

LOG OF BORING

Date Started 3/7/06
Date Completed 3/7/06

Sampler: Type SS Dia. 1.375"
Casing: Length 19ft Dia. 3.25"

Water Elev. 700.1ft
Surface Elev. 712.1ft

Boring No. RW- 3 Station & Offset 205+49.46, 35.46' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)			Description	Sample No.	Physical Characteristics							ODOT Class		
									% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
712.1	0																	
712.1		4/4/5				0.5'	Asphalt concrete (6")											
711.6						1.2'	Crushed stone base (8 inches)											
710.9							Brown, stiff, SILT AND CLAY, trace gravel, little sand, moist, possible fill	1								21	VIS.	
	2																	
709.1		4/5/6				3.0'												
708.6							Brown, stiff, SILT AND CLAY, trace gravel, some sand, moist, till	2	5	7	18	36	34	30	12	22	A-6a	
	4																	
706.6		5/7/31				5.5'												
	6						Brown and gray, hard, SANDY SILT, little gravel, some clay, damp	3	11	9	19	32	29	26	6	15	A-4a	
704.1	8	50-6"				8.0'												
703.6							SHALE, gray, with limestone layers, augered	4										VIS.
	10																	
		50-6"																
698.6																		
	14							5								13	VIS.	
		50-6"																
	16																	
	18																	
693.6		50-6"																
693.1						19.0'		6										VIS.

BOTTOM OF BORING

LOG OF BORING

Date Started 3/7/06
Date Completed 3/7/06

Sampler: Type SS Dia. 1.375"
Casing: Length 14ft Dia. 3.25"

Water Elev. Dry
Surface Elev. 697.2ft

Boring No. RW- 4 Station & Offset 207+67.20, 42.06' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
697.2	0																
697.2 696.4 696.2		2/2/3			0.8'	Topsoil (9 inches)											
	2						Dark brown, medium stiff, SILTY CLAY, trace gravel, little sand, with root hairs, moist, fill	1								21	VIS.
694.2		4/4/5			3.0'												
	4						Dark brown and black, stiff, SILTY CLAY, trace gravel, little sand, with root hairs, moist, fill	2	5	4	13	32	46	40	17	27	A-6b
691.7		8/11/12			5.5'												
	6						Brown and gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, damp, possible fill	3	51	12	10	15	12			10	A-2-4
689.7		22/50-6"			7.5'												
688.7	8						SHALE, gray, with limestone layers, augered	4								11	VIS.
	10																
	12																
683.7		50-3"			14.0'												
683.2	14							5									NO REC.

BOTTOM OF BORING

LOG OF BORING

Date Started3/15/06

Sampler: TypeSSDia.1.375"

Date Completed3/15/06

Casing: Length60ftDia.3.25"

Boring No.RW- 5

Station & Offset24+28.29, 49.43' Rt.

Water Elev.670.4ft

Surface Elev.718.4ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
718.4	0				Asphalt concrete (3.5 inches)										
718.4 718.1 717.4 717.1		4/2/3			Gray, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, base course (12 inches)	1								18	VIS.
715.9 715.4	2	2/2/3			Dark brown, medium stiff, SILT AND CLAY, moist, possible fill	2								15	VIS.
	4				Brown, medium stiff, SANDY SILT, trace gravel, little clay, moist, possible fill										
712.9	6	3/3/3			Brown, medium stiff, SILT AND CLAY, little sand, moist, possible fill	3								15	VIS.
	8														
709.9	10	3/4/7			Dark brown, stiff, SILTY CLAY, trace gravel, trace sand, moist	4	1	1	6	80	12	37	17	23	A-6b
	12	3/3/6			Dark brown, stiff, CLAY, and silt, trace sand, moist	5	0	0	1	92	7	45	22	25	A-7-6
704.9	14	3/4/11			Brown and gray, stiff, SANDY SILT, little clay, damp	6								12	VIS.
	16	5/6/12			Brown, very stiff, SANDY SILT, little clay, damp	7								11	VIS.
699.9	18	10/16/37			Gray, hard, SILTY CLAY, trace sand, damp, till	8								10	VIS.
	20														
	22														
694.9	24	50-5"			Gray, hard, SILTY CLAY, trace sand, with cobbles, damp, till	9									VIS.
	26														
	28	5/6/9			Gray, stiff, SANDY SILT, little gravel, little clay, damp, till	10								11	VIS.
689.9	30														
	32	6/6/8												11	VIS.
684.9	34					11									

LOG OF BORING (Continued)

Boring No.RW- 5

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
683.4	36														
	38														
679.9	40	15/20/23			Gray, hard, SANDY SILT, little gravel, little clay, with cobbles, damp, till	12								9	VIS.
	42														
	44	13/15/15			Gray, very stiff, SANDY SILT, little gravel, little clay, with cobbles, damp, till	13								6	VIS.
674.9	46														
	48														
669.9	50	16/18/15			Brown, dense, COARSE AND FINE SAND, trace gravel, little silt, little clay, wet	14								17	VIS.
	52														
	54	5/5/6			Gray, stiff, CLAY, trace silt, moist	15								34	VIS.
664.9	56														
	58	9/9/11			Gray, very stiff, CLAY, trace silt, moist	16								23	VIS.
659.9	60														
658.4				60.0'	BOTTOM OF BORING										

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45440
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
05-04-06

REVIEWED
MP

DRAWN
BRU

DESIGNED
CHECKED

STRUCTURE FOUNDATION INVESTIGATION

WAR-75-3.40

14 / 27

Date Started3/16/06

Sampler: TypeSSDia.1.375"

Date Completed3/16/06

Casing: Length42.5ftDia.3.25"

Boring No.RW- 6

Station & Offset25+52.84, 49.22' Rt.

Water Elev.677.8ft

Surface Elev.714.8ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
714.8	0					Asphalt concrete (4 inches)										
714.8					0.3'	Gray, GRAVEL AND/OR STONE										
714.5					1.5'	FRAGMENTS WITH SAND, trace silt, base course (13 inches)										
	2															
711.3		3/3/3													22	VIS.
	4					Brown, medium stiff, SILT AND CLAY, trace sand, moist, possible fill	1									
	6															
	8															
706.3		8/5/5			8.5'											
	10					Dark gray, stiff, SANDY SILT, little clay, moist	2								20	VIS.
	12															
701.3		6/12/12			13.5'	Brown, very stiff, SANDY SILT, trace gravel, some clay, damp, till	3	11	10	20	33	26	21	6	9	A-4a
	14															
698.8	16	10/12/19				Brown, hard, SANDY SILT, little gravel, little clay, damp, till	4								11	VIS.
	18															
696.3		13/16/20			18.5'	Brown, hard, SILT AND CLAY, little sand, damp, till	5								11	VIS.
	20															
693.8		11/13/15				Brown, very stiff, SILT AND CLAY, till	6									NO REC
	22															
691.3		5/9/10			23.5'	Gray, very stiff, SANDY SILT, little gravel, little clay, damp, till	7								11	VIS.
	24															
688.8	26	5/5/8			26.0'	Gray, stiff, SILT AND CLAY, little gravel, little sand, damp, till	8								11	VIS.
	28															
686.3		5/6/9					9								13	VIS.
	30				30.0'											
						Gray, stiff, SILTY CLAY, little gravel, some sand, moist, till	10								12	VIS.
683.8		5/5/7														
	32															
681.3		5/5/6			33.5'	Gray, stiff, SANDY SILT, little gravel, little clay, damp, till	11								10	VIS.
	34															

Boring No.RW- 6

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
679.8																
678.8	36	10/10/18			36.0'											
						Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, moist, till	12								13	VIS.
	38															
676.3		24/35/25			38.5'	Brown, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, damp	13								8	VIS.
	40															
673.8		6/13/15			41.0'	Brown, medium dense, FINE SAND, moist	14								16	VIS.
	42															
672.3					42.5'											
						BOTTOM OF BORING										

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE05-04-06
REVIEWEDMP
DRAWNBRU
DESIGNED
CHECKED

STRUCTURE FOUNDATION INVESTIGATION

WAR-75-3.40

15/27

Date Started 3/16/06
Date Completed 3/16/06

Sampler: Type SS Dia. 1.375"
Casing: Length 35ft Dia. 3.25"

Boring No. RW- 7 Station & Offset 27+02.99, 49.05' Rt. Water Elev. 674.4ft
Surface Elev. 710.4ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
710.4	0															
710.4	0.3'					Asphalt concrete (4 inches)										
710.1						Gray, GRAVEL AND/OR STONE										
	1.6'					FRAGMENTS WITH SAND, trace silt, base course (16 inches)										
	2															
707.4		6/4/5				Brown, stiff, SILTY CLAY, little gravel, little sand, damp, possible fill	1A								13	VIS.
	4															
705.4		6/5/6				Brown, stiff, SILTY CLAY, little gravel, little sand, moist, possible fill	1B								20	VIS.
	6															
	8															
701.9		3/6/6			8.5'											
	10					Dark brown to black, stiff, SILT AND CLAY, trace gravel, trace sand, moist	2	1	3	7	57	32	35	15	25	A-6a
	12															
	14	3/5/8			13.5'											
696.9						Brown, stiff, SANDY SILT, trace gravel, little clay, damp, till	3								11	VIS.
	16															
694.4		9/15/21			16.0'										8	VIS.
	18					Brown, hard, SANDY SILT, little gravel, little clay, damp, till	4									
691.9		13/24/25			18.5'										9	VIS.
	20					Mottled dark brown and dark gray, hard, SANDY SILT, trace gravel, little clay, damp, till	5									
689.4		10/21/24					6									NO REC.
	22															
686.9		6/12/21			23.5'											
	24					Gray, hard, SANDY SILT, trace gravel, some clay, damp, till	7								7	VIS.
	26	5/9/9			26.0'											
684.4						Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, moist	8	51	21	14	10	4	NP	NP	7	A-1-a
	28															
681.9		7/7/9			28.5'											
	30					Gray, very stiff, SANDY SILT, little gravel, little clay, damp, till	9								10	VIS.
679.4		12/22/25			31.0'											
	32					Gray, hard, SANDY SILT, some gravel, little clay, with cobbles, damp, till	10									VIS.
676.9		10/15/17					11								9	VIS.
	34															
675.4					35.0'											

BOTTOM OF BORING

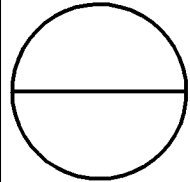
Date Started 3/17/06
Date Completed 3/17/06

Sampler: Type SS Dia. 1.375"
Casing: Length 35ft Dia. 3.25"

Boring No. RW- 8 Station & Offset 28+50.66, 49.97' Rt. Water Elev. Dry
Surface Elev. 705.8ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
705.8	0	2/3/4			0.5'	Asphalt concrete (5 inches)										
705.8					1.2'	Gray, GRAVEL AND/OR STONE										
705.3	2				FRAGMENTS WITH SAND, trace silt, base course (9 inches)											
702.3	4				Brown, medium stiff, SILT AND CLAY, little gravel, little sand, moist, possible fill	1	13	7	13	42	25	33	15	22	A-6a	
	6															
	8	7/7/8			7.0'											
697.3					Brown and gray, stiff, SANDY SILT, little gravel, little clay, damp, possible fill	2								17	VIS.	
	10															
	12				12.0'											
692.3	14	2/2/4				Dark gray, medium stiff, SANDY SILT, trace gravel, and clay, damp	3	2	4	21	28	45	26	7	17	A-4a
	16	3/2/3			16.5'		4A								20	VIS.
689.8					18.0'	Dark gray and black, medium stiff, SANDY SILT, trace clay, wet	4B								36	VIS.
689.3	18	4/6/8			20.0'	Brown and gray, stiff, SANDY SILT, little clay, damp, till	5								16	VIS.
	20															
684.8	22	6/15/21				Brown and gray, hard, SANDY SILT, little clay, with cobbles, damp, till	6								8	VIS.
682.3	24	5/8/13			23.5'	Gray, very stiff, SANDY SILT, little gravel, little clay, with cobbles, damp, till	7								10	VIS.
679.8	26	12/12/15					8									NO REC.
	28															
677.3		6/8/15					9								7	VIS.
	30															
674.8		15/50-6"			31.0'	BOULDER ZONE	10									VIS.
	32				32.5'											
672.3	34	10/36/34				Gray, hard, SANDY SILT, some gravel, little clay, with cobbles, with boulders, damp, till	11								7	VIS.
670.8					35.0'											

BOTTOM OF BORING



LOG OF BORING

Date Started 3/16/06
Date Completed 3/16/06

Sampler: Type SS Dia. 1.375"
Casing: Length 35ft Dia. 3.25"

Water Elev. 674.4ft
Surface Elev. 710.4ft

Boring No. RW- 7 Station & Offset 27+02.99, 49.05' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
710.4	0															
710.4					0.3'	Asphalt concrete (4 inches)										
710.1					Gray, GRAVEL AND/OR STONE											
					FRAGMENTS WITH SAND, trace silt,											
	2				1.6'	base course (16 inches)										
707.4		6/4/5				Brown, stiff, SILTY CLAY, little gravel, little sand, damp, possible fill	1A								13	VIS.
705.4		6/5/6				Brown, stiff, SILTY CLAY, little gravel, little sand, moist, possible fill	1B								20	VIS.
	6															
	8															
701.9		3/6/6			8.5'	Dark brown to black, stiff, SILT AND CLAY, trace gravel, trace sand, moist	2	1	3	7	57	32	35	15	25	A-6a
	10															
	12															
696.9		3/5/8			13.5'	Brown, stiff, SANDY SILT, trace gravel, little clay, damp, till	3								11	VIS.
	14															
694.4	16	9/15/21			16.0'	Brown, hard, SANDY SILT, little gravel, little clay, damp, till	4								8	VIS.
	18															
691.9		13/24/25			18.5'	Mottled dark brown and dark gray, hard, SANDY SILT, trace gravel, little clay, damp, till	5								9	VIS.
	20															
689.4		10/21/24					6									NO REC.
	22															
686.9		6/12/21			23.5'	Gray, hard, SANDY SILT, trace gravel, some clay, damp, till	7								7	VIS.
	24															
684.4	26	5/9/9			26.0'	Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, moist	8	51	21	14	10	4	NP	NP	7	A-1-a
	28															
681.9		7/7/9			28.5'	Gray, very stiff, SANDY SILT, little gravel, little clay, damp, till	9								10	VIS.
	30															
679.4		12/22/25			31.0'	Gray, hard, SANDY SILT, some gravel, little clay, with cobbles, damp, till	10									VIS.
	32															
676.9		10/15/17					11								9	VIS.
	34															
675.4					35.0'											

BOTTOM OF BORING

LOG OF BORING

Date Started 3/17/06
Date Completed 3/17/06

Sampler: Type SS Dia. 1.375"
Casing: Length 35ft Dia. 3.25"

Water Elev. Dry
Surface Elev. 705.8ft

Boring No. RW- 8 Station & Offset 28+50.66, 49.97' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
705.8	0															
705.8		2/3/4			0.5'	Asphalt concrete (5 inches)										
705.3					1.2'	Gray, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, base course (9 inches)										
	2															
702.3		2/3/4														
	4					Brown, medium stiff, SILT AND CLAY, little gravel, little sand, moist, possible fill	1	13	7	13	42	25	33	15	22	A-6a
	6															
		7/7/8			7.0'											
697.3	8															
	10															
		2/2/4			12.0'											
692.3	12															
	14					Dark gray, medium stiff, SANDY SILT, trace gravel, and clay, damp	3	2	4	21	28	45	26	7	17	A-4a
689.8	16	3/2/3			16.5'											
689.3																
	18	4/6/8			18.0'											
687.3																
	20	6/15/21			20.0'											
684.8																
	22	5/8/13			23.5'											
682.3																
	24	12/12/15														
679.8																
	26	6/8/15														
677.3																
	28	15/50-6"			31.0'											
674.8																
	30	10/36/34			32.5'											
672.3																
	32				35.0'											
670.8																

BOTTOM OF BORING

LOG OF BORING

Date Started3/17/06

Date Completed3/17/06

Sampler: TypeSSDia.1.375"

Casing: Length35ftDia.3.25"

Boring No.RW- 9

Station & Offset30+47.68, 51.69' Rt.

Water Elev.Dry

Surface Elev.699.8ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
699.8	0					Asphalt concrete (5 inches)												
699.8	0.8'					Gray, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, base course (5 inches)												
	2																	
696.3	4	3/5/5				Brown, stiff, SILT AND CLAY, some sand, damp, fill	1									12	VIS.	
	6																	
	8																	
691.3	10	8/15/16			8.5'	Brown and gray, hard, SANDY SILT, little gravel, little clay, with cobbles, damp, fill	2										8	VIS.
	12																	
686.3	14	3/4/5			13.5'	Brown, gray, and black, stiff, SANDY SILT, little gravel, some clay, with cobbles, damp, fill	3	17	9	13	31	30	27	7	12		A-4a	
683.8	16	2/50-2"			16.0'	Dark gray, hard, SANDY SILT, little gravel, some clay, with cobbles, moist, fill	4									19	VIS.	
681.3	18	9/14/9			18.5'	Brown, very stiff, SANDY SILT, some gravel, little clay, with cobbles, damp, till	5									13	VIS.	
678.8	22	5/8/8					6										NO REC.	
676.3	24	8/13/17			23.5'	Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, little sand, trace silt, trace clay, moist	7	69	9							8	A-I-a	
673.8	26	10/15/21			26.0'	Gray, hard, SANDY SILT, some gravel, little clay, with cobbles, damp, till±	8									10	VIS.	
671.3	28	19/24/18					9									10	VIS.	
668.8	32	19/17/19					10									10	VIS.	
666.3	34	11/12/16				Gray, very stiff, SANDY SILT, some gravel, little clay, with cobbles, damp, till±	11									3	VIS.	
664.8					35.0'													
BOTTOM OF BORING																		

LOG OF BORING

Date Started3/23/06

Date Completed3/23/06

Sampler: TypeSSDia.1.375"

Casing: Length28.5ftDia.3.25"

Boring No.RW-10

Station & Offset47+19.76, 25.24' Rt.

Water Elev.688.5ft

Surface Elev.704.5ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
704.5	0					Asphalt concrete (6 inches)												
704.5	0.5'					Gray, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, base course (6 inches)	1										10	VIS.
704.0	1.0'	11/12/11				Brown, very stiff, SILT AND CLAY, trace gravel, some sand, damp, possible fill												
703.5	2																	
	4	5/5/8				Brown, stiff, SANDY SILT, trace gravel, some clay, damp, possible fill	2										15	VIS.
	6																	
	8																	
696.0	10	4/7/7			8.5'	Dark gray to black, stiff, SILT AND CLAY, some gravel, little sand, with rock fragments, damp	3	32	4	14	19	31	36	13	22		A-6a	
	12																	
691.0	14	11/4/6			13.5'	Brown, loose, GRAVEL AND/OR STONE FRAGMENTS W/ SAND AND SILT, with dolomite, limestone, and chert fragments, damp	4									9	VIS.	
	16																	
687.0	18	8/9/15			17.5'	Brown, very stiff, SANDY SILT, some gravel, some clay, damp, till	5	26	8	13	20	33	18	4	12		A-4a	
684.5	20				20.0'	Gray and rusty brown, very stiff, SANDY SILT, trace gravel, some clay, damp, till												
683.0	22	16/15/15					6									10	VIS.	
	24																	
679.0	26	50-2"			25.5'	Gray, hard, SANDY SILT, little gravel, little clay, with rock fragments, damp, till/rock transition material	7										VIS.	
676.0	28																	
AUGER REFUSAL AT 28.5 FEET BOTTOM OF BORING																		

CTI ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE05-04-06
FILE NUMBER

REVIEWEDMP
STRUCTURE

DRAWNBRU
REVISED

DESIGNED
CHECKED

STRUCTURE FOUNDATION INVESTIGATION

WAR-75-3.40

17/27

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LOG OF BORING

Date Started 3/17/06
Date Completed 3/17/06

Sampler: Type SS Dia. 1.375"
Casing: Length 35ft Dia. 3.25"

Boring No. RW- 9

Station & Offset 30+47.68, 51.69' Rt.

Water Elev. Dry
Surface Elev. 699.8ft

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
699.8	0															
699.8		3/5/5			0.4'	Asphalt concrete (5 inches)										
699.4					0.8'	Gray, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, base course (5 inches)										
	2															
	4					Brown, stiff, SILT AND CLAY, some sand, damp, fill	1								12	VIS.
	6															
	8															
691.3		8/15/16			8.5'											
	10					Brown and gray, hard, SANDY SILT, little gravel, little clay, with cobbles, damp, fill	2								8	VIS.
	12															
	14				13.5'	Brown, gray, and black, stiff, SANDY SILT, little gravel, some clay, with cobbles, damp, fill	3	17	9	13	31	30	27	7	12	A-4a
686.3	16	2/50-2"			16.0'											
683.8	18					Dark gray, hard, SANDY SILT, little gravel, some clay, with cobbles, moist, fill	4								19	VIS.
681.3		9/14/9			18.5'										13	VIS.
	20					Brown, very stiff, SANDY SILT, some gravel, little clay, with cobbles, damp, till	5									
678.8	22	5/8/8					6									NO REC.
	24				23.5'	Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, little sand, trace silt, trace clay, moist	7	69	9						8	A-1-a
673.8	26	10/15/21			26.0'											
	28					Gray, hard, SANDY SILT, some gravel, little clay, with cobbles, damp, till±	8								10	VIS.
671.3	30	19/24/18					9								10	VIS.
	32						10								10	VIS.
668.8		19/17/19														
	34				11/12/16	Gray, very stiff, SANDY SILT, some gravel, little clay, with cobbles, damp, till±	11								3	VIS.
664.8					35.0'											

BOTTOM OF BORING

LOG OF BORING

Date Started 3/23/06
Date Completed 3/23/06

Sampler: Type SS Dia. 1.375"
Casing: Length 28.5ft Dia. 3.25"

Water Elev. 688.5ft
Surface Elev. 704.5ft

Boring No. RW-10 Station & Offset 47+19.76, 25.24' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
704.5	0																
704.5		11/12/11			0.5'	Asphalt concrete (6 inches)											
704.0					1.0'	Gray, GRAVEL AND/OR STONE											
703.5						FRAGMENTS WITH SAND, trace silt, base course (6 inches)	1								10	VIS.	
	2					Brown, very stiff, SILT AND CLAY, trace gravel, some sand, damp, possible fill											
		5/5/8															
701.0					3.5'	Brown, stiff, SANDY SILT, trace gravel, some clay, damp, possible fill	2								15	VIS.	
	4																
	6																
	8																
696.0		4/7/7			8.5'												
						Dark gray to black, stiff, SILT AND CLAY, some gravel, little sand, with rock fragments, damp	3	32	4	14	19	31	36	13	22	A-6a	
	10																
	12																
691.0		11/4/6			13.5'												
						Brown, loose, GRAVEL AND/OR STONE FRAGMENTS W/ SAND AND SILT, with dolomite, limestone, and chert fragments, damp	4								9	VIS.	
	16																
687.0		8/9/15			17.5'												
						Brown, very stiff, SANDY SILT, some gravel, some clay, damp, till	5	26	8	13	20	33	18	4	12	A-4a	
	20																
684.5		16/15/15			20.0'												
						Gray and rusty brown, very stiff, SANDY SILT, trace gravel, some clay, damp, till											
683.0																	
	22						6							10	VIS.		
	24																
679.0		50-2"			25.5'												
						Gray, hard, SANDY SILT, little gravel, little clay, with rock fragments, damp, till/rock transition material	7									VIS.	
	26																
	28																
676.0					28.5'												

AUGER REFUSAL AT 28.5 FEET
BOTTOM OF BORING

LOG OF BORING																
Date Started 3/24/06			Sampler: Type SS			Dia. 1.375"										
Date Completed 3/24/06			Casing: Length 33.5ft			Dia. 3.25"										
Boring No. RW-II			Station & Offset 48+76.55, 24.77' Rt.			Water Elev. 697.6ft			Surface Elev. 705.1ft							
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
705.1	0					Asphalt (6 inches)										
705.1		12/9/10				Gray, GRAVEL AND/OR STONE										
704.6						FRAGMENTS WITH SAND, trace silt,	1								12	VIS.
704.1						base course (6 inches)										
	2					Brown, very stiff, SANDY SILT, trace gravel, some clay, damp, till										
701.6		7/7/6														
	4					Brown, stiff, SANDY SILT, trace gravel, some clay, damp, till	2								15	VIS.
	6															
	8															
696.6		17/9/9														
	10					Dark gray, very stiff, SANDY SILT, some clay, damp, possible till	3								19	VIS.
	12															
691.6		20/17/13														
	14					Brown and gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS W/ SAND, trace silt, trace clay, damp	4								4	VIS.
	16															
687.6		14/15/32														
	18					Brown and gray, dense, GRAVEL AND/OR STONE FRAGMENTS W/ SAND, trace silt, trace clay, moist	5	60	12	7	9	12	17	4	15	A-1-b
	20															
684.1		14/26/15														
	22					Brown and gray, dense, GRAVEL AND/OR STONE FRAGMENTS W/ SAND AND SILT, little clay, with limestone, dolomite, and chert fragments, damp	6	48	13	12	11	16	21	6	15	A-2-4
	24															
680.1		16/17/17														
	26						7								8	VIS.
	28															
676.1		25/50-5"														
	30					SHALE, gray, with limestone interbeds, augered	8									VIS.
	32															
672.1		50-2"														
671.6							9									VIS.
BOTTOM OF BORING																

LOG OF BORING																
Date Started		3/24/06		Sampler: Type		SS		Dia.		1.375"						
Date Completed		3/24/06		Casing: Length		29ft		Dia.		3.25"						
Boring No.		RW-12		Station & Offset		49+88.27, 24.50' Rt.		Water Elev.		687.9ft		Surface Elev. 704.9ft				
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
704.9	0															
704.9		9/5/5			0.5'	Asphalt (6.5 inches)										
704.4					1.0'	Gray, GRAVEL AND/OR STONE										
703.9						FRAGMENTS WITH SAND, trace silt, base course (6 inches)	1								21	VIS.
	2					Brown, stiff, SANDY SILT, trace gravel, some clay, moist										
701.4		4/4/5			3.5'											
	4					Brown and gray, stiff, SANDY SILT, trace gravel, some clay, damp	2								18	VIS.
	6															
	8															
696.4		6/5/5			8.5'											
	10					Gray, stiff, SANDY SILT, little gravel, some clay, moist	3	13	9	33	14	31	26	10	20	A-4a
	12															
691.4		4/6/16			13.5'											
	14					Brown, stiff, SILT, some sand, little clay, moist	4A								20	VIS.
690.4																
	16					Brown, very stiff, SILT, trace gravel, little sand, trace clay, with rock fragments, damp	4B								9	VIS.
687.4		9/8/10			17.5'											
	18					Brown and gray, very stiff, SANDY SILT, some clay, with sand seams, moist	5	0	1	53	22	24	NP	NP	25	A-4a
	20															
683.9		9/8/11			21.0'											
	22					Gray, very stiff, SILT, and sand, trace clay, with sand seams, moist	6								21	VIS.
	24															
679.9		30/50-6"			25.0'											
	26					SHALE, gray, with limestone interbeds, augered	7									VIS.
	28															
675.9		50-5"														
675.4					29.5'			8								VIS.
BOTTOM OF BORING																

LOG OF BORING

Date Started 3/24/06
Date Completed 3/24/06

Sampler: Type SS Dia. 1.375"
Casing: Length 33.5ft Dia. 3.25"

Water Elev. 697.6ft
Surface Elev. 705.1ft

Boring No. RW-II Station & Offset 48+76.55, 24.77' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)			Description	Sample No.	Physical Characteristics							ODOT Class	
									% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
705.1	0						Asphalt (6 inches)										
705.1		12/9/10				0.5'	Gray, GRAVEL AND/OR STONE										
704.6			1.0'	FRAGMENTS WITH SAND, trace silt,													
704.1				base course (6 inches)	1										12	VIS.	
	2						Brown, very stiff, SANDY SILT, trace gravel, some clay, damp, till										
		7/7/6															
701.6	4			Brown, stiff, SANDY SILT, trace gravel, some clay, damp, till	2									15	VIS.		
	6																
		17/9/9															
	8																
696.6						8.5'	Dark gray, very stiff, SANDY SILT, some clay, damp, possible till	3								19	VIS.
	10																
		20/17/13															
	12																
691.6	14			Brown and gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS W/ SAND, trace silt, trace clay, damp	4									4	VIS.		
		14/15/32															
	16																
687.6	18			Brown and gray, dense, GRAVEL AND/OR STONE FRAGMENTS W/ SAND, trace silt, trace clay, moist	5	60	12	7	9	12	17	4	15	A-1-b			
		14/26/15															
	20																
684.1	22			Brown and gray, dense, GRAVEL AND/OR STONE FRAGMENTS W/ SAND AND SILT, little clay, with limestone, dolomite, and chert fragments, damp	6	48	13	12	11	16	21	6	15	A-2-4			
		16/17/17															
	24																
680.1	26								7						8	VIS.	
		25/50-5"															
	28																
676.1	30			SHALE, gray, with limestone interbeds, augered	8											VIS.	
		50-2"															
	32																
672.1									9								VIS.
671.6						33.5'											

BOTTOM OF BORING

LOG OF BORING

Date Started 3/24/06
Date Completed 3/24/06

Sampler: Type SS Dia. 1.375"
Casing: Length 29ft Dia. 3.25"

Water Elev. 687.9ft
Surface Elev. 704.9ft

Boring No. RW-12 Station & Offset 49+88.27, 24.50' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
704.9	0	9/5/5			0.5'	Asphalt (6.5 inches)											
704.9					1.0'	Gray, GRAVEL AND/OR STONE											
704.4					2	FRAGMENTS WITH SAND, trace silt, base course (6 inches)	1	Brown, stiff, SANDY SILT, trace gravel, some clay, moist								21	VIS.
703.9																	
		4/4/5			3.5'	Brown and gray, stiff, SANDY SILT, trace gravel, some clay, damp	2								18	VIS.	
701.4	4																
	6																
	8	6/5/5			8.5'												
696.4						Gray, stiff, SANDY SILT, little gravel, some clay, moist	3	13	9	33	14	31	26	10	20	A-4a	
	10																
	12	4/6/16			13.5'												
691.4						Brown, stiff, SILT, some sand, little clay, moist	4A								20	VIS.	
690.4						Brown, very stiff, SILT, trace gravel, little sand, trace clay, with rock fragments, damp	4B								9	VIS.	
	16	9/8/10			17.5'												
687.4	18					Brown and gray, very stiff, SANDY SILT, some clay, with sand seams, moist	5	0	1	53	22	24	NP	NP	25	A-4a	
	20																
		9/8/11			21.0'												
683.9						Gray, very stiff, SILT, and sand, trace clay, with sand seams, moist	6								21	VIS.	
	22																
	24	30/50-6"			25.0'												
679.9						SHALE, gray, with limestone interbeds, augered	7									VIS.	
	26																
	28	50-5"															
675.9																	
675.4					29.5'		8									VIS.	

BOTTOM OF BORING

Date Started 3/7/06
Date Completed 3/7/06

Sampler: Type SS Dia. 1.375"
Casing: Length 55ft Dia. 3.25"

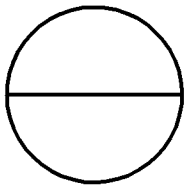
Water Elev. 673.0ft
Surface Elev. 719.0ft

Boring No. RW-13
Station & Offset 219+92.54, 23.02' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
719.0	0					Topsoil (12 inches)											
718.0	2	3/4/4			1.0'	Brown, medium stiff, SANDY SILT, little gravel, little clay, moist, fill	1								22		VIS.
716.0	4	9/10/9			3.0'	Brown, very stiff, SANDY SILT, little gravel, little clay, damp, fill	2								9		VIS.
713.5	6	4/5/5			5.5'	Brown and gray, medium stiff, SANDY SILT, little gravel, little clay, damp, fill	3								11		VIS.
710.5	8	33/12/9			8.5'	Brown and gray, very stiff, SANDY SILT, little gravel, little clay, damp, fill	4								9		VIS.
708.0	10	5/7/7			11.0'	Brown, stiff, SANDY SILT, some gravel, little clay, with cobbles, damp, fill	5	30	8	14	28	20	20	9	11		A-4a
705.5	12	4/4/7			13.5'	Gray, stiff, SILT AND CLAY, little sand, with limestone rock fragments, damp, fill	6								5		VIS.
703.0	14	4/5/8			16.0'	Brown and gray, stiff, SANDY SILT, trace gravel, little clay, damp, fill	7								10		VIS.
701.0	16	10/14/17			18.0'	Brown and gray, hard, SANDY SILT, with cobbles. Visual classification from cuttings only.	8										NO REC.
700.5	18				23.5'	Dark gray, medium stiff, SILT, trace gravel, little sand, some clay, moist	9	1	0	15	56	28	28	9	23		A-4b
695.5	20	2/2/3			29.5'	Dark gray, soft, SILT, little sand, some clay, moist	10								24		VIS.
690.5	22	1/1/12			33.5'	Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, damp, till	10A								11		VIS.
689.5	24	10/15/16				Gray, hard, SANDY SILT, little gravel, some clay, damp, till	11	16	9	15	29	31	15	2	7		A-4a

Boring No. RW-13

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics							ODOT Class		
							% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
684.0																
	36	12/23/20				12									8	VIS.
680.5	38															
	40															
	42															
675.5	44	20/50-6"			46.0'	13									7	VIS.
673.0	46															
	48	50-6"			48.5'	14	Gray, COARSE AND FINE SAND							VIS.		
670.5																
	50															
667.0	52	13/15/17			52.0'	15	Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, damp							6	VIS.	
665.5	54															
664.0					55.0'		7	7	15	36	35	29	11	13	A-6a	
BOTTOM OF BORING																



LOG OF BORING

Date Started 3/14/06
Date Completed 3/14/06

Sampler: Type SS Dia. 1.375"
Casing: Length 55ft Dia. 3.25"

Boring No. RW-14 Station & Offset 222+17.79, 30.61' Rt.

Water Elev. 690.0ft
Surface Elev. 723.5ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	Class	
723.5	0																
723.5 723.1 723.0		2/3/5			0.3'	Topsoil (4 inches) Brown, medium stiff, SILTY CLAY, trace sand, with root hairs, moist, fill	1								22	VIS.	
	2																
720.5		5/6/7			3.0'	Brown, stiff, SILTY CLAY, trace sand, moist, fill	2								19	VIS.	
	4																
718.0		6/7/9			5.5'	Brown, dark brown, and gray, very stiff, SANDY SILT, trace gravel, damp, fill	3								14	VIS.	
	6																
715.0		5/4/7			8.5'	Brown, gray, and dark gray, stiff, SILT AND CLAY, trace gravel, trace sand, moist, fill	4								22	VIS.	
	8																
712.5		5/6/8			11.0'	Brown, stiff, SANDY SILT, little gravel, some clay, damp, fill	5	15	12	21	27	25	17	4	11	A-4a	
	10																
710.0		10/8/11			13.5'	Dark brown and dark gray, very stiff, SILT AND CLAY, trace sand, moist, fill	6								16	VIS.	
	12																
707.5		7/9/13			16.0'	Brown and gray, very stiff, SANDY SILT, some gravel, some clay, damp, fill	7								10	VIS.	
	14																
705.0		7/12/14				Brown and gray, very stiff, SANDY SILT, some gravel, some clay, damp, fill	8	28	9	11	21	31	31	1	7	A-4a	
	16																
	18																
	20																
	22																
700.0		15/16/22			23.5'	Brown and gray, hard, SANDY SILT, trace gravel, little clay, with cobbles, damp, fill	9								9	VIS.	
	24																
	26																
	28																
695.0		3/4/5			28.5'	Brown, stiff, SANDY SILT, little gravel, little clay, damp, till	10								13	VIS.	
	30																
	32																
690.0		12/17/22			33.5'	Brown, hard, SILT, trace sand, some clay, wet	11	0	0	11	58	31	NP	NP	20	A-4b	
	34																

LOG OF BORING (Continued)

Boring No. RW-14

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	Class	
688.5																	
686.5	36				37.0'												
685.0	38	50-5"				Gray, hard, SANDY SILT, some gravel, little clay, with cobbles, with boulders, damp, till	12								9	VIS.	
	40																
	42																
680.0	44	17/22/26					13								10	VIS.	
	46																
	48																
675.0	50	22/50-4"					14								6	VIS.	
	52																
670.0	54	21/30/50-3"					15								9	VIS.	
668.5				55.0'		BOTTOM OF BORING											

LOG OF BORING

Date Started 3/14/06
Date Completed 3/14/06

Sampler: Type SS Dia. 1.375"
Casing: Length 55ft Dia. 3.25"

Boring No. RW-15 Station & Offset 223+72.58, 7.03' Rt.

Water Elev. 692.7ft
Surface Elev. 726.2ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
726.2	0					Topsoil (5 inches)											
726.2		6/9/4			0.4'	Brown, stiff, SANDY SILT, little gravel, little clay, with cobbles, damp, fill	1								11		VIS.
725.8																	
725.7	2																
723.2		5/6/8					2								11		VIS.
	4																
720.7		3/4/4			5.5'	Brown, medium stiff, SILT, some gravel, little sand, trace clay, with cobbles, damp, fill	3	24	8	12	51	5	26	10	12		A-4b
	6																
	8																
717.7		3/4/5			8.5'	Brown and gray, stiff, SANDY SILT, trace gravel, little clay, damp, fill	4								15		VIS.
	10																
715.2		5/5/7			11.0'	Brown and gray, medium dense, CLAYSHALE FRAGMENTS, damp, fill	5								21		VIS.
	12																
712.7		8/7/6			13.5'	Dark brown and dark gray, stiff, SILT, little gravel, some sand, trace clay, damp, fill	6	19	10	15	53	3	16	4	9		A-4b
	14																
710.2		5/7/7			16.0'	Brown, stiff, SANDY SILT, little gravel, little clay, damp, fill	7								10		VIS.
	18																
707.7		3/6/7			18.5'	Brown and gray, stiff, SANDY SILT, little gravel, little clay, damp, fill	8								11		VIS.
	20																
	22																
702.7		12/14/17			23.5'	Brown and gray, hard, SANDY SILT, little gravel, trace clay, with cobbles, damp, fill	9								10		VIS.
	24																
	26																
	28																
697.7		3/4/5			28.5'	Brown, stiff, CLAY, some silt, moist	10								23		VIS.
	30																
	32																
692.7		13/15/16			33.5'	Gray, hard, SANDY SILT, little gravel, little clay, with cobbles, damp, till	11								10		VIS.
	34																

LOG OF BORING (Continued)

Boring No. RW-15

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
691.2																	
	36																
	38																
687.7		13/15/17					12								11		VIS.
	40																
	42																
	44																
682.7		50-3"			43.5'	Gray, hard, SANDY SILT, some gravel, trace clay, with cobbles, with boulders, damp, till	13								5		VIS.
	46																
	48																
677.7		14/17/25			48.5'	Gray, hard, SANDY SILT, little gravel, little clay, with cobbles, with boulders, moist, till	14								12		VIS.
	50																
	52																
672.7		50-5"				Gray, hard, SANDY SILT, little gravel, little clay, with cobbles, with boulders, damp, till	15								2		VIS.
671.2					55.0'												
BOTTOM OF BORING																	

LOG OF BORING

Date Started 3/15/06
Date Completed 3/15/06

Sampler: Type SS Dia. 1.375"
Casing: Length 50ft Dia. 3.25"

Boring No. RW-16
Station & Offset 225+24.86, 5.98' Lt.

Water Elev. Dry
Surface Elev. 730.1ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
730.1	0					Asphalt (7 inches)										
729.5					0.6'	Gray, GRAVEL AND/OR STONE										
728.8					1.3'	FRAGMENTS WITH SAND, trace silt,										
728.6	2	3/5/7				damp, base course (8 inches)	1								14	VIS.
						Dark brown and dark gray, stiff, SANDY										
727.1		7/8/8			3.0'	SILT, some clay, with cobbles, damp, fill										
	4					Brown and gray, very stiff, SANDY SILT,	2								10	VIS.
						trace gravel, little clay, with cobbles,										
						damp, fill										
724.6		5/5/7			5.5'											
	6					Brown, medium dense, GRAVEL AND/OR	3	13	26	26	31	4	25	11	11	A-2-6
						STONE FRAGMENTS WITH SAND,										
						SILT, AND CLAY, damp, fill										
721.6	8				8.5'											
		4/4/7				Light brown, stiff, SANDY SILT, trace	4								10	VIS.
						gravel, little clay, damp, fill										
	10						5									
719.1		4/5/6														
	12															
716.6		3/3/6			13.5'											
	14					Brown and gray, stiff, SILTY CLAY, and	6								15	VIS.
						sand, damp, fill										
714.1	16				16.0'											
		4/4/7				Dark brown to black, stiff, TOPSOIL, with	7								9	VIS.
						organics, damp, fill										
712.6	18				17.5'											
711.6		9/11/12				Brown and gray, very stiff, SANDY SILT,	8									
						trace gravel, little clay, damp, fill										
	20															
	22															
706.6		12/7/7			23.5'											
	24					Black to brown, stiff, SILTY CLAY, trace	9	0	0	3	84	13	40	19	24	A-6b
						gravel, trace sand, moist, possible fill										
	26															
	28				28.5'											
701.6		13/15/18				Gray, hard, SANDY SILT, with cobbles,	10									NO REC.
						with boulders										
	30															
	32															
696.6		10/14/16			33.5'											
	34					Gray, very stiff, SILT, trace gravel, trace	11	1	0	9	84	6	NP	NP	16	A-4b
						sand, trace clay, moist										

LOG OF BORING (Continued)

Boring No. RW-16

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
695.1																
	36															
	38															
691.6		12/18/13			38.5'											
						Gray, hard, SANDY SILT, little gravel,	12								10	VIS.
						little clay, with cobbles, damp, till										
	40															
	42															
686.6		14/17/23														
	44						13								10	VIS.
	46															
	48															
681.6		16/17/19														
							14								10	VIS.
680.1	50				50.0'											
BOTTOM OF BORING																

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE 05-04-06
REVIEWED MP
DRAWN BRU
DESIGNED
CHECKED

STRUCTURE FOUNDATION INVESTIGATION

WAR-75-3.40

22/27

LOG OF BORING

Date Started 3/13/06
Date Completed 3/13/06

Sampler: Type SS Dia. 1.375"
Casing: Length 60ft Dia. 3.25"

Boring No. RW-17
Station & Offset 226+90.90, 1.48' Rt.

Water Elev. 697.3ft
Surface Elev. 731.3ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.				
731.3	0																		
731.3 731.0 730.8		2/3/5			0.3'	Topsoil (4 inches) Dark brown, light brown, and gray, medium stiff, SILT AND CLAY, little sand, damp, fill	1									16		VIS.	
	2																		
728.3		5/6/6			3.0'	Dark brown and gray, stiff, SILT AND CLAY, little gravel, some sand, with sand seams, moist, fill	2	14	10	18	28	30	28	11	19			A-6a	
	4																		
725.8		3/3/4			5.5'	Brown, medium stiff, SANDY SILT, little clay, moist, fill	3									24		VIS.	
	6																		
	8																		
722.8		8/11/8			8.5'	Brown and gray, very stiff, SANDY SILT, trace gravel, little clay, with cobbles, damp, fill	4									19		VIS.	
	10																		
720.3		5/7/7			11.0'	Brown, stiff, SILT AND CLAY, little gravel, little sand, with cobbles, damp, till	5									12		VIS.	
	12																		
717.8		9/8/7					6									17		VIS.	
	14																		
715.3	16	6/8/6				Brown, stiff, SILT AND CLAY, little gravel, little sand, with cobbles, damp, till	7	15	9	11	22	43	33	14	15			A-6a	
	18																		
712.8		5/7/11				Brown, very stiff, SILT AND CLAY, trace gravel, some sand, with cobbles, damp, till	8									11		VIS.	
	20																		
	22																		
707.8		5/7/9					9									11		VIS.	
	24																		
	26																		
704.3					27.0'														
	28	12/12/12				Gray, very stiff, SANDY SILT, with cobbles, damp, till	10											NO REC.	
702.8																			
	30																		
	32																		
697.8		7/5/4			33.5'	Dark gray, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, trace clay, moist	11	23	33	33	5	6	NP	NP	16			A-1-b	
	34																		

LOG OF BORING (Continued)

Boring No. RW-17

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class																	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.																		
696.3																																	
	36	12/14/17			37.0'																												
694.3																																	
	38																																
692.8																																	
	40																																
	42	13/14/17				Gray, hard, SANDY SILT, little gravel, little clay, with cobbles, damp, till	12										11	VIS.															
	44																																
687.8																																	
	46																																
	48	14/16/18					13										12	VIS.															
	50																																
682.8																																	
	52																																
	54	15/14/18			53.5'	Brown, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, trace clay, with cobbles, with boulders, wet	14										11	VIS.															
	56																																
677.8																																	
	58	15/17/21					15											NO REC.															
	60																																
672.8																																	
671.3	60				60.0'												20	VIS.															
BOTTOM OF BORING																																	

LOG OF BORING

Date Started 3/8/06
Date Completed 3/8/06

Sampler: Type SS Dia. 1.375"
Casing: Length 29ft Dia. 3.25"

Water Elev. 694.8ft
Surface Elev. 703.3ft

Boring No. RW-18
Station & Offset 224+41.57, 24.47' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	Class	
703.3	0					Topsoil (12 inches)											
703.3		2/2/3			1.0'	Brown, medium stiff, SILTY CLAY, trace sand, with root hairs, moist	1								27		VIS.
702.3	2																
700.3		2/2/2				Brown, soft, SILTY CLAY, trace sand, moist	2	0	0	5	62	33	38	16	27		A-6b
	4																
697.8		3/5/6			5.5'	Brown, stiff, SANDY SILT, little gravel, little clay, damp, till	3									10	VIS.
	6																
695.3	8	14/17/18			8.0'	Brown, hard, SANDY SILT, some gravel, little clay, with rock fragments, with cobbles, with boulders, moist, till	4									14	VIS.
694.8																	
	10	14/16/16					5										NO REC.
692.3																	
	12	11/13/18			13.0'	Gray, hard, SANDY SILT, little gravel, some clay, with cobbles, with boulders, damp, till	6	19	10	16	33	22	19	6	9		A-4a
690.3																	
689.8		50-6"					7										NO REC.
	14																
687.3		12/14/17					8									11	VIS.
	16																
	18	12/16/17					9									11	VIS.
684.8																	
	20	50-6"															
	22																
679.8		50-6"															
	24																
	26																
	28																
674.8		50-6"			29.0'		10										NO REC.
674.3																	

BOTTOM OF BORING

LOG OF BORING

Date Started 3/9/06
Date Completed 3/9/06

Sampler: Type SS Dia. 1.375"
Casing: Length 44.5ft Dia. 3.25"

Water Elev. 697.5ft
Surface Elev. 709.0ft

Boring No. RW-19
Station & Offset 226+04.51, 23.66' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
709.0	0					Topsoil (8 inches)											
709.0 708.5 708.3	— 2 —	4/5/6			0.7'	Brown and tan, stiff, SANDY SILT, some gravel, little clay, with cobbles, damp, till	1									10	VIS.
706.0	— 4	7/9/10				Brown and tan, very stiff, SANDY SILT, some gravel, little clay, with cobbles, damp, till	2									12	VIS.
703.5	— 6	5/6/8			5.5'	Brown, stiff, SANDY SILT, trace gravel, little clay, with rock fragments, damp, till	3									12	VIS.
700.5	— 8 10	9/11/13			8.5'	Gray, very stiff, SILT, trace gravel, little sand, little clay, with sand seams, moist, till	4	6	5	13	59	17	NP	NP		9	A-4b
698.0	— 12	5/7/9				Gray, very stiff, SILT, trace gravel, little sand, little clay, with sand seams, wet, till	5									19	VIS.
695.5	— 14	9/11/12				Gray, very stiff, SILT, trace gravel, little sand, little clay, with sand seams, moist, till	6									10	VIS.
693.0	— 16 18	7/8/6			16.0'	Gray, stiff, SANDY SILT, little gravel, little clay, with sand seams, wet, till	7	17	6	18	40	19	19	4		22	A-4a
690.5	— 20 22	5/5/6			18.5'	Gray, stiff, SANDY SILT, little gravel, little clay, with sand seams, damp, till	8									9	VIS.
685.5	— 24 26 28	30/16/18			23.5'	Gray, hard, SANDY SILT, little gravel, little clay, with sand seams, with cobbles, with boulders, moist, till	9									13	VIS.
680.5	— 30 32	12/15/16				Gray, hard, SANDY SILT, little gravel, little clay, with sand seams, with cobbles, with boulders, damp, till	10									9	VIS.
675.5	— 34	12/16/21			33.5'	Gray, dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, trace silt, trace clay, with cobbles, with boulders, moist	11	52	26	15	5	2	NP	NP		13	A-1-a

LOG OF BORING

Date Started 3/8/06
Date Completed 3/8/06

Sampler: Type SS Dia. 1.375"
Casing: Length 29ft Dia. 3.25"

Water Elev. 694.8ft
Surface Elev. 703.3ft

Boring No. RW-18 Station & Offset 224+41.57, 24.47' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
703.3	0					Topsoil (12 inches)											
703.3		2/2/3			1.0'	Brown, medium stiff, SILTY CLAY, trace sand, with root hairs, moist	1								27	VIS.	
702.3	2																
700.3		2/2/2			5.5'	Brown, soft, SILTY CLAY, trace sand, moist	2	0	0	5	62	33	38	16	27	A-6b	
	4																
697.8		3/5/6			8.0'	Brown, stiff, SANDY SILT, little gravel, little clay, damp, till	3								10	VIS.	
	6																
695.3	8	14/17/18			13.0'	Brown, hard, SANDY SILT, some gravel, little clay, with rock fragments, with cobbles, with boulders, moist, till	4								14	VIS.	
694.8																	
	10																
692.3		14/16/16					5										NO REC.
	12																
690.3		11/13/18					Gray, hard, SANDY SILT, little gravel, some clay, with cobbles, with boulders, damp, till	6	19	10	16	33	22	19	6	9	A-4a
689.8	14																
687.3		50-6"						7									NO REC.
	16																
684.8		12/14/17						8								11	VIS.
	18																
	20																
	22																
679.8		12/16/17						9								11	VIS.
	24																
	26																
	28																
674.8		50-6"			29.0'		10									NO REC.	
674.3																	

BOTTOM OF BORING

LOG OF BORING

Date Started 3/9/06
Date Completed 3/9/06

Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	<u>44.5ft</u>	Dia.	<u>3.25"</u>

Water Elev.	<u>697.5ft</u>
Surface Elev.	<u>709.0ft</u>

Boring No. RW-19

Station & Offset 226+04.51, 23.66' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
709.0	0																
709.0		4/5/6			0.7'	Topsoil (8 inches)											
708.5			2			Brown and tan, stiff, SANDY SILT, some gravel, little clay, with cobbles, damp, till	1								10	VIS.	
708.3																	
706.0		7/9/10			5.5'	Brown and tan, very stiff, SANDY SILT, some gravel, little clay, with cobbles, damp, till	2									12	VIS.
	4																
703.5		5/6/8			8.5'	Brown, stiff, SANDY SILT, trace gravel, little clay, with rock fragments, damp, till	3									12	VIS.
	6																
	8	9/11/13			16.0'	Gray, very stiff, SILT, trace gravel, little sand, little clay, with sand seams, moist, till	4	6	5	13	59	17	NP	NP	9	A-4b	
700.5																	
	10																
698.0		5/7/9			18.5'	Gray, very stiff, SILT, trace gravel, little sand, little clay, with sand seams, wet, till	5									19	VIS.
	12																
695.5		9/11/12			23.5'	Gray, very stiff, SILT, trace gravel, little sand, little clay, with sand seams, moist, till	6									10	VIS.
	14																
693.0		7/8/6			33.5'	Gray, stiff, SANDY SILT, little gravel, little clay, with sand seams, wet, till	7	17	6	18	40	19	19	4	22	A-4a	
	16																
	18	5/5/6			33.5'	Gray, stiff, SANDY SILT, little gravel, little clay, with sand seams, damp, till	8									9	VIS.
690.5																	
	20																
	22	30/16/18			33.5'	Gray, hard, SANDY SILT, little gravel, little clay, with sand seams, with cobbles, with boulders, moist, till	9									13	VIS.
685.5																	
	24																
	26	12/15/16			33.5'	Gray, hard, SANDY SILT, little gravel, little clay, with sand seams, with cobbles, with boulders, damp, till	10									9	VIS.
680.5																	
	28																
	30	12/16/21			33.5'	Gray, dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, trace silt, trace clay, with cobbles, with boulders, moist	11	52	26	15	5	2	NP	NP	13	A-1-a	
	32																
675.5																	

LOG OF BORING (Continued)

Boring No. RW-19

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
674.0																
670.5	36	50-5"			38.5'											
	38															
	40					Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, trace clay, with cobbles, with boulders, wet	12							9	VIS.	
	42															
	44															
665.5		32/50-5"			44.5'		13									NO REC.
664.5																

BOTTOM OF BORING

Date Started 3/10/06
Date Completed 3/10/06

Sampler: Type SS Dia. 1.375"
Casing: Length 54ft Dia. 3.25"

Water Elev. 699.2ft
Surface Elev. 715.2ft

Boring No. RW-19

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
674.0																	
670.5	36	50-5"			38.5'												
	38																
	40																
	42																
665.5																	
	44	32/50-5"															
664.5					44.5'		13									NO REC.	

BOTTOM OF BORING

Boring No. RW-20

Station & Offset 227+58.02, 25.81' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
715.2	0															
715.2		3/5/5			0.7'	Topsoil (8 inches)										
714.7						Brown, stiff, SILTY CLAY, damp	1								26	VIS.
714.5																
	2															
712.2		3/3/3			3.0'											
	4					Brown and dark brown, medium stiff, CLAY, trace gravel, little sand, some silt, moist	2	10	2	10	34	44	43	20	32	A-7-6
709.7																
	6	3/4/6			5.5'										8	VIS.
	8					Brown, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT AND CLAY, damp, till	3									
706.7																
		13/17/16			8.5'										10	VIS.
	10					Brown and gray, hard, SILT AND CLAY, little gravel, little sand, with cobbles, damp, till	4									
704.2																
		12/15/15			11.0'										9	A-4a
	12					Gray, very stiff, SANDY SILT, little gravel, and clay, with cobbles, damp, till	5	18	10	13	22	37	22	8		
701.7																
	14	14/16/16													10	VIS.
						Gray, hard, SANDY SILT, little gravel, and clay, with cobbles, damp, till	6									
699.2																
	16	4/5/6			16.0'										20	A-4b
						Gray, stiff, SILT, trace gravel, little sand, some clay, wet	7	1	0	12	60	27	NP	NP		
	18															
696.7																
		13/13/16			18.5'											NO REC.
	20					Gray, very stiff, SANDY SILT, little gravel, little clay, with cobbles, damp, till	8									
	22															
691.7																
	24	9/10/12													13	VIS.
	26															
	28															
686.7																
		10/12/14													11	VIS.
	30							10								
	32															
681.7																
	34	9/11/12													12	VIS.
								11								

LOG OF BORING

Date Started 3/10/06

Sampler: Type SS Dia. 1.375"

Date Completed 3/10/06

Casing: Length 54ft Dia. 3.25"

Water Elev. 699.2ft

Boring No. RW-20

Station & Offset 227+58.02, 25.81' Rt.

Surface Elev. 715.2ft

[illegible]

LOG OF BORING (Continued)

Boring No. RW-20

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class				
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.			
680.2																			
677.7	36	24/30/32			37.5'														
38																			
676.7																	8	VIS.	
675.2	40	15/24/29			40.0'														
42																			
671.7	44																	12	VIS.
666.7	46	50-5"			48.5'														
	48																		
	50	50-2"			54.0'														
52																			
661.7																			
661.2	54						15										VIS.		
BOTTOM OF BORING																			

LOG OF BORING

LOG OF BORING (Continued)

Boring No. RW-20

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
680.2																	
	36																
677.7					37.5'												
676.7	38	24/30/32				Brown, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, wet	12									8	VIS.
675.2	40				40.0'												
	42					Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, wet											
671.7		15/24/29					13									12	VIS.
	44																
	46																
	48																
666.7		50-5"			48.5'												
	50					SHALE, gray with brown staining, slightly weathered, soft, augered	14										VIS.
	52																
661.7																	
661.2	54	50-2"			54.0'		15										VIS.
BOTTOM OF BORING																	

Boring No. RW-21

Station & Offset229+08.07, 22.46' Rt.

Water Elev.710.7ft

Surface Elev.721.7ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
721.7	0																
721.7		4/7/8			0.5'	Topsoil (6 inches)											
721.2						Brown and dark brown, stiff, SANDY SILT, with rock fragments, with cobbles, with root hairs, damp, till	1									16	VIS.
	2																
718.7		7/7/8			3.0'												
	4					Brown with dark brown staining, stiff, SANDY SILT, little gravel, some clay, damp, till	2									12	VIS.
	6	7/8/9					3	17	9	13	32	29	24	7	10		A-4a
716.2						Brown with dark brown staining, very stiff, SANDY SILT, little gravel, some clay, damp, till											
	8																
713.2		7/9/10			8.5'		4									13	VIS.
	10																
710.7		6/7/9			11.0'		5	1	2	45	40	12	NP	NP	21		A-4a
	12					Brown, very stiff, SANDY SILT, trace gravel, little clay, damp, till											
708.2		5/6/7			13.5'		6									11	VIS.
	14					Gray, stiff, SANDY SILT, little gravel, some clay, with sand seams, damp, till											
	16	5/6/8					7									13	VIS.
705.7																	
	18																
703.2		7/7/9					8									11	VIS.
	20					Gray, very stiff, SANDY SILT, little gravel, some clay, with sand seams, damp, till											
	22																
698.2		13/15/16			23.5'		9									13	VIS.
	24					Gray, hard, SANDY SILT, little gravel, some clay, with sand seams, with silt seams, damp, till											
	26																
	28																
693.2		10/12/12					10									11	VIS.
	30					Gray, very stiff, SANDY SILT, little gravel, some clay, with sand seams, with silt seams, with cobbles, damp, till											
	32																
688.2		11/12/19					11									10	VIS.
	34					Gray, hard, SANDY SILT, little gravel, some clay, with sand seams, with cobbles, damp, till											

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE05-04-06

REVIEWEDMP

DRAWNBRU

DESIGNEDCHECKED

STRUCTURE FOUNDATION INVESTIGATION

WAR-75-3.40

26/27

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LOG OF BORING

Date Started 3/10/06

Sampler: Type SS Dia. 1.375"

Date Completed 3/10/06

Casing: Length 55ft Dia. 3.25"

Water Elev. 710.7ft

Boring No. RW-21

Station & Offset 229+08.07, 22.46' Rt.

Surface Elev. 721.7ft

[illegible]

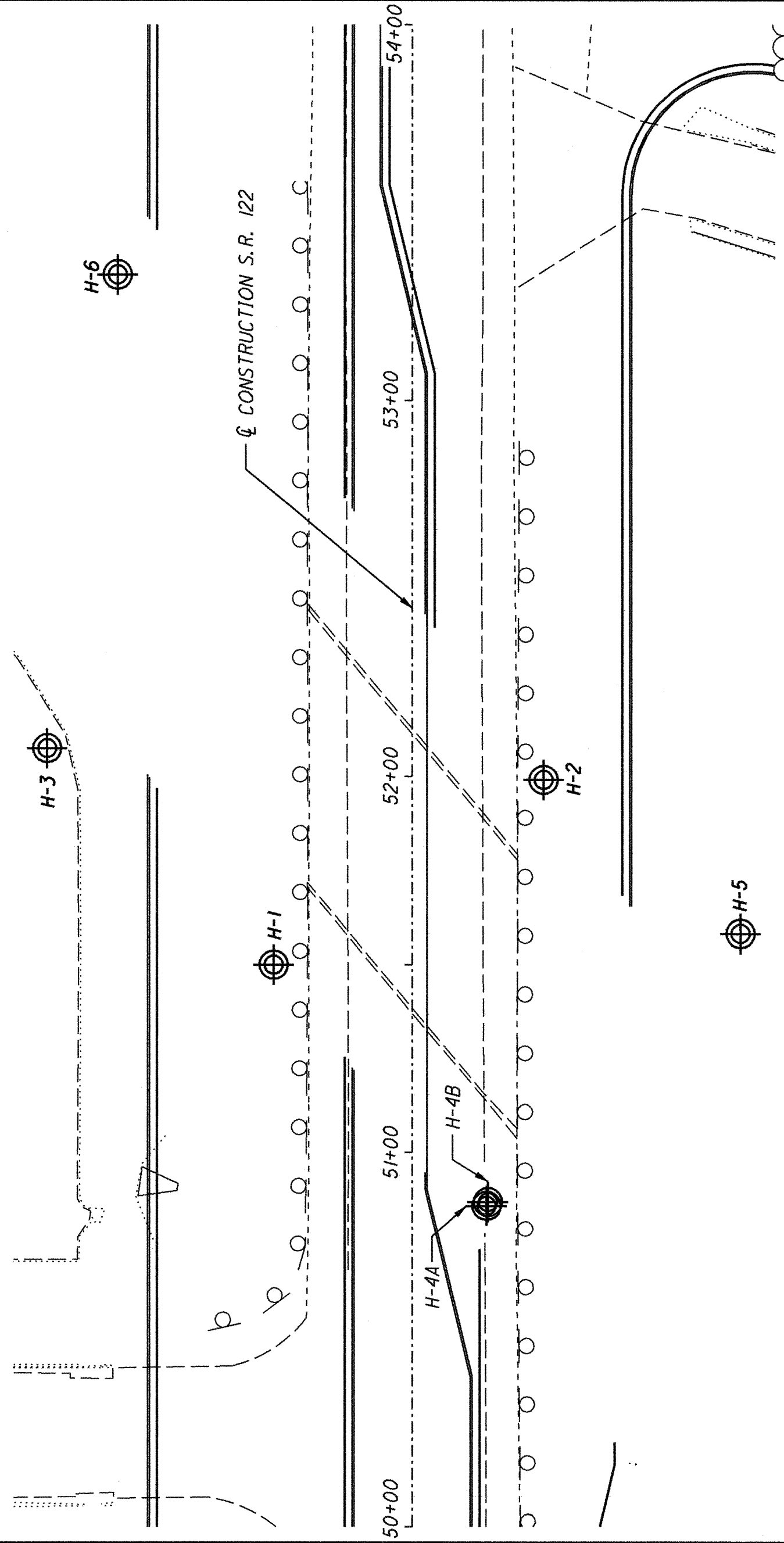
LOG OF BORING (Continued)

Boring No. RW-21

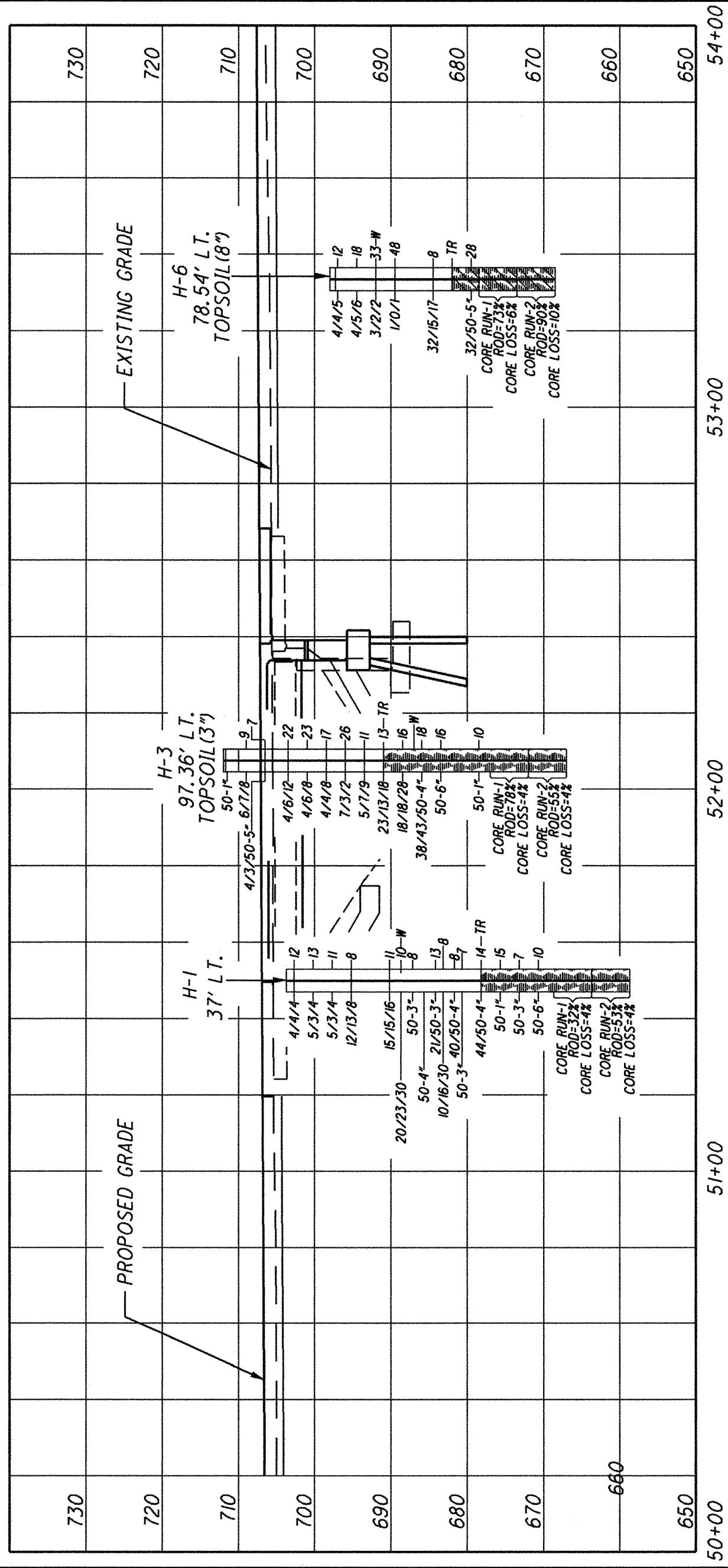
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.		
686.7																		
683.2	36	17/19/21					12									5	VIS.	
	38																	
	40																	
679.7	42	15/17/21			42.0'	Brown, dense, COARSE AND FINE SAND, little silt, trace clay, moist	13										11	VIS.
678.2	44																	
	46																	
673.7	48	14/16/16			48.0'	Dark gray and black with brown staining, hard, SANDY SILT, trace gravel, and clay, with fibrous organics, moist	14	0	1	2	32	65	23	7	22		A-4a	
673.2																		
	50																	
	52																	
668.2		14/17/21					15										VIS.	
	54																	
666.7					55.0'													
BOTTOM OF BORING																		

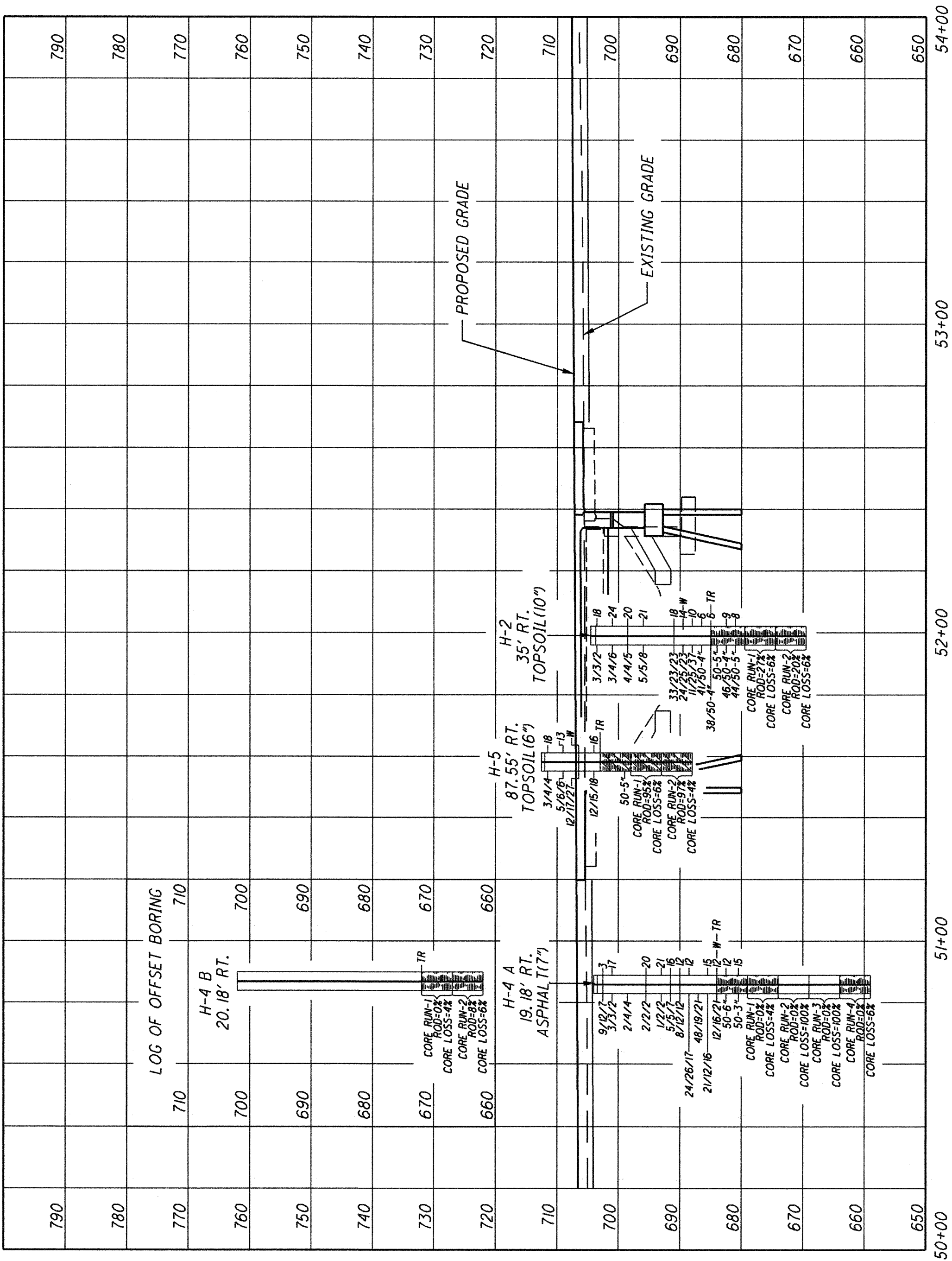
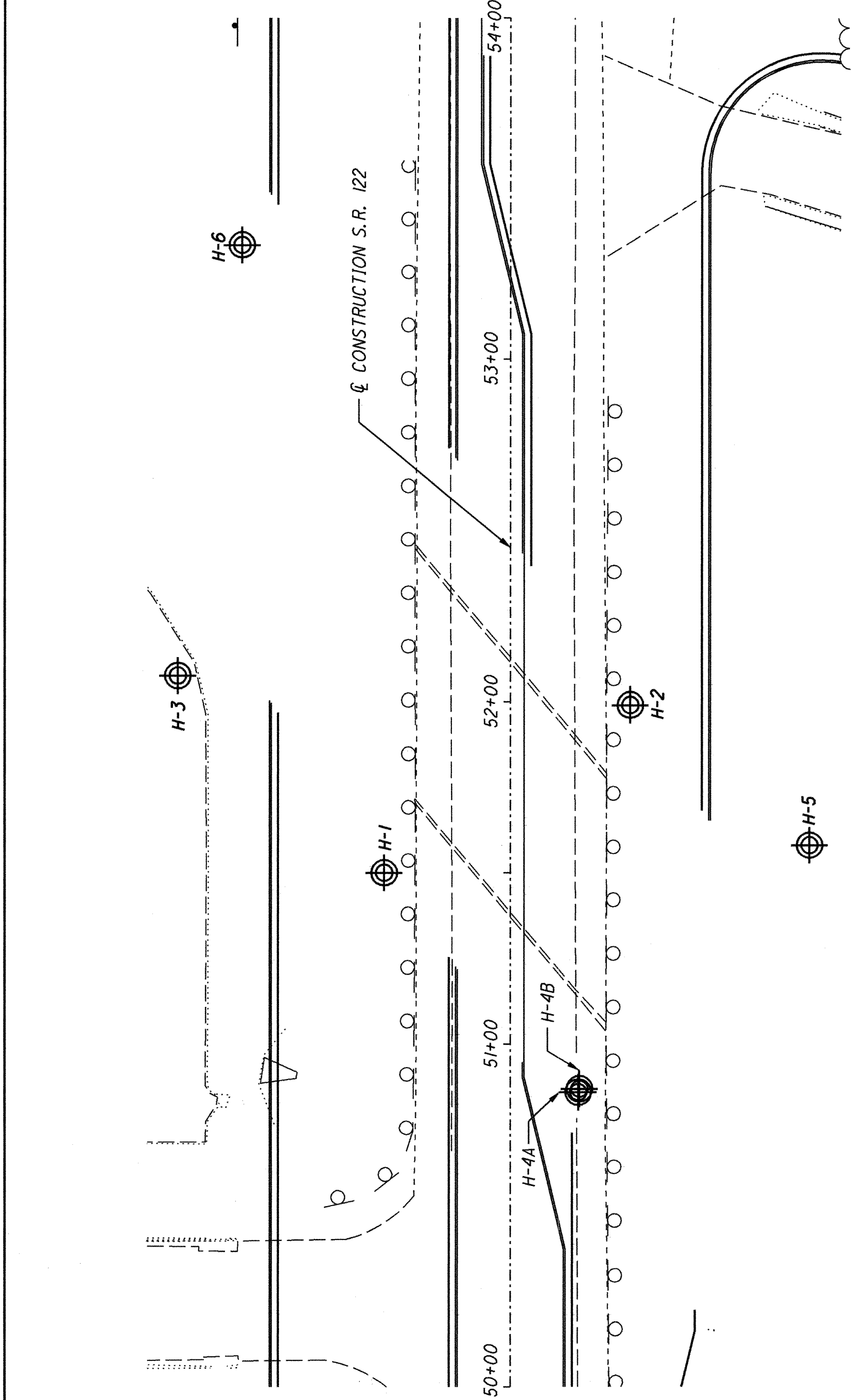
Boring No. RW-21

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
686.7																	
	36	17/19/21					12									5	VIS.
683.2	38																
	40																
		15/17/21			42.0'	Brown, dense, COARSE AND FINE SAND, little silt, trace clay, moist	13									11	VIS.
679.7	42																
678.2	44																
	46	14/16/16			48.0'	Dark gray and black with brown staining, hard, SANDY SILT, trace gravel, and clay, with fibrous organics, moist	14	0	1	2	32	65	23	7	22	A-4a	
673.7	48																
673.2																	
	50	14/17/21			55.0'		15									VIS.	
	52																
668.2	54																
666.7																	
BOTTOM OF BORING																	



NOTE: FOR PROFILE VIEW OF BORINGS H-2, H-4A, H-4B & H-5, REFER SHEET 3 OF 9.





Sampler: Type SS Dia. 1.375"
Casing: Length 45ft Dia. 3.25"

Boring No.		H-1		Station & Offset		51+50, 37' Lt.		Water Elev.		688.7ft		Surface Elev.		703.7ft		
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
703.7	0					Sand, gravel, with cobbles, fill										
702.7	2	4/4/4			1.0'	Brown, medium stiff, SANDY SILT, some clay, trace gravel, damp	1	5	5	9	47	34	26	10	12	A-4a
700.2	4	5/3/4					2								13	VIS.
697.7	6	5/3/4					3								11	VIS.
695.2	8				8.5'											
	10	12/13/8				Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, little clay, damp	4								8	VIS.
	12															
690.2	14	15/15/16			13.5'		5	51	16	11	14	8	NP	NP	11	A-1-b
688.7	16	20/23/30				Brown and gray, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, little clay, damp	6								10	VIS.
687.2	18	50-3"				Brown and gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, little clay, damp	7								8	VIS.
685.7	20	50-4"					8									VIS.
684.2	22	21/50-3"					9								13	VIS.
683.2	24	10/16/30					10								8	VIS.
681.7	26	40/50-4"				Brown and gray, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, little clay, damp	11								8	VIS.
680.7	28	50-3"				Brown and gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, little clay, damp	12								7	VIS.
678.2	30				25.5'											
	32	44/50-4"				SHALE, gray, augered	13								14	VIS.
675.7	34	50-1"					14								15	VIS.
673.2	36	50-3"					15								7	VIS.
670.7	38	50-6"					16								10	VIS.
668.7	40															

Boring No.		H-1															
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
668.7		32%	4.8	0.2		SHALE (83%), medium gray, moderately soft, with interbedded LIMESTONE (17%), light to medium gray, moderately hard	RC-1										VIS.
	36																
	38																
	40																
663.7		53%	4.8	0.2	40.0'	SHALE (74%), dark gray, moderately hard, with interbedded LIMESTONE (26%), light to dark gray, moderately hard	RC-2										VIS.
	42																
	44																
	46																
658.7					45.0'												
BOTTOM OF BORING																	

D ₅₀ VALUES			
BOREHOLE	DEPTH	SAMPLE	D50
H-1	1	1	0.016
H-1	13.5	5	2.168
H-2	3.5	2	0.014
H-2	6	3	0.009
H-3	3	2	3.441
H-3	8.5	4	0.019
H-3	13.5	6	0.272
H-4A	3	2	0.011
H-4A	11	5	0.05
H-4A	18.5	10	0.011
H-5	1	1	0.125
H-6	3.5	2	0.07
H-6	13.5	5	1.566

LOG OF BORING

Date Started6/14/05

Date Completed6/14/05

Sampler: TypeSS

Casing: Length35ft

Dia.1.375"

Dia.3.25"

Boring No.H-2

Station & Offset51+99, 35' Rt.

Water Elev.689.5ft

Surface Elev.704.5ft

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
704.5	0					Topsoil (10")											VIS.
703.7		3/3/2			0.8'	Brown, medium stiff, SILTY CLAY, some sand, trace gravel, damp	1								18		VIS. VIS.
703.5	2																
701.0	4	3/4/6				Brown, stiff, SILTY CLAY, some sand, trace gravel, moist	2	5	6	15	37	37	38	18	24		A-6b
698.5	6				6.0'												
	8	4/4/5				Brown, stiff, SILT AND CLAY, little sand, trace gravel, damp	3	8	6	11	32	43	36	15	20		A-6a
696.0							4								21		VIS.
	10	5/5/8															
	12																
691.0	14	33/23/23			13.5'	Brown, hard, SANDY SILT, some clay, with cobbles, damp	5								18		VIS.
689.5							6								14		VIS.
688.0	16	24/25/23					7								10		VIS.
686.5	18	11/25/37					8								6		VIS.
685.0		41/50-4"															
684.0	20	38/50-4"			19.5'	SHALE, gray, augered	9								6		VIS.
682.5	22	50-5"					10										VIS.
681.0	24	46/50-4"					11								9		VIS.
679.5	26	44/50-5"					12								8		VIS.
	28	27%	4.7	0.3	25.0'	SHALE (80%), medium gray, moderately soft, with interbedded LIMESTONE (20%), light to dark gray, moderately hard	RC-1										VIS.
674.5	30	20%	4.7	0.3	30.0'	SHALE (72%), medium gray, moderately hard, with interbedded LIMESTONE (28%), light to dark gray, moderately hard	RC-2										VIS.
	32																
	34																
669.5					35.0'												

LOG OF BORING (Continued)

Boring No.H-2

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
669.5						BOTTOM OF BORING											

WAR-75-3.40

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-122-0094 OVER DICKS CREEK

5'9"

CTL ENGINEERING, INC.
145 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-28-06

REVIEWED
NT

DRAWN
C.N.

DESIGNED
CHECKED

...WAR-122-0094_P_&P_SHEETS_WITH 3/28/2008 12:31:48 PM

Date Started 12/27/05
Date Completed 12/28/05

Sampler: Type SS Dia. 2.25 O.D.
Casing: Length 21ft Dia. 3.25"

Boring No. H-3 Station & Offset 52+07.51, 97.36 Lt.*

Water Elev. 687.0ft
Surface Elev. 712.0ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
712.0	0					Topsoil (3")										
711.5	1.5	50-1"			0.3'	Concrete slab (12"), fill	1									NO REC.
709.0	2				2.0'											
706.5	4	6/7/8				Brown, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, trace clay, damp, fill	2	56	13	12	11	8	18	18	9	A-1-b
703.5	6	4/3/50-5"			5.5'	Brown, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, trace clay, with cobbles, damp, fill	3								7	VIS.
701.0	8				8.5'											
698.5	10	4/6/12				Brown, very stiff, SILT AND CLAY, some sand, trace gravel, moist, fill	4	4	5	15	45	31	33	14	22	A-6a
696.0	12	4/6/8					5								23	VIS.
693.5	14	4/4/8			13.5'	Brown, stiff, SANDY SILT, some clay, some gravel, moist, fill	6	30	16	16	20	18	27	10	17	A-4a
691.0	16	7/3/2			16.0'	Brown, soft, SANDY SILT, some clay, some gravel, moist	7								26	VIS.
688.5	18	5/7/9			18.5'	Brown, very stiff, SANDY SILT, some clay, some gravel, moist	8								11	VIS.
686.0	20	23/13/18			21.0'	SHALE, gray, augered	9								13	VIS.
683.5	22															
681.0	24	18/18/28					10								16	VIS.
678.5	26	38/43/50-4"					11								18	VIS.
676.0	28															
673.5	30	50-6"					12								16	VIS.
671.0	32															
668.5	34	50-1"					13								10	VIS.
667.0																

Boring No. H-3

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
677.0		78%	4.8	0.2		SHALE (73%), medium to dark gray, soft, with interbedded LIMESTONE (27%), gray, moderately hard	RC-1									VIS.
672.0	36															
670.0	38															
668.0	40	55%	4.8	0.2	40.0'	SHALE (56%), dark gray, moderately soft, with interbedded LIMESTONE (44%), gray, moderately hard	RC-2									VIS.
666.0	42															
664.0	44															
662.0					45.0'											
BOTTOM OF BORING																
*Estimated value. Final station, offset, and surface elevation to be determined.																

LOG OF BORING

Date Started12/22/05

Date Completed12/22/05

Sampler: TypeSS

Casing: Length14ft

Dia.2.250.D.

Dia.3.25"

Boring No.H-4 A

Station & Offset50+85.81, 19.18 Rt.*

Water Elev.684.0ft

Surface Elev.704.0ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
704.0	0					Asphalt (7")											
703.4						Road base (12")											
702.5	2	9/12/7			0.6'												
					1.5'	Brown and black, very stiff, SILTY CLAY, trace sand, trace gravel, damp, fill	1										VIS.
701.0	4	3/3/2				Brown and black, medium stiff, SILTY CLAY, trace sand, trace gravel, damp, fill	2	9	2	4	45	40	39	18	17		A-6b
698.5	6	2/4/4				Brownish black, stiff, SILTY CLAY, trace sand, trace gravel, fill	3										NO REC.
695.5	8	2/2/2			8.5'												
	10					Gray, soft, SANDY SILT, some clay, trace gravel, moist	4								20		VIS.
693.0	12	1/2/2				Gray, soft, SANDY SILT, some clay, trace gravel, moist	5	7	8	28	34	23	23	8	21		A-4a
691.5		5/5/7			12.5'												
690.0	14	8/12/12			14.0'	Gray, stiff, SANDY SILT, little clay, trace gravel, moist	6								16		VIS.
688.5	16	24/26/17				Brown and gray, very stiff, SILT AND CLAY, little sand, trace gravel, with limestone seams, damp	7								12		VIS.
687.0						Brown and gray, hard, SILT AND CLAY, little sand, trace gravel, with limestone seams, damp	8								12		VIS.
685.5	18	48/19/21					9										VIS.
684.0	20	21/12/16				Brown and gray, very stiff, SILT AND CLAY, little sand, trace gravel, with limestone seams, damp	10	9	8	10	38	35	30	13	15		A-6a
682.5	22	12/16/21			20.0'	SHALE, gray, augered	11								12		VIS.
680.5	24	50-6"					12								12		VIS.
679.0	26	50-3"					13								15		VIS.
	28	0%	4.8	0.2	25.0'												
						SHALE (77%), dark gray, soft, with interbedded LIMESTONE (23%), medium gray, moderately hard	RC-1										VIS.
674.0	30	0%	0.0	5.0	30.0'												
	32					No Recovery	RC-2										NO REC.
669.0	34				35.0'												

Boring No.H-4 A

Station & Offset50+85.81, 19.18 Rt.*

Water Elev.684.0ft

Surface Elev.704.0ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
669.0		0%	0.0	5.0		No Recovery	RC-3										NO REC.
664.0	40	0%	4.7	0.3	40.0'	SHALE (60%), gray, moderately soft, with interbedded LIMESTONE (40%), gray, moderately hard	RC-4										VIS.
659.0					45.0'												

Boring No.H-4 A

Station & Offset50+85.81, 19.18 Rt.*

Water Elev.684.0ft

Surface Elev.704.0ft

BOTTOM OF BORING

*Estimated value. Final station, offset, and surface elevation to be determined.

CTI ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

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STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-122-0094 OVER DICKS CREEK

WAR-75-3.40

7/9

Date Started 12/27/05
Date Completed 12/27/05

Sampler: Type SS Dia. 2.25 O.D.
Casing: Length 30ft Dia. 3.25"

Boring No. H-4 B Station & Offset 50+86.8l, 20.18 Rt.*

Water Elev.
Surface Elev. 704.0ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
704.0	0															
	2															
	4															
	6															
	8															
	10															
	12															
	14															
	16															
	18															
	20															
	22															
	24															
	26															
	28															
674.0	30	0	4.8	0.2	30.0'	SHALE (66%), light gray, soft, with interbedded LIMESTONE (34%), light gray, moderately hard	RC-1									VIS.
	32															
	34															
669.0					35.0'											

Boring No. H-4 B

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
669.0		8%	4.7	0.3		SHALE (69%), dark gray, moderately soft, with interbedded LIMESTONE (31%), dark gray, moderately hard, fractured	RC-2									VIS.
	36															
	38															
664.0	40				40.0'											
BOTTOM OF BORING																
*Estimated value. Final station, offset, and surface elevation to be determined.																

LOG OF BORING																
Date Started		12/22/05		Sampler: Type		SS		Dia.		2.25 O.D.						
Date Completed		12/22/05		Casing: Length		9.9ft		Dia.		3.25"						
Boring No.		H-5		Station & Offset		51+58.18, 87.55 Rt.*		Water Elev.		706.5ft						
								Surface Elev.		712.5ft						
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
712.5	0					0.5' Topsoil (6")										VIS.
711.5	1	3/4/4				Brown, medium stiff, SILT AND CLAY, some sand, little gravel, moist	1	22	12	23	29	14	32	15	18	A-6a
709.0	2															
709.0	4	5/6/6				Brown, stiff, SILT AND CLAY, some sand, little gravel, damp	2								13	VIS.
706.5	6															
706.5	6	12/17/27				6.0' Brown, hard, SILT AND CLAY, some sand, little gravel	3									NO REC.
704.0	8															
704.0	8	12/15/18				9.5' Brown, hard, SILT AND CLAY, some sand, little gravel, damp	4								16	VIS.
699.0	10															
699.0	12															
699.0	14	50-5"				14.5' SHALE, gray and brown, limestone seams, augered	5									VIS.
698.0	14	95%	4.7	0.3		SHALE (80%), gray, with brown staining, soft, with interbedded LIMESTONE (20%), gray, moderately hard	RC-1									VIS.
698.0	16															
698.0	18															
693.0	20	97%	4.8	0.2		19.5' SHALE (74%), gray, with brown staining, soft, with interbedded LIMESTONE (26%), gray, moderately hard	RC-2									VIS.
693.0	22															
693.0	24															
688.0	24					24.5' BOTTOM OF BORING										
*Estimated value. Final station, offset, and surface elevation to be determined.																

LOG OF BORING																
Date Started		12/20/05		Sampler: Type		SS		Dia.		2.25 O.D.						
Date Completed		12/21/05		Casing: Length		16ft		Dia.		3.25"						
Boring No.		H-6		Station & Offset		53+33.45, 78.54 Lt.*		Water Elev.		692.0ft						
								Surface Elev.		698.0ft						
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
698.0	0					0.7' Topsoil (8")										VIS.
698.0	1	4/4/5				Brown, stiff, SILT, some sand, little gravel, trace clay, damp	1								12	VIS.
697.0	2															
694.5	4	4/5/6				Brown, stiff, SILT, some sand, little gravel, trace clay, moist	2	20	11	17	44	8	20	6	18	A-4b
692.0	6															
692.0	6	3/2/2				6.0' Gray, soft, SILT AND CLAY, little sand, little gravel, wet	3								33	VIS.
689.5	8															
689.5	8	1/0/1				8.5' Gray, very soft, SILT AND CLAY, little sand, little gravel, wet	4								48	VIS.
689.5	10															
689.5	12															
684.5	14	32/15/17				13.5' Brown, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, trace clay, with cobbles, damp	5	36	15	18	28	3			8	A-I-b
684.5	16															
684.5	18															
679.5	20	32/50-5"														
678.5	20	73%	4.7	0.3		16.0' SHALE, brown and gray, weathered, augered	6								28	VIS.
678.5	22															
678.5	22															
673.5	24															
673.5	24	90%	4.5	0.5		19.5' SHALE (75%), dark gray, moderately soft, with interbedded LIMESTONE (25%), gray, moderately hard	RC-1									VIS.
673.5	26															
673.5	28															
668.5	29.5'					24.5' SHALE (62%), gray to olive, moderately soft, with interbedded LIMESTONE (38%), gray, moderately hard	RC-2									VIS.
BOTTOM OF BORING																
*Estimated value. Final station, offset, and surface elevation to be determined.																

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STRUCTURE

BRIDGE NO. WAR-122-0094 OVER DICKS CREEK

WAR-75-3.40

9/9

LOG OF BORING

Date Started12/22/05

Date Completed12/22/05

Sampler: TypeSS

Casing: Length9.9ft

Dia.2.25 O.D.

Dia.3.25"

Boring No.H-5

Station & Offset51+58.18, 87.55 Rt.*

Water Elev.706.5ft

Surface Elev.712.5ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
712.5	0															VIS.
712.5 711.5		3/4/4			0.5'	Topsoil (6")										VIS.
	2				Brown, medium stiff, SILT AND CLAY, some sand, little gravel, moist	1	22	12	23	29	14	32	15	18	A-6a	
709.0	4	5/6/6				Brown, stiff, SILT AND CLAY, some sand, little gravel, damp	2								13	VIS.
706.5	6	12/17/27			6.0'	Brown, hard, SILT AND CLAY, some sand, little gravel	3									NO REC.
	8															
704.0		12/15/18			9.5'	Brown, hard, SILT AND CLAY, some sand, little gravel, damp	4								16	VIS.
	10															
	12															
699.0	14	50-5"	4.7	0.3	14.5'	SHALE, gray and brown, limestone seams, augered	5									VIS.
698.0		95%						SHALE (80%), gray, with brown staining, soft, with interbedded LIMESTONE (20%), gray, moderately hard	RC-1							
	16															
	18															
693.0	20	97%	4.8	0.2	19.5'	SHALE (74%), gray, with brown staining, soft, with interbedded LIMESTONE (26%), gray, moderately hard	RC-2									VIS.
	22															
	24															
688.0					24.5'											

BOTTOM OF BORING

*Estimated value. Final station, offset, and surface elevation to be determined.

LOG OF BORING

Date Started12/20/05
Date Completed12/21/05

Sampler: TypeSSDia.2.25 O.D.
Casing: Length16ftDia.3.25"

Boring No.H-6

Station & Offset53+33.45, 78.54 Lt.*

Water Elev.692.0ft
Surface Elev.698.0ft

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
698.0	0																VIS.
698.0		4/4/5			0.7'	Topsoil (8")											VIS.
697.0	2					Brown, stiff, SILT, some sand, little gravel, trace clay, damp	1									12	VIS.
		4/5/6															A-4b
694.5	4																
		3/2/2			6.0'												VIS.
692.0	6																
		1/0/1			8.5'												VIS.
689.5	8																
	10																
	12																
		32/15/17			13.5'												A-1-b
684.5	14																
	16				16.0'												
	18																
679.5		32/50-5"	4.7	0.3	19.5'	SHALE, brown and gray, weathered, augered	6									28	VIS.
678.5	20	73%				SHALE (75%), dark gray, moderately soft, with interbedded LIMESTONE (25%), gray, moderately hard	RC-1										VIS.
	22																
	24																
673.5		90%	4.5	0.5	24.5'	SHALE (62%), gray to olive, moderately soft, with interbedded LIMESTONE (38%), gray, moderately hard	RC-2										VIS.
	26																
	28																
668.5					29.5'												

BOTTOM OF BORING

*Estimated value. Final station, offset, and surface elevation to be determined.

GEOLOGY OF THE SITE

THE SITE IS LOCATED WHERE STILLWATER RIVER FLOWS FROM WEST TO EAST BENEATH SR I21. THE SITE’S TOPOGRAPHY IN THE IMMEDIATE AREA IS RELATIVELY FLAT TO MODERATELY SLOPING ALONG THE RIVERBANK. THE SITE IS LOCATED ON A RELATIVELY FLAT ALLUVIAL TERRACE, WHICH CONSISTS OF RECENT ALLUVIUM OVER GLACIAL OUTWASH DEPOSITS AND GLACIAL TILL FORMED DURING THE WISCONSIN GLACIATION. THE DEPTH TO ROCK IN THE IMMEDIATE PROJECT AREA IS ON THE ORDER OF 50 TO 75 FEET BELOW THE GROUND SURFACE. THE ALLUVIAL AND GLACIAL DEPOSITS ARE UNDERLAIN BY SEDIMENTARY ROCK CONSISTING OF DOLOMITE IDENTIFIED AS THE LOCKPORT DOLOMITE FORMATION. NO MAPPED KARST FEATURES ARE PRESENT IN THE CARBONATE DOMINANT GEOLOGY.

EXPLORATION

FOUR (4) STRUCTURE SOIL TEST BORINGS, IDENTIFIED AS B-1 THROUGH B-4, WERE DRILLED FOR THIS INVESTIGATION. TEST BORINGS B-1 THROUGH B-4 WERE DRILLED TO DEPTHS RANGING FROM 50 TO 60 FEET. THE TEST BORINGS WERE DRILLED WITH A TRUCK-MOUNTED DRILL RIG UTILIZING HOLLOW-STEM AUGERS (HSA) BETWEEN THE DATES OF OCTOBER 12 TO OCTOBER 15, 2004.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

AT THE ABUTMENTS, TEST BORINGS B-1 AND B-4 WERE DRILLED IN THE EXISTING S.R. I21 ROADWAY PAVEMENT. AT THE GROUND SURFACE, THESE TWO TEST BORINGS ENCOUNTERED APPROXIMATELY 2 INCHES OF ASPHALT PAVEMENT FOLLOWED BY APPROXIMATELY 12 INCHES OF CONCRETE PAVEMENT. TEST BORINGS B-2 AND B-3 ENCOUNTERED APPROXIMATELY 10 INCHES OF REINFORCED CONCRETE AT THE BRIDGE DECK.

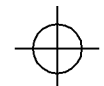
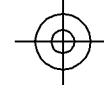

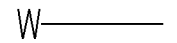
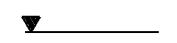
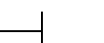




BENEATH THE PAVEMENT MATERIALS IN ABUTMENT TEST BORINGS B-1 AND B-4, FILL MATERIAL CONSISTING OF SILT AND CLAY (A-6A) WAS ENCOUNTERED TO DEPTHS RANGING FROM 5 TO 13.5 FEET. BENEATH THE FILL THE ABUTMENT TEST BORNIGS ENCOUNTERED SILT AND CLAY (A-6A), SANDY SILT (A-4A), COARSE AND FINE SAND (A-3A).

ALL FOUR TEST BORINGS ENCOUNTERED GRAVEL AND/OR STONE FRAGMENTS WITH VARYING AMOUNTS OF SAND, SILT AND CLAY (A-2-7 AND A-1-A) BEGINNING AT THE APPROXIMATE STREAMBED ELEVATION. THESE GRANULAR MATERIALS WERE INTERBEDDED WITH GLACIAL TILL CONSISTING OF SANDY SILT (A-4A) AND SILT (A-4B) LAYERS AND COBBLES AND BOULDERS DOWN TO THE BORING TERMINATION DEPTHS.







GROUNDWATER WAS ENCOUNTERED DURING DRILLING AND RANGED IN DEPTH FROM 18 FEET TO 21.5 FEET. UPON COMPLETION OF THE TEST BORINGS THE GROUNDWATER DEPTHS RANGED FROM 14 FEET TO 19 FEET.

D50 VALUES WHICH HAVE BEEN CALCUALTED FOR THE SCOUR ANALYSIS CAN BE FOUND ON PAGE NO. 4 AND 5.

LEGEND

-  AUGER BORING LOCATION
-  PRESS SAMPLE, DRIVE SAMPLE, AND/OR CORE BORING LOCATION
-  TR TOP OF ROCK
-  W INDICATES FREE WATER ELEVATION
-  INDICATES STATIC WATER ELEVATION
-  HORIZONTAL BAR ON BORING INDICATES THE DEPTH THE SAMPLE WAS TAKEN - PROFILE VIEW
-  FIGURES BESIDE THE BORING IN PROFILE INDICATE THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST
-  X = NUMBER OF BLOWS FOR FIRST 6 INCHES
-  Y = NUMBER OF BLOWS FOR SECOND 6 INCHES
-  Z = NUMBER OF BLOWS FOR THIRD 6 INCHES

SYMBOLS OF ROCK TYPES

	Fire Clay or Underclay		Weathered Siltstone
	Weathered Mudstone		Siltstone
	Mudstone		Weathered Sandstone
	Weathered Shale		Sandstone
	Shale		Leached Dolomite
	Weathered Clay-Shale		Dolomite
	Clay-Shale		Leached Limestone
	Boulders or Cobbles		Limestone

PARTICLE SIZE DEFINITIONS

	300 mm	75 mm	2.0 mm	0.42 mm	0.074 mm	0.005 mm
Boulders	Cobbles	Gravel	Coarse Sand	FINE SAND	Silt	Clay
		No. 10 SIEVE	No. 40 SIEVE	No. 200 SIEVE		

NOTES

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATIONS SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR’S OFFICE, THE OFFICE OF MATERIALS MANAGEMENT AT 1600 WEST BROAD STREET, THE OFFICE OF ROADWAY ENGINEERING OR THE OFFICE OF STRUCTURAL ENGINEERING AT 25 SOUTH FRONT STREET, COLUMBUS, OHIO 43215.

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECH-ANICALLY-POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 2 INCH O.D., 1-3/8” I.D. SPLIT SPOON SAMPLING DE-VICE, AT 2-1/2 AND/OR 5 FOOT DEPTH INTERVALS, DRIVEN BY MEANS OF A 140 lb. HAMMER WITH A FREE FALL OF 30 INCHES. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLING DEVICE THREE 18 INCH INCREMENTS IS CONSIDERED THE STANDARD PENETRATION TEST.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF MECHANICALLY POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2 INCH O.D. THIN WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE APPLIED BY THE DRILLING MACHINE.

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NQ CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

SAMPLING AND TESTING

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVA-TION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6 INCH INCRE-MENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS UTILIZING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BED-DING ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVEL-LY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

CTI ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
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C.N.

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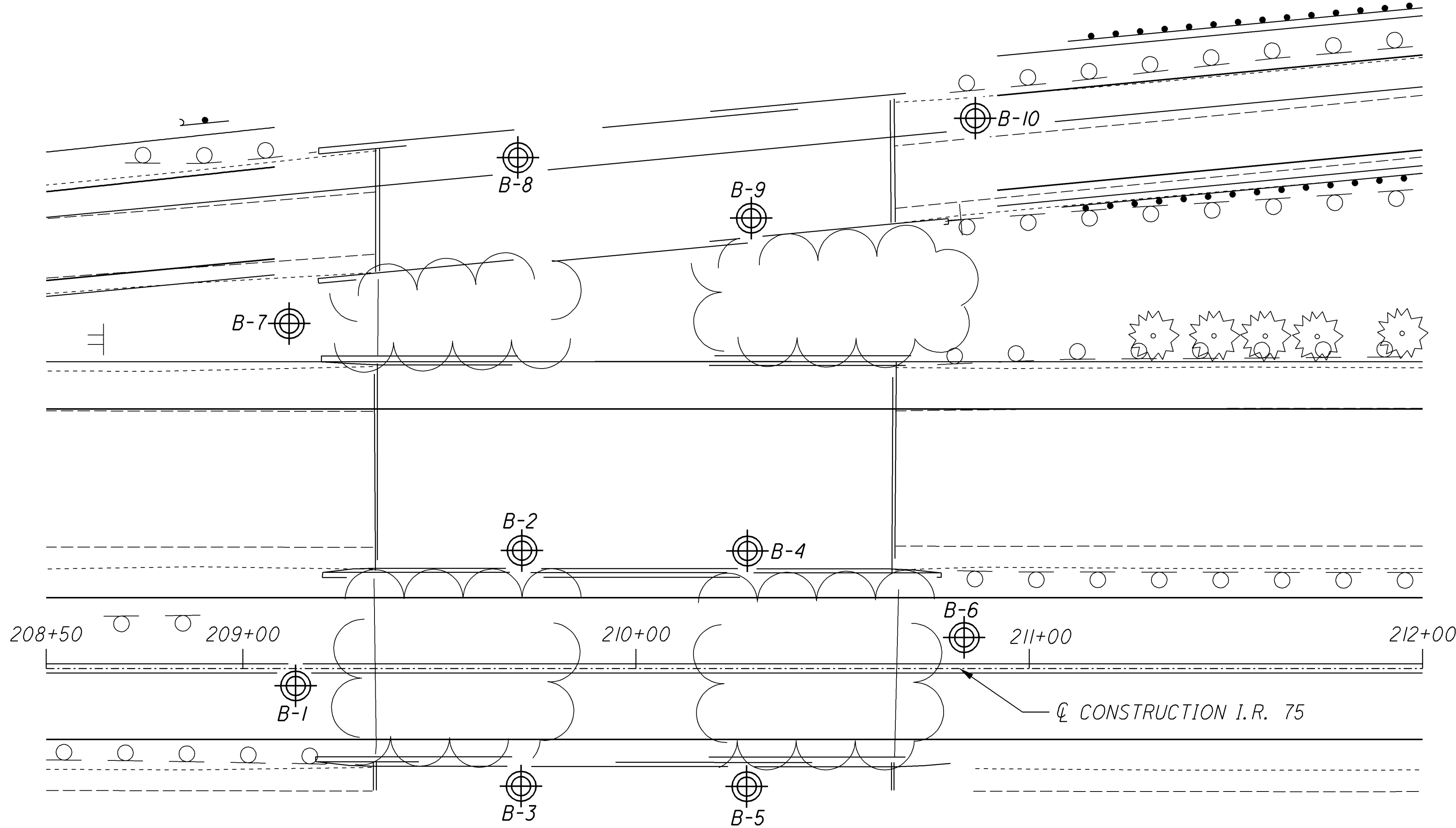
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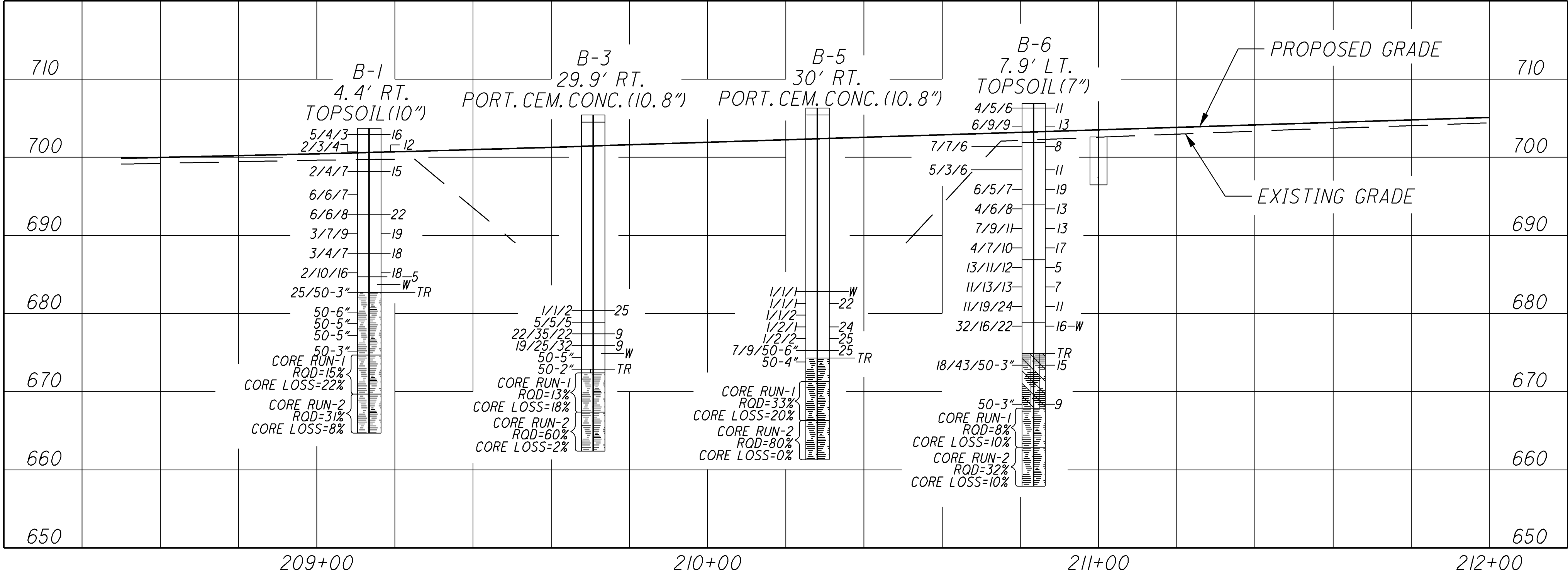
WAR-75-3.40

1 / 14





NOTE: FOR PROFILE VIEW OF BORINGS B-2, B-4 & B-7, REFER SHEET 3 OF 14.
FOR PROFILE VIEW OF BORINGS B-8, B-9 & B-10, REFER SHEET 4 OF 14.



02-27-06

DATE

NT

REVIEWED

C.N.

DRAWN

CHECKED

DESIGNED

STRUCTURE FILE NUMBER

STRUCTURE

02-27-06

DATE

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REVIEWED

C.N.

DRAWN

CHECKED

DESIGNED

STRUCTURE

FOUNDATION INVESTIGATION

BRIDGE NO. WAR-75-0396 OVER DICKS CREEK

WAR-75-3.40

2

14

0

20

40

HORIZONTAL

SCALE IN FEET

0

20

40

HORIZONTAL

SCALE IN FEET

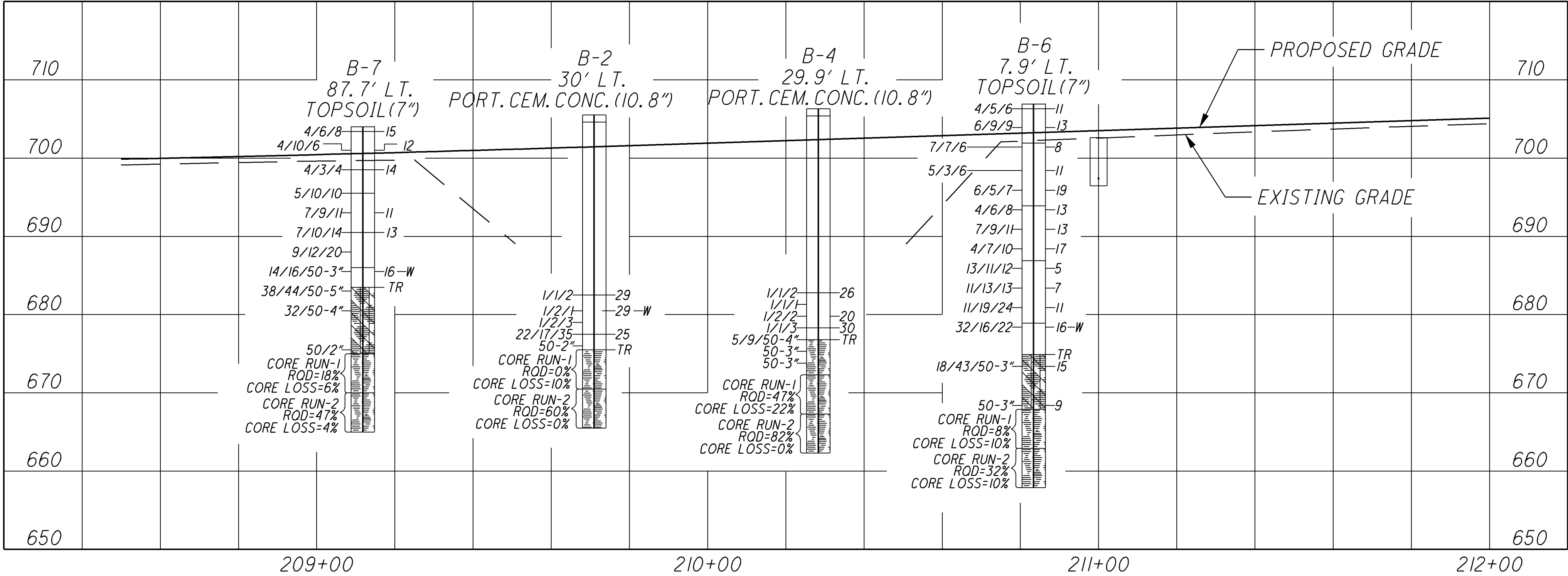
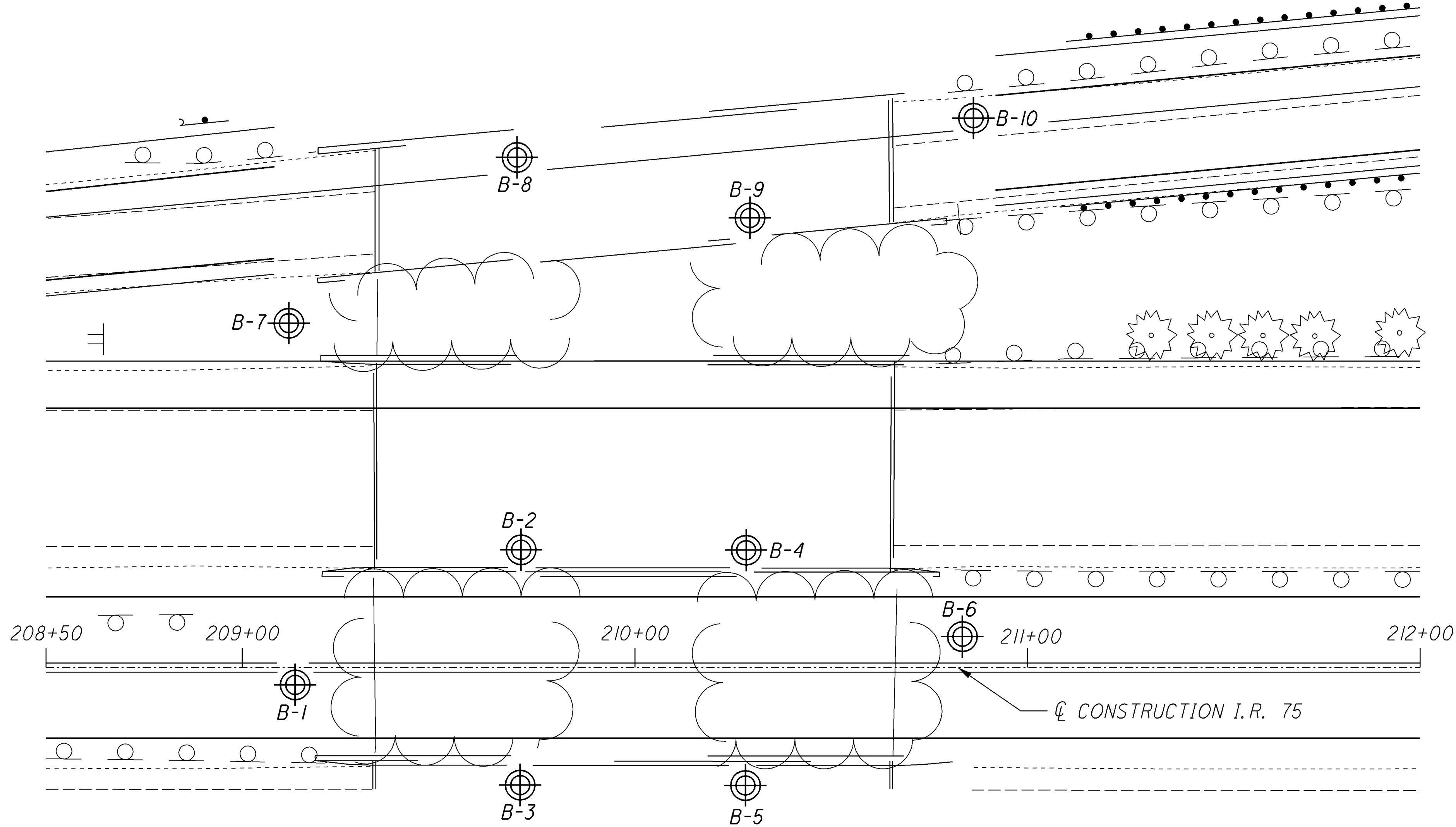
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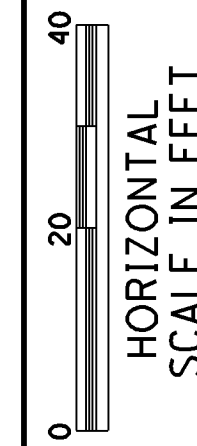
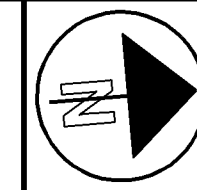
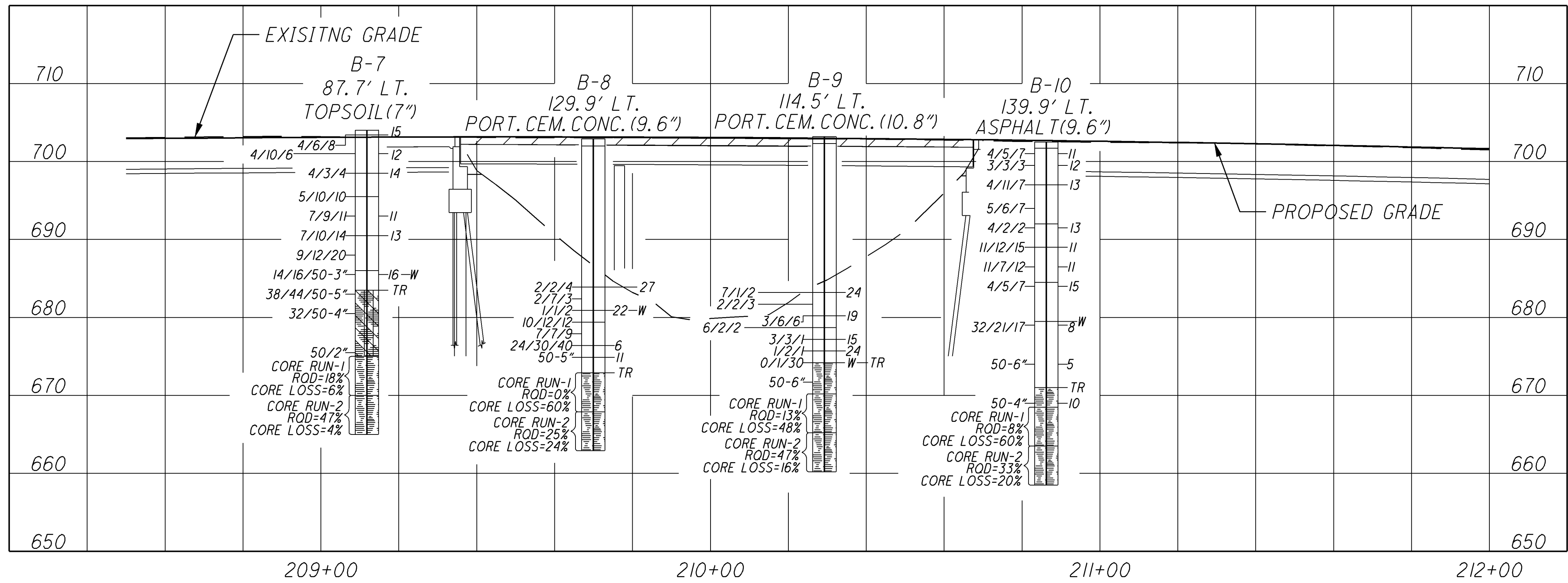
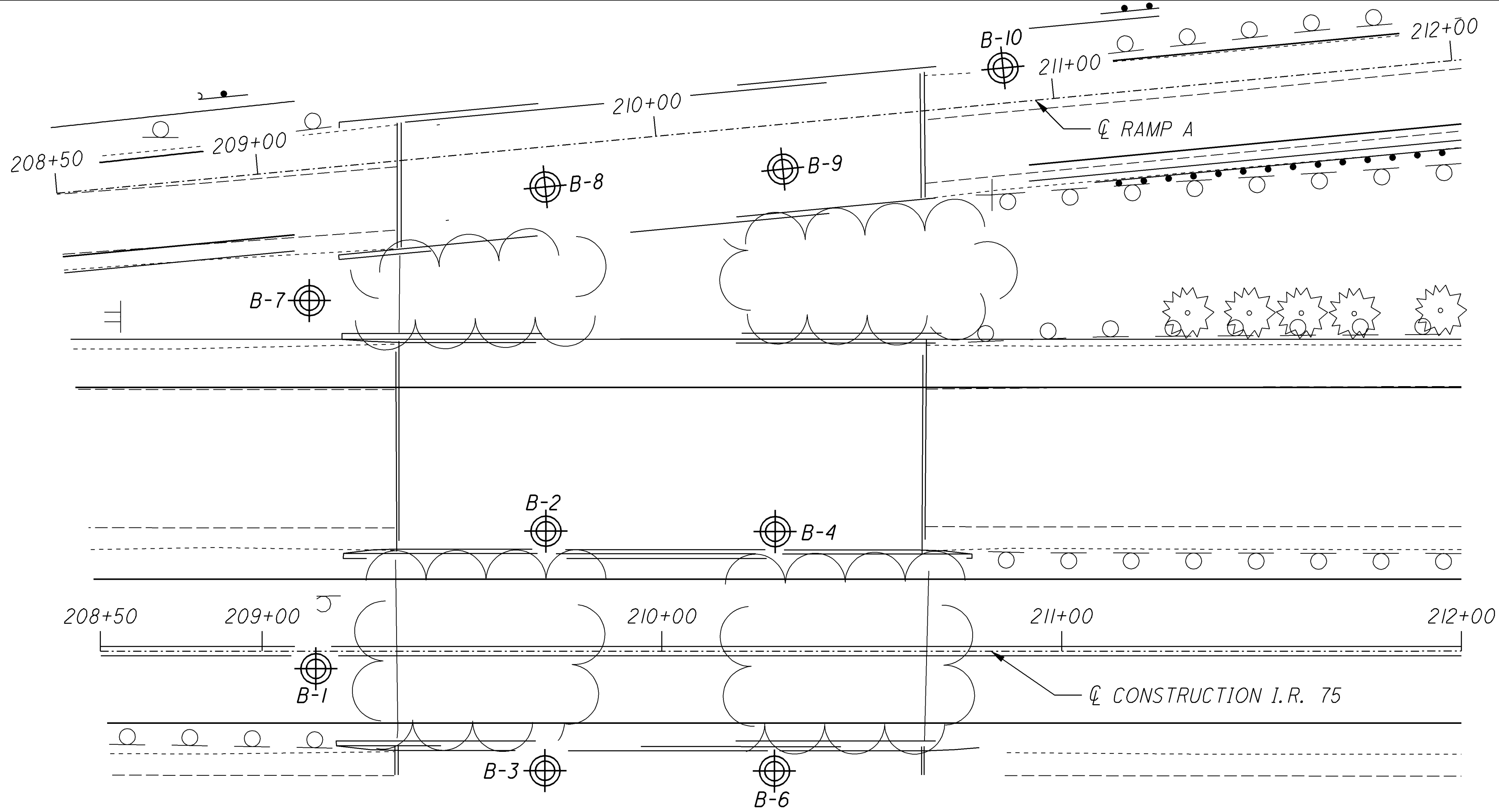
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40

HORIZONTAL

SCALE IN FEET





DESIGNED	DRAWN	REVIEWED	DATE
CHECKED	C.N.	NT	02-27-06
		STRUCTURE	FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0396 OVER DICKS CREEK

LOG OF BORING

Date Started 1/17/05
Date Completed 1/18/05

Sampler: Type SS Dia. 1.375"
Casing: Length 29ft Dia. 3.25"

Boring No. B- 1 Station & Offset 209+13.44, 4.4' Rt.

Water Elev. 683.7ft
Surface Elev. 703.7ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
703.7	0					Topsoil (10")										
703.7	1	5/4/3			0.7'	Brown, medium stiff, SILT AND CLAY, some sand, little gravel, damp, fill	1	20	11	12	19	38	30	11	16	A-6a
702.9	2															
700.7	4	2/3/4					2								12	VIS.
698.2	6	2/4/7			5.5'	Brown, stiff, SILTY CLAY, some sand, some gravel, damp, fill	3	22	14	13	9	42	35	16	15	A-6b
695.2	8															
695.2	10	6/6/7					4									NO REC.
692.7	12	6/6/8			11.0'	Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, damp	5	44	18	3	22	13	37	15	22	A-2-6
690.2	14	3/7/9				Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, with cobbles, damp	6								19	VIS.
687.7	16	3/4/7			16.0'	Dark gray, stiff, SANDY SILT, and clay, damp	7	0	0	46	16	38	NP	NP	18	A-4a
685.2	18															
684.7	20	2/10/16			19.0'	Dark gray, very stiff, SANDY SILT, and clay, with organics from 18.5-19ft, damp	8A								18	VIS.
682.7	22	25/50-3"			21.0'	Gray, dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace clay, trace silt, damp	8B	66	12	11	7	4	NP	NP	5	A-1-a
680.2	24	50-6"				Gray, moderately hard, SHALE, with interbedded LIMESTONE, augered	9									VIS.
678.7	26	50-5"					10									VIS.
677.2	28	50-5"					11									VIS.
675.2	30	50-3" 15%	3.9	1.1	29.0'		12									VIS.
674.7	32					SHALE (62%), medium gray, moderately hard, with interbedded LIMESTONE (38%), medium gray, moderately weathered, moderately hard	RC-1									VIS.
669.7	34	31%	4.6	0.4	34.0'	SHALE (75%), medium gray, hard, with interbedded LIMESTONE (25%), light	RC-2									VIS.

LOG OF BORING (Continued)

Boring No. B- 1

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
668.7						gray, slightly weathered, hard										
	36															
	—															
	38															
664.7					39.0'											

BOTTOM OF BORING

D ₅₀ VALUES			
BOREHOLE	DEPTH	SAMPLE	D50
B- 1	0.8	1	0.015
B- 1	5.5	3	0.039
B- 1	11	5	1.208
B- 1	16	7	0.023
B- 1	19	8B	5.788
B- 2	23	1	0.064
B- 2	25	2	0.078
B- 2	28	4	0.714
B- 3	25	1	0.339
B- 3	28	3	1.185
B- 3	29.5	4	0.045
B- 4	23.5	1	0.118
B- 4	26.5	3	0.046
B- 4	28	4	0.415
B- 5	25	2	0.059
B- 5	28	4	0.023
B- 5	29.5	5	0.124
B- 5	31	6	7.228
B- 6	0.5	1	0.145
B- 6	8.5	4	0.06
B- 6	13.5	6	0.019
B- 6	21	9	2.485
B- 6	26	11	2.602
B- 6	28.5	12	0.004
B- 7	0.6	1	0.102
B- 7	5.5	3	0.074
B- 8	19	1	5.489
B- 8	22	3	0.632
B- 8	26.5	6	0.012
B- 8	28	7	2.594
B- 9	20	1	0.029
B- 9	23	3	0.438
B- 9	26	5	14.199
B- 9	27.5	6	0.067

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-27-06

REVIEWED
NT

DRAWN
C.N.

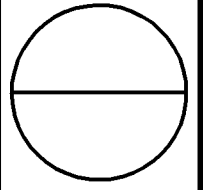
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STRUCTURE FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0396 OVER DICKS CREEK

WAR-75-3.40

5 / 14



Date Started 2/17/05
Date Completed 2/17/05

Sampler: Type SS Dia. 1.375"
Casing: Length 30ft Dia. 3.25"

Boring No. B- 2 Station & Offset 209+70.98, 30.0' Lt.

Water Elev. 680.5ft
Surface Elev. 705.5ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
705.5	0					Portland cement concrete										
704.6					0.9'	Boring through bridge deck										
	2															
	4															
	6															
	8															
	10															
	12															
	14															
	16															
	18															
	20															
	22															
682.5		1/1/2			23.0'											
	24					Dark grayish brown, soft, SANDY SILT, little clay, trace gravel, moist	1	3	9	37	32	19	30	6	29	A-4a
680.5		1/2/1				Dark grayish brown, soft, SANDY SILT, little clay, trace gravel, moist	2	8	12	32	30	18	31	6	29	A-4a
679.0		1/2/3				Dark grayish brown, medium stiff, SANDY SILT	3									NO REC.
677.5	28	22/17/35			28.0'											
						Gray, hard, SILTY CLAY, and gravel, little sand, moist	4	39	16	1	18	26	39	18	25	A-6b
676.0																
675.5	30	50-2" 0%	4.5	0.5	30.0'		5									NO REC.
						SHALE (100%), light gray, hard	RC-1									VIS.
	32															
	34															
670.5					35.0'											

Boring No. B- 2

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
670.5		60%	5.0	0.0		SHALE (83%), medium gray, hard, with interbedded LIMESTONE (17%), medium gray, not weathered, very hard	RC-2									VIS.
	36															
	38															
665.5	40			40.0'												
BOTTOM OF BORING																

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-27-06

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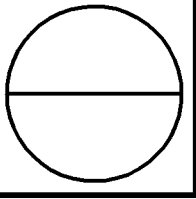
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STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0396 OVER DICKS CREEK

WAR-75-3.40

6 / 14



Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	<u>33ft</u>	Dia.	<u>3.25"</u>

Station & Offset 209+70.75, 29.9' Rt.

Water Elev.	<u>674.9ft</u>
Surface Elev.	<u>705.4ft</u>

Boring No. B- 3

[illegible]

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics							ODOT Class	
							% Aq	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
670.4	36	60%	4.9	0.1	38.0'	RC-2									VIS.
667.4	38														
	40														
	42														
	662.4														
BOTTOM OF BORING															

Date Started 2/17/05
Date Completed 2/17/05

Sampler: Type SS Dia. 1.375"
Casing: Length 34ft Dia. 3.25"

Boring No. B- 4

Station & Offset 210+28.32, 29.9' Lt.

Water Elev.
Surface Elev. 706.3ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
706.3	0					Portland cement concrete										
705.4					0.9'	Boring drilled through bridge deck										
	2															
	4															
	6															
	8															
	10															
	12															
	14															
	16															
	18															
	20															
	22															
682.8					23.5'											
	24	1/1/2				Brown, soft, SILT AND CLAY, some gravel, little sand, moist, fill	1	34	6	14	35	11	35	12	26	A-6a
681.3							2									NO REC.
	26	1/1/1														
679.8						Brown, soft, SILT AND CLAY, some sand, little gravel, damp, fill	3	12	11	22	37	18	37	13	20	A-6a
678.3	28				28.0'		4	41	9	15	22	13	32	10	30	A-2-4
		1/1/3				Brown, very loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, moist	4									
676.8					29.5'		5									VIS.
	30	5/9/50-4"				SHALE, gray, moderately hard, with interbedded LIMESTONE, gray, moderately weathered, moderately hard, augered	6									NO REC.
675.3							7									NO REC.
	32	50-3"														
673.8																
		50-3"														
672.3	34				34.0'		RC-1									VIS.
		47%	3.9	1.1		SHALE (62%), medium gray, hard, with interbedded LIMESTONE (38%), gray,										

Boring No. B- 4

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
671.3						moderately weathered, hard										
	36															
	38															
667.3		82%	5.0	0.0	39.0'	SHALE (67%), medium gray, with interbedded LIMESTONE (33%), gray, not weathered, very hard	RC-2									VIS.
	40															
	42															
662.3	44				44.0'											
						BOTTOM OF BORING										

Date Started2/15/05
Date Completed2/16/05

Sampler: TypeSS
Casing: Length35ft

Dia.1.375"
Dia.3.25"

Water Elev.682.8ft
Surface Elev.706.3ft

Boring No.B- 5

Station & Offset210+28.13, 30.0' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
706.3	0					Portland cement concrete										
706.3					0.9'	Boring drilled through bridge deck										
705.4																
	2															
	4															
	6															
	8															
	10															
	12															
	14															
	16															
	18															
	20															
	22															
682.8	24	1/1/1			23.5'	Grayish brown, soft, SANDY SILT, some clay, trace gravel	1									NO REC.
681.3		1/1/1				Grayish brown, soft, SANDY SILT, some clay, trace gravel, moist	2	3	26	19	30	22	26	8	22	A-4a
679.8	26	1/1/2					3									NO REC.
678.3	28	1/2/1				Grayish brown, soft, SANDY SILT, some clay, trace gravel, moist	4	5	9	19	45	22	27	8	24	A-4a
676.8		1/2/2				Grayish brown, soft, SANDY SILT, little clay, little gravel, moist	5	20	18	18	25	19	27	9	25	A-4a
675.3		7/9/50-6"			31.0'	Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS, little sand, trace silt, trace clay, moist	6	76	10	2	5	7	NP	NP	25	A-I-a
674.3	32				32.0'	SHALE, gray, augered	7									VIS.
673.8		50-4"														
	34															
671.3					35.0'											

Boring No.B- 5

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
671.3		33%	4.0	1.0		SHALE (68%), medium gray, hard, with interbedded LIMESTONE (38%), medium gray, moderately weathered, hard	RC-1									VIS.
	36															
	38															
	40	80%	5.0	0.0	40.0'											
666.3						SHALE (70%), medium gray, hard,with interbedded LIMESTONE (30%), medium gray, not weathered, hard	RC-2									VIS.
	42															
	44															
661.3					45.0'											
BOTTOM OF BORING																

LOG OF BORING

Date Started2/9/05

Date Completed2/9/05

Sampler: TypeSS

Casing: Length39ft

Dia.1.375"

Dia.3.25"

Boring No.B- 6

Station & Offset210+83.41, 7.9' Lt.

Water Elev.678.4ft

Surface Elev.706.9ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics										ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
706.9	0					Topsoil (7")												
706.9		4/5/6			0.6'	Brownish gray, stiff, SILT AND CLAY, some sand, some gravel, damp, fill	1									II	A-6a	
706.3	2																	
703.9		6/9/9				Brownish gray, very stiff, SILT AND CLAY, some sand, some gravel, damp, fill	2									I3	VIS.	
701.9	4																	
701.4		7/7/6			5.0'	Gray, stiff, SANDY SILT, some gravel, some clay, with cobbles, damp, fill	3									8	VIS.	
	6																	
	8																	
698.4		5/3/6				Gray, stiff, SANDY SILT, some gravel, some clay, with cobbles, damp, fill	4	30	10	9	26	25	30	10	II		A-4a	
	10																	
695.9		6/5/7					5									19	VIS.	
	12																	
693.9					13.0'	Brown, stiff, SILTY CLAY, little gravel, little sand, damp	6	18	5	11	35	31	36	17	I3		A-6b	
693.4	14	4/6/8																
690.9	16	7/9/11				Brown, very stiff, SILTY CLAY, little gravel, little sand, damp	7									I3	VIS.	
	18																	
688.4		4/7/10					8									17	VIS.	
	20				20.0'													
686.9																		
685.9	22	13/11/12				Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little clay, trace silt, damp	9	53	16	15	5	11	21	4	5		A-I-b	
683.4	24	11/13/13					10									7	VIS.	
680.9	26	11/19/24				Brownish gray, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little clay, trace silt, damp	11	55	16	9	8	12	20	3	11		A-I-b	
	28				28.0'													
678.9																		
678.4		32/16/22				Brown, hard, CLAY, some silt, trace gravel, trace sand, damp	12	10	3	4	29	54	47	27	16		A-7-6	
	30																	
674.9	32				32.0'													
673.4	34	18/43/50-3"				CLAY SHALE, gray, moderately to severely weathered, moderately hard, augered	13									15	VIS.	

Boring No.B- 6

Station & Offset210+83.41, 7.9' Lt.

Water Elev.678.4ft

Surface Elev.706.9ft

LOG OF BORING (Continued)

Boring No.B- 6

Station & Offset210+83.41, 7.9' Lt.

Water Elev.678.4ft

Surface Elev.706.9ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics										ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
671.9																		
	36																	
	38																	
668.4																		
667.9		50-3" 8%	4.5	0.5	39.0'		14										9	VIS.
	40					SHALE (70%), medium gray, moderately hard, with interbedded LIMESTONE (30%), medium gray, slightly weathered, hard	RC-1											VIS.
	42																	
	44																	
662.9		32%	4.5	0.5	44.0'													
						SHALE (77%), medium gray, moderately hard, with interbedded LIMESTONE (23%), medium gray, slightly weathered, hard	RC-2											VIS.
	46																	
	48																	
657.9					49.0'													
BOTTOM OF BORING																		

Boring No.B- 6

Station & Offset210+83.41, 7.9' Lt.

Water Elev.678.4ft

Surface Elev.706.9ft

CTL ENGINEERING, INC.

1451 S.R. 28 BLDG. B-NORTH

LOVELAND, OHIO 45140

PHONE: 513-722-8665 FAX: 513-722-8669

DATE

02-27-06

REVIEWED

NT

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C.N.

DESIGNED

CHECKED

STRUCTURE FOUNDATION INVESTIGATION

BRIDGE NO. WAR-75-0396 OVER DICKS CREEK

WAR-75-3.40

1014

...\\WAR-75-0396_P_&_P_SHEETS_WITH_ 3/28/2008 10:46:37 AM

Date Started 1/19/05
Date Completed 1/19/05

Sampler: Type SS Dia. 1.375"
Casing: Length 29ft Dia. 3.25"

Boring No. B- 7 Station & Offset 209+11.82, 87.7' Lt.

Water Elev. 685.5ft
Surface Elev. 704.0ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
704.0	0					Topsoil										
703.4		4/6/8			0.6'	Brown, stiff, SILT AND CLAY, some sand, some gravel, damp, fill	1	26	15	11	21	27	30	11	15	A-6a
	2															
701.0		4/10/6				Brown, very stiff, SILT AND CLAY, some sand, some gravel, with cobbles, damp, fill	2								12	VIS.
	4															
698.5		4/3/4			5.5'	Brown, medium stiff, SILT AND CLAY, some sand, some gravel, damp, fill	3	23	13	14	18	32	33	14	14	A-6a
	6															
695.5		5/10/10			8.5'	Brown, very stiff, SILT AND CLAY, some sand, some gravel, with cobbles, damp, fill	4									VIS.
	8															
693.0		7/9/11				Brown, very stiff, SILT AND CLAY, some sand, some gravel, damp, fill	5								11	VIS.
	10															
690.5		7/10/14			13.5'	Brown, very stiff, SILT AND CLAY, little sand, little gravel, damp	6	10	3	7	16	64	35	14	13	A-6a
	14															
688.0		9/12/20				Brown, hard, SILT AND CLAY, little sand, little gravel	7									NO REC.
	16															
686.0		14/16/50-3"			18.0'	Gray, hard, CLAY, with clay shale fragments, damp	8								16	VIS.
685.5																
	20				20.5'											
683.0		38/44/50-5"				CLAY SHALE, gray, severely to moderately weathered, moderately hard, with clay seams, augered	9									VIS.
	22															
680.5		32/50-4"					10									VIS.
	24															
	26															
	28															
675.5		50/2" 18%			29.0'		11									VIS.
675.0			4.7	0.3		SHALE (72%), medium gray, moderately hard, with interbedded LIMESTONE (28%), light gray, slightly weathered, moderately hard	RC-1									VIS.
	30															
	32															
670.0		47%	4.8	0.2	34.0'	SHALE (68%), medium gray, moderately hard, with interbedded LIMESTONE	RC-2									VIS.

Boring No. B- 7

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
669.0						(32%), light gray, slightly weathered, moderately hard										
	36															
	38															
665.0					39.0'											
BOTTOM OF BORING																

Date Started 2/10/05
Date Completed 2/14/05

Sampler: Type SS Dia. 1.375"
Casing: Length 30ft Dia. 3.25"

Boring No. B- 8

Station & Offset 209+71.26, 10.0' Rt.

Water Elev. 680.9ft
Surface Elev. 702.9ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
702.9	0					Portland cement concrete										
702.0	—				0.8'	Boring drilled through bridge deck										
	2															
	—															
	4															
	—															
	6															
	—															
	8															
	—															
	10															
	—															
	12															
	—															
	14															
	—															
	16															
	—															
	18															
683.9	—	2/2/4			19.0'											
682.4	20	2/7/3				Brown, loose, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, moist, fill	1	65	12	9	8	6	NP	NP	27	A-1-a
	—						2									NO REC.
680.9	22	1/1/2			22.0'											
	—					Brown, very loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, trace clay, damp	3	37	18	15	20	10	33	6	22	A-2-4
679.4	24	10/12/12			23.5'	Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, trace clay, damp	4									NO REC.
677.9	—	7/7/9					5									VIS.
676.4	26				26.5'											
	—	24/30/40				Gray, hard,CLAY, some gravel, some silt, trace sand, damp	6	33	3	4	24	36	41	19	6	A-7-6
674.9	28	50-5"			28.0'											
	—					Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, damp	7	53	8	5	17	17	30	11	11	A-2-6
672.9	30	0%	2.0	3.0	30.0'											
	—					SHALE (85%), medium gray, moderately hard, with interbedded LIMESTONE (15%), gray, severely weathered, moderately hard	RC-1									VIS.
	32															
	—															
	34															
667.9	—				35.0'											

Boring No. B- 8

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
667.9		25%	3.8	1.2		SHALE (82%), medium gray, moderately hard, with interbedded LIMESTONE (18%), gray, severely weathered, moderately hard	RC-2										VIS.
	36																
	38																
662.9	40				40.0'												
BOTTOM OF BORING																	

CTI ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-27-06

REVIEWED
NT

DRAWN
C.N.

DESIGNED
CHECKED

STRUCTURE
FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0396 OVER DICKS CREEK

WAR-75-3.40

12/14

Date Started2/21/05

Date Completed2/21/05

Sampler: TypeSS

Casing: Length33ft

Dia.1.375"

Dia.3.25"

Boring No.B- 9

Station & Offset210+30.87, 11.2' Rt.

Water Elev.674.2ft

Surface Elev.703.2ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqq	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
703.2	0					Portland cement concrete										
703.2					0.9'	Boring through bridge deck										
702.3																
	2															
	4															
	6															
	8															
	10															
	12															
	14															
	16															
	18															
683.2	20	7 1/2			20.0'											
						Gray, soft, SANDY SILT, some clay, little gravel, moist, fill	1	18	4	19	38	21	32	10	24	A-4a
681.7																
	22	2 2/3				Gray, medium stiff, SANDY SILT, some clay, little gravel, fill	2									NO REC.
680.2																
	24	3 6/6			23.0'	Gray, stiff, SILT AND CLAY, and gravel, little sand, moist, fill	3	42	8	11	25	14	30	11	19	A-6a
678.7																
		6 2/2			24.5'	Gray, soft, SILT AND CLAY, and gravel, little sand, with cobbles, damp, fill	4									VIS.
677.2	26	3 3/1			26.0'	Gray, very loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, trace clay, with cobbles, damp, fill	5	74	4	6	10	6	NP	NP	15	A-1-b
675.7																
	28	1 2/1			27.5'	Gray, soft, SANDY SILT, little clay, trace gravel, moist	6	7	6	35	33	19	26	7	24	A-4a
674.2																
	30	0 1/30			29.0'	SHALE, gray, soft, with interbedded LIMESTONE, gray, severely weathered, medium hard, augered	7									VIS.
671.7																
	32	50-6"					8									VIS.
670.2																
	34	13%	2.6	2.4	33.0'	SHALE (85%), medium gray, moderately hard, with interbedded LIMESTONE (15%), gray, severely weathered, hard	RC-1									VIS.

Boring No.B- 9

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqq	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
668.2																
	36															
665.2	38	47%	4.2	0.8	38.0'	SHALE (68%), medium gray, moderately hard, with interbedded LIMESTONE (32%), gray, slightly weathered, hard	RC-2									VIS.
	40															
	42															
660.2					43.0'											
						BOTTOM OF BORING										

LOG OF BORING

Date Started2/9/05

Date Completed2/9/05

Sampler: TypeSS

Casing: Length34ft

Dia.1.375"

Dia.3.25"

Boring No.B-10

Station & Offset210+88.08, 8.8' Lt.

Water Elev.679.5ft

Surface Elev.702.5ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
702.5	0					Asphalt												
702.5					0.8'													
701.7																		
701.0	2	4/5/7				Brownish gray, stiff, SILT AND CLAY, some sand, some gravel, with cobbles/boulders, damp, fill	1	22	12	12	25	29	30	13	11	A-6a		
699.5																		
699.5	4	3/3/3				Brownish gray, medium stiff, SILT AND CLAY, some sand, some gravel, with cobbles/boulders, damp, fill	2								12	VIS.		
697.5																		
697.0																		
697.0	6	4/11/7			5.5'	Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND,SILT, AND CLAY, with cobbles/boulders, damp, fill	3	54	4	9	12	21	29	11	13	A-2-6		
694.0																		
694.0	8	5/6/7																
692.0																		
691.5	10				10.5'													
691.5																		
691.5	12	4/2/2				Brownish gray, soft, SILT AND CLAY, some gravel, little sand, with cobbles/boulders, damp, fill	5	31	5	12	19	33	30	13	13	A-6a		
689.0																		
689.0	14	11/12/15			13.5'	Gray, very stiff, SILTY CLAY, and gravel, little sand, with cobbles/boulders, damp	6	37	1	12	20	30	35	17	11	A-6b		
686.5																		
686.5	16	11/7/12													11	VIS.		
684.5																		
684.0	18				18.0'													
684.0																		
684.0	20	4/5/7				Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, trace clay, with cobbles/boulders, damp	8	66	3	16	7	8	NP	NP	15	A-1-b		
679.5																		
679.0	22																	
679.5																		
679.0	24	32/21/17			23.0'													
679.0																		
679.0	26																	
674.0																		
674.0	28	50-6"																
671.0																		
671.0	30																	
669.0																		
669.0	32				31.5'													
668.5																		
668.5	34	50-4" 8%	2.0	3.0	34.0'	SHALE, gray, moderately hard, with LIMESTONE seams, augered	11											
						SHALE (87%), medium gray, moderately	RC-1											

LOG OF BORING (Continued)

Boring No.B-10

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
667.5																		
	36					hard, with interbedded LIMESTONE (13%), dark gray, moderately weathered, hard												
	38																	
663.5		33%	4.0	1.0	39.0'													
						SHALE (85%), medium gray, hard, with interbedded LIMESTONE (15%), dark gray, moderately weathered, hard	RC-2											VIS
	40																	
	42																	
658.5	44				44.0'													
						BOTTOM OF BORING												

WAR-75-0396 P & P SHEETS WITH_ 3/28/2008 10:51:29 AM

WAR-75-0396

STRUCTURE FOUNDATION INVESTIGATION

BRIDGE NO. WAR-75-0396 OVER DICKS CREEK

WAR-75-3.40

14/14

CTL ENGINEERING, INC.

1451 S.R. 28 BLDG. B-NORTH

LOVELAND, OHIO 45140

PHONE: 513-722-8665 FAX: 513-722-8669

GEOLOGY OF THE SITE

THE SITE IS LOCATED WHERE STILLWATER RIVER FLOWS FROM WEST TO EAST BENEATH SR 121. THE SITE'S TOPOGRAPHY IN THE IMMEDIATE AREA IS RELATIVELY FLAT TO MODERATELY SLOPING ALONG THE RIVERBANK. THE SITE IS LOCATED ON A RELATIVELY FLAT ALLUVIAL TERRACE, WHICH CONSISTS OF RECENT ALLUVIUM OVER GLACIAL OUTWASH DEPOSITS AND GLACIAL TILL FORMED DURING THE WISCONSIN GLACIATION. THE DEPTH TO ROCK IN THE IMMEDIATE PROJECT AREA IS ON THE ORDER OF 50 TO 75 FEET BELOW THE GROUND SURFACE. THE ALLUVIAL AND GLACIAL DEPOSITS ARE UNDERLAIN BY SEDIMENTARY ROCK CONSISTING OF DOLOMITE IDENTIFIED AS THE LOCKPORT DOLOMITE FORMATION. NO MAPPED KARST FEATURES ARE PRESENT IN THE CARBONATE DOMINANT GEOLOGY.

EXPLORATION

FOUR (4) STRUCTURE SOIL TEST BORINGS, IDENTIFIED AS B-1 THROUGH B-4, WERE DRILLED FOR THIS INVESTIGATION. TEST BORINGS B-1 THROUGH B-4 WERE DRILLED TO DEPTHS RANGING FROM 50 TO 60 FEET. THE TEST BORINGS WERE DRILLED WITH A TRUCK-MOUNTED DRILL RIG UTILIZING HOLLOW-STEM AUGERS (HSA) BETWEEN THE DATES OF OCTOBER 12 TO OCTOBER 15, 2004.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

AT THE ABUTMENTS, TEST BORINGS B-1 AND B-4 WERE DRILLED IN THE EXISTING S.R. 121 ROADWAY PAVEMENT. AT THE GROUND SURFACE, THESE TWO TEST BORINGS ENCOUNTERED APPROXIMATELY 2 INCHES OF ASPHALT PAVEMENT FOLLOWED BY APPROXIMATELY 12 INCHES OF CONCRETE PAVEMENT. TEST BORINGS B-2 AND B-3 ENCOUNTERED APPROXIMATELY 10 INCHES OF REINFORCED CONCRETE AT THE BRIDGE DECK.




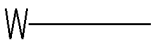
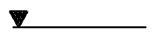





BENEATH THE PAVEMENT MATERIALS IN ABUTMENT TEST BORINGS B-1 AND B-4, FILL MATERIAL CONSISTING OF SILT AND CLAY (A-6A) WAS ENCOUNTERED TO DEPTHS RANGING FROM 5 TO 13.5 FEET. BENEATH THE FILL THE ABUTMENT TEST BORNIGS ENCOUNTERED SILT AND CLAY (A-6A), SANDY SILT (A-4A), COARSE AND FINE SAND (A-3A).

ALL FOUR TEST BORINGS ENCOUNTERED GRAVEL AND/OR STONE FRAGMENTS WITH VARYING AMOUNTS OF SAND, SILT AND CLAY (A-2-7 AND A-1-A) BEGINNING AT THE APPROXIMATE STREAMBED ELEVATION. THESE GRANULAR MATERIALS WERE INTERBEDDED WITH GLACIAL TILL CONSISTING OF SANDY SILT (A-4A) AND SILT (A-4B) LAYERS AND COBBLES AND BOULDERS DOWN TO THE BORING TERMINATION DEPTHS.

GROUNDWATER WAS ENCOUNTERED DURING DRILLING AND RANGED IN DEPTH FROM 18 FEET TO 21.5 FEET. UPON COMPLETION OF THE TEST BORINGS THE GROUNDWATER DEPTHS RANGED FROM 14 FEET TO 19 FEET.

D50 VALUES WHICH HAVE BEEN CALCUALTED FOR THE SCOUR ANALYSIS CAN BE FOUND ON PAGE NO. 4 AND 5.

LEGEND

-  AUGER BORING LOCATION
-  PRESS SAMPLE, DRIVE SAMPLE, AND/OR CORE BORING LOCATION
-  TOP OF ROCK
-  INDICATES FREE WATER ELEVATION
-  INDICATES STATIC WATER ELEVATION
-  HORIZONTAL BAR ON BORING INDICATES THE DEPTH THE SAMPLE WAS TAKEN - PROFILE VIEW
-  FIGURES BESIDE THE BORING IN PROFILE INDICATE THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST
-  X = NUMBER OF BLOWS FOR FIRST 6 INCHES
-  Y = NUMBER OF BLOWS FOR SECOND 6 INCHES
-  Z = NUMBER OF BLOWS FOR THIRD 6 INCHES

SYMBOLS OF ROCK TYPES

-  Fire Clay or Underclay
-  Weathered Mudstone
-  Mudstone
-  Weathered Shale
-  Shale
-  Weathered Clay-Shale
-  Clay-Shale
-  Boulders or Cobbles
-  Weathered Siltstone
-  Siltstone
-  Weathered Sandstone
-  Sandstone
-  Leached Dolomite
-  Dolomite
-  Leached Limestone
-  Limestone

PARTICLE SIZE DEFINITIONS

	300 mm	75 mm	2.0 mm	0.42 mm	0.074 mm	0.005 mm
Boulders	Cobbles	Gravel	Coarse Sand	FINE SAND	Silt	Clay
		No. 10 SIEVE	No. 40 SIEVE	No. 200 SIEVE		

NOTES

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATIONS SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE OFFICE OF MATERIALS MANAGEMENT AT 1600 WEST BROAD STREET, THE OFFICE OF ROADWAY ENGINEERING OR THE OFFICE OF STRUCTURAL ENGINEERING AT 25 SOUTH FRONT STREET, COLUMBUS, OHIO 43215.

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECH-ANICALLY-POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 2 INCH O.D., 1-3/8" I.D. SPLIT SPOON SAMPLING DE-VICE, AT 2-1/2 AND/OR 5 FOOT DEPTH INTERVALS, DRIVEN BY MEANS OF A 140 lb. HAMMER WITH A FREE FALL OF 30 INCHES. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLING DEVICE THREE 18 INCH INCREMENTS IS CONSIDERED THE STANDARD PENETRATION TEST.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF MECHANICALLY POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2 INCH O.D. THIN WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE APPLIED BY THE DRILLING MACHINE.

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NO CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

SAMPLING AND TESTING

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVA-TION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6 INCH INCRE-MENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS UTILIZING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BED-DING ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVEL-LY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

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1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-27-06

REVIEWED
NT

DRAWN
C.N.

DESIGNED

FILE NUMBER

STRUCTURE

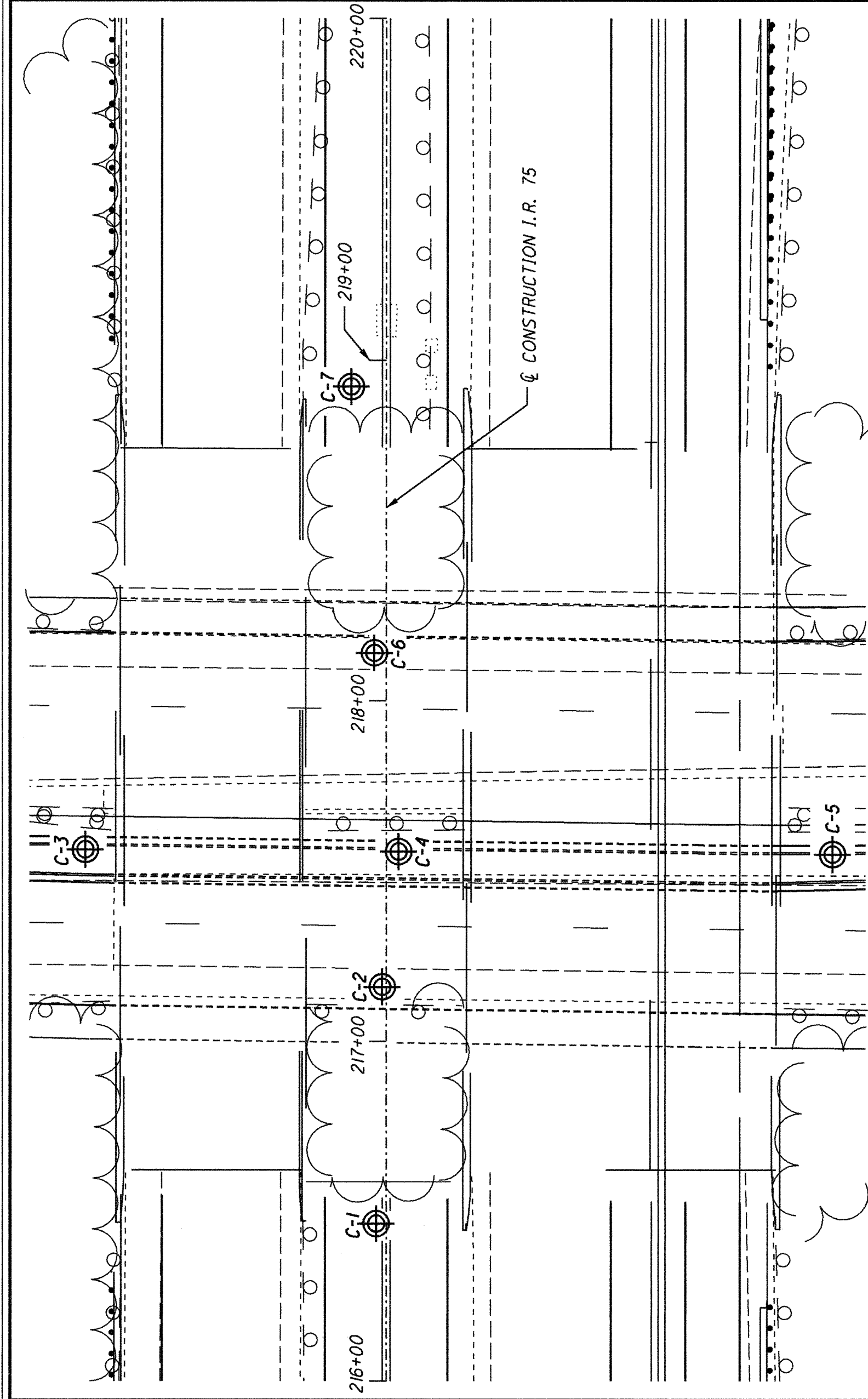
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STRUCTURE FOUNDATION INVESTIGATION

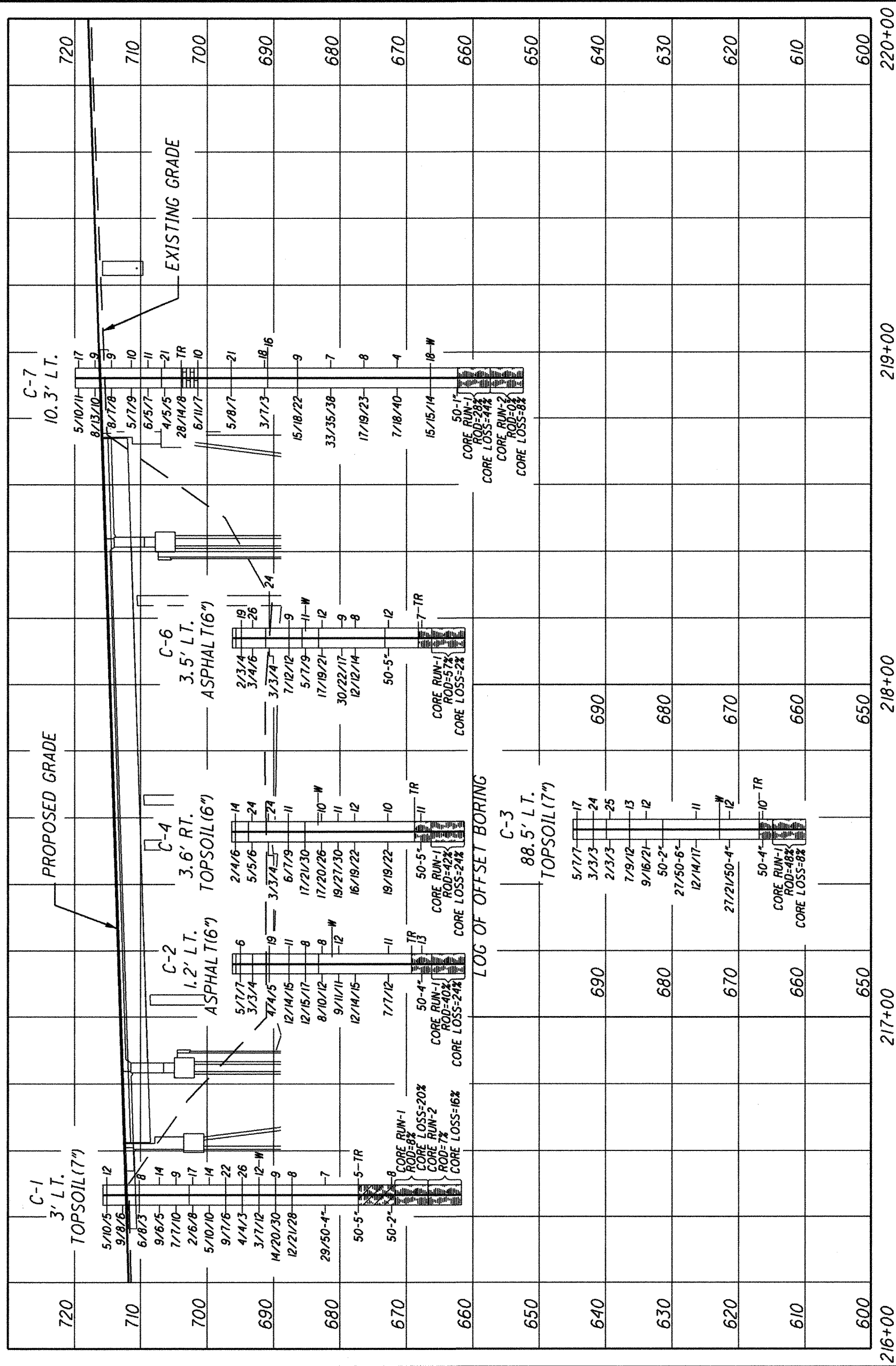
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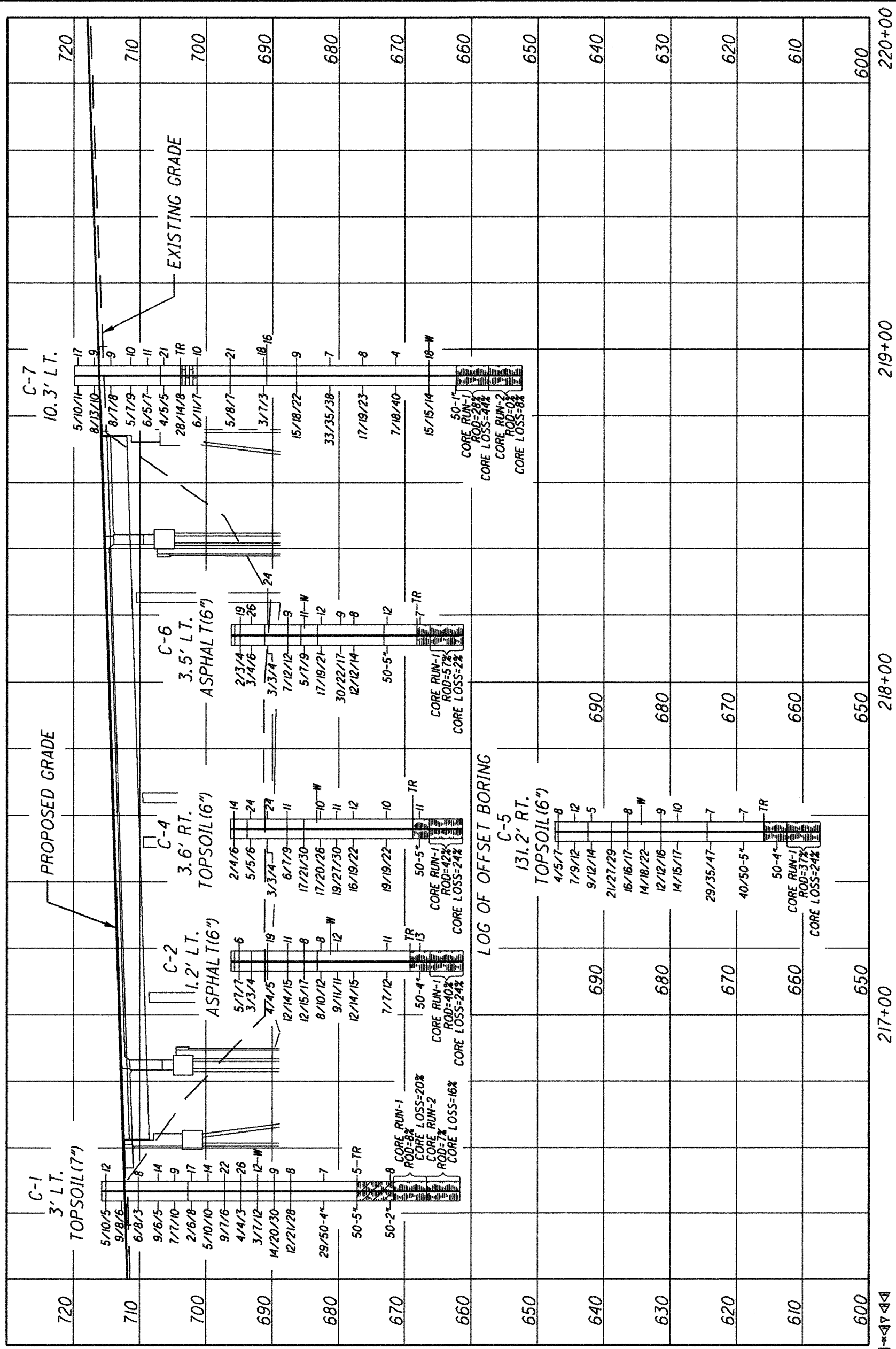
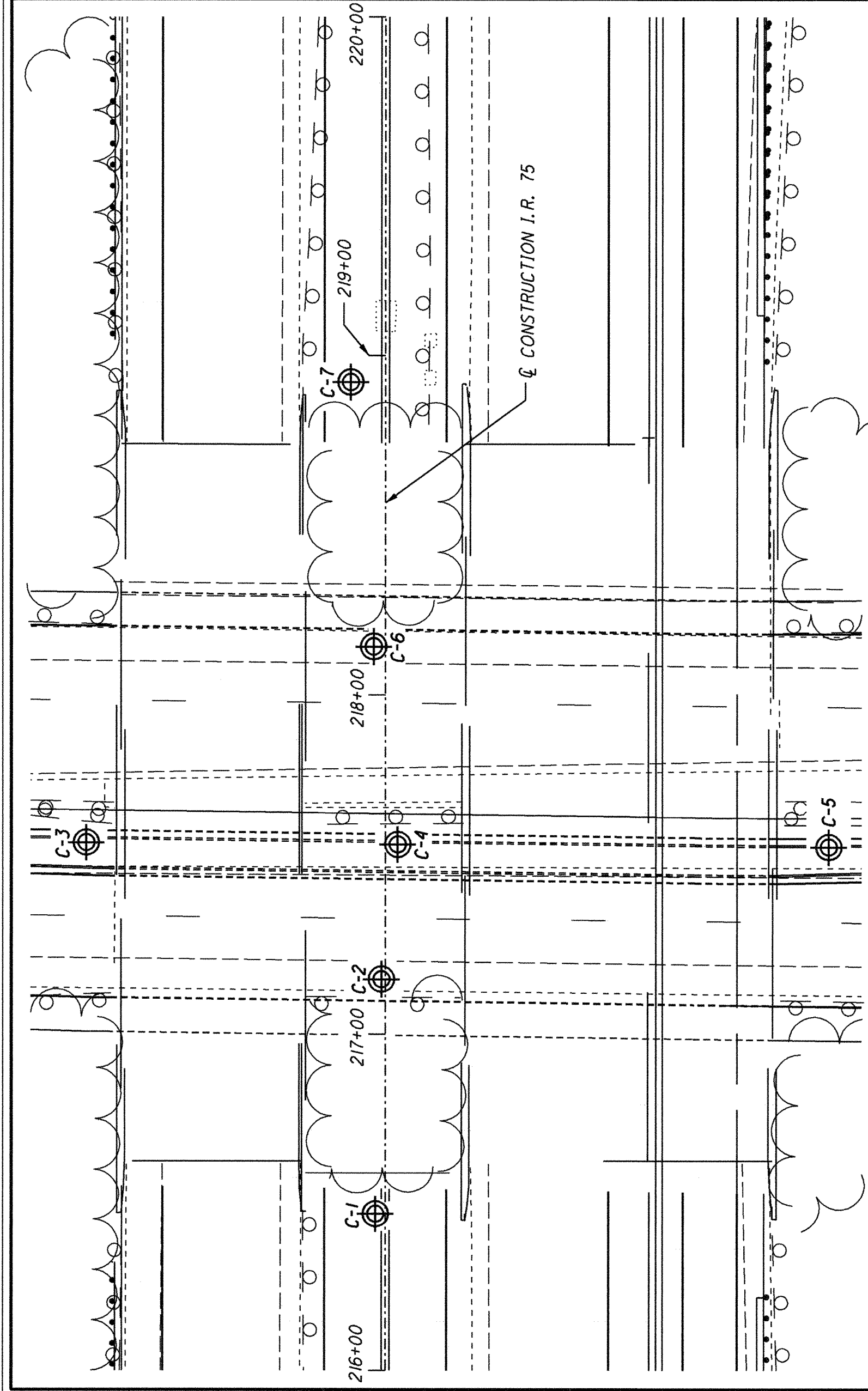
1 / 8





NOTE: FOR PROFILE VIEW OF BORING C-5, REFER SHEET 3 OF 8.





Date Started2/10/05
Date Completed2/10/05

Sampler: TypeSSDia.1.375"
Casing: Length44ftDia.3.25"

Boring No.C-1Station & Offset216+46.57, 3.0' Lt.

Water Elev.692.2ft
Surface Elev.715.7ft

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
715.7	0					Topsoil (7")										
715.1	—	5/10/5			0.6'	Brown and gray, stiff, SANDY SILT, some gravel, some clay, damp, fill	1	22	18	18	20	22	25	9	12	A-4a
712.7	2															
712.7	—	9/8/6					2									VIS.
710.2	4															
710.2	—	6/8/3			5.5'	Brown and gray, stiff, SILT AND CLAY, and gravel, little sand, with cobbles, damp, fill	3								8	VIS.
707.2	6															
707.2	—	9/6/5				Brown and gray, stiff, SILT AND CLAY, and gravel, little sand, with cobbles, damp, fill	4	44	9	6	14	27	29	11	14	A-6a
704.7	8															
704.7	—	7/7/10				Brown and gray, very stiff, SILT AND CLAY, and gravel, little sand, with cobbles, damp, fill	5								9	VIS.
702.7	10															
702.2	—	2/6/8			13.0'	Brown and gray, stiff, SILT AND CLAY, little sand, trace gravel, damp, fill	6	4	13	4	46	33	35	14	17	A-6a
699.7	14															
699.7	—	5/10/10				Brown and gray, very stiff, SILT AND CLAY, little sand, trace gravel, damp, fill	7								14	VIS.
697.2	16															
697.2	—	9/7/6			18.5'	Dark gray, stiff, SILT, some clay, trace gravel, trace sand, moist	8	1	4	6	59	30	31	9	22	A-4b
694.7	18															
694.7	—	4/4/3			21.0'	Brown and light brown, medium stiff, SANDY SILT, some clay, some gravel, with cobbles, moist, till	9								26	VIS.
692.2	20															
692.2	—	3/7/12			23.5'	Brown and light brown, very stiff, SANDY SILT, some clay, some gravel, with cobbles, damp, till	10	28	14	14	18	26	25	10	12	A-4a
689.7	22															
689.7	—	14/20/30			26.0'	Brown and light brown, hard, SANDY SILT, some clay, some gravel, with cobbles, damp, till	11								9	VIS.
687.2	24															
687.2	—	12/21/28			28.5'	Brownish gray to gray, hard, SANDY SILT, some gravel, some clay, damp, till	12								8	VIS.
682.2	26															
682.2	—	29/50-4"				Brownish gray to gray, hard, SANDY SILT, some gravel, some clay, damp, till	13	25	14	16	21	24	22	9	7	A-4a

Boring No. C-1

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
680.7	—															
677.2	36															
677.2	—	50-5"			38.5'											
672.2	38					CLAY SHALE, gray, with limestone fragments, augered	14								5	VIS.
672.2	—															
671.7	40															
671.7	—	50-2" 8%	4.0	1.0	44.0'	SHALE (83%), medium gray, silty, laminated, soft, with interbedded LIMESTONE (17%), light gray, fine to medium grained, very thinly bedded, hard	RC-1								8	VIS.
666.7	42															
666.7	—	7%	4.2	0.8	49.0'	SHALE (83%), medium gray, silty, laminated, soft, with interbedded LIMESTONE (17%), light gray, fine to medium grained, very thinly bedded, hard	RC-2									VIS.
661.7	44															
661.7	—				54.0'											
BOTTOM OF BORING																

LOG OF BORING														LOG OF BORING																								
Date Started 12/20/04				Sampler: Type SS				Dia. 1.375"				Date Completed 12/20/04				Sampler: Type SS				Dia. 1.375"				Date Completed 12/15/04														
Casing: Length 30.0ft				Dia. 3.25"				Water Elev. 681.2ft				Surface Elev. 696.2ft				Casing: Length 30.0ft				Dia. 3.25"				Water Elev. 672.9ft														
Boring No. C-2				Station & Offset 217+16.11, 1.2' Lt.												Boring No. C-3				Station & Offset 217+56.46, 88.5' Lt.																		
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class		Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class				
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.											% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.					
696.2	0					Asphalt (6")												694.9	0																			
696.2		5/7/7				GRAVEL AND/OR STONE FRAGMENTS WITH SAND, base course (8")	1									6	VIS.	694.3		5/7/7						0.6'	TOPSOIL (7")											
695.7						Brown and gray, stiff, SANDY SILT, some clay, with cobbles, damp, fill												694.3	2								1						17	VIS.				
695.0	2																			2						3.0'	Brown, medium stiff, SILT AND CLAY, and sand, trace gravel, moist, fill	2	3	26	17	26	28	37	12	24	A-6a	
693.2	4	3/3/4				Brown and gray, medium stiff, SANDY SILT, with cobbles, fill	2										NO REC.	691.9	4	3/3/3																		
	6	4/4/5				Brown, stiff, SILT AND CLAY, and sand, little gravel, damp	3	15	18	29	17	21	32	12	19		A-6a	689.9	6	2/3/3							5.0'	Dark brown and black, medium stiff, CLAY, some sand, some silt, little gravel, damp, fill	3	16	26	10	20	28	46	19	25	A-7-6
690.7	8																	689.4	8																			
687.7		12/14/15				Brown, very stiff, SANDY SILT, some clay, little gravel, damp, till	4	11	14	30	20	25	25	9	11		A-4a	686.4		7/9/12							8.5'	Light brown, very stiff, SANDY SILT, some gravel, some clay, with cobbles, damp, till	4	23	30	10	17	20	24	7	13	A-4a
	10																		10																			
685.2		12/15/17				Gray, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, trace clay, damp, till	5	34	20	31	6	9	16	3	8		A-1-b	683.9	12	9/16/21														12	VIS.			
683.2	12																									13.5'	Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, with cobbles, damp, till	6									VIS.	
682.7	14	8/10/12				Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, damp, till	6	37	15	23	13	12	20	7	8		A-2-4	681.4	14	50-2"																		
		9/11/11					7									12	VIS.	678.9	16	27/50-6"								7								VIS.		
680.2	16																																					
	18	12/14/15					8										VIS.	676.4	18	12/14/17								8	40	11	30	0	19	26	10	11	A-2-4	
677.7	20																		20																			
	22	7/7/12																								22.0'												
672.7	24					Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, damp, till	9	25	16	29	13	17	19	6	11		A-2-4	671.4	24	27/21/50-4"								9	55	12	31		NP	NP	12		A-1-b	
	26	50-4"																																				
669.2	28																									28.0'												
667.7		40%	3.8	1.2		SHALE, gray, with limestone fragments, augered	10									13	VIS.	666.9		50-4"								10								VIS.		
666.2	30					SHALE (75%), medium gray, silty, laminated, thin bedded, soft, with interbedded LIMESTONE (25%), light gray, fine to medium grained, crystalline, fractured and jointed, very thinly bedded, hard	RC-1										VIS.	666.4		48%	3.6	0.4				30.0'	SHALE (65%), medium gray, silty, laminated, thin bedded, soft, with interbedded LIMESTONE (35%), light gray, fine to medium grained, crystalline, fractured and jointed, very thinly bedded, hard	RC-1										
	32																																					
	34																																					
661.2					35.0'													659.9								35.0'												

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STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0410 OVER S.R. 122

WAR-75-3.40

5/8

LOG OF BORING

Date Started 12/20/04
Date Completed 12/20/04

Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	<u>30.0ft</u>	Dia.	<u>3.25"</u>

Water Elev.	681.2ft
Surface Elev.	696.2ft

Boring No. C-2 Station & Offset 217+16.11, 1.2' Lt.

[illegible]

LOG OF BORING

Date Started	12/10/04
Date Completed	12/15/04

Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	30.0ft	Dia.	3.25"

Water Elev.	672.9ft
Surface Elev.	<u>694.9ft</u>

Boring No. C-3

Station & Offset 217+56.46, 88.5' Lt.[illegible]

Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	<u>35.0ft</u>	Dia.	<u>3.25"</u>

Water Elev.	684.4ft
Surface Elev.	697.4ft

[illegible]

LOG OF BORING

Date Started 12/15/04
Date Completed 12/16/04

Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	<u>30.0ft</u>	Dia.	<u>3.25"</u>

Water Elev.	683.3ft
Surface Elev.	696.3ft

Boring No. C-4

Station & Offset 217+55.82, 3.6' Rt.[illegible]

LOG OF BORING

Date Started 12/16/04
Date Completed 12/17/04

Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	<u>35.0ft</u>	Dia.	<u>3.25"</u>

Water Elev.	684.4ft
Surface Elev.	697.4ft

Boring No. C-5

Station & Offset 217+55.00, 131.2' Rt.

[illegible]

LOG OF BORING (Continued)

Boring No. C-5

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
662.4		37%	3.8	1.2		SHALE (65%), medium gray, silty, laminated, thin bedded, soft, with interbedded LIMESTONE (35%), light gray, fine to medium grained, crystalline, fractured and jointed, very thinly bedded, hard	RC-1									VIS.
	36															
	—															
	38															
	—															
657.4	40				40.0'											

BOTTOM OF BORING

Boring No. C-5

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
662.4		37%	3.8	1.2		SHALE (65%), medium gray, silty, laminated, thin bedded, soft, with interbedded LIMESTONE (35%), light gray, fine to medium grained, crystalline, fractured and jointed, very thinly bedded, hard	RC-1									VIS.
	36															
	38															
657.4	40				40.0'											

BOTTOM OF BORING

Date Started 12/21/04
Date Completed 12/21/04

Sampler: Type SS Dia. 1.375"
Casing: Length 30.0ft Dia. 3.25"

Boring No. C-6

Station & Offset 218+14.04, 3.5' Lt.

Water Elev. 685.2ft
Surface Elev. 696.2ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
696.2	0					Asphalt (6")										
696.2					0.5'	GRAVEL AND/OR STONE FRAGMENTS WITH SAND, base course (10")										
695.7					1.3'											
694.9		2/3/4				Brown and black, medium stiff, CLAY, and silt, little gravel, trace sand, damp, fill	1								19	VIS.
693.2	2															
	4	3/4/6				Brown and black, stiff, CLAY, and silt, little gravel, trace sand, moist, fill	2	14	4	5	39	38	45	22	26	A-7-6
691.2																
690.7					5.0'											
	6	3/3/4				Brown and black, medium stiff, SILTY CLAY, and sand, little gravel, moist, fill	3	15	23	25	10	27	37	17	24	A-6b
	8															
687.7		7/12/12														
	10				8.5'	Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, damp, till	4	42	20	28			21	6	9	A-I-b
685.7																
685.2		5/7/9			10.5'											
	12					Brown, very stiff, SANDY SILT, some gravel, some clay, damp, till	5	34	17	13	14	22	23	8	11	A-4a
683.2																
682.7		17/19/21			13.0'											
	14					Gray, dense, GRAVEL AND/OR STONE FRAGMENTS, little sand, with cobbles, damp, till	6								12	VIS.
	16															
679.7		30/22/17											NP	NP	9	A-I-a
	18					Gray, dense, GRAVEL AND/OR STONE FRAGMENTS, little sand, with cobbles, damp, till	7	77	12	4						
677.7		12/12/14														
	20					Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS, little sand, with cobbles, damp, till	8								8	VIS.
	22															
673.2																
672.7		50-5"			23.0'								NP	NP	12	A-I-a
	24					Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS, little sand, damp, till	9	87	9	2						
	26															
	28															
668.2																
667.7					28.0'	SHALE, gray, with limestone fragments, augered	10								7	VIS.
666.2	30	57%	4.9	0.1	30.0'											
						SHALE (69%), medium gray, silty, laminated, thin bedded, soft, with interbedded LIMESTONE (31%), light gray, fine to medium grained, crystalline, fractured and jointed, very thinly bedded, hard	RC-1									VIS.
	32															
	34															
661.2					35.0'											

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STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0410 OVER S.R. 122

WAR-75-3.40

7/8

Date Started 12/27/04
Date Completed 12/29/04

Sampler: Type SS Dia. 1.375"
Casing: Length 57.5ft Dia. 3.25"

Water Elev. 666.4ft
Surface Elev. 719.9ft

Boring No. C-7 Station & Offset 218+92.16, 10.3' Lt.

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
719.9	0																
719.9 719.4	2	5/10/11				Brown and gray, very stiff, SANDY SILT, some clay, little gravel, moist, fill	1									17	VIS.
716.9	4	8/13/10				Brown and gray, very stiff, SANDY SILT, some clay, little gravel, damp, fill	2	12	43	9	13	23	21	7	9		A-4a
714.4	6	8/7/8				Brown and gray, stiff, SANDY SILT, some clay, little gravel, damp, fill	3									9	VIS.
711.4	8																
711.4	10	5/7/9				Brown and gray, very stiff, SANDY SILT, some clay, little gravel, damp, fill	4									10	VIS.
708.9	12	6/5/7			13.0'	Brown and gray, stiff, SANDY SILT, some clay, little gravel, damp, fill	5	11	17	16	25	31	22	7	11		A-4a
706.9 706.4	14	4/5/5				Light brown, stiff, SILT AND CLAY, some sand, little gravel, moist, fill	6	17	18	6	41	18	31	11	21		A-6a
703.9	16	28/14/8			16.0'	Limestone fragments, augered, fill	7										VIS.
701.4	18																
701.4	20	6/11/7			18.5'	Brown and gray, very stiff, SANDY SILT, with limestone fragments, damp, fill	8									10	VIS.
	22																
696.4	24	5/8/7			23.5'	Dark brownish gray, stiff, SILT, some sand, some clay, damp	9	0	18	6	55	21	33	8	21		A-4b
	26																
	28																
691.4 690.9	30	3/7/3			29.0'	Brown and gray, stiff, SANDY SILT, some clay, damp	10A 10B									18 16	VIS. VIS.
	32																
686.4	34	15/18/22			33.5'	Gray, hard, SANDY SILT, some clay, little gravel, damp, fill	11	18	23	10	25	24	23	7	9		A-4a

Boring No. C-7

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
684.9																	
681.4	36	33/35/38					12									7	VIS.
	38																
	40																
	42																
676.4	44	17/19/23					13									8	VIS.
	46																
	48																
	50																
671.4	52	7/18/40					14									4	VIS.
	54																
	56																
	58																
666.4	60	15/15/14			53.5'	Brown and gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, moist,	15	54	37	6			NP	NP		18	A-1-a
	62																
	64																
	66																
662.7 662.4 662.3	68	50-1" 28%	2.8	2.2	57.6'	SHALE (50%), medium gray, silty, laminated, thin bedded, soft, with interbedded LIMESTONE (50%), light gray, fine to medium grained, crystalline, fractured and jointed, very thinly bedded, hard	RC-1									VIS. VIS.	
70																	
72																	
74																	
657.3	76	0%	4.6	0.4	62.6'	SHALE (85%), medium gray, silty, laminated, thin bedded, soft, with interbedded LIMESTONE (15%), light gray, fine to medium grained, crystalline, fractured and jointed, very thinly bedded, hard	RC-2										VIS.
	78																
	80																
	82																
652.3	84				67.6'												
BOTTOM OF BORING																	

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STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0410 OVER S.R. 122

WAR-75-3.40

8/8

Water Elev.	<u>685.2ft</u>
Surface Elev.	<u>696.2ft</u>

[illegible]

Date Started 12/27/04
Date Completed 12/29/04

Sampler: Type SS Dia. 1.375"
Casing: Length 57.5ft Dia. 3.25"

Water Elev. 666.4ft
Surface Elev. 719.9ft

Boring No. C-7 Station & Offset 218+92.16, 10.3' Lt.

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqq	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
719.9 719.4	0	5/10/11				Brown and gray, very stiff, SANDY SILT, some clay, little gravel, moist, fill	1								17	VIS.
716.9	2	8/13/10				Brown and gray, very stiff, SANDY SILT, some clay, little gravel, damp, fill	2	12	43	9	13	23	21	7	9	A-4a
714.4	4															
711.4	6	8/7/8				Brown and gray, stiff, SANDY SILT, some clay, little gravel, damp, fill	3								9	VIS.
708.9	8	5/7/9				Brown and gray, very stiff, SANDY SILT, some clay, little gravel, damp, fill	4								10	VIS.
706.9 706.4	10															
703.9	12	6/5/7			13.0'	Brown and gray, stiff, SANDY SILT, some clay, little gravel, damp, fill	5	11	17	16	25	31	22	7	11	A-4a
701.4	14	4/5/5				Light brown, stiff, SILT AND CLAY, some sand, little gravel, moist, fill	6	17	18	6	41	18	31	11	21	A-6a
699.4	16	28/14/8			16.0'	Limestone fragments, augered, fill	7									VIS.
697.4	18															
695.4	20	6/11/7			18.5'	Brown and gray, very stiff, SANDY SILT, with limestone fragments, damp, fill	8								10	VIS.
693.4	22	5/8/7			23.5'	Dark brownish gray, stiff, SILT, some sand, some clay, damp	9	0	18	6	55	21	33	8	21	A-4b
691.4	24															
689.4	26															
687.4	28															
685.4	30	3/7/3			29.0'	Brown and gray, stiff, SANDY SILT, some clay, damp	10A 10B								18 16	VIS. VIS.
683.4	32	15/18/22			33.5'	Gray, hard, SANDY SILT, some clay, little gravel, damp, fill	11	18	23	10	25	24	23	7	9	A-4a
681.4	34															

Boring No. C-7

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqq	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
684.9	36	33/35/38					12								7	VIS.
681.4	38															
679.4	40															
677.4	42															
675.4	44	17/19/23					13								8	VIS.
673.4	46	7/18/40														
671.4	48															
669.4	50															
667.4	52	15/15/14			53.5'	Brown and gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, moist,	15	54	37	6			NP	NP	18	A-1-a
665.4	54															
663.4	56															
661.4	58															
659.4	60	50-1" 28%	2.8	2.2	57.6'	SHALE (50%), medium gray, silty, laminated, thin bedded, soft, with interbedded LIMESTONE (50%), light gray, fine to medium grained, crystalline, fractured and jointed, very thinly bedded, hard	RC-1									VIS. VIS.
657.4	62	0%														
655.4	64															
653.4	66															
651.4	68	62.6'			62.6'	SHALE (85%), medium gray, silty, laminated, thin bedded, soft, with interbedded LIMESTONE (15%), light gray, fine to medium grained, crystalline, fractured and jointed, very thinly bedded, hard	RC-2									VIS.
649.4	70															
647.4	72	67.6'			67.6'	BOTTOM OF BORING										
645.4	74															

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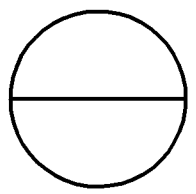
DRAWN
C.N.

DESIGNED
CHECKED

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0410 OVER S.R. 122

WAR-75-3.40

8/8



GEOLOGY OF THE SITE

THE SITE IS LOCATED WHERE STILLWATER RIVER FLOWS FROM WEST TO EAST BENEATH SR 121. THE SITE’S TOPOGRAPHY IN THE IMMEDIATE AREA IS RELATIVELY FLAT TO MODERATELY SLOPING ALONG THE RIVERBANK. THE SITE IS LOCATED ON A RELATIVELY FLAT ALLUVIAL TERRACE, WHICH CONSISTS OF RECENT ALLUVIUM OVER GLACIAL OUTWASH DEPOSITS AND GLACIAL TILL FORMED DURING THE WISCONSIN GLACIATION. THE DEPTH TO ROCK IN THE IMMEDIATE PROJECT AREA IS ON THE ORDER OF 50 TO 75 FEET BELOW THE GROUND SURFACE. THE ALLUVIAL AND GLACIAL DEPOSITS ARE UNDERLAIN BY SEDIMENTARY ROCK CONSISTING OF DOLOMITE IDENTIFIED AS THE LOCKPORT DOLOMITE FORMATION. NO MAPPED KARST FEATURES ARE PRESENT IN THE CARBONATE DOMINANT GEOLOGY.

EXPLORATION

FOUR (4) STRUCTURE SOIL TEST BORINGS, IDENTIFIED AS B-1 THROUGH B-4, WERE DRILLED FOR THIS INVESTIGATION. TEST BORINGS B-1 THROUGH B-4 WERE DRILLED TO DEPTHS RANGING FROM 50 TO 60 FEET. THE TEST BORINGS WERE DRILLED WITH A TRUCK-MOUNTED DRILL RIG UTILIZING HOLLOW-STEM AUGERS (HSA) BETWEEN THE DATES OF OCTOBER 12 TO OCTOBER 15, 2004.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

AT THE ABUTMENTS, TEST BORINGS B-1 AND B-4 WERE DRILLED IN THE EXISTING S.R. 121 ROADWAY PAVEMENT. AT THE GROUND SURFACE, THESE TWO TEST BORINGS ENCOUNTERED APPROXIMATELY 2 INCHES OF ASPHALT PAVEMENT FOLLOWED BY APPROXIMATELY 12 INCHES OF CONCRETE PAVEMENT. TEST BORINGS B-2 AND B-3 ENCOUNTERED APPROXIMATELY 10 INCHES OF REINFORCED CONCRETE AT THE BRIDGE DECK.

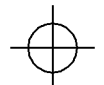
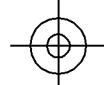

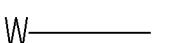
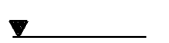
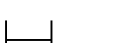




BENEATH THE PAVEMENT MATERIALS IN ABUTMENT TEST BORINGS B-1 AND B-4, FILL MATERIAL CONSISTING OF SILT AND CLAY (A-6A) WAS ENCOUNTERED TO DEPTHS RANGING FROM 5 TO 13.5 FEET. BENEATH THE FILL THE ABUTMENT TEST BORNIGS ENCOUNTERED SILT AND CLAY (A-6A), SANDY SILT (A-4A), COARSE AND FINE SAND (A-3A).

ALL FOUR TEST BORINGS ENCOUNTERED GRAVEL AND/OR STONE FRAGMENTS WITH VARYING AMOUNTS OF SAND, SILT AND CLAY (A-2-7 AND A-1-A) BEGINNING AT THE APPROXIMATE STREAMBED ELEVATION. THESE GRANULAR MATERIALS WERE INTERBEDDED WITH GLACIAL TILL CONSISTING OF SANDY SILT (A-4A) AND SILT (A-4B) LAYERS AND COBBLES AND BOULDERS DOWN TO THE BORING TERMINATION DEPTHS.












GROUNDWATER WAS ENCOUNTERED DURING DRILLING AND RANGED IN DEPTH FROM 18 FEET TO 21.5 FEET. UPON COMPLETION OF THE TEST BORINGS THE GROUNDWATER DEPTHS RANGED FROM 14 FEET TO 19 FEET.

D50 VALUES WHICH HAVE BEEN CALCUALTED FOR THE SCOUR ANALYSIS CAN BE FOUND ON PAGE NO. 4 AND 5.

LEGEND

-  AUGER BORING LOCATION
-  PRESS SAMPLE, DRIVE SAMPLE, AND/OR CORE BORING LOCATION
-  TR TOP OF ROCK
-  W INDICATES FREE WATER ELEVATION
-  INDICATES STATIC WATER ELEVATION
-  HORIZONTAL BAR ON BORING INDICATES THE DEPTH THE SAMPLE WAS TAKEN - PROFILE VIEW
-  FIGURES BESIDE THE BORING IN PROFILE INDICATE THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST
-  X = NUMBER OF BLOWS FOR FIRST 6 INCHES
-  Y = NUMBER OF BLOWS FOR SECOND 6 INCHES
-  Z = NUMBER OF BLOWS FOR THIRD 6 INCHES

SYMBOLS OF ROCK TYPES

-  Fire Clay or Underclay
-  Weathered Mudstone
-  Mudstone
-  Weathered Shale
-  Shale
-  Weathered Clay-Shale
-  Clay-Shale
-  Boulders or Cobbles
-  Weathered Siltstone
-  Siltstone
-  Weathered Sandstone
-  Sandstone
-  Leached Dolomite
-  Dolomite
-  Leached Limestone
-  Limestone

PARTICLE SIZE DEFINITIONS

300 mm	75 mm	2.0 mm	0.42 mm	0.074 mm	0.005 mm	
Boulders	Cobbles	Gravel	Coarse Sand	FINE SAND	Silt	Clay
		No. 10 SIEVE	No. 40 SIEVE	No. 200 SIEVE		

NOTES

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATIONS SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR’S OFFICE, THE OFFICE OF MATERIALS MANAGEMENT AT 1600 WEST BROAD STREET, THE OFFICE OF ROADWAY ENGINEERING OR THE OFFICE OF STRUCTURAL ENGINEERING AT 25 SOUTH FRONT STREET, COLUMBUS, OHIO 43215.

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECH-ANICALLY-POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 2 INCH O.D., 1-3/8” I.D. SPLIT SPOON SAMPLING DE-VICE, AT 2-1/2 AND/OR 5 FOOT DEPTH INTERVALS, DRIVEN BY MEANS OF A 140 lb. HAMMER WITH A FREE FALL OF 30 INCHES. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLING DEVICE THREE 18 INCH INCREMENTS IS CONSIDERED THE STANDARD PENETRATION TEST.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF MECHANICALLY POWERED ROTARY-TYPE DRILLING MACHINE, EMPLOYING A 2 INCH O.D. THIN WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE APPLIED BY THE DRILLING MACHINE.

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILLING MACHINE, EMPLOYING AN NQ CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

SAMPLING AND TESTING

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVA-TION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6 INCH INCRE-MENTS, DEPTH AND ELEVATION OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION-BASED ON LABORATORY TESTS UTILIZING GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BED-DING ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVEL-LY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

CTL ENGINEERING, INC.
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LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-24-06

REVIEWED
NT

DRAWN
C.N.

DESIGNED

FILE NUMBER

CHECKED

REVISIED

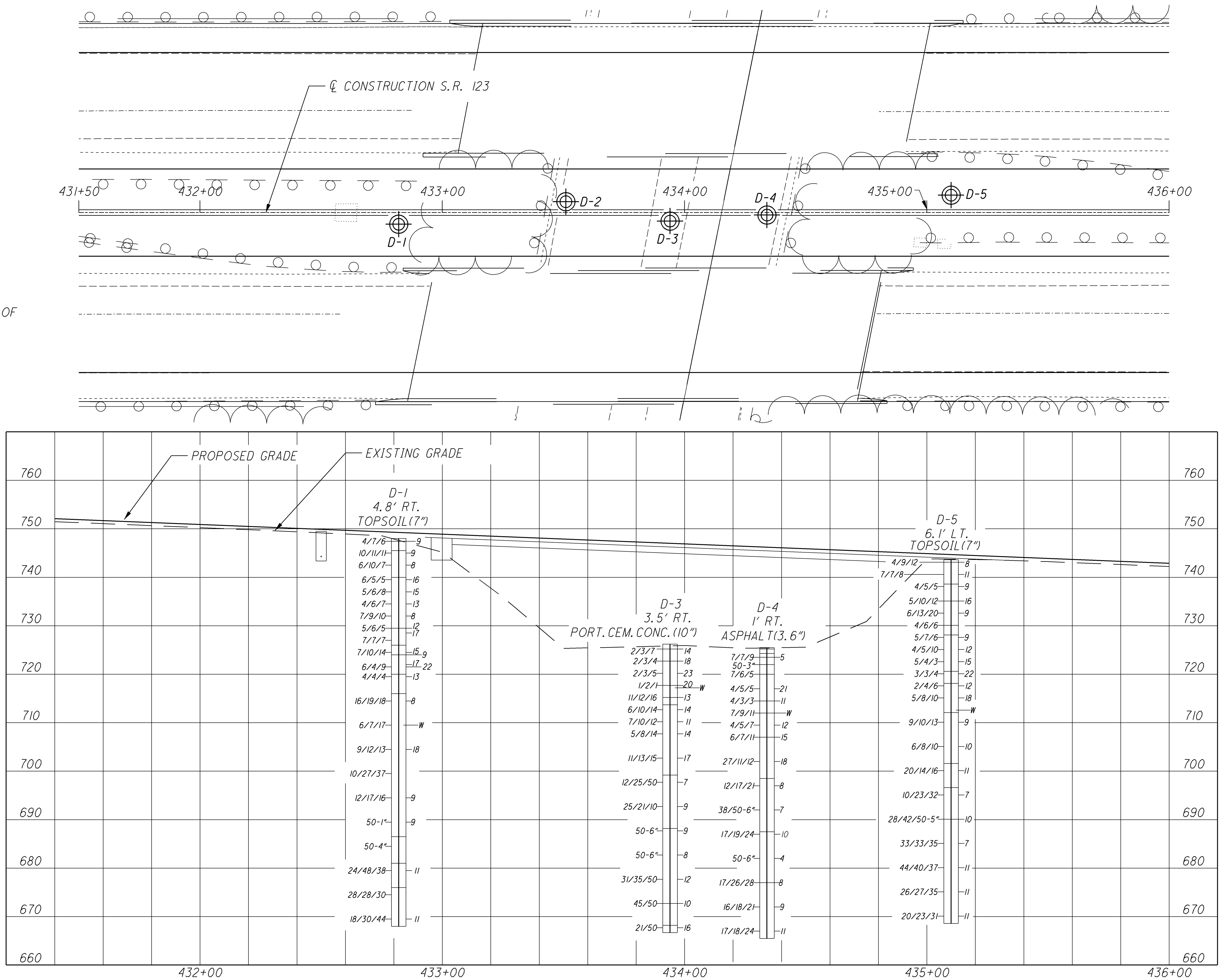
STRUCTURE FOUNDATION INVESTIGATION

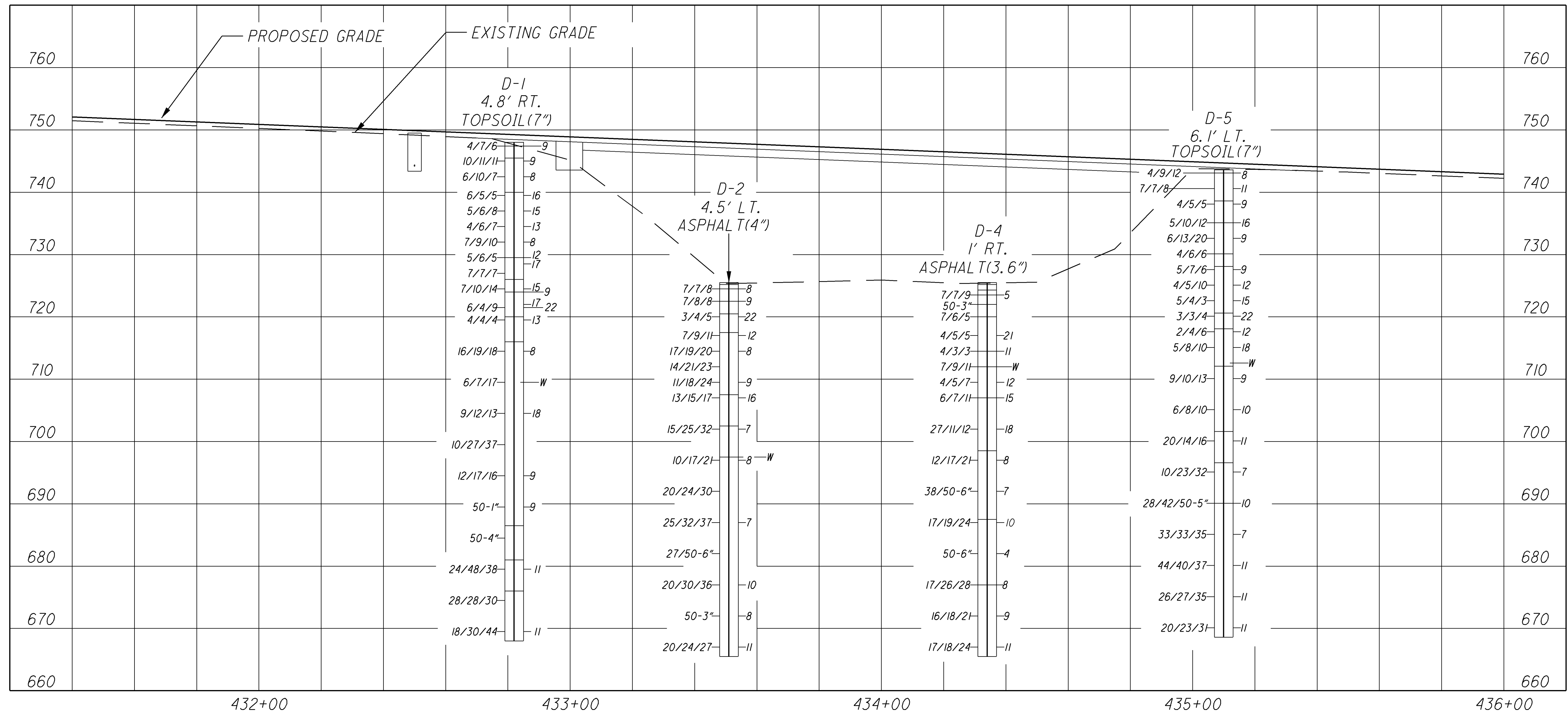
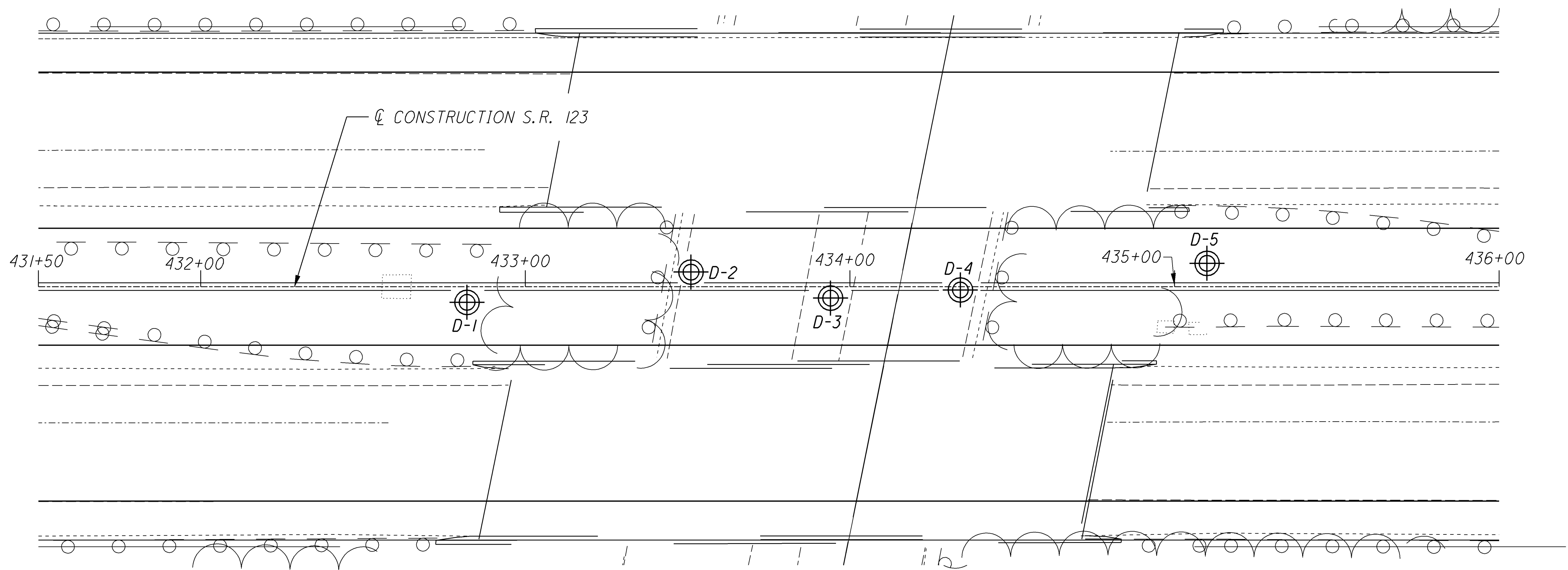
WAR-75-3.40

19



NOTE:
FOR PROFILE VIEW OF
BORING D-2, REFER
SHEET 3 OF 9.





LOG OF BORING																		LOG OF BORING (Continued)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Date Started 2/1/05					Sampler: Type SS Dia. 1.375"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Date Completed 2/2/05					Casing: Length 80ft Dia. 3.25"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Boring No. D-1					Station & Offset 432+82, 4.8' Rt.					Water Elev. 709.5ft Surface Elev. 748.0ft																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</

LOG OF BORING (Continued)

Boring No. D-1

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
676.9																		
676.0	72	28/28/30		72.0'														
674.5	74				Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, some clay, damp, till	21												NO REC.
	76																	
	78																	
669.5					18/30/44		80.0'		22									
668.0	80	Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, some clay, damp, till																

LOG OF BORING

LOG OF BORING (Continued)

Boring No. D-1

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.				
676.9																			
676.0	72	28/28/30			72.0'														
674.5					Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, some clay, damp, till	21													NO REC.
	74																		
	76																		
669.5	78	18/30/44																	
668.0	80				80.0'	22												II	VIS.
BOTTOM OF BORING																			

LOG OF BORING

Date Started 3/1/05
Date Completed 3/1/05

Sampler: Type SS
Casing: Length 60ft

Dia. 1.375"
Dia. 3.25"

Boring No. D-2

Station & Offset 433+51, 4.5' Lt.

Water Elev. 697.5ft
Surface Elev. 725.5ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.				
725.5	0					Asphalt (4")													
725.5	1.0'	7/7/8				Portland cement concrete (8")													
724.5					Brown,stiff, SANDY SILT, some clay, trace gravel, damp, fill	1											8	VIS.	
	2	7/8/8																	
722.5	4				Dark grayish brown, very stiff, SILT AND CLAY, some sand, trace gravel, damp, fill	2	2	16	10	48	24	32	11	9	A-6a				
720.5		3/4/5																	
720.0	6				Brown, loose,GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, moist	3	26	37	11	8	18	51	32	22	A-2-7				
	8	7/9/11																	
717.5					Brown, very stiff, SANDY SILT, little gravel, little clay, damp	4	15	16	31	24	14	19	4	12	A-4a				
717.0	10	17/19/20																	
714.5	12				Brown, hard, SANDY SILT, little gravel, little clay, damp	5	16	19	19	28	18	19	6	8	A-4a				
		14/21/23																	
712.0	14					6											NO REC.		
		11/18/24																	
709.5	16					7										9	VIS.		
		13/15/17																	
707.5	18																		
707.0	20				Gray, hard, SILTY CLAY, little sand, trace gravel, damp	8	1	8	3	26	62	36	18	16	A-6b				
	22																		
	24	15/25/32																	
702.5																			
702.0	26				Brown, hard, SANDY SILT, damp, till	9										7	VIS.		
	28																		
697.5		10/17/21																	
697.0	30																		
	32				Gray, hard, SANDY SILT, some clay, little gravel, damp, till	10	18	14	23	20	25	17	4	8	A-4a				
	34	20/24/30																	
692.0					Gray, hard, SANDY SILT, some clay, little gravel, with cobbles, damp, till	11													VIS.

CTL ENGINEERING, INC.
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LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE 02-24-06
FILE NUMBER

REVIEWED NT
STRUCTURE

DRAWN C.N.
REVISED

DESIGNED
CHECKED

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0817 OVER S.R. 123

WAR-75-3.40

5/9

...\\WAR-75-0817_P_&_P_SHEETS_WITH_ 3/28/2008 11:12:58 AM

LOG OF BORING

Date Started	<u>3/1/05</u>
Date Completed	<u>3/1/05</u>

Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	<u>60ft</u>	Dia.	<u>3.25"</u>

Water Elev.	697.5ft
Surface Elev.	<u>725.5ft</u>

Boring No. D-2

Station & Offset 433+51, 4.5' Lt.[illegible]

LOG OF BORING (Continued)

Boring No. D-2

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
690.5																	
	36	25/32/37					12								7	VIS.	
	38																
687.0	40	27/50-6"					13									NO REC.	
42																	
682.0	44	20/30/36					14								10	VIS.	
	46																
677.0	48	50-3"					15								8	VIS.	
	50																
672.0	52	20/24/27					16									VIS.	
	54																
667.0	56																
	58																
665.5	60				60.0'												

BOTTOM OF BORING

LOG OF BORING

LOG OF BORING (Continued)

Boring No. D-2

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
690.5																		
	36																	
687.0	38	25/32/37					12									7		VIS.
	40																	
	42																	
682.0	44	27/50-6"					13											NO REC.
	46																	
	48																	
677.0	50	20/30/36					14									10		VIS.
	52																	
672.0	54	50-3"					15									8		VIS.
	56																	
667.0	58	20/24/27					16									11		VIS.
665.5	60				60.0'													
BOTTOM OF BORING																		

LOG OF BORING

Date Started 1/14/05
Date Completed 1/14/05

Sampler: Type SS
Casing: Length 59.5ft

Dia. 1.375"
Dia. 3.25"

Water Elev. 717.2ft
Surface Elev. 726.2ft

Boring No. D-3
Station & Offset 433+94, 3.5' Rt.

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
726.2	0					Portland cement concrete (10")												
725.2	2	2/3/7			1.0'	Brown, stiff, SANDY SILT, trace gravel, damp	1										14	VIS.
722.7	4	2/3/4			3.5'	Brownish gray, medium stiff, SANDY SILT, some clay, trace gravel, damp	2										18	VIS.
720.2	6	2/3/5				Brownish gray, medium stiff, SANDY SILT, some clay, trace gravel, moist	3	3	15	18	41	23	31	10		23		A-4a
718.2	8				8.5'	Brown, very loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, trace clay, damp	4	46	28	9	11	6	26	8		20		A-2-4
717.7	10	1/2/1			11.0'	Brown, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, trace clay, damp	5										13	VIS.
715.2	12	11/12/16			12.5'	Gray, very stiff, SANDY SILT, little gravel, little clay, damp, till	6										14	VIS.
714.7	14	6/10/14				Gray, very stiff, SANDY SILT, little gravel, little clay, damp, till	7	19	16	14	30	21	20	6		11		A-4a
712.7	16	7/10/12			18.5'	Brownish gray, very stiff, SANDY SILT, some clay, little gravel, damp, till	8										14	VIS.
710.2	18	5/8/14				Brownish gray, very stiff, SANDY SILT, some clay, little gravel, moist, till	9	11	12	9	44	24	20	4		17		A-4a
707.7	20	12/25/50			27.0'	Gray, hard, SANDY SILT, some gravel, damp, till	10										7	VIS.
702.7	24	25/21/10					11										9	VIS.
699.2	26																	
697.7	28																	
692.7	32																	
	34																	

CTI ENGINEERING, INC.
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LOVELAND, OHIO 45140
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DATE 02-24-06
REVIEWED NT
DRAWN C.N.
DESIGNED
CHECKED

STRUCTURE FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0817 OVER S.R. 123

WAR-75-3.40

6/9

...\\WAR-75-0817_P_&P_SHEETS_WITH_ 3/28/2008 11:13:58 AM

Boring No. D-3 Station & Offset 433+94, 3.5' Rt.

[illegible]

LOG OF BORING (Continued)

Boring No. D-3

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.		
691.2																		
	36	50-6"			38.0'													
688.2	38																	
687.7							Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, damp, till	12	50	14	11	11	14	20	6	9	A-1-b	
	40																	
	42	50-6"			38.0'													
682.7	44							13								8	VIS.	
	46																	
	48																	
677.7		31/35/50			38.0'		14									12	VIS.	
	50																	
	52																	
672.7	54		45/50				53.5'	Greenish and bluish gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, with limestone fragments, damp, till	15								10	VIS.
	56																	
668.2	58																	
667.7		21/50			58.0'													
666.7							Greenish gray, hard, SILT AND CLAY, some sand, little gravel, with limestone	16	20	16	8	18	38	30	13	16	A-6a	

BOTTOM OF BORING

LOG OF BORING (Continued)

Boring No. D-3

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.				
691.2	36	50-6"			38.0'														
688.2	38																		
687.7	40																		
	42																		
682.7	44	50-6"					12	50	14	11	11	14	20	6	9		A-I-b		
	46	31/35/50			53.5'														
677.7	48																		
	50																		
	52																		
672.7	54	45/50					15								10		VIS.		
	56	21/50			58.0'														
668.2	58																		
667.7																			
666.7																			
BOTTOM OF BORING																			

LOG OF BORING

Boring No. D-4

Station & Offset 434+34, 1.0' Rt.

Water Elev. 712.0ft
Surface Elev. 725.5ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.				
725.5	0	7/7/9				0.3' Asphalt													
725.5	1.2'					Concrete													
725.2	2.0'					Gravel roadbase													
724.3																			
723.5	2					Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little silt, trace clay, with	1	50	19	13	11	7	NP	NP	5	A-I-b			
722.0	4	50-3"				wood/cobbles/boulders, damp, fill	2									NO REC.			
720.0	6	7/6/5				Brown, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, with wood/cobbles/boulders, fill	3									VIS.			
717.0	8	4/5/5				Brown, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, with wood/cobbles/boulders, damp, fill	4								21	VIS.			
714.5	10																		
712.0	12	4/3/3				Gray, medium stiff, SANDY SILT, trace gravel, damp, till	5								11	VIS.			
709.5	14	7/9/11				Gray, very stiff, SANDY SILT, and clay, trace gravel,damp, till	6									NO REC.			
707.0	16	4/5/7				Gray, stiff, SANDY SILT, and clay, trace gravel, damp, till	7	3	5	13	41	38	22	8	12	A-4a			
702.0	18	6/7/11				Gray, very stiff, SILT AND CLAY, trace gravel, trace sand, damp, till	8	2	1	1	51	45	27	11	15	A-6a			
698.5	20	27/11/12					9								18	VIS.			
697.0	22																		
	24																		
	26																		
692.0	28	12/17/21				Gray, hard, SANDY SILT, some clay, some gravel, damp, till	10	25	14	22	16	23	18	5	8	A-4a			
	30	38/50-6"					11								7	VIS.			
	32																		
	34																		

CTI ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE 02-24-06

REVIEWED NT

DRAWN C.N.

DESIGNED

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FILE NUMBER

STRUCTURE

REVIS

STRUCTURE FOUNDATION INVESTIGATION

BRIDGE NO. WAR-75-0817 OVER S.R. 123

WAR-75-3.40

7/9

LOG OF BORING

Date Started 3/2/05

Date Completed 3/2/05

Sampler: Type SS Dia. 1.375"

Casing: Length 60ft Dia. 3.25"

Water Elev. 712.0ft

Surface Elev. 725.5ft

Boring No. D-4

Station & Offset 434+34, 1.0' Rt.[illegible]

LOG OF BORING (Continued)

Boring No. D-4

[illegible]

BOTTOM OF BORING

Boring No. D-4

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
690.5																
	36	17/19/24			38.0'											
687.5	38															
687.0																
	40															
	42															
682.0		50-6"			48.5'		12	37	16	18	17	12	NP	NP	10	A-2-4
	44													4	VIS.	
	46															
	48	17/26/28			48.5'											
677.0															8	VIS.
	50															
	52	16/18/21			48.5'											
672.0																
	54															
	56	17/18/24			48.5'											
667.0																
	58															
665.5	60				60.0'		16								11	VIS.
BOTTOM OF BORING																

Date Started 2/1/05
Date Completed 2/1/05

Sampler: Type SS Dia. 1.375"
Casing: Length 75ft Dia. 3.25"

Boring No. D-5

Station & Offset 435+10, 6.1' Lt.

Water Elev. 712.6ft
Surface Elev. 743.6ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
743.6	0															
743.6		4/9/12			0.5'	Topsoil (7")										
743.1						Brown, very stiff, SANDY SILT, damp	1								8	VIS.
	2															
740.6		7/7/8				Brown, stiff, SANDY SILT, damp	2								11	VIS.
	4															
738.6					5.0'											
738.1		4/5/5				Brown, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, trace clay, damp	3	36	14	22	19	9	21	3	9	A-2-4
	6															
	8				8.5'											
735.1		5/10/12				Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, damp	4								16	VIS.
	10															
732.6		6/13/20				Brown, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, damp	5								9	VIS.
	12															
730.1		4/6/6			13.5'	Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, damp	6									VIS.
	14															
					15.5'											
728.1		5/7/6				Dark brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, damp	7								9	VIS.
727.6	16															
	18															
725.1		4/5/10				Dark brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, damp	8	35	26	15	12	12	30	13	12	A-2-6
	20															
722.6		5/4/3			21.0'	Dark brown, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, damp	9								15	VIS.
	22															
720.6					23.0'											
720.1		3/3/4				Gray, medium stiff, SILT AND CLAY, damp	10									22
	24															
718.1					25.5'											
717.6	26	2/4/6				Brownish gray, stiff, SILT AND CLAY, some sand, little gravel, damp	11									12
	28															
715.1		5/8/10				Brownish gray, very stiff, SILT AND CLAY, some sand, little gravel, damp	12	12	27	0	22	39	36	15	18	A-6a
	30															
712.1					31.5'											
	32															
710.1	34	9/10/13				Brown, very stiff, SANDY SILT, some clay, trace gravel, damp, till	13								9	VIS.

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-24-06

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C.N.

DESIGNED
CHECKED

STRUCTURE FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0817 OVER S.R. 123

WAR-75-3.40

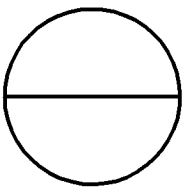
8/9

Boring No. D-5

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
708.6																	
	36	6/8/10				Brown, very stiff, SANDY SILT, some clay, trace gravel, damp, till	14	7	26	10	27	30	24	8	10	A-4a	
705.1	38																
	40																
701.6	42																
	44	20/14/16			42.0'	Brownish gray, very stiff, SANDY SILT, some clay, little gravel, damp till	15								11	VIS.	
700.1	46																
	48	10/23/32			47.0'	Brown, hard, SANDY SILT, some gravel, damp, till	16								7	VIS.	
696.6	50																
695.1	52																
691.6	54																
690.1	56	28/42/50-5"			53.5'	Gray, hard, SANDY SILT, some gravel, damp, till	17								10	VIS.	
	58																
685.1	60																
	62																
680.1	64	44/40/37					18								7	VIS.	
	66																
	68	26/27/35					19								11	VIS.	
675.1	70																

Boring No. D-5

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
672.5	72	20/23/31					21								II	VIS.
670.1	74															
668.6																
BOTTOM OF BORING																



WAR-75-3.40

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0817 OVER S.R. 123

DESIGNED	DRAWN	REVIEWED
CHECKED	C.N.	NT
	REVISED	STRUCTURE FILE NUMBER

DATE
02-24-06

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

LOG OF BORING

Date Started 2/1/05
Date Completed 2/1/05

Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	75ft	Dia.	3.25"

Boring No. D-5

Station & Offset 435+10. 6.1' Lt.

Water Elev.	712.6ft
Surface Elev.	<u>743.6ft</u>

[illegible]

Boring No. D-5

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
708.6																	
	36	6/8/10				Brown, very stiff, SANDY SILT, some clay, trace gravel, damp, till	14	7	26	10	27	30	24	8	10	A-4a	
705.1	38																
	40																
701.6	42																
	44	20/14/16			42.0'	Brownish gray, very stiff, SANDY SILT, some clay, little gravel, damp till	15								11	VIS.	
700.1	46																
	48	10/23/32			47.0'	Brown, hard, SANDY SILT, some gravel, damp, till	16								7	VIS.	
696.6	50																
695.1	52																
691.6	54																
690.1	56	28/42/50-5"			53.5'	Gray, hard, SANDY SILT, some gravel, damp, till	17								10	VIS.	
	58																
685.1	60																
	62																
680.1	64	44/40/37					18								7	VIS.	
	66																
	68	26/27/35					19								11	VIS.	
675.1	70																

Boring No. D-5

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
672.5	72	20/23/31					21								II	VIS.
670.1	74															
668.6																
BOTTOM OF BORING																

WAR-75-3.40

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0817 OVER S.R. 123

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STRUCTURE FILE NUMBER

DATE
02-24-06

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

...\\WAR-75-0864_P_&P_SHEETS_WITH_ 3/28/2008 11:22:04 AM

Date Started 1/28/05
Date Completed 1/31/05

Sampler: Type SS Dia. 1.375"
Casing: Length 90ft Dia. 3.25"

Water Elev. 678.7ft
Surface Elev. 703.2ft

Boring No. E-I Station & Offset 20+22.48, 17.26' Lt.

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
703.2	0															
703.2 702.7		3/5/7				Brown, stiff, SANDY SILT, some clay, little gravel, damp, fill	1								9	VIS.
	2															
700.2		10/8/8				Brown, very stiff, SANDY SILT	2									NO REC.
	4															
697.7		4/6/6				Brown, stiff, SANDY SILT, some clay, little gravel, damp, fill	3	15	9	19	29	28	26	10	12	A-4a
	6															
695.2	8				8.0'											
694.7		6/10/12				Brown, very stiff, SANDY SILT, some clay, some gravel, damp, fill	4								8	VIS.
	10															
692.2		20/17/14				Brown, hard, SANDY SILT, some clay, some gravel, damp, fill	5								9	VIS.
	12															
689.7		10/8/6			13.5'	Brown, stiff, SANDY SILT, fill	6									NO REC.
	14															
687.2	16				16.0'											
		3/3/4				Brown, medium stiff, SANDY SILT, some clay, moist	7	0	10	41	25	24	23	5	17	A-4a
	18															
684.7		4/4/5				Brown, stiff, SANDY SILT, some clay, moist	8									VIS.
	20															
682.2		3/4/5			21.0'	Gray, stiff, SILTY CLAY, trace sand, moist	9	0	0	0	30	70	37	18	22	A-6b
	22															
679.7		4/4/22				Gray, very stiff, SILTY CLAY, some gravel, trace sand, moist	10A								19	VIS.
678.7					24.5'	Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, trace silt, trace clay, damp	10B								12	VIS.
677.2	26	15/15/17			26.0'	Brown, dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, trace silt, trace clay, damp	11								6	VIS.
	28															
674.7		10/12/20				Brown, dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, trace silt, trace clay, damp	12	54	31	10	3	2	NP	NP	9	A-1-a
	30															
	32															
669.7		5/3/4			33.5'	Gray, medium stiff, SILT AND CLAY, trace sand, moist	13								18	VIS.
668.7	34															

Boring No. E-I

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
668.2	36	3/5/6				Gray, stiff,SILT AND CLAY, trace sand, moist	14								20	VIS.
664.7	38															
	40															
	42															
659.7	44	3/5/5				Gray, stiff, SILT AND CLAY, trace sand, moist	15	0	2	4	43	51	28	11	19	A-6a
	46	3/4/6					16								18	VIS.
654.7	48															
	50															
	52															
649.7	54	2/3/3			54.0'	Gray, medium stiff, SILT AND CLAY, trace sand, moist	17A								19	VIS.
649.2	54				Gray, medium stiff, SANDY SILT, some gravel, some clay, moist	17B	19								VIS.	
	56	23/50-6"				Gray, hard, SANDY SILT, trace gravel, some clay, damp	18								11	VIS.
644.7	58															
	60															
641.7	62															
639.7	64	50-4"			61.5'	Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, damp, till	19								8	VIS.
	66															
	68															
634.7	70															
		50-5"					20								7	VIS.

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-24-06

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STRUCTURE FILE NUMBER

STRUCTURE REVISED

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0864 OVER CLEAR CREEK

WAR-75-3.40

3/8

Date Started1/28/05
Date Completed1/31/05

Sampler: TypeSSDia. 1.375"
Casing: Length90ftDia. 3.25"

Boring No.E-1Station & Offset20+22.48, 17.26' Lt.

Water Elev.678.7ft
Surface Elev.703.2ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
703.2	0																
703.2 702.7	— 2	3/5/7				Brown, stiff, SANDY SILT, some clay, little gravel, damp, fill	1									9	VIS.
700.2	— 4	10/8/8				Brown, very stiff, SANDY SILT	2										NO REC.
697.7	— 6	4/6/6				Brown, stiff, SANDY SILT, some clay, little gravel, damp, fill	3	15	9	19	29	28	26	10	12		A-4a
695.2 694.7	8 — 10	6/10/12			8.0'	Brown, very stiff, SANDY SILT, some clay, some gravel, damp, fill	4									8	VIS.
692.2	— 12	20/17/14				Brown, hard, SANDY SILT, some clay, some gravel, damp, fill	5									9	VIS.
689.7	— 14	10/8/6			13.5'	Brown, stiff, SANDY SILT, fill	6										NO REC.
687.2	16 — 18	3/3/4			16.0'	Brown, medium stiff, SANDY SILT, some clay, moist	7	0	10	41	25	24	23	5	17		A-4a
684.7	— 20	4/4/5				Brown, stiff, SANDY SILT, some clay, moist	8										VIS.
682.2	— 22	3/4/5			21.0'	Gray, stiff, SILTY CLAY, trace sand, moist	9	0	0	0	30	70	37	18	22		A-6b
679.7	— 24	4/4/22				Gray, very stiff, SILTY CLAY, some gravel, trace sand, moist	10A									19	VIS.
678.7	— 26				24.5'	Gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, trace silt, trace clay, damp	10B									12	VIS.
677.2	26 — 28	15/15/17			26.0'	Brown, dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, trace silt, trace clay, damp	11									6	VIS.
674.7	— 30	10/12/20				Brown, dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, trace silt, trace clay, damp	12	54	31	10	3	2	NP	NP	9		A-1-a
669.7 668.7	— 34	5/3/4			33.5'	Gray, medium stiff, SILT AND CLAY, trace sand, moist	13									18	VIS.

Boring No. E-1

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class									
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.								
668.2	36	3/5/6				Gray, stiff,SILT AND CLAY, trace sand, moist	14									20	VIS.							
664.7	38																							
	40																							
	42																							
659.7	44	3/5/5				Gray, stiff, SILT AND CLAY, trace sand, moist	15	0	2	4	43	51	28	11	19	A-6a								
	46	3/4/6					16									18	VIS.							
654.7	48																							
	50																							
	52																							
649.7	54	2/3/3			54.0'	Gray, medium stiff, SILT AND CLAY, trace sand, moist	17A									19	VIS.							
649.2	54				Gray, medium stiff, SANDY SILT, some gravel, some clay, moist	17B	19									VIS.								
	56	23/50-6"					18																11	VIS.
	58																							
644.7	60																							
	62																							
641.7	62	50-4"			61.5'	Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, damp, till	19									8	VIS.							
639.7	64																							
	66																							
	68																							
634.7	68	50-5"					20									7	VIS.							
	70																							

LOG OF BORING (Continued)

Boring No. E-1

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class													
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.														
632.1																													
629.7	72	50-6"			Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, damp, till	21									7	VIS.													
	74																												
	76																												
624.7	78	43/50-4"				86.0'	22	16	28	21	18	17	16	3	8	A-2-4													
	80																												
	82																												
619.7	84	50-3"		23											5	VIS.													
617.2	86	36/48/50-5"															24											14	VIS.
88																													
614.7																													
613.2	90																												
					90.0'																								

Boring No. E-1

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
632.1	72	50-6"					21								7	VIS.
629.7	74															
	76															
	78															
624.7	80															
	82	43/50-4"				Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, damp, till	22	16	28	21	18	17	16	3	8	A-2-4
	84															
619.7	86															
	88															
617.2	90															
	92	50-3"					23								5	VIS.
614.7	94															
	96															
613.2	98															
	100															
		36/48/50-5"													14	VIS.
BOTTOM OF BORING																

Date Started 2/22/05
Date Completed 2/22/05

Sampler: Type SS Dia. 1.375"
Casing: Length 85.0ft Dia. 3.25"

Boring No. E-2

Station & Offset 20+70.44, 29.5' Rt.

Water Elev. 674.3ft
Surface Elev. 702.9ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
702.9	0					Boring through bridge deck											
	2																
	4																
	6																
	8																
	10																
	12																
	14																
	16																
	18																
682.9	20	1/1/2			20.0'	Brown, soft, SILT AND CLAY, little sand, trace gravel, damp	1	9	5	11	28	47	31	11	17		A-6a
681.4	22	2/2/2			21.5'	Brown, soft, SANDY SILT, little clay, little gravel, damp	2	13	12	23	32	20	22	7	10		A-4a
679.9	24	0/0/2			23.0'	Gray, soft, SANDY SILT, some gravel, little clay, damp, till	3	23	13	18	28	18	21	6	13		A-4a
678.4		2/2/3					4										NO REC.
676.9	26	5/3/3					5										NO REC.
675.4	28	3/3/2					6										NO REC.
673.9	30	3/3/3			29.0'	Gray, medium stiff, SILT AND CLAY, little gravel, trace sand, damp, till	7	16	4	1	34	45	31	12	18		A-6a
671.9	32	5/5/7				Gray, stiff, SILT AND CLAY, trace sand, damp, till	8	0	0	1	37	62	32	13	18		A-6a
668.9	34	5/6/7					9								20		VIS.

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-24-06

REVIEWED
NT

DRAWN
C.N.

DESIGNED
CHECKED

STRUCTURE FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0864 OVER CLEAR CREEK

WAR-75-3.40

4/8



Boring No. E-2

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
667.9																	
666.4	36	10/12/17			36.5'												
	Gray, very stiff, SILT AND CLAY, till					10										NO REC.	
663.9	38	8/8/12				Gray, very stiff, SILT AND CLAY, trace sand, moist, till	11									20	VIS.
	40																
	42																
659.4	44	6/7/7			43.5'	Gray, stiff, SILT AND CLAY, trace sand, moist, till	12									22	VIS.
	46																
	48																
654.4	50	6/10/15			48.5'	Gray, very stiff, SILT AND CLAY, trace sand, moist, till	13									24	VIS.
	52																
649.9	54	10/15/16			53.0'	Gray, hard, SILT, some clay, trace sand, damp	14	0	0	1	73	26	NP	NP		20	A-4b
649.4	56																
644.9	58	10/15/47			58.0'	Gray, hard, SANDY SILT, some clay, trace gravel, damp, till	15									12	VIS.
644.4	60																
	62																
639.4	64	29/50-6"				Gray, hard, SANDY SILT, some clay, trace gravel, damp, till	16	9	10	21	28	32	20	6		10	A-4a
	66																
	68																
634.4	70	23/50-6"					17									10	VIS.

Boring No. E-2

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
631.8																	
	72	50-6"					18									10	VIS.
629.4																	
	74																
	76	16/20/31															
625.9																	
	78																
624.4																	
	80	17/24/30				Gray, hard, CLAY, some sand, little silt, trace gravel, moist, till	19	3	24	0	11	62	41	19		23	A-7-6
	82																
619.4	84						20									18	VIS.
617.9																	

BOTTOM OF BORING

D ₅₀ VALUES			
BOREHOLE	DEPTH	SAMPLE	D50
E-1	5.5	3	0.033
E-1	16	7	0.077
E-1	28.5	12	2.273
E-1	43.5	15	0.005
E-1	78.5	22	0.26
E-2	20	1	0.007
E-2	21.5	2	0.063
E-2	23	3	0.104
E-2	29	7	0.006
E-2	31.5	8	0.003
E-2	53.5	14	0.012
E-2	63.5	16	0.021
E-3	23	3	0.674
E-3	24.5	4	1.324
E-3	26	5	3.854
E-3	27.5	6	2.716
E-3	32.5	8	0.004
E-3	37.5	10	0.018
E-3	53.5	13	0.004
E-3	68.5	16	2.019
E-4	5.5	3	0.045
E-4	18.5	8	2.606
E-4	23.5	10	3.414
E-4	15	15	0.003
E-4	58.5	18	0.003

LOG OF BORING

Date Started 2/22/05
Date Completed 2/22/05

Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>
Casing: Length	<u>85.0ft</u>	Dia.	<u>3.25"</u>

Water Elev.	<u>674.3ft</u>
Surface Elev.	<u>702.9ft</u>

Boring No. E-2

Station & Offset 20+70.44, 29.5' Rt.[illegible]

Boring No. E-2

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
667.9																	
666.4	36	10/12/17			36.5'												
	Gray, very stiff, SILT AND CLAY, till					10										NO REC.	
663.9	38	8/8/12				Gray, very stiff, SILT AND CLAY, trace sand, moist, till	11									20	VIS.
	40																
	42																
659.4	44																
	46																
	48																
654.4	50																
	52																
649.9	54																
649.4	56																
	60																
	62																
639.4	64																
	66																
	68																
634.4	70																

Boring No. E-2

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
631.8																	
629.4	72	50-6"					18									10	VIS.
	74																
	76																
625.9					77.0'												
624.4	78	16/20/31				Gray, hard, CLAY, some sand, little silt, trace gravel, moist, till	19	3	24	0	11	62	41	19		23	A-7-6
	80																
	82																
619.4																	
	84	17/24/30					20									18	VIS.
617.9					85.0'												

BOTTOM OF BORING

D ₅₀ VALUES			
BOREHOLE	DEPTH	SAMPLE	D50
E-1	5.5	3	0.033
E-1	16	7	0.077
E-1	28.5	12	2.273
E-1	43.5	15	0.005
E-1	78.5	22	0.26
E-2	20	1	0.007
E-2	21.5	2	0.063
E-2	23	3	0.104
E-2	29	7	0.006
E-2	31.5	8	0.003
E-2	53.5	14	0.012
E-2	63.5	16	0.021
E-3	23	3	0.674
E-3	24.5	4	1.324
E-3	26	5	3.854
E-3	27.5	6	2.716
E-3	32.5	8	0.004
E-3	37.5	10	0.018
E-3	53.5	13	0.004
E-3	68.5	16	2.019
E-4	5.5	3	0.045
E-4	18.5	8	2.606
E-4	23.5	10	3.414
E-4	15	15	0.003
E-4	58.5	18	0.003

LOG OF BORING																	LOG OF BORING (Continued)																
Date Started		2/22/05		Sampler: Type		SS		Dia.		1.375"		Date Completed		2/23/05		Casing: Length		90.0ft		Dia.		3.25"		Water Elev.		678.6ft							
Boring No.		E-3		Station & Offset		21+41.46, 29.39' Lt.		Surface Elev.		702.6ft		Boring No.		E-3																			
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class																	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.																		
702.6	0					Boring through bridge deck																											
702.6	2																																
	4																																
	6																																
	8																																
	10																																
	12																																
	14																																
	16																																
	18																																
682.6	20	12/5/4			20.0'																												
						Brown, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, damp	1																										
681.1	22	4/9/3			21.5'																												
						Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little clay, trace silt, damp	2																										
679.6	24	7/5/7			24.5'																												
						Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little clay, trace silt, damp	3	29	29	21	8	13	20	3	13																		
678.1		4/3/3																															
						Brownish gray, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, some clay, damp	4	45	17	9	7	22	26	10	10																		
676.6	26	17/19/21			26.0'																												
						Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	5	60	18	13	5	4	NP	NP	8																		
675.1	28	14/19/22																															
						Brownish gray, dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	6	56	23	12	5	4	NP	NP	7																		
672.6	30	14/16/18			30.0'																												
						Brownish gray, hard, SILT AND CLAY, trace sand, moist, till	7																										
670.1	32	12/15/17																															
						Brownish gray, hard, SILT AND CLAY, trace sand, moist, till	8	0	0	4	39	57	31	13	18																		
667.6	34																																
	35.0'																																
Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class																	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.																		
667.6	36	11/12/9				Gray, very stiff, SILT, little sand, trace clay, damp, till	9									20	VIS.																
665.1	38	11/12/14				Gray, very stiff, SILT, little sand, trace clay, damp, till	10	0	0	12	78	10	NP	NP	18		A-4b																
	40																																
660.6	42				42.0'																												
659.1	44	9/5/7				Gray, stiff, SILT, some sand, damp, till	11									18	VIS.																
	46																																
655.6	48				47.0'																												
654.1	50	4/5/5				Gray, stiff, SANDY SILT, and clay, moist, till	12									21	VIS.																
	52																																
649.1	54	4/4/5				Gray, stiff, SANDY SILT, and clay, moist, till	13	0	0	2	46	52	24	7	19		A-4a																
	56																																
645.6	58				57.0'																												
644.1	60	14/17/23				Gray, hard, SANDY SILT, damp, till	14									11	VIS.																
	62																																
639.1	64	9/24/27				Gray, hard, SANDY SILT, till	15										NO REC.																
636.6	66				66.0'																												
634.1	68	19/21/20				Grayish brown, dense, GRAVEL AND/OR STONE FRAGMENTS, and sand, trace silt, trace clay, damp	16	51	40	5	3	1	NP	NP	7		A-1-a																
	70																																

LOG OF BORING

Date Started2/22/05

Date Completed2/23/05

Sampler: TypeSS

Casing: Length90.0ft

Dia.1.375"

Dia.3.25"

Boring No.E-3

Station & Offset21+41.46, 29.39' Lt.

Water Elev.678.6ft

Surface Elev.702.6ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.		
702.6	0					Boring through bridge deck												
702.6	2																	
	4																	
	6																	
	8																	
	10																	
	12																	
	14																	
	16																	
	18																	
682.6	20	12/5/4			20.0'													
						Brown, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, damp	1									17	VIS.	
681.1	22	4/9/3			21.5'											13	VIS.	
						Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little clay, trace silt, damp	2											
679.6	24	7/5/7			24.5'											13	A-I-b	
						Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, little clay, trace silt, damp	3	29	29	21	8	13	20	3		13		
678.1		4/3/3			26.0'											10	A-2-4	
						Brownish gray, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, some clay, damp	4	45	17	9	7	22	26	10	10			
676.6	26	17/19/21			30.0'											8	A-I-a	
						Brownish gray, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	5	60	18	13	5	4	NP	NP		7	A-I-a	
675.1	28	14/19/22														7		
						Brownish gray, dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	6	56	23	12	5	4	NP	NP				
672.6	30	14/16/18																
						Brownish gray, hard, SILT AND CLAY, trace sand, moist, till	7										NO REC.	
670.1	32	12/15/17																
						Brownish gray, hard, SILT AND CLAY, trace sand, moist, till	8	0	0	4	39	57	31	13	18		A-6a	
667.6	34				35.0'													

Boring No.E-3

LOG OF BORING (Continued)

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)			Description	Sample No.	Physical Characteristics							ODOT Class		
									% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
667.6		11/12/9					Gray, very stiff, SILT, little sand, trace clay, damp, till	9									20	VIS.
	36																	
665.1		11/12/14					Gray, very stiff, SILT, little sand, trace clay, damp, till	10	0	0	12	78	10	NP	NP		18	A-4b
	38																	
	40																	
	42				42.0'													
660.6																		
	44	9/5/7					Gray,											

LOG OF BORING (Continued)

Boring No. E-3

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
631.5																	
629.1	72	17/19/24			77.0'		17								4	VIS.	
	74																
	76																
625.6		50-6"			77.0'	Gray, hard, SANDY SILT, little gravel, damp, till	18								10	VIS.	
78																	
80																	
82																	
619.1	84	50-5"			87.0'		19								10	VIS.	
	86																
615.6		41/50-5"			87.0'	Gray, hard, SILT AND CLAY, damp, till	20								17	VIS.	
88																	
614.1																	
612.6	90																

BOTTOM OF BORING

Boring No. E-3

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
631.5																
629.1	72	17/19/24					17								4	VIS.
	74															
625.6	76															
	78															
624.1	80	50-6"				Gray, hard, SANDY SILT, little gravel, damp, till	18								10	VIS.
	82															
619.1	84	50-5"					19								10	VIS.
	86															
615.6	88															
	90															
614.1		41/50-5"				Gray, hard, SILT AND CLAY, damp, till	20								17	VIS.
612.6																

BOTTOM OF BORING

Date Started 1/27/05
Date Completed 1/28/05

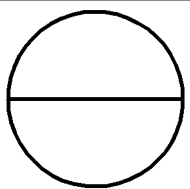
Sampler: Type SS Dia. 1.375"
Casing: Length 90ft Dia. 3.25"

Boring No. E-4

Station & Offset 21+82.26, 18.51' Rt.

Water Elev. 681.2ft
Surface Elev. 702.2ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
702.2	0															
702.2 702.0 701.7		4/4/6			0.2'	Topsoil (2") Brown, stiff, SANDY SILT, fill	1									NO REC.
	2															
699.2		4/3/4				Brown, medium stiff, SANDY SILT, some clay, damp, fill	2								14	VIS.
	4															
696.7		2/2/2			5.5'	Brown, soft, SANDY SILT, little gravel, some clay, damp, fill	3	11	12	22	29	26	20	5	12	A-4a
	6															
	8															
693.7		6/10/9			8.5'	Brown, very stiff, SANDY SILT, little gravel, some clay, damp, fill	4								10	VIS.
	10															
691.2		8/7/8			11.0'	Dark brown, stiff, SANDY SILT, little gravel, some clay, damp, fill	5								13	VIS.
	12															
688.7		3/3/6			13.5'	Brown, medium stiff, SANDY SILT, some clay, damp	6								10	VIS.
	14															
686.7 686.2	16	7/6/7			15.5'	Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	7								5	VIS.
	18															
683.7		6/5/8				Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	8	55	24	11	6	4	NP	NP	5	A-I-a
	20															
681.7 681.2		2/4/5				Brown, loose, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	9								8	VIS.
	22															
678.7		4/5/6				Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	10	61	19	8	8	4	NP	NP	11	A-I-a
	24															
676.2		6/4/14				Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	11								9	VIS.
	26															
	28															
673.7		14/15/20			28.5'	Brown, dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, little silt, little clay, damp	12								9	VIS.
	30															
	32															
668.7		6/11/14			33.5'	Gray, very stiff, SILT AND CLAY, trace sand, damp	13	0	1	1	32	66	32	13	17	A-6a
	34															



Boring No. E-4

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class														
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.															
667.2	36	5/5/8			39.5'	Gray, stiff, SILT AND CLAY, trace sand, moist	14A								20	VIS.														
663.7	38																Gray, stiff, SANDY SILT, and clay, moist	14B	21	VIS.										
662.7	40					Gray, stiff, SANDY SILT, and clay, moist	15								0	2					5	35	58	26	8	18	A-4a			
	42							4/5/8																						
658.7	44	3/3/5																										16		
	46						0/0/3			53.5'	Gray, medium stiff, SANDY SILT, and clay, moist																			
653.7	48	Gray, soft, SANDY SILT, and clay, moist	17																										18	VIS.
	50					Gray, hard, SILT AND CLAY, trace gravel, trace sand, damp, till					18	6	3	4	30	57	34	15	15	A-6a										
648.7	52	58.5'																												
	54						9/18/23																							
643.7	56	38/50-6"																									9	VIS.		
	58					50-3"																								
638.7	60																													
	62																													
633.7	64																													
	66																													
	68																													
	70																													

Boring No. E-4

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
631.1	72	43/50-6"					21									9	VIS.
628.7	74																
	76																
625.2	78																
623.7	80	10/23/42				Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, damp, till	22									17	VIS.
620.7	82																
618.7	84	11/18/22				Gray, hard, SANDY SILT, little clay, moist, till	23									17	VIS.
	86																
	88																
613.7	90																
612.2	90	12/15/24					24									17	VIS.
BOTTOM OF BORING																	

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-24-06

REVIEWED
NT

DRAWN
C.N.

DESIGNED
CHECKED

STRUCTURE FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0864 OVER CLEAR CREEK

WAR-75-3.40

8/8



Date Started	<u>1/27/05</u>	Sampler: Type	<u>SS</u>	Dia.	<u>1.375"</u>		
Date Completed	<u>1/28/05</u>	Casing: Length	<u>90ft</u>	Dia.	<u>3.25"</u>		
Boring No.	E-4	Station & Offset	21+82.26, 18.51' Rt.			Water Elev.	<u>681.2ft</u>
					Surface Elev.	<u>702.2ft</u>	

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
702.2 702.0 701.7	0 — 2	4/4/6			0.2'	Topsoil (2") Brown, stiff, SANDY SILT, fill	1									NO REC.
699.2	4	4/3/4				Brown, medium stiff, SANDY SILT, some clay, damp, fill	2								14	VIS.
696.7	6	2/2/2			5.5'	Brown, soft, SANDY SILT, little gravel, some clay, damp, fill	3	11	12	22	29	26	20	5	12	A-4a
693.7	8	6/10/9			8.5'	Brown, very stiff, SANDY SILT, little gravel, some clay, damp, fill	4								10	VIS.
691.2	10	8/7/8			11.0'	Dark brown, stiff, SANDY SILT, little gravel, some clay, damp, fill	5								13	VIS.
688.7	14	3/3/6			13.5'	Brown, medium stiff, SANDY SILT, some clay, damp	6								10	VIS.
686.7 686.2	16	7/6/7			15.5'	Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	7								5	VIS.
683.7	18	6/5/8				Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	8	55	24	11	6	4	NP	NP	5	A-1-a
681.7 681.2	20	2/4/5				Brown, loose, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	9								8	VIS.
678.7	22	4/5/6				Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	10	61	19	8	8	4	NP	NP	11	A-1-a
676.2	24	6/4/14				Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, damp	11								9	VIS.
673.7	26	14/15/20			28.5'	Brown, dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, little silt, little clay, damp	12								9	VIS.
668.7	28															
	30															
	32															
	34	6/11/14			33.5'	Gray, very stiff, SILT AND CLAY, trace sand, damp	13	0	1	1	32	66	32	13	17	A-6a

Boring No. E-4

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class												
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.													
667.2																												
	36	5/5/8			39.5'	Gray, stiff, SILT AND CLAY, trace sand, moist	14A								20	VIS.												
663.7	38																											
662.7	40					Gray, stiff, SANDY SILT, and clay, moist	14B								21	VIS.												
	42					Gray, stiff, SANDY SILT, and clay, moist	15	0	2	5	35	58	26	8	18	A-4a												
658.7	44	4/5/8																										
	46																											
	48	3/3/5				Gray, medium stiff, SANDY SILT, and clay, moist	16								22	VIS.												
653.7	50																											
	52	0/0/3			53.5'	Gray, soft, SANDY SILT, and clay, moist	17								18	VIS.												
648.7	54																											
	56																											
	58																											
643.7		9/18/23			58.5'	Gray, hard, SILT AND CLAY, trace gravel, trace sand, damp, till	18	6	3	4	30	57	34	15	15	A-6a												
	60																											
	62																											
638.7	64																											
	66	38/50-6"					19								9	VIS.												
	68																											
633.7		50-3"					20								6	VIS.												
	70																											

Boring No. E-4

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Aqg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
631.1	72	43/50-6"					21									9	VIS.
628.7	74																
	76																
625.2	78																
623.7	80	10/23/42				Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, little clay, damp, till	22									17	VIS.
	82																
620.7	84																
618.7	86																
	88	11/18/22				Gray, hard, SANDY SILT, little clay, moist, till	23									17	VIS.
613.7	90																
612.2	90	12/15/24					24									17	VIS.
BOTTOM OF BORING																	

CTL ENGINEERING, INC.
1451 S.R. 28 BLDG. B-NORTH
LOVELAND, OHIO 45140
PHONE: 513-722-8665 FAX: 513-722-8669

DATE
02-24-06

REVIEWED
NT

DRAWN
C.N.

DESIGNED
CHECKED

STRUCTURE FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0864 OVER CLEAR CREEK

WAR-75-3.40

8/8

GEOLOGY OF SITE

THE OVERBURDEN SOILS IN THIS REGION ARE FORMED PRIMARILY IN WISCONSIN-AGE GLACIAL TILLS AND GROUND MORAINES. THESE GLACIAL SOILS ARE CONSIST OF UNSTRATIFIED LAYERS OF INTERMIXED CLAY, SILT, SAND, AND GRAVEL WHOSE COMPOSITION OF THESE MATERIALS VARIES BOTH Laterally AND VERTICALLY. IN ADDITION, A BURIED VALLEY OF GLACIAL OUTWASH CONSISTING OF SAND AND GRAVEL INTERBEDDED WITH GLACIAL TILL IS LOCATED WHERE IR 75 CROSSES CLEAR CREEK.

THE SOIL OVERBURDEN IS UNDERLAIN BY ORDOVICIAN -AGE SEDIMENTARY ROCK CONSISTING OF INTERBEDDED SHALE AND LIMESTONE OF THE FORMATION AS GRANT LAKE FORMATION. IN GENERAL, THE SEDIMENTARY ROCK ENCOUNTERED IS TYPICALLY DISTINGUISHED BY THE RATIO OF SHALE (50 PERCENT) AND LIMESTONE (50 PERCENT). THE GENERAL DESCRIPTION OF THESE FORMATION ARE DESCRIBED AS SHALE GRAY TO BLUIISH GRAY, WEATHERS TO LIGHT GRAY AND/OR YELLOWISH GRAY, NODULAR, WAVY, IRREGULAR, PLANAR WITH BEDDING THAT IS THIN, MEDIUM TO THICK.

EXPLORATION

FOUR (4) STRUCTURE TEST BORINGS, IDENTIFIED AS Y-1 THROUGH Y-4 WERE DRILLED FOR THIS INVESTIGATION TO DEPTHS RANGING FROM 80 TO 85 FEET. THE TEST BORINGS WERE DRILLED USING TRUCK MOUNTED AND ATV DRILL RIGS UTILIZING HOLLOW STEM AUGERS.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE TEST BORINGS Y-1 AND Y-4 EXHIBITED 5 INCHES OF ASPHALT CONCRETE OVER 4 TO 5 INCHES OF CRUSHED BASE COURSE WHILE BORINGS Y-2 AND Y-3 EXHIBITED 12 INCHES OF BERM MATERIALS AT THE SURFACE.

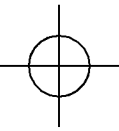
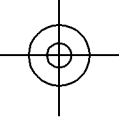

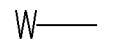



BELOW THE PAVEMENT COMPOSITION, THE BORINGS EXHIBITED GRAVEL AND STONE FRAGMENTS WITH SAND, SANDY SILT, SILT, SILT AND CLAY OR SILTY CLAY OF THE A-1-A, A-1-B, A-2-4, A-4A, A-4b, A-6A, A-6B AND A-7-6 SOIL CATEGORIES TO THE TERMINATION DEPTHS IN BORINGS

BELOW A DEPTH OF 78.5 FEET, BORING Y-3 EXHIBITED GRAY SHALE (AUGERED)

GROUNDWATER WAS ENCOUNTERED IN THE BORINGS TO DEPTHS RANGING FROM 18.5 TO 44.0 FEET DURING DRILLING.

NOTE:
ALL AVAILABLE SOIL AND BEDROCK INFORMATION THAT CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE OFFICE OF GEOTECHNICAL ENGINEERING AT 1600 WEST BROAD STREET AND/OR THE OFFICE OF STRUCTURAL ENGINEERING AT 1980 WEST BROAD STREET.

LEGEND

-  Boring Location - Plan View
-  Instrumented Boring Location - Plan View
-  TR Top of Rock
-  W— Indicates Free Water Elevation
-  ▼— Indicates Static Water Elevation
-  — Horizontal Bar on Boring Log in the profile view indicates the Depth the Sample was taken
-  X/Y/Z Figures Beside the Boring Log in the Profile view Indicate the Number of Blows for Standard Penetration Test
- X = Number of Blows for First 6 in

Y = Number of Blows for Second 6 in

Z = Number of Blows for Third 6 in

SYMBOLS OF ROCK TYPES



Shale

GENERAL INFORMATION

Drive Sample/Press Sample/Core Borings

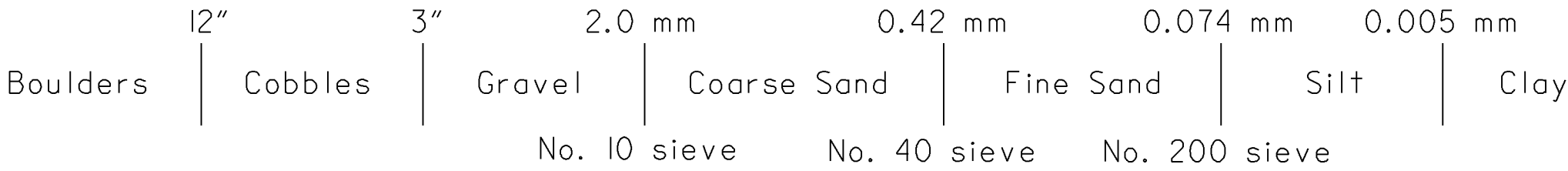
Drive sample borings are made by means of a mechanically-powered rotary-type drill rig employing a 2" O.D., 1⅜" I.D. split spoon sampler, at 2.5 ft. and/or 5.0 ft. depth intervals, driven by means of a 140 lbs. hammer with a free fall of 2.5 ft. The number of blows required to drive the sampler three 0.5 ft. increments is considered the standard penetration test.

Drive/press sample borings are made by means of a mechanically-powered rotary-type drill rig, employing a 2 in. O.D., 1⅜" I.D. split spoon sampler, and a 3 in. O.D. thin wall press sampling tube. The press sampling tube is advanced by continous uniform pressure, applied by the drill rig.

Core borings are made by means of a mechanically-powered rotary-type drill rig, employing a NW-PAM core barrel with an industrial diamond cutting head.

The boring log sheets show a graphic plot of the information obtained, including depth and elevation of the sample, type of sample, number of blows for the standard penetration test in three 0.15 m increments, sample description based on laboratory test results utilizing the Casagrande AC classification system, sample number, and gradation, plasticity and moisture content determinations. Results of strength and consolidation testing, if performed on undisturbed samples, will appear graphically on separate enclosures. Rock samples are displayed on the log sheets including depth and elevation of the sample, amount of recovery and a visual classification based on type, color, degree of hardness, grain size, deterioration, bedding, acid reaction and other qualifying factors.

PARTICLE SIZE DEFINITIONS



RECON. - DB
DRILLING - CTL ENGINEERING, INC.
DRAWN - B.R.U.
REVIEWED - DB

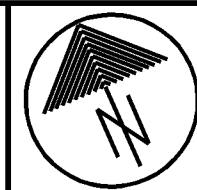
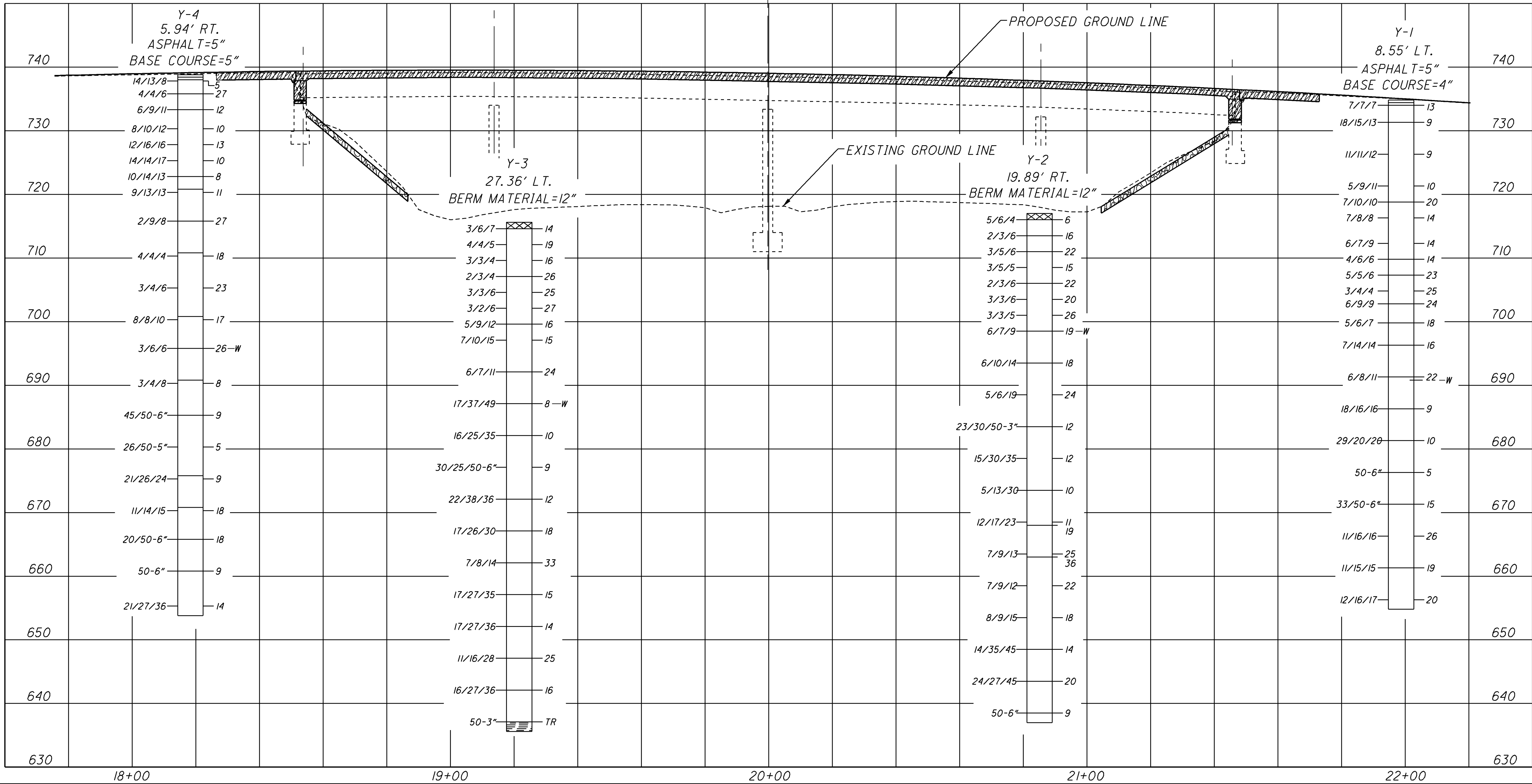
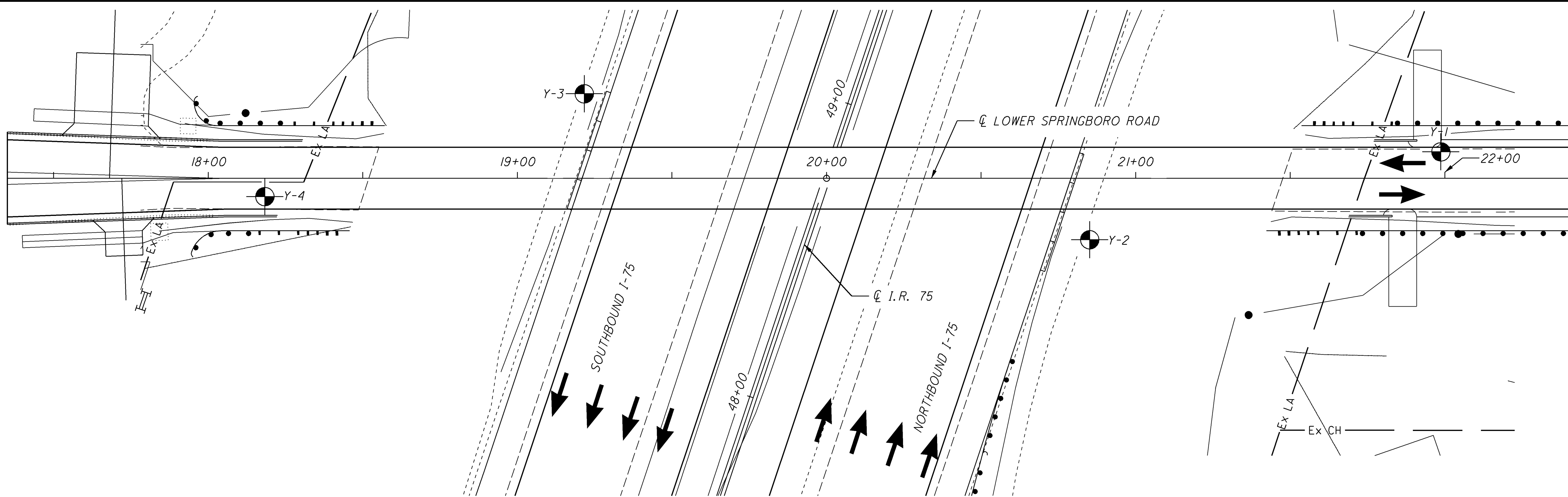
CTIL ENGINEERING, INC.
422 E WARD'S CORNER ROAD
LOVELAND, OH 45140
PHONE: (513) 722-8665 FAX: (513) 722-8669

DATE: 01-29-07
REVIEWED: STRUCTURE FILE NUMBER:
DRAWN: B.R.U.
DESIGNED: CHECKED: REVISED:

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0918
UNDER LOWER SPRINGBORO ROAD

WAR-75-3.40

1/8

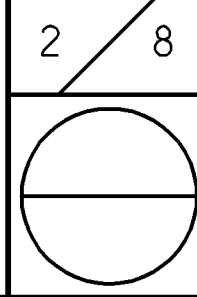


0 20 40
HORIZONTAL
SCALE IN FEET

DESIGNED	DRAWN	REVIEWED	DATE
CHECKED	C.N.	NT	02-13-07
STRUCTURE FILE NUMBER			

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0918
UNDER LOWER SPRINGBORO ROAD
STA. 18 + 00 TO 22 + 00

WAR-75-3.40



LOG OF BORING
Date Started 12/29/07 Sampler: Type SS Dia. 1.375" Project Identification: WAR-75-3.40
Date Completed 12/29/07 Casing: Length 80ft Dia. 3.25" Warren County, Ohio

Boring No. Y-1 Station & Offset 21+98.72, 8.55' Lt. Water Elev. 690.8ft CTL Project No. 04120056G
Surface Elev. 734.8ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.				
734.8	0	7/7/7			0.4'	Asphalt (5")													
734.4	—					Crushed Base Coarse (4")	1												
734.0	2					Brown, stiff, SANDY SILT, damp												13	VIS.
731.3	4	18/15/13			3.5'	Brown, very stiff, SANDY SILT, trace gravel, some clay, damp	2	10	12	22	34	22	20	6	9	A-4a			
—	6																		
—	8																		
726.3	10	11/11/12					3									9	VIS.		
—	12																		
—	14																		
721.3	16	5/9/11					4									10	VIS.		
—	18																		
718.8	20	7/10/10																	
716.3	22	7/8/8					6	0	0	6	61	33	23	8	14	A-4b			
—	24																		
—	26																		
712.3	28	6/7/9					7									14	VIS.		
—	30																		
709.8	32	4/6/6																	
707.3	34	5/5/6			27.5'	Gray, stiff to medium stiff, SILT AND CLAY, trace sand, moist	9									23	VIS.		
704.8	36	3/4/4																	
702.8	38	6/9/9						32.0'	Gray, very stiff, SILT AND CLAY, moist	11									24
—	40																		
699.8	42																		

Boring No. Y-1 Station & Offset 21+98.72, 8.55' Lt. Surface Elev. 734.8ft Project 04120056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
699.8		5/6/7				Gray, stiff, SILT, trace sand, some clay, moist	12								18	VIS.
696.3	36	7/14/14			38.5'	Gray, very stiff, SILT, trace sand, some clay, moist	13	0	0	0	67	33	23	6	16	A-4b
	38															
	40															
	42	6/8/11			43.5'	Gray, very stiff, SILT AND CLAY, damp	14								22	VIS.
44																
46																
691.3	48	18/16/16			48.5'	Brown, dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, moist	15	53	17	18	8	4	NP	NP	9	A-1-a
	50															
	52															
686.3	54	29/20/20			53.5'	Gray, hard, SANDY SILT, some clay, with limestone fragments, damp	16								10	VIS.
	56															
	58															
681.3	60	50-6"			58.5'	Brown, very dense, GRAVEL AND/OR STONE FRAGMENTS,some sand, trace silt, trace clay, moist	17	62	23	12	2	1	NP	NP	5	A-1-a
	62															
	64															
676.3	66	33/50-6"			63.5'	Gray, hard, SILT, trace clay, damp	18								15	VIS.
	68															
	70															
666.3		11/16/16					19								26	VIS.

LOG OF BORING
Date Started 12/29/07 Sampler: Type SS Dia. 1.375" Project Identification: WAR-75-3.40
Date Completed 12/29/07 Casing: Length 80ft Dia. 3.25" Warren County, Ohio
Boring No. Y-1 Station & Offset 21+98.72, 8.55' Lt. Water Elev. 690.8ft CTL Project No. 04120056G
Surface Elev. 734.8ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
734.8	0	7/7/7				Asphalt (5")											
734.4						Crushed Base Coarse (4")											
734.0						Brown, stiff, SANDY SILT, damp	1									13	VIS.
	2	18/15/13															
731.3																	
	4																Brown, very stiff, SANDY SILT, trace gravel, some clay, damp
	6	11/11/12															
726.3																	
	8																
	10	5/9/11															
721.3																	
	12																
	14	7/10/10															
718.8																	
	16																
	18	7/8/8															
716.3																	
	20																
	22	6/7/9															
712.3																	
	24																
	26	4/6/6															
709.8																	
	28																
	30	3/4/4															
704.8																	
	32																
	34	6/9/9															
702.8																	
699.8																	

Boring No. Y-1 Station & Offset 21+98.72, 8.55' Lt. Surface Elev. 734.8ft Project 04120056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
699.8		5/6/7				Gray, stiff, SILT, trace sand, some clay, moist	12								18	VIS.
696.3	36	7/14/14			38.5'	Gray, very stiff, SILT, trace sand, some clay, moist	13	0	0	0	67	33	23	6	16	A-4b
	38															
	40															
	42	6/8/11			43.5'	Gray, very stiff, SILT AND CLAY, damp	14								22	VIS.
44																
46																
691.3	48	18/16/16			48.5'	Brown, dense, GRAVEL AND/OR STONE FRAGMENTS, some sand, trace silt, trace clay, moist	15	53	17	18	8	4	NP	NP	9	A-I-a
50																
52																
686.3	54	29/20/20			53.5'	Gray, hard, SANDY SILT, some clay, with limestone fragments, damp	16								10	VIS.
	56															
	58															
681.3	60	50-6"			58.5'	Brown, very dense, GRAVEL AND/OR STONE FRAGMENTS,some sand, trace silt, trace clay, moist	17	62	23	12	2	1	NP	NP	5	A-I-a
62																
64																
676.3	66	33/50-6"			63.5'	Gray, hard, SILT, trace clay, damp	18								15	VIS.
	68															
	70															
671.3		11/16/16					19								26	VIS.
666.3																

3

3

State of Ohio
Department of Transportation
Office of Geotechnical Engineering
LOG OF BORING

1

3

Date Started12/19/07

Sampler: TypeSS

Dia.1.375"

Project Identification:WAR-75-3.40

Date Completed12/19/07

Casing: Length80ft

Dia.3.25"

Warren County, Ohio

Water Elev.698.5ft

CTL Project No. 04I20056G

Boring No. Y-1Station & Offset2I+98.72, 8.55' Lt.Surface Elev.734.8ftProject04I20056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
663.7																
661.3	72	11/15/15			73.5'											
	74					Gray, hard, CLAY, trace gravel, little sand, some silt, moist	20								19	VIS.
	76															
656.3	78	12/16/17														
654.8	80				80.0'		21	0	4	17	34	45	44	26	20	A-7-6

BOTTOM OF BORING

3

3

State of Ohio
Department of Transportation
Office of Geotechnical Engineering
LOG OF BORING

1

3

Date Started12/19/07

Sampler: TypeSS

Dia.1.375"

Project Identification:WAR-75-3.40

Date Completed12/19/07

Casing: Length80ft

Dia.3.25"

Warren County, Ohio

Water Elev.698.5ft

CTL Project No. 04I20056G

Boring No. Y-2Station & Offset20+85.13, 19.89' Rt.Surface Elev.717.0ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
717.0	0					Berm Material										VIS.
716.0	2	5/6/4			1.0'	Brown, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, damp	1								6	VIS.
713.5	4	2/3/6			3.5'	Gray, stiff, SILT, little clay, damp	2								16	VIS.
711.0	6	3/5/6			6.0'	Gray, stiff, SILT, little clay, moist	3								22	VIS.
708.5	8	3/5/5					4								15	VIS.
706.0	10	2/3/6			11.0'	Gray, stiff to medium stiff, SILTY CLAY, trace sand, moist	5	0	0	0	41	59	35	16	22	A-6b
703.5	12															
	14	3/3/6					6								20	VIS.
701.0	16	3/3/5					7								26	VIS.
	18															
698.5	20	6/7/9			18.5'	Gray, very stiff, SILTY CLAY, moist	8								19	VIS.
	22															
693.5	24	6/10/14			23.5'	Gray, very stiff, SILT AND CLAY, damp	9								18	VIS.
	26															
688.5	28	5/6/19					10								24	VIS.
	30															
	32															
683.5	34	23/30/50-3"			33.5'	Gray, hard, SANDY SILT, little clay, some gravel, damp	11	25	12	17	31	15	18	5	12	A-4a

CTL ENGINEERING, INC.
422 E WARD'S CORNER ROAD
LOVELAND, OH 45140
PHONE:(513) 722-8665 FAX:(513) 722-8669

DATE
01-29-07

REVIEWED

DRAWN
B.R.U

DESIGNED

STRUCTURE FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. WAR-75-0918
UNDER LOWER SPRINGBORO ROAD

WAR-75-3.40

4/8

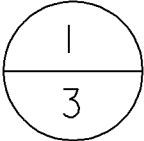
Boring No. Y-2 Station & Offset 20+85.13, 19.89' Rt. Surface Elev. 717.0ft Project 04120056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics									ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.		
682.0																	
	36	15/30/35					12									12	VIS.
678.5	38																
	40																
	42																
		5/13/30			43.5'	Gray, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, trace clay, wet	13	41	29	26	3	1	NP	NP		10	A-I-b
673.5	44																
	46																
	48																
668.5		12/17/23			49.0'	Gray, hard, SILT AND CLAY, damp	14A 14B									11 19	VIS. VIS.
668.0	50																
	52																
663.5		7/9/13			54.0'	Gray, very stiff, CLAY, trace gravel, some sand, some silt, damp	15A 15B									25 36	VIS. VIS.
663.0	54																
	56																
	58																
658.5		7/9/12			58.5'		16	11	7	17	28	37	46	24	22	A-7-6	
	60																
	62																
653.5		8/9/15			63.5'		17									18	VIS.
	64																
	66																
	68																
648.5		14/35/45			68.5'	Gray, hard, CLAY, trace gravel, some sand, some silt, damp	18									14	VIS.
	70																

Boring No. Y-2 Station & Offset 20+85.13, 19.89' Rt. Surface Elev. 717.0ft Project 04120056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
645.9	72	24/27/45			73.5'											
643.5	74					Gray, hard, SILT, trace sand, little clay, damp	19	0	0	0	80	20	23	I	20	A-4b
	76															
	78															
638.5		50-6"			78.5'	Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, wet	20								9	VIS.
637.0	80															
BOTTOM OF BORING																

State of Ohio
Department of Transportation
Office of Geotechnical Engineering



LOG OF BORING

Date Started12/19/07

Sampler: TypeSS

Dia.1.375"

Project Identification:WAR-75-3.40

Date Completed12/19/07

Casing: Length80ft

Dia.3.25"

Warren County, Ohio

Boring No.Y-2

Station & Offset20+85.13, 19.89' Rt.

Water Elev.698.5ft

CTL Project No. 04I20056G

Surface Elev.717.0ft

Elev. (ft)	Depth (ft)	Std. Pen. RQD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.
717.0	0					Berm Material										VIS.
717.0 716.0	2	5/6/4			1.0'	Brown, loose, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, damp	1								6	VIS.
713.5	4	2/3/6			3.5'	Gray, stiff, SILT, little clay, damp	2								16	VIS.
711.0	6	3/5/6			6.0'	Gray, stiff, SILT, little clay, moist	3								22	VIS.
708.5	8	3/5/5					4								15	VIS.
706.0	10															
706.0	12	2/3/6			11.0'	Gray, stiff to medium stiff, SILTY CLAY, trace sand, moist	5	0	0	0	41	59	35	16	22	A-6b
703.5	14	3/3/6					6								20	VIS.
701.0	16	3/3/5					7								26	VIS.
698.5	18															
698.5	20	6/7/9			18.5'	Gray, very stiff, SILTY CLAY, moist	8								19	VIS.
	22															
693.5	24	6/10/14			23.5'	Gray, very stiff, SILT AND CLAY, damp	9								18	VIS.
	26															
	28															
688.5	30	5/6/19					10								24	VIS.
	32															
683.5	34	23/30/50-3"			33.5'	Gray, hard, SANDY SILT, little clay, some gravel, damp	11	25	12	17	31	15	18	5	12	A-4a

Boring No. Y-2 Station & Offset 20+85.13, 19.89' Rt. Surface Elev. 717.0ft Project 04I20056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class		
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.	
682.0																	
678.5	36	15/30/35					12									12	VIS.
	38																
673.5	40	5/13/30															
	42																
668.5	44				43.5'	Gray, dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, trace clay, wet	13	41	29	26	3	I	NP	NP	10	A-I-b	
	46																
668.0	48	12/17/23			49.0'		14A									11	VIS.
	50																
663.5	52	7/9/13			54.0'		14B									19	VIS.
	54																
658.5	56				54.0'	Gray, very stiff, CLAY, trace gravel, some sand, some silt, damp	15A									25	VIS.
	58																
653.5	60	7/9/12			58.5'		15B									36	VIS.
	62																
648.5	64	8/9/15			63.5'		17									18	VIS.
	66																
	68	14/35/45			68.5'	Gray, hard, CLAY, trace gravel, some sand, some silt, damp	18									14	VIS.
	70																

Boring No. Y-2 Station & Offset 20+85.13, 19.89' Rt. Surface Elev. 717.0ft Project 04I20056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.		
645.9																		
	72	24/27/45			73.5'													
643.5																		
	74																	
	76																	
	78	50-6"			78.5'													
638.5																		
637.0	80				80.0'	Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, wet	20									9	VIS.	
BOTTOM OF BORING																		

Date Started12/20/07Sampler: TypeSSDia.1.375"Project Identification:WAR-75-3.40

Date Completed12/20/07Casing: Length80ftDia.3.25"Warren County, Ohio

Boring No.Y-3Station & OffsetI9+21.64, 27.36' Lt.Water Elev.687.1ftCTL Project No. 04120056G

Surface Elev.715.6ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
715.6	0					Berm Material										VIS.
714.6		3/6/7			1.0'	Brown, stiff, SILT, trace sand, moist	1								14	VIS.
	2															
712.1		4/4/5					2								19	VIS.
	4															
709.6		3/3/4					3								16	VIS.
	6															
707.1		2/3/4			8.5'	Gray, medium stiff, SILT AND CLAY, damp	4								26	VIS.
	8															
704.6		3/3/6					5								25	VIS.
	10															
702.1		3/2/6				Gray, medium stiff, SILT AND CLAY, with sand layers, damp	6								27	VIS.
	12															
699.6		5/9/12			16.0'	Gray, very stiff, SILT, and clay, trace gravel, trace sand, damp	7	0	0	1	52	47	27	10	16	A-4b
	14															
697.1		7/10/15					8								15	VIS.
	16															
	18															
692.1		6/7/11			23.5'	Gray, very stiff, SILT AND CLAY, damp	9								24	VIS.
	20															
	22															
687.1		17/37/49			28.5'	Brown, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, trace clay, wet	10	45	10	16	22	7	NP	NP	8	A-2-4
	24															
	26															
	28															
682.1		16/25/35			33.5'	Gray, hard, SANDY SILT, little gravel, some clay, damp, till	11								10	VIS.
	30															
	32															
	34															

Boring No.Y-3Station & OffsetI9+21.64, 27.36' Lt.Surface Elev.715.6ftProject04120056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
680.6																
	36															
677.1		30/25/50-6"					12	14	13	20	28	25	22	9	9	A-4a
	38															
	40															
	42															
672.1		22/38/36					13								12	VIS.
	44					Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, moist										
	46															
667.1		17/26/30					14								18	VIS.
	48					Gray, hard, SILT, little clay, damp										
	50															
	52															
662.1		7/8/14					15	0	4	23	47	26	25	9	33	A-4a
	54					Gray, very stiff,SANDY SILT, trace gravel, some clay, wet										
	56															
	58															
657.1		17/27/35					16								15	VIS.
	60					Brown, hard, SANDY SILT, little clay, damp										
	62															
	64															
652.1		17/27/36					17								14	VIS.
	66					Gray, hard, SILT AND CLAY, little sand, damp										
	68															
647.1		11/16/28					18								25	VIS.
	70					Gray to brown, hard, SILT AND CLAY, little sand, damp, till										

Date Started12/20/07Sampler: TypeSSDia.1.375"Project Identification:WAR-75-3.40

Date Completed12/20/07Casing: Length80ftDia.3.25"Warren County, Ohio

Boring No.Y-3Station & OffsetI9+21.64, 27.36' Lt.Water Elev.687.1ftCTL Project No. 04120056G

Surface Elev.715.6ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
715.6	0	3/6/7			1.0'	Berm Material										VIS.
714.6	2					Brown, stiff, SILT, trace sand, moist	1								14	VIS.
712.1	4						2								19	VIS.
709.6	6	3/3/4					3								16	VIS.
707.1	8															
704.6	10	2/3/4			8.5'	Gray, medium stiff, SILT AND CLAY, damp	4								26	VIS.
702.1	12						5								25	VIS.
699.6	14	3/3/6				Gray, medium stiff, SILT AND CLAY, with sand layers, damp	6								27	VIS.
697.1	16															
692.1	18	5/9/12			16.0'	Gray, very stiff, SILT, and clay, trace gravel, trace sand, damp	7	0	0	1	52	47	27	10	16	A-4b
687.1	20						8								15	VIS.
682.1	22	7/10/15														
679.6	24															
677.1	26	6/7/11			23.5'	Gray, very stiff, SILT AND CLAY, damp	9								24	VIS.
672.1	28															
669.6	30	17/37/49			28.5'	Brown, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT, trace clay, wet	10	45	10	16	22	7	NP	NP	8	A-2-4
667.1	32															
662.1	34	16/25/35			33.5'	Gray, hard, SANDY SILT, little gravel, some clay, damp, till	11								10	VIS.
660.6																

Boring No.Y-3Station & OffsetI9+21.64, 27.36' Lt.Surface Elev.715.6ftProject04120056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics								ODOT Class
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
677.1	30/25/50-6"						12	14	13	20	28	25	22	9	9	A-4a
672.1	40															
667.1	42															
662.1	44	22/38/36			43.5'	Gray, very dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, trace silt, moist	13								12	VIS.
660.6	46															
657.1	48	17/26/30			48.5'	Gray, hard, SILT, little clay, damp	14								18	VIS.
652.1	50															
647.1	52	7/8/14			53.5'	Gray, very stiff,SANDY SILT, trace gravel, some clay, wet	15	0	4	23	47	26	25	9	33	A-4a
642.1	54															
637.1	56	17/27/35			58.5'	Brown, hard, SANDY SILT, little clay, damp	16								15	VIS.
632.1	58															
627.1	60	17/27/36			63.5'	Gray, hard, SILT AND CLAY, little sand, damp	17								14	VIS.
622.1	62															
617.1	64	11/16/28			68.5'	Gray to brown, hard, SILT AND CLAY, little sand, damp, till	18								25	VIS.
612.1	66															
607.1	68															
602.1	70															
597.1																

3

3

State of Ohio

Department of Transportation

Office of Geotechnical Engineering

LOG OF BORING

1

3

Date Started12/21/07

Sampler: TypeSS

Dia.1.375"

Project Identification:WAR-75-3.40

Date Completed12/21/07

Casing: Length85ft

Dia.3.25"

Warren County, Ohio

Water Elev.695.8ft

CTL Project No. 04I20056G

Boring No.Y-3

Station & Offset19+21.64, 27.36' Lt.

Surface Elev.715.6ft

Project04I20056G

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class			
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.		
644.5	72	16/27/36			73.5'													
642.1	74					Gray, hard, SILT, trace sand, some clay, damp	19	0	0	1	67	32	26	7	16	A-4b		
637.1	76																	
635.6	80	50-3"			78.5'	SHALE, gray, soft, augered, with limestone fragments	20											VIS.
BOTTOM OF BORING																		

Boring No.Y-4

Station & Offset18+18.31, 5.94' Rt.

Surface Elev.738.8ft

Elev. (ft)	Depth (ft)	Std. Pen. ROD	Rec. (ft)	Loss (ft)		Description	Sample No.	Physical Characteristics							ODOT Class																	
								% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.																
738.8	0	14/13/8			0.4' 0.8'	Asphalt (5")																										
738.4	2					Crushed Base Coarse (5")	1								5	VIS.																
737.8						Brown, medium dense, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, with asphalt fragments, damp																										
735.8	4	4/4/6			3.0'	Brown, stiff, SILTY CLAY, trace sand, damp	2										27	VIS.														
733.3	6	6/9/11				5.5'	Brown, very stiff to hard, SANDY SILT, trace gravel, some clay, damp	3	9	8	16	35	32	24	8	12	A-4a															
730.3	8	8/10/12					4									10	VIS.															
727.8	10	12/16/16	5											13	VIS.																	
725.3	14	14/14/17			16.0'	Brown and gray, very stiff, SANDY SILT, little clay, little gravel, damp	7	11	9	23	38	19	19	6	8	A-4a																
722.8	16	10/14/13																	18.0'	Gray, very stiff, SANDY SILT, little clay, damp	8								11	VIS.		
720.3	18	9/13/13																														
715.8	20	2/9/8	23.0'	Brown, medium dense, COARSE AND FINE SAND, trace silt, wet	9									27	VIS.																	
710.3	22			28.0'	Gray, medium stiff to stiff, SANDY SILT, little clay, moist	10	0	0	31	50	19	NP	NP	18	A-4b																	
705.3	24																															
	26																															
	28	4/4/4			28.0'	Gray, medium stiff to stiff, SANDY SILT, little clay, moist	10	0	0	31	50	19	NP	NP	18	A-4b																
	30																															
	32																															
	34	3/4/6					11										23	VIS.														

DATE01-29-07

REVIEWED

DRAWN B.R.U

DESIGNED

STRUCTURE FILE NUMBER

STRUCTURE FOUNDATION INVESTIGATION

BRIDGE NO. WAR-75-0918

UNDER LOWER SPRINGBORO ROAD

WAR-75-3.40

7/8

CTL ENGINEERING, INC.
422 E WARDS CORNER ROAD
LOVELAND, OH 45140
PHONE:(513) 722-8665 FAX:(513) 722-8669

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