

October 15, 2024

ODOT District 11
2201 Reiser Avenue
New Philadelphia, Ohio 44663

Attention: Ms. Adrienne N. Slanina
Consultant Contract Manager

Reference: Roadway Exploration – Final Submission
PID N. 119710
Agreement No. 39773
Task Order No. 11-C
BEL-70-9.35, PID 120547
Belmont County, Ohio
CTL Project No. 24050033MOR

Dear Ms. Slanina

CTL Engineering, Inc. has completed the field and laboratory testing for the above referenced project. We received the boring survey data and proposed subgrade elevations via email on September 30, 2024. Stations and offsets were received via email on October 3, 2024.

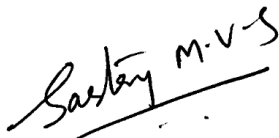
The following information is attached to this letter.

- Typed Boring Logs
- Pavement Core Photo Report
- Sulfate Content in Soils Report (All Roadway Borings)
- Rock Core Photos
- Subgrade Analysis (All Roadway Borings)
- DCP Results

We appreciate the opportunity to be of service to you on this project. If you have any questions, please contact us.

Respectfully submitted,

CTL Engineering, Inc.



Sastry Malladi, P.E.
Project Engineer



Joe Grani, P.E.
Project Engineer

cc: Mr. Cody Notz, P.E. (via email)

MATERIAL DESCRIPTION AND NOTES		ELEV. 1173.0	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO ₄ ppm	ABAN- DONED	
									GR	CS	FS	SI	CL	LL	PL	PI					
ASPHALT (9")		1172.2	TR	1	4	21	78	SS-1	4.00	1	4	20	37	38	42	22	20	15	A-7-6 (12)	<100	
VERY STIFF, BROWN, CLAY, AND SILT, SOME SAND, TRACE GRAVEL, DAMP		1170.5		2	7	9															
SANDSTONE, BROWN, HIGHLY WEATHERED.		1167.0		3	50/2"	-	100	SS-2	-	-	-	-	-	-	-	-	-	5	Rock (V)	-	
				4	50/3"	-	100	SS-3	-	-	-	-	-	-	-	-	7	Rock (V)	-		
				5	50/1"	-	100	SS-4	-	-	-	-	-	-	-	8	Rock (V)	-			
			EOB	6																	

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

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ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 10/14/24 12:01 - O:\PROJECT\2024\MOR-05\24050033\MOR_OHIO DEPARTMENT OF TRANSPORTATION BEL-70-9-35 PID 12054

PROJECT: BEL-70-9.35		DRILLING FIRM / OPERATOR: CTL / A. WILDER		DRILL RIG: CME 45 TRACK		STATION / OFFSET: 113+87, 69' LT.		EXPLORATION ID												
TYPE: RETAINING WALL		SAMPLING FIRM / LOGGER: CTL / CTL		HAMMER: CME AUTOMATIC		ALIGNMENT: SR 149		B-003-2-24												
PID: 120547 SFN:		DRILLING METHOD: 3.25" HSA / NQ2		CALIBRATION DATE: 3/27/24		ELEVATION: 1159.6 (MSL) EOB: 21.0 ft.		PAGE												
START: 6/26/24 END: 6/26/24		SAMPLING METHOD: SPT / NQ2		ENERGY RATIO (%): 77		LAT / LONG: 40.056131, -81.051284		1 OF 1												
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABANDONED
		1159.6							GR	CS	FS	SI	CL	LL	PL	PI	WC			
GRAVEL (10")		1158.7																		
VERY DENSE, GRAY, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, DAMP			1	27																
			2	19 21	51	56	SS-1	-	-	-	-	-	-	-	-	-	4	A-2-7 (V)	-	
		1156.6	3																	
HARD, GRAY/BROWN, SILT AND CLAY, SOME SAND, TRACE GRAVEL, DAMP			4	3																
			5	4 6	13	100	SS-2	4.25	2	6	20	39	33	32	19	13	9	A-6a (9)	-	
		1153.6	6																	
HARD, GRAY/BROWN, CLAY, SOME SILT, TRACE GRAVEL, MOIST			7	27 7 8	19	100	SS-3	4.50	2	10	5	33	50	48	23	25	24	A-7-6 (16)	-	
			8																	
@ 8.5'; VERY STIFF, DAMP		1150.6	9	5																
HARD, GRAY/BROWN, CLAY, POSSIBLE CLAYSTONE, DAMP		1149.6	10	8 11	24	100	SS-4	4.00	-	-	-	-	-	-	-	-	15	A-7-6 (V)	-	
LIMESTONE, GRAY, HIGHLY WEATHERED.		1148.6	11	50/1"	-	0		-	-	-	-	-	-	-	-	-	-	Rock (V)	-	
LIMESTONE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, STRONG, WITH SHALE LAYERS; RQD 51%, REC 100%.			12																	
			13																	
			14	47		100	NQ2-1											CORE		
			15																	
@ 15.1' - 16.0'; Compressive Strength = 10,940 psi			16																	
			17																	
			18																	
			19	55		100	NQ2-2											CORE		
			20																	
		1138.6	21																	
			EOB																	
NOTES: NONE																				
ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS																				

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ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 10/14/24 12:01 - O:\PROJECT\2024\MOR-05\24050033\MOR_OHIO DEPARTMENT OF TRANSPORTATION BEL-70-9-35 PID 12054

PROJECT: BEL-70-9.35		DRILLING FIRM / OPERATOR: CTL / A. WILDER		DRILL RIG: CME 45 TRACK		STATION / OFFSET: 120+76, 12' LT.		EXPLORATION ID B-005-0-24												
TYPE: SUBGRADE		SAMPLING FIRM / LOGGER: CTL / CTL		HAMMER: CME AUTOMATIC		ALIGNMENT: SR 149														
PID: 120547 SFN:		DRILLING METHOD: 3.25" HSA		CALIBRATION DATE: 3/27/24		ELEVATION: 1191.2 (MSL) EOB: 4.08 ft.		PAGE 1 OF 1												
START: 6/24/24 END: 6/24/24		SAMPLING METHOD: SPT		ENERGY RATIO (%): 77		LAT / LONG: 40.057965, -81.051917														
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABANDONED
		1191.2							GR	CS	FS	SI	CL	LL	PL	PI	WC			
ASPHALT (9.5")		1190.5																		
AGGREGATE BASE (4")		1190.1	1	11																
VERY DENSE, BROWN, COARSE AND FINE SAND, LITTLE SILT, LITTLE CLAY, DRY		1188.7	2	33 50/2"	-	100	SS-1	-	13	15	44	14	14	NP	NP	NP	4	A-3a (0)	<100	
SANDSTONE, BROWN, HIGHLY WEATHERED.			3	50/2"	-	100	SS-2	-	-	-	-	-	-	-	-	-	7	Rock (V)	-	
		1187.2	4	50/1"	-	100	SS-3	-	-	-	-	-	-	-	-	-	7	Rock (V)	-	
			EOB																	
NOTES: NONE																				
ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS																				

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ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABAN-DONED
		1193.6								GR	CS	FS	SI	CL	LL	PL	PI	WC			
CONCRETE (12")		1192.6		1	 7																
MEDIUM DENSE, BROWN, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, DAMP				2	 4	12	72	SS-1	2.50	55	10	8	11	16	29	17	12	11	A-2-6 (0)	1600	
		1190.1		3																	
VERY STIFF, BROWN/GRAY, SILTY CLAY, SOME SAND, LITTLE GRAVEL, DAMP				4	 7	10	56	SS-2	3.00	14	15	8	21	42	40	21	19	17	A-6b (9)	-	
				5	 4																
@ 6.0'; MOIST				6	 4																
				7	 5	13	100	SS-3	3.00	-	-	-	-	-	-	-	-	23	A-6b (V)	-	
		1185.6		8																	
VERY STIFF, GRAY/BROWN, SILTY CLAY, SOME GRAVEL, TRACE SAND, DAMP				9	 3																
				10	 5	12	100	SS-4	2.50	-	-	-	-	-	-	-	-	12	A-6b (V)	-	
		1183.6			 4																

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 10/14/24 12:01 - O:\PROJECT\2024\MOR-05\24050033\MOR-05\24050033\MOR-05\24050033\MOR-05\24050033\PID 12054

PROJECT: BEL-70-9.35		DRILLING FIRM / OPERATOR: CTL / A. WILDER		DRILL RIG: CME 45 TRACK		STATION / OFFSET: 125+62, 159' RT.		EXPLORATION ID												
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: CTL / CTL		HAMMER: CME AUTOMATIC		ALIGNMENT: SR 149		B-006-2-24												
PID: 120547 SFN:		DRILLING METHOD: 3.25" HSA		CALIBRATION DATE: 3/27/24		ELEVATION: 1193.9 (MSL) EOB: 10.0 ft.		PAGE												
START: 6/27/24 END: 6/27/24		SAMPLING METHOD: SPT		ENERGY RATIO (%): 77		LAT / LONG: 40.059380, -81.051924		1 OF 1												
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABANDONED
		1193.9							GR	CS	FS	SI	CL	LL	PL	PI	WC			
GRAVEL (1")		1193.8																		
VERY STIFF, BROWN, CLAY, SOME SAND, SOME SILT, LITTLE GRAVEL, MOIST			1	3	9	72	SS-1	2.75	20	14	10	21	35	43	21	22	23	A-7-6 (9)	<100	
		1190.9	2	4																
VERY STIFF, BROWN/GRAY, CLAY, LITTLE SILTY, LITTLE GRAVEL, TRACE CLAY, DAMP			3																	
			4	4	10	100	SS-2	3.25	13	1	3	17	66	63	28	35	27	A-7-6 (20)	-	
			5																	
SHALE, BROWN/GRAY, SEVERELY WEATHERED.		1187.9	6	7																
			7	12	54	100	SS-3	4.50	-	-	-	-	-	-	-	-	12	Rock (V)	-	
				30																
		1185.4	8																	
SHALE, BROWN, HIGHLY WEATHERED.			9	50/2"	-	100	SS-4	3.50	-	-	-	-	-	-	-	-	6	Rock (V)	-	
		1183.9	10																	
			EOB																	
NOTES: NONE																				
ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS																				

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 10/14/24 12:01 - O:\PROJECT\2024\MOR-05\24050033\MOR-05\24050033\MOR-05\24050033\MOR-05\24050033\PID 12054

PROJECT: BEL-70-9.35		DRILLING FIRM / OPERATOR: CTL / A. WILDER		DRILL RIG: CME 45 TRACK		STATION / OFFSET: 128+67, 8' LT.		EXPLORATION ID												
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: CTL / CTL		HAMMER: CME AUTOMATIC		ALIGNMENT: SR 149		B-008-0-24												
PID: 120547 SFN:		DRILLING METHOD: 3.25" HSA		CALIBRATION DATE: 3/27/24		ELEVATION: 1200.1 (MSL) EOB: 10.0 ft.		PAGE												
START: 6/24/24 END: 6/24/24		SAMPLING METHOD: SPT		ENERGY RATIO (%): 77		LAT / LONG: 40.060009, -81.052866		1 OF 1												
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABAN- DONED
		1200.1							GR	CS	FS	SI	CL	LL	PL	PI	WC			
ASPHALT (9")		1199.3																		
AGGREGATE BASE (3")		1199.1	1	5	15	67	SS-1	4.50	16	8	10	33	33	38	19	19	17	A-6b (10)	<100	
HARD, BROWN, SILTY CLAY, LITTLE SAND, LITTLE GRAVEL, CONTAINS ASPHALT, DAMP @ 2.5'; VERY STIFF			2	7																
			3	6	19	100	SS-2	4.00	-	-	-	-	-	-	-	-	18	A-6b (V)	-	
		1196.1	4	9																
MEDIUM DENSE, BROWN, SANDY SILT, LITTLE CLAY, DAMP			5	8	18	100	SS-3	3.25	0	16	48	18	18	NP	NP	NP	13	A-4a (0)	-	
			6	8																
			7	8	21	100	SS-4	2.50	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
			8	7	18	100	SS-5	2.50	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
			9	7																
		1190.1	10	10	24	100	SS-6	4.25	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
			EOB																	
NOTES: NONE																				
ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS																				

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 10/14/24 12:01 - O:\PROJECT\2024\MOR-05\24050033\MOR-05\24050033\MOR-05\24050033\MOR-05\24050033\PID 12054

PROJECT: BEL-70-9.35		DRILLING FIRM / OPERATOR: CTL / A. WILDER		DRILL RIG: CME 45 TRACK		STATION / OFFSET: 130+76, 223' LT.		EXPLORATION ID												
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: CTL / CTL		HAMMER: CME AUTOMATIC		ALIGNMENT: SR 149		B-009-1-24												
PID: 120547 SFN:		DRILLING METHOD: 3.25" HSA		CALIBRATION DATE: 3/27/24		ELEVATION: 1207.3 (MSL) EOB: 10.0 ft.		PAGE												
START: 6/27/24 END: 6/27/24		SAMPLING METHOD: SPT		ENERGY RATIO (%): 77		LAT / LONG: 40.060295, -81.053862		1 OF 1												
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABANDONED
		1207.3							GR	CS	FS	SI	CL	LL	PL	PI	WC			
CONCRETE (12")		1206.3																		
VERY STIFF, BROWN, SILTY CLAY, AND SAND, TRACE GRAVEL, DAMP			1	3																
			2	4	13	83	SS-1	3.00	6	24	22	21	27	32	15	17	9	A-6b (5)	<100	
		1204.3																		
MEDIUM DENSE, BROWN, COARSE AND FINE SAND, DAMP			3																	
			4	10																
			5	7	18	100	SS-2	-	-	-	-	-	-	-	-	-	6	A-3a (V)	-	
		1201.8																		
VERY STIFF, BROWN, SILT AND CLAY, SOME SAND, TRACE GRAVEL, MOIST			6	3																
			7	5	14	100	SS-3	2.75	1	16	12	46	25	31	17	14	18	A-6a (9)	-	
			8																	
@ 8.5'; DAMP			9	13																
		1197.3		6	15	100	SS-4	2.50	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
			10	6																
			EOB																	
NOTES: NONE																				
ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS																				

MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABAN- DONED
		1208.9								GR	CS	FS	SI	CL	LL	PL	PI	WC			
CONCRETE (12")		1207.9		1	12																
MEDIUM DENSE, GRAY, GRAVEL AND/OR STONE FRAGMENTS WITH SAND , TRACE SILT, TRACE CLAY, DAMP (FILL)		1203.4	2	11	10	27	100	SS-1	-	46	25	11	9	9	NP	NP	NP	6	A-1-b (0)	560	
			3																		
			4	8	5	17	72	SS-2	-	-	-	-	-	-	-	-	8	A-1-b (V)	-		
5																					
VERY STIFF, BROWN, SILTY CLAY , LITTLE SAND, LITTLE GRAVEL, CONTAINS BRICK PIECES, DAMP (FILL)				6	4	6	14	56	SS-3	3.50	12	13	7	38	30	37	19	18	11	A-6b (10)	-
@ 8.5'; NO BRICK			7	5	5																
		8																			
		9	5	5	15	100	SS-4	3.25	-	-	-	-	-	-	-	18	A-6b (V)	-			
		1198.9	EOB	10	7																

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

PAVEMENT CORE REPORT

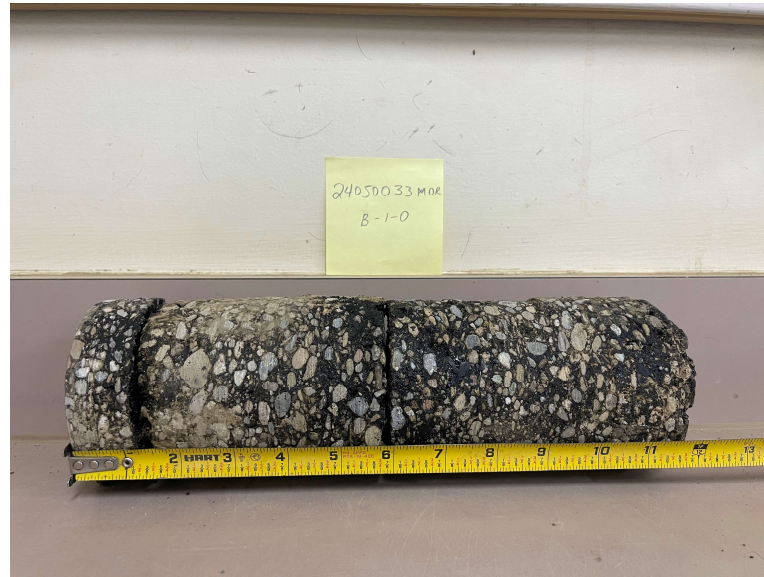
Ohio Department of Transportation

BEL-70-9-35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050033MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-001-0-24	6/25/24	4.0"	40.054237	-81.050177	1175.7



Depth (inches)	Pavement Type	Notes
0 – 1.25	Asphalt Concrete	Surface Course
1.25 - 11.6	Asphalt Concrete	Intermediate Course

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
11.6	11.6	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9-35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050033MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-002-0-24	6/26/24	4.0"	40.055261	-81.050584	1173.0



Depth (inches)	Pavement Type	Notes
0 – 1.0	Asphalt Concrete	Surface Course
1.0 - 7.5	Asphalt Concrete	Intermediate Course

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
7.5	9.0	83

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9-35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050033MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-003-0-24	6/26/24	4.0"	40.056172	-81.051069	1171.8



Depth (inches)	Pavement Type	Notes
0 – 1.75	Asphalt Concrete	Surface Course
1.75 – 10.25	Asphalt Concrete	Intermediate Course

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
10.25	12	85

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9-35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050033MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-004-0-24	6/24/24	4.0"	40.056921	-81.051443	1179.2



Depth (inches)	Pavement Type	Notes
0 – 5.0	Asphalt Concrete	Surface Course
5.0 - 9.625	Asphalt Concrete	Intermediate Course

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
9.6	9.6	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9-35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050033MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-005-0-24	6/24/24	4.0"	40.057965	-81.051917	1191.2



Depth (inches)	Pavement Type	Notes
0 – 1.5	Asphalt Concrete	Surface Course
1.5 - 9.5	Asphalt Concrete	Intermediate Course

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
9.5	9.5	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9-35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050033MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-006-0-24	6/24/24	4.0"	40.058961	-81.052376	1193.4



Depth (inches)	Pavement Type	Notes
0 – 4.1	Asphalt Concrete	Surface Course
0	Asphalt Concrete	Intermediate Course

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
4.1	8.0	51

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9-35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050033MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-008-0-24	6/24/24	4.0"	40.060009	-81.052866	1200.1



Depth (inches)	Pavement Type	Notes
0 – 2.25	Asphalt Concrete	Surface Course
2.25 - 6.5	Asphalt Concrete	Intermediate Course

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
6.5	9.0	72

PAVEMENT CORE REPORT

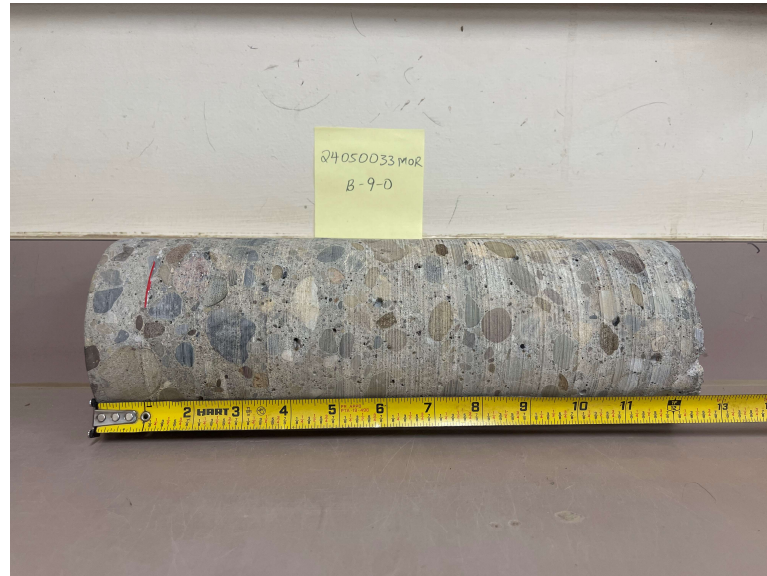
Ohio Department of Transportation

BEL-70-9-35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050033MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-009-0-24	6/24/24	4.0"	40.060563	-81.053061	1205.7



Depth (inches)	Pavement Type	Notes
0 – 12.5	Portland Cement	Concrete Pavement

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
12.5	12.5	100



OHIO DEPARTMENT OF TRANSPORTATION
DETERMINING SULFATE CONTENT IN SOILS
SUPPLEMENT 1122

Project C-R-S: BEL-70-9.35

PID No: 120547

Report Date: 7/26/2024

Consultant: CTL Engineering, Inc.

Technician: RV

Sample or Boring ID	Station	Offset	Latitude & Longitude or State Plane Coordinates		Elevation	Soaking Time (hr)	Replicate Sample Readings						Sulfate Content (ppm)
							1		2		3		
							Dilution	Reading	Dilution	Reading	Dilution	Reading	
B-001-0-24	106+32.87	-8.827	40.054237	-81.050177	1175.71	20	20	190	20	190	20	190	3800
B-002-0-24	110+22.62	8.924	40.055261	-81.050584	1172.99	20	20	<5	20	<5	20	<5	< 100
B-003-0-24	113+80.66	-7.707	40.056172	-81.051069	1171.83	20	20	18	20	18	20	18	360
B-004-0-24	116+72.96	-14.79	40.056921	-81.051443	1179.17	20	20	<5	20	<5	20	<5	< 100
B-005-0-24	120+75.91	-12.17	40.057965	-81.051917	1191.24	20	20	<5	20	<5	20	<5	< 100
B-006-0-24	124+60.85	-11.39	40.058961	-81.052376	1193.39	20	20	<5	20	<5	20	<5	< 100
B-006-1-24	125+38.94	-130.3	40.059054	-81.052870	1193.55	20	20	78	20	78	20	78	1560
B-006-2-24	125+62.04	158.8	40.059380	-81.051924	1193.87	20	20	<5	20	<5	20	<5	< 100
B-008-0-24	128+66.69	-7.697	40.060009	-81.052866	1200.06	20	20	<5	20	<5	20	<5	< 100
B-009-0-24	130+73.74	21.18	40.060563	-81.053061	1205.67	20	20	19	20	19	20	19	380
B-009-1-24	130+76.11	-223.2	40.060295	-81.053862	1207.32	20	20	<5	20	<5	20	<5	< 100
B-009-2-24	130+89.33	158	40.060757	-81.052638	1208.92	20	20	28	20	28	20	28	560

B-003-0-24 Box 1 of 1



Run #:	Depth:		Recovery		RQD	
1	16.0'	21.0'	5.0/5.0	97%	0.0/5.0	0%
2	21.0'	26.0'	4.8/5.0	96%	1.9/5.0	38%

24050033MOR – BEL-70-9.35

B-003-2-24 Box 1 of 1



Run #:	Depth:		Recovery		RQD	
1	11.0'	16.0'	5.0/5.0	100%	2.35/5.0	47%
2	16.0'	21.0'	5.0/5.0	100%	2.75/5.0	55%

24050033MOR – BEL-70-9.35

B-008-1-24 Box 1 of 1



Run #:	Depth:		Recovery		RQD	
1	38.0'	43.0'	5.0/5.0	100%	3.25/5.0	65%
2	43.0'	48.0'	5.0/5.0	100%	2.6/5.0	52%

24050033MOR – BEL-70-9.35

B-008-2-24 Box 1 of 1



Run #:	Depth:		Recovery		RQD	
1	32.0'	37.0'	5.0/5.0	100%	1.35/5.0	27%
2	37.0'	42.0'	5.0/5.0	100%	1.15/5.0	23%

24050033MOR – BEL-70-9.35



OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES

Geotechnical Design Manual Section 600

Instructions: Enter data in the shaded cells only.

(Enter state route number, project description, county, consultant's name, prepared by name, and date prepared. This information will be transferred to all other sheets. The date prepared must be entered in the appropriate cell on this sheet to remove these instructions prior to printing.)

BEL-70-9.35

120547

Major Design-Build interchange Project Involving Widening of SR 149 and Replacement of the IR 70 Bridges over SR 149, 8 Roadway borings along SR 149

CTL Engineering, Inc.

Prepared By: Joe Grani, P.E.
Date prepared: Monday, October 14, 2024

CTL Engineering, Inc.
2860 Fisher Road
Columbus, OH 43204

(614) 276-8123
jgrani@ctleng.com

NO. OF BORINGS: **12**



#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-24	SR 149	106+33	8.827	Lt.	CME 45 Track	77	1175.71	1174.42	1.3 C
2	B-002-0-24	SR 149	11023	8.924	Rt.	CME 45 Track	77	1172.99	1171.7	1.3 C
3	B-003-0-24	SR 149	11381	7.707	Lt.	CME 45 Track	77	1171.83	1170.54	1.3 C
4	B-004-0-24	SR 149	11673	14.787	Lt.	CME 45 Track	77	1179.17	1177.84	1.3 C
5	B-005-0-24	SR 149	12076	12.173	Lt.	CME 45 Track	77	1191.24	1189.91	1.3 C
6	B-006-0-24	SR 149	12461	11.387	Lt.	CME 45 Track	77	1193.39	1192.06	1.3 C
7	B-006-1-24	SR 149	12539	130.3	Lt.	CME 45 Track	77	1193.55	1191.97	1.6 C
8	B-006-2-24	SR 149	12562	158.81	Rt.	CME 45 Track	77	1193.87	1191.79	2.1 C
9	B-008-0-24	SR 149	12867	7.697	Lt.	CME 45 Track	77	1200.06	1197.59	2.5 C
10	B-009-0-24	SR 149	13074	21.178	Rt.	CME 45 Track	77	1205.67	1203.33	2.3 C
11	B-009-1-24	SR 149	13076	223.22	Lt.	CME 45 Track	77	1207.32	1205.24	2.1 C
12	B-009-2-24	SR 149	13089	157.99	Rt.	CME 45 Track	77	1208.92	1206.84	2.1 C

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics					Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)	
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _C	M _{OPT}	Class		GI	Unsuitable	Unstable	Unsuitable		Unstable
1	B 001-0 24	SS-1	1.0	2.5	-0.3	1.2	30	8		NP	NP	NP	3		3	18	6	A-1-a	0	3800					
		SS-2	2.5	4.0	1.2	2.7	12									16	A-6b	16							
		SS-3	4.0	5.5	2.7	4.2	8		2	37	20	17	34	33	67	17	16	A-6b	9						
		SS-4	5.5	7.0	4.2	5.7	8		1.75							29	16	A-6b	16						
2	B 002-0 24	SS-1	1.0	2.5	-0.3	1.2	21	21	4	42	22	20	37	38	75	15	19	A-7-6	12	99					
		SS-2	2.5	4.0	1.2	2.7									5	0	Rock	0							
		SS-3	4.0	5.5	2.7	4.2									7	0	Rock	0							
		SS-4	5.5	7.0	4.2	5.7									8	0	Rock	0							
3	B 003-0 24	SS-1	1.0	2.5	-0.3	1.2	10	10	2.75	26	16	10	21	23	44	11	11	A-4a	2	360		N ₆₀		12"	12" 204 Geotextile
		SS-2	2.5	4.0	1.2	2.7	23		4	NP	NP	NP	18	20	38	14	11	A-4a	1			Mc			
		SS-3	4.0	5.5	2.7	4.2	18		3.5							12	10	A-4a	8						
		SS-4	5.5	7.0	4.2	5.7	18		3.75							13	10	A-4a	8						
4	B 004-0 24	SS-1	1.0	2.5	-0.3	1.2	10	10	3.5	27	17	10	23	19	42	15	12	A-4a	1	99		N ₆₀ & Mc		12"	12" 204 Geotextile
		SS-2	2.5	4.0	1.2	2.7	14		2.5							19	10	A-4a	8			N ₆₀ & Mc			
		SS-3	4.0	5.5	2.7	4.2	12		4.25	26	16	10	30	22	52	16	11	A-4a	3						
		SS-4	5.5	7.0	4.2	5.7	12		3							14	10	A-4a	8						
5	B 005-0 24	SS-1	1.0	2.5	-0.3	1.2	30	30		NP	NP	NP	14	14	28	4	8	A-3a	0	99					
		SS-2	2.5	4.0	1.2	2.7									7	0	Rock	0							
		SS-3	4.0	5.5	2.7	4.2									7	0	Rock	0							
6	B 006-0 24	SS-1	1.0	2.5	-0.3	1.2	15	10		21	13	8	9	11	20	9	10	A-2-4	0	99					
		SS-2	2.5	4.0	1.2	2.7	10									10	A-2-4	0			N ₆₀				
		SS-3	4.0	5.5	2.7	4.2	15		4.5	NP	NP	NP	13	14	27	13	8	A-3a	0						
		SS-4	5.5	7.0	4.2	5.7	28		4							9	10	A-4a	8						
7	B 006-1 24	SS-1	1.0	2.5	-0.6	0.9	12	10	2.5	29	17	12	11	16	27	11	10	A-2-6	0	1600					
		SS-2	3.5	5.0	1.9	3.4	10		3	40	21	19	21	42	63	17	16	A-6b	9			N ₆₀			
		SS-3	6.0	7.5	4.4	5.9	13		3							23	16	A-6b	16						
		SS-4	8.5	10.0	6.9	8.4	12		2.5							12	16	A-6b							
8	B 006-2 24	SS-1	1.0	2.5	-1.1	0.4	9	9	2.75	43	21	22	21	35	56	23	18	A-7-6	9	99		N ₆₀ & Mc		12"	12" 204 Geotextile
		SS-2	3.5	5.0	1.4	2.9	10		3.25	63	28	35	17	66	83	27	25	A-7-6	20			N ₆₀			
		SS-3	6.0	7.5	3.9	5.4			4.5							12	0	Rock	0						
		SS-4	8.5	10.0	6.4	7.9			3.5							6	0	Rock							
9	B 008-0 24	SS-1	1.0	2.5	-1.5	0.0	15		4.5	38	19	19	33	33	66	17	16	A-6b	10	99					
		SS-2	2.5	4.0	0.0	1.5	19		4							18	16	A-6b	16						
		SS-3	4.0	5.5	1.5	3.0	18		3.25	NP	NP	NP	18	18	36	13	11	A-4a	0						

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _C	M _{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
		SS-4	5.5	7.0	3.0	4.5	21	15	2.5							16	10	A-4a	8						
10	B 009-0 24	SS-1	1.0	2.5	-1.3	0.2	10	10	3.25	29	16	13	25	31	56	9	14	A-6a	5	380		N ₆₀		12"	12" 204 Geotextile
		SS-2	2.5	4.0	0.2	1.7	13		3.25							17	16	A-6b	16						
		SS-3	4.0	5.5	1.7	3.2	15		4.5	37	19	18	41	42	83	15	16	A-6b	11						
		SS-4	5.5	7.0	3.2	4.7	24		3.5							18	16	A-6b	16						
11	B 009-1 24	SS-1	1.0	2.5	-1.1	0.4	13	13	3	32	15	17	21	27	48	9	16	A-6b	5	99					
		SS-2	3.5	5.0	1.4	2.9	18								6	8	A-3a	0							
		SS-3	6.0	7.5	3.9	5.4	14		2.75	31	17	14	46	25	71	18	14	A-6a	9						
		SS-4	8.5	10.0	6.4	7.9	15		2.5							16	14	A-6a							
12	B 009-2 24	SS-1	1.0	2.5	-1.1	0.4	27	14		NP	NP	NP	9	9	18	6	6	A-1-b	0	560					
		SS-2	3.5	5.0	1.4	2.9	17								8	6	A-1-b	0							
		SS-3	6.0	7.5	3.9	5.4	14		3.5	37	19	18	38	30	68	11	16	A-6b	10						
		SS-4	8.5	10.0	6.4	7.9	15		3.25							18	16	A-6b							

PID: 120547

County-Route-Section: BEL-70-9.35

No. of Borings: 12

Geotechnical Consultant: CTL Engineering, Inc.

Prepared By: Joe Grani, P.E.

Date prepared: 10/14/2024

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	Option
206	Depth	12"

Excavate and Replace Stabilization Options	
Global Geotextile Average(N60L): Average(HP):	12" 0"
Global Geogrid Average(N60L): Average(HP):	0" 0"

Design CBR	7
---------------	---

% Samples within 3 feet of subgrade			
N ₆₀ ≤ 5	0%	HP ≤ 0.5	0%
N ₆₀ < 12	19%	0.5 < HP ≤ 1	0%
12 ≤ N ₆₀ < 15	14%	1 < HP ≤ 2	2%
N ₆₀ ≥ 20	14%	HP > 2	47%
M+	9%		
Rock	13%		
Unsuitable Soil	0%		

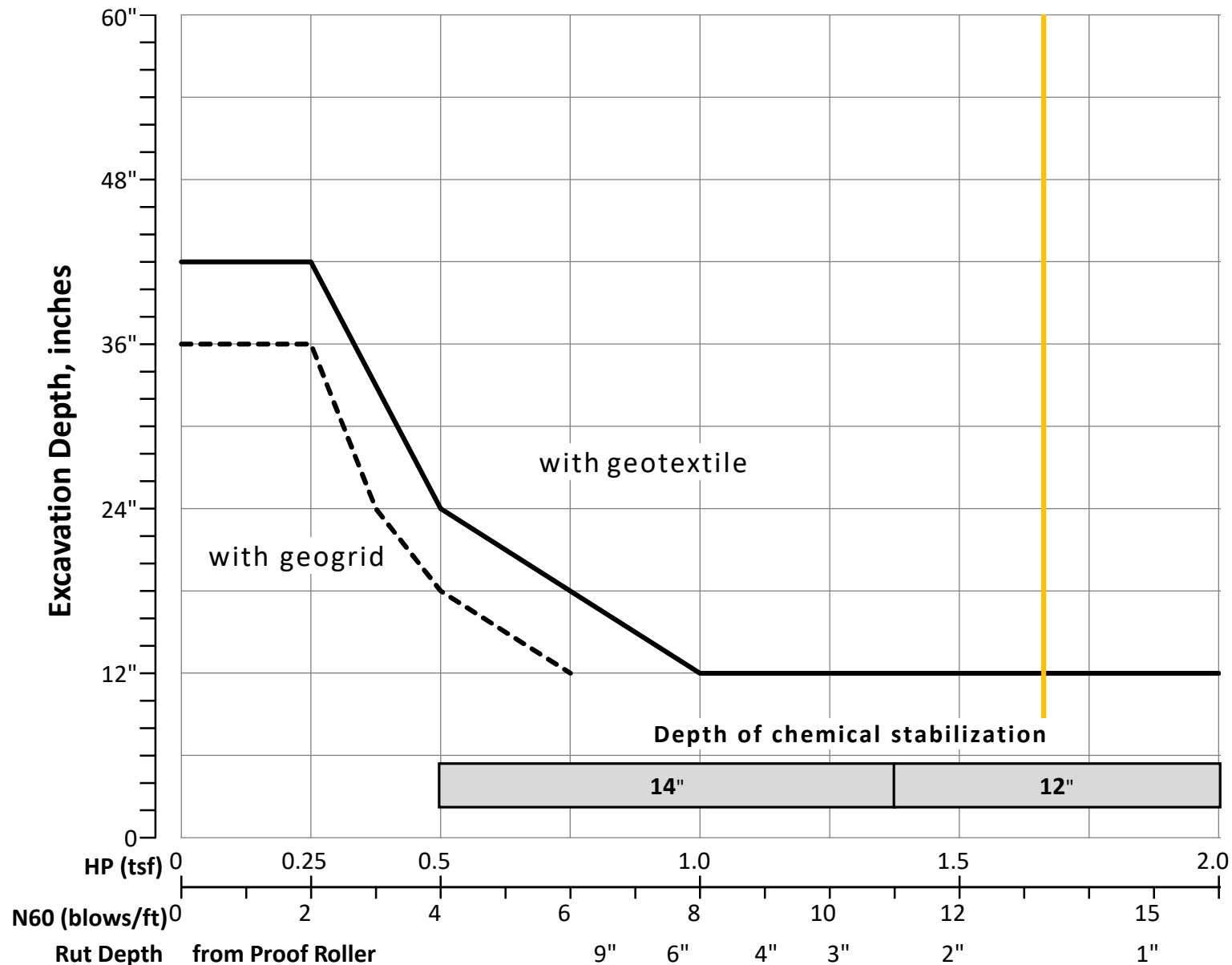
Excavate and Replace at Surface	
Average	4"
Maximum	12"
Minimum	0"

% Proposed Subgrade Surface	
Unstable & Unsuitable	28%
Unstable	28%
Unsuitable (Soil & Rock)	0%

	N ₆₀	N _{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M _C	M _{OPT}	GI
Average	16	13	3.30	35	19	16	23	27	49	14	11	6
Maximum	30	30	4.50	63	28	35	46	66	83	29	25	20
Minimum	8	8	1.75	21	13	8	3	9	3	4	0	0

Classification Counts by Sample																					
ODOT Class	UCF	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals	
Count	0	7	1	2	2	0	1	0	0	3	11	0	0	3	14	0	3	0	0	47	
Percent	0%	15%	2%	4%	4%	0%	2%	0%	0%	6%	23%	0%	0%	6%	30%	0%	6%	0%	0%	100%	
% Rock Granular Cohesive	0%	15%	43%									43%									100%
Surface Class Count	0	4	1	2	2	0	1	0	0	3	7	0	0	1	8	0	3	0	0	32	
Surface Class Percent	0%	13%	3%	6%	6%	0%	3%	0%	0%	9%	22%	0%	0%	3%	25%	0%	9%	0%	0%	100%	

Fig. 600-1 – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.30	0.50	☐ HP
13.33	6.00	☐ N60L

Average HP

Average N_{60L}



DCP Test Data

Project : BEL-70-9.35
Exploration ID: D-003-1-24
Surface Elev: 1158.2
Lat/Long: 40.055791, -81.051068
Consultant: CTL Engineering, Inc.

PID: 120547
Date: 6/27/2024
Surface Materials: N/A
Test Starting Depth (ft): 0
Hammer Wt. (lbs): 17.6

No. of Blows	Accumulative Penetration (mm)	Accumulative Penetration (in)	SPT N-Value (bpf)
0	0	0	0
1	152	6	1
3	305	12	3
3	457	18	3
5	610	24	7
3	762	30	3
2	914	36	2
3	1067	42	3
6	1219	48	9
60	1372	54	51

DCP Test Data

Project : BEL-70-9.35
Exploration ID: D-004-1-24
Surface Elev: 1160.4
Lat/Long: 40.056919, -81.051664
Consultant: CTL Engineering, Inc.

PID: 120547
Date: 6/27/2024
Surface Materials: N/A
Test Starting Depth (ft): 0
Hammer Wt. (lbs): 17.6

No. of Blows	Accumulative Penetration (mm)	Accumulative Penetration (in)	SPT N-Value (bpf)
0	0	0	0
7	152	6	11
7	305	12	11
3	457	18	3
3	610	24	3
7	762	30	11
6	914	36	9
5	1067	42	7
9	1219	48	15
4	1372	54	5
4	1524	60	5
7	1676	66	11
11	1829	72	17
30	1981	78	33
14	2134	84	20
17	2286	90	23
25	2438	96	29

DCP Test Data

Project : BEL-70-9.35
Exploration ID: D-006-3-24
Surface Elev: 1176.5
Lat/Long: 40.058926, -81.052652
Consultant: CTL Engineering, Inc.

PID: 120547
Date: 6/28/2024
Surface Materials: N/A
Test Starting Depth (ft): 0
Hammer Wt. (lbs): 17.6

No. of Blows	Accumulative Penetration (mm)	Accumulative Penetration (in)	SPT N-Value (bpf)
0	0	0	0
1	152	6	1
4	305	12	5
2	457	18	2
2	610	24	2
2	762	30	2
8	914	36	13
6	1067	42	9
11	1219	48	17
12	1372	54	18
13	1524	60	19
18	1676	66	24
29	1829	72	32
34	1981	78	36

DCP Test Data

Project : BEL-70-9.35
Exploration ID: D-007-0-24
Surface Elev: 1180.0
Lat/Long: 40.059451, -81.052774
Consultant: CTL Engineering, Inc.

PID: 120547
Date: 6/27/2024
Surface Materials: N/A
Test Starting Depth (ft): 0
Hammer Wt. (lbs): 17.6

No. of Blows	Accumulative Penetration (mm)	Accumulative Penetration (in)	SPT N-Value (bpf)
0	0	0	0
9	152	6	15
10	305	12	16
9	457	18	15
6	610	24	9
7	762	30	10
11	914	36	17
12	1067	42	18
13	1219	48	19
26	1372	54	30
30	1524	60	33

February 12, 2025

ODOT District 11
2201 Reiser Avenue
New Philadelphia, Ohio 44663

Attention: Ms. Adrienne N. Slanina
Consultant Contract Manager

Reference: Roadway Exploration – Final Submittal
PID No. 119710
Agreement No. 39773
Task Order No. 11-H
BEL-70-9.35, PID 120547
Belmont County, Ohio
CTL Project No. 24050049MOR

Dear Ms. Slanina

CTL Engineering, Inc. has completed the field and laboratory testing for the above referenced project. The following information is attached to this letter.

- Typed Boring Logs
- Pavement Core Photo Report
- Sulfate Content in Soils Report
- Subgrade Analysis

For the subgrade analysis, the proposed grade for the new pavement was assumed to be the same as the existing grade. Additionally, it was assumed that new pavement section would be 24 inches in thickness. Therefore, the appended Subgrade Analysis spreadsheet contains estimated values for cut/fill.

Exploration

The test borings were drilled between December 3 and December 4, 2024, utilizing 3-¼ inch I.D. hollow-stem augers powered by a truck-mounted drill rig. Split-spoon samples and Standard Penetration Tests (SPTs) were performed in the test borings using a 140-pound automatic hammer falling 30 inches to drive a 2-inch O.D. split barrel sampler for 18 inches. The automatic hammer was calibrated at an energy ratio of 81.9 percent on April 1, 2024.

The test borings were located in the field by ODOT Dist. 11 personnel. The test borings were drilled at the locations shown in the following table.

Borehole	Location Description	Latitude	Longitude
B-010-0-24	70 Eastbound, Center of Passing Lane	40.059206	-81.055034
B-010-1-24	70 Westbound, Center of Passing Lane	40.059086	-81.055979
B-011-0-24	70 Eastbound, Center of Driving Lane	40.059312	-81.054539
B-011-1-24	70 Westbound, Center of Driving Lane	40.059568	-81.054693
B-012-0-24	70 Eastbound, Center of Passing Lane	40.059793	-81.053247
B-012-1-24	70 Westbound, Center of Passing Lane	40.059949	-81.053365
B-013-0-24	70 Eastbound, Center of Driving Lane	40.060049	-81.052301
B-013-1-24	70 Westbound, Center of Driving Lane	40.060302	-81.052469
B-014-0-24	70 Eastbound, Center of Passing Lane	40.060528	-81.051018
B-014-1-24	70 Westbound, Center of Passing Lane	40.060684	-81.051132
B-015-0-24	70 Eastbound, Center of Driving Lane	40.060918	-81.049667
B-015-1-24	70 Westbound, Center of Driving Lane	40.061051	-81.050190

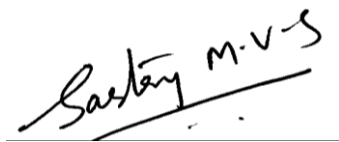
Pavement cores were obtained at each boring location. Then continuous sampling was performed in the test borings to depths of 6.0 feet below the bottom of pavement subgrade (4 continuous SPT samples).

The recovered split spoon samples obtained during the drilling operations were preserved in glass jars, visually classified in the field, and laboratory and tested for moisture content. Representative samples were subjected to laboratory testing including Atterberg Limits, grain size distribution, hand penetrometer, and sulfate content.

We appreciate the opportunity to be of service to you on this project. If you have any questions, please contact us.

Respectfully submitted,

CTL Engineering, Inc.



Sastry Malladi, P.E.
Project Engineer



Joe Grani, P.E.
Project Engineer

cc: Mr. Cody Notz, P.E. (via email)



[illegible]

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABAN- DONED	
		1224.6								GR	CS	FS	SI	CL	LL	PL	PI	WC				
CONCRETE (9.75")		1223.8	TR	1																		
ASPHALT (2")		1223.6																				
CONCRETE (9.25")		1222.9																				
AGGREGATE BASE (6")		1222.3																				
MEDIUM DENSE, GRAY, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, LITTLE CLAY, DRY		1221.1					10 10 14	33	33	SS-1	-	19	21	26	22	12	NP	NP	NP	6	A-2-4 (0)	2600
MEDIUM DENSE, GRAY, COARSE AND FINE SAND, LITTLE SILT, LITTLE GRAVEL, TRACE CLAY, DRY		1219.6					10 10 10	27	-	SS-2	-	13	23	36	19	9	NP	NP	NP	4	A-3a (0)	-
COAL, BLACK, VERY WEAK.		1217.9			18 36 50/4"	-	-	SS-3	-	-	-	-	-	-	-	-	-	4	Rock (V)	-		
EOB					60/2"	-	-	SS-4	-	-	-	-	-	-	-	-	-	3	Rock (V)	-		

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO ₄ ppm	ABAN- DONED
										GR	CS	FS	SI	CL	LL	PL	PI				
		1225.5																			
CONCRETE (9.25")		1224.7																	✓✓✓✓		
ASPHALT (3")		1224.5		1															✓✓✓✓		
CONCRETE (9.25")		1223.7																	✓✓✓✓		
AGGREGATE BASE (6.5")		1223.2		2															✓✓✓✓		
VERY STIFF, BROWN, SILT AND CLAY, AND SAND, TRACE GRAVEL, DAMP		1221.5		3	8	22	44	SS-1	3.00	9	17	22	25	27	30	19	11	17	✓✓✓✓		
VERY STIFF, GRAY, SILT AND CLAY, AND SAND, LITTLE GRAVEL, DAMP				4	8	27	56	SS-2	3.50	-	-	-	-	-	-	-	-	14	✓✓✓✓		
				5	9	26	67	SS-3	3.50	15	20	16	21	28	31	20	11	16	✓✓✓✓		
		1218.5		6	10	25	56	SS-4	4.50	-	-	-	-	-	-	-	-	14	✓✓✓✓		
				7	7														✓✓✓✓		
HARD, BROWN, CLAY, LITTLE GRAVEL, DAMP		1217.0		8	8														✓✓✓✓		
					10														✓✓✓✓		

-EOB-

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABANDONED
		1225.3								GR	CS	FS	SI	CL	LL	PL	PI	WC			
CONCRETE (9.5")		1224.5	500	1																	
ASPHALT (2")		1224.3																			
CONCRETE (8.5")		1223.6																			
AGGREGATE BASE (6")		1223.0																			
VERY STIFF, BROWN, SILT AND CLAY, SOME SAND, TRACE GRAVEL, DAMP		1221.3			4	4	11	44	SS-1	3.50	5	16	13	40	26	32	20	12	13	A-6a (7)	<100
VERY STIFF, BROWN/GRAY, SILTY CLAY, SOME GRAVEL, DAMP		1220.3			6	8	22	67	SS-2	4.00	-	-	-	-	-	-	-	-	10	A-6b (V)	-
STIFF, GRAY/RED, SILT AND CLAY, SOME SAND, TRACE GRAVEL, DAMP		1218.3			5	5	14	33	SS-3	-	8	19	10	35	28	34	20	14	15	A-6a (7)	-
VERY STIFF, BROWN, SILTY CLAY, AND GRAVEL, DAMP		1216.8			8	8	22	67	SS-4	3.00	-	-	-	-	-	-	-	-	15	A-6b (V)	-

-EOB

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO ₄ ppm	ABAN- DONED
										GR	CS	FS	SI	CL	LL	PL	PI	WC			
CONCRETE (9.75")		1223.0																			
ASPHALT (5.5")		1222.2		1																	
CONCRETE (8.75")		1221.7																			
CONCRETE (8.75")		1221.0		2																	
AGGREGATE BASE (7")		1220.4																			
VERY STIFF, BROWN, SILTY CLAY , LITTLE SAND, TRACE GRAVEL, DAMP				3	4	11	44	SS-1	3.50	1	6	10	33	50	39	22	17	17	A-6b (11)	<100	
				4	3	14	44	SS-2	3.25	-	-	-	-	-	-	-	-	19	A-6b (V)	-	
		1217.5		5	5																
				6	4	11	56	SS-3	4.00	14	15	13	31	27	33	20	13	13	A-6a (6)	-	
VERY STIFF, BROWN, SILT AND CLAY , SOME SAND, LITTLE GRAVEL, DAMP				7	4																
		1214.5		8	7	16	67	SS-4	4.00	-	-	-	-	-	-	-	-	13	A-6a (V)	-	

-EOB-

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

MATERIAL DESCRIPTION AND NOTES		ELEV. 1222.9	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO ₄ ppm	ABAN- DONED
										GR	CS	FS	SI	CL	LL	PL	PI	WC			
CONCRETE (8.5")		1222.2	500	1																<	
ASPHALT (4.5")		1221.8			>																
CONCRETE (9")		1221.1			>																
AGGREGATE BASE (7")		1220.5			>																
HARD, BROWN, CLAY , AND SILT, LITTLE SAND, TRACE GRAVEL, DAMP		1218.9			>																
VERY STIFF, BROWN, SILT AND CLAY , SOME SAND, LITTLE GRAVEL, DAMP		1217.4			>																
VERY STIFF, BROWN/GRAY, SILTY CLAY , SOME GRAVEL, DAMP		1214.4			>																
					>																
			>																		

-EOB

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

[illegible]

-EOB-

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

MATERIAL DESCRIPTION AND NOTES		ELEV. 1219.4	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO ₄ ppm	ABAN- DONED	
									GR	CS	FS	SI	CL	LL	PL	PI					
CONCRETE (9.25")		1218.6	1															< >			
ASPHALT (5.75")		1218.2		1														< >			
AGGREGATE BASE (6")		1217.7		2	10	30	44	SS-1	-	30	32	21	9	8	NP	NP	NP	9	A-1-b (0)	200	< >
MEDIUM DENSE, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, TRACE SILT, TRACE CLAY, DAMP		1216.4		3	11														< >		
VERY STIFF, BROWN, SILT AND CLAY, SOME SAND, LITTLE GRAVEL, DAMP		1214.9		4	9	25	44	SS-2	3.00	13	12	16	34	25	31	19	12	16	A-6a (6)	-	< >
STIFF, BROWN, SILTY CLAY, LITTLE GRAVEL, MOIST		1211.9		5	10	37	28	SS-3	1.25	-	-	-	-	-	-	-	-	23	A-6b (V)	-	< >
				6	9	15														< >	
			7	13	35	28	SS-4	1.50	-	-	-	-	-	-	-	-	21	A-6b (V)	-	< >	

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT GDT - 2/12/25 14:47 - O:\PROJECT\2024\MOR-05\24050049\MOR_OHIO DEPARTMENT OF TRANSPORTATION BEL-70-9-35 PID 120547

PROJECT: BEL-70-9.35		DRILLING FIRM / OPERATOR: CTL / MM		DRILL RIG: MOBILE B-57		STATION / OFFSET: 524+13, 33' RT.		EXPLORATION ID B-014-0-24												
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: CTL / CTL		HAMMER: MOBILE AUTOMATIC		ALIGNMENT: IR70														
PID: 120547 SFN:		DRILLING METHOD: 3.25" HSA		CALIBRATION DATE: 4/1/24		ELEVATION: 1211.9 (MSL) EOB: 4.5 ft.		PAGE 1 OF 1												
START: 12/3/24 END: 12/3/24		SAMPLING METHOD: SPT		ENERGY RATIO (%): 81.9		LAT / LONG: 40.060528, -81.051018														
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS	SPT/RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABANDONED
		1211.9							GR	CS	FS	SI	CL	LL	PL	PI	WC			
CONCRETE (9")		1211.2																		< 7 > 7 >
ASPHALT (3")		1210.9	1																	< 7 > 7 >
CONCRETE (9")		1210.2	2																	< 7 > 7 >
AGGREGATE BASE (6")		1209.7	3	10																< 7 > 7 >
HARD, BROWN, SILT AND CLAY, TRACE SAND, TRACE GRAVEL, DAMP (Possible Decomposed Shale)		1208.4	4	12	41	39	SS-1	4.50	5	4	4	44	43	36	24	12	9	A-6a (9)	400	< 7 > 7 >
SHALE, GRAY, HIGHLY WEATHERED.		1207.4	4	18	-	100	SS-2	-	-	-	-	-	-	-	-	-	9	Rock (V)	-	< 7 > 7 >
			EOB	60/3"																
NOTES: NONE																				
ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS																				

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO ₄ ppm	ABAN- DONED
								GR	CS	FS	SI	CL	LL	PL	PI				
CONCRETE (10")	1211.9																		
ASPHALT (1.5")	1211.1																		
CONCRETE (8.5")	1210.9	1																	
CONCRETE (8.5")	1210.2	2																	
AGGREGATE BASE (8")	1209.6	3	11	33	44	SS-1	3.00	19	28	10	18	25	35	23	12	21	A-6a (2)	<100	
VERY STIFF, GRAY/BROWN, SILT AND CLAY, AND SAND, LITTLE GRAVEL, DAMP	1208.4	4	10	14															
	1207.6	5	60/3"	-	100	SS-2	4.50	-	-	-	-	-	-	-	-	11	A-6b (V)	-	
HARD, GRAY, SILTY CLAY, TRACE GRAVEL, DRY	1206.7	TR																	
SHALE, GRAY, HIGHLY WEATHERED.		EOB	60/2"	-	100	SS-3	4.50	-	-	-	-	-	-	-	-	10	Rock (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

MATERIAL DESCRIPTION AND NOTES			ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO ₄ ppm	ABAN- DONED
											GR	CS	FS	SI	CL	LL	PL	PI	WC			
CONCRETE (9.25")			1201.0																			
ASPHALT (2.75")			1200.2		1																	
CONCRETE (8.5")			1200.0																			
CONCRETE (8.5")			1199.3																			
AGGREGATE BASE (6.5")			1198.8		2	6																
HARD, GRAY/BROWN, SILT AND CLAY, LITTLE SAND, TRACE GRAVEL, DAMP			1197.5		3	8	22	56	SS-1	4.25	10	8	7	38	37	35	22	13	18	A-6a (9)	<100	
VERY STIFF, GRAY/BROWN, SANDY SILT, SOME CLAY, SOME GRAVEL, DAMP					4	9	27	50	SS-2	2.50	22	13	10	32	23	31	21	10	16	A-4a (4)	-	
					5	10																
					6	15	59	28	SS-3	3.50	-	-	-	-	-	-	-	-	11	A-4a (V)	-	
						20																
			1194.1			23																
						50/5"	-	100	SS-4	3.00	-	-	-	-	-	-	-	-	13	A-4a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT GDT - 2/12/25 14:47 - O:\PROJECT\2024\MOR-05\24050049\MOR_OHIO DEPARTMENT OF TRANSPORTATION BEL-70-9-35 PID 120547

PROJECT: BEL-70-9.35		DRILLING FIRM / OPERATOR: CTL / MM		DRILL RIG: MOBILE B-57		STATION / OFFSET: 527+01, 51' LT.		EXPLORATION ID														
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: CTL / CTL		HAMMER: MOBILE AUTOMATIC		ALIGNMENT: IR70		B-015-1-24														
PID: 120547 SFN:		DRILLING METHOD: 3.25" HSA		CALIBRATION DATE: 4/1/24		ELEVATION: 1204.3 (MSL) EOB: 3.75 ft.		PAGE														
START: 12/3/24 END: 12/3/24		SAMPLING METHOD: SPT		ENERGY RATIO (%): 81.9		LAT / LONG: 40.061051, -81.050190		1 OF 1														
MATERIAL DESCRIPTION AND NOTES			ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	ABANDONED	
			1204.3							GR	CS	FS	SI	CL	LL	PL	PI	WC				
CONCRETE (9")			1203.6																			< 7 > 7 <
ASPHALT (2.5")			1203.3	1																		< 7 > 7 <
CONCRETE (9")			1202.6																			< 7 > 7 <
AGGREGATE BASE (6.5")			1202.1	2	10																	< 7 > 7 <
HARD, GRAY, SILT AND CLAY, TRACE SAND, DAMP			1200.8	3	10	27	-	SS-1	4.50	0	2	5	59	34	33	21	12	15	A-6a (9)	360		< 7 > 7 <
SHALE, GRAY, HIGHLY WEATHERED.			1200.6	TR	60/3"	-	100	SS-2	-	-	-	-	-	-	-	-	-	9	Rock (V)	-		< 7 > 7 <

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-010-0-24	12/03/24	4.0"	40.059206	-81.055034	1225.6



Depth (inches)	Pavement Type	Notes
0.0 – 9.0	Concrete	---
9.0 – 12.5	Asphalt	---
12.5 – 21.5	Concrete	---

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
21.5	21.5	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-010-1-24	12/04/24	4.0"	40.059086	-81.055979	1224.6



Depth (inches)	Pavement Type	Notes
0.0 – 9.75	Concrete	---
9.75 – 11.75	Asphalt	---
11.75 – 21.0	Concrete	---

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
21	21	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-011-0-24	12/03/24	4.0"	40.059312	-81.054539	1225.5



Depth (inches)	Pavement Type	Notes
0.0 – 9.25	Concrete	---
9.25 – 12.25	Asphalt	---
12.25 – 21.5	Concrete	---

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
21.5	21.5	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-011-1-24	12/03/24	4.0"	40.059568	-81.054693	1225.3



Depth (inches)	Pavement Type	Notes
0.0 – 9.5	Concrete	---
9.5 – 11.5	Asphalt	---
11.5 – 20.0	Concrete	Horizontal Crack

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
20	20	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-012-0-24	12/03/24	4.0"	40.059793	-81.053247	1223.0



Depth (inches)	Pavement Type	Notes
0.0 – 9.75	Concrete	---
9.75 – 15.25	Asphalt	---
15.25 – 24.0	Concrete	Horizontal Crack

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
24	24	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-012-1-24	12/04/24	4.0"	40.059949	-81.053365	1222.9



Depth (inches)	Pavement Type	Notes
0.0 – 8.5	Concrete	---
8.5 – 13.0	Asphalt	---
13.0– 22.0	Concrete	Horizontal Crack

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
22	22	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-013-0-24	12/03/24	4.0"	40.060049	-81.052301	1219.5



Depth (inches)	Pavement Type	Notes
0.0 – 9.5	Concrete	---
9.5 – 14.0	Asphalt	---
14.0 – 23.0	Concrete	---

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
23	23	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-013-1-24	12/03/24	4.0"	40.060302	-81.052469	1219.4



Depth (inches)	Pavement Type	Notes
0.0 – 9.25	Concrete	---
9.25 – 15.0	Asphalt	---

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
15	15	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-014-0-24	12/03/24	4.0"	40.060528	-81.051018	1211.9



Depth (inches)	Pavement Type	Notes
0.0 – 9.0	Concrete	---
9.0 – 12.0	Asphalt	---
12.0 – 21.0	Concrete	---

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
21	21	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-014-1-24	12/04/24	4.0"	40.060684	-81.051132	1211.9



Depth (inches)	Pavement Type	Notes
0.0 – 10.0	Concrete	---
10.0 – 11.5	Asphalt	---
11.5 – 20.0	Concrete	---

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
20	20	100

PAVEMENT CORE REPORT

Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-015-0-24	12/03/24	4.0"	40.060918	-81.049667	1201.0



Depth (inches)	Pavement Type	Notes
0.0 – 9.25	Concrete	---
9.25 – 12.0	Asphalt	---
12.0 – 20.5	Concrete	---

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
20.5	20.5	100

PAVEMENT CORE REPORT

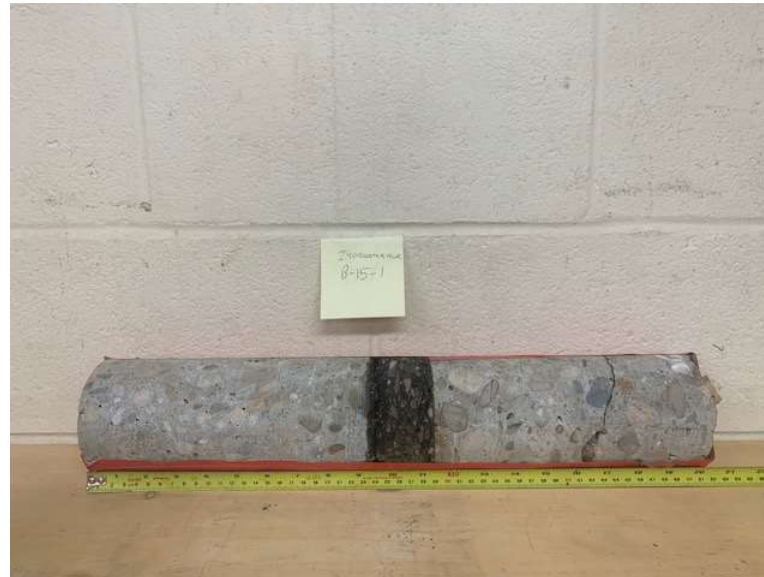
Ohio Department of Transportation

BEL-70-9.35 PID 120547

Belmont Co., Ohio

CTL Project No.: 24050049MOR

Core No.	Date Cored	Core Diameter	Latitude (Degrees)	Longitude (Degrees)	Elevation (feet)
B-015-1-24	12/03/24	4.0"	40.061051	-81.050190	1204.3



Depth (inches)	Pavement Type	Notes
0.0 – 9.0	Concrete	---
9.0 – 11.5	Asphalt	---
11.5 – 20.5	Concrete	Horizontal Crack

Recovered Core Length (inches)	In-hole Depth (inches)	Recovery (%)
20.5	20.5	100



OHIO DEPARTMENT OF TRANSPORTATION
DETERMINING SULFATE CONTENT IN SOILS
SUPPLEMENT 1122

Project C-R-S:

PID No: 120547

Report Date: 2/12/2025

Consultant:

Technician: RV

Sample or Boring ID	Station	Offset	Latitude & Longitude		Elevation	Soaking Time (hr)	Replicate Sample Readings						Sulfate Content (ppm)
							1		2		3		
							Dilution	Reading	Dilution	Reading	Dilution	Reading	
B-010-0-24	511+90	32 RT	40.05920604	-81.05503373	1225.6	20	20	< 5	20	< 5	20	< 5	< 100
B-010-1-24	509+30	32 LT	40.05908598	-81.05597942	1224.6	20	20	128	20	128	20	128	2560
B-011-0-24	513+33	51 RT	40.05931182	-81.05453863	1225.5	20	20	22	20	22	20	22	440
B-011-1-24	513+30	52 LT	40.05956776	-81.05469344	1225.3	20	20	< 5	20	< 5	20	< 5	< 100
B-012-0-24	517+34	33 RT	40.05979265	-81.05324677	1223.0	20	20	< 5	20	< 5	20	< 5	< 100
B-012-1-24	517+26	32 LT	40.05994885	-81.05336518	1222.9	20	20	< 5	20	< 5	20	< 5	< 100
B-013-0-24	520+14	52 RT	40.06004888	-81.05230139	1219.5	20	20	11	20	11	20	11	220
B-013-1-24	520+07	52 LT	40.06030154	-81.0524694	1219.4	20	20	10	20	10	20	10	200
B-014-0-24	524+13	33 RT	40.06052754	-81.05101762	1211.9	20	20	20	20	20	20	20	400
B-014-1-24	524+06	32 LT	40.06068445	-81.05113249	1211.9	20	20	< 5	20	< 5	20	< 5	< 100
B-015-0-24	528+17	52 RT	40.06091757	-81.04966701	1201.0	20	20	< 5	20	< 5	20	< 5	< 100
B-015-1-24	527+01	51 LT	40.06105145	-81.05019032	1204.3	20	20	18	20	18	20	18	360

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES

Geotechnical Design Manual Section 600

Instructions: Enter data in the shaded cells only.

(Enter state route number, project description, county, consultant's name, prepared by name, and date prepared. This information will be transferred to all other sheets. The date prepared must be entered in the appropriate cell on this sheet to remove these instructions prior to printing.)

BEL-70-9.35

120547

Major Design-Build Interchange Project - Widening of SR149 and Replacement of
IR70 Bridges over SR149

CTL Engineering, Inc.

Prepared By: Joe Grani, P.E.
Date prepared: Wednesday, February 12, 2025

CTL Engineering, Inc.
2860 Fisher Road
Columbus, OH 43204

614.276.8123
jgrani@ctleng.com

NO. OF BORINGS: 12



#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-010-0-24	IR70	511+90	32	RT	Moble B-57	82	100.0	98.0	2.0 C
2	B-010-1-24	IR70	509+30	32	LT	Moble B-57	82	100.0	98.0	2.0 C
3	B-011-0-24	IR70	513+33	51	RT	Moble B-57	82	100.0	98.0	2.0 C
4	B-011-1-24	IR70	513+30	52	LT	Moble B-57	82	100.0	98.0	2.0 C
5	B-012-0-24	IR70	517+34	33	RT	Moble B-57	82	100.0	98.0	2.0 C
6	B-012-1-24	IR70	517+26	32	LT	Moble B-57	82	100.0	98.0	2.0 C
7	B-013-0-24	IR70	520+14	52	RT	Moble B-57	82	100.0	98.0	2.0 C
8	B-013-1-24	IR70	520+07	52	LT	Moble B-57	82	100.0	98.0	2.0 C
9	B-014-0-24	IR70	524+13	33	RT	Moble B-57	82	100.0	98.0	2.0 C
10	B-014-1-24	IR70	524+06	32	LT	Moble B-57	82	100.0	98.0	2.0 C
11	B-015-0-24	IR70	528+17	52	RT	Moble B-57	82	100.0	98.0	2.0 C
12	B-015-1-24	IR70	527+01	51	LT	Moble B-57	82	100.0	98.0	2.0 C

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics					Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)	
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _C	M _{OPT}	Class		GI	Unsuitable	Unstable	Unsuitable		Unstable
1	B 010-0 24	SS-1	2.0	3.5	0.0	1.5	14	14	3	NP	NP	NP	28	22	50	16	11	A-4a	3	99		N ₆₀ & Mc		12"	
		SS-2	3.5	5.0	1.5	3.0	14			NP	NP	NP	2	6	8	12	6	A-1-a	0						
		SS-3	5.0	6.5	3.0	4.5	19		2							28	18	A-7-6	16						
		SS-4	6.5	8.0	4.5	6.0	25		2							32	18	A-7-6	16						
2	B 010-1 24	SS-1	2.0	3.5	0.0	1.5	33	27		NP	NP	NP	22	12	34	6	10	A-2-4	0	2600					
		SS-2	3.5	5.0	1.5	3.0	27			NP	NP	NP	19	9	28	4	8	A-3a	0						
		SS-3	5.0	6.5	3.0	4.5									4	0	Rock	0							
		SS-4	6.5	8.0	4.5	6.0									3	0	Rock	0							
3	B 011-0 24	SS-1	2.5	4.0	0.5	2.0	22	22	3	30	19	11	25	27	52	17	14	A-6a	4	440		Mc			
		SS-2	4.0	5.5	2.0	3.5	27		3.5							14	14	A-6a	10						
		SS-3	5.5	7.0	3.5	5.0	26		3.5	31	20	11	21	28	49	16	15	A-6a	3						
		SS-4	7.0	8.5	5.0	6.5	25		4.5							14	18	A-7-6	16						
4	B 011-1 24	SS-1	2.5	4.0	0.5	2.0	11	11	3.5	32	20	12	40	26	66	13	15	A-6a	7	99		N ₆₀		12"	
		SS-2	4.0	5.5	2.0	3.5	22		4							10	16	A-6b	16						
		SS-3	5.5	7.0	3.5	5.0	14			34	20	14	35	28	63	15	15	A-6a	7						
		SS-4	7.0	8.5	5.0	6.5	22		3							15	16	A-6b	16						
5	B 012-0 24	SS-1	2.5	4.0	0.5	2.0	11	11	3.5	39	22	17	33	50	83	17	17	A-6b	11	99		N ₆₀		12"	
		SS-2	4.0	5.5	2.0	3.5	14		3.25							19	16	A-6b	16		N ₆₀ & Mc				
		SS-3	5.5	7.0	3.5	5.0	11		4	33	20	13	31	27	58	13	15	A-6a	6						
		SS-4	7.0	8.5	5.0	6.5	16		4							13	14	A-6a	10						
6	B 012-1 24	SS-1	2.5	4.0	0.5	2.0	11	11	4.5	41	24	17	36	44	80	17	21	A-7-6	11	99		N ₆₀		12"	
		SS-2	4.0	5.5	2.0	3.5	15		4	32	20	12	35	20	55	13	15	A-6a	5						
		SS-3	5.5	7.0	3.5	5.0	18		3.75							15	16	A-6b	16						
		SS-4	7.0	8.5	5.0	6.5	22		3.5							11	16	A-6b	16						
7	B 013-0 24	SS-1	2.5	4.0	0.5	2.0	14	14	4.25	35	21	14	30	34	64	18	16	A-6a	7	220					
		SS-2	4.0	5.5	2.0	3.5	15			29	18	11	5	12	17	14	10	A-2-6	0			Mc			
		SS-3	5.5	7.0	3.5	5.0	15		1							23	16	A-6b	16						
		SS-4	7.0	8.5	5.0	6.5	16		1.75							23	16	A-6b	16						
8	B 013-1 24	SS-1	1.5	3.0	-0.5	1.0	30	25		NP	NP	NP	9	8	17	9	6	A-1-b	0	200					
		SS-2	3.0	4.5	1.0	2.5	25		3	31	19	12	34	25	59	16	14	A-6a	6						
		SS-3	4.5	6.0	2.5	4.0	37		1.25							23	16	A-6b	16						
		SS-4	6.0	7.5	4.0	5.5	35		1.5							21	16	A-6b	16						
9	B 014-0 24	SS-1	2.5	4.0	0.5	2.0	41		4.5	36	24	12	44	43	87	9	19	A-6a	9	400					
		SS-2	4.0	5.5	2.0	3.5									9	0	Rock	0							

[illegible]

PID: 120547

County-Route-Section: BEL-70-9.35

No. of Borings: 12

Geotechnical Consultant: CTL Engineering, Inc.

Prepared By: Joe Grani, P.E.

Date prepared: 2/12/2025

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	NA

Excavate and Replace Stabilization Options	
Global Geotextile Average(N60L): Average(HP):	0" 0"
Global Geogrid Average(N60L): Average(HP):	0" 0"

Design CBR	7
---------------	---

% Samples within 3 feet of subgrade			
N ₆₀ ≤ 5	0%	HP ≤ 0.5	0%
N ₆₀ < 12	7%	0.5 < HP ≤ 1	0%
12 ≤ N ₆₀ < 15	9%	1 < HP ≤ 2	5%
N ₆₀ ≥ 20	33%	HP > 2	44%
M+	12%		
Rock	8%		
Unsuitable Soil	0%		

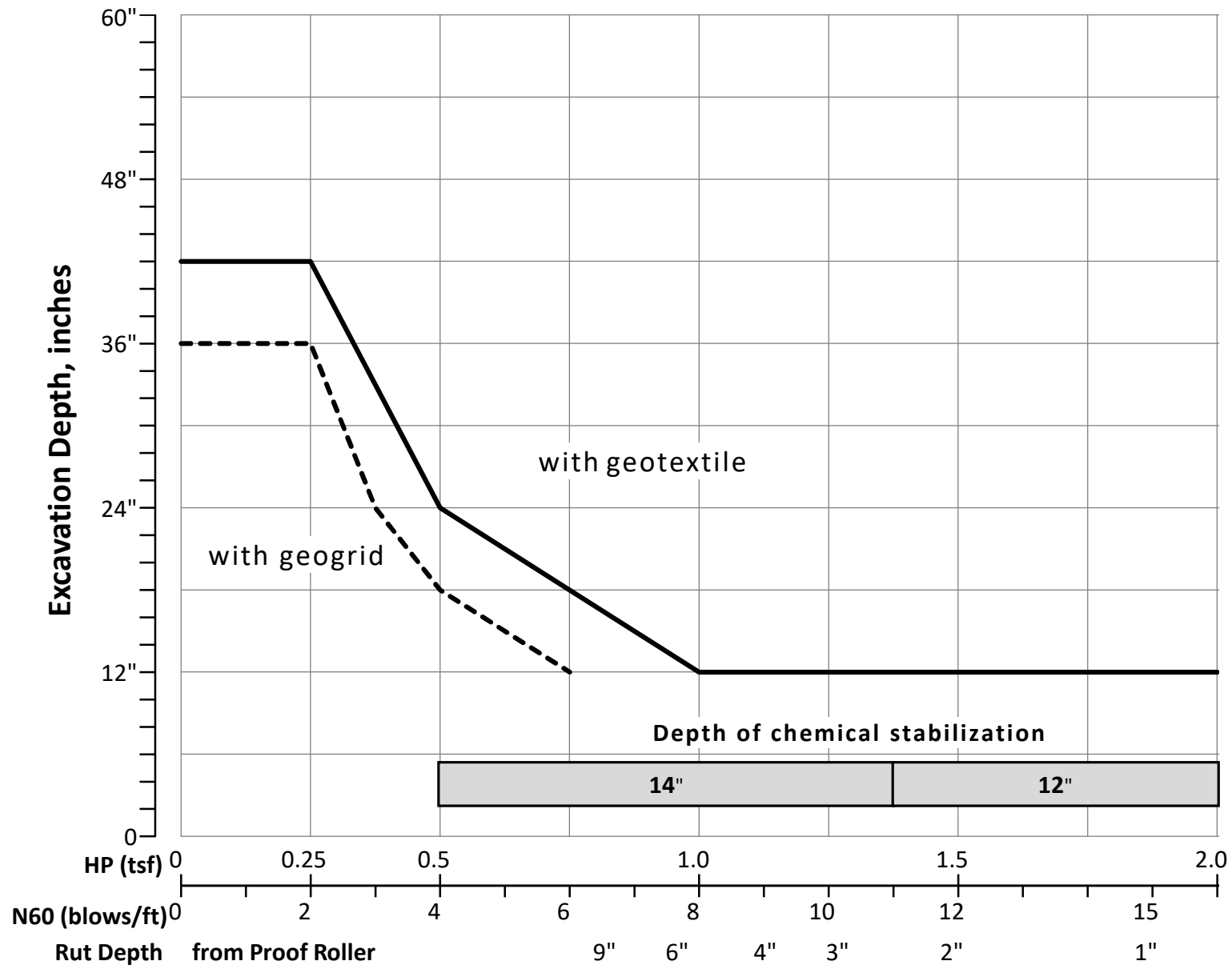
Excavate and Replace at Surface	
Average	0"
Maximum	0"
Minimum	0"

% Proposed Subgrade Surface	
Unstable & Unsuitable	36%
Unstable	36%
Unsuitable (Soil & Rock)	0%

	N ₆₀	N _{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M _C	M _{OPT}	GI
Average	23	20	3.32	34	21	13	28	26	54	15	13	8
Maximum	59	30	4.50	41	24	17	59	50	93	32	21	16
Minimum	11	11	1.00	29	18	10	2	6	8	3	0	0

Classification Counts by Sample																				
ODOT Class	UCF	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	0	5	1	1	1	0	1	0	0	1	4	0	0	14	11	0	4	0	0	43
Percent	0%	12%	2%	2%	2%	0%	2%	0%	0%	2%	9%	0%	0%	33%	26%	0%	9%	0%	0%	100%
% Rock Granular Cohesive	0%	12%	21%									67%							100%	
Surface Class Count	0	2	1	1	1	0	1	0	0	1	2	0	0	10	5	0	1	0	0	25
Surface Class Percent	0%	8%	4%	4%	4%	0%	4%	0%	0%	4%	8%	0%	0%	40%	20%	0%	4%	0%	0%	100%

Fig. 600-1 – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.32	0.50	☐ HP
20.33	6.00	☐ N60L

Average HP

Average N_{60L}

