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DESIGN MEMORANDUM

Date: April 17, 2025

To: Mr. Vince Amato, Burgess & Niple, Inc.

From: Brendan P. Andrews P.E., NEAS Inc.

RE: **Geotechnical Design Memorandum**
Project HAM-75-1.05, PID 113361/122048
Noise Wall 6
City of Cincinnati, Hamilton County, Ohio

INTRODUCTION

Per your request, this memorandum presents foundation design information for the proposed Noise Wall 6 (NW-6) as part of the overall Ohio Department of Transportation (ODOT) HAM-75-1.05 (PID 113361/122048) project located in the City of Cincinnati, Hamilton County, Ohio. A summary of: 1) the proposed structure; 2) the existing site conditions; 3) the surficial and subsurface conditions via project borings; and, 4) our recommendations for noise wall foundation design is presented below.

NEAS's analysis has been performed in accordance with Load and Resistance Factor Design (LRFD) method as set forth in AASHTO's Publication LRFD Bridge Design Specifications, 9th Edition (BDS) (AASHTO, 2020) and ODOT's 2021 LRFD Bridge Design Manual (BDM) (ODOT, 2025).

PROPOSED/EXISTING SITE CONDITIONS

Proposed Construction

The eastern limits of Interstate Route 75 (IR-75) northbound (NB) from Linn Street to the Freeman Avenue (Ave) Bridge and IR-75 NB entrance ramp is planned to be realigned and improved as part of the referenced project. The improvements to IR-75 at this location will also include alterations to Winchell Ave and Ramp V as well as the addition of a 12 foot wide shared use path planned along Winchell Ave. As part of these improvements, NW-6 is planned to extend along the north/northeast side of Winchell Ave. NW-6 begins at the Linn St/Winchell Ave intersection and extends approximately 800 ft east along the newly widened Winchell Ave alignment.

Historical Records

A historic record search was performed through ODOT's Transportation Information Mapping System (TIMS). However, no geotechnical data or information was available for review within the immediate vicinity of the proposed noise wall site. Therefore, historic borings are not referenced within this report nor pictured within the associated developed Structure Foundation Exploration Sheets.

Site Reconnaissance

A field reconnaissance visit for the proposed NW-6 was conducted on January 13, 2022, during which site conditions were noted and photographed. During our field reconnaissance, no geohazards were observed within the immediate vicinity of the proposed noise wall site. Land use of the area surrounding the proposed project site can be described as commercial properties, institutional properties, and residential properties.

NW-6 is proposed to be located along the edges of an open, grassy field that is currently being utilized as a sports field (Photograph 1). The proposed location is immediately adjacent to an existing mature tree line that approximately parallels Winchell Ave to the south/southwest. In the area of the proposed wall, grades are relatively level with the surrounding property which rises gently from west to east. Winchell Ave and IR-75 are situated in a cut and below the proposed NW-6 site. The immediate area of the wall is lightly vegetated with no signs of standing water observed. The area appeared to be stable with no signs of geotechnical instability. In general, the adjacent Winchell Ave pavement was observed to be fair to poor with signs of surface wear. High severity longitudinal and transverse cracking was observed along this section as well as wheel track cracking and crack sealing deficiencies.

Photograph 1: Overall Noise Wall 6 Site

SUBSURFACE EXPLORATION

The exploration for NW-6 was conducted by NEAS between November 30, 2021 and January 31, 2022. The exploration for the referenced structure included 6 borings drilled to depths ranging from 25.0 to 45.6 ft below ground surface (bgs). Boring logs for the borings performed are attached. A summary of the exploration locations including latitude/longitude location information and elevations of the subject structure exploration are shown in Table 1 below. Additional information with respect to the subsurface exploration can be found in the Geotechnical Exploration Report for the overall project, HAM-75-1.05 (PID 113361).

Table 1: Structure Boring Summary

Boring Number	Latitude	Longitude	Elevation (NAVD 88) (ft)	Depth (ft)
B-004-0-21	39.105003	-84.528156	510.1	46.5
B-108-0-21	39.104218	-84.526069	524.0	25.0
B-109-0-21	39.104330	-84.526504	520.5	25.0
B-110-0-21	39.104489	-84.526943	514.9	25.0
B-111-0-21	39.104690	-84.527371	512.2	25.0
B-112-0-21	39.104839	-84.527786	511.3	25.0

Notes:
1. As-drilled boring location and corresponding ground surface elevation was surveyed in the field by NEAS Inc.

SUBSURFACE CONDITIONS

The subsurface profile at NW-6 site is generally consistent with the geological model for the project regarding the materials encountered. The subsurface profile along the proposed noise wall consists of surficial materials comprised of topsoil overlying existing fill soils and natural interlayered medium-fine to fine-grained materials.

The soil profile (B-004-0-21, B-108-0-21 to B-112-0-21) generally consisted of 3.0 to 14.0 ft of existing "man-made" fill soils atop 19.5 to 32.5 ft of natural interlayered medium-fine to fine grained material. The fill soils along the noise wall alignment consisted of both low plasticity, fine-grained soils and non-cohesive, coarse- and fine-grained material. The cohesive fills are classified on the boring logs as Sandy Silt (A-4a) and Silt (A-4b), while the non-cohesive fill soils are classified on the logs as Gravel and/or Stone Fragments with Sand and Silt (A-2-4) and Sandy Silt (A-4a).

The natural soils consisted of predominantly coarse- and fine-grained non-cohesive material interlayered with low to moderately plastic, fine-grained cohesive soils. The non-cohesive natural soils are classified on the boring logs as Gravel with Sand (A-1-b), Gravel with Sand, Silt, and Clay (A-2-7), Coarse and Fine Sand (A-3a), Fine Sand (A-3) and Silt (A-4b), while the cohesive natural soils are classified on the logs as Sandy Silt (A-4a), Silt (A-4b), Silt and Clay (A-6a), Silty Clay (A-6b) and Clay (A-7-6).

Groundwater

Groundwater measurements were taken during the boring drilling procedures at each borehole location. Groundwater was not encountered during or following the completion of drilling in the referenced project borings performed at the proposed noise wall site. It should be noted that groundwater is affected by many hydrologic characteristics in the area and may vary from those measured at the time of the exploration. The specific groundwater observations are included on the attached boring logs.

ANALYSES AND RECOMMENDATIONS

Noise Wall Foundation Design

This memo provides information required to complete the design of 30-inch diameter drilled shaft noise wall supports. Geotechnical information has been developed in accordance with the ODOT GDM, Section 1600. ODOT design methodology requires that the N_{60} values of the granular soils be corrected using a factor to account for the depth of each test, and the material be broadly classified as either cohesive or granular soils. As several sampling intervals may have not aligned with those shown in the ODOT GDM, linear interpolation was used to acquire $N1_{60}$ correction factors for unlisted depths. These corrected N_{60} values along with material classification are provided per boring within the $N1_{60}$ Values and Soil Type Tables attached.

Using the ODOT design methodology presented in Section 1600 of the GDM, NEAS has developed and attached tables (Design $N1_{60}$ Values Based on Drilled Shaft Length Tables) indicating design $N1_{60}$ values and soil types for various design shafts depth (i.e., 6 ft, 8 ft, 10 ft, etc.) per boring. For these tables the average of the $N1_{60}$ values along the length of the drilled shaft (designated as the design $N1_{60}$ herein) as well as the design soil type based on the majority soil type within the design length of the drilled shaft foundation is presented. Based on the design tables provided in the ODOT GDM, these design $N1_{60}$ values and the design soil type should be used together with the proposed wall geometry (i.e., barrier height, post spacing, etc.) to determine the depth of shaft required for each boring location.

The conditions reflected at each boring in the attached tables were observed at those locations only and may not be indicative of conditions at intermediate points between borings. However, for purposes of design it is recommended that the supports be sized based on conditions at the nearest boring. In other terms, each boring may be considered representative of sub-surface conditions up to half the distance to the next nearest boring away for design purposes.

Drilled Shaft Depths

Utilizing the design methodology presented in the above section of this memo and in accordance with Section 1600 "Noise Barrier Foundations" of the ODOT GDM, the drilled shaft design depths for the project noise walls are to be determined by Burgess & Niple, Inc. These drilled shaft depth calculations will be provided to ODOT as part of a separate submission.

SOIL BORING LOGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 4/10/25 12:04 - X:\1ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\1ARCHIVE BY YEAR\2024 ARCHIVE\HAM-75-1.05\GINT FILES\HA

PROJECT: HAM-75-1.05	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 55T	STATION / OFFSET: 53+94, 163' RT.	EXPLORATION ID B-004-0-21
TYPE: RETAINING WALL	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-75	
PID: 113361 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 510.1 (MSL) EOB: 46.5 ft.	PAGE 1 OF 2
START: 11/30/21 END: 11/30/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 68.4	LAT / LONG: 39.105003, -84.528156	

MATERIAL DESCRIPTION AND NOTES	ELEV. 510.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
6.0" TOPSOIL (DRILLERS DESCRIPTION)	509.6																	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, CONTAINS ROOTS, DAMP **(FILL)**	505.6		4 7 9	18	56	SS-1	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	
VERY STIFF TO HARD, BROWN AND GRAY, **SILT**, SOME SAND, LITTLE CLAY, TRACE GRAVEL, CONTAINS TRACE BRICK, ROOTS, AND BLACK COAL FRAGMENTS, DAMP TO MOIST **(FILL)**			4 6 8	16	61	SS-2	4.25	3	8	21	51	17	27	18	9	14	A-4b (7)	
			5 7 9	18	89	SS-3	4.50	-	-	-	-	-	-	-	-	16	A-4b (V)	
			6 6 8	16	100	SS-4	3.50	-	-	-	-	-	-	-	-	17	A-4b (V)	
	496.2		4 4 6	11	100	SS-5	2.75	-	-	-	-	-	-	-	-	21	A-4b (V)	
LOOSE, BROWN, **COARSE AND FINE SAND**, LITTLE CLAY, LITTLE SILT, TRACE GRAVEL, WET	493.7		2 3 5	9	100	SS-6	-	6	36	27	15	16	NP	NP	NP	17	A-3a (0)	
VERY STIFF, BROWN WITH TRACE GRAY MOTTLES, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, MOIST	492.1		3 4 3	8	100	SS-7A	2.25	9	13	14	27	37	41	20	21	24	A-7-6 (10)	
LOOSE, BROWN WITH TRACE GRAY MOTTLES, **SILT**, LITTLE CLAY, TRACE SAND, TRACE GRAVEL, WET						SS-7B	-	-	-	-	-	-	-	-	-	28	A-4b (V)	
			3 3 3	7	100	SS-8	-	0	1	2	82	15	NP	NP	NP	29	A-4b (8)	
	486.4		3 2 3	6	100	SS-9A	-	-	-	-	-	-	-	-	-	26	A-4b (V)	
SOFT TO MEDIUM STIFF, BROWN, **CLAY**, SOME SILT, TRACE SAND, TRACE GRAVEL, MOIST	485.6					SS-9B	0.50	-	-	-	-	-	-	-	-	26	A-7-6 (V)	
MEDIUM STIFF TO VERY STIFF, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, WET TO MOIST			2 3 3	7	100	SS-10	0.75	-	-	-	-	-	-	-	-	28	A-6a (V)	
			3 3 3	7	100	SS-11	2.25	1	15	17	47	20	30	18	12	24	A-6a (7)	
	480.6																	

PID: 113361	SFN:	PROJECT: HAM-75-1.05	STATION / OFFSET: 53+94, 163' RT.	START: 11/30/21	END: 11/30/21	PG 2 OF 2	B-004-0-21

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)	BACK FILL
LOOSE TO MEDIUM DENSE, BROWN AND GRAY, **SILT**, TRACE TO LITTLE CLAY, TRACE SAND, TRACE GRAVEL, WET *(continued)*	480.1	31	3 4 4	9	100	SS-12	-	-	-	-	-	-	-	-	-	24	A-4b (V)	
		32																
		33																
		34																
		35	3 4 5	10	100	SS-13	-	0	1	4	79	16	NP	NP	NP	27	A-4b (8)	
		36																
		37																
		38																
		39																
		40	5 7 9	18	100	SS-14	-	-	-	-	-	-	-	-	-	31	A-4b (V)	
		41																
		42																
		43																
		44																
		45	6 8 8	18	100	SS-15	-	0	0	10	85	5	NP	NP	NP	29	A-4b (8)	
	463.6	46 EOB																

NOTES: GROUNWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 4/10/25 12:04 - X:\1ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\1ARCHIVE BY YEAR\2024 ARCHIVE\HAM-75-1.05\GINT FILES\HA

PROJECT: HAM-75-1.05	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 47+38, 205' RT.	EXPLORATION ID B-108-0-21
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-75	
PID: 113361 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 524.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 1/27/22 END: 1/27/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 39.104218, -84.526069	

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)	BACK FILL
VERY STIFF TO HARD, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, CONTAINS BRICK AND GLASS FRAGMENTS, DAMP **(FILL)**	524.0	1	6 6 7	18	100	SS-1	4.50	-	-	-	-	-	-	-	-	16	A-4a (V)	
		2																
		3																
		4	1 5 8	18	22	SS-2	3.50	10	13	18	40	19	27	18	9	15	A-4a (5)	
	518.5	5																
STIFF TO VERY STIFF, BROWN, **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST		6	1 3 3	8	100	SS-3	3.00	-	-	-	-	-	-	-	-	19	A-2-7 (V)	
		7																
		8																
		9	2 2 2	5	100	SS-4	1.75	19	33	18	7	23	48	16	32	19	A-2-7 (3)	
	513.5	10																
VERY LOOSE TO LOOSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, DAMP TO MOIST		11	0 0 0	0	100	SS-5	-	-	-	-	-	-	-	-	-	14	A-3a (V)	
		12																
		13																
		14	1 1 1	3	100	SS-6	-	-	-	-	-	-	-	-	-	15	A-3a (V)	
		15																
		16																
		17	2 3 3	8	100	SS-7	-	0	18	63	17	2	NP	NP	NP	10	A-3a (0)	
		18																
BECOMES WET		19	1 1 2	4	100	SS-8	-	-	-	-	-	-	-	-	-	24	A-3a (V)	
		20																
		21																
		22	2 1 1	3	100	SS-9	-	-	-	-	-	-	-	-	-	23	A-3a (V)	
	501.0	23																
STIFF, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, WET		24	1 1 1	3	100	SS-10	1.50	0	10	25	45	20	22	16	6	22	A-4a (6)	
	499.0	EOB 25																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 4/10/25 12:38 - X:\1ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\1ARCHIVE BY YEAR\2024 ARCHIVE\HAM-75-1.05\GINT FILES\HAM-75-1.05 GINT.GPJ

PROJECT: HAM-75-1.05	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 48+66, 180' RT.	EXPLORATION ID B-109-0-21
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-75	
PID: 113361 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 520.5 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 1/28/22 END: 1/28/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 39.104330, -84.526504	

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)	BACK FILL
VERY STIFF TO HARD, BROWN, **SANDY SILT**, SOME GRAVEL AND STONE FRAGMENTS, LITTLE CLAY, SS-1 CONTAINS A 3.0" STONE FRAGMENT (ENCOUNTER WITH COBBLE), CONTAINS BRICK FRAGMENTS, CONTAINS NO INTACT SOIL FOR HP READINGS, DAMP **(FILL)**	520.5	1	3 10 30	55	100	SS-1	-	-	-	-	-	-	-	-	-	13	A-4a (V)	
		2																
		3																
		4	5 3 10	18	100	SS-2	-	27	12	18	29	14	28	20	8	18	A-4a (2)	
	515.0	5																
HARD, BROWN, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, DAMP		6																
		7	4 3 10	18	100	SS-3	4.50	0	10	25	30	35	37	17	20	14	A-6b (10)	
	512.5	8																
LOOSE TO MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, DAMP		9	3 8 5	18	100	SS-4	-	-	-	-	-	-	-	-	-	6	A-3a (V)	
		10																
		11																
		12	2 2 3	7	100	SS-5	-	-	-	-	-	-	-	-	-	6	A-3a (V)	
		13																
		14	1 2 3	7	100	SS-6	-	-	-	-	-	-	-	-	-	10	A-3a (V)	
		15																
		16																
		17	2 3 4	10	100	SS-7	-	0	13	71	14	2	NP	NP	NP	6	A-3a (0)	
		18																
		19	2 3 4	10	100	SS-8	-	-	-	-	-	-	-	-	-	3	A-3a (V)	
		20																
		21																
		22	5 6 6	16	100	SS-9	-	-	-	-	-	-	-	-	-	3	A-3a (V)	
		23																
		24	3 5 6	15	100	SS-10	-	-	-	-	-	-	-	-	-	3	A-3a (V)	
	495.5	EOB 25																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 4/10/25 12:38 - X:\1ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\1ARCHIVE BY YEAR\2024 ARCHIVE\HAM-75-1.05\GINT FILES\HAM-75-1.05 GPJ

PROJECT: HAM-75-1.05	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 50+03, 169' RT.	EXPLORATION ID B-110-0-21
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-75	
PID: 113361 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 514.9 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 1/28/22 END: 1/28/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 39.104489, -84.526943	

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)	BACK FILL
HARD, BROWN, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, CONTAINS BRICK FRAGMENTS, DAMP **(FILL)**	514.9	1	15 15 7	30	100	SS-1	4.50	14	13	20	33	20	27	17	10	14	A-4a (4)	
		2																
		3																
		4	17 15 9	33	22	SS-2	4.25	-	-	-	-	-	-	-	-	12	A-4a (V)	
	509.4	5																
LOOSE, DARK BROWN, **COARSE AND FINE SAND**, SOME SILT, LITTLE CLAY, TRACE GRAVEL, CONTAINS TRACE ROOTS, MOIST		6	4 3 4	10	100	SS-3	-	-	-	-	-	-	-	-	-	18	A-3a (V)	
	506.9	7																
HARD, BROWN AND ORANGISH BROWN, **SILTY CLAY**, "AND" SAND, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP TO MOIST		8																
		9	3 3 4	10	100	SS-4	4.50	0	23	40	11	26	37	16	21	15	A-6b (3)	
	503.6	10																
LOOSE, BROWN, **FINE SAND**, TRACE COARSE SAND, TRACE GRAVEL, TRACE SILT, TRACE CLAY, DAMP		11				SS-5A	4.25	-	-	-	-	-	-	-	-	21	A-6b (V)	
		12	2 2 3	7	100	SS-5B	-	-	-	-	-	-	-	-	-	7	A-3 (V)	
		13																
		14	2 2 3	7	100	SS-6	-	-	-	-	-	-	-	-	-	5	A-3 (V)	
	499.4	15																
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, DAMP		16																
		17	4 4 4	11	100	SS-7	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
	496.9	18																
LOOSE, LIGHT BROWN, **SILT**, LITTLE CLAY, TRACE SAND, TRACE GRAVEL, WET		19	2 3 3	8	100	SS-8	-	-	-	-	-	-	-	-	-	27	A-4b (V)	
	494.4	20																
VERY STIFF, LIGHT BROWN, **SILT**, SOME CLAY, TRACE SAND, TRACE GRAVEL, MOIST		21																
		22	3 3 5	11	100	SS-9	3.50	0	1	2	68	29	29	21	8	26	A-4b (8)	
	491.9	23																
MEDIUM DENSE, LIGHT BROWN, **SILT**, LITTLE CLAY, TRACE SAND, TRACE GRAVEL, WET		24	3 4 6	14	100	SS-10	-	-	-	-	-	-	-	-	-	26	A-4b (V)	
	489.9 EOB	25																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 4/10/25 12:38 - X:\1ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\1ARCHIVE BY YEAR\2024 ARCHIVE\HAM-75-1.05\GINT FILES\HAM-75-1.05 GPJ

PROJECT: HAM-75-1.05	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 51+44, 173' RT.	EXPLORATION ID B-111-0-21
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-75	
PID: 113361 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 512.2 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 1/31/22 END: 1/31/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 39.104690, -84.527371	

MATERIAL DESCRIPTION AND NOTES	ELEV. 512.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, CONTAINS BRICK FRAGMENTS, MOIST **(FILL)**	509.2	1	4 6 7	18	100	SS-1	-	-	-	-	-	-	-	-	-	15	A-2-4 (V)	
STIFF TO VERY STIFF, BROWN, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, CONTAINS BRICK FRAGMENTS, DAMP **(FILL)**	506.7	4	3 2 2	5	100	SS-2	2.00	13	14	28	26	19	26	16	10	15	A-4a (2)	
STIFF TO VERY STIFF, BROWN MOTTLED WITH ORANGISH BROWN AND GRAY, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST	501.7	7	2 1 1	3	100	SS-3	1.50	-	-	-	-	-	-	-	-	26	A-6b (V)	
		9	1 3 4	10	100	SS-4	2.25	0	0	9	62	29	37	17	20	24	A-6b (12)	
VERY LOOSE TO LOOSE, BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE GRAVEL, TRACE CLAY, CONTAINS IRON STAINING, WET TO MOIST	496.7	12	1 2 2	5	100	SS-5	-	-	-	-	-	-	-	-	-	15	A-3a (V)	
		14	1 2 1	4	100	SS-6	-	-	-	-	-	-	-	-	-	9	A-3a (V)	
VERY STIFF, BROWN, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, DAMP	494.2	17	2 2 3	7	100	SS-7	3.25	5	15	19	24	37	39	20	19	20	A-6b (9)	
STIFF TO VERY STIFF, BROWN, **SILT**, LITTLE CLAY, LITTLE SAND, TRACE GRAVEL, SS-10 CONTAINS NO INTACT SOIL FOR HP READINGS, WET TO MOIST	487.2	19	2 3 2	7	100	SS-8	2.50	-	-	-	-	-	-	-	-	32	A-4b (V)	
		22	2 3 4	10	100	SS-9	1.50	0	0	11	73	16	NP	NP	NP	22	A-4b (8)	
EOB		24	3 2 4	8	100	SS-10	-	-	-	-	-	-	-	-	-	16	A-4b (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

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PROJECT: HAM-75-1.05	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 52+74, 163' RT.	EXPLORATION ID B-112-0-21
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-75	
PID: 113361 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 511.3 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 1/31/22 END: 1/31/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 39.104839, -84.527786	

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)	BACK FILL
DENSE, BROWN AND GRAY, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP	511.3	1	10 17 8	34	100	SS-1	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
	508.3	3																
VERY STIFF, BROWN MOTTLED WITH ORANGISH BROWN AND GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST		4	4 5 5	14	100	SS-2	2.75	1	4	15	33	47	41	20	21	22	A-7-6 (13)	
	505.8	5																
VERY STIFF, BROWN MOTTLED WITH ORANGISH BROWN AND GRAY, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST		6 7	2 2 4	8	100	SS-3	2.50	0	1	22	51	26	32	18	14	22	A-6a (10)	
	503.3	8																
VERY STIFF, BROWN MOTTLED WITH ORANGISH BROWN AND GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST		9	1 3 4	10	100	SS-4	3.00	1	0	1	61	37	33	21	12	25	A-6a (9)	
	500.1	10 11																
LOOSE TO MEDIUM DENSE, LIGHT BROWN BECOMING DARK BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE GRAVEL, TRACE CLAY, MOIST		12	1 3 6	12	100	SS-5	-	-	-	-	-	-	-	-	-	12	A-3a (V)	
	495.8	13																
MEDIUM STIFF TO HARD, BROWN, **SILT**, SOME CLAY, TRACE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, WET TO MOIST		14 15	1 2 4	8	100	SS-6	-	-	-	-	-	-	-	-	-	13	A-3a (V)	
		16																
		17	1 2 1	4	100	SS-7	1.00	-	-	-	-	-	-	-	-	31	A-4b (V)	
		18 19																
			2 2 2	5	100	SS-8	2.00	0	0	1	73	26	29	22	7	28	A-4b (8)	
		20 21																
		22	2 4 6	14	100	SS-9	4.25	-	-	-	-	-	-	-	-	26	A-4b (V)	
		23 24																
	486.3	EOB 25	3 4 5	12	100	SS-10	4.25	-	-	-	-	-	-	-	-	21	A-4b (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

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$N1_{60}$ VALUES AND SOIL TYPE

National Engineering & Architectural Services Inc.

Noise Wall 6
HAM-75-1.05 (PID: 113361/122048)
$N1_{60}$ Values and Soil Type

Depth of SPT (ft)	Correction Factor	B-004-0-21		Cohesive or Granular
		N_{60}	$N1_{60}$	
4	1.496	18	27	Granular
6.5	1.322	16	-	Cohesive
9	1.21	18	-	Cohesive
11.5	1.128	16	-	Cohesive
14	1.064	11	-	Cohesive
16.5	1.004	9	9	Granular
19	0.956	8	8	Granular
21.5	0.916	7	6	Granular
24	0.876	6	5	Granular
26.5	0.86	7	-	Cohesive

Depth of SPT (ft)	Correction Factor	B-108-0-21		Cohesive or Granular
		N_{60}	$N1_{60}$	
2.5	1.64	18	-	Cohesive
5	1.4	18	-	Cohesive
7.5	1.27	8	-	Cohesive
10	1.17	5	-	Cohesive
12.5	1.1	0	0	Granular
15	1.04	3	3	Granular
17.5	0.98	8	8	Granular
20	0.94	4	4	Granular
22.5	0.9	3	3	Granular
25	0.86	3	-	Cohesive

Depth of SPT (ft)	Correction Factor	B-109-0-21		Cohesive or Granular
		N_{60}	$N1_{60}$	
2.5	1.64	55	-	Cohesive
5	1.4	18	-	Cohesive
7.5	1.27	18	-	Cohesive
10	1.17	18	21	Granular
12.5	1.1	7	8	Granular
15	1.04	7	7	Granular
17.5	0.98	10	10	Granular
20	0.94	10	9	Granular
22.5	0.9	16	14	Granular
25	0.86	15	13	Granular

Depth of SPT (ft)	Correction Factor	B-110-0-21		Cohesive or Granular
		N_{60}	$N1_{60}$	
2.5	1.64	30	-	Cohesive
5	1.4	33	-	Cohesive
7.5	1.27	10	13	Granluar
10	1.17	10	-	Cohesive
12.5	1.1	7	8	Granluar
15	1.04	7	7	Granluar
17.5	0.98	11	11	Granluar
20	0.94	8	-	Cohesive
22.5	0.9	11	-	Cohesive
25	0.86	14	-	Cohesive

Depth of SPT (ft)	Correction Factor	B-111-0-21		Cohesive or Granular
		N_{60}	$N1_{60}$	
2.5	1.64	18	30	Granular
5	1.4	5	-	Cohesive
7.5	1.27	3	-	Cohesive
10	1.17	10	-	Cohesive
12.5	1.1	5	6	Granular
15	1.04	4	4	Granular
17.5	0.98	7	-	Cohesive
20	0.94	7	7	Granular
22.5	0.9	10	9	Granular
25	0.86	8	7	Granular

Depth of SPT (ft)	Correction Factor	B-112-0-21		Cohesive or Granular
		N_{60}	$N1_{60}$	
2.5	1.64	34	56	Granular
5	1.4	14	-	Cohesive
7.5	1.27	8	-	Cohesive
10	1.17	10	-	Cohesive
12.5	1.1	12	13	Granular
15	1.04	8	8	Granular
17.5	0.98	4	-	Cohesive
20	0.94	5	-	Cohesive
22.5	0.9	14	-	Cohesive
25	0.86	12	-	Cohesive

DESIGN $N1_{60}$ VALUES BASED ON DRILLED SHAFT LENGTH

Noise Wall 6
HAM-75-1.05 (PID: 113361/122048)
Design $N1_{60}$ Values Based on Drilled Shaft Length

	B-004-0-21	
Depth of Shaft (ft)	Design $N1_{60}$	**Cohesive or Granular**
6	21	Granular
8	20	Cohesive
10	19	Cohesive
12	18	Cohesive
14	16	Cohesive
16	16	Cohesive
18	15	Cohesive
20	14	Cohesive
22	13	Granular
24	12	Granular

	B-108-0-21	
Depth of Shaft (ft)	Design $N1_{60}$	**Cohesive or Granular**
6	18	Cohesive
8	15	Cohesive
10	12	Cohesive
12	10	Cohesive
14	9	Cohesive
16	9	Cohesive
18	9	Cohesive
20	8	Cohesive
22	7	Granular
24	7	Granular

	B-109-0-21	
Depth of Shaft (ft)	Design $N1_{60}$	**Cohesive or Granular**
6	37	Cohesive
8	30	Cohesive
10	28	Cohesive
12	24	Cohesive
14	21	Cohesive
16	21	Granular
18	20	Granular
20	18	Granular
22	18	Granular
24	17	Granular

	B-110-0-21	
Depth of Shaft (ft)	Design $N1_{60}$	**Cohesive or Granular**
6	32	Cohesive
8	25	Cohesive
10	21	Cohesive
12	19	Cohesive
14	17	Cohesive
16	17	Cohesive
18	16	Granular
20	15	Granular
22	14	Granular
24	14	Granular

	B-111-0-21	
Depth of Shaft (ft)	Design $N1_{60}$	**Cohesive or Granular**
6	17	Granular
8	13	Cohesive
10	12	Cohesive
12	11	Cohesive
14	10	Cohesive
16	10	Granular
18	9	Cohesive
20	9	Granular
22	9	Granular
24	9	Granular

	B-112-0-21	
Depth of Shaft (ft)	Design $N1_{60}$	**Cohesive or Granular**
6	35	Granular
8	26	Cohesive
10	22	Cohesive
12	20	Cohesive
14	18	Cohesive
16	18	Cohesive
18	16	Cohesive
20	15	Cohesive
22	15	Cohesive
24	14	Cohesive