REPORT OF SUBSURFACE INVESTIGATION
MUHLHAUSER ROAD BRIDGES
BUTLER COUNTY, OHIO

GENERAL INFORMATION

INTRODUCTION

THIS REPORT CONSISTS OF THE SOILS INVESTIGATION FOR TWO (2) BRIDGES THAT ARE TO BE CONSTRUCTED AS PART OF THE EXTENSION OF MUHLHAUSER ROAD FROM ITS CURRENT EASTERN TERMINUS TO ALLEN ROAD IN BUTLER COUNTY, OHIO. SPECIFICALLY, THESE BRIDGES WILL CROSS AN EXISTING RAILWAY AT APPROXIMATELY STATION 140+00, AND THE MILL CREEK AT APPROXIMATELY STATION 150+00.

SITE GEOLOGY

THIS SITE IS LOCATED ON THE WEST SIDE OF THE PRESENT MILL CREEK VALLEY JUST SOUTH OF ITS JUNCTURE WITH THE GREAT MIAMI RIVER VALLEY. THESE CURRENT DAY VALLEYS WERE ACTUALLY FORMED BY TRIBUTARIES OF THE PREGLACIAL TEAYS RIVER WHICH FLOWED IN A NORTHERLY DIRECTION. THESE ANCIENT VALLEYS ARE FILLED WITH RECENT ALLUVIUM AND GLACIAL OUTWASH, WITH INTERSPERSED DEPOSITS OF GLACIAL TILL AND GLACIO-LACUSTRINE SOILS, UNDERLAIN BY BEDROCK AT RELATIVELY GREAT DEPTHS. THE BEDROCK BENEATH THIS SITE IS MAPPED AS BEING SEDIMENTARY ROCK OF THE ORDOVICIAN GEOLOGIC SYSTEM, SPECIFICALLY SHALE WITH INTERBEDDED LIMESTONE OF THE KOPE FORMATION.

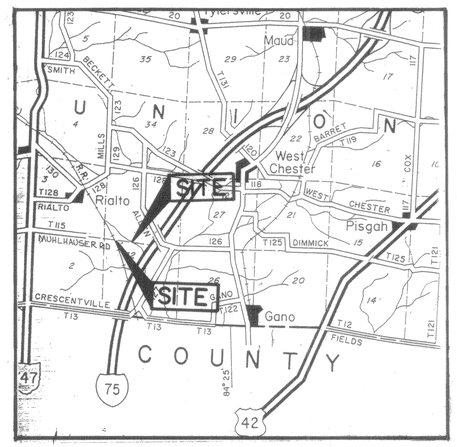
EXPLORATION

EIGHT (8) EXPLORATORY BORINGS WERE MADE FOR THE INVESTIGATION REPORTED ON HEREIN USING TRUCK AND SKID-MOUNTED DRILLING RIGS EQUIPPED WITH ROTARY HEADS. THE BORINGS WERE ADVANCED WITH HOLLOW STEM AUGERS, AND SOIL SAMPLES WERE OBTAINED BY SPLIT SPOON AND THIN-WALL (SHELBY) TUBE METHODS IN ACCORDANCE WITH ASTM D-1586 AND D-1587, RESPECTIVELY. THE DRILLING OF THESE BORINGS TOOK PLACE BETWEEN MAY 1 AND MAY 12, 1995. SEVERAL BORINGS HAD PREVIOUSLY BEEN MADE IN THE VICINITY OF THE WEST END OF THE RAILWAY CROSSING BRIDGE. ALTHOUGH THE LOCATIONS OF THESE PREVIOUS BORINGS ARE SHOWN ON THE ATTACHED PLANS, THE OLD BORING LOGS ARE NOT PRESENTED ON THESE DRAWINGS, BUT ARE INCLUDED WITH THE REPORT TEXT.

LEGEND FOR PROJECT – AVERAGE RESULTS OF TESTS – 12 SAMPLES TESTED

DESCRIPTION	CLASS H.R.B.	CLASS OHIO	% AGG.	% C. SAND	% F. SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	WATER CONTENT	SAMPLES TESTED
GRAVEL AND/OR STONE FRAGMENTS	A-1-a(0)	A-1-a	60	21	11	– 8 –		NP	NP	—	2
GRAVEL AND/OR STONE FRAGMENTS WITH SAND	A-1-b(0)	A-1-b	31	45	11	– 13 –		NP	NP	9	2
COARSE AND FINE SAND	——	A-3a	VISUAL ESTIMATION								
SANDY SILT	A-4(3)	A-4a	21	17	14	26	22	23	10	11	1
SILT AND CLAY	A-6(6)	A-6a	4	14	25	30	27	28	15	13	2
SILTY CLAY	A-6(9)	A-6b	1	9	26	35	29	36	17	26	3
CLAY	A-7-6(9)	A-7-6	0	17	27	44	12	42	22	20	1

SOIL BORING - PLAN VIEW STATIC WATER W - FREE WATER



SITE VICINITY MAP

NUMBER OF BLOWS FOR STANDARD PENETRATION TEST

X / Y / Z

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

NOTE: FIGURES BESIDE BORINGS INDICATE WATER CONTENT IN PERCENT.

GENERAL INFORMATION (CONTINUED)

INVESTIGATIONAL FINDINGS

RAILWAY CROSSING BRIDGE: APPROXIMATELY 5 TO 8 FEET OF RECENT ALLUVIUM CONSISTING OF BROWN OR GRAY SILTY TO SANDY CLAYS (A-6b AND A-7-6) WITH OCCASIONAL TO NUMEROUS SAND SEAMS WAS FOUND FROM THE SURFACE OR BENEATH THE FILL. THE CONSISTENCY OF THE ALLUVIUM RANGES FROM SOFT TO STIFF. BENEATH THE ALLUVIUM, A VERY STIFF TO HARD BROWN GRADING TO GRAY SILTY CLAY TO SILT AND CLAY (A-6a OR A-6b) GLACIAL TILL WAS TYPICALLY ENCOUNTERED. A MEDIUM DENSE TO DENSE LAYER OF SAND (A-3a) WAS ENCOUNTERED WITHIN THE TILL IN OLD BORING 12A AND BORING 101 AT ABOUT 17 TO 23 FEET DEEP, AND A VERY DENSE DEPOSIT OF GRAVEL (A-1-a) OR GRAVEL AND SAND (A-1-b) WAS ENCOUNTERED BELOW ABOUT 84 TO 102 FEET DEEP IN BORINGS 102 AND 103. REFUSAL, POSSIBLY DUE TO THE ENCOUNTER OF BEDROCK, OCCURRED AT ABOUT 79 AND 104 FEET DEEP IN BORINGS 102 AND 103. THE WATER TABLE WAS AT ABOUT ELEVATION 580± AT THE TIME OF THE BORINGS, BUT APPEARS TO RISE TO NEAR THE GROUND SURFACE ON OCCASION.

MILL CREEK CROSSING BRIDGE: BENEATH THE RECENTLY PLACED FILLS, 6 TO 11± FEET OF ALLUVIUM SIMILAR TO THAT DESCRIBED ABOVE WAS ENCOUNTERED AT THIS LOCATION. THE ALLUVIUM IS IN TURN UNDERLAIN BY MEDIUM DENSE TO DENSE GRAVEL AND SAND (A-1-a) TO SAND AND GRAVEL (A-1-b) OR VERY DENSE SAND (A-3a) TO ABOUT 47 TO 52 FEET DEEP. THESE GRANULAR SOILS ARE THEN UNDERLAIN BY HARD GRAY SANDY SILT (A-4a) TO SILT AND CLAY (A-6a) GLACIAL TILLS TO THE TERMINATION DEPTH OF THE BORINGS (90 FEET). THE GROUNDWATER TABLE APPEARED TO COINCIDE WITH THE LEVEL OF THE ADJACENT MILL CREEK AT THE TIME OF OUR DRILLING, OR AT ABOUT ELEVATION 578±.

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DESIGNED | DRAWN | CHECKED | REVIEWED | DATE
STRUCTURE FILE NUMBER 22-03-95-5307O
REVISED

SOIL PROFILE
MUHLHAUSER ROAD BRIDGES
BUTLER COUNTY, OHIO

BORING NUMBER 101
STATION and OFFSET 139+64, 26' RT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY (Y)

GROUNDWATER DEPTH
AT COMPLETION 10.0 FT.
AFTER ____ FT.
WATER ON RODS 19.5 FT.

DRILLING and SAMPLING INFORMATION
DATE STARTED 05-04-95
DATE COMPLETED 05-10-95
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA
HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. ____ IN.

BORING METHOD
HSA-HOLLOW STEM AUGERS
CFA-CONTINUOUS FLIGHT AUGERS
DC -DRIVING CASING
MD -MUD DRILLING

SAMPLE METHOD
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

SURFACE ELEVATION 592.2

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
FILL - BROWN SILTY CLAY.	1.5		1	SS	2-2-2	27								16	
MOTTLED BROWN SILTY CLAY TO SILT AND CLAY, WITH TRACE SAND AND FINE GRAVEL. MOIST, SCFT TO STIFF	8.0	5	2	SS	3-5-5	87								22	
			3	SS	5-5-7	100								18	
BROWN (GRADING TO GRAY BELOW 15.0 FT) SILT AND CLAY, WITH LITTLE SAND AND TRACE GRAVEL. (GLACIAL TILL) MOIST, VERY STIFF TO HARD		10	4	SS	6-10-15	100									
			5	SS	5-15-19	100								11	
		15	6	SS	8-12-19	73									
			7	SS	8-13-19	80								10	
		20	8	SS	4-19-36	60									
	23.0		9	SS	9-13-19	67								10	
GRAY SILTY FINE TO COARSE SAND AND GRAVEL, WITH TRACE CLAY. WET, DENSE		25	10	SS	19-26-22	27									
		30	11	SS	9-23-16	53									
		35	12	SS	10-31-50/.3	47									
	37.0														
GRAY SILT AND CLAY, WITH TRACE SAND TO SANDY SILT, WITH SOME CLAY AND TRACE TO LITTLE GRAVEL. (GLACIAL TILL) MOIST, HARD		40	13	SS	15-14-19	93								13	
		45	14	SS	11-22-28	100									
		50	15	SS	13-16-23	100								10	
		55	16	SS	10-19-31	100									

BORING NUMBER 101
STATION and OFFSET 139+64, 26' RT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY (Y)

GROUNDWATER DEPTH
AT COMPLETION 10.0 FT.
AFTER ____ FT.
WATER ON RODS 19.5 FT.

DRILLING and SAMPLING INFORMATION
DATE STARTED 05-04-95
DATE COMPLETED 05-10-95
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA
HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. ____ IN.

BORING METHOD
HSA-HOLLOW STEM AUGERS
CFA-CONTINUOUS FLIGHT AUGERS
DC -DRIVING CASING
MD -MUD DRILLING

SAMPLE METHOD
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

SURFACE ELEVATION 592.2

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
GRAY SILT AND CLAY, WITH TRACE SAND TO SANDY SILT, WITH SOME CLAY AND TRACE TO LITTLE GRAVEL. (GLACIAL TILL) MOIST, HARD		60	17	SS	9-16-23	87								13	
		65	18	SS	8-14-19	100									
		70	19	SS	13-21-35	73								11	
		75	20	SS	11-19-31	100									
	77.0														
MOTTLED GRAY AND BROWN SILTY CLAY AND LIGHT GRAY POSSIBLE WEATHERED SHALE, WITH SOME ROCK FRAGMENTS AND TRACE GRAVEL.	79.0	80	21	SS	100/0.5'	80								15	
BORING DISCONTINUED AT 79.0 FEET DEPTH DUE TO SAMPLER REFUSAL.		85													
BORING CAVED AT 2.0 FEET DEPTH.		90													
		95													
		100													
		105													
		110													

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DESIGNED | DRAWN | REVIEWED | DATE
CHECKED (Y)
REVISED

STRUCTURE FILE NUMBER 22-03-95-53070

BORING NUMBER 101

SOIL PROFILE
MUHLHAUSER ROAD BRIDGES
BUTLER COUNTY, OHIO

10

BORING NUMBER 102
STATION and OFFSET 140+28, 13' LT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH

AT COMPLETION DRY FT.
AFTER 36 HOURS DRY FT.
WATER ON RODS 10.0 FT.

DRILLING and SAMPLING INFORMATION

DATE STARTED 05-06-95
DATE COMPLETED 05-08-95
DRILL FOREMAN R. GERARD
INSPECTOR
BORING METHOD HSA

HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. 2 IN.
SHELBY TUBE O.D. 3 IN.

BORING METHOD: HSA-HOLLOW STEM AUGERS; CFA-CONTINUOUS FLIGHT AUGERS; DC -DRIVING CASING; MD -MUD DRILLING

SAMPLE METHOD: SS - DRIVEN SPLIT SPOON; ST - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE

SURFACE ELEVATION 590.2

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
GRAY SILT AND CLAY WITH TRACE SAND TO SANDY SILT, WITH SOME CLAY AND TRACE TO LITTLE GRAVEL. (GLACIAL TILL) MOIST, VERY STIFF TO HARD		60	16	SS	14-18-27	100									
--SILT PARTINGS IN SAMPLE #17		65	17	SS	11-16-22	80								19	
--OCCASIONAL SMALL WET SAND SEAMS BELOW APPROXIMATELY 67 FEET.		70	18	SS	12-15-17	27									
		75	19	SS	10-17-21	90								10	
		80	20	SS	9-15-19	7									
	84.0														
GRAY FINE TO COARSE GRAVEL AND SAND, WET, DENSE		85	21	SS	7-15-31	67									
		90	22	SS	8-21-42	100	51	24	9	16					A-1-b
	93.0														
GRAY FINE TO COARSE GRAVEL WITH COBBLE/ BOULDER ZONES. WET, VERY DENSE		95	23	SS	50/0.3'	0									
MOTTLED BROWN AND GRAY SANDY CLAY, WITH TRACE TO LITTLE GRAVEL. (APPARENT GRAY WEATHERED SHALE IN BOTTOM OF SAMPLE #24) MOIST, HARD	102.0	100	23A	RC		20									
	103.9		24	SS	100/0.4'	100								11	
BORING DISCONTINUED AT 103.9 FEET DEPTH DUE TO SAMPLER REFUSAL. BORING CAVED AT 8.0 FEET DEPTH.		105													
		110													

BORING NUMBER 102
STATION and OFFSET 140+28, 13' LT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH

AT COMPLETION DRY FT.
AFTER 36 HOURS DRY FT.
WATER ON RODS 10.0 FT.

DRILLING and SAMPLING INFORMATION

DATE STARTED 05-06-95
DATE COMPLETED 05-08-95
DRILL FOREMAN R. GERARD
INSPECTOR
BORING METHOD HSA

HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. 2 IN.
SHELBY TUBE O.D. 3 IN.

BORING METHOD: HSA-HOLLOW STEM AUGERS; CFA-CONTINUOUS FLIGHT AUGERS; DC -DRIVING CASING; MD -MUD DRILLING

SAMPLE METHOD: SS - DRIVEN SPLIT SPOON; ST - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE

SURFACE ELEVATION 590.2

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
FILL - DARK GRAYISH-BROWN SILTY CLAY, WITH TRACE SAND, GRAVEL, CINDERS AND SLAG, MOIST, MEDIUM STIFF	5.0	5	1	SS	2-3-5	73								22	
			2	SS	3-4-7	0									
BROWNISH-GRAY SILTY CLAY, WITH TRACE FINE SAND, MOIST, MEDIUM STIFF	10.5	10	3	SS	2-3-4	87	2	6	20	33	39	38	19	24	A-6b
			3A	ST		55								16	
BROWN SILTY CLAY, WITH TRACE SAND AND FINE TO MEDIUM GRAVEL. (GLACIAL TILL) MOIST, VERY STIFF	13.5		4	SS	10-10-15	80								8	
		15	5	SS	9-13-18	100								12	
GRAY SILT AND CLAY, WITH TRACE SAND TO SANDY SILT WITH SOME CLAY AND TRACE TO LITTLE GRAVEL. (GLACIAL TILL) MOIST, VERY STIFF TO HARD			6	SS	11-15-17	87									
		20	7	SS	12-14-16	100								12	
			8	SS	10-11-11	100									
		25	9	SS	5-7-12	100								15	
		30	10	SS	10-12-18	87									
		35	11	SS	7-15-19	100								12	
		40	12	SS	10-15-19	100									
		45	13	SS	11-16-21	100	8	11	28	29	24	27	15	11	A-6a
		50	14	SS	15-18-26	100									
		55	15	SS	12-17-25	100								10	

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DESIGNED | DRAWN | REVIEWED | DATE
CHECKED | REVISED | STRUCTURE FILE NUMBER 22-03-95-53070

BORING NUMBER 102

SOIL PROFILE
MUHLHAUSER ROAD BRIDGES
BUTLER COUNTY, OHIO

9
9

BORING NUMBER 103
STATION and OFFSET 141+27, 36' RT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH

AT COMPLETION ____ FT.
AFTER ____ FT.
WATER ON RODS 10.5 FT.

DRILLING and SAMPLING INFORMATION

DATE STARTED 05/04/95
DATE COMPLETED 05/04/95
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA

HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. 3 IN.

BORING METHOD	SAMPLE METHOD
HSA-HOLLOW STEM AUGERS	SS - DRIVEN SPLIT SPOON
CFA-CONTINUOUS FLIGHT AUGERS	ST - PRESSED SHELBY TUBE
DC -DRIVING CASING	CA - CONTINUOUS FLIGHT AUGER
MD -MUD DRILLING	RC - ROCK CORE

SURFACE ELEVATION 590.3

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
FILL - BROWN SILTY CLAY, WITH TRACE LIMESTONE FRAGMENTS AND OCCASIONAL LIMESTONE BOULDER. MOIST, STIFF			1	SS	15-9-9	53								16	
	6.0	5	2	SS	9-50/0.3'	75								12	
DARK BROWN SILTY CLAY, WITH TRACE SAND AND ORGANICS. MOIST, STIFF	8.0		3	SS	6-7-50/0.2	50								24	
--HIT BOULDER IN SAMPLE #3		10	4	SS	3-5-5	80	5	19	35	18	23	41	20	24	A-7-6
			4A	ST		100								17	
GRAY SANDY CLAY, WITH TRACE FINE GRAVEL. VERY MOIST, MEDIUM STIFF	13.0	15	5	SS	12-16-26	20								16	
BROWN TO MOTTLED BROWN AND GRAY SILTY CLAY, WITH TRACE SAND AND FINE GRAVEL. (GLACIAL TILL) MOIST, VERY STIFF	18.0		6	SS	21-20-27	53									
		20	7	SS	9-9-10	67								12	
GRAY SILT AND CLAY, WITH TRACE SAND TO SANDY SILT WITH SOME CLAY AND TRACE TO LITTLE GRAVEL. (GLACIAL TILL) MOIST, VERY STIFF TO HARD.			8	SS	11-12-13	80									
--WET SEAM OF COARSE SAND IN SAMPLE #7		25	9	SS	6-11-16	87								17	
--SMALL THIN SILT PARTINGS AND NO GRAVEL IN SAMPLES #8 AND #9		30	10	SS	7-17-21	93									
		35	11	SS	8-16-24	100								11	
		40	12	SS	12-26-28	80									
		45	13	SS	12-15-20	100								11	
		50	14	SS	11-17-19	100									
		55	15	SS	13-16-21	100								10	

BORING NUMBER 103
STATION and OFFSET 141+27, 36' RT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH

AT COMPLETION ____ FT.
AFTER ____ FT.
WATER ON RODS 10.5 FT.

DRILLING and SAMPLING INFORMATION

DATE STARTED 05/04/95
DATE COMPLETED 05/04/95
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA

HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. 3 IN.

BORING METHOD
HSA-HOLLOW STEM AUGERS
CFA-CONTINUOUS FLIGHT AUGERS
DC -DRIVING CASING
MD -MUD DRILLING

SAMPLE METHOD
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

SURFACE ELEVATION 590.3

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
GRAY SILT AND CLAY WITH TRACE SAND TO SANDY SILT WITH SOME CLAY AND TRACE TO LITTLE GRAVEL. (GLACIAL TILL) MOIST, HARD		60	16	SS	22-22-25	67									
		65	17	SS	10-17-20	100								12	
		70	18	SS	12-25-17	100									
		75	19	SS	14-18-20	100								11	
		80	20	SS	12-23-25	100									
		85	21	SS	12-20-24	100								11	
		90	22	SS	12-25-26	33									
		95	23	SS	15-22-27	100								10	
--SEAM OF FINE GRAVEL IN SAMPLE #24		100	24	SS	17-20-21	73									
GRAY FINE SAND TO MEDIUM GRAVEL. WET, VERY DENSE	102.0	105	25	SS	21-46-38	67									
BORING DISCONTINUED AT 105.0 FEET DEPTH. BORING CAVED AT 11.0 FEET DEPTH.	105.0	110													

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FAX 513/297-6805

DRAWN | DESIGNED | CHECKED | REVIEWED | DATE | STRUCTURE FILE NUMBER 22-03-95-53070 | REVISED

BORING NUMBER 103

SOIL PROFILE
MUHLHAUSER ROAD BRIDGES
BUTLER COUNTY, OHIO

7

10

BORING NUMBER 104
STATION and OFFSET 142+43, 87' RT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH

AT COMPLETION 18.5 FT.
AFTER ____ FT.
WATER ON RODS 18.5 FT.

DRILLING and SAMPLING INFORMATION

DATE STARTED 05/12/05
DATE COMPLETED 05/12/95
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA
HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. 3 IN.

BORING METHOD: HSA-HOLLOW STEM AUGERS; CFA-CONTINUOUS FLIGHT AUGERS; DC -DRIVING CASING; MD -MUD DRILLING

SAMPLE METHOD: SS - DRIVEN SPLIT SPOON; ST - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE

SURFACE ELEVATION 590.8

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
FILL - MOTTLED BROWN SILTY CLAY, WITH TRACE SAND, FINE TO COARSE GRAVEL AND SHALE FRAGMENTS, MOIST, SOFT TO STIFF	5.5	5	1	SS	2-1-7	67								17	
			2	SS	6-11-9	40								16	
MOTTLED BROWN SILTY CLAY, WITH TRACE SAND, FINE TO COARSE GRAVEL AND IRON OXIDE STAINS, MOIST, MEDIUM STIFF	11.0		3	SS	3-5-7	67								24	
		10	4	SS	2-3-6	67								10	
BROWN (GRADING TO GRAY BELOW 13.0 FT) SILT AND CLAY, WITH TRACE SAND AND FINE TO COARSE GRAVEL. (GLACIAL TILL) MOIST, VERY STIFF			5	SS	6-8-11	100								9	
		15	6	SS	10-13-12	100								10	
--WET COARSE GRAVEL SEAMS BELOW 18.0 FT			7	SS	12-14-14	100								7	
		20	8	SS	24-50/0.4'	78								8	
	23.0		9	SS	26-27-30	100								10	
GRAY SILT AND CLAY, WITH OCCASIONAL THIN FINE SAND LENSE AND TRACE ORGANICS. (GLACIO-LAUCUSTRINE) MOIST, HARD	25.0	25	10	SS	19-17-24	100	0	17	22	31	30	28	15	15	A-6a

BORING DISCONTINUED AT 25.0 FEET DEPTH.
BORING CAVED AT 2.0 FEET DEPTH.

SHELBY TUBE SAMPLE (3A) OBTAINED IN OFFSET BORING FROM 7 TO 9 FT DEPTH, 52% RECOVERY.

BORING NUMBER 105
STATION and OFFSET 141+35, 89' LT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH

AT COMPLETION 5.5 FT.
AFTER ____ FT.
WATER ON RODS 15.0 FT.

DRILLING and SAMPLING INFORMATION

DATE STARTED 05/12/95
DATE COMPLETED 05/12/95
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA
HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. 3 IN.

BORING METHOD: HSA-HOLLOW STEM AUGERS; CFA-CONTINUOUS FLIGHT AUGERS; DC -DRIVING CASING; MD -MUD DRILLING

SAMPLE METHOD: SS - DRIVEN SPLIT SPOON; ST - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE

SURFACE ELEVATION 588.9

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
FILL - MOTTLED BROWN SILTY CLAY, WITH TRACE LIMESTONE FRAGMENTS AND SHALE, MOIST, STIFF	2.0		1	SS	6-5-11	100								21	
DARK BROWN SILTY CLAY, WITH TRACE SAND, MOIST, STIFF	5.5	5	2	SS	5-6-8	80								22	
MOTTLED BROWN SILTY CLAY, WITH TRACE FINE SAND, MOIST, STIFF	10.0		3	SS	4-4-6	27								19	
		10	3A	ST		100								15	
MOTTLED ORANGE BROWN AND GRAY SILTY CLAY, WITH SOME FINE SAND, MOIST, MEDIUM STIFF	14.5		4	SS	3-4-5	100	0	9	30	25	36	35	16	30	A-6b
		15	5	SS	2-2-3	100								20	
GRAY SILTY CLAY, WITH TRACE TO LITTLE SAND, TRACE FINE GRAVEL AND NUMEROUS SAND SEAMS, MOIST, MEDIUM STIFF	18.5		5A	ST		75								19	
			6	SS	8-5-4	67								11	
GRAY VERY SILTY CLAY, WITH LITTLE FINE SAND, WET, MEDIUM STIFF	20.5	20	7	SS	1-2-4	100	0	12	29	47	12	36	17	25	A-6b
			8	SS	9-18-10	100								7	
GRAY FINE TO COARSE SAND AND GRAVEL, WET, MEDIUM DENSE	24.0	25	9	SS	10-25-26	33								12	
GRAY SILTY CLAY, WITH GRAVEL AND ROCK FRAGMENTS, MOIST, HARD	25.0														

BORING DISCONTINUED AT 25.0 FEET DEPTH.
BORING CAVED AT 9.4 FEET DEPTH.

ATEC Associates, Inc.
CINCINNATI 45241-1861 (513)771-2112
DAYTON 45429 (513)297-6666
FAX 513/297-6699

REVIEWED | DATE
DRAWN | REVISED
DESIGNED | CHECKED

STRUCTURE FILE NUMBER 22-03-95-53070

BORING NUMBER 104 & 105

SOIL PROFILE
MUHLHAUSER ROAD BRIDGES
BUTLER COUNTY, OHIO

10

BORING NUMBER 106
STATION and OFFSET 149+62, 32' RT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH

AT COMPLETION 18.5 FT.
AFTER ____ FT.
WATER ON RODS 18.0 FT.

DRILLING and SAMPLING INFORMATION

DATE STARTED 05/03/95
DATE COMPLETED 05/03/95
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA

HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. ____ IN.

BORING METHOD: HSA-HOLLOW STEM AUGERS; CFA-CONTINUOUS FLIGHT AUGERS; DC -DRIVING CASING; MD -MUD DRILLING

SAMPLE METHOD: SS - DRIVEN SPLIT SPOON; ST - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE

SURFACE ELEVATION 588.9

SOIL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
FILL - BROWN SILTY CLAY, WITH TRACE GRAY SHALE AND LIMESTONE FRAGMENTS AND OCCASIONAL LIMESTONE BOULDER, MOIST, MEDIUM STIFF		1	SS	2-3-3	47								17	
		2	SS	3-4-4	40								25	
	7.0	3	SS	5-6-13	87								14	
DARK BROWN SILTY CLAY, WITH TRACE SAND AND FINE GRAVEL, MOIST, VERY STIFF	10.5	4	SS	6-8-12	80								18	
GRAY SILTY CLAY, WITH TRACE SAND, FINE GRAVEL AND ORGANICS, MOIST, MEDIUM STIFF		5	SS	4-5-5	100								25	
		6	SS	3-3-5	100									
		7	SS	3-4-4	67								23	
	18.0	8	SS	1-1-4	100									
GRAY FINE TO COARSE SAND, WITH LITTLE FINE GRAVEL, WET, LOOSE TO MEDIUM DENSE		9	SS	4-5-6	100	12	65	12	11				9	A-1-b
		10	SS	7-8-9	67									
		11	SS	8-15-17	100								9	
--COARSE GRAVEL FRAGMENTS IN SAMPLE #12		12	SS	15-15-8	100									
	37.0													
GRAY FINE TO COARSE GRAVEL AND SAND, MOIST, WET, DENSE		13	SS	17-27-22	13									
		14	SS	22-39-35	67	50	24	14	12					A-1-a
	47.0													
GRAY SILT AND CLAY, WITH TRACE SAND TO SANDY SILT WITH SOME CLAY AND TRACE TO LITTLE GRAVEL, (GLACIAL TILL) MOIST, HARD --FINE SAND SEAM IN SAMPLE #16		15	SS	15-28-40	67								9	
		16	SS	15-30-41	7									

BORING NUMBER 106
STATION and OFFSET 149+62, 32' RT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH

AT COMPLETION 18.5 FT.
AFTER ____ FT.
WATER ON RODS 18.0 FT.

DRILLING and SAMPLING INFORMATION

DATE STARTED 05/03/95
DATE COMPLETED 05/03/95
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA

HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. ____ IN.

BORING METHOD: HSA-HOLLOW STEM AUGERS; CFA-CONTINUOUS FLIGHT AUGERS; DC -DRIVING CASING; MD -MUD DRILLING

SAMPLE METHOD: SS - DRIVEN SPLIT SPOON; ST - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE

SURFACE ELEVATION 588.9

SOIL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
GRAY SILT AND CLAY, WITH TRACE SAND TO SANDY SILT, WITH SOME CLAY, AND TRACE TO LITTLE GRAVEL, (GLACIAL TILL) MOIST, HARD		17	SS	20-30-40	53								9	
		18	SS	12-26-32	93									
		19	SS	17-19-26	100	21	17	14	26	22	23	10	11	A-4a
		20	SS	12-15-28	100									
		21	SS	13-15-17	100								13	
		22	SS	8-11-15	47									
	90.0	23	SS	11-15-25	100								9	
BORING DISCONTINUED AT 90.0 FEET DEPTH. BORING CAVED AT 19.0 FEET DEPTH.														

ATEC Associates, Inc.
CINCINNATI 45241-1861 11727 Chesterdale Rd. (513)771-2112 FAX 513/782-6606
DAYTON 45449 2227 Stonington West (513)859-8202 FAX 513/297-6606

DESIGNED | DRAWN | REVIEWED | DATE
CHECKED
REVISED
STRUCTURE FILE NUMBER 22-03-95-53070

BORING NUMBER 106

SOIL PROFILE
MUHLHAUSER ROAD BRIDGES
BUTLER COUNTY, OHIO

10

BORING NUMBER 107
STATION and OFFSET 149+88, 24' LT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH
AT COMPLETION 8.5 FT.
AFTER ____ FT.
WATER ON RODS 8.0 FT.

DRILLING and SAMPLING INFORMATION
DATE STARTED 05/05/95 HAMMER WEIGHT 140 LBS.
DATE COMPLETED 05/05/95 HAMMER DROP 30 IN.
DRILL FOREMAN R. GERARD SPOON SAMPLER O.D. 2 IN.
INSPECTOR ____ ROCK CORE DIA. ____ IN.
BORING METHOD HSA SHELBY TUBE O.D. ____ IN.

BORING METHOD: HSA-HOLLOW STEM AUGERS; CFA-CONTINUOUS FLIGHT AUGERS; DC -DRIVING CASING; MD -MUD DRILLING
SAMPLE METHOD: SS - DRIVEN SPLIT SPOON; ST - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE

SURFACE ELEVATION 584.0

SOIL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
FILL - BROWN SILTY CLAY, WITH SOME LIMESTONE COBBLES AND BOULDERS, (TEMPORARY FILL FOR CREEK CROSSING) MOIST, MEDIUM STIFF	7.5	1	SS	2-3-7	87								20	
BROWN SILTY CLAY, WITH NUMEROUS SAND SEAMS, MOIST TO WET, MEDIUM STIFF TO SOFT	13.0	2	SS	2-5-5	100								17	
		3	SS	1-2-1	67								18	
BROWNISH-GRAY SANDY SILT WITH LITTLE CLAY, MOIST, MEDIUM STIFF	16.0	4	SS	4-6-5	87	0	17	27	44	12	42	22	20	A-7-6
BROWN TO GRAY FINE SAND TO MEDIUM GRAVEL, WET, MEDIUM DENSE		5	SS	5-12-21	100									
		6	SS	12-9-15	100									
		7	SS	17-15-15	100									
		8	SS	20-14-14	100									
GRAY FINE TO MEDIUM GRAVEL WITH LITTLE SAND, WET, MEDIUM DENSE	27.0	9	SS	5-5-11	87	71	17	8	-4-	--				A-1-a
GRAY FINE SAND TO MEDIUM GRAVEL, WET, MEDIUM DENSE	31.0	10	SS	11-36-17	100									
		11	SS	20-10-15	100									
GRAY FINE TO MEDIUM SAND, MOIST, VERY DENSE	42.0	12	SS	33-44-40	100									
		13	SS	34-38-40	67									
GRAY SILT AND CLAY WITH TRACE SAND TO SANDY SILT WITH SOME CLAY, AND TRACE TO LITTLE GRAVEL, (GLACIAL TILL)	52.0	14	SS	10-17-34	80								12	

BORING NUMBER 107
STATION and OFFSET 149+88, 24' LT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH
AT COMPLETION 8.5 FT.
AFTER ____ FT.
WATER ON RODS 8.0 FT.

DRILLING and SAMPLING INFORMATION
DATE STARTED 05/05/95 HAMMER WEIGHT 140 LBS.
DATE COMPLETED 05/05/95 HAMMER DROP 30 IN.
DRILL FOREMAN R. GERARD SPOON SAMPLER O.D. 2 IN.
INSPECTOR ____ ROCK CORE DIA. ____ IN.
BORING METHOD HSA SHELBY TUBE O.D. ____ IN.

BORING METHOD: HSA-HOLLOW STEM AUGERS; CFA-CONTINUOUS FLIGHT AUGERS; DC -DRIVING CASING; MD -MUD DRILLING
SAMPLE METHOD: SS - DRIVEN SPLIT SPOON; ST - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE

SURFACE ELEVATION 584.0

SOIL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
GRAY SILT AND CLAY, WITH TRACE SAND TO SANDY SILT, WITH SOME CLAY AND TRACE TO LITTLE GRAVEL, (GLACIAL TILL) MOIST, HARD		15	SS	22-23-26	0									
		16	SS	11-17-24	93								12	
		17	SS	12-19-24	100									
		18	SS	15-19-19	100								11	
		19	SS	17-22-26	73									
		20	SS	19-28-38	67								11	
		21	SS	12-21-27	60									
	90.0													
BORING DISCONTINUED AT 90.0 FEET DEPTH. BORING CAVED AT 9.0 FEET DEPTH.														

ATEC Associates, Inc.
CINCINNATI 45241-1861 (513)771-2112 FAX 771-2052
DAYTON 45458 (513)433-3500 FAX 433-2666
COLUMBUS 43085 (614)846-5757 FAX 846-5558

DESIGNED | DRAWN | REVIEWED | DATE
CHECKED
REVISED
STRUCTURE FILE NUMBER 22-03-95-53070

BORING NUMBER 107

SOIL PROFILE
MUHLHAUSER ROAD BRIDGES
BUTLER COUNTY, OHIO

NO

BORING NUMBER 108
STATION and OFFSET 150+78, 27' RT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH

AT COMPLETION 18.5 FT.
AFTER ____ FT.
WATER ON RODS 18.0 FT.

DRILLING and SAMPLING INFORMATION

DATE STARTED 05/01/95
DATE COMPLETED 05/01/95
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA

HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. ____ IN.

BORING METHOD	SAMPLE METHOD
HSA-HOLLOW STEM AUGERS	SS - DRIVEN SPLIT SPOON
CFA-CONTINUOUS FLIGHT AUGERS	ST - PRESSED SHELBY TUBE
DC -DRIVING CASING	CA - CONTINUOUS FLIGHT AUGER
MD -MUD DRILLING	RC - ROCK CORE

SURFACE ELEVATION 595.2

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
FILL - DARK BROWN SILTY CLAY, WITH TRACE SAND, GRAVEL AND ORGANICS, MOIST, MEDIUM STIFF	2.5		1	SS	2-3-2	20								19	
FILL - BROWN SILTY CLAY, WITH SOME GRAY SHALE, WITH LIMESTONE COBBLES AND SMALL BOULDERS TO 5.0 FEET. MOIST, HARD		5	2	SS	5-15-19	80								13	
			3	SS	9-19-18	33								12	
		10	4	SS	9-16-18	67								14	
	11.5		5	SS	6-9-9	87								13	
DARK BROWN SILTY CLAY, WITH TRACE FINE SAND, MOIST, VERY STIFF	13.0	15	6	SS	6-8-13	47								27	
MOTTLED GRAY AND DARK BROWN SILTY CLAY, MOIST, VERY STIFF	15.5		7	SS	6-6-7	100								23	
MOTTLED LIGHT BROWN AND GRAY SILTY CLAY, WITH IRON OXIDE STAINS, MOIST, STIFF	18.0	20	8	SS	2-2-2	27									
BROWN SILTY FINE TO COARSE SAND AND GRAVEL, WITH TRACE CLAY. WET, VERY LOOSE	20.5		9	SS	2-3-7	80									
GRAY FINE TO COARSE SAND AND GRAVEL. WET, MEDIUM DENSE			10	SS	3-9-14	93									
		25													
		30	11	SS	13-15-17	100									
--THIN ZONE OF COBBLES AT 38.0 FEET			12	SS	10-12-15	80									
		35													
		40	13	SS	9-16-18	67									
			14	SS	19-7-5	33									
		45													
		50	15	SS	17-12-14	67									
	52.5														
GRAY SILT AND CLAY, WITH TRACE FINE TO COARSE GRAVEL AND OCCASIONAL THIN SAND SEAM. (GLACIAL TILL)		55	16	SS	14-15-25	53								11	

BORING NUMBER 108
STATION and OFFSET 150+78, 27' RT
JOB NUMBER 22-03-95-53070
DRAWN BY TSH
APPROVED BY

GROUNDWATER DEPTH
AT COMPLETION 18.5 FT.
AFTER ____ FT.
WATER ON RODS 18.0 FT.

DRILLING and SAMPLING INFORMATION
DATE STARTED 05/01/95
DATE COMPLETED 05/01/05
DRILL FOREMAN R. GERARD
INSPECTOR ____
BORING METHOD HSA

HAMMER WEIGHT 140 LBS.
HAMMER DROP 30 IN.
SPOON SAMPLER O.D. 2 IN.
ROCK CORE DIA. ____ IN.
SHELBY TUBE O.D. ____ IN.

BORING METHOD: HSA-HOLLOW STEM AUGERS; CFA-CONTINUOUS FLIGHT AUGERS; DC -DRIVING CASING; MD -MUD DRILLING
SAMPLE METHOD: SS - DRIVEN SPLIT SPOON; ST - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE

SURFACE ELEVATION 595.2

SOIL DESCRIPTION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NUMBER	SAMPLE TYPE	STANDARD PENETRATION TEST	% RECOVERY	% GRAVEL	% COARSE SAND	% FINE SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	% WATER CONTENT	OHIO CLASSIFICATION
GRAY SILT AND CLAY, WITH TRACE SAND AND FINE TO COARSE GRAVEL AND OCCASIONAL THIN SAND SEAM. (GLACIAL TILL) MOIST, HARD		60	17	SS	14-15-22	67									
		65	18	SS	10-14-19	67								13	
		70	19	SS	13-19-21	100									
		75	20	SS	17-18-24	27								13	
		80	21	SS	10-13-19	87									
		85	22	SS	12-17-25	80								12	
	90.0	90	23	SS	7-14-20	73									
BORING DISCONTINUED AT 90.0 FEET DEPTH. BORING CAVED AT 20.0 FEET DEPTH.		95													
		100													
		105													
		110													

ATEC Associates, Inc.
CINCINNATI 45241-1861 (513)771-2277
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COLUMBUS 43220 West (614)451-1900
FAX 513/297-6606

DESIGNED | DRAWN | REVIEWED | DATE
CHECKED | REVISED | STRUCTURE FILE NUMBER 22-03-95-53070

SOIL PROFILE
MUHLHAUSER ROAD BRIDGES
BUTLER COUNTY, OHIO

BORING NUMBER 108