

# OFFICE OF THE FULTON COUNTY ENGINEER

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County Engineer

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Chief Deputy Engineer

March 23, 2017

## ADDENDUM 1

Repair of Embankment Failure of TR-22 Bridge over The Ohio Turnpike

**RE:** Technical Design Memorandum

1. The Technical Design Memorandum outlines the methods and results of the embankment stability evaluation. Please attach the Technical Design Memorandum to the proposal.

End of addendum.

# TECHNICAL DESIGN MEMORANDUM



CLIENT: Fulton County Engineer's Office/Franklin Township Trustees  
JOB TITLE: Fulton TR 22 Turnpike Mitigation  
PROJECT NO.: 98693  
DATE: 22 March 2017  
PREPARED BY: Keyden K. Turner, EIT, MS  
Steven Riedy, PE

## **SUBJECT: FUL-TR22-Turnpike**

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Repair is required for approach embankments to a bridge on Township Road 22 (TR22) that travels over the Ohio Turnpike. This memo outlines the methods and results of the embankment stability evaluation.

### **Soil and Bedrock Conditions**

Bowser-Morner drilled four borings designated B-001-0-16, B-002-0-16, B-003-0-16 and B-004-0-16. Borings B-001 and B-004 were drilled roughly 400 feet from the south and north abutments, respectively. Borings B-002 and B-003 were drilled 40 feet from the south and north abutments, respectively. Boring B-002 was used to develop the subsurface profile used for the embankment stability evaluation. Borings B-002 encountered very stiff to hard clay (A-7-6) and silt and clay (A-6a) to completion of the boring at a depth of 36.0 feet. The Bowser-Morner geotechnical data report is attached to this document.

### **Analytical Approach**

The repair of the approach embankments consists first of removing the top soil and creating temporary a cut slope in accordance with *ODOT Geotechnical Bulletin 2 (GB-2)*. Second, the cut slope is to be filled in with compacted fill to the design grade and temporary fill placed on top to ensure that proper compaction occurs. The final phase consists of removal of the temporary compaction fill and the slope to be graded to its final design grade.

The limit equilibrium evaluations were conducted using the software *Slide v7.0* developed by Rocscience. Per *ODOT Design Checklist - Embankments*, the required factor of safety for total and effective stress conditions is to be 1.3. Limit equilibrium evaluations were conducted using Spencer's method in order to evaluate the slopes. Non-circular surfaces were assumed for this work.

The first and second phase consists of total stress (short-term) evaluations only. These phases are to be temporary, therefore pore pressures will not have time to dissipate and effective stress (long-term) conditions will not occur. It should be noted that if the temporary cut slope or compacted fill is left in place for an extended period of time, pore pressures will begin to dissipate and the slope will become unstable. The final evaluation of the completed embankment consists of total and effective stress evaluations. A typical cross-section of the approach embankment is presented in the attached calculation package.

# TECHNICAL DESIGN MEMORANDUM



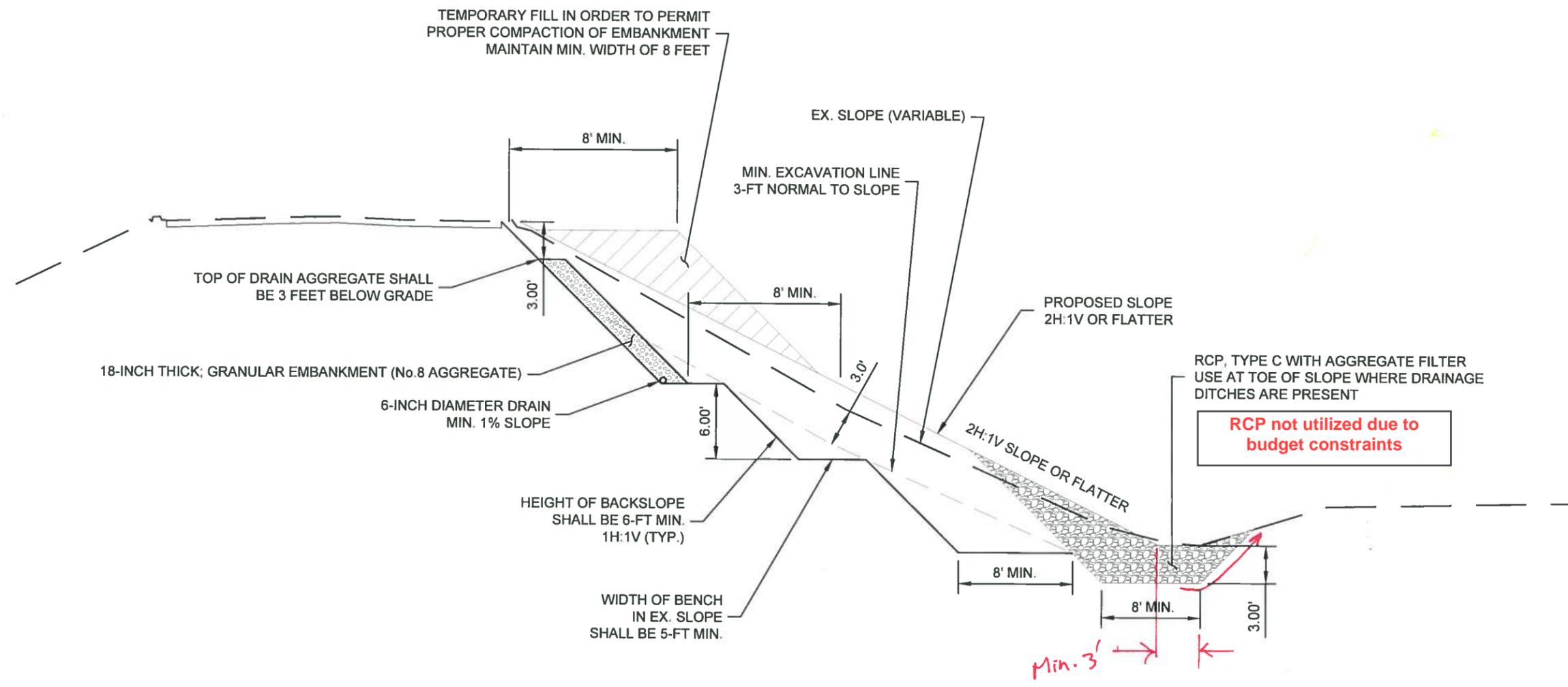
## Summary of Findings

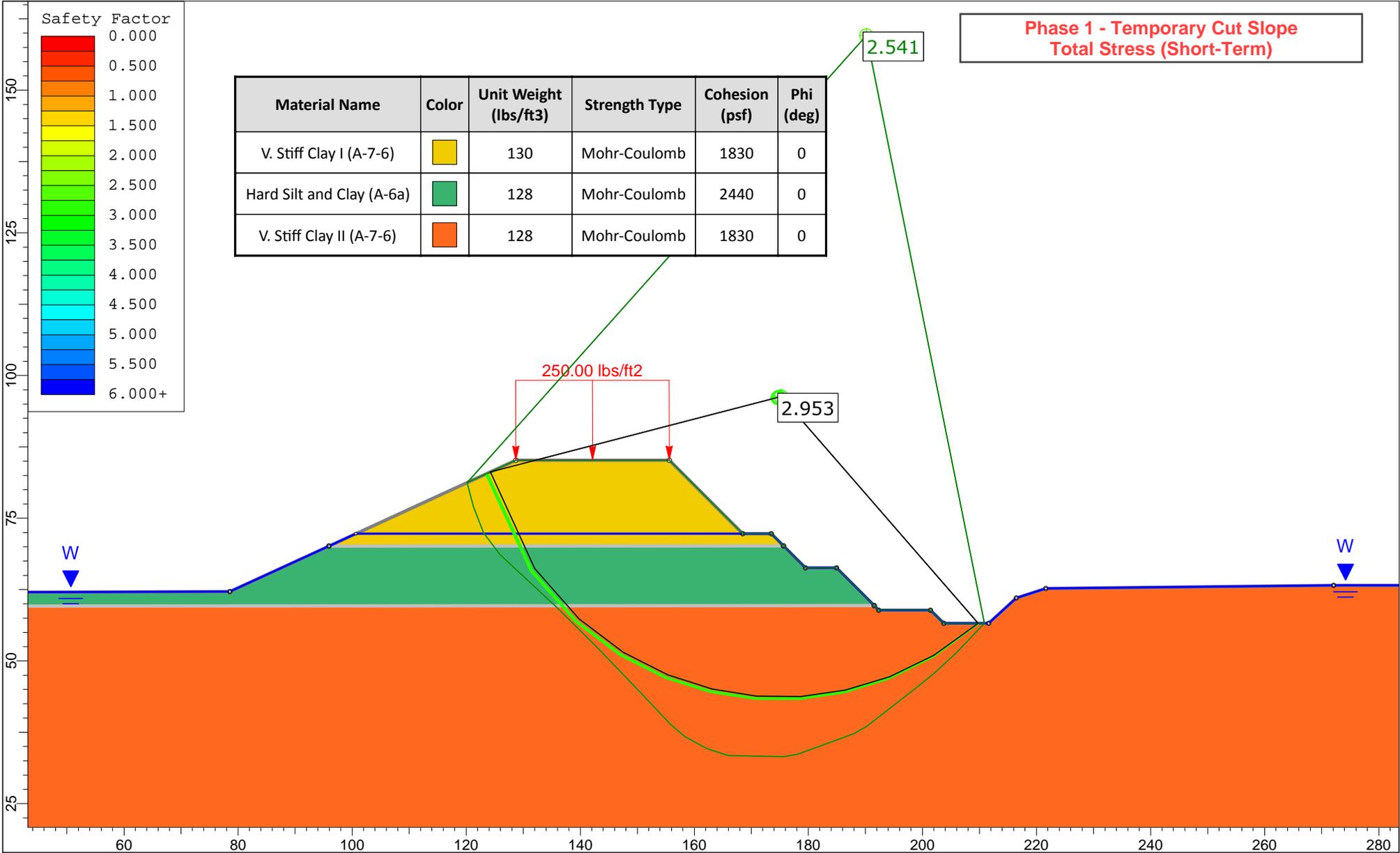
The following table presents the summarized results of the slope stability evaluations.

Phase ID	Stress Condition	Factor of Safety	Required Factor of Safety
Phase 1 - Cut Slope	Total (Short-Term)	2.5	1.3
	Effective (Long-Term)	n/a	
Phase 2 - Final Grade with Compacted Fill	Total (Short-Term)	3.0	
	Effective (Long-Term)	n/a	
Phase 3 - Final Grade	Total (Short-Term)	3.1	
	Effective (Long-Term)	1.5	

As noted previously, the temporary cut slopes (phase 1) and compacted fill (phase 2) configurations are representative of temporary conditions. The construction should limit the time of these phases during construction to avoid cut slope stability issues. Please refer to the attached exhibits for the detailed results.

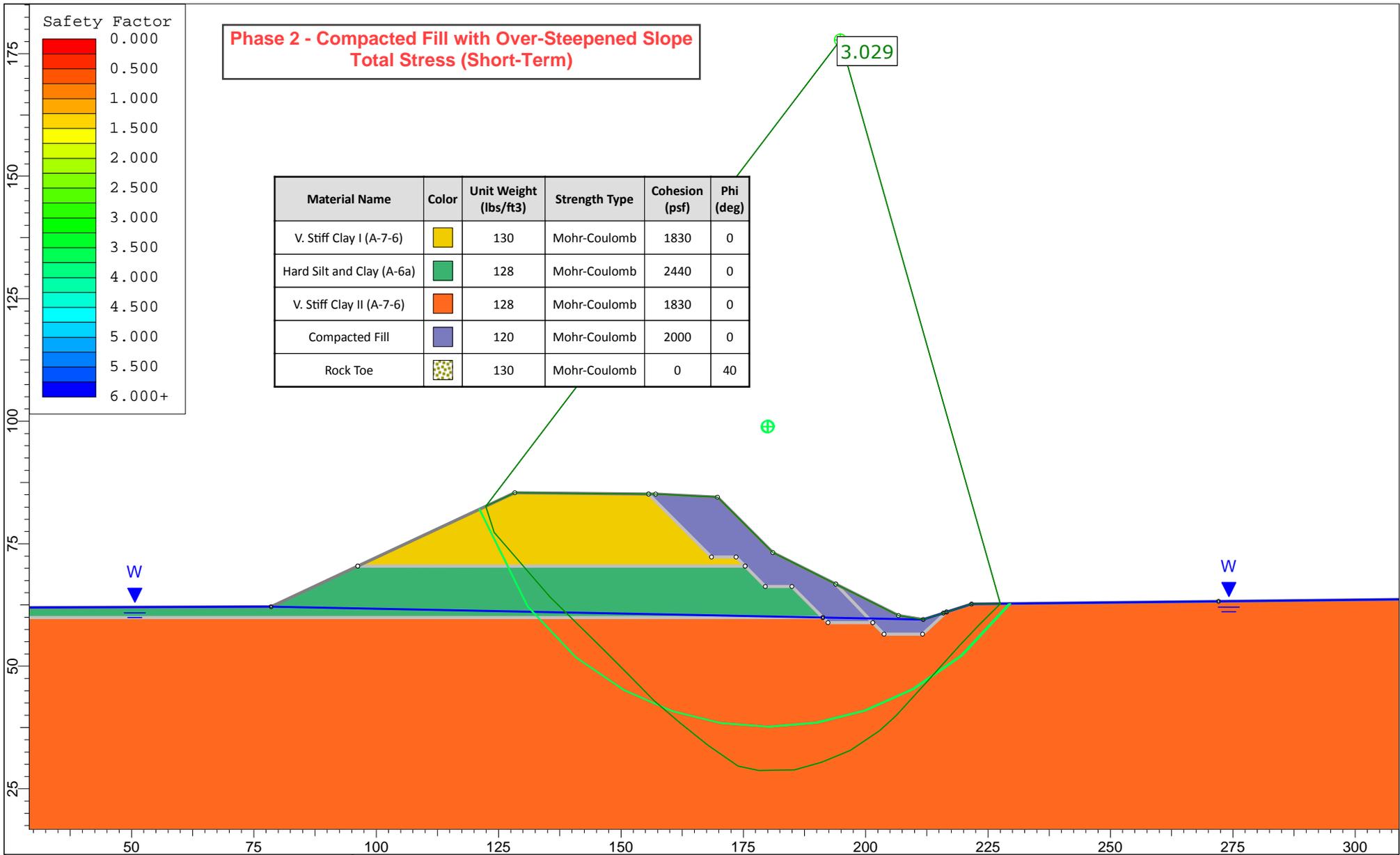
Typical Cross-Section





**TETRA TECH**  
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 SLIDEINTERPRET 7.013  
 Tetra Tech, Inc.  
 6530 West Campus Oval, Ste. 130  
 New Albany, Ohio 43054

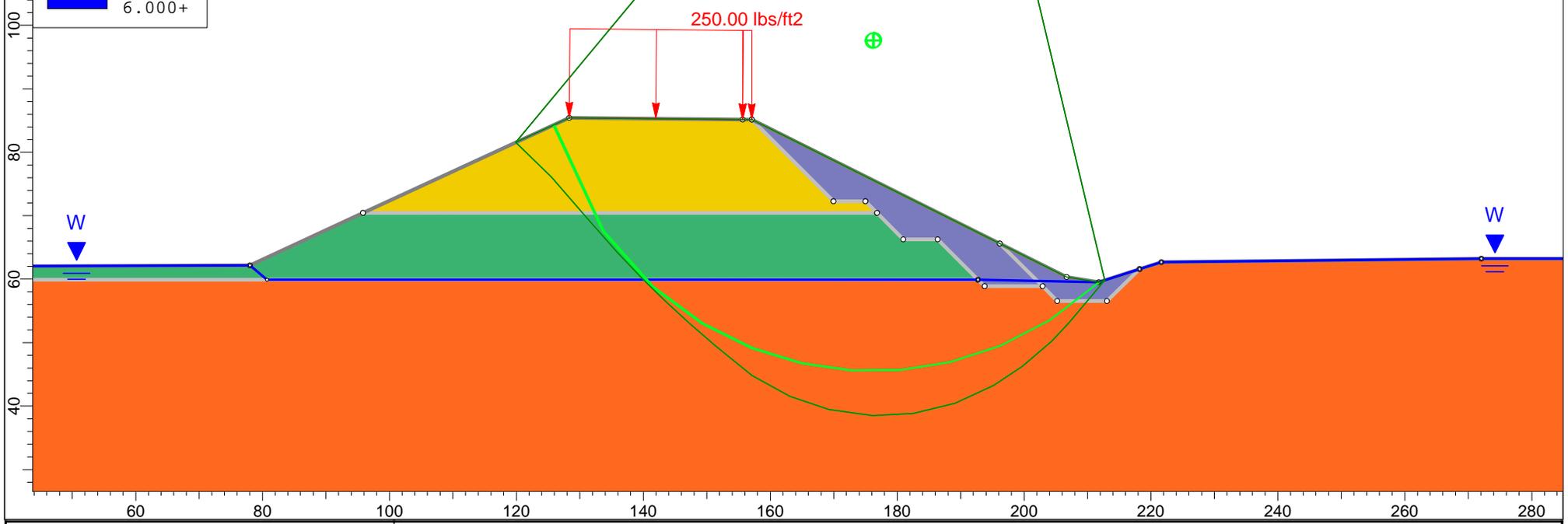
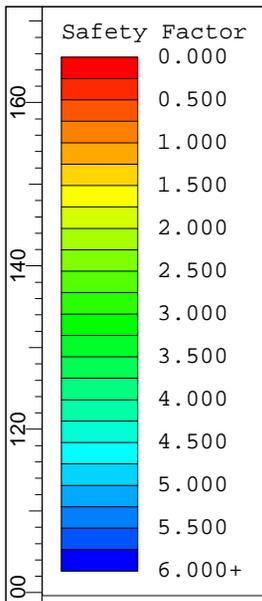
Project		FUL-TR22	
Analysis Description		Temp Cut Slope	
Drawn By	KKT	Scale	1:280
Date	3/21/2017, 1:46:32 PM	Company	Tetra Tech, Inc.
		File Name	TempCutS_UD.slim



 <p><b>TETRA TECH</b> complex world   CLEAR SOLUTIONS™ SLIDEINTERPRET 7.013</p>	Project			FUL-TR22	
	Analysis Description			Temp Cut Slope	
Drawn By		KKT	Scale	1:326	Company
Date		3/21/2017, 1:46:32 PM		File Name	
Tetra Tech, Inc. 6530 West Campus Oval, Ste. 130 New Albany, Ohio 43054			Tetra Tech, Inc. FinalS_TempF_UD.slim		

**Phase 3 - Final Slope Grading  
Total Stress (Short-Term)**

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
V. Stiff Clay I (A-7-6)		130	Mohr-Coulomb	1830	0
Hard Silt and Clay (A-6a)		128	Mohr-Coulomb	2440	0
V. Stiff Clay II (A-7-6)		128	Mohr-Coulomb	1830	0
Compacted Fill		120	Mohr-Coulomb	2000	0
Rock Toe		130	Mohr-Coulomb	0	40



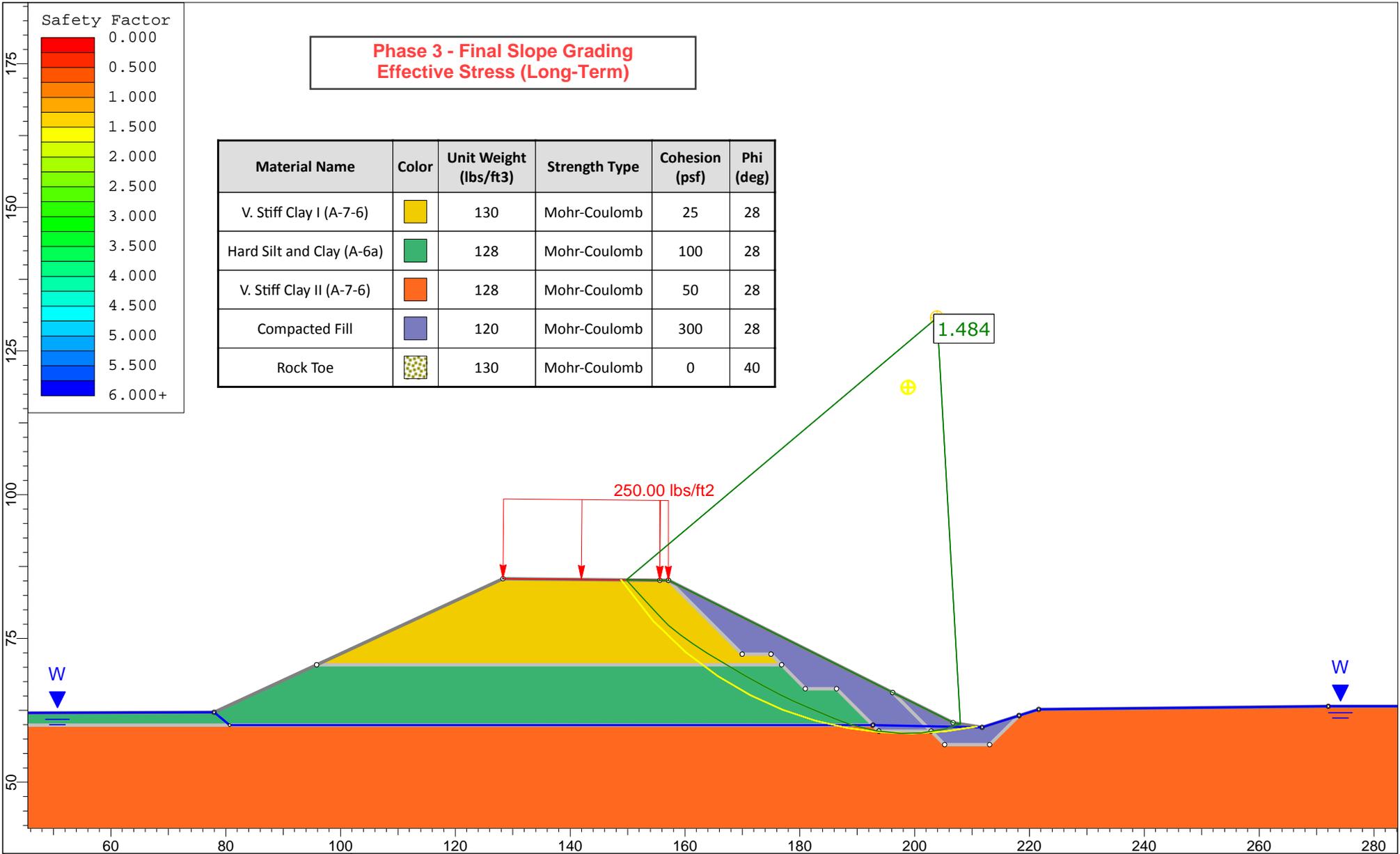
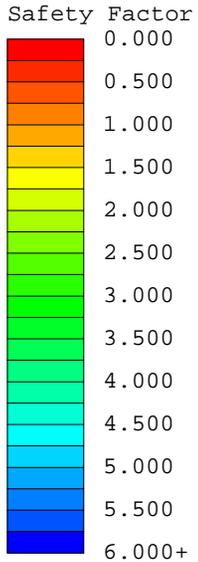

**TETRA TECH**  
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Tetra Tech, Inc.  
6530 West Campus Oval, Ste. 130  
New Albany, Ohio 43054

Project		FUL-TR22	
Analysis Description		Temp Cut Slope	
Drawn By	KKT	Scale	1:281
Date	3/21/2017, 1:46:32 PM	Company	Tetra Tech, Inc.
		File Name	FinalS_UD.slim

**Phase 3 - Final Slope Grading  
Effective Stress (Long-Term)**

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
V. Stiff Clay I (A-7-6)		130	Mohr-Coulomb	25	28
Hard Silt and Clay (A-6a)		128	Mohr-Coulomb	100	28
V. Stiff Clay II (A-7-6)		128	Mohr-Coulomb	50	28
Compacted Fill		120	Mohr-Coulomb	300	28
Rock Toe		130	Mohr-Coulomb	0	40



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SLIDEINTERPRET 7.013

Tetra Tech, Inc.  
6530 West Campus Oval, Ste. 130  
New Albany, Ohio 43054

Project

FUL-TR22

Analysis Description

Temp Cut Slope

Drawn By

KKT

Scale

1:278

Company

Tetra Tech, Inc.

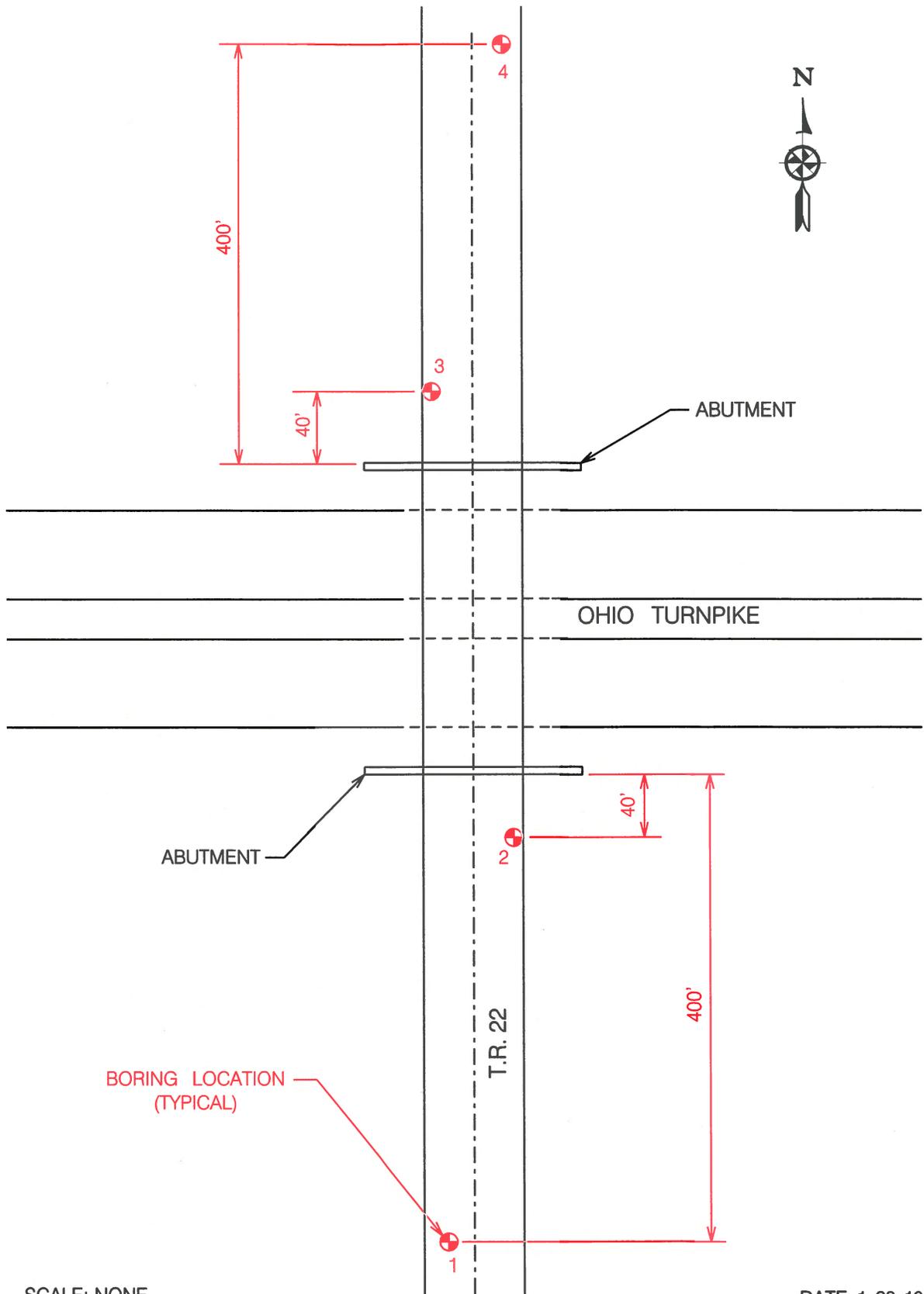
Date

3/21/2017, 1:46:32 PM

File Name

FinalS\_DR.slim





SCALE: NONE

DATE: 1-29-16  
JOB NO. 173368

BORING LOCATION PLAN  
 FUL-TR22 - TURNPIKE MITIGATION  
 STABILIZATION OF ROADWAY EMBANKMENTS  
 FRANKLIN TOWNSHIP ROAD 22 OVER THE OHIO TURNPIKE  
 FULTON COUNTY, OHIO



PROJECT: FUL-TR22	DRILLING FIRM / OPERATOR: BMI / JW JB	DRILL RIG: D-90	STATION / OFFSET: _____	EXPLORATION ID: B-001-0-16
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: BMI / ABK	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: _____	
PID: 98693 BR ID: _____	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/19/16	ELEVATION: 100.0 (MSL) EOB: 18.5 ft.	PAGE 1 OF 1
START: 1/19/16 END: 1/19/16	SAMPLING METHOD: SPT	ENERGY RATIO (%): 80	LAT / LONG: Not Recorded	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/RQD	N <sub>60</sub>	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	INST.
								GR	CS	FS	SI	CL	LL	PL	PI			
ASPHALT	99.5																	
AGGREGATE BASE	99.0	1	9															
VERY STIFF, BROWN AND GRAY, UNCONTROLLED FILL, SILTY CLAY, SOME SAND, TRACE OF GRAVEL, MOIST (with sand seam at 3.5' to 5')		2	10	25	78	SS-1A	>4.5	2	4	7	34	53	37	20	17	18	A-6b (11)	
		3																
		4	9															
		5	10	33	89	SS-2A	4.00	-	-	-	-	-	-	-	-	17	A-6b (V)	
	94.5	6	6															
VERY STIFF, BROWN AND GRAY, SILTY CLAY, TRACE OF SAND, MOIST	93.5	7	8	24	78	SS-3A	4.0-4.5	0	2	5	54	39	39	21	18	20	A-6b (11)	
VERY STIFF, BROWN AND GRAY, SILT AND CLAY, TRACE OF SAND, MOIST		8	5															
		9	6	17	78	SS-4A	2.75-3.25	0	2	3	56	39	32	19	13	22	A-6a (9)	
	91.5	10	5															
VERY STIFF, GRAY AND BROWN, SILT AND CLAY, TRACE OF SAND, MOIST		11	6	15	89	SS-5A	3.0-3.25	0	1	3	59	37	33	19	14	22	A-6a (10)	
		12	4															
		13	5	17	89	SS-6A	4.50	-	-	-	-	-	-	-	-	20	A-6a (V)	
	88.0	14	5															
VERY STIFF, GRAY AND BROWN, SILT AND CLAY, TRACE OF SAND, MOIST		15	6	17	89	SS-7A	3.5-4.0	-	-	-	-	-	-	-	-	25	A-6a (V)	
		16	5	16	89	SS-8A	2.5-3.5	-	-	-	-	-	-	-	-	22	A-6a (V)	
		17	3															
		18	5	13	89	SS-9A	3.25	-	-	-	-	-	-	-	-	22	A-6a (V)	
		19	4															
		20	5	15	89	SS-10A	3.50	-	-	-	-	-	-	-	-	22	A-6a (V)	
		21	4															
		22	5	15	89	SS-11A	2.50	-	-	-	-	-	-	-	-	23	A-6a (V)	
	81.5	23	4															
		24	5	13	78													
		25	5															

EOB

NOTES: NONE  
 ABANDONMENT METHODS, MATERIALS, QUANTITIES: NOT RECORDED

STANDARD OHDOT SOIL BORING LOG (8.5X11) - OH DOT.GDT - 2/17/16 14:26 - E:\DEPT. 28\28 BORING LOGS\GINT\PROJECTS\173368-XXXX-XXXX.GPJ

PROJECT: FUL-TR22	DRILLING FIRM / OPERATOR: BMI / JW JB	DRILL RIG: D-90	STATION / OFFSET:	EXPLORATION ID: B-002-0-16
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: BMI / ABK	HAMMER: AUTOMATIC HAMMER	ALIGNMENT:	
PID: 98693 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/19/16	ELEVATION: 100.0 (MSL) EOB: 36.0 ft.	PAGE: 1 OF 2
START: 1/19/16 END: 1/19/16	SAMPLING METHOD: SPT	ENERGY RATIO (%): 80	LAT / LONG: Not Recorded	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/RQD	N <sub>60</sub>	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	INST.
								GR	CS	FS	SI	CL	LL	PL	PI			
ASPHALT	99.5																	
AGGREGATE BASE	99.0																	
VERY STIFF, BROWN AND GRAY, UNCONTROLLED FILL, CLAY, SOME SILT, TRACE OF SAND, MOIST			1	3			4.25-4.5	1	1	3	35	60	41	22	19	24	A-7-6 (12)	
			2	4	13	78	SS-1A											
	96.5		3															
VERY STIFF, BROWN AND GRAY, UNCONTROLLED FILL, SILT AND CLAY, TRACE OF SAND, MOIST			4	3														
			5	5	15	78	SS-2A	4.00	-	-	-	-	-	-	-	18	A-6a (V)	
			6															
			7	4														
			8	5	15	89	SS-3A	4.50	-	-	-	-	-	-	-	20	A-6a (V)	
			9															
			10	3														
			11	5	13	78	SS-4A	4.00	-	-	-	-	-	-	-	22	A-6a (V)	
			12															
			13	5														
			14	6	17	78	SS-5A	4.00	-	-	-	-	-	-	-	23	A-6a (V)	
			15															
			16	5	21	89	SS-6A	4.50	-	-	-	-	-	-	-	21	A-6a (V)	
(becomes gray and brown at 15')			17	8														
	83.5		18	8	24	89	SS-7A	4.0-4.5	-	-	-	-	-	-	-	18	A-6a (V)	
VERY STIFF, GRAY AND BROWN, UNCONTROLLED FILL, SILT AND CLAY, SOME SAND, MOIST			19	4	15	89	SS-8A	2.25	0	2	15	33	50	34	19	15	27	A-6a (10)
	82.0		20	3	16	78	SS-9A	4.00	-	-	-	-	-	-	-	24	A-6a (V)	
VERY STIFF, GRAY AND BROWN, UNCONTROLLED FILL, SILT AND CLAY, TRACE OF SAND, MOIST			21	5	20	89	SS-10A	4.50	-	-	-	-	-	-	-	22	A-6a (V)	
			22	9	29	89	SS-11A	>4.5	-	-	-	-	-	-	-	20	A-6a (V)	
(becomes hard at 21')			23	4	20	89	SS-12A	4.50	-	-	-	-	-	-	-	22	A-7-6 (V)	
VERY STIFF, DARK GRAY, UNCONTROLLED FILL, CLAY, SOME SILT, TRACE OF SAND, TRACE OF ROOT HAIRS (POSSIBLE ORIGINAL TOPSOIL), MOIST			24	6	20	89	SS-13A	4.50	-	-	-	-	-	-	-	22	A-7-6 (V)	
	76.0		25	7	24	89	SS-13A	4.0-4.5	0	1	1	38	60	48	24	24	26	A-7-6 (15)
VERY STIFF, BROWN AND GRAY, CLAY, SOME SILT, TRACE OF SAND, MOIST			26	8	17	78	SS-14A	3.25-4.0	-	-	-	-	-	-	-	25	A-6a (V)	
VERY STIFF, BROWN AND GRAY, SILT AND CLAY, TRACE OF SAND, MOIST			27	5	12	67	SS-15A	1.5-3.0	-	-	-	-	-	-	-	26	A-6a (V)	
(with wet silt seams at 27' - 28.5')			28	3	13	89	SS-16A	4.00	0	0	1	54	45	32	18	14	26	A-6a (10)
	71.5		29	4														
VERY STIFF, BROWN, SILT AND CLAY, TRACE OF SAND, MOIST				5														
	70.0																	

STANDARD OHDOT SOIL BORING LOG (8.5X11) - OH DOT GDT - 2/18/16 11:35 - E:\DEPT - 28\28 BORING LOGS\GINT\PROJECTS\173368-XXXX-XXXX.GPJ

MATERIAL DESCRIPTION AND NOTES	ELEV. 70.0	DEPTHS	SPT/ RQD	N <sub>60</sub>	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	INST.	
								GR	CS	FS	SI	CL	LL	PL	PI				
VERY STIFF, GRAY AND BROWN, SILT AND CLAY, TRACE OF SAND, MOIST  (becomes gray at 32')	64.0	31	5 6 7	17	78	SS-17A	4.0 - 4.5	-	-	-	-	-	-	-	-	-	23	A-6a (V)	
		32	5 6 6	16	78	SS-18A	3.0 - 4.5	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
		33	6 7 6	17	78	SS-19A	3.0 - 4.0	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
		34	6 7 6	17	78	SS-19A	3.0 - 4.0	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
		35	6 6 7	17	89	SS-20A	3.5 - 4.5	-	-	-	-	-	-	-	-	-	-	19	A-6a (V)
		EOB 36																	

STANDARD OHDOT SOIL BORING LOG (8.5X11) - OH DOT.GDT - 2/18/16 11:35 - E:\DEPT\_28\28 BORING LOGS\GINT\PROJECTS\173368-XXXX-XXXX.GPJ

NOTES: NONE  
 ABANDONMENT METHODS, MATERIALS, QUANTITIES: NOT RECORDED

PROJECT: FUL-TR22	DRILLING FIRM / OPERATOR: BMI / JW JB	DRILL RIG: D-90	STATION / OFFSET:	EXPLORATION ID B-003-0-16
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: BMI / ABK	HAMMER: AUTOMATIC HAMMER	ALIGNMENT:	
PID: 98693 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/19/16	ELEVATION: 100.0 (MSL) EOB: 36.0 ft.	PAGE 1 OF 2
START: 1/22/16 END: 1/22/16	SAMPLING METHOD: SPT	ENERGY RATIO (%): 80	LAT / LONG: Not Recorded	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N <sub>60</sub>	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	INST.	
								GR	CS	FS	SI	CL	LL	PL	PI				
ASPHALT	99.3																		
AGGREGATE BASE	99.0																		
VERY STIFF, BROWN AND GRAY, UNCONTROLLED FILL, SILTY CLAY, TRACE OF SAND, MOIST           (with thin sand seams at 15' to 16.5')		1	6		19	89	SS-1A	3.00	1	0	1	41	57	39	21	18	21	A-6b (11)	
		2	6	8															
		3																	
		4	4	5	7	16	89	SS-2A	4.00	-	-	-	-	-	-	-	-	23	A-6b (V)
		5																	
		6	4	5	6	15	89	SS-3A	4.5- >4.5	-	-	-	-	-	-	-	-	24	A-6b (V)
		7																	
		8																	
		9	4	7	7	19	78	SS-4A	3.75- >4.5	-	-	-	-	-	-	-	-	24	A-6b (V)
		10																	
		11	4	5	7	16	89	SS-5A	4.00	-	-	-	-	-	-	-	-	21	A-6b (V)
		12																	
		13																	
	14	4	4	7	15	78	SS-6A	4.0- 4.5	-	-	-	-	-	-	-	-	24	A-6b (V)	
	15																		
	16	4	6	10	21	89	SS-7A	3.5- 4.5	-	-	-	-	-	-	-	-	19	A-6b (V)	
	17																		
	18	5	7	9	21	78	SS-8A	4.50	-	-	-	-	-	-	-	-	22	A-6b (V)	
	19	3	6	6	16	89	SS-9A	3.50	0	1	3	34	62	47	23	24	25	A-7-6 (15)	
VERY STIFF, BROWN AND GRAY, UNCONTROLLED FILL, CLAY, SOME SILT, TRACE OF SAND, MOIST (becomes gray and brown at 19.5')		20	4	6	8	19	89	SS-10A	3.5- 3.75	-	-	-	-	-	-	-	-	23	A-7-6 (V)
	21																		
	22	6	7	9	21	78	SS-11A	4.50	-	-	-	-	-	-	-	-	-	21	A-7-6 (V)
(with 2" sand and gravel seam at 22')	77.8																		
VERY STIFF, BLACK, UNCONTROLLED FILL, CLAY, SOME SILT, TRACE OF SAND (POSSIBLE ORIGINAL TOPSOIL), MOIST	77.0																		
		23	6	8	10	24	78	SS-12A	4.5- >4.5	-	-	-	-	-	-	-	-	19	A-7-6 (V)
		24	4	10															
HARD, BROWN AND GRAY, CLAY, AND SILT, TRACE OF SAND, MOIST		25	5	8	17	89	SS-13A	4.5- >4.5	0	2	1	44	53	41	21	20	20	A-7-6 (12)	
		26	4	7	8	20	78	SS-14A	>4.5	-	-	-	-	-	-	-	-	22	A-6a (V)
	73.0																		
HARD, BROWN AND GRAY, SILT AND CLAY, TRACE OF SAND, MOIST		27	8	11	13	32	89	SS-15A	4.0- 4.5	-	-	-	-	-	-	-	-	25	A-6a (V)
		28																	
		29	4	7	10	23	89	SS-16A	4.5- >4.5	-	-	-	-	-	-	-	-	23	A-6a (V)

STANDARD OHDOT SOIL BORING LOG (8.5X11) - OH DOT.GDT - 2/18/16 11:36 - E:\DEPT. 2828 BORING LOGS\GINT\PROJECTS\173388-XXXX-XXXX.GPJ

STANDARD OHDOT SOIL BORING LOG (8.5X11) - OH DOT.GDT - 2/18/16 11:36 - E:\DEPT. 28\28 BORING LOGS\GINT\PROJECTS\173368-XXXX-XXXX.GPJ

PID: 98693		BR ID:		PROJECT: FUL-TR22		STATION / OFFSET:		START: 1/22/16		END: 1/22/16		PG 2 OF 2		B-003-0-16									
MATERIAL DESCRIPTION AND NOTES			ELEV. 70.0	DEPTHS	SPT/ RQD	N <sub>60</sub>	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	INST.			
										GR	CS	FS	SI	CL	LL	PL	PI						
HARD, BROWN AND GRAY, SILT AND CLAY, TRACE OF SAND, MOIST (continued)  (becomes very stiff and gray at 32')  (becomes stiff at 34.5')			64.0	31	4	7	20	78	SS-17A	4.0-4.5	-	-	-	-	-	-	-	-	-	A-6a (V)			
				32	4	7	19	78	SS-18A	3.50	-	-	-	-	-	-	-	-	-	32	A-6a (V)		
				33	4	7	19	78	SS-19A	3.50	-	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
				34	6	8	19	78	SS-19A	3.50	-	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
				35	5	6	17	78	SS-20A	1.50	0	0	0	48	52	32	18	14	25	A-6a (10)			
				EOB	36																		
NOTES: NONE ABANDONMENT METHODS, MATERIALS, QUANTITIES: NOT RECORDED																							

PROJECT: <u>FUL-TR22</u>	DRILLING FIRM / OPERATOR: <u>BMI / JW JB</u>	DRILL RIG: <u>D-90</u>	STATION / OFFSET: _____	EXPLORATION ID <u>B-004-0-16</u>
TYPE: <u>ROADWAY</u>	SAMPLING FIRM / LOGGER: <u>BMI / ABK</u>	HAMMER: <u>AUTOMATIC HAMMER</u>	ALIGNMENT: _____	
PID: <u>98693</u> BR ID: _____	DRILLING METHOD: <u>3.25" HSA</u>	CALIBRATION DATE: <u>1/19/16</u>	ELEVATION: <u>100.0 (MSL)</u> EOB: <u>18.5 ft.</u>	PAGE 1 OF 1
START: <u>1/22/16</u> END: <u>1/22/16</u>	SAMPLING METHOD: <u>SPT</u>	ENERGY RATIO (%): <u>80</u>	LAT / LONG: <u>Not Recorded</u>	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N <sub>60</sub>	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	INST.
								GR	CS	FS	SI	CL	LL	PL	PI			
ASPHALT	100.0																	
AGGREGATE BASE	99.4																	
HARD, BROWN AND GRAY, UNCONTROLLED FILL, SILTY CLAY, TRACE OF SAND, MOIST	99.0	1	7	21	78	SS-1A	4.5 - >4.5	0	1	3	34	62	40	21	19	19	A-6b (12)	
		2	7															
		3																
		4	7	17	78	SS-2A	>4.5	-	-	-	-	-	-	-	-	19	A-6b (V)	
(with sand seam at 5' to 6.5')		5	14															
		6	15	41	89	SS-3A	>4.5	4	14	14	25	43	36	18	18	21	A-6b (10)	
	93.5	7	5															
VERY STIFF, BROWN AND GRAY, SILTY CLAY, SOME SAND, MOIST	92.0	8	7	20	78	SS-4A	4.0 - 4.5	0	1	18	48	33	33	16	17	18	A-6b (11)	
		9	3	9	78	SS-5A	4.00	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
VERY STIFF, BROWN AND GRAY, CLAY, SOME SILT, TRACE OF SAND, MOIST		10	3	4														
(with sand seam at 9.5' to 11')		11	6	7	20	SS-6A	3.00	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
	89.0	12	7	9	27	SS-7A	3.5 - 4.0	-	-	-	-	-	-	-	-	27	A-7-6 (V)	
VERY STIFF, BROWN AND GRAY, CLAY, SOME SILT, TRACE OF SAND, MOIST		13	2	3	11	SS-8A	4.50	0	0	0	26	74	42	22	20	24	A-7-6 (12)	
		14	4	5														
(becomes gray and brown at 14.5')		15	4	5	15	SS-9A	3.5 - 4.5	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
(becomes gray at 15.5')		16	4	4	13	SS-10A	4.00	-	-	-	-	-	-	-	-	26	A-7-6 (V)	
		17	5	6														
	81.5	18	5	6	16	SS-11A	3.5 - >4.5	-	-	-	-	-	-	-	-	21	A-7-6 (V)	

EOB

STANDARD OHDOT SOIL BORING LOG (8.5X11) - OH DOT.GDT - 2/17/16 14:26 - E:\DEPT. 28\28 BORING LOGS\GINT\PROJECTS\173368-XXXX-XXXX.GPJ

NOTES: NONE  
 ABANDONMENT METHODS, MATERIALS, QUANTITIES: NOT RECORDED

# MOISTURE CONTENT SUMMARY SHEET

Job No. 173368

Boring No.	Sample No.	Depth (Feet)	Moisture (%)
1	1A	1.0-2.5	18.1
	2A	3.5-5.0	16.7
	3A	5.0-6.5	19.9
	4A	6.5-8.0	22.1
	5A	8.0-9.5	22.1
	6A	9.5-11.0	19.9
	7A	11.0-12.5	24.9
	8A	12.5-14.0	22.1
	9A	14.0-15.5	22.2
	10A	15.5-17.0	22.0
	11A	17.0-18.5	22.8

# MOISTURE CONTENT SUMMARY SHEET

Job No. 173368

Boring No.	Sample No.	Depth (Feet)	Moisture (%)
2	1A	1.0-2.5	23.8
	2A	3.5-5.0	17.5
	3A	6.0-7.5	20.4
	4A	8.5-10.0	21.8
	5A	11.0-12.5	22.9
	6A	13.5-15.0	21.0
	7A	15.0-16.5	17.5
	8A	16.5-18.0	26.9
	9A	18.0-19.5	23.8
	10A	19.5-21.0	21.9
	11A	21.0-22.5	20.1
	12A	22.5-24.0	21.5
	13A	24.0-25.5	26.1
	14A	25.5-27.0	24.6
	15A	27.0-28.5	25.9
	16A	28.5-30.0	26.0
	17A	30.0-31.5	23.4
	18A	31.5-33.0	*
	19A	33.0-34.5	*
	20A	34.5-36.0	18.5

\* Not Tested



# MOISTURE CONTENT SUMMARY SHEET

Job No. 173368

Boring No.	Sample No.	Depth (Feet)	Moisture (%)
3	1A	1.0-2.5	21.1
	2A	3.5-5.0	23.4
	3A	6.0-7.5	23.5
	4A	8.5-10.0	23.4
	5A	11.0-12.5	21.0
	6A	13.5-15.0	24.2
	7A	15.0-16.5	19.4
	8A	16.5-18.0	21.7
	9A	18.0-19.5	24.8
	10A	19.5-21.0	23.3
	11A	21.0-22.5	20.5
	12A	22.5-24.0	18.8
	13A	24.0-25.5	19.7
	14A	25.5-27.0	21.5
	15A	27.0-28.5	25.1
	16A	28.5-30.0	23.0
	17A	30.0-31.5	*
	18A	31.5-33.0	31.8
	19A	33.0-34.5	*
	20A	34.5-36.0	25.0

\* Not Tested

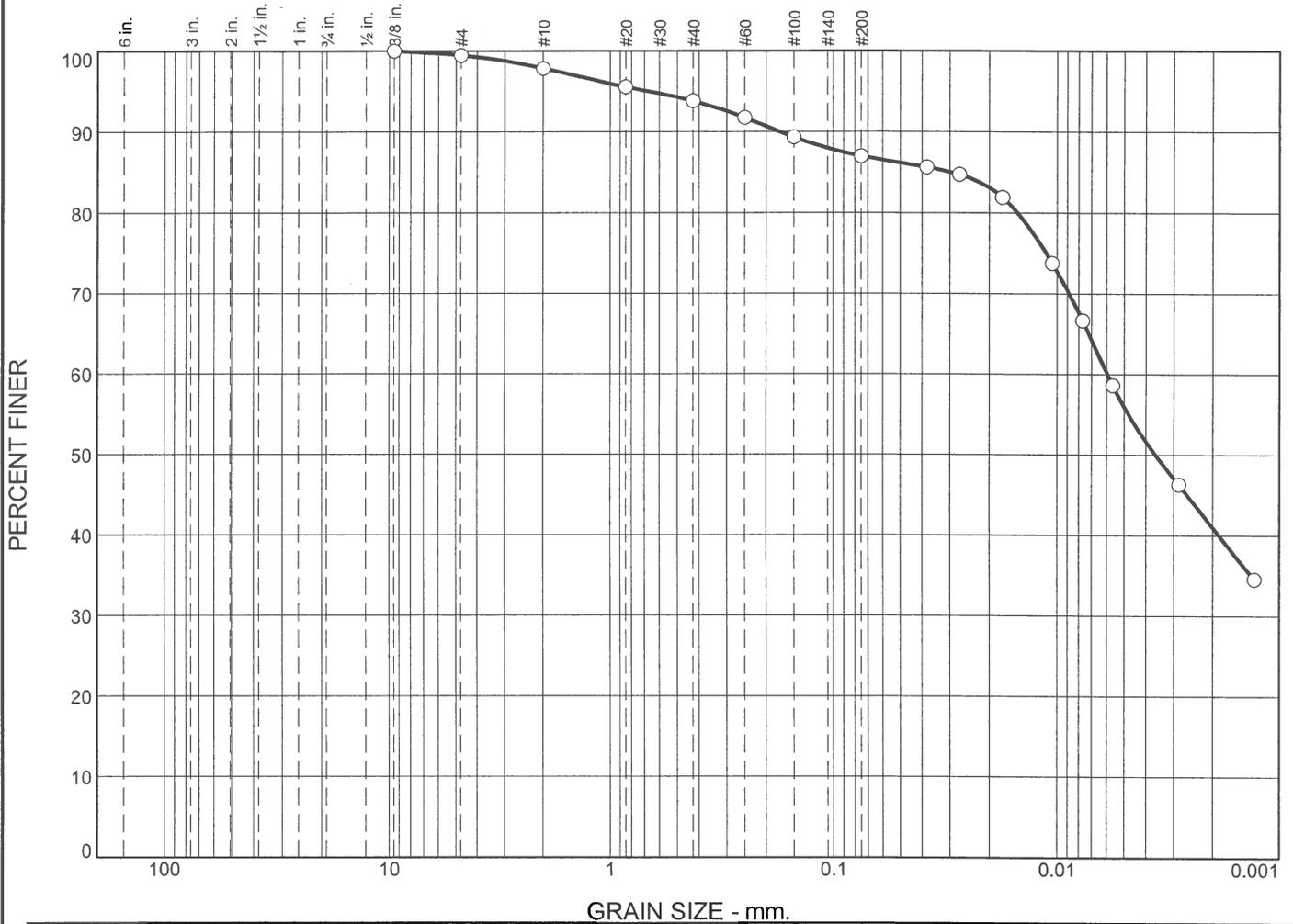


# MOISTURE CONTENT SUMMARY SHEET

Job No. 173368

Boring No.	Sample No.	Depth (Feet)	Moisture (%)
4	1A	1.0-2.5	19.2
	2A	3.5-5.0	18.7
	3A	5.0-6.5	21.2
	4A	6.5-8.0	18.0
	5A	8.0-9.5	21.2
	6A	9.5-11.0	22.7
	7A	11.0-12.5	26.8
	8A	12.5-14.0	24.2
	9A	14.0-15.5	24.8
	10A	15.5-17.0	26.0
	11A	17.0-18.5	21.0

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○ 0.0	0.0	0.0	2.1	4.1	6.8	31.1	55.9			
×	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	37	20	0.0295	0.0060	0.0036					

Material Description	USCS	AASHTO
○ Gray clay, some silt, some sand, trace of gravel		

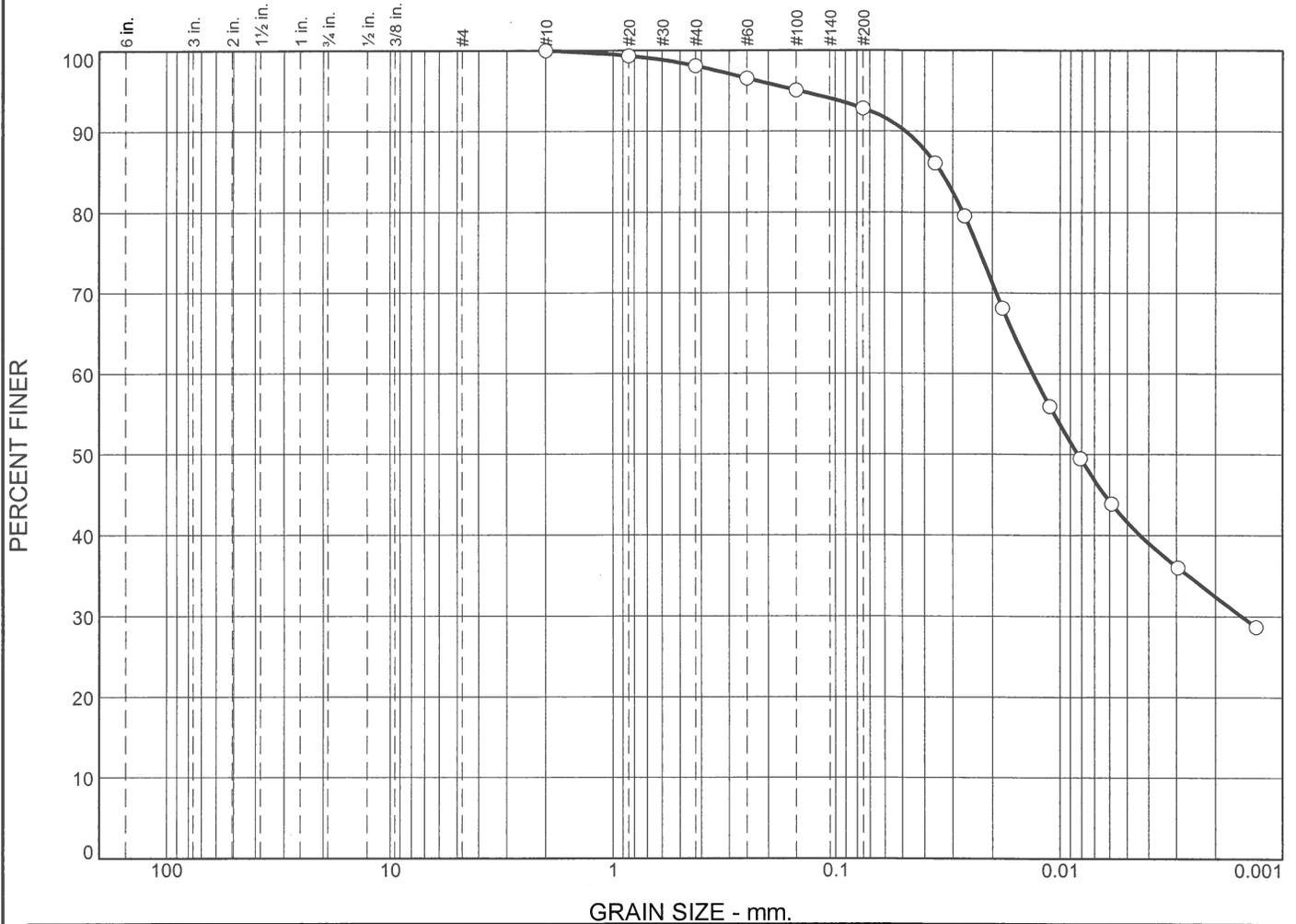
**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 ○ **Source of Sample:** Boring #1-1A, Depth 1.0' - 2.5'

**BOWSER-MORNER, INC.**  
 Toledo, Ohio

**Remarks:**  
 ○ 4.1 % Coarse Sand  
 6.8 % Fine Sand  
 ODOT Classification  
 A-6b (11), D<sub>50</sub> = 0.0036 mm

Figure

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○ 0.0	0.0	0.0	0.0	1.9	5.3	51.2	41.6			
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	39	21	0.0339	0.0133	0.0083	0.0015				

Material Description	USCS	AASHTO
○ Brown silt and clay, trace of sand		

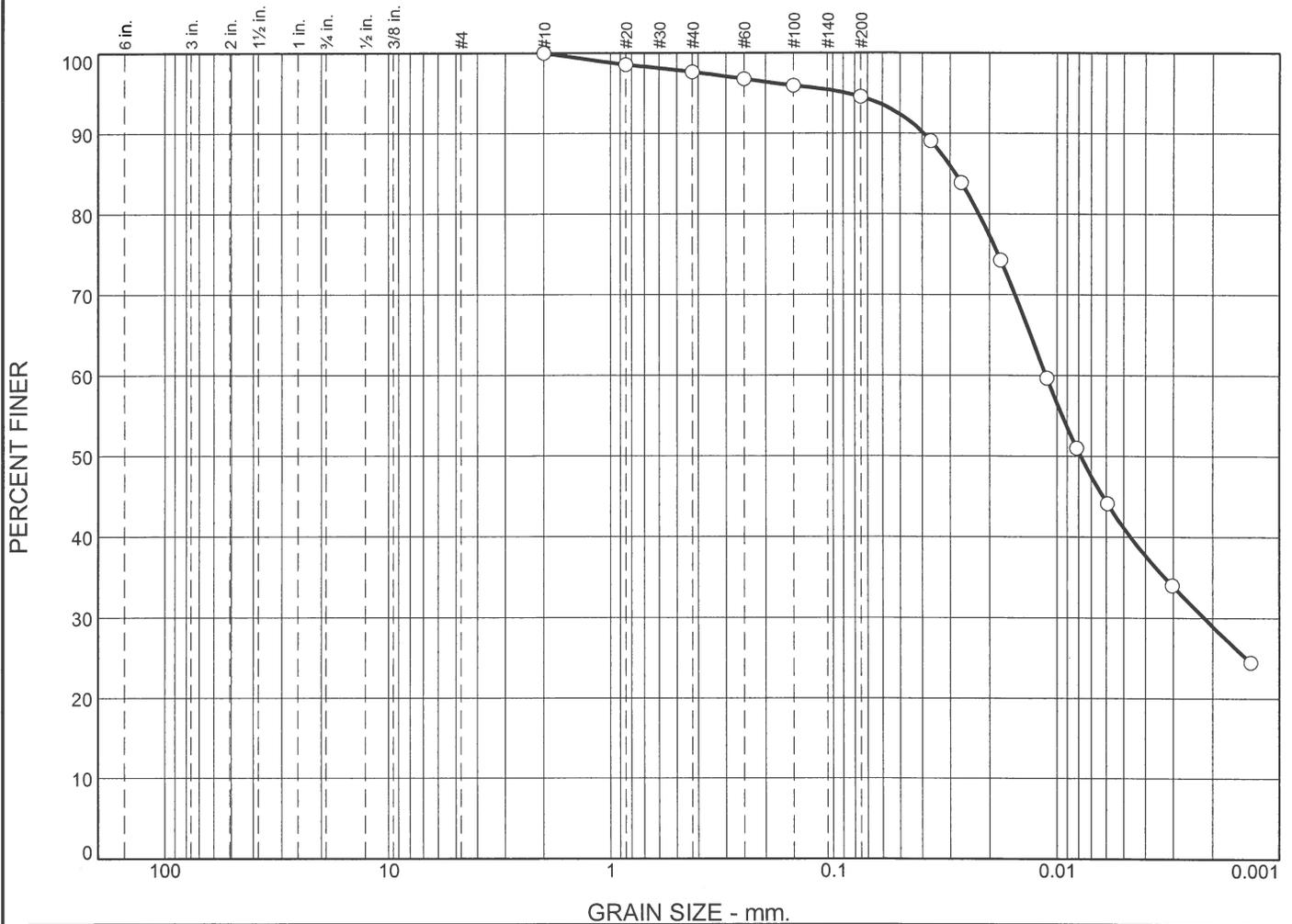
**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 ○ **Source of Sample:** Boring #1-3A, Depth 5.0' - 6.5'

**BOWSER-MORNER, INC.**  
Toledo, Ohio

**Remarks:**  
 ○ 1.9 % Coarse Sand  
 5.3 % Fine Sand  
 ODOT Classification  
 A-6b (11), D50 = 0.0083 mm

Figure

# GRAIN SIZE DISTRIBUTION REPORT



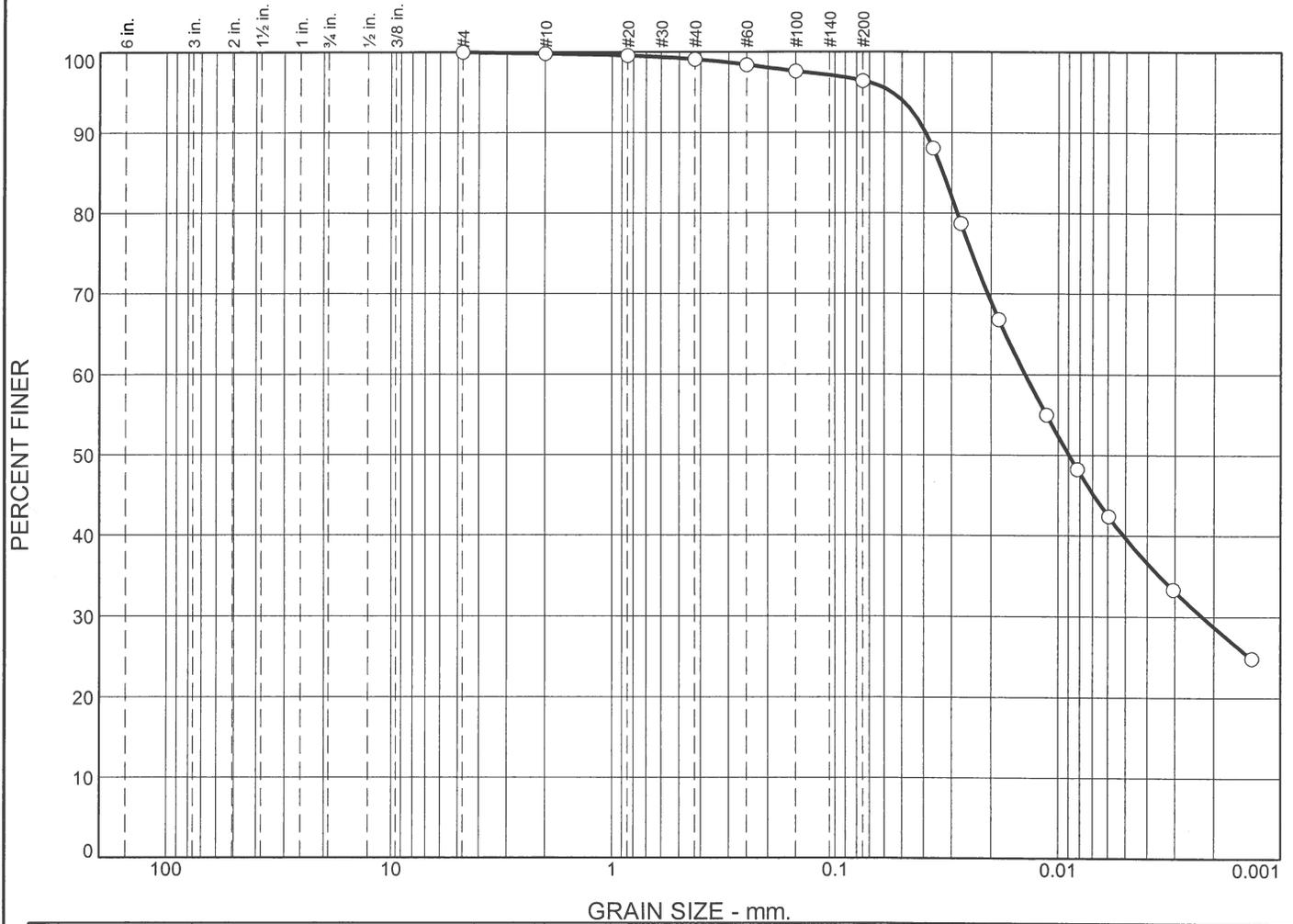
	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○	0.0	0.0	0.0	2.4	3.0	53.5	41.1			
×	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	32	19	0.0284	0.0112	0.0078	0.0022				

Material Description	USCS	AASHTO
○ Brown silt and clay, trace of sand		

<p><b>Project No.</b> 173368      <b>Client:</b> Tetra Tech Professional Services, Inc., Toledo, Ohio</p> <p><b>Project:</b> FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio</p> <p>○ <b>Source of Sample:</b> Boring #1-4A, Depth 6.5' - 8.0'</p>	<p><b>Remarks:</b></p> <p>○ 2.4 % Coarse Sand          3.0 % Fine Sand          ODOT Classification          A-6a (9), D<sub>50</sub> = 0.0078 mm</p>
<p><b>BOWSER-MORNER, INC.</b></p> <p><b>Toledo, Ohio</b></p>	

Figure

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
<input type="radio"/>	0.0	0.0	0.2	0.7	2.7	56.7	39.7			
<input checked="" type="checkbox"/>	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
<input type="radio"/>	33	19	0.0329	0.0141	0.0090	0.0023				

Material Description	USCS	AASHTO
<input type="radio"/> Brown silt and clay, trace of sand		

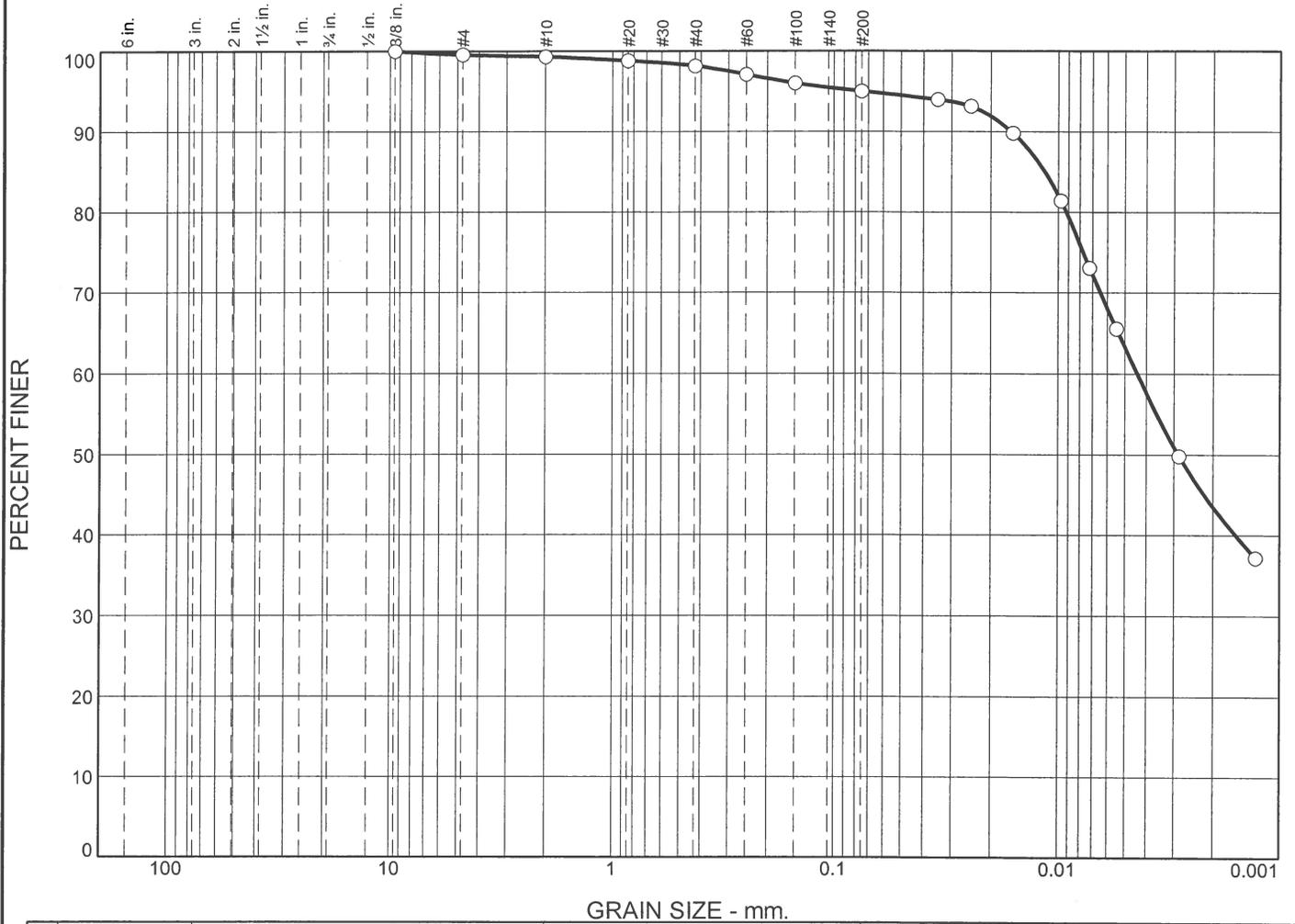
**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 **Source of Sample:** Boring #1-5A, Depth 8.0' - 9.5'

**Remarks:**  
 0.7 % Coarse Sand  
 2.7 % Fine Sand  
 ODOT Classification  
 A-6a (10), D<sub>50</sub> = 0.0090 mm

**BOWSER-MORNER, INC.**  
 Toledo, Ohio

Figure

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○ 0.0	0.0	0.0	0.7	1.1	3.2	31.7	63.3			
×	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	41	22	0.0115	0.0044	0.0029					

Material Description	USCS	AASHTO
○ Brown clay, some silt, trace of sand, trace of gravel		

**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 ○ **Source of Sample:** Boring #2-1A, Depth 1.0' - 2.5'

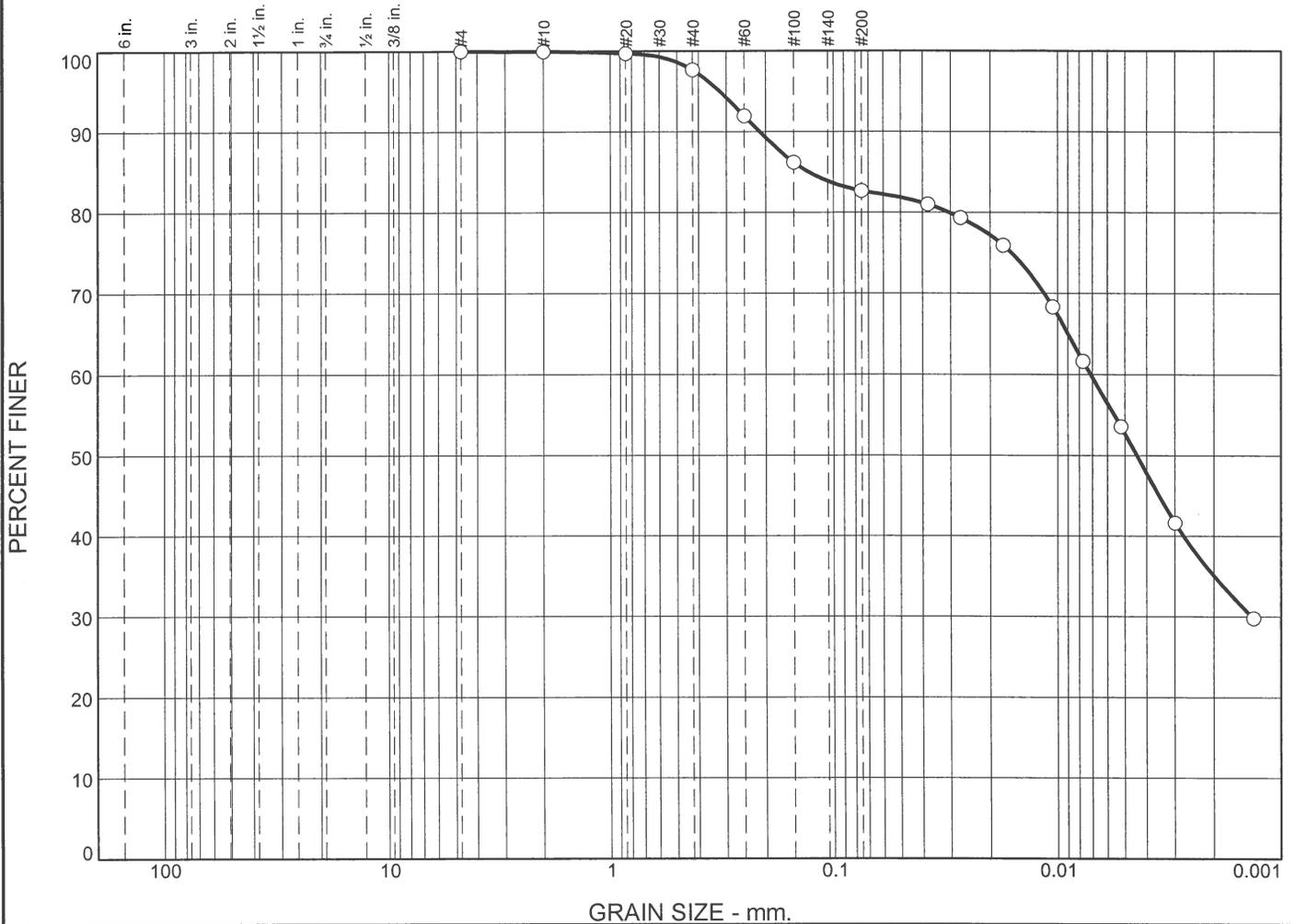
**BOWSER-MORNER, INC.**

Toledo, Ohio

**Remarks:**  
 ○ 1.1 % Coarse Sand  
 3.2 % Fine Sand  
 ODOT Classification  
 A-7-6 (12), D<sub>50</sub> = 0.0029 mm

Figure

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
<input type="radio"/>	0.0	0.0	0.0	2.3	15.0	30.0	52.7			
<input checked="" type="checkbox"/>	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
<input type="radio"/>	34	19	0.1286	0.0071	0.0044	0.0013				

Material Description	USCS	AASHTO
<input type="radio"/> Gray and brown clay, some silt, some sand		

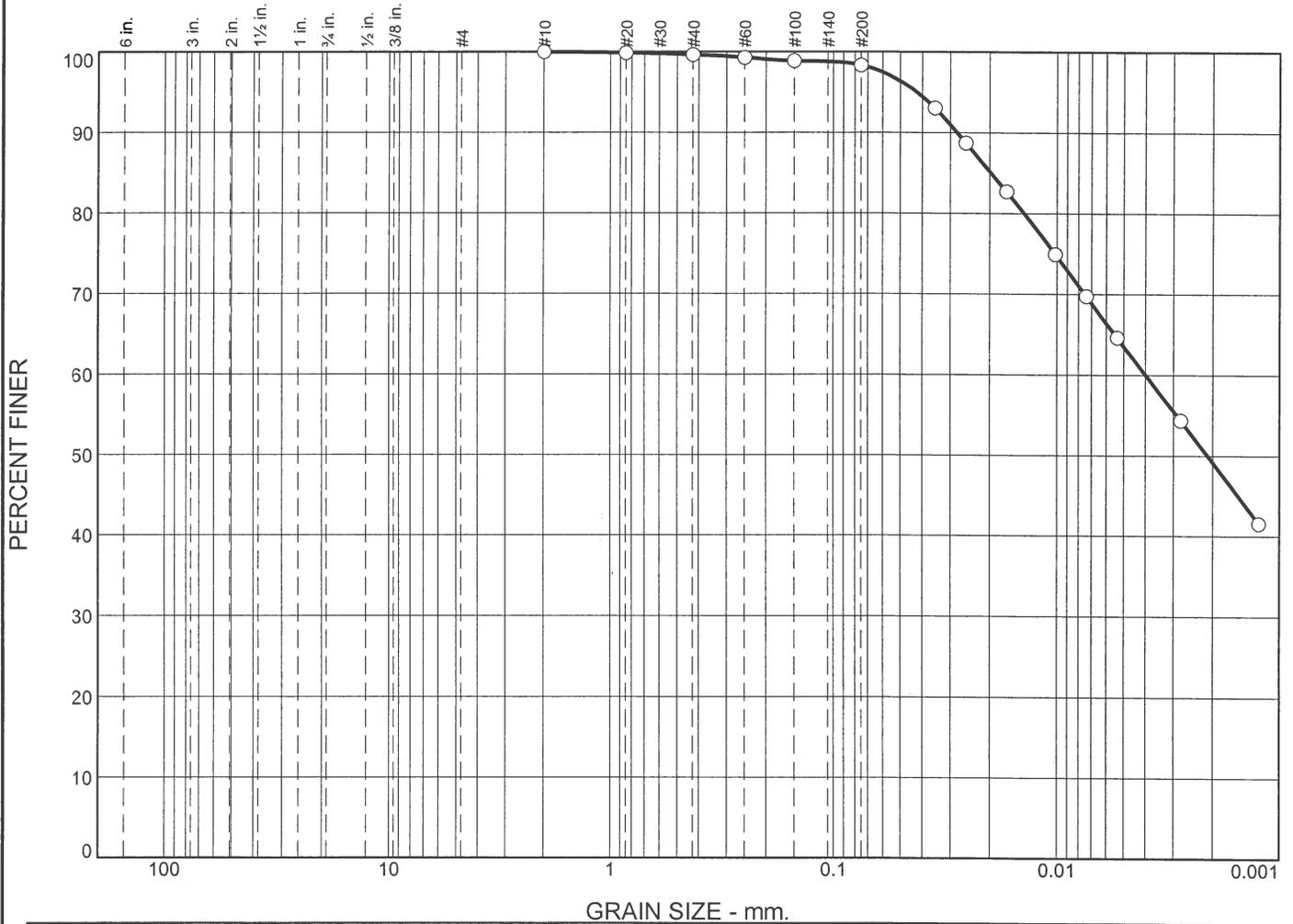
**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 **Source of Sample:** Boring #2-8A, Depth 16.5' - 18.0'

**BOWSER-MORNER, INC.**  
 Toledo, Ohio

**Remarks:**  
 2.3 % Coarse Sand  
 15.0 % Fine Sand  
 ODOT Classification  
 A-6a (10), D50 = 0.0044 mm

Figure

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
<input type="radio"/>	0.0	0.0	0.0	0.4	1.3	34.8	63.5			
<input type="checkbox"/>	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
<input type="radio"/>	48	24	0.0197	0.0040	0.0021					

Material Description	USCS	AASHTO
<input type="radio"/> Gray and brown clay, some silt, trace of sand		

**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 **Source of Sample:** Boring #2-13A, Depth 24.0' - 25.5'

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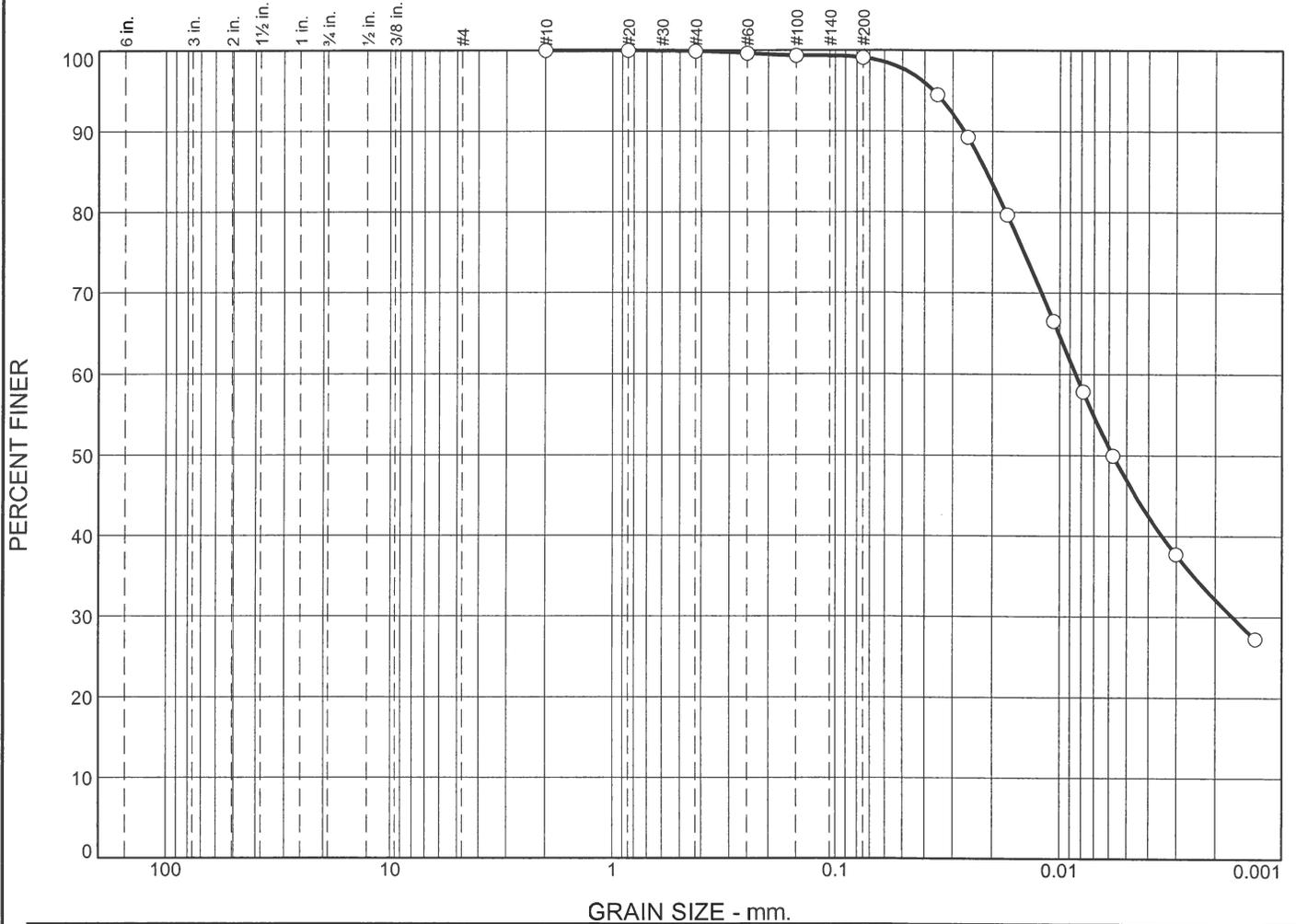
**BOWSER-MORNER, INC.**

**Toledo, Ohio**

**Remarks:**  
 0.4 % Coarse Sand  
 1.3 % Fine Sand  
 ODOT Classification  
 A-7-6 (15), D<sub>50</sub> = 0.0021 mm

**Figure**

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○ 0.0	0.0	0.0	0.0	0.1	0.8	52.3	46.8			
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	32	18	0.0213	0.0085	0.0058	0.0017				

Material Description	USCS	AASHTO
○ Brown silt and clay, trace of sand		

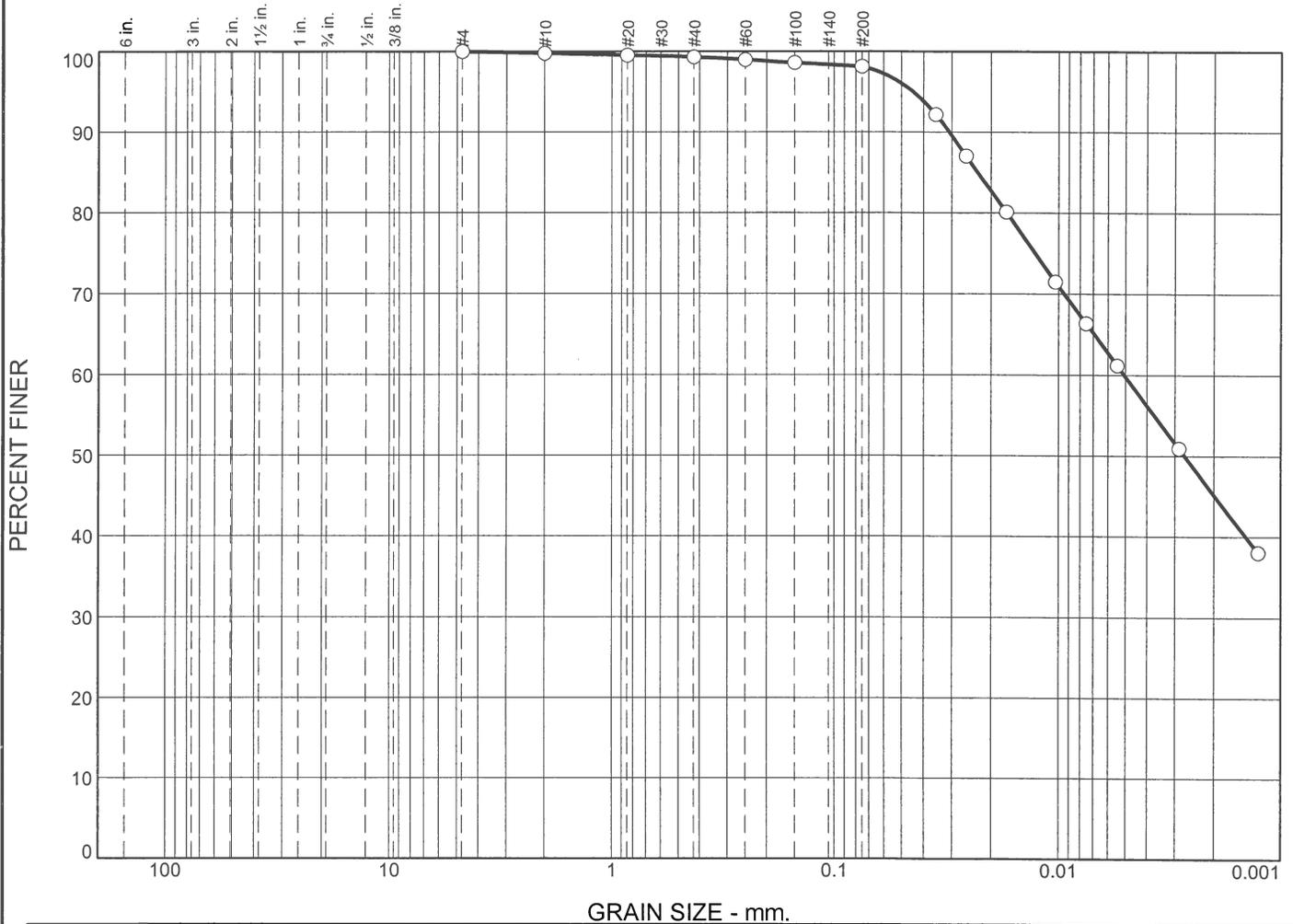
**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 ○ **Source of Sample:** Boring #2-16A, Depth 28.5' - 30.0'

**BOWSER-MORNER, INC.**  
 Toledo, Ohio

**Remarks:**  
 ○ 0.1 % Coarse Sand  
 0.8 % Fine Sand  
 ODOT Classification  
 A-6a (10), D50 = 0.0058 mm

Figure

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
<input type="radio"/>	0.0	0.0	0.2	0.5	1.2	38.3	59.8			
<input checked="" type="checkbox"/>	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
<input type="radio"/>	39	21	0.0230	0.0051	0.0027					

Material Description	USCS	AASHTO
<input type="radio"/> Gray and brown clay and silt, trace of sand		

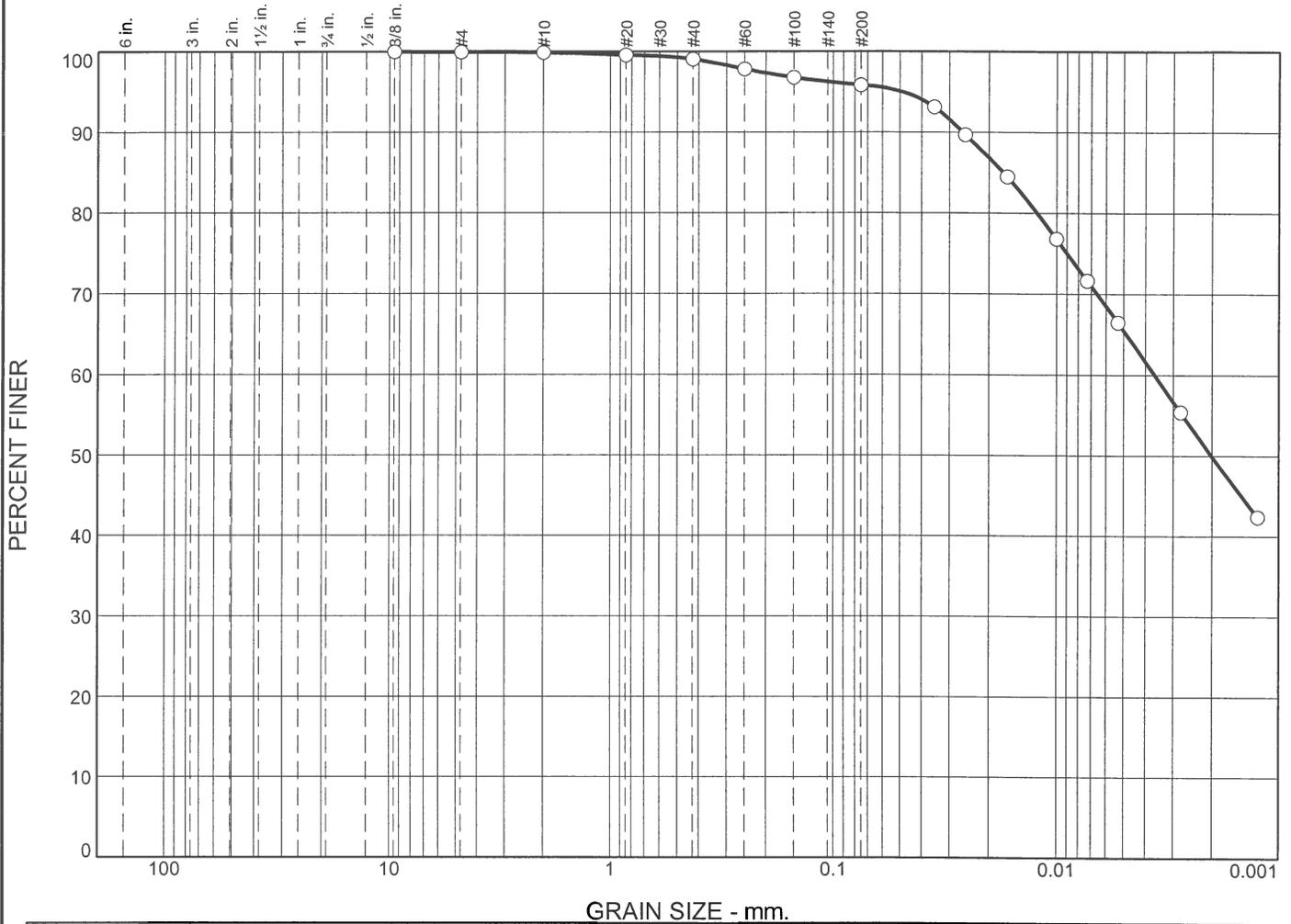
**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 **Source of Sample:** Boring #3-1A, Depth 1.0' - 2.5'

**BOWSER-MORNER, INC.**  
Toledo, Ohio

**Remarks:**  
 0.5 % Coarse Sand  
 1.2 % Fine Sand  
 ODOT Classification  
 A-6b (11), D50 = 0.0027 mm

Figure

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○	0.0	0.0	0.1	0.8	3.3	30.3	65.5			
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	47	23	0.0173	0.0036	0.0020					

Material Description	USCS	AASHTO
○ Gray and brown clay, some silt, trace of sand		

**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 ○ **Source of Sample:** Boring #3-9A, Depth 18.0' - 19.5'

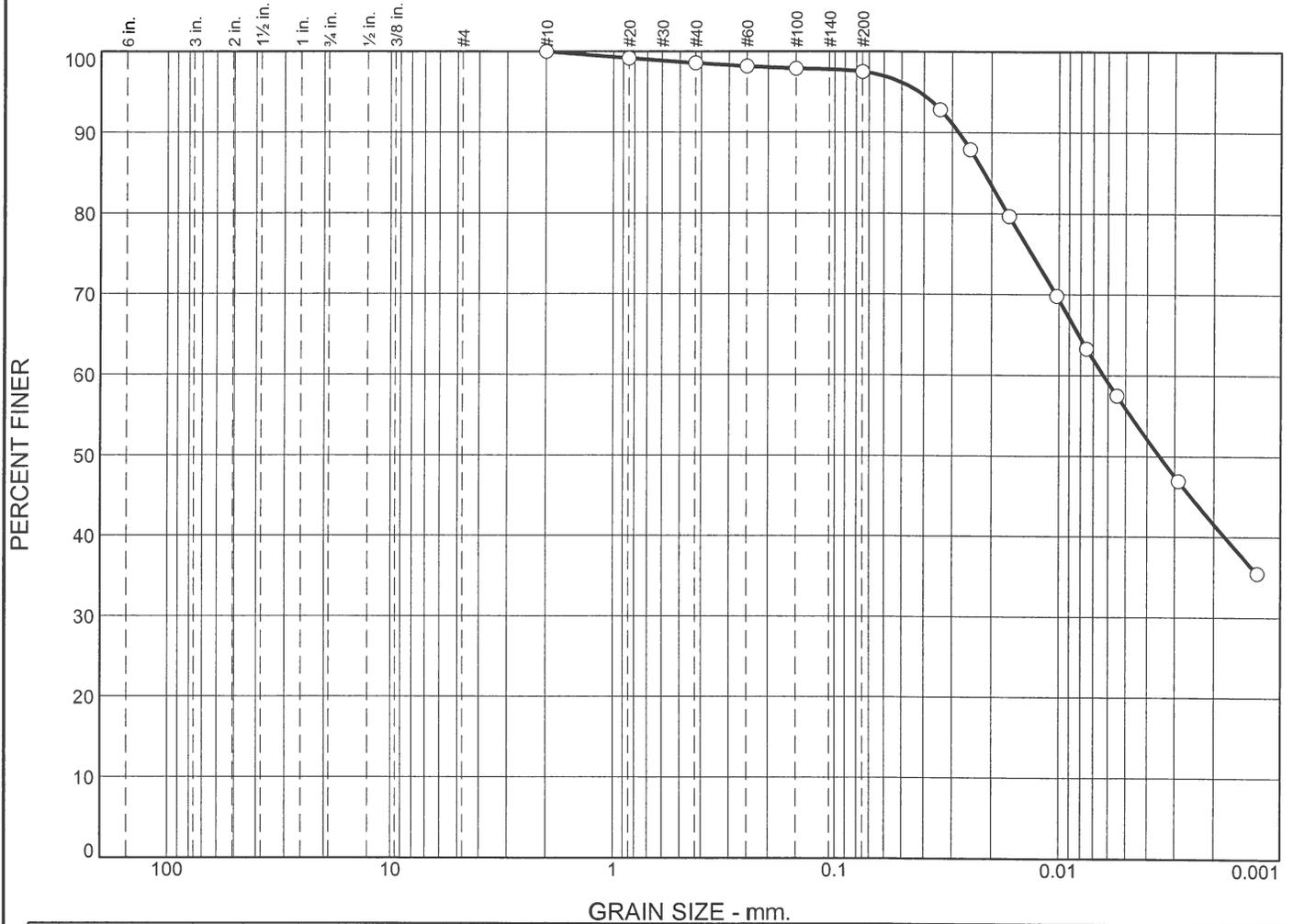
**BOWSER-MORNER, INC.**

Toledo, Ohio

**Remarks:**  
 ○ 0.8 % Coarse Sand  
 3.3 % Fine Sand  
 ODOT Classification  
 A-7-6 (15), D50 = 0.0020 mm

Figure

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
<input type="radio"/>	0.0	0.0	0.0	1.4	1.1	41.6	55.9			
<input checked="" type="checkbox"/>	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
<input type="radio"/>	41	21	0.0216	0.0063	0.0035					

Material Description	USCS	AASHTO
<input type="radio"/> Brown and gray clay and silt, trace of sand		

**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 **Source of Sample:** Boring #3-13A, Depth 24.0' - 25.5'

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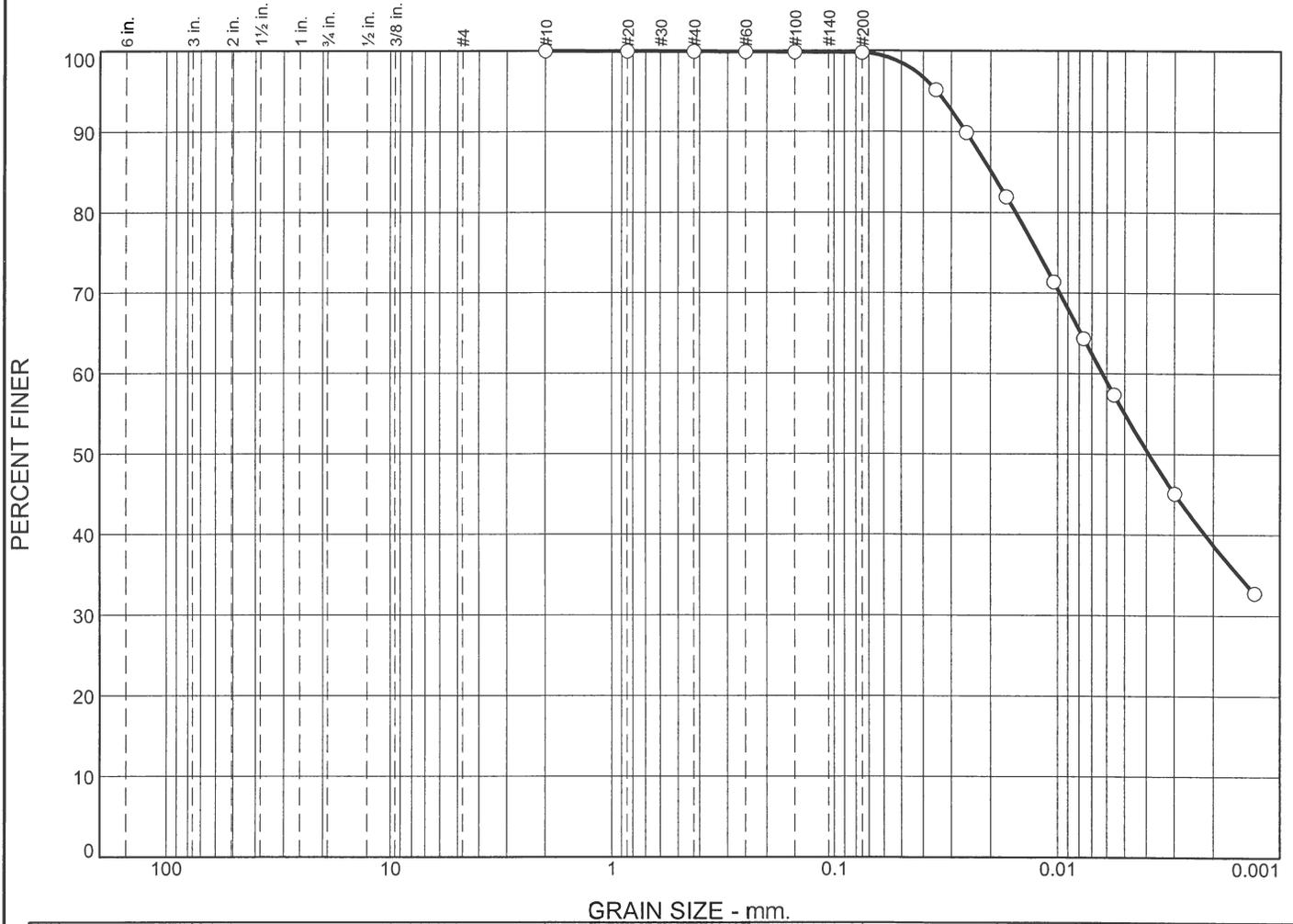
**BOWSER-MORNER, INC.**

Toledo, Ohio

**Remarks:**  
 1.4 % Coarse Sand  
 1.1 % Fine Sand  
 ODOT Classification  
 A-7-6 (12), D50 = 0.0035 mm

**Figure**

# GRAIN SIZE DISTRIBUTION REPORT

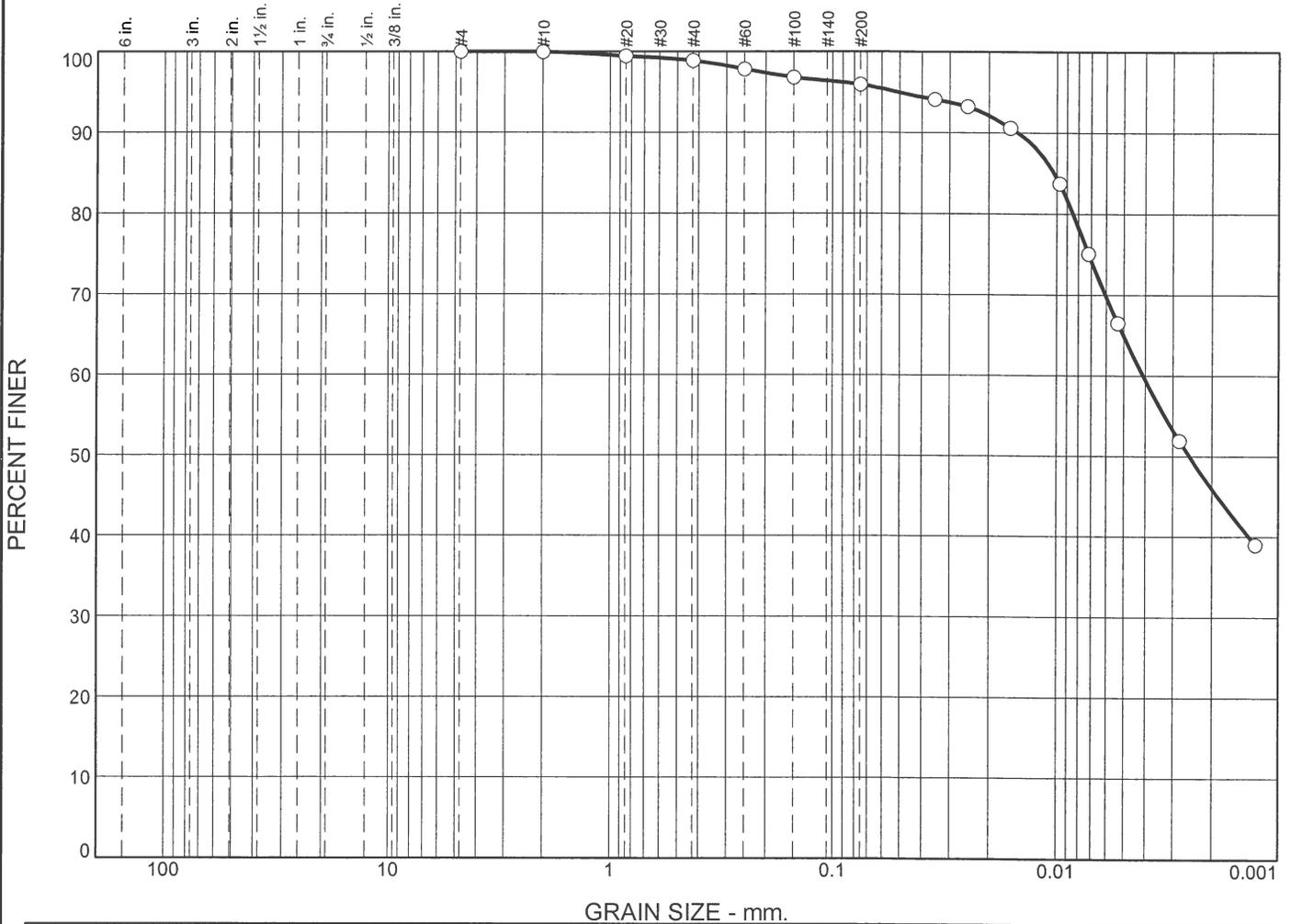


	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○ 0.0	0.0	0.0	0.0	0.1	0.1	44.8	55.0			
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	32	18	0.0199	0.0063	0.0039					

Material Description	USCS	AASHTO
○ Gray and brown clay and silt, trace of sand		

<p><b>Project No.</b> 173368      <b>Client:</b> Tetra Tech Professional Services, Inc., Toledo, Ohio</p> <p><b>Project:</b> FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio</p> <p>○ <b>Source of Sample:</b> Boring #3-20A, Depth 34.5' - 36.0'</p>	<p><b>Remarks:</b></p> <ul style="list-style-type: none"> <li>○ 0.1 % Coarse Sand</li> <li>○ 0.1 % Fine Sand</li> <li>○ ODOT Classification A-6a (10), D50 = 0.0039 mm</li> </ul>
<p><b>BOWSER-MORNER, INC.</b></p> <p><b>Toledo, Ohio</b></p>	
<p><b>Figure</b></p>	

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○	0.0	0.0	0.0	1.1	3.0	31.0	64.9			
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	40	21	0.0103	0.0041	0.0025					

Material Description	USCS	AASHTO
○ Brown clay, some silt, trace of sand		

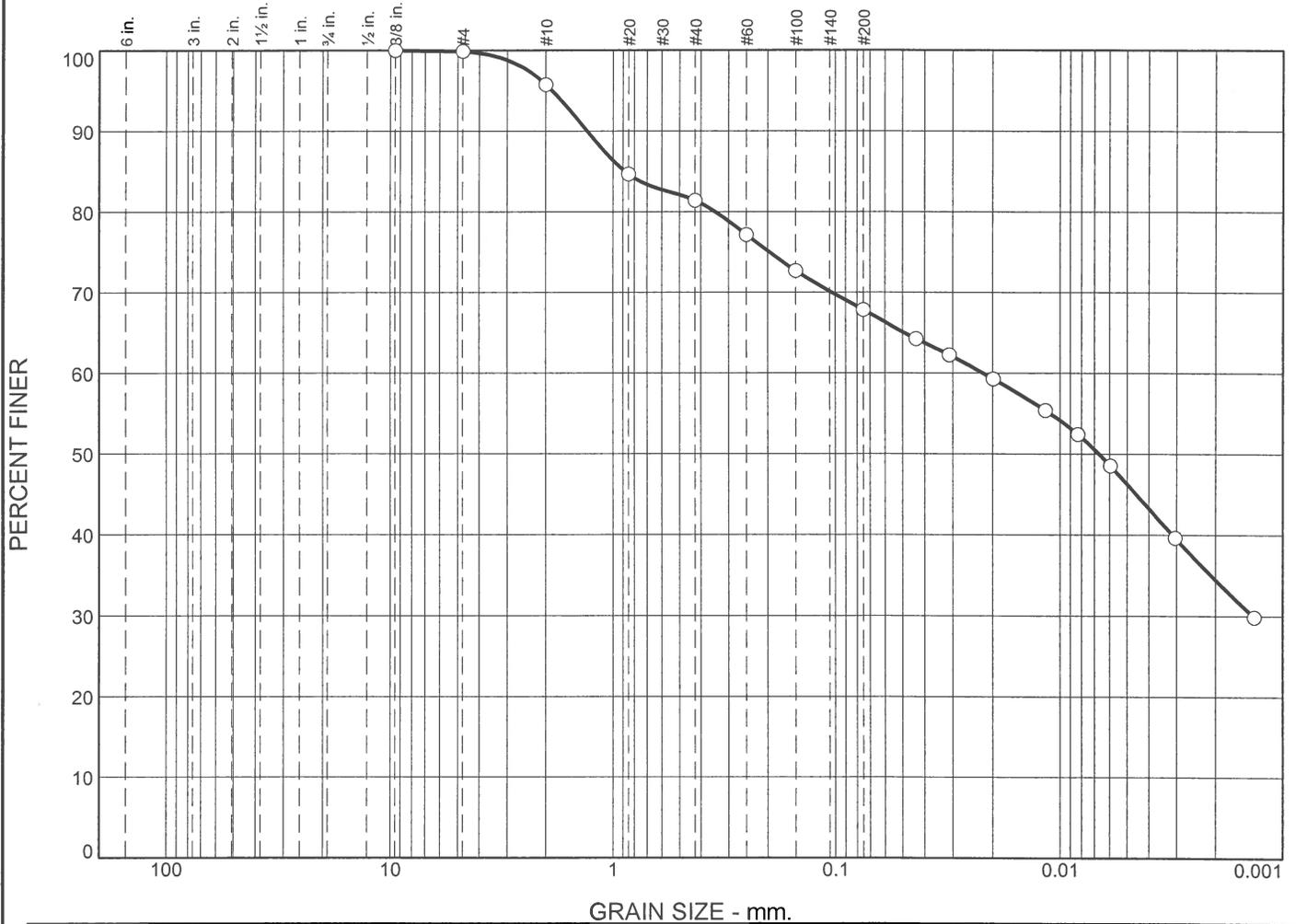
**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 ○ **Source of Sample:** Boring #4-1A, Depth 1.0' - 2.5'

**Remarks:**  
 ○ 1.1 % Coarse Sand  
 3.0 % Fine Sand  
 ODOT Classification  
 A-6b (12), D50 = 0.0025 mm

**BOWSER-MORNER, INC.**  
 Toledo, Ohio

Figure

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○ 0.0	0.0	0.0	4.2	14.4	13.6	21.5	46.3			
×	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	36	18	0.8819	0.0221	0.0067	0.0014				

Material Description	USCS	AASHTO
○ Gray and brown clay, some sand, some silt, trace of gravel		

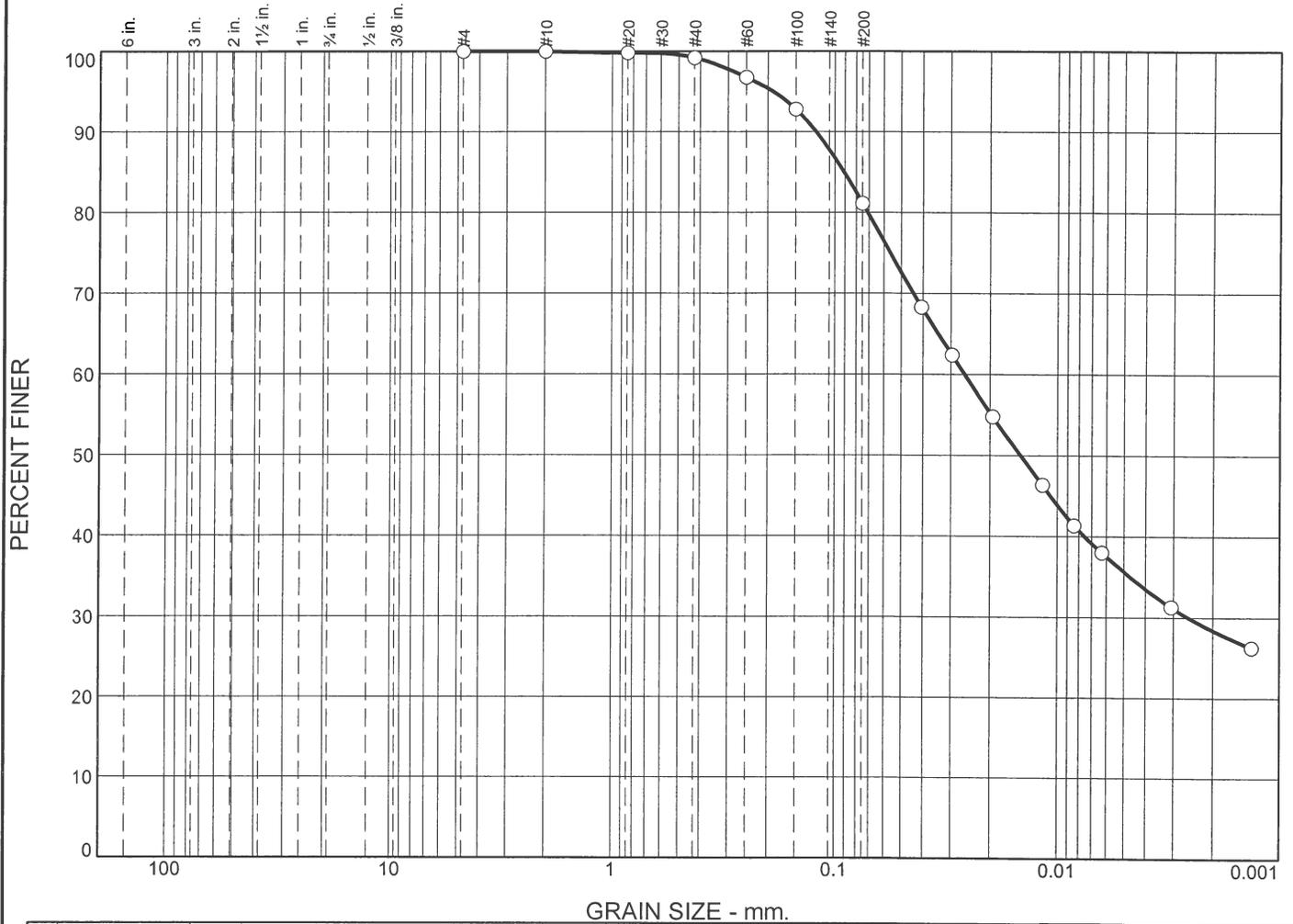
**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 ○ **Source of Sample:** Boring #4-3A, Depth 5.0' - 6.5'

**Remarks:**  
 ○ 14.4 % Coarse Sand  
 13.6 % Fine Sand  
 ODOT Classification  
 A-6b (10), D<sub>50</sub> = 0.0067 mm

**BOWSER-MORNER, INC.**  
 Toledo, Ohio

Figure

# GRAIN SIZE DISTRIBUTION REPORT

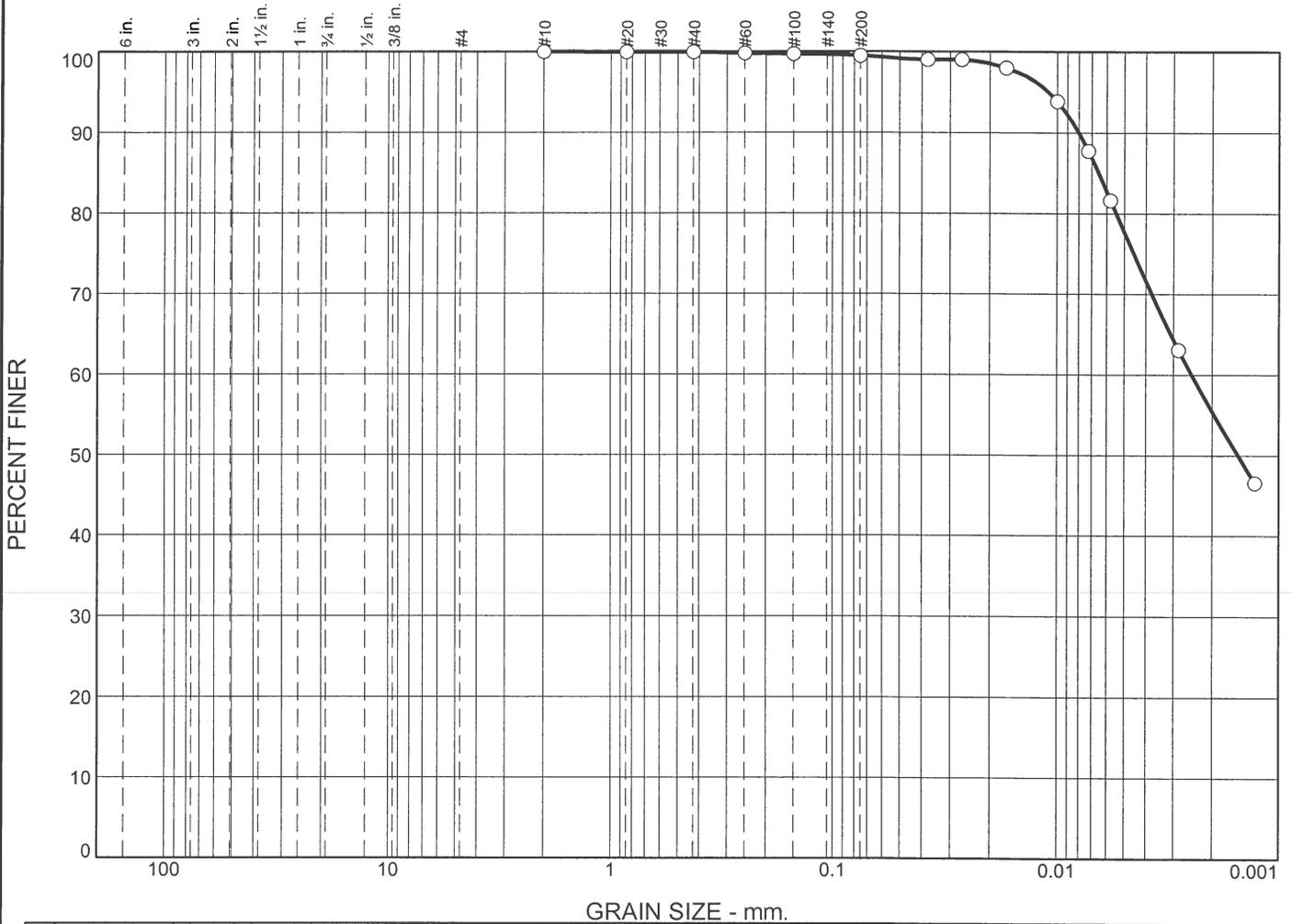


	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○ 0.0	0.0	0.0	0.0	0.8	18.1	45.4	35.7			
×	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	33	16	0.0912	0.0261	0.0146	0.0026				

Material Description	USCS	AASHTO
○ Brown silt and clay, some sand		

<p><b>Project No.</b> 173368      <b>Client:</b> Tetra Tech Professional Services, Inc., Toledo, Ohio</p> <p><b>Project:</b> FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio</p> <p>○ <b>Source of Sample:</b> Boring #4-4A, Depth 6.5' - 8.0'</p>	<p><b>Remarks:</b></p> <ul style="list-style-type: none"> <li>○ 0.8 % Coarse Sand</li> <li>18.1 % Fine Sand</li> <li>ODOT Classification</li> <li>A-6b (11), D<sub>50</sub> = 0.0146 mm</li> </ul>
<p><b>BOWSER-MORNER, INC.</b></p> <p>Toledo, Ohio</p>	
<p>Figure</p>	

# GRAIN SIZE DISTRIBUTION REPORT



	% +3"	% Gravel		% Sand		% Fines				
		Coarse	Fine	Coarse	Fine	Silt	Clay			
○	0.0	0.0	0.0	0.0	0.5	21.9	77.6			
×	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	42	22	0.0065	0.0025	0.0015					

Material Description	USCS	AASHTO
○ Gray clay, some silt, trace of sand		

**Project No.** 173368      **Client:** Tetra Tech Professional Services, Inc., Toledo, Ohio  
**Project:** FUL-TR22-Turnpike Mitigation, PID 98693, Stabilization of Roadway Embankments, Franklin Township Road 22 over the Ohio Turnpike, Fulton County, Ohio  
 ○ **Source of Sample:** Boring #4-8A, Depth 12.5' - 14.0'

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**BOWSER-MORNER, INC.**

Toledo, Ohio

**Remarks:**  
 ○ 0.0 % Coarse Sand  
 0.5 % Fine Sand  
 ODOT Classification  
 A-7-6 (12), D<sub>50</sub> = 0.0015 mm

Figure