| 1961 | Job. No. 11437 | 004288 | County HARRISON |
|---|---|---|---|
| Year | Changes | | Bridge No. HAS-342-0401 |
| | | | Section HAS-342-3.95 |
| File No. FES-50 4K-34 | | | ☒ over ☐ under |
| | | | Location Stillwater Cr |

DESIGN BY

| | RECON | AUGER | CORE | DRIVE ROD |
|---|---|---|---|---|
| By | | | J. Morris Bowen | Albertson |
| Dates | | | 11/15-22/61 | 10/23-27/61 |
| No. of Holes or Soundings | | | 2 | 8 |
| Footage | | | 115.0 | 458.8 |
| Samples Tested | | | 29 | |

| SITE PLANS | |
|---|---|
| Date Rec'd | 10-17-61 |
| Revised Plan | |

Topo Sheet

☐ Samples Accounted For

Transmittal Date 12/8/61

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 |
| — | — | — | 8 | 458.8 | 2 | 115.0 | 29 |

December 8, 1961

Pace Associates of Ohio
4500 Euclid Avenue
Cleveland 3, Ohio

Attention: Alfred D. Yanda

Re: Structure Foundation Investigation
HAS-342-0401 Over Stillwater Creek
Fed. Proj. No. S-

File: 13-4-1
Harrison

Gentlemen:

Transmitted herewith are the results of the foundation investigation made for the SR 342 structure over Stillwater Creek, on project HAS-342-3.95.

Very truly yours,

R. R. Litehiser
Engineer of Tests

Per: Dorothy J. Ray
Assistant Engineer

GPH:DEM:pjs
Encl.
cc: R. E. M. des Islets (2)(no encl.)
W. P. McKenna, Attn: L. C. Mast, Attn: W. A. Miller
D. P. Overman, Attn: C. H. Altvater
Ohio State Geological Survey, Attn: Karl Hoover
N. E. Mason (4)

engineers architects consulting engineers

associates
OF OHIO

2500 Euclid Avenue, Cleveland 3, Ohio
1400 Hanna Building (P. O. Box 6400) Cleveland 15, Ohio Telephone TOwer 1-3300

October 11, 1961

W H Blickard AIA
Alfred D Yanda ASCE

Mr. V. C. Strong
Final Construction
Division Engineer
State Highway Office Building
Columbus 15, Ohio

Re: Deficient Bridge Program No. 2
Engr. Agreement No. 823
Bridges Nos. HAS-342-0401
BEL-655-0134
Foundation Investigation

Dear Sir:

We are enclosing three (3) prints each of the Test Boring Location plans for the referenced projects and request that the foundation investigations be made.

Centerline staking of BEL-655-0134 has been completed in the field and HAS-342-0401 will be completed by October 13.

Very truly yours,

FACE ASSOCIATES OF OHIO

Alfred D. Yanda

ADY:NLS:eb
encl.

cc. Wm. P. McKenna

OCT 1961
RECEIVED
STATE HIGHWAY TESTING LABORATORY

November 20, 1961

Pace Associates of Ohio
4500 Euclid Avenue
Cleveland 3, Ohio

Attention: Mr. Alfred D. Yanda

Re: Preliminary Information
Structure Foundation Investigation
HAS-342-0401 Over Stillwater Creek

File: 13-4-1
Harrison

Gentlemen:

In an effort to expedite design considerations for the subject structure, transmitted herewith is information available to date.

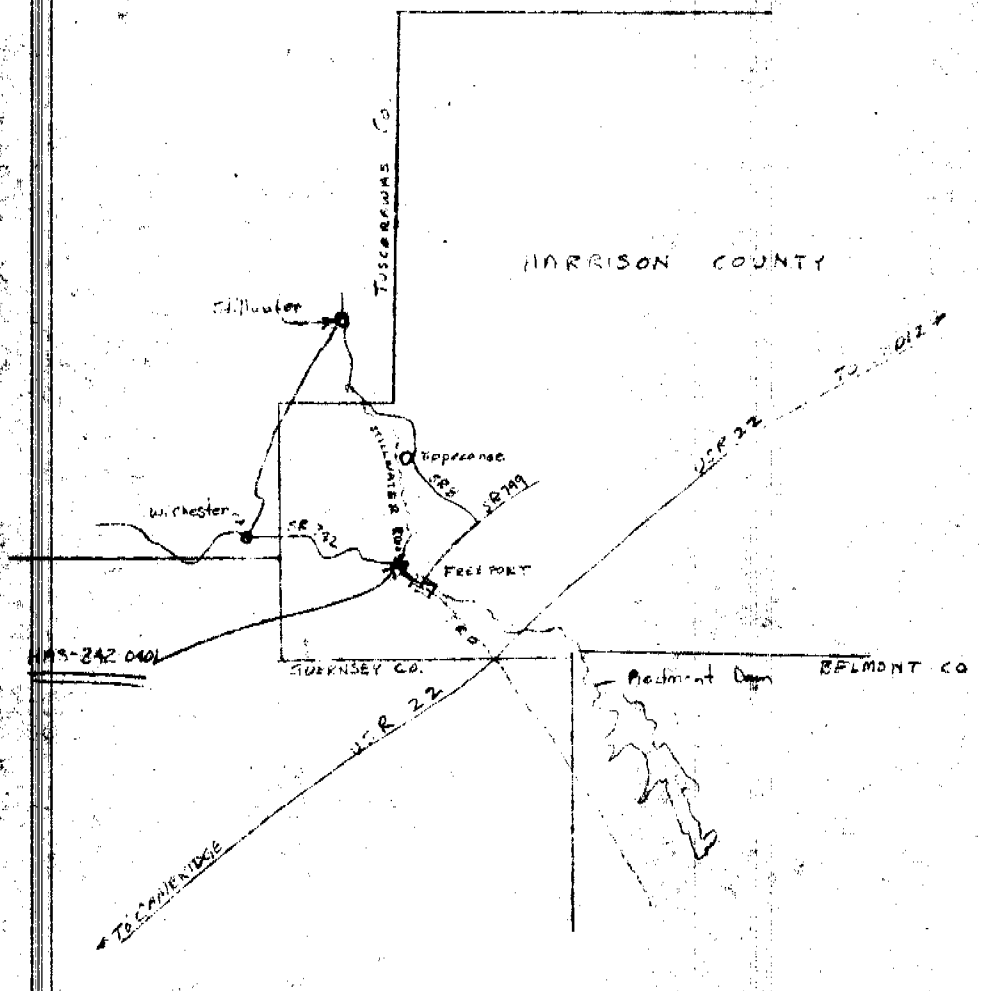
Field work is still being performed and is expected to be completed this week. The final report will be forwarded upon processing of data of laboratory tests of samples received, probably within two weeks.

E. R. Litehiser
Engineer of Tests

Per: Dorothy J. Rayborn
Dorothy J. Rayborn
Assistant Engineer

GPH:pjs
Encl.
cc: R. E. M. des Islets (2)(no encl.)
W. P. McKenna, Attn: L. C. Mast (no encl.)
D. H. Overman, Attn: C. H. Altvater (no encl.)
N. E. Mason (3)

HARRISON COUNTY
HAS- 342- 0401
N.P.L. 10-23-81



LOGS OF CORE BORINGS
Prepared by
State Highway Testing Laboratory
For

County, Rt. No. & Section Has-342-0401

Hole No. 1 Surface Elevation 882.3

Station 209+70, 12' Lt. Elevation Top of Rock 862.8

Total Depth of Hole 35.0 Elevation Bottom of Hole 847.3

| Depth | Elev. | Description | Core Loss in Percent |
|---|---|---|---|
| 0.0 | 882.3 | Overburden (Jar samples) | |
| | | TOP OF WEATHERED ROCK | |
| 21.0 ~~19.5~~ | 861.3 ~~862.8~~ | Shale, gray, argillaceous, micaceous, soft, | 22% ~~38%~~ |
| ~~8.1~~ ~~7.0~~ (actual run) | | extremely weathered, crumbly. | |
| | | TOP OF HARD ROCK | |
| 25.0 | 857.3 | Sandstone; fine-grained; micaceous, argillaceous; | 0% |
| 3.0 / 3.0 | | hard; broken. | |
| 28.0 | 854.3 | Shale; gray; argillaceous, siliceous, micaceous; | 0% |
| 3.9 / 3.9 | | fissile; hard; broken to badly broken. | |
| 31.9 | 850.4 | Limestone; gray; with pyrite crystals; hard; dense; | 0% |
| 3.1 / 3.1 | | broken. | |
| 35.0 | 847.3 | BOTTOM OF BORING | |

VISUAL CLASSIFICATION OF DRIVE SAMPLES

PROJECT: HAS 342 0201

BORING LOCATION: 209 L 70, 12' Lt

DRILLER: Bowen, CLASSIFIED BY: D.A.P., DATE: 11-24-61

| | Field No. | Visual Description | No. Of Blows | Density | Moist. Cont. |
|---|---|---|---|---|---|
| qu = 1.25 | 1 | Br & Gr SCM | 4/4 | MED | M> |
| qu = 0.75 | 2 | Br & Gr SCM | 3/3 | MED | M+ |
| | 3 | Br & Gr. S, CM w/ LITTLE SS. FRAGS | 8/6 | MED | M+ |
| Qu = 1.50 | 4 | Br & Gr. SMC TO. SS. FRAGS | 9/17 | MED STIFF | M= |
| Qu = 2.75 | 5 | Br. & Gr. SMC TO. SS. FRAGS | 16/24 | STIFF | M |
| | 6 | Br & Gr. SMC w/ LITTLE SOFT SANDY SH. FRAGS | 11/17 | STIFF | M |
| | 7 | Br & Gr. SMC w/ LITTLE SOFT SANDY SH. FRAGS. | 20/24 | MED STIFF | M |
| | 8 | Gr. MC w/ SOME SOFT SH. FRAGS | 16/41 | — | M |

SO-7

County, Rt. No., Section

Bridge No. HBM-342-0401 (URA)

# SUMMARY OF SOIL TEST DATA ON FOUNDATION SAMPLES

1/1

| Lab. No. So.- | Sample No. | Station No. | Represents Feet | Mechanical Analysis: Agg % | C Sand % | F Sand % | Silt % | Clay % | Physical Characteristics: L.L. | P.I. | Water Cont. | Ohio Class | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37347 | 1 | 204+70 12'Rt | 2.5-3.5 | 0 | 0 | 3 | 57 | 40 | 38 | 14 | 23 | Br+Gr | M+C |
| 8 | 2 | " | 5'-6' | 0 | 2 | 6 | 51 | 41 | 31 | 9 | 27 | Br+Gr | CM |
| 9 | 3 | " | 7.5-8.5 | 0 | 4 | 19 | 44 | 33 | 26 | 6 | 27 | Br+Gr | SM |
| 37350 | 4 | " | 10-11 | 9 | 2 | 17 | 39 | 33 | 31 | 14 | 15 | Br+Gr | SC |
| 1 | 5 | " | 12.5-13.5 | 0 | 3 | 15 | 50 | 32 | 30 | 11 | 14 | Br+Gr | M+C |
| 2 | 6 | " | — — | 7 | 11 | 13 | 26 | 43 | 31 | 9 | 20 | Br+Gr | SM |
| 3 | 7 | " | 17.5-18.5 | 10 | 7 | 11 | 25 | 47 | 29 | 7 | 17 | Br+Gr | SM |
| 4 | 8 | " | 20-21 | 36 | 3 | 4 | 31 | 26 | 21 | 5 | 8 | Gr | GM |

VISUAL CLASSIFICATION OF DRIVE SAMPLES

PROJECT: HAS- 342- Br. 0401

BORING LOCATION: Sta. 211+42, 12' Rt.

DRILLER: Morris, CLASSIFIED BY: D.A.P., DATE: 11-18-61

| | Field No. | Visual Description | No. Of Blows | Density | Moist. Cont. |
|---|---|---|---|---|---|
| | 1 | Br. SCM, T.O. small gravel, T.O. coal blos. | 3/3 | Med | M+ |
| org | 2 | Br & Gr. SCM w/soft sandy shale frag, T.O. org | 2/2 | Soft | Wet |
| | 3 | Br & Gr CMS | 2/3 | | Wet |
| | 4 | Br. & Gr CMS, T.O. soft sandy shale frags | 2/3 | | M+ |
| | 5 | Gr. CSM w/little soft shale frags | 6/11 | | Wet |
| | 6 | Gr. SM, T.O. sandy shale frags | 6/12 | | M |
| org | 7 | Gr. SM, T.O. org | 7/14 | | M+ |
| org | 8 | Gr. M & S, T.O. org | 7/12 | | M+ |
| org | 9 | Ditto | 7/9 | | M+ |
| org | 10 | Gr M & S, T.O. org | 9/11 | | M+ |
| org | 11 | Gr. MS, T.O. org | 7/7 | | Wet |
| org | 12 | Gr. MS w/little coal blossom, T.O. org | 11/13 | | M+ |
| | 13 | Gr. M Fine S | 5/6 | | Wet |
| | 14 | Gr. MS w/stone frags, T.O. org | 12/9 | | Wet |
| | 15 | Greenish Gr. CMS & stone frags | 16/16 | | M |
| | 16 | Greenish Gr. MS w/small size stone frags | 18/13 | Loose | M |
| | 17 | Ditto | 16/18 | Loose | M+ |
| org | 18 | Greenish Gr. MS w/small size stone frags T.O. org | 15/15 | Loose | M+ |
| $q_u = 1.5$ | 19 | Gr. SMC w/little , stone frags | 18/21 | Med | M> |
| $q_u = 1.5$ | 20 | Gr. SMC, T.O. soft sandy shale frags | 15/20 | Med | M= |
| | 21 | Gr. MC w/soft shale frags | 18/29 | Med | M> |
| | | | | | |
| | | | | | |
| | | | | | |

SO-7

SUMMARY OF SOIL TEST DATA ON FOUNDATION SAMPLES

County, Rt. No., Section HAS-342-"0901 (2.m)

Bridge No.

1/2

| Lab. No. So.- | Sample No. | Station No. | Represents Feet | Mechanical Analysis: Agg % | C Sand % | F Sand % | Silt % | Clay % | Physical Characteristics: L.L. | P.I. | Water Cont. | Ohio Class | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36381 | 1 | 211-42 12Rt | 5-6' | 0 | 10 | 21 | 28 | 41 | 39 | 11 | 38 | [illegible] | SC, Trace of Coal Frags. |
| 2 | 2 | " | 10-11 | 24 | 16 | 18 | 20 | 22 | 30 | 8 | 36 | [illegible] Br Gr | GSM, Trace Organic |
| 3 | 3 | " | 15-16 | 0 | 2 | 53 | 25 | 20 | NP | | 30 | Br+Gr | SM |
| 4 | 4 | " | 17.5-18.5 | 0 | 2 | 49 | 21 | 28 | NP | | 28 | Br+Gr | SM |
| 5 | 5 | " | 20-21 | 8 | 29 | 32 | 17 | 19 | NP | | 24 | Gr | MS |
| 6 | 6 | " | 22.5-23.5 | 0 | 2 | 18 | 48 | 32 | NP | | 29 | Gr | SM |
| 7 | 7 | " | 25-26 | 0 | 3 | 50 | 28 | 19 | NP | | 28 | Gr | SM, Trace Org. |
| 8 | 8 | " | 27.5-28.5 | 0 | 4 | 32 | 46 | 18 | NP | | 27 | Gr | SM, Trace Org. |
| 9 | 9 | " | 30-31 | 0 | 5 | 26 | 47 | 22 | NP | | 30 | Gr | SM, Trace Org. |
| 36390 | 10 | " | 32.5-33.5 | 0 | 4 | 38 | 41 | 17 | NP | | 31 | Gr | SM, Trace Org. |
| 1 | 11 | " | 35-36 | 0 | 2 | 29 | 45 | 24 | NP | | 32 | Gr | SM, Trace Org. |
| 2 | 12 | " | 37.5-38.5 | 10 | 4 | 43 | 24 | 19 | NP | | 22 | Gr | SM, Trace Org. |
| 3 | 13 | " | 40-41 | 0 | 19 | 37 | 26 | 18 | NP | | 27 | Gr | SM |

SUMMARY OF SOIL TEST DATA ON FOUNDATION SAMPLES

2
2

SO-7
County, Rt. No., Section
Bridge No. HAS-342 - #0401

| Lab. No. So.- | Sample No. | Station No. | Represents Feet | Mechanical Analysis: Agg % | C Sand % | F Sand % | Silt % | Clay % | Physical Characteristics: L.L. | P.I. | Water Cont. | Ohio Class | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36394 | 14 | 211+42 12Rt | 45-46 | 16 | 3 | 44 | 27 | 10 | NP | | 23 | [illegible] | MGS, Trace Org. |
| 5 | 15 | " | 50-51 | 27 | 13 | 41 | 9 | 10 | NP | | 17 | [illegible] Gr | MGS |
| 6 | 16 | " | 55-56 | 20 | 15 | 38 | 18 | 9 | NP | | 21 | Grn-Gr | MGS |
| 7 | 17 | " | 60-61 | 11 | 15 | 49 | 13 | 12 | NP | | 21 | Grn-Gr | MS |
| 8 | 18 | " | 65-66 | 21 | 28 | 26 | 17 | 8 | NP | | 20 | Grn-Gr | MGS, Trace Organic |
| 9 | 19 | " | 70-71 | 18 | 8 | 12 | 26 | 36 | 26 | 7 | 17 | Gr | GSM |
| 36400 | 20 | " | 75-76 | 16 | 9 | 14 | 27 | 34 | 25 | 6 | 18 | Gr | GSM |
| 1 | 21 | " | 80-81 | 9 | 5 | 12 | 33 | 41 | 28 | 9 | 18 | Gr | SM |

# SYMBOLS FOR SOIL CLASSIFICATION AND ROCK TYPES

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| G | Gravel | CGS | Clayey Gravelly Sand | M | Silt | C | Clay | | Shale |
| SG | Sandy Gravel | S | Sand | CM | Clayey Silt | | Organic Clay | | Weathered Sandstone |
| MG | Silty Gravel | MS | Silty Sand | GC | Gravelly Clay | | Peat | | Sandstone |
| CG | Clayey Gravel | CS | Clayey Sand | SGC | Sandy Gravelly Clay | | Boulders and Cobbles | | Limestone |
| MSG | Silty Sandy Gravel | GM | Gravelly Silt | GSC | Gravelly Sandy Clay | | Coal | | Dolomite |
| CSG | Clayey Sandy Gravel | SGM | Sandy Gravelly Silt | SC | Sandy Clay | | Weathered Indurated Clay | | |
| GS | Gravelly Sand | GSM | Gravelly Sandy Silt | MC | Silty Clay | | Indurated Clay | | |
| MGS | Silty Gravelly Sand | SM | Sandy Silt | M&C | Silt and Clay | | Weathered Shale | | |

T.W.R. Top of Weathered Rock
T.H.R. Top of Hard Rock

Casing

Resistance 'R' < 10,000 lbs.

Resistance 'R' > 10,000 lbs.

Particle Size Definitions

Boulders 8" | Cobbles 3" | Gravel 2.0mm | Coarse Sand 0.42mm | Fine Sand 0.074mm | Silt 0.005mm | Clay

/ Indicates final measurement of 16 penetration in inches

(S.F) Indicates aggregate size particles consist of stone fragments rather than gravel

Auger Boring - Plan View

Press-Drive Sample-Core Boring-Plan View

Drive Rod Penetration Resistance Soundings - Plan View

A Indicates Auger Boring

B Indicates Press-Drive Sample-Core Boring

Horizontal bar on boring log indicates the depth the sample was taken

X/Y Figures to the left of boring log in profile view:
X = Plastic Limit
Y = Moisture Content

P/Q Figures to the right of boring log in profile view indicate the number of blows for "Standard Penetration Test"
P = First 6 inches
Q = Second 6 inches

Sod and Topsoil Visual Classification

Berm material - Visual Classification

W Indicates Free Water elevation

Indicates Static Water elevation

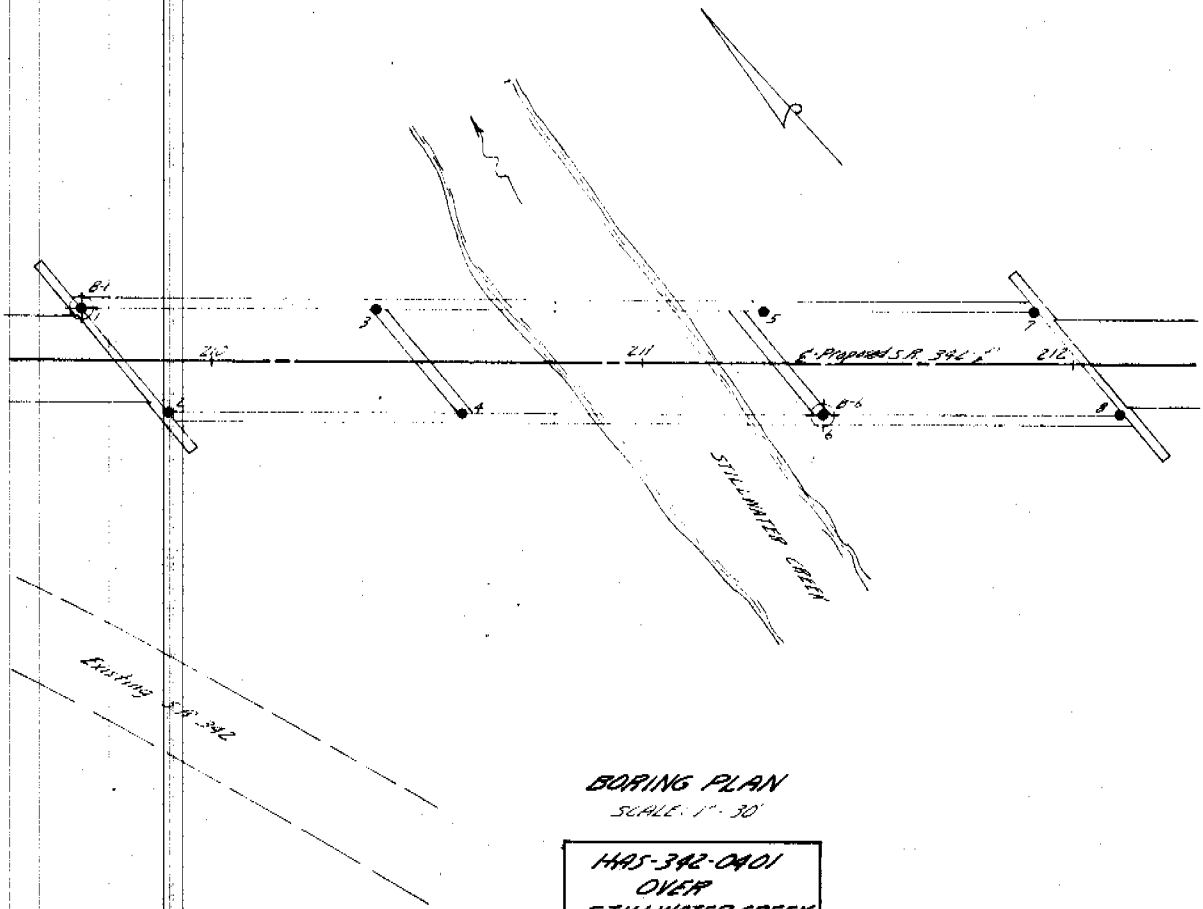
Footing

Capped pile

Footing on pile

Drafting By J.K.W.

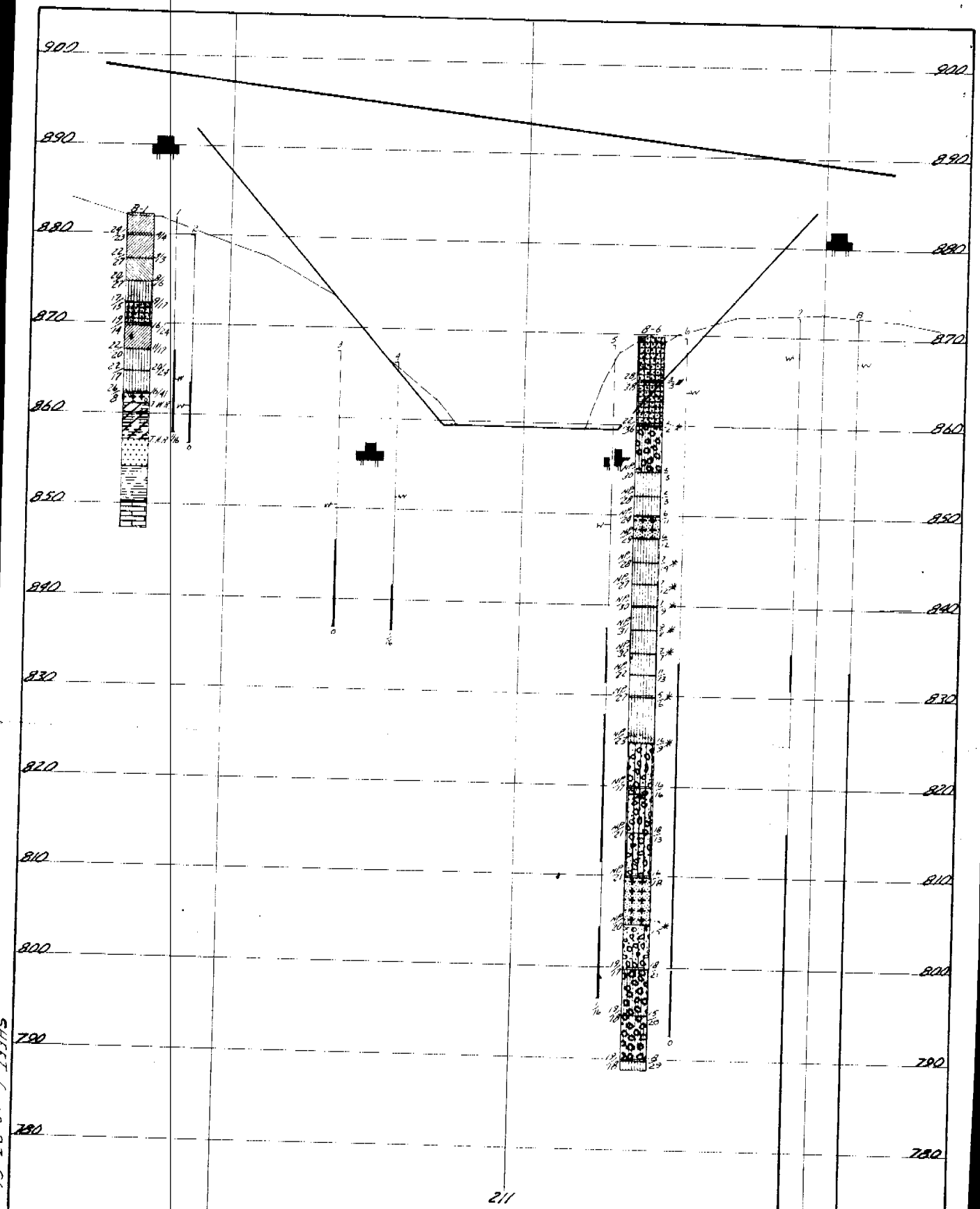
HAS-342-0401
OVER
STILLWATER CREEK




BORING PLAN

SCALE: 1" = 30'

HAS-342-0401
OVER
STILLWATER CREEK




SHEET 6 of 23 Sheets

State of Ohio
Department of Highways
Testing Laboratory

# LOG OF BORING

Date Started 11-21-61 Sampler Type SS Dia. 1 3/8" Water Elev.
Date Completed 11-22-61 Casing Length Dia.

Project Identification HARRISON
HAS-342-3.95
HAS-342-0401
OVER STILLWATER CREEK

Boring No. B-1 Station & Offset 209+70, 12' LT. (REAR ABUTMENT) Surface Elev. 882.3

| Elev | Depth | Sh. Pen. (N) | Rec ft. | Loss ft. | Description | Field No. | Lab. Nos. So | % Agg | % C S | % F S | % Silt | % Clay | LL | PI | W.C | SHTL Class |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 882.3 | 0 | | | | | | | | | | | | | | | |
| 879.8 | 2 | | | | | | | | | | | | | | | |
| 877.3 | 4 | 4/4 | | | Brown & Gray Silt & Clay | 1 | 37347 | 0 | 0 | 3 | 57 | 40 | 38 | 14 | 23 | |
| 874.8 | 6 | 3/3 | | | Brown & Gray Clayey Silt | 2 | 37348 | 0 | 2 | 6 | 51 | 41 | 31 | 9 | 27 | |
| 872.3 | 8 | 8/6 | | | Brown & Gray Sandy Silt | 3 | 37349 | 0 | 4 | 19 | 44 | 33 | 26 | 6 | 27 | |
| 869.8 | 10 | 9/17 | | | Brown & Gray Sandy Clay | 4 | 37350 | 9 | 2 | 17 | 39 | 33 | 31 | 14 | 15 | |
| 867.3 | 12 | 16/24 | | | Brown & Gray Silt & Clay | 5 | 37351 | 0 | 3 | 15 | 50 | 32 | 30 | 11 | 14 | |
| 864.8 | 14 | 11/17 | | | Brown & Gray Sandy Silt | 6 | 37352 | 7 | 11 | 13 | 26 | 43 | 31 | 9 | 20 | |
| 862.3 | 16 | 20/24 | | | Brown & Gray Sandy Silt | 7 | 37353 | 10 | 7 | 11 | 25 | 47 | 29 | 7 | 17 | |
| 861.3 | 18 | 16/41 | | | Gray Silt with Shale Fragments | 8 | 37354 | 36 | 3 | 4 | 31 | 26 | 31 | 5 | 8 | |
| | 20 | | | | TOP OF WEATHERED ROCK | | | | | | | | | | | |
| 857.3 | 22 | | 7.1 | 0.9 | Shale, gray, argillaceous, micaceous, soft, extremely weathered, crumbly. Core loss: 22% | | | | | | | | | | | |
| 854.3 | 24 | | | | TOP OF HARD ROCK | | | | | | | | | | | |
| | 26 | | 5.0 | 0.0 | Sandstone; fine-grained; micaceous, argillaceous; hard; broken. No core loss | | | | | | | | | | | |
| 850.4 | 28 | | | | Shale; gray; argillaceous, siliceous, micaceous; fissile; hard; broken to badly broken. No core loss | | | | | | | | | | | |
| 847.3 | 30 | | 5.0 | 0.0 | Limestone; gray; with pyrite crystals; hard; dense; broken. No core loss | | | | | | | | | | | |
| | 32 | | | | | | | | | | | | | | | |
| | 34 | | | | | | | | | | | | | | | |
| | 36 | | | | BOTTOM OF BORING | | | | | | | | | | | |

Particle Sizes: Agg = >2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay = <0.005mm

SHEET 4 of 23 SHEETS

State of Ohio
Department of Highways
Testing Laboratory

# LOG OF BORING

Date Started 11-15-61 Sampler: Type SS Dia. 1-3/8" Water Elev: Immediate
Date Completed 11-17-61 Casing: Length 75' Dia. 3-1/2" After Hours

Project Identification: HARRISON
HAS-342-3.95
HAS-342-8401
OVER STILLWATER CREEK

Boring No. B-6 Station & Offset 211+42, 12'RT (FORWARD PIER) Surface Elev. 869.8

| Elev. | Depth | Sil. Pen. (N) | Description | Field No. | Lab. No.Sa. | % Gr. | % C.S. | % F.S. | % Silt | % Clay | L.L. | PI | W.C. | SHTC Class. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 869.8 | 0 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| 864.8 | 6 | 3/3 | Brown Sandy Clay, Trace of Coal Frags. | 1 | 36381 | 0 | 10 | 21 | 28 | 41 | 39 | 11 | 38 | |
| | 8 | | | | | | | | | | | | | |
| 859.8 | 10 | 2/2 | Brown & Gray Gravelly Sandy Silt, Trace Organic | 2 | 36382 | 24 | 16 | 18 | 20 | 22 | 30 | 8 | 36 | |
| | 12 | | | | | | | | | | | | | |
| 854.8 | 14 | | | | | | | | | | | | | |
| | 16 | 2/3 | Brown & Gray Sandy Silt | 3 | 36383 | 0 | 2 | 53 | 25 | 20 | N | P | 30 | |
| 850.8 | 18 | 2/3 | Brown & Gray Sandy Silt | 4 | 36384 | 0 | 2 | 49 | 21 | 28 | N | P | 28 | |
| 849.8 | 20 | 6/11 | Gray Silty Sand | 5 | 36385 | 8 | 24 | 32 | 17 | 19 | N | P | 24 | |
| 847.8 | 22 | | | | | | | | | | | | | |
| | 24 | 6/12 | Gray Sandy Silt | 6 | 36386 | 0 | 2 | 18 | 48 | 32 | N | P | 29 | |
| 844.8 | 26 | 7/14 | Gray Sandy Silt, Trace Organic | 7 | 36387 | 0 | 3 | 50 | 28 | 19 | N | P | 28 | |
| 842.8 | 28 | 7/12 | Gray Sandy Silt, Trace Organic | 8 | 36388 | 0 | 4 | 32 | 46 | 18 | N | P | 27 | |
| 839.8 | 30 | 7/9 | Gray Sandy Silt, Trace Organic | 9 | 36389 | 0 | 5 | 26 | 47 | 22 | N | P | 30 | |
| 837.8 | 32 | 9/11 | Gray Sandy Silt, Trace Organic | 10 | 36390 | 0 | 4 | 38 | 41 | 17 | N | P | 31 | |
| 834.8 | 35 | 7/7 | Gray Sandy Silt, Trace Organic | 11 | 36391 | 0 | 2 | 29 | 45 | 24 | N | P | 32 | |

Particle Sizes: Gravel = +2.00mm, Coarse Sand = 2.00 - 0.42mm, Fine Sand = 0.42 - 0.074mm, Silt = 0.074 - 0.005mm, Clay = < 0.005 mm

Boring No. B-6 Station & Offset 211+42, 12'RT Surface Elev. 869.8 Project: HAS-342-0401

| Elev. | Depth | Std. Pen. (N) | Description | Field No. | Lab. Nos.Sa | Physical Characteristics % Agg | % C.S. | % F.S. | % Silt | % Clay | L.L. | P.I. | W.C. | SHTL Class. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 832.3 | 38 | 11/13 | Gray Sandy Silt, Trace Organic | 12 | 36392 | 10 | 4 | 43 | 24 | 19 | N | P | 22 | |
| 829.8 | 40 | 5/6 | Gray Sandy Silt | 13 | 36393 | 0 | 19 | 37 | 26 | 18 | N | P | 27 | |
| | 42 | | | | | | | | | | | | | |
| | 44 | | | | | | | | | | | | | |
| 824.8 | 46 | 12/9 | Gray Silty Gravelly Sand, Trace Organic | 14 | 36394 | 16 | 3 | 44 | 27 | 10 | N | P | 23 | |
| | 48 | | | | | | | | | | | | | |
| 819.8 | 50 | 16/16 | Greenish-Gray Silty Gravelly Sand | 15 | 36395 | 27 | 13 | 41 | 9 | 10 | N | P | 17 | |
| | 52 | | | | | | | | | | | | | |
| | 54 | | | | | | | | | | | | | |
| 814.8 | 56 | 18/13 | Greenish-Gray Silty Gravelly Sand | 16 | 36396 | 20 | 15 | 38 | 18 | 9 | N | P | 21 | |
| | 58 | | | | | | | | | | | | | |
| 809.8 | 60 | 16/18 | Greenish-Gray Silty Sand | 17 | 36397 | 11 | 15 | 49 | 13 | 12 | N | P | 21 | |
| | 62 | | | | | | | | | | | | | |
| | 64 | | | | | | | | | | | | | |
| 804.8 | 66 | 15/15 | Greenish-Gray Silty Gravelly Sand, Trace Organic | 18 | 36398 | 21 | 28 | 26 | 17 | 8 | N | P | 20 | |
| | 68 | | | | | | | | | | | | | |
| 799.8 | 70 | 18/21 | Gray Gravelly Sandy Silt | 19 | 36399 | 18 | 8 | 12 | 26 | 36 | 26 | 7 | 17 | |
| | 72 | | | | | | | | | | | | | |
| | 74 | | | | | | | | | | | | | |
| 794.8 | 76 | 15/20 | Gray Gravelly Sandy Silt | 20 | 36400 | 16 | 9 | 14 | 27 | 34 | 25 | 6 | 18 | |
| | 78 | | | | | | | | | | | | | |
| 789.8 | 80 | | | | | | | | | | | | | |
| 788.8 | | 13/20 | Gray Sandy Silt | 21 | 36401 | 9 | 3 | 12 | 33 | 43 | 28 | 9 | 15 | |

BOTTOM OF BORING

State of Ohio
Department of Highways
Testing Laboratory

# DRIVE ROD
# PENETRATION RESISTANCE DATA

Test Location No. 1
Station & Offset 209+70, 12' Lt
REAR ABUTMENT
Surface Elev. 882.0 Water Elev. 864.0

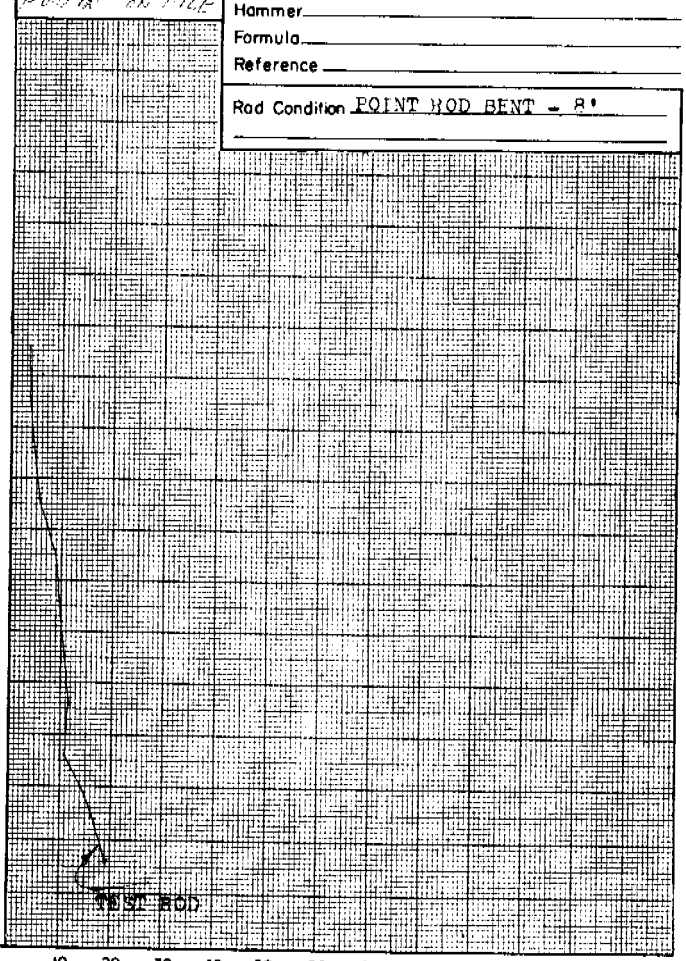
Project Identification HARRISON
HAS-342-3.95
HAS-342-0401
OVER STILLWATER CREEK

Date Completed 10-26-61

Piling
Hammer
Formula
Reference

Rod Condition POINT ROD BENT - 8'

| Elev. | Depth | Soil Log |
|---|---|---|
| 890.8 | 0 | |
| | 2 | |
| 886.8 | 4 | |
| | 6 | |
| 882.8 | 8 | |
| | 10 | |
| 878.8 | 12 | |
| | 14 | |
| 874.8 | 16 | |
| | 18 | |
| 870.8 | 20 | |
| | 22 | |
| 866.8 | 24 | |
| | 26 | |
| 862.8 | 28 | |
| | 30 | |
| 858.8 | 32 | |
| | 34 | |
| 854.8 | 36 | |




By [illegible] Date 12-8-61

SHEET 10 of 23 Sheets

State of Ohio
Department of Highways
Testing Laboratory

# DRIVE ROD
# PENETRATION RESISTANCE DATA

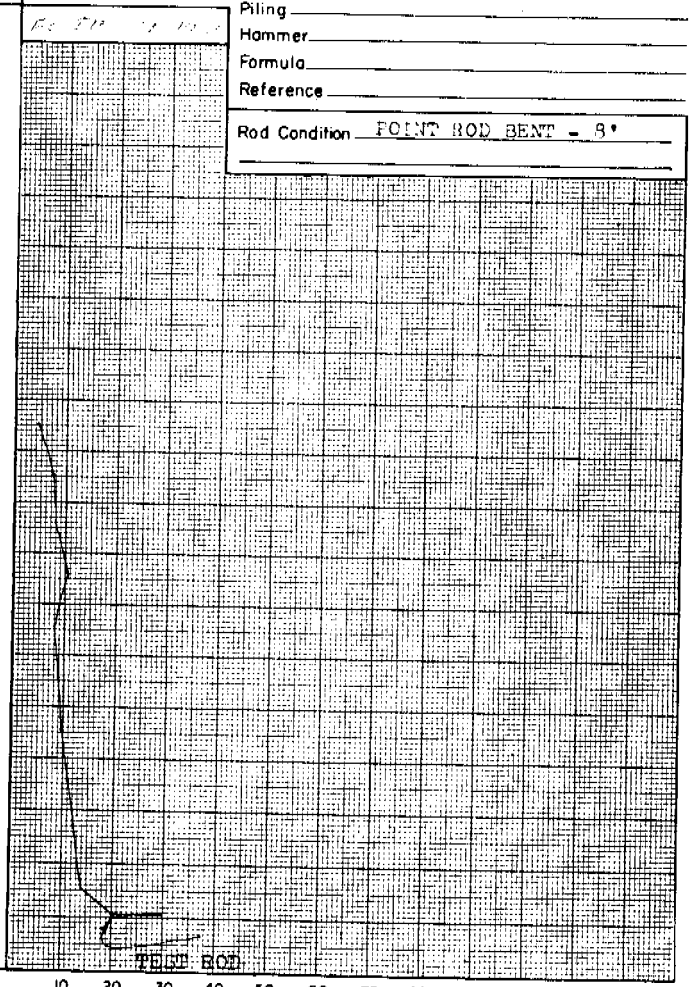
Test Location No. 2
Station & Offset 209+90, 12' Rt.
REAR ABUTMENT
Surface Elev. 829.2 Water Elev. 860.9

Project Identification HARRISON
HAS-342-3.95
HAS-342-0401
OVER STILLWATER CREEK

Date Completed 10-26-61

Piling
Hammer
Formula
Reference
Rod Condition POINT ROD BENT - 8"

| Elev. | Depth | Soil Log |
|---|---|---|
| 829.8 | 0 | |
| | 2 | |
| 886.8 | 4 | |
| | 6 | |
| 882.8 | 8 | |
| | 10 | |
| 878.8 | 12 | |
| | 14 | |
| 874.8 | 16 | |
| | 18 | |
| 870.8 | 20 | |
| | 22 | |
| 866.8 | 24 | |
| | 26 | |
| 862.8 | 28 | |
| | 30 | |
| 858.8 | 32 | |
| | 34 | |
| 854.8 | 36 | |




By [illegible] Date 10-26-61

SHEET 11 of 23 Sheets

State of Ohio
Department of Highways
Testing Laboratory

# DRIVE ROD
# PENETRATION RESISTANCE DATA

Test Location No. 3
Station & Offset 210+38, 12' Lt
REAR PIER
Surface Elev. 867.5 Water Elev. [illegible]

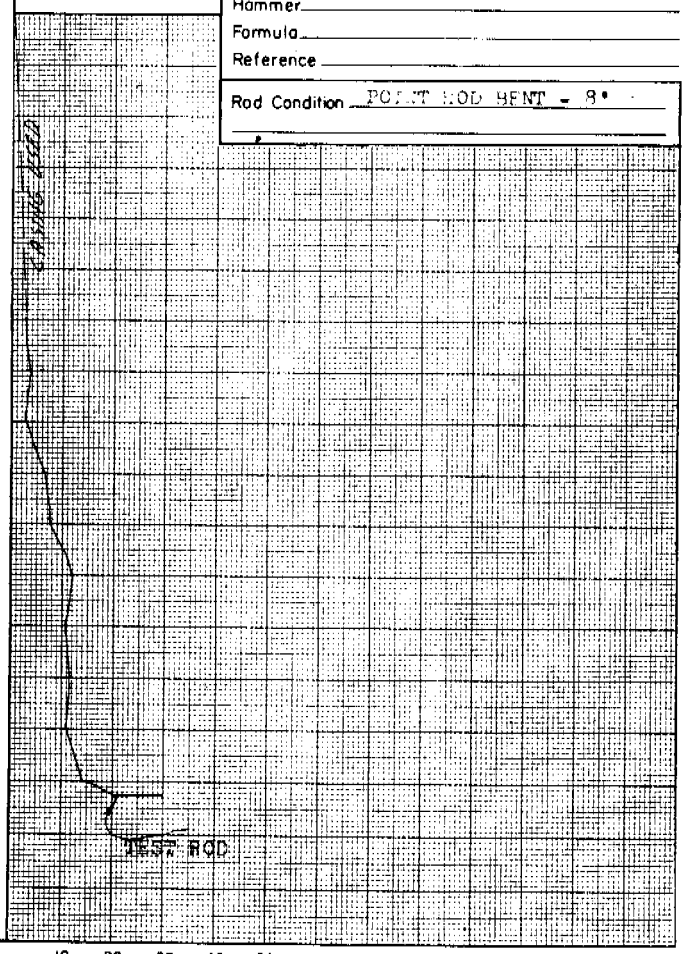
Project Identification HARRISON
HAS-342-3.55
HAS-342-0401
OVER STILLWATER CREEK

Date Completed 10-26-61

Piling
Hammer
Formula
Reference

Rod Condition POINT ROD BENT - 8°

| Elev. | Depth | Soil Log |
|---|---|---|
| 867.6 | 0 | |
| | 2 | |
| 865.6 | 4 | |
| | 6 | |
| 863.6 | 8 | |
| | 10 | |
| 859.6 | 12 | |
| | 14 | |
| 851.6 | 16 | |
| | 18 | |
| 847.6 | 20 | |
| | 22 | |
| 843.6 | 24 | |
| | 26 | |
| 839.6 | 28 | |
| | 30 | |
| 835.6 | 32 | |
| | 34 | |
| | 36 | |




10 20 30 40 50 60 70 80 90 100 110 120 130
Capacity "R" in Thousands of Pounds

By [illegible] Date 12-8-61

SHEET 12 of 23 Sheets

State of Ohio
Department of Highways
Testing Laboratory

# DRIVE ROD
# PENETRATION RESISTANCE DATA

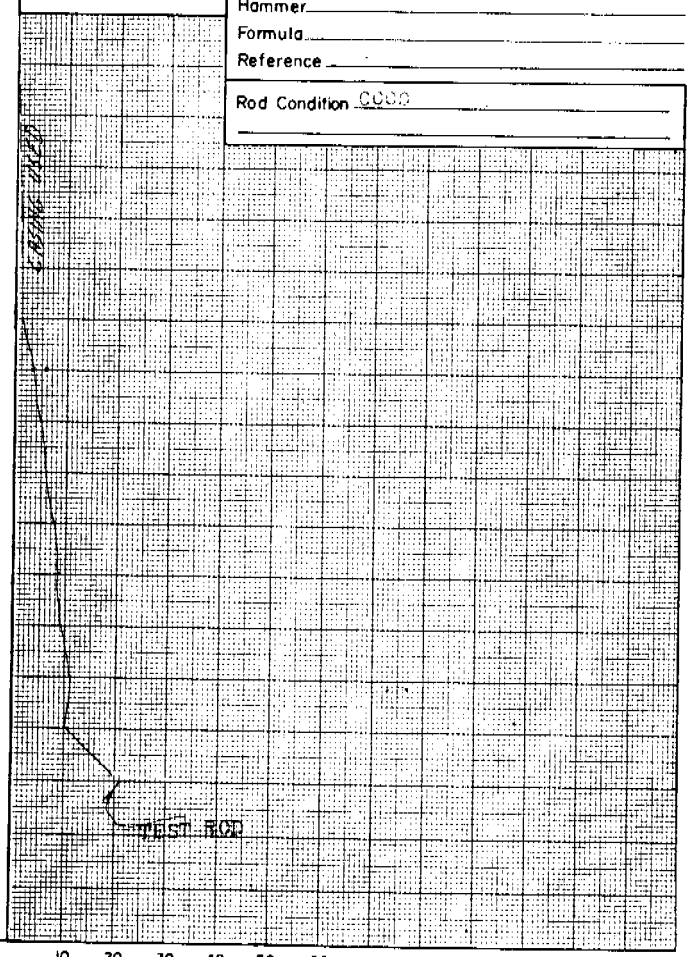
Test Location No. 4
Station & Offset 210+53, 12'Rt
REAR PIER
Surface Elev. 866.5 Water Elev. 851.5

Project Identification HARRISON
HAS-342-0.95
HAS-342-0401
OVER STILLWATER CREEK

Date Completed 10-26-61

Piling
Hammer
Formula
Reference
Rod Condition GOOD

| Elev. | Depth | Soil Log |
|---|---|---|
| 866.5 | 0 | |
| | 2 | |
| 862.5 | 4 | |
| | 6 | |
| 858.5 | 8 | |
| | 10 | |
| 854.5 | 12 | |
| | 14 | |
| 850.5 | 16 | |
| | 18 | |
| 846.5 | 20 | |
| | 22 | |
| 842.5 | 24 | |
| | 26 | |
| 838.5 | 28 | |
| | 30 | |
| 834.5 | 32 | |
| | 34 | |
| | 36 | |




By [illegible] Date [illegible]

SHEET 13 of 23 Sheets

State of Ohio
Department of Highways
Testing Laboratory

# DRIVE ROD
# PENETRATION RESISTANCE DATA

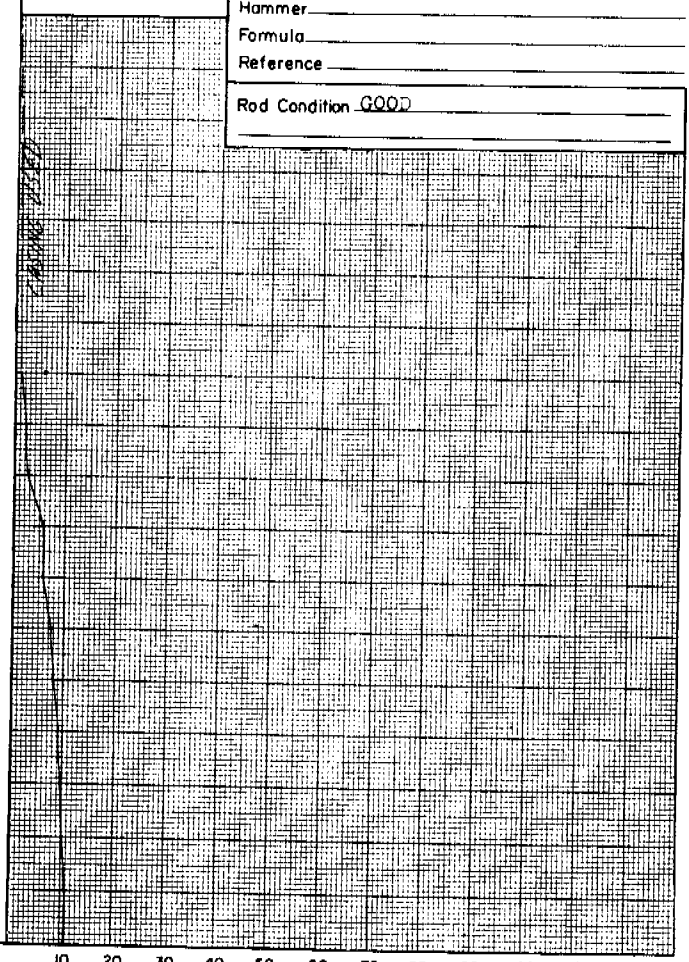
Test Location No. 5
Station & Offset 211+28, 12' Lt
FORWARD PIER
Surface Elev. 868.9 Water Elev. 848.9

Project Identification HARRISON
HAS-342-3.95
HAS-342-0401
OVER STILLWATER CREEK

Date Completed 10-24-61

Piling
Hammer
Formula
Reference
Rod Condition GOOD

| Elev. | Depth | Soil Log |
|---|---|---|
| 868.9 | 0 | |
| | 2 | |
| 864.9 | 4 | |
| | 6 | |
| 860.9 | 8 | |
| | 10 | |
| 856.9 | 12 | |
| | 14 | |
| 852.9 | 16 | |
| | 18 | |
| 848.9 | 20 | |
| | 22 | |
| 844.9 | 24 | |
| | 26 | |
| 840.9 | 28 | |
| | 30 | |
| 836.9 | 32 | |
| | 34 | |
| 832.9 | 36 | |



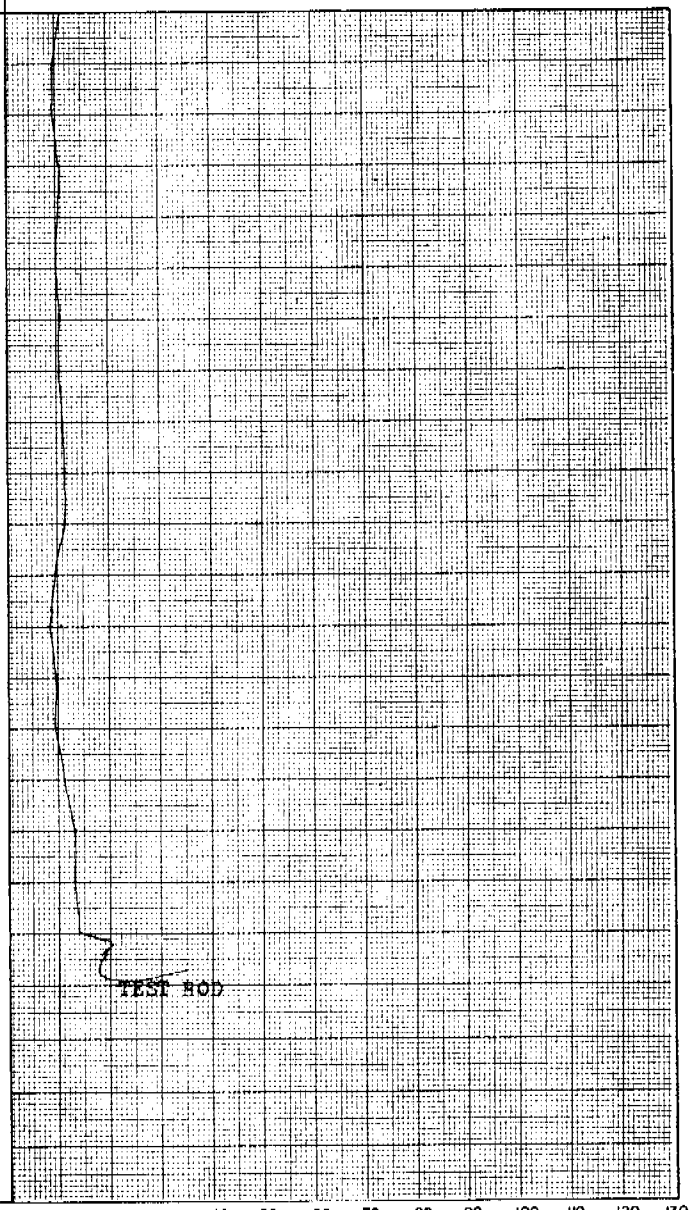

By [illegible] Date 11-8-61

SHEET 14 of 23 Sheets

DRIVE ROD
PENETRATION RESISTANCE DATA (Continued)

Test Location No. 5 Station & Offset 211+22, 12' Lt Project Identification HAC-342-0401

| Elev | Depth | Soil Log |
|---|---|---|
| 832.9 | | |
| | 38 | |
| 828.9 | 40 | |
| | 42 | |
| 824.9 | 44 | |
| | 46 | |
| 820.9 | 48 | |
| | 50 | |
| 816.9 | 52 | |
| | 54 | |
| 812.9 | 56 | |
| | 58 | |
| 808.9 | 60 | |
| | 62 | |
| 804.9 | 64 | |
| | 66 | |
| 800.9 | 68 | |
| | 70 | |
| 796.9 | 72 | |
| | 74 | |
| 792.9 | 76 | |
| | 78 | |
| | 80 | |
| | 82 | |




10 20 30 40 50 60 70 80 90 100 110 120 130

Capacity "R" in Thousands of Pounds

State of Ohio
Department of Highways
Testing Laboratory

# DRIVE ROD
# PENETRATION RESISTANCE DATA

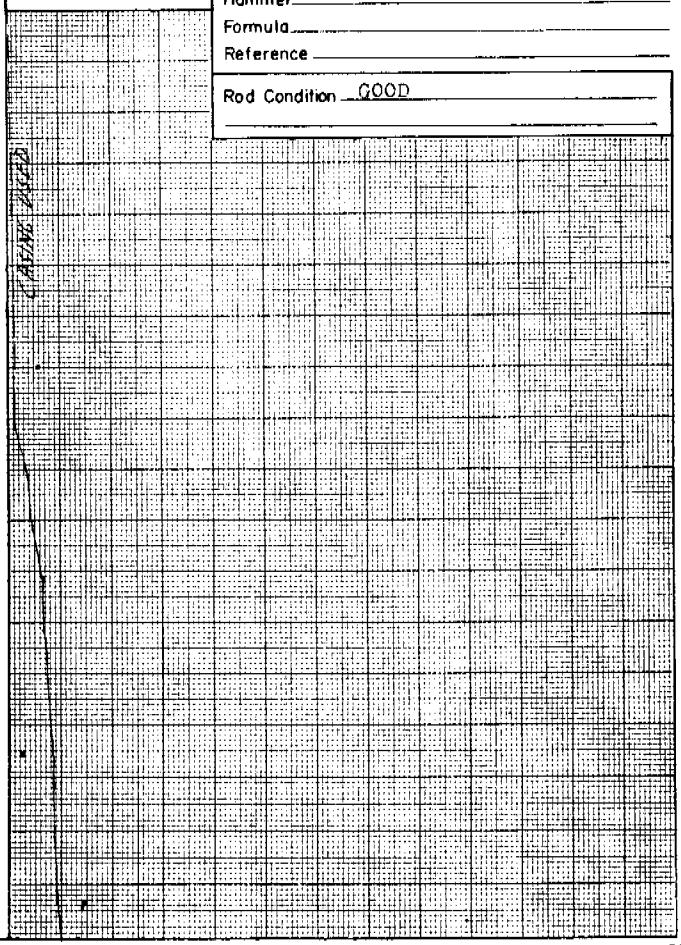
Test Location No. 6
Station & Offset 211+42, 12' Rt
FORWARD PIER
Surface Elev. 869.8 Water Elev. 863.8

Project Identification HARRISON
HAS-342-3.95
HAS-342-0401
OVER STILLWATER CREEK

Date Completed 10-24-61

Piling
Hammer
Formula
Reference
Rod Condition GOOD

| Elev. | Depth | Soil Log |
|---|---|---|
| 869.8 | 0 | |
| | 2 | |
| 865.8 | 4 | |
| | 6 | |
| 861.8 | 8 | |
| | 10 | |
| 857.8 | 12 | |
| | 14 | |
| 853.8 | 16 | |
| | 18 | |
| 849.8 | 20 | |
| | 22 | |
| 845.8 | 24 | |
| | 26 | |
| 841.8 | 28 | |
| | 30 | |
| 837.8 | 32 | |
| | 34 | |
| 833.8 | 36 | |



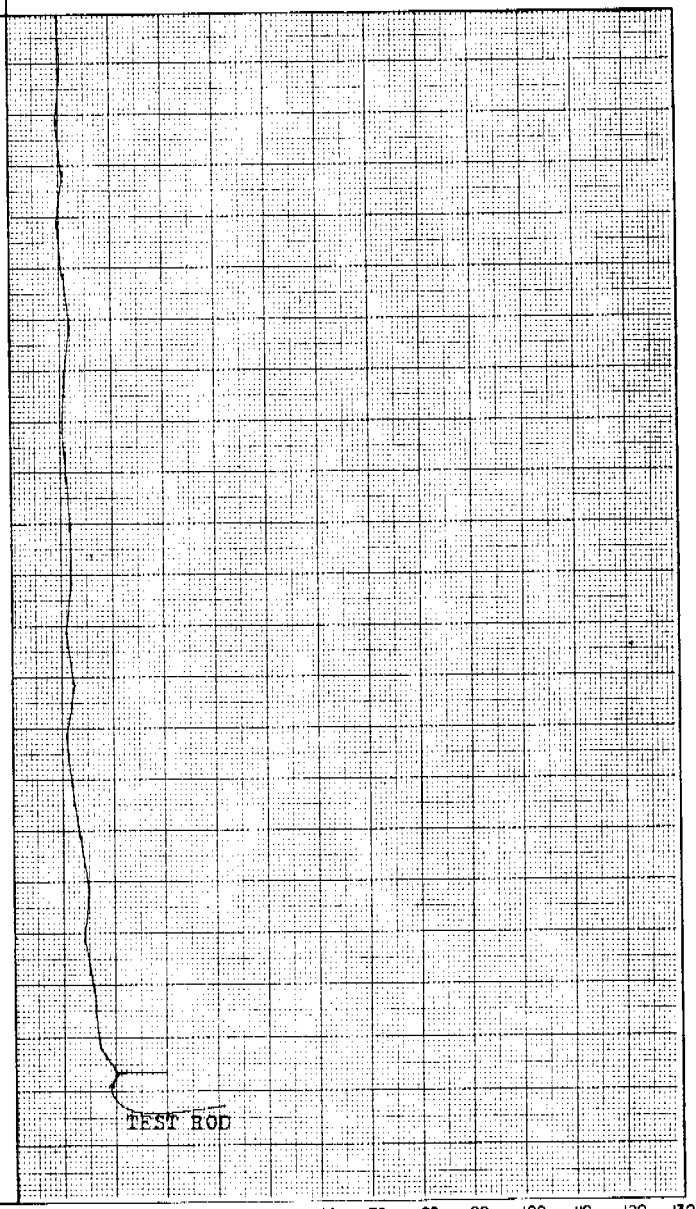

By [illegible] Date 12-8-61

SHEET 16 of 23 Sheets

DRIVE ROD
PENETRATION RESISTANCE DATA (Continued)

Test Location No. 6 Station & Offset 211+42, 23' Rt. Project Identification HAS-342-0401

| Elev. | Depth | Soil Log |
|---|---|---|
| 833.8 | | |
| | 38 | |
| 829.8 | 40 | |
| | 42 | |
| 825.8 | 44 | |
| | 46 | |
| 821.8 | 48 | |
| | 50 | |
| 817.8 | 52 | |
| | 54 | |
| 813.8 | 56 | |
| | 58 | |
| 809.8 | 60 | |
| | 62 | |
| 805.8 | 64 | |
| | 66 | |
| 801.8 | 68 | |
| | 70 | |
| 797.8 | 72 | |
| | 74 | |
| 793.8 | 76 | |
| | 78 | |
| 789.8 | 80 | |
| | 82 | |



State of Ohio
Department of Highways
Testing Laboratory

# DRIVE ROD
# PENETRATION RESISTANCE DATA

Test Location No. 7
Station & Offset 211+91, 12' Lt
FORWARD ABUTMENT
Surface Elev. 872.2 Water Elev. 868.2

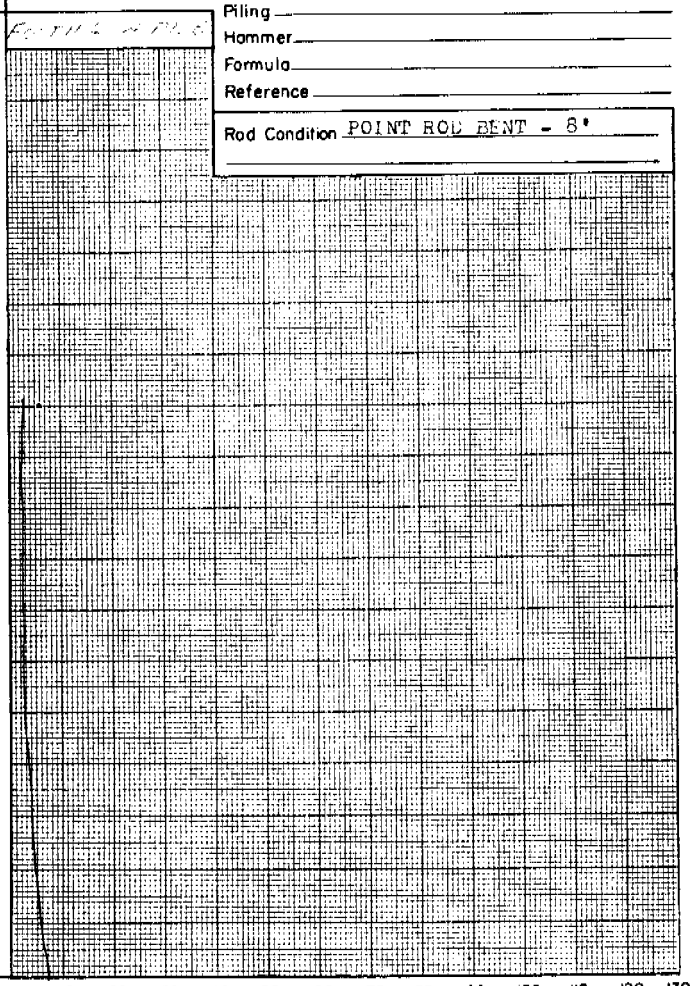
Project Identification HARRISON
HAS-342-3.95
HAS-342-0401
OVER STILLWATER CREEK

Date Completed 10-27-61

Piling
Hammer
Formula
Reference

Rod Condition POINT ROD BENT - 8"

| Elev. | Depth | Soil Log |
|---|---|---|
| 882.0 | 0 | |
| | 2 | |
| 878.0 | 4 | |
| | 6 | |
| 874.0 | 8 | |
| | 10 | |
| 870.0 | 12 | |
| | 14 | |
| 866.0 | 16 | |
| | 18 | |
| 862.0 | 20 | |
| | 22 | |
| 858.0 | 24 | |
| | 26 | |
| 854.0 | 28 | |
| | 30 | |
| 850.0 | 32 | |
| | 34 | |
| 846.0 | 36 | |



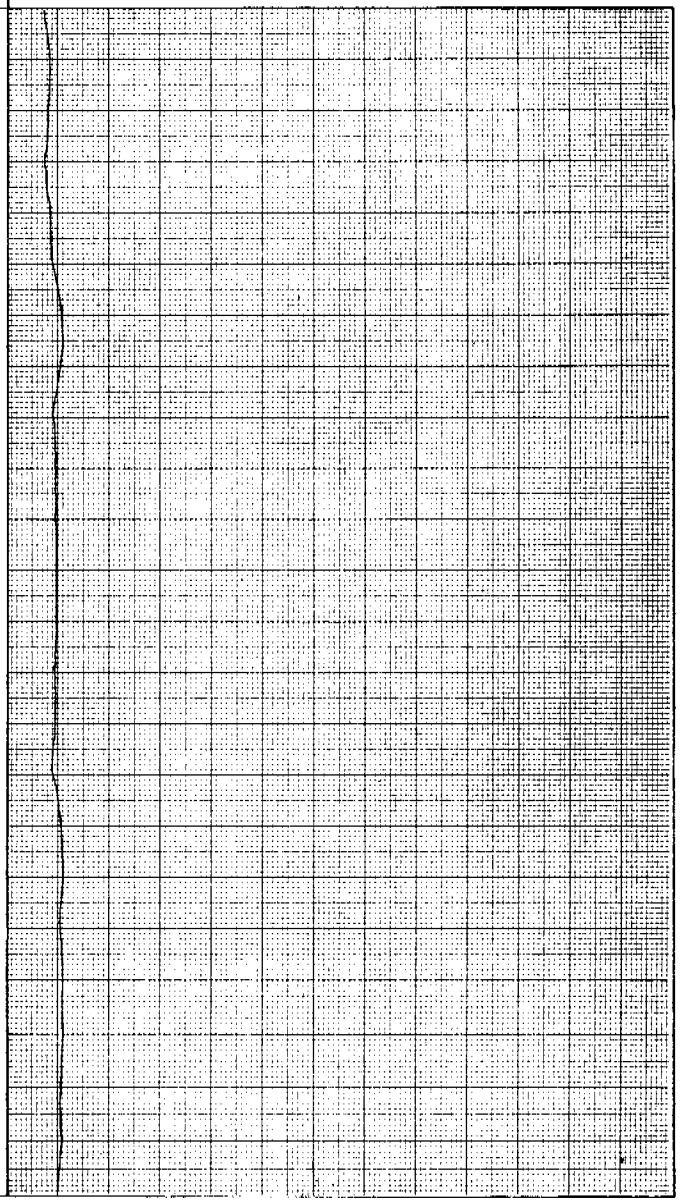

By [illegible] Date 12-8-61

SHEET 18 of 23 Sheets

DRIVE ROD
PENETRATION RESISTANCE DATA (Continued)

Test Location No. 7 Station & Offset 211+91, 12' Lt Project Identification HAS-342-0401

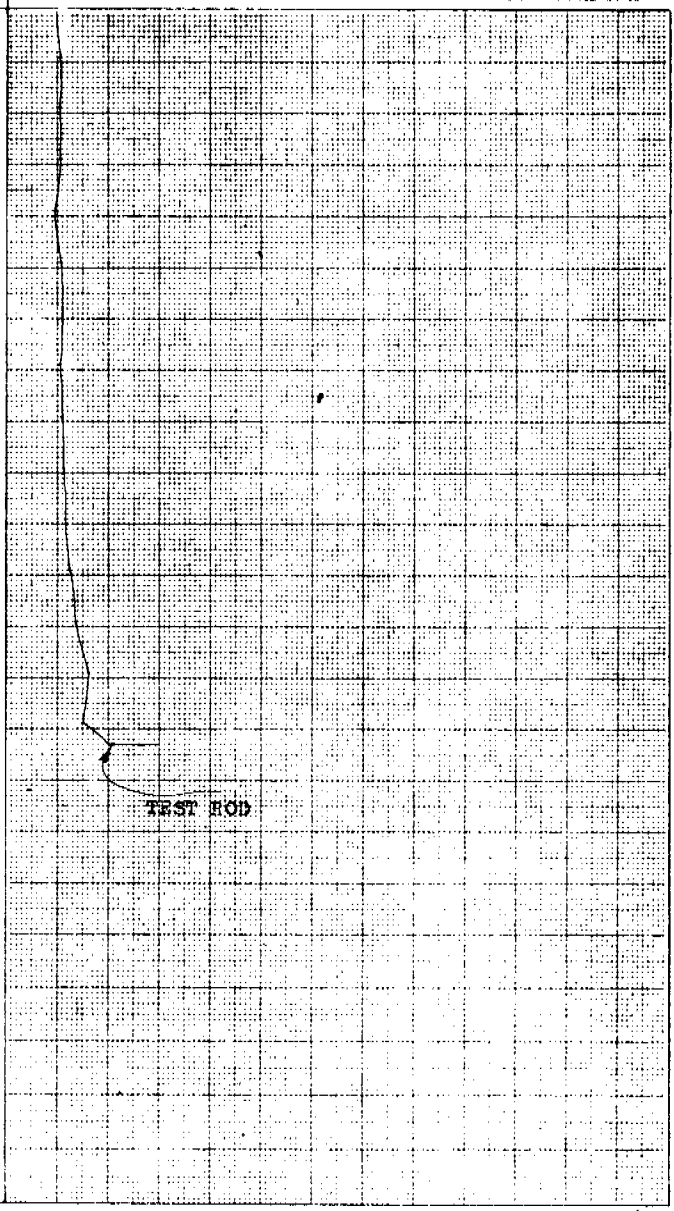
| Elev. | Depth | Soil Log |
|---|---|---|
| 846.0 | | |
| | 38 | |
| 842.0 | 40 | |
| | 42 | |
| 838.0 | 44 | |
| | 46 | |
| 834.0 | 48 | |
| | 50 | |
| 830.0 | 52 | |
| | 54 | |
| 826.0 | 56 | |
| | 58 | |
| 822.0 | 60 | |
| | 62 | |
| 818.0 | 64 | |
| | 66 | |
| 814.0 | 68 | |
| | 70 | |
| 810.0 | 72 | |
| | 74 | |
| 806.0 | 76 | |
| | 78 | |
| 802.0 | 80 | |
| | 82 | |



FOUNDATION DATA (Continued)

Boring No 7 Station & Offset 211+91, 12'Lt Project Identification HAS-342-0401

| Elev | Depth | Soil Log |
|---|---|---|
| 798.0 | 84 | |
| | 86 | |
| 794.0 | 88 | |
| | 90 | |
| 790.0 | 92 | |
| | 94 | |
| 786.0 | 96 | |
| | 98 | |
| 782.0 | 100 | |
| | 102 | |
| 778.0 | 104 | |
| | 106 | |
| 774.0 | 108 | |
| | 110 | |
| 770.0 | 112 | |
| | 114 | |
| | 116 | |
| | 118 | |
| | 120 | |
| | 122 | |
| | 124 | |
| | 126 | |
| | 128 | |



State of Ohio
Department of Highways
Testing Laboratory

# DRIVE ROD
# PENETRATION RESISTANCE DATA

Test Location No. 8
Station & Offset 212+11.6 12' Rt.
FORWARD ABUTMENT
Surface Elev. 872.3 Water Elev. 862.5

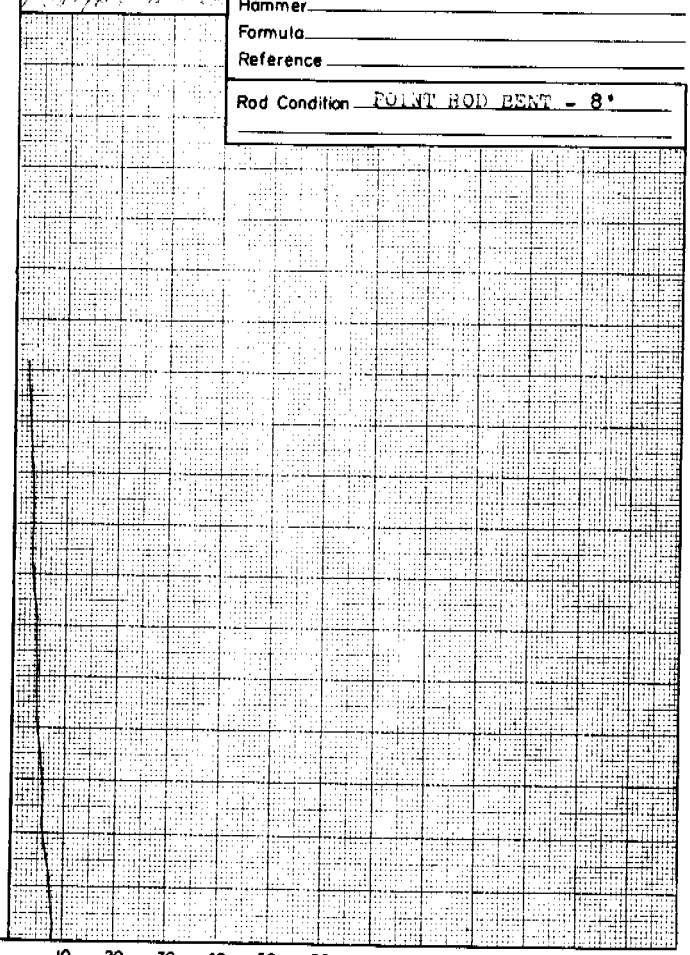
Project Identification HARRISON
HAS-342-3.95
HAS-342-0401
OVER STILLWATER CREEK

Date Completed 10-26-61

Piling
Hammer
Formula
Reference

Rod Condition POINT ROD BENT - 8°

| Elev. | Depth | Soil Log |
|---|---|---|
| 882.0 | 0 | |
| | 2 | |
| 878.0 | 4 | |
| | 6 | |
| 874.0 | 8 | |
| | 10 | |
| 870.0 | 12 | |
| | 14 | |
| 866.0 | 16 | |
| | 18 | |
| 862.0 | 20 | |
| | 22 | |
| 858.0 | 24 | |
| | 26 | |
| 854.0 | 28 | |
| | 30 | |
| 850.0 | 32 | |
| | 34 | |
| 846.0 | 36 | |



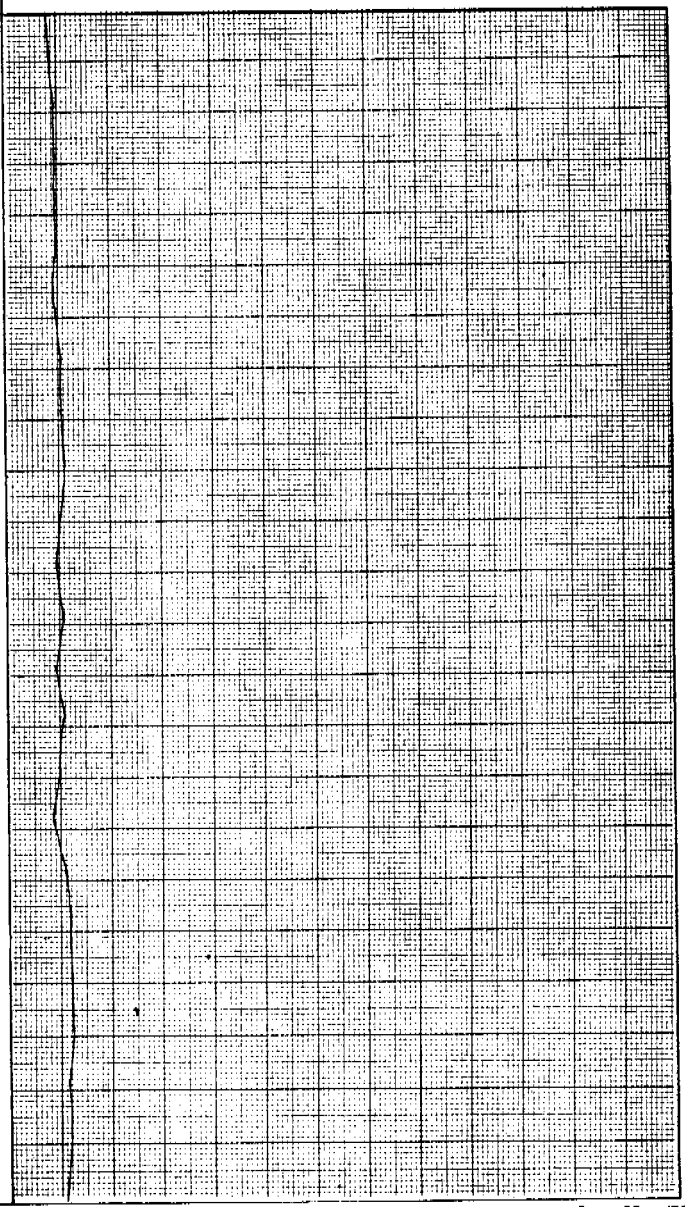

By L.H.W. Date 10-26-61

SHEET 21 of 23 Sheets

DRIVE ROD
PENETRATION RESISTANCE DATA (Continued)

Test Location No. 8 Station & Offset 212+11, 12' Rt Project Identification HAS-342-0401

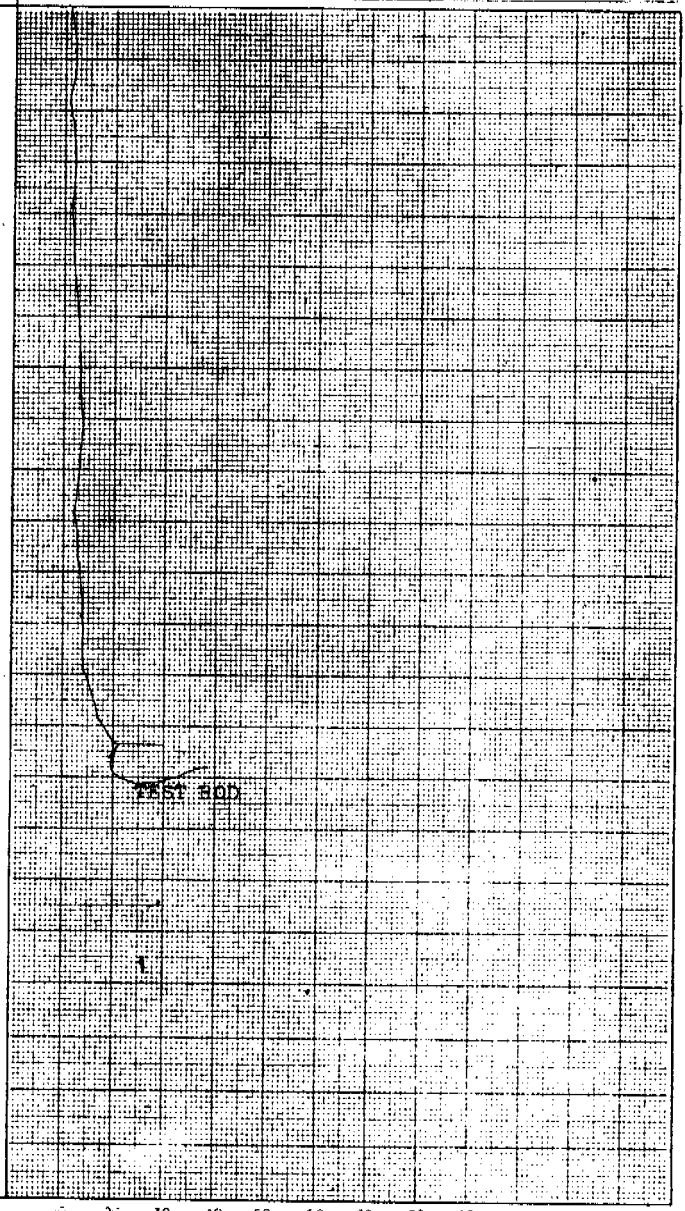
| Elev. | Depth | Soil Log |
|---|---|---|
| 846.0 | | |
| | 38 | |
| 842.0 | 40 | |
| | 42 | |
| 838.0 | 44 | |
| | 46 | |
| 834.0 | 48 | |
| | 50 | |
| 830.0 | 52 | |
| | 54 | |
| 826.0 | 56 | |
| | 58 | |
| 822.0 | 60 | |
| | 62 | |
| 818.0 | 64 | |
| | 66 | |
| 814.0 | 68 | |
| | 70 | |
| 810.0 | 72 | |
| | 74 | |
| 806.0 | 76 | |
| | 78 | |
| 802.0 | 80 | |
| | 82 | |



FOUNDATION DATA (Continued)

Boring No 8 Station & Offset 212+11, 12'Rt Project Identification HAS-342-0401

| Elev | Depth | Soil Log |
|---|---|---|
| 798.0 | 84 | |
| | 86 | |
| 794.0 | 88 | |
| | 90 | |
| 790.0 | 92 | |
| | 94 | |
| 786.0 | 96 | |
| | 98 | |
| 782.0 | 100 | |
| | 102 | |
| 778.0 | 104 | |
| | 106 | |
| 774.0 | 108 | |
| | 110 | |
| 770.0 | 112 | |
| | 114 | |
| | 116 | |
| | 118 | |
| | 120 | |
| | 122 | |
| | 124 | |
| | 126 | |
| | 128 | |




SHEET 23 of 23 Sheets

STATE OF OHIO

DEPARTMENT OF HIGHWAYS

TESTING LABORATORY

FOUNDATION EXPLORATION SECTION

Structure Foundation Investigation

HAS-342-0401

OVER STILLWATER CREEK

## GEOLOGY OF THE SITE

The structure site is located on the flood plain, at the base of the west valley wall of Stillwater Creek, over the buried valley wall of the Deep Stage Urichsville Creek. Valley fill, found to be 20 to at least 100 feet deep, overlies shale, sandstone, and limestone bedrock, of Pennsylvanian age.

## EXPLORATION

The exploration consisted of one drive sample-core boring and one drive sample boring, made between November 15 and 22, 1961, and eight drive rod penetration tests, made between October 24 and 26, 1961.

## INVESTIGATIONAL FINDINGS

Boring B-1, in the rear portion of the site, disclosed moist to very moist, loose to dense and stiff to hard, slightly plastic sandy silts, clayey silts and silty clays with occasional gravel to 21-foot depth, elevation 861 feet, where extremely weathered bedrock surface was encountered.

Boring B-6, in the forward portion of the site, disclosed moist to wet, very loose to dense, slightly plastic sandy silts, gravelly sands and sandy clays with occasional organic material to 81-foot depth, elevation 789 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 in the rear portion of the site, cased to proposed footing elevation at the pier location, met increasing resistance to penetration with increase in depth, and were terminated upon encounter with refusal or near refusal to penetration on what is considered to be hard bedrock surface, at the rear abutment and pier areas, 23 to 31 feet below ground surface, elevations 858 to 837 feet, after penetrating as much as four feet of soft weathered shale bedrock.

Rod soundings in the forward portion of the site, with soundings 5 and 6 cased to proposed footing elevation, met very gradually increasing resistance to penetration with increase in depth, and were terminated upon encounter with refusal or near refusal to penetration 72 to 101 feet below ground surface, elevations 796 to 771 feet, on the basis of the borings, considered to be in dense silts and sands.

STATE OF OHIO

DEPARTMENT OF HIGHWAYS

TESTING LABORATORY

FOUNDATION EXPLORATION SECTION

Structure Foundation Investigation

HAS-342-0401

OVER STILLWATER CREEK (Cont'd)

On the basis of tests, bedrock surface is considered to slope sharply downward from rear to forward, between elevations 861 and as deep as 771 feet.

Free water was observed in all the rod sounding holes, between elevations 868 and 849 feet.

STATE OF OHIO

DEPARTMENT OF HIGHWAYS

TESTING LABORATORY

FOUNDATION EXPLORATION SECTION

## FOUNDATION INVESTIGATIONAL PROCEDURES

### 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.

3 File

Sheet No. 1 of ___

FOUNDATION EXPLORATION SECTION

SUBSURFACE INVESTIGATION RECONNAISSANCE REPORT

RECONNAISSANCE OF:

Roadway ___

Bridge X

Retaining Wall ___

Other ___; If other, specify ___

PROJECT: HAS-342 0401

BRIDGE NO.: ___

RECONN. BY: N. P. LEHART

DATES: from ___ to 10-19-61

NOTE: In preparing the reconnaissance report, the above entries shall be completed. In accordance with instructions to reconnaissance personnel the report shall include the following:

1. Description of Work.
2. Geology of Location or Site.
3. Topography
4. General Subsurface conditions.
5. Schedule of Borings.
6. Sketches of Water Points
7. Sketches of off-plan access
8. Listing of Special Equipment Required.

Sheet No.___ of___

FOUNDATION EXPLORATION SECTION

SUBSURFACE INVESTIGATION RECONNAISSANCE REPORT

This project deals with a minor alignment change and replacement of the existing portable panel bridge which spans Stillwater Creek. The job is located about 1 mile northwest of Freeport on SR 342 in the southwest portion of Harrison County. About 1000 feet of roadway will be relocated for tangent approaches to the proposed 3 span structure. This new bridge will have station limits of 226.88 feet from 209+78 to 212+05.

This job is located in the Stillwater Creek valley in the highly dissected Allegheny Plateau just west of the Flushing Escarpment and lying at an elevation of about 870 feet. Stillwater Creek was a minor Deep Stage Stream which was in glacial times filled to a depth of about 20 feet mud sediments.

An Abandoned sandstone quarry is located ½ mile north of the project on the west side of the road and was operated by the Freeport Quarries Company. About 20 feet of sandstone face is present and this is probably the Buffalo sandstone of the Conemaugh formation. Local coal horizons and variegated shales are present beneath the sandstone member. This sandstone is a cliff former in many location along the course of the Stillwater creek.

At about Station 210+50 a small section of bank has begun to slip forming a fracture about 6 inches wide at the break and moving into the stream channel.

Sheet No.___ of___

FOUNDATION EXPLORATION SECTION

SUBSURFACE INVESTIGATION RECONNAISSANCE REPORT

Topography is well developed in this region. Much of the steepslope or cliff condition is due to the Buffalo sandstone which outcrops along the creek and which lies at an elevation of about 890 feet. Stillwater Creek which occupies a minor buried valley now originates at Piedmont Dam as spillwater. The dam is located near the Harrison-Belmont County line.

Subsurface materials are probably of silty clay somewhat sandy in nature and are probably about 20 feet in thickness. Bedrock conditions should be relatively flat and of clay shale varegated in color and some local coal horizons.

Water is available at the project and no special equipment is needed. Core Borings at #1 and 8 stations are suggested and all locations should be tested by drive Rods. Private property clearance should be obtained.