

**54-F-207c**

**Hwy. 401**

**DORCHESTER #5**

FRANK

54F-207C

Our Reference:  
PC 312  
 August 16, 1964.

SOIL INVESTIGATION REPORT  
For  
REPLACEMENT OF HIGHWAY 412, BOSTON  
 (S. S. Miles, Consulting Engineers.)  
 at  
HIGHWAY 412, BOSTON, MASS.

As requested we carried out a soil investigation at the proposed arch culvert site, Dorchester St., at Highway 412.

REPORT OF INVESTIGATION

Fourteen penetration tests were made at the locations shown on the location sketch. The results are shown on the accompanying diagrams and are summarized as follows:

S U M M A R Y

Hole No.	Ground Surface	Water Level	2,000 lbs per sq. ft.	4,000 lbs per sq. ft.	Refusal
1	859.6	Flooding	845	838	837
2	859.9	Ground Surface	850	842	837
3	860.7	Ground Surface	852	842	833
4	859.2	857	848	840	837
5	859.6	852	851	841	837
6	854.4	Ground Surface	846	844	841
7	859.8	Ground Surface	847	840	836
10	858.7	Ground Surface	851	844	836
11	858.8	857	846	838	836
12	858.6	856	854	843	842
13	859.8	Flooding	846	843	833
14	860.9	858	850	845	836
15	860.2	Flooding	854	846	837
16	859.3	Flooding	851	841	840

After rods were withdrawn from the ground, water level in the holes were checked, with results shown in the above summary.

Four Auger borings were made at holes #1, 6, 11, & 16, with the following results.

LOG OF AUGER BORINGS

Hole #1

0' - 2'	Sandy top soil	Sample #1
2' - 3'	Loamy sand	#2
3' - 3'6"	Saturated fine sand	#3
3'6" - 4'	Peat and fine sand	#4
4' - 6'	Saturated fine gravel	#5
6' - 22'	Clay silt	#6
22' - 23'	Silty gravel, saturated	#7
23' - 25'	Fine gravel, saturated	#8
25' +	Hard cemented gravel, dry	#9

Hole #6

0' - 2'	Sandy top soil	Sample #1
2' - 2'6"	Loamy sand	#2
2'6" - 3'	Peat and fine sand, saturated	#3
3' - 4'	Saturated gravel	#4
4' - 21'	Clay silt (4 samples)	#5, 6, 7, 8
21' - 25'	Silty fine gravel	#9
25' +	Hard cemented gravel, dry	#10

Hole #11

0' - 2'	Brown sandy top soil, peaty	Sample #1
2' - 3'	Brown very fine sand, peaty	#2
3' - 6'	Fine gravel, saturated	#3
6' - 20'	Gray clayey silt, moist	#4
20' - 22'	Very fine sand & silt, saturated	#5, 6
22'	Silty very fine sand, gravelly	#7

Firm refusal at 22'

Hole #16

0' - 1'6"	Brown sandy top soil	Sample #1
1'6" - 4'	Loamy fine sand, saturated	#2, 3
4' - 19'6"	Gray clayey silt, moist	#4, 5, 6
19'6" - 20'	Silty very fine sand, gravelly	#7

Firm refusal at 20'

### DISCUSSION

A standpipe was placed in percussion holes #1, 35 and 36 to determine the pressure behind the flowing water. The water rose about five feet above the ground surface, to elevation 863. An examination of our soil report RC 299, on Dorchester 3 and 4, showed a water level of 866.

The water at elevation 866 at Dorchester 3 and 4 cannot flow onto lower ground to the West because of a sloping stratum of impervious clayey silt. The water, however, flows beneath this stratum to Dorchester #5 site, retaining a pressure head equivalent to elevation 865.

Examination of the percussion test summary indicates that a bearing value of 2,000 paf is not encountered until elevations below 850.

Any excavation below 850 would probably leave insufficient weight of overburden to contain the hydrostatic head beneath the clayey silt.

### CONCLUSION

Because of the inadequate bearing capacity of the soil at elevations above 850, and because of the inherent instability of the clayey silt below elevation 850, it is our opinion that the culvert foundation should be based at refusal depth.

Because of the presence of springs, consideration should be given to the underdrainage of the highway embankment, particularly if the fill is of sandy nature.

W. H. T. Wilson

W. H. T. Wilson, P. Eng.

# LOCATION SKETCH

FRANKI COMRESSED TILE CO OF CANADA LTD

HIGH  
BANK

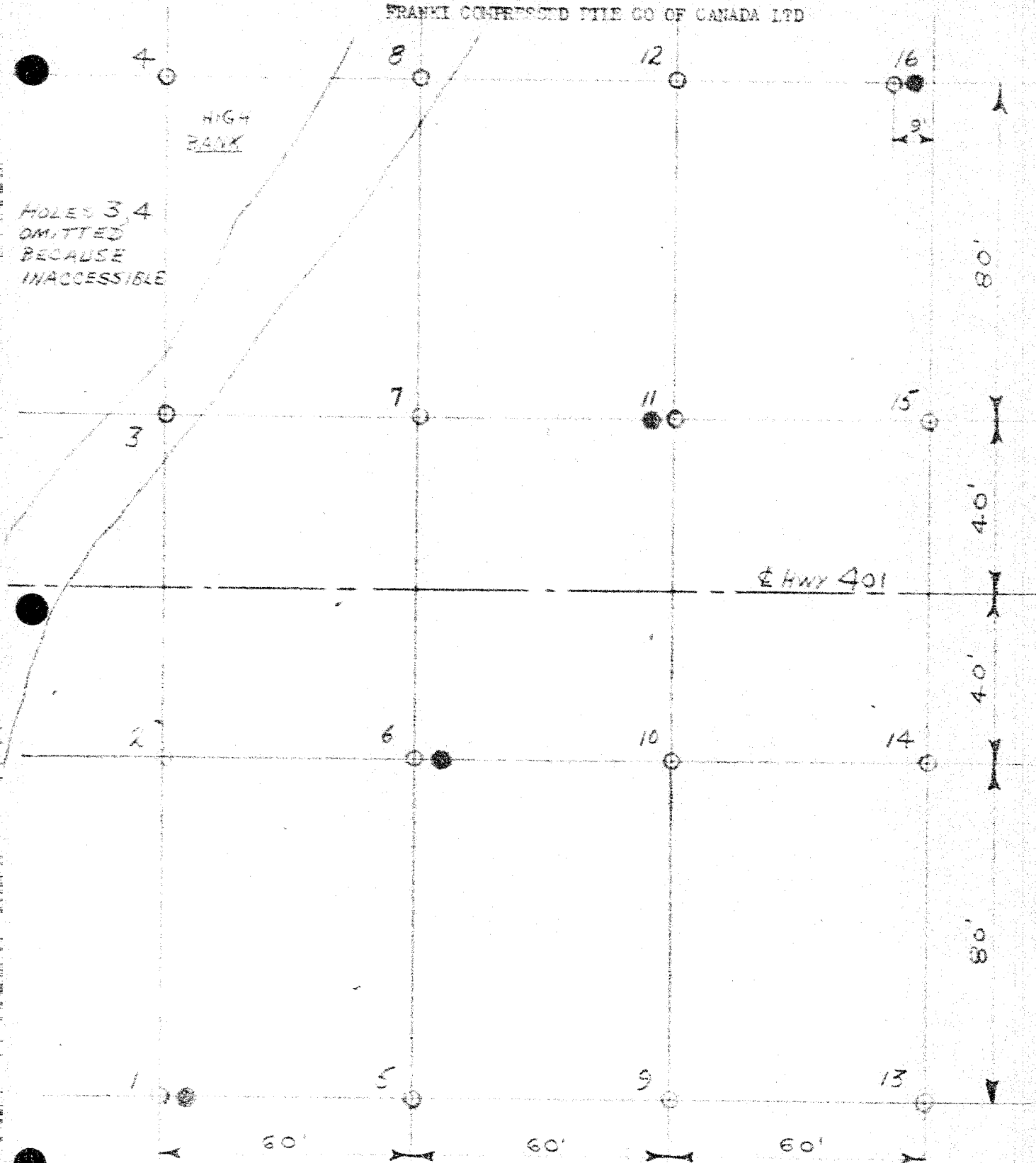
HOLES 3, 4  
OMITTED  
BECAUSE  
INACCESSIBLE

± HWY 401

PERCUSSION TEST ⊕  
AUGER BORING ●

for  
DEPARTMENT OF HIGHWAYS  
at  
HIGHWAY 401, DORCHESTER # 5.

August 18, 1954.  
PC 300



## FRANKI

COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

JOB NO. PC 300

DATE: AUGUST 4, 1954

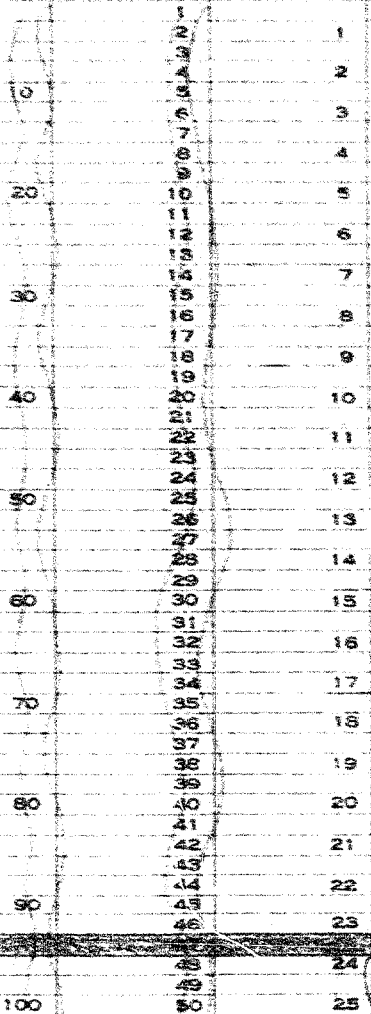
TEST NO.: 1

WEIGHT OF HAMMER 2250

DROP 3 FT.

DEPTH IN FEET

NUMBER OF BLOWS PER FOOT

Ground Surface Elevation 859.6  
Refusal Elevation 837  
Number of Blows 200 for 10"

SIGNED

W. H. Gibson

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COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #1.

JCB NO. PC 300

DATE: AUGUST 4, 1954.

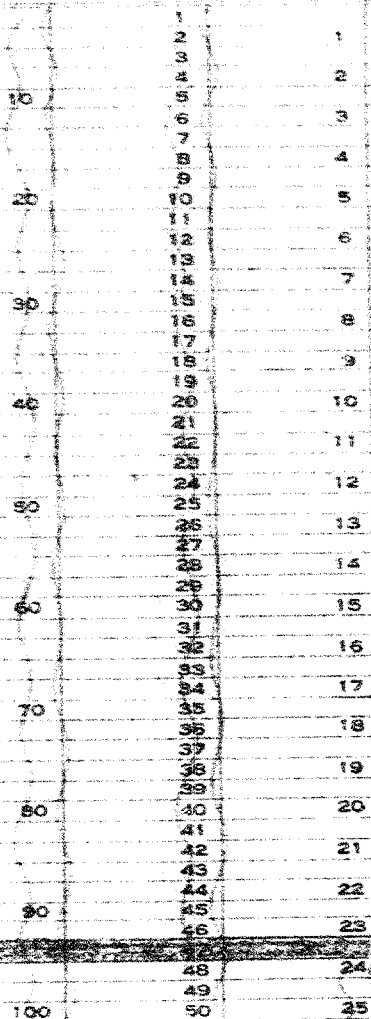
TEST NO.: 2

WEIGHT OF HAMMER 1250

DROP 3 FT

DEPTH IN FEET

NUMBER OF BLOWS PER FOOT



Ground Surface Elevation 859.9  
Refusal Elevation 837  
Number of Blows 200 for 5"

SIGNED

W. T. White

FRANKI

COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

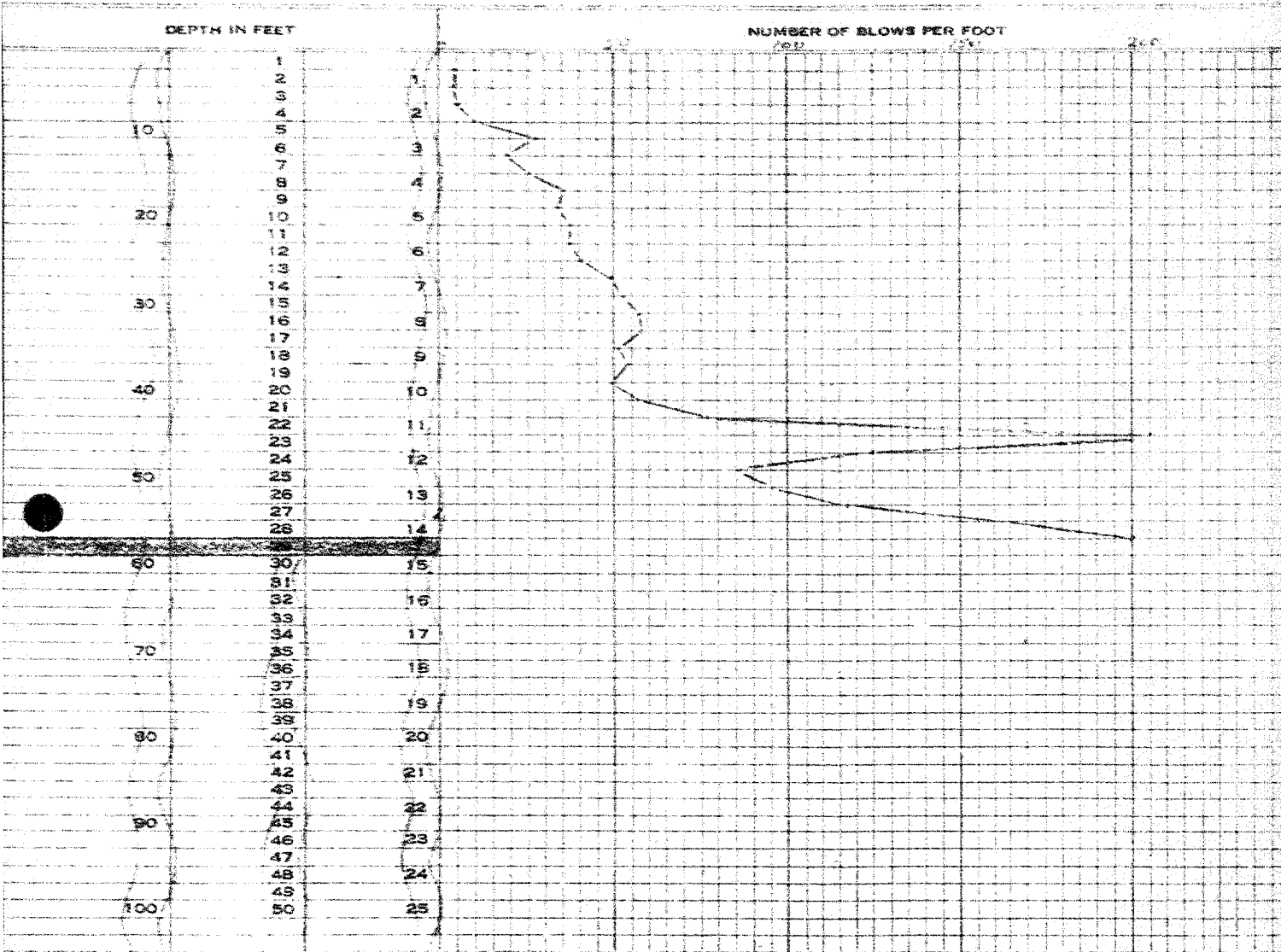
JOB NO. PC 300

DATE: AUGUST 4, 1954.

TEST NO. 5

WEIGHT OF HAMMER 225\*

DROP 3 FT.

Ground Surface Elevation 860.7  
Refusal Elevation 833  
Number of Blows 200

SIGNED

W. H. Wilson



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## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

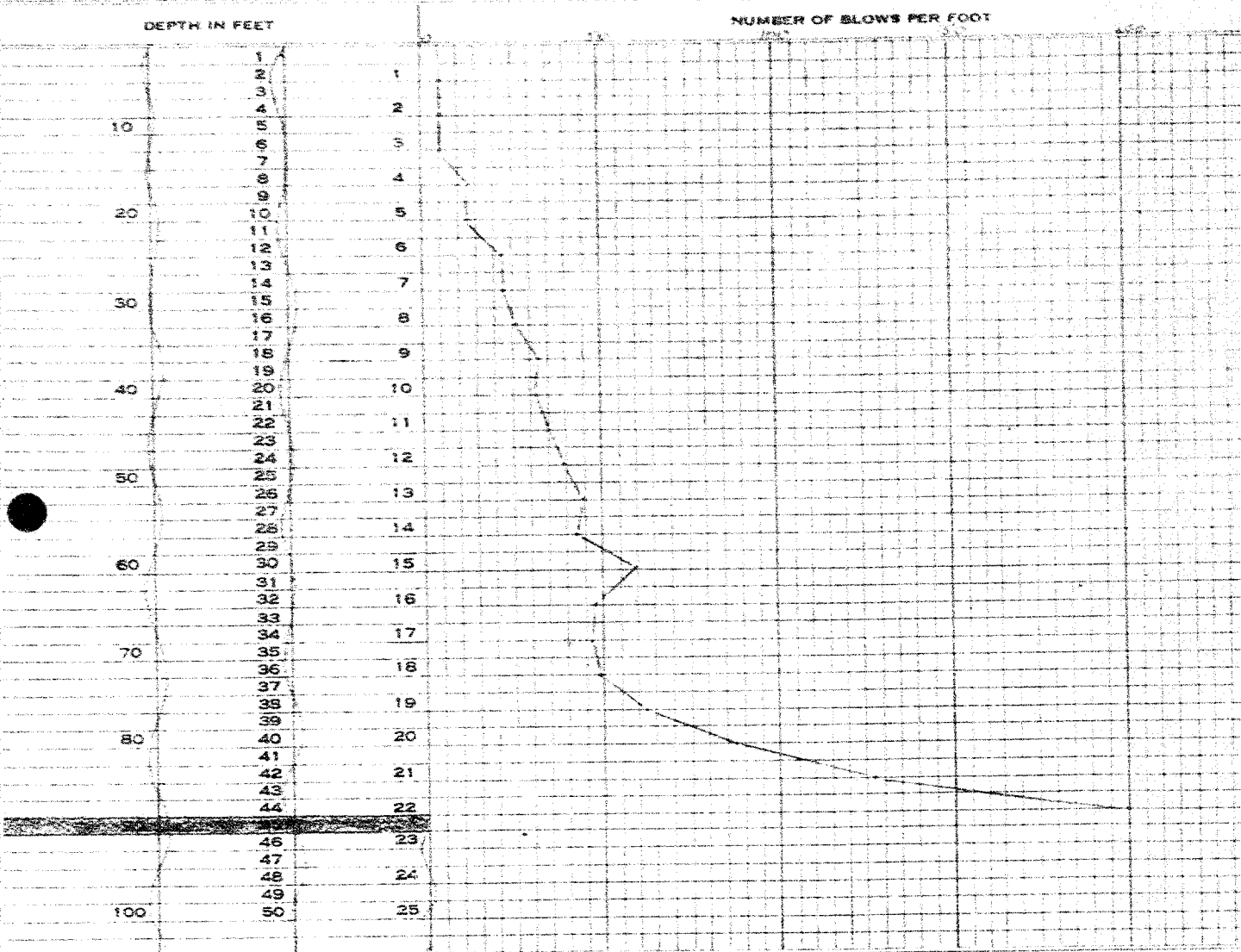
JOB NO. PC 300

DATE: AUGUST 5, 1954.

TEST NO. 6

WEIGHT OF HAMMER 2254

DROP 3 FT



Ground Surface Elevation 859.3  
Refusal Elevation 837  
Number of Blows 200 for 2"

SIGNED

*W. H. White*

# FRANKI

COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

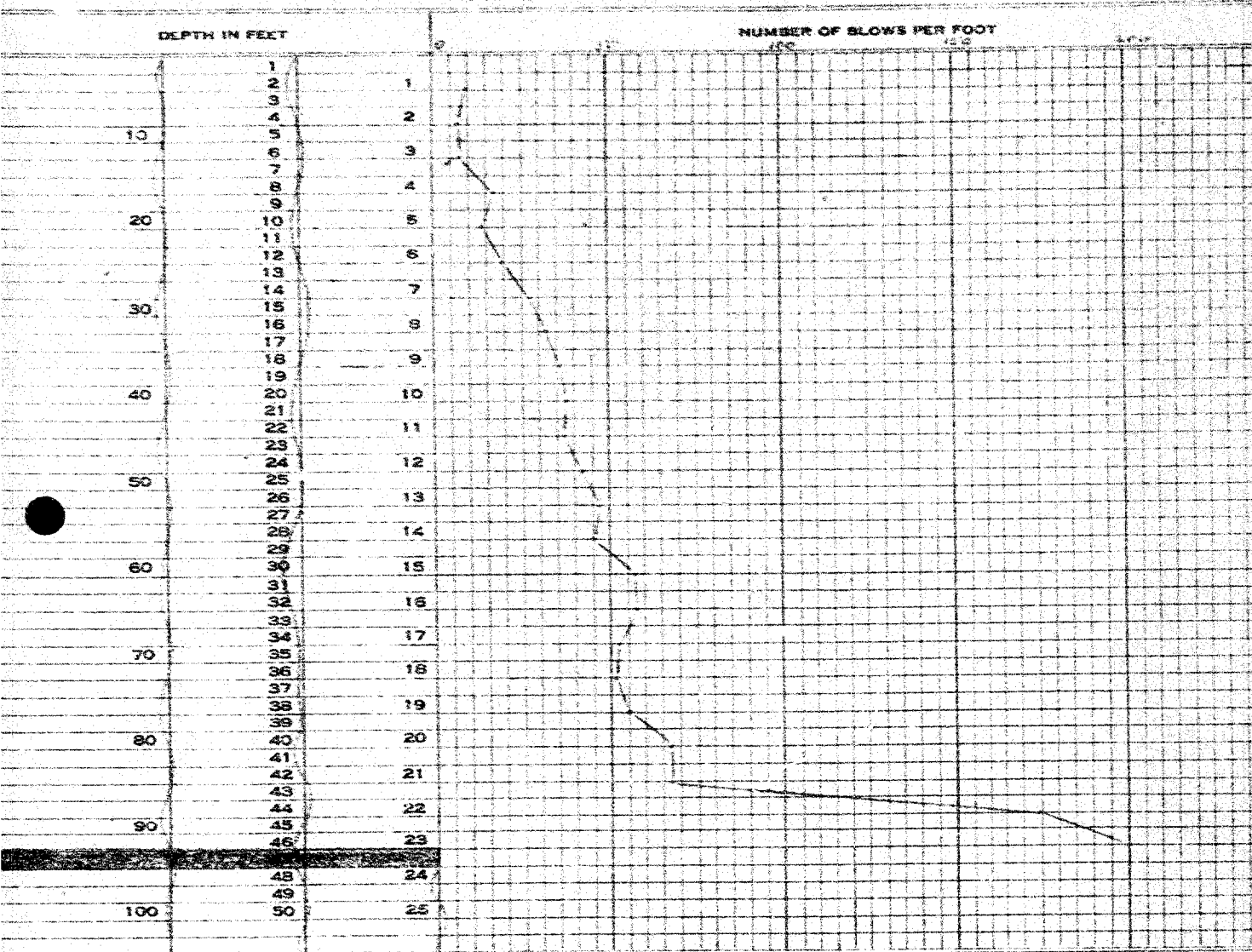
JOB NO. FC 300

DATE: AUGUST 6, 1954.

TEST NO.: 7

WEIGHT OF HAMMER 3250

DROP 3 FT.



Ground Surface Elevation 859.6  
Refusal Elevation 837  
Number of Blows 200 for 5"

SIGNED

W.H.T. Wilson

# FRANKI

COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

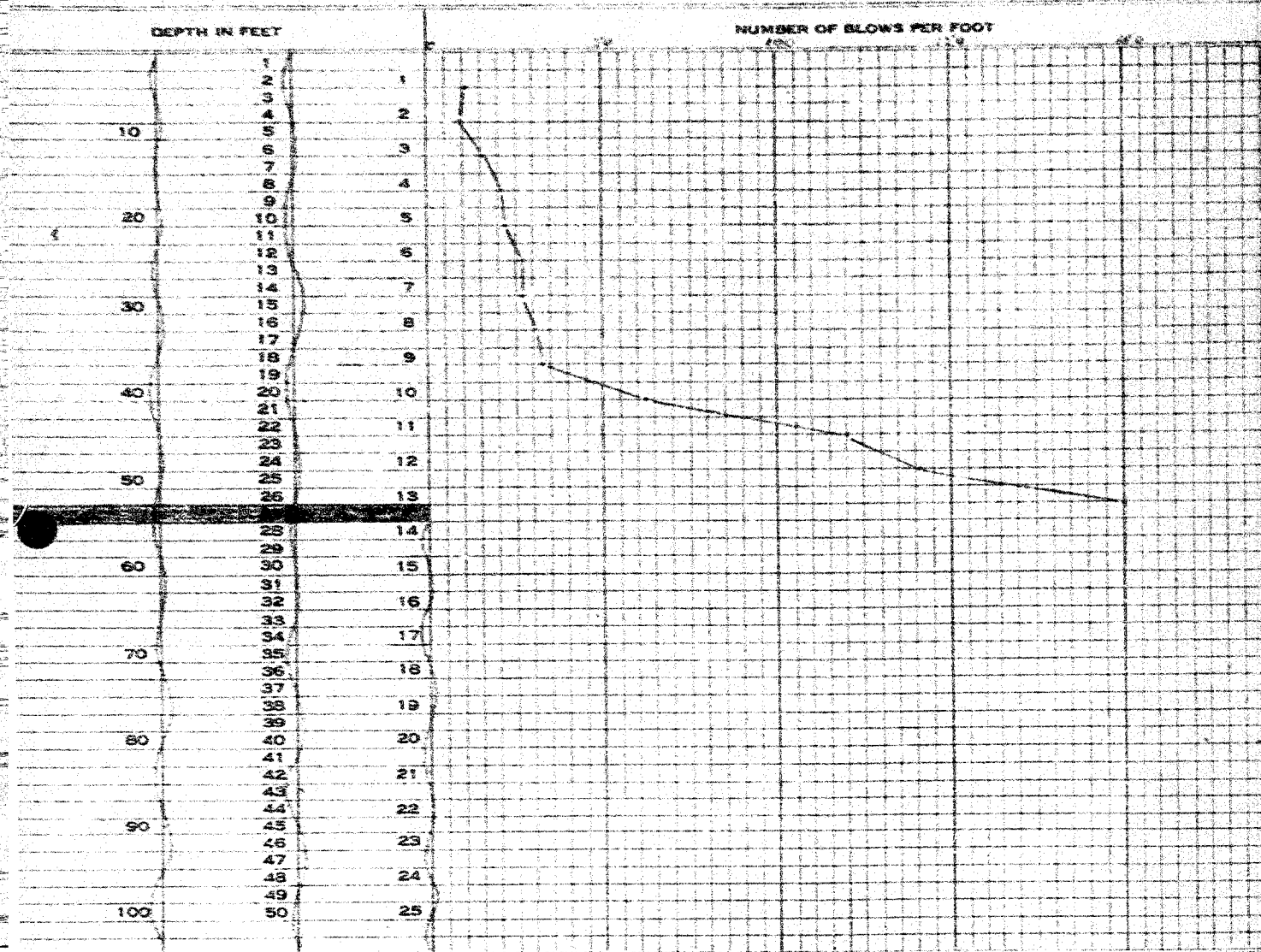
JOB NO. PC 300

DATE: AUGUST 7, 1954.

TEST NO. 8

WEIGHT OF HAMMER 2254

DROP 3 FT



Ground Surface Elevation 854.4  
Refusal Elevation 841  
Number of Blows 200 for 10"

SIGNED

*W. H. T. White*

# FRANKI

COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

JOB NO. PU 300

DATE: AUGUST 3, 1964.

TEST NO.: 9

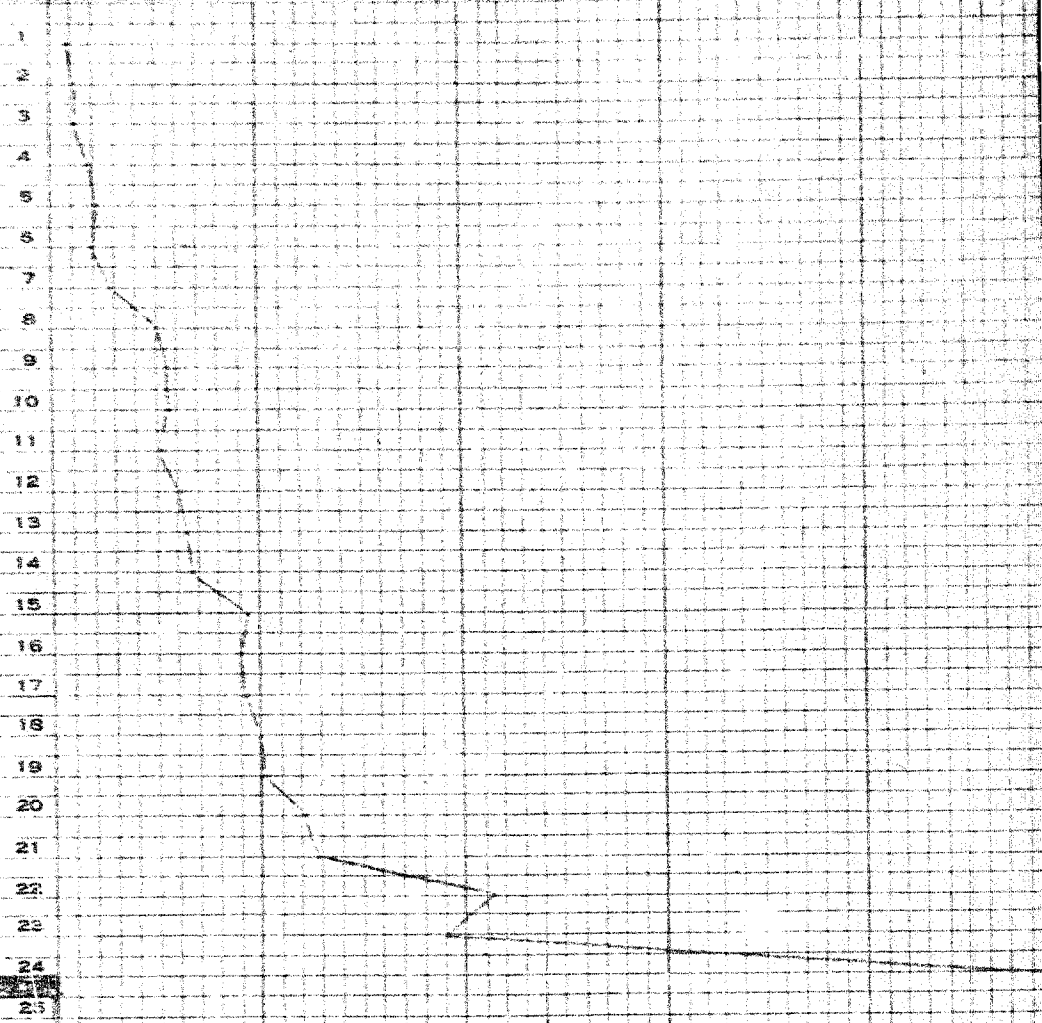
WEIGHT OF HAMMER 2254

DROP 3 FT

DEPTH IN FEET

NUMBER OF BLOWS PER FOOT

1	1
2	2
3	3
4	4
5	5
6	6
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40	40
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43	43
44	44
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48	48
49	49
50	50



100 50

Ground Surface Elevation 859.8  
Refusal Elevation 836  
Number of Blows 355

SIGNED

W. H. White

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COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

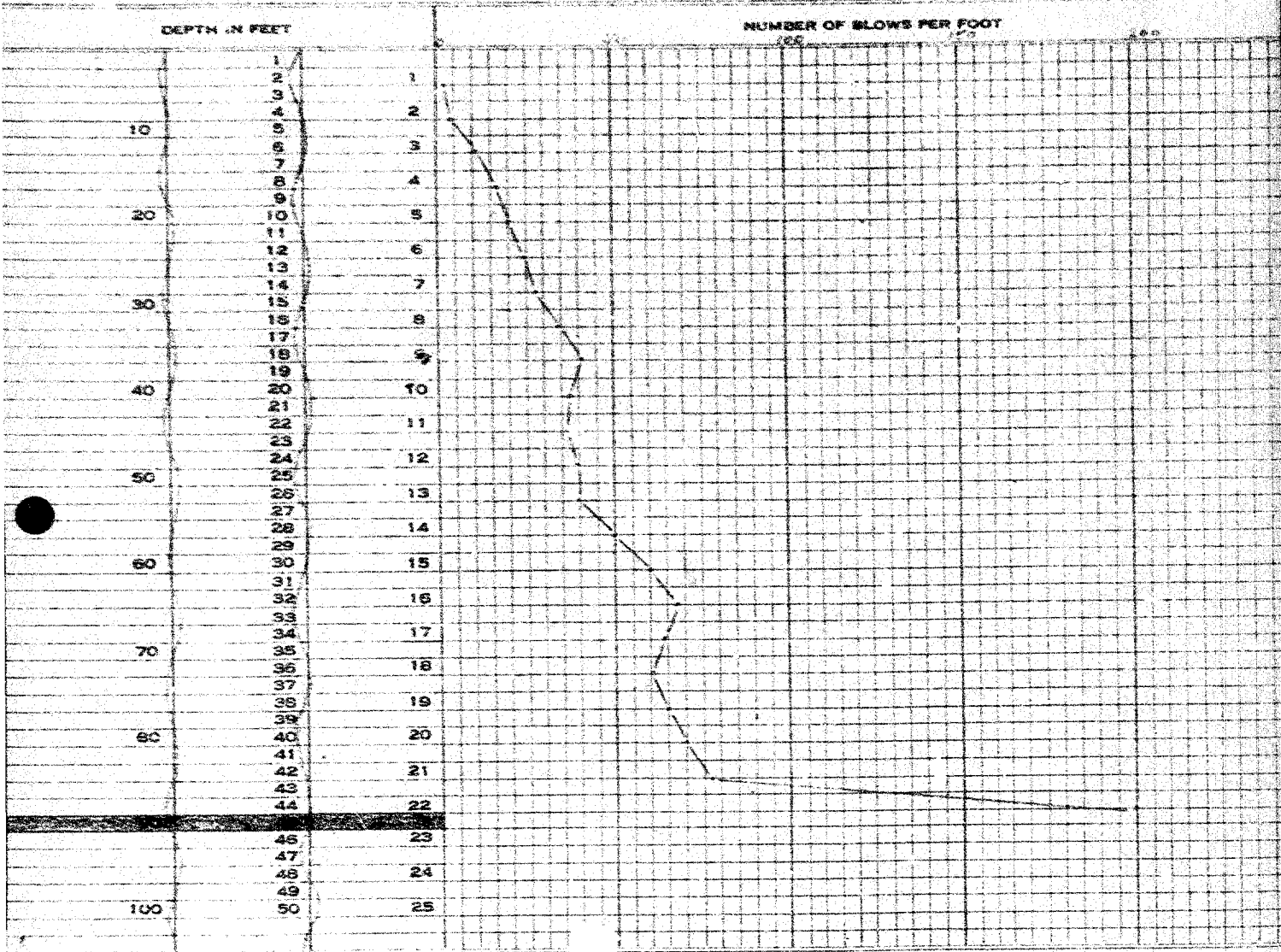
JOB NO. EC 300

DATE: AUGUST 5, 1954.

TEST NO.: 10

WEIGHT OF HAMMER 2254

DROP 3 FT.



Ground Surface Elevation 858.7  
Refusal Elevation 836  
Number of Blows 200 for 9"

SIGNED

W. H. T. White

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COMPRESSED PILE COMPANY  
OF CANADA LIMITED

PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5

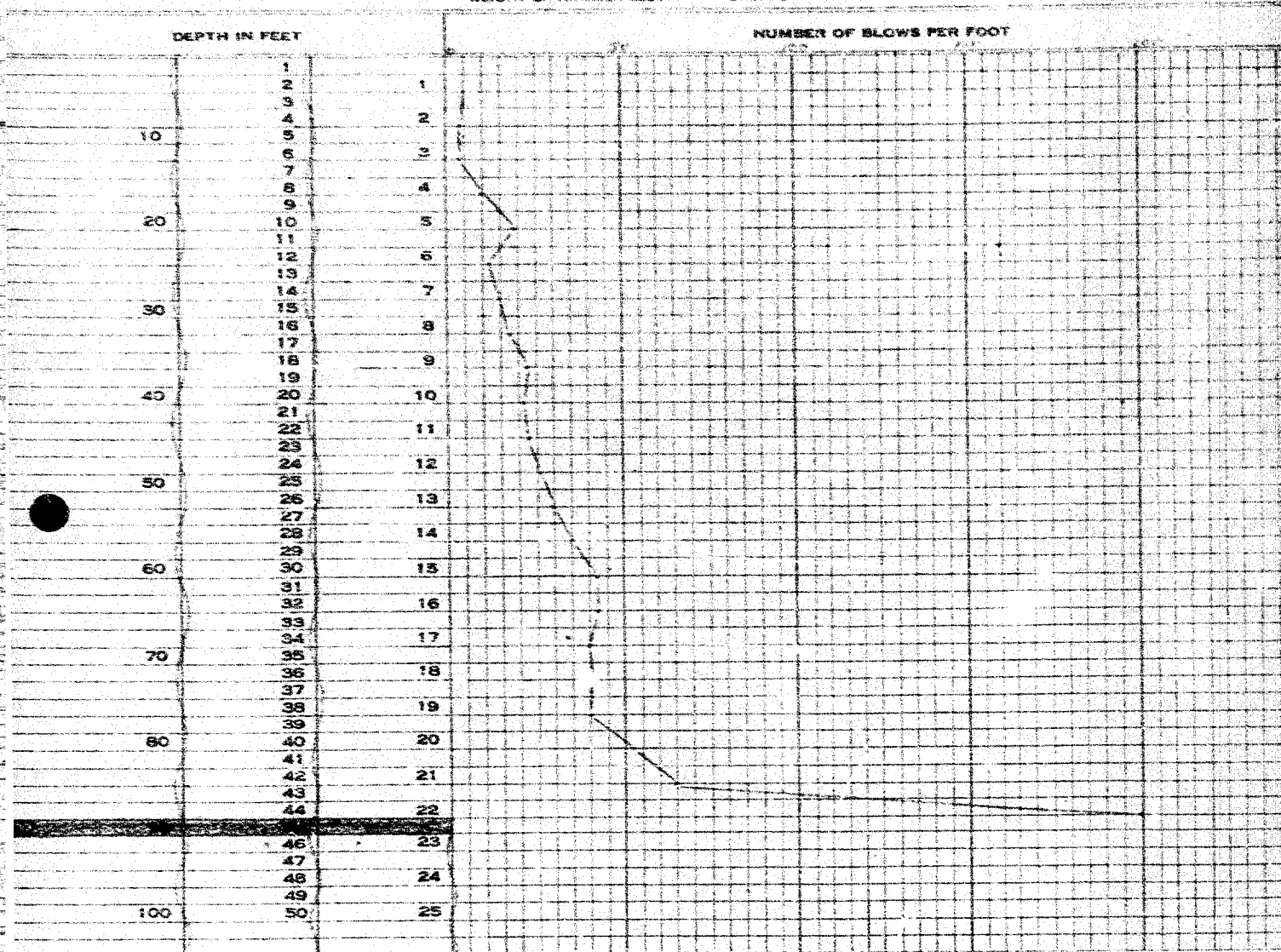
JOB NO. PC 300

DATE: AUGUST 6, 1954.

TEST NO.: 11

WEIGHT OF HAMMER 2254

DROP 3 FT.



G. & T. LTD.

Ground Surface Elevation 858.8  
Refusal Elevation 836  
Number of Blows 200 for 7"

SIGNED

WHT White



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COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

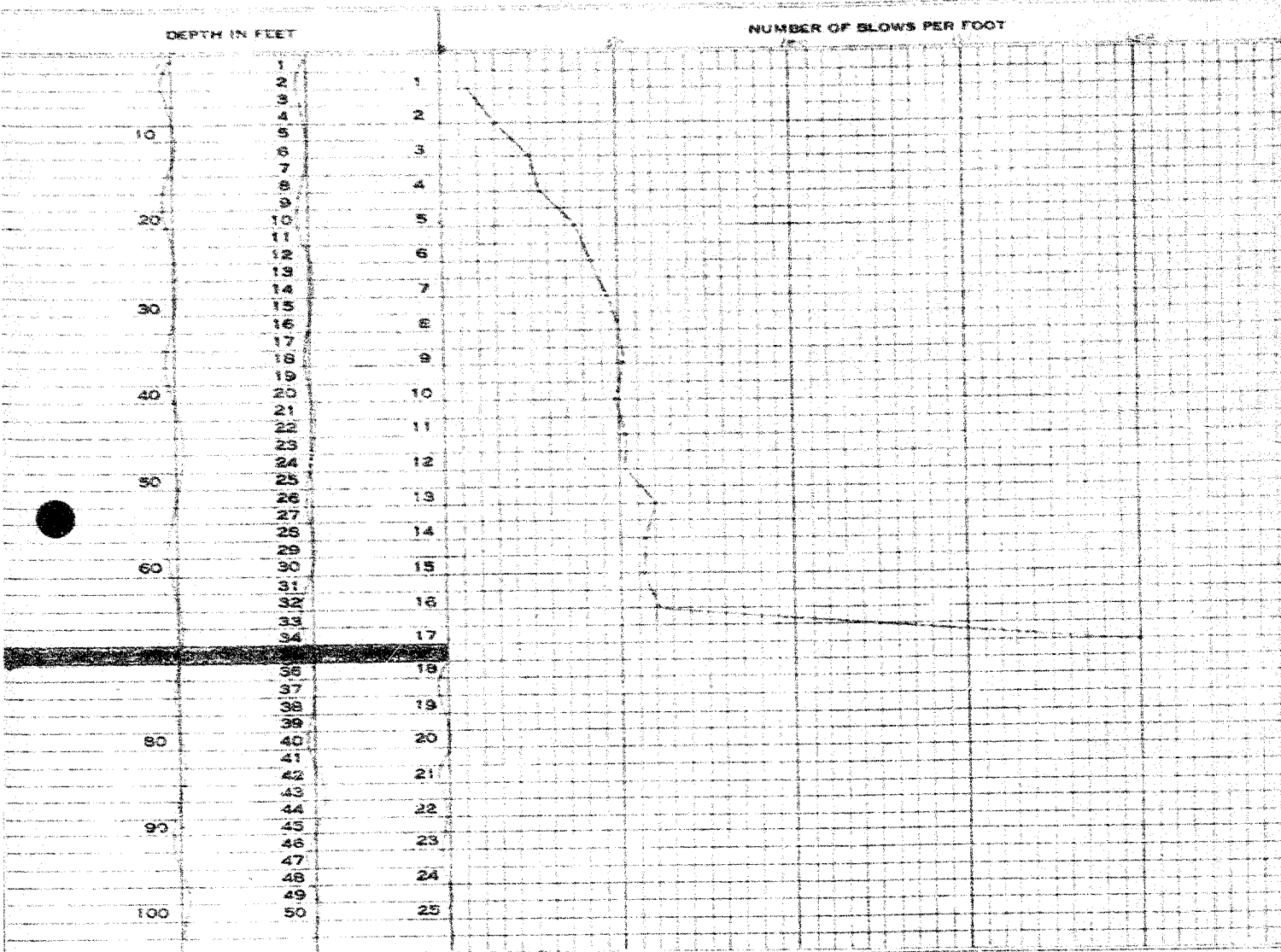
JOB NO. PC 200

DATE: AUGUST 7, 1954.

TEST NO.: 12

WEIGHT OF HAMMER 2054

DROP 3 FT.



G. &amp; S. LTD.

Ground Surface Elevation 858.6  
Refusal Elevation 842  
Number of Blows 200 for 9"

SIGNED

WHT Wilson

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COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

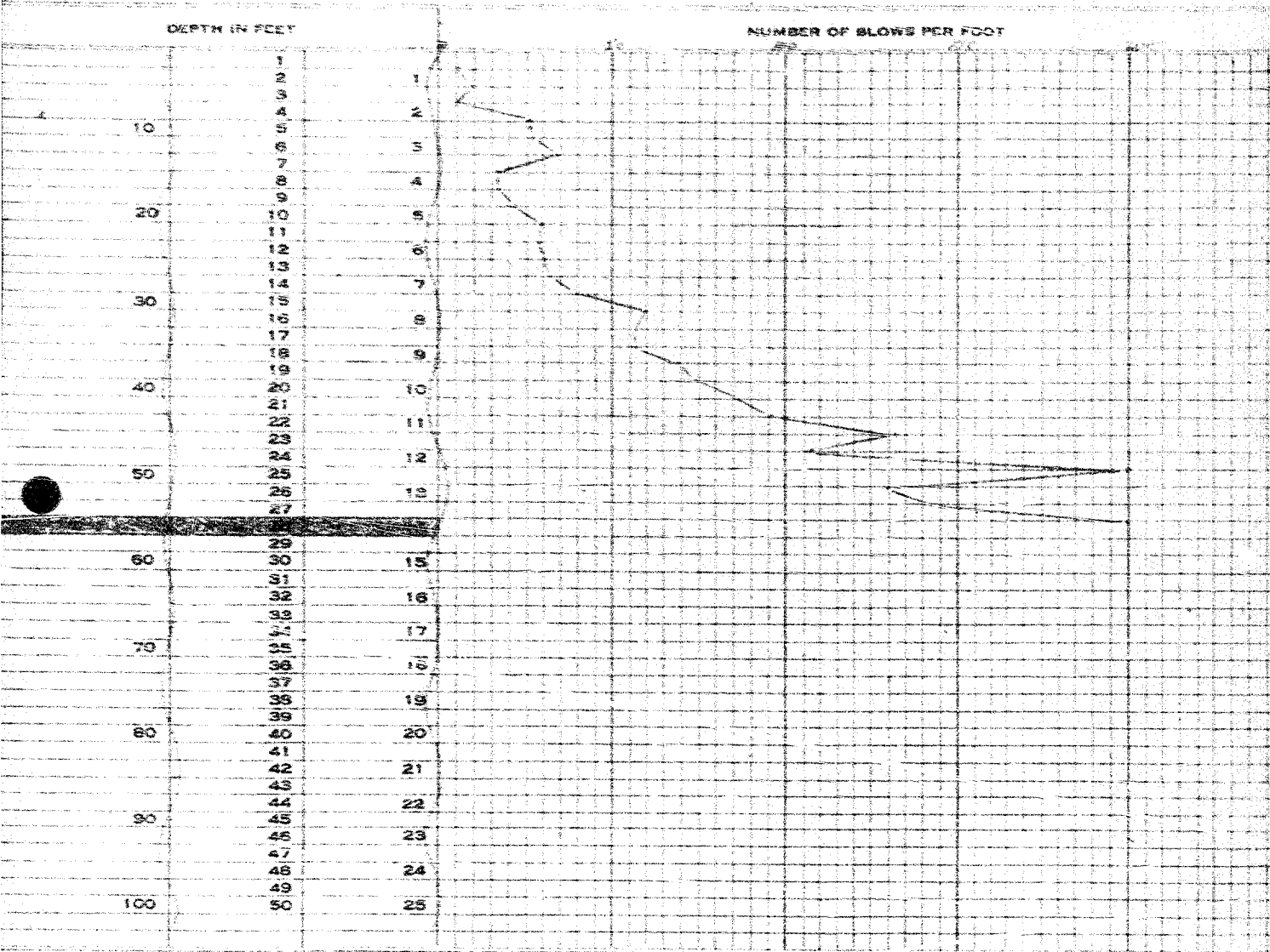
JOB NO. PC 300

DATE: AUGUST 3, 1954.

TEST NO. 13

WEIGHT OF HAMMER 2254

DROP 3 FT



Ground Surface Elevation 559.8  
Refusal Elevation 833  
Number of Blows 200 for 6"

SIGNED

W.H.T. Wilson



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PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HURWAY A01, DORCHESTER #5.

DATE: AUGUST 5, 1954.

JOB NO. PC 300

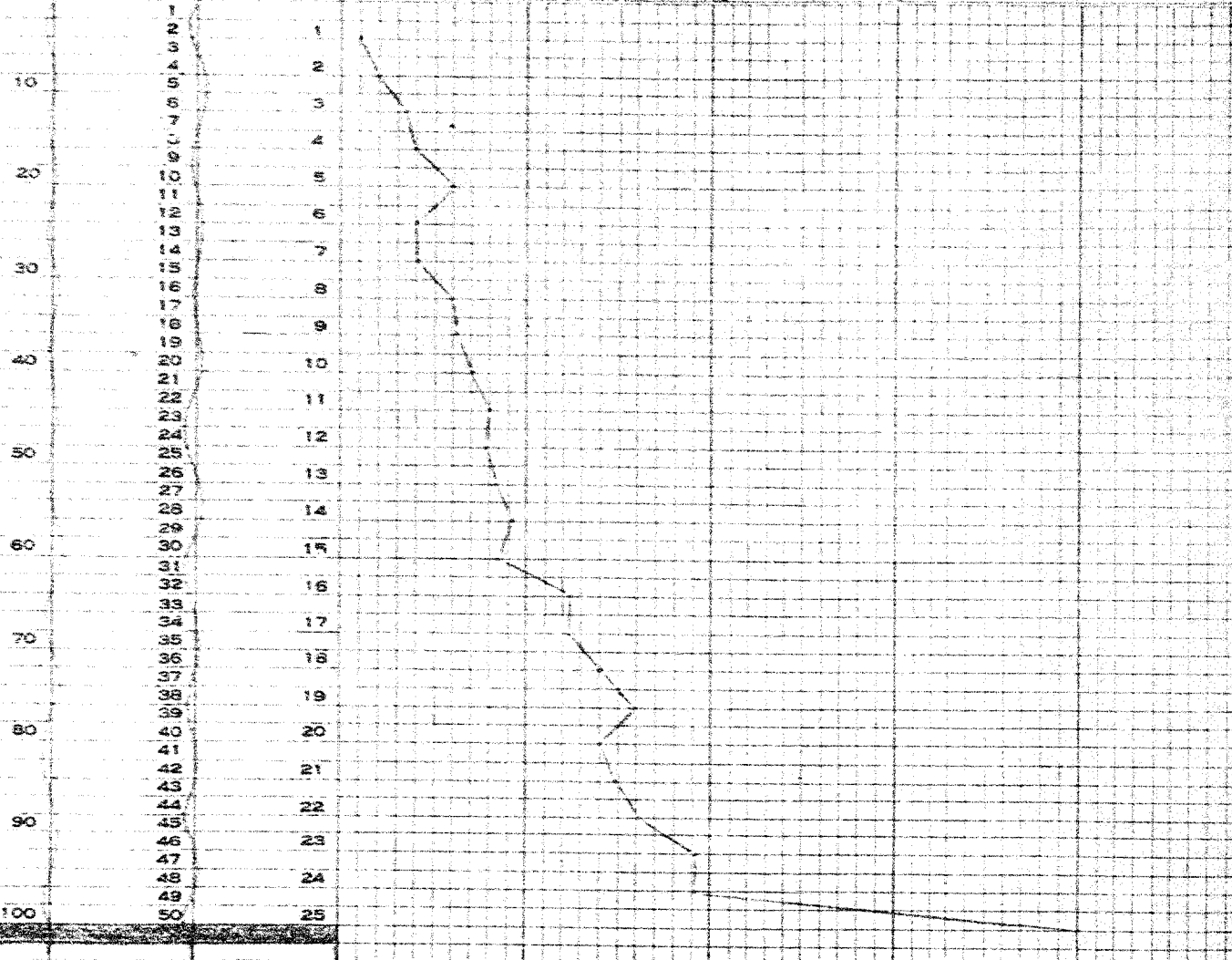
TEST NO.: 14

WEIGHT OF HAMMER 2550

DROP 3 FT

DEPTH IN FEET

NUMBER OF BLOWS PER FOOT



Ground Surface Elevation 860.9  
Refusal Elevation 836  
Number of Blows 200 for 7"

SIGNED

W.H.T. White

# FRANKI

COMPRESSED PILE COMPANY  
OF CANADA LIMITED

## PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

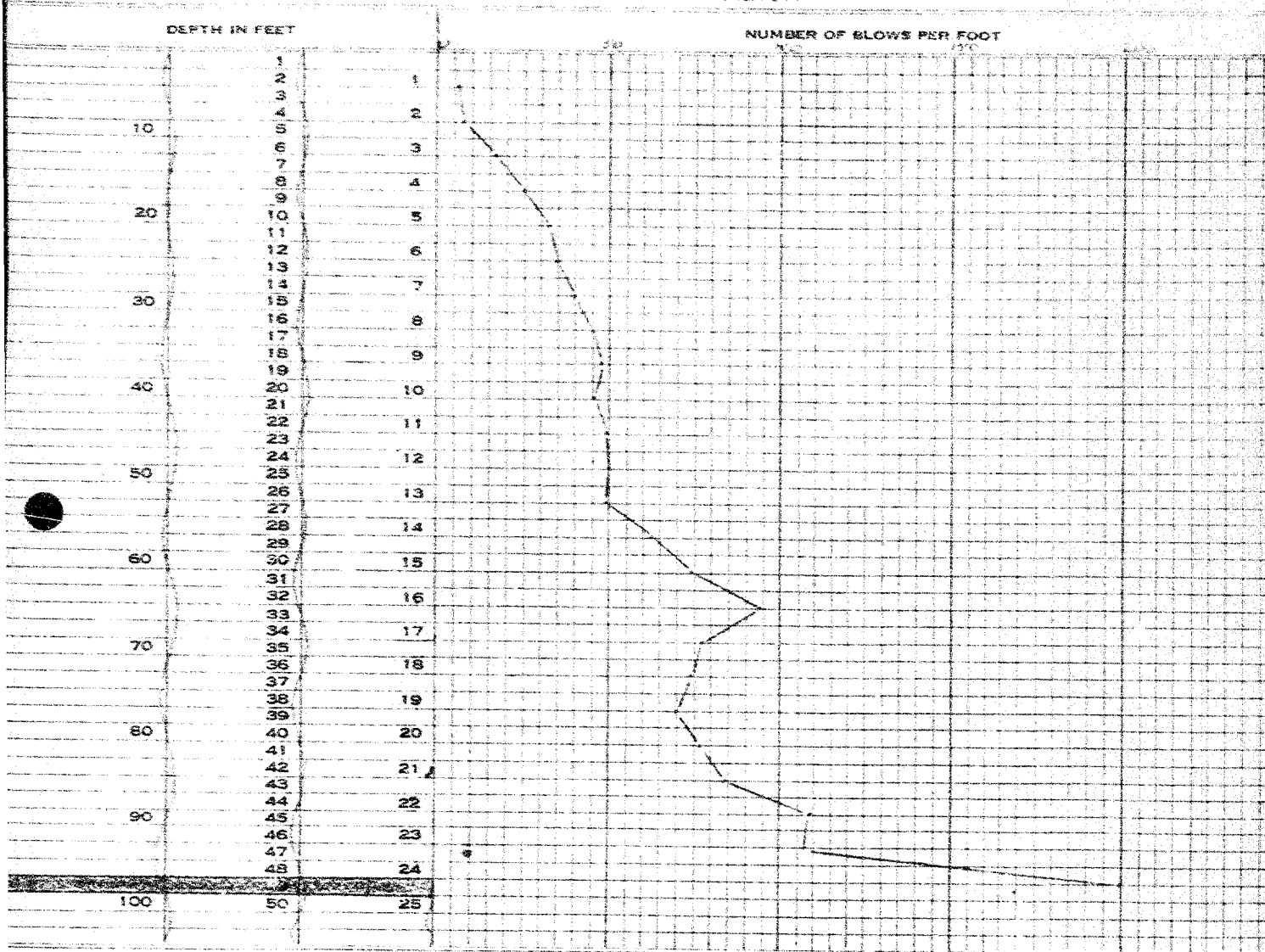
DATE: AUGUST 6, 1954.

JOB NO. PC 300

TEST NO. 15

WEIGHT OF HAMMER 2250

DROP 3 FT



Ground Surface Elevation 860.2

Refusal Elevation 837

Number of Blows 200 for 7"

SIGNED

W. H. T. White

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COMPRESSED FILE COMPANY  
OF CANADA LIMITED

PERCUSSION TEST DIAGRAM

FOR: DEPARTMENT OF HIGHWAYS

AT: HIGHWAY 401, DORCHESTER #5.

DATE: AUGUST 9, 1954.

TEST NO.: 16

JOB NO. PC 300

WEIGHT OF HAMMER 2554

DROP 3 FT.

DEPTH IN FEET

NUMBER OF BLOWS PER FOOT

	1	
	2	
	3	
	4	
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80	40	
	41	
	42	
	43	
90	44	
	45	
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	48	
100	49	
	50	

Ground Surface Elevation 859.8  
Refusal Elevation 840  
Number of Blows 200 for 9"

SIGNED

W.H. White