

SOIL PROFILE PROJECT MAH - 18 - 0.91 MILTON TOWNSHIP

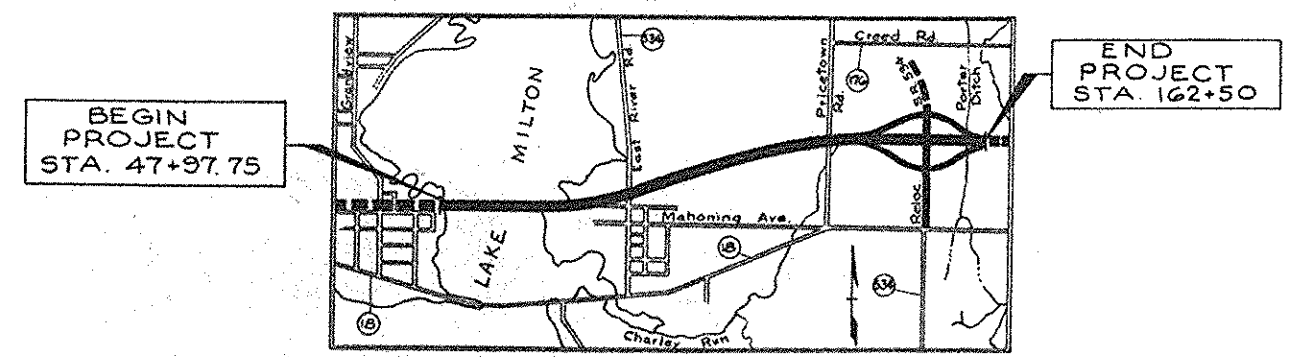
FED. NR 1-805 7(11) 213

NOTE:
INFORMATION SHOWN BY THIS SUBGRADE PROFILE WAS OBTAINED SOLELY FOR USE IN ESTABLISHING DESIGN CONTROLS FOR THE PROJECT. THE STATE OF OHIO DOES NOT GUARANTEE THE ACCURACY OF THIS DATA AND IT IS NOT TO BE CONSTRUED AS A PART OF THE PLANS GOVERNING CONSTRUCTION OF THE PROJECT.

DESCRIPTION	AVERAGE RESULTS OF TESTS							LIQUID LIMIT	PLASTICITY INDEX	WATER CONTENT	SAMPLES TESTED
	H.R.B. CLASS	OHIO CLASS	% AGG.	% C SAND	% F SAND	% SILT	% CLAY				
GRAVEL WITH SAND	A-1-b(0)	A-1-b	51	15	13	19	2	22	4	16	2
FINE SAND	A-3(0)	A-3	5	31	57	5	2	N.P.	N.P.	14	2
COURSE & FINE SAND	A-3(0)	A-3a	4	23	40	29	4	29	3	14	3
GRAVEL, SAND & SILT	A-2-4(0)	A-2-4	33	11	22	32	2	25	5	16	2
SANDY SILT	A-4(5)	A-4a	12	4	25	48	12	23	5	14	8
SILT	A-4(7)	A-4b	2	7	9	66	16	29	8	21	7
SILT & CLAY	A-6(3)	A-6a	15	7	9	48	21	34	12	20	13
SILTY CLAY	A-6(7)	A-6b	5	10	10	46	29	40	17	21	1
CLAY	A-7-6(6)	A-7-6	3	3	6	54	34	46	23	19	5
TOPSOIL	CLASSIFIED BY VISUAL INSPECTION										
SANDSTONE	CLASSIFIED BY VISUAL INSPECTION										
SHALE	CLASSIFIED BY VISUAL INSPECTION										

ALGER BORINGS PLOTTED TO VERTICAL SCALE ONLY.	AUGER BORING-PLAN VIEW
TOPSOIL = TS-X=APPROXIMATE DEPTH	WATER CONTENT NEARLY EQUAL TO OR GREATER THAN LIQUID LIMIT.
BERM MATERIAL	GROUND WATER ELEVATION

NOTE: FIGURES BESIDE BORINGS INDICATE MOISTURE CONTENT IN PERCENT

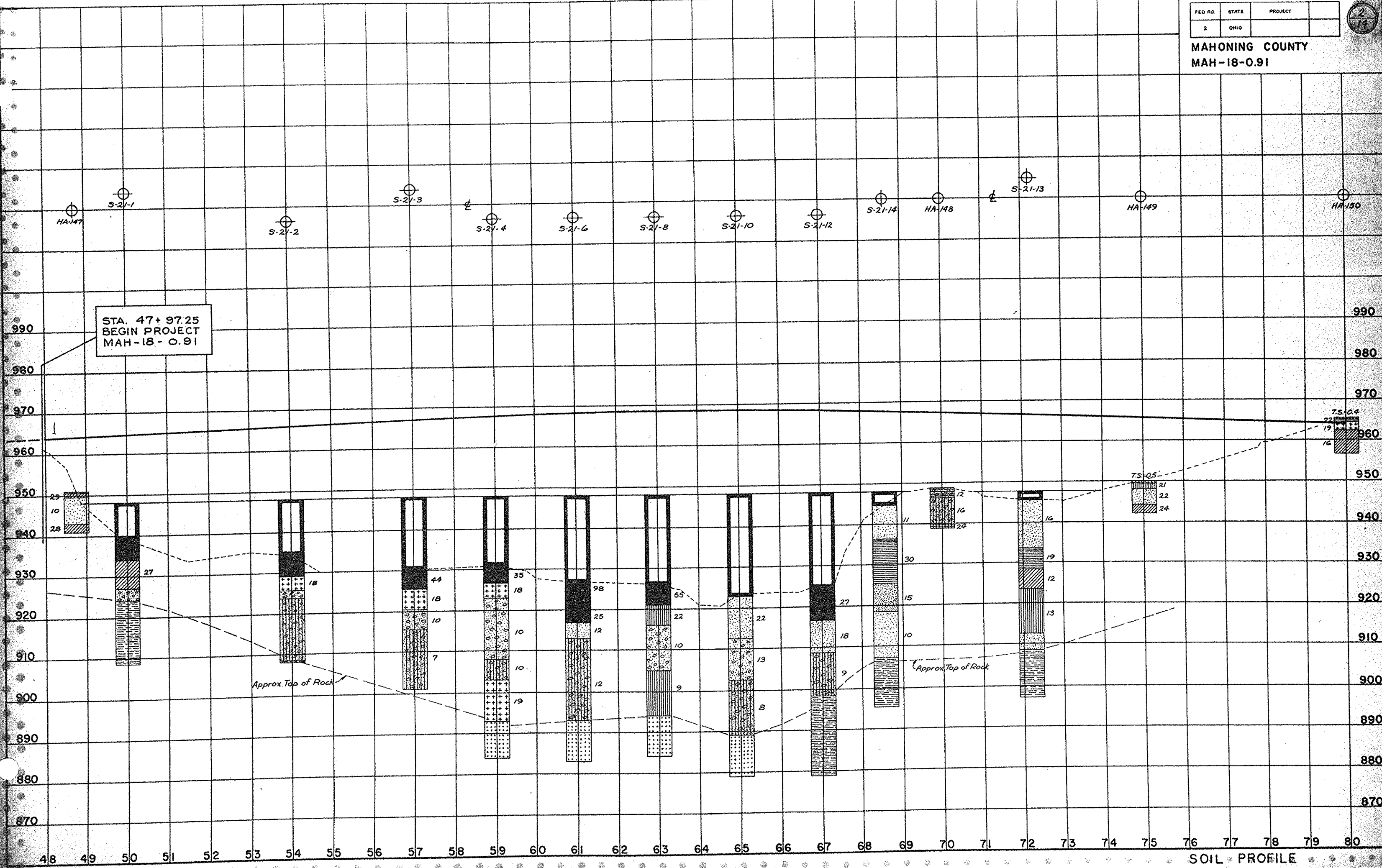


-LOCATION PLAN-

FED. RD.	STATE	PROJECT
2	OHIO	

2
14

MAHONING COUNTY
MAH-18-0.91



STA. 47+97.25
BEGIN PROJECT
MAH-18-0.91

Approx. Top of Rock

Approx. Top of Rock

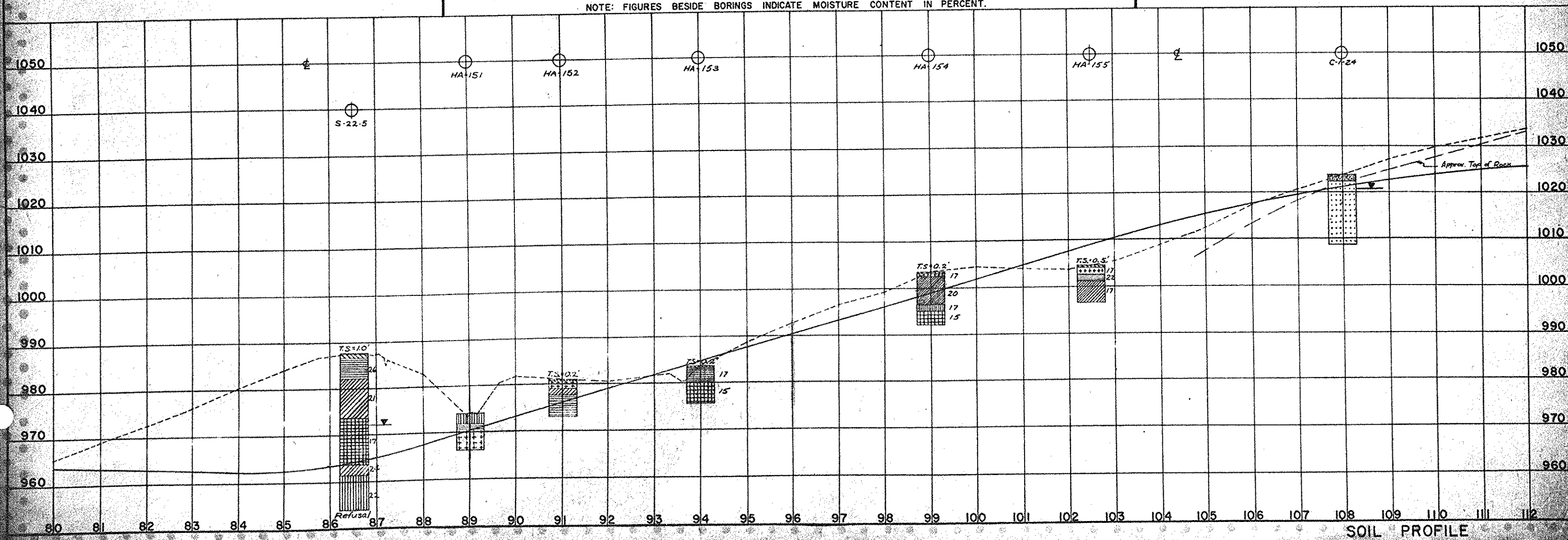
SOIL PROFILE

LEGEND FOR PROJECT — AVERAGE RESULTS OF TESTS — SAMPLES TESTED

DESCRIPTION	H.R.B. CLASS	OHIO CLASS	% A.G.G.	% C. SAND	% F. SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	WATER CONTENT	SAMPLES TESTED
GRAVEL WITH SAND	A-1-b(0)	A-1-b	51	15	13	19	2	22	4	16	2
FINE SAND	A-3(0)	A-3	5	31	57	5	2	N.P.	N.P.	14	2
COURSE & FINE SAND	A-3-(0)	A-3a	4	23	40	29	4	29	3	14	3
GRAVEL, SAND & SILT	A-2-4(0)	A-2-4	33	11	22	32	2	25	5	16	2
SANDY SILT	A-4(5)	A-4a	12	4	25	48	12	23	5	14	8
SILT	A-4(7)	A-4b	2	7	9	66	16	29	8	21	7
SILT & CLAY	A-6(3)	A-6a	15	7	9	48	21	34	12	20	13
SILTY CLAY	A-6(7)	A-6b	5	10	10	46	29	40	17	21	1
CLAY	A-7-6(6)	A-7-6	3	3	6	54	34	46	23	19	5
TOPSOIL	CLASSIFIED BY VISUAL INSPECTION										
SANDSTONE	CLASSIFIED BY VISUAL INSPECTION										
SHALE	CLASSIFIED BY VISUAL INSPECTION										

- AUGER BORINGS PLOTTED TO VERTICAL SCALE ONLY.
- AUGER BORING — PLAN VIEW
- TOPSOIL = TS=X=APPROXIMATE DEPTH
- WATER CONTENT NEARLY EQUAL TO OR GREATER THAN LIQUID LIMIT.
- BERM MATERIAL
- GROUND WATER ELEVATION

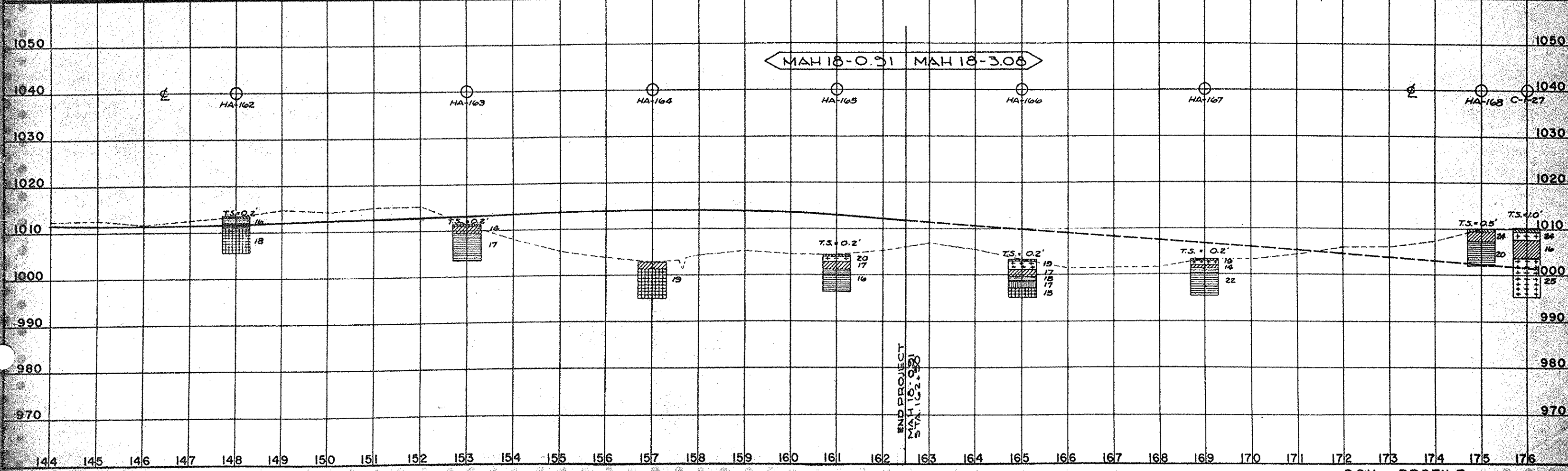
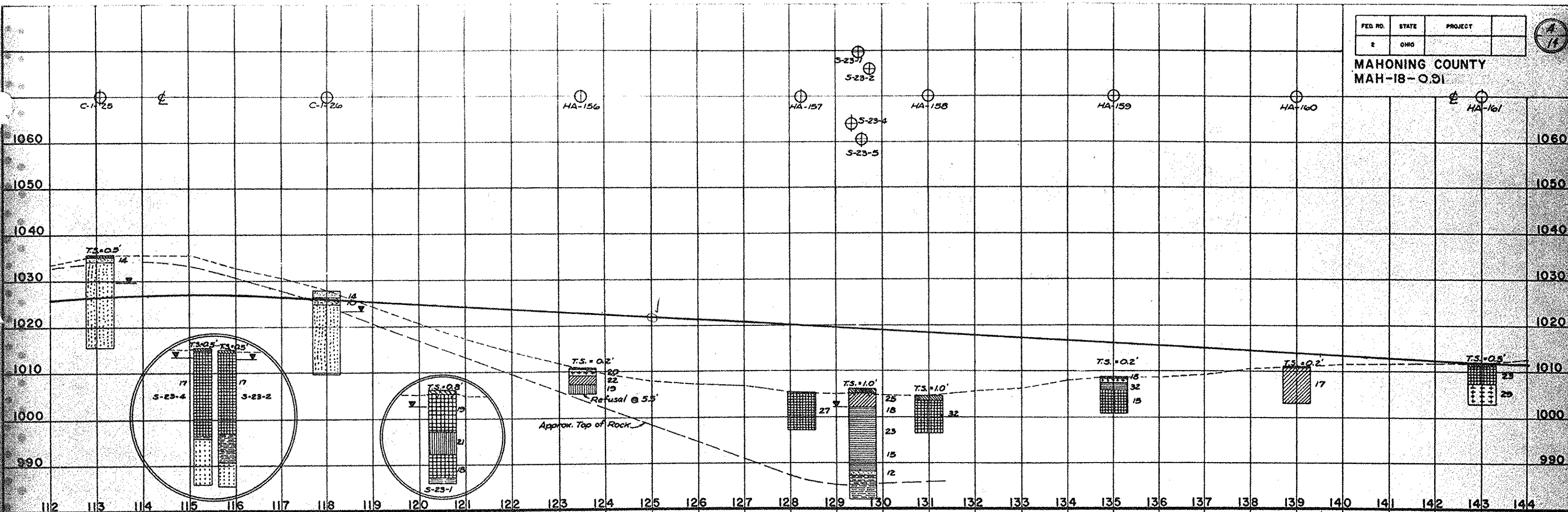
NOTE: FIGURES BESIDE BORINGS INDICATE MOISTURE CONTENT IN PERCENT.



FED. RD.	STATE	PROJECT
2	OHIO	






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MAHONING COUNTY
MAH-18-0.91














MAH-18-091

LEGEND

-  PRESS AND/OR DRIVE SAMPLE AND/OR CORE BORING PLAN VIEW.
-  HORIZONTAL BAR ON LOG INDICATES THE DEPTH THE SAMPLE WAS TAKEN.
- S-RG-1 INDICATES PRESS AND/OR DRIVE SAMPLE AND/OR CORE BORING.
- X-Y FIGURES TO THE RIGHT OF BORING LOG IN PROFILE VIEW INDICATES THE NUMBER OF BLOWS FOR "STANDARD PENETRATION" TEST.
X = FIRST 6 INCHES.
Y = SECOND 6 INCHES.
- TR_ TOP OF ROCK.
- FOOTING 
- TD_ TOTAL DEPTH.
- FOOTING ON PILE 
- W_ INDICATES FREE WATER ELEVATION.
- INDICATES STATIC WATER ELEVATION 

SYMBOLS OF ROCK TYPES

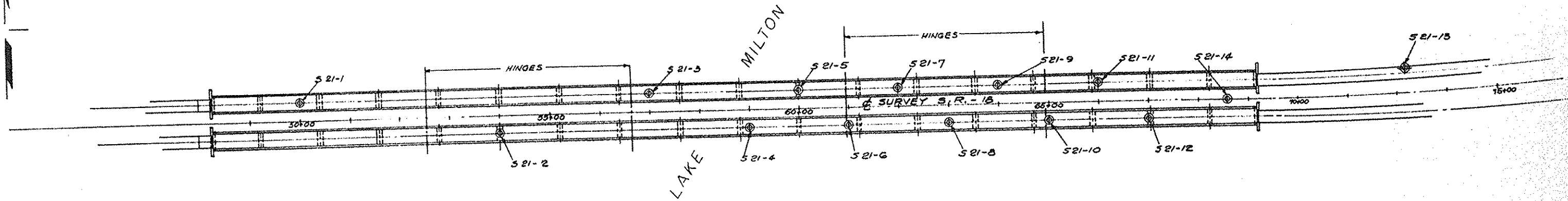
-  COAL
-  WEATHERED SANDSTONE
-  WEATHERED, INDURATED CLAY
-  SANDSTONE
-  INDURATED CLAY
-  LEACHED DOLOMITE.
-  WEATHERED SHALE
-  DOLOMITE
-  SHALE
-  LEACHED LIMESTONE
-  LIMESTONE.

STATE OF OHIO DEPARTMENT OF HIGHWAYS BUREAU OF BRIDGES						
BEISWENGER & HOCH, Consulting Engineers AKRON, OHIO						
STRUCTURE FOUNDATION INVESTIGATION LEGEND AND ROCK TYPES MAH-18-091 MAHONING COUNTY						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REV
	JK					

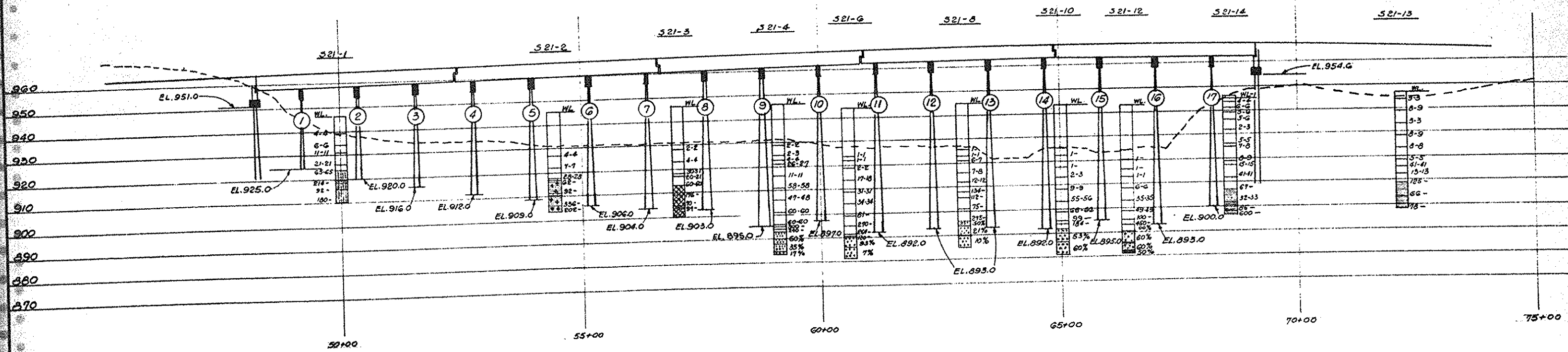
FED. RD.	STATE	PROJECT
3	OHIO	

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MAH-18-0.91.



NOTE: THE FOLLOWING BORINGS HAVE BEEN ELIMINATED:
 S 21-5
 S 21-7
 S 21-9
 S 21-11



STATE OF OHIO DEPARTMENT OF HIGHWAYS BUREAU OF BRIDGES						
BEISWENGER & HOCH, Consulting Engineers AKRON, OHIO						
STRUCTURE FOUNDATION INVESTIGATION BRIDGE NO. MAH-18-0117 L. & R. OVER LAKE MILTON MAHONING COUNTY STA 48+22.75 TO STA 69+17.25						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	JK					

LOG OF BORING
 DATE: DEC 7-1956 SAMPLER TYPE: S.S. DIA. 2" O.D.
 BORING NO: S 21-10 CASING LENGTH: 52'7" DIA. 4"
 STA. & OFFSET: STA 65+00 31' RT.
 SURFACE ELEV. WATER ELEV. 943.5

ELEV.	DEPTH	STD. PEN N	DESCRIPTION	
943.5	0		LAKE LEVEL	
	2		WATER	
	4			
	6			
	8			
	10			
	12			
	14			
	16			
925.5	18	110"		LOOSE VERY FINE VERY SILTY GREY SAND.
	20	112"		
	24	3/2"		
	28			
914.5	30	10 1/2"	FIRM MEDIUM GREY AND BROWN SAND AND GRAVEL, FEW SANDSTONE FRAGMENTS.	
910.5	32	11 1/2"	VERY COMPACT GREY COARSE SAND AND GRAVEL, TRACE OF SILT.	
906.5	36			
	40	13 1/2"	VERY COMPACT SANDY GREY SILT, LITTLE GRAVEL SOME SHALE AND SANDSTONE FRAGMENTS.	
	42			
	44	115 1/2"		
	46			
	48			
	50	92 1/2"		
890.9	52	42 1/2"	GREY SANDSTONE AND SHALE, CORED---60" REC.---32"	
	54			
885.9	56	53%	GREY SANDSTONE CORED---60" REC.---36"	
	58			
880.9	60	60%		
	62			
	64			

LOG OF BORING
 DATE: DEC 7-1956 SAMPLER TYPE: S.S. DIA. 2" O.D.
 BORING NO: S 21-13 CASING LENGTH: 38'0" DIA. 3"
 STA. & OFFSET: STA. 72+20 50' LT.
 SURFACE ELEV. WATER ELEV. 946.9

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
946.9	0		LAKE LEVEL
944.9	2		WATER
	4	8 1/2"	LOOSE FINE TO MEDIUM BROWN SAND SOME SILT.
939.9	6		
	8	11 1/2"	FIRM MEDIUM BROWN CLAYEY SAND, TRACE OF GRAVEL.
934.9	10		
	12	6 1/2"	SOFT GREY SILTY CLAY, LARGE GRAVEL.
929.9	14		
	16		FIRM SANDY GREY SILT AND GRAVEL.
924.9	18	11 1/2"	
	20		FIRM TO COMPACT VERY FINE TO MEDIUM SILTY GREY SAND AND GRAVEL, FEW SHALE FORMATIONS.
	22	14 1/2"	
	24		
	26	10 1/2"	
	28	22 1/2"	
	30		
	32	26 1/2"	SOFT ROTTEN GREY CLAY SHALE.
909.9	34		
	36	125 1/2"	
	40		
	42	66 1/2"	
	44		
898.4	46	70 1/2"	
	48		
	50		

LOG OF BORING
 DATE: DEC 7-1956 SAMPLER TYPE: S.S. DIA. 2" O.D.
 BORING NO: S 21-12 CASING LENGTH: 50'0" DIA. 3"
 STA. & OFFSET: STA. 67+00 31' RT.
 SURFACE ELEV. WATER ELEV. 943.1

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
943.1	0		LAKE LEVEL
	2		WATER
	4		
	6		
	8		
	10		
	12		
	14		
	16		
	18		
924.9	20	1 1/2"	
	22	1 1/2"	
	24	2 1/2"	
914.1	26		
	28		LOOSE FINE SILTY GREY SAND AND GRAVEL, SHALE FRAGMENTS.
909.1	30	7 1/2"	
	32		COMPACT SANDY AND GRAVELLY GREY SILT, SOME BUILDERS AND SHALE, SANDSTONE FORMATIONS.
	34	10 1/2"	
	36		
	38		
	40	98 1/2"	
	42		
	44	100 1/2"	
	46		
893.1	48	90 1/2"	VARY COMPACT SAND, CORED---36" REC.---00"
890.1	50	10 1/2"	
	52	00%	GREY SANDY SHALE, CORED---60" REC.---36"
885.1	54		
	56	60%	GREY SANDY SHALE, CORED---48" REC.---29"
881.1	58		
870.7	60	60%	GREY SANDY SHALE WITH CLAY SHALES, CORED---12" REC.---0"
	62		
	64	70 1/2"	

LOG OF BORING
 DATE: DEC 7-1956 SAMPLER TYPE: S.S. DIA. 2" O.D.
 BORING NO: S 21-14 CASING LENGTH: 38'0" DIA. 3"
 STA. & OFFSET: STA. 68+58 ON E
 SURFACE ELEV. WATER ELEV. 945.0

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
946.0	0		
	2	8 1/2"	LOOSE MEDIUM CLAYEY BROWN SAND AND GRAVEL.
	4	12 1/2"	
	6	11 1/2"	
937.5	8		MEDIUM GREY SANDY CLAY, SILT LENSES.
	10	11 1/2"	
	12		SOFT GREY SILT WITH CLAY LENSES
932.5	14	5 1/2"	
	16		
	18		FIRM EXTREMELY FINE SILTY GREY SAND.
926.7	20	12 1/2"	
925.0	22	18 1/2"	FIRM FINE TO MEDIUM GREY SAND AND GRAVEL SOME SILT.
	24		
918.8	26	17 1/2"	
	28	30 1/2"	
	30		COMPACT FINE TO MEDIUM SILTY GREY SAND AND LARGE GRAVEL.
914.0	32		
	34	82 1/2"	VERY COMPACT VERY SILTY MEDIUM GREY SAND AND GRAVEL, SOME BROKEN SANDSTONE AND SHALE.
908.5	36		
	38	100 1/2"	HARDPAN, VERY COMPACT MEDIUM GREY SAND AND GRAVEL WITH SILT BINDER, SOME BROKEN SHALE AND SANDSTONE.
	40		
903.0	42	75 1/2"	
	44		ROTTEN BLACK CLAY SHALE
896.5	46	100 1/2"	
	48	100 1/2"	
	50		

GENERAL NOTE:
 [---] INDICATES A FAILURE TO OBTAIN STANDARD BORING SAMPLE.
 THE FOLLOWING BORINGS HAVE BEEN ELIMINATED: S 21-5; S 21-7; S 21-9; S 21-11

FED. RD.	STATE	PROJECT
2	OHIO	

7
14

MAH-18-0.91.

STATE OF OHIO DEPARTMENT OF HIGHWAYS BUREAU OF BRIDGES						
BEISWENGER & HOCH, Consulting Engineers AKRON, OHIO						
STRUCTURE FOUNDATION INVESTIGATION BRIDGE NO MAH-18-0117 L & R OVER LAKE MILTON MAHONING COUNTY STA 48+22.75 TO STA 69+17.25						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISION
	JK					

LOG OF BORING

DATE: DEC. 7 - 1956 SAMPLER TYPE: S.S. DIA. 2' O.D.
 BORING NO: S 21-1 CASING LENGTH: 23' O.D. DIA. 3"
 STA. & OFFSET: STA. 50+00 37' LT.
 SURFACE ELEV. WATER ELEV. 946.5

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
946.5	0		LAKE LEVEL
	2		WATER
	4		
	6		
940.5	8	8 1/2"	
	10		
	12	12 1/2"	SOFT SILTY SANDY GREY AND BROWN CLAY
	14		
932.5	16	16 1/2"	MEDIUM HARD SANDY BROWN AND GREY CLAY, OCCASIONAL LARGE GRAVEL.
928.5	18		COMPACT MEDIUM TO FINE BROWN SAND WITH BROKEN SANDSTONE CHIPS
925.5	20	20 1/2"	
	22	22 1/2"	
	24	24 1/2"	
	26	26 1/2"	
	28	28 1/2"	
	30	30 1/2"	
	32	32 1/2"	
	34	34 1/2"	
910.2	36	36 1/2"	SOFT BLACK CLAYEY SHALE WITH OCCASIONAL LARGE GRAVEL.
	38		

LOG OF BORING

DATE: DEC. 7 - 1956 SAMPLER TYPE: S.S. DIA. 2' O.D.
 BORING NO: S 21-2 CASING LENGTH: 33' O.D. DIA. 3"
 STA. & OFFSET: STA. 54+00 37' RT.
 SURFACE ELEV. WATER ELEV. 946.8

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
946.8	0		LAKE LEVEL
	2		WATER
	4		
	6		
	8		
	10		
	12		
	14		
	16		
929.5	18	18 1/2"	SOFT VARICOLORED SILT WITH VERY LITTLE CLAY.
924.3	20		
	22	22 1/2"	MEDIUM VERY SANDY VARICOLORED CLAY WITH SOME SILT.
920.3	24		
918.3	26	26 1/2"	COMPACT MED. BROWN SAND WITH VERY LITTLE SILT SOME GRAVEL
	28		
	30		
	32		
	34	34 1/2"	
	36	36 1/2"	SOFT TO COMPACT SANDY GREY SHALE, SOME GRAVEL AND SANDSTONE CHIPS; TRACE OF SILT.
	38	38 1/2"	
	40	40 1/2"	
	42	42 1/2"	
903.5	44	44 1/2"	

GENERAL NOTE:
 --- INDICATES A FAILURE TO OBTAIN STANDARD BORING SAMPLE.

LOG OF BORING

DATE: DEC. 7 - 1956 SAMPLER TYPE: S.S. DIA. 2' O.D.
 BORING NO: S 21-3 CASING LENGTH: 32' O.D. DIA. 3"
 STA. & OFFSET: STA. 57+00 37' LT.
 SURFACE ELEV. WATER ELEV. 946.2

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
946.2	0		LAKE LEVEL
	2		WATER
	4		
	6		
	8		
	10		
	12		
	14		
	16		
829.2	18	18 1/2"	SOFT VARICOLORED SILT WITH VERY LITTLE CLAY.
	20		
924.2	22	22 1/2"	MEDIUM VERY SANDY BROWN CLAY, SOME SILT.
	24		
919.2	26	26 1/2"	COMPACT COARSE GREY SAND AND GRAVEL WITH SILT BINDER; SOME BROKEN LIMESTONE.
	28		
914.2	30	30 1/2"	
	32	32 1/2"	
	34	34 1/2"	
	36	36 1/2"	
	38	38 1/2"	VERY COMPACT CLAYEY BLACK - GREY SAND AND GRAVEL; LITTLE SHALE AND SANDSTONE
	40	40 1/2"	
	42	42 1/2"	
	44	44 1/2"	
899.9	46	46 1/2"	
	48		

GENERAL NOTE:
 --- INDICATES A FAILURE TO OBTAIN STANDARD BORING SAMPLE.

FED. RD.	STATE	PROJECT
2	OHIO	

8
14

MAH-18 - C-91.

LOG OF BORING

DATE: DEC. 7 - 1956 SAMPLER TYPE: S.S. DIA. 2' O.D.
 BORING NO: S 21-4 CASING LENGTH: 52' O.D. DIA. 3"
 STA. & OFFSET: STA. 59+00 37' RT.
 SURFACE ELEV. WATER ELEV. 946.2

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
946.2	0		LAKE LEVEL
	2		WATER
	4		
	6		
	8		
	10		
	12		
	14		
930.0	16	16 1/2"	SOFT VARICOLORED SILT.
	18		
925.2	20	20 1/2"	MEDIUM SILTY BROWN CLAY, OCCASIONAL GRAVEL.
	22		
922.2	24	24 1/2"	COMPACT MEDIUM TO COARSE BROWN SAND AND GRAVEL, SHALE AND SANDSTONE.
	26		
	28	28 1/2"	
	30	30 1/2"	
	32	32 1/2"	
912.2	34	34 1/2"	VERY COMPACT SILTY FINE GREY SAND, SOME GRAVEL AND BROKEN SANDSTONE.
	36		
	38	38 1/2"	
	40	40 1/2"	
	42	42 1/2"	
	44	44 1/2"	
	46	46 1/2"	
	48	48 1/2"	
897.2	50	50 1/2"	VERY COMPACT GREY SILT.
	52	52 1/2"	
892.2	54	54 1/2"	GREY SANDSTONE, WITH CLAY SEAMS CORED --- 60" REC. --- 36"
	56		
887.2	58	58 1/2"	GREY SANDSTONE, WITH SAND SEAMS CORED --- 57" REC. --- 15"
	60		
884.1	62	62 1/2"	GREY SANDSTONE, SEAMS OF BROWN SAND CORED --- 60" REC. --- 4"
883.5	64	64 1/2"	

LOG OF BORING

DATE: DEC. 7 - 1956 SAMPLER TYPE: S.S. DIA. 2' O.D.
 BORING NO: S 21-6 CASING LENGTH: 53' O.D. DIA. 4"
 STA. & OFFSET: STA. 61+00 37' RT.
 SURFACE ELEV. WATER ELEV. 944.0

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
944.0	0		LAKE LEVEL
	2		WATER
	4		
	6		
	8		
	10		
	12		
	14		
	16		
	18		
924.0	20	20 1/2"	SOFT VARICOLORED SILT
	22		
921.0	24	24 1/2"	SOFT BROWN SANDY SILT
	26		
915.0	28	28 1/2"	COMPACT MEDIUM TO COARSE GREY SAND AND GRAVEL, TRACE OF SILT.
	30		
911.0	32	32 1/2"	VERY COMPACT FINE TO COARSE GREY SAND AND GRAVEL, SILT BINDER
	34		
905.0	36	36 1/2"	VERY COMPACT MEDIUM TO COARSE SAND AND GRAVEL, PARTINGS OF GREY SILT.
	38		
900.0	40	40 1/2"	VERY COMPACT GREY SANDY SILT.
	42		
	44	44 1/2"	
	46	46 1/2"	
	48	48 1/2"	
	50	50 1/2"	
891.0	52	52 1/2"	GREY SANDSTONE, SAND SEAMS CORED --- 60" REC. --- 56"
	54		
	56	56 1/2"	
886.0	58	58 1/2"	GREY SANDSTONE, SEAMS OF BROWN SAND CORED --- 60" REC. --- 4"
	60		
	62	62 1/2"	
	64	64 1/2"	

LOG OF BORING

DATE: DEC. 7 - 1956 SAMPLER TYPE: S.S. DIA. 2' O.D.
 BORING NO: S 21-8 CASING LENGTH: 50' O.D. DIA. 3"
 STA. & OFFSET: STA. 63+00 37' RT.
 SURFACE ELEV. WATER ELEV. 945.2

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
945.2	0		LAKE LEVEL
	2		WATER
	4		
	6		
	8		
	10		
	12		
	14		
	16		
926.9	18	18 1/2"	SOFT BROWN CLAYEY SILT.
	20		
922.2	22	22 1/2"	SOFT BROWN SANDY SILT
	24		
917.2	26	26 1/2"	FIRM FINE TO COARSE GREY SAND AND GRAVEL TRACE OF BLACK COAL.
	28		
	30	30 1/2"	
	32		
	34	34 1/2"	
908.2	36	36 1/2"	COMPACT GRAVELLY GREY SILT.
	38		
904.7	40	40 1/2"	VERY COMPACT GREY SANDY SILT SOME GRAVEL, TRACE OF CLAY.
	42		
	44	44 1/2"	
	46	46 1/2"	
	48	48 1/2"	
895.2	50	50 1/2"	GREY SANDY SHALE CORED --- 18" REC. --- 6"
894.7	52	52 1/2"	GREY SANDSTONE WITH SAND SEAMS CORED --- 45" REC. --- 10"
	54		
890.2	56	56 1/2"	GREY SANDSTONE, COMPACT SAND AND GRAVEL. CORED --- 60" REC. --- 6"
	58		
885.2	60	60 1/2"	

STATE OF OHIO
 DEPARTMENT OF HIGHWAYS
 BUREAU OF BRIDGES

BEISWENGER & HOCH, Consulting Engineers
 AKRON, OHIO

STRUCTURE FOUNDATION INVESTIGATION
 BRIDGE NO. MAH-18-0117 L & R
 OVER LAKE MILTON
 MAHONING COUNTY
 STA. 48+22.75 TO STA. 69+17.25

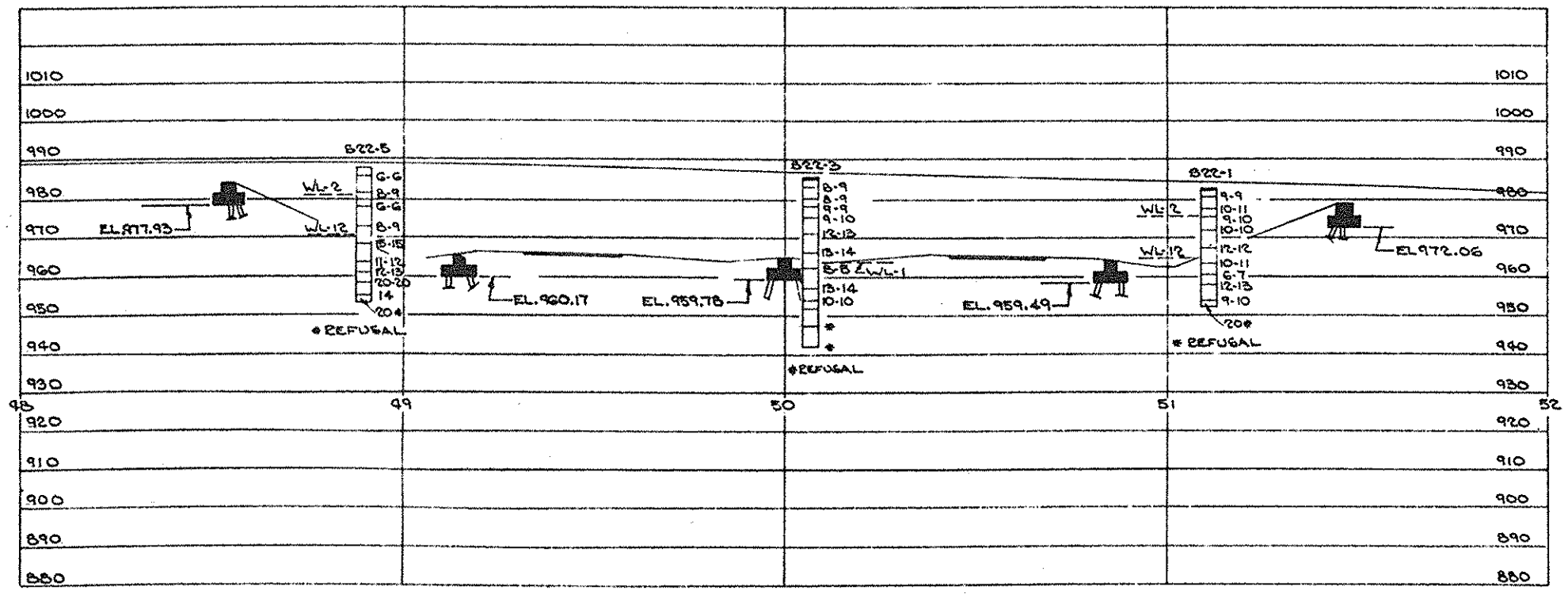
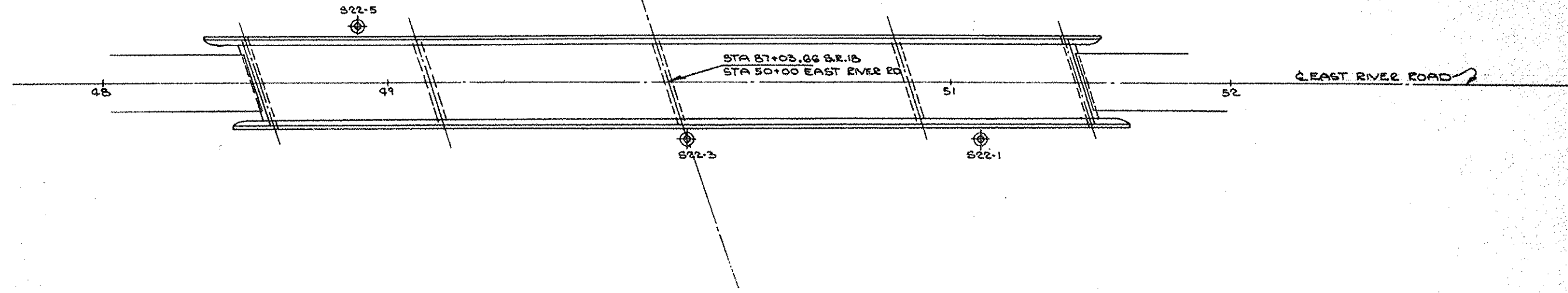
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	JK					

SURVEY S.R. 18

FED. RD.	STATE	PROJECT	
2	OHIO		

9/14

MAH-18-091



STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

BEISWENGER & NOCH, Consulting Engineers
AKRON, OHIO

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE No MAH-18-0165
UNDER EAST RIVER ROAD
MAHONING COUNTY
STA 87+03.66

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	JWW					

LOG OF BORING

DATE: OCT. 31-1956 SAMPLER TYPE: S.S. DIA. 2" O.D.
 BORING NO.: 5-22-1 CASING LENGTH: 46" DIA. 2 1/2"
 STA. & OFFSET: 51+10.60 20' RT.
 SURFACE ELEV. 983.2 WATER ELEV. 976.2

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
983.2	0		TOP SOIL
982.9	2	18 1/2"	
	4	21 1/2"	
	6	19 1/2"	MEDIUM HARD BROWN SANDY CLAY TRACE OF GRAVEL.
	8		
	10	20 1/2"	
	12		
969.1	14	24 1/2"	
	16		HARD BROWN SANDY CLAY, SOME GRAVEL PARTINGS AND SEAMS OF FINE BROWN SAND.
	18	21 1/2"	
962.4	20		
	22	19 1/2"	FIRM MEDIUM BROWN SAND AND GRAVEL, LARGE GRAVEL CLAY BINDER.
960.0	24	25 1/2"	
	26		COMPACT MEDIUM BROWN SAND AND GRAVEL, LARGE GRAVEL, CLAY BINDER.
955.7	28	19 1/2"	
	30	19 1/2"	FIRM FINE GRAY SAND AND GRAVEL, LARGE GRAVEL BROWN SANDSTONE AND SHALE, CLAY BINDER.
952.7	32	29 1/2"	

LOG OF BORING

DATE: OCT. 31-1956 SAMPLER TYPE: S.S. DIA. 2" O.D.
 BORING NO.: 5-22-3 CASING LENGTH: 38 1/2" DIA. 4"
 STA. & OFFSET: 50+06.60 20' RT.
 SURFACE ELEV. 986.1 WATER ELEV. 964.1

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
986.1	0		TOP SOIL
985.8	2	17 1/2"	
	4	17 1/2"	
	6	17 1/2"	MEDIUM HARD BROWN SANDY CLAY, PARTINGS OF FINE BROWN SAND, TRACE OF GRAVEL.
	8	18 1/2"	
	10	19 1/2"	
	12		
972.6	14	25 1/2"	
	16		HARD BROWN SANDY CLAY, PARTINGS OF FINE BROWN SAND, TRACE OF GRAVEL.
	18		
	20	27 1/2"	
963.6	22		
	24	25 1/2"	FIRM MEDIUM BROWN SAND AND GRAVEL, CLAY BINDER.
	26		
958.6	28	27 1/2"	COMPACT MED. BROWN SAND AND GRAVEL, LARGE GRAVEL, BROKEN SHALE AND SANDSTONE PARTINGS OF FINE BROWN SAND, CLAY BINDER.
955.6	30	29 1/2"	
	32	29 1/2"	FIRM FINE GRAY SAND AND GRAVEL, BROKEN SHALE AND SANDSTONE, CLAY BINDER.
952.6	34	30 1/2"	
	36	38%	SOFT SANDSTONE WITH BLACK SEAMS, SANDY SHALE. COCED --- 60" REC --- 25'
949.6	38		FISHTAILED
948.7	40		
	42	93%	BLACK AND GRAY SANDY SHALE CORED --- 60" REC. --- 56'
942.1	44		

LOG OF BORING

DATE: OCT. 31-1956 SAMPLER TYPE: S.S. DIA. 2" O.D.
 BORING NO.: 5-22-5 CASING LENGTH: 42" DIA. 2 1/2"
 STA. & OFFSET: 48+90.40 20' LT.
 SURFACE ELEV. 988.1 WATER ELEV. 972.3

ELEV.	DEPTH	STD. PEN N	DESCRIPTION
988.1	0		
	2	12 1/2"	
	4		MEDIUM BROWN SANDY CLAY, PARTINGS OF FINE BROWN SAND.
	6	17 1/2"	
979.6	8		
	10	18 1/2"	MEDIUM BROWN SANDY CLAY, TRACE OF GRAVEL.
	12		
974.2	14	17 1/2"	
	16		MEDIUM HARD BROWN SANDY CLAY, SEAMS OF EXTREMELY FINE BROWN SAND, SOME GRAVEL.
970.6	18		
	20	39 1/2"	HARD BROWN SANDY CLAY, SOME GRAVEL.
	22		
963.4	24	23 1/2"	
962.3	26		COMPACT MEDIUM BROWN SAND AND GRAVEL.
	28	25 1/2"	
	30	40 1/2"	HARD BROWN SANDY CLAY, SOME GRAVEL BROKEN SHALE AND SANDSTONE.
	32		
	34	14 1/2"	
953.7	36	20 1/2"	

GENERAL INFORMATION

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 or two-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 that 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.

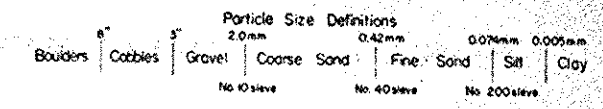
Drive Sample Borings - Drive - Press Sample Borings

Drive sample borings are 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.

Drive-press sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. drive sampler, and 3" O.D. thin-wall press sampler. The press sampler is advanced by continuous uniform pressure, applied by the drill rig.

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, depths of press samples, field sample number, sample description—based on laboratory test results and the Casagrande-A-C classification system—and gradation, plasticity and moisture content determinations. Results of strength and consolidation testing appear on separate enclosures.

At depths where materials are 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

- Auger Boring - Plan View.
- Press and/or Drive Sample and/or Core Boring - Plan View.
- Drive Rod Penetration Resistance - Soundings - Plan View.
- Electrical Resistivity Probe - Plan View.
- Indicates Auger Boring.
- Indicates Press and/or Drive Sample and/or Core Boring.
- Electrical Resistivity Probe plotted to vertical scale only.
- Top of Rock.
- Water saturated zone.
- Total Depth.
- Horizontal bar on log indicates the depth the sample was taken.
- Figures to the right of boring log in profile view indicate the number of blows for Standard Penetration test.
X = First 6 inches
Y = Second 6 inches
- Casing.
- Resistance "R" ≤ 10,000 lbs.
- Resistance "R" ≥ 10,000 lbs.
- Indicates final measurement of penetration in inches.
- Indicates Free Water elevation.
- Indicates Static Water elevation.
- Footings
- Capped pile
- Footings on pile

SYMBOLS OF ROCK TYPES

- Coal
- Weathered Indurated Clay
- Indurated Clay
- Weathered Shale
- Shale
- Weathered Sandstone
- Sandstone
- Leached Dolomite
- Dolomite
- Leached Limestone
- Limestone

GEOLOGY OF THE SITE

The structure site is located upon relatively flat ground consisting of moderately deep glacial drift overlies sandstone bedrock, of Pennsylvanian age.

EXPLORATION

The exploration consisted of two drive sample-core borings and ten drive rod penetration tests, made between April 10 and 16, and May 8 and 9, 1963.

INVESTIGATIONAL FINDINGS

The borings disclosed moist, medium-dense to dense silts and very stiff to hard clays overlying bedrock surface, encountered at 40 and 82-foot depths, elevations 975 and 973 feet. The borings were terminated at 45 and 50-foot depths, elevations 970 and 965 feet, after penetrating 5 and 8 feet below bedrock surface.

The rod soundings generally met increasing and erratic resistance to penetration with increase in depth, and were terminated upon encounter with near refusal and refusal to penetration at 16 to 25-foot depths, elevations 998 to 990 feet, considered to be in medium-dense silts and very stiff clays, as substantiated by the borings.

On the basis of the tests, bedrock surface is considered to be essentially flat-lying across the structure site, occurring between approximately elevations 975 and 973 feet.

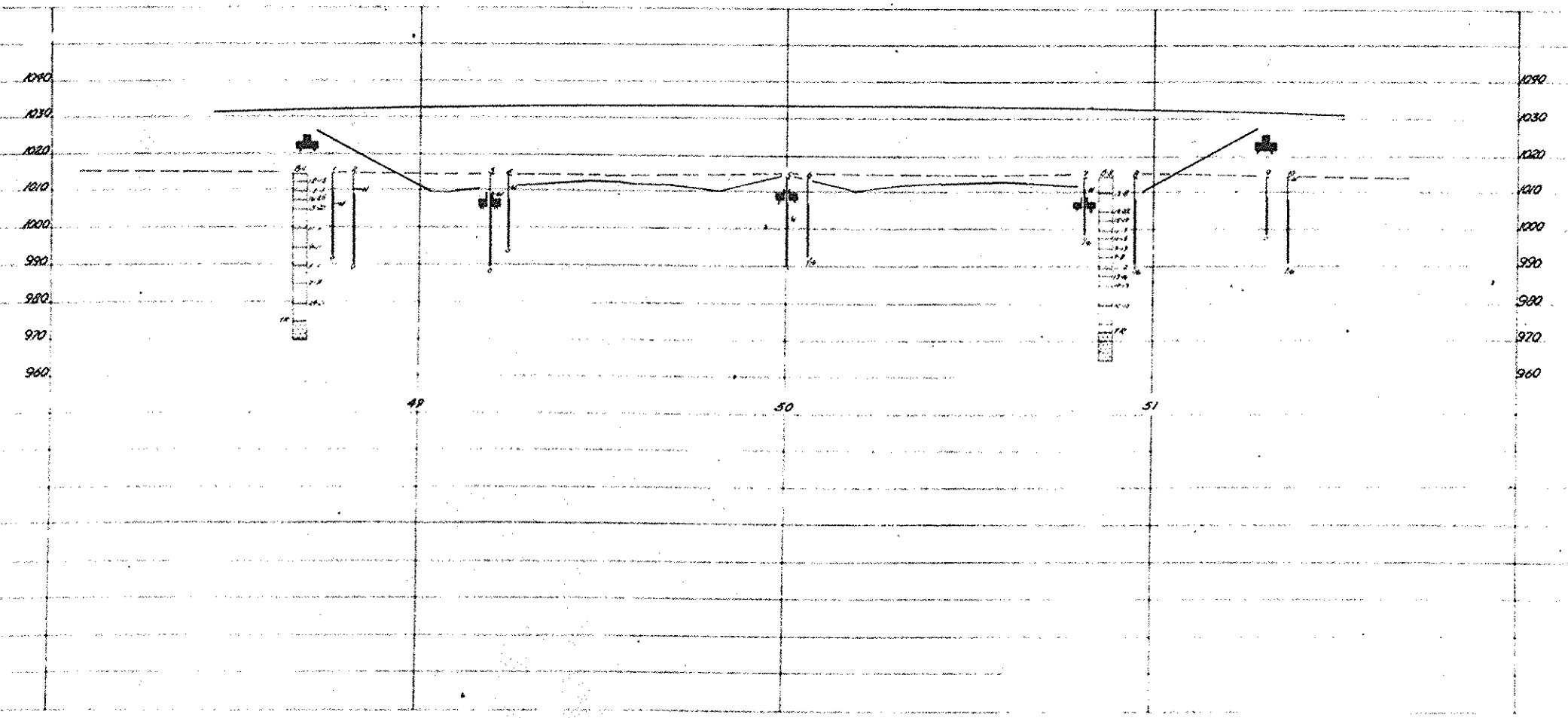
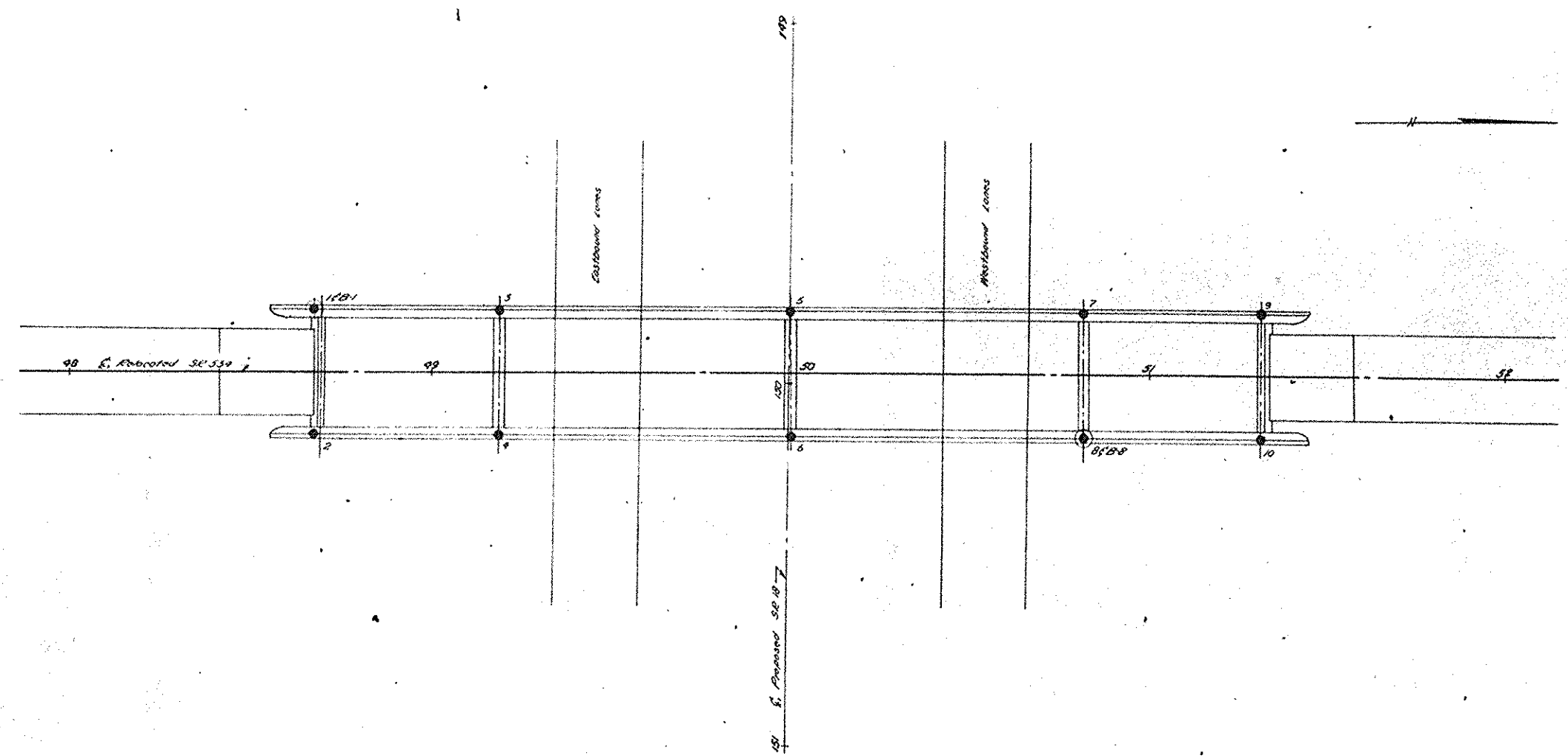
Free water level was observed in all rod sounding holes with the exception of numbers 6, 8, and 9, between elevations 1014 and 1003 feet.

NOTE: Information shown by this subsurface investigation was obtained solely for the use in establishing design controls for the project. The State of Ohio does not guarantee the accuracy of the data and it is not to be construed as a part of the plans governing construction of the project.

OHIO STATE HIGHWAY
TESTING LABORATORY
1620 WEST BROAD STREET, COLUMBUS 23, OHIO

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. MAH-18-0284
UNDER RELOCATED SR 534
SEC. MAH-18-0.91

CHECKED BY: F.L.R. REVIEWED BY: P.D.R. DATE: 5-22-63



STATE HIGHWAY
TESTING LABORATORY
TRUCK FUNDATION INVESTIGATION
MAH-18-0289
UNDER RELOCATED SR 534
MAH-18-091
P. 10 OF 10 FILE
DRAWN BY: RLF CHECKED BY: RRP REVISION: 5/20/44

1" = 20'

MAN-18-031

LOG OF BORING

Date Started 5-8-63 Sampler Type SS Dia. 1 3/8" Water Elev. _____
 Date Completed 5-9-63 Casing Length _____ Dia. _____
 Boring No. B-1 Station & Offset 50+67, 17' Lt. (REAR ABUTMENT) Surface Elev. 1014.7'

Elev.	Depth	Sig. Rem. (ft)	Rec. R.	Loss H.	Description	Sample No.	Physical Characteristics							SHTL Class.	
							% Agg.	% G.S.	% F.S.	% Silt	% Clay	LL	PL		W.C.
1014.7	0														
1012.2	2														
1009.7	5	12/15			Brownish-Gray Silt	1	0	4	10	36	50	31	10	17	
1007.2	7	13/18			Brownish-Gray Silt	2	7	3	8	34	48	31	10	16	
1004.7	10	16/25			Brownish-Gray Gravelly Clay	3	21	3	7	28	41	33	11	20	
1004.7	10	15/20			Brown Clay	4	0	1	6	28	67	39	15	23	
999.7	15	10/12			Gray Silt	5	0	2	4	53	41	NP	NP	21	
994.7	20	9/11			Gray Sandy Silt	6	14	8	11	45	22	NP	NP	18	
989.7	25	8/9			Gray Sandy Silty Clay	7									
984.7	30	7/9			Gray Gravelly Silt	8	26	7	4	34	31	26	8	23	
979.7	35	24/21			Gray Silty Sandy Gravel	9	54	8	19	10	9	NP	NP	11	
974.7	40				TOP OF ROCK	10									
969.7	45		5.0	0.0	Sandstone, gray, medium-grained, micaceous, iron-stain on bedding planes, broken in top 1.0', few carbonaceous inclusions. No core loss.										

*REFUSAL BOTTOM OF BORING

LOG OF BORING

Date Started 5-9-63 Sampler Type ST Dia. 1 3/8" Water Elev. _____
 Date Completed 5-9-63 Casing Length _____ Dia. _____
 Boring No. B-2 Station & Offset 50+81, 17' Rt. (FORWARD PIER) Surface Elev. 1014.8'

Elev.	Depth	Sig. Rem. (ft)	Rec. R.	Loss H.	Description	Sample No.	Physical Characteristics							SHTL Class.	
							% Agg.	% G.S.	% F.S.	% Silt	% Clay	LL	PL		W.C.
1014.8	0														
1009.8	5	13/18			Brown Silt	1	0	3	13	38	46	27	10	16	
1004.8	10	14/22			Brown Clay	2	0	3	9	35	53	33	11	18	
1002.3	12	15/19			Brownish-Gray Silt	3	9	3	6	32	50	29	7	19	
999.8	15	11/13			Brownish-Gray Silty Clay	4									
997.3	17	11/13			Gray Gravelly Silt	5	17	4	5	28	46	32	10	20	
994.8	20	9/13			Gray Clay	6	0	1	4	26	69	38	15	17	
992.3	22	7/8			Gray Clay	7	0	1	3	28	68	39	14	27	
989.8	25	11/12			Gray Sandy Gravelly Silt	8	25	10	15	23	27	22	6	18	
987.3	28	13/16			Gray Sandy Clay	9	11	6	7	28	48	34	13	20	
984.8	30	10/13			Gray Silt	10	0	2	3	49	46	26	6	18	
979.8	35	10/10			Brownish-Gray Sandy Gravelly Silt	11	29	7	19	26	19	19	3	14	
974.8	40				Brown Sandy Silt and Stone Fragments (Driller's Description)										
972.8	42		2.8	2.2	TOP OF ROCK										
969.8	45		4.0	1.0	Sandstone, gray, medium-grained, friable, porous, (broken to 46.0') damp to 44.2' and in interval 46.0' to 48.0'; carbonaceous and micaceous stringers in 46.0' to 48.0' interval; coarse-grained to pebble conglomerate 0.3' thick at 49.1' with carbonaceous fragments. Core loss 13%.										

BOTTOM OF BORING

OHIO STATE HIGHWAY
TESTING LABORATORY
1620 WEST BROAD ST., COLUMBUS 23, OHIO

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. MAN-18-031
UNDER RELOCATED SP 534
SEC. MAN-18-031

BORING DATA

TYPED BY <u>C.H.</u>	CHECKED BY <u>C.R.</u>	REVIEWED BY <u>R.R.</u>	DATE <u>5-15-63</u>
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Test Location No. 1
 Station B Offset 88+67.17' LT
 REAR ABUTMENT
 Surface Elev. 1015.0' Water Elev. 1006.0'

Test Location No. 2
 Station B Offset 90+67.17' RT
 REAR ABUTMENT
 Surface Elev. 1015.0' Water Elev. 1010.0'

Test Location No. 3
 Station B Offset 92+19.17' LT
 REAR PIER
 Surface Elev. 1010.8' Water Elev. 1008.8'

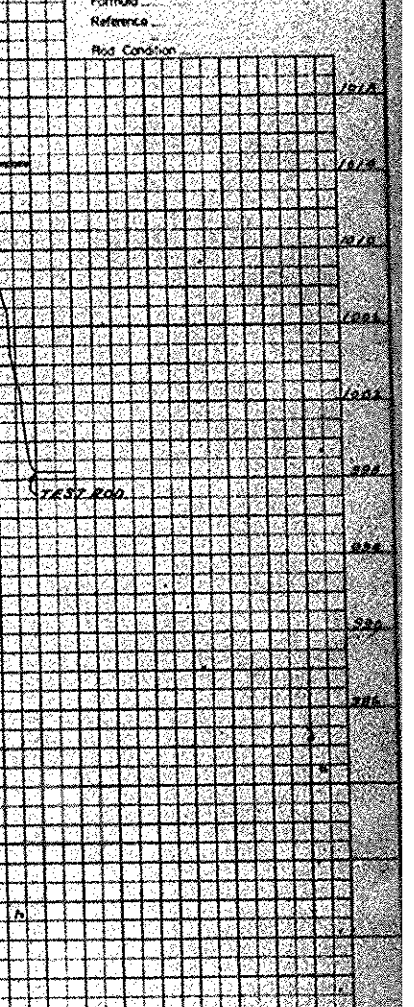
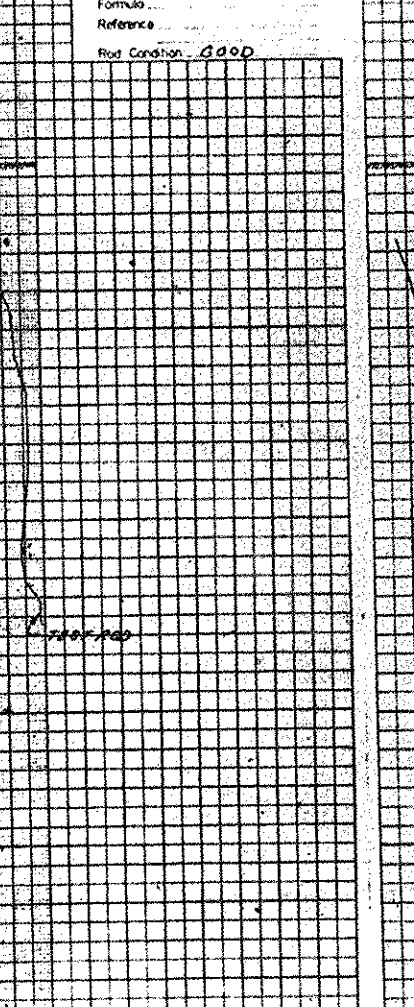
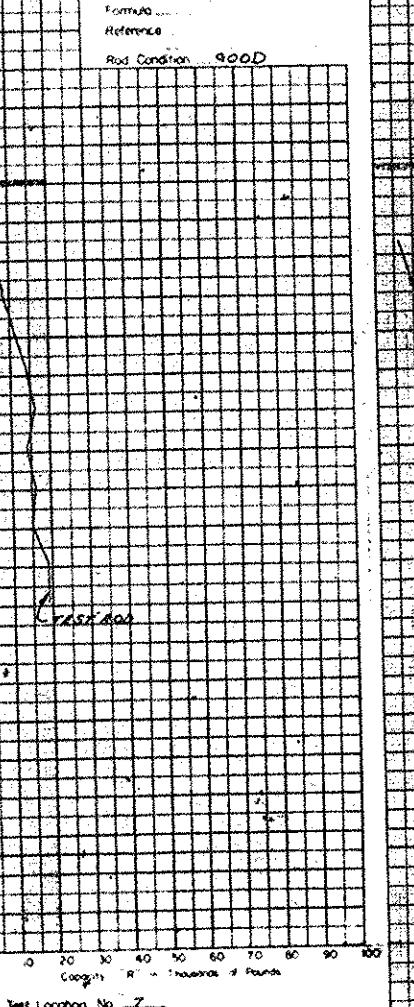
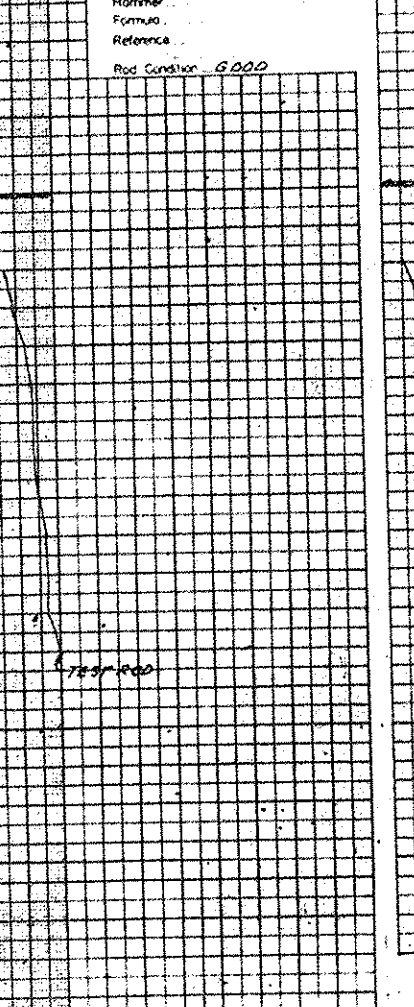
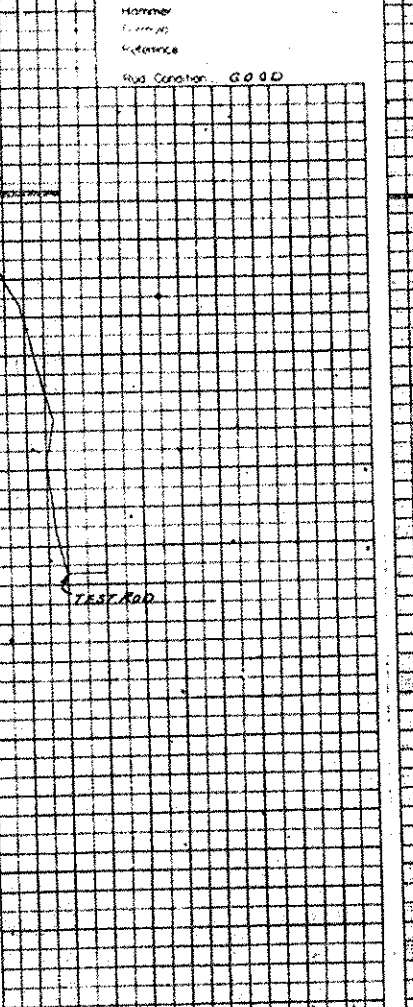
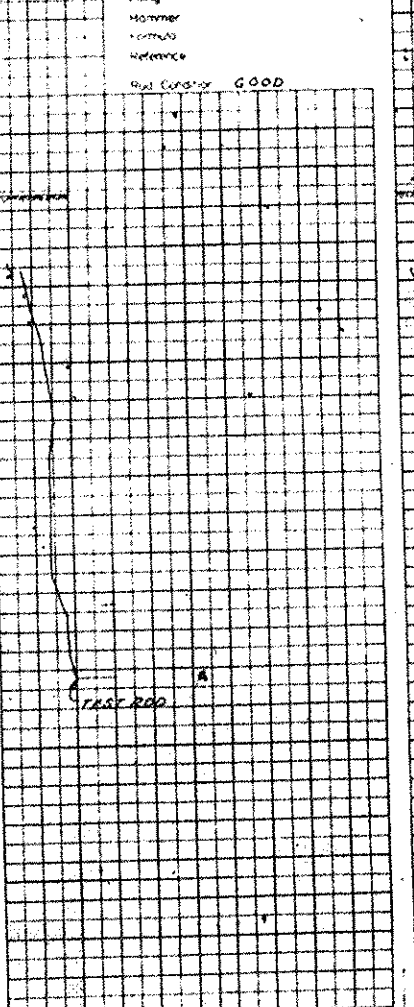
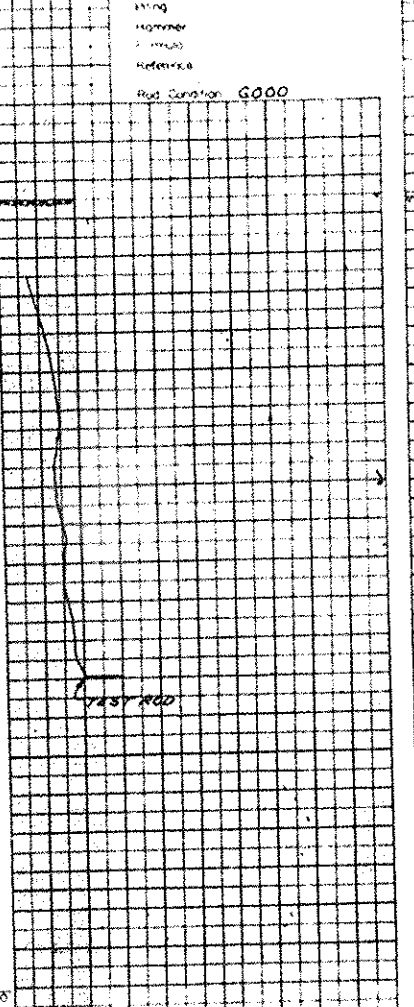
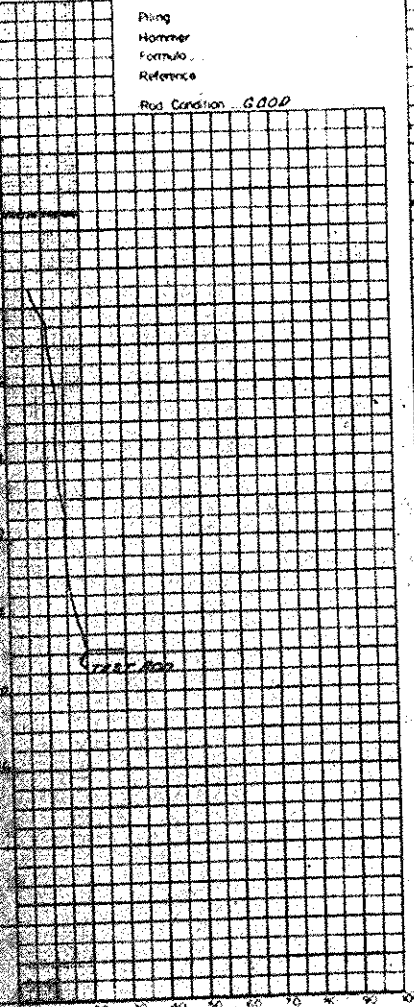
Test Location No. 4
 Station B Offset 93+19.17' RT
 REAR PIER
 Surface Elev. 1014.6' Water Elev. 1010.6'

Test Location No. 5
 Station B Offset 50+00.17' LT
 CENTER PIER
 Surface Elev. 1014.0' Water Elev. 1003.0'

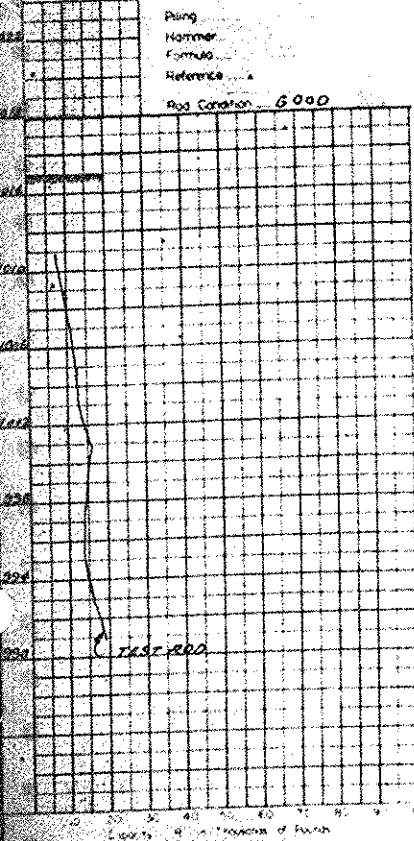
Test Location No. 6
 Station B Offset 50+00.17' RT
 CENTER PIER
 Surface Elev. 1014.2' Water Elev. DRY

Test Location No. 7
 Station B Offset 50+81.17' RT
 FORWARD PIER
 Surface Elev. 1014.7' Water Elev. DRY

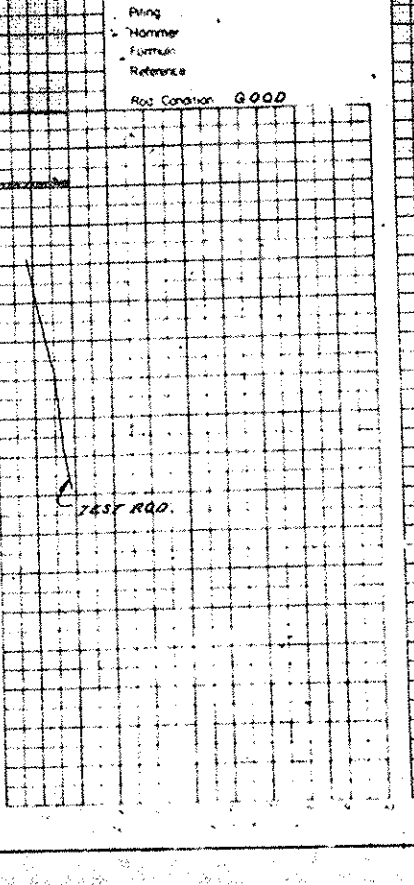
Test Location No. 8
 Station B Offset 51+31.17' LT
 FORWARD ABUTMENT
 Surface Elev. 1019.6' Water Elev. DRY



Test Location No. 9
 Station B Offset 51+31.17' RT
 FORWARD ABUTMENT
 Surface Elev. 1014.3' Water Elev. 1013.0'



Test Location No. 10
 Station B Offset 50+81.17' LT
 FORWARD PIER
 Surface Elev. 1014.3' Water Elev. 1010.3'



OHIO STATE HIGHWAY
 TESTING LABORATORY
 620 WEST BROAD ST., COLUMBUS 23, OHIO

STRUCTURE FOUNDATION INVESTIGATION
 BRIDGE NO. MAH-18-0884
 UNDER RELOCATED SP539
 SEC. MAH-18-0.91

DRIVE ROD PENETRATION RESISTANCE DATA

PLOTTED BY RC	CHECKED BY FLP	REVIEWED BY B.A.	DATE 5-27-64
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