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November 14, 2007

Robert Miller, P.E.
Project Manager
CH2M Hill Ltd.
1001 Lakeside Avenue
990 North Point Tower
Cleveland, Ohio 44114

Re: **Bearing Capacity and Settlement Evaluation**
(Culvert at STA. 619+73.25)
SCI-823-0.00 Portsmouth Bypass
DLZ Job No.: 0121-3070.03
Document # 0095

Dear Mr. Miller:

This letter presents the findings of preliminary evaluations of the proposed culvert at Station 619+73.25 on the above-referenced project. The findings of other culvert and embankment evaluations will be submitted in separate documents.

It is our understanding that a new culvert will be constructed at Station 619+73.25 for the above referenced project. The culvert will be a 66-inch Type A conduit in accordance with ODOT Item 706.02 Reinforced Concrete Circular Pipe). Preliminary plans indicate the flow line of the culvert will be range from 0 to 13 feet below existing grade. It is therefore anticipated that portions of the culvert will be constructed in accordance with ODOT CMS Item 603.05 Method B. The maximum cover over the culvert at this location is approximately 18 feet beneath the fill for proposed Ramp C. The inlet and outlet of the culvert will be supported by headwalls flush with the face of the pipe. At the time of preparing this letter no further information was available regarding the culvert.

It should be noted that this preliminary evaluation is based upon the findings of two bridge borings (B-1122 and B-1122A) and one culvert boring (C-123) located in the proximity of the proposed alignment of the culvert. The borings were advanced to depths ranging between 27.4 and 32.5 feet below the ground surface. Logs of the borings, a plan and profile drawing showing the approximate locations of the borings, a legend of the boring log terminology and general information regarding the drilling procedures are attached. The surveyed ground elevations at the boring locations are reported on the logs.

Exploration Findings

The borings generally encountered 19.5 to 27.5 feet of soil overlying sandstone bedrock. Borings B-1122, B-1122A, and C-123 generally encountered 10.5 to 22.0 feet of cohesive soil (A4a, A4b, A-6a, A-6b, A-7-6) underlain by granular soil (A-1-b, A-2-6, A-3) over sandstone and shale bedrock. The consistency of the cohesive soils ranged from soft to hard but was predominantly very stiff. The bedrock was generally slightly weathered and slightly to severely fractured.

Bearing Capacity Evaluation

The preliminary plans indicate that the invert elevations at the inlet and outlet of the proposed culvert are 529.00 and 527.02, respectively. The bottoms of the headwall footings were assumed to be 4 feet below the invert elevations to place them below the frost zone and prevent scour of the headwall (Ohio BDM Section 200). Based on the results of the borings, footings at these elevations will bear in medium stiff to stiff cohesive soil (A-6a, A-6b, A-7-6). Footings bearing in the medium stiff or better material at this location may be designed based on an allowable bearing capacity of up to 1,500 pounds per square foot (psf).

Settlement Evaluation

Soil parameters for use in the settlement calculations were estimated using laboratory test results and correlations with moisture content and Atterberg limits. Settlement below the centerline of the embankment was evaluated using the maximum cover of the embankment (approximately 9.0 feet) as the surcharge load and using the soil profile encountered in borings B-1122, B-1122A, and C-123.

The settlement analysis indicated that the soil below the embankment at Ramp C and Ramp D will yield total primary settlements of 3.3 and 1.8 inches, respectively. The analysis indicated that 90% of the consolidation settlement will occur within 47 days after the end of the embankment construction. Settlement at the ends of the culvert, due to the embankment loading, is expected to be 0.1 and 0.2 inch at the inlet and the outlet, respectively. Based on these analyses, the maximum differential settlement between the center of the ramp embankment and the ends of the culvert is expected to be approximately 3.2 inches. The settlement analysis is attached.

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We appreciate having the opportunity to be of service to you on this project. Please do not hesitate to call if you have any questions concerning our preliminary findings.

Respectfully submitted,

DLZ OHIO, INC.

Wael Alkasawneh, P.E.
Geotechnical Engineer

Bryan Wilson, P.E.
Senior Geotechnical Engineer

Encl: As noted.

cc: Andy Wolpert (CH2M Hill Ltd.), File

GENERAL INFORMATION
DRILLING PROCEDURES AND LOGS OF BORINGS

Drilling and sampling were conducted in accordance with procedures generally recognized and accepted as standardized methods of investigation of subsurface conditions concerning geotechnical engineering considerations. Borings were drilled with either a truck-mounted or ATV-mounted drill rig.

Drive split-barrel sampling was performed in 1.5 foot increments at intervals not exceeding 5 feet. In the event the sampler encountered resistance to penetration of 6 inches or less after 50 blows of the drop hammer, the sampling increment was discontinued. Standard penetration data were recorded and one or more representative samples were preserved from each sampling increment.

In borings where rock was cored, NXM or NQ size diamond coring tools were used.

In the laboratory all samples were visually classified by a soils engineer. Moisture contents of representative fine-grained soil samples were determined. A limited number of samples, considered representative of foundation materials present, were selected for performance of grain-size analyses and plasticity characteristics tests. The results of these tests are shown on the boring logs.

The boring logs included in the Appendix have been prepared on the basis of the field record of drilling and sampling, and the results of the laboratory examination and testing of samples. Stratification lines on the boring logs indicating changes in soil stratigraphy represent depths of changes approximated by the driller, by sampling effort and recovery, and by laboratory test results. Actual depths to changes may differ somewhat from the estimated depths, or transitions may occur gradually and not be sharply defined. The boring logs presented in this report therefore contain both factual and interpretative information and are not an exact copy of the field log.

Although it is considered that the borings have disclosed information generally representative of site conditions, it should be expected that between borings conditions may occur which are not precisely represented by any one of the borings. Soil deposition processes and natural geologic forces are such that soil and rock types and conditions may change in short vertical intervals and horizontal distances.

Soil/rock samples will be stored at our laboratory for a period of six months. After this period of time, they will be discarded, unless notified to the contrary by the client.

LEGEND - BORING LOG TERMINOLOGY

Explanation of each column, progressing from left to right

1. Depth (in feet) - refers to distance below the ground surface.

2. Elevation (in feet) - is referenced to mean sea level, unless otherwise noted.

3. Standard Penetration (N) - the number of blows required to drive a 2-inch O.D., 1-3/8 inch I.D., split-barrel sampler, using a 140-pound hammer with a 30-inch free fall. The blows are recorded in 6-inch drive increments. Standard penetration resistance is determined from the total number of blows required for one foot of penetration by summing the second and third 6-inch increments of an 18-inch drive.

   50/n - indicates number of blows (50) to drive a split-barrel sampler a certain number of inches (n) other than the normal 6-inch increment.

4. The length of the sampler drive is indicated graphically by horizontal lines across the "Standard Penetration" and "Recovery" columns.

5. Sample recovery from each drive is indicated numerically in the column headed "Recovery".

6. The drive sample location is designated by the heavy vertical bar in the "Sample No., Drive" column.

7. The length of hydraulically pressed "Undisturbed" samples is indicated graphically by horizontal lines across the "Press" column.

8. Sample numbers are designated consecutively, increasing in depth.

9. Soil Description

   a. The following terms are used to describe the relative compactness and consistency of soils:

Granular Soils - Compactness

Terms	Blows/Foot Standard Penetration
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	over 50

Cohesive Soils - Consistency

Term	Unconfined Compression tons/sq.ft.	Blows/Foot Standard Penetration	Hand Manipulation
Very Soft	less than 0.25	below 2	Easily penetrated by fist
Soft	0.25 - 0.50	2 - 4	Easily penetrated by thumb
Medium Stiff	0.50 - 1.00	4 - 8	Penetrated by thumb w/ moderate effort
Stiff	1.0 - 2.0	8 - 15	Readily indented by thumb but not penetrated
Very Stiff	2.0 - 4.0	15 - 30	Readily indented by thumb nail
Hard	over 4.0	over 30	Indented with difficulty by thumb nail

   b. Color - If a soil is a uniform color throughout, the term is single, modified by such adjective as light and dark. If the predominant color is shaded by a secondary color, the secondary color precedes the primary color. If two major and distinct colors are swirled throughout the soil, the colors are modified by the term "mottled".

   c. Texture is based on the ODOT Classification System. Soil particle size definitions are as follows:

Description	Size	Description	Size
Boulders	Larger than 8"	Sand-Coarse	2.00 mm. to 0.42 mm.
Cobbles	8" to 3"	-Fine	0.42 mm. to 0.074 mm.
Gravel-Coarse	3" to 3/4"	Silt	0.074 mm. to 0.005 mm.
-Fine	3/4" to 2.00" mm.	Clay	Smaller than 0.005 mm.

   d. The main soil component is listed first. The minor components are listed in order of decreasing percentage of particle size.

e. Modifiers to main soil descriptions are indicated as a percentage by weight of particle sizes.

trace	- 0 to 10%
little	- 10 to 20%
some	- 20 to 35%
"and"	- 35 to 50%

f. The moisture content of **cohesive soils** (silts and clays) is expressed relative to plastic properties.

Term	Relative Moisture or Appearance
Dry	Powdery
Damp	Moisture content slightly below plastic limit
Moist	Moisture content above plastic limit, but below liquid limit
Wet	Moisture content above liquid limit

g. Moisture content of **cohesionless soils** (sands and gravels) is described as follows:

Term	Relative Moisture or Appearance
Dry	No moisture present
Damp	Internal moisture, but none to little surface moisture
Moist	Free water on surface
Wet	Voids filled with free water

10. **Rock hardness and rock quality description.**

a. The following terms are used to describe the relative hardness of the bedrock.

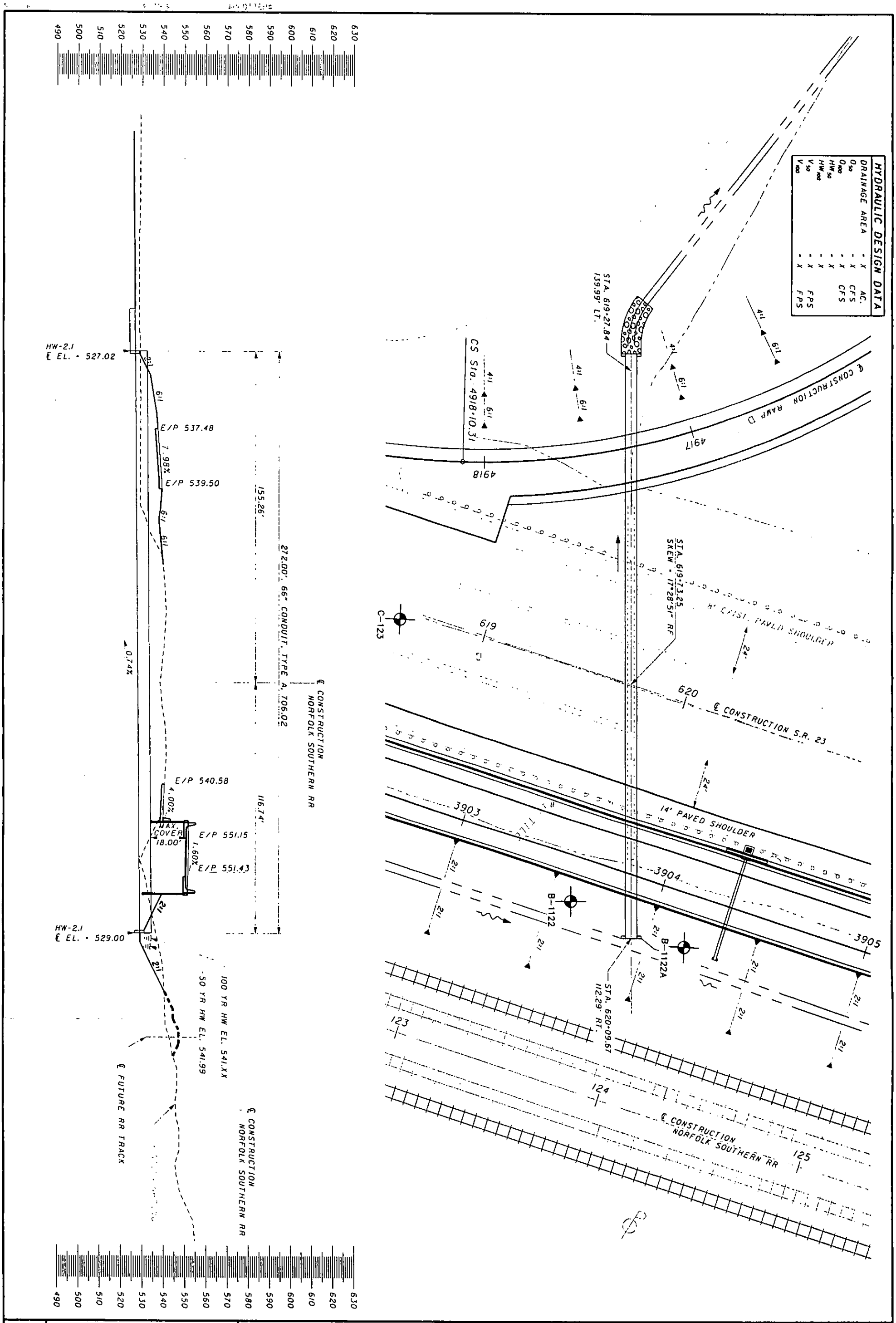
Term	Description
Very Soft	Difficult to indent with thumb nails; resembles hard soil but has rock structure
Soft	Resists indentation with thumb nail but can be abraded and pierced to a shallow depth by a pencil point.
Medium Hard	Resists pencil point, but can be scratched with a knife blade.
Hard	Can be deformed or broken by light to moderate hammer blows.
Very Hard	Can be broken only by heavy blows, and in some rocks, by repeated hammer blows.

b. Rock Quality Designation, RQD - This value is expressed in percent and is an indirect measure of rock soundness. It is obtained by summing the total length of all core pieces which are at least four inches long, and then dividing this sum by the total length of the core run.

11. Gradation - when tests are performed, the percentage of each particle size is listed in the appropriate column (defined in Item 9c).

12. When a test is performed to determine the natural moisture content, liquid limit moisture content, or plastic limit moisture content, the moisture content is indicated graphically.

13. The standard penetration (N) value in blows per foot is indicated graphically.



SCI-823-10.13	CULVERT DETAIL US 23 STA. 619+73.25	CTS ADW HORIZONTAL SCALE IN FEET

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1122 | Location: Sta. 3903+45.0, 34.5 ft. LT of US 23 Ramp C BL | Date Drilled: 7/19/05

WATER OBSERVATIONS: Water seepage at: 16.0'-22.0'; Water level at completion: 16.0' (prior to coring), 10.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	540.7						Asphalt - 8" Aggregate Base - 4"						
1.0	539.7	5 5 6	9	1		2.0	FILL: Stiff to very stiff brown SANDY SILT (A-4a), little clay, little gravel; damp to moist.	16	19	--	22	28	15
3.0	537.7	5 5 9	14	2		4.5+	Hard brown and gray SILTY CLAY (A-6b), trace fine to coarse sand; moist.	0	1	--	4	56	39
6.0	534.7	5 5 7	12	3		4.0	Very stiff to hard brown SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; contains sand seams; moist.	13	11	--	8	44	24
8.0	532.7	10 5 4	9	4			Loose brown COARSE AND FINE SAND (A-3a), little gravel, trace clay; damp to moist.						
10.5	530.2	3 5 4	2	5		3.0	Stiff to very stiff brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; moist.						
		2 2 3	12	6		1.0							
		1 1 1	8	7		--	@ 16.0'-20.0', soft to medium stiff; wet.						
		WOH 3 3	6	8		0.5							
20.5	520.2	13 16 15	12	9			Dense to very dense brown and gray GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); contains sandstone fragments; moist.						
		18 24 18	10	10									
		22 50/3	4	11									
27.5	513.2	Core 60"	Rec 54"	RQD 65%	R1		Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, thinly bedded to massive, slightly fractured.						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+

FILE: 0121-3070-03 [11/8/2007 10:28 AM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1122 | Location: Sta. 3903+45.0, 34.5 ft. LT of US 23 Ramp C BL | Date Drilled: 7/19/05

WATER OBSERVATIONS:
Water seepage at: 16.0'-22.0'
Water level at completion: 16.0' (prior to coring)
10.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % · ● PL ⊢—⊣ LL Blows per foot · ○ 10 20 30 40
30	510.7						Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, thinly bedded to massive, slightly fractured, iron-staining. @ 28.2' to 28.3', broken. @ 28.5' to 28.9', broken and decomposed. @ 30.4' to 30.7', broken with decomposed zones.							
32.5	508.2						Bottom of Boring - 32.5'							
35														
40														
45														
50														
55														
60														

FILE: 0121-3070-03 [11/8/2007 10:25 AM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

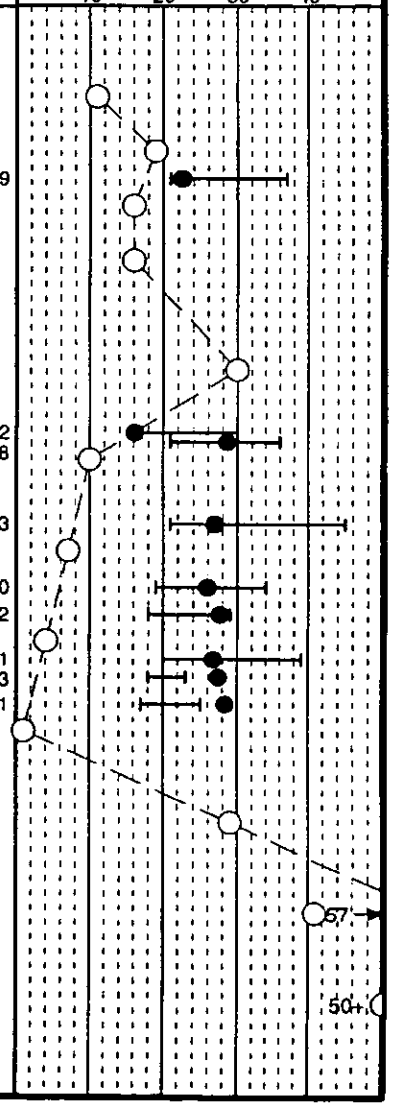
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1122A | Location: Sta. 3904+16.1, 35.8 ft. LT of US 23 Ramp C BL | Date Drilled: 07/31/07

WATER OBSERVATIONS: Water seepage at: 18.5'-20.0'
Water level at completion: 17.4' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	540.7						Asphalt Concrete Pavement- 7" Aggregate base - 9"						
1.3	539.4	6 4 7	16	1		3.5	POSSIBLE FILL: Very stiff to hard brownish gray SILTY CLAY (A-6b), trace gravel, trace fine to coarse sand; damp to moist.						
		8 9 10	14	2		4.5+							
5		6 7 9	18	3		4.0		1	1	--	3	46	49
6.5	534.2	3 6 10	12	4		4.5+							
8.0	532.7						POSSIBLE FILL: Medium dense brown FINE SAND (A-3), trace to little gravel, trace silty clay; damp.						
		10 16 14	15	5		4.5+	Very stiff to hard brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace gravel; damp.						
10													
		5 5 5	18	6		2.0	@ 11.0', trace fine to coarse sand, moist.	9	20	--	11	28	32
13.0	527.7				ST1	1.5		0	1	--	4	57	38
		2 3 4	13	7		2.0	Stiff to very stiff mottled brown and gray CLAY (A-7-6), some to "and" silt, trace fine sand; moist. @ 13.8', encountered red clay tile fragment.	0	0	--	2	35	63
15													
15.5	525.2				ST2	1.0							
17.0	523.7	WOH 2 2	18	8		0.75	Medium stiff brown SILT AND CLAY (A-6a), trace to little fine sand, trace coarse sand; moist to wet.	0	1	--	4	56	40
								0	1	--	10	57	32
18.0	522.7				ST3	1.0	Medium stiff brown SILTY CLAY (A-6b), trace fine sand; moist.	0	0	--	3	46	51
		WOH WOH 1	18	9		--	Soft to medium stiff brown SILT (A-4b), some clay, little to some fine to coarse sand; wet.	0	1	--	18	58	23
20								0	0	--	25	54	21
22.0	518.7	8 9 20	10	10		--							
		28 31 26	16	11			Severely weathered reddish brown SANDSTONE fragments.						
25													
27.4	513.3	7 18 50/5	14	12			@ 26.5', gray.						
							Bottom of Boring - 27.4'						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



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DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring C-123 | Location: Sta. 619+33.7, 102.7 ft. LT of US 23 CL | Date Drilled: 08/01/07

WATER OBSERVATIONS: Water seepage at: 11.0'-19.5'
Water level at completion: 8.9' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) / Natural Moisture Content, % / Blows per foot
0	529.7													
0.3	529.4						Topsoil - 4"							
		1 2 4	13	1		1.0	Stiff brown SILT (A-4b), little clay; damp.							
3.0	526.7													
		2 2 4	15	2		1.5	Stiff brown CLAY (A-7-6), trace fine to coarse sand; moist.	0	2	--	5	46	47	PL LL
5														
		3 2 3	17	3	ST1	1.5								
8.0	521.7													
		3 3 2	12	4	ST2	0.5	Soft to medium stiff brown and gray SILT AND CLAY (A-6a), trace to little fine to coarse sand; moist.	0	0	--	10	63	27	
10														
10.5	519.2													
		WOH 1 1	18	5			Very loose to loose brown and gray GRAVEL WITH SAND (A-1-b), trace silt; wet.							
		WOH 1 1	16	6										
15								24	61	--	9	6		Non-Plastic
		3 3 4	18	7										
		10 21 26	16	8A 8B										
19.5	510.2													
20							Severely weathered brown SANDSTONE interbedded with SHALE; very fine to fine grained, argillaceous, micaceous.							
		14 33 50/3	10	9										
22.5	507.2													
		Core 60"	Rec 55"	RQD 45%	R-1		Medium hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded, moderately fractured, with typical low angle fractures. @ 25.6'-26.0',26.6'-27.0', broken zones.							50+
25														
27.5	502.2						Bottom of Boring - 27.5'							
30														

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CLIENT	CH2M Hill	JOB NUMBER	0121-3070-03
PROJECT	Portsmouth Bypass	SHEET NO.	OF
SUBJECT	Culvert at Station 619+73.25	COMP. BY	SJR DATE
	Bearing Capacity Analysis	CHECKED BY	DATE

Base analysis on results of boring B-1122, B-1122A, and C-123

Analysis is representative of both left and right headwall locations

Assume qu =	0.9	tsf for stiff cohesive material
c =	900	psf
Factor of Safety (FS) =	3	(ODOT BDM 202.2.3.1)

For cohesive foundation soil:

Meyerhof's Method

$q_u = S_c * c * N_c + q * N_q$ $\quad q = \gamma * D$ **Can be neglected since footing depth is less than 5 ft**

Since footing Dimensions are not known assume $S_c = 1.0$. For $\phi = 0$, use $N_c = 5.14$ and $N_q = 1$

$q_a = q_u / FS$= 1542 psf

Use $q_a <$ 1542 psf

ÚÄÄÄÄÄ ONE DIMENSIONAL SETTLEMENT ANALYSIS/Federal Highway Administration ÄÄÄÄÄ¿
³ STRIP SYMMETRICAL VERTICAL EMBANKMENT LOADING ³

Project Name	: SCI-823	Client	: CH2M Hill
File Name	: cvt2.emb	Project Manager	: Nix
Date	: 10/25/07	Computed by	: sjr

Settlement for X-Direction

Embankment slope a	= 35.00 (ft)	Height of fill H	=	9.50	(ft)
Embankment top width	= 35.00 (ft)	Unit weight of fill	=	120.00	(pcf)
Embankment bottom width	= 105.00 (ft)	p load/unit area	=	1140.00	(psf)
Ground Surface Elev.	= 530.00 (ft)	Foundation Elev.	=	530.00	(ft)
Water table Elev.	= 519.20 (ft)	Unit weight of Wat.	=	62.40	(pcf)

NS.	LAYER TYPE	THICK. (ft)	COEFFICIENT COMP.	RECOMP.	SWELL.	UNIT WEIGHT (pcf)	SPECIFIC GRAVITY	VOID RATIO
1	INCOMP.	3.0	-----	-----	-----	120.00	----	----
2	COMP.	7.8	0.370	0.070	0.000	120.00	2.65	1.10
3	COMP.	9.0	0.050	0.050	0.000	120.00	2.65	1.00

NS.	SUBLAYER THICK. (ft)	ELEV. (ft)	SOIL STRESSES INITIAL (psf)	MAX.PAST PRESS. (psf)
1	INCOMP.			
2	7.80	523.10	828.00	3000.00
3	9.00	514.70	1555.20	3000.00

Layer	X = 0.00 Stress (psf)	Sett. (in.)	X = 14.00 Stress (psf)	Sett. (in.)	X = 28.00 Stress (psf)	Sett. (in.)	X = 42.00 Stress (psf)	Sett. (in.)
1	INCOMP.	INCOMP.	INCOMP.	INCOMP.				
2	70.50	0.11	458.43	0.60	897.89	1.00	1124.46	1.16
3	148.20	0.11	470.34	0.31	845.22	0.51	1060.30	0.61
		------		------		------		------
		0.22		0.91		1.50		1.77

Layer	X = 56.00 Stress (psf)	Sett. (in.)	X = 70.00 Stress (psf)	Sett. (in.)
1	INCOMP.	INCOMP.		
2	1133.34	1.17	1068.69	1.12
3	1088.92	0.62	983.83	0.57
		------		------
		1.79		1.70

³ ³

ÀÄÄÄÄÄ Hit arrow keys to display next screen. <F8> Print. <F10> Main Menu ÄÄÄÄÄÙ

ÚÄÄÄÄÄ ONE DIMENSIONAL SETTLEMENT ANALYSIS/Federal Highway Administration ÄÄÄÄÄ¿
³ STRIP SYMMETRICAL VERTICAL EMBANKMENT LOADING ³

Project Name	: SCI-823	Client	: CH2M Hill
File Name	: Cvt1.emb	Project Manager	: Nix
Date	: 10/25/07	Computed by	: sjr

Settlement for X-Direction

Embankment slope a	= 0.10 (ft)	Height of fill H	= 21.40 (ft)		
Embankment top width	= 33.90 (ft)	Unit weight of fill	= 120.00 (pcf)		
Embankment bottom width	= 34.10 (ft)	p load/unit area	= 2568.00 (psf)		
Ground Surface Elev.	= 530.00 (ft)	Foundation Elev.	= 530.00 (ft)		
Water table Elev.	= 524.70 (ft)	Unit weight of Wat.	= 62.40 (pcf)		

LAYER N$.	TYPE	THICK. (ft)	COEFFICIENT COMP.	RECOMP.	SWELL.	UNIT WEIGHT (pcf)	SPECIFIC GRAVITY	VOID RATIO
1	INCOMP.	1.0	-----	-----	-----	120.00	----	----
2	COMP.	8.8	0.370	0.070	0.000	120.00	2.65	1.10
3	COMP.	7.0	0.025	0.025	0.000	120.00	2.65	1.00

SUBLAYER N$.	THICK. (ft)	ELEV. (ft)	SOIL STRESSES INITIAL (psf)	MAX.PAST PRESS. (psf)
1	INCOMP.			
2	8.80	524.60	641.76	3000.00
3	7.00	516.70	1096.80	3000.00

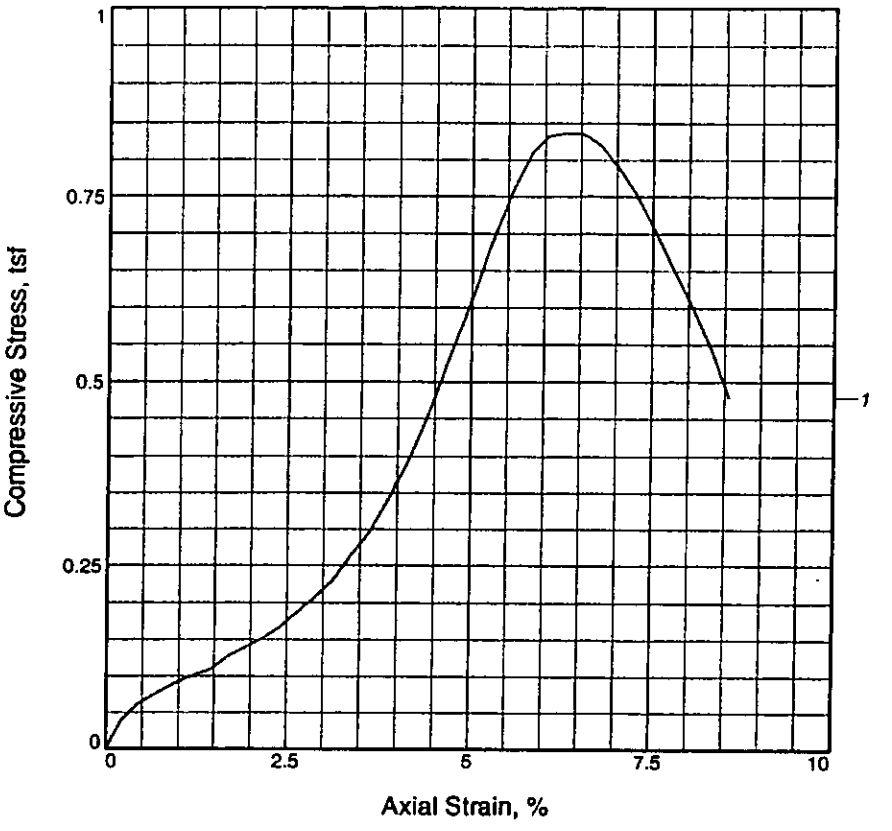
Layer	X = Stress (psf)	17.10 Sett. (in.)	X = Stress (psf)	24.10 Sett. (in.)	X = Stress (psf)	31.10 Sett. (in.)	X = Stress (psf)	38.10 Sett. (in.)
1	INCOMP.	INCOMP.	INCOMP.	INCOMP.				
2	2536.88	2.82	2498.43	2.73	2033.84	2.18	364.12	0.69
3	2276.04	0.51	2134.36	0.49	1600.27	0.41	794.33	0.25
		3.34		3.22		2.59		0.94

Layer	X = Stress (psf)	45.10 Sett. (in.)	X = Stress (psf)	52.10 Sett. (in.)
1	INCOMP.	INCOMP.		
2	48.19	0.11	12.56	0.03
3	302.85	0.11	120.29	0.05
		0.22		0.08

³ ³

ÄÄÄÄÄÄ Hit arrow keys to display next screen. <F8> Print. <F10> Main Menu ÄÄÄÄÄÙ

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	0.835			
Undrained shear strength, tsf	0.418			
Failure strain,	6.5			
Strain rate, in./min.	0.06			
Water content, %	32.0			
Wet density, pcf	111.1			
Dry density, pcf	84.2			
Saturation, %	84.7			
Void ratio	1.0397			
Specimen diameter, in.	2.84			
Specimen height, in.	5.53			
Height/diameter ratio	1.95			

Description:

LL = 36	**PL** = 21	**PI** = 15	**Assumed GS**= 2.75	**Type:** 3" press tube

Project No.: 0121-3070.03

Date: 9/17/07

Remarks:

Client: TranSystems, Inc.

Project: SCI-823-0.00

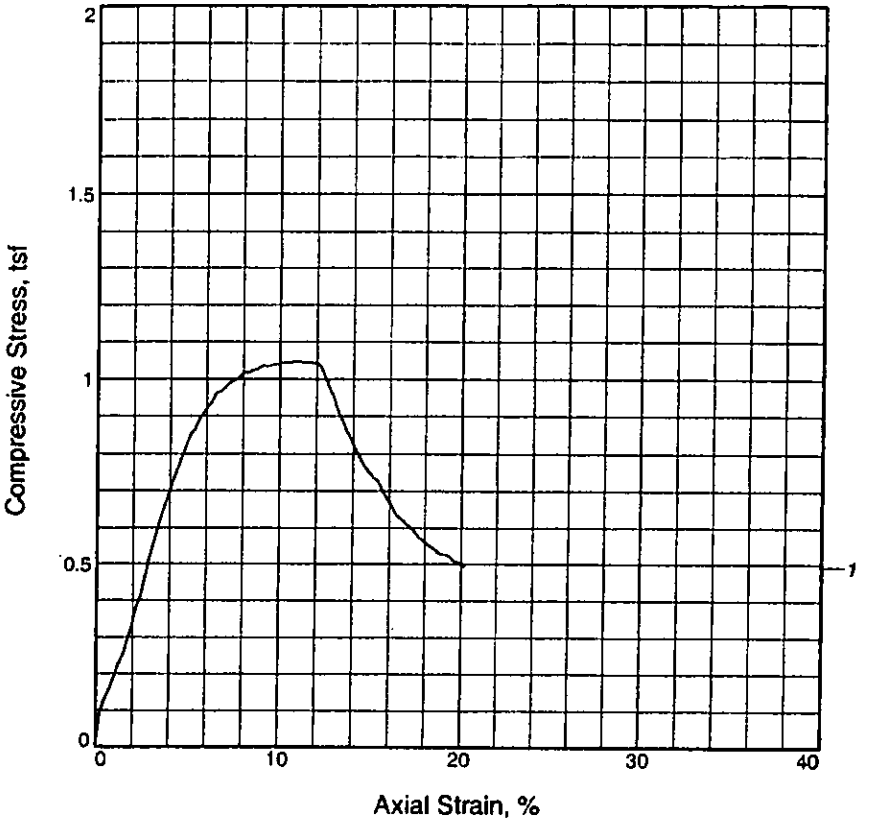
Source of Sample: B-1122A **Depth:** 12.0

Sample Number: ST1

Figure _____

DLZ

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	1.046			
Undrained shear strength, tsf	0.523			
Failure strain,	11.4			
Strain rate, In./min.	0.06			
Water content, %	30.9			
Wet density, pcf	119.0			
Dry density, pcf	90.9			
Saturation, %	95.6			
Void ratio	0.8890			
Specimen diameter, in.	2.84			
Specimen height, in.	5.54			
Height/diameter ratio	1.95			

Description:

LL =	**PL =**	**PI =**	**Assumed GS=** 2.75	**Type:** 3" press tube

Project No.: 0121-3070 03

Date:

Remarks:

Figure _____

Client: TranSystems, Inc.

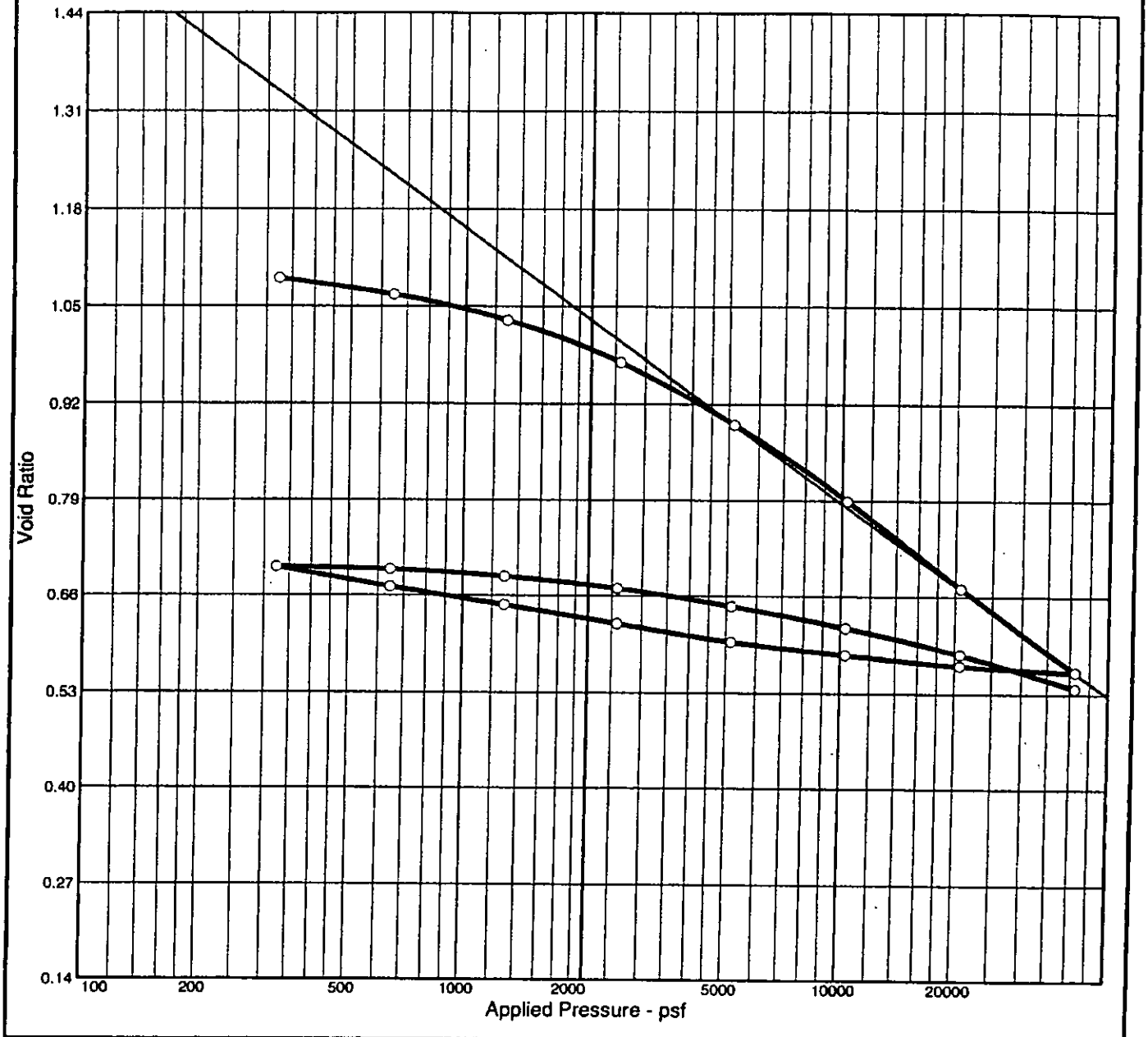
Project: SCI-823-0.00

Source of Sample: B-1122A **Depth:** 12.0

Sample Number: ST1

DLZ

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	USCS	AASHTO	Initial Void Ratio
Saturation	Moisture							
82.6 %	34.2 %	79.4	36	15	2.68	CL	A-6(15)	1.108

MATERIAL DESCRIPTION

Project No. 0121- **Client:** TranSystems, Inc.

Project: SCI-823-0.00

Source: B-1122A **Sample No.:** ST1 **Elev./Depth:** 12.0

Remarks:

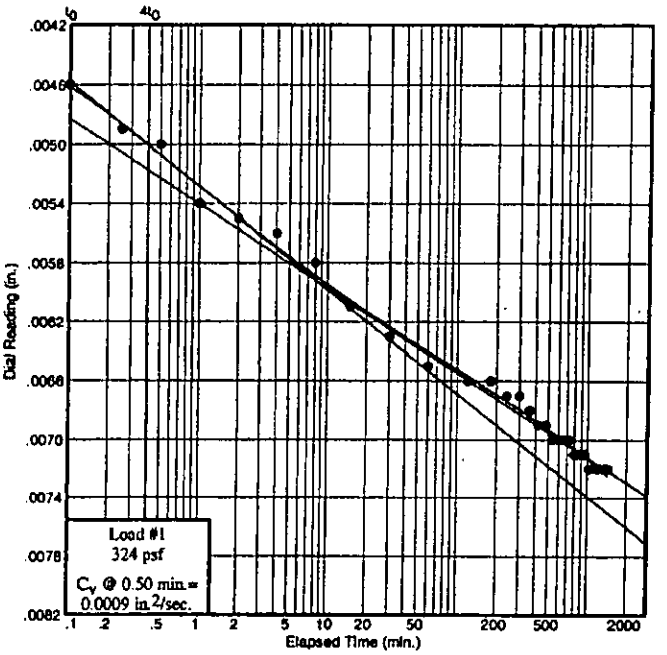
DLZ

Figure

Dial Reading vs. Time

Project No.: 0121-3070.03
Project: SCI-823-0.00

Source: B-1122A Sample No.: ST1 Elev./Depth: 12.0



DLZ

Figure