Stantec Consulting Services Inc.
10200 Alliance Road Suite 300, Cincinnati OH 45242

December 15, 2022
File: 175538119

Attention: Jeff Hipp, PE
Ohio Department of Transportation, District 6
400 East William Street
Delaware, Ohio 43015

Reference: Report of Geotechnical Data
FAY-35 Ramp to SR 435 Widening (PID No. 117955)
Fayette County, Ohio

Dear Mr. Hipp,

Stantec Consulting Services Inc. (Stantec) has completed the geotechnical exploration for the FAY-35 Ramp to SR 435 Widening project located in Jeffersonville, Ohio. The enclosed report contains a brief description of the site, the scope of work performed, and geotechnical data obtained for the proposed widening.

The Ohio Department of Transportation (ODOT) is planning to widen exit ramp from US 35 westbound onto SR 435 near Jeffersonville, Ohio. Stantec was contracted to perform soil borings, pavement coring, and soil laboratory testing for the project. Stantec performed three soil borings and four pavement cores along the west side of the US 35 exit ramp, with approximate locations shown on the plan sheet in Appendix A. The latitudes and longitudes for the borings were recorded using smartphone GPS functions. Surface elevations for the borings were estimated using recorded coordinates with topographic data supplied by Google Earth.

The soil samples obtained from the borings were returned to a geotechnical laboratory for visual classification and tested for water content. Engineering classification testing was performed on samples reflecting each of the main soil horizons. The engineering classification tests conducted on the samples were sieve and hydrometer analysis (ASTM D 422) and Atterberg limits (ASTM D 4318). The samples were classified according to the ODOT classification method. Sulfate content testing was performed on one sample from each boring in accordance with the ODOT Supplement 1122.

The surface material encountered consisted of 3 to 5 inches of topsoil for borings completed off the road surface or 11 to 13 inches of asphalt pavement in road surface borings and pavement cores. A thin layer of aggregate base was then encountered for 1 to 2 inches below asphalt. Below the surface materials, cohesive soils classifying as silt and clay (A-6a), sandy silt (A-4a), and clay (A-7-6) were encountered in all borings. These soils were described as stiff to hard with SPT N_{60} values ranging from 11 to over 50 blows per foot and pocket penetrometer readings ranging from 2.0 tons per square foot (tsf) to over 4.5 tsf. Moisture contents varied from 8 to 26 percent with an average of 14 percent. Liquid limit values varied from 20 to 51 with an average of 30 and plastic limit values varied from 14 to 27 with an average of 19. The sulfate content of this material ranged from under 100 to over 8000 parts per million. Ground water was observed in B-001-0-22 while drilling at a depth of 24 feet. Bedrock was not encountered in the borings.

Reference: **FAY-35 Ramp to SR 435 Widening**

Boring logs showing approximate locations and elevations determined as described previously are included in Appendix B. Pavement core logs are included in Appendix C.

Regards,

Stantec Consulting Services Inc.

James Samples EI
Project Engineer in Training

Phone: (513) 842-8204
James.Samples@stantec.com

Eric Kistner PE
Geotechnical Project Manager

Phone: (513) 842-8213
Eric.Kistner@stantec.com

Appendices: Appendix A – Boring Location Map
Appendix B – Boring Logs
Appendix C – Pavement Core Logs

cc: Andrew Holloway – District 6 Transportation Engineer

APPENDIX A
BORING LOCATION MAP

TIMS TRANSPORTATION INFORMATION MAPPING SYSTEM

Date: 11/2/2022

APPENDIX B
BORING LOGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 12/15/22 07:48 - U:\1755381191\TECHNICAL_PRODUCTION\FIELD_DATA\ORIGINAL SCOPE\BORINGS\FAY-35 RAMP BORINGS.GP.

PROJECT: FAY-35-04.67	DRILLING FIRM / OPERATOR: STANTEC / DC	DRILL RIG: CME 45#2T (814)	STATION / OFFSET: TBD	EXPLORATION ID B-001-0-22
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: STANTEC / JS	HAMMER: CME AUTOMATIC	ALIGNMENT: NB US35 RAMP TO SR435	
PID: 117955 SFN: N/A	DRILLING METHOD: 3.75" HSA	CALIBRATION DATE: 3/16/21	ELEVATION: 1074.0 (MSL) EOB: 26.5 ft.	PAGE 1 OF 1
START: 11/29/22 END: 11/29/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.613188, -83.594538	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	HOLE SEALED
DARK BROWN, **TOPSOIL**, 5 INCHES	1074.0																		
VERY STIFF TO HARD, BROWN, **SILT AND CLAY**, SOME GRAVEL, LITTLE SAND, DAMP TO MOIST	1073.6		4 5 8	20	83	SS-1	3.50	29	8	9	29	25	30	18	12	9	A-6a (5)	-	
			2 27 22	74	67	SS-2	4.50	-	-	-	-	-	-	-	-	18	A-6a (V)	2500	
VERY STIFF TO HARD, LIGHT BROWN TO GRAY, **SANDY SILT**, LITTLE TO SOME GRAVEL, SOME CLAY, DAMP TO MOIST	1071.0		16 20 21	62	100	SS-3	4.50	14	12	15	36	23	20	14	6	8	A-4a (5)	-	
			9 11 14	38	100	SS-4	4.50	-	-	-	-	-	-	-	-	8	A-4a (V)	-	
			10 22 23	68	6	SS-5	4.50	-	-	-	-	-	-	-	-	8	A-4a (V)	-	
			5 9 11	30	100	SS-6	3.50	23	11	13	32	21	21	15	6	10	A-4a (4)	-	
			7 9 17	39	0	SS-7	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
			39 12 7	29	78	SS-8	3.00	-	-	-	-	-	-	-	-	24	A-4a (V)	-	
VERY STIFF TO HARD, GRAY, **CLAY**, TRACE GRAVEL, TRACE SAND, "AND" SILT, DAMP TO MOIST	1056.5		7 6 7	20	94	SS-9	2.50	5	1	6	42	46	51	26	25	26	A-7-6 (16)	-	
			12 13 7	30	28	SS-10	4.50	-	-	-	-	-	-	-	-	17	A-7-6 (V)	-	
STIFF TO VERY STIFF, BROWNISH GRAY, **SANDY SILT**, LITTLE GRAVEL, LITTLE TO SOME CLAY, DAMP TO MOIST	1051.5	W 1050.0	2 3 4	11	89	SS-11	2.50	14	11	15	40	20	23	17	6	16	A-4a (5)	-	
			7 9 11	30	100	SS-12	4.00	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
	1047.5	EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH BENTONITE CHIPS

PROJECT: FAY-35-04.67	DRILLING FIRM / OPERATOR: STANTEC / DC	DRILL RIG: CME 45#2T (814)	STATION / OFFSET: TBD	EXPLORATION ID B-002-0-22
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: STANTEC / JS	HAMMER: CME AUTOMATIC	ALIGNMENT: NB US35 RAMP TO SR435	
PID: 117955 SFN: N/A	DRILLING METHOD: 3.75" HSA	CALIBRATION DATE: 3/16/21	ELEVATION: 1069.0 (MSL) EOB: 6.0 ft.	PAGE 1 OF 1
START: 11/29/22 END: 11/29/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.612472, -83.594571	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	HOLE SEALED
	1069.0																		
DARK BROWN, **TOPSOIL**, 3 INCHES	1068.8																		
STIFF TO VERY STIFF, BROWN, **SILT AND CLAY**, SOME GRAVEL, SOME SAND, DAMP		1	2 3 5	12	56	SS-1	3.00	22	11	12	31	24	32	21	11	15	A-6a (4)	-	
	1066.0	2	15 50 /4"	75	89	SS-2	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	8000	
HARD, BROWNISH GRAY, **SANDY SILT**, LITTLE GRAVEL, SOME CLAY, DAMP		3	24 32 36	102	0	SS-3	-	-	-	-	-	-	-	-	-	9	A-4a (V)	-	
	1063.0	4	22 15 18	50	67	SS-4	4.50	11	8	15	37	29	24	16	8	-	A-4a (6)	-	
		EOB 5 6																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH BENTONITE CHIPS

PROJECT: FAY-35-04.67	DRILLING FIRM / OPERATOR: STANTEC / DC	DRILL RIG: CME 45#2T (814)	STATION / OFFSET: TBD	EXPLORATION ID B-003-0-22
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: STANTEC / JS	HAMMER: CME AUTOMATIC	ALIGNMENT: NB US35 RAMP TO SR435	
PID: 117955 SFN: N/A	DRILLING METHOD: 3.75" HSA	CALIBRATION DATE: 3/16/21	ELEVATION: 1062.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 11/29/22 END: 11/29/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.610453, -83.594085	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	HOLE SEALED
PAVEMENT AND BASE, 12 INCHES ASPHALT, 1 INCH GRANULAR BASE	1062.0																		
	1061.0																		
VERY STIFF TO HARD, ORANGISH BROWN, **SILT AND CLAY**, SOME GRAVEL, SOME SAND, DAMP		1	12 12 12	36	83	SS-1	4.50	23	11	14	28	24	26	17	9	9	A-4a (3)	-	
	1058.0	2																	
		3	7 9 11	30	78	SS-2	2.00	-	-	-	-	-	-	-	-	12	A-4a (V)	100	
STIFF TO VERY STIFF, BROWNISH GRAY TO GRAY, **CLAY**, TRACE GRAVEL, TRACE SILT, SOME SILT, DAMP		4	2 4 5	14	61	SS-3	3.00	-	-	-	-	-	-	-	-	19	A-7-6 (V)	-	
	1055.0	5																	
		6	2 4 7	17	67	SS-4	3.50	7	2	8	34	49	47	27	20	17	A-7-6 (13)	-	
		EOB 7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; AUGER CUTTINGS MIXED WITH BENTONITE CHIPS

APPENDIX C
PAVEMENT CORE LOG

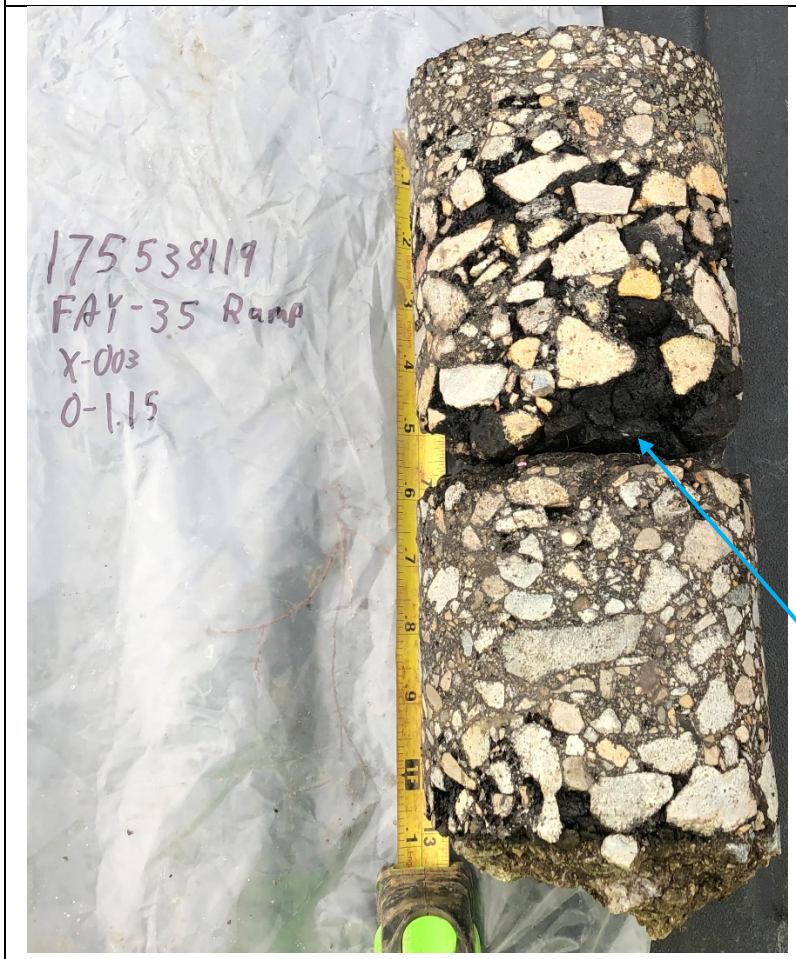
Stantec
10200 Alliance Road, Suite 300
Cincinnati, OH 45241

X-002-0-22	Pavement core description and notes.
	Pavement core coordinate: 39.612476, -83.594582 Asphalt pavement to full depth, encountered granular base below core. Asphalt depth from 0.0” to 11.25” Pavement core diameter: 6.25” General asphalt condition of the area surrounding the pavement core was good. Finer coarse aggregate used in asphalt from 0.0” to approximately 1.75” with larger coarse below. Mechanical break at a depth of 6.5”.

Stantec
10200 Alliance Road, Suite 300
Cincinnati, OH 45241

X-002-1-22	Pavement core description and notes.
	Pavement core coordinate: 39.610453, -83.594085 Asphalt pavement to full depth, encountered granular base below core. Asphalt depth from 0.0” to 11.375” Pavement core diameter: 6.25” General asphalt condition of the area surrounding the pavement core was good. Finer coarse aggregate used in asphalt from 0.0” to approximately 2” with larger coarse aggregate below. Mechanical break at a depth of 7”.

Stantec
10200 Alliance Road, Suite 300
Cincinnati, OH 45241

X-003-0-22	Pavement core description and notes.
	Pavement core coordinate: 39.610471, -83.594047 Asphalt pavement to full depth, encountered granular base below core. Asphalt depth from 0.0” to 13.25” Pavement core diameter: 3.75” General asphalt condition of the area surrounding the pavement core was good. Finer coarse aggregate used in asphalt from 0.0” to approximately 2.25” with larger coarse aggregate below. Mechanical break at a depth of 6.5”.

Stantec
10200 Alliance Road, Suite 300
Cincinnati, OH 45241

B-003-0-22	Pavement core description and notes.
	Pavement core coordinate: Asphalt pavement to full depth, encountered granular base below core. Asphalt depth from 0.0” to 12.125” Pavement core diameter: 6.25” General asphalt condition of the area surrounding the pavement core was good. Finer coarse aggregate used in asphalt from 0.0” to approximately 1.75” with larger coarse aggregate below. Mechanical break at a depth of 6”.