

PROJECT DESCRIPTION

INTRODUCTION

THIS PROJECT, ALL/HAN-30-20.31(0.00), ENCOMPASSES THE NEW ALIGNMENT OF U.S. 30 LOCATED IN ALLEN AND HANCOCK COUNTIES, OHIO. THE PROJECT BEGINS ALONG EXISTING U.S. 30 AT THE INTERSECTION WITH REPERT ROAD (EASTBOUND LANES) IN ALLEN COUNTY AND TERMINATES AT S.R. 235 IN HANCOCK COUNTY. THE PROPOSED CENTERLINE PARALLELS EXISTING S.R. 30 TO THE SOUTH AND COVERS APPROXIMATELY EIGHT (8) MILES OF ROADWAY. THE U.S. 30 PROJECT ALSO INCLUDES NINE GRADE SEPARATIONS (BRIDGE STRUCTURES), SIX STREAM CROSSINGS (BOX OR LARGE DIAMETER PIPE CULVERTS), AND INTERCHANGE RAMP AT EACH END OF THE PROJECT.

THE PROJECT BEGINS IN RICHLAND TOWNSHIP, PROGRESSES EASTWARD, AND TERMINATES IN ORANGE TOWNSHIP OF HANCOCK COUNTY. THE U.S. 30 CENTERLINE STATIONING BEGINS AT STATION 1039+00 (EASTBOUND) AND CONTINUES TO STATION 1269+13 AT THE ALLEN/HANCOCK COUNTY LINE. AT WHICH LOCATION THE STATIONING BEGINS AT STATION 0+00 AND TERMINATES AT STATION 156+00. THE ALIGNMENT OF U.S. 30 INTERSECTS REPERT ROAD (T.R. 223), SWANEY ROAD (T.R. 227), PHILLIPS ROAD (C.R. 230), PEVEE ROAD (T.R. 237), BENTLEY ROAD (T.R. 239), COUNTY LINE ROAD (C.R. 15), TOWNSHIP ROAD 51, TOWNSHIP ROAD 52, AND STATE ROUTE 235. EIGHT OF THE NINE GRADE SEPARATION STRUCTURES WILL BE CONSTRUCTED AT EACH OF THE ABOVE NOTED INTERSECTIONS, EXCEPT FOR REPERT ROAD. THE PLANS INDICATE THAT REPERT ROAD WILL BE MADE DISCONTINUOUS AT THE PROPOSED INTERSECTION. THE GRADE SEPARATION STRUCTURES AT PHILLIPS ROAD, PEVEE ROAD AND BENTLEY ROAD WILL BE TWIN BRIDGE STRUCTURES ELEVATING U.S. 30 OVER THE REFERENCED CROSSROADS. THE REMAINING GRADE SEPARATIONS WILL OVERPASS THE U.S. 30 ROADWAY. THE NINTH GRADE SEPARATION STRUCTURE WILL BE INCLUDED WITH THE INTERCHANGE RAMP AT THE BEGINNING (WEST) PORTION OF THE PROJECT.

THE U.S. 30 ROADWAY WILL BE A FOUR-LANE, DIVIDED HIGHWAY HAVING A LIMITED ACCESS CLASSIFICATION. THE EASTBOUND AND WESTBOUND ROADWAYS WILL HAVE TWO 12 FT. WIDE DRIVING LANES AND 14 FT. WIDE SHOULDERS. THE MEDIAN SEPARATING THE EASTBOUND/WESTBOUND ROADWAYS WILL BE APPROXIMATELY 60 FT. WIDE.

THE MAJORITY OF THE EARTHWORK FOR THIS PROJECT WILL BE FOR THE CONSTRUCTION OF THE U.S. 30 ROADWAY EMBANKMENTS, THE BRIDGE STRUCTURE APPROACH EMBANKMENTS AND THE INTERCHANGE RAMP EMBANKMENTS. THE ROADWAY EMBANKMENT HEIGHTS ARE TYPICALLY LESS THAN 12 FT. IN HEIGHT; HOWEVER, THE EMBANKMENT HEIGHTS INCREASE WITHIN THE VICINITY OF THE PHILLIPS, PEVEE AND BENTLEY ROAD TWIN BRIDGE STRUCTURES WHERE THE MAXIMUM EMBANKMENT HEIGHT REACHES 28 FT. THE OVERPASS BRIDGE APPROACH EMBANKMENTS ALONG THE REFERENCED CROSSROADS AND INTERCHANGE RAMP WILL HAVE MAXIMUM EMBANKMENT HEIGHTS OF BETWEEN 18 AND 29 FT.

THE PROPOSED U.S. 30 ROADWAY CUT LOCATIONS ARE LIMITED FOR THIS PROJECT. THE ROADWAY CUT DEPTHS RANGE FROM LESS THAN 2 FT. UP TO 7 FT. THE MOST SUBSTANTIAL ROADWAY EXCAVATIONS WILL BE BETWEEN STATIONS 111 AND 127, HAVING CUT DEPTHS BETWEEN 2 AND 5 FT.

THE DRAINAGE STRUCTURES FOR THE PROJECT WILL BE FOR STREAM CROSSINGS AT LITTLE RILEY CREEK AND BRANCHES OF LITTLE RILEY CREEK. THESE DRAINAGE STRUCTURES ARE LOCATED IN THE EAST HALF OF THE PROJECT. BETWEEN STATIONS 1244 AND 142, THE CULVERTS WILL INCLUDE 54 IN. DIAMETER PIPES AND THREE 12 X 6 FT. BOX STRUCTURES. SMALLER DRAINAGE STRUCTURES ARE ANTICIPATED THROUGHOUT THE PROJECT BUT WERE NOT ESTABLISHED AT THE TIME OF THIS REPORT.

SWANEY ROAD (T.R. 227)

SWANEY ROAD INTERSECTS U.S. 30 AT STATION 1067+29.5 EASTBOUND LANES AND 1067+43.6 WESTBOUND LANES. A BRIDGE STRUCTURE, BRIDGE NO. ALL-30-2091 (SWANEY ROAD OVER U.S. 30 AND RAMP C) WILL BE CONSTRUCTED BETWEEN STATIONS 32+70.12 AND 35+54.2. THE BRIDGE WILL BE A THREE-SPAN, CONTINUOUS STEEL PLATE GIRDER STRUCTURE WITH A COMPOSITE CONCRETE DECK. THE SPAN LENGTHS ARE 113 FT. 9 IN., 87 FT. 4 IN., AND 83 FT. 0 IN., FOR A TOTAL BRIDGE LENGTH 288.59 FT.

THE OVERPASS BRIDGE STRUCTURE WILL HAVE APPROACH EMBANKMENTS BEGINNING AT APPROXIMATELY STATION 22+00 AND TERMINATING AT STATION 49+00 (EXCLUDING THE BRIDGE STRUCTURE). THE MAXIMUM EMBANKMENT HEIGHT IS APPROXIMATELY 25 FT. AT THE BRIDGE ABUTMENTS. IN CROSS SECTION, THE APPROACH EMBANKMENT WILL HAVE AN APPROXIMATE 40 FT. CREST WIDTH AND SIDE SLOPES EQUAL TO 2H:1V.

PHILLIPS ROAD (C.R. 230)

A TWIN BRIDGE STRUCTURE WILL BE CONSTRUCTED TO ELEVATE THE U.S. 30 EASTBOUND AND WESTBOUND ROADWAYS OVER PHILLIPS ROAD. EACH BRIDGE, BRIDGE NO. ALL-30-2096 (EASTBOUND AND WESTBOUND LANES OVER PHILLIPS ROAD) WILL BE A THREE-SPAN, CONTINUOUS STEEL BEAM STRUCTURE. THE CENTERLINE FOR EACH BRIDGE WILL BE OFFSET 42.0 FT. (LEFT AND RIGHT) FROM THE U.S. 30 CENTERLINE. THE SPAN LENGTHS ARE 39 FT. 0 IN., 52 FT. 0 IN., AND 39 FT. 0 IN., FOR A TOTAL BRIDGE LENGTH OF 132.0 FT.

THE APPROACH EMBANKMENTS WILL HAVE A MAXIMUM HEIGHT OF APPROXIMATELY 23 FT. AT THE ABUTMENTS. IN CROSS SECTION, THE APPROACH EMBANKMENT WILL HAVE A CREST WIDTH OF APPROXIMATELY 145 FT. AND SIDE SLOPES CONSTRUCTED TO 2H:1V.

PEVEE ROAD (T.R. 237)

A TWIN BRIDGE STRUCTURE WILL BE CONSTRUCTED TO ELEVATE THE U.S. 30 EASTBOUND AND WESTBOUND ROADWAYS OVER PEVEE ROAD. EACH BRIDGE, BRIDGE NO. ALL-30-2251 (EASTBOUND AND WESTBOUND LANES OVER PEVEE ROAD) WILL BE A THREE-SPAN CONTINUOUS STEEL BEAM STRUCTURE. THE CENTERLINE FOR EACH BRIDGE WILL BE OFFSET 42 FT. (LEFT AND RIGHT) FROM THE U.S. 30 CENTERLINE. THE SPAN LENGTHS ARE 36 FT. 6 IN., 51 FT. 0 IN., AND 36 FT. 6 IN., FOR A TOTAL BRIDGE LENGTH OF 126.02 FT.

THE APPROACH EMBANKMENTS WILL HAVE A MAXIMUM HEIGHT OF APPROXIMATELY 18 FT. AT THE ABUTMENTS, POSSIBLY HIGHER WITHIN THE LIMITS OF THE EXISTING POND AT THE EAST ABUTMENT. IN CROSS SECTION, THE APPROACH EMBANKMENT WILL HAVE A CREST WIDTH OF APPROXIMATELY 145 FT. AND SIDE SLOPES CONSTRUCTED TO 2H:1V.

CONTINUED ON PAGE 2

LEGEND FOR PROJECT - AVERAGE RESULTS OF TESTS - 139 SAMPLES TESTED

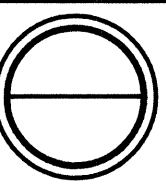
DESCRIPTION	SHTL CLASS	% AGG	% C.SAND	% F.SAND	% SILT	% CLAY	% LL	WATER CONTENT	SAMPS TESTED
GRAVEL	A-1-a								
GRAVEL WITH SAND	A-1-b								
FINE SAND	A-3								
SAND	A-3a(0)	7	19	44	19	11	-	16	3
GRAVEL WITH SAND AND SILT	A-2-4								
SANDY SILT	A-4a(7)	1	9	18	39	33	25	8	18
SILT	A-4b(8)	0	3	16	54	27	23	5	2
SILT AND CLAY	A-6a(9)	3	6	13	36	42	32	13	60
SILTY CLAY	A-6b(11)	1	5	13	34	47	38	18	26
CLAY	A-7-6(14)	0	5	11	31	53	44	22	30
DOLOMITE									
PAVEMENT. SEE LOG OF BORING FOR DESCRIPTION.									
EXISTING FILL MATERIAL. SEE LOG OF BORING FOR DESCRIPTION.									
DRIVE SAMPLE - PLAN VIEW									
DRIVE SAMPLE PLOTTED TO VERTICAL SCALE ONLY									
22 WATER CONTENT IN PERCENT									

W FREE WATER
 ▽ STATIC WATER LEVEL
 (N) NUMBER OF BLOWS FOR "STANDARD PENETRATION TEST"
 X=NUMBER OF BLOWS FOR FIRST 6 INCHES
 Y=NUMBER OF BLOWS FOR SECOND 6 INCHES
 Z=NUMBER OF BLOWS FOR THIRD 6 INCHES

SOIL PROFILE

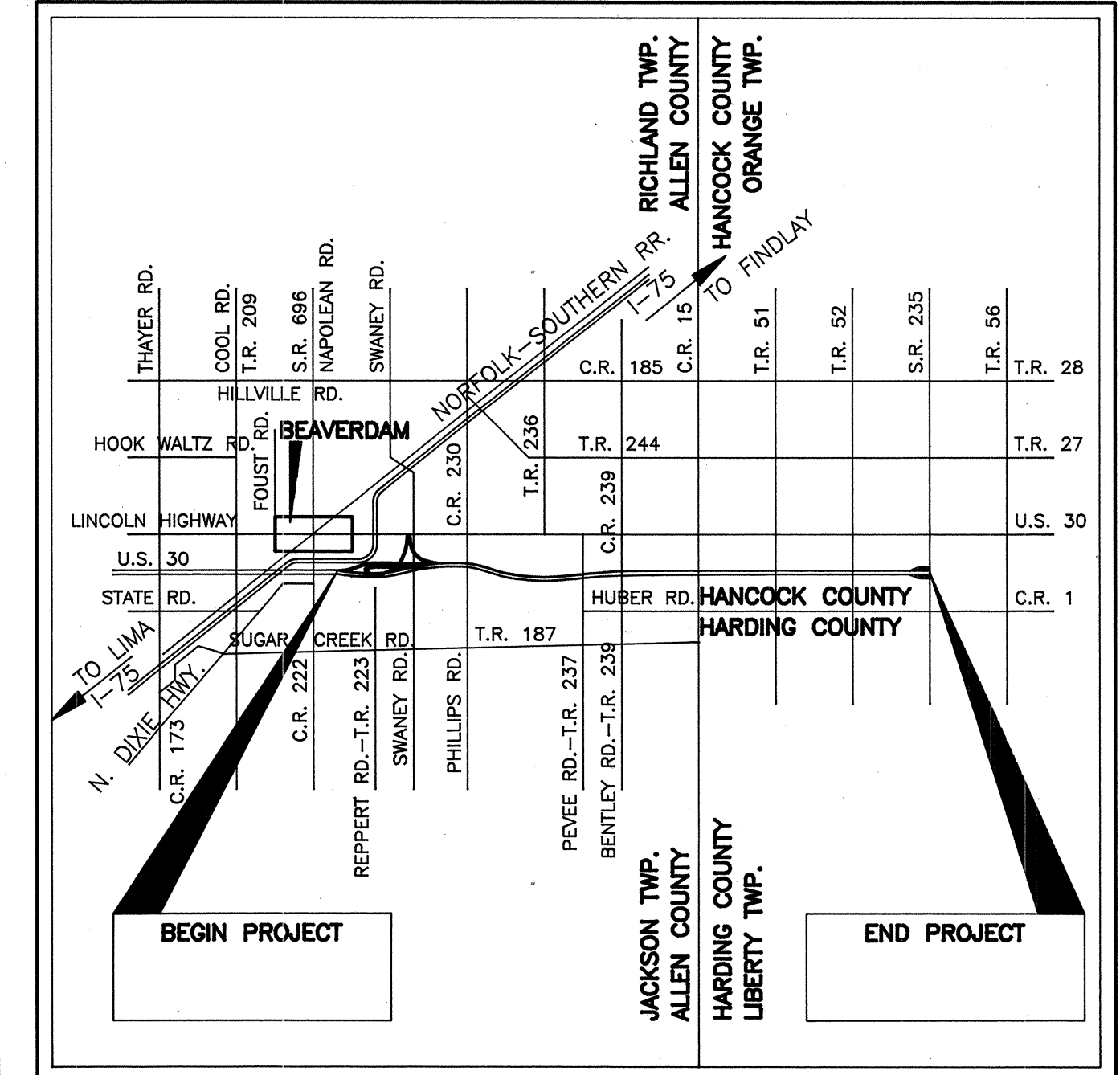
ALLEN/HANCOCK COUNTIES
 ALL/HAN-30(20.31) (0.00)

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



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NOTE: INFORMATION SHOWN BY THIS SUBGRADE PROFILE WAS OBTAINED SOLELY FOR THE 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.



LOCATION MAP

PROJECT INDEX				
STATIONS FROM	TO	PLAN/PROFILE SHEET	CUT MAX.	FILL EMB. MAX.
MAINLINE				
1075+00	1093+00	15	-	7
1093+00	1120+00	15-16	-	23
1120+00	1182+00	16-19	2	11
1182+00	1232+00	19-21	-	28
1232+00	1240+00	21	4	-
1240+00	1268+00	21-22	-	8
1268+00	10+00	22	1	2
10+00	41+00	22-24	-	10
41+00	47+00	24	7	-
47+00	64+00	24	2	3
64+00	111+00	24-26	-	13
111+00	128+00	26-27	5	-
128+00	146+00	27-28	-	10
146+00	156+00	28	2	-
EASTBOUND				
1039+00	1075+50	10-11	-	19
WESTBOUND				
1005+00	1077+63	12-14	3	7

PROJECT INDEX				
STATIONS FROM	TO	PLAN/PROFILE SHEET	CUT MAX.	FILL EMB. MAX.
RAMP A				
1050+93	1066+13	OMITTED	-	15
RAMP B				
1042+50	1055+00	OMITTED	-	28
RAMP C				
1052+39	1075+50	30	-	12
RAMP D				
1003+87	1066+45	31-33	5	29
RAMP E				
136+24	156+38	34	-	22
RAMP F				
135+20	156+46	35	-	22
RAMP BD				
986+00	1003+87	29	-	26

PROJECT INDEX				
STATIONS FROM	TO	PLAN/PROFILE SHEET	CUT MAX.	FILL EMB. MAX.
SWANEY ROAD		36	-	25
COUNTY ROAD 15		37	-	24
TOWNSHIP ROAD 51		38	-	24
TOWNSHIP ROAD 52		39	-	28
STATE ROUTE 235		40	-	23

TOWNSHIP ROAD 52 CONTINUED

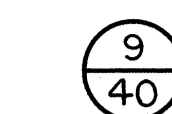
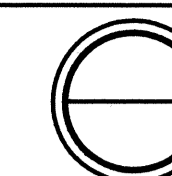
BORING NO.	STATION	OFFSET	DEPTH		% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SHTL CLASSIFICATION
			FROM	TO									
TR52-6	29+17	8' LT	0.0	0.5	PAVEMENT								VISUAL
			0.5	6.0	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL (FILL)								VISUAL
			6.0	8.5	BRN SILTY CLAY, TRACE SAND & CONCRETIONS								VISUAL
			8.5	12.5	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								VISUAL
			12.5	20.0	GR SILT & CLAY, LITTLE SAND, TRACE GRAVEL								VISUAL
			20.0	23.0	GR COARSE & FINE SAND, TRACE GRAVEL								VISUAL
			23.0		BEDROCK								VISUAL
TR52-7	29+10	8' LT	0.0	0.5	DARK BRN SILT & CLAY (FILL)								VISUAL
			0.5	5.0	DARK BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL (FILL)								VISUAL
			5.0	7.5	BRN & GR SILT & CLAY, LITTLE SAND, TRACE GRAVEL								20 VISUAL
			7.5	12.5	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								19 VISUAL
			12.5	17.5	GR SILT & CLAY, TRACE SAND & GRAVEL								16 VISUAL
			17.5	20.0	GR SILT & CLAY, TRACE SAND & GRAVEL								VISUAL
			20.0		BEDROCK								VISUAL
TR52-8	34+07	8' LT	0.0	0.5	PAVEMENT								VISUAL
			0.5	1.0	DARK BRN SANDY SILT								VISUAL
			1.0	2.5	BRN CLAY, TRACE SAND & CONCRETIONS								VISUAL
			2.5	14.0	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								VISUAL

STATE ROUTE 235

SR235-1	16+59	9' LT	0.0	0.6	PAVEMENT								VISUAL
			0.6	2.5	DARK BRN SILT & CLAY (FILL)								VISUAL
			2.5	5.0	BRN CLAY, TRACE SAND & CONCRETIONS (FILL)								VISUAL
			5.0	7.5	BRN CLAY								24 VISUAL
			7.5	9.0	BRN CLAY								28 VISUAL
SR235-2	23+63	9' LT	0.0	0.3	PAVEMENT								VISUAL
			0.3	2.5	DARK BRN SANDY SILT (FILL)								VISUAL
			2.5	5.0	DARK BRN SILT & CLAY, LITTLE SAND (FILL)								VISUAL
			5.0	8.0	BRN SANDY SILT, TRACE GRAVEL (FILL)								VISUAL
			8.0	15.0	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								16 VISUAL
			15.0	20.0	GR SILT & CLAY, TRACE SAND & GRAVEL								16 VISUAL
			20.0	28.0	GR SILT & CLAY, TRACE SAND & GRAVEL								VISUAL
28.0		BEDROCK								VISUAL			
SR235-3	24+23	9' LT	0.0	0.9	PAVEMENT								VISUAL
			0.9	2.5	BRN CLAY, LITTLE SAND (FILL)								VISUAL
			2.5	5.0	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								16 VISUAL
			5.0	12.5	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								17 VISUAL
			12.5	15.0	GR SILT & CLAY, TRACE SAND & GRAVEL								17 VISUAL
			15.0	17.5	GR SILT								VISUAL
			17.5	29.0	GR SILT & CLAY, TRACE SAND & GRAVEL								18 VISUAL
29.0		BEDROCK								VISUAL			
SR235-4	25+09	9' LT	0.0	1.0	PAVEMENT								VISUAL
			1.0	2.5	DARK BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL (FILL)								VISUAL
			2.5	5.0	BRN SILTY CLAY, TRACE SAND & CONCRETIONS (FILL)								VISUAL
			5.0	7.5	BRN & GR SILT & CLAY, LITTLE SAND, TRACE GRAVEL (FILL)								20 VISUAL
			7.5	10.0	4	7	10	36	43	33	15	16	A-6a(10)
			10.0	15.0	GR SILT & CLAY, TRACE SAND & GRAVEL								16 VISUAL
			15.0	29.0	GR SILT & CLAY, TRACE SAND & GRAVEL								17 VISUAL
29.0		BEDROCK								VISUAL			
SR235-5	25+95	9' LT	0.0	1.0	PAVEMENT								VISUAL
			1.0	2.5	DARK BRN SANDY SILT (FILL)								VISUAL
			2.5	5.0	BRN CLAY (FILL)								VISUAL
			5.0	7.5	BRN CLAY								VISUAL
			7.5	10.0	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								20 VISUAL
			10.0	12.5	GR SILT & CLAY, LITTLE SAND, TRACE GRAVEL								17 VISUAL
			12.5	15.0	GR SILT & CLAY, LITTLE SAND, TRACE GRAVEL								17 VISUAL
15.0	29.0	3	6	12	37	42	29	13	17	A-6a(9)			
29.0		BEDROCK								VISUAL			
SR235-6	26+55	9' LT	0.0	0.6	PAVEMENT								VISUAL
			0.6	2.5	DARK BRN SANDY SILT, TRACE GRAVEL (FILL)								VISUAL
			2.5	7.5	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								17 VISUAL
			7.5	12.5	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								15 VISUAL
			12.5	17.5	3	10	15	36	36	27	12	15	A-6a(8)
			17.5	28.5	GR SILT & CLAY, TRACE SAND & GRAVEL								16 VISUAL
			28.5		BEDROCK								VISUAL
SR235-7	31+59	9' LT	0.0	0.7	PAVEMENT								VISUAL
			0.7	2.5	DARK BRN SANDY SILT (FILL)								VISUAL
			2.5	7.5	BRN CLAY								24 VISUAL
			7.5	10.0	BRN & GR SILT & CLAY, LITTLE SAND, TRACE GRAVEL								VISUAL
10.0	11.5	BRN SILT & CLAY, LITTLE SAND, TRACE GRAVEL								VISUAL			

SOIL PROFILE

ALLEN/HANCOCK COUNTIES
ALL/HAN-30(20.31) (0.00)



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CINCINNATI, OHIO 45226

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GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI OHIO 45226

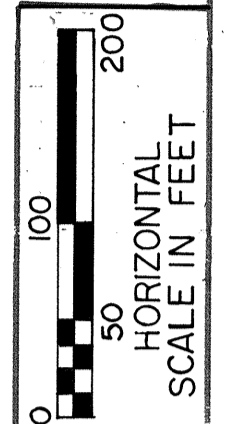
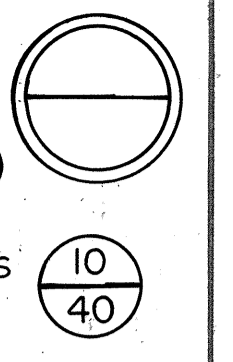
SUBSURFACE INVESTIGATION
PROJECT NO. ALL/HAN-30(20.31)(0.00) W.O. NO. 04062.119
ALLEN/HANCOCK COUNTIES

BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	REVISED DATE 9/7/94
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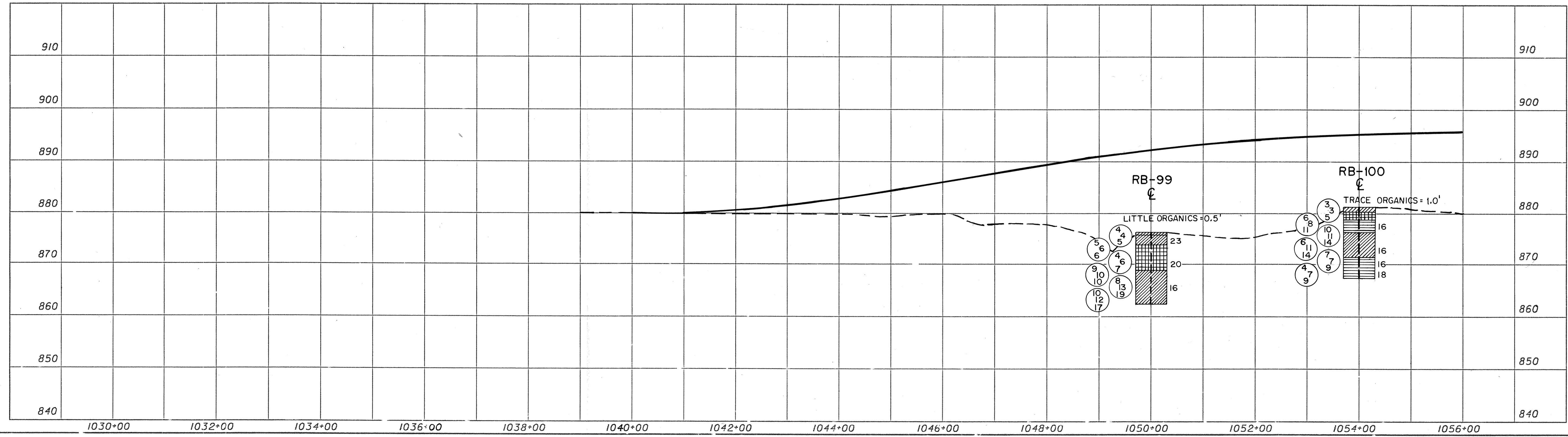
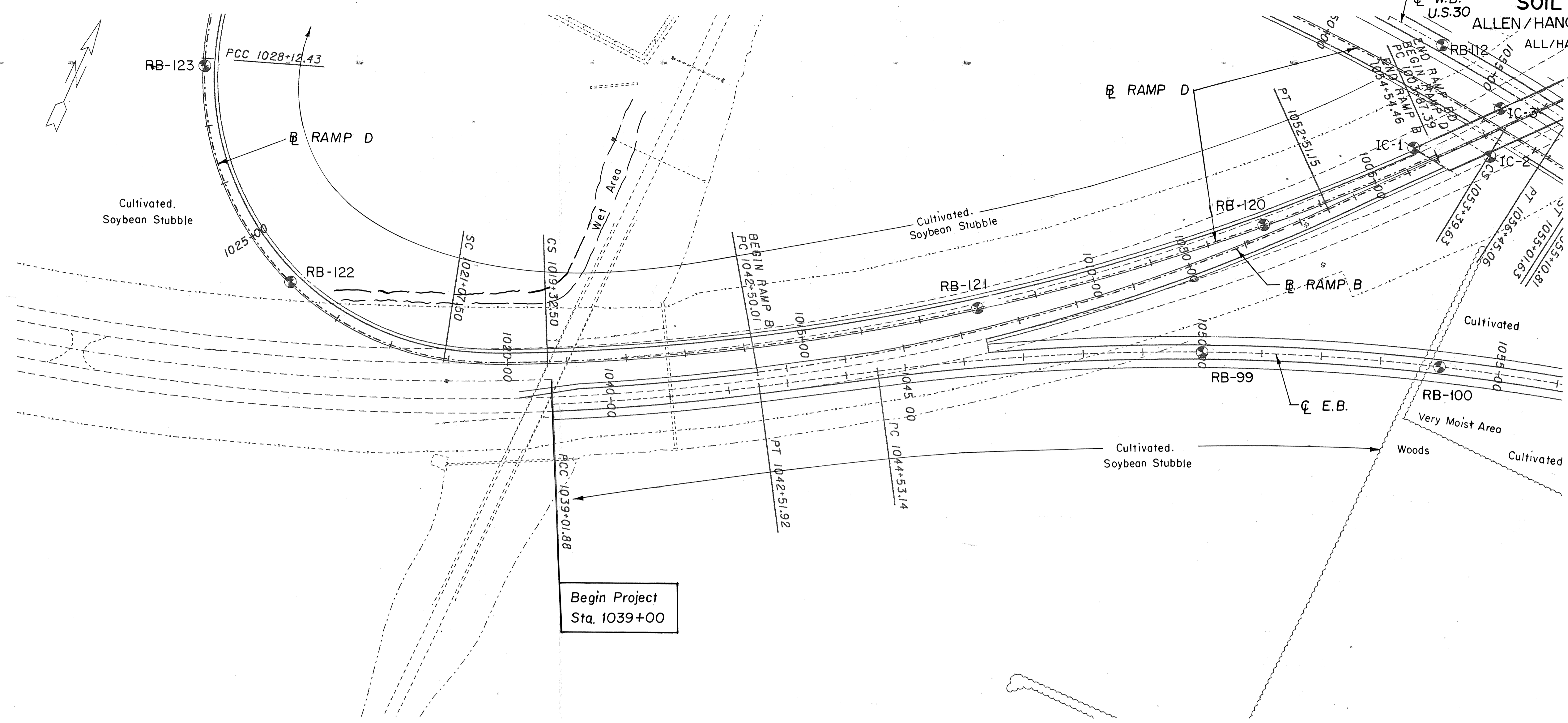
SOIL PROFILE
ALLEN/HANCOCK COUNTIES
ALL/HAN-30-(20.31)(0.00)

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CINCINNATI, OHIO 45226



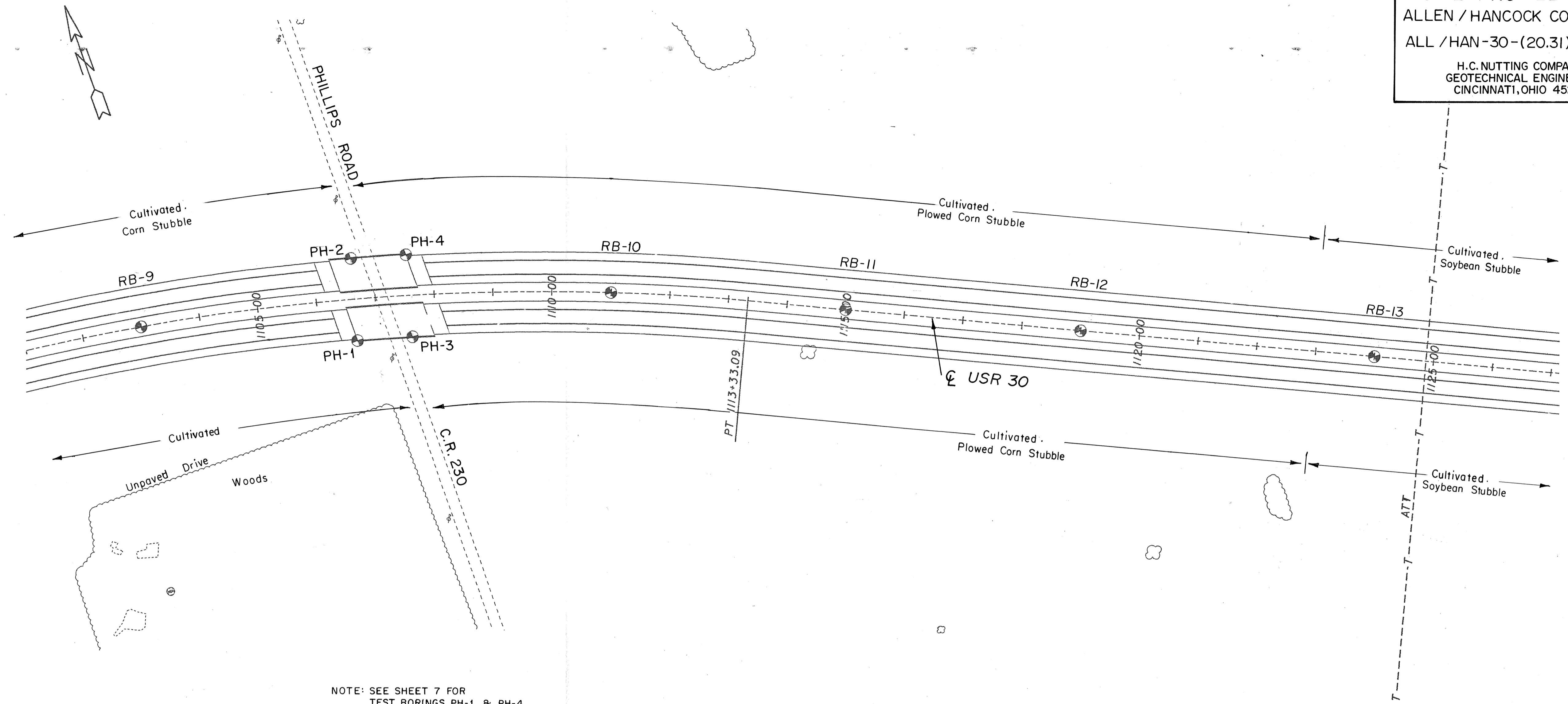
PLAN AND PROFILE SHEET
STA. 1039+00 to STA. 1056+00 E.B.

ALL/HAN-30-(20.31)(0.00)

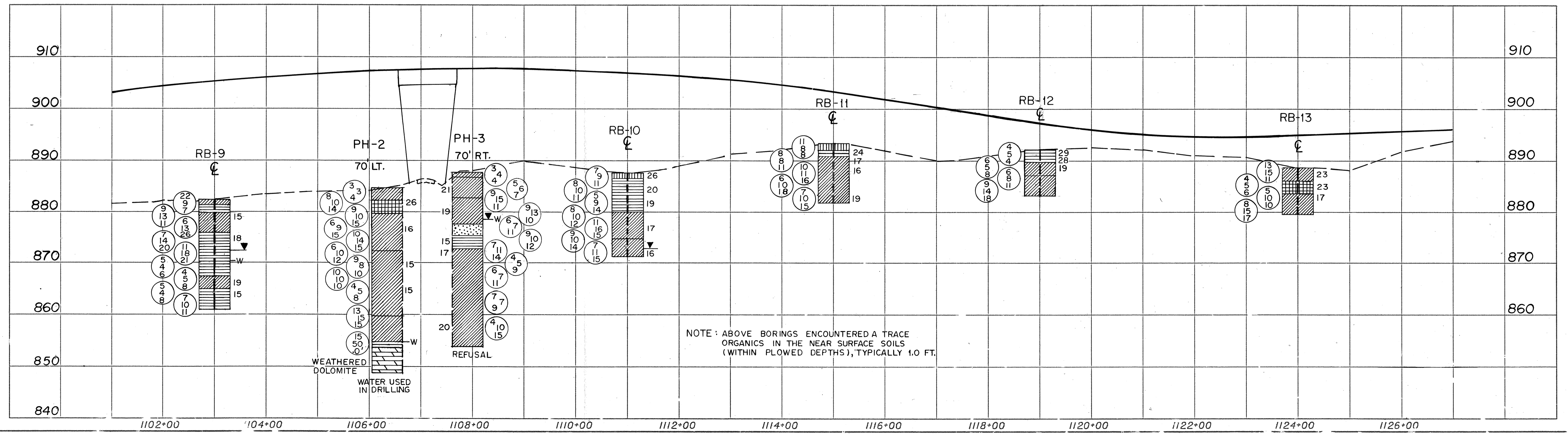


REVISED 10/24/98 1994
BY: JLN
CHECKED: JLN
DATE: 10/24/98
REF: ALL/HAN-30-(20.31)(0.00)
ACTIVE LEVELS: 01, 31, 32, 33, 41-43

SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN-30-(20.31) (0.00)
 H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



NOTE: SEE SHEET 7 FOR
 TEST BORINGS PH-1 & PH-4

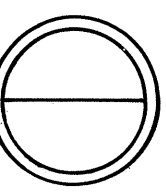


PLAN AND PROFILE SHEET
 STA. 1101+00 TO STA. 1127+00

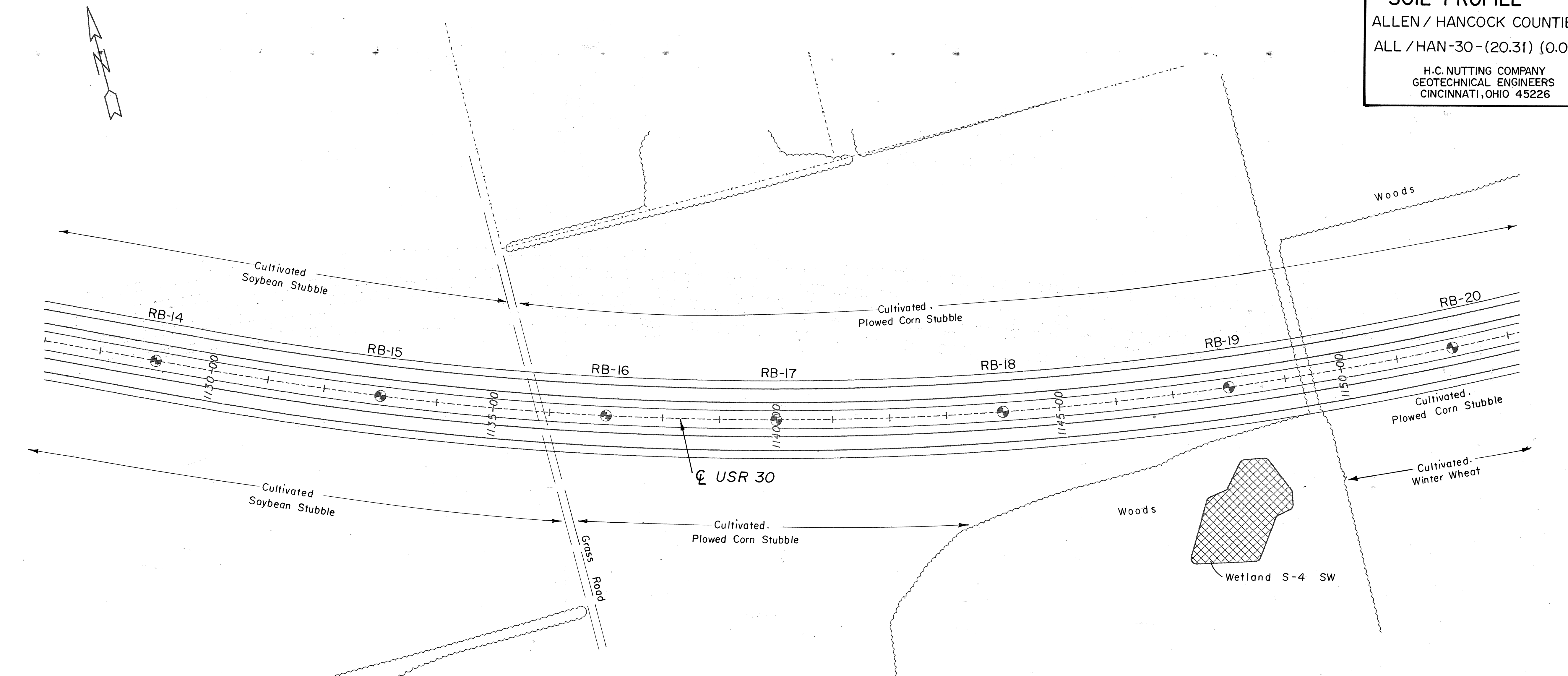
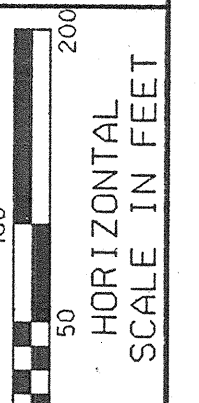
ALL / HAN-30-(20.31)(0.00)

REF: M.C. 14, 2000-09, 894
 USE: 11/15/01
 FILE: HANCOCK COUNTY
 PROJECT: ALL / HAN-30-(20.31)(0.00)
 ACTIVE LEVELS: 01, 31, 02, 07, 33, 41, 63

SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN-30-(20.31) (0.00)
 H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226

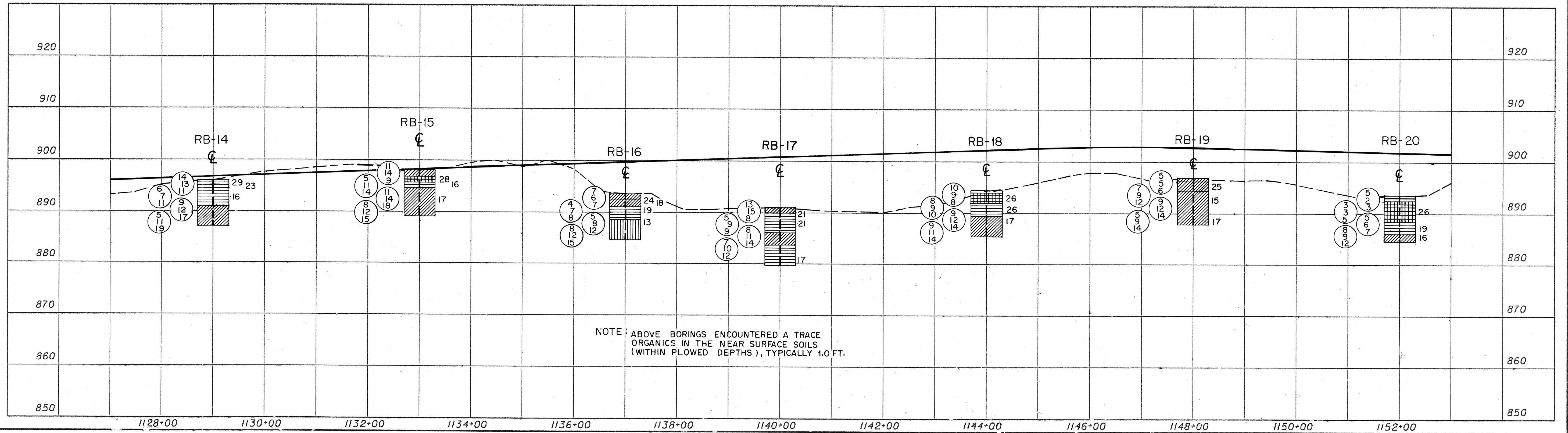


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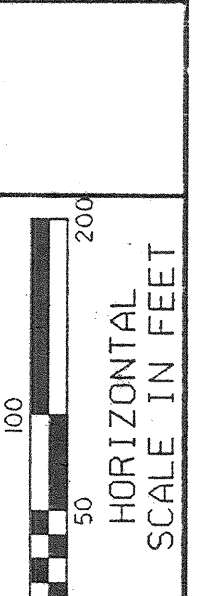
PLAN AND PROFILE SHEET
 STA. 1127+00 TO STA. 1154+00

ALL / HAN-30-(20.31)(0.00)



REF: 10/14/2023 10:41 AM
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 PROJECT: ALL / HAN-30-(20.31)(0.00)
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 ACTIVE LEVELS: 0.00, 17.00, 40.00

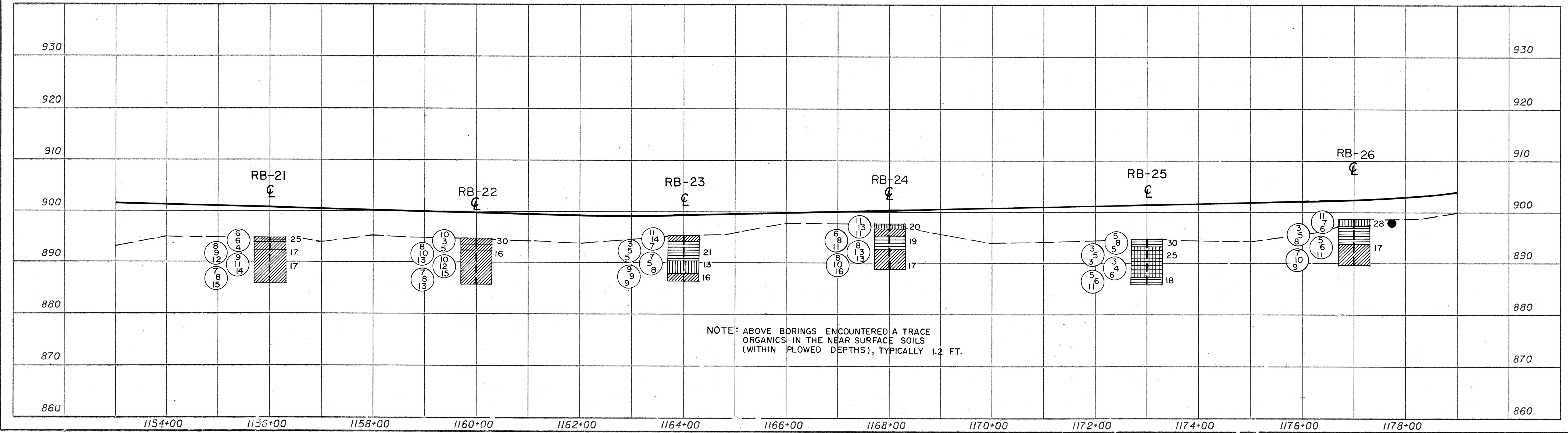
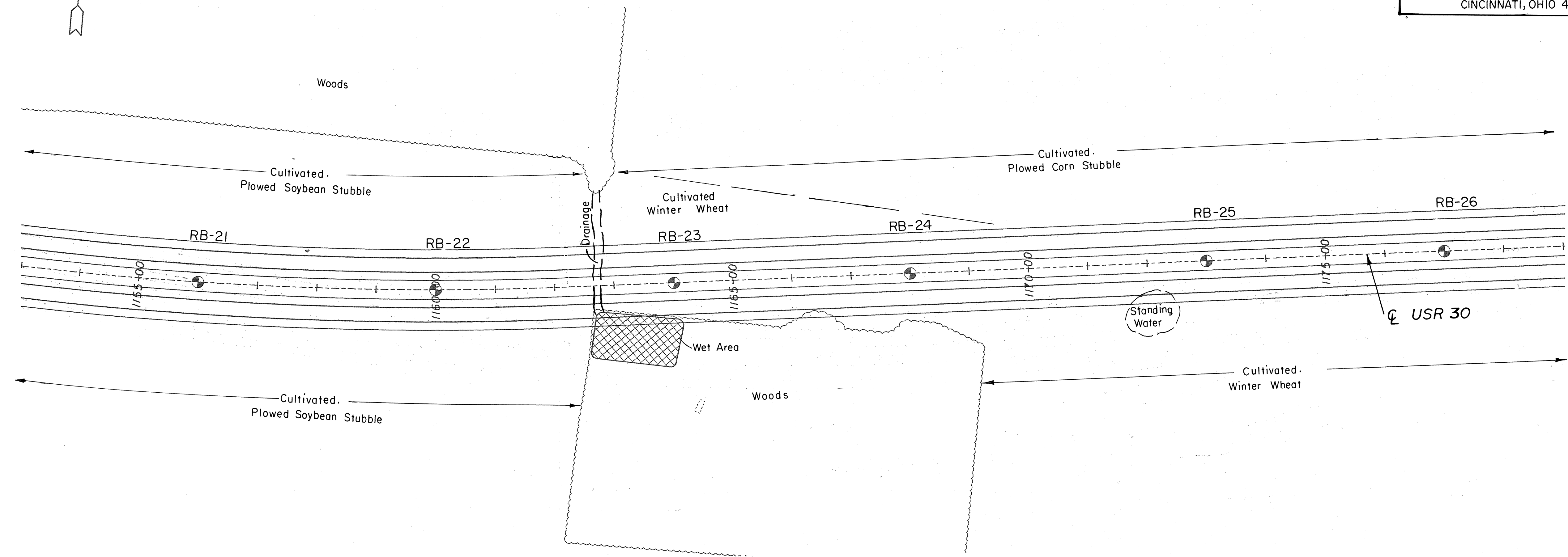
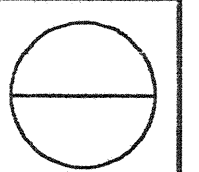
SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL/HAN-30-(20.31)(0.00)
 H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



CALCULATED
 CHECKED

PLAN AND PROFILE SHEET
 STA. 1152+00 TO STA. 1179+00

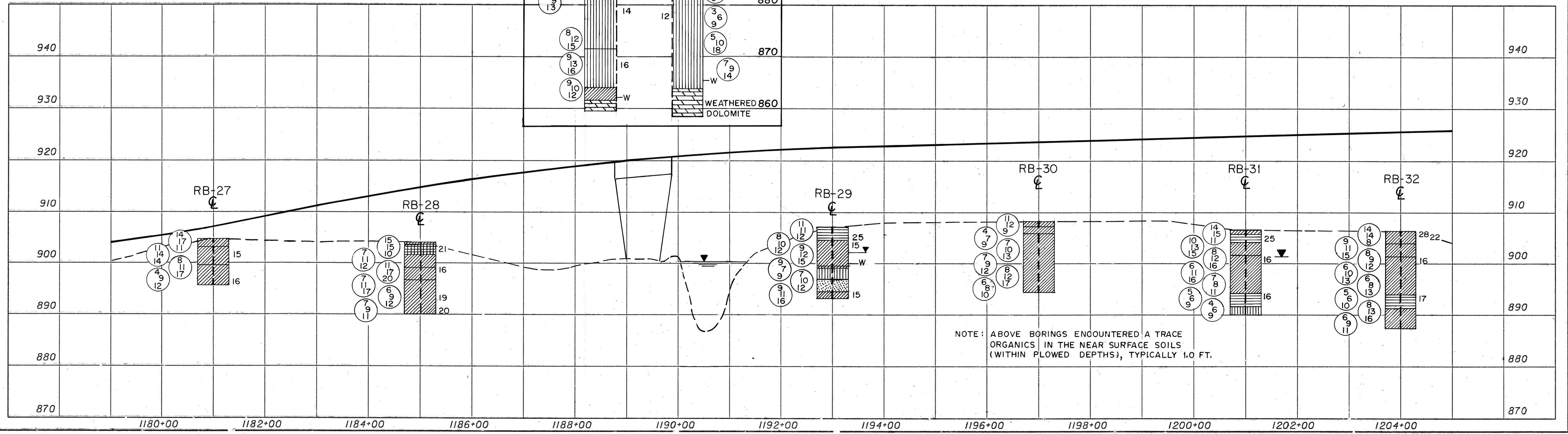
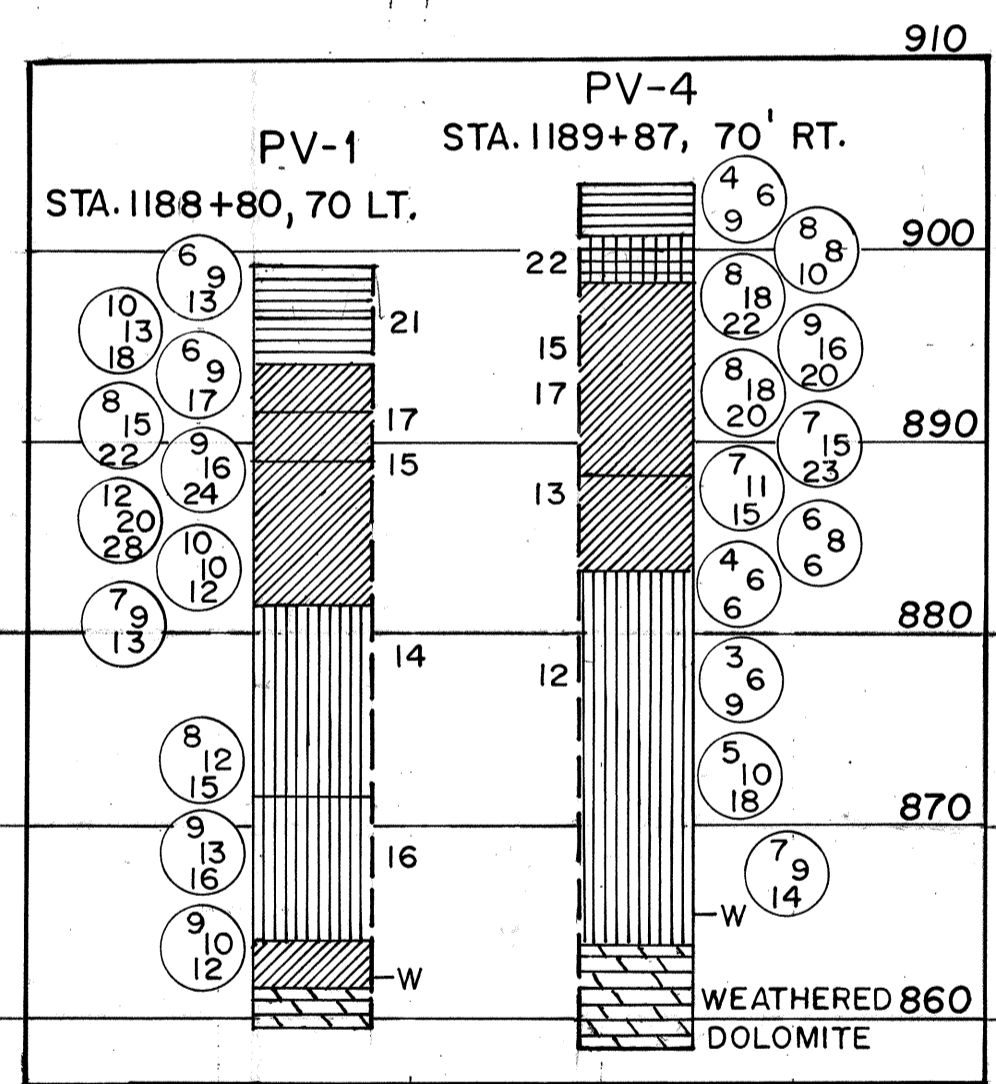
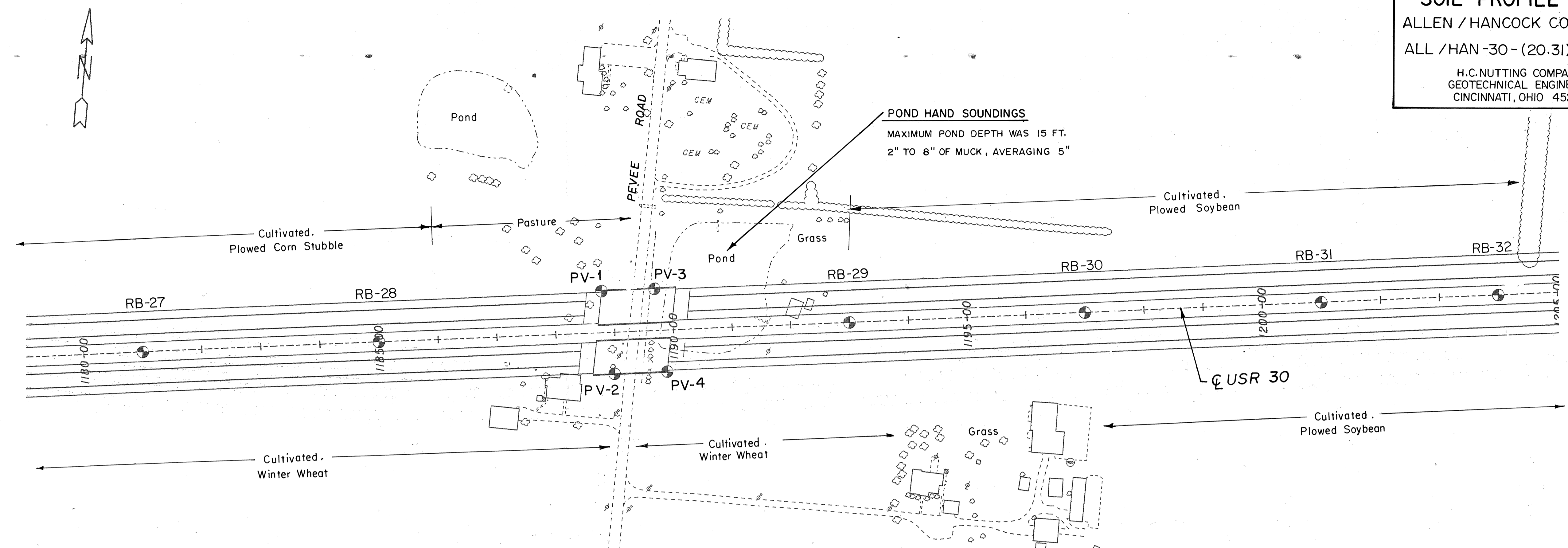
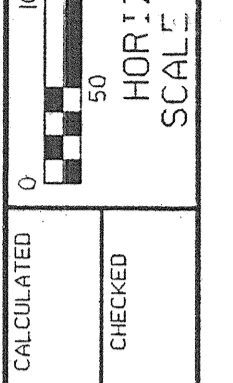
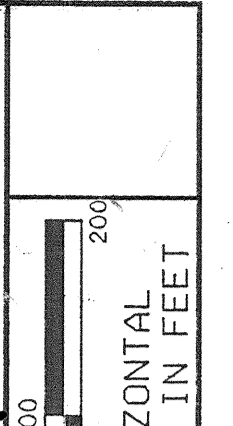
ALL/HAN-30-(20.31)(0.00)



NOTE: ABOVE BORINGS ENCOUNTERED A TRACE ORGANICS IN THE NEAR SURFACE SOILS (WITHIN PLOWED DEPTHS), TYPICALLY 1.2 FT.

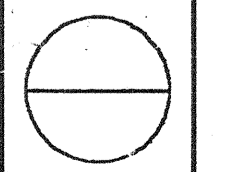
DATE: 09/03/86 10:34 AM
 DRAWN BY: J. W. B. (JWB)
 CHECKED BY: J. W. B. (JWB)
 PROJECT: ALL/HAN-30-(20.31)(0.00)
 SHEET: 1 OF 1
 ACTIVE LEVELS: 0.00, 1.20, 2.40, 3.60, 4.80, 6.00, 7.20, 8.40, 9.60, 10.80, 12.00, 13.20, 14.40, 15.60, 16.80, 18.00, 19.20, 20.40, 21.60, 22.80, 24.00, 25.20, 26.40, 27.60, 28.80, 30.00

SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN -30 - (20.31) (0.00)
 H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



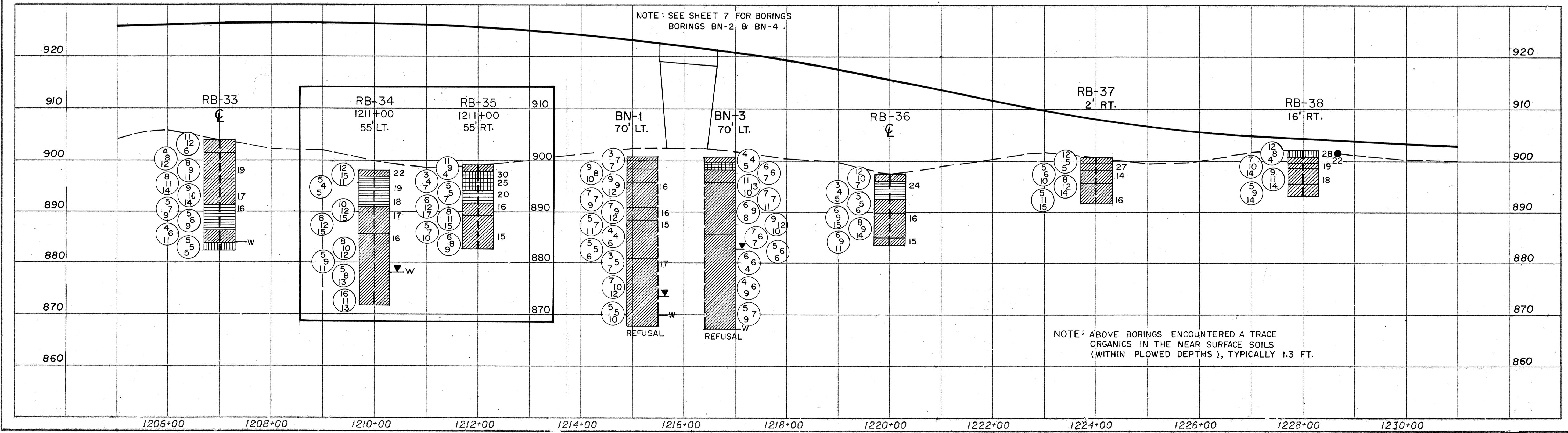
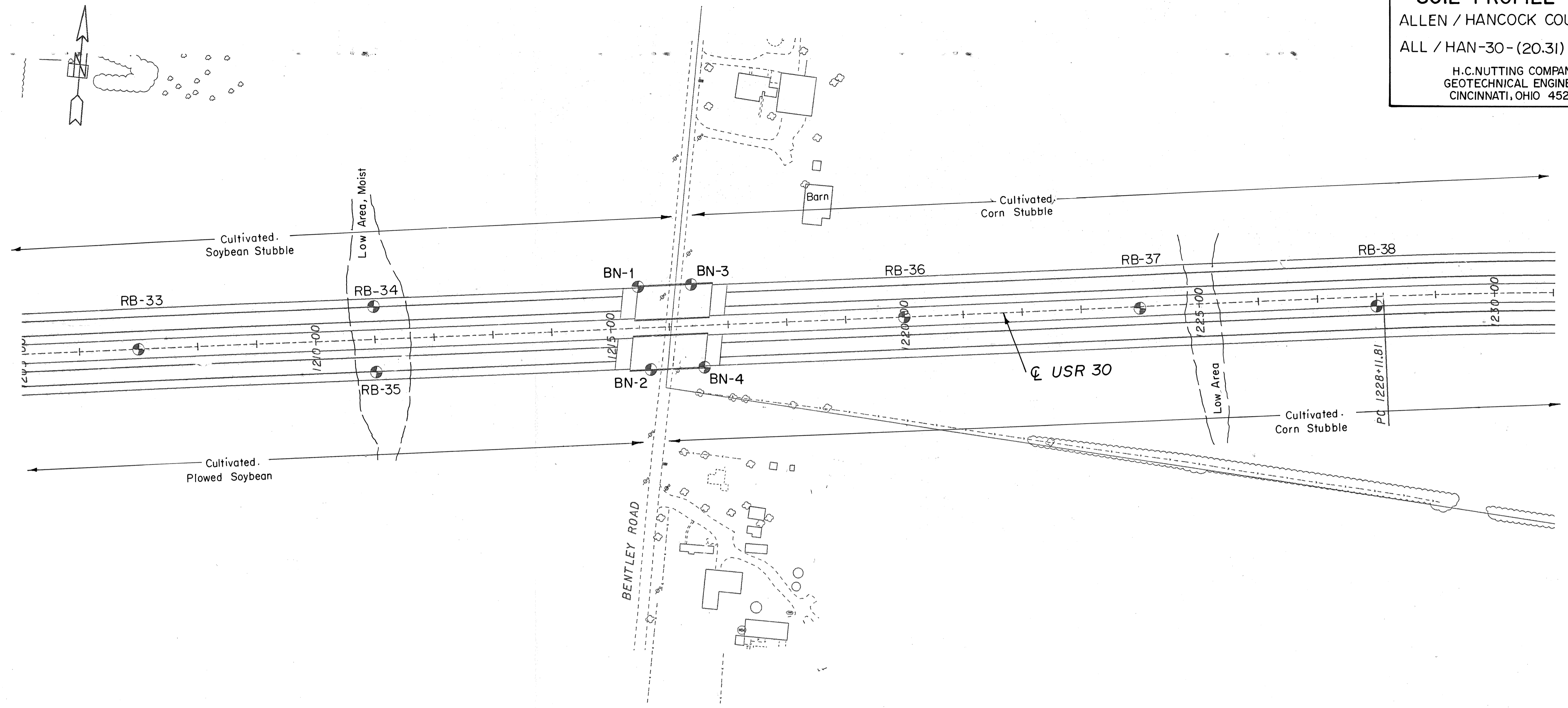
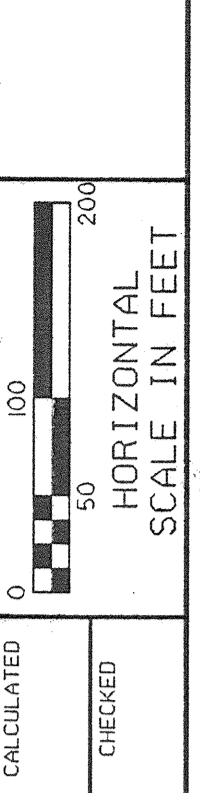
PLAN AND PROFILE SHEET
 STA. 1179+00 TO STA. 1205+00

ALL / HAN -30 - (20.31) (0.00)



REF: 04/14/84/05/28/1884
 DATE: 04/14/84
 PROJ: HANCOCK COUNTY
 PREP: J. W. H. / J. W. H.
 CHECK: J. W. H. / J. W. H.
 SCALE: AS SHOWN
 ACTIVE LEVELS: 0.00, 1.00, 2.00, 3.00, 4.00, 5.00, 6.00, 7.00, 8.00, 9.00, 10.00, 11.00, 12.00, 13.00, 14.00, 15.00, 16.00, 17.00, 18.00, 19.00, 20.00, 21.00, 22.00, 23.00, 24.00, 25.00

SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN-30-(20.31) (0.00)
 H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



NOTE: SEE SHEET 7 FOR BORINGS BORINGS BN-2 & BN-4

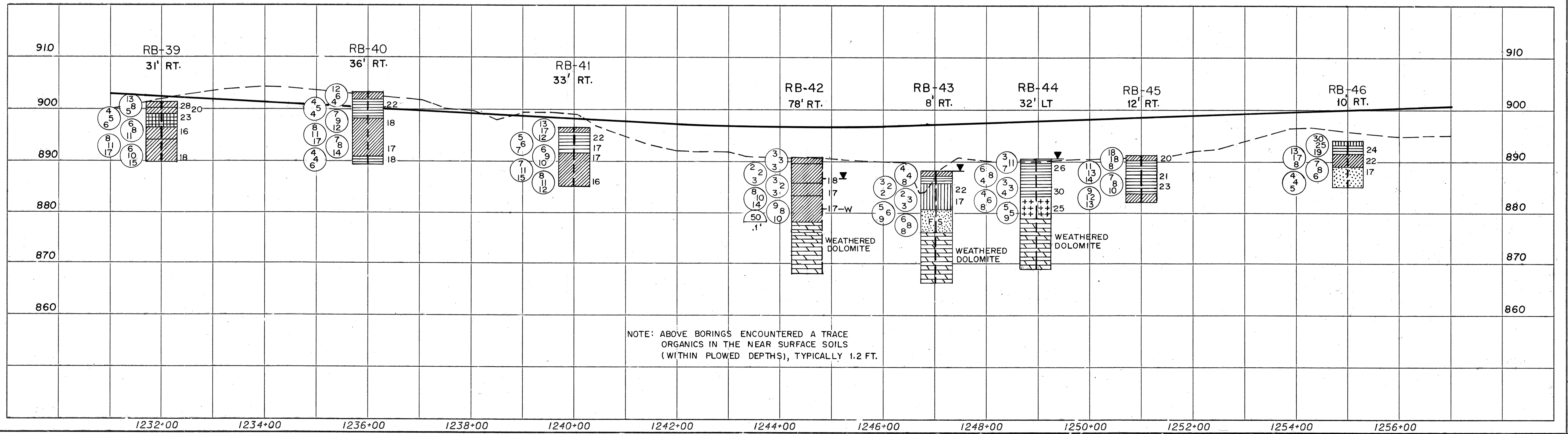
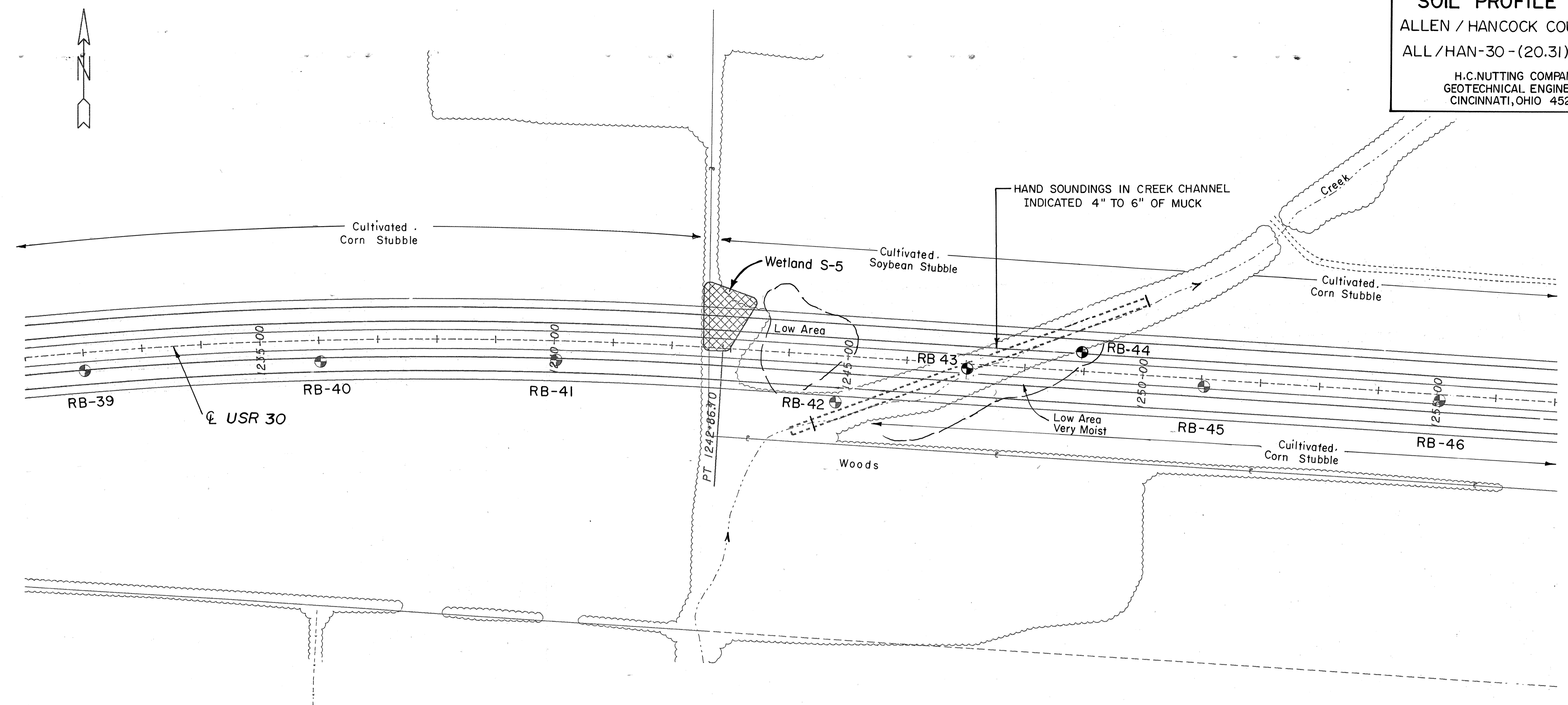
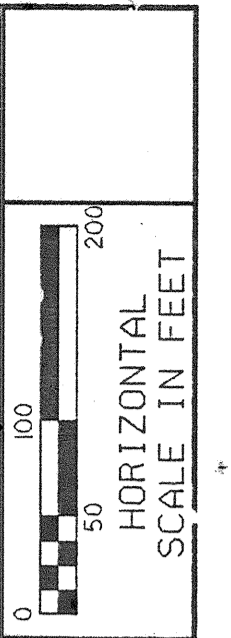
NOTE: ABOVE BORINGS ENCOUNTERED A TRACE ORGANICS IN THE NEAR SURFACE SOILS (WITHIN PLOWED DEPTHS), TYPICALLY 1.3 FT.

PLAN AND PROFILE SHEET
 STA. 1205+00 TO STA. 1231+00

ALL / HAN-30-(20.31)(0.00)

REVISIONS:
 1. DATE: 01/03/01 BY: JAC/AMH
 2. DATE: 02/03/01 BY: JAC/AMH
 3. DATE: 03/03/01 BY: JAC/AMH
 4. DATE: 04/03/01 BY: JAC/AMH
 5. DATE: 05/03/01 BY: JAC/AMH
 6. DATE: 06/03/01 BY: JAC/AMH
 7. DATE: 07/03/01 BY: JAC/AMH
 8. DATE: 08/03/01 BY: JAC/AMH
 9. DATE: 09/03/01 BY: JAC/AMH
 10. DATE: 10/03/01 BY: JAC/AMH
 11. DATE: 11/03/01 BY: JAC/AMH
 12. DATE: 12/03/01 BY: JAC/AMH

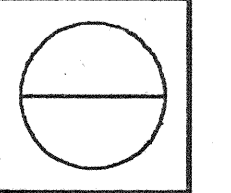
SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL/HAN-30-(20.31)(0.00)
 H.C.NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



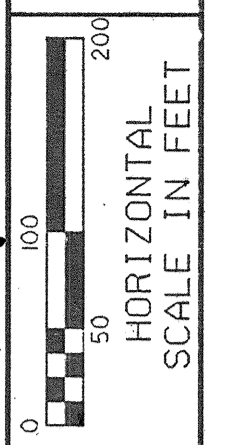
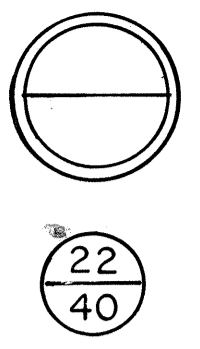
Mod. No. 14, 19/04/53 1994
 H.C. Nutting Company
 10000 W. Chester Road
 Cincinnati, Ohio 45248
 Phone 513-262-2000
 Fax 513-262-2001
 E-mail: hcnut@hcnut.com
 Website: www.hcnut.com

PLAN AND PROFILE SHEET
 STA. 1231+00 TO STA. 1257+00

ALL/HAN-30-(20.31)(0.00)



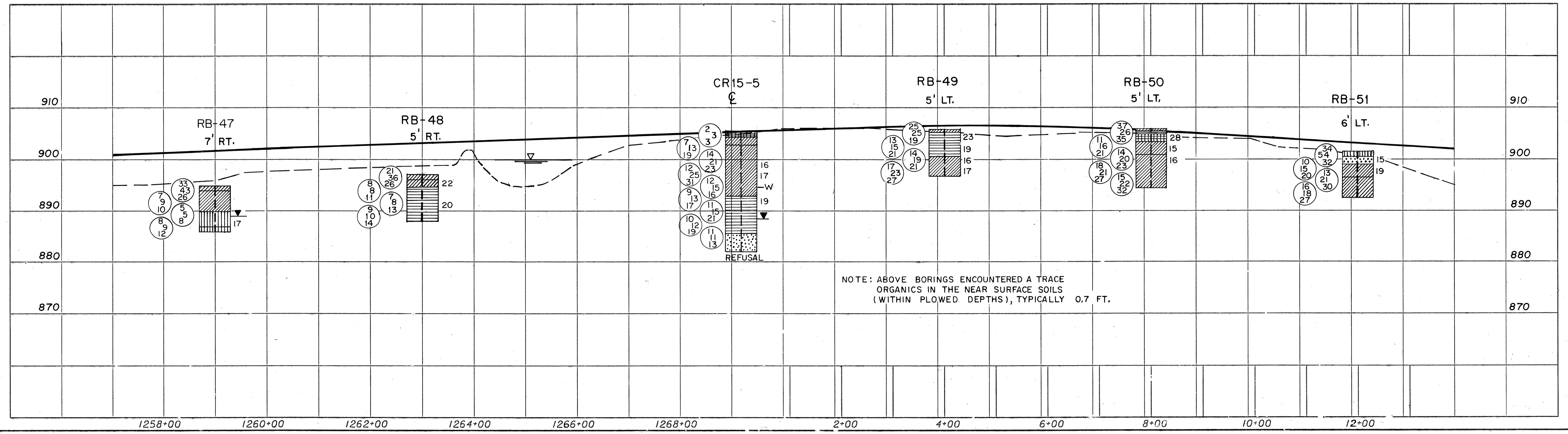
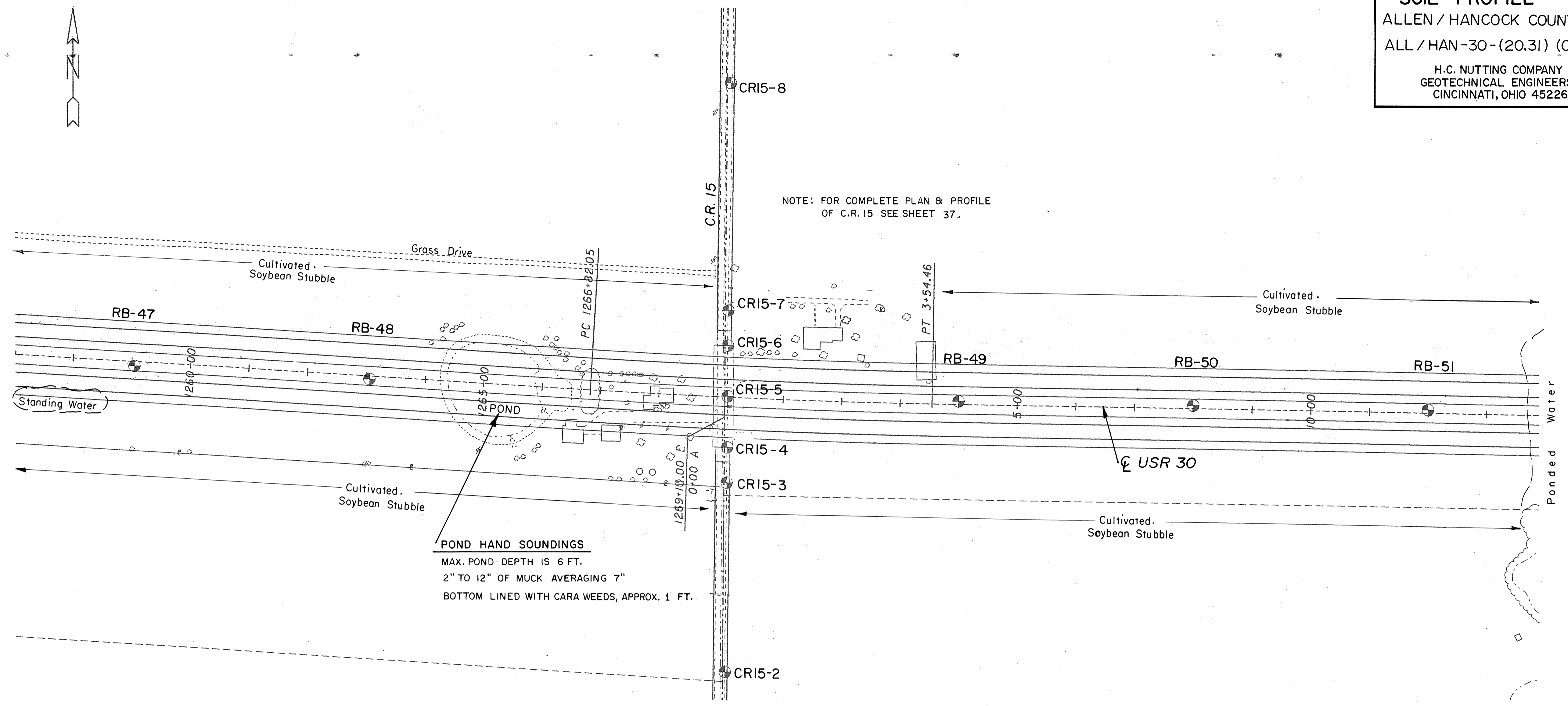
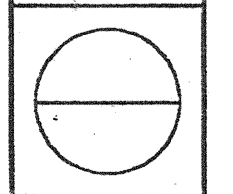
SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN-30-(20.31) (0.00)
 H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



CALCULATED
 CHECKED

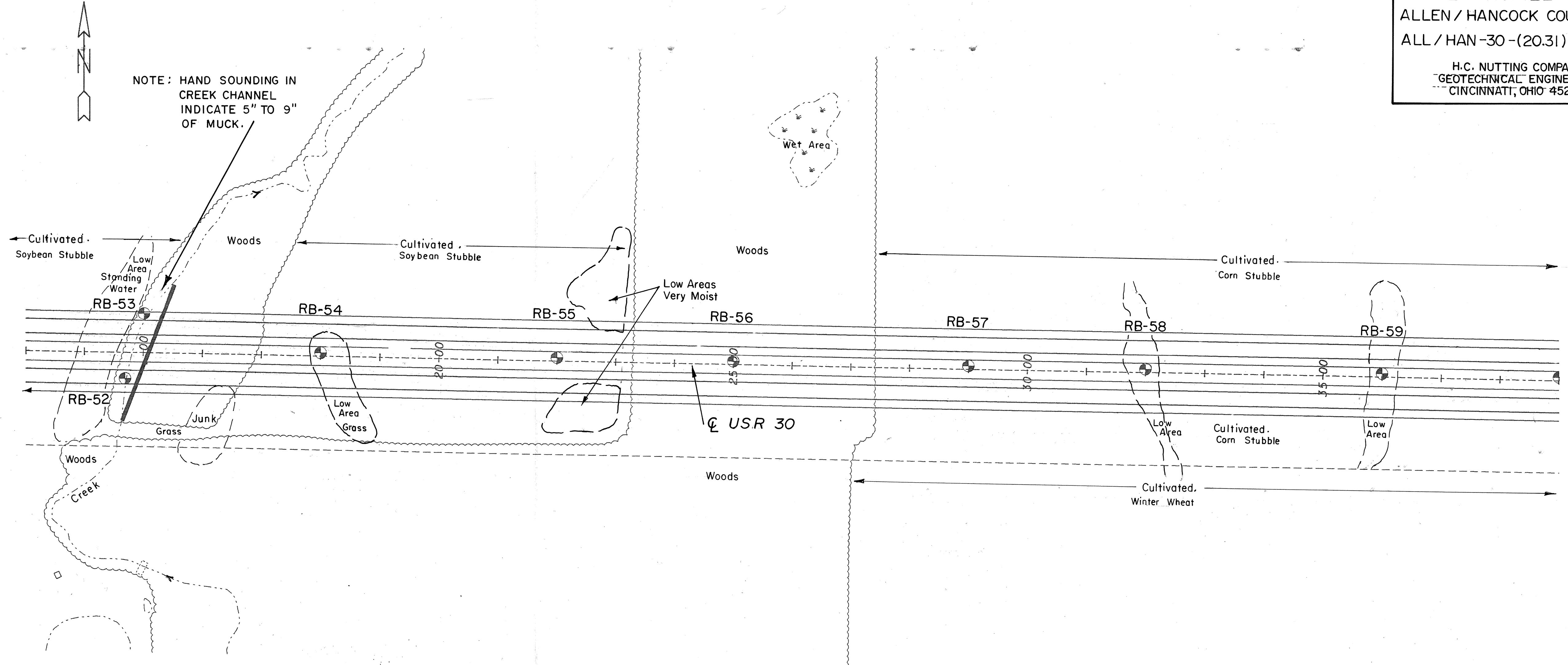
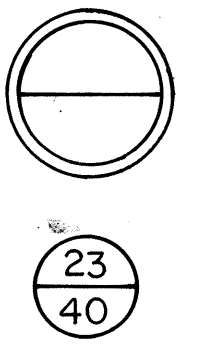
PLAN AND PROFILE SHEET
 STA. 1257+00 To STA. 1269+0794 / STA. 0+00 TO STA. 14+00

ALL / HAN-30-(20.31)(0.00)



REF: ccr1003.dgn
 USER: hcn
 DATE: 11/26/94
 TIME: 10:05:00
 PROJECT: ALL / HAN-30-(20.31)(0.00)
 SHEET: ALL / HAN-30-(20.31)(0.00)
 ACTIVE LEVELS: 0h: 3/12/27-39, 41-63

SOIL PROFILE
ALLEN / HANCOCK COUNTIES
ALL / HAN -30 - (20.31) (0.00)
H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
CINCINNATI, OHIO 45226



CALCULATED
CHECKED

PLAN AND PROFILE SHEET
STA. 13+00 TO STA. 39+00

ALL / HAN -30 - (20.31) (0.00)

930																								930
920	NOTE: BORING RB-52 PERFORMED WITH HAND EQUIPMENT. THE REPORTED BLOW COUNTS ARE APPROXIMATELY 4 TIMES GREATER THAN THE STANDARD N-VALUE, SINCE A 35 lb. HAMMER WEIGHT WAS USED TO DRIVE THE SPLIT SPOON SAMPLE.																						920	
910																								910
900																								900
890																								890
880																								880
870																								870
860																								860

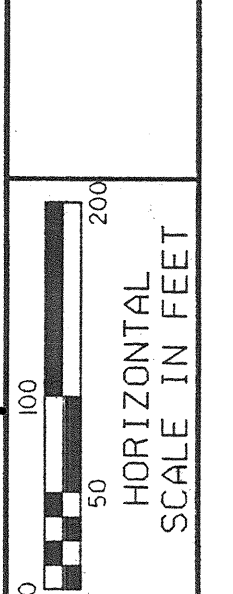
RB-52 44' RT.
RB-53 66' LT.
RB-54 6' LT.
RB-55 6' LT.
RB-56 6' LT.
RB-57 6' LT.
RB-58 6' LT.
RB-59 6' LT.

TOPSOIL=0.5'

NOTE: ABOVE BORINGS ENCOUNTERED A TRACE ORGANICS IN THE NEAR SURFACE SOILS (WITHIN PLOWED DEPTHS), TYPICALLY 1.2 FT.

NO. 14, 16421994
DATE: 10/22/94
PROJECT: 10140530
DRAWN: J.E.P./L.P.
CHECKED: J.E.P./L.P.
ACTIVE LEVELS: 031, 31, 27, 23, 14-63
REF: 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018, 019, 020, 021, 022, 023, 024, 025, 026, 027, 028, 029, 030, 031, 032, 033, 034, 035, 036, 037, 038, 039, 040, 041, 042, 043, 044, 045, 046, 047, 048, 049, 050, 051, 052, 053, 054, 055, 056, 057, 058, 059, 060, 061, 062, 063, 064, 065, 066, 067, 068, 069, 070, 071, 072, 073, 074, 075, 076, 077, 078, 079, 080, 081, 082, 083, 084, 085, 086, 087, 088, 089, 090, 091, 092, 093, 094, 095, 096, 097, 098, 099, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 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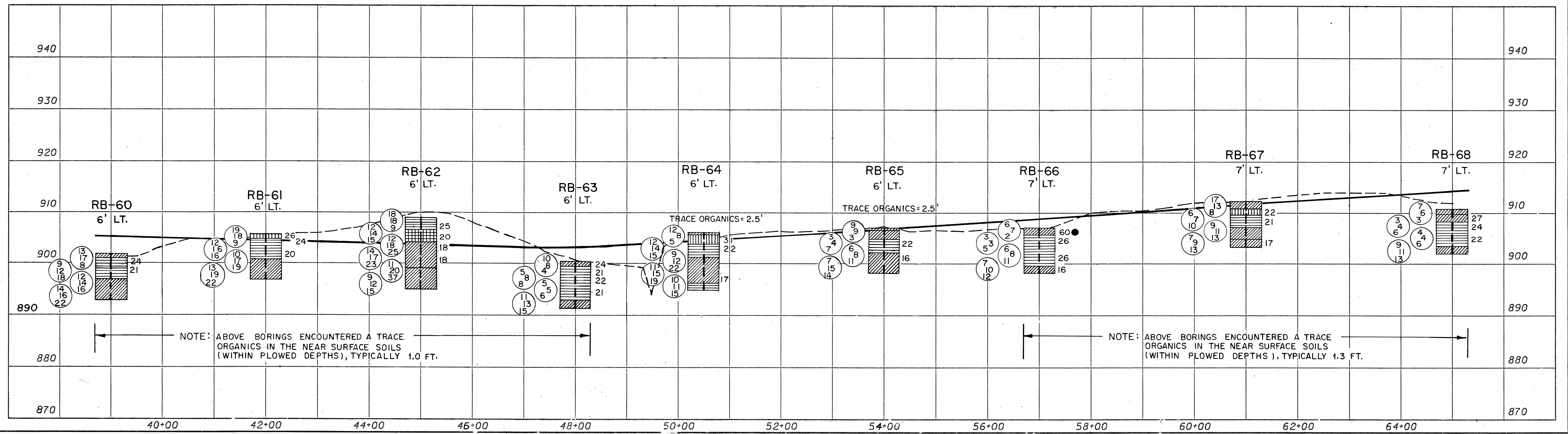
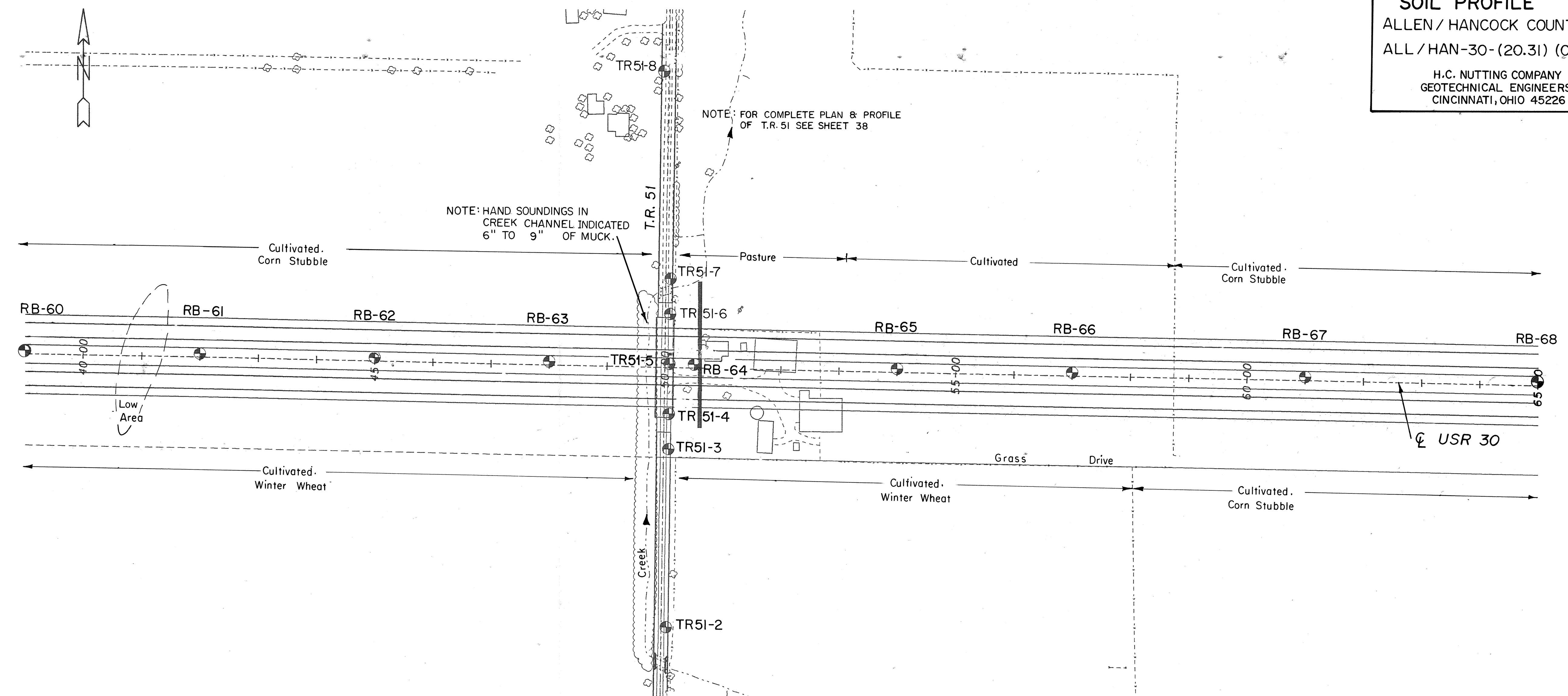
SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN-30-(20.31) (0.00)
 H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



CALCULATED
 CHECKED

PLAN AND PROFILE SHEET
 STA. 39+00 TO STA. 65+00

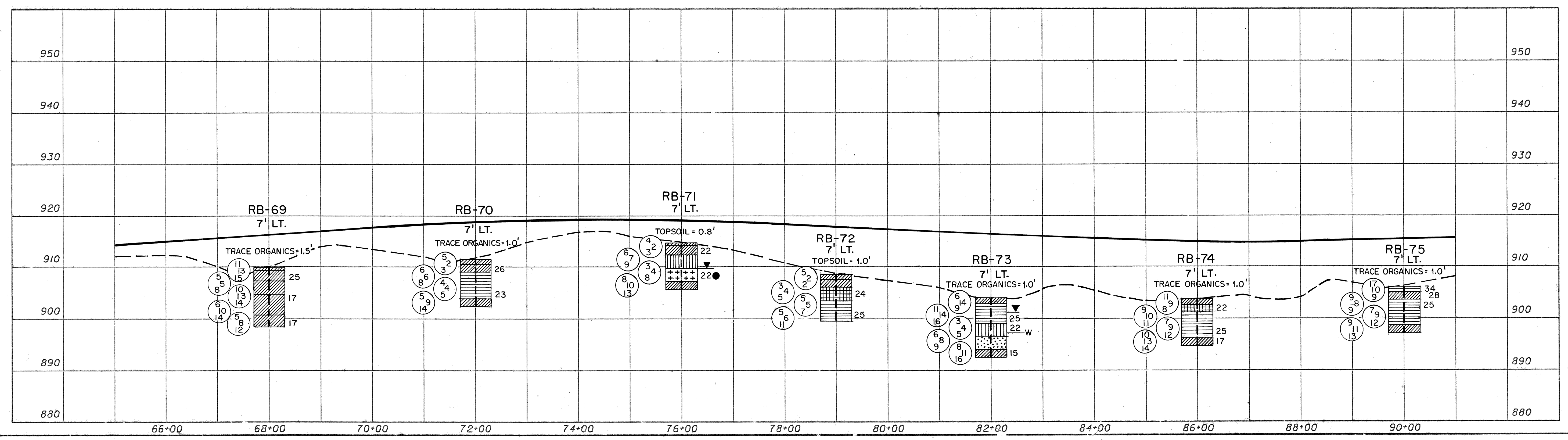
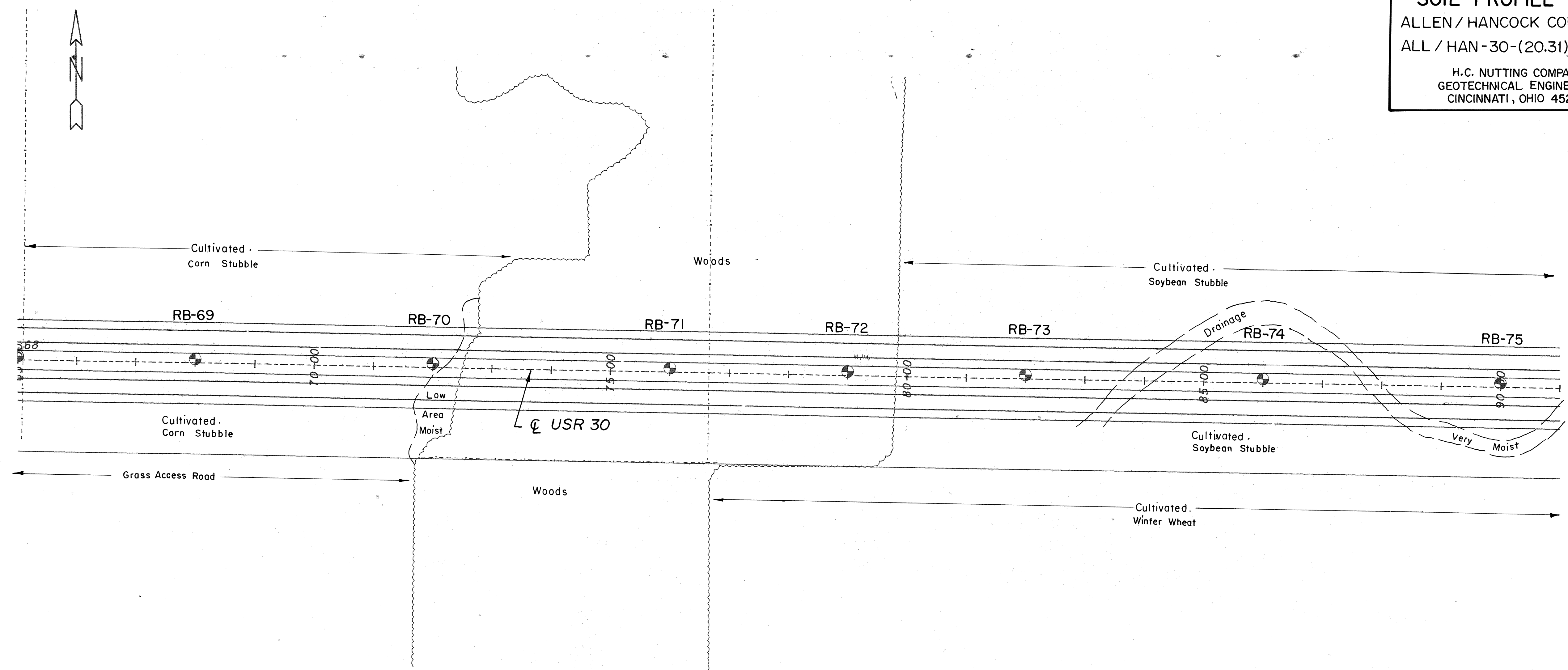
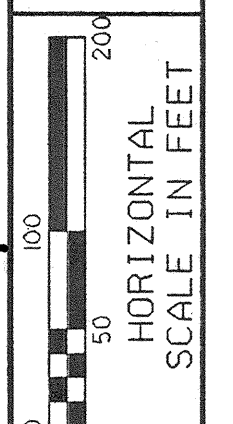
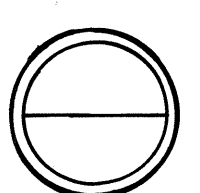
ALL / HAN-30-(20.31)(0.00)



REF: C:\p1007\p1007.dwg (R:\p1007.dwg) Plot: P1007-33
 USER: HCNUTTING
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 PLOT TIME: 11:11:11 AM
 ACTIVE LEVELS: ON: 3/2/2007 3:46:53

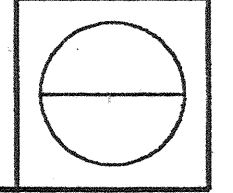
SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN-30-(20.31) (0.00)

H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



PLAN AND PROFILE SHEET
 STA. 65+00 TO STA. 91+00

ALL / HAN-30-(20.31)(0.00)

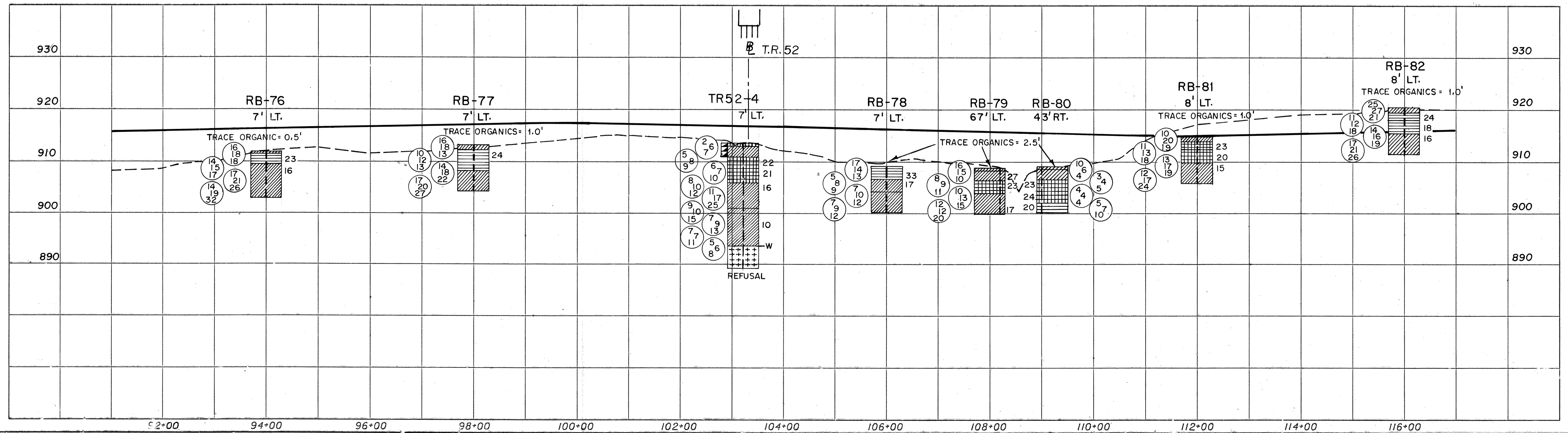
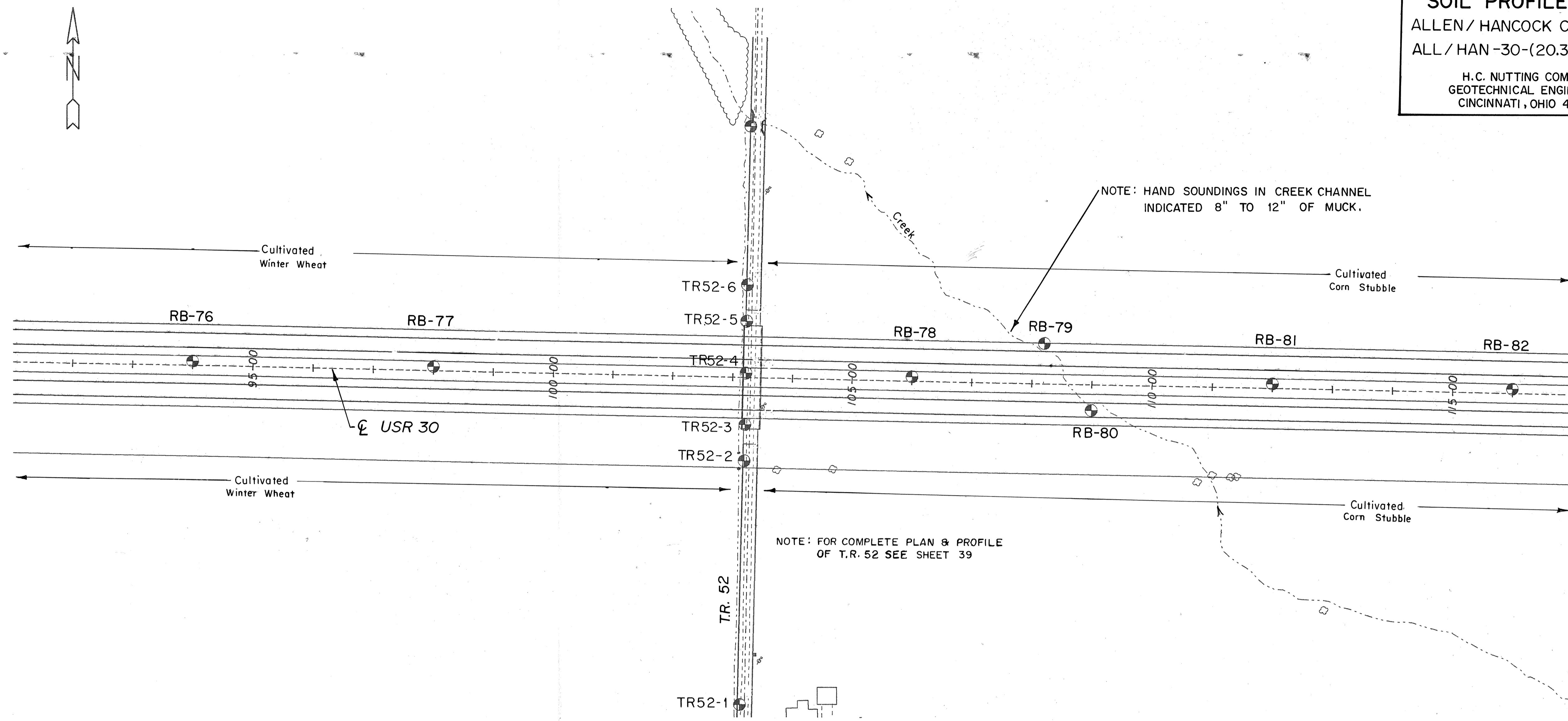
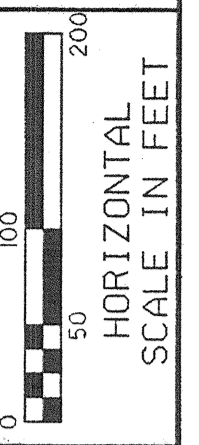
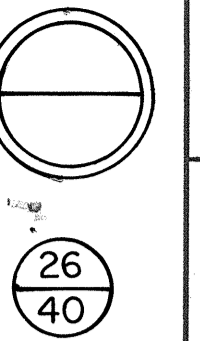


USER: 191145 1994
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 TIME: 10:00 AM
 PROJECT: ALL / HAN-30-(20.31)(0.00)
 SHEET: PLAN AND PROFILE SHEET
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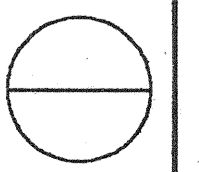
SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN -30-(20.31) (0.00)

H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



PLAN AND PROFILE SHEET
 STA. 91+00 TO STA. 117+00

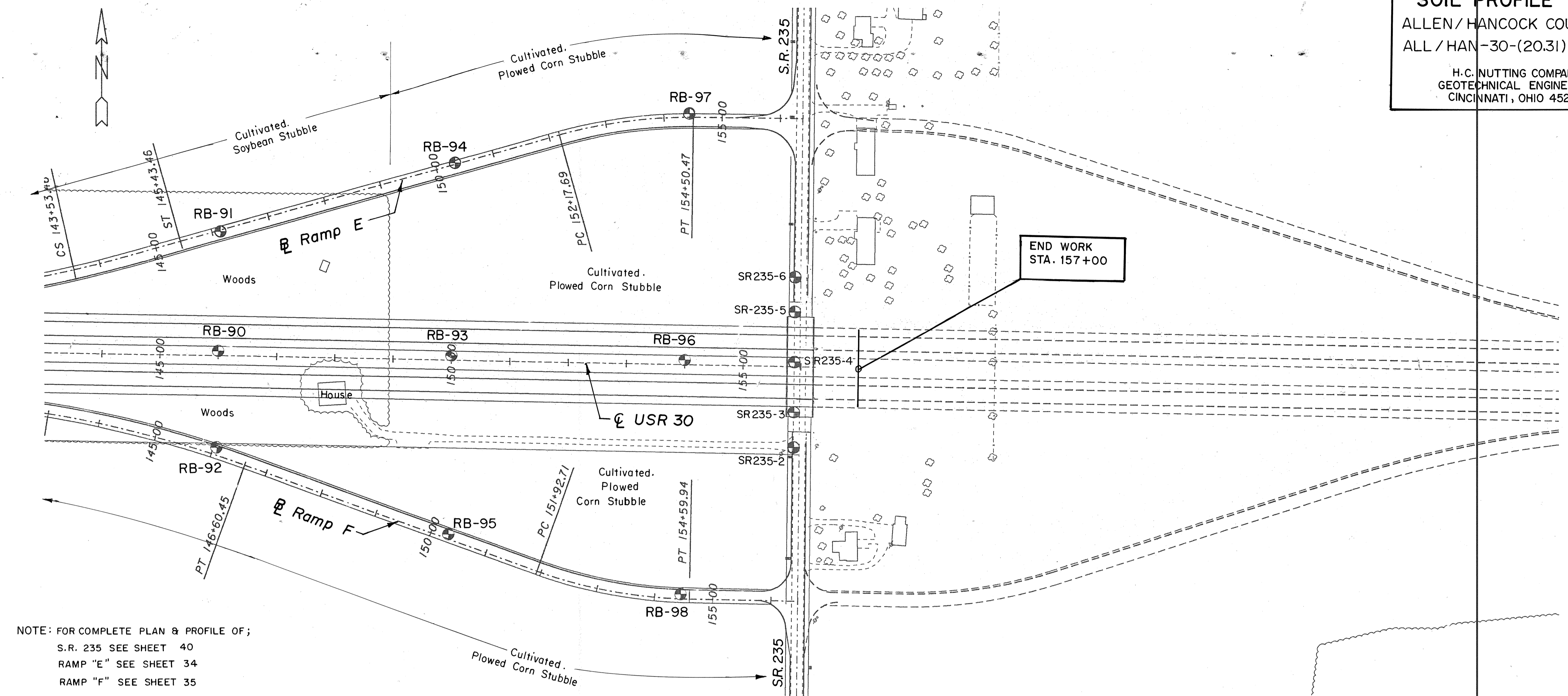
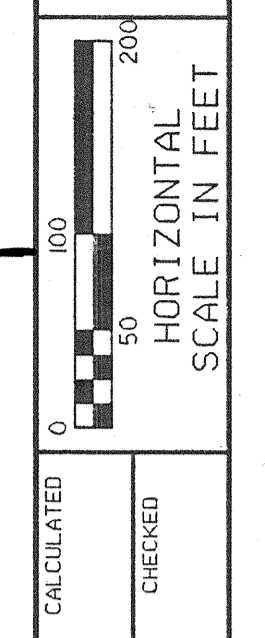
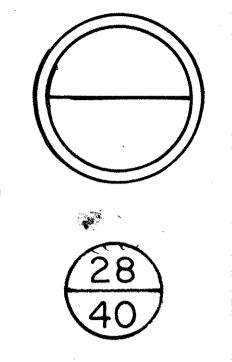
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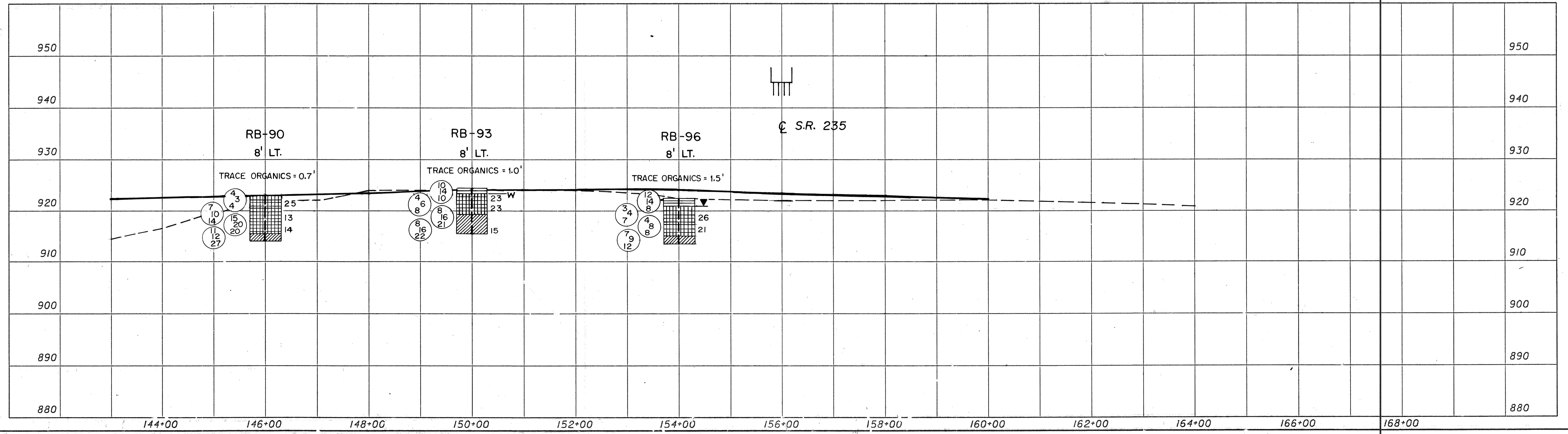
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SOIL PROFILE
 ALLEN/HANCOCK COUNTIES
 ALL/HAN-30-(20.31) (0.00)

H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



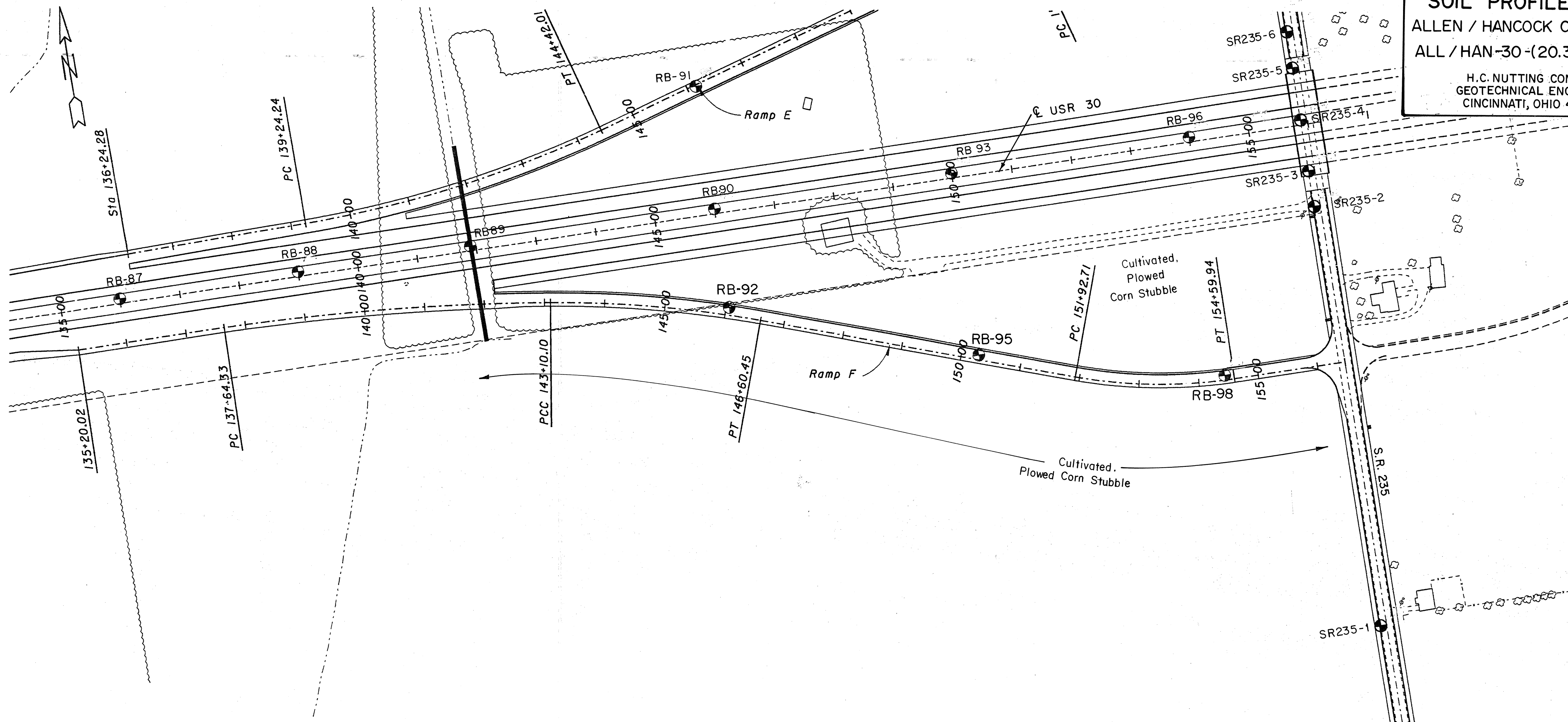
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 RAMP "E" SEE SHEET 34
 RAMP "F" SEE SHEET 35



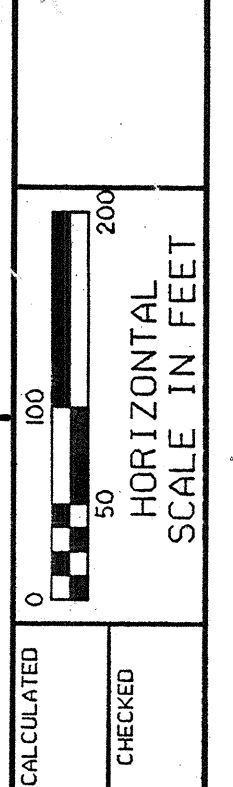
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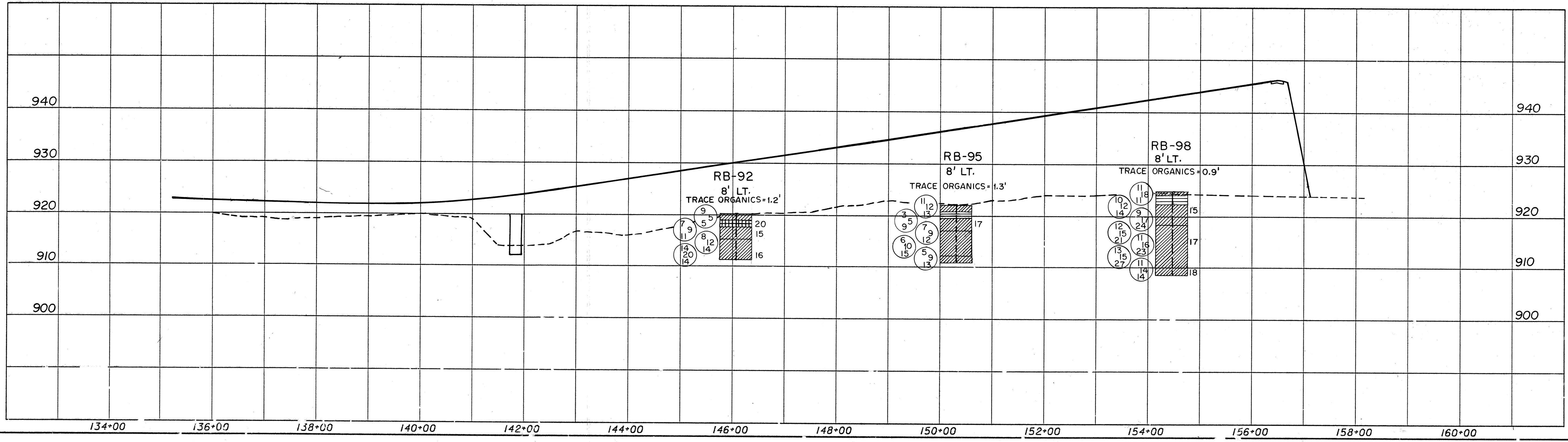
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 SHEET: 28 OF 40
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 TIME: 10:00 AM
 ACTIVE LEVELS: ON: 3/10/2006 10:00 AM



SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN-30-(20.31) (0.00)
 H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



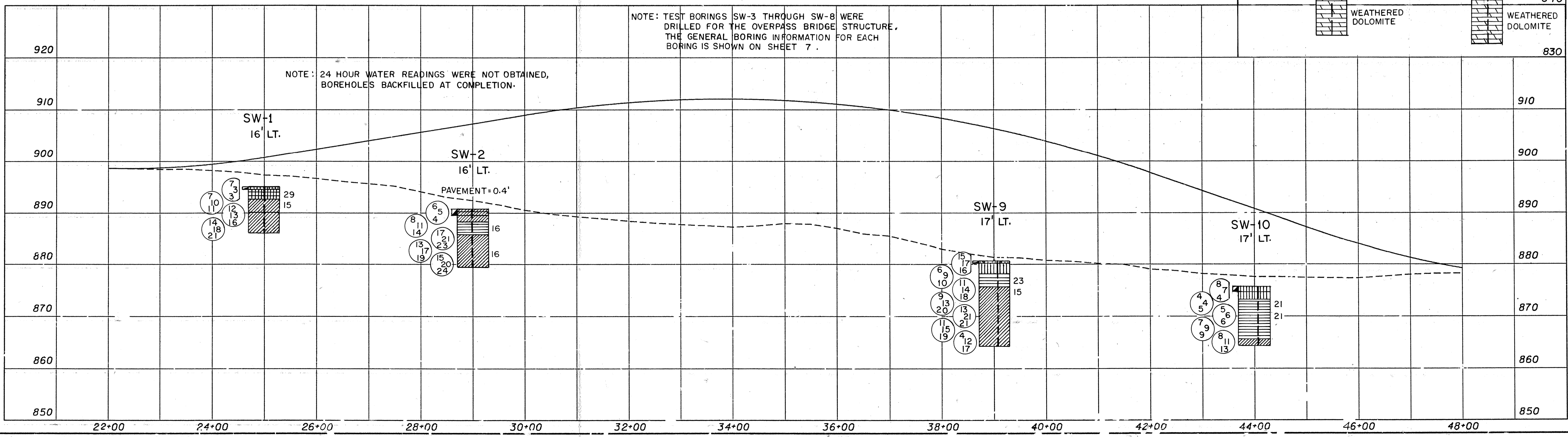
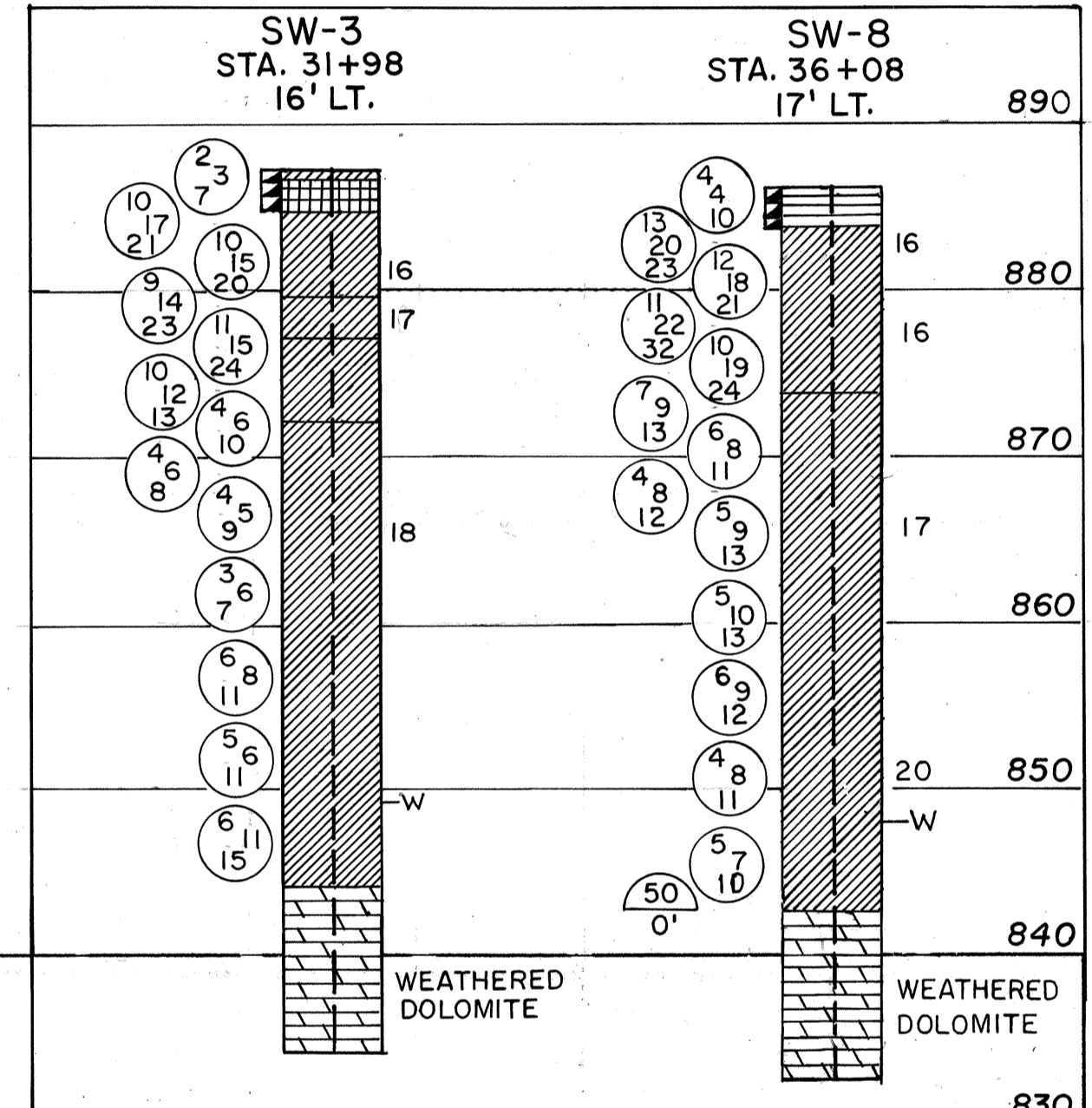
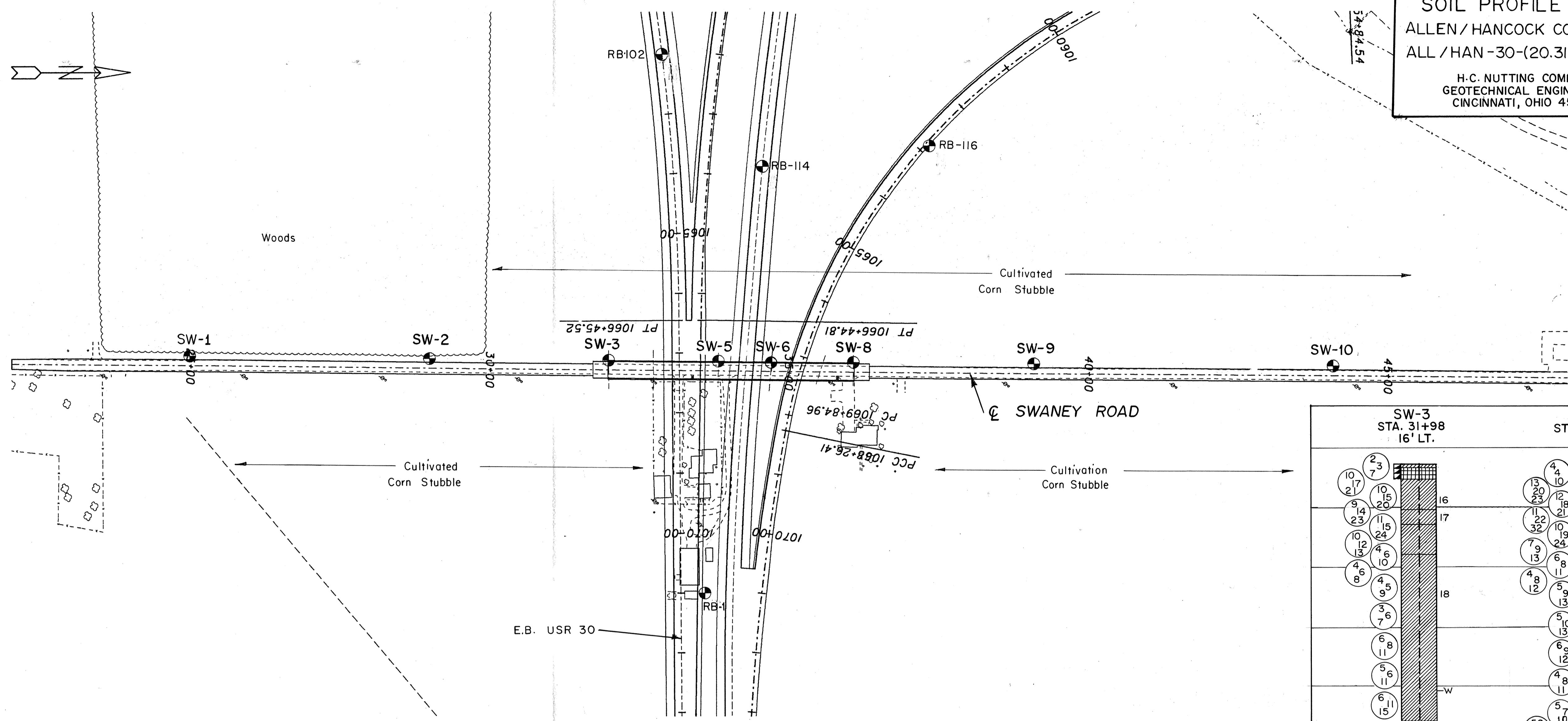
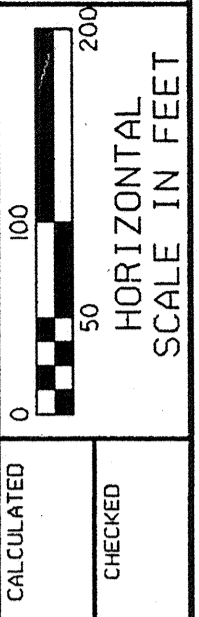
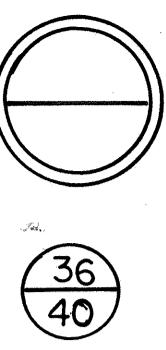
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 SHEET: 350522 1994

SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN -30-(20.31) (0.00)
 H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



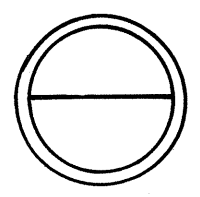
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SOIL PROFILE
ALLEN / HANCOCK COUNTIES
ALL / HAN -30 - (20.31) (0.00)

H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
CINCINNATI, OHIO 45226

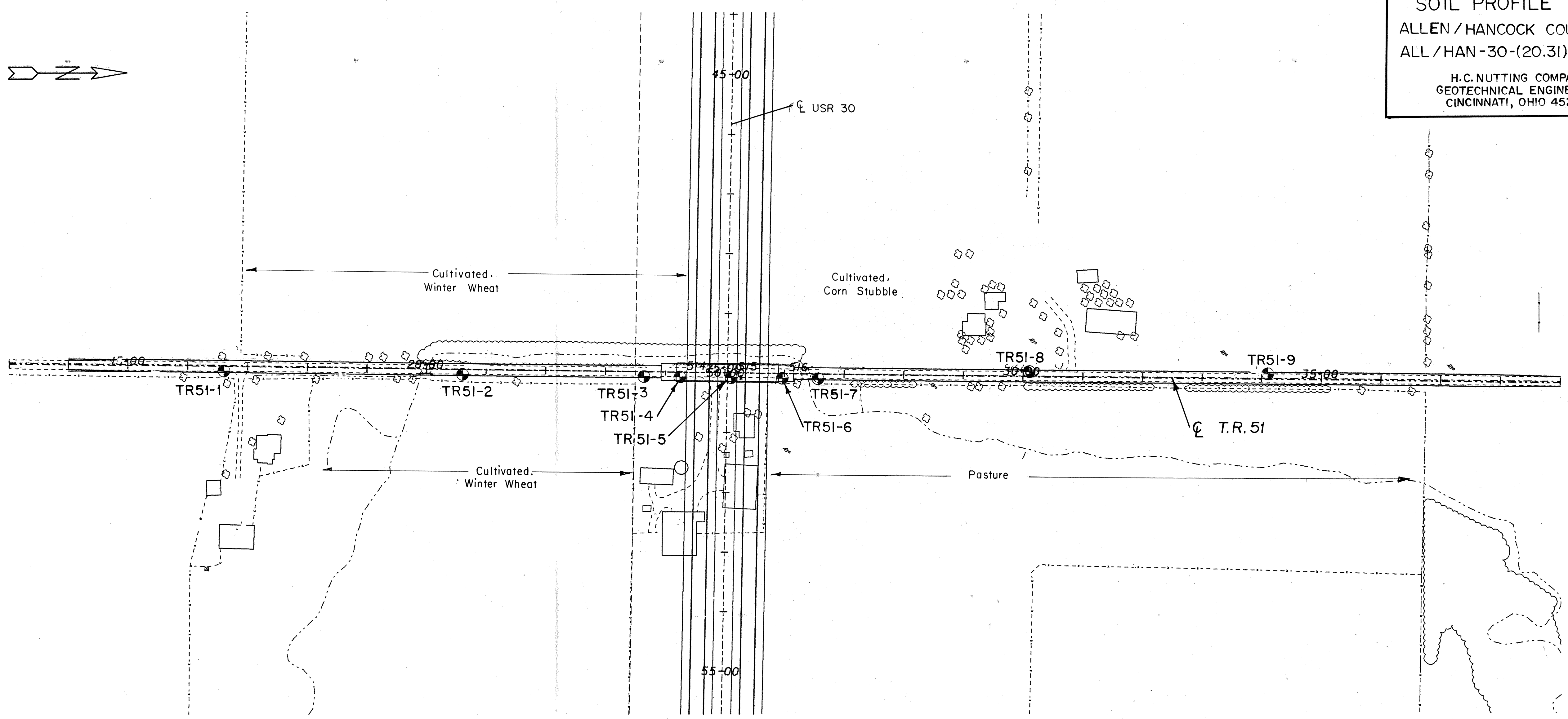


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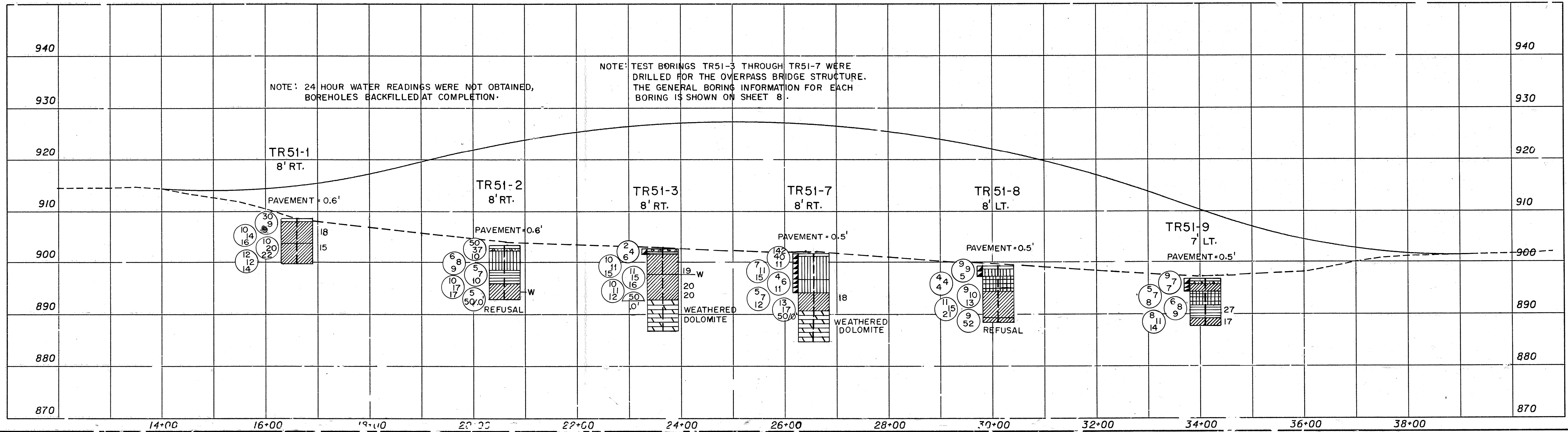
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PLAN AND PROFILE SHEET
T.R. 51



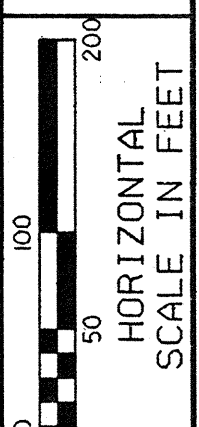
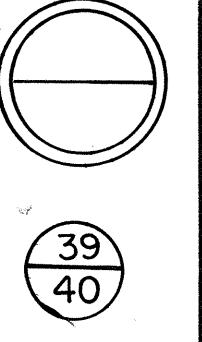
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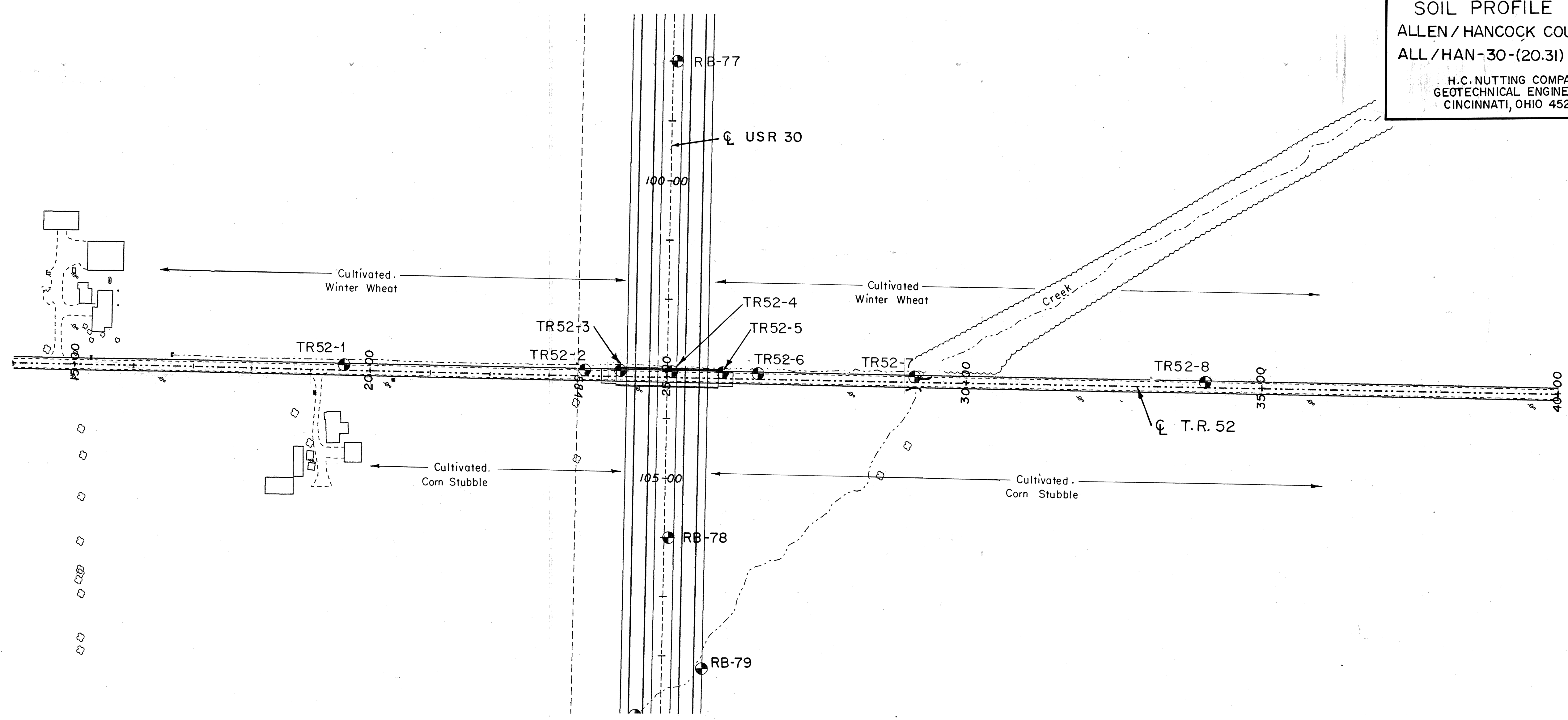
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SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN-30-(20.31) (0.00)

H.C. NUTTING COMPANY
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 CINCINNATI, OHIO 45226

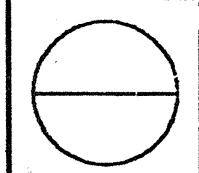


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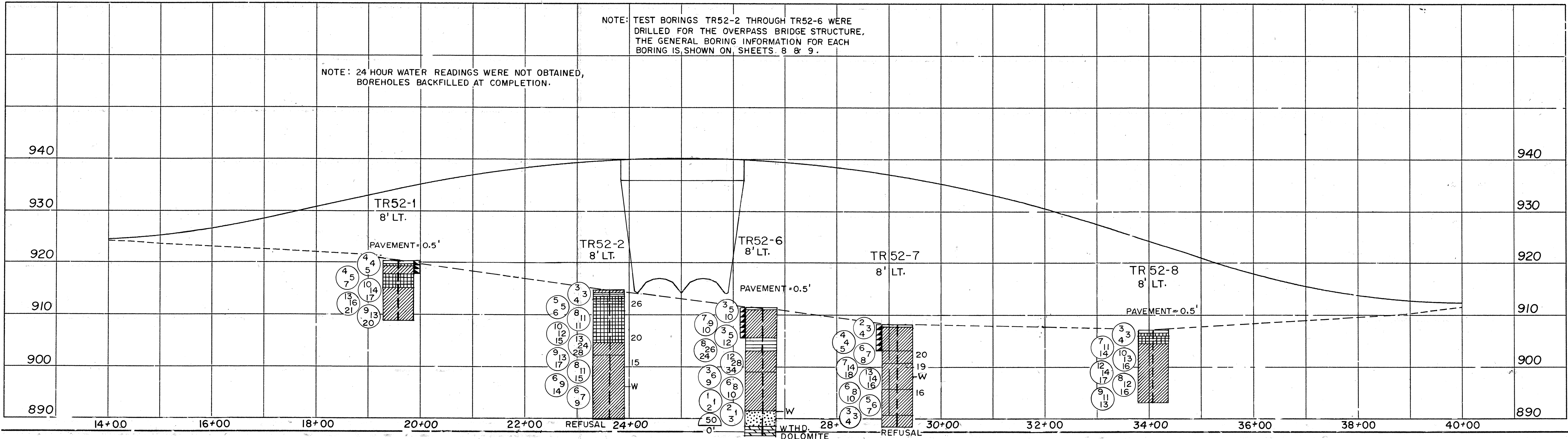
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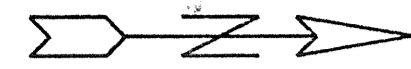


NOTE: TEST BORINGS TR52-2 THROUGH TR52-6 WERE DRILLED FOR THE OVERPASS BRIDGE STRUCTURE. THE GENERAL BORING INFORMATION FOR EACH BORING IS SHOWN ON SHEETS 8 & 9.

NOTE: 24 HOUR WATER READINGS WERE NOT OBTAINED, BOREHOLES BACKFILLED AT COMPLETION.

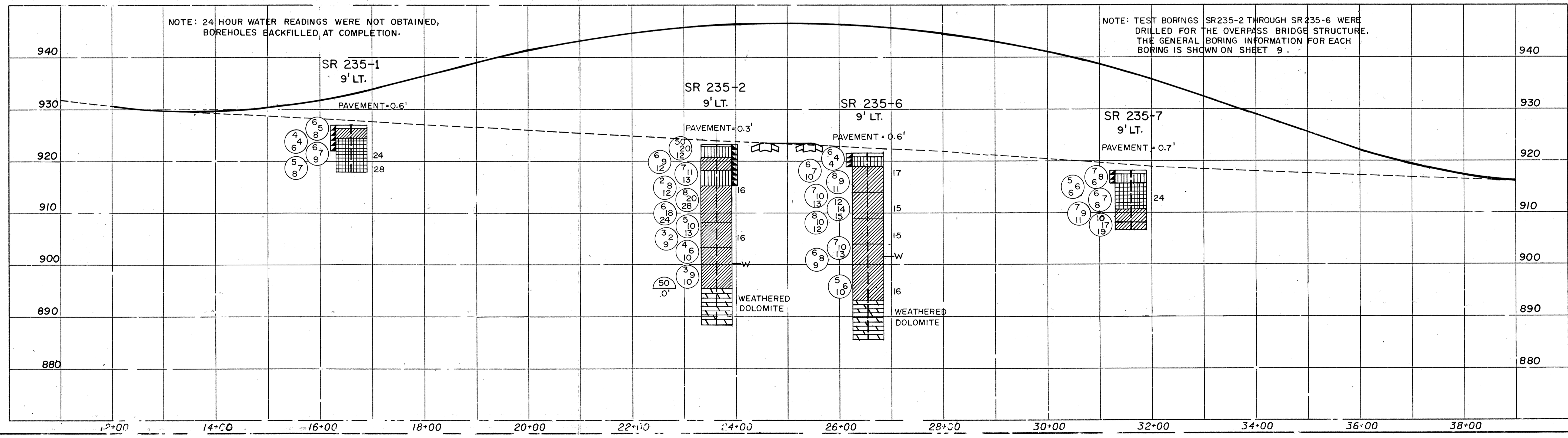
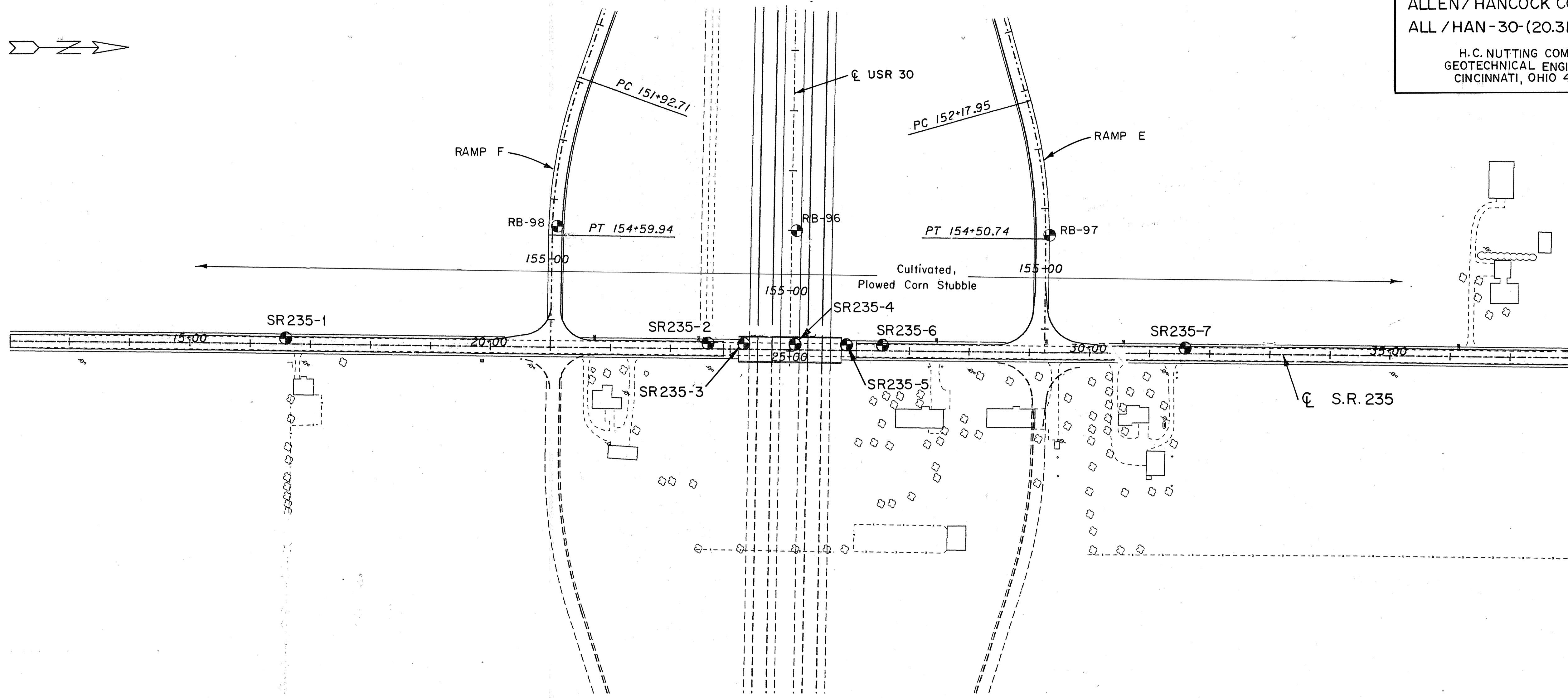
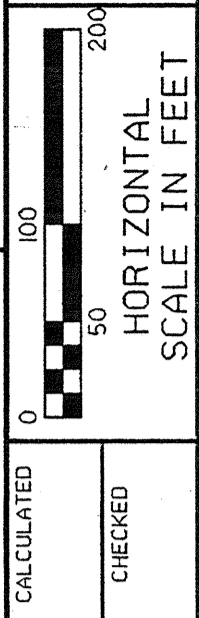
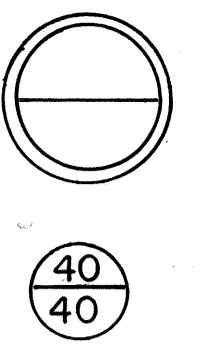


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SOIL PROFILE
 ALLEN / HANCOCK COUNTIES
 ALL / HAN-30-(20.31) (0.00)

H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



PLAN AND PROFILE SHEET
 S.R. 235

ALL / HAN-30-(20.31)(0.00)

REF: 6/17/87 1994
 USED: 3/28/94
 PREP: H.C. NUTTING COMPANY
 ACTIVE LEVELS ON 3/28/94

PROJECT DESCRIPTION

A BRIDGE STRUCTURE WILL BE CONSTRUCTED ALONG RAMPS B AND D TO SPAN THE U.S. 30 WESTBOUND LANES AND RAMP D. THE ABUTMENTS ARE TO BE LOCATED AT STATION 1001+29.25 AND 1003+30.0 ALONG RAMP BD. THE STRUCTURE, BRIDGE NO. ALL-30-1999 WB (RAMPS BD OVER U.S. 30 WESTBOUND LANES AND RAMP D) WILL BE A TWO-SPAN, PRESTRESSED CONCRETE "I" GIRDER BRIDGE WITH A COMPOSITE REINFORCED CONCRETE DECK AND REINFORCED CONCRETE SUBSTRUCTURE. THE SPAN LENGTHS WILL BE 107 FT. 3 IN. AND 93 FT. 6 IN. FOR A TOTAL BRIDGE LENGTH OF 206.17 FT.

THE APPROACH EMBANKMENTS WILL BE HAVE A MAXIMUM HEIGHT OF APPROXIMATELY 29 FT. AT THE ABUTMENTS. THE APPROACH EMBANKMENTS WILL HAVE A CREST WIDTH OF APPROXIMATELY 65 FT. AND SIDE SLOPES CONSTRUCTED TO 2H:1V.

GEOLOGY

THE PROJECT SITE IS LOCATED WITHIN THE TILL PLAINS PHYSIOGRAPHIC REGION OF OHIO. THE AREA WAS COVERED BY CONTINENTAL GLACIERS IN TWO TIME PERIODS, THE ILLINOIAN AND WISCONSIN GLACIATIONS. THE ADVANCING AND RETREATING ICE SHEETS DEPOSITED GROUND MORAINES (GLACIAL TILL) AND END MORAINES, THE WISCONSIN AGE DEPOSITS OVERLYING THE OLDER ILLINOIAN DEPOSITS. THE SURFACE DEPOSITS ARE CONSIDERED GROUND MORAINES (WISCONSIN AGE), LOCATED JUST NORTH OF THE EAST-WEST ORIENTED FORT WAYNE END MORAINES.

THE OVERBURDEN SOILS WITHIN THE PROJECT LIMITS ARE TYPICALLY GROUND MORAINES OR GLACIAL TILL DEPOSITS. A GLACIAL TILL SOIL CAN BE DESCRIBED AS AN UNSORTED, UNSTRATIFIED MIXTURE OF CLAY, SILT, SAND, GRAVEL, COBBLES AND BOULDERS. THE GLACIAL DEPOSITS WITHIN THE PROJECT LIMITS ARE TYPICALLY 25 TO 60 FT. THICK, THINNER IN THE DRAINAGE VALLEYS.

THE BEDROCK WITHIN THE PROJECT VICINITY, UNDERLYING THE GLACIAL TILL OVERBURDEN, IS UPPER SILURIAN TO LOWER DEVONIAN IN AGE. GEOLOGIC LITERATURE INDICATES THAT THE BEDROCK BELONGS TO THE MONROE FORMATION THAT IS TYPICALLY LIMESTONE AND DOLOMITE.

INVESTIGATIONAL PROCEDURES

TEST BORINGS, LABELED AS IC-1 THROUGH IC-5, WERE PERFORMED FOR THE BRIDGE STRUCTURE ALONG RAMP BD AS PART OF THE U.S. 30 ROADWAY PROJECT (ALL/HAN-30-20.31/0.00). THE STRUCTURE TEST BORINGS WERE PERFORMED USING A TRUCK-MOUNTED DRILLING RIG BETWEEN MARCH 31 AND APRIL 2, 1994. TEST BORINGS IC-1, IC-3 AND IC-5 WERE ADVANCED TO A CONDITION OF REFUSAL ON THE DOLOMITE BEDROCK, AT WHICH A ROCK CORE SAMPLE WAS OBTAINED. TEST BORINGS IC-2 AND IC-4 WERE TERMINATED ABOVE THE BEDROCK SURFACE AT A DEPTH OF 21.5 FT. THE DEPTH TO THE BEDROCK SURFACE RANGED BETWEEN 34 AND 36 FT.

EACH TEST BORING WAS ADVANCED WITH HOLLOW-STEM AUGERS. THE DRIVE SAMPLING WAS ACCOMPLISHED THROUGH AND BELOW THE TIP OF THE HOLLOW-STEM AUGERS AT 2.5 FT. INTERVALS TO A DEPTH OF 20 FT., AT WHICH DEPTH 5 FT. SAMPLING INTERVALS WERE USED. THE DRIVE SAMPLING WAS ACCOMPLISHED IN ACCORDANCE WITH "PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS," ASTM D 1586. A 2 IN. O.D. BY 1 3/8 IN. I.D. SPLIT-SPOON SAMPLER WAS DRIVEN A TOTAL OF 18 IN., WITH A TOTAL NUMBER OF BLOWS OF 140 LB. HAMMER WEIGHT FALLING 30 IN. BEING RECORDED FOR 6 IN. OF PENETRATION. THE SUM OF BLOWS FOR THE FINAL 12 IN. OF PENETRATION IS THE STANDARD PENETRATION TEST RESULT, COMMONLY REFERENCED TO AS THE N-VALUE.

BEDROCK CORE SAMPLING WAS PERFORMED AT TEST BORINGS IC-1, IC-3 AND IC-5. THE BEDROCK CORE SAMPLING WAS PERFORMED IN ACCORDANCE WITH ASTM D 2113. THE BEDROCK CORE SAMPLES WERE CUT WITH AN NX SERIES CORE BARREL, PRODUCING A CORE HAVING A NOMINAL DIAMETER OF 2 1/8 IN. THE BEDROCK CORE SAMPLE LENGTHS WERE 10 FT. IN EACH BORING.

THE UNDISTURBED SOIL SAMPLES WERE OBTAINED BY PUSHING A 3 IN. O.D. SHELBY TUBE SAMPLER IN ACCORDANCE WITH ASTM D 1587.

ALL SOIL SAMPLES WERE STORED IN SEALED JARS AND THE BEDROCK CORE SAMPLES WERE STORED IN WOODEN CORE BOXES. THE DRILLER MAINTAINED A LOG OF THE ENTIRE DRILLING OPERATION, INCLUDING A DESCRIPTION OF THE MATERIALS ENCOUNTERED IN EACH SPLIT-SPOON OR BEDROCK CORE RUN, THE DEPTH AT WHICH THE DESCRIPTION OF THE SOIL OR BEDROCK CHANGED, THE DEPTH FROM WHICH EACH SAMPLE WAS RECOVERED, THE TYPE OF SAMPLE, THE NUMBER OF BLOWS FOR EACH 6 IN. OF DRIVE ON THE SPLIT-SPOON SAMPLER, THE NUMBER OF INCHES OF RECOVERY FOR EACH SAMPLE OBTAINED, LEVELS AT WHICH ANY GROUNDWATER OR SEEPAGE WAS ENCOUNTERED, ALONG WITH ANY OTHER PERTINENT INFORMATION DEVELOPED DURING THE DRILLING OPERATIONS.

UPON COMPLETION OF THE DRILLING PROGRAM, ALL SAMPLES (SOIL AND ROCK CORE) WERE RETURNED TO OUR CINCINNATI SOIL MECHANICS LABORATORY WHERE THE PROJECT ENGINEER INSPECTED EACH SAMPLE. THE ATTACHED STRUCTURE BORING LOGS WERE PREPARED BASED ON THE VISUAL INSPECTION OF THE RECOVERED SAMPLES, THE LABORATORY TEST DATA AND ODOT STANDARDS.

REPRESENTATIVE SOIL AND ROCK CORE SAMPLES WERE SELECTED FOR THE PERFORMANCE OF PHYSICAL TESTS IN OUR LABORATORY TO DETERMINE THEIR ENGINEERING CHARACTERISTICS. INCLUDED IN THE LABORATORY TEST PROGRAM WERE NATURAL MOISTURE CONTENT DETERMINATIONS, ATTERBERG LIMITS, SIEVE ANALYSES WITH HYDROMETER TESTS, UNCONFINED COMPRESSION TESTS AND A CONSOLIDATION TEST.

LEGEND

- AUGER BORING LOCATION-PLAN VIEW
- PRESS AND/OR DRIVE SAMPLE AND/OR CORE BORING LOCATION-PLAN VIEW
- CAPPED PILE
- FOOTING
- FOOTING ON PILE
- TR TOP OF ROCK

HORIZONTAL BAR ON BORING LOG INDICATES THE DEPTH THE SAMPLE WAS TAKEN

X/Y/Z FIGURES BESIDE THE BORING LOG IN PROFILE INDICATES THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST. X=NUMBER OF BLOWS FOR FIRST 6-INCHES Y=NUMBER OF BLOWS FOR SECOND 6-INCHES Z=NUMBER OF BLOWS FOR THIRD 6-INCHES

W INDICATES FREE WATER ELEVATION

INDICATES STATIC WATER ELEVATION

SYMBOLS OF ROCK TYPES

- COAL
- WEATHERED MUDSTONE
- MUDSTONE
- WEATHERED SHALE
- SHALE
- CLAYSTONE
- SILTSTONE
- WEATHERED SANDSTONE
- SANDSTONE
- LEACHED DOLOMITE
- DOLOMITE
- LEACHED LIMESTONE
- LIMESTONE
- BOULDERS OR COBBLES

INVESTIGATIONAL FINDINGS

THE SOIL PROFILE AT THE PROJECT SITE WAS COMPRISED OF GLACIALLY DEPOSITED MATERIALS, RESTING ON DOLOMITE BEDROCK. THE GLACIAL DEPOSITS WERE PREDOMINANTLY COMPRISED OF GROUND MORAINES OR GLACIAL TILL. THE NEAR SURFACE MATERIALS DEVELOPED THROUGH SEVERE WEATHERING OF THE PARENT GLACIAL TILL DEPOSITS. THE SURFACE MANTLE OF SEVERELY WEATHERED GLACIAL SOILS WAS UNDERLAIN BY LESS WEATHERED TO RELATIVELY UNWEATHERED DEPOSITS OF GLACIAL TILL. THE GLACIAL TILL DEPOSITS WERE COMPRISED OF TWO DISTINCT ZONES; AN UPPER ZONE THAT WAS BROWN IN COLOR AND THE LOWER ZONE OF GRAY COLOR. THE THICKNESS OF THE OVERBURDEN SOIL PROFILE (SEVERELY WEATHERED NEAR SURFACE GLACIAL SOILS AND THE UNDERLYING, LESS WEATHERED GLACIAL TILL DEPOSITS) RANGED BETWEEN APPROXIMATELY 30 AND 35 FT.

THE TEST BORINGS REPRESENTING THE OVERPASS STRUCTURE (RAMP BD), IC-1 THROUGH IC-5, WERE DRILLED WITHIN THE LIMITS OF THE EXISTING ROADWAYS. THESE BORINGS INITIALLY ENCOUNTERED ASPHALT PAVEMENT AND/OR FILL MATERIALS. THE FILL DEPTHS RANGED FROM 0.5 TO 5.0 FT. THE FILL MATERIALS WERE CLASSIFIED AS A-6A SILT AND CLAY. THE CONSISTENCY OF THE ROADWAY FILL MATERIAL WAS TYPICALLY STIFF TO VERY STIFF.

THE SEVERELY WEATHERED NEAR SURFACE SOILS WERE ENCOUNTERED UNDERLYING THE FILL SOILS TO A MAXIMUM DEPTH OF 12.5 FT. BELOW THE NATURAL GROUND SURFACE. THESE MATERIALS WERE MODERATE PLASTICITY SOILS, CLASSIFIED AS A-6A SILT AND CLAY, AND A-7-6 CLAY.

THE SEVERELY WEATHERED GLACIAL SOIL STRATUM WAS UNDERLAIN BY THE RELATIVELY UNWEATHERED GLACIAL TILL DEPOSITS. THE UPPER GLACIAL TILL SOILS WERE BROWN IN COLOR, BECOMING GRAY IN COLOR WITH DEPTH, TRANSITIONING FROM BROWN TO GRAY AT APPROXIMATELY 7.5 TO 15 FT. BELOW THE NATURAL GROUND SURFACE. THE GLACIAL TILL SOILS WERE PRIMARILY CLASSIFIED AS A-6A SILT AND CLAY, COMPRISED OF 15 TO 20% SAND SIZE PARTICLES AND LESS THAN 5% GRAVEL SIZE PARTICLES.

THE CONSISTENCY OF THE GLACIAL TILL SOILS RANGED FROM VERY STIFF TO HARD IN THE UPPER PORTION OF THE DEPOSITS, DECREASING TO BETWEEN STIFF AND VERY STIFF WITH INCREASED DEPTH. THE TEST BORINGS INDICATED THAT THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS WERE RATED VERY STIFF TO HARD, TYPICALLY CORRESPONDED TO THE BROWN COLORED GLACIAL TILL SOILS. THE N-VALUES WITHIN THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS RANGED FROM THE LOW 20'S TO IN EXCESS OF 40 BLOWS PER FT. THE DECREASED CONSISTENCY, TO BETWEEN STIFF AND VERY STIFF, CORRESPONDED TO THE TRANSITION FROM THE BROWN TO THE GRAY GLACIAL TILL SOILS. THE N-VALUES TYPICALLY DECREASED TO BETWEEN THE MID TEENS AND THE LOW 20'S (BLOWS PER FT.) WITHIN THE LOWER PORTION OF THE GLACIAL TILL DEPOSITS.

POCKETS, SEAMS AND LAYERS OF SAND TO SAND AND GRAVEL WERE INTERBEDDED WITHIN THE GLACIAL TILL DEPOSITS. THESE GRANULAR FEATURES WERE TYPICALLY WATER BEARING AND RATED FROM MEDIUM DENSE TO DENSE IN COMPACTNESS. LOCALIZED ZONES OF SATURATED, MEDIUM STIFF TO STIFF CONSISTENCY GLACIAL TILL SOILS WERE ENCOUNTERED ABOVE AND BELOW THE WATER BEARING GRANULAR MATERIALS. TEST BORINGS IC-1 AND IC-3 ENCOUNTERED A STRATUM (BETWEEN 4.5 AND 11 FT. THICK) OF SATURATED GRANULAR MATERIAL OVERLYING THE BEDROCK.

THE BEDROCK WITHIN THE PROJECT LIMITS, ENCOUNTERED BETWEEN ELEVATIONS 838.9 AND 839.9 AT THE REFERENCED SITE, IS UPPER SILURIAN TO LOWER DEVONIAN AGE DOLOMITE. THE BEDROCK CORES PERFORMED AT THE BRIDGE STRUCTURE INDICATED THAT THE DOLOMITE BEDROCK WAS SLIGHTLY VUGGY TO VUGGY AND HAD NEARLY UNIFORM, CLOSE TO VERY CLOSE SPACED PARTINGS. THE PARTINGS WERE WEATHERED NEAR THE SURFACE OF THE BEDROCK AND BECAME LESS WEATHERED WITH DEPTH, TYPICALLY SPACED AT LESS THAN 2 IN. NEAR VERTICAL JOINTS WERE NOTED THROUGHOUT THE BEDROCK CORE LENGTHS. THE ROCK HARDNESS RATING FOR THE DOLOMITE BEDROCK WAS HARD.

GENERAL INFORMATION

DRIVE SAMPLE/PRESS SAMPLE/CORE BORINGS

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, 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 SAMPLING DEVICE 18 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

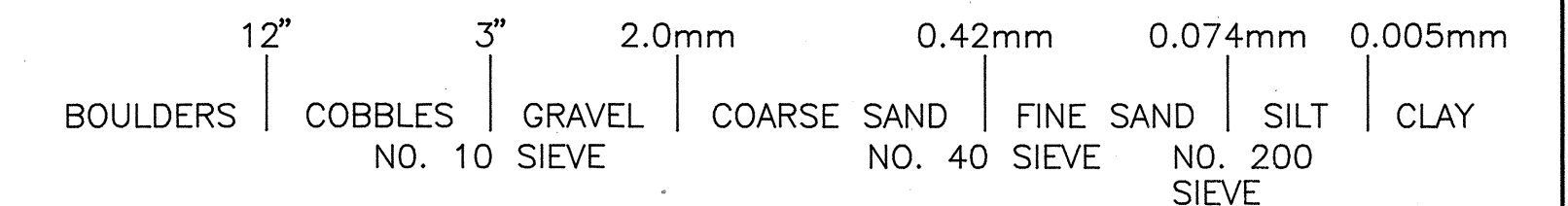
DRIVE/PRESS SAMPLE BORINGS ARE ALSO MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, OR A 3" O.D. THIN WALL PRESS SAMPLING DEVICE. THE PRESS SAMPLER IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE, APPLIED BY THE DRILLING MACHINE.

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NXM CORE BARREL, WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6-INCH INCREMENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS, UTILIZING THE CASAGRANDE AC CLASSIFICATION SYSTEM, INCLUDING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

PARTICLE SIZE DEFINITIONS



NOTE: ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1800 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

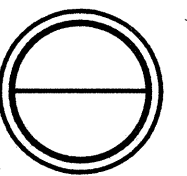
NOTE: Information shown by this subsurface investigation was obtained solely for the use in establishing design controls for the project. The State of Ohio does not guarantee the accuracy of this data and it is not to be construed as a part of the plans governing construction of the project.

THE H. C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI, OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION		
PROJECT NO. ALL/HAN-30-20.31/0.00 BRIDGE CONSTRUCTION FOR INTERCHANGE RAMP BD OVER WESTBOUND LANES AND RAMP D, ALLEN COUNTY, OHIO		
STRUCTURE NO. ALL-30-1999 WB W.O. NO. 04062.119		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	REVISED DATE 08/30/94

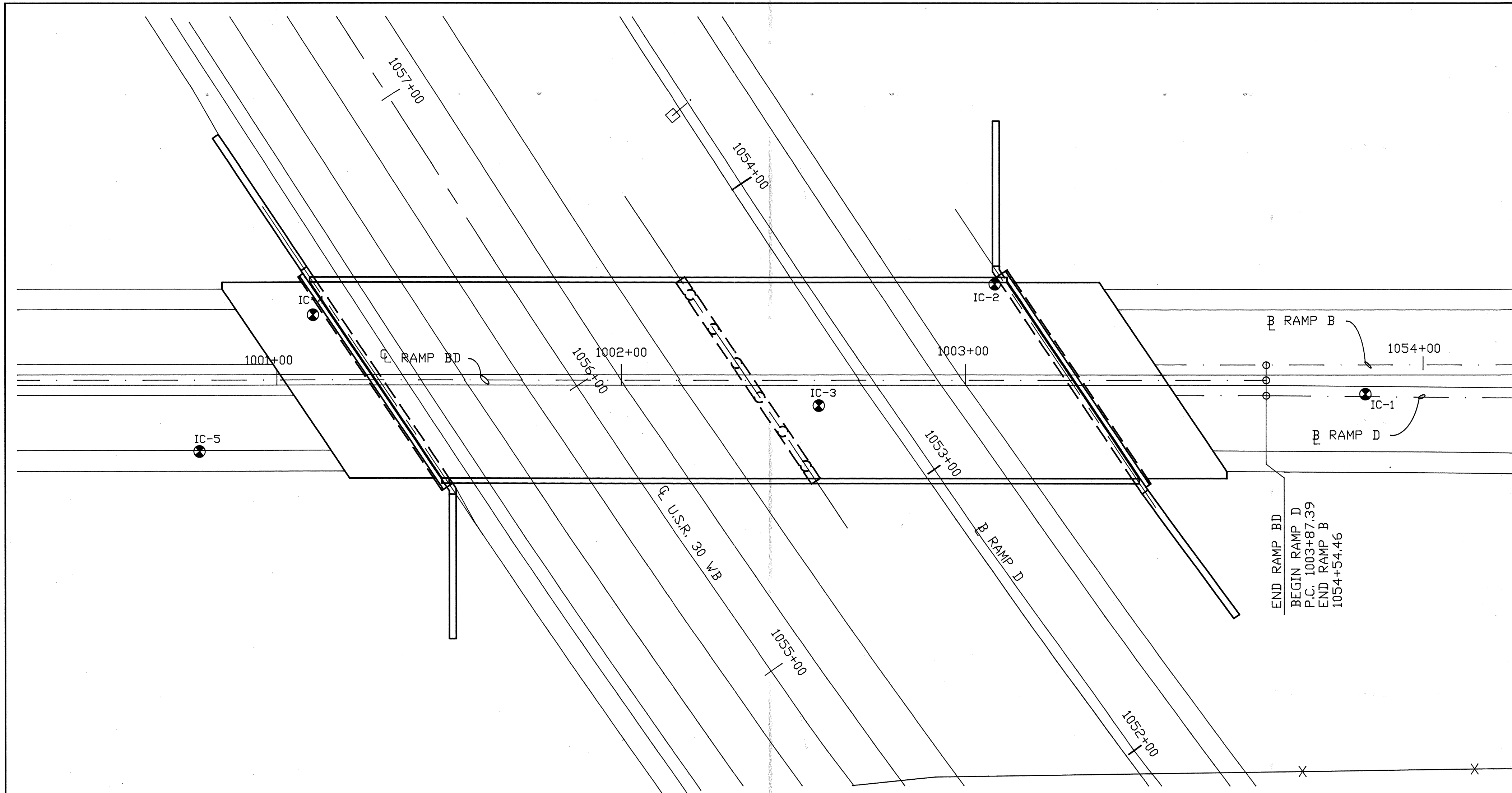
SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR INTERCHANGE
 RAMP BD OVER WESTBOUND LANES AND
 RAMP D, ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



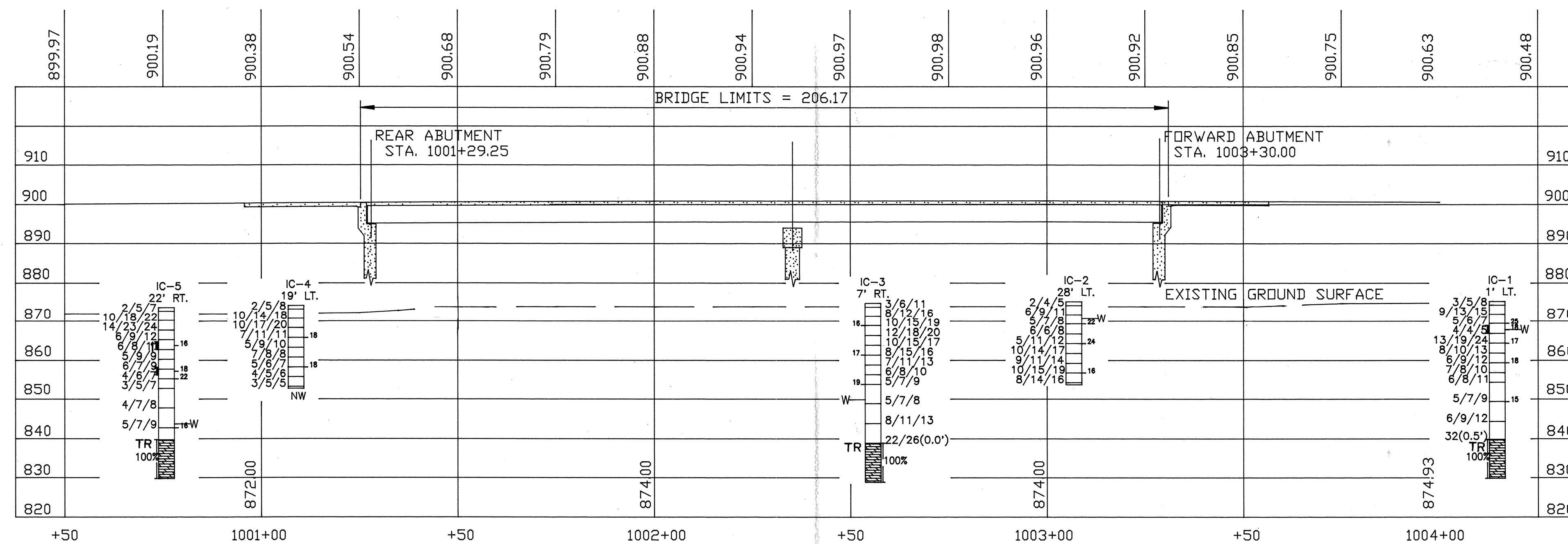
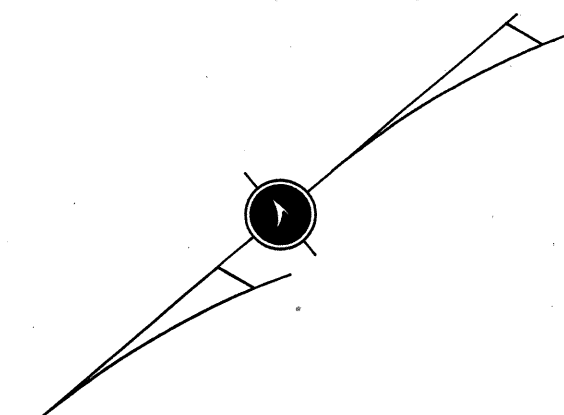
2
4



PLAN

B-1
 ● INDICATES SOIL BORING LOCATION

SCALE: 1"=20' HORIZONTAL AND VERTICAL



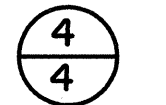
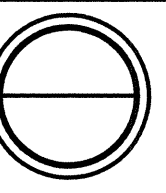
PROFILE RAMP BD

THE H.C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119 BRIDGE CONSTRUCTION FOR INTERCHANGE RAMP BD OVER WESTBOUND LANES AND RAMP D, ALLEN COUNTY, OHIO		
STRUCTURE NO. ALL-30-1999 WB		
BORING DATA		
CHECKED BY K.C.A.	REVIEWED BY A.P.A.	DATE 05/23/94

DRAWING BY: J. ALBERS/DWG

SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR INTERCHANGE
 RAMP BD OVER WESTBOUND LANES AND
 RAMP D, ALLEN COUNTY, OHIO



THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226

LOG OF BORING													
DATE STARTED		04/02/94		SAMPLER: TYPE		SPLIT SPOON		DIA. 2.0" O.D.		WATER ELEVATION:			
DATE COMPLETED		04/02/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA. 3.25" I.D.		IMMEDIATE		NONE	
BORING NUMBER		IC-4		CORE BARREL: TYPE				SIZE		AFTER COMP. HRS.		NONE	
STATION & OFFSET				1001+10 19' LT., (RAMP BD)				SURFACE ELEVATION				874.2	
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL. CLASS
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	
874.2	0												
873.7	2	2-5-8	DARK BROWN SILT AND CLAY, TRACE ROCK FRAGMENTS AND ORGANICS, MOIST - SOFT (FILL)	1A	V	I	S	U	A	L			A-6a
871.7	4	10-14-18	BROWN, TRACE GRAY, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	2	V	I	S	U	A	L			A-6a
869.2	6	10-17-20	BROWN SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - HARD TO VERY STIFF (GLACIAL TILL)	3	V	I	S	U	A	L			A-6a
	8	7-11-11		4	V	I	S	U	A	L	18		A-6a
864.2	10	5-9-10	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO STIFF (GLACIAL TILL)	5	V	I	S	U	A	L			A-6a
	12	7-8-8		6	V	I	S	U	A	L			A-6a
	14	5-6-7		7	V	I	S	U	A	L	18		A-6a
	16	4-5-6		8	V	I	S	U	A	L			A-6a
852.7	20	3-5-5		9	V	I	S	U	A	L			A-6a

BORING COMPLETED @ 21.5'

LOG OF BORING													
DATE STARTED		03/31/94		SAMPLER: TYPE		SPLIT SPOON		DIA. 2.0" O.D.		WATER ELEVATION:			
DATE COMPLETED		03/31/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA. 3.25" I.D.		IMMEDIATE		843.8	
BORING NUMBER		IC-5		CORE BARREL: TYPE		NXM		SIZE 2.125" I.D.		AFTER COMP. HRS.		859.8	
STATION & OFFSET				1000+77 22' RT., (RAMP BD)				SURFACE ELEVATION				873.8	
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL. CLASS
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	
873.8	0												
872.8	2	2-5-7	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - MEDIUM STIFF (FILL)	1	V	I	S	U	A	L			A-6a
871.3	4	10-18-22	BROWN, TRACE GRAY, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	2	V	I	S	U	A	L			A-6a
	6	14-23-24		3	V	I	S	U	A	L			A-6a
866.3	8	6-9-12	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	4	V	I	S	U	A	L			A-6a
	10	6-8-11		ST 4	V	I	S	U	A	L	16		A-6a(9)
	12	5-9-9		5	V	I	S	U	A	L			A-6a
	14	6-7-9		6	V	I	S	U	A	L			A-6a
	16	6-7-9		7	V	I	S	U	A	L			A-6a
	18	4-6-7		ST 8	V	I	S	U	A	L	18		A-6a
856.3	20	3-5-7	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, NOTED WET SAND LAYER @ 30', MOIST - STIFF TO VERY STIFF (GLACIAL TILL)	9	V	I	S	U	A	L			A-6a
	22												
	24												
	26	4-7-8		10	V	I	S	U	A	L			A-6a
	28												
	30	5-7-9		11	V	I	S	U	A	L	16		A-6a
	32												
839.8	34												
838.0	36		LIGHT BROWN, WEATHERED, VUGGY, HARD DOLOMITE, NOTED WEATHERED PARTINGS AND NEAR VERTICAL JOINTS (CORE BROKEN UP)										
	38		LIGHT BROWN, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED WEATHERED NEARLY UNIFORM PARTINGS	C-1		NXM		REC. 100%		RQD. 0%			
833.3	40												
	42		GRAY, SLIGHTLY VUGGY TO VUGGY, HARD DOLOMITE, NOTED UNIFORM CLOSE TO VERY CLOSE PARTINGS AND NEAR VERTICAL JOINTS										
829.8	44												

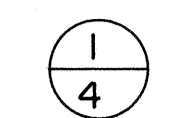
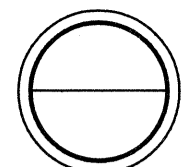
BORING COMPLETED @ 44.0'

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR INTERCHANGE RAMP BD OVER WESTBOUND LANES AND RAMP D, ALLEN COUNTY, OHIO
 STRUCTURE NO. ALL-30-1999 WB

BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94
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GENERAL INFORMATION

DRIVE SAMPLE/PRESS SAMPLE/CORE BORINGS

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, 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 SAMPLING DEVICE 18 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

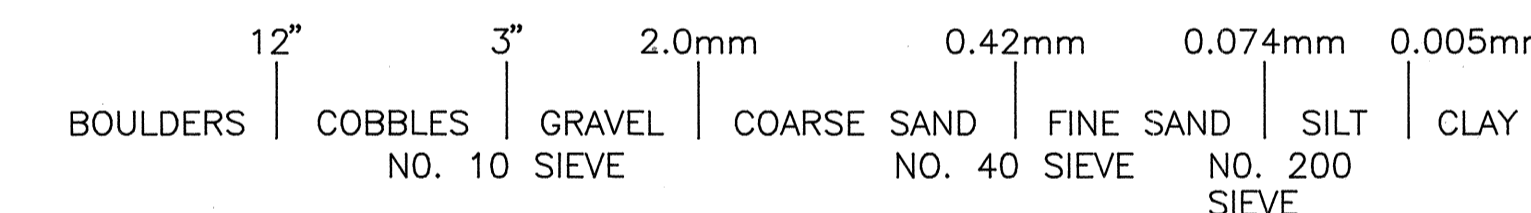
DRIVE/PRESS SAMPLE BORINGS ARE ALSO MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, OR A 3" O.D. THIN WALL PRESS SAMPLING DEVICE. THE PRESS SAMPLER IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE, APPLIED BY THE DRILLING MACHINE.

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NXM CORE BARREL, WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6-INCH INCREMENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS, UTILIZING THE CASAGRANDE AC CLASSIFICATION SYSTEM, INCLUDING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

PARTICLE SIZE DEFINITIONS



NOTE: ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1800 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

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 this data and it is not to be construed as a part of the plans governing construction of the project.

THE H. C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI, OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION

PROJECT NO. ALL/HAN-30-20.31/0.00 BRIDGE CONSTRUCTION FOR SWANEY ROAD OVER U.S. 30 AND RAMP C, ALLEN COUNTY, OHIO

STRUCTURE NO. ALL-30-2021 W.O. NO. 04062.119

Table with 3 columns: CHECKED BY (K.G.A.), REVIEWED BY (A.P.A.), REVISED DATE (08/30/94)

LEGEND

- Auger boring location-plan view, Press and/or drive sample and/or core boring location-plan view, Capped pile, Footing, Footing on pile, Top of rock, Horizontal bar on boring log indicates the depth the sample was taken, X/Y/Z figures beside the boring log in profile indicates the number of blows for standard penetration test, W indicates free water elevation, indicates static water elevation

SYMBOLS OF ROCK TYPES

- Coal, Weathered mudstone, Mudstone, Weathered shale, Shale, Claystone, Siltstone, Weathered sandstone, Sandstone, Leached dolomite, Dolomite, Leached limestone, Limestone, Boulders or cobbles

PROJECT DESCRIPTION

SWANEY ROAD INTERSECTS U.S. 30 AT STATION 1067+29.5 EASTBOUND LANES AND 1067+43.6 WESTBOUND LANES. A BRIDGE STRUCTURE, BRIDGE NO. ALL-30-2021 (SWANEY ROAD OVER U.S. 30 AND RAMP C) WILL BE CONSTRUCTED BETWEEN STATIONS 32+70.12 AND 35+54.2. THE BRIDGE WILL BE A THREE-SPAN, CONTINUOUS STEEL PLATE GIRDER STRUCTURE. THE SPAN LENGTHS ARE 113 FT. 9 IN., 87 FT. 4 IN., AND 83 FT. 0 IN., FOR A TOTAL BRIDGE LENGTH 288.59 FT.

THE OVERPASS BRIDGE STRUCTURE WILL HAVE APPROACH EMBANKMENTS BEGINNING AT APPROXIMATELY STATION 22+00 AND TERMINATING AT STATION 49+00 (EXCLUDING THE BRIDGE STRUCTURE). THE MAXIMUM EMBANKMENT HEIGHT IS APPROXIMATELY 25 FT. AT THE BRIDGE ABUTMENTS. IN CROSS SECTION, THE APPROACH EMBANKMENT WILL HAVE AN APPROXIMATE 40 FT. CREST WIDTH AND SIDE SLOPES EQUAL TO 2H:1V.

GEOLOGY

THE PROJECT SITE IS LOCATED WITHIN THE TILL PLAINS PHYSIOGRAPHIC REGION OF OHIO. THE AREA WAS COVERED BY CONTINENTAL GLACIERS IN TWO TIME PERIODS, THE ILLINOIAN AND WISCONSIN GLACIATIONS. THE ADVANCING AND RETREATING ICE SHEETS DEPOSITED GROUND MORAINE (GLACIAL TILL) AND END MORAINES, THE WISCONSIN AGE DEPOSITS OVERLYING THE OLDER ILLINOIAN DEPOSITS. THE SURFACE DEPOSITS ARE CONSIDERED GROUND MORAINE (WISCONSIN AGE), LOCATED JUST NORTH OF THE EAST-WEST ORIENTED FORT WAYNE END MORAINE.

THE OVERBURDEN SOILS WITHIN THE PROJECT LIMITS ARE TYPICALLY GROUND MORAINE OR GLACIAL TILL DEPOSITS. A GLACIAL TILL SOIL CAN BE DESCRIBED AS AN UNSORTED, UNSTRATIFIED MIXTURE OF CLAY, SILT, SAND, GRAVEL, COBBLES AND BOULDERS. THE GLACIAL DEPOSITS WITHIN THE PROJECT LIMITS ARE TYPICALLY 25 TO 60 FT. THICK, THINNER IN THE DRAINAGE VALLEYS.

THE BEDROCK WITHIN THE PROJECT VICINITY, UNDERLYING THE GLACIAL TILL OVERBURDEN, IS UPPER SILURIAN TO LOWER DEVONIAN IN AGE. GEOLOGIC LITERATURE INDICATES THAT THE BEDROCK BELONGS TO THE MONROE FORMATION THAT IS TYPICALLY LIMESTONE AND DOLOMITE.

INVESTIGATIONAL PROCEDURES

A TOTAL OF EIGHT (8) DRIVE SAMPLE TEST BORINGS, LABELED AS SW-1 THROUGH SW-10, WERE PERFORMED FOR THE SWANEY ROAD MODIFICATION AS PART OF THE U.S. 30 ROADWAY PROJECT (ALL/HAN-30-20.31/0.00). TEST BORINGS SW-4 AND SW-7 WERE OMITTED FROM THE BORING PROGRAM. THE TEST BORINGS REPRESENTING THE SWANEY ROAD BRIDGE STRUCTURE WERE SW-3, SW-5, SW-6 AND SW-8. THE SUBSURFACE INFORMATION ESTABLISHED FROM THE STRUCTURE BORINGS HAS BEEN PRESENTED ON THE ATTACHED GEOTECHNICAL STRUCTURE DRAWINGS.

THE STRUCTURE TEST BORINGS WERE PERFORMED BETWEEN MARCH 1 AND 20, 1994. A TRUCK-MOUNTED DRILLING RIG WAS USED TO PERFORM THE BORING PROCEDURES. EACH STRUCTURE BORING WAS ADVANCED TO A CONDITION OF REFUSAL ON THE DOLOMITE BEDROCK. A ROCK CORE SAMPLE WAS OBTAINED ONCE AUGER REFUSAL WAS MET AT BORINGS SW-3, SW-5 AND SW-8. THE DEPTH TO THE BEDROCK SURFACE RANGED BETWEEN 43.0 AND 45.0 FT.

EACH TEST BORING WAS ADVANCED WITH HOLLOW-STEM AUGERS. THE DRIVE SAMPLING WAS ACCOMPLISHED THROUGH AND BELOW THE TIP OF THE HOLLOW-STEM AUGERS AT 2.5 FT. INTERVALS TO A DEPTH OF 20 FT., AT WHICH DEPTH 5 FT. SAMPLING INTERVALS WERE USED. THE DRIVE SAMPLING WAS ACCOMPLISHED IN ACCORDANCE WITH "PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS," ASTM D 1586. A 2 IN. O.D. BY 1 3/8 IN. I.D. SPLIT-SPOON SAMPLER WAS DRIVEN A TOTAL OF 18 IN., WITH A TOTAL NUMBER OF BLOWS OF 140 LB. HAMMER WEIGHT FALLING 30 IN. BEING RECORDED FOR 6 IN. OF PENETRATION. THE SUM OF BLOWS FOR THE FINAL 12 IN. OF PENETRATION IS THE STANDARD PENETRATION TEST RESULT, COMMONLY REFERENCED TO AS THE N-VALUE.

BEDROCK CORE SAMPLING WAS PERFORMED AT TEST BORINGS SW-3, SW-5 AND SW-8. THE BEDROCK CORE SAMPLING WAS PERFORMED IN ACCORDANCE WITH ASTM D 2113. THE BEDROCK CORE SAMPLES WERE CUT WITH AN NX SERIES CORE BARREL, PRODUCING A CORE HAVING A NOMINAL DIAMETER OF 2 1/8 IN. THE BEDROCK CORE SAMPLE LENGTHS WERE 10 FT. IN EACH BORING.

THE UNDISTURBED SOIL SAMPLES WERE OBTAINED BY PUSHING A 3 IN. O.D. SHELBY TUBE SAMPLER IN ACCORDANCE WITH ASTM D 1587.

ALL SOIL SAMPLES WERE STORED IN SEALED JARS AND THE BEDROCK CORE SAMPLES WERE STORED IN WOODEN CORE BOXES. THE DRILLER MAINTAINED A LOG OF THE ENTIRE DRILLING OPERATION, INCLUDING A DESCRIPTION OF THE MATERIALS ENCOUNTERED IN EACH SPLIT-SPOON OR BEDROCK CORE RUN. THE DEPTH AT WHICH THE DESCRIPTION OF THE SOIL OR BEDROCK CHANGED, THE DEPTH FROM WHICH EACH SAMPLE WAS RECOVERED, THE TYPE OF SAMPLE, THE NUMBER OF BLOWS FOR EACH 6 IN. OF DRIVE ON THE SPLIT-SPOON SAMPLER, THE NUMBER OF INCHES OF RECOVERY FOR EACH SAMPLE OBTAINED, LEVELS AT WHICH ANY GROUNDWATER OR SEEPAGE WAS ENCOUNTERED, ALONG WITH ANY OTHER PERTINENT INFORMATION DEVELOPED DURING THE DRILLING OPERATIONS.

UPON COMPLETION OF THE DRILLING PROGRAM, ALL SAMPLES (SOIL AND ROCK CORE) WERE RETURNED TO OUR CINCINNATI SOIL MECHANICS LABORATORY WHERE THE PROJECT ENGINEER INSPECTED EACH SAMPLE. THE ATTACHED STRUCTURE BORING LOGS WERE PREPARED BASED ON THE VISUAL INSPECTION OF THE RECOVERED SAMPLES, THE LABORATORY TEST DATA AND ODOT STANDARDS.

REPRESENTATIVE SOIL SAMPLES WERE SELECTED FOR THE PERFORMANCE OF PHYSICAL TESTS IN OUR LABORATORY TO DETERMINE THEIR ENGINEERING CHARACTERISTICS. INCLUDED IN THE LABORATORY TEST PROGRAM WERE NATURAL MOISTURE CONTENT DETERMINATIONS, ATTERBERG LIMITS, SIEVE ANALYSES WITH HYDROMETER TESTS, AND UNCONFINED COMPRESSION TESTS.

INVESTIGATIONAL FINDINGS

THE SOIL PROFILE AT THE PROJECT SITE WAS COMPRISED OF GLACIALLY DEPOSITED MATERIALS, RESTING ON DOLOMITE BEDROCK. THE GLACIAL DEPOSITS WERE PREDOMINANTLY COMPRISED OF GROUND MORAINE OR GLACIAL TILL. THE NEAR SURFACE MATERIALS DEVELOPED THROUGH SEVERE WEATHERING OF THE PARENT GLACIAL TILL DEPOSITS. THE SURFACE MANTLE OF SEVERELY WEATHERED GLACIAL SOILS WAS UNDERLAIN BY LESS WEATHERED TO RELATIVELY UNWEATHERED DEPOSITS OF GLACIAL TILL. THE GLACIAL TILL DEPOSITS WERE COMPRISED OF TWO DISTINCT ZONES; AN UPPER ZONE THAT WAS BROWN IN COLOR AND THE LOWER ZONE OF GRAY COLOR. THE THICKNESS OF THE OVERBURDEN SOIL PROFILE (SEVERELY WEATHERED NEAR SURFACE GLACIAL SOILS AND THE UNDERLYING, LESS WEATHERED GLACIAL TILL DEPOSITS) RANGED BETWEEN APPROXIMATELY 43 AND 45 FT.

THE TEST BORINGS REPRESENTING THE SWANEY ROAD OVERPASS STRUCTURE (SW-3, SW-5, SW-6, AND SW-8) WERE DRILLED WITHIN THE LIMITS OF THE EXISTING ROADWAY. THESE BORINGS, DRILLED AT THE EDGE OF THE PAVEMENT OR IN THE SHOULDER, INITIALLY ENCOUNTERED ASPHALT PAVEMENT AND/OR FILL MATERIALS. THE FILL, ENCOUNTERED TO A DEPTH OF 2.5 FT., WAS CLASSIFIED AS A-7-6 CLAY AND A-6A SILT AND CLAY. THE CONSISTENCY OF THE ROADWAY FILL MATERIAL WAS TYPICALLY MEDIUM STIFF TO STIFF.

THE SEVERELY WEATHERED NEAR SURFACE SOILS WERE ENCOUNTERED UNDERLYING THE FILL SOILS TO A MAXIMUM DEPTH OF 7.5 FT. BELOW THE NATURAL GROUND SURFACE. THESE MATERIALS WERE MODERATE PLASTICITY SOILS, CLASSIFIED AS A-6A SILT AND CLAY, AND A-7-6 CLAY.

THE SEVERELY WEATHERED GLACIAL SOIL STRATUM WAS UNDERLAIN BY THE RELATIVELY UNWEATHERED GLACIAL TILL DEPOSITS. THE UPPER GLACIAL TILL SOILS WERE BROWN IN COLOR, BECOMING GRAY IN COLOR WITH DEPTH, TRANSITIONING FROM BROWN TO GRAY AT APPROXIMATELY 10 TO 15 FT. BELOW THE NATURAL GROUND SURFACE. THE GLACIAL TILL SOILS WERE PRIMARILY CLASSIFIED AS A-6A SILT AND CLAY, COMPRISED OF 15 TO 20% SAND SIZE PARTICLES AND UP TO 17% GRAVEL SIZE PARTICLES.

THE CONSISTENCY OF THE GLACIAL TILL SOILS RANGED FROM VERY STIFF TO HARD IN THE UPPER PORTION OF THE DEPOSITS, DECREASING TO BETWEEN STIFF AND VERY STIFF WITH INCREASED DEPTH. THE TEST BORINGS INDICATED THAT THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS WERE RATED VERY STIFF TO HARD, TYPICALLY CORRESPONDED TO THE BROWN COLORED GLACIAL TILL SOILS. THE N-VALUES WITHIN THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS RANGED FROM THE LOW 30'S TO IN EXCESS OF 40 BLOWS PER FT. DECREASED CONSISTENCY, TO BETWEEN STIFF AND VERY STIFF, CORRESPONDED TO THE TRANSITION FROM THE BROWN TO THE GRAY GLACIAL TILL SOILS. THE N-VALUES TYPICALLY DECREASED TO BETWEEN THE MID TEENS AND THE LOW 20'S (BLOWS PER FT.) WITHIN THE LOWER PORTION OF THE GLACIAL TILL DEPOSITS.

POCKETS, SEAMS AND LAYERS OF SAND TO SAND AND GRAVEL WERE INTERBEDDED WITHIN THE GLACIAL TILL DEPOSITS. THESE GRANULAR FEATURES WERE TYPICALLY WATER BEARING AND RATED FROM MEDIUM DENSE TO DENSE IN COMPACTNESS. LOCALIZED ZONES OF SATURATED, MEDIUM STIFF TO STIFF CONSISTENCY GLACIAL TILL SOILS WERE ENCOUNTERED ABOVE AND BELOW THE WATER BEARING GRANULAR MATERIALS. TEST BORINGS SW-5 AND SW-6 ENCOUNTERED A STRATUM (BETWEEN 3.5 AND 5 FT. THICK) OF SATURATED GRANULAR MATERIAL OVERLYING THE BEDROCK.

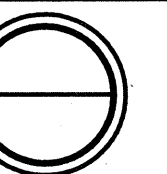
THE BEDROCK WITHIN THE PROJECT LIMITS, ENCOUNTERED BETWEEN ELEVATIONS 841.7 AND 844.3 AT THE REFERENCED SITE, IS UPPER SILURIAN TO LOWER DEVONIAN AGE DOLOMITE. THE BEDROCK CORES PERFORMED AT THE BRIDGE STRUCTURE INDICATED THAT THE DOLOMITE BEDROCK WAS SLIGHTLY VUGGY TO VUGGY AND HAD NEARLY UNIFORM, CLOSE TO VERY CLOSE SPACED PARTINGS. THE PARTINGS WERE WEATHERED NEAR THE SURFACE OF THE BEDROCK AND BECAME LESS WEATHERED WITH DEPTH, TYPICALLY SPACED AT LESS THAN 2 IN. NEAR VERTICAL JOINTS WERE NOTED THROUGHOUT THE BEDROCK CORE LENGTHS. THE ROCK HARDNESS RATING FOR THE DOLOMITE BEDROCK WAS HARD.

DRAWING NO. - ALL-30-20.31-10

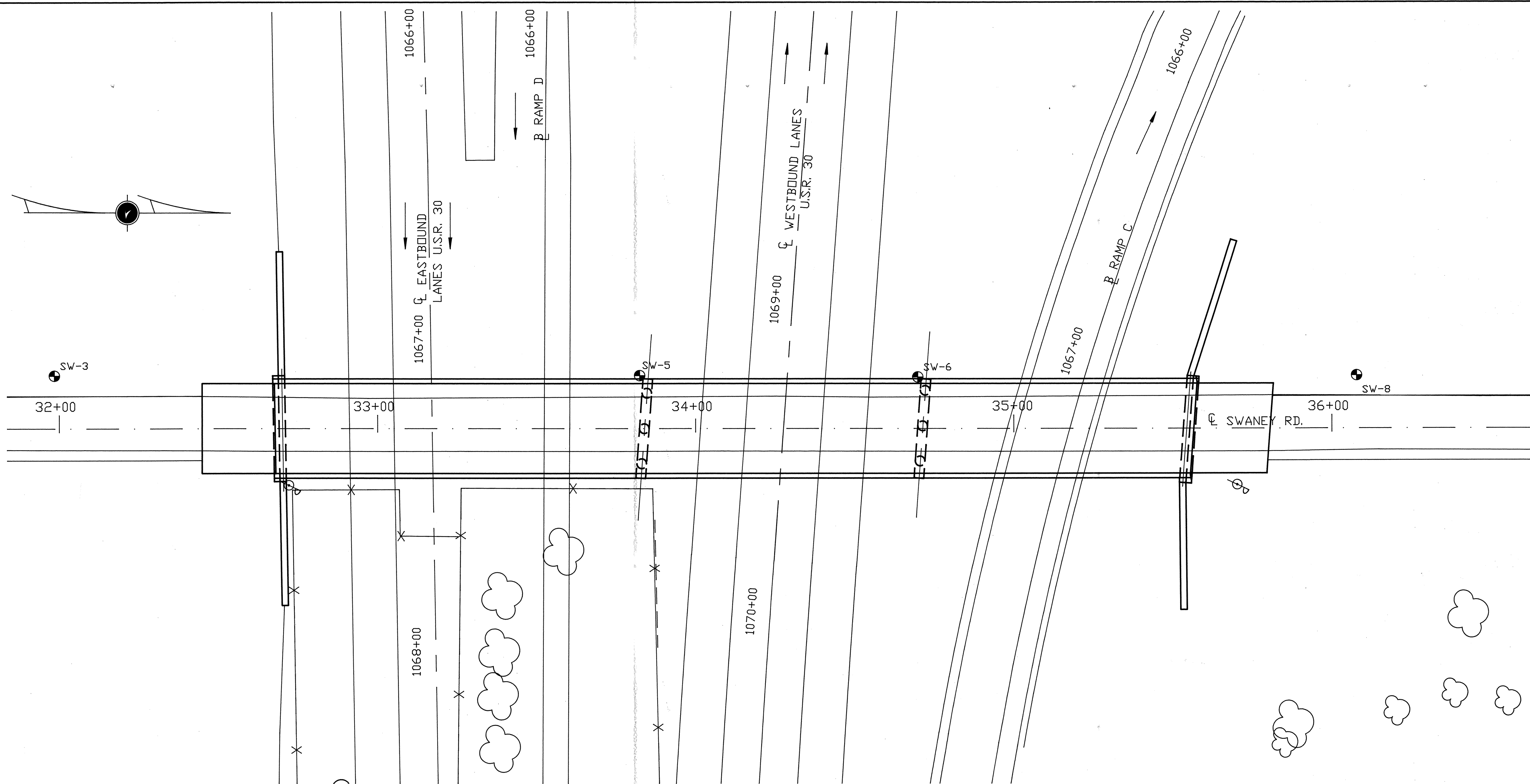
SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR SWANEY
 ROAD OVER U.S. 30 AND RAMP C,
 ALLEN COUNTY, OHIO

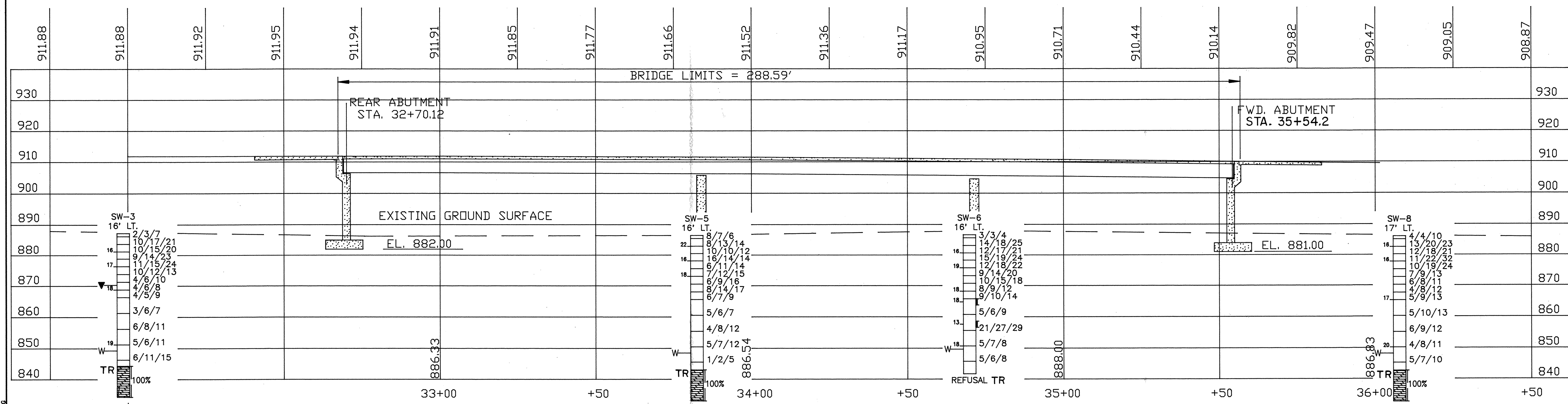
THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



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4



B-1 INDICATES SOIL BORING LOCATION
 SCALE: 1"=20' HORIZONTAL AND VERTICAL



PROFILE ALONG CL SWANEY RD.

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR SWANEY ROAD OVER
 U.S. 30 AND RAMP C, ALLEN COUNTY, OHIO

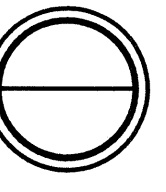
STRUCTURE NO. ALL-30-2021

BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94
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SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR SWANEY
 ROAD OVER U.S. 30 AND RAMP C,
 ALLEN COUNTY, OHIO



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THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226

LOG OF BORING													
DATE STARTED <u>03/08/94</u> SAMPLER: TYPE <u>SPLIT SPOON</u> DIA. <u>2.0"</u> O.D. WATER ELEVATION:													
DATE COMPLETED <u>03/09/94</u> CASING: LENGTH <u>5'</u> HOLLOW STEM AUGER DIA. <u>3.25"</u> I.D. IMMEDIATE <u>849.3</u>													
BORING NUMBER <u>SW-3</u> CORE BARREL: TYPE <u>NXM</u> SIZE <u>2.125"</u> I.D. AFTER COMP. HRS. <u>857.8</u>													
STATION & OFFSET <u>31+98 16' LT., (SWANEY ROAD)</u> SURFACE ELEVATION <u>887.3</u>													
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS							SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI		% WC
887.3	0												
886.8	2-3-7	1A	DARK BROWN SILT AND CLAY, TRACE ORGANICS, MOIST - MEDIUM STIFF (FILL)	1A		V	I	S	U	A	L		A-6a
884.8	10-17-21	2	BROWN AND GRAY CLAY, TRACE CONCRETIONS AND ORGANICS, MOIST - STIFF (FILL)	2		V	I	S	U	A	L	22	A-7-6
	10-15-20	3	BROWN, TRACE GRAY, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	3		V	I	S	U	A	L	16	A-6a
879.8	9-14-23	4	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	4		V	I	S	U	A	L		A-6a
877.3	11-15-24	5	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	5		V	I	S	U	A	L	17	A-6a
	10-12-13	6		6		V	I	S	U	A	L		A-6a
872.3	4-6-10	7	GRAY SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	7		V	I	S	U	A	L		A-6a
	4-6-8	8		8		V	I	S	U	A	L	18	A-6a
	4-5-9	9		9		V	I	S	U	A	L		A-6a
	3-6-7	10		10		V	I	S	U	A	L		A-6a
	6-8-11	11		11		V	I	S	U	A	L		A-6a
	5-6-11	12		12		V	I	S	U	A	L	19	A-6a
	6-11-15	13		13		V	I	S	U	A	L		A-6a
844.3	44	C-1	LIGHT GRAY, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED NEARLY UNIFORM WEATHERED CLOSE TO VERY CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS	C-1		NXM		REC. 100%		RQD 0%			
	48	C-1	ROCK CORE	C-1		NXM		REC. 100%		RQD 0%			
834.3													

BORING COMPLETED @ 53.0'

LOG OF BORING													
DATE STARTED <u>03/01/94</u> SAMPLER: TYPE <u>SPLIT SPOON</u> DIA. <u>2.0"</u> O.D. WATER ELEVATION:													
DATE COMPLETED <u>03/02/94</u> CASING: LENGTH <u>5'</u> HOLLOW STEM AUGER DIA. <u>3.25"</u> I.D. IMMEDIATE <u>848.5</u>													
BORING NUMBER <u>SW-5</u> CORE BARREL: TYPE <u>NXM</u> SIZE <u>2.125"</u> I.D. AFTER COMP. HRS. <u>859.5</u>													
STATION & OFFSET <u>33+82 16' LT., (SWANEY ROAD)</u> SURFACE ELEVATION <u>886.5</u>													
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS							SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI		% WC
886.5	0												
886.0	8-7-6	1A	DARK BROWN SILT AND CLAY, LITTLE ORGANICS, VERY MOIST - SOFT (FILL)	1A		V	I	S	U	A	L		A-6a
884.0	8-13-14	2	DARK BROWN SILT AND CLAY, TRACE SAND AND ROCK FRAGMENTS, MOIST - STIFF (FILL)	2		V	I	S	U	A	L	22	A-7-6
881.5	10-10-12	3	BROWN AND GRAY SILTY CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF	3		V	I	S	U	A	L		A-6b
879.0	16-14-14	4	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	4	4	5	12	35	44	31	11	16	A-6a(8)
	6-11-14	5		5		V	I	S	U	A	L		A-6a
	7-12-15	6		6		V	I	S	U	A	L	18	A-6a
871.5	6-9-16	7	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	7		V	I	S	U	A	L		A-6a
	8-14-17	8		8		V	I	S	U	A	L		A-6a
866.5	6-7-9	9	GRAY SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	9		V	I	S	U	A	L		A-6a
	5-6-7	10		10		V	I	S	U	A	L		A-6a
	4-8-12	11		11		V	I	S	U	A	L		A-6a
	5-7-12	12		12		V	I	S	U	A	L		A-6a
846.5	1-2-5	13	GRAY COARSE AND FINE SAND, WET - LOOSE	13		V	I	S	U	A	L		A-3a
843.0													
840.5	44	C-1	LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED NEARLY UNIFORM WEATHERED CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS	C-1		NXM		REC. 100%		RQD 0%			
	48	C-1	LIGHT GRAY, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED WEATHERED NEAR UNIFORM CLOSE TO VERY CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS	C-1		NXM		REC. 100%		RQD 0%			
833.0													

BORING COMPLETED @ 53.5'

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR SWANEY ROAD OVER
 U.S. 30 AND RAMP C, ALLEN COUNTY, OHIO

STRUCTURE NO. ALL-30-2021

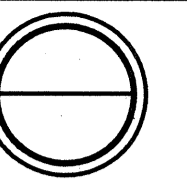
BORING DATA

CHECKED BY	REVIEWED BY	DATE
K.G.A.	A.P.A.	05/23/94

SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR SWANEY
 ROAD OVER U.S. 30 AND RAMP C,
 ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



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LOG OF BORING

DATE STARTED 03/20/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
 DATE COMPLETED 03/20/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE 849.7
 BORING NUMBER SW-6 CORE BARREL: TYPE SIZE AFTER COMP. HRS. 857.7
 STATION & OFFSET 34+70 16' LT., (SWANEY ROAD) SURFACE ELEVATION 886.7

ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS											
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS			
886.7	0		ASPHALT PAVEMENT													
886.1	3-3-4		BROWN AND GRAY SILTY CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - STIFF (FILL)	1		V	I	S	U	A	L					A-6b
884.2	2		BROWN, TRACE GRAY, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	2		V	I	S	U	A	L					A-6a
	4			3		V	I	S	U	A	L	16				A-6a
	6		GRAY, TRACE BROWN, SILT AND CLAY, LITTLE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	4		V	I	S	U	A	L					A-6a
	8			5		V	I	S	U	A	L	19				A-6a
	10			6		V	I	S	U	A	L					A-6a
	12			7		V	I	S	U	A	L					A-6a
870.7	16		GRAY, TRACE BROWN, SILT AND CLAY, LITTLE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	8		V	I	S	U	A	L	18				A-6a
	18			9		V	I	S	U	A	L					A-6a
	20			ST 17	7	9	31	36	34	14	18					A-6a(8)
	22			10		V	I	S	U	A	L					A-4a
861.7	26		GRAY FINE SAND, MOIST - DENSE	ST 5	11	23	29	39	22	8	13					A-4a(5)
	28			11		V	I	S	U	A	L					A-3
857.2	30		GRAY SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - STIFF (GLACIAL TILL)	12		V	I	S	U	A	L	18				A-6a
	32			13		V	I	S	U	A	L					A-3a
851.7	36		GRAY COARSE AND FINE SAND, WET - MEDIUM DENSE													
	38															
846.7	40															
841.7	44															

BORING COMPLETED @ 45.0'
 (AUGER REFUSAL ON BEDROCK)

LOG OF BORING

DATE STARTED 03/09/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
 DATE COMPLETED 03/10/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE 848.1
 BORING NUMBER SW-8 CORE BARREL: TYPE NXM SIZE 2.125" I.D. AFTER COMP. HRS. 862.1
 STATION & OFFSET 36+07 17' LT., (SWANEY ROAD) SURFACE ELEVATION 886.1

ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS											
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS			
886.1	0		DARK BROWN SILTY CLAY, LITTLE ORGANICS, MOIST - MEDIUM STIFF (FILL)	1A		V	I	S	U	A	L					A-6b
885.8	2		BROWN, TRACE GRAY, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - STIFF (FILL)	2		V	I	S	U	A	L	16				A-6a
883.6	4			3		V	I	S	U	A	L					A-6a
	6		GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	4		V	I	S	U	A	L	16				A-6a
	8			5		V	I	S	U	A	L					A-6a
	10			6		V	I	S	U	A	L					A-6a
	12			7		V	I	S	U	A	L					A-6a
873.6	14		GRAY SANDY SILT, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	8		V	I	S	U	A	L	18				A-6a
	16			9		V	I	S	U	A	L	17				A-6a
	18			10		V	I	S	U	A	L					A-6a
	20			11		V	I	S	U	A	L					A-6a
	22		LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY TO VUGGY, HARD DOLOMITE, NOTED WEATHERED NEAR UNIFORM CLOSE TO VERY CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS	12		V	I	S	U	A	L	20				A-6a
	24			13		V	I	S	U	A	L					A-6a
	26															
	28															
	30		LIGHT GRAY, SLIGHTLY WEATHERED, DENSE, HARD DOLOMITE, NOTED NEAR UNIFORM SLIGHTLY WEATHERED CLOSE SPACED PARTINGS	ST 1	NXM			REC. 100%		RQD 0%						
	32															
	34															
	36															
	38															
	40															
	42															
842.6	44															
	46															
	48															
	50															
	52															
843.6																
832.6																

BORING COMPLETED @ 53.5'

THE H.C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119 BRIDGE CONSTRUCTION FOR SWANEY ROAD OVER U.S. 30 AND RAMP C, ALLEN COUNTY, OHIO STRUCTURE NO. ALL-30-2021		
BORING DATA		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94

DRAWING ID: ALLSW82.DWG

PROJECT DESCRIPTION

A TWIN BRIDGE STRUCTURE WILL BE CONSTRUCTED TO ELEVATE THE U.S. 30 EASTBOUND AND WESTBOUND ROADWAYS OVER PHILLIPS ROAD. EACH BRIDGE, BRIDGE NO. ALL-30-2096 (EASTBOUND AND WESTBOUND LANES OVER PHILLIPS ROAD) WILL BE A THREE-SPAN, CONTINUOUS STEEL BEAM STRUCTURE. THE CENTERLINE FOR EACH BRIDGE WILL BE OFFSET 42.0 FT. (LEFT AND RIGHT) FROM THE U.S. 30 CENTERLINE. THE SPAN LENGTHS ARE 39 FT. 0 IN., 52 FT. 0 IN., AND 39 FT. 0 IN. FOR A TOTAL BRIDGE LENGTH OF 132.10 FT.

THE APPROACH EMBANKMENTS WILL HAVE A MAXIMUM HEIGHT OF APPROXIMATELY 23 FT. AT THE ABUTMENTS. IN CROSS SECTION, THE APPROACH EMBANKMENT WILL HAVE A CREST WIDTH OF 14 FT. APPROXIMATELY 145 FT. AND SIDE SLOPES CONSTRUCTED TO 2H:1V.

GEOLOGY

THE PROJECT SITE IS LOCATED WITHIN THE TILL PLAINS PHYSIOGRAPHIC REGION OF OHIO. THE AREA WAS COVERED BY CONTINENTAL GLACIERS IN TWO TIME PERIODS, THE ILLINOIAN AND WISCONSIN GLACIATIONS. THE ADVANCING AND RETREATING ICE SHEETS DEPOSITED GROUND MORANE (GLACIAL TILL) AND END MORAINES, THE WISCONSIN AGE DEPOSITS OVERLYING THE OLDER ILLINOIAN DEPOSITS. THE SURFACE DEPOSITS ARE CONSIDERED GROUND MORAINES (WISCONSIN AGE), LOCATED JUST NORTH OF THE EAST-WEST ORIENTED FORT WAYNE END MORANE.

THE OVERBURDEN SOILS WITHIN THE PROJECT LIMITS ARE TYPICALLY GROUND MORANE OR GLACIAL TILL DEPOSITS. A GLACIAL TILL SOIL CAN BE DESCRIBED AS AN UNSORTED, UNSTRATIFIED MIXTURE OF CLAY, SILT, SAND, GRAVEL, COBBLES AND BOULDERS. THE GLACIAL DEPOSITS WITHIN THE PROJECT LIMITS ARE TYPICALLY 25 TO 60 FT. THICK, THINNER IN THE DRAINAGE VALLEYS.

THE BEDROCK WITHIN THE PROJECT VICINITY, UNDERLYING THE GLACIAL TILL OVERBURDEN, IS UPPER SILURIAN TO LOWER DEVONIAN IN AGE. GEOLOGIC LITERATURE INDICATES THAT THE BEDROCK BELONGS TO THE MONROE FORMATION THAT IS TYPICALLY LIMESTONE AND DOLOMITE.

INVESTIGATIONAL PROCEDURES

TEST BORINGS, LABELED AS PH-1 THROUGH PH-4, WERE PERFORMED FOR THE TWIN BRIDGE STRUCTURES AS PART OF THE U.S. 30 ROADWAY PROJECT (ALL/HAN-30-20.31/0.00). THE STRUCTURE TEST BORINGS WERE PERFORMED USING BOTH TRUCK-MOUNTED AND ATV-MOUNTED DRILLING RIGS BETWEEN JANUARY 28 AND FEBRUARY 13, 1994. THE TEST BORINGS WERE ADVANCED TO A CONDITION OF REFUSAL ON THE DOLOMITE BEDROCK. A ROCK CORE SAMPLE WAS OBTAINED ONCE AUGER REFUSAL WAS MET IN BORINGS PH-2 AND PH-4. THE DEPTH TO THE BEDROCK SURFACE RANGED BETWEEN 30.5 AND 34 FT.

EACH TEST BORING WAS ADVANCED WITH HOLLOW-STEM AUGERS. THE DRIVE SAMPLING WAS ACCOMPLISHED THROUGH AND BELOW THE TIP OF THE HOLLOW-STEM AUGERS AT 2.5 FT. INTERVALS TO A DEPTH OF 20 FT., AT WHICH DEPTH 5 FT. SAMPLING INTERVALS WERE USED. THE DRIVE SAMPLING WAS ACCOMPLISHED IN ACCORDANCE WITH "PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS," ASTM D 1586. A 2 IN. O.D. BY 1 3/8 IN. I.D. SPLIT-SPOON SAMPLER WAS DRIVEN A TOTAL OF 18 IN., WITH A TOTAL NUMBER OF BLOWS OF 140 LB. HAMMER WEIGHT FALLING 30 IN. BEING RECORDED FOR 6 IN. OF PENETRATION. THE SUM OF BLOWS FOR THE FINAL 12 IN. OF PENETRATION IS THE STANDARD PENETRATION TEST RESULT, COMMONLY REFERENCED TO AS THE N-VALUE.

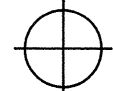
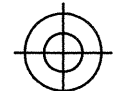




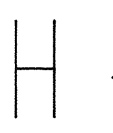
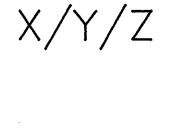
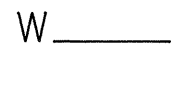
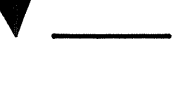
BEDROCK CORE SAMPLING WAS PERFORMED AT TEST BORINGS PH-2 AND PH-4. THE BEDROCK CORE SAMPLING WAS PERFORMED IN ACCORDANCE WITH ASTM D 2113. THE BEDROCK CORE SAMPLES WERE CUT WITH AN NX SERIES CORE BARREL, PRODUCING A CORE HAVING A NOMINAL DIAMETER OF 2 1/8 IN. THE BEDROCK CORE SAMPLE LENGTHS WERE 5 AND 10 FT. AT BORINGS PH-2 AND PH-4, RESPECTIVELY.

ALL SOIL SAMPLES WERE STORED IN SEALED JARS AND THE BEDROCK CORE SAMPLES WERE STORED IN WOODEN CORE BOXES. THE DRILLER MAINTAINED A LOG OF THE ENTIRE DRILLING OPERATION, INCLUDING A DESCRIPTION OF THE MATERIALS ENCOUNTERED IN EACH SPLIT-SPOON OR BEDROCK CORE RUN, THE DEPTH AT WHICH THE DESCRIPTION OF THE SOIL OR BEDROCK CHANGED, THE DEPTH FROM WHICH EACH SAMPLE WAS RECOVERED, THE TYPE OF SAMPLE, THE NUMBER OF BLOWS FOR EACH 6 IN. OF DRIVE ON THE SPLIT-SPOON SAMPLER, THE NUMBER OF INCHES OF RECOVERY FOR EACH SAMPLE OBTAINED, LEVELS AT WHICH ANY GROUNDWATER OR SEEPAGE WAS ENCOUNTERED, ALONG WITH ANY OTHER PERTINENT INFORMATION DEVELOPED DURING THE DRILLING OPERATIONS.


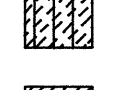


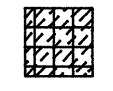
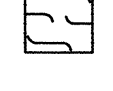

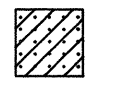
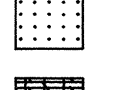
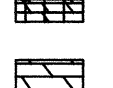
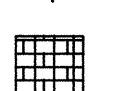
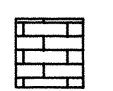
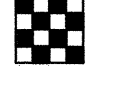

UPON COMPLETION OF THE DRILLING PROGRAM, ALL SAMPLES (SOIL AND ROCK CORE) WERE RETURNED TO OUR CINCINNATI SOIL MECHANICS LABORATORY WHERE THE PROJECT ENGINEER INSPECTED EACH SAMPLE. THE ATTACHED STRUCTURE BORING LOGS WERE PREPARED BASED ON THE VISUAL INSPECTION OF THE RECOVERED SAMPLES, THE LABORATORY TEST DATA AND ODOT STANDARDS.

REPRESENTATIVE SOIL AND ROCK CORE SAMPLES WERE SELECTED FOR THE PERFORMANCE OF PHYSICAL TESTS IN OUR LABORATORY TO DETERMINE THEIR ENGINEERING CHARACTERISTICS. INCLUDED IN THE LABORATORY TEST PROGRAM WERE NATURAL MOISTURE CONTENT DETERMINATIONS, ATTERBERG LIMITS, SIEVE ANALYSES WITH HYDROMETER TESTS AND UNCONFINED COMPRESSION TESTS.

LEGEND

-  AUGER BORING LOCATION-PLAN VIEW
-  PRESS AND/OR DRIVE SAMPLE AND/OR CORE BORING LOCATION-PLAN VIEW
-  CAPPED PILE
-  FOOTING
-  FOOTING ON PILE
-  TR TOP OF ROCK
-  HORIZONTAL BAR ON BORING LOG INDICATES THE DEPTH THE SAMPLE WAS TAKEN
-  X/Y/Z FIGURES BESIDE THE BORING LOG IN PROFILE INDICATES THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST.
X=NUMBER OF BLOWS FOR FIRST 6-INCHES
Y=NUMBER OF BLOWS FOR SECOND 6-INCHES
Z=NUMBER OF BLOWS FOR THIRD 6-INCHES
-  W INDICATES FREE WATER ELEVATION
-  INDICATES STATIC WATER ELEVATION

SYMBOLS OF ROCK TYPES

-  COAL
-  WEATHERED MUDSTONE
-  MUDSTONE
-  WEATHERED SHALE
-  SHALE
-  CLAYSTONE
-  SILTSTONE
-  WEATHERED SANDSTONE
-  SANDSTONE
-  LEACHED DOLOMITE
-  DOLOMITE
-  LEACHED LIMESTONE
-  LIMESTONE
-  BOULDERS OR COBBLES

GENERAL INFORMATION

DRIVE SAMPLE/PRESS SAMPLE/CORE BORINGS

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, 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 SAMPLING DEVICE 18 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

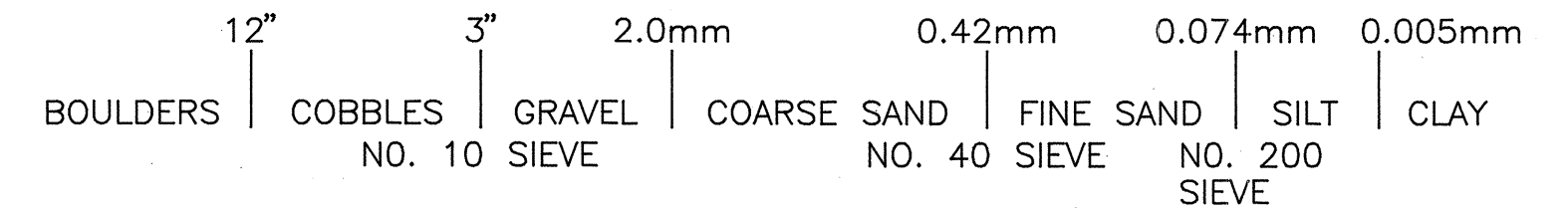
DRIVE/PRESS SAMPLE BORINGS ARE ALSO MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, OR A 3" O.D. THIN WALL PRESS SAMPLING DEVICE. THE PRESS SAMPLER IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE, APPLIED BY THE DRILLING MACHINE.

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NXM CORE BARREL, WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6-INCH INCREMENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS, UTILIZING THE CASAGRANDE AC CLASSIFICATION SYSTEM, INCLUDING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

PARTICLE SIZE DEFINITIONS



INVESTIGATIONAL FINDINGS

THE SOIL PROFILE AT THE PROJECT SITE WAS COMPRISED OF GLACIALLY DEPOSITED MATERIALS, RESTING ON DOLOMITE BEDROCK. THE GLACIAL DEPOSITS WERE PREDOMINANTLY COMPRISED OF GROUND MORANE OR GLACIAL TILL. THE NEAR SURFACE MATERIALS DEVELOPED THROUGH SEVERE WEATHERING OF THE PARENT GLACIAL TILL DEPOSITS. THE SURFACE MANTLE OF SEVERELY WEATHERED GLACIAL SOILS WAS UNDERLAIN BY LESS WEATHERED TO RELATIVELY UNWEATHERED DEPOSITS OF GLACIAL TILL. THE GLACIAL TILL DEPOSITS WERE COMPRISED OF TWO DISTINCT ZONES; AN UPPER ZONE THAT WAS BROWN IN COLOR AND THE LOWER ZONE OF GRAY COLOR. THE THICKNESS OF THE OVERBURDEN SOIL PROFILE (SEVERELY WEATHERED NEAR SURFACE GLACIAL SOILS AND THE UNDERLYING, LESS WEATHERED GLACIAL TILL DEPOSITS) RANGED BETWEEN APPROXIMATELY 30 AND 34 FT.

THE TEST BORINGS REPRESENTING THE PHILLIPS ROAD OVERPASS STRUCTURE, PH-1 THROUGH PH-4, ENCOUNTERED SEVERELY WEATHERED, NEAR SURFACE SOILS TO DEPTHS OF BETWEEN 2.5 AND 7.5 FT. BELOW THE NATURAL GROUND SURFACE. THESE MATERIALS WERE LOW PLASTICITY TO MODERATE PLASTICITY SOILS, CLASSIFIED AS A-6A SILT AND CLAY, A-6B SILTY CLAY, AND A-7-6 CLAY.

THE SEVERELY WEATHERED GLACIAL SOIL STRATUM WAS UNDERLAIN BY THE RELATIVELY UNWEATHERED GLACIAL TILL DEPOSITS. THE UPPER GLACIAL TILL SOILS WERE BROWN IN COLOR, BECOMING GRAY IN COLOR WITH DEPTH, TRANSITIONING FROM BROWN TO GRAY AT APPROXIMATELY 10 TO 20 FT. BELOW THE NATURAL GROUND SURFACE. THE GLACIAL TILL SOILS WERE PRIMARILY CLASSIFIED AS A-6A SILT AND CLAY, COMPRISED OF 15 TO 20% SAND SIZE PARTICLES AND LESS THAN 5% GRAVEL SIZE PARTICLES.

THE CONSISTENCY OF THE GLACIAL TILL SOILS RANGED FROM VERY STIFF TO HARD IN THE UPPER PORTION OF THE DEPOSITS, DECREASING TO BETWEEN STIFF AND VERY STIFF WITH INCREASED DEPTH. THE TEST BORINGS INDICATED THAT THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS WERE RATED VERY STIFF TO HARD, TYPICALLY CORRESPONDED TO THE BROWN COLORED GLACIAL TILL SOILS. THE N-VALUES WITHIN THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS RANGED FROM THE LOW 20'S TO IN EXCESS OF 40 BLOWS PER FT. DECREASED CONSISTENCY TO BETWEEN STIFF AND VERY STIFF, CORRESPONDED TO THE TRANSITION FROM THE BROWN TO THE GRAY GLACIAL TILL SOILS. THE N-VALUES TYPICALLY DECREASED TO BETWEEN THE MID TEENS AND THE LOW 20'S (BLOWS PER FT.) WITHIN THE LOWER PORTION OF THE GLACIAL TILL DEPOSITS.

POCKETS, SEAMS AND LAYERS OF SAND TO SAND AND GRAVEL WERE INTERBEDDED WITHIN THE GLACIAL TILL DEPOSITS. THESE GRANULAR FEATURES WERE TYPICALLY WATER BEARING AND RATED FROM MEDIUM DENSE TO DENSE IN COMPACTNESS. LOCALIZED ZONES OF SATURATED, MEDIUM STIFF TO STIFF CONSISTENCY GLACIAL TILL SOILS WERE ENCOUNTERED ABOVE AND BELOW THE WATER BEARING GRANULAR MATERIALS.

THE BEDROCK WITHIN THE PROJECT LIMITS, ENCOUNTERED BETWEEN ELEVATIONS 853.7 AND 854.8 AT THE REFERENCED SITE, IS UPPER SILURIAN TO LOWER DEVONIAN AGE DOLOMITE. THE BEDROCK CORES PERFORMED AT THE BRIDGE STRUCTURE INDICATED THAT THE DOLOMITE BEDROCK WAS SLIGHTLY VUGGY TO VUGGY AND HAD NEARLY UNIFORM, CLOSE TO VERY CLOSE SPACED PARTINGS. THE PARTINGS WERE WEATHERED NEAR THE SURFACE OF THE BEDROCK AND BECAME LESS WEATHERED WITH DEPTH, TYPICALLY SPACED AT LESS THAN 2 IN. NEAR VERTICAL JOINTS WERE NOTED THROUGHOUT THE BEDROCK CORE LENGTHS. THE ROCK HARDNESS RATING FOR THE DOLOMITE BEDROCK WAS HARD.

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 this data and it is not to be construed as a part of the plans governing construction of the project.

THE H. C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI, OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION

PROJECT NO. ALL/HAN-30-20.31/0.00
BRIDGE CONSTRUCTION FOR U.S. 30 OVER
PHILLIPS ROAD, ALLEN COUNTY, OHIO

STRUCTURE NO. ALL-30-2096 W.O. NO. 04062.119

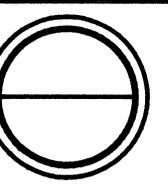
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	REVISED DATE 08/30/94
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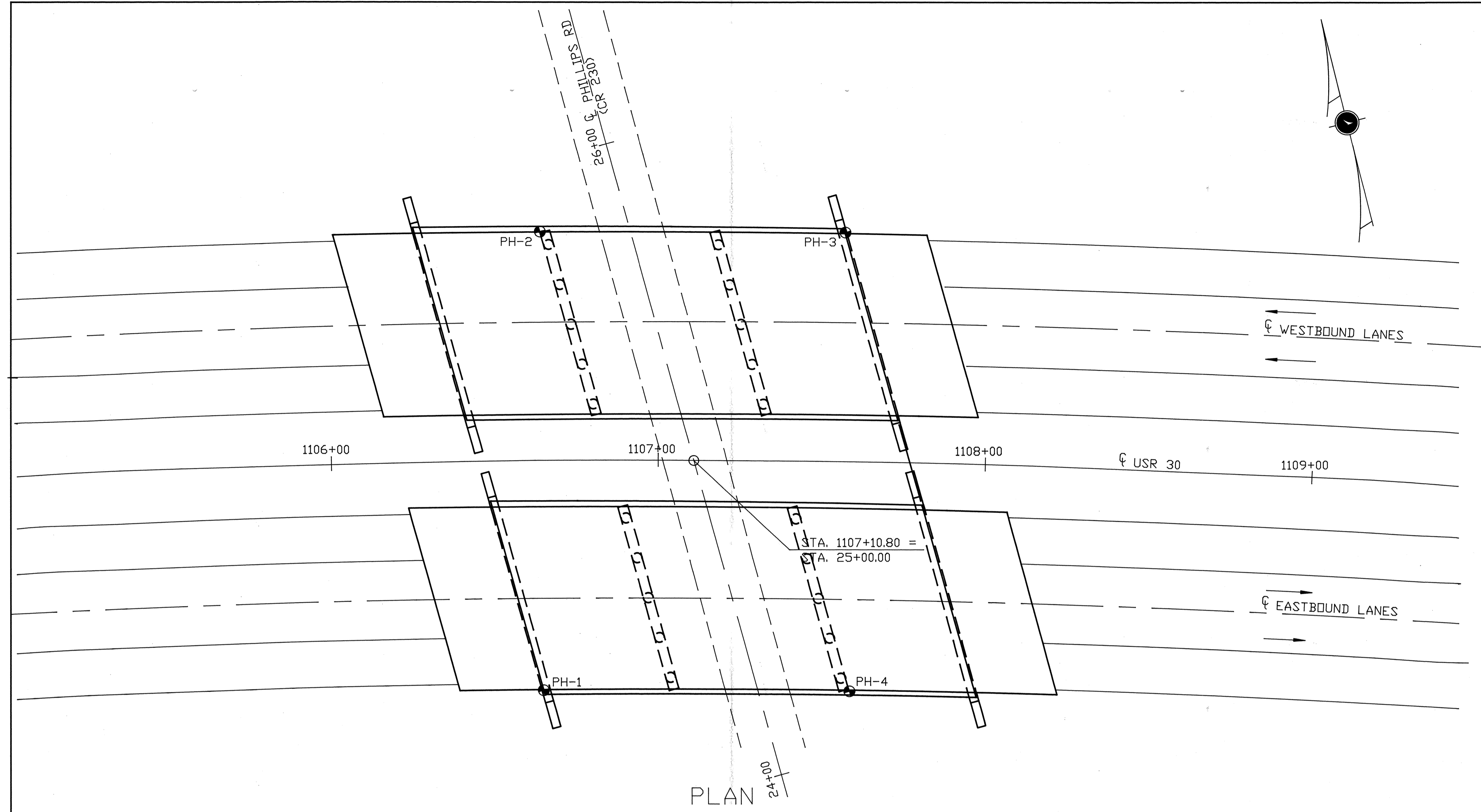
SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 U.S. 30 OVER PHILLIPS ROAD,
 ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226

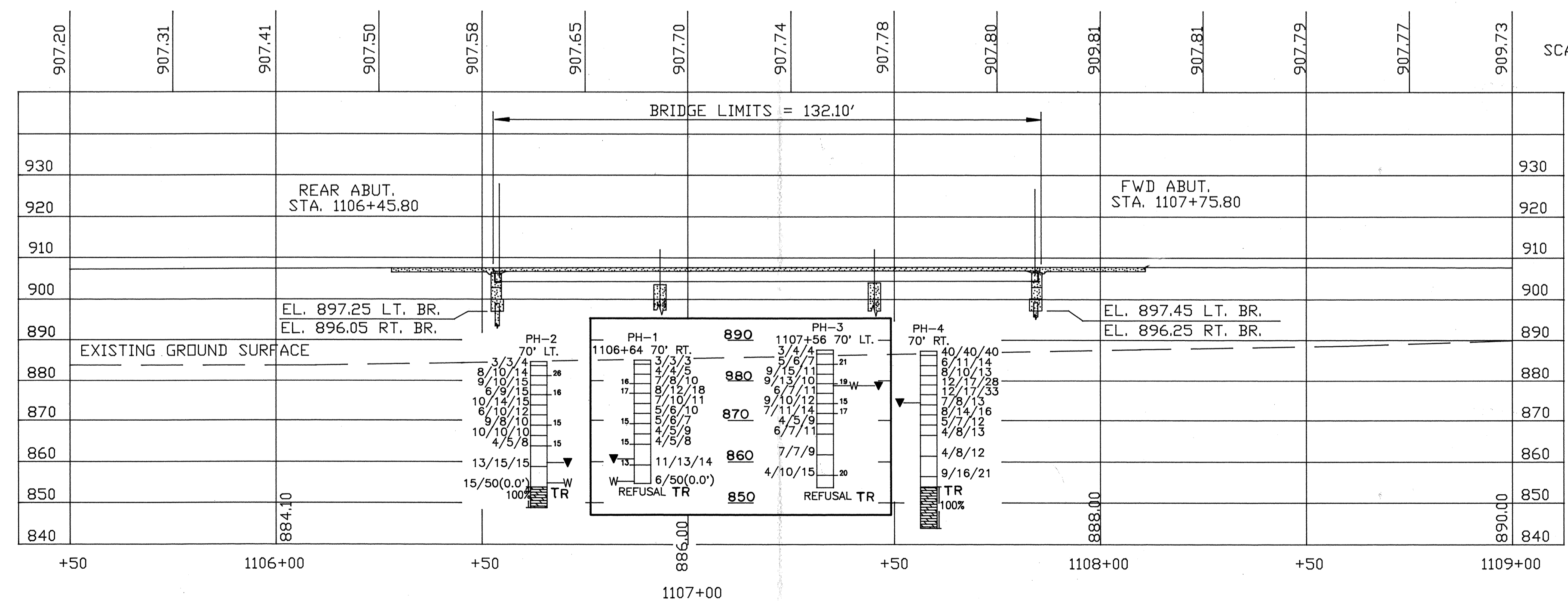


2
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B-1 INDICATES SOIL BORING LOCATION

SCALE: 1"=20' HORIZONTAL AND VERTICAL



PROFILE ALONG INSIDE EDGE OF EASTBOUND PAVEMENT U.S.R. 30

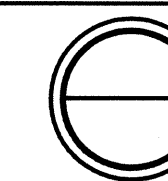
THE H.C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119 BRIDGE CONSTRUCTION FOR U.S. 30 OVER PHILLIPS ROAD, ALLEN COUNTY, OHIO STRUCTURE NO. ALL-30-2096		
BORING DATA		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94

DRAWING BY: J. A. HARRIS

SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 U.S. 30 OVER PHILLIPS ROAD,
 ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



3
4

LOG OF BORING

DATE STARTED 01/28/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
 DATE COMPLETED 01/28/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE 855.2
 BORING NUMBER PH-1 CORE BARREL: TYPE SIZE AFTER COMP. HRS. 854.7
 AFTER 24 HRS. 860.2
 SURFACE ELEVATION 855.2
 STATION & OFFSET 1106+64 70' RT., (U.S. 30)

ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS										SHTL CLASS			
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	% PI	% WC				
885.2	0																	
884.5	3-3-3		DARK BROWN SILT AND CLAY, TRACE ORGANICS, VERY MOIST TO MOIST - MEDIUM STIFF	1B		V		S	U	A	L						A-6a	
882.7	4-4-5		BROWN AND GRAY SILTY CLAY, MOIST - STIFF	2		V		S	U	A	L						A-6a	
	7-8-10		BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF	3		V		S	U	A	L		16				A-6a	
877.7	8-12-18		BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	4		V		S	U	A	L		17				A-6a	
	7-10-11			5		V		S	U	A	L						A-6a	
872.7	5-6-10		GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	6		V		S	U	A	L						A-6a	
870.2	5-6-7		GRAY SILTY CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO STIFF (GLACIAL TILL)	7		V		S	U	A	L		15				A-6b	
	4-5-9			8		V		S	U	A	L						A-6b	
	4-5-8			9		V		S	U	A	L		15				A-6b	
860.2	11-13-14		GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	10		V		S	U	A	L		13				A-6a	
855.2	6-50/0		GRAY SILTY CLAY, TRACE SAND, VERY MOIST - MEDIUM STIFF (GLACIAL TILL)	11		V		S	U	A	L						A-6b	

BORING COMPLETED @ 30.5'
 (AUGER REFUSAL ON BEDROCK)

LOG OF BORING

DATE STARTED 01/28/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
 DATE COMPLETED 01/28/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE 854.8
 BORING NUMBER PH-2 CORE BARREL: TYPE NXM SIZE 2.125" I.D. AFTER COMP. HRS. 855.8
 AFTER 24 HRS. 859.8
 SURFACE ELEVATION 884.8
 STATION & OFFSET 1106+64 70' LT., (U.S. 30)

ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS										SHTL CLASS		
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	% PI	% WC			
884.8	0																
883.8	3-3-4		DARK BROWN SILT AND CLAY, TRACE ORGANICS, VERY MOIST TO MOIST - SOFT TO MEDIUM STIFF	1B		V		S	U	A	L						A-6a
882.3	8-10-14		BROWN AND GRAY CLAY, TRACE SAND, MOIST - MEDIUM STIFF	2		V		S	U	A	L		26				A-7-6
879.8	9-10-15		BROWN AND GRAY CLAY, MOIST - STIFF	3		V		S	U	A	L						A-6a
	6-9-15		BROWN TRACE GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	4	5	8	11	33	43	33	14	16					A-6a(10)
	10-14-15			5		V		S	U	A	L						A-6a
872.3	6-10-12		GRAY SILT AND CLAY, SOME SAND, MOIST - STIFF TO VERY STIFF (GLACIAL TILL)	6		V		S	U	A	L						A-6a
	9-8-10			7		V		S	U	A	L		15				A-6a
	10-10-10			8		V		S	U	A	L						A-6a
	4-5-8			9	0	7	14	38	41	26	11	15					A-6a(8)
859.8	13-15-15		GRAY SILT AND CLAY, SOME SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	10		V		S	U	A	L						A-6a
854.8	15-50/0		DARK BROWN SILTY CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - STIFF (GLACIAL TILL)	11		V		S	U	A	L						A-6b
853.8	ROCK CORE		LIGHT GRAY, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED WEATHERED NEARLY UNIFORM CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS	C-1		NXM		REC. 100%		ROD. 0%							
848.8																	

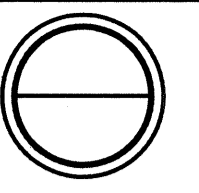
BORING COMPLETED @ 36.0'

DRAWING ID. - ALPHASIT.PWG

THE H.C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION		
PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119 BRIDGE CONSTRUCTION FOR U.S. 30 OVER PHILLIPS ROAD, ALLEN COUNTY, OHIO		
STRUCTURE NO. ALL-30-2096		
BORING DATA		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94

SOIL PROFILE

ALL/HAN-30-20.31/0.00
BRIDGE CONSTRUCTION FOR
U.S. 30 OVER PHILLIPS ROAD,
ALLEN COUNTY, OHIO



4
4

THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
CINCINNATI, OHIO 45226

LOG OF BORING

DATE STARTED 01/29/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
DATE COMPLETED 01/29/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE 878.7
BORING NUMBER PH-3 CORE BARREL: TYPE _____ SIZE _____ AFTER COMP. HRS. 857.7
STATION & OFFSET 1107+56 70' LT., (U.S. 30) AFTER 24 HRS. 878.7
SURFACE ELEVATION 887.7

ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS															
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS							
887.7	0																			
886.7	2	3-4-4	DARK BROWN SILT AND CLAY WITH ORGANICS, VERY MOIST TO MOIST - VERY SOFT TO SOFT	1		V	I	S	U	A	L			A-6a						
			BROWN SILT AND CLAY, LITTLE SAND, MOIST - STIFF	1A		V	I	S	U	A	L			A-6a						
882.7	4	5-6-7		2	0	7	12	35	46	35	15	21	A-6a(10)							
882.7	6	9-15-11	BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF	3		V	I	S	U	A	L			A-6a						
877.7	8	9-13-10		4		V	I	S	U	A	L	19	A-6a							
877.7	10	6-7-11	GRAY COARSE AND FINE SAND, WET - MEDIUM DENSE	5		V	I	S	U	A	L			A-3a						
875.2	12																			
875.2	14	9-10-12	GRAY SILTY CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, NOTED SAND SEAMS, MOIST - STIFF (GLACIAL TILL)	6		V	I	S	U	A	L	15	A-6b							
872.7	16	7-11-14	GRAY SILT AND CLAY, LITTLE SAND TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	7		V	I	S	U	A	L	17	A-6a							
	18	4-5-9		8		V	I	S	U	A	L			A-6a						
	20																			
	22	6-7-11		9		V	I	S	U	A	L			A-6a						
	24																			
	26	7-7-9		10		V	I	S	U	A	L			A-6a						
	28																			
	30																			
	32	4-10-15		11		V	I	S	U	A	L	20	A-6a							
853.7	34																			

BORING COMPLETED @ 34.0'
(AUGER REFUSAL ON BEDROCK)

LOG OF BORING

DATE STARTED 02/12/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
DATE COMPLETED 02/13/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE NONE
BORING NUMBER PH-4 CORE BARREL: TYPE NXM SIZE 2.125" I.D. AFTER COMP. HRS. 859.4
STATION & OFFSET 1107+59 70' RT., (U.S. 30) AFTER 24 HRS. 876.4
SURFACE ELEVATION 887.4

ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS															
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS							
887.4	0																			
886.4	2	40-40-40	DARK BROWN SILTY CLAY, VERY MOIST TO WET - SOFT	1		V	I	S	U	A	L			A-6b						
			BROWN AND GRAY SILT AND CLAY, MOIST - MEDIUM STIFF	1A		V	I	S	U	A	L			A-6a						
884.9	4	6-11-14	BROWN SANDY SILT, MOIST - STIFF	2		V	I	S	U	A	L			A-4a						
	6	8-10-13		3		V	I	S	U	A	L			A-4a						
879.9	8	12-17-28	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	4		V	I	S	U	A	L			A-6a						
	10	12-17-33		5		V	I	S	U	A	L			A-6a						
874.9	12	7-8-13	GRAY AND BROWN SILT AND CLAY, TRACE SAND, GRAVEL, AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	6		V	I	S	U	A	L			A-6a						
	14	8-14-16		7		V	I	S	U	A	L			A-6a						
869.9	18	5-7-12	GRAY SILT AND CLAY, TRACE SAND, GRAVEL, AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	8		V	I	S	U	A	L			A-6a						
	20	4-8-13		9		V	I	S	U	A	L			A-6a						
	22																			
	24																			
	26	4-8-12		10		V	I	S	U	A	L			A-6a						
	28																			
	30																			
	32	9-16-21		11		V	I	S	U	A	L			A-6a						
853.9	34		LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED WEATHERED CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS (CORE BROKEN UP)																	
	36																			
	38	ROCK CORE		C-1			NXM		REC. 100%					RQD. 6%						
846.9	40																			
	42		GRAY, DENSE, HARD DOLOMITE, NOTED NEARLY UNIFORM CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS																	
843.9																				

BORING COMPLETED @ 43.5'

DRAWING NO. 1-ALPHESZBWS

THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
BRIDGE CONSTRUCTION FOR U.S. 30
OVER PHILLIPS ROAD, ALLEN COUNTY, OHIO
STRUCTURE NO. ALL-30-2096

BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94
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PROJECT DESCRIPTION

A TWIN BRIDGE STRUCTURE WILL BE CONSTRUCTED TO ELEVATE THE U.S. 30 EASTBOUND AND WESTBOUND ROADWAYS OVER PEVEE ROAD.

THE APPROACH EMBANKMENTS WILL HAVE A MAXIMUM HEIGHT OF APPROXIMATELY 18 FT. AT THE ABUTMENTS, POSSIBLY HIGHER WITHIN THE LIMITS OF THE EXISTING POND AT THE EAST ABUTMENT.

GEOLOGY

THE PROJECT SITE IS LOCATED WITHIN THE TILL PLAINS PHYSIOGRAPHIC REGION OF OHIO. THE AREA WAS COVERED BY CONTINENTAL GLACIERS IN TWO TIME PERIODS, THE ILLINOIAN AND WISCONSIN GLACIATIONS.

THE OVERBURDEN SOILS WITHIN THE PROJECT LIMITS ARE TYPICALLY GROUND MORAINIC OR GLACIAL TILL DEPOSITS. A GLACIAL TILL SOIL CAN BE DESCRIBED AS AN UNSORTED, UNSTRATIFIED MIXTURE OF CLAY, SILT, SAND, GRAVEL, COBBLES AND BOULDERS.

THE BEDROCK WITHIN THE PROJECT VICINITY, UNDERLYING THE GLACIAL TILL OVERBURDEN, IS UPPER SILURIAN TO LOWER DEVONIAN IN AGE.

INVESTIGATIONAL PROCEDURES

TEST BORINGS, LABELED AS PV-1 THROUGH PV-4, WERE PERFORMED FOR THE TWIN BRIDGE STRUCTURES AS PART OF THE U.S. 30 ROADWAY PROJECT (ALL/HAN-30-20.31/0.00).

EACH TEST BORING WAS ADVANCED WITH HOLLOW-STEM AUGERS. THE DRIVE SAMPLING WAS ACCOMPLISHED THROUGH AND BELOW THE TIP OF THE HOLLOW-STEM AUGERS AT 2.5 FT. INTERVALS TO A DEPTH OF 20 FT.

BEDROCK CORE SAMPLING WAS PERFORMED AT TEST BORINGS PV-1 AND PV-4. THE BEDROCK CORE SAMPLING WAS PERFORMED IN ACCORDANCE WITH ASTM D 2113.

ALL SOIL SAMPLES WERE STORED IN SEALED JARS AND THE BEDROCK CORE SAMPLES WERE STORED IN WOODEN CORE BOXES. THE DRILLER MAINTAINED A LOG OF THE ENTIRE DRILLING OPERATION, INCLUDING A DESCRIPTION OF THE MATERIALS ENCOUNTERED IN EACH SPLIT-SPOON OR BEDROCK CORE RUN.

UPON COMPLETION OF THE DRILLING PROGRAM, ALL SAMPLES (SOIL AND ROCK CORE) WERE RETURNED TO OUR CINCINNATI SOIL MECHANICS LABORATORY WHERE THE PROJECT ENGINEER INSPECTED EACH SAMPLE.

REPRESENTATIVE SOIL AND ROCK CORE SAMPLES WERE SELECTED FOR THE PERFORMANCE OF PHYSICAL TESTS IN OUR LABORATORY TO DETERMINE THEIR ENGINEERING CHARACTERISTICS.

- AUGER BORING LOCATION-PLAN VIEW
PRESS AND/OR DRIVE SAMPLE AND/OR CORE BORING LOCATION-PLAN VIEW
CAPPED PILE
FOOTING
FOOTING ON PILE
TOP OF ROCK

LEGEND

- HORIZONTAL BAR ON BORING LOG INDICATES THE DEPTH THE SAMPLE WAS TAKEN
X/Y/Z FIGURES BESIDE THE BORING LOG IN PROFILE INDICATES THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST.
X=NUMBER OF BLOWS FOR FIRST 6-INCHES
Y=NUMBER OF BLOWS FOR SECOND 6-INCHES
Z=NUMBER OF BLOWS FOR THIRD 6-INCHES
W INDICATES FREE WATER ELEVATION
INDICATES STATIC WATER ELEVATION

SYMBOLS OF ROCK TYPES

- WEATHERED SANDSTONE
SANDSTONE
LEACHED DOLOMITE
DOLOMITE
LEACHED LIMESTONE
LIMESTONE
BOULDERS OR COBBLES
WEATHERED MUDSTONE
MUDSTONE
WEATHERED SHALE
SHALE
CLAYSTONE
SILTSTONE
COAL

INVESTIGATIONAL FINDINGS

THE SOIL PROFILE AT THE PROJECT SITE WAS COMPRISED OF GLACIALLY DEPOSITED MATERIALS, RESTING ON DOLOMITE BEDROCK. THE GLACIAL DEPOSITS WERE PREDOMINANTLY COMPRISED OF GROUND MORAINIC OR GLACIAL TILL.

THE TEST BORINGS REPRESENTING THE PEVEE ROAD OVERPASS STRUCTURE, PV-1 THROUGH PV-4, ENCOUNTERED SEVERELY WEATHERED, NEAR SURFACE SOILS TO DEPTHS OF BETWEEN 2.5 AND 7.5 FT. BELOW THE NATURAL GROUND SURFACE.

THE SEVERELY WEATHERED GLACIAL SOIL STRATUM WAS UNDERLAIN BY THE RELATIVELY UNWEATHERED GLACIAL TILL DEPOSITS. THE UPPER GLACIAL TILL SOILS WERE BROWN IN COLOR, BECOMING GRAY IN COLOR WITH DEPTH.

THE CONSISTENCY OF THE GLACIAL TILL SOILS RANGED FROM VERY STIFF TO HARD IN THE UPPER PORTION OF THE DEPOSITS, DECREASING TO VERY STIFF WITH INCREASED DEPTH. THE TEST BORINGS INDICATED THAT THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS WHICH WERE RATED VERY STIFF TO HARD, TYPICALLY CORRESPONDED TO THE BROWN COLORED GLACIAL TILL SOILS.

POCKETS, SEAMS AND LAYERS OF SAND TO SAND AND GRAVEL WERE INTERBEDDED WITHIN THE GLACIAL TILL DEPOSITS. THESE GRANULAR FEATURES WERE TYPICALLY WATER BEARING AND RATED FROM MEDIUM DENSE TO DENSE IN COMPACTNESS.

THE BEDROCK WITHIN THE PROJECT LIMITS, ENCOUNTERED BETWEEN ELEVATIONS 861.6 AND 864.3 AT THE REFERENCED SITE, IS UPPER SILURIAN TO LOWER DEVONIAN AGE DOLOMITE.

GENERAL INFORMATION

DRIVE SAMPLE/PRESS SAMPLE/CORE BORINGS

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, 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.

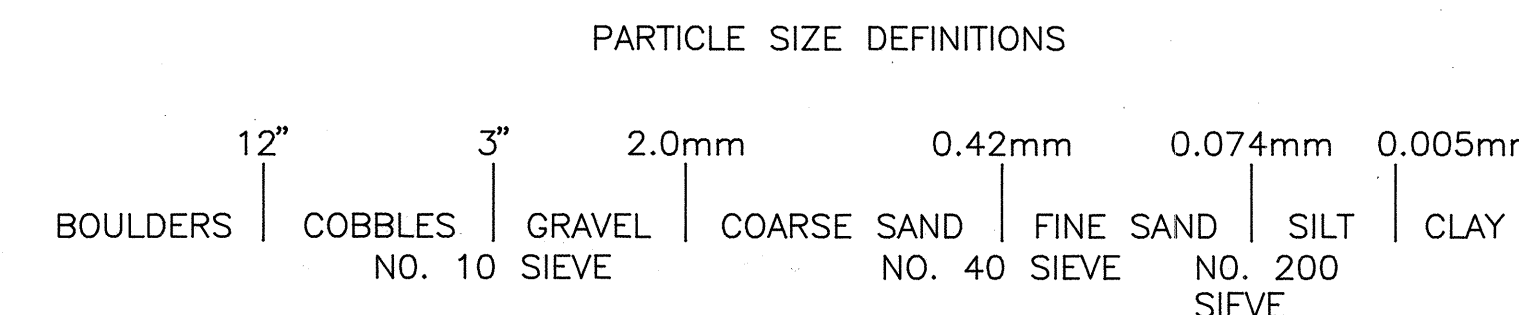
DRIVE/PRESS SAMPLE BORINGS ARE ALSO MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, OR A 3" O.D. THIN WALL PRESS SAMPLING DEVICE.

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NXM CORE BARREL, WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6-INCH INCREMENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS, UTILIZING THE CASAGRANDE AC CLASSIFICATION SYSTEM, INCLUDING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL.

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 this data and it is not to be construed as a part of the plans governing construction of the project.



NOTE: ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN REPORTED.

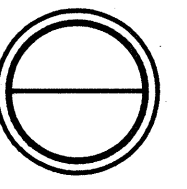
NOTE: Information shown by this subsurface investigation was obtained solely for the use in establishing design controls for the project.

THE H. C. NUTTING COMPANY GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI, OHIO 45226
STRUCTURE FOUNDATION INVESTIGATION
PROJECT NO. ALL/HAN-30-20.31/0.00
BRIDGE CONSTRUCTION FOR U.S. 30 OVER PEVEE ROAD, ALLEN COUNTY, OHIO
STRUCTURE NO. ALL-30-2251 W.O. NO. 04062.119
CHECKED BY K.G.A. REVIEWED BY A.P.A. REVISED DATE 08/30/94

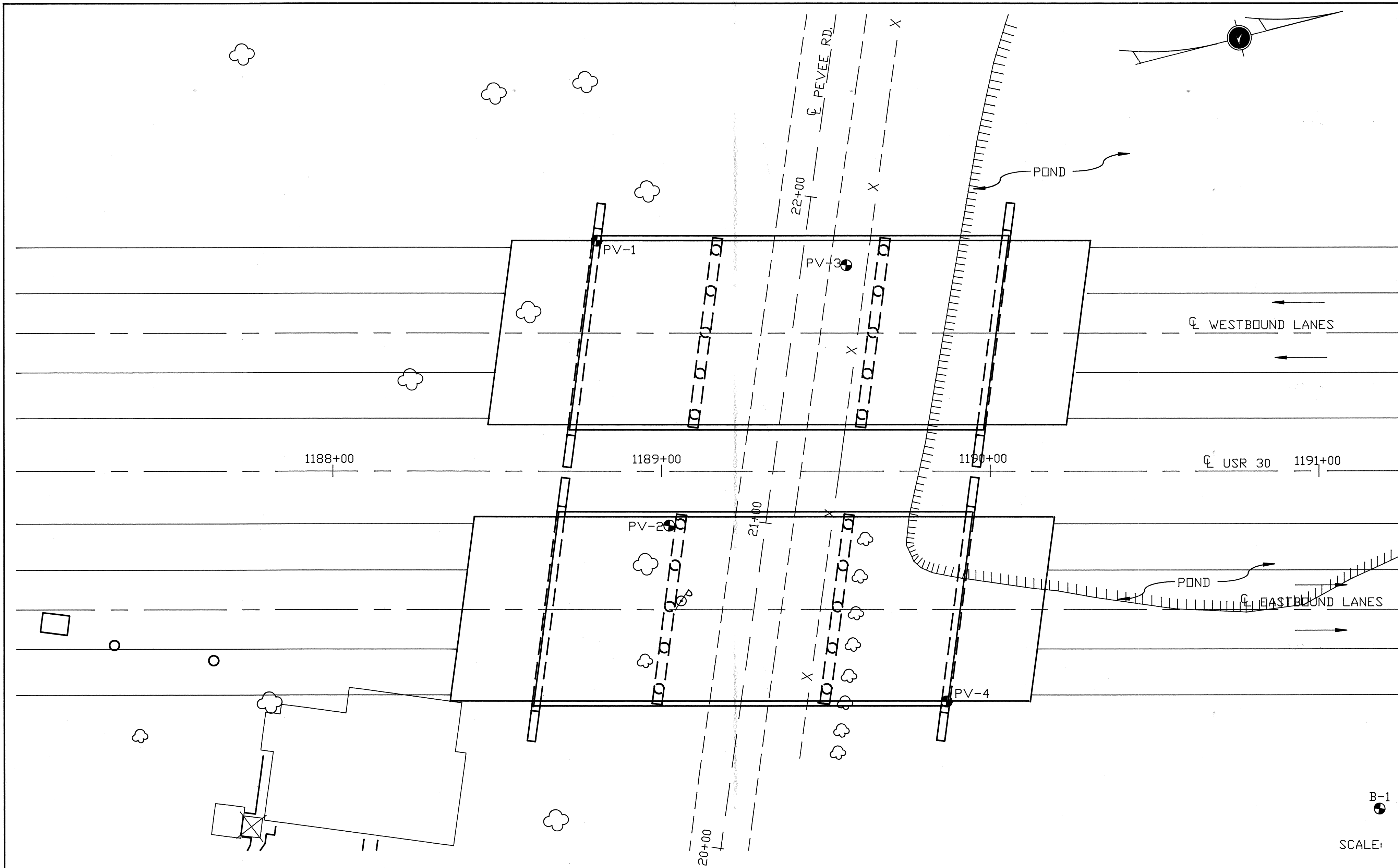
SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 U.S. 30 OVER PEVEE ROAD,
 ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



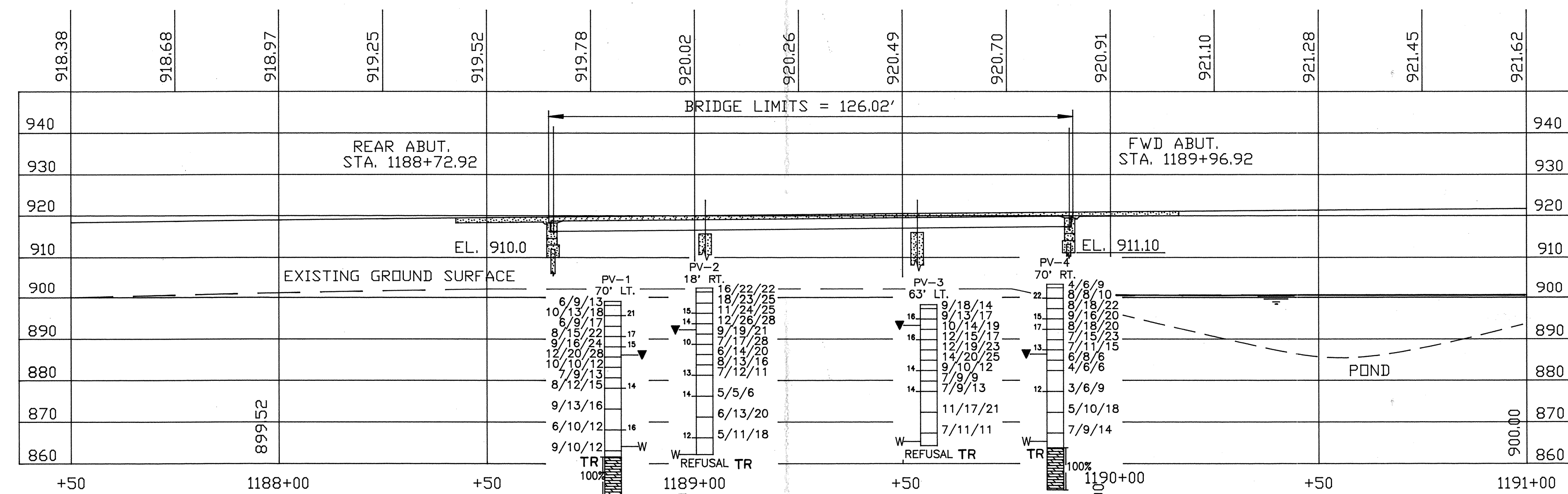
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B-1 INDICATES SOIL BORING LOCATION

SCALE: 1"=20' HORIZONTAL AND VERTICAL

PLAN



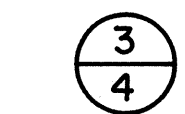
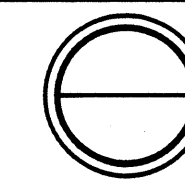
PROFILE ALONG INSIDE EDGE OF EASTBOUND PAVEMENT U.S.R. 30

THE H.C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119 BRIDGE CONSTRUCTION FOR U.S. 30 OVER PEVEE ROAD, ALLEN COUNTY, OHIO STRUCTURE NO. ALL-30-2251		
BORING DATA		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94

DRAWING BY: J. ALDRIDGE

SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 U.S. 30 OVER PEVEE ROAD,
 ALLEN COUNTY, OHIO



THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226

LOG OF BORING													
DATE STARTED		02/27/94		SAMPLER: TYPE		SPLIT SPOON		DIA.		2.0" O.D.		WATER ELEVATION:	
DATE COMPLETED		02/27/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA.		3.25" I.D.		IMMEDIATE	
BORING NUMBER		PV-1		CORE BARREL: TYPE		NXM		SIZE		2.125" I.D.		AFTER COMP. HRS. 871.1	
STATION & OFFSET		1188+80 70' LT., (U.S. 30)										AFTER 24 HRS. 886.1	
												SURFACE ELEVATION 899.1	
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS
899.1	0			1A									A-8B
898.6	2	6-9-13	DARK BROWN SILTY CLAY, TRACE ORGANICS, VERY MOIST TO MOIST - VERY SOFT	1A	V	I	S	U	A	L			A-8B
896.6	2	6-9-13	BROWN AND GRAY SILTY CLAY, MOIST - MEDIUM STIFF	1A	V	I	S	U	A	L			A-8B
	4	10-13-18	BROWN AND GRAY SILTY CLAY, TRACE SAND, MOIST - VERY STIFF	2	V	I	S	U	A	L	21		A-6b
894.1	6	6-9-17	BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	3	V	I	S	U	A	L			A-6a
	8	8-15-22		4	V	I	S	U	A	L	17		A-6a
889.1	10	9-16-24	DARK BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	5	V	I	S	U	A	L	15		A-6a
	12	12-20-28		6	V	I	S	U	A	L			A-6a
	14	12-20-28		6	V	I	S	U	A	L			A-6a
	16	10-10-12		7	V	I	S	U	A	L			A-6a
881.6	18	7-9-13	GRAY SANDY SILT, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	8	V	I	S	U	A	L			A-4a
	20	8-12-15		9	0	12	14	38	36	24	8	14	A-4a(B)
	22												
	24												
	26	9-13-16		10	V	I	S	U	A	L			A-4a
	28												
	30												
	32	6-10-12		11	V	I	S	U	A	L	16		A-4a
	34												
864.1	36	9-10-12	GRAY SILT AND CLAY, TRACE SAND, MOIST - VERY STIFF (GLACIAL TILL)	12	V	I	S	U	A	L			A-6a
861.6	38												
859.6	40		LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED WEATHERED CLOSE SPACED PARTINGS AND MULTIPLE VERTICAL JOINTS (CORE BROKEN UP)										
	42		LIGHT GRAY, HARD DOLOMITE, NOTED SLIGHTLY WEATHERED NEAR UNIFORM CLOSE SPACED PARTINGS	C-1	NXM		REC. 100%			RQD. 0%			
856.1	44		GRAY, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED NEAR UNIFORM CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS										
	46												
851.6													

BORING COMPLETED @ 47.5'

LOG OF BORING													
DATE STARTED		02/16/94		SAMPLER: TYPE		SPLIT SPOON		DIA.		2.0" O.D.		WATER ELEVATION:	
DATE COMPLETED		02/16/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA.		3.25" I.D.		IMMEDIATE	
BORING NUMBER		PV-2		CORE BARREL: TYPE				SIZE				AFTER COMP. HRS. 862.2	
STATION & OFFSET		1189+01 18' RT., (U.S. 30)										AFTER 24 HRS. 892.2	
												SURFACE ELEVATION 902.2	
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS
902.2	0			1A									A-6a
901.4	2	16-22-22	DARK BROWN SILT AND CLAY, LITTLE ORGANICS, VERY MOIST - SOFT	1A	V	I	S	U	A	L			A-6a
	4	18-23-25	BROWN AND GRAY SILTY CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF TO HARD	2	V	I	S	U	A	L			A-6b
897.2	6	11-24-25	BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - HARD	3	V	I	S	U	A	L	15		A-6a
894.7	8	12-26-28	BROWN SILT AND CLAY, SOME SAND, TRACE GRAVEL AND ROCK FRAGMENTS, NOTED SILT LENSES, MOIST - HARD (GLACIAL TILL)	4	V	I	S	U	A	L	14		A-6a
	10	9-19-21		5	V	I	S	U	A	L			A-6a
	12												
	14	7-17-28		6	3	12	14	35	36	32	12	10	A-6a(B)
	16	6-14-20		7	V	I	S	U	A	L			A-6a
	18	8-13-16		8	V	I	S	U	A	L			A-6a
882.2	20	7-12-11	GRAY SANDY SILT, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	9	V	I	S	U	A	L	13		A-4a
	22												
	24												
	26	5-5-6		10	V	I	S	U	A	L	14		A-4a
	28												
	30												
	32	6-13-20		11	V	I	S	U	A	L			A-4a
	34												
	36	5-11-18		12	V	I	S	U	A	L	12		A-4a
	38												
862.2	40												

BORING COMPLETED @ 40.0'
 (AUGER REFUSAL ON BEDROCK)

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR U.S. 30 OVER
 PEVEE ROAD, ALLEN COUNTY, OHIO
 STRUCTURE NO. ALL-30-2251

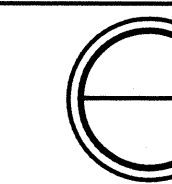
BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94
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SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 U.S. 30 OVER PEVEE ROAD,
 ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



4
4

LOG OF BORING														
DATE STARTED <u>02/16/94</u>			SAMPLER: TYPE <u>SPLIT SPOON</u>			DIA. <u>2.0"</u> O.D.			WATER ELEVATION:					
DATE COMPLETED <u>02/16/94</u>			CASING: LENGTH <u>5'</u> HOLLOW STEM AUGER			DIA. <u>3.25"</u> I.D.			IMMEDIATE <u>865.3</u>					
BORING NUMBER <u>PV-3</u>			CORE BARREL: TYPE _____			SIZE _____			AFTER COMP. HRS. <u>NONE</u>					
STATION & OFFSET <u>1189+55 63' LT., (U.S. 30)</u>									AFTER <u>24</u> HRS. <u>893.3</u>					
									SURFACE ELEVATION <u>898.3</u>					
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS									
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS	
898.3	0													
897.3	2	9-18-14	DARK BROWN SILT AND CLAY, LITTLE SAND, TRACE ORGANICS, MOIST - SOFT	1A	V	I	S	U	A	L				A-6a
895.8	4	9-13-17	BROWN AND GRAY SILTY CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - MEDIUM STIFF	2	V	I	S	U	A	L	16			A-6a
	6	10-14-19	BROWN SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	3	V	I	S	U	A	L				A-6a
	8													
	12	12-15-17		4	V	I	S	U	A	L	16			A-6a
	10													
	12	12-19-23		5	V	I	S	U	A	L				A-6a
885.8	14	14-20-25	GRAY SANDY SILT, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	6	V	I	S	U	A	L				A-4a
	16	9-10-12		7	V	I	S	U	A	L	14			A-4a
	18	7-9-9		8	V	I	S	U	A	L				A-4a
	20													
	22	7-9-13		9	4	10	14	36	36	25	10	14		A-4a(7)
	24													
	26	11-17-21		10	V	I	S	U	A	L				A-4a
	28													
868.3	30	7-11-11	GRAY SILT AND CLAY, TRACE SAND, MOIST - VERY STIFF (GLACIAL TILL)	11	V	I	S	U	A	L				A-6a
864.3	34													

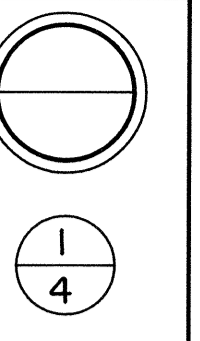
BORING COMPLETED @ 34.0'
 (AUGER REFUSAL ON BEDROCK)

LOG OF BORING														
DATE STARTED <u>02/26/94</u>			SAMPLER: TYPE <u>SPLIT SPOON</u>			DIA. <u>2.0"</u> O.D.			WATER ELEVATION:					
DATE COMPLETED <u>02/26/94</u>			CASING: LENGTH <u>5'</u> HOLLOW STEM AUGER			DIA. <u>3.25"</u> I.D.			IMMEDIATE <u>865.3</u>					
BORING NUMBER <u>PV-4</u>			CORE BARREL: TYPE <u>NXM</u>			SIZE <u>2.125"</u> I.D.			AFTER COMP. HRS. <u>873.3</u>					
STATION & OFFSET <u>1189+87 70' RT., (U.S. 30)</u>									AFTER <u>24</u> HRS. <u>886.3</u>					
									SURFACE ELEVATION <u>903.3</u>					
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS									
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS	
903.3	0													
	2	4-6-9	BROWN SILTY CLAY, TRACE ROOTS, MOIST - MEDIUM STIFF	1A	V	I	S	U	A	L				A-6b
900.8	4	8-8-10	BROWN AND GRAY CLAY, MOIST - STIFF	2	V	I	S	U	A	L	22			A-7-6
898.3	6	8-18-22	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	3	V	I	S	U	A	L				A-6a
	8													
	10	9-16-20		4	0	8	11	35	46	34	15	15		A-6a(10)
	12	8-18-20		5	V	I	S	U	A	L	17			A-6a
	14	7-15-23		6	V	I	S	U	A	L				A-6a
888.3	16	7-11-15	BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	7	V	I	S	U	A	L	13			A-6a
	18	6-8-6		8	V	I	S	U	A	L				A-6a
883.3	20	4-6-6	GRAY SANDY SILT, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	9	V	I	S	U	A	L				A-4a
	22													
	24													
	26	3-6-9		10	V	I	S	U	A	L	12			A-4a
	28													
	30	5-10-18		11	V	I	S	U	A	L				A-4a
	32													
	34													
	36	7-9-14		12	V	I	S	U	A	L				A-4a
	38													
863.8	40		LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED WEATHERED NEAR UNIFORM CLOSE TO VERY CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS											
	42													
	44													
858.3	46		LIGHT GRAY, VUGGY, HARD DOLOMITE, NOTED NEAR UNIFORM CLOSE TO VERY CLOSE SPACED PARTINGS	C-1				REC. 100%		RQD. 4%				
	48													
853.8														

BORING COMPLETED @ 49.5'

DRAWING NO. 1-ALE-PV2-BORING

THE H.C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION		
PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119		
BRIDGE CONSTRUCTION FOR U.S. 30 OVER PEVEE ROAD, ALLEN COUNTY, OHIO		
STRUCTURE NO. ALL-30-2251		
BORING DATA		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94



LEGEND

GENERAL INFORMATION

PROJECT DESCRIPTION

A TWIN BRIDGE STRUCTURE WILL BE CONSTRUCTED TO ELEVATE THE U.S. 30 EASTBOUND AND WESTBOUND ROADWAYS OVER BENTLEY ROAD. EACH BRIDGE, BRIDGE NO. ALL-30-2302 (EASTBOUND AND WESTBOUND LANES OVER BENTLEY ROAD) WILL BE A THREE-SPAN, CONTINUOUS STEEL BEAM STRUCTURE. THE CENTERLINE FOR EACH BRIDGE WILL BE OFFSET 42 FT. (LEFT AND RIGHT) FROM THE U.S. 30 CENTERLINE. THE SPAN LENGTHS ARE 34 FT. 9 IN., 50 FT. 6 IN., AND 34 FT. 9 IN., FOR A TOTAL BRIDGE LENGTH OF 122.02 FT.

THE APPROACH EMBANKMENTS WILL HAVE A MAXIMUM HEIGHT OF APPROXIMATELY 20 FT. AT THE ABUTMENTS. IN CROSS SECTION, THE APPROACH EMBANKMENT WILL HAVE A CREST WIDTH OF APPROXIMATELY 45 FT. AND SIDE SLOPES CONSTRUCTED TO 2H:1V.

GEOLOGY

THE PROJECT SITE IS LOCATED WITHIN THE TILL PLAINS PHYSIOGRAPHIC REGION OF OHIO. THE AREA WAS COVERED BY CONTINENTAL GLACIERS IN TWO TIME PERIODS, THE ILLINOIAN AND WISCONSIN GLACIATIONS. THE ADVANCING AND RETREATING ICE SHEETS DEPOSITED GROUND MORaine (GLACIAL TILL) AND END MORAINES. THE WISCONSIN AGE DEPOSITS OVERLYING THE OLDER ILLINOIAN DEPOSITS. THE SURFACE DEPOSITS ARE CONSIDERED GROUND MORaine (WISCONSIN AGE), LOCATED JUST NORTH OF THE EAST-WEST ORIENTED FORT WAYNE END MORaine.

THE OVERBURDEN SOILS WITHIN THE PROJECT LIMITS ARE TYPICALLY GROUND MORaine OR GLACIAL TILL DEPOSITS. A GLACIAL TILL SOIL CAN BE DESCRIBED AS AN UNSORTED, UNSTRATIFIED MIXTURE OF CLAY, SILT, SAND, GRAVEL, COBBLES AND BOULDERS. THE GLACIAL DEPOSITS WITHIN THE PROJECT LIMITS ARE TYPICALLY 25 TO 60 FT. THICK, THINNER IN THE DRAINAGE VALLEYS.

THE BEDROCK WITHIN THE PROJECT VICINITY, UNDERLYING THE GLACIAL TILL OVERBURDEN, IS UPPER SILURIAN TO LOWER DEVONIAN IN AGE. GEOLOGIC LITERATURE INDICATES THAT THE BEDROCK BELONGS TO THE MONROE FORMATION THAT IS TYPICALLY LIMESTONE AND DOLOMITE.

INVESTIGATIONAL PROCEDURES

TEST BORINGS, LABELED AS BN-1 THROUGH BN-4, WERE PERFORMED FOR THE TWIN BRIDGE STRUCTURES AS PART OF THE U.S. 30 ROADWAY PROJECT (ALL/HAN-30-20.31/0.00). THE STRUCTURE TEST BORINGS WERE PERFORMED USING BOTH TRUCK-MOUNTED AND ATV-MOUNTED DRILLING RIGS BETWEEN FEBRUARY 20 AND 25, 1994. THE TEST BORINGS WERE ADVANCED TO A CONDITION OF REFUSAL ON THE DOLOMITE BEDROCK. A ROCK CORE SAMPLE WAS OBTAINED ONCE AUGER REFUSAL WAS MET IN BORINGS BN-2 AND BN-4. THE DEPTH TO THE BEDROCK SURFACE RANGED BETWEEN 32.5 AND 33.5 FT.

EACH TEST BORING WAS ADVANCED WITH HOLLOW-STEM AUGERS. THE DRIVE SAMPLING WAS ACCOMPLISHED THROUGH AND BELOW THE TIP OF THE HOLLOW-STEM AUGERS AT 2.5 FT. INTERVALS TO A DEPTH OF 20 FT., AT WHICH DEPTH 5 FT. SAMPLING INTERVALS WERE USED. THE DRIVE SAMPLING WAS ACCOMPLISHED IN ACCORDANCE WITH "PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS," ASTM D 1586. A 2 IN. O.D. BY 1 3/8 IN. I.D. SPLIT-SPOON SAMPLER WAS DRIVEN A TOTAL OF 18 IN., WITH A TOTAL NUMBER OF BLOWS OF 140 LB. HAMMER WEIGHT FALLING 30 IN. BEING RECORDED FOR 6 IN. OF PENETRATION. THE SUM OF BLOWS FOR THE FINAL 12 IN. OF PENETRATION IS THE STANDARD PENETRATION TEST RESULT, COMMONLY REFERENCED TO AS THE N-VALUE.

BEDROCK CORE SAMPLING WAS PERFORMED AT TEST BORINGS BN-2 AND BN-4. THE BEDROCK CORE SAMPLING WAS PERFORMED IN ACCORDANCE WITH ASTM D 2113. THE BEDROCK CORE SAMPLES WERE CUT WITH AN NX SERIES CORE BARREL, PRODUCING A CORE HAVING A NOMINAL DIAMETER OF 2 1/8 IN. THE BEDROCK CORE SAMPLE LENGTHS WERE 10 FT. AT EACH BORING.

ALL SOIL SAMPLES WERE STORED IN SEALED JARS AND THE BEDROCK CORE SAMPLES WERE STORED IN WOODEN CORE BOXES. THE DRILLER MAINTAINED A LOG OF THE ENTIRE DRILLING OPERATION, INCLUDING A DESCRIPTION OF THE MATERIALS ENCOUNTERED IN EACH SPLIT-SPOON OR BEDROCK CORE RUN, THE DEPTH AT WHICH THE DESCRIPTION OF THE SOIL OR BEDROCK CHANGED, THE DEPTH FROM WHICH EACH SAMPLE WAS RECOVERED, THE TYPE OF SAMPLE, THE NUMBER OF BLOWS FOR EACH 6 IN. OF DRIVE ON THE SPLIT-SPOON SAMPLER, THE NUMBER OF INCHES OF RECOVERY FOR EACH SAMPLE OBTAINED, LEVELS AT WHICH ANY GROUNDWATER OR SEEPAGE WAS ENCOUNTERED, ALONG WITH ANY OTHER PERTINENT INFORMATION DEVELOPED DURING THE DRILLING OPERATIONS.

UPON COMPLETION OF THE DRILLING PROGRAM, ALL SAMPLES (SOIL AND ROCK CORE) WERE RETURNED TO OUR CINCINNATI SOIL MECHANICS LABORATORY WHERE THE PROJECT ENGINEER INSPECTED EACH SAMPLE. THE ATTACHED STRUCTURE BORING LOGS WERE PREPARED BASED ON THE VISUAL INSPECTION OF THE RECOVERED SAMPLES, THE LABORATORY TEST DATA AND ODOT STANDARDS.

REPRESENTATIVE SOIL SAMPLES WERE SELECTED FOR THE PERFORMANCE OF PHYSICAL TESTS IN OUR LABORATORY TO DETERMINE THEIR ENGINEERING CHARACTERISTICS. INCLUDED IN THE LABORATORY TEST PROGRAM WERE NATURAL MOISTURE CONTENT DETERMINATIONS, ATTERBERG LIMITS, SIEVE ANALYSES WITH HYDROMETER TESTS AND UNCONFINED COMPRESSION TESTS.

- AUGER BORING LOCATION-PLAN VIEW
- PRESS AND/OR DRIVE SAMPLE AND/OR CORE BORING LOCATION-PLAN VIEW
- CAPPED PILE
- FOOTING
- FOOTING ON PILE
- TR TOP OF ROCK
- HORIZONTAL BAR ON BORING LOG INDICATES THE DEPTH THE SAMPLE WAS TAKEN
- X/Y/Z FIGURES BESIDE THE BORING LOG IN PROFILE INDICATES THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST.
X=NUMBER OF BLOWS FOR FIRST 6-INCHES
Y=NUMBER OF BLOWS FOR SECOND 6-INCHES
Z=NUMBER OF BLOWS FOR THIRD 6-INCHES
- W_____ INDICATES FREE WATER ELEVATION
- ▼_____ INDICATES STATIC WATER ELEVATION

SYMBOLS OF ROCK TYPES

- COAL
- WEATHERED MUDSTONE
- MUDSTONE
- WEATHERED SHALE
- SHALE
- CLAYSTONE
- SILTSTONE
- WEATHERED SANDSTONE
- SANDSTONE
- LEACHED DOLOMITE
- DOLOMITE
- LEACHED LIMESTONE
- LIMESTONE
- BOULDERS OR COBBLES

INVESTIGATIONAL FINDINGS

THE SOIL PROFILE AT THE PROJECT SITE WAS COMPRISED OF GLACIALLY DEPOSITED MATERIALS, RESTING ON DOLOMITE BEDROCK. THE GLACIAL DEPOSITS WERE PREDOMINANTLY COMPRISED OF GROUND MORaine OR GLACIAL TILL. THE NEAR SURFACE MATERIALS DEVELOPED THROUGH SEVERE WEATHERING OF THE PARENT GLACIAL TILL DEPOSITS. THE SURFACE MANTLE OF SEVERELY WEATHERED GLACIAL SOILS WAS UNDERLAIN BY LESS WEATHERED TO RELATIVELY UNWEATHERED DEPOSITS OF GLACIAL TILL. THE GLACIAL TILL DEPOSITS WERE COMPRISED OF TWO DISTINCT ZONES; AN UPPER ZONE THAT WAS BROWN IN COLOR AND THE LOWER ZONE OF GRAY COLOR. THE THICKNESS OF THE OVERBURDEN SOIL PROFILE (SEVERELY WEATHERED NEAR SURFACE GLACIAL SOILS AND THE UNDERLYING, LESS WEATHERED GLACIAL TILL DEPOSITS) WAS APPROXIMATELY 33 FT.

THE TEST BORINGS REPRESENTING THE BENTLEY ROAD OVERPASS STRUCTURE, BN-1 THROUGH BN-4, ENCOUNTERED SEVERELY WEATHERED, NEAR SURFACE SOILS TO A DEPTH OF APPROXIMATELY 5 FT. BELOW THE NATURAL GROUND SURFACE. THESE MATERIALS WERE LOW PLASTICITY TO MODERATE PLASTICITY SOILS, CLASSIFIED AS A-A SILT AND CLAY, A-6B SILTY CLAY, AND A-7-6 CLAY.

THE SEVERELY WEATHERED GLACIAL SOIL STRATUM WAS UNDERLAIN BY THE RELATIVELY UNWEATHERED GLACIAL TILL DEPOSITS. THE UPPER GLACIAL TILL SOILS WERE BROWN IN COLOR, BECOMING GRAY IN COLOR WITH DEPTH, TRANSITIONING FROM BROWN TO GRAY AT APPROXIMATELY 12.5 TO 15 FT. BELOW THE NATURAL GROUND SURFACE. THE GLACIAL TILL SOILS WERE CLASSIFIED AS A-6A SILT AND CLAY TO A-4A SANDY SILT. THESE SOILS WERE COMPRISED OF 15 TO 20% SAND SIZE PARTICLES AND LESS THAN 5% GRAVEL SIZE PARTICLES.

THE CONSISTENCY OF THE GLACIAL TILL SOILS RANGED FROM VERY STIFF TO HARD IN THE UPPER PORTION OF THE DEPOSITS, DECREASING TO STIFF WITH INCREASED DEPTH. THE TEST BORINGS INDICATED THAT THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS WHICH WERE RATED VERY STIFF TO HARD, TYPICALLY CORRESPONDED TO THE BROWN COLORED GLACIAL TILL SOILS. THE N-VALUES WITHIN THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS RANGED FROM THE LOW 20'S TO IN EXCESS OF 30 BLOWS PER FT. THE DECREASED CONSISTENCY, TO STIFF, CORRESPONDED TO THE TRANSITION FROM THE BROWN TO THE GRAY GLACIAL TILL SOILS. THE N-VALUES TYPICALLY DECREASED TO BETWEEN 10 AND 20 BLOWS PER FT. WITHIN THE LOWER PORTION OF THE GLACIAL TILL DEPOSITS.

POCKETS, SEAMS AND LAYERS OF SAND TO SAND AND GRAVEL WERE INTERBEDDED WITHIN THE GLACIAL TILL DEPOSITS. THESE GRANULAR FEATURES WERE TYPICALLY WATER BEARING AND RATED FROM MEDIUM DENSE TO DENSE IN COMPACTNESS. LOCALIZED ZONES OF SATURATED, MEDIUM STIFF TO STIFF CONSISTENCY GLACIAL TILL SOILS WERE ENCOUNTERED ABOVE AND BELOW THE WATER BEARING GRANULAR MATERIALS.

THE BEDROCK WITHIN THE PROJECT LIMITS, ENCOUNTERED BETWEEN ELEVATIONS 867.2 AND 870.6 AT THE REFERENCED SITE, IS UPPER SILURIAN TO LOWER DEVONIAN AGE DOLOMITE. THE BEDROCK CORES PERFORMED AT THE BRIDGE STRUCTURE INDICATED THAT THE DOLOMITE BEDROCK WAS SLIGHTLY VUGGY TO VUGGY AND HAD NEARLY UNIFORM, CLOSE TO VERY CLOSE SPACED PARTINGS. THE PARTINGS WERE WEATHERED NEAR THE SURFACE OF THE BEDROCK AND BECAME LESS WEATHERED WITH DEPTH, TYPICALLY SPACED AT LESS THAN 2 IN. NEAR VERTICAL JOINTS WERE NOTED THROUGHOUT THE BEDROCK CORE LENGTHS. THE ROCK HARDNESS RATING FOR THE DOLOMITE BEDROCK WAS HARD.

DRIVE SAMPLE/PRESS SAMPLE/CORE BORINGS

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, 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 SAMPLING DEVICE 18 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

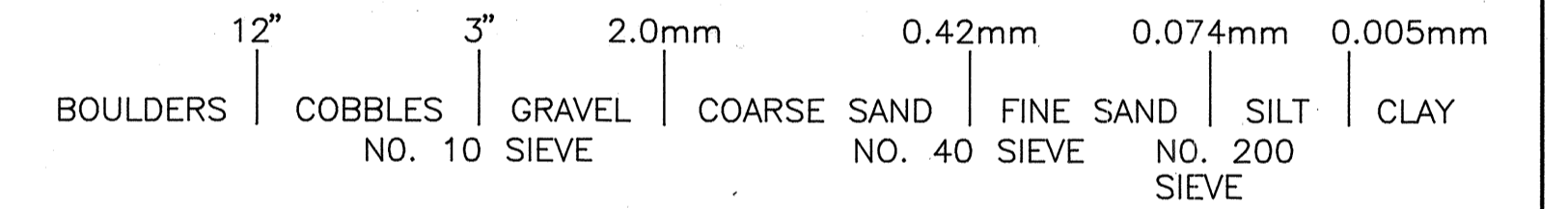
DRIVE/PRESS SAMPLE BORINGS ARE ALSO MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, OR A 3" O.D. THIN WALL PRESS SAMPLING DEVICE. THE PRESS SAMPLER IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE, APPLIED BY THE DRILLING MACHINE.

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NXM CORE BARREL, WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6-INCH INCREMENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS, UTILIZING THE CASAGRANDE AC CLASSIFICATION SYSTEM, INCLUDING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

PARTICLE SIZE DEFINITIONS



NOTE: ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1800 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

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 this data and it is not to be construed as a part of the plans governing construction of the project.

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 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI, OHIO 45226

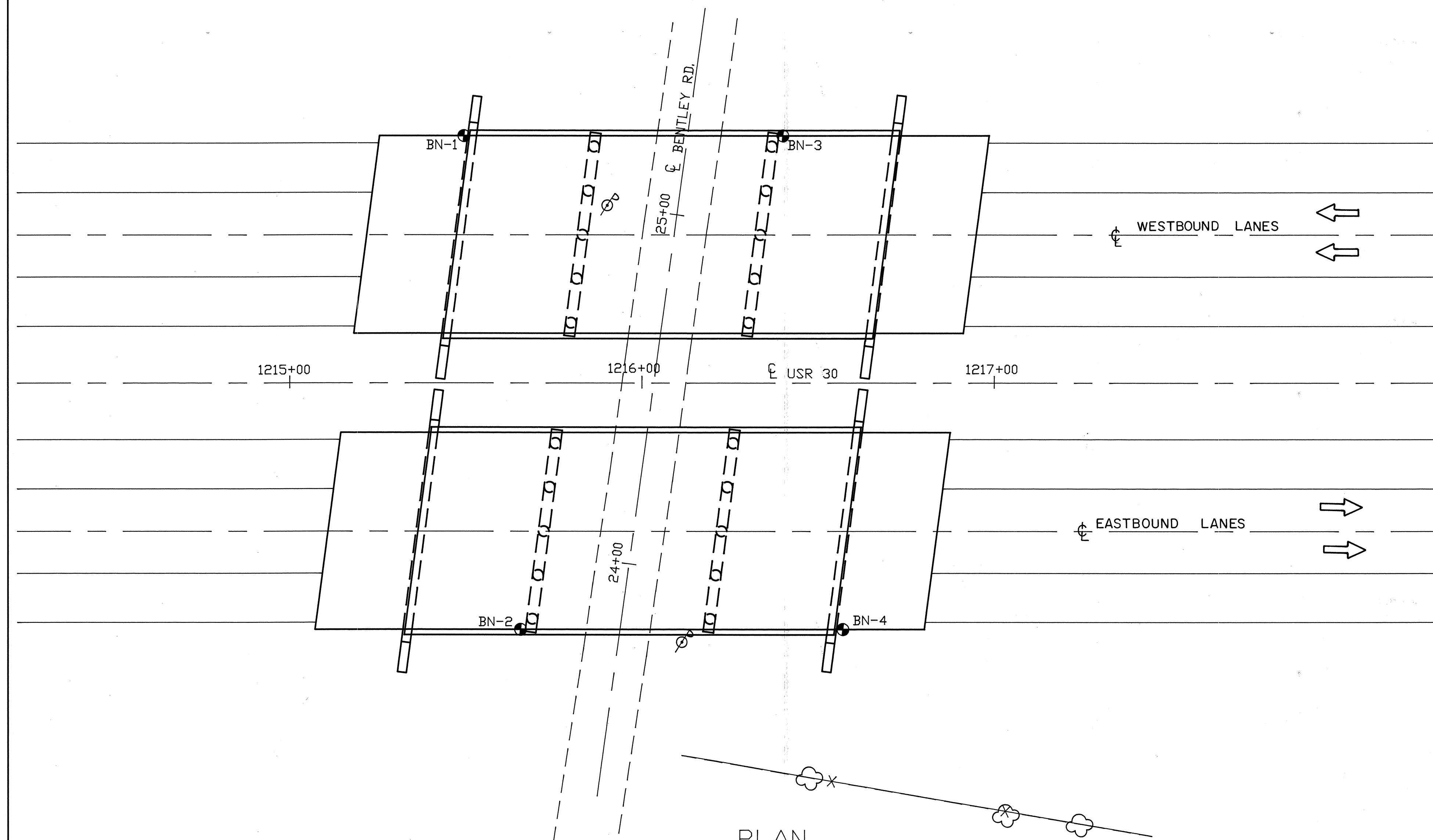
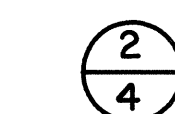
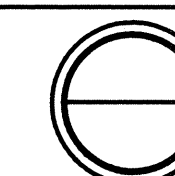
STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR U.S. 30 OVER
 BENTLEY ROAD, ALLEN COUNTY, OHIO

STRUCTURE NO. ALL-30-2302			W.O. NO. 04062.119		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	REVISED DATE 08/30/94			

SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 U.S. 30 OVER BENTLEY ROAD,
 ALLEN COUNTY, OHIO

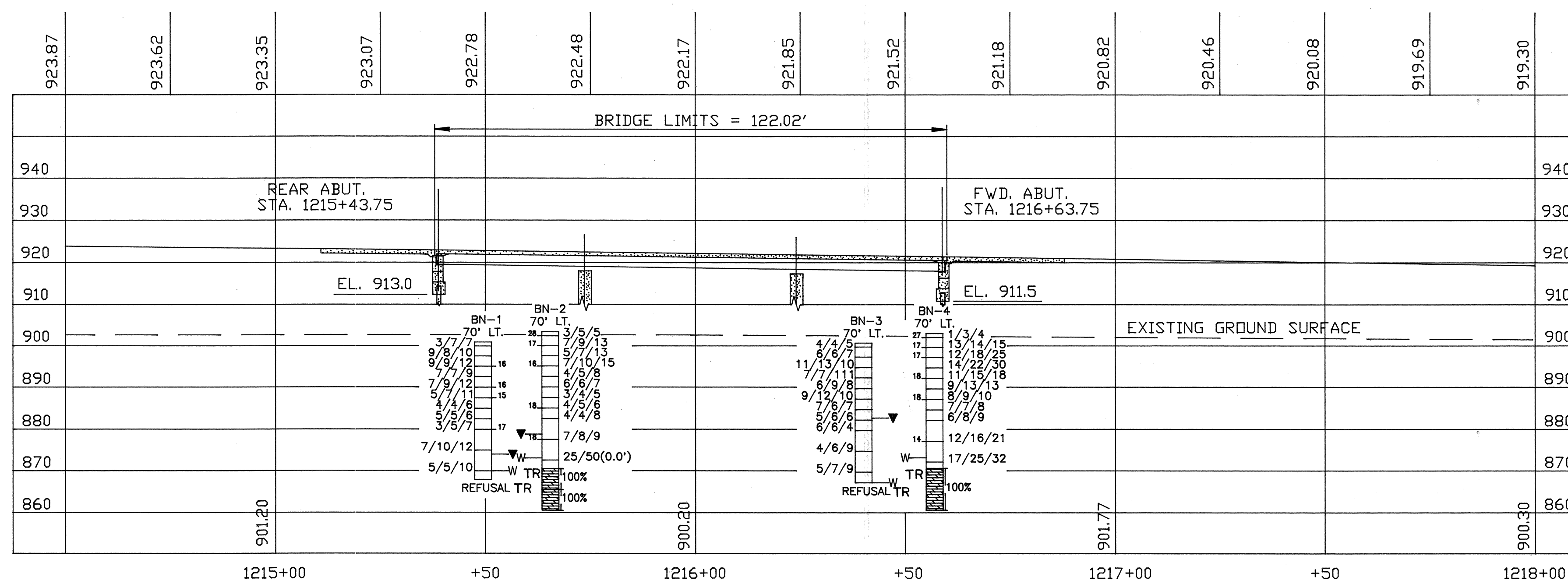
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PLAN

B-1 INDICATES SOIL BORING LOCATION

SCALE: 1"=20' HORIZONTAL AND VERTICAL



PROFILE ALONG INSIDE EDGE OF EASTBOUND PAVEMENT U.S.R-30

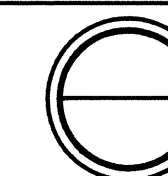
THE H.C. NUTTING COMPANY GEOTECHNICAL ENGINEERS		
AIRPORT ROAD CINCINNATI OHIO 45226		
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STRUCTURE NO. ALL-30-2302		
BORING DATA		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94

DRAWING BY: A. ALBERTSON

SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 U.S. 30 OVER BENTLEY ROAD,
 ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



3
4

LOG OF BORING													
DATE STARTED		02/21/94		SAMPLER: TYPE		SPLIT SPOON		DIA. 2.0" O.D.		WATER ELEVATION:			
DATE COMPLETED		02/21/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA. 3.25" I.D.		IMMEDIATE		869.9	
BORING NUMBER		BN-1		CORE BARREL: TYPE				SIZE		AFTER COMP. HRS.		869.9	
STATION & OFFSET		1215+49 70' LT., (U.S. 30)								AFTER 24 HRS.		873.6	
										SURFACE ELEVATION		900.9	
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL class
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	
900.9	0												
900.0	2	3-7-7	DARK BROWN SILT AND CLAY, TRACE ORGANICS, VERY MOIST - SOFT	1	V	I	S	U	A	L		A-6a	
898.4	4	9-8-10	BROWN AND GRAY SILT AND CLAY, MOIST - SOFT	2	V	I	S	U	A	L		A-6a	
895.9	6	9-9-12	BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF	3	0	7	12	34	47	37	14	16 A-6a(10)	
	8	7-7-9		4	V	I	S	U	A	L		A-6a	
890.9	10	7-9-12	BROWN AND GRAY SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	5	V	I	S	U	A	L	16	A-6a	
888.4	12	5-7-11	GRAY SILT AND CLAY, TRACE SAND, MOIST - STIFF (GLACIAL TILL)	6	V	I	S	U	A	L	15	A-6a	
	14	4-4-6		7	V	I	S	U	A	L		A-6a	
	16	5-5-6		8	V	I	S	U	A	L		A-6a	
880.9	20	3-5-7	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	9	V	I	S	U	A	L	17	A-6a	
	22												
	24												
	26	7-10-12		10	V	I	S	U	A	L		A-6a	
	28												
	30												
	32	5-5-10		11	V	I	S	U	A	L		A-6a	
867.9													

BORING COMPLETED @ 33.0'
 (AUGER REFUSAL ON BEDROCK)

LOG OF BORING													
DATE STARTED		02/20/94		SAMPLER: TYPE		SPLIT SPOON		DIA. 2.0" O.D.		WATER ELEVATION:			
DATE COMPLETED		02/20/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA. 3.25" I.D.		IMMEDIATE		873.0	
BORING NUMBER		BN-2		CORE BARREL: TYPE		NXM		SIZE 2.125" I.D.		AFTER COMP. HRS.		873.0	
STATION & OFFSET		1215+66 70' RT., (U.S. 30)								AFTER 24 HRS.		878.5	
										SURFACE ELEVATION		903.5	
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL class
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	
903.5	0												
902.7	2	3-5-5	DARK BROWN SILT AND CLAY, TRACE ORGANICS, VERY MOIST - SOFT	1A	V	I	S	U	A	L		A-6a	
901.0	4	7-9-13	BROWN AND GRAY SILTY CLAY, VERY MOIST - SOFT	2	V	I	S	U	A	L	17	A-6a	
898.5	6	5-7-13	BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF	3	V	I	S	U	A	L		A-6a	
	8	7-10-15		4	V	I	S	U	A	L	16	A-6a	
893.5	10	4-5-8	BROWN SANDY SILT, MOIST TO VERY MOIST - STIFF (GLACIAL TILL)	5	V	I	S	U	A	L		A-4a	
890.0	12	6-6-7	GRAY SANDY SILT, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - STIFF (GLACIAL TILL)	6	V	I	S	U	A	L		A-4a	
	14	3-4-5		7	V	I	S	U	A	L		A-4a	
	16	4-5-6		8	3	8	11	35	43	29	10	18 A-4a(8)	
	18	4-4-8		9	V	I	S	U	A	L		A-4a	
	20												
	22												
	24												
	26	7-8-9		10	V	I	S	U	A	L	18	A-4a	
	28												
873.5	30	25-50/0'	GRAY SANDY SILT, LITTLE GRAVEL AND ROCK FRAGMENTS, VERY MOIST - STIFF (GLACIAL TILL)	11	V	I	S	U	A	L		A-4a	
870.5	32												
868.0	34		LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED WEATHERED PARTINGS AND NEAR VERTICAL JOINTS (CORE WAS BROKEN UP)	C-1	NXM		REC. 100%		RQD 0%				
	36		LIGHT GRAY, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED WEATHERED UNIFORM VERY CLOSE TO CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS										
	38												
863.0	40		GRAY, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED NEARLY UNIFORM CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS	C-2	NXM		REC. 100%		RQD 0%				
	42												
860.5													

BORING COMPLETED @ 43.0'

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR U.S. 30 OVER
 BENTLEY ROAD, ALLEN COUNTY, OHIO

STRUCTURE NO. ALL-30-2302

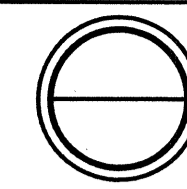
BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94
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SOIL PROFILE

ALL/HAN-30-20.31/0.00
BRIDGE CONSTRUCTION FOR
U.S. 30 OVER BENTLEY ROAD,
ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
CINCINNATI, OHIO 45226



LOG OF BORING														
DATE STARTED		02/22/94		SAMPLER: TYPE		SPLIT SPOON		DIA.		2.0" O.D.		WATER ELEVATION:		
DATE COMPLETED		02/22/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA.		3.25" I.D.		IMMEDIATE		
BORING NUMBER		BN-3		CORE BARREL: TYPE				SIZE				AFTER COMP. HRS.		
STATION & OFFSET		1216+40 70' LT., (U.S. 30)		SURFACE ELEVATION		900.7						871.4		
												882.7		
												867.2		
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS									SHTL CLASS
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC		
900.7	0													
899.7	2	4-4-5	DARK BROWN SILT AND CLAY, TRACE ORGANICS, VERY MOIST - SOFT	1A 1B	V									A-6a
898.2			BROWN AND GRAY CLAY, MOIST - MEDIUM STIFF		V									A-6a
	4	6-6-7	BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - STIFF	2	V	I	S	U	A	L				A-6a
895.7	6	11-13-10	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	3	V	I	S	U	A	L				A-6a
	8				V	I	S	U	A	L				A-6a
	10				V	I	S	U	A	L				A-6a
	12				V	I	S	U	A	L				A-6a
	14				V	I	S	U	A	L				A-6a
885.7	16	7-6-7	GRAY SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - STIFF (GLACIAL TILL)	7	V	I	S	U	A	L				A-6a
	18				V	I	S	U	A	L				A-6a
	20				V	I	S	U	A	L				A-6a
	22				V	I	S	U	A	L				A-6a
	24				V	I	S	U	A	L				A-6a
	26				V	I	S	U	A	L				A-6a
	28				V	I	S	U	A	L				A-6a
	30				V	I	S	U	A	L				A-6a
	32				V	I	S	U	A	L				A-6a

BORING COMPLETED @ 33.5'
(AUGER REFUSAL ON BEDROCK)

LOG OF BORING														
DATE STARTED		02/21/94		SAMPLER: TYPE		SPLIT SPOON		DIA.		2.0" O.D.		WATER ELEVATION:		
DATE COMPLETED		02/21/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA.		3.25" I.D.		IMMEDIATE		
BORING NUMBER		BN-4		CORE BARREL: TYPE		NXM		SIZE		2.125" I.D.		AFTER COMP. HRS.		
STATION & OFFSET		1216+57 70' RT., (U.S. 30)		SURFACE ELEVATION		903.1						873.1		
												876.1		
												903.1		
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS									SHTL CLASS
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC		
903.1	0													
902.6	2	1-3-4	DARK BROWN SILT AND CLAY, LITTLE ORGANICS, WET - SOFT	1A 1B	V									A-6a
900.6			BROWN AND GRAY SILTY CLAY, MOIST - STIFF		V									A-6a
	4	13-14-15	BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF	2	V	I	S	U	A	L				A-6a
898.1	6	12-18-25	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	3	6	5	10	31	48	33	13	17		A-6a(9)
	8				V	I	S	U	A	L				A-6a
	10				V	I	S	U	A	L				A-6a
	12				V	I	S	U	A	L				A-6a
890.6	14	9-13-13	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - STIFF TO VERY STIFF (GLACIAL TILL)	6	V	I	S	U	A	L				A-6a
	16				6	8	10	34	42	28	11	18		A-6a(8)
	18				V	I	S	U	A	L				A-6a
	20				V	I	S	U	A	L				A-6a
883.1	22	6-8-9	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	9	V	I	S	U	A	L				A-6a
	24				V	I	S	U	A	L				A-6a
	26				V	I	S	U	A	L				A-6a
	28				V	I	S	U	A	L				A-6a
873.1	30	17-25-32	GRAY GRAVEL WITH SAND, WET - DENSE	11	V	I	S	U	A	L				A-1-b
870.6	32				V	I	S	U	A	L				A-1-b
868.6	34		LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED WEATHERED PARTINGS AND NEAR VERTICAL JOINTS (CORE BROKEN UP IN PLACES)											
	36		LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY TO VUGGY, HARD DOLOMITE, NOTED WEATHERED NEARLY UNIFORM CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS	C-1	NXM		REC. 100%		RQD 0%					
	38				NXM		REC. 100%		RQD 0%					
862.6	40				NXM		REC. 100%		RQD 0%					
860.6	42		GRAY, VUGGY, HARD DOLOMITE, NOTED NEARLY UNIFORM CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS		NXM		REC. 100%		RQD 0%					

BORING COMPLETED @ 42.5'

THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
BRIDGE CONSTRUCTION FOR U.S. 30 OVER
BENTLEY ROAD, ALLEN COUNTY, OHIO

STRUCTURE NO. ALL-30-2302

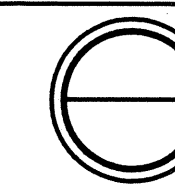
BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94
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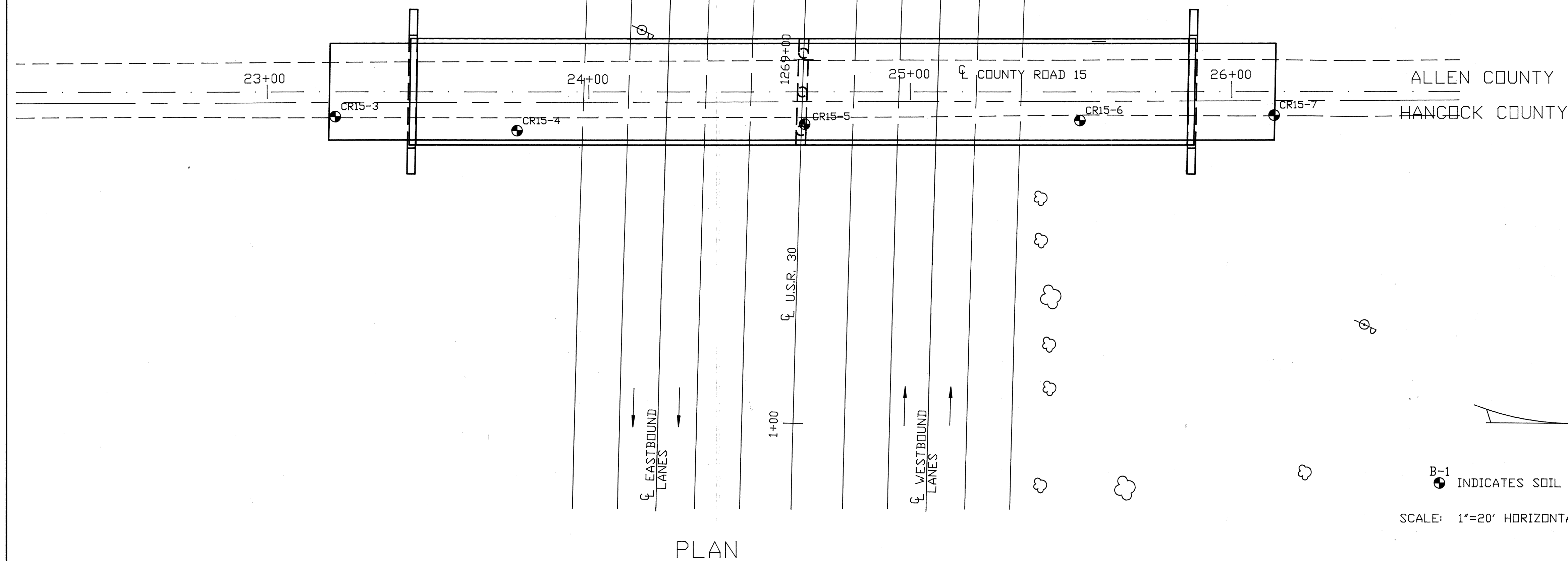
SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 COUNTY ROAD 15 OVER U.S. 30,
 ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



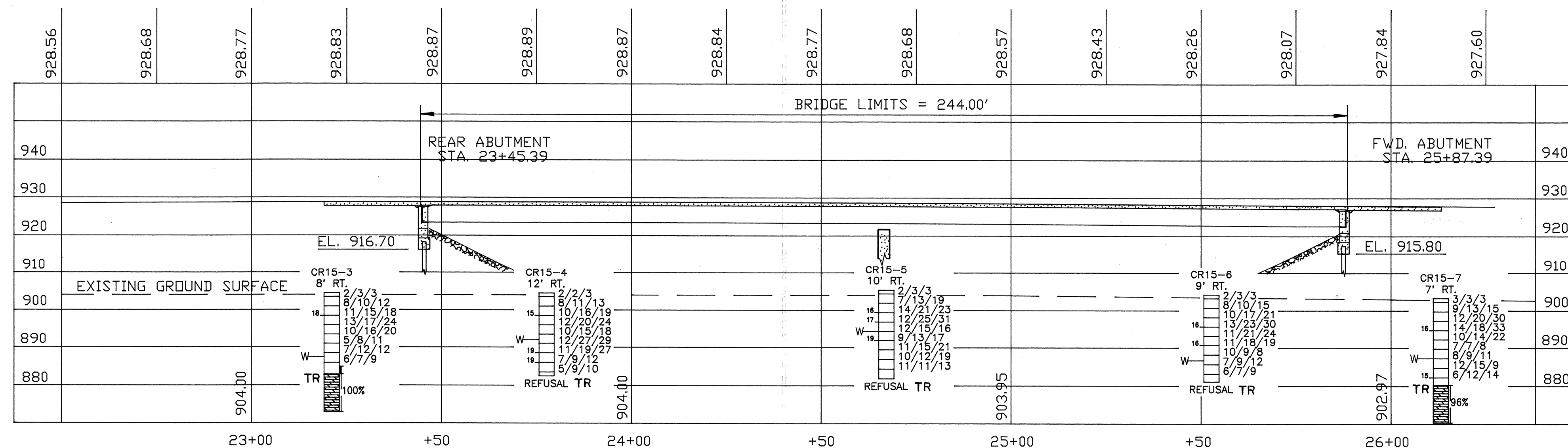
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4



B-1 INDICATES SOIL BORING LOCATION

SCALE: 1"=20' HORIZONTAL AND VERTICAL

PLAN



PROFILE ALONG CL CR-15

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR COUNTY ROAD 15
 OVER U.S. 30, ALLEN COUNTY, OHIO

STRUCTURE NO. ALL-30-2403

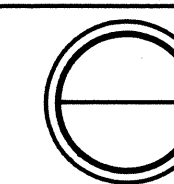
BORING DATA

CHECKED BY	REVIEWED BY	DATE
K.G.A.	A.P.A.	05/23/94

SOIL PROFILE

ALL/HAN-30-20.31/0.00
BRIDGE CONSTRUCTION FOR
COUNTY ROAD 15 OVER U.S. 30,
ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
CINCINNATI, OHIO 45226



3
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LOG OF BORING

DATE STARTED 03/30/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
DATE COMPLETED 03/30/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE _____ 887.7
BORING NUMBER CR15-3 CORE BARREL: TYPE NXM SIZE 2.125" I.D. AFTER COMP. HRS. 888.7
STATION & OFFSET 23+21 8' RT., (COUNTY ROAD 15) SURFACE ELEVATION 904.7

ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS									SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC			
904.7	0		ASPHALT PAVEMENT	1											
904.4	2	2-3-3	BROWN SILT AND CLAY, LITTLE SAND AND ROCK FRAGMENTS, MOIST - SOFT TO MEDIUM STIFF (FILL)	1A	V	I	S	U	A	L					A-6a A-7-6
902.2	4	8-10-12	BROWN CLAY, TRACE SAND AND ROCK FRAGMENTS, MOIST - STIFF (FILL)	2	V	I	S	U	A	L					A-6a
	6	11-15-18	BROWN, TRACE GRAY, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	3	V	I	S	U	A	L	18				A-6a
	8	13-17-24		4	V	I	S	U	A	L					A-6a
894.7	10	10-16-20	DARK BROWN SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	5	V	I	S	U	A	L					A-6a
892.2	12	5-8-11	GRAY SILTY CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO STIFF (GLACIAL TILL)	6	V	I	S	U	A	L					A-6b
	14	7-12-12		7	V	I	S	U	A	L					A-6b
	16	6-7-9		8	V	I	S	U	A	L					A-6b
	18														
	20														
883.2	22	PUSHED	LIGHT GRAY, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED WEATHERED NEAR UNIFORM VERY CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS	ST	V	I	S	U	A	L					A-6b
880.7	24		LIGHT GRAY, VUGGY, HARD DOLOMITE, NOTED NEAR UNIFORM CLOSE TO VERY CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS	C-1	NXM		REC. 100%		RQD. 0%						
	26	ROCK CORE													
	28														
	30														
873.2															

BORING COMPLETED @ 31.5'

LOG OF BORING

DATE STARTED 03/29/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
DATE COMPLETED 03/29/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE _____ 894.4
BORING NUMBER CR15-5 CORE BARREL: TYPE _____ SIZE _____ AFTER COMP. HRS. 888.4
STATION & OFFSET 24+67 10' RT., (COUNTY ROAD 15) SURFACE ELEVATION 905.4

ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS									SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC			
905.4	0														
904.9	2	2-3-3	DARK BROWN SILT AND CLAY, LITTLE ROCK FRAGMENTS, TRACE ORGANICS, VERY MOIST - SOFT (FILL)	1B	V	I	S	U	A	L					A-6a A-7-6 A-6b
904.4	4	7-13-19	BROWN AND GRAY CLAY, MOIST - MEDIUM STIFF	2	V	I	S	U	A	L					A-6a
902.9	6	14-21-23	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, NOTED WET SAND LAYER @ 11', MOIST - VERY STIFF TO HARD (GLACIAL TILL)	3	V	I	S	U	A	L	16				A-6a
	8	12-25-31		4	V	I	S	U	A	L	17				A-6a
	10	12-15-16		5	V	I	S	U	A	L					A-6a
892.9	12	9-13-17	DARK BROWN SILTY CLAY, LITTLE SAND, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	6	0	5	10	35	50	35	16	19			A-6b(10)
	14	11-15-21		7	V	I	S	U	A	L					A-6b
	16	10-12-19		8	V	I	S	U	A	L					A-6b
885.4	20	11-11-13	GRAY COARSE AND FINE SAND, WET - MEDIUM DENSE	9	V	I	S	U	A	L					A-3a
881.9	22														

BORING COMPLETED @ 23.5'
(AUGER REFUSAL ON BEDROCK)

LOG OF BORING

DATE STARTED 03/30/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
DATE COMPLETED 03/30/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE _____ 892.0
BORING NUMBER CR15-4 CORE BARREL: TYPE _____ SIZE _____ AFTER COMP. HRS. NONE
STATION & OFFSET 23+78 12' RT., (COUNTY ROAD 15) SURFACE ELEVATION 904.5

ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS									SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC			
904.5	0														
904.0	2	2-2-3	DARK BROWN SILT AND CLAY, LITTLE ROCK FRAGMENTS, MOIST - SOFT (FILL)	1A	V	I	S	U	A	L					A-6a A-7-6
902.0	4	8-11-13	BROWN AND GRAY CLAY, MOIST - MEDIUM STIFF	2	V	I	S	U	A	L					A-6a
899.5	6	10-16-19	BROWN, TRACE GRAY, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	3	3	7	10	34	46	34	15	15			A-6a(10)
	8	12-20-24		4	V	I	S	U	A	L					A-6a
894.5	10	10-15-18	DARK BROWN SILTY CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - HARD (GLACIAL TILL)	5	V	I	S	U	A	L					A-6b
	12	12-27-29		6	V	I	S	U	A	L					A-6b
	14	11-19-27		7	V	I	S	U	A	L	19				A-6b
887.0	18	7-9-12	GRAY SILTY CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	8	V	I	S	U	A	L	19				A-6b
	20														
882.5	22	5-9-10		9	V	I	S	U	A	L					A-6b

BORING COMPLETED @ 22.0'
(AUGER REFUSAL ON BEDROCK)

THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION

PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
BRIDGE CONSTRUCTION FOR COUNTY ROAD 15
OVER U.S. 30, ALLEN COUNTY, OHIO
STRUCTURE NO. ALL-30-2403

BORING DATA

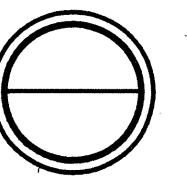
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94
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DRAWING NO. - AUGER-2096

SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 COUNTY ROAD 15 OVER U.S. 30,
 ALLEN COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



4
4

LOG OF BORING													
DATE STARTED		03/30/94		SAMPLER: TYPE		SPLIT SPOON		DIA.		2.0" O.D.		WATER ELEVATION:	
DATE COMPLETED		03/30/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA.		3.25" I.D.		IMMEDIATE	
BORING NUMBER		CR15-6		CORE BARREL: TYPE				SIZE				AFTER COMP. HRS.	
STATION & OFFSET		25+53 9' RT., (COUNTY ROAD 15)		SURFACE ELEVATION		904.2							
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL. CLASS
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	
904.2	0												
903.2	2	2-3-3	DARK BROWN SILT AND CLAY, LITTLE ROCK FRAGMENTS, MOIST - STIFF (FILL)	1A	V	I	S	U	A	L			A-6a
901.7	4	8-10-15	BROWN AND GRAY SILT AND CLAY, MOIST - MEDIUM STIFF	2	V	I	S	U	A	L			A-6a
	6	10-17-21	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	3	V	I	S	U	A	L			A-6a
	8	13-23-30		4	V	I	S	U	A	L	16		A-6a
	10												
	12	11-21-24		5	V	I	S	U	A	L			A-6a
891.7	14	11-18-19	DARK BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	6	V	I	S	U	A	L	16		A-6a
889.2	16	10-9-8	BROWN GRAVEL WITH SILT AND SAND, MOIST - MEDIUM DENSE	7	V	I	S	U	A	L			A-2-4
886.7	18	7-9-12	GRAY COARSE AND FINE SAND, LITTLE GRAVEL, WET - MEDIUM DENSE	8	V	I	S	U	A	L			A-3a
	20												
	22	6-7-9		9	V	I	S	U	A	L			A-3a

BORING COMPLETED @ 23.0'
 (AUGER REFUSAL ON BEDROCK)

LOG OF BORING													
DATE STARTED		03/29/94		SAMPLER: TYPE		SPLIT SPOON		DIA.		2.0" O.D.		WATER ELEVATION:	
DATE COMPLETED		03/29/94		CASING: LENGTH		5' HOLLOW STEM AUGER		DIA.		3.25" I.D.		IMMEDIATE	
BORING NUMBER		CR15-7		CORE BARREL: TYPE		NXM		SIZE		2.125" I.D.		AFTER COMP. HRS.	
STATION & OFFSET		26+13 7' RT., (COUNTY ROAD 15)		SURFACE ELEVATION		903.3							
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL. CLASS
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	
903.3	0												
903.0	2	3-3-3	ASPHALT PAVEMENT	1A	V	I	S	U	A	L			A-7-6
902.3	2		BROWN AND GRAY CLAY, MOIST - MEDIUM STIFF TO STIFF	1A	V	I	S	U	A	L			A-6a
900.8	4	9-13-15	BROWN AND GRAY SILT AND CLAY, MOIST - STIFF	2	V	I	S	U	A	L			A-6a
	6	12-20-30	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	3	V	I	S	U	A	L			A-6a
	8	14-18-33		4	V	I	S	U	A	L	16		A-6a
	10												
	12	10-14-22		5	V	I	S	U	A	L			A-6a
890.8	14	7-7-8	BROWN GRAVEL WITH SILT AND SAND, WET - MEDIUM DENSE	6	V	I	S	U	A	L			A-2-4
	16	8-9-11		7	V	I	S	U	A	L			A-2-4
885.8	18		GRAY COARSE AND FINE SAND, WET - MEDIUM DENSE	8	V	I	S	U	A	L			A-3a
884.8	20	12-15-9	GRAY SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	8A	V	I	S	U	A	L			A-6a
	22	6-12-14		9	V	I	S	U	A	L	15		A-6a
880.3	24		LIGHT BROWN, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED WEATHERED VERY CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS										
876.8	26												
	28		LIGHT GRAY, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED SLIGHTLY WEATHERED NEAR UNIFORM CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS	C-1	NXM		REC. 96%		RQD. 3%				
	30												
872.3	32		LIGHT GRAY, DENSE, HARD DOLOMITE, NOTED NEAR UNIFORM CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS										
870.3													

BORING COMPLETED @ 33.0'

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR COUNTY ROAD 15
 OVER U.S. 30, ALLEN COUNTY, OHIO

STRUCTURE NO. ALL-30-2403

BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/23/94
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PROJECT DESCRIPTION

TOWNSHIP ROAD 51 (T.R. 51) INTERSECTS THE U.S. 30 ROADWAY CENTERLINE AT STATION 49+99.59, CORRESPONDING TO STATION 25+04.23 ALONG THE T.R. 51 CENTERLINE. A BRIDGE STRUCTURE, BRIDGE NO. HAN-30-0094 (T.R. 51 OVER U.S. 30) WILL BE CONSTRUCTED OVER U.S. 30 BETWEEN STATIONS 23+83.23 AND 26+25.23. THE BRIDGE STRUCTURE WILL BE A TWO-SPAN, CONTINUOUS STEEL PLATE GIRDER BRIDGE WITH A COMPOSITE REINFORCED CONCRETE DECK AND REINFORCED CONCRETE SUBSTRUCTURE. EACH SPAN LENGTH WILL BE 121 FT. 0 IN., FOR A TOTAL BRIDGE LENGTH OF 244.0 FT.

THE OVERPASS BRIDGE STRUCTURE WILL HAVE APPROACH EMBANKMENTS BEGINNING AT APPROXIMATELY STATION 14+00 AND TERMINATING AT STATION 39+00 (EXCLUDING THE BRIDGE STRUCTURE). THE MAXIMUM EMBANKMENT HEIGHT IS APPROXIMATELY 24 FT. AT THE BRIDGE ABUTMENTS. IN CROSS SECTION, THE APPROACH EMBANKMENT WILL HAVE AN APPROXIMATE 40 FT. CREST WIDTH AND SIDE SLOPES EQUAL TO 2H:1V.

GEOLOGY

THE PROJECT SITE IS LOCATED WITHIN THE TILL PLAINS PHYSIOGRAPHIC REGION OF OHIO. THE AREA WAS COVERED BY CONTINENTAL GLACIERS IN TWO TIME PERIODS, THE ILLINOIAN AND WISCONSIN GLACIATIONS. THE ADVANCING AND RETREATING ICE SHEETS DEPOSITED GROUND MORAINES (GLACIAL TILL) AND END MORAINES. THE WISCONSIN AGE DEPOSITS OVERLYING THE OLDER ILLINOIAN DEPOSITS. THE SURFACE DEPOSITS ARE CONSIDERED GROUND MORAINES (WISCONSIN AGE), LOCATED JUST NORTH OF THE EAST-WEST ORIENTED FORT WAYNE END MORAINES.

THE OVERBURDEN SOILS WITHIN THE PROJECT LIMITS ARE TYPICALLY GROUND MORAINES OR GLACIAL TILL DEPOSITS. A GLACIAL TILL SOIL CAN BE DESCRIBED AS AN UNSORTED, UNSTRATIFIED MIXTURE OF CLAY, SILT, SAND, GRAVEL, COBBLES AND BOULDERS. THE GLACIAL DEPOSITS WITHIN THE PROJECT LIMITS ARE TYPICALLY 25 TO 60 FT. THICK, THINNER IN THE DRAINAGE VALLEYS.

THE BEDROCK WITHIN THE PROJECT VICINITY, UNDERLYING THE GLACIAL TILL OVERBURDEN, IS UPPER SILURIAN TO LOWER DEVONIAN IN AGE. GEOLOGIC LITERATURE INDICATES THAT THE BEDROCK BELONGS TO THE MONROE FORMATION THAT IS TYPICALLY LIMESTONE AND DOLOMITE.

INVESTIGATIONAL PROCEDURES

A TOTAL OF NINE (9) DRIVE SAMPLE TEST BORINGS, LABELED AS TR51-1 THROUGH TR51-9, WERE PERFORMED FOR THE T.R. 51 MODIFICATION AS PART OF THE U.S. 30 ROADWAY PROJECT (ALL/HAN-30-20.31/0.00). THE TEST BORINGS REPRESENTING THE T.R. 51 BRIDGE STRUCTURE WERE TR51-3 THROUGH TR51-7. THE SUBSURFACE INFORMATION ESTABLISHED FROM THE STRUCTURE BORINGS HAS BEEN PRESENTED ON THE ATTACHED GEOTECHNICAL STRUCTURE DRAWINGS.

THE STRUCTURE TEST BORINGS WERE PERFORMED BETWEEN MARCH 11 AND 12, 1994. A TRUCK-MOUNTED DRILLING RIG WAS USED TO PERFORM THE BORING PROCEDURES. EACH STRUCTURE BORING WAS ADVANCED TO A CONDITION OF REFUSAL ON THE DOLOMITE BEDROCK. A ROCK CORE SAMPLE WAS OBTAINED ONCE AUGER REFUSAL WAS MET AT BORINGS TR51-3, TR51-5 AND TR51-7. THE DEPTH TO THE BEDROCK SURFACE RANGED BETWEEN 10.0 AND 11.0 FT.

EACH TEST BORING WAS ADVANCED WITH HOLLOW-STEM AUGERS. THE DRIVE SAMPLING WAS ACCOMPLISHED THROUGH AND BELOW THE TIP OF THE HOLLOW-STEM AUGERS AT 2.5 FT. INTERVALS TO A DEPTH OF 20 FT., AT WHICH DEPTH 5 FT. SAMPLING INTERVALS WERE USED. THE DRIVE SAMPLING WAS ACCOMPLISHED IN ACCORDANCE WITH "PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS," ASTM D 1586. A 2 IN. O.D. BY 1 3/8 IN. I.D. SPLIT-SPOON SAMPLER WAS DRIVEN A TOTAL OF 18 IN., WITH A TOTAL NUMBER OF BLOWS OF 140 LB. HAMMER WEIGHT FALLING 30 IN. BEING RECORDED FOR 6 IN. OF PENETRATION. THE SUM OF BLOWS FOR THE FINAL 12 IN. OF PENETRATION IS THE STANDARD PENETRATION TEST RESULT, COMMONLY REFERENCED TO AS THE N-VALUE.

BEDROCK CORE SAMPLING WAS PERFORMED AT TEST BORINGS TR51-3, TR51-5 AND TR51-7. THE BEDROCK CORE SAMPLING WAS PERFORMED IN ACCORDANCE WITH ASTM D 2113. THE BEDROCK CORE SAMPLES WERE CUT WITH AN NX SERIES CORE BARREL, PRODUCING A CORE HAVING A NOMINAL DIAMETER OF 2 1/8 IN. THE BEDROCK CORE SAMPLE LENGTHS WERE 10 FT. IN EACH BORING.

ALL SOIL SAMPLES WERE STORED IN SEALED JARS AND THE BEDROCK CORE SAMPLES WERE STORED IN WOODEN CORE BOXES. THE DRILLER MAINTAINED A LOG OF THE ENTIRE DRILLING OPERATION, INCLUDING A DESCRIPTION OF THE MATERIALS ENCOUNTERED IN EACH SPLIT-SPOON OR BEDROCK CORE RUN, THE DEPTH AT WHICH THE DESCRIPTION OF THE SOIL OR BEDROCK CHANGED, THE DEPTH FROM WHICH EACH SAMPLE WAS RECOVERED, THE TYPE OF SAMPLE, THE NUMBER OF BLOWS FOR EACH 6 IN. OF DRIVE ON THE SPLIT-SPOON SAMPLER, THE NUMBER OF INCHES OF RECOVERY FOR EACH SAMPLE OBTAINED, LEVELS AT WHICH ANY GROUNDWATER OR SEEPAGE WAS ENCOUNTERED, ALONG WITH ANY OTHER PERTINENT INFORMATION DEVELOPED DURING THE DRILLING OPERATIONS.

UPON COMPLETION OF THE DRILLING PROGRAM, ALL SAMPLES (SOIL AND ROCK CORE) WERE RETURNED TO OUR CINCINNATI SOIL MECHANICS LABORATORY WHERE THE PROJECT ENGINEER INSPECTED EACH SAMPLE. THE ATTACHED STRUCTURE BORING LOGS WERE PREPARED BASED ON THE VISUAL INSPECTION OF THE RECOVERED SAMPLES, THE LABORATORY TEST DATA AND ODOT STANDARDS.

REPRESENTATIVE SOIL AND ROCK CORE SAMPLES WERE SELECTED FOR THE PERFORMANCE OF PHYSICAL TESTS IN OUR LABORATORY TO DETERMINE THEIR ENGINEERING CHARACTERISTICS. INCLUDED IN THE LABORATORY TEST PROGRAM WERE NATURAL MOISTURE CONTENT DETERMINATIONS, ATTERBERG LIMITS, SIEVE ANALYSES WITH HYDROMETER TESTS, AND UNCONFINED COMPRESSION TESTS.

LEGEND

 AUGER BORING LOCATION-PLAN VIEW

 PRESS AND/OR DRIVE SAMPLE AND/OR CORE BORING LOCATION-PLAN VIEW

 CAPPED PILE

 FOOTING

 FOOTING ON PILE

TR TOP OF ROCK

 HORIZONTAL BAR ON BORING LOG INDICATES THE DEPTH THE SAMPLE WAS TAKEN

X/Y/Z FIGURES BESIDE THE BORING LOG IN PROFILE INDICATES THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST.
X=NUMBER OF BLOWS FOR FIRST 6-INCHES
Y=NUMBER OF BLOWS FOR SECOND 6-INCHES
Z=NUMBER OF BLOWS FOR THIRD 6-INCHES

W _____ INDICATES FREE WATER ELEVATION

 _____ INDICATES STATIC WATER ELEVATION


SYMBOLS OF ROCK TYPES

 COAL

 WEATHERED MUDSTONE

 MUDSTONE

 WEATHERED SHALE

 SHALE

 CLAYSTONE

 SILTSTONE

 WEATHERED SANDSTONE

 SANDSTONE

 LEACHED DOLOMITE

 DOLOMITE

 LEACHED LIMESTONE

 LIMESTONE

 BOULDERS OR COBBLES

GENERAL INFORMATION

DRIVE SAMPLE/PRESS SAMPLE/CORE BORINGS

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, 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 SAMPLING DEVICE 18 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

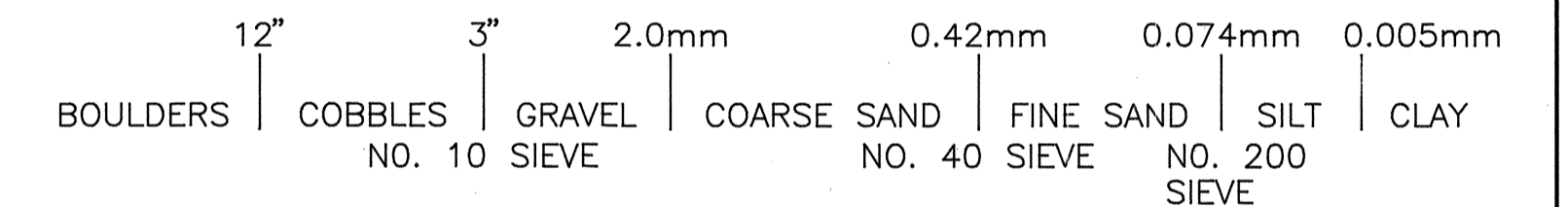
DRIVE/PRESS SAMPLE BORINGS ARE ALSO MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, OR A 3" O.D. THIN WALL PRESS SAMPLING DEVICE. THE PRESS SAMPLER IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE, APPLIED BY THE DRILLING MACHINE.

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NXM CORE BARREL, WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6-INCH INCREMENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS, UTILIZING THE CASAGRANDE AC CLASSIFICATION SYSTEM, INCLUDING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

PARTICLE SIZE DEFINITIONS



NOTE: ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1800 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

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 this data and it is not to be construed as a part of the plans governing construction of the project.

THE H. C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI, OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION

PROJECT NO. ALL/HAN-30-20.31/0.00
BRIDGE CONSTRUCTION FOR TOWNSHIP
ROAD 51 OVER U.S. 30, HANCOCK COUNTY, OHIO

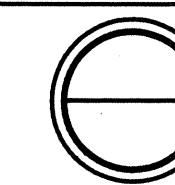
STRUCTURE NO. HAN-30-0094 W.O. NO. 04062.119

CHECKED BY K.G.A. REVIEWED BY A.P.A. REVISED DATE 08/30/94

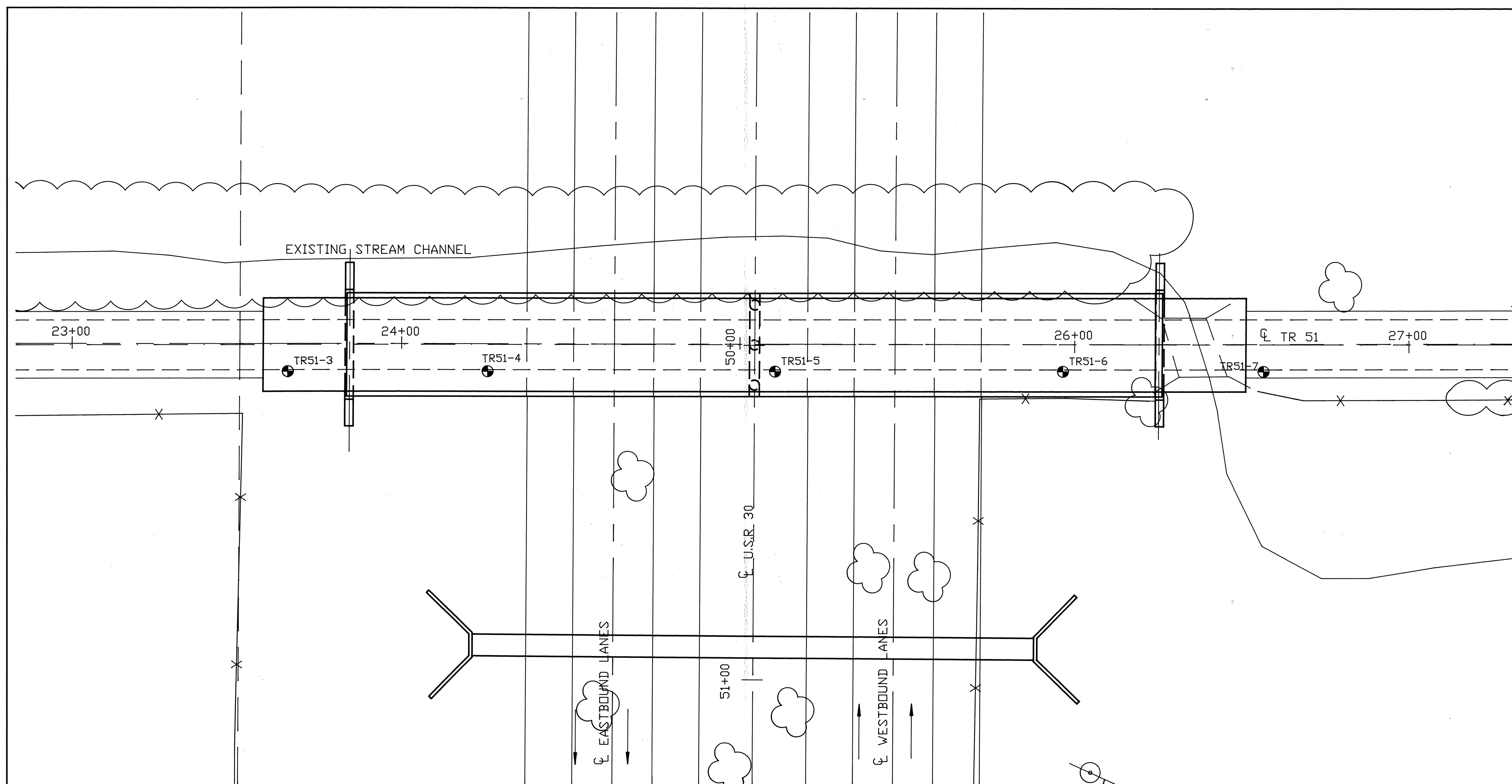
SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 TOWNSHIP ROAD 51 OVER U.S. 30,
 HANCOCK COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



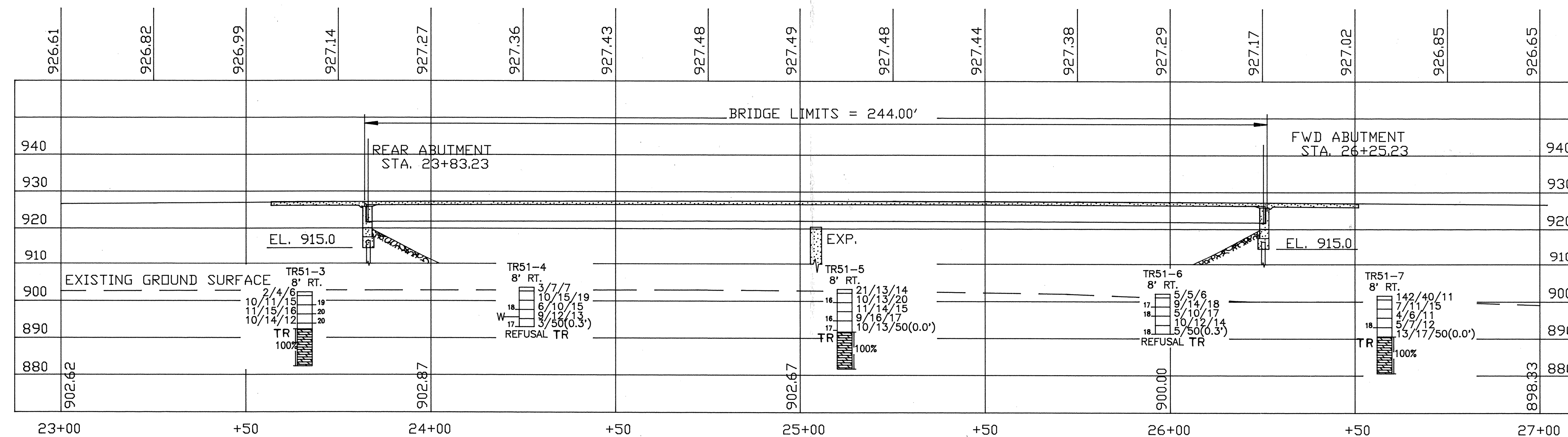
2
3



PLAN

B-1 INDICATES SOIL BORING LOCATION

SCALE: 1"=20' HORIZONTAL AND VERTICAL



PROFILE ALONG CL TR 51

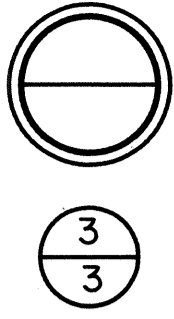
THE H.C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119 BRIDGE CONSTRUCTION FOR TOWNSHIP ROAD 51 OVER U.S. 30, HANCOCK COUNTY, OHIO STRUCTURE NO. HAN-30-0094		
BORING DATA		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 06/03/94

DRAWING BY: HANS DEJONG

SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 TOWNSHIP ROAD 51 OVER U.S. 30,
 HANCOCK COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



LOG OF BORING																
DATE STARTED	03/11/94			SAMPLER: TYPE	SPLIT SPOON			DIA.	2.0" O.D.			WATER ELEVATION:				
DATE COMPLETED	03/11/94			CASING: LENGTH	5' HOLLOW STEM AUGER			DIA.	3.25" I.D.			IMMEDIATE	NONE			
BORING NUMBER	TR51-3			CORE BARREL: TYPE	NXM			SIZE	2.125" I.D.			AFTER COMP. HRS.	897.7			
STATION & OFFSET					23+64 8' RT., (TOWNSHIP ROAD 51)					SURFACE ELEVATION					902.7	
ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS			
902.7	0			1A									A-1-a			
902.3	2	2-4-6	GRAVEL AND STONE FRAGMENTS, MOIST - LOOSE (GRANULAR BASE)	1B									A-6a			
901.7	4	10-11-15	BROWN AND GRAY SILTY CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - MEDIUM STIFF (FILL)	2									A-6a			
897.7	6	11-15-16	BROWN AND GRAY SILT AND CLAY, TRACE GRAVEL, MOIST - STIFF TO VERY STIFF	3									A-6a			
	8	10-14-12	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO STIFF (GLACIAL TILL)	4									A-6a			
892.7	10		LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED NEARLY UNIFORM CLOSE SPACED WEATHERED PARTINGS AND NEAR VERTICAL JOINTS													
889.2	14															
886.7	16		LIGHT GRAY, SLIGHTLY WEATHERED, DENSE, HARD DOLOMITE, NOTED NEARLY UNIFORM CLOSE SPACED WEATHERED PARTINGS	C-1												
	18		GRAY, VUGGY, HARD DOLOMITE, NOTED NEARLY UNIFORM CLOSE SPACED PARTINGS													
882.7	20															

BORING COMPLETED @ 20.0'

LOG OF BORING																
DATE STARTED	03/11/94			SAMPLER: TYPE	SPLIT SPOON			DIA.	2.0" O.D.			WATER ELEVATION:	895.6			
DATE COMPLETED	03/11/94			CASING: LENGTH	5' HOLLOW STEM AUGER			DIA.	3.25" I.D.			IMMEDIATE	NONE			
BORING NUMBER	TR51-4			CORE BARREL: TYPE	NXM			SIZE	2.125" I.D.			AFTER COMP. HRS.	898.6			
STATION & OFFSET					24+24 8' RT., (TOWNSHIP ROAD 51)					SURFACE ELEVATION					903.6	
ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS			
903.6	0			1A									A-1-a			
903.3	2	3-7-7	GRAVEL AND STONE FRAGMENTS, MOIST - LOOSE (GRANULAR BASE)	1B									A-6a			
902.6	4	10-15-19	BROWN SANDY SILT, LITTLE ROCK FRAGMENTS, MOIST - LOOSE	2									A-6a			
	6	6-10-15	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	3									A-6a			
896.1	8	9-12-13	BROWN SANDY SILT, NOTED SAND SEAMS, MOIST - MEDIUM DENSE (GLACIAL TILL)	4									A-4a			
893.6	10	3-50/3'	GRAY SANDY SILT, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - STIFF (GLACIAL TILL)	5	4	9	14	36	37	25	9	17	A-4a(8)			

BORING COMPLETED @ 10.6'
 (AUGER REFUSAL ON BEDROCK)

LOG OF BORING																
DATE STARTED	03/12/94			SAMPLER: TYPE	SPLIT SPOON			DIA.	2.0" O.D.			WATER ELEVATION:	NONE			
DATE COMPLETED	03/12/94			CASING: LENGTH	5' HOLLOW STEM AUGER			DIA.	3.25" I.D.			IMMEDIATE	NONE			
BORING NUMBER	TR51-5			CORE BARREL: TYPE	NXM			SIZE	2.125" I.D.			AFTER COMP. HRS.	898.2			
STATION & OFFSET					25+10 8' RT., (TOWNSHIP ROAD 51)					SURFACE ELEVATION					903.2	
ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS			
903.2	0			1									A-4a			
902.9	2	21-13-14	ASPHALT PAVEMENT	1A									A-6a			
902.2	4	10-13-20	DARK BROWN SANDY SILT, LITTLE ROCK FRAGMENTS, MOIST - LOOSE (FILL)	2									A-6a			
	6	11-14-15	GRAY SILT AND CLAY, SOME SAND, TRACE GRAVEL, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	3									A-6a			
	8	9-16-17		4	9	8	14	34	35	31	11	16	A-6a(7)			
	10	10-13-50		5									A-6a			
891.7	12		LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY VUGGY, HARD DOLOMITE, NOTED WEATHERED CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS													
890.2	14															
885.7	18		LIGHT GRAY, SLIGHTLY WEATHERED, DENSE, HARD DOLOMITE, NOTED NEARLY UNIFORM WEATHERED CLOSE TO VERY CLOSE SPACED PARTINGS	C-1												
	20		GRAY, VUGGY, HARD DOLOMITE, NOTED NEARLY UNIFORM CLOSE TO VERY CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS													

BORING COMPLETED @ 21.5'

LOG OF BORING																
DATE STARTED	03/11/94			SAMPLER: TYPE	SPLIT SPOON			DIA.	2.0" O.D.			WATER ELEVATION:	NONE			
DATE COMPLETED	03/11/94			CASING: LENGTH	5' HOLLOW STEM AUGER			DIA.	3.25" I.D.			IMMEDIATE	NONE			
BORING NUMBER	TR51-6			CORE BARREL: TYPE	NXM			SIZE	2.125" I.D.			AFTER COMP. HRS.	897.1			
STATION & OFFSET					25+96 8' RT., (TOWNSHIP ROAD 51)					SURFACE ELEVATION					902.1	
ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS			
902.1	0			1A									A-1-a			
901.7	2	5-5-6	GRAVEL AND ROCK FRAGMENTS, MOIST - LOOSE (GRANULAR BASE)	1B									A-4a			
899.6	4	9-14-18	DARK BROWN TO BROWN SANDY SILT, MOIST - MEDIUM STIFF TO STIFF (FILL)	2									A-6b			
897.1	6	5-10-17	BROWN AND GRAY SILTY CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF	3	2	5	10	35	48	32	12	18	A-6a(9)			
894.6	8	10-12-14	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	4									A-6a			
891.3	10															

BORING COMPLETED @ 10.8'
 (AUGER REFUSAL ON BEDROCK)

LOG OF BORING																
DATE STARTED	03/12/94			SAMPLER: TYPE	SPLIT SPOON			DIA.	2.0" O.D.			WATER ELEVATION:	NONE			
DATE COMPLETED	03/12/94			CASING: LENGTH	5' HOLLOW STEM AUGER			DIA.	3.25" I.D.			IMMEDIATE	NONE			
BORING NUMBER	TR51-7			CORE BARREL: TYPE	NXM			SIZE	2.125" I.D.			AFTER COMP. HRS.	897.6			
STATION & OFFSET					25+56 8' RT., (TOWNSHIP ROAD 51)					SURFACE ELEVATION					901.6	
ELEV.	DEPTH	STD.PEN. (N)	DESCRIPTION	SA. NO.	% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	SHTL CLASS			
901.6	0			1A									A-4a			
901.1	2	142-40-11	ASPHALT PAVEMENT	1B									A-4a			
	4	7-11-15	DARK BROWN AND BROWN SANDY SILT, TRACE ROCK FRAGMENTS AND GRAVEL, MOIST - VERY STIFF (FILL)	2									A-4a			
896.6	6	4-6-11	BROWN SANDY SILT, MOIST - STIFF (FILL)	3									A-4a			
894.1	8	5-7-12	BROWN TO BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	4									A-6a			
890.6	10	3-17-50/3'		5									A-6a			
	12		LIGHT GRAY, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED NEARLY UNIFORM WEATHERED VERY CLOSE TO CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS													
	14															
884.6	16		LIGHT GRAY, SLIGHTLY WEATHERED, DENSE, HARD DOLOMITE, NOTED SLIGHTLY WEATHERED NEARLY UNIFORM CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS	C-1												
	18															
880.6	20															

BORING COMPLETED @ 21.0'

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR TOWNSHIP
 ROAD 51 OVER U.S. 30, HANCOCK COUNTY, OHIO

STRUCTURE NO. HAN-30-0094

BORING DATA

CHECKED BY	REVIEWED BY	DATE
K.C.A.	A.P.A.	05/20/94

LEGEND

PROJECT DESCRIPTION

TOWNSHIP ROAD 52 (T.R. 52) INTERSECTS THE U.S. 30 ROADWAY CENTERLINE AT STATION 103+29.69, CORRESPONDING TO STATION 25+00.0 ALONG THE T.R. 52 CENTERLINE. A BRIDGE STRUCTURE, BRIDGE NO. HAN-30-0195 (T.R. 52 OVER U.S. 30) WILL BE CONSTRUCTED OVER U.S. 30 BETWEEN STATIONS 23+79.0 AND 26+21.0. THE BRIDGE STRUCTURE WILL BE A TWO-SPAN, CONTINUOUS STEEL PLATE GIRDER BRIDGE WITH A COMPOSITE REINFORCED CONCRETE DECK AND REINFORCED CONCRETE SUBSTRUCTURE. EACH SPAN LENGTH WILL BE 121 FT. 0 IN., FOR A TOTAL BRIDGE LENGTH OF 244.0 FT.

THE OVERPASS BRIDGE STRUCTURE WILL HAVE APPROACH EMBANKMENTS BEGINNING AT APPROXIMATELY STATION 0+00 AND TERMINATING AT STATION 27+00 (EXCLUDING THE BRIDGE STRUCTURE). THE MAXIMUM EMBANKMENT HEIGHT IS APPROXIMATELY 23 FT. AT THE BRIDGE ABUTMENTS. IN CROSS SECTION, THE APPROACH EMBANKMENT WILL HAVE AN APPROXIMATE 40 FT. CREST WIDTH AND SIDE SLOPES EQUAL TO 2H:1V.

GEOLOGY

THE PROJECT SITE IS LOCATED WITHIN THE TILL PLAINS PHYSIOGRAPHIC REGION OF OHIO. THE AREA WAS COVERED BY CONTINENTAL GLACIERS IN TWO TIME PERIODS, THE ILLINOIAN AND WISCONSIN GLACIATIONS. THE ADVANCING AND RETREATING ICE SHEETS DEPOSITED GROUND MORAINIC (GLACIAL TILL) AND END MORAINES, THE WISCONSIN AGE DEPOSITS OVERLYING THE OLDER ILLINOIAN DEPOSITS. THE SURFACE DEPOSITS ARE CONSIDERED GROUND MORAINIC (WISCONSIN AGE), LOCATED JUST NORTH OF THE EAST-WEST ORIENTED FORT WAYNE END MORAINIC.

THE OVERBURDEN SOILS WITHIN THE PROJECT LIMITS ARE TYPICALLY GROUND MORAINIC OR GLACIAL TILL DEPOSITS. A GLACIAL TILL SOIL CAN BE DESCRIBED AS AN UNSORTED, UNSTRATIFIED MIXTURE OF CLAY, SILT, SAND, GRAVEL, COBBLES AND BOULDERS. THE GLACIAL DEPOSITS WITHIN THE PROJECT LIMITS ARE TYPICALLY 25 TO 60 FT. THICK, THINNER IN THE DRAINAGE VALLEYS.

THE BEDROCK WITHIN THE PROJECT VICINITY, UNDERLYING THE GLACIAL TILL OVERBURDEN, IS UPPER SILURIAN TO LOWER DEVONIAN IN AGE. GEOLOGIC LITERATURE INDICATES THAT THE BEDROCK BELONGS TO THE MONROE FORMATION THAT IS TYPICALLY LIMESTONE AND DOLOMITE.

INVESTIGATIONAL PROCEDURES

A TOTAL OF EIGHT (8) DRIVE SAMPLE TEST BORINGS, LABELED AS TR52-1 THROUGH TR52-8, WERE PERFORMED FOR THE T.R. 52 MODIFICATION AS PART OF THE U.S. 30 ROADWAY PROJECT (ALL/HAN-30-20.31/0.00). THE TEST BORINGS REPRESENTING THE T.R. 52 BRIDGE STRUCTURE WERE TR52-2 THROUGH TR52-6. THE SUBSURFACE INFORMATION ESTABLISHED FROM THE STRUCTURE BORINGS HAS BEEN PRESENTED ON THE ATTACHED GEOTECHNICAL STRUCTURE DRAWINGS.

THE STRUCTURE TEST BORINGS WERE PERFORMED BETWEEN MARCH 14 AND 20, 1994. A TRUCK-MOUNTED DRILLING RIG WAS USED TO PERFORM THE BORING PROCEDURES. EACH STRUCTURE BORING WAS ADVANCED TO A CONDITION OF REFUSAL ON THE DOLOMITE BEDROCK. A ROCK CORE SAMPLE WAS OBTAINED ONCE AUGER REFUSAL WAS MET AT BORINGS TR52-3 AND TR52-6. THE DEPTH TO THE BEDROCK SURFACE RANGED BETWEEN 23 AND 25 FT.

EACH TEST BORING WAS ADVANCED WITH HOLLOW-STEM AUGERS. THE DRIVE SAMPLING WAS ACCOMPLISHED THROUGH AND BELOW THE TIP OF THE HOLLOW-STEM AUGERS AT 2.5 FT. INTERVALS TO A DEPTH OF 20 FT., AT WHICH DEPTH 5 FT. SAMPLING INTERVALS WERE USED. THE DRIVE SAMPLING WAS ACCOMPLISHED IN ACCORDANCE WITH "PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS," ASTM D 1586. A 2 IN. O.D. BY 1 3/8 IN. I.D. SPLIT-SPOON SAMPLER WAS DRIVEN A TOTAL OF 18 IN., WITH A TOTAL NUMBER OF BLOWS OF 140 LB. HAMMER WEIGHT FALLING 30 IN. BEING RECORDED FOR 6 IN. OF PENETRATION. THE SUM OF BLOWS FOR THE FINAL 12 IN. OF PENETRATION IS THE STANDARD PENETRATION TEST RESULT, COMMONLY REFERENCED TO AS THE N-VALUE.

BEDROCK CORE SAMPLING WAS PERFORMED AT TEST BORINGS TR52-3 AND TR52-6. THE BEDROCK CORE SAMPLING WAS PERFORMED IN ACCORDANCE WITH ASTM D 2113. THE BEDROCK CORE SAMPLES WERE CUT WITH AN NX SERIES CORE BARREL, PRODUCING A CORE HAVING A NOMINAL DIAMETER OF 2 1/8 IN. THE BEDROCK CORE SAMPLE LENGTHS WERE 10 FT. IN EACH BORING.

ALL SOIL SAMPLES WERE STORED IN SEALED JARS AND THE BEDROCK CORE SAMPLES WERE STORED IN WOODEN CORE BOXES. THE DRILLER MAINTAINED A LOG OF THE ENTIRE DRILLING OPERATION, INCLUDING A DESCRIPTION OF THE MATERIALS ENCOUNTERED IN EACH SPLIT-SPOON OR BEDROCK CORE RUN, THE DEPTH AT WHICH THE DESCRIPTION OF THE SOIL OR BEDROCK CHANGED, THE DEPTH FROM WHICH EACH SAMPLE WAS RECOVERED, THE TYPE OF SAMPLE, THE NUMBER OF BLOWS FOR EACH 6 IN. OF DRIVE ON THE SPLIT-SPOON SAMPLER, THE NUMBER OF INCHES OF RECOVERY FOR EACH SAMPLE OBTAINED, LEVELS AT WHICH ANY GROUNDWATER OR SEEPAGE WAS ENCOUNTERED, ALONG WITH ANY OTHER PERTINENT INFORMATION DEVELOPED DURING THE DRILLING OPERATIONS.

UPON COMPLETION OF THE DRILLING PROGRAM, ALL SAMPLES (SOIL AND ROCK CORE) WERE RETURNED TO OUR CINCINNATI SOIL MECHANICS LABORATORY WHERE THE PROJECT ENGINEER INSPECTED EACH SAMPLE. THE ATTACHED STRUCTURE BORING LOGS WERE PREPARED BASED ON THE VISUAL INSPECTION OF THE RECOVERED SAMPLES, THE LABORATORY TEST DATA AND ODOT STANDARDS.

REPRESENTATIVE SOIL AND ROCK CORE SAMPLES WERE SELECTED FOR THE PERFORMANCE OF PHYSICAL TESTS IN OUR LABORATORY TO DETERMINE THEIR ENGINEERING CHARACTERISTICS. INCLUDED IN THE LABORATORY TEST PROGRAM WERE NATURAL MOISTURE CONTENT DETERMINATIONS, ATTERBERG LIMITS, SIEVE ANALYSES WITH HYDROMETER TESTS, AND UNCONFINED COMPRESSION TESTS.

AUGER BORING LOCATION--PLAN VIEW

PRESS AND/OR DRIVE SAMPLE AND/OR CORE BORING LOCATION--PLAN VIEW

CAPPED PILE

FOOTING

FOOTING ON PILE

TR TOP OF ROCK

HORIZONTAL BAR ON BORING LOG INDICATES THE DEPTH THE SAMPLE WAS TAKEN

X/Y/Z FIGURES BESIDE THE BORING LOG IN PROFILE INDICATES THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST.

X=NUMBER OF BLOWS FOR FIRST 6-INCHES
Y=NUMBER OF BLOWS FOR SECOND 6-INCHES
Z=NUMBER OF BLOWS FOR THIRD 6-INCHES

W INDICATES FREE WATER ELEVATION

▼ INDICATES STATIC WATER ELEVATION

SYMBOLS OF ROCK TYPES

COAL

WEATHERED MUDSTONE

MUDSTONE

WEATHERED SHALE

SHALE

CLAYSTONE

SILTSTONE

WEATHERED SANDSTONE

SANDSTONE

LEACHED DOLOMITE

DOLOMITE

LEACHED LIMESTONE

LIMESTONE

BOULDERS OR COBBLES

INVESTIGATIONAL FINDINGS

THE SOIL PROFILE AT THE PROJECT SITE WAS COMPRISED OF GLACIALLY DEPOSITED MATERIALS, RESTING ON DOLOMITE BEDROCK. THE GLACIAL DEPOSITS WERE PREDOMINANTLY COMPRISED OF GROUND MORAINIC OR GLACIAL TILL. THE NEAR SURFACE MATERIALS DEVELOPED THROUGH SEVERE WEATHERING OF THE PARENT GLACIAL TILL DEPOSITS. THE SURFACE MANTLE OF SEVERELY WEATHERED GLACIAL SOILS WAS UNDERLAIN BY LESS WEATHERED TO RELATIVELY UNWEATHERED DEPOSITS OF GLACIAL TILL. THE GLACIAL TILL DEPOSITS WERE COMPRISED OF TWO DISTINCT ZONES; AN UPPER ZONE THAT WAS BROWN IN COLOR AND THE LOWER ZONE OF GRAY COLOR. THE THICKNESS OF THE OVERBURDEN SOIL PROFILE (SEVERELY WEATHERED NEAR SURFACE GLACIAL SOILS AND THE UNDERLYING, LESS WEATHERED GLACIAL TILL DEPOSITS) RANGED BETWEEN APPROXIMATELY 23 AND 25 FT.

THE TEST BORINGS REPRESENTING THE TOWNSHIP ROAD 52 OVERPASS STRUCTURE, TR52-2 THROUGH TR52-6, WERE DRILLED WITHIN THE LIMITS OF THE EXISTING ROADWAY. THESE BORINGS, DRILLED AT THE EDGE OF THE PAVEMENT OR IN THE SHOULDER, INITIALLY ENCOUNTERED ASPHALT PAVEMENT AND/OR FILL MATERIALS. THE FILL, ENCOUNTERED TO A DEPTH OF BETWEEN 0.5 AND 6 FT., WAS CLASSIFIED AS A-7-8 CLAY, A-6B SILTY CLAY, AND A-6A SILT AND CLAY. THE CONSISTENCY OF THE ROADWAY FILL MATERIAL WAS SOFT TO VERY STIFF.

THE SEVERELY WEATHERED NEAR SURFACE SOILS WERE ENCOUNTERED UNDERLYING THE FILL SOILS TO A MAXIMUM DEPTH OF 10 FT. BELOW THE NATURAL GROUND SURFACE. THESE MATERIALS WERE MODERATE PLASTICITY SOILS, CLASSIFIED AS A-6B SILTY CLAY, AND A-7-8 CLAY.

THE SEVERELY WEATHERED GLACIAL SOIL STRATUM WAS UNDERLAIN BY THE RELATIVELY UNWEATHERED GLACIAL TILL DEPOSITS. THE UPPER GLACIAL TILL SOILS WERE BROWN IN COLOR, BECOMING GRAY IN COLOR WITH DEPTH, TRANSITIONING FROM BROWN TO GRAY AT APPROXIMATELY 10 TO 12.5 FT. BELOW THE NATURAL GROUND SURFACE. THE GLACIAL TILL SOILS WERE PRIMARILY CLASSIFIED AS A-6A SILT AND CLAY, COMPRISED OF 15 TO 20% SAND SIZE PARTICLES AND LESS THAN 5% GRAVEL SIZE PARTICLES.

THE CONSISTENCY OF THE GLACIAL TILL SOILS RANGED FROM VERY STIFF TO HARD IN THE UPPER PORTION OF THE DEPOSITS, DECREASING TO VERY STIFF WITH INCREASED DEPTH. THE TEST BORINGS INDICATED THAT THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS WHICH WERE RATED VERY STIFF TO HARD, TYPICALLY CORRESPONDED TO THE BROWN COLORED GLACIAL TILL SOILS. THE N-VALUES WITHIN THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS WERE IN THE UPPER TEENS TO IN EXCESS OF 30 BLOWS PER FT. THE DECREASED CONSISTENCY, TO VERY STIFF, CORRESPONDED TO THE TRANSITION FROM THE BROWN TO THE GRAY GLACIAL TILL SOILS. THE N-VALUES TYPICALLY DECREASED TO THE MID TEENS TO THE LOW 20'S (BLOWS PER FT.) WITHIN THE LOWER PORTION OF THE GLACIAL TILL DEPOSITS.

POCKETS, SEAMS AND LAYERS OF SILT, SAND OR SAND AND GRAVEL WERE INTERBEDDED WITHIN THE GLACIAL TILL DEPOSITS. THESE GRANULAR FEATURES WERE TYPICALLY WATER BEARING AND RATED FROM MEDIUM DENSE TO DENSE IN COMPACTNESS. LOCALIZED ZONES OF SATURATED, MEDIUM STIFF TO STIFF CONSISTENCY GLACIAL TILL SOILS WERE ENCOUNTERED ABOVE AND BELOW THE WATER BEARING GRANULAR MATERIALS.

THE BEDROCK WITHIN THE PROJECT LIMITS, ENCOUNTERED BETWEEN ELEVATIONS 888.5 AND 889.8 AT THE REFERENCED SITE, IS UPPER SILURIAN TO LOWER DEVONIAN AGE DOLOMITE. THE BEDROCK CORES PERFORMED AT THE BRIDGE STRUCTURE INDICATED THAT THE DOLOMITE BEDROCK WAS SLIGHTLY VUGGY TO VUGGY AND HAD NEARLY UNIFORM, CLOSE TO VERY CLOSE SPACED PARTINGS. THE PARTINGS WERE WEATHERED NEAR THE SURFACE OF THE BEDROCK AND BECAME LESS WEATHERED WITH DEPTH, TYPICALLY SPACED AT LESS THAN 2 IN. NEAR VERTICAL JOINTS WERE NOTED THROUGHOUT THE BEDROCK CORE LENGTHS. THE ROCK HARDNESS RATING FOR THE DOLOMITE BEDROCK WAS HARD.

GENERAL INFORMATION

DRIVE SAMPLE/PRESS SAMPLE/CORE BORINGS

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, 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 SAMPLING DEVICE 18 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

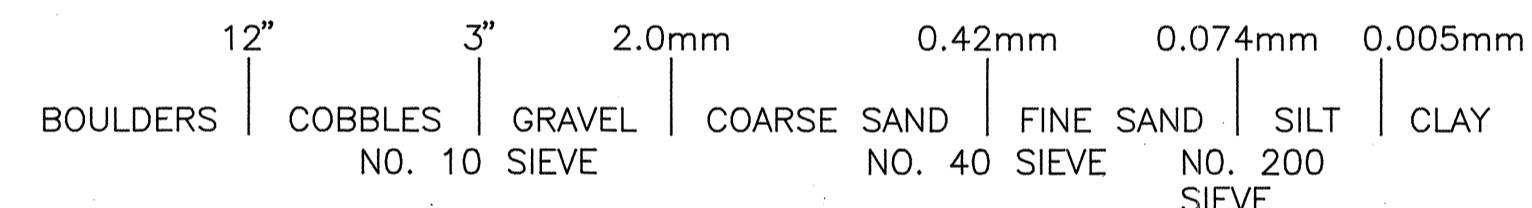
DRIVE/PRESS SAMPLE BORINGS ARE ALSO MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, OR A 3" O.D. THIN WALL PRESS SAMPLING DEVICE. THE PRESS SAMPLER IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE, APPLIED BY THE DRILLING MACHINE.

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NXM CORE BARREL, WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6-INCH INCREMENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS, UTILIZING THE CASAGRANDE AC CLASSIFICATION SYSTEM, INCLUDING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

PARTICLE SIZE DEFINITIONS



NOTE: ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1800 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

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 this data and it is not to be construed as a part of the plans governing construction of the project.

THE H. C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI, OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION

PROJECT NO. ALL/HAN-30-20.31/0.00
BRIDGE CONSTRUCTION FOR TOWNSHIP
ROAD 52 OVER U.S. 30, HANCOCK COUNTY, OHIO

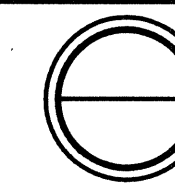
STRUCTURE NO. HAN-30-0195 W.O. NO. 04062.119

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	REVISED DATE 08 / 30 / 94
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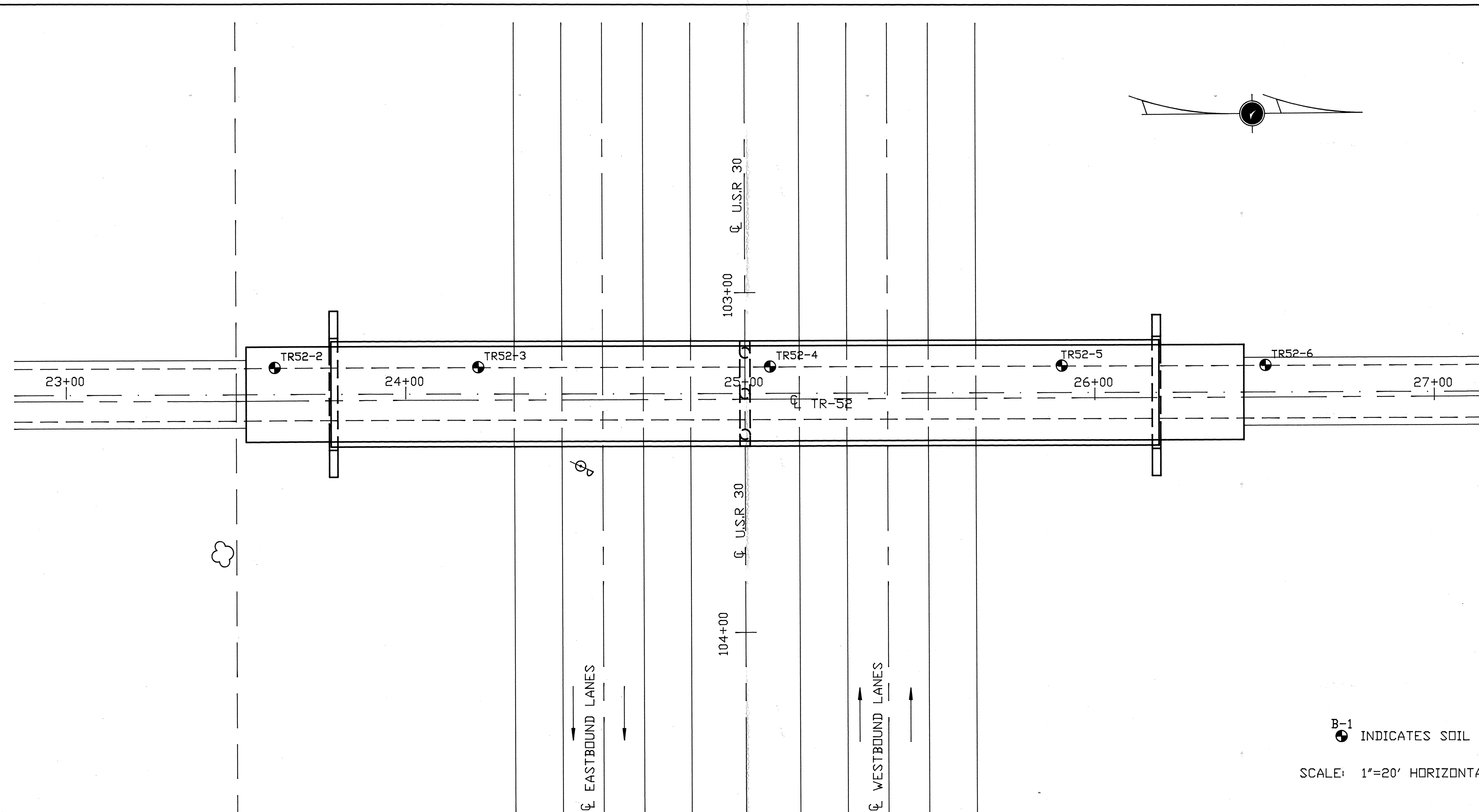
SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 TOWNSHIP ROAD 52 OVER U.S. 30,
 HANCOCK COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



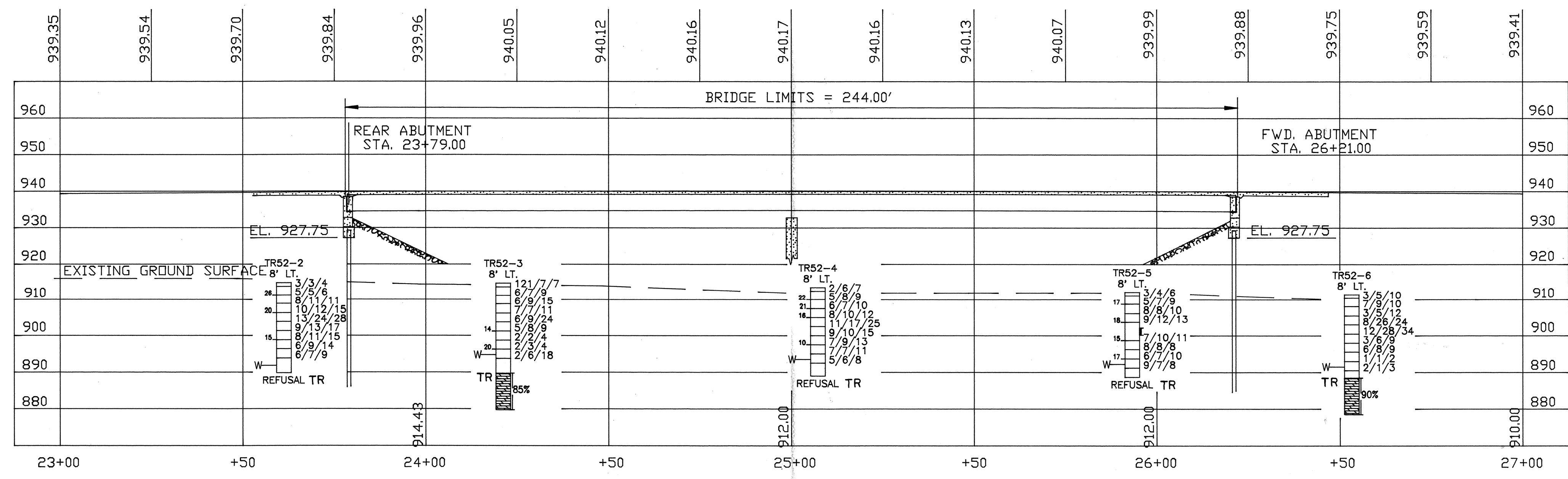
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B-1 INDICATES SOIL BORING LOCATION

SCALE: 1"=20' HORIZONTAL AND VERTICAL

PLAN



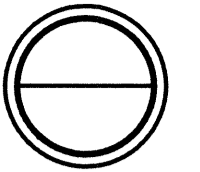
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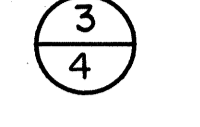
THE H.C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119 BRIDGE CONSTRUCTION FOR TOWNSHIP ROAD 52 OVER U.S. 30, HANCOCK COUNTY, OHIO STRUCTURE NO. HAN-30-0195		
BORING DATA		
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 06/03/94

DRAWING BY: HANCOCK COUNTY, OHIO

SOIL PROFILE

ALL/HAN-30-20.31/0.00
BRIDGE CONSTRUCTION FOR
TOWNSHIP ROAD 52 OVER U.S. 30,
HANCOCK COUNTY, OHIO





THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
CINCINNATI, OHIO 45226

LOG OF BORING														
DATE STARTED <u>03/20/94</u> SAMPLER: TYPE <u>SPLIT SPOON</u> DIA. <u>2.0"</u> O.D. WATER ELEVATION:														
DATE COMPLETED <u>03/20/94</u> CASING: LENGTH <u>5'</u> HOLLOW STEM AUGER DIA. <u>3.25"</u> I.D. IMMEDIATE <u>891.8</u>														
BORING NUMBER <u>TR52-2</u> CORE BARREL: TYPE _____ SIZE _____ AFTER <u>COMP</u> HRS. <u>896.3</u>														
STATION & OFFSET <u>23+61 8' LT., (TOWNSHIP ROAD 52)</u>			SURFACE ELEVATION <u>914.8</u>											
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC		
914.8	0													
	2	3-3-4	DARK BROWN SILT AND CLAY, TRACE SAND, GRAVEL, ROCK FRAGMENTS AND ORGANICS, MOIST - SOFT (FILL)	1										A-6a
	4	5-5-6	BROWN AND GRAY SILTY CLAY, MOIST - MEDIUM STIFF	2										A-7-g
	6	8-11-11	BROWN AND GRAY CLAY, MOIST - STIFF	3										A-7-6
	8													
	10	10-12-15		4										A-7-6
	12	13-24-28	BROWN SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	5										A-6a
	14	9-13-17	GRAY SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - HARD TO VERY STIFF (GLACIAL TILL)	6										A-6a
	16	8-11-15		7										A-6a
	18	6-9-14		8										A-6a
	20	6-7-9		9										A-6a
	22													
	24													

BORING COMPLETED @ 25.0'
(AUGER REFUSAL ON BEDROCK)

LOG OF BORING														
DATE STARTED <u>03/14/94</u> SAMPLER: TYPE <u>SPLIT SPOON</u> DIA. <u>2.0"</u> O.D. WATER ELEVATION:														
DATE COMPLETED <u>03/14/94</u> CASING: LENGTH <u>5'</u> HOLLOW STEM AUGER DIA. <u>3.25"</u> I.D. IMMEDIATE <u>894.7</u>														
BORING NUMBER <u>TR52-3</u> CORE BARREL: TYPE <u>NXM</u> SIZE <u>2.125"</u> I.D. AFTER <u>COMP</u> HRS. <u>904.7</u>														
STATION & OFFSET <u>24+21 8' LT., (TOWNSHIP ROAD 52)</u>			SURFACE ELEVATION <u>914.7</u>											
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC		
914.7	0		ASPHALT PAVEMENT											
	2	121-7-7	DARK BROWN SANDY SILT, TRACE ROCK FRAGMENTS, MOIST - VERY STIFF (FILL)	1										A-4a
	4	6-7-9	BROWN AND GRAY SILTY CLAY, MOIST - STIFF	2										A-6b
	6	6-9-15	BROWN AND GRAY SILT AND CLAY, LITTLE SAND AND GRAVEL, MOIST - VERY STIFF (GLACIAL TILL)	3										A-6a
	8	7-7-11		4										A-6a
	10	6-9-24	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	5										A-6a
	12													
	14	5-8-9		6										A-6a
	16	2-2-4	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - MEDIUM STIFF TO VERY STIFF (GLACIAL TILL)	7										A-6a
	18	2-3-4		8	3	6	10	40	41	29	12	20		A-6a(9)
	20	2-6-18		9										A-6a
	22													
	24													
	26		LIGHT GRAY, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED WEATHERED NEAR UNIFORM CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS	C-1		NXM		REC. 85%						
	28		GRAY, DENSE, HARD DOLOMITE, NOTED CLOSE TO VERY CLOSE PARTINGS											
	30													
	32													
	34													
	36													

BORING COMPLETED @ 35.0'

LOG OF BORING														
DATE STARTED <u>03/15/94</u> SAMPLER: TYPE <u>SPLIT SPOON</u> DIA. <u>2.0"</u> O.D. WATER ELEVATION:														
DATE COMPLETED <u>03/15/94</u> CASING: LENGTH <u>5'</u> HOLLOW STEM AUGER DIA. <u>3.25"</u> I.D. IMMEDIATE <u>893.5</u>														
BORING NUMBER <u>TR52-4</u> CORE BARREL: TYPE _____ SIZE _____ AFTER <u>COMP</u> HRS. <u>896.5</u>														
STATION & OFFSET <u>25+07 8' LT., (TOWNSHIP ROAD 52)</u>			SURFACE ELEVATION <u>913.5</u>											
ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC		
913.5	0													
	2	2-6-7	DARK BROWN SANDY SILT, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - SOFT (FILL)	1										A-4a
	4	5-8-9	DARK BROWN SILT AND CLAY, TRACE ORGANICS, MOIST - SOFT (FILL)	2										A-6a
	6	6-7-10	BROWN AND GRAY CLAY, LITTLE SAND, TRACE GRAVEL, MOIST - VERY STIFF	3	3	4	12	31	50	42	21	21		A-7-6(13)
	8	8-10-12	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	4	3	7	12	62	16	31	13	16		A-6a(9)
	10													
	12	11-17-25		5										A-6a
	14	9-10-15	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	6										A-6a
	16	7-9-13		7										A-6a
	18	7-7-11		8										A-6a
	20	5-6-8	GRAY SILT, NOTED SAND SEAMS, WET - MEDIUM DENSE	9										A-4b
	22													
	24													

BORING COMPLETED @ 24.5'
(AUGER REFUSAL ON BEDROCK)

THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI OHIO 45226

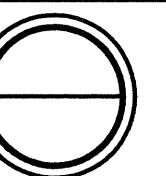
STRUCTURE FOUNDATION INVESTIGATION
PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
BRIDGE CONSTRUCTION FOR TOWNSHIP
ROAD 52 OVER U.S. 30, HANCOCK COUNTY, OHIO
STRUCTURE NO. HAN-30-0195

BORING DATA		
CHECKED BY	REVIEWED BY	DATE
K.G.A.	A.P.A.	05/20/94

SOIL PROFILE

ALL/HAN-30-20.31/0.00
BRIDGE CONSTRUCTION FOR
TOWNSHIP ROAD 52 OVER U.S. 30,
HANCOCK COUNTY, OHIO

THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
CINCINNATI, OHIO 45226



4
4

LOG OF BORING

DATE STARTED 03/18/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
DATE COMPLETED 03/18/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE 892.2
BORING NUMBER TR52-5 CORE BARREL: TYPE _____ SIZE _____ AFTER COMP. HRS. 898.2
STATION & OFFSET 25+93 8' LT., (TOWNSHIP ROAD 52) SURFACE ELEVATION 912.2

ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS										SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC				
912.2	0		ASPHALT PAVEMENT													
912.0	2	3-4-5	BROWN AND GRAY SILTY CLAY, TRACE ROCK FRAGMENTS, MOIST - VERY STIFF (FILL)	1A	V	I	S	U	A	L						A-6a
911.2	4	5-7-9	BROWN AND GRAY SILTY CLAY, MOIST - VERY STIFF	2	V	I	S	U	A	L			17			A-6a
909.7	6	8-8-10	BROWN, TRACE GRAY, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, NOTED SANDY SILT SEAMS, MOIST - VERY STIFF (GLACIAL TILL)	3	V	I	S	U	A	L						A-6a
	8															
	10	9-12-13		4	V	I	S	U	A	L			18			A-6a
	12	PUSHED		ST	V	I	S	U	A	L						A-6a
899.7	14	7-10-11	GRAY SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, NOTED SILT LENSES, MOIST - STIFF TO VERY STIFF (GLACIAL TILL)	5	V	I	S	U	A	L			15			A-6a
	16	8-8-8		6	V	I	S	U	A	L						A-6a
894.7	18	6-7-10	GRAY SILTY CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, NOTED SAND SEAMS, MOIST - VERY STIFF TO STIFF (GLACIAL TILL)	7	V	I	S	U	A	L			17			A-6b
	20															
	22	9-7-8		8	V	I	S	U	A	L						A-6b

BORING COMPLETED @ 23.5'
(AUGER REFUSAL ON BEDROCK)

LOG OF BORING

DATE STARTED 03/15/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
DATE COMPLETED 03/15/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE 891.5
BORING NUMBER TR52-6 CORE BARREL: TYPE NXM SIZE 2.125" I.D. AFTER COMP. HRS. 894.5
STATION & OFFSET 26+53 8' LT., (TOWNSHIP ROAD 52) SURFACE ELEVATION 911.5

ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS										SHTL CLASS	
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC				
911.5	0		ASPHALT PAVEMENT													
911.0	2	3-5-10	BROWN AND GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - STIFF TO VERY STIFF (FILL)	1	V	I	S	U	A	L						A-6a
	4	7-9-10		2	V	I	S	U	A	L						A-6a
	6															
905.5	6	3-5-12	BROWN AND GRAY SILTY CLAY, MOIST - STIFF	3	V	I	S	U	A	L						A-6a
	8			3A	V	I	S	U	A	L						A-6b
903.0	8	8-26-24	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - HARD (GLACIAL TILL)	4	V	I	S	U	A	L						A-6b
	10			4A	V	I	S	U	A	L						A-6a
	12	12-28-34		5	V	I	S	U	A	L						A-6a
899.0	14	3-6-9	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST TO VERY MOIST - VERY STIFF TO STIFF (GLACIAL TILL)	6	V	I	S	U	A	L						A-6a
	16	6-8-9		7	V	I	S	U	A	L						A-6a
	18															
	20	1-1-2		8	V	I	S	U	A	L						A-6a
891.5	20	2-1-3	GRAY COARSE AND FINE SAND, WET - LOOSE	9	V	I	S	U	A	L						A-3a
	22															
888.5	24		LIGHT GRAY, WEATHERED, VUGGY, HARD DOLOMITE, WEATHERED NEAR UNIFORM CLOSE SPACED PARTINGS AND NEAR VERTICAL JOINTS													
887.5	26		GRAY, DENSE, HARD DOLOMITE, NOTED CLOSE TO VERY CLOSE SPACED PARTINGS													
	28	ROCK CORE		C-1		NXM		REC. 90%		ROD. 4%						
	30															
	32															
878.5																

BORING COMPLETED @ 33.0'

THE H.C. NUTTING COMPANY
GEOTECHNICAL ENGINEERS
AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION

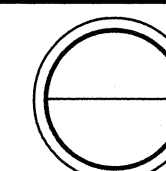
PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
BRIDGE CONSTRUCTION FOR TOWNSHIP
ROAD 52 OVER U.S. 30, HANCOCK COUNTY, OHIO

STRUCTURE NO. HAN-30-0195

BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/20/94
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DRAWING ID: HAN52S2.DWG



LEGEND

PROJECT DESCRIPTION

STATE ROUTE 235 (S.R. 235) INTERSECTS THE U.S. 30 ROADWAY CENTERLINE AT STATION 155+97.55, CORRESPONDING TO STATION 25+00.04 ALONG THE S.R. 235 CENTERLINE. A BRIDGE STRUCTURE, BRIDGE NO. HAN-30-0295 (S.R. 235 OVER U.S. 30) WILL BE CONSTRUCTED OVER U.S. 30 BETWEEN STATIONS 23+79.4 AND 26+21.4. THE BRIDGE STRUCTURE WILL BE A TWO-SPAN, CONTINUOUS STEEL PLATE GIRDER BRIDGE WITH A COMPOSITE REINFORCED CONCRETE DECK AND REINFORCED CONCRETE SUBSTRUCTURE. EACH SPAN LENGTH WILL BE 121 FT. 0 IN., FOR A TOTAL BRIDGE LENGTH OF 244.0 FT.

THE OVERPASS BRIDGE STRUCTURE WILL HAVE APPROACH EMBANKMENTS BEGINNING AT APPROXIMATELY STATION 13+00 AND TERMINATING AT STATION 39+00 (EXCLUDING THE BRIDGE STRUCTURE). THE MAXIMUM EMBANKMENT HEIGHT IS APPROXIMATELY 24 FT. AT THE BRIDGE ABUTMENTS. IN CROSS SECTION, THE APPROACH EMBANKMENT WILL HAVE AN APPROXIMATE 40 FT. CREST WIDTH AND SIDE SLOPES EQUAL TO 2H:1V.

GEOLOGY

THE PROJECT SITE IS LOCATED WITHIN THE TILL PLAINS PHYSIOGRAPHIC REGION OF OHIO. THE AREA WAS COVERED BY CONTINENTAL GLACIERS IN TWO TIME PERIODS, THE ILLINOIAN AND WISCONSIN GLACIATIONS. THE ADVANCING AND RETREATING ICE SHEETS DEPOSITED GROUND MORAINIC (GLACIAL TILL) AND END MORAINES, THE WISCONSIN AGE DEPOSITS OVERLYING THE OLDER ILLINOIAN DEPOSITS. THE SURFACE DEPOSITS ARE CONSIDERED GROUND MORAINIC (WISCONSIN AGE), LOCATED JUST NORTH OF THE EAST-WEST ORIENTED FORT WAYNE END MORAINIC.

THE OVERBURDEN SOILS WITHIN THE PROJECT LIMITS ARE TYPICALLY GROUND MORAINIC OR GLACIAL TILL DEPOSITS. A GLACIAL TILL SOIL CAN BE DESCRIBED AS AN UNSORTED, UNSTRATIFIED MIXTURE OF CLAY, SILT, SAND, GRAVEL, COBBLES AND BOULDERS. THE GLACIAL DEPOSITS WITHIN THE PROJECT LIMITS ARE TYPICALLY 25 TO 60 FT. THICK, THINNER IN THE DRAINAGE VALLEYS.

THE BEDROCK WITHIN THE PROJECT VICINITY, UNDERLYING THE GLACIAL TILL OVERBURDEN, IS UPPER SILURIAN TO LOWER DEVONIAN IN AGE. GEOLOGIC LITERATURE INDICATES THAT THE BEDROCK BELONGS TO THE MONROE FORMATION THAT IS TYPICALLY LIMESTONE AND DOLOMITE.

INVESTIGATIONAL PROCEDURES

A TOTAL OF SEVEN (7) DRIVE SAMPLE TEST BORINGS, LABELED AS SR235-1 THROUGH SR235-7, WERE PERFORMED FOR THE S.R. 235 MODIFICATION AS PART OF THE U.S. 30 ROADWAY PROJECT (ALL/HAN-30-20.31/0.00). THE TEST BORINGS REPRESENTING THE S.R. 235 BRIDGE STRUCTURE WERE SR235-2 THROUGH SR235-6. THE SUBSURFACE INFORMATION ESTABLISHED FROM THE STRUCTURE BORINGS HAS BEEN PRESENTED ON THE ATTACHED GEOTECHNICAL STRUCTURE DRAWINGS.

THE STRUCTURE TEST BORINGS WERE PERFORMED BETWEEN MARCH 16 AND 22, 1994. A TRUCK-MOUNTED DRILLING RIG WAS USED TO PERFORM THE BORING PROCEDURES. EACH STRUCTURE BORING WAS ADVANCED TO A CONDITION OF REFUSAL ON THE DOLOMITE BEDROCK. A ROCK CORE SAMPLE WAS OBTAINED ONCE AUGER REFUSAL WAS MET AT BORINGS SR235-2, SR235-4 AND SR235-6. THE DEPTH TO THE BEDROCK SURFACE RANGED BETWEEN 28 AND 29 FT.

EACH TEST BORING WAS ADVANCED WITH HOLLOW-STEM AUGERS. THE DRIVE SAMPLING WAS ACCOMPLISHED THROUGH AND BELOW THE TIP OF THE HOLLOW-STEM AUGERS AT 2.5 FT. INTERVALS TO A DEPTH OF 20 FT. AT WHICH DEPTH 5 FT. SAMPLING INTERVALS WERE USED. THE DRIVE SAMPLING WAS ACCOMPLISHED IN ACCORDANCE WITH "PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS," ASTM D 1586. A 2 IN. O.D. BY 1 3/8 IN. I.D. SPLIT-SPOON SAMPLER WAS DRIVEN A TOTAL OF 18 IN., WITH A TOTAL NUMBER OF BLOWS OF 140 LB. HAMMER WEIGHT FALLING 30 IN. BEING RECORDED FOR 6 IN. OF PENETRATION. THE SUM OF BLOWS FOR THE FINAL 12 IN. OF PENETRATION IS THE STANDARD PENETRATION TEST RESULT, COMMONLY REFERENCED TO AS THE N-VALUE.

BEDROCK CORE SAMPLING WAS PERFORMED AT TEST BORINGS SR235-2, SR235-4 AND SR235-6. THE BEDROCK CORE SAMPLING WAS PERFORMED IN ACCORDANCE WITH ASTM D 2113. THE BEDROCK CORE SAMPLES WERE CUT WITH AN NX SERIES CORE BARREL, PRODUCING A CORE HAVING A NOMINAL DIAMETER OF 2 1/8 IN. THE BEDROCK CORE SAMPLE LENGTHS WERE 10 FT. IN EACH BORING.

THE UNDISTURBED SOIL SAMPLES WERE OBTAINED BY PUSHING A 3 IN. O.D. SHELBY TUBE SAMPLER IN ACCORDANCE WITH ASTM D 1587.

ALL SOIL SAMPLES WERE STORED IN SEALED JARS AND THE BEDROCK CORE SAMPLES WERE STORED IN WOODEN CORE BOXES. THE DRILLER MAINTAINED A LOG OF THE ENTIRE DRILLING OPERATION, INCLUDING A DESCRIPTION OF THE MATERIALS ENCOUNTERED IN EACH SPLIT-SPOON OR BEDROCK CORE RUN, THE DEPTH AT WHICH THE DESCRIPTION OF THE SOIL OR BEDROCK CHANGED, THE DEPTH FROM WHICH EACH SAMPLE WAS RECOVERED, THE TYPE OF SAMPLE, THE NUMBER OF BLOWS FOR EACH 6 IN. OF DRIVE ON THE SPLIT-SPOON SAMPLER, THE NUMBER OF INCHES OF RECOVERY FOR EACH SAMPLE OBTAINED, LEVELS AT WHICH ANY GROUNDWATER OR SEEPAGE WAS ENCOUNTERED, ALONG WITH ANY OTHER PERTINENT INFORMATION DEVELOPED DURING THE DRILLING OPERATIONS.

UPON COMPLETION OF THE DRILLING PROGRAM, ALL SAMPLES (SOIL AND ROCK CORE) WERE RETURNED TO OUR CINCINNATI SOIL MECHANICS LABORATORY WHERE THE PROJECT ENGINEER INSPECTED EACH SAMPLE. THE ATTACHED STRUCTURE BORING LOGS WERE PREPARED BASED ON THE VISUAL INSPECTION OF THE RECOVERED SAMPLES, THE LABORATORY TEST DATA AND ODOT STANDARDS.

REPRESENTATIVE SOIL AND ROCK CORE SAMPLES WERE SELECTED FOR THE PERFORMANCE OF PHYSICAL TESTS IN OUR LABORATORY TO DETERMINE THEIR ENGINEERING CHARACTERISTICS. INCLUDED IN THE LABORATORY TEST PROGRAM WERE NATURAL MOISTURE CONTENT DETERMINATIONS, ATTERBERG LIMITS, SIEVE ANALYSES WITH HYDROMETER TESTS, UNCONFINED COMPRESSION TESTS AND A CONSOLIDATION TEST.

AUGER BORING LOCATION--PLAN VIEW

PRESS AND/OR DRIVE SAMPLE AND/OR CORE BORING LOCATION--PLAN VIEW

CAPPED PILE

FOOTING

FOOTING ON PILE

TR TOP OF ROCK

HORIZONTAL BAR ON BORING LOG INDICATES THE DEPTH THE SAMPLE WAS TAKEN

X/Y/Z FIGURES BESIDE THE BORING LOG IN PROFILE INDICATES THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST.

X=NUMBER OF BLOWS FOR FIRST 6-INCHES
Y=NUMBER OF BLOWS FOR SECOND 6-INCHES
Z=NUMBER OF BLOWS FOR THIRD 6-INCHES

W INDICATES FREE WATER ELEVATION

INDICATES STATIC WATER ELEVATION

SYMBOLS OF ROCK TYPES

- COAL
- WEATHERED MUDSTONE
- MUDSTONE
- WEATHERED SHALE
- SHALE
- CLAYSTONE
- SILTSTONE

- WEATHERED SANDSTONE
- SANDSTONE
- LEACHED DOLOMITE
- DOLOMITE
- LEACHED LIMESTONE
- LIMESTONE
- BOULDERS OR COBBLES

INVESTIGATIONAL FINDINGS

THE SOIL PROFILE AT THE PROJECT SITE WAS COMPRISED OF GLACIALLY DEPOSITED MATERIALS, RESTING ON DOLOMITE BEDROCK. THE GLACIAL DEPOSITS WERE PREDOMINANTLY COMPRISED OF GROUND MORAINIC OR GLACIAL TILL. THE NEAR SURFACE MATERIALS DEVELOPED THROUGH SEVERE WEATHERING OF THE PARENT GLACIAL TILL DEPOSITS. THE SURFACE MANTLE OF SEVERELY WEATHERED GLACIAL SOILS WAS UNDERLAIN BY LESS WEATHERED TO RELATIVELY UNWEATHERED DEPOSITS OF GLACIAL TILL. THE GLACIAL TILL DEPOSITS WERE COMPRISED OF TWO DISTINCT ZONES; AN UPPER ZONE THAT WAS BROWN IN COLOR AND THE LOWER ZONE OF GRAY COLOR. THE THICKNESS OF THE OVERBURDEN SOIL PROFILE (SEVERELY WEATHERED NEAR SURFACE GLACIAL SOILS AND THE UNDERLYING, LESS WEATHERED GLACIAL TILL DEPOSITS) WAS APPROXIMATELY 29 FT.

THE TEST BORINGS REPRESENTING THE STATE ROUTE 235 OVERPASS STRUCTURE, SR235-2 THROUGH SR235-6, WERE DRILLED WITHIN THE LIMITS OF THE EXISTING ROADWAY. THESE BORINGS, DRILLED AT THE EDGE OF THE PAVEMENT OR IN THE SHOULDER, INITIALLY ENCOUNTERED ASPHALT PAVEMENT AND/OR FILL MATERIALS. THE FILL, ENCOUNTERED TO A DEPTH OF BETWEEN 2.5 AND 8 FT., WAS CLASSIFIED AS A-7-6 CLAY, A-6B SILTY CLAY, A-6A SILT AND CLAY, AND A-4A SANDY SILT. THE CONSISTENCY OF THE ROADWAY FILL MATERIAL WAS STIFF TO VERY STIFF.

IN GENERAL, THE GLACIAL TILL DEPOSITS WERE ENCOUNTERED IMMEDIATELY UNDERLYING THE FILL SOILS. THE UPPER GLACIAL TILL SOILS WERE BROWN IN COLOR, BECOMING GRAY IN COLOR WITH DEPTH, TRANSITIONING FROM BROWN TO GRAY AT APPROXIMATELY 12.5 TO 15 FT. BELOW THE NATURAL GROUND SURFACE. THE GLACIAL TILL SOILS WERE PRIMARILY CLASSIFIED AS A-6A SILT AND CLAY, COMPRISED OF 15 TO 25% SAND SIZE PARTICLES AND LESS THAN 5% GRAVEL SIZE PARTICLES.

THE CONSISTENCY OF THE GLACIAL TILL SOILS RANGED FROM VERY STIFF TO HARD IN THE UPPER PORTION OF THE DEPOSITS, DECREASING TO VERY STIFF WITH INCREASED DEPTH. THE TEST BORINGS INDICATED THAT THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS WHICH WERE RATED VERY STIFF TO HARD, TYPICALLY CORRESPONDED TO THE BROWN COLORED GLACIAL TILL SOILS. THE N-VALUES WITHIN THE UPPER PORTION OF THE GLACIAL TILL DEPOSITS WERE IN THE LOW 20'S TO IN EXCESS OF 30 BLOWS PER FT. THE DECREASED CONSISTENCY, TO VERY STIFF, CORRESPONDED TO THE TRANSITION FROM THE BROWN TO THE GRAY GLACIAL TILL SOILS. THE N-VALUES TYPICALLY DECREASED TO THE MID TEENS TO THE LOW 20'S (BLOWS PER FT.) WITHIN THE LOWER PORTION OF THE GLACIAL TILL DEPOSITS.

POCKETS, SEAMS AND LAYERS OF SILT, SAND OR SAND AND GRAVEL WERE INTERBEDDED WITHIN THE GLACIAL TILL DEPOSITS. THESE GRANULAR FEATURES WERE TYPICALLY WATER BEARING AND RATED FROM MEDIUM DENSE TO DENSE IN COMPACTNESS. LOCALIZED ZONES OF SATURATED, MEDIUM STIFF TO STIFF CONSISTENCY GLACIAL TILL SOILS WERE ENCOUNTERED ABOVE AND BELOW THE WATER BEARING GRANULAR MATERIALS.

THE BEDROCK WITHIN THE PROJECT LIMITS, ENCOUNTERED BETWEEN ELEVATIONS 895.2 AND 893.9 AT THE REFERENCED SITE, IS UPPER SILURIAN TO LOWER DEVONIAN AGE DOLOMITE. THE BEDROCK CORES PERFORMED AT THE BRIDGE STRUCTURE INDICATED THAT THE DOLOMITE BEDROCK WAS SLIGHTLY VUGGY TO VUGGY AND HAD NEARLY UNIFORM, CLOSE TO VERY CLOSE SPACED PARTINGS. THE PARTINGS WERE WEATHERED NEAR THE SURFACE OF THE BEDROCK AND BECAME LESS WEATHERED WITH DEPTH, TYPICALLY SPACED AT LESS THAN 2 IN. NEAR VERTICAL JOINTS WERE NOTED THROUGHOUT THE BEDROCK CORE LENGTHS. THE ROCK HARDNESS RATING FOR THE DOLOMITE BEDROCK WAS HARD.

GENERAL INFORMATION

DRIVE SAMPLE/PRESS SAMPLE/CORE BORINGS

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, 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 SAMPLING DEVICE 18 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

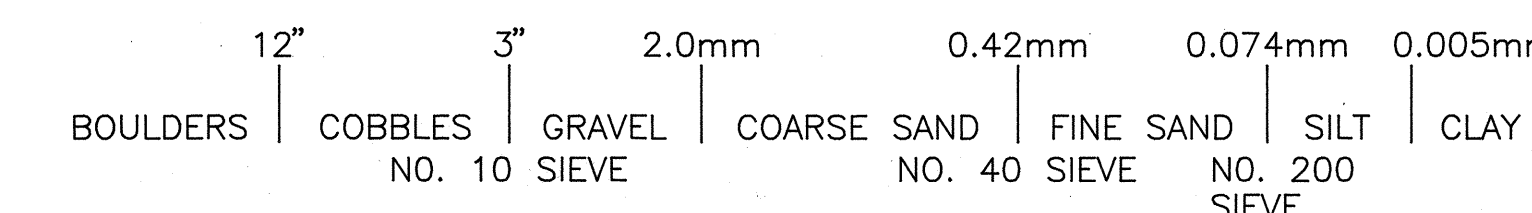
DRIVE/PRESS SAMPLE BORINGS ARE ALSO MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DEVICE, OR A 3" O.D. THIN WALL PRESS SAMPLING DEVICE. THE PRESS SAMPLER IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE, APPLIED BY THE DRILLING MACHINE.

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NXM CORE BARREL, WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6-INCH INCREMENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS, UTILIZING THE CASAGRANDE AC CLASSIFICATION SYSTEM, INCLUDING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS, RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

PARTICLE SIZE DEFINITIONS



NOTE: ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1800 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

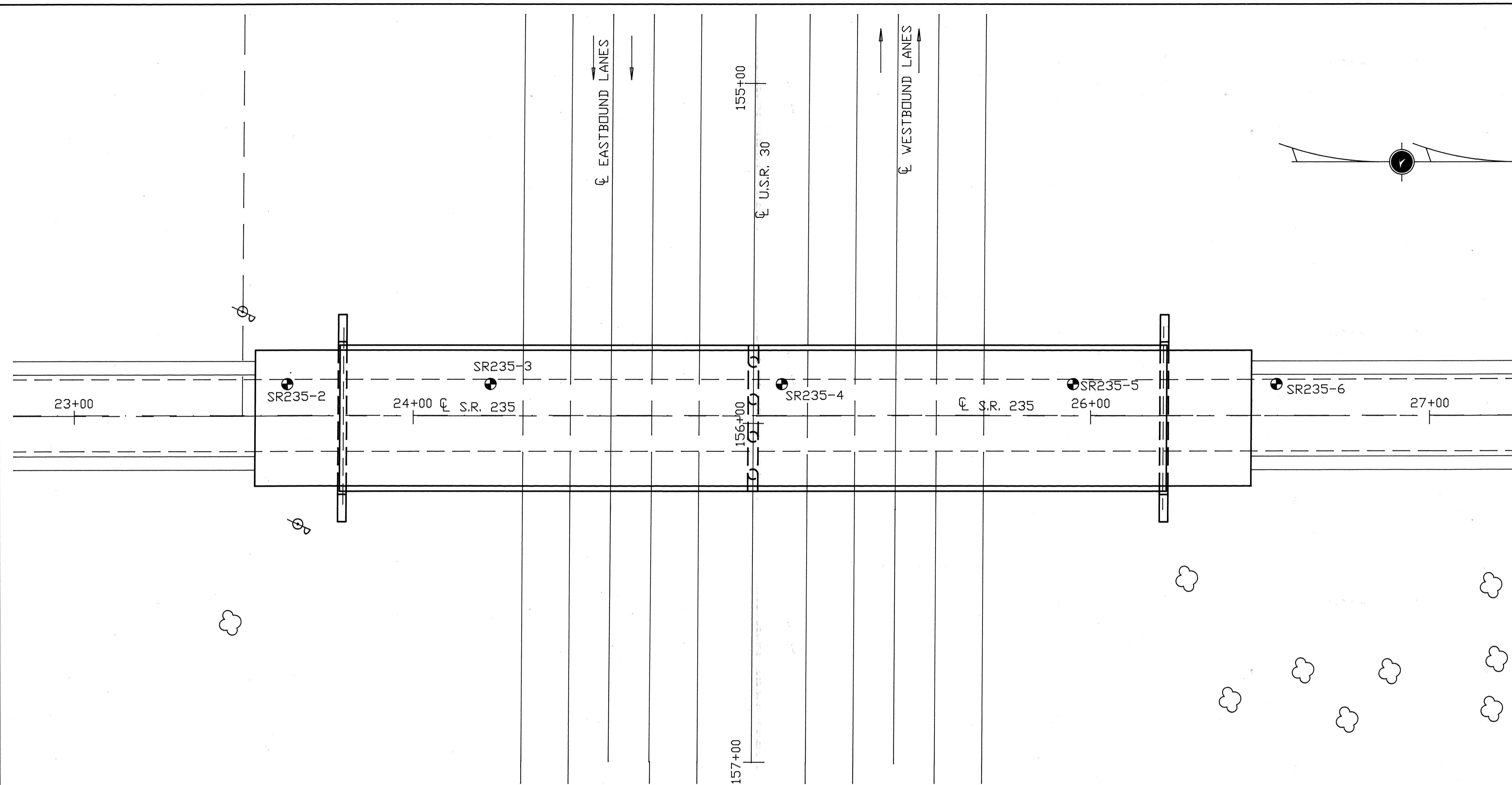
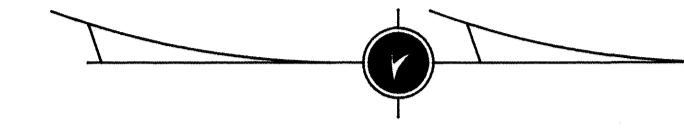
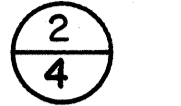
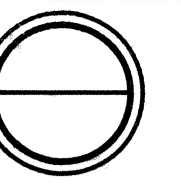
NOTE: Information shown by this subsurface investigation was obtained solely for the use in establishing design controls for the project. The State of Ohio does not guarantee the accuracy of this data and it is not to be construed as a part of the plans governing construction of the project.

THE H. C. NUTTING COMPANY GEOTECHNICAL ENGINEERS AIRPORT ROAD CINCINNATI, OHIO 45226		
STRUCTURE FOUNDATION INVESTIGATION		
PROJECT NO. ALL/HAN-30-20.31/0.00 BRIDGE CONSTRUCTION FOR STATE ROUTE 235 OVER U.S. 30, HANCOCK COUNTY, OHIO		
STRUCTURE NO. HAN-30-0295		W.O. NO. 04062.119
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	REVISED DATE 08 / 30 / 94

SOIL PROFILE

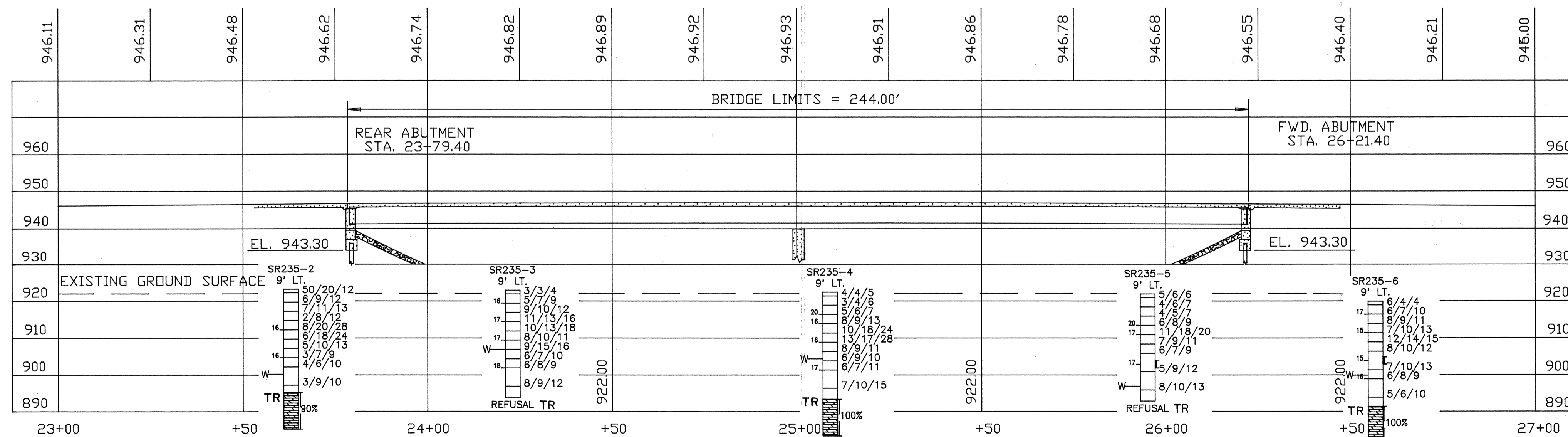
ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 STATE ROUTE 235 OVER U.S. 30,
 HANCOCK COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



PLAN

B-1 INDICATES SOIL BORING LOCATION
 SCALE: 1"=20' HORIZONTAL AND VERTICAL



PROFILE ALONG CL SR 235

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR STATE ROUTE 235
 OVER U.S. 30, HANCOCK COUNTY, OHIO
 STRUCTURE NO. HAN-30-0295

BORING DATA

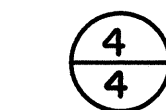
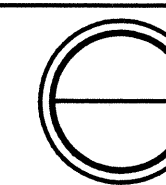
CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 06/03/94
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DRAWING NO. 111555P-101

SOIL PROFILE

ALL/HAN-30-20.31/0.00
 BRIDGE CONSTRUCTION FOR
 STATE ROUTE 235 OVER U.S. 30,
 HANCOCK COUNTY, OHIO

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 CINCINNATI, OHIO 45226



LOG OF BORING

DATE STARTED 03/17/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
 DATE COMPLETED 03/17/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE 896.9
 BORING NUMBER SR235-5 CORE BARREL: TYPE NXM SIZE 2.125" I.D. AFTER COMP. HRS. 905.9
 STATION & OFFSET 25+95 9' LT., (STATE ROUTE 235) SURFACE ELEVATION 921.9

ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL. class
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	
921.9	0		ASPHALT PAVEMENT										
920.9	2	5-6-6	DARK BROWN SANDY SILT, MOIST - VERY STIFF (FILL)	1	V	I	S	U	A	L			A-4a
919.4	4	4-6-7	BROWN AND GRAY CLAY, MOIST - STIFF (FILL)	2	V	I	S	U	A	L			A-7-6
916.9	6	4-5-7	BROWN AND GRAY CLAY, MOIST - STIFF	3	V	I	S	U	A	L			A-7-6
914.4	8	6-8-9	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	4	V	I	S	U	A	L	20		A-6a
	10												
	12	11-18-20		5	V	I	S	U	A	L	17		A-6a
909.4	14	7-9-11	GRAY SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, NOTED SAND SEAMS, MOIST - STIFF TO VERY STIFF (GLACIAL TILL)	6	V	I	S	U	A	L	17		A-6a
	16	6-7-9		7	V	I	S	U	A	L			A-6a
	18												
	20	PUSHED		ST	3	6	12	37	42	29	13	17	A-6a(9)
	22	5-9-12		8	V	I	S	U	A	L			A-6a
	24												
	26	8-10-13		9	V	I	S	U	A	L			A-6a
892.9	28												

BORING COMPLETED @ 29.0'
 (AUGER REFUSAL ON BEDROCK)

LOG OF BORING

DATE STARTED 03/17/94 SAMPLER: TYPE SPLIT SPOON DIA. 2.0" O.D. WATER ELEVATION:
 DATE COMPLETED 03/17/94 CASING: LENGTH 5' HOLLOW STEM AUGER DIA. 3.25" I.D. IMMEDIATE 901.6
 BORING NUMBER SR235-6 CORE BARREL: TYPE NXM SIZE 2.125" I.D. AFTER COMP. HRS. 909.6
 STATION & OFFSET 26+55 9' LT., (STATE ROUTE 235) SURFACE ELEVATION 921.6

ELEV.	DEPTH	STD. PEN. (N)	DESCRIPTION	SA. NO.	PHYSICAL CHARACTERISTICS								SHTL. class
					% AGG	% CS	% FS	% SILT	% CLAY	% LL	% PI	% WC	
921.6	0		ASPHALT PAVEMENT										
921.0	2	6-4-4	DARK BROWN SANDY SILT, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO STIFF (FILL)	1	V	I	S	U	A	L			A-4a
919.1	4	6-7-10	BROWN, TRACE GRAY, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	2	V	I	S	U	A	L	17		A-6a
	6	8-9-11		3	V	I	S	U	A	L			A-6a
914.1	8	7-10-13	BROWN SILT AND CLAY, LITTLE SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF TO HARD (GLACIAL TILL)	4	V	I	S	U	A	L	15		A-6a
	10												
	12	12-14-15		5	V	I	S	U	A	L			A-6a
909.1	14	8-10-12	GRAY SILT AND CLAY, SOME SAND, TRACE GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	6	V	I	S	U	A	L			A-6a
	16	PUSHED		ST	3	10	15	36	36	27	12	15	A-6a(8)
904.1	18	7-10-13	GRAY SILT AND CLAY, TRACE SAND, GRAVEL AND ROCK FRAGMENTS, MOIST - VERY STIFF (GLACIAL TILL)	7	V	I	S	U	A	L			A-6a
	20												
	22	6-8-9		8	V	I	S	U	A	L			A-6a
	24												
	26	5-6-10		9	V	I	S	U	A	L	16		A-6a
893.1	28												
	30		LIGHT BROWN, SLIGHTLY WEATHERED, SLIGHTLY VUGGY, DENSE, HARD DOLOMITE, NOTED NEAR UNIFORM WEATHERED CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS										
889.1	32												
	34		LIGHT GRAY, SLIGHTLY WEATHERED, VUGGY, HARD DOLOMITE, NOTED NEAR UNIFORM SLIGHTLY WEATHERED CLOSE TO VERY CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS	C-1	NXM		REC. 100%		RQD. 3%				
886.1	36												
	38		GRAY, SLIGHTLY VUGGY, DENSE, HARD DOLOMITE, NOTED NEAR UNIFORM CLOSE SPACED PARTINGS, NOTED NEAR VERTICAL JOINTS										

BORING COMPLETED @ 38.5'

THE H.C. NUTTING COMPANY
 GEOTECHNICAL ENGINEERS
 AIRPORT ROAD CINCINNATI OHIO 45226

STRUCTURE FOUNDATION INVESTIGATION
 PROJECT NO. ALL/HAN-30-20.31/0.00 W.O. NO. 04062.119
 BRIDGE CONSTRUCTION FOR STATE ROUTE 235
 OVER U.S. 30, HANCOCK COUNTY, OHIO
 STRUCTURE NO. HAN-30-0295

BORING DATA

CHECKED BY K.G.A.	REVIEWED BY A.P.A.	DATE 05/20/94
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