

1960.

Year

Job. No.

045-15

Changes

County

TRUMBULL

Bridge No.

TRU-46-2319

Section

TRU-46-23.19

☒ over☐ under

Location

BR. OF MILD CREEK

File No.

FES-47
4J-63

008560

DESIGN BY

PACE & ASSOC.

	RECON	AUGER	CORE	DRIVE ROD
By	L.M.T.		VAN-FOSSEN	R.A.Y.
Dates	10/25/60		11/2-3/60	11/2-3/60
No. of Holes or Soundings			1	3
Footage			55.5	120.6
Samples Tested			13	

SITE PLANS	
Date Rec'd	10/26/60
Revised Plan	

Topo Sheet

Transmittal Date 11/21/60

No. of Tracings

Filed with year

Revisions

Remarks

Refer To

Auger Data			Drive Rod		Core Data		
No. of Holes	Footage	Samples	No. of Soundings	Footage	No. of Holes	Footage	Samples
—	—	—	3	120.6	1	55.5	13

FIELD DATA - ROD PENETRATION

Location No. 1 County: TRV

Rear Pier Abut Bridge No. 46-2319

Station: 2+28 Over: MVD CREEK

Offset: 22 FT.

Started: 11-2-60

Completed: 11-2-60 Equipment: 21-0-29

Diameter 1.825

Ground Line

Proposed Footer

Depth Feet	Elevation	Penetration
0	920.1	
5	915.1	
10	910.1	
15	905.1	
20	900.1	
25	895.1	

Party KASSON JAMES RYAN

25	895.1	
30	890.1	
35	885.1	
40	880.1	
45	875.1	
50	870.1	
55	865.1	
60	860.1	

HRMMEP BOUNCE

881.1 (39.0')

Rod Condition: PAINTED BENT

Chief of Party P. RAY

FIELD DATA - ROD PENETRATION

Location No. 2 County: TRV
 Rear ~~Abut.~~ Bridge No. 46-2219
 Station: 2+25 Over: MVD CREEK
 Offset: 10 LT.
 Started: 11-3-60
 Completed: 11-3-60

Equipment: 21-0-29

Diameter 1.325

Ground Line

Proposed Footer

Depth Feet	Penetration	Elevation
0		922.2
5	8 1/16 5 3/4 3 1/2 2 1/16 1 15/16 1 1/2	917.2
10	5/16 1 5/16 1 1/8 3/4 15/16	912.2
15	1 - 3/4 7/8 15/16 3/4 13/16	907.2
20	5/9 5/8 3/4 11/16	902.2
25	3/4	897.2

WATER AT 7'

25	3/4	897.2	
	1 1/16		
	5/8		
	3/4		
30	5/9	892.2	
	5/8		
	5/8		
	9/16		
	7/16		
35	3/8	887.2	
	3/8		
	3/16		
	1/8		
	3/16		
40	1/8	882.2	
	0	882.2	
45			
50			
55			
60			

HOLE CLOSE AT 27

HAMMER BOUNCE

40.1
40.1
MR. Pease

Rod Condition: POINT ROD BENT

Chief of Party R. RAY

Party KRSON JONES RYAN

FIELD DATA - ROD PENETRATION

Location No. 7 County: TRV

Find ~~in~~ Abut Bridge No. 416-2319

Station: 2+73 Over: ALVD CREEK

Offset: 11 RT.

Started: 11-3-60

Completed: 11-3-60 Equipment: 2100-25

Diameter 1.325

Ground Line

Proposed Footer

Depth Feet	Penetration	Elevation
0		921.8 ✓
5	10 1/8 7 1/2 4 1/2 2 1/8 1 7/8 1 3/4	916.8
10	1 3/8 1 3/4 1 7/8 1	911.8
15	13 1/4 15 1/4 13 1/4 3 1/4 5 1/4	906.8
20	7 1/8 3 1/4 3 1/4 3 1/4 1 1/4	901.8
25	1 1/4	896.8

Party JONES KASSON SPAN

25	5/8 5/8 5/8 3/4 9 1/4 9 1/4 5/8 9 1/4 5/8 1/2 1/2 7/4 5/4 5/4	896.8	HOLE CLOSE PT. 26'
30	9 1/4 9 1/4 5/8 9 1/4 5/8 1/2 1/2 7/4 5/4 5/4	891.8	
35	1/8 1/8 1/8 1/8 1/8 1/8 1/8 1/8 1/8 1/8	886.8	HAMMER BOUNCE
40	1/8 1/4 0	881.8 880.8 880.8	41.5'
41.5			
45			
50			
55			
60			

Rod Condition: POINT ROD BENT

Chief of Party P. PRAY

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY
FOUNDATION EXPLORATION SECTION

Structure Foundation Investigation

TRU-46-2319

OVER BRANCH OF MUD CREEK

GEOLOGY OF THE SITE

The structure site is located on the glaciated Allegheny Plateau, in an area where moderately deep glacial deposits, found to exceed 55 feet in depth, overlie sandstones, of Mississippian age.

EXPLORATION

The exploration consisted of one drive sample boring and three drive rod penetration tests, made on November 2 and 3, 1960.

INVESTIGATIONAL FINDINGS

The boring disclosed moist, medium-dense to very dense gravels, sands, and silts to a 55-foot depth, elevation 863 feet, where the boring was terminated after penetrating more than 30 feet of material requiring in excess of 30 blows per foot in the standard penetration test.

Rod soundings disclose subsurface conditions to be essentially uniform across the site. Soundings met low to medium-high, and occasionally erratic, penetration resistance and were terminated upon encounter with refusal to penetration at 39 to 41-foot depths, between elevations 882 and 880 feet, in the very dense materials revealed by the boring. The abrupt flexures in the resistance curves are considered to be indicative of dense gravelly zones.

Free water was encountered in all sounding holes at 3 to 7-foot depths, elevations 917 to 915 feet.

No test penetrated to bedrock.

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY
FOUNDATION EXPLORATION SECTION

FOUNDATION INVESTIGATIONAL PROCEDURES

Standard Drive Rod Penetration Tests

Drive rod penetration resistance tests constitute driving a 1.315-inch diameter steel rod, with a 45° cone point, into the ground, using a 122 pound drop-hammer with a free fall of five feet. At one-foot depth intervals, a measurement is taken to determine the amount of penetration achieved in three hammer drops. This reading is converted to an empirical value for capacity "R", in thousands of pounds (which is a measure of both the point resistance and frictional resistance on the rod), by using charts prepared by the Ohio Department of Highways, Bureau of Bridges, on the basis of correlation study of rod penetration with past performance of pile driving. For interpretation, a graph is prepared by plotting the value "R" against the depth at which the reading was taken, and connecting the plotted points. The curve so obtained reflects the density of subsurface materials in a manner than can be readily compared with data from similar tests at other locations on the structure site. From this comparison, the overall uniformity of subsurface conditions may be evaluated.

Drive Sample Borings

Drive sample borings are made by means of a rotary-type drill rig, employing a 2" O. D., 1-3/8" I. D. sampler, at 2-1/2 and/or 5-foot depth intervals, driven by means of a 140 pound drop-hammer, with a free fall of 30 inches. The number of blows required to drive the sampler 12 inches is considered the standard penetration test. The Boring Log sheets show a graphic plot of the information obtained, including depth and elevation of the sample, number of blows for the standard penetration tests in two 6-inch increments, laboratory sample number, sample description - based on laboratory test results and the Casagrande AC classification system - and the results of laboratory testing which consists of gradation, plasticity, and moisture content determinations. At depths where the drift is bouldery or gravelly to the extent that the sampler can not be driven, a wash sample is procured for visual classification, in order to determine the general character of the material. These samples are not considered sufficiently representative to warrant laboratory testing.

LEGEND



Gravel



Sandy gravelly silt



Auger Boring - Plan View



Sandy gravel



Gravelly sandy silt



Drive Sample - Core Boring - Plan View



Silty gravel



Sandy silt

Drive Rod Penetration Resistance Soundings - Plan View

A

Indicates Auger Boring

B

Indicates Drive Sample - Core Boring



Clayey gravel



Silt



Horizontal bar indicates the depth the sample was taken



Silty sandy gravel



Clayey silt



Figures to the left of boring log in profile view

X = Plastic Limit

Y = Moisture Content



Clayey sandy gravel



Gravelly clay

P

Figures to the right of boring log in profile view

Q

indicate the number of blows for Standard Penetration Test

P = First 6 inches

Q = Second 6 inches



Gravelly sand



Sandy gravelly clay

Drive Rod Penetration Resistance Soundings - Depth Penetrated



Silty gravelly sand



Gravelly sandy clay

Casing



Clayey gravelly sand



Sandy clay

Resistance R < 10,000 lbs

Resistance R > 10,000 lbs



Sand



Silty clay

I

Indicates final measurement of penetration

16

in inches



Silty sand



Silt and clay



Sod & topsoil - Visual Classification



Clayey sand



Clay



Berm material - Visual Classification



Indicates water elevation



Gravelly silt



Footing



Footing on pile



Capped pile

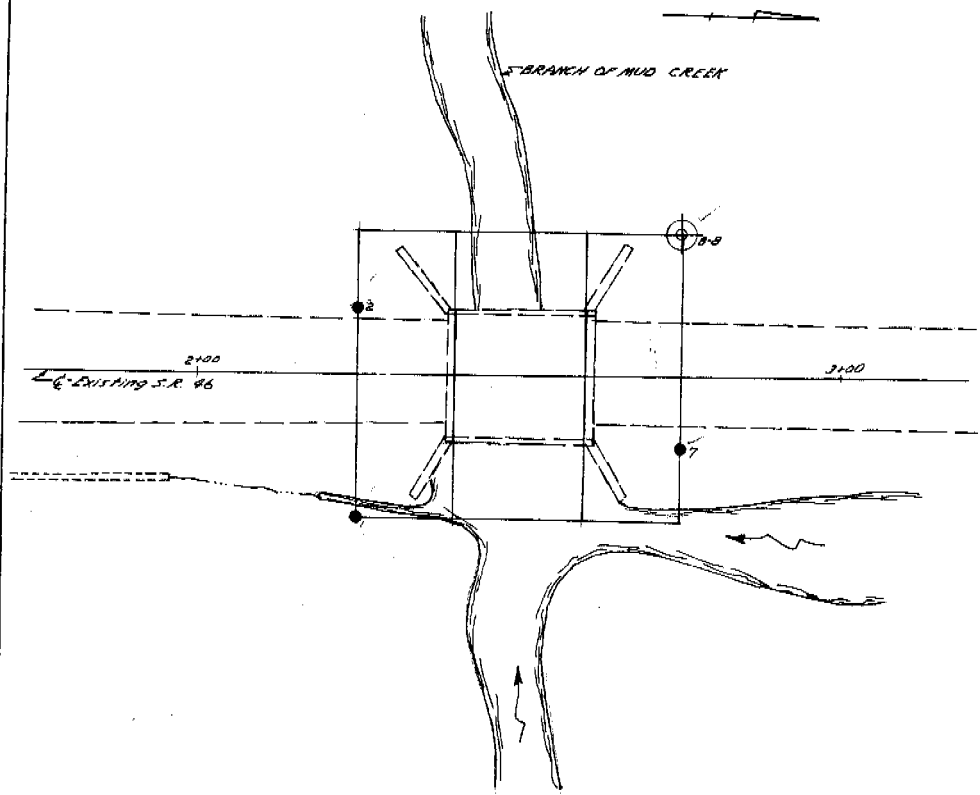
TRU-96-2319

OVER

BRANCH OF MUD CREEK

Drafting By J.H.W.

SHEET 3 of 13 sheets



BORING PLAN
SCALE: 1" = 20'

TRU-46-2319
OVER
BRANCH OF MUD CREEK

930

930

920

920

910

910

900

900

890

890

880

880

870

870

860

860

2

3

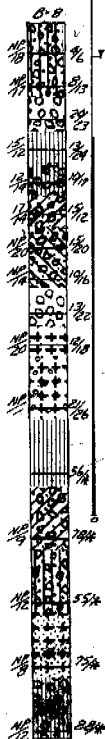
* Denotes Refusal

SUBSURFACE PROFILE

VERT. SCALE: 1" = 10'

HOR. SCALE: 1" = 20'

TRU-46-2319
OVER
BRANCH OF MUD CREEK



ASSOCIATES
OF OHIO

1400 Hanna Building, P. O. Box 6508, Cleveland 15, Ohio Telephone 2-1400

W H Bonford
Alfred D. Yand...

State Highway Testing Laboratory
State University Campus
Columbus 10, Ohio

File # 13
TAW-ATB

Foundation Exploration Section
Mr. N.E. Mason

Re: Deficient Bridge Foundation
Division No. 11

Enclosed:

enclosed herewith 2 sets of prints of the Soil
Location Plans for the following structures:

- TRU-67-0409
- TRU-46-2211
- TRU-46-2319
- TRU-46-2421
- ATB-90-0628
- ATB-90-2334
- ATB-84-0502
- ATB-46-1808

Two sets of these prints were handed your Mr. Norman P.
on October 24th for his use in the field.

Very truly yours,

FACE ASSOCIATES OF OHIO

By _____
W. H. Bonford

DATE 02/20/60 TIME _____COUNTY DECATUR

S. R. _____

SECTION _____

RECORD OF
TELEPHONE CALLOF LaboratoryOF Location and DesignFile 13-1ath 3SUBJECT DISCUSSEDACTION TO BE TAKEN

Efficient Bridge Structures

Test Bridge to be made
by State Forces.Structures to be designed
by Pace & Associates

02-46-1098

02-46-2211

02-46-2319

02-46-2521

02-46-0382

02-46-0828

02-46-2348

02-46-0909

HEM:mva

cc:

Pace Associates

V. C. Stump

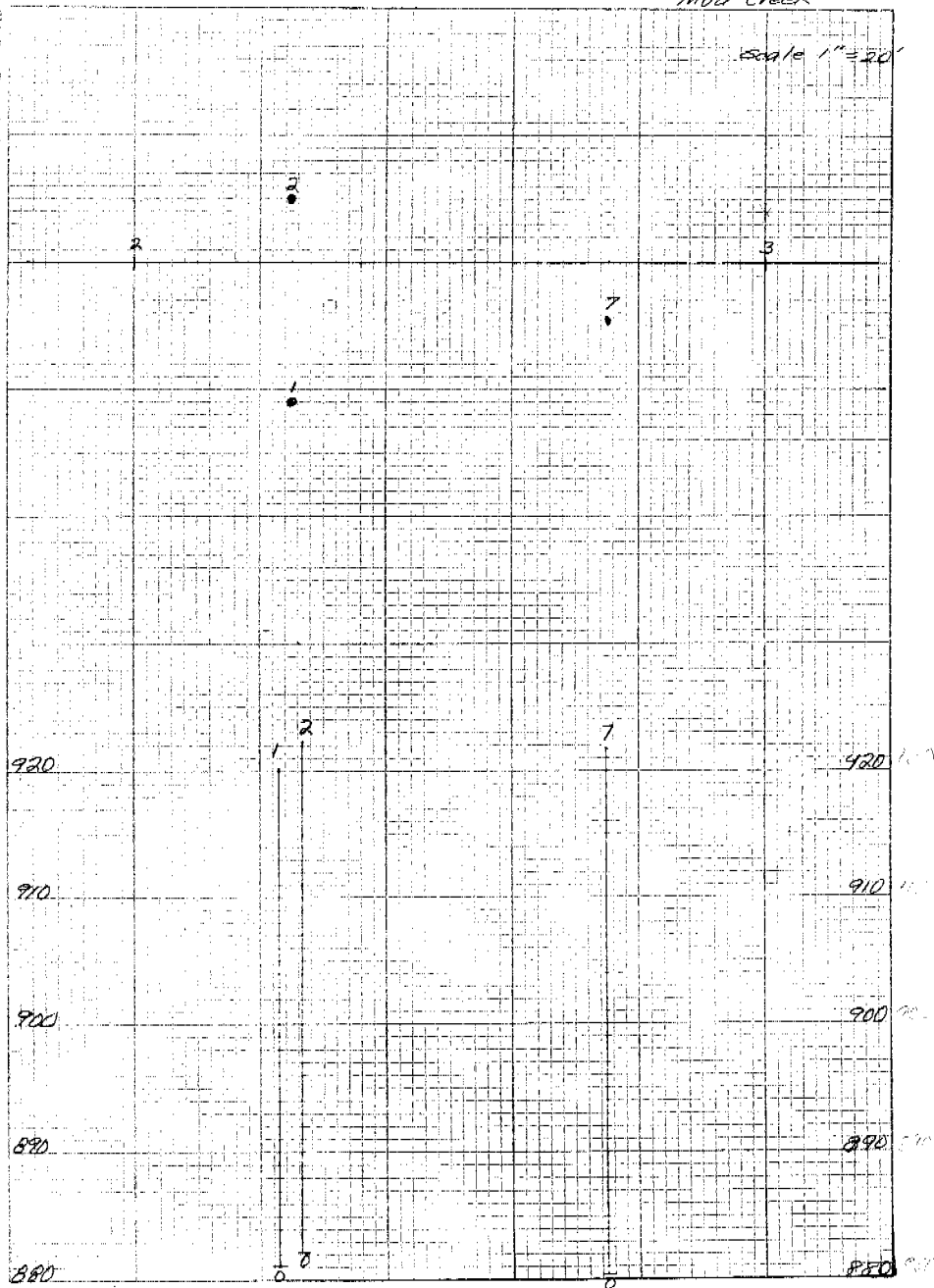
Bridge Bureau

File

TAU-46-2319
On Branch of
Mud Creek

Scale 1"=20'

On the Branch of Mud Creek



Fwd. About. *On your job on this job* 1/2

FIELD LOG
CORE BORING

T.H. B-2 Surf. Elev. 117.5
Sta. 222 Offset 222 Bridge No. 222
Date Started 11-2-60 Completed 11-3-60 Water Elev. 917.5
Crew Van Rossum

General Notes

Depth	Elev.	No. of Blows	Sample Number	Water Color	Recovery	Description
0-2.5	917.5			Brown		1' Top soil to bruceloxys sand & gravel
2.5-3.5	916.0	1/6	1	Gray		Gray sand & gravel.
3.5-5.5	913.5					sand & gravel.
5-6	913.5	8/13	2			Gray sand & glacial + ill.
6-7.5	912.5					sand & ill.
7.5-8.5	910.0	20/23	3			No sample. Hitting on hard sand & gravel.
8.5-10	908.5					Glacial material.
10-11	908.5	13/24	3			Gray glacial sandy silty clay.
11-12.5	906.0					Gray glacial sandy silty clay.
12.5-13.5	905.5	10/17	4			Gray glacial sandy silty clay.
13.5-15	905.0					Gray glacial sandy silty clay.
15-16	902.5	15/12	5			Gray glacial sandy silty clay.
16-17.5	901.0					Gray glacial material with sand & gravel.
17.5-18.5	900.0	20	6			Gray sand, silt & sandstone frags.
18.5-20	898.5					Gray silt & sandstone frags.
20-21	897.5	10/16	7			Gray silt & clayey silt & gravel.
21-22.5	896.0					Gray sand silt & gravel.
22.5-23.5	895.0	13/22	8			Gray sand silt & gravel.
23.5-25	893.5					Gray sand & clayey silt.
25-26	892.5	10/18	9			Gray silt to gray clayey silt.
26-27	892.5					

$\frac{a}{b}$ [illegible]

VISUAL CLASSIFICATION OF DRIVE SAMPLES

PROJECT: TRU 46 2319

BORING LOCATION: 2+75 22' Lt.

DRILLER: VAN FOSSEN, CLASSIFIED BY: _____, DATE: 11-5-60

For * Little Camp. In Jan.

[illegible]

SO-7
County, Rt. No., Section
Bridge No.

SUMMARY OF SOIL TEST DATA ON FOUNDATION SAMPLES

TRU-46-2319

(Fossett)

1
1

Lab. No. So.-	Sample No.	Station No.	Represents Feet	Mechanical Analysis					Physical Characteristics			Ohio Class.	Remarks
				Agg. %	C Sand %	F Sand %	Silt %	Clay %	L.L.	P.I.	Water Cont.		
85937	1	2+75 22' LT	25-35	28	24	23	15	10	NP		18	A-1-A Gr	MGS
8	2	"	5-6	13	20	25	18	14	NP		17	A-2-4 Gr	MGS
9	3	"	10-11	10	9	15	37	29	21	6	12	A-4-A Gr	SM
85940	4	"	12.5-13.5	19	12	15	29	25	19	7	14	A-4-A Gr	GSM
1	5	"	15-16	50	9	8	21	12	20	3	14	A-2-4 Gr	MSG
2	6	"	17.5-18.5	19	6	13	42	14	NP		20	A-4-A Gr	SGM
3	7	"	20-21	28	7	11	36	18	NP		14	A-4-A Gr	SGM
8	8	"	22.5-23.5	✓	1	5	✓	H					Gr, Gr
4	9	"	25-26	12	2	3	68	15	NP		20	A-4-A Gr	M
5	10	"	30-31	23	3	12	54	8	NP		34	A-4-A Br	GM
11	11	"	35-36	✓	1	✓	✓	H	L				SM
6	12	"	40-40.5	65	10	6	15	4	NP		9	A-1-A Gr	MSG
7	13	"	45-45.5	21	22	27	20	10	NP		12	A-2-4 Gr	MGS
8	14	"	50-50.5	13	15	41	16	15	NP		8	A-3-A Gr	MS
9	15	"	55-55.5	24	15	29	20	12	NP		12	A-2-4 Gr	GSM



STATE OF OHIO

Department of Highways

COLUMBUS 15
October 25, 1960

MICHAEL V. DISALLE
GOVERNOR

E. S. PRESTON
DIRECTOR

Face Associates of Ohio
4500 Euclid Avenue
Cleveland 8, Ohio

Attn: Mr. Balderson

Re: Deficient Bridge Program, Div. 4,
Agreement No. 680.

Gentlemen:

This letter is to confirm our telephone discussion of October 20, 1960, wherein the State agreed to perform the foundation investigation of the bridge sites referred to in Agreement No. 680. This contract covers the design of eight structures and their approaches by your firm at various locations throughout Division 4.

According to the information available at the moment, the preliminary designs for these bridges have all been approved except for Bridge No. ATH-46-1998.

We would recommend submission of prints of the site plans for all of the structures at your earliest convenience in order that the Soils Laboratory may have an opportunity to work this project into their drilling schedule as soon as possible. Forward the prints, including those for Bridge No. ATH-46-1998, to the Ohio State Highway Testing Laboratory, Ohio State University Campus, Columbus 10, Ohio, Attn: Foundation Exploration Section.

The drilling for Bridge No. ATH-46-1998 may not be performed until the preliminary design has been officially approved, but in sending us the prints of this site plan along with the others it will be available for immediate use when approval is finally given.

If we can be of further assistance please do not hesitate to advise at your convenience.

Very truly yours,

V. C. Stump
Rural Consultant
Liaison Engineer

VCS:lj

cc: Cremer, Overman, Ricketts, Marshall, Mason, Campbell-Div. 4, File

C
O
P
Y

File 13-43

November 21, 1960

Face Associates of Ohio
4500 Euclid Avenue
Cleveland 3, Ohio

Attention: Mr. L. Elderson

Re: Structure Foundation
Investigation
SRU-46-2319 Over Branch
of Mud Creek

File: 13-4-1
Crumbull

Gentlemen:

In accordance with your request of October 26, 1960, transmitted herewith are the results of the foundation investigation made for the SR 46 structure over a branch of Mud Creek.

Very truly yours,

E. H. Litchiser
Engineer of Tests

Per: M. E. Mason
M. E. Mason
Assistant Engineer

DJR:DEM:djm
Encl.

cc: V. C. Stump (2) (no encl.)
D. H. Overman, Attn: E. H. Altwater
Carl Campbell, Attn: E. H. Whitacre
M. E. Mason (4)

State of Ohio
Department of Highways
Testing Laboratory



FOUNDATION DATA

Boring No. 1 Station & Offset 2 + 25.22 RT
REAR ABUTMENT
Surface Elev 920.1 Water Elev 917.1

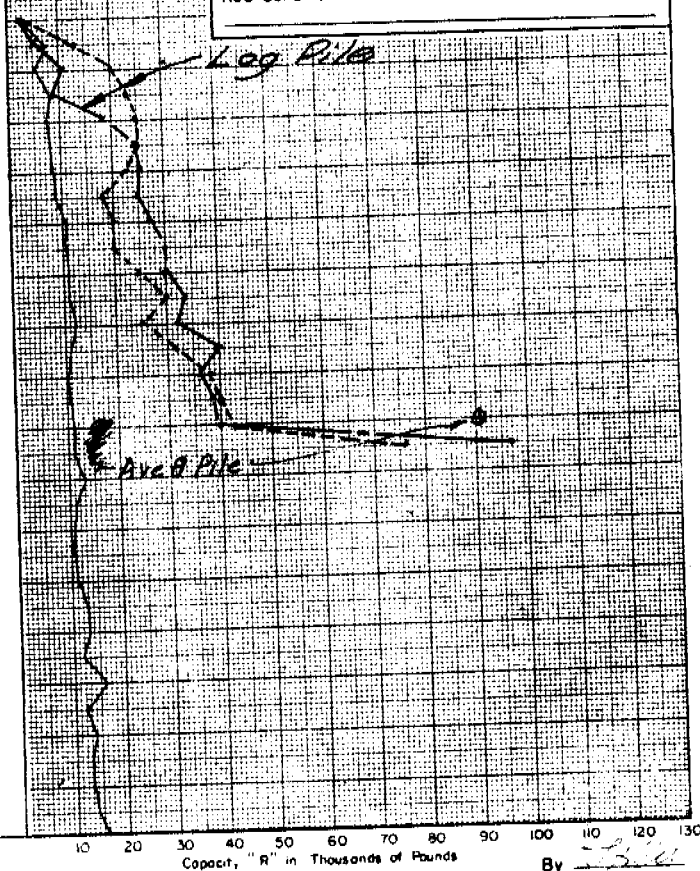
Project Identification TRUMBULL
TRU-46-2319
TRU-46-2319
OVER BRANCH OF MUD CREEK

Date Completed 11-3-60

Elev.	Depth	Soil Log
920.1	0	
	2	Top of Pile
916.1	4	
	6	
912.1	8	
	10	
908.1	12	
	14	
904.1	16	
	18	
900.1	20	
	22	
896.1	24	
	26	
892.1	28	
	30	
888.1	32	
	34	
884.1	36	

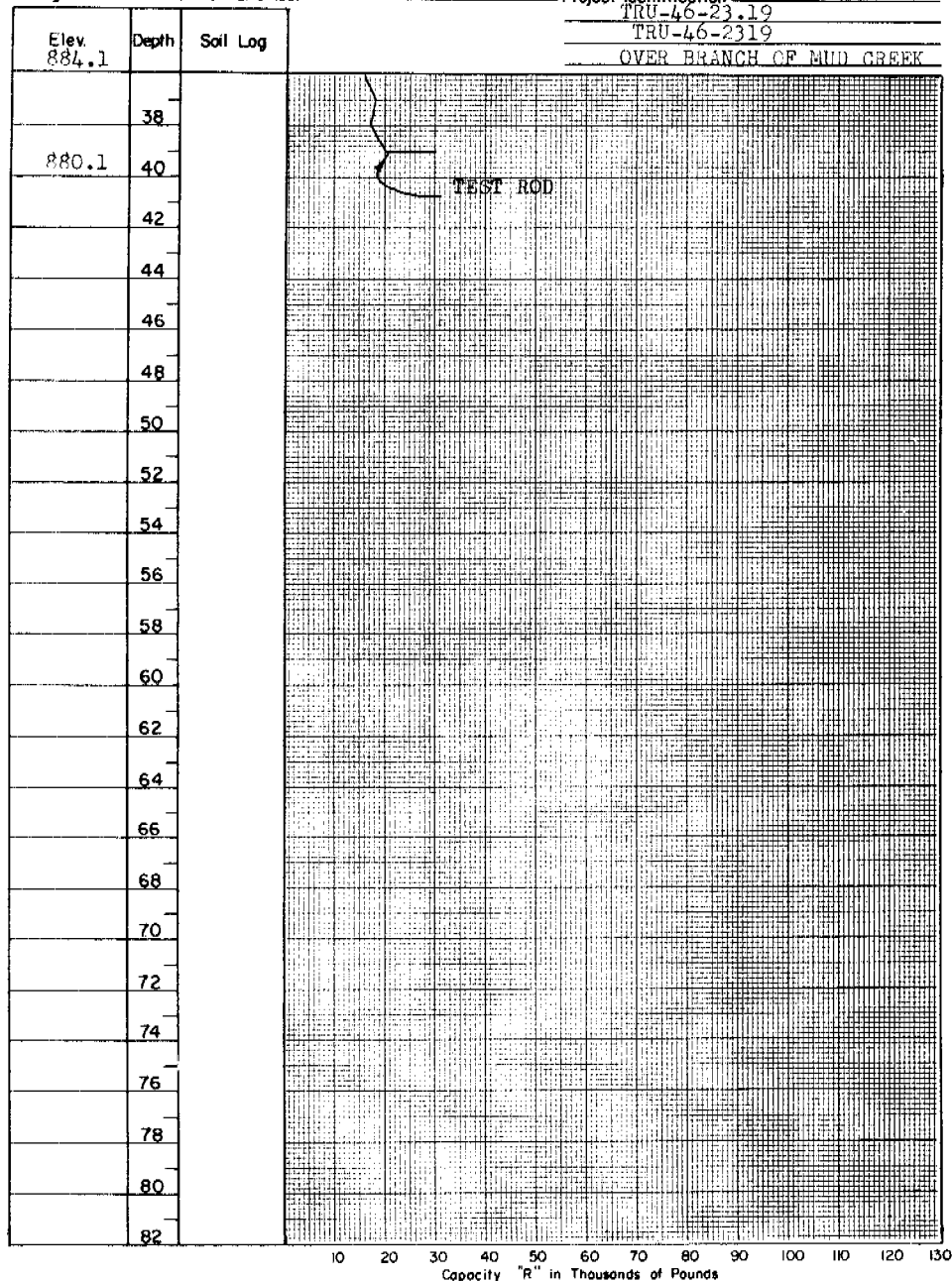
Piling 14" C-I-P R/c
Hammer Dalmag D-12 SA
Formula 2F/5 to 1
Reference _____

Rod Condition POINT ROD BENT



By [Signature]
Date 11-21-60

FOUNDATION DATA (Continued)

Boring No. 1 Station & Offset 2 + 25.22' RTProject Identification TRUMBULLTRU-46-23.19TRU-46-2319OVER BRANCH OF MUD CREEK

State of Ohio
Department of Highways
Testing Laboratory

10

FOUNDATION DATA

Boring No. 2 Station & Offset 2 + 25.10 LT

Project Identification TRUMBULL

REAR ABUTMENT

TRU-46-23.19

Surface Elev. 922.2 Water Elev. 915.2

TRU-46-2319

OVER BRANCH OF MUD CREEK

Date Completed 11-3-60

Elev.	Depth	Soil Log
922.2	0	
	2	
918.2	4	Top of Pile
	6	
914.2	8	FL
	10	
910.2	12	
	14	
906.2	16	
	18	
902.2	20	
	22	
898.2	24	
	26	
894.2	28	
	30	
890.2	32	
	34	
886.2	36	

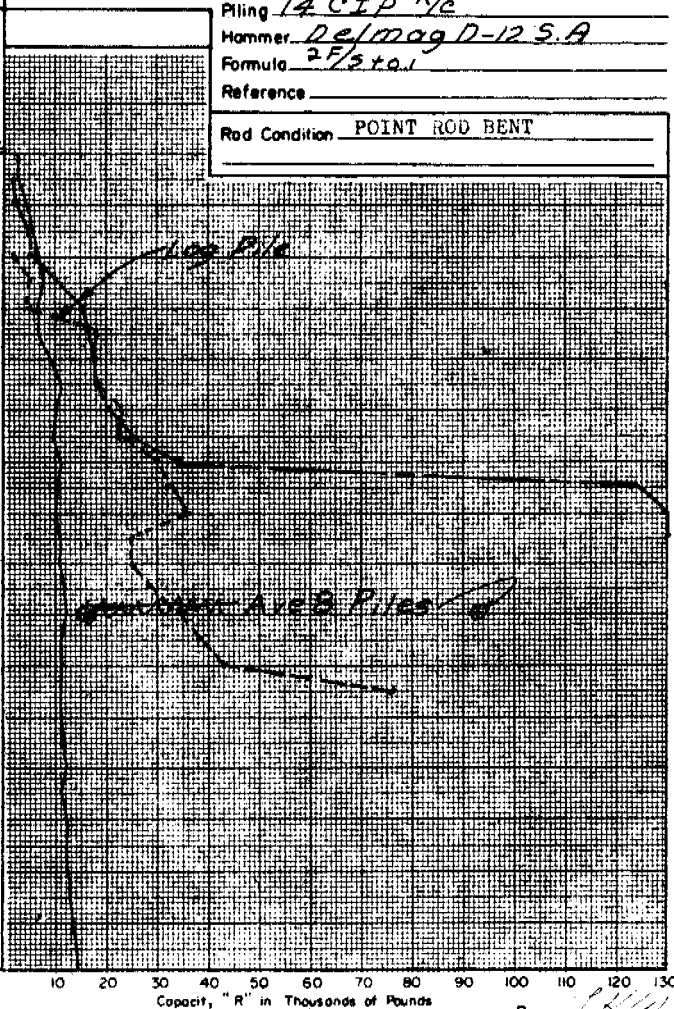
Piling 14 CIP R/c

Hammer Delmag D-12 S.A

Formula 2 F/3 x 0.1

Reference

Rod Condition POINT ROD BENT



Capacity, "R" in Thousands of Pounds

By S. J. Hill
Date 11-21-60

FOUNDATION DATA (Continued)

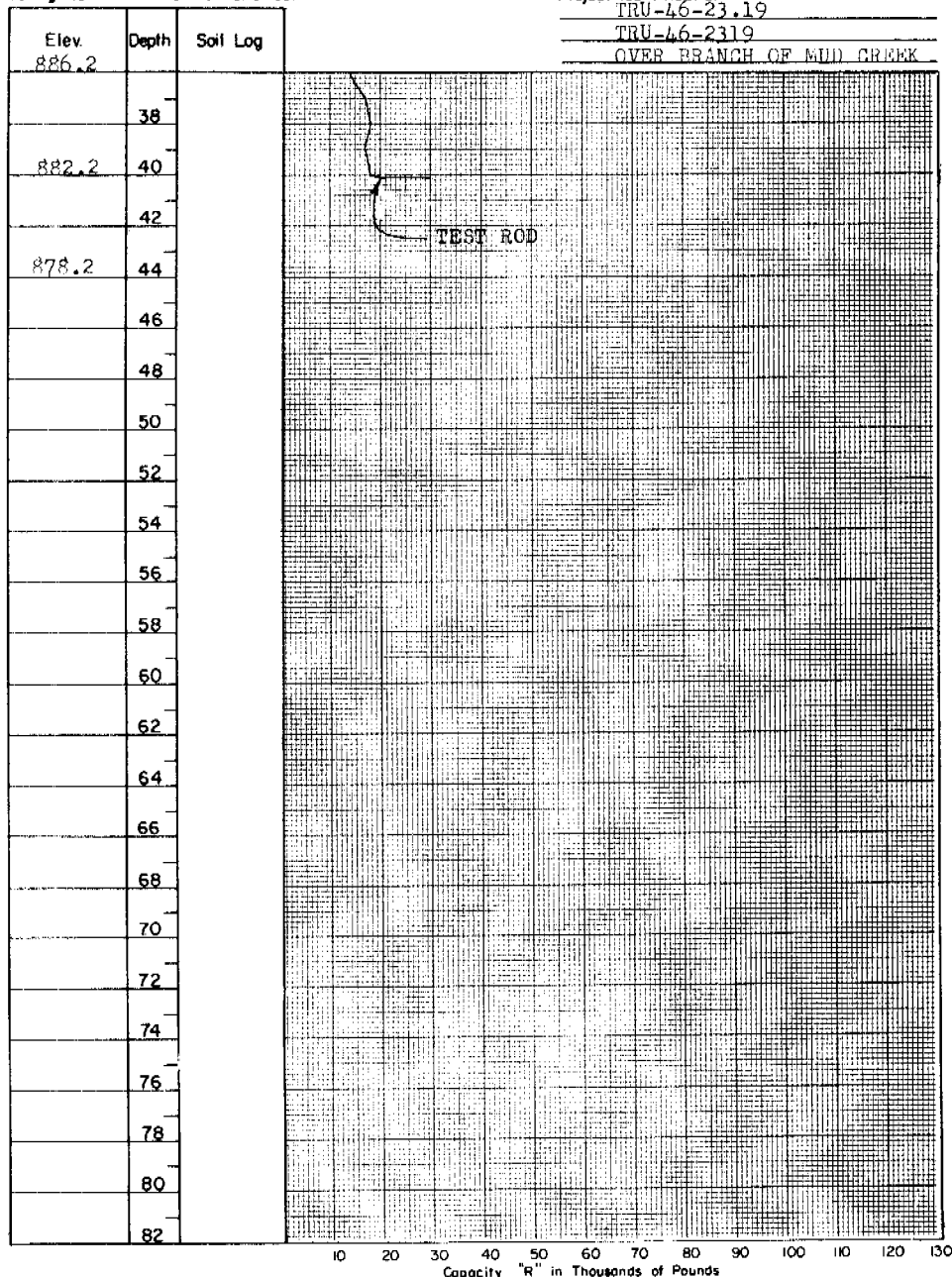
Boring No. 2 Station & Offset 2 + 25.10 LT

Project Identification TRUMBULL

TRU-46-23.19

TRU-46-2319

OVER BRANCH OF MUD CREEK



State of Ohio
Department of Highways
Testing Laboratory

12
13

FOUNDATION DATA

Boring No. 7 Station & Offset 2 + 75.11' RT
FORWARD ABUTMENT
Surface Elev. 921.8 Water Elev. 915.8

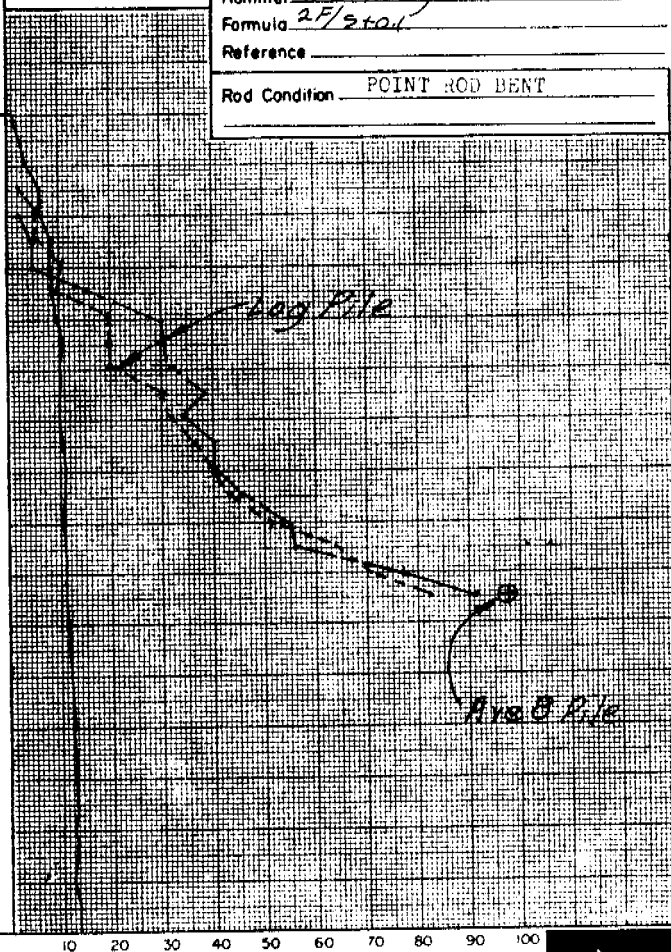
Project Identification TRUMBULL
TRU-46-2319
TRU-46-2319
OVER BRANCH OF MUD CREEK

Date Completed 11-3-60

Elev.	Depth	Soil Log
921.8	0	
	2	
917.8	4	
	6	
913.8	8	
	10	
909.8	12	
	14	
905.8	16	
	18	
901.8	20	
	22	
897.8	24	
	26	
893.8	28	
	30	
889.8	32	
	34	
885.8	36	

Piling 14" C.T.P. R/c
Hammer De/mag D-12 S.A.
Formula 2F/9+0.1
Reference _____

Rod Condition POINT ROD BENT



Capacity, "R" in Thousands of Pounds

By
D.

FOUNDATION DATA (Continued)

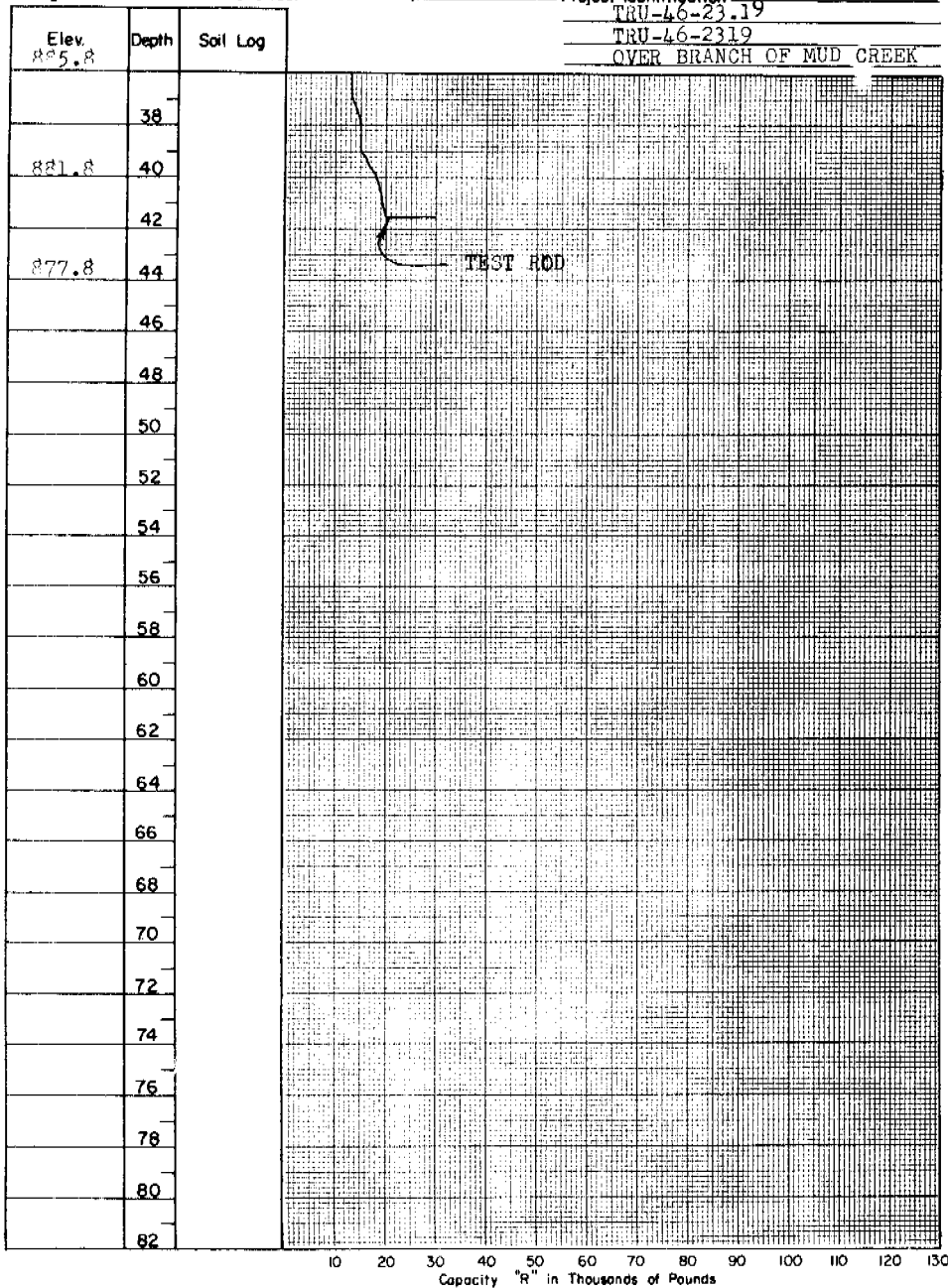
Boring No. 7 Station & Offset 2 + 75.11' RT

Project Identification TRUMBULL

TRU-46-23.19

TRU-46-2319

OVER BRANCH OF MUD CREEK



State of Ohio
Department of Highways
Testing Laboratory

LOG OF BORING

Date Started 11-2-60 Sampler Type SS Dia. 1 3/8" Water Elev. Immediate _____
Date Completed 11-3-60 Casing Length NONE Dia. _____ After _____ Hours _____

Project Identification: TRUMBULL
TRU-46-2319
TRU-46-2319
OVER BRANCH OF MUD CREEK

Boring No. B-8 Station & Offset 2+75.22LT (FORWARD ABUTMENT) Surface Elev. 928.5

Boring No. 42-2 Station 21 Offset														Physical Characteristics														SHTL
Elev.	Depth	Std. Pen. (lb)	Description											Field No.	Lab. Nos.	% Agg.	% C.S.	% F.S.	% Silt	% Clay	LL	PI	W.C.	Class.				
918.5	0																											
916.0	2													1	85937	28	24	23	15	10	NP	NP	18					
	4	4/6	Gray Silty Gravelly Sand																									
913.5	6	8/13	Gray Silty Gravelly Sand											2	85938	23	20	25	18	14	NP	NP	17					
911.0	8	20/23	Large Gravel													V	I	S	U	A	L							
908.5	10	13/24	Gray Sandy Silt											3	85939	10	9	15	37	29	21	6	12					
906.0	12																											
	14	10/17	Gray Gravelly Sandy Silt											4	85940	19	12	15	29	25	19	7	14					
903.5	16	15/12	Gray Silty Sandy Gravel											5	85941	50	9	8	21	12	20	3	14					
901.0	18	15/20	Gray Sandy Gravelly Silt											6	85942	19	6	13	48	14	NP	NP	20					
898.5	20	10/16	Gray Sandy Gravelly Silt											7	85943	28	7	11	36	18	NP	NP	14					
896.0	22																											
	24	13/22	Gray Gravel											8		V	I	S	U	A	L							
893.5	26	12/18	Gray Silt											9	85944	12	2	3	68	15	NP	NP	20					
	28																											
888.5	30	21/26	Gray Gravelly Silt											10	85945	23	3	12	54	8	NP	NP	--					
	32																											
	34																											
883.5	36	56/*	Gray Sandy Silt											11		V	I	S	U	A	L							

Particle Sizes: Agg. = > 200mm, Coarse Sand = 200 - 0.42mm, Fine Sand = 0.42 - 0.074mm, Silt = 0.074 - 0.005mm, Clay = < 0.005mm

* Refusal

Boring No. B-8Station & Offset 2+75.22 LTSurface Elev. 918.5Project: TRU-46-2319

Elev.	Depth	Std. Pen. (N)	Description	Field No.	Lab. Nos. So.	Physical Characteristics								SHTL Class.
						% Ag.	% C.S.	% F.S.	% Silt	% Clay	LL	PI	W.C.	
878.5	38													
	40		Gray Silty Sandy Gravel	12	85946	65	10	6	15	4	NP	NP	9	
	42	78/*												
873.5	44		Gray Silty Gravelly Sand	13	85947	21	22	27	20	10	NP	NP	12	
	46	55/*												
	48													
868.5	50		Gray Silty Sand	14	85948	13	15	41	16	15	NP	NP	8	
	52	75/*												
863.5	54		Gray Gravelly Sandy Silt	15	85949	24	15	29	20	12	NP	NP	12	
863.0	56	88/*												
	58		← BOTTOM OF BORING											
	60													
	62		* Refusal											
	64													
	66													
	68													
	70													
	72													
	74													
	76													
	78													
	80													

[illegible] $4 + 00$

+50