briefly, one boring has been put down at each proposed structure 1S to 7S and 10S and 11S and two borings at structures 8S and 9S. One additional boring was located between structures 8S and 11S at a high embankment section.

We feel that further borings will be necessary but we can discuss this with you once detailed plans for the interchange have been prepared. In the meantime we are proceeding with the engineering analyses of the foundation problems of the interchange. If we can be of assistance to you at this time, please give us a call.

Yours faithfully,

H. Q. GOLDER & ASSOCIATES LTD.

N. R. McCammon

N. R. McCammon, P. Eng.

McC/jb
6248

cc: Mr. A.G. Stermac ✓

H. Q. GOLDER & ASSOCIATES LTD.

CONSULTING CIVIL ENGINEERS

H. Q. GOLDER
V. MILLIGAN
L. G. SODERMAN

2444 BLOOR STREET WEST
TORONTO 9, ONTARIO
767-9201
763-4103

October 12, 1962

De Leuw, Cather & Company of Canada Limited,
1491 Yonge Street,
TORONTO 7, Ontario.

Attention: Mr. H. van Bodegom, P.Eng.

RE: SOIL INVESTIGATION
PROPOSED ALTERATIONS -
HIGHWAY 400-401 INTERCHANGE
TORONTO, ONTARIO.

W.P. 234-60

Dear Sirs:

We enclose a copy of our progress report on the above project detailing the results available to date of the first eleven borings put down at the site. The locations of these borings, each of which is located at a proposed structure, are shown on Figure 1 and a typical soil section on Figure 2. The summarized soil properties are given on Figures 3 to 6.

We are continuing the investigation at this time and will keep you fully informed of our findings and recommendations concerning foundation design.

Yours faithfully,

H. Q. GOLDER & ASSOCIATES LTD.



N. R. McCammon, P.Eng.

McC/jb
6248
Enc.

cc: Mr. A.G. Stermac ✓

PROGRESS

REPORT

TO

DE LEUW, CATHER & COMPANY OF CANADA LIMITED

ON

SOIL CONDITIONS

PROPOSED ALTERATIONS - HIGHWAY 400-401 INTERCHANGE

TORONTO

ONTARIO

W.P. 234-60

October, 1962

6248

GOLDER & ASSOCIATES

H. Q. GOLDER & ASSOCIATES LTD.

CONSULTING CIVIL ENGINEERS

H. Q. GOLDER
V. MILLIGAN
L. G. SODERMAN

2444 BLOOR STREET WEST
TORONTO 9, ONTARIO
767-9201
763-4103

PROGRESS

REPORT

TO

DE LEUW, CATHER & COMPANY OF CANADA LIMITED

ON

SOIL CONDITIONS

PROPOSED ALTERATIONS - HIGHWAY 400-401 INTERCHANGE

TORONTO

ONTARIO

Distribution:

- 1 copy - De Leuw, Cather & Company of Canada Limited,
Toronto, Ontario.
- 1 copy - Department of Highways, Ontario,
Toronto, Ontario.
- 1 copy - H. Q. Golder & Associates Ltd.,
Toronto, Ontario.

October, 1962

6248

LIST OF STANDARD ABBREVIATIONS

The standard abbreviations commonly employed on each "Record of Borehole", on the figures, and in the text of the report are as follows:

SAMPLE TYPES

A.S. - Auger Sample	R.C. - Rock Core
C.S. - Chunk Sample	S.T. - Slotted Tube
D.O. - Drive Open	T.O. - Thin-walled, Open
D.S. - Denison Type Sample	T.P. - Thin-walled, Piston
F.S. - Foil Sample	W.S. - Wash Sample

PENETRATION RESISTANCES

Dynamic Penetration Resistance - The energy required to drive a 2 inch diameter, 60 degree cone attached to the end of the drilling rods into the ground: expressed in blows per foot, where each blow represents 4,200 inch-pounds of energy.

Standard Penetration Resistance, N - The number of blows by a 140 pound hammer dropped 30 inches required to drive a 2 inch drive open sampler one foot into the ground.

Sampler advanced by static weight - weight, hammer - Wh
Sampler advanced by pressure - pressure, hydraulic - Ph
Sampler advanced by pressure - pressure, manual - Pm

SOIL DESCRIPTION

The standard terminology for the descriptions of the relative density of cohesionless soils and the consistency of cohesive soils is as follows:

<u>Relative Density</u>	<u>N, Blows/ft.</u>	<u>Consistency</u>	<u>c, lb/sq. ft.</u>
Very Loose	0 to 4	Very Soft	Less than 250
Loose	4 to 10	Soft	250 to 500
Compact	10 to 30	Firm	500 to 1,000
Dense	30 to 50	Stiff	1,000 to 2,000
Very Dense	over 50	Very Stiff	2,000 to 4,000
		Hard	over 4,000

SOIL TESTS

C - Consolidation Test	Q - Undrained Triaxial
H - Hydrometer Analysis	Qc - Consolidated Undrained Triaxial
M - Sieve Analysis	S - Drained Triaxial
MH - Combined Analysis, Sieve and Hydrometer	U - Unconfined Compression
	V - Field Vane Test

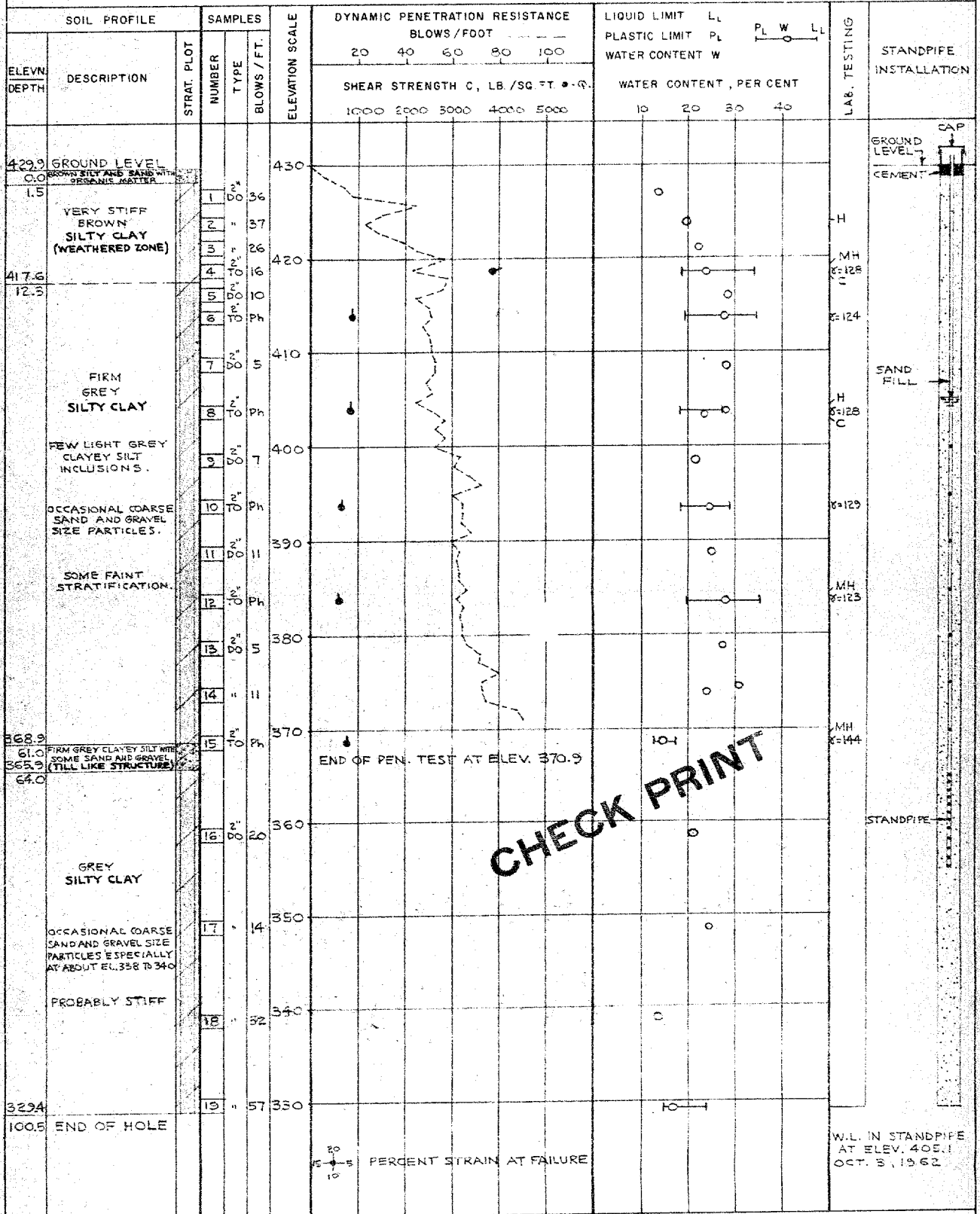
Note: Undrained triaxial tests in which pore pressures are measured are shown as Q' or Q'c.

SOIL PROPERTIES

γ - Total Unit Weight	K - Coefficient of Permeability
γ_d - Dry Unit Weight	c - Undrained Shear Strength ($\frac{1}{2}$ Compressive Strength)
γ_b - Submerged Unit Weight	St - Sensitivity
L _L - Liquid Limit	ϕ' - Effective Angle of Shearing Resistance
P _L - Plastic Limit	c' - Effective Cohesion Intercept
W - Natural Water Content	Cc - Compression Index
G - Specific Gravity	Cv - Coefficient of Consolidation
e - Void Ratio	

RECORD OF BOREHOLE 1

LOCATION SEE FIGURE 1 BORING DATE SEPT. 10-12, 1962 DATUM GEODETIC
BOREHOLE TYPE POWER AUGER BORING BOREHOLE DIAMETER 4.5"
SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES PEN. TEST HAMMER WEIGHT 140 LB DROP 30 INCHES



(a) Dynamic penetration resistance converted to 4200 inch lb. energy
(b) Abbreviations listed on page

VERTICAL SCALE
1 INCH TO 10'-0"

GOLDER & ASSOCIATES

DRAWN M.W.
CHECKED

RECORD OF BOREHOLE 2

LOCATION SEE FIGURE 1

BORING DATE SEPT 12-14, 1962

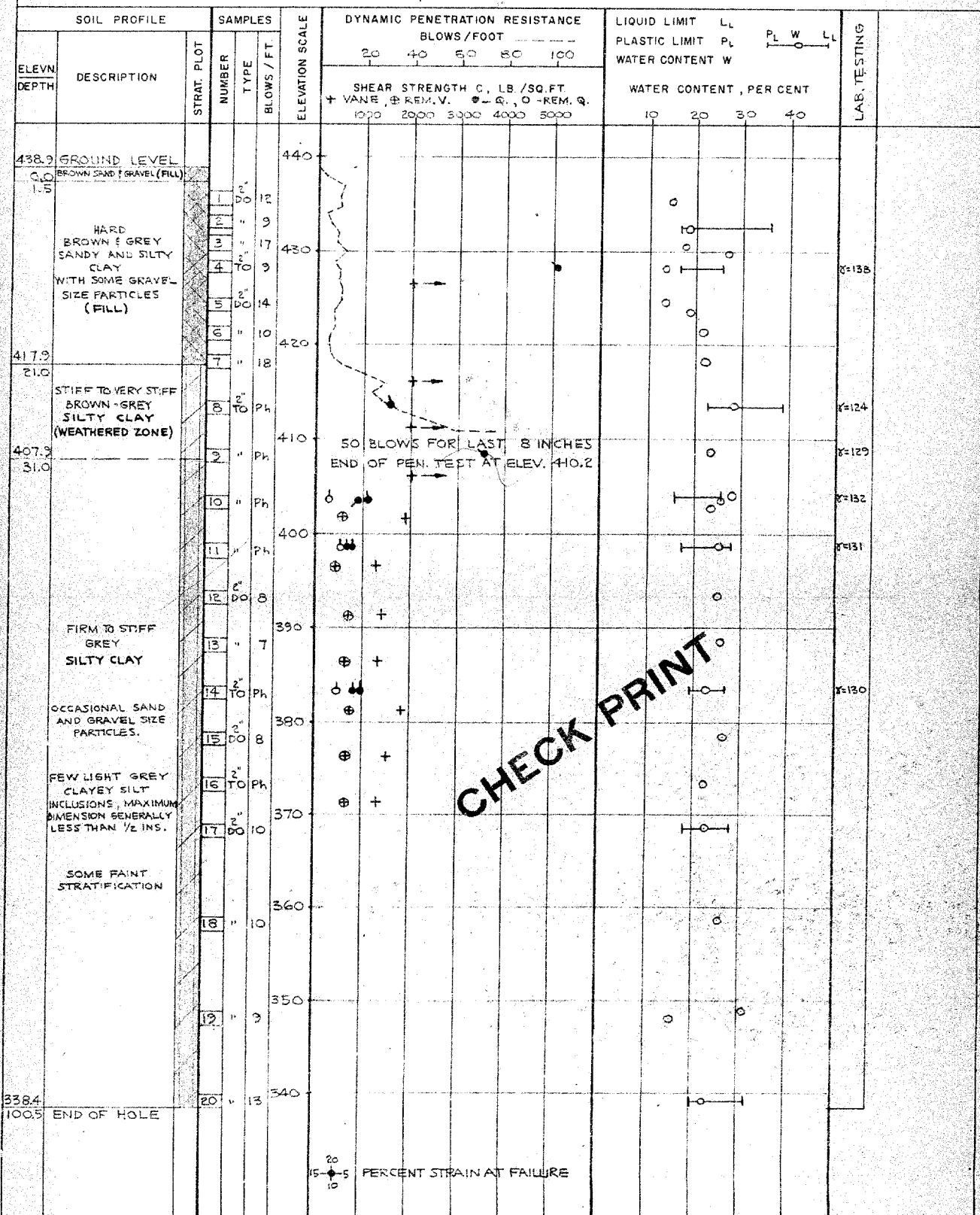
DATUM GEODETTIC

BOREHOLE TYPE POWER AUGER BORING

BOREHOLE DIAMETER 4.5 "

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES

PEN. TEST HAMMER WEIGHT 140 LB. DROP 30 INCHES



(a) Dynamic penetration resistance converted to 4200 inch lb. energy

(b) Abbreviations listed on page

VERTICAL SCALE
1 INCH TO 10'-0"

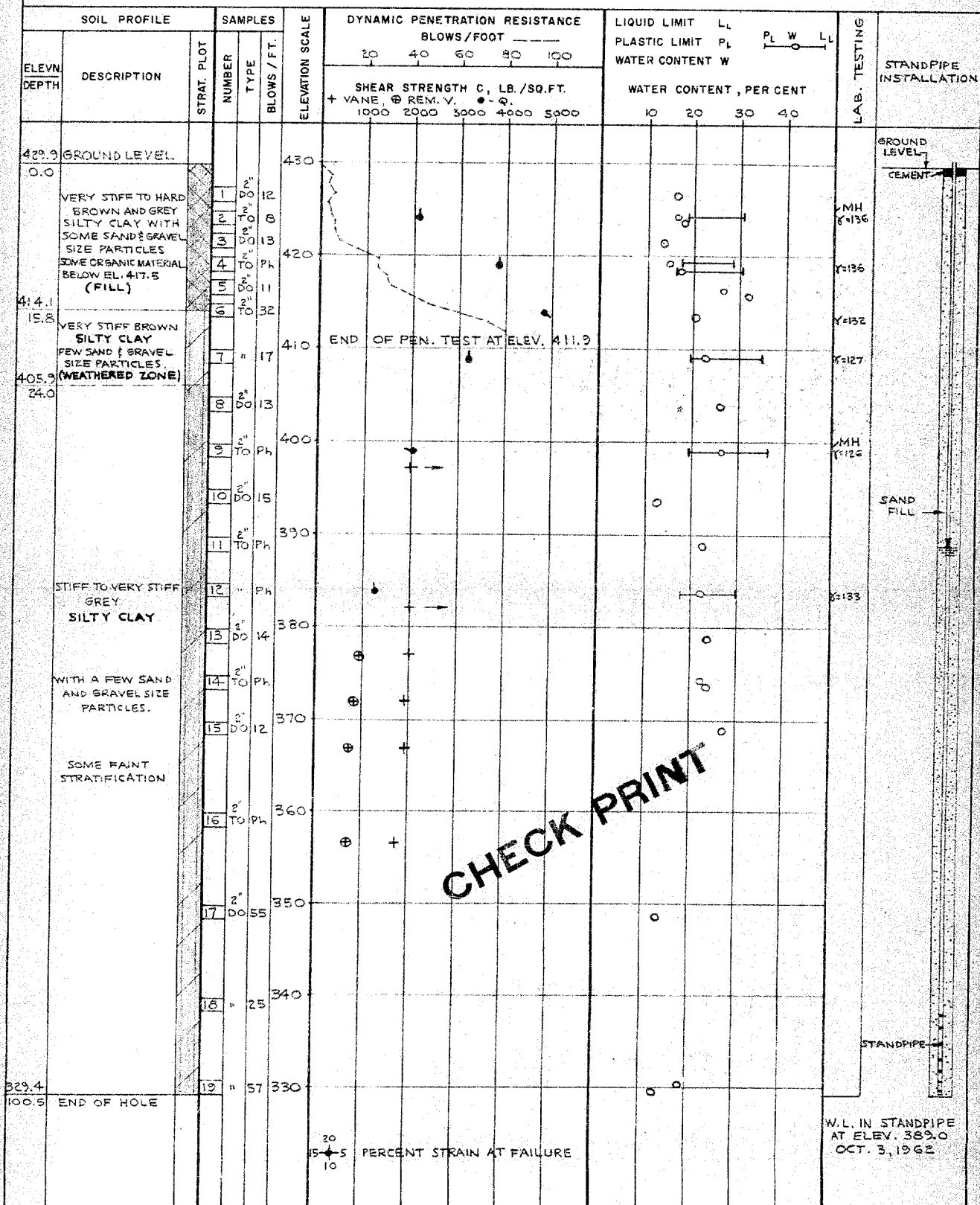
GOLDER & ASSOCIATES

DRAWN M. W.

CHECKED

RECORD OF BOREHOLE 3

LOCATION SEE FIGURE 1 BORING DATE SEPT. 15 - 1962 DATUM GEODETIC
 BOREHOLE TYPE POWER AUGER BORING BOREHOLE DIAMETER 4.5"
 SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES PEN. TEST HAMMER WEIGHT 140 LB. DROP 30 INCHES



(a) Dynamic penetration resistance converted to 4200 inch lb. energy

(b) Abbreviations listed on page

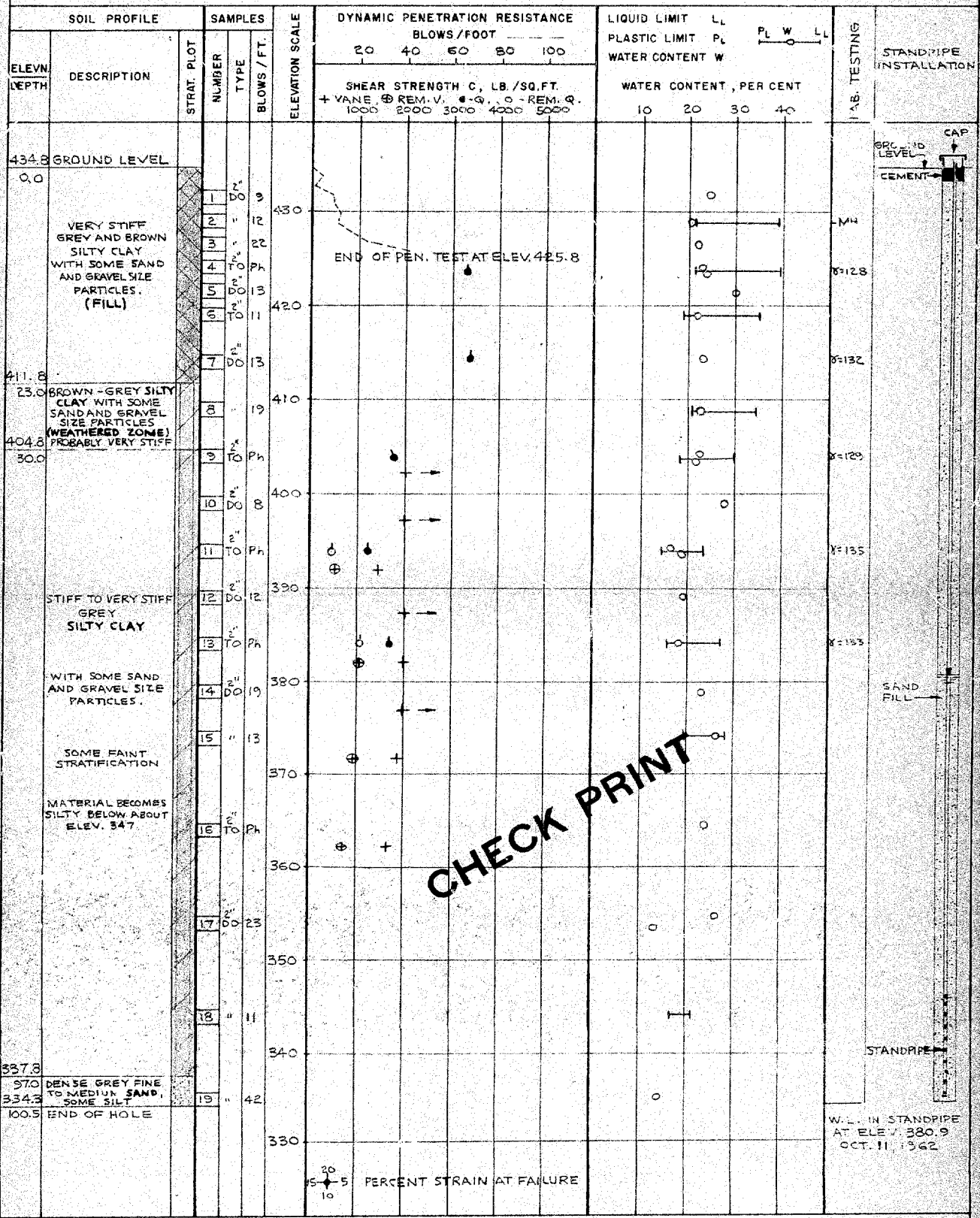
 VERTICAL SCALE
 1 INCH TO 10' - 0"

GOLDER & ASSOCIATES

 DRAWN M.W.
 CHECKED

RECORD OF BOREHOLE 4

LOCATION SEE FIGURE 1 BORING DATE SEPT. 18 - 20, 1962 DATUM GEODETIC
BOREHOLE TYPE POWER AUGER BORING BOREHOLE DIAMETER 4.5"
SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES PEN. TEST HAMMER WEIGHT 140 LB. DROP 30 INCHES



(a) Dynamic penetration resistance converted to 4200 inch lb. energy

(b) Abbreviations listed on page

VERTICAL SCALE
1 INCH TO 10'-0"

GOLDER & ASSOCIATES

DRAWN M.W.
CHECKED

RECORD OF BOREHOLE 5

LOCATION SEE FIGURE 1

BORING DATE SEPT 20-21, 1962

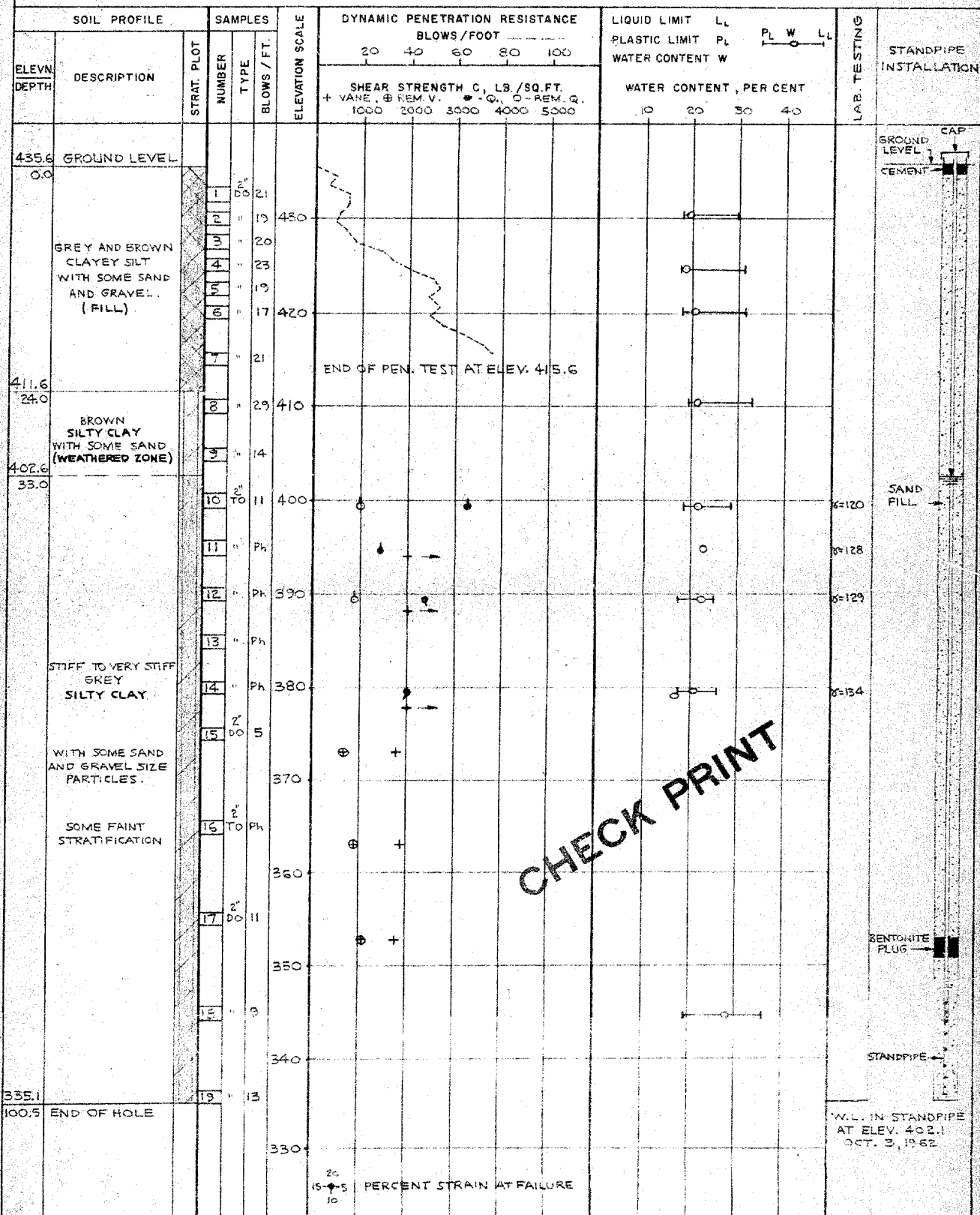
DATUM GEODETIC

BOREHOLE TYPE POWER AUGER BORING

BOREHOLE DIAMETER 4.5 "

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES

PEN. TEST HAMMER WEIGHT 140 LB. DROP 30 INCHES

(a) Dynamic penetration resistance converted to 4200 inch² energy

(b) Abbreviations listed on page

VERTICAL SCALE

1 INCH TO 10'-0"

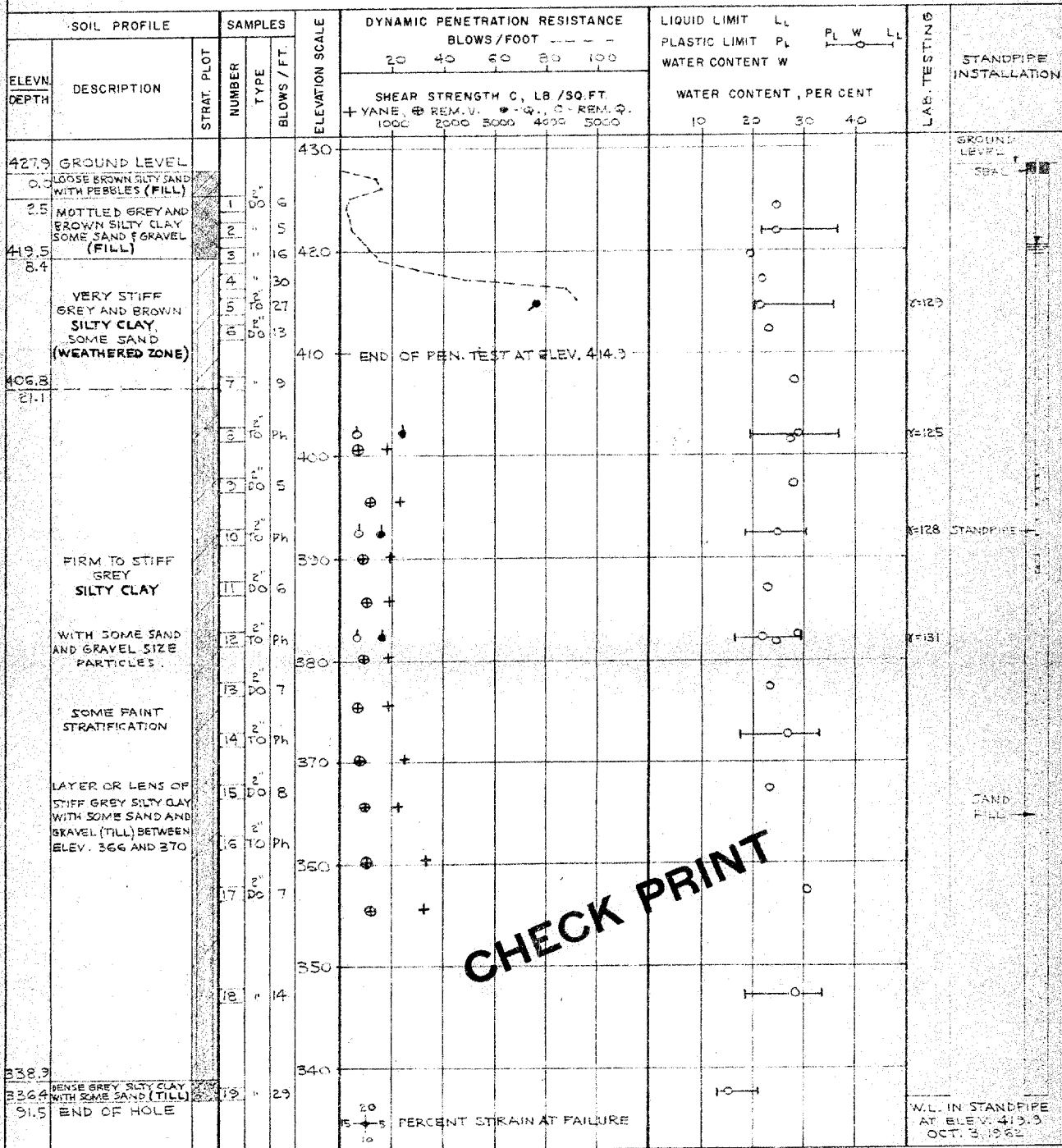
DRAWN M.W.

CHECKED

GOLDER & ASSOCIATES

RECORD OF BOREHOLE G

LOCATION: SEE FIGURE 1 BORING DATE: SEPT. 24 - 25, 1962 DATUM: GEODETIC
 BOREHOLE TYPE: POWER AUGER BORING BOREHOLE DIAMETER: 4.5"
 SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES PEN. TEST HAMMER WEIGHT 140 LB. DROP 30 INCHES



(a) Dynamic penetration resistance converted to 4200 inch lb energy
 (b) Abbreviations listed on page

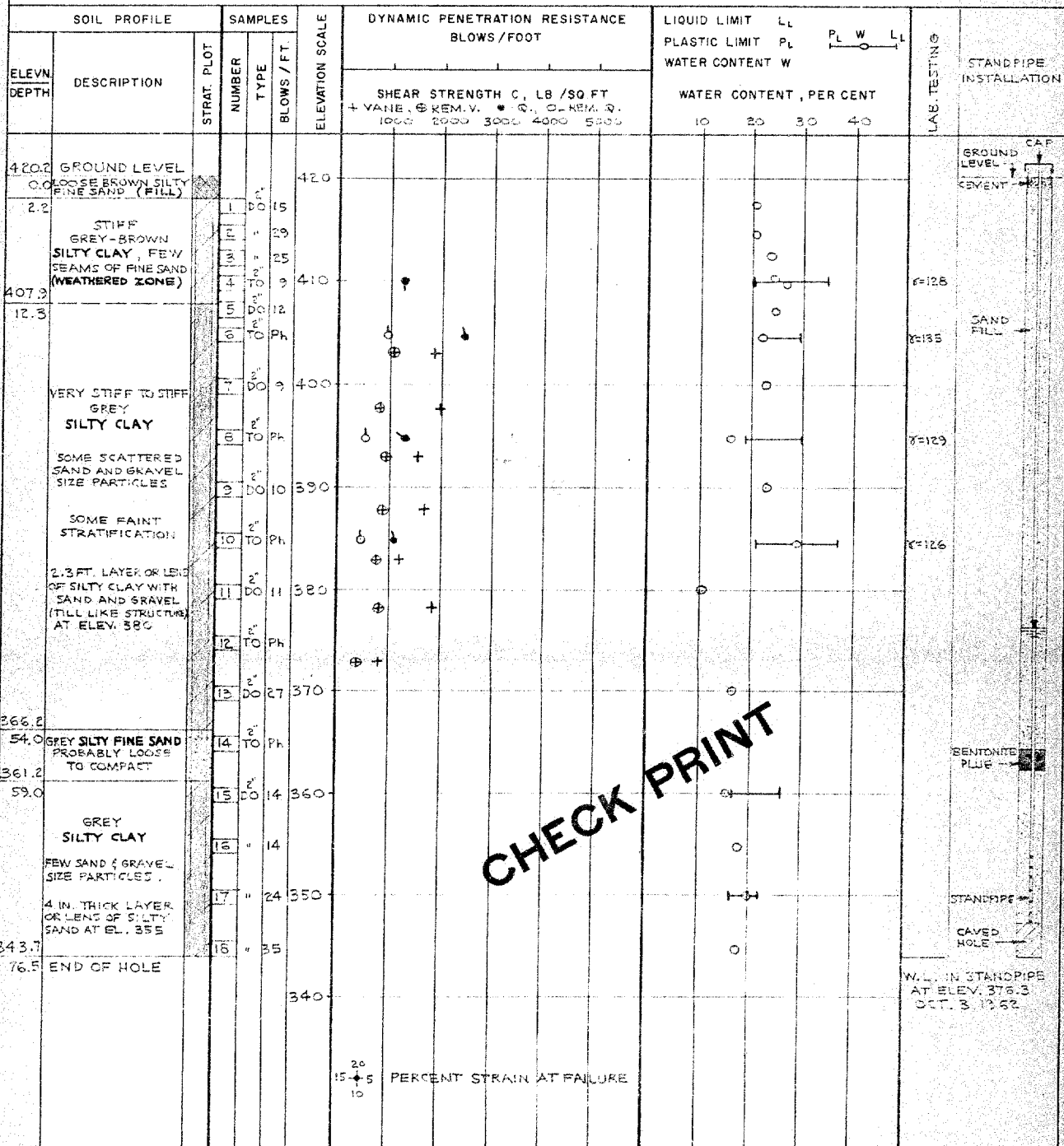
VERTICAL SCALE
 1 INCH TO 10'-0"

GOLDER & ASSOCIATES

DRAWN M.W.
 CHECKED

RECORD OF BOREHOLE 7

LOCATION SEE FIGURE 1 BORING DATE SEPT. 26-27, 1962 DATUM GEODETIC
 BOREHOLE TYPE POWER AUGER BORING BOREHOLE DIAMETER 4.5"
 SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES PEN. TEST HAMMER WEIGHT - LB DROP - INCHES



RECORD OF BOREHOLE 8

LOCATION SEE FIGURE 1

BORING DATE SEPT. 27-OCT. 1, 1962

DATUM GEODETIC

BOREHOLE TYPE

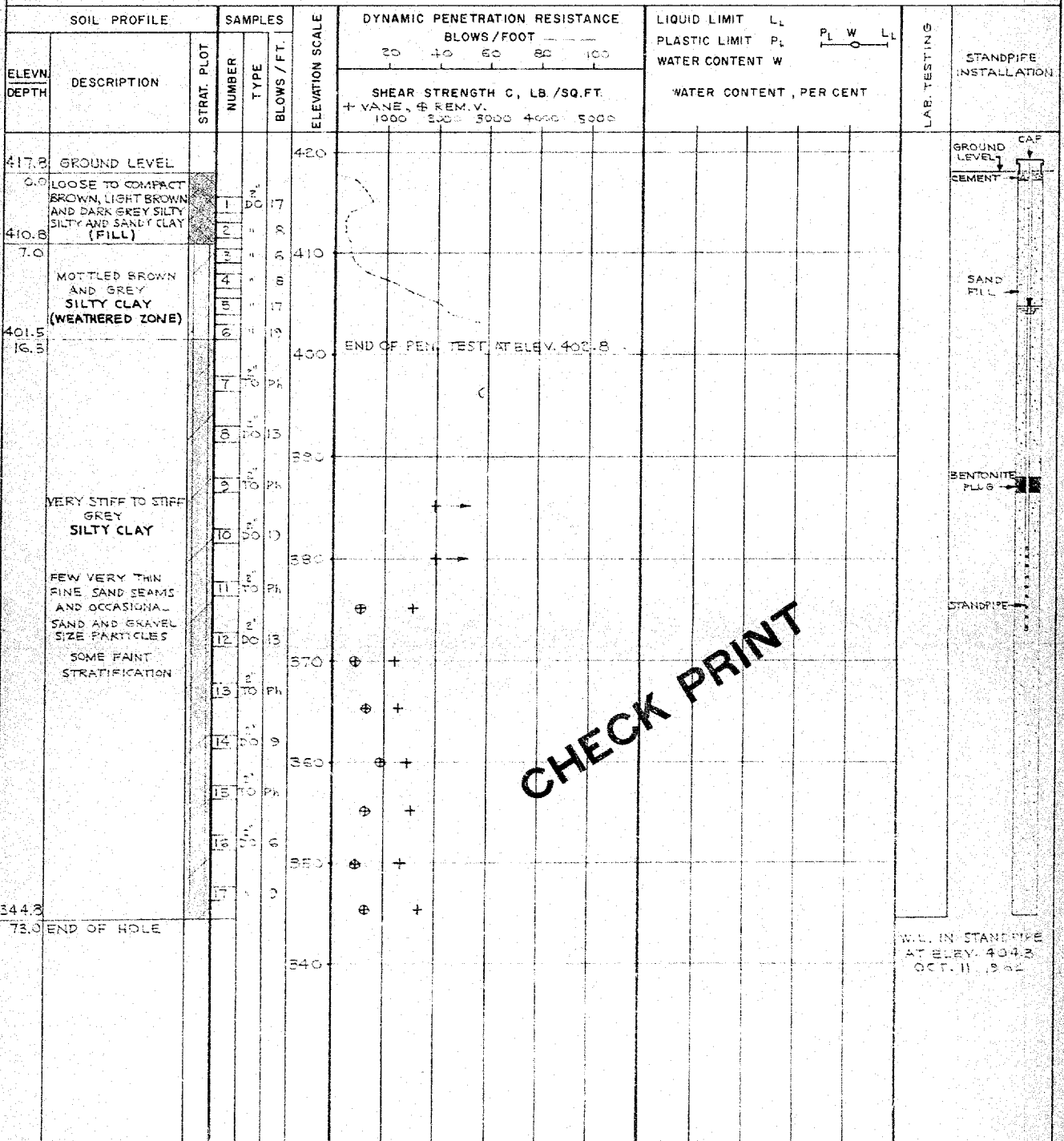
POWER AUGER BORING

BOREHOLE DIAMETER

4.5"

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES

PEN. TEST HAMMER WEIGHT 140 LB. DROP 30 INCHES



(a) Dynamic penetration resistance converted to 4200 inch lb energy

(b) Abbreviations listed on page

VERTICAL SCALE
1 INCH TO 10'-0"

GOLDER & ASSOC. ATES

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CHECKED

RECORD OF BOREHOLE 9

LOCATION SEE FIGURE 1

BORING DATE OCT. 2-3, 1962

DATUM GEODETIC

BOREHOLE TYPE

POWER AUGER BORING

BOREHOLE DIAMETER

4.5"

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES

PEN. TEST HAMMER WEIGHT

LB DROP

INCHES

SOIL PROFILE		SAMPLES		ELEVATION SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT					LIQUID LIMIT L_L PLASTIC LIMIT P_L WATER CONTENT W			LAB. TESTING	STANDPIPE INSTALLATION
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER TYPE		BLOWS / FT.	SHEAR STRENGTH C , LB./SQ.FT. + VANE, Φ NAT.V. 1000 2000 3000 4000 5000					WATER CONTENT, PER CENT			
416.8	GROUND LEVEL				420									<div>CAP</div> <div>GROUND LEVEL</div> <div>CEMENT</div> <div>SAND FILL</div> <div>STANDPIPE</div>
0.0	BROWN SAND AND GRAVEL (FILL)													
2.0														
	GREY AND BROWN SILTY CLAY (WEATHERED ZONE)		1 DO	6	410									
			2 "	13										
			3 "	17										
			4 "	18										
402.0			5 "	19	400									
14.8			6 TO	PH										
			7 DO	12	390									
	VERY STIFF GREY SILTY CLAY		8 "	15										
	FEW THIN FINE SAND SEAMS OCCASIONAL SCATTERED SAND AND GRAVEL SIZE PARTICLES		9 TO	PH	380									
			10 DO	22										
			11 TO	PI	370									
			12 DO	16										
			13 TO	PH	360									
			14 TO	PH										
349.8			15 DO	12	350									
67.0	END OF HOLE				340									
													W.L. IN STANDPIPE AT ELEV. 336.7 OCT. 11, 1962	

CHECK PRINT

(a) Dynamic penetration resistance converted to 4200 inch lb energy

(b) Abbreviations listed on page

VERTICAL SCALE

1 INCH TO

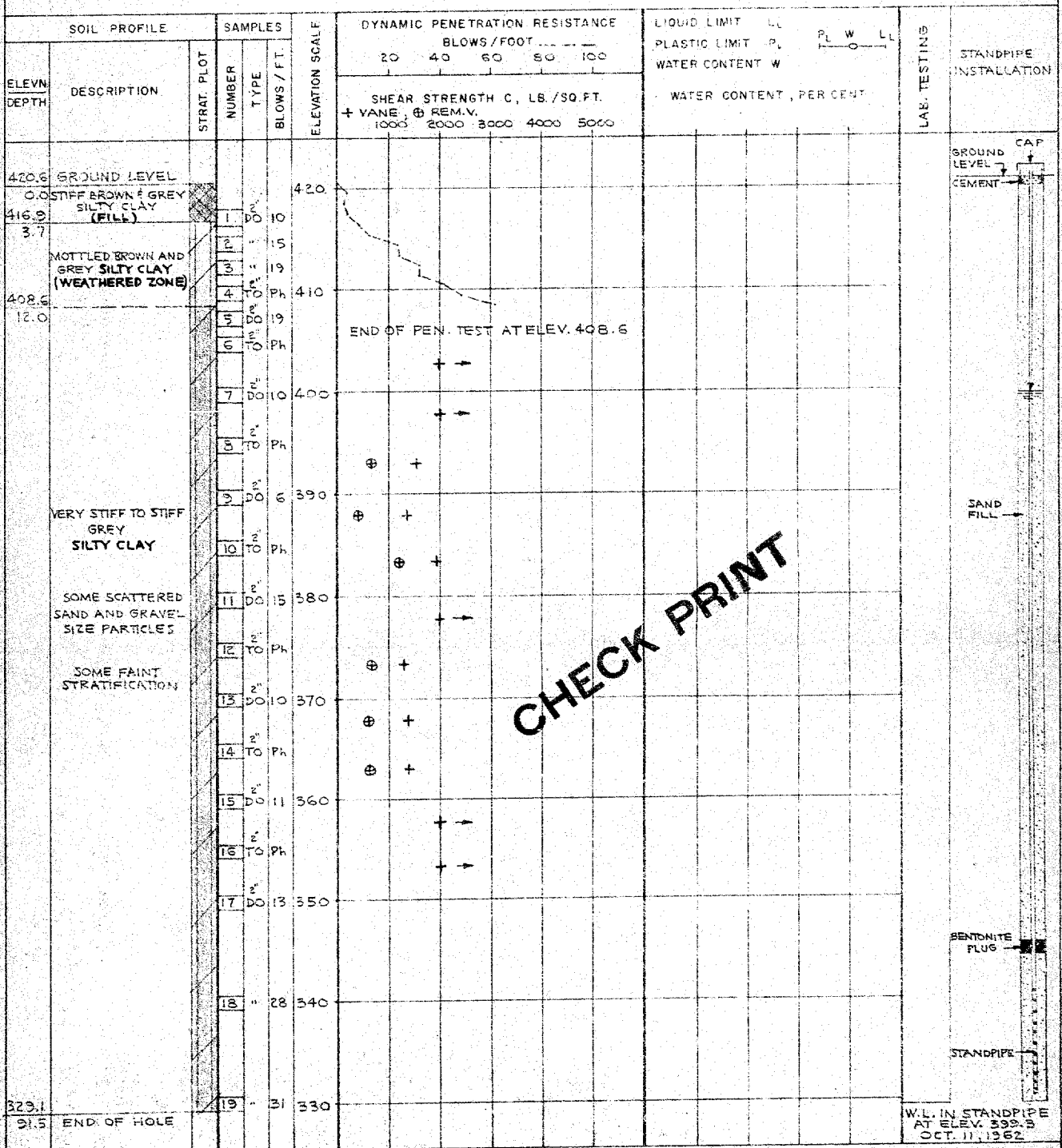
DRAWN

CHECKED

GOLDER & ASSOCIATES

RECORD OF BOREHOLE 10

LOCATION SEE FIGURE 1 BORING DATE OCT. 3-4, 1962 DATUM GEODETIC
 BOREHOLE TYPE POWER AUGER BORING BOREHOLE DIAMETER 4.5"
 SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES PEN TEST HAMMER WEIGHT 140 LB. DROP 30 INCHES



CHECK PRINT

RECORD OF BOREHOLE 11

LOCATION SEE FIGURE 1

BORING DATE OCT. 5-9, 1962

DATUM

GEODETIC

BOREHOLE TYPE POWER AUGER BORING

BOREHOLE DIAMETER 4.5"

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES

PEN. TEST HAMMER WEIGHT LB. DROP INCHES

SOIL PROFILE		SAMPLES		ELEVATION SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT					LIQUID LIMIT L_L PLASTIC LIMIT P_L WATER CONTENT W			LAB. TESTS	STANDPIPE INSTALLATION
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER TYPE		BLOWS / FT.	SHEAR STRENGTH C , LB./SQ.FT. + VANE, \oplus REM.V. 1000 2000 3000 4000 5000					WATER CONTENT, PER CENT			
420.5 0.0	GROUND LEVEL		1 DO	6	420									<p>GROUND LEVEL CEMENT SAND FILL BENTONITE PLUG STANDPIPE</p> <p>W.L. IN STANDPIPE AT ELEV. 410.2 OCT. 11, 1962</p>
	BROWN CLAYEY SILT WITH SOME SAND AND GRAVEL (FILL)		2 "	18										
414.5 6.0			3 "	13										
	BROWN AND GREY- BROWN SILTY CLAY SOME FISSURES (WEATHERED ZONE)		4 "	11										
			5 "	7	410									
405.5 15.0			6 "	23										
			7 TO	Ph										
			8 "	Ph	400									
			9 "	Ph										
			10 DO	6	390									
	VERY STIFF TO STIFF GREY SILTY CLAY		11 TO	Ph										
			12 "	Ph	380									
	SOME SCATTERED SAND AND GRAVEL SIZE PARTICLES.		13 DO	6										
			14 TO	Ph	370									
			15 "	Ph										
			16 DO	8	360									
			17 "	9										
347.5 73.0	END OF HOLE		18 "	7	350									
					340									
					330									

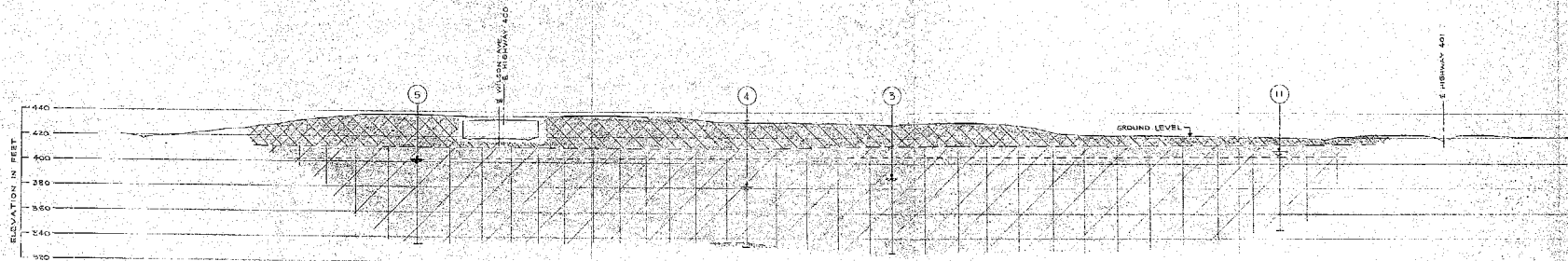
(a) Dynamic penetration resistance converted to 4200 inch lb. energy

(b) Abbreviations listed on page

VERTICAL SCALE
1 INCH TO 10'-0"

GOLDER & ASSOCIATES

DRAWN M.W.
CHECKED



SECTION AT STATION 50+00, HIGHWAY 401
(LOOKING TOWARD INCREASING CHAINAGE)

LEGEND



BOREHOLE IN ELEVATION



WATER LEVEL IN STANDOFF, OCT. 11, 1952

STRATIGRAPHY



GENERALLY STIFF TO HARD BROWN AND GREY SILTY AND SANDY CLAY. (FILL)



BROWN SILT AND SAND WITH ORGANIC MATTER.



GENERALLY STIFF TO VERY STIFF BROWN AND GREY SILTY CLAY (WEATHERED ZONE)



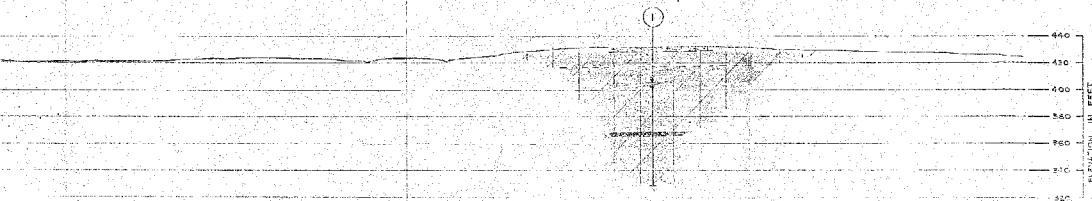
GENERALLY FIRM TO STIFF GREY SILTY CLAY, WITH A FEW SAND AND GRAVEL SIZE PARTICLES, SOME FAINT STRATIFICATION



FIRM GREY CLAYEY SILT WITH SOME SAND AND GRAVEL (TILL, LIKE STRUCTURE)



DENSE GREY FINE TO MEDIUM SAND, TRACE SILT.



NOTE: FOR LOCATION OF SECTION SEE FIGURE 1.

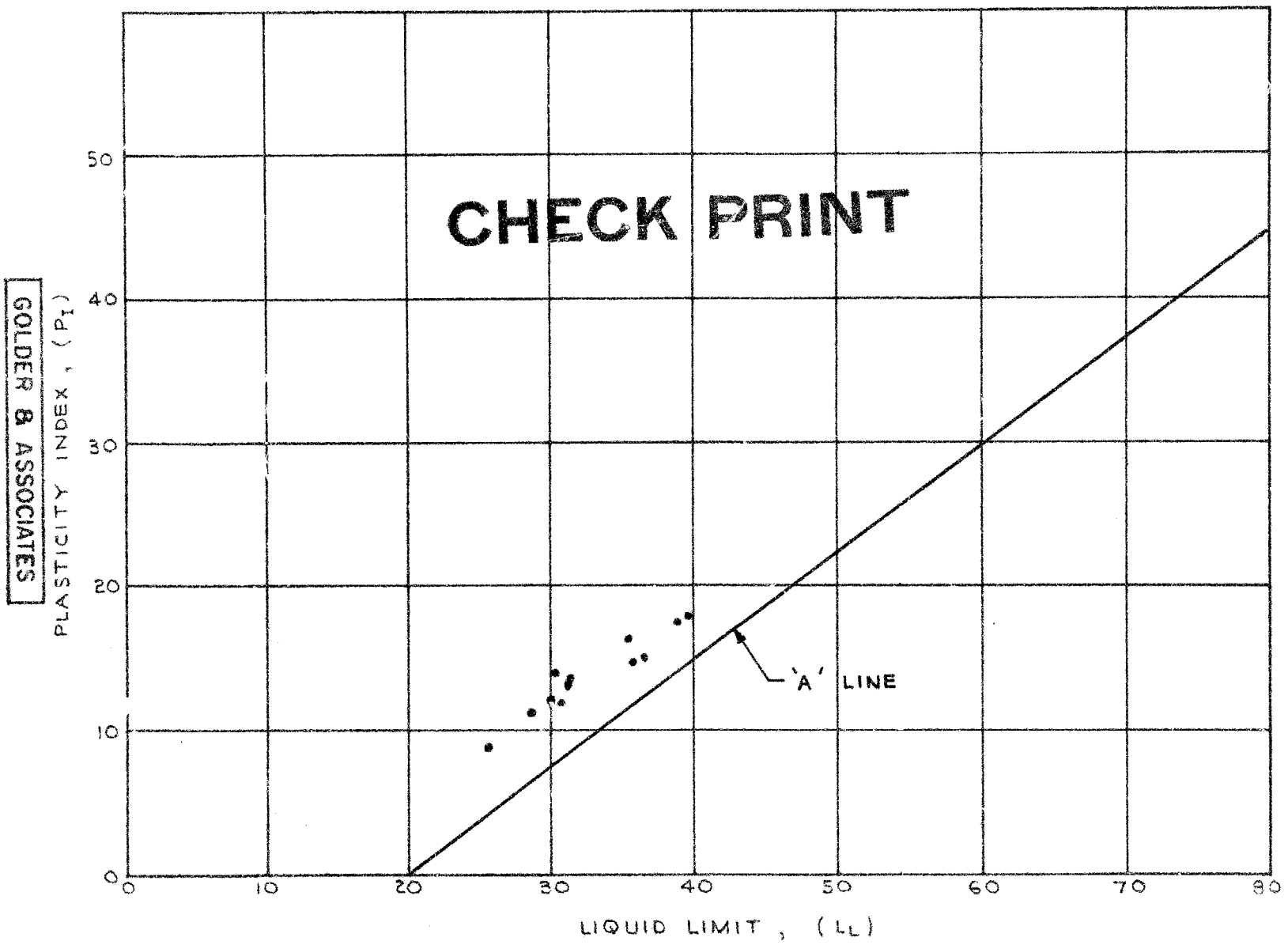
SPECIAL NOTE: DATA CONCERNING THE VARIOUS STRATA HAVE BEEN OBTAINED AT BOREHOLE LOGS. ONLY ONLY. THE SOIL STRATIGRAPHY BETWEEN BOREHOLE HAS BEEN INFERRED FROM GEOLOGICAL EVIDENCE AND MAY VARY FROM THAT SHOWN.

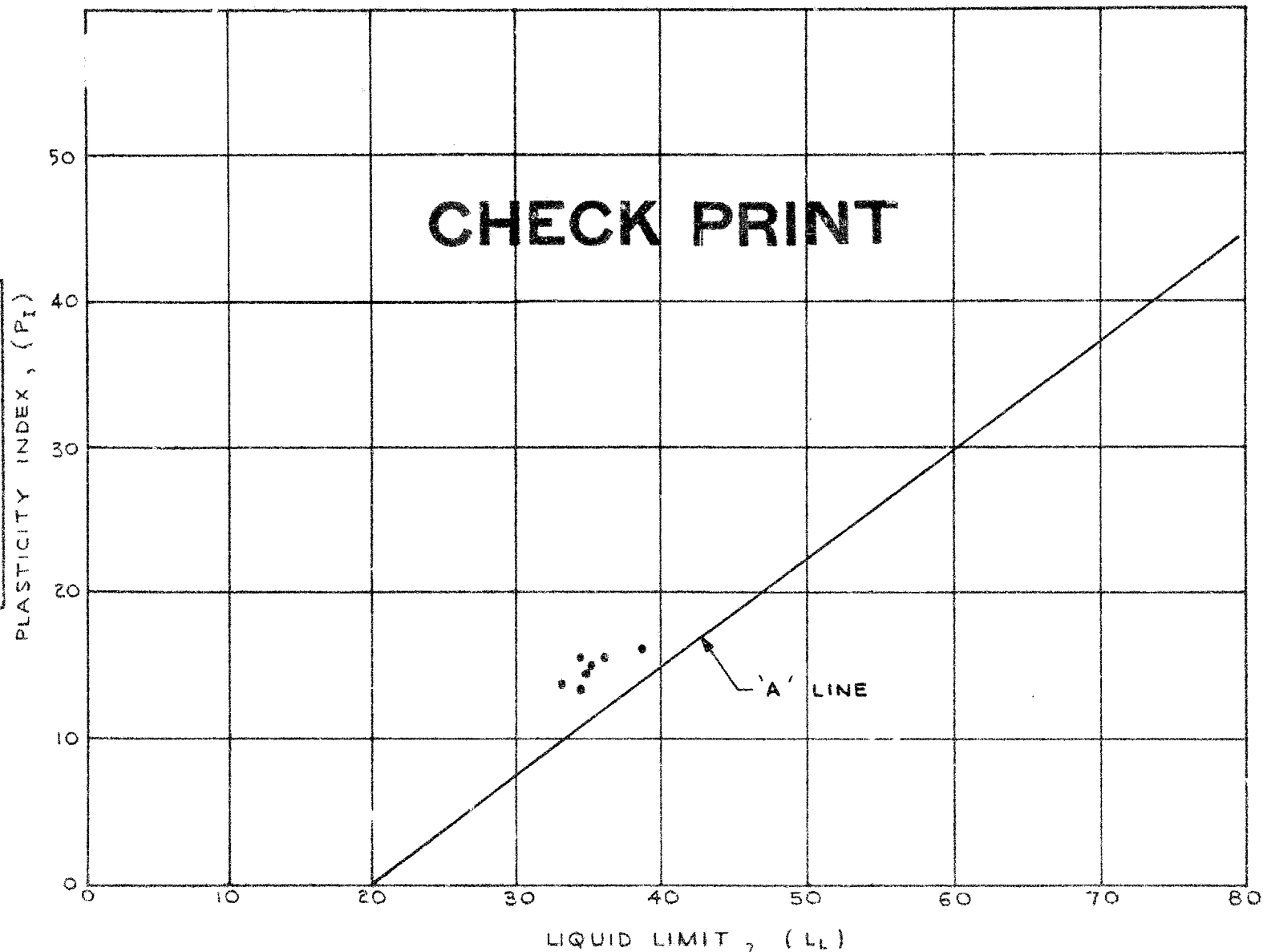
REFERENCE	
DRWG. NO.	DESCRIPTION
PI 136/53	ONTARIO DEPARTMENT OF HIGHWAYS - TOPOGRAPHIC MAP OF THE INTERSECTION OF HIGHWAYS 400 & 401, DATED NOV. 1953

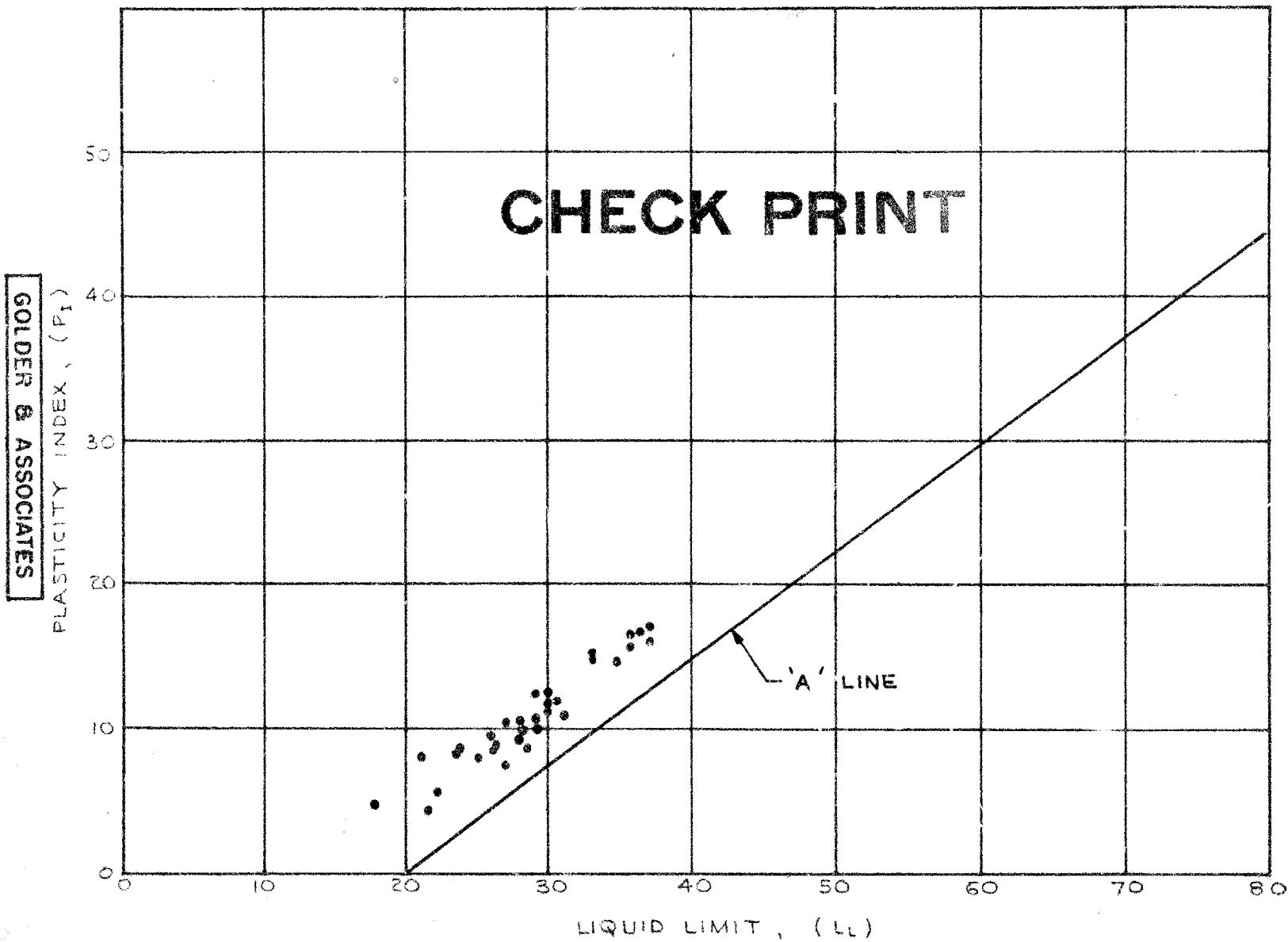
DE. LEUW, CATHIER & COMPANY OF CANADA LIMITED	
TORONTO	ONTARIO
PROPOSED ALTERATIONS HIGHWAY 401 - 400 INTERCHANGE	
TORONTO	ONTARIO
SOIL STRATIGRAPHY	

GOLDER & ASSOCIATES CONSULTING CIVIL ENGINEERS	
DATE OCT. 10, 1952 SCALE 1" TO 40'-0"	
MADE M.W.	APPD. FIGURE 2

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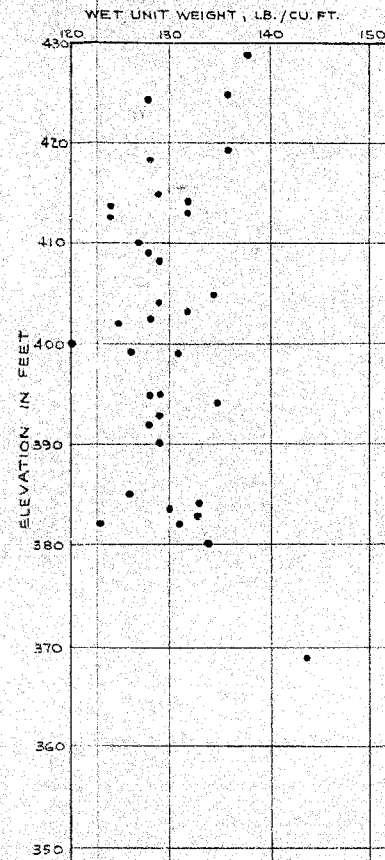
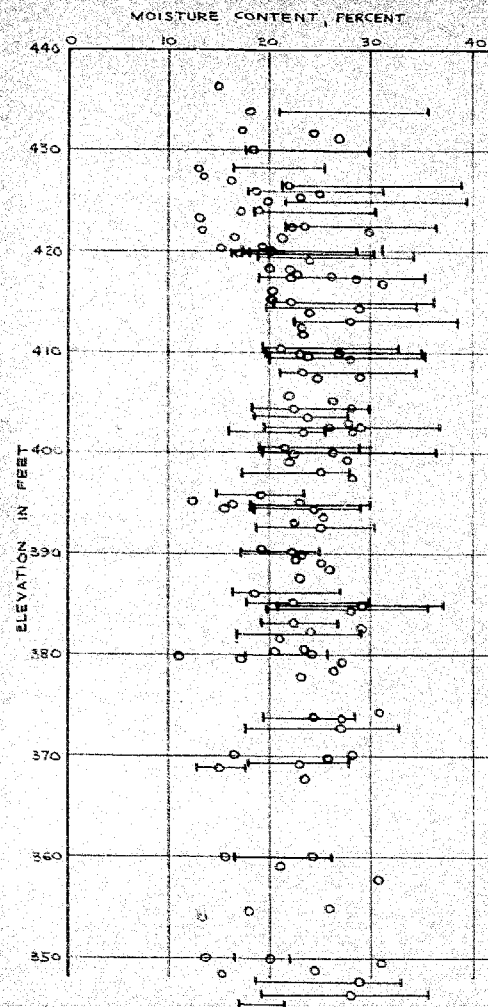
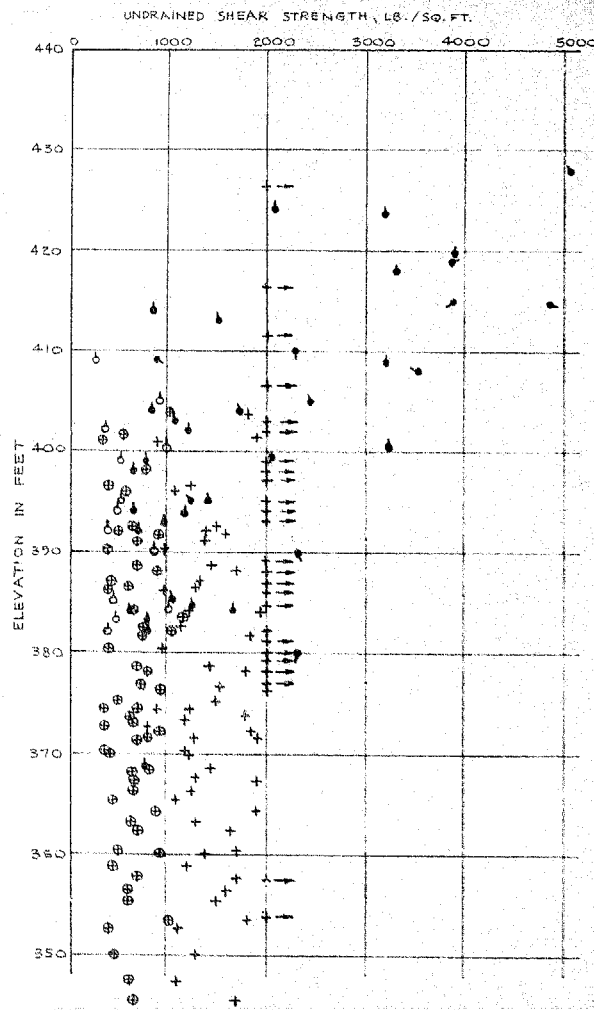






UNDRAINED SHEAR STRENGTH,
MOISTURE CONTENT & WET UNIT WEIGHT VS
ELEVATION - INTERCHANGE AREA.

FIGURE 6



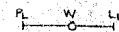
LEGEND

UNDRAINED SHEAR STRENGTH

- UNDRAINED TRIAXIAL COMPRESSION TEST
- REMOULDED UNDRAINED TRIAXIAL COMPRESSION TEST
- + IN-SITU VANE TEST
- ⊙ REMOULDED IN-SITU VANE TEST
- 20
15 — 5 PERCENT STRAIN AT FAILURE (TRIAxIAL TEST)
10

MOISTURE CONTENT

- LL - LIQUID LIMIT
- PL - PLASTIC LIMIT
- W - MOISTURE CONTENT



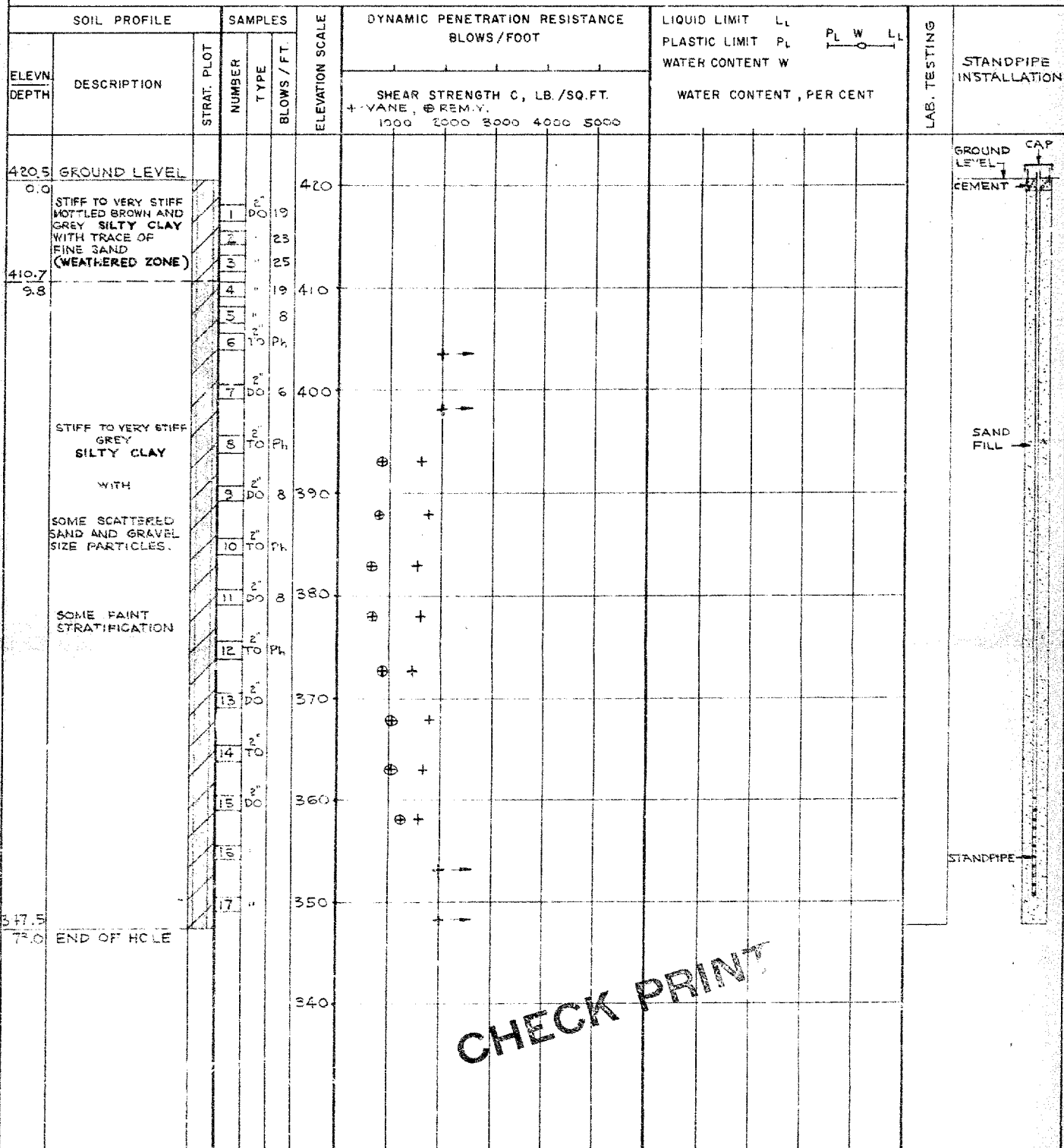
WET UNIT WEIGHT

- WET UNIT WEIGHTS

CHECK PRINT

RECORD OF BOREHOLE 12

LOCATION SEE FIGURE 1 BORING DATE OCT 10-11, 1962 DATUM GEODETIC
 BOREHOLE TYPE POWER AUGER BORING BOREHOLE DIAMETER 4.5"
 SAMPLER HAMMER WEIGHT 120 LB. DROP 30 INCHES PEN. TEST HAMMER WEIGHT - LB. DROP - INCHES



CHECK PRINT

(a) Dynamic penetration resistance converted to 4200 inch lb energy
 (b) Abbreviations listed on page

VERTICAL SCALE
 1 INCH TO 10'-0"

GOLDER & ASSOCIATES

DRAWN M.W.
 CHECKED

RECORD OF BOREHOLE 13

LOCATION SEE FIGURE 1 BORING DATE OCT. 11-12, 1962 DATUM GEODETIC
 BOREHOLE TYPE POWER AUGER BORING BOREHOLE DIAMETER 4.5"
 SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES PEN. TEST HAMMER WEIGHT -- LB. DROP -- INCHES

SOIL PROFILE			SAMPLES		ELEVATION SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT		LIQUID LIMIT L_L PLASTIC LIMIT P_L WATER CONTENT W		LAB. TESTING	STANDPIPE INSTALLATION
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER TYPE	BLOWS/FT.		SHEAR STRENGTH C , LB./SQ. FT. + - VANE, 6 - REM.V. 1000 2000 3000 4000 5000		WATER CONTENT, PER CENT			
422.8	GROUND LEVEL										
0.0	MOTTLED BROWN AND GREY SILTY CLAY (CELL)										
1.5	VERY STIFF MOTTLED GREY AND BROWN SILTY CLAY WITH TRACE OF FINE SAND, SOME FISSURES (WEATHERED ZONE)		1 CO	28	420						
			2 "	26							
			3 "	26							
412.5			4 "	14							
10.3			5 "	9	410						
			6 "	Ph							
			7 "	5	400						
	STIFF TO VERY STIFF GREY SILTY CLAY		8 "	5							
	WITH		9 "	Ph	390						
	SOME SCATTERED SAND AND GRAVEL SIZE PARTICLES.		10 "	9							
			11 "	9	380						
	SOME FAINT STRATIFICATION		12 "	Ph							
			13 "	8	370						
			14 "	Ph							
			15 "	8	360						
			16 "	13							
			17 "	10	350						
349.8											
73.0	END OF HOLE										

GROUND LEVEL
CAP
CEMENT
SAND FILL
STANDPIPE

CHECK PRINT

CHECK PRINT

VERTICAL SCALE
 1 INCH TO 10'-0"

(a) Dynamic penetration resistance converted to 4200 inch lb. energy
 (b) Abbreviations listed on page

GOLDER & ASSOCIATES

DRAWN M.W.
 CHECKED

RECORD OF BOREHOLE 14

LOCATION SEE FIGURE 1 BORING DATE OCT. 15-16, 1962 DATUM GEODETIC
 BOREHOLE TYPE POWER AUGER BORING BOREHOLE DIAMETER 4.5"
 SAMPLER HAMMER WEIGHT 140 LB. DROP 30 INCHES PEN. TEST HAMMER WEIGHT — LB. DROP — INCHES

SOIL PROFILE		SAMPLES		ELEVATION SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT		LIQUID LIMIT L_L PLASTIC LIMIT P_L WATER CONTENT W		LAB. TESTING	STANDPIPE INSTALLATION
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER TYPE		BLOWS/FT	SHEAR STRENGTH C , LB./SQ.FT. + - VANE, Φ - REM.V. 1000 2000 3000 4000 5000		WATER CONTENT, PER CENT		
426.1 0.0	GROUND LEVEL									GROUND LEVEL CEMENT
	STIFF TO VERY STIFF MOTTLED BROWN AND GREY SILTY CLAY, TRACE FINE SAND (WEATHERED ZONE)		1 2"	31						
			2 "	25	420					
			3 "	25						
415.1 11.0			4 "	17						
			5 2" TO	Ph						
			6 DO	10	410					
			7 2" TO	Ph						
			8 DO	6	400					
	STIFF TO VERY STIFF GREY SILTY CLAY		9 2" TO	Ph						
	WITH		10 DO	7	390					
	SOME SCATTERED SAND AND GRAVEL SIZE PARTICLES.		11 2" TO	Ph						
			12 DO	8	380					
	SOME FAINT STRATIFICATION		13 2" TO	Ph						
			14 DO	12	370					
			15 "	12						
			16 "	23	360					
353.1			17 "	15						
73.0	END OF HOLE				350					
					340					

GROUND LEVEL

CEMENT

SAND FILL

BENTONITE PLUG

SANDPIPE

CHECK PRINT

CHECK PRINT

(a) Dynamic penetration resistance converted to 4200 inch lb. energy
 (b) Abbreviations listed on page

VERTICAL SCALE
 1 INCH TO 10' - 0"

GOLDER & ASSOCIATES

DRAWN M. W.
 CHECKED

#62-F-225-C

W.P. #233-60

HWYS. #400 & 401

INTERCHANGE,

9 STRUCTURE
SITES.

