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Washington State Department of Transportation

Memorandum

March 12, 1993

FROM: R. G. Finkle/D. G. Chadbourne
Headquarters Materials Laboratory, 7365
Phone: 586-7838 SCAN 321-7838

TO: R. Q. Anderson/A. E. Stiles
District 1 Materials/NB-82, MS-29

RE: SR-542, C.S. 3705 & 3706, OL-1071
Nugents Vicinity Bridges
Embankment Widening

As requested, we have reviewed the foundation conditions for the embankment widening and realignment of SR-542 for the Nugents Vicinity Bridges Project. This project requires widening of the existing embankments on SR-542 from Station 406+50 to 412+50, replacement of Bridge 542/9 with an embankment, and realignment of the existing roadway from 417+00 to 436+50. This report does not address the replacement of Bridges 542/10 and 542/11.

The analysis, conclusions, and recommendations contained in this report are based on the project description and site conditions that existed at the time of the field explorations. The exploratory borings are assumed to represent the subsurface conditions throughout the project area. If subsurface conditions different from those found by the explorations are encountered during construction, or appear to be present beneath or beyond the excavations, we should be advised so that we can aid you and reevaluate our recommendations.

Field Investigation

Eight test borings were made by the District to evaluate subsurface conditions. In general, standard penetrometer tests (SPT) were taken at five foot intervals in each test hole. Disturbed soil samples from the standard penetrometer were visually identified in the field and then submitted to the Materials Laboratory for more detailed classification. Undisturbed samples consisting of Shelby tubes and Washington DOT samplers were also obtained at regular intervals in cohesive soils. Three piezometers were installed for the purpose of monitoring groundwater fluctuation. A plan view of the project site showing test hole locations is included in Appendix A. Copies of the boring logs, edited to our standard format, are included in Appendix B.

In general, soils at the project site consist of glacial outwash deposits of medium to very dense sands and gravels, and glaciomarine deposited stiff to very stiff clays with sand lenses. These soils were deposited during the last glacial period as the main continental ice sheets were retreating to the north.

Laboratory Testing

The laboratory testing program for this project consisted of the identification and classification of selected disturbed samples from the test borings. The Unified Soil Classification System was used to classify the selected samples. Visual classification included density or consistency, color, water content, major soil type, and modifying fractions of the samples. Grain size analyses and water content tests were conducted according to the procedures detailed in AASHTO T-88 and ASTM D 2216, respectively. Determination of Atterberg limits for the fine-grained samples was performed in accordance with AASHTO T-88 and T-90. Consolidation tests were conducted on selected undisturbed samples to evaluate long-term settlement. The results of the laboratory testing are included in Appendix C.

EMBANKMENT DESIGN

The Bridge 542/9 will be replaced with a fill section from Station 406+50 to Station 407+80. The embankment reaches a maximum height of 31 ft at Station 407+00. Test borings TH-1-93 and TH-2-93 made at Station 407+00 encountered approximately 20 ft of medium to very dense gravelly sands and sandy gravels with sandy clay lenses, underlain by 30 to 35 ft of interbedded stiff to very stiff silty clays and medium dense to very dense gravelly, silty sands. This sequence is underlain by stiff to hard, silty clays with sand lenses.

Settlement of the embankment in this area will be approximately 8 inches. Approximately 6 inches of the settlement will occur within the first 2 months after construction of the embankment. The remaining 2 inches will occur over a period of approximately 5 years. This long term settlement may cause some minor roadway maintenance problems. Maximum settlement will occur over the highest section of the embankment in the vicinity of Station 407+00 to 407+30. The amount of settlement will decrease as the embankment height decreases from Station 406+50 to 407+00 and from Station 407+30 to 407+80. Some minor cracking of the pavement may occur in

this area. Please inform us if this is not acceptable. Surcharge loading of the embankment or wick drains could be used to increase the settlement rate and decrease the amount of long term settlement. Please note that due to the depth (approximately 55 ft) of the clay layers involved, these solutions would be expensive. A cross section of the embankment at Station 407+00 showing the subsurface conditions is provided in Appendix A.

From Station 407+80 to Station 412+50, sliver fills of up to 25 ft in height will widen the existing embankments up to 15 ft on each side and flatten the slopes to 4:1. The soils in this area consist of approximately 8 ft of loose to medium dense gravelly sands underlain by dense to very dense gravelly sands and sandy gravels. Settlement of the fills will be approximately 1 inch at the shoulder and will occur during construction.

At Station 417+00 the proposed alignment moves to the north of the existing roadway requiring construction of embankments of up to 35 ft in height. The soils in this area consist of 10 to 20 ft of very loose to loose gravelly, silty sands underlain by dense to very dense gravelly sands and sandy gravels with cobbles and boulders. Settlement of the fills in this area will be 5 inches or less and occur during construction. Post construction settlement will be negligible.

Northeast of the Nooksack River, from Station 430+00 to Station 436+50, the alignment continues north of the existing roadway. The maximum fill height in this section is 24 ft. Test boring TH-8-92, at Station 433+00, encountered 13 ft of very loose very silty sand underlain by 4 ft of soft sandy silt. These soils are underlain by dense to very dense sandy gravels and gravelly sands. Settlement of the fills in this section will be approximately 6 inches and will occur during construction. Embankment slopes of 2:1 have been proposed for this section and will have adequate stability. A subsurface cross section for Station 433+00 is provided in Appendix A.

CONCLUSION

Subsurface cross sections, Logs of Test Borings, and laboratory test data are included in Appendices A, B, and C, respectively. Please note that Section 1-02.4 of the Standard Specifications allows potential bidders to inspect all factual data, which includes the boring logs and laboratory test data. If you have any questions regarding the recommendations made in this memorandum, please call

Don Chadbourne at SCAN 321-7838.

RGF:dgc

DGC
Attachments

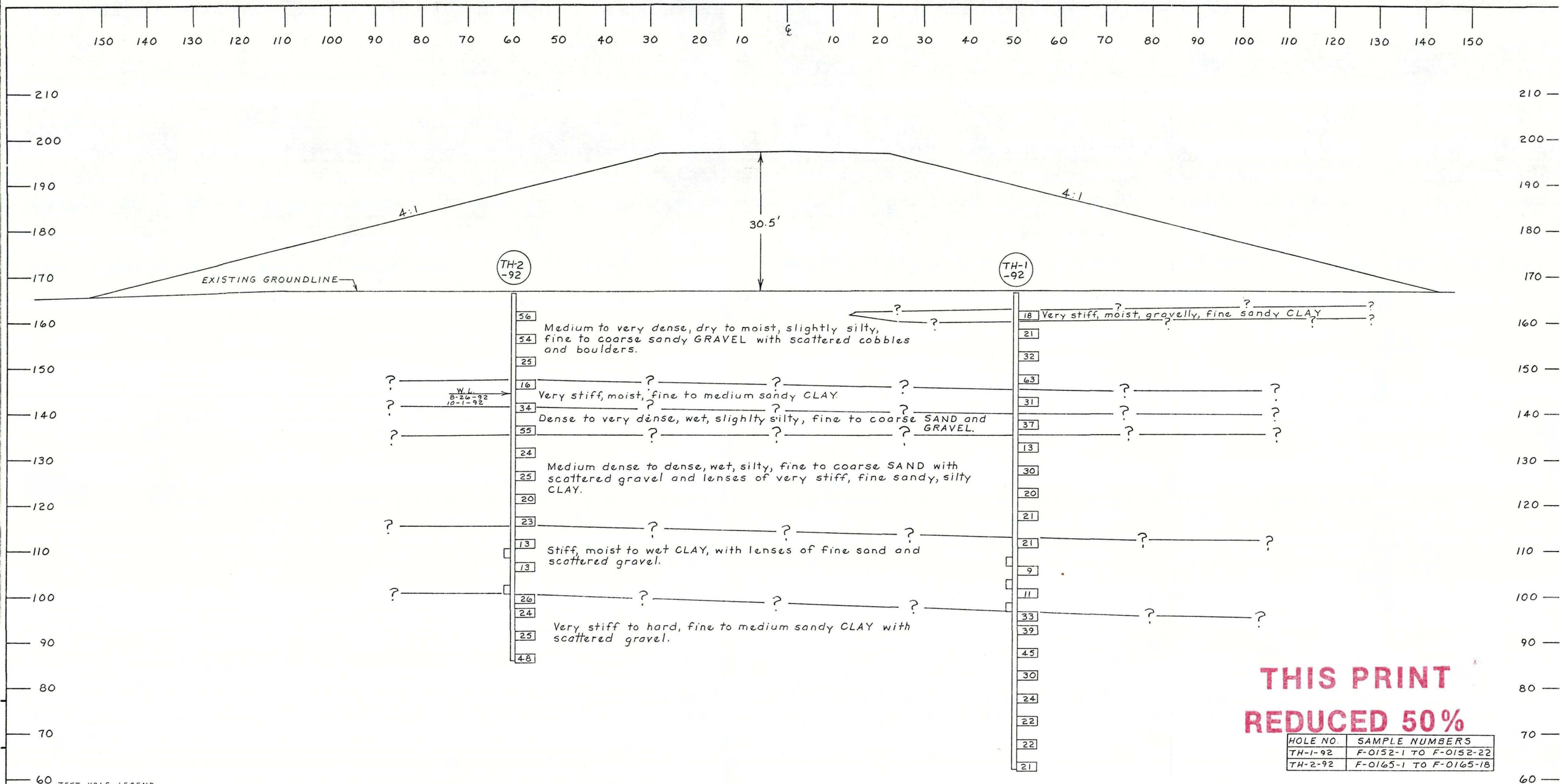
cc: T. L. Nelson, HQ Construction, 7354
J. M. Hayes, District 1, NB-82, MS-54

APPENDIX A

TEST HOLE PLAN

AND

CROSS SECTIONS



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HOLE NO.	SAMPLE NUMBERS
TH-1-92	F-0152-1 TO F-0152-22
TH-2-92	F-0165-1 TO F-0165-18

TEST HOLE LEGEND

- H-1 ℄ TEST HOLE NUMBER AND OFFSET
- 23 STANDARD PENETROMETER TEST (BLOWS PER FOOT)
- UNDISTURBED SAMPLE
- W.L. WATER LEVEL AND DATE
- ? INDICATES SOIL/ROCK STRATA BETWEEN TEST HOLES MAY NOT BE CONTINUOUS
- 86% ROCK CORE
- ROCK QUALITY DESIGNATION

CROSS SECTION AT STATION 407+00

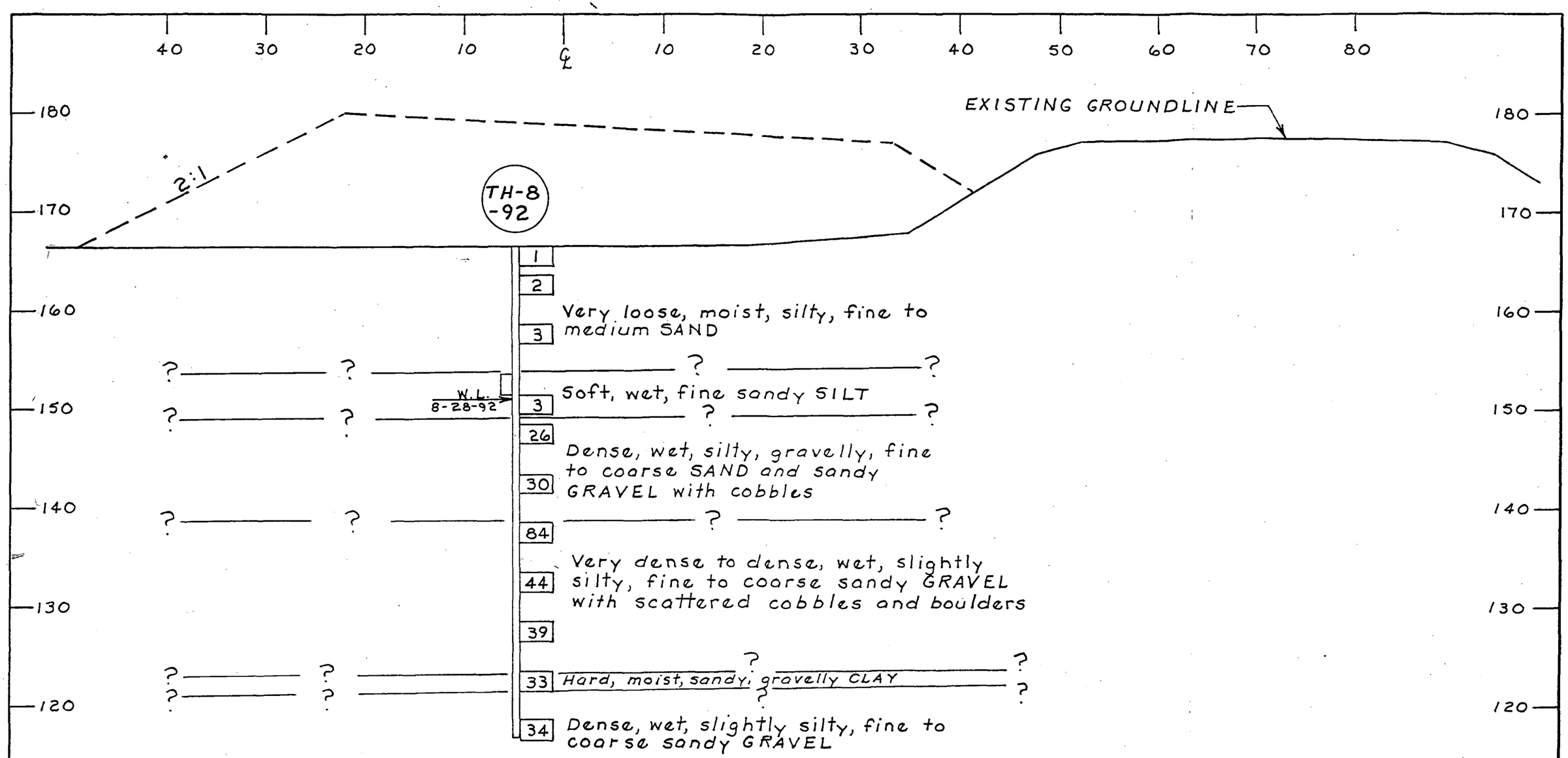
JOB OL-0701 S.R. 542 C.S. 3705-6 Layout

NUGENTS VICINITY BRIDGES

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
Materials Engineer

DATE FEB. 1993
SCALE 1"= 10' VERT.
1"= 10' HORIZ.
SHEET ___ OF ___
DRAWN BY LSH

221-095
(8)



TEST HOLE LEGEND

H-1 ℄ TEST HOLE NUMBER AND OFFSET

23 STANDARD PENETROMETER TEST (BLOWS PER FOOT)

UNDISTURBED SAMPLE

W.L. WATER LEVEL AND DATE

? ? INDICATES SOIL/ROCK STRATA BETWEEN TEST HOLES MAY NOT BE CONTINUOUS

86% ROCK CORE

ROCK QUALITY DESIGNATION

HOLE NO.	SAMPLE NUMBERS
TH-8-92	F-0180-1 TO F-0180-12.

CROSS SECTION AT STATION 433+00

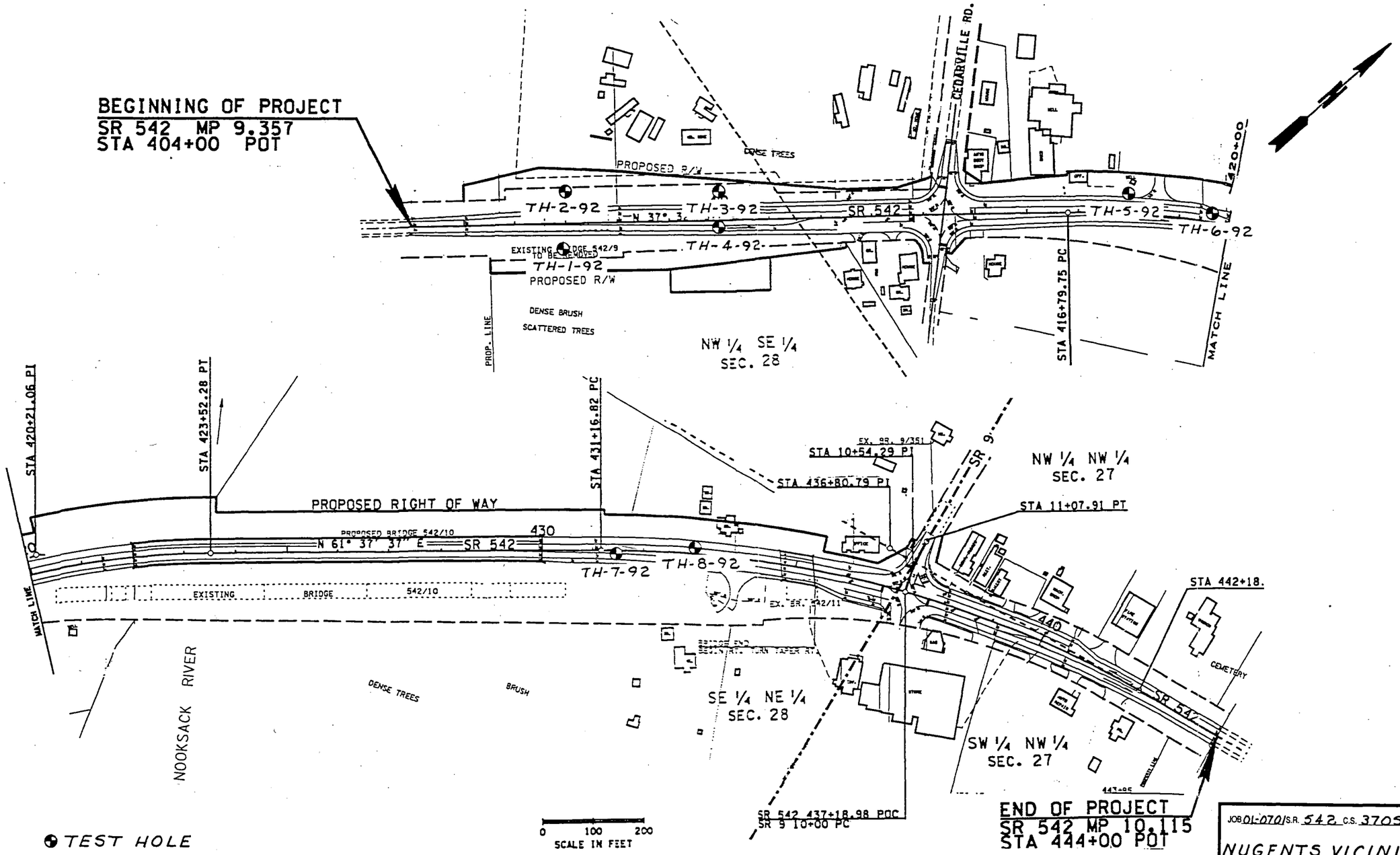
JOB 01-1071 S.R. 542 C.S. 3705-6

NUGENTS VICINITY BRIDGES

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
RODNEY G. FINKLE Materials Engineer

DATE FEB. 1993
SCALE 1" = 10' VERT.
1" = 10' HORIZ.
SHEET ____ OF ____
DRAWN BY L.S.H.

DOTC—1



PLAN VIEW SHOWING TEST HOLE LOCATIONS

JOB 01-070 / S.R. 542 C.S. 3705-6

NUGENTS VICINITY BRIDGES

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
RODNEY G. FINKLE Materials Engineer

DATE FEB. 1993
SCALE 1" = 200' VERT. HORIZ.
SHEET ____ OF ____
DRAWN BY L.S.H.

DOTC—1

APPENDIX B

LOGS OF TEST BORINGS

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-1-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 50.0' Rt. Ground El. 167.0'

Type of Boring CME 850 Casing Auger - HQ W.T. El. SEE LOG

Inspector Date August 13, 1992 Sheet 1 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				Loose, dark brown, moist, slightly silty, gravelly, fine to medium **SAND.**
5	18		STD. PEN. 1: 0, 3, 15	**CL, M.C. = 26.0%, PI = 10.2** Very stiff, light yellowish brown, moist, gravelly, fine sandy **CLAY.** Retained 1.5 ft.
10	21		STD. PEN. 2: 3, 10, 11	Medium dense, brown, moist, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES.** Retained 0.7 ft.
15	32		STD. PEN. 3: 14, 17, 15	Dense, brown, wet, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES.** Retained 0.8 ft.
20	63		STD. PEN. 4: 18, 26, 37	**GW, M.C. = 4.6%** Very dense, olive grey, wet, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES.** Retained 0.7 ft.

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-1-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 50.0' Rt. Ground El. 167.0'

Type of Boring CME 850 Casing Auger - HQ W.T. El. SEE LOG

Inspector Date August 13, 1992 Sheet 2 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
	31		STD. PEN. 5	18 15 16		Hard, grey, wet, gravelly, fine to medium sandy **CLAY.** Retained 1.5 ft.
25						
	37		STD. PEN. 6	14 16 21		***SW, M.C. = 11.5%** Dense, olive, wet, slightly silty, fine to coarse sandy **GRAVEL.** Retained 1.5 ft.
30						
	13		STD. PEN. 7	3 6 7		**SP-SM, M.C. = 26.0%** Medium dense, olive grey, saturated, silty, fine to medium **SAND.** Retained 1.5 ft.
35						
	30		STD. PEN. 8	5 10 20		Dense, dark grey, wet, silty, fine to medium sandy **CLAY.** Retained 1.5 ft.
40						

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-1-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 50.0' Rt. Ground El. 167.0'

Type of Boring CME 850 Casing Auger - HQ W.T. El. SEE LOG

Inspector Date August 13, 1992 Sheet 3 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	20		STD. PEN. 9 (4, 8, 12)	**SM, M.C. = 21.9%** Medium dense, dark grey, wet, very silty, fine to coarse **SAND** with a 0.4 ft. layer of fine gravel. (2.0 ft. of heave in auger) Retained 1.5 ft.
45				
	21		STD. PEN. 10 (4, 7, 14)	**ML-CL, M.C. = 20.7%, PI = 5.3** Medium dense, dark grey, wet, fine sandy, silty **CLAY** with fine layers of **SILT.** (2.0 ft. of heave in auger) Retained 1.5 ft.
50				
				Pushed shelby tube 1.0 ft. with no recovery.
55	21		STD. PEN. 11 (5, 10, 11)	Medium dense, dark grey, moist, fine sandy, silty **CLAY.** Retained 1.5 ft.
			S-1	
60				

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-1-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 50.0' Rt. Ground El. 167.0'

Type of Boring CME 850 Casing Auger - HQ W.T. El. SEE LOG

Inspector Date August 13, 1992 Sheet 4 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	9		STD. PEN. 12 — 2, 3, 6	Stiff, dark grey, moist, fine sandy **CLAY.** Retained 1.5 ft.
				CL, M.C. = 27.3%, PI = 10.6 Dark grey, moist, fine sandy **CLAY.**
			S-2	
65	11		STD. PEN. 13 — 3, 5, 6	**CH, M.C. = 31.2%, PI = 39.7** Stiff, grey, wet, fine sandy **CLAY.** Retained 1.5 ft.
			S-3	
70	33		STD. PEN. 14 — 5, 12, 21	Hard, dark grey, wet, gravelly, fine sandy **CLAY.** Retained 1.5 ft.
	39		STD. PEN. 15 — 8, 16, 23	Hard, dark grey, moist, gravelly, fine sandy **CLAY.** Retained 1.5 ft.
75	45		STD. PEN. 16 — 8, 18, 27	Hard, dark grey, moist, gravelly, fine sandy **CLAY.** Retained 1.5 ft.
80				

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-1-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 50.0' Rt. Ground El. 167.0'

Type of Boring CME 850 Casing Auger - HQ W.T. El. SEE LOG

Inspector Date August 13, 1992 Sheet 5 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
	30		STD. PEN. 17	11 14 16		Very stiff, dark grey, moist, gravelly, fine sandy **CLAY.** Retained 1.5 ft.
85						
	24		STD. PEN. 18	6 12 12		Very stiff, grey, wet, fine sandy **CLAY.** Retained 1.5 ft.
90						
	22		STD. PEN. 19	6 10 12		**CL, M.C. = 31.0%, PI = 23.2** Very stiff, grey, wet, fine sandy **SILT.** Retained 0.6 ft.
95						
	22		STD. PEN. 20	4 8 14		Very stiff, dark grey, wet, silty, fine sandy **CLAY.** Retained 1.5 ft.
100						

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-1-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 50.0' Rt. Ground El. 167.0'

Type of Boring CME 850 Casing Auger - HQ W.T. El. SEE LOG

Inspector Date August 13, 1992 Sheet 6 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
	22		STD. PEN. 21		6 10 11	Medium dense, dark grey, wet, fine sandy **CLAY** with fine sand lenses. Retained 1.5 ft.
105						End of Test Hole Boring at 104.5 ft. below ground
						* Laboratory test results reflects the finer fraction of the soil observed in the field.
						Water Table Elevation:Not determined
110						
						This is a Summary Log of the Test Hole Boring. *Soil/Rock descriptions are derived from visual field identifications and laboratory test data.*
115						
120						

DOT FORM 351-003 REVISED 12/79

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-2-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 60.0' Lt. Ground El. 167.0'

Type of Boring Casing Augers W.T. El. 145.0'

Inspector Date August 18, 1992 Sheet 1 of 5

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
5	56		STD. PEN. 1	7 31 25		Very dense, brown, dry, slightly silty, fine to coarse sandy **GRAVEL** with cobbles. Retained 1.4 ft.
10	54		STD. PEN. 2	25 26 28		Very dense, greyish brown, dry, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS.** Retained 1.2 ft.
15	25		STD. PEN. 3	9 10 15		Dense, brown, moist, slightly silty, fine to coarse sandy **GRAVEL** Retained 1.2 ft.
20	16		STD. PEN.	4 7		**CL, M.C. = 23.0%, PI = 20.2** Very stiff, olive grey, wet, gravelly, fine to medium sandy

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-2-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 60.0' Lt. Ground El. 167.0'

Type of Boring Casing Augers W.T. El. 145.0'

Inspector Date August 18, 1992 Sheet 2 of 5

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			4 9	**CLAY.** Retained 1.5 ft.
				∇ 8/26/92 10/1/92
25	34		STD. PEN. 5 2 15 19	
				Dense, brown, wet, slightly silty, fine to coarse sandy **GRAVEL.** Retained 0.8 ft.
30	55		STD. PEN. 6 10 33 22	Very dense, brown, wet, slightly silty, fine to coarse sandy **GRAVEL.** Retained 1.5 ft.
35	24		STD. PEN. 7 3 7 17	Medium dense, brownish grey, wet, gravelly, silty, fine to medium **SAND.** Retained 1.5 ft.
40	25		STD. PEN. 3 9	Dense, dark grey, wet, gravelly, very silty, fine to coarse **SAND.** (1.0 ft. of heave in augers) Retained 1.5 ft.

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-2-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 60.0' Lt. Ground El. 167.0'

Type of Boring Casing Augers W.T. El. 145.0'

Inspector Date August 18, 1992 Sheet 3 of 5

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			8 16	
45	20		STD. PEN. 9 4 9 11	Medium dense, dark grey, saturated, gravelly, very silty, fine to coarse **SAND.** (1.0 ft. of heave in augers) Retained 1.5 ft.
50	23		STD. PEN. 10 5 9 14	Medium dense, dark grey, wet, slightly silty, fine **SAND.** Retained 1.5 ft.
55	13		STD. PEN. 11 2 5 8	**CL, M.C. = 25.5%, PI = 21.9** Stiff, grey, moist **CLAY.** Retained 1.5 ft.
			S-1	**CL, M.C. = 20.4%, PI = 20.3** Grey, moist, gravelly, fine sandy **CLAY.** Retained 2.0 ft.
60	13		STD. PEN. 3 5	Stiff, dark grey, wet, coarse sandy **CLAY.** Retained 1.5 ft.

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-2-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 60.0' Lt. Ground El. 167.0'

Type of Boring Casing Augers W.T. El. 145.0'

Inspector Date August 18, 1992 Sheet 4 of 5

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			12 8	
65			S-2	
	26		STD. PEN. 13 9 12 14	Very stiff, dark grey, wet, gravelly, fine to medium sandy **CLAY.** Retained 1.5 ft.
70	24		STD. PEN. 14 5 10 14	**CL, M.C. = 12.2%, PI = 19.9** Very stiff, dark grey, wet, gravelly, fine to medium sandy **CLAY.** Retained 1.5 ft.
75	25		STD. PEN. 15 9 11 14	Very stiff, dark grey, wet, gravelly, fine to medium sandy **CLAY.** Retained 1.5 ft.
80	48		STD. PEN. 11 19	**M.C. = 18.6%** Hard, dark grey, wet, gravelly, fine to medium sandy **CLAY.**

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-2-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 407+00 Offset 60.0' Lt. Ground El. 167.0'

Type of Boring Casing Augers W.T. El. 145.0'

Inspector Date August 18, 1992 Sheet 5 of 5

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
			16		29	Retained 1.5 ft.
						End of Test Hole Boring at 80.5 ft. below ground elevation.
						Installed piezometer pipe to 80.0 ft. below ground elevation.
85						This is a Summary Log of the Test Hole Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.
90						
95						
100						

DOT FORM 351-003 REVISED 12/79

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-3-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 410+00 Offset 50.0' Lt. Ground El. 166.0'

Type of Boring CME 850 Casing Augers W.T. El. 136.0'

Inspector Date August 20, 1992 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	7		STD. PEN. 1 — 1, 3, 4	**SM, M.C. = 11.7%** Loose, light olive brown, moist, gravelly, silty, fine to coarse **SAND** with root hairs. Retained 1.0 ft.
5	19		STD. PEN. 2 — 10, 11, 8	Medium dense, greyish brown, dry, silty, gravelly, fine to coarse **SAND** with **COBBLES** and **BOULDERS.** Retained 1.1 ft.
10	41		STD. PEN. 3 — 6, 17, 24	Dense, greyish brown, moist, silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS.** Retained 1.4 ft.
15	52		STD. PEN. 4 — 14, 34, 18	Very dense, dark brown, moist, silty, fine to coarse sandy **GRAVEL** with **COBBLES.** Retained 0.9 ft.
20	70		STD. PEN. 5 — 22, 23, 47	Very dense, dark greyish brown, moist, silty, fine to coarse sandy **GRAVEL** with **COBBLES.** Retained 1.2 ft.

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-3-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 410+00 Offset 50.0' Lt. Ground El. 166.0'

Type of Boring CME 850 Casing Augers W.T. El. 136.0'

Inspector Date August 20, 1992 Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
	89		STD. PEN. 6	21 44 45		*SP-SM, M.C. = 1.9% Very dense, dark greyish brown, wet, silty, gravelly, fine to coarse sandy **GRAVEL**. Retained 1.4 ft.
25						
	47		STD. PEN. 7	17 21 21		Dense, dark greyish brown, saturated, silty, fine to coarse sandy **GRAVEL**. Retained 1.5 ft.
30					▽	
	21		STD. PEN. 8	5 10 11		Medium dense, dark greyish brown, saturated, slightly silty, fine to coarse sandy **GRAVEL**. Retained 1.2 ft.
35						
	64		STD. PEN. 9	12 21 43 60		Very dense, dark greyish brown, saturated, slightly silty fine to coarse sandy **GRAVEL**. Retained 0.7 ft.
40						

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LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-3-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 410+00 Offset 50.0' Lt. Ground El. 166.0'

Type of Boring CME 850 Casing Augers W.T. El. 136.0'

Inspector Date August 20, 1992 Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				End of Test Hole Boring at 40.0 ft. below ground elevation.
				* Laboratory test results reflects the finer fraction of the soil observed in the field.
45				
				This is a Summary Log of the Test Hole Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.
50				
55				
60				

DOT FORM 351-003 REVISED 12/79

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-4-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 410+00 Offset 10.0' Rt. Ground El. 181.3'

Type of Boring CME 850 Casing Augers W.T. El. 138.3'

Inspector Date August 27, 1992 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
						ASPHALT
	57		STD. PEN. 1	16 24 33		*SW-SM, M.C. = 0.9% Very dense, olive grey, moist, silty, fine to coarse sandy GRAVEL. Retained 1.3 ft.
5	10		STD. PEN. 2	5 4 6		Loose, dark greyish brown, moist, silty, fine to coarse sandy GRAVEL. Retained 0.4 ft.
10	6		STD. PEN. 3	2 3 3		Loose, dark brown, wet, silty, fine to coarse sandy GRAVEL with COBBLES. Retained 0.5 ft.
15	13		STD. PEN. 4	2 6 7		Medium dense, dark brown, wet, silty, fine to coarse sandy GRAVEL with COBBLES. Retained 0.5 ft.
20	6		STD. PEN.	3 3		Loose, dark brown, wet, sandy GRAVEL with COBBLES. Retained 0.4 ft.

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-4-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 410+00 Offset 10.0' Rt. Ground El. 181.3'

Type of Boring CME 850 Casing Augers W.T. El. 138.3'

Inspector Date August 27, 1992 Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			5 3	
25	30		STD. PEN. 6 14 14 16	Dense, dark greyish brown, moist, silty, fine to coarse sandy **GRAVEL** with **COBBLES**. Retained 1.0 ft.
30	50/5"		STD. PEN. 7 24 50/5"	Very dense, dark greyish brown, moist, silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS**. Retained 0.8 ft.
35	36		STD. PEN. 8 9 21 15	Dense, dark greyish brown, moist, silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS**. Retained 1.0 ft.
40	50/6"		STD. PEN. 17 50/6"	Very dense, dark greyish brown, wet, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES**.

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-4-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 410+00 Offset 10.0' Rt. Ground El. 181.3'

Type of Boring CME 850 Casing Augers W.T. El. 138.3'

Inspector Date August 27, 1992 Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
			9			Retained 1.4 ft.
						▽
45	55		STD. PEN. 10		26 27 28	Very dense, dark greyish brown, wet, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES**.
50	65		STD. PEN. 11		19 22 33	***SW, M.C. = 6.3%** Very dense, olive grey, saturated, slightly silty, fine to coarse sandy **GRAVEL**. Retained 1.5 ft.
55	69		STD. PEN. 12		20 35 34	Very dense, olive grey, saturated, slightly silty, fine to coarse sandy **GRAVEL**. Retained 1.5 ft.
60						End of Test Hole Boring at 55.5 ft. below ground elevation.

* Laboratory test results reflects the finer fraction of the soil observed in the field.

This is a Summary of the Test Hole Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.

DOT FORM 351-003 REVISED 12/79

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-5-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 418+00 Offset 35.0' Lt. Ground El. 152.0'

Type of Boring CME 850 Casing Augers W.T. El. 144.0'

Inspector Date August 24, 1992 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.		DESCRIPTION OF MATERIAL
	3		STD. PEN. 1	1 1 2	Very loose, dark brown, dry, gravelly, silty, fine to medium **SAND** with root hairs. Retained 0.5 ft.
5	5		STD. PEN. 2	1 2 3	Loose, dark greyish brown, dry, silty, fine to medium **SAND.** Retained 1.0 ft.
					▽
10	10		STD. PEN. 3	3 3 7	Loose, dark greyish brown, saturated, silty, gravelly, fine to coarse **SAND.** Retained 0.9 ft.
15			U-1	B C	
	37		STD. PEN. 4	2 9 28	**SP-SM, M.C. = 14.8%** Dense, dark greyish brown, saturated, silty, gravelly, fine to coarse **SAND.** Retained 1.5 ft.
20	34		STD. PEN.	3 15	***SW, M.C. = 2.0%** Dense, dark yellowish brown, water bearing, slightly silty,

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-5-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 418+00 Offset 35.0' Lt. Ground El. 152.0'

Type of Boring CME 850 Casing Augers W.T. El. 144.0'

Inspector Date August 24, 1992 Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			5 19	fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS**. Retained 1.5 ft. (2.0 ft. of heave in augers)
25	74/8"		STD. PEN. 6 12 24 50/2"	Very dense, dark grey, saturated, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS**. Retained 1.2 ft. (2.0 ft. of heave in augers)
30	63		STD. PEN. 7 32 29 34	Very dense, dark grey, wet, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS**. Retained 1.5 ft. (1.0 ft. of heave in augers)
35	50/6"		STD. PEN. 8 43 50/6"	Very dense, dark grey, wet, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES**. Retained 1.0 ft. (4.0 ft. of heave in augers)
40	50/6"		STD. PEN. 33 50/6"	Very dense, dark grey, wet, slightly silty, gravelly, fine to coarse **SAND**. Retained 1.5 ft.

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-5-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 418+00 Offset 35.0' Lt. Ground El. 152.0'

Type of Boring CME 850 Casing Augers W.T. El. 144.0'

Inspector Date August 24, 1992 Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
			9			(3.0 ft. of heave in augers)
45	50/6"		STD. PEN. 10		40 50/6"	**SW, M.C. = 4.6%** Very dense, dark olive brown, dry, slightly silty, gravelly, fine to coarse **SAND.** Retained 1.5 ft.
						End of Test Hole Boring at 45.0 ft. below ground elevation.
						* Laboratory test results reflects the finer fraction of the soil observed in the field.
						This is a Summary Log of the Test Hole Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.
50						
55						
60						

DOT FORM 351-003 REVISED 12/79

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-6-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 419+75 Offset 20.0' Lt. Ground El. 154.0'

Type of Boring CME 850 Casing Augers W.T. El. 142.0'

Inspector Date August 26, 1992 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
			STD. PEN. 1		0 1 1	Very loose, greyish brown, moist, silty, gravelly, fine to coarse **SAND**. Retained 1.0 ft.
	2					
5						
	9		STD. PEN. 2		2 3 6	Loose, greyish brown, wet, slightly silty, fine to coarse sandy **GRAVEL**. Retained 0.6 ft.
10						▽ 8/26/92
						▼ 10/1/92
	51		STD. PEN. 3		6 26 25	Very dense, dark grey, saturated, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS**. Retained 1.0 ft.
15						
	35		STD. PEN. 4		8 10 25	Dense, dark grey, saturated, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS**. Retained 1.1 ft.
20						

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-6-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 419+75 Offset 20.0' Lt. Ground El. 154.0'

Type of Boring CME 850 Casing Augers W.T. El. 142.0'

Inspector Date August 26, 1992 Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
	39		STD. PEN. 5	12 14 25		Dense, dark brownish grey, saturated, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES**. Retained 1.5 ft.
25						
	59		STD. PEN. 6	33 30 29		Very dense, dark brownish grey, saturated, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES**. Retained 1.5 ft. (4.0 ft. of heave in augers.)
30						
	74		STD. PEN. 7	18 24 50		Very dense, dark brownish grey, saturated, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES**. Retained 1.5 ft. (3.0 ft. of heave in augers.)
35						
	45		STD. PEN. 8	13 20 25		Dense, dark brownish grey, saturated, fine to coarse sandy **GRAVEL** with **COBBLES**. Retained 0.7 ft. (3.0 ft. of heave in augers.)
40						

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-6-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 419+75 Offset 20.0' Lt. Ground El. 154.0'

Type of Boring CME 850 Casing Augers W.T. El. 142.0'

Inspector Date August 26, 1992 Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
	50		STD. PEN. 9		16 24 26	Very dense, dark brownish grey, saturated, fine to coarse sandy **GRAVEL** with **COBBLES.** Retained 0.8 ft. (3.0 ft. of heave in augers.)
45						End of Test Hole Boring at 44.5 ft. below ground elevation.
						Piezometer pipe installed to 38.0 ft. below ground elevation.
50						This is a Summary Log of the Test Hole Boring. Soil/Rock descriptions are derived from visual field identifications.
55						
60						

DOT FORM 351-003 REVISED 12/79

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-7-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 431+25 Offset 5.0' Rt. Ground El. 149.5'

Type of Boring CME 850 Casing Augers W.T. El. 136.7'

Inspector Date September 1, 1992 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				Brown, dry, fine **SAND.**
	2		STD. PEN. 1: 1 1 1	Very loose, greyish brown, dry, fine sandy **SILT.** Retained 1.2 ft.
5				
	2		STD. PEN. 2: 0 1 1	**ML, M.C. = 45.3%** Very loose, dark grey, wet, fine sandy **SILT.** Retained 1.5 ft.
10				
	44		STD. PEN. 3: 4 20 24	▽ 10/1/92 Dense, dark grey, saturated, fine to coarse sandy **GRAVEL.** Retained 1.0 ft.
15				
	26		STD. PEN. 4: 11 13 13	Dense, dark grey, wet, slightly silty, fine to coarse sandy **GRAVEL** with **BOULDERS** and **COBBLES.** Retained 1.1 ft.
20				

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-7-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 431+25 Offset 5.0' Rt. Ground El. 149.5'

Type of Boring CME 850 Casing Augers W.T. El. 136.7'

Inspector Date September 1, 1992 Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
	41		STD. PEN. 5	15 20 21		Dense, dark grey, wet, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS.** Retained 1.5 ft. (2.0 ft. of heave in augers)
25						
	53		STD. PEN. 6	28 28 25		**GW-GM** Very dense, grey, wet, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS.** Retained 1.5 ft. (2.0 ft. of heave in augers)
30						
	38		STD. PEN. 7	25 16 22		Dense, dark grey, wet, slightly silty, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS.** Retained 1.5 ft. (2.0 ft. of heave in augers)
35						
	39		STD. PEN. 8	6 18 21		**CL, M.C. = 9.7%, PI = 14.6** Hard, dark olive brown, moist, fine to coarse sandy, gravelly **CLAY.** Retained 1.5 ft.
40						

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-7-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 431+25 Offset 5.0' Rt. Ground El. 149.5'

Type of Boring CME 850 Casing Augers W.T. El. 136.7'

Inspector Date September 1, 1992 Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
	36		STD. PEN. 9		10 18 18	Dense, dark brownish grey, saturated, medium to coarse sandy **GRAVEL**. Retained 1.0 ft. (2.0 ft. of heave in augers)
45						End of Test Hole Boring at 44.5 ft. below ground elevation.
						Piezometer pipe installed to 44.0 ft. below ground elevation.
50						This is a Summary Log of the Test Hole Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.
55						
60						

DOT FORM 351-003 REVISED 12/79

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-8-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 433+00 Offset 5.0' Lt. Ground El. 166.5'

Type of Boring CME 850 Casing Augers W.T. El. 151.0'

Inspector Date August 28, 1992 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.		DESCRIPTION OF MATERIAL
	1		STD. PEN. 1	1/12" 1	Very loose, greyish brown, dry, silty, fine to medium **SAND.** Retained 1.5 ft.
	2		STD. PEN. 2	1 1 1	Very loose, greyish brown, moist, silty, fine to medium **SAND.** Retained 1.5 ft.
5					
	3		STD. PEN. 3	1 1 2	**SM, M.C. = 11.2%** Very loose, dark yellowish brown, moist, silty, fine to medium **SAND.** Retained 1.5 ft.
10					
			S-1		**ML, M.C. = 43.1%** Grey, wet, fine sandy **SILT.**
15	3		STD. PEN. 4	1 1 2	▽ **ML, M.C. = 42.2%** Soft, dark grey, saturated, fine sandy **SILT.** Retained 1.5 ft.
	26		STD. PEN. 5	17 16 10	Dense, dark grey, saturated, silty, fine to coarse sandy **GRAVEL** with **COBBLES.** Retained 1.5 ft.
20					

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-8-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 433+00 Offset 5.0' Lt. Ground El. 166.5'

Type of Boring CME 850 Casing Augers W.T. El. 151.0'

Inspector Date August 28, 1992 Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.			DESCRIPTION OF MATERIAL
	30		STD. PEN. 6		7 7 23	Dense, dark grey, wet silty, gravelly, fine to coarse **SAND.** Retained 1.5 ft. (2.0 ft. of heave in augers)
25						
	84		STD. PEN. 7		18 34 50	Very dense, dark grey, wet, slightly silty, fine to coarse sandy **GRAVEL.** Retained 1.5 ft. (5.0 ft. of heave in augers)
30						
	44		STD. PEN. 8		29 26 18	Dense, dark grey, saturated, fine to coarse sandy **GRAVEL.** Retained 1.5 ft.
35						
	39		STD. PEN. 9		8 15 24	Dense, dark grey, saturated, fine to coarse sandy **GRAVEL** with **COBBLES** and **BOULDERS.** Retained 0.5 ft.
40						

Continued Next Page

LOG OF TEST BORING

Washington State Department of Transportation

S.R. 542 SECTION VICINITY NUGENTS BRIDGES Job No. OL-1071

Hole No. TH-8-92 Sub Section EMBANKMENTS Cont. Sec. 3705/06

Station 433+00 Offset 5.0' Lt. Ground El. 166.5'

Type of Boring CME 850 Casing Augers W.T. El. 151.0'

Inspector Date August 28, 1992 Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	33		STD. PEN. 10 — 18, 17, 16	Dense, dark grey, saturated, slightly silty, fine to coarse sandy **GRAVEL** to a clayey **SILT**. Retained 1.5 ft.
45				
	34		STD. PEN. 11 — 14, 16, 18	Dense, dark grey, wet, slightly silty, fine to coarse sandy **GRAVEL**. Retained 0.8 ft.
50				End of Test Hole Boring at 49.5 ft. below ground elevation.
				This is a Summary Log of the Test Hole Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.
55				
60				

DOT FORM 351-003 REVISED 12/79

APPENDIX C

LABORATORY TEST DATA

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-20-92

Page 1 of 4

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Wuguttsville Bridge Replacement
SR No. 542 Sub-Section

Station & Offset 407+00 50 FT RT Hole # TH-1-92

F-0152 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-1	D-0	0.0' to 4.0'	HAND Hole		As on log
-2	D-1	4.0' to 5.5'	MC= 26.0%	CL	PI
-3	D-2	8.0' to 9.5'			LK F-0152-5
-4	D-3	13.0' to 14.5'			LK F-0152-5
-5	D-4	18.0' to 19.5'	MC= 4.6%	GW	
-6	D-5	23.0' to 24.5'			LK F-0165-4
-7	D-6	28.0' to 29.5'	MC= 11.5%	GW	LK —
-8	D-7	33.0' to 34.5'	MC= 26.0%	SP-SM	
-9	D-8	38.0' to 39.5'			LK F-0152-11 INCR SAND

1 copy with samples
1 copy to addressee

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-20-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. 01-1071 Section Nugents U.C. Bridge Replacement SR No. 521 Sub-Section

Station & Offset 407+00 50 FT RT Hole # TH-1-92

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-10	D-9	43.0' to 44.5'	MC= 21.9%	SM	
-11	D-10	48.0' to 49.5'	MC= 20.7%	ML-CL	PI ~~LK~~
-12	D-11	54.0' to 55.5'			LK F-0152-11
-13	D-12	60.0' to 61.5'			LK F-0152-14
-14	D-13	65.0' to 66.5'	MC= 31.2%	CH	PI
-15	D-14	70.0' to 71.5'			LK F-0152-14
-16	D-15	73.0' to 74.5'			LK F-0152-14 incr silt
-17	D-16	78.0' to 79.5'			LK F-0152-14
-18	D-17	83.0' to 84.5'			LK F-0152-14 [illegible]

1 copy with samples
1 copy to addressee

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

Yours very truly,

[signature]
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-20-92

Page 3 of 4

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Duwamish Vic Bridge Replacement SR No. 512 Sub-Section

Station & Offset 401+00 50 FT RT Hole # TH-1-92

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-19	D-18	88.0' to 89.5'			LK F-0152-20
-20	D-19	93.0' to 94.5'	MC= 31.0%	CL	
-21	D-20	98.0' to 99.5'			LK F-0152-20 w/ inc silt
-22	D-21	103.0' to 104.5'			LK F-0152-20 w/ fine SAND LENSE

copy with samples
copy to addressee

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Sea Hte
Date 8-20-92

Page 4 of 4

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. DL-1071 Section Nugent's Vic Br. Replacement
SR No. 509 Sub-Section

Station & Offset 407 + 00 50 FT RT Hole # TH-92

F-0152 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-23	S-1	58.0' to 60.0'			
-24	S-2	63.0' to 65.0'	MC = 27.3%	CL	
-25	S-3	68.0' to 70.0'			

1 copy with samples
1 copy to addressee

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0152-2
HOLE NO.:	TH-1-92
DATE:	2-17-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

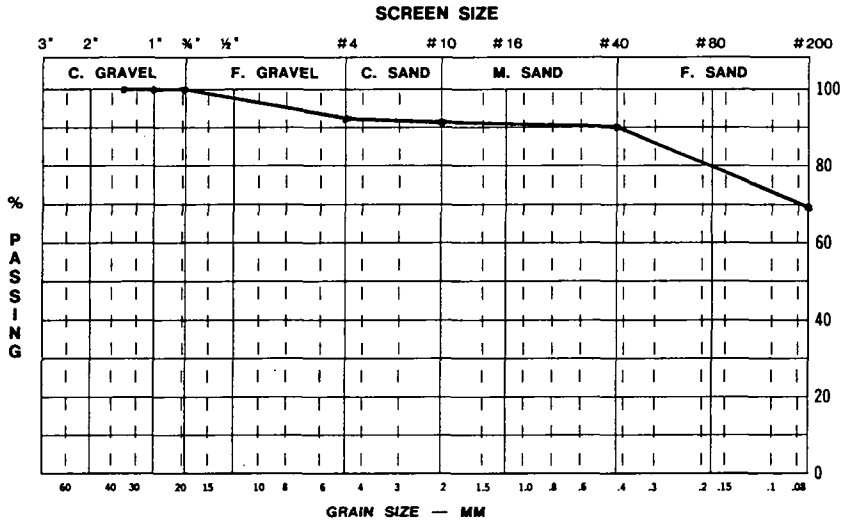
TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓		✓
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

SIEVE ANALYSIS

DRY WT.:	31.9g
WET WT.:	40.2g
% H_2O:	26.0%
WT. OF SAMPLE:	319.2g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	25.5g	100.0
-#4	2.7g	92.0
-#10	2.4g	91.2
-#40	69.3g	90.4
-#200	219.3g	68.7

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

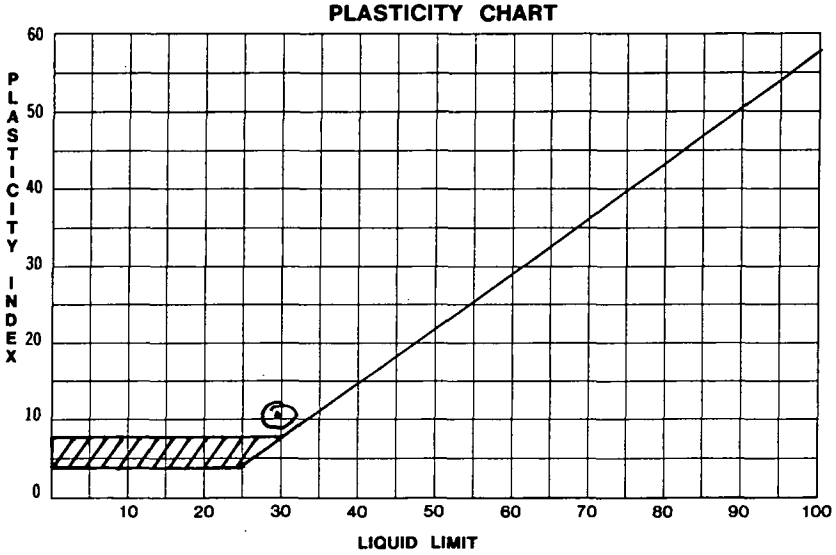
	LIQUID LIMIT				PLASTIC LIMIT
Can No.	2				16
Wet Wt.	26.0g				7.5g
Dry Wt.	20.6g				6.3g
% H_2O	29.2				PL= 19.0
Blows	24				PI= 10.2

SAMPLE DESCRIPTION

CLASS. CL

Light Yellowish Brown, Moist, Gravelly, Fine Sandy Clay.

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0152-5
HOLE NO.:	TH-1-92
DATE:	1-29-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

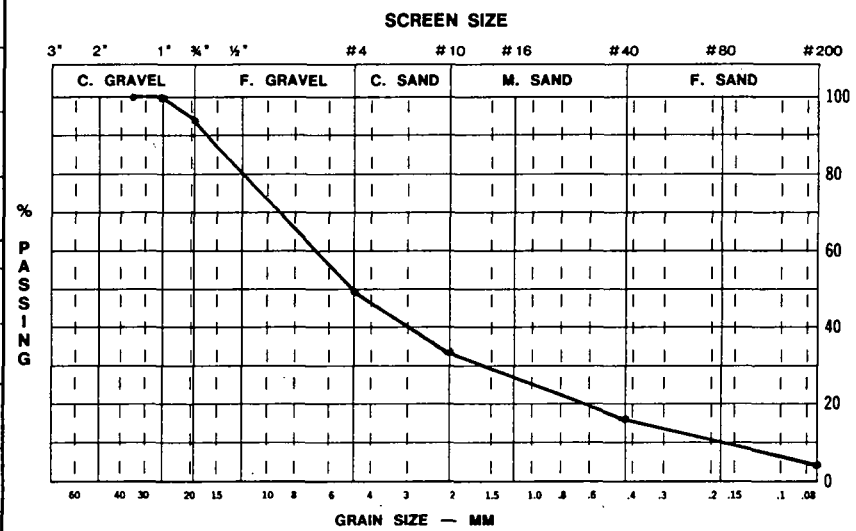
TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

SIEVE ANALYSIS

DRY WT.:	94.9g
WET WT.:	99.3g
% H_2O:	4.6%
WT. OF SAMPLE:	449.2g

	WT.	% PASS
-1½"	Ø	100.0
-1"	29.0g	100.0
-¾"	198.6g	93.5
-#4	74.4g	49.3
-#10	75.9g	32.8
-#40	53.7g	15.9
-#200	17.6g	3.9

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

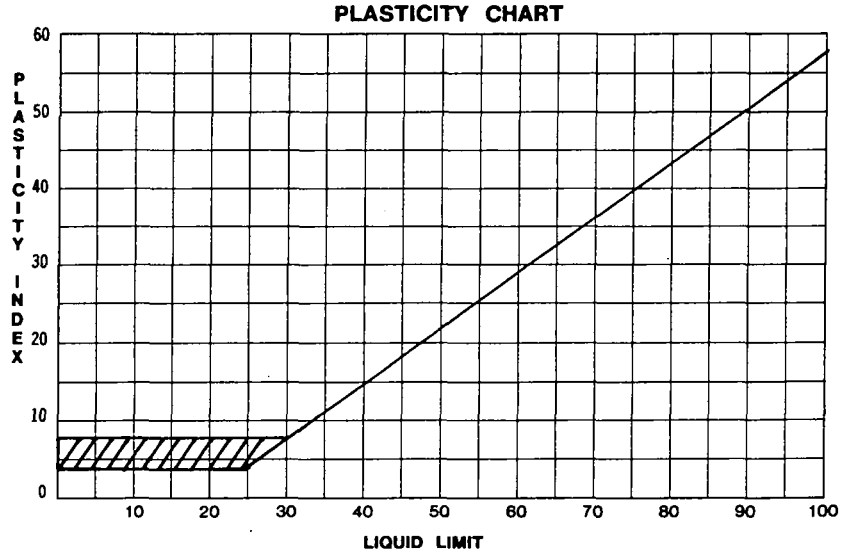
	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

SAMPLE DESCRIPTION

CLASS. GW

Olive Gray, Slightly Silty, Fine To Coarse Sandy Gravel.

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	02-1071
SAMPLE NO.:	F-0152-7
HOLE NO.:	TH-1-92
DATE:	1-29-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	69.4g
WET WT.:	77.4g
% H_2O:	11.5%
WT. OF SAMPLE:	527.5g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	232.9g	100.0
-#4	96.2g	55.8
-#10	107.7g	37.6
-#40	71.8g	17.2
-#200	18.9g	3.6

SAMPLE DESCRIPTION

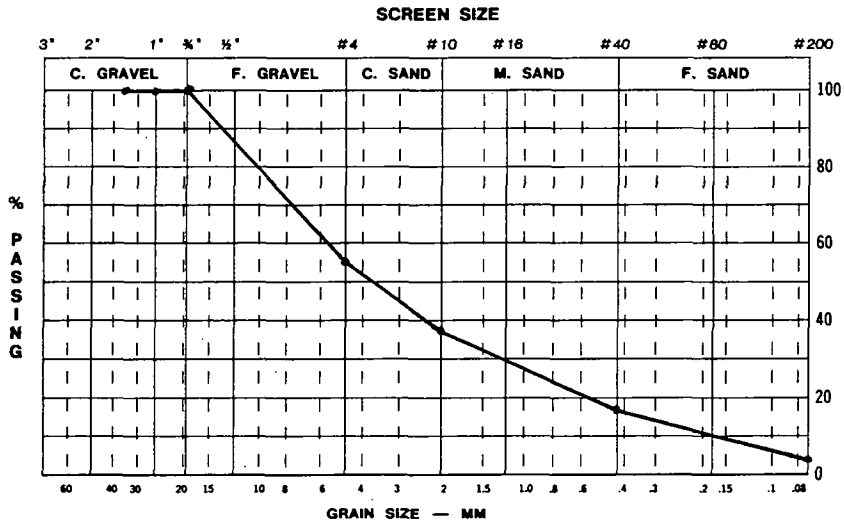
CLASS. SW

Olive, Moist, Slightly Silty, Gravelly Fine To Coarse Sand.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

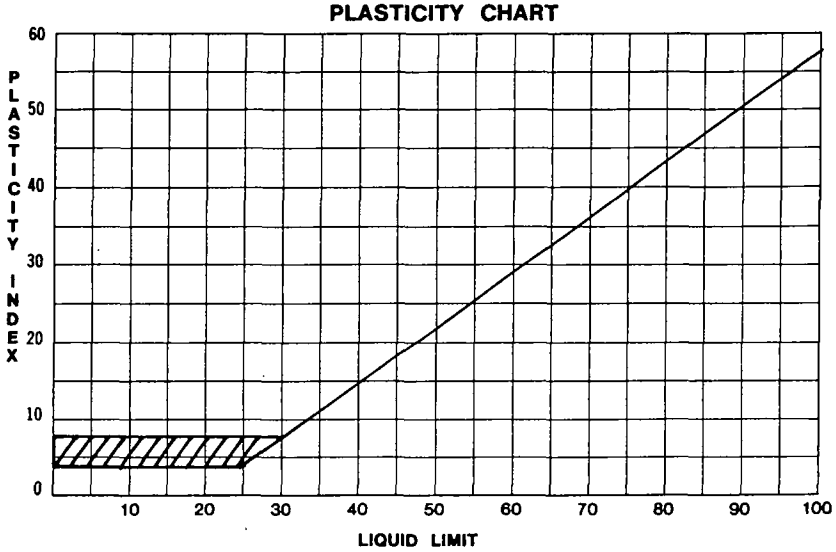
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	02-1071
SAMPLE NO.:	F-0152-8
HOLE NO.:	TH-1-92
DATE:	1-29-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

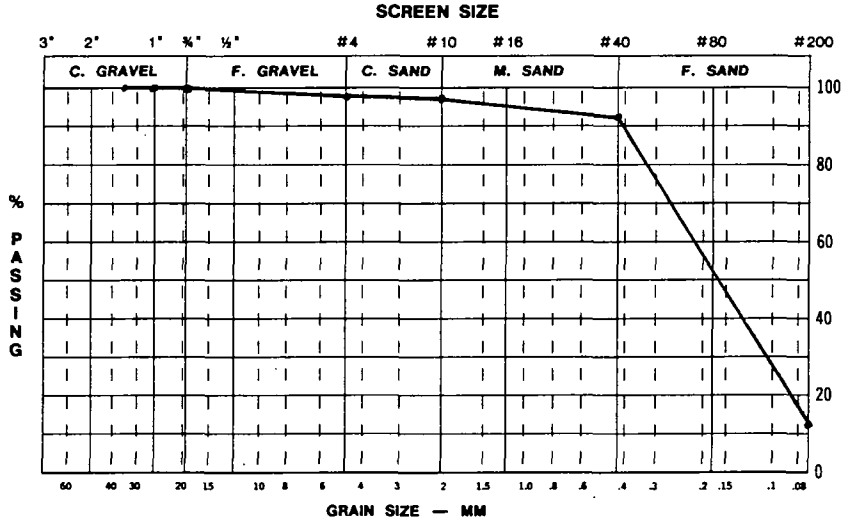
TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

SIEVE ANALYSIS

DRY WT.:	64.9g
WET WT.:	81.8g
% H_2O:	26.0%
WT. OF SAMPLE:	333.5g

	WT.	% PASS
-1½"	Ø	100.0
-1"	Ø	100.0
-¾"	7.1g	100.0
-#4	3.5g	97.9
-#10	15.9g	96.8
-#40	267.3g	92.1
-#200	39.7g	11.9

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

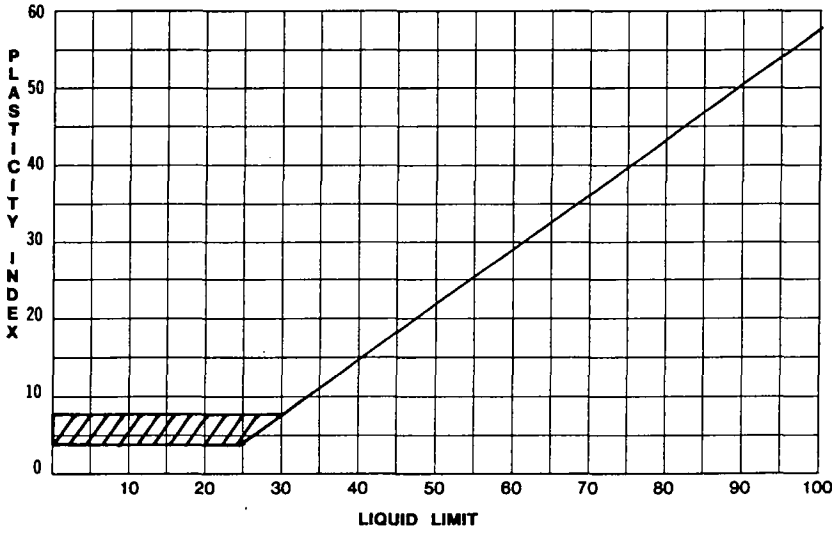
	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

SAMPLE DESCRIPTION

CLASS.

SP-SM Olive Gray, Moist, Gravelly, Silty Fine To Medium Sand.

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	02-1071
SAMPLE NO.:	F-0152-10
HOLE NO.:	TH-1-92
DATE:	1-29-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

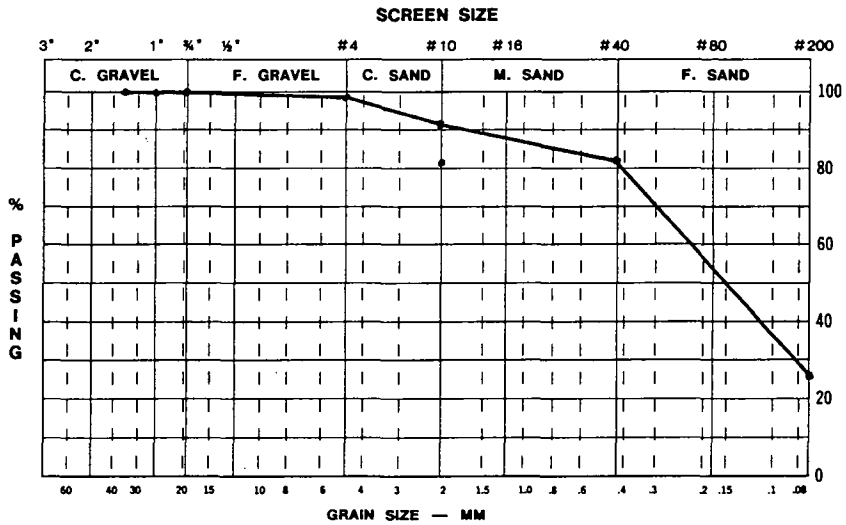
TEST	GRAVEL	SAND	SILT	CLAY
VISUAL		✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

SIEVE ANALYSIS

DRY WT.:	52.1g
WET WT.:	63.5g
% H_2O:	21.9%
WT. OF SAMPLE:	351.2g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	5.5g	100.0
-#4	25.4g	98.4
-#10	34.7g	91.2
-#40	193.8g	81.3
-#200	91.8g	26.1

GRAIN SIZE CURVE



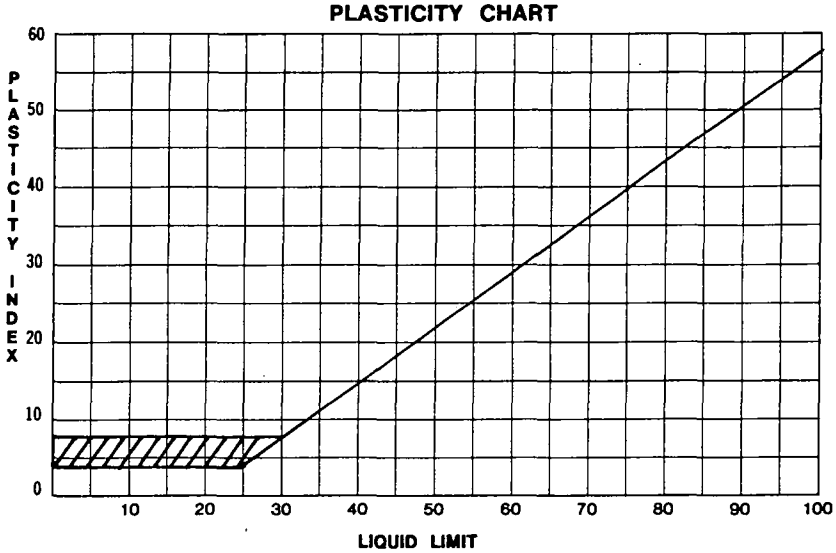
LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

SAMPLE DESCRIPTION

CLASS. SM Dark Gray, Moist, Very Silty, Fine To Coarse Sand.

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0152-11
HOLE NO.:	TH-1-92
DATE:	2-17-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

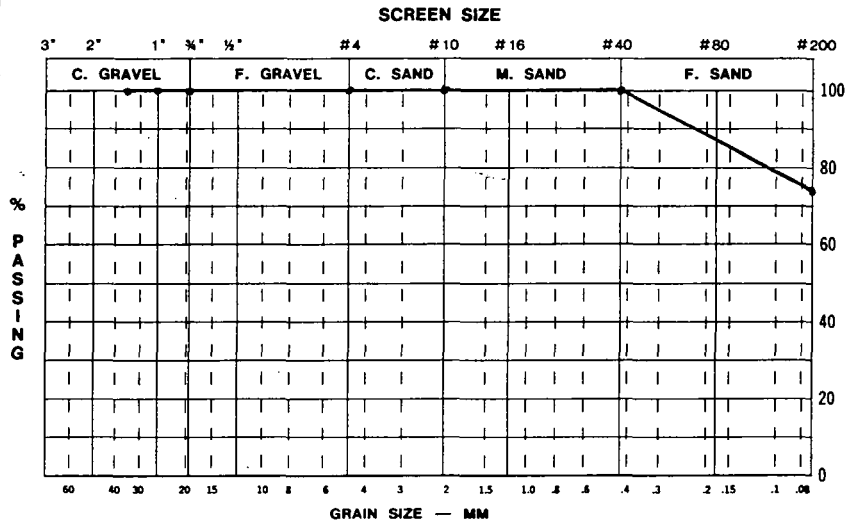
TEST	GRAVEL	SAND	SILT	CLAY
VISUAL		✓	✓	✓
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

SIEVE ANALYSIS

DRY WT.:	59.5g
WET WT.:	71.8g
% H_2O:	20.7%
WT. OF SAMPLE:	300.6g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	∅	100.0
-#4	∅	100.0
-#10	∅	100.0
-#40	80.4g	100.0
-#200	220.2g	73.3

GRAIN SIZE CURVE



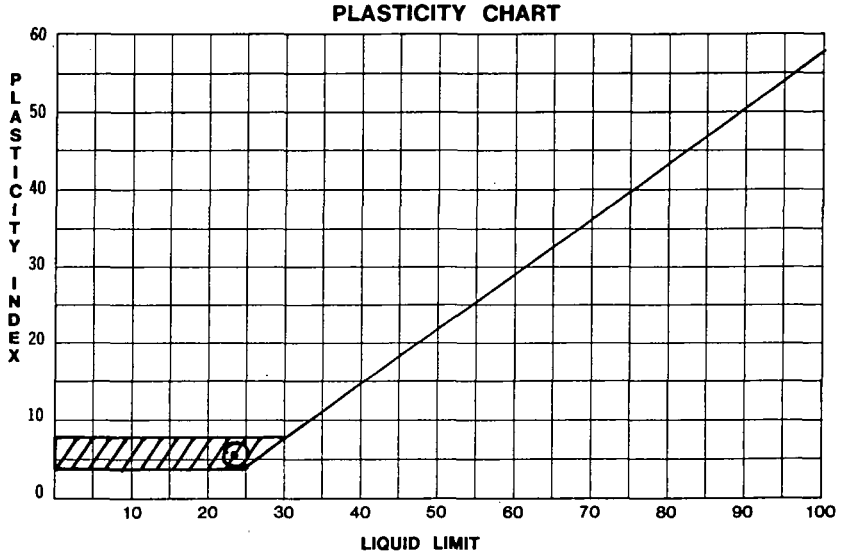
SAMPLE DESCRIPTION

CLASS. ML-CL Dark Gray, Moist, Fine Sandy, Silty Clay.

LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	10				32
Wet Wt.	21.3g				7.9g
Dry Wt.	17.3g				6.7g
% H_2O	23.2				PL= 17.9
Blows	26				PI= 5.3

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	01-1071
SAMPLE NO.:	F-0152-14
HOLE NO.:	TH-1-92
DATE:	2-17-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	65.4g
WET WT.:	85.8g
% H_2O:	31.2%
WT. OF SAMPLE:	280.7g

	WT.	% PASS
-1½"	Ø	100.0
-1"	Ø	100.0
-¾"	Ø	100.0
-#4	Ø	100.0
-#10	Ø	100.0
-#40	5.7g	100.0
-#200	275.0g	98.0

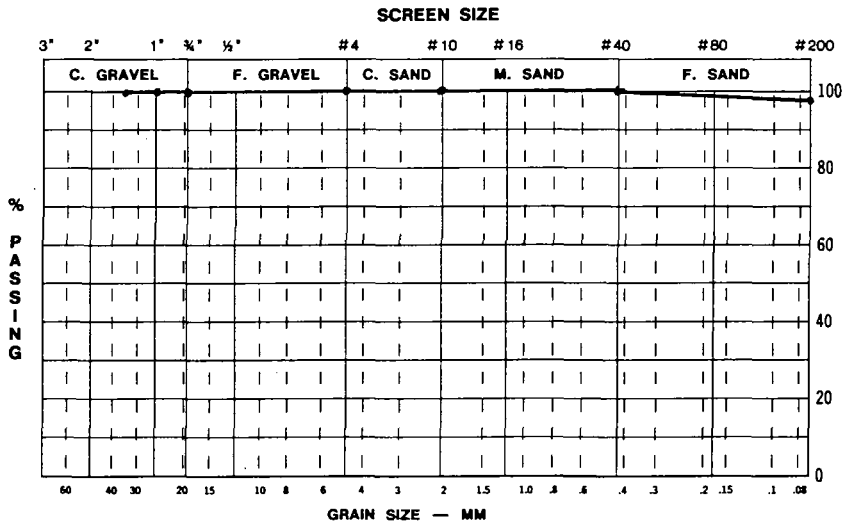
SAMPLE DESCRIPTION

CLASS. CH Gray, Wet, Fine Sandy Clay.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL		✓		✓
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

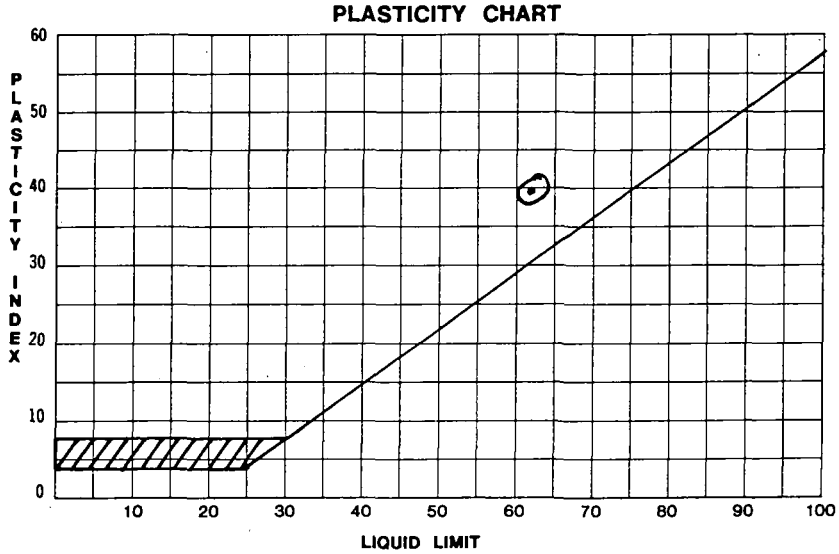
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	15				8
Wet Wt.	13.7g				7.1g
Dry Wt.	8.4g				5.8g
% H_2O	62.7				PL= 22.4
Blows	22				PI= 39.7

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0152-20
HOLE NO.:	TH-1-92
DATE:	2-17-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	52.6g
WET WT.:	68.9g
% H_2O:	31.0%
WT. OF SAMPLE:	243.2g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	∅	100.0
-#4	0.5g	100.0
-#10	0.2g	99.8
-#40	15.7g	99.7
-#200	226.8g	93.3

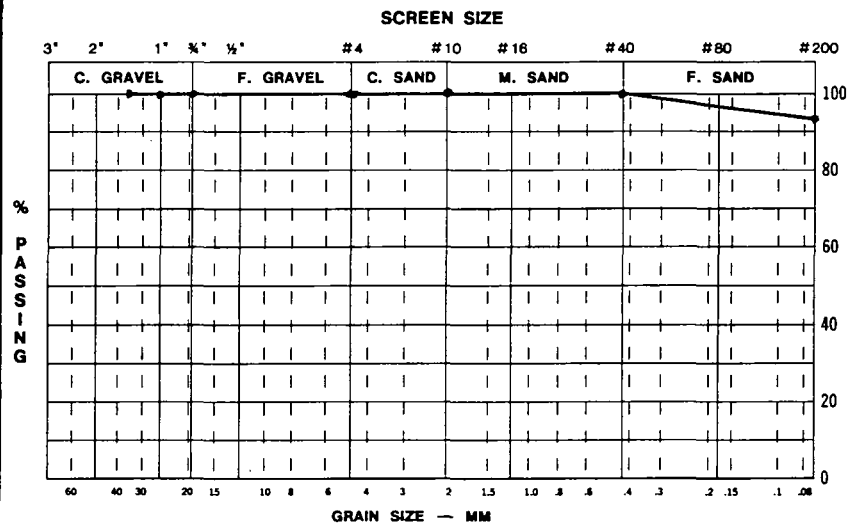
SAMPLE DESCRIPTION

CLASS. CL Gray, Wet, Fine Sandy Clay.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL		✓		✓
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

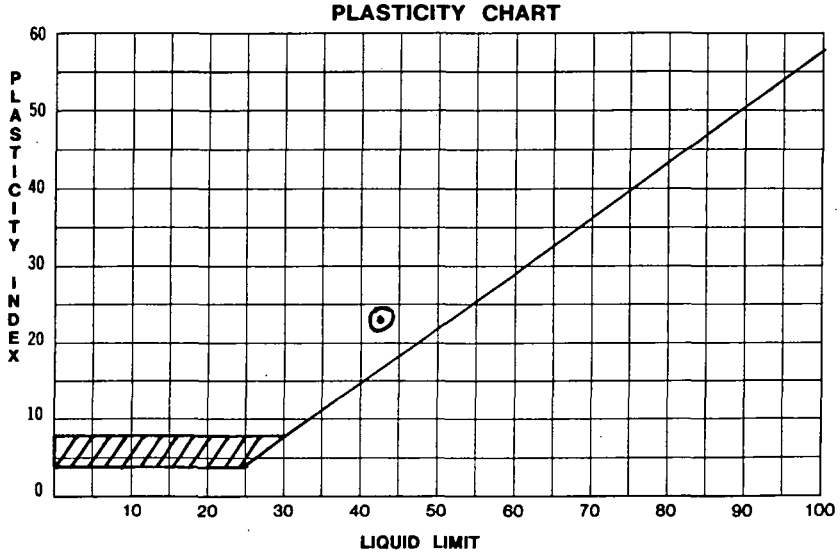
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	28				29
Wet Wt.	18.9g				8.1g
Dry Wt.	13.3g				6.8g
% H_2O	42.3				PL= 19.1
Blows	26				PI= 23.2

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0152-24
HOLE NO.:	TH-1-92
DATE:	2-24-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL		✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

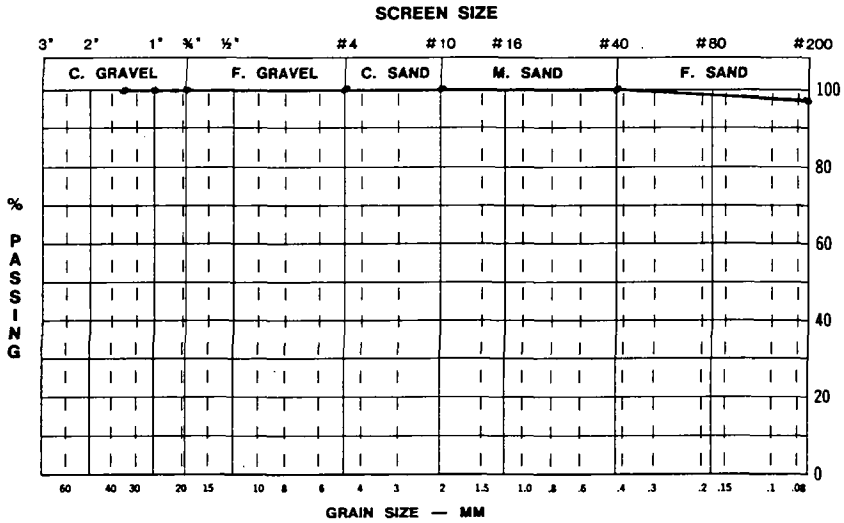
SIEVE ANALYSIS

Top of Tube

DRY WT.:	703.0g
WET WT.:	894.8g
% H_2O:	27.3%
WT. OF SAMPLE:	274.0g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	∅	100.0
-#4	0.1g	100.0
-#10	∅	100.0
-#40	8.8g	100.0
-#200	265.1g	96.8

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	36				15
Wet Wt.	23.2g				7.8g
Dry Wt.	17.8g				6.5g
% H_2O	30.6				PL= 20.0
Blows	27				PI= 10.6

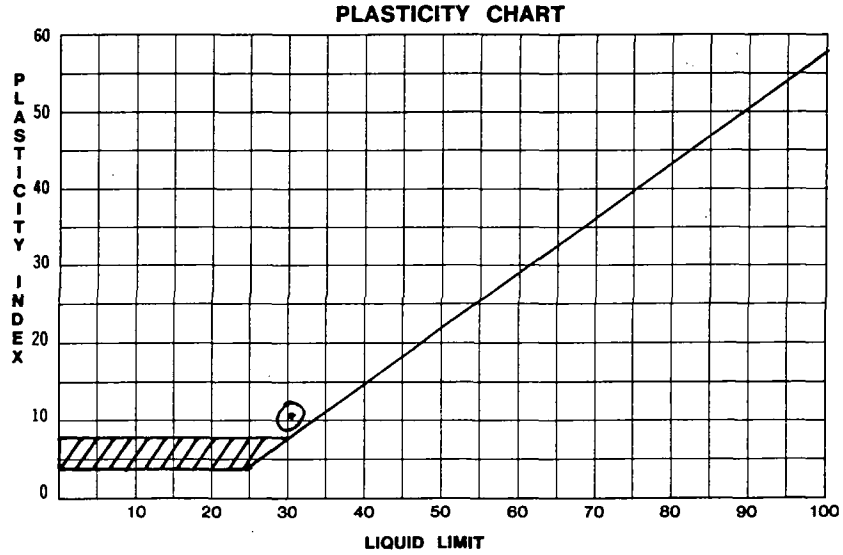
SAMPLE DESCRIPTION

CLASS. CL Dark Gray, Moist Fine Sandy Clay.

Consol. Test #1071-2
Drive # S-2, Depth: 63.5'
wt. of Wet Soil: 447.1g
wt. of Dry Soil: 348.3g
γ Wet = 122.9 pcf
γ Dry = 95.8 pcf

Moisture Content for Bottom of Tube = 30.7%

PLASTICITY CHART



CONSOLIDATION TEST DATA

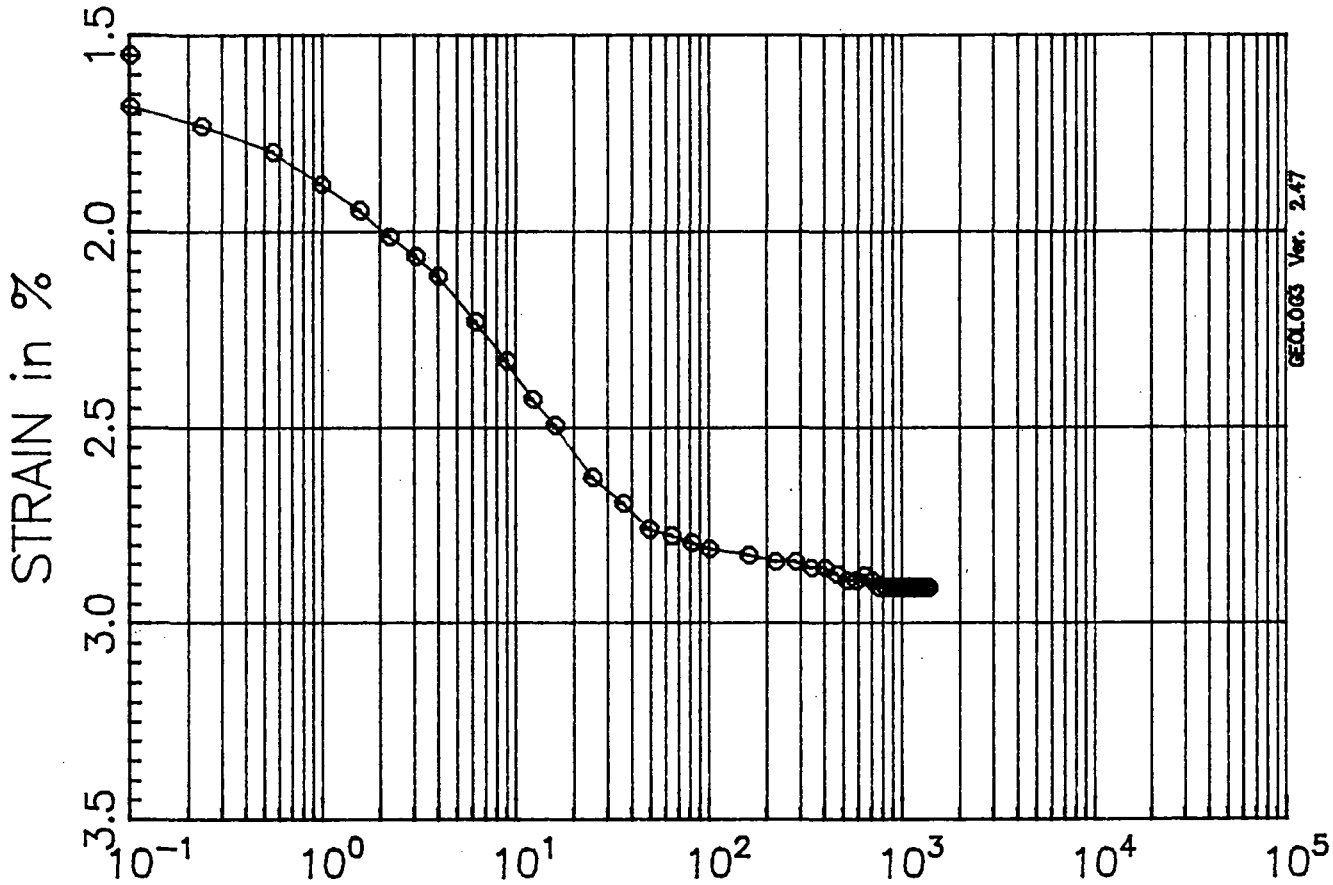
SOIL SAMPLE: D.GRAY MOIST
FINE SANDY CLAY
LOCATION: 407+00 50'RT
BORING NO: H-1-92
SAMPLE NO: S-2 DEPTH: 63.5'

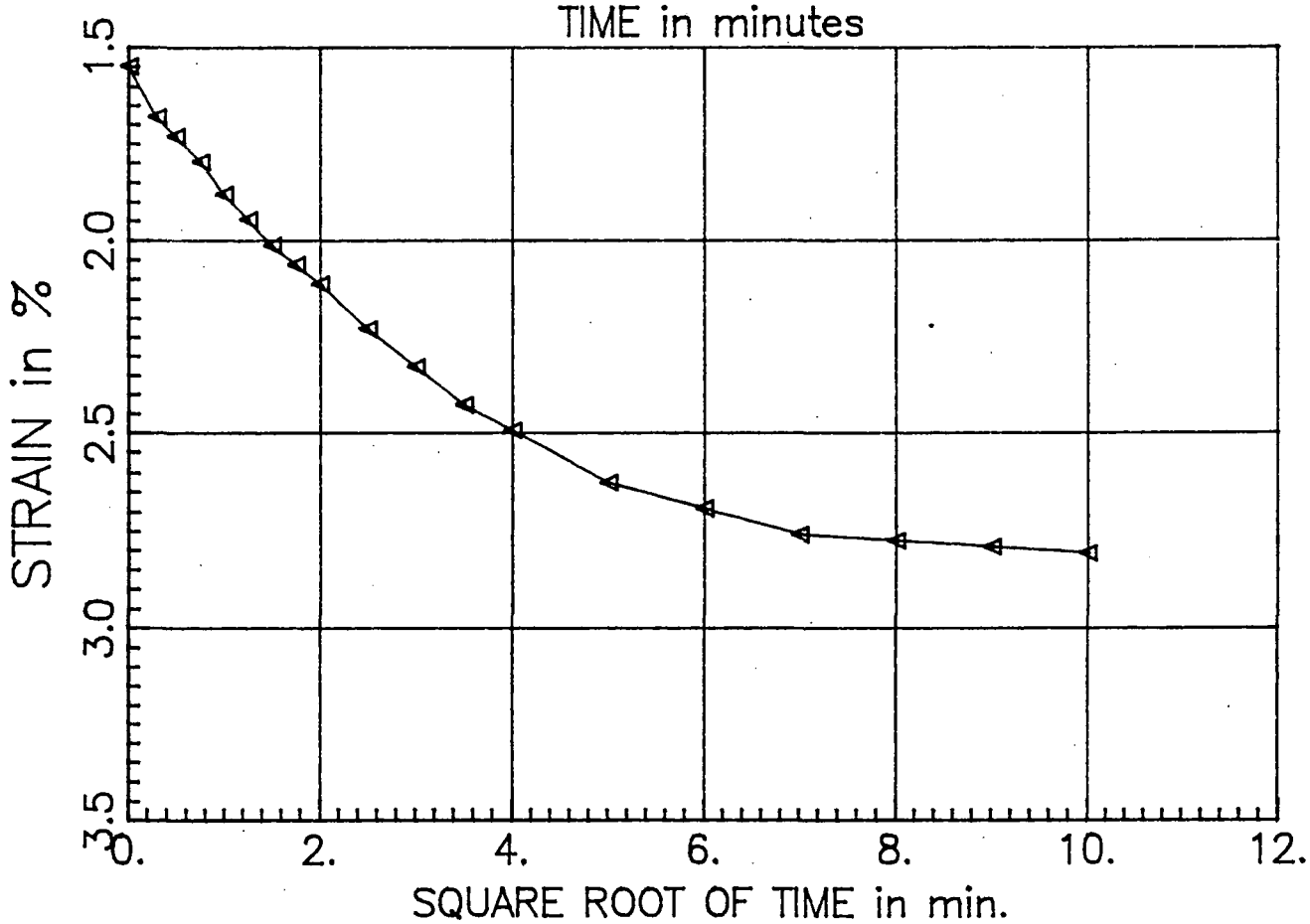
SPECIFIC GRAVITY OF SOLIDS: 2.65
HEIGHT OF SOLIDS: 0.3683 in.
SAMPLE DIAMETER: 1.91 in.
CALIBRATION FACTOR: .10624
INITIAL DISP. READING: -1.015

	TRIMMINGS	SPECIMEN + RING BEFORE	SPECIMEN + RING AFTER	AFTER
CONTAINER NO		RING	RING	
WT CONTAINER + WET SOIL gm	976.200	456.600	454.600	93.900
WT CONTAINER + DRY SOIL gm	784.400	444.200	444.200	83.500
WT CONTAINER gm	81.400	398.400	398.400	37.700
WT DRY SOIL gm	703.000	45.800	45.800	45.800
WATER CONTENT %	27.283	27.074	22.707	22.707
VOID RATIO	----------	0.697	0.498	----------
DEGREE OF SATURATION %	----------	102.914	120.816	----------

PROJECT: NUGENT VICINITY BRIDGES
FILE NO.: DL-1071 TEST NO.: F-0152-24
DATE: 2-19-93
TESTED BY: LHB
CHECKED BY: DC

WASHINGTON STATE DOT





PRESSURE INCREMENT
FROM 0.00 TSF TO 0.25 TSF

Test No: F-0152-24
Testname: 1071-2

LOAD INCREMENT DATA

TEST NAME 1071-2 PAGE NO: 41

TEST NO: F-0152-24 TESTED BY: LHB

PRESSURE INCREMENT FROM 0 TSF TO .25 TSF

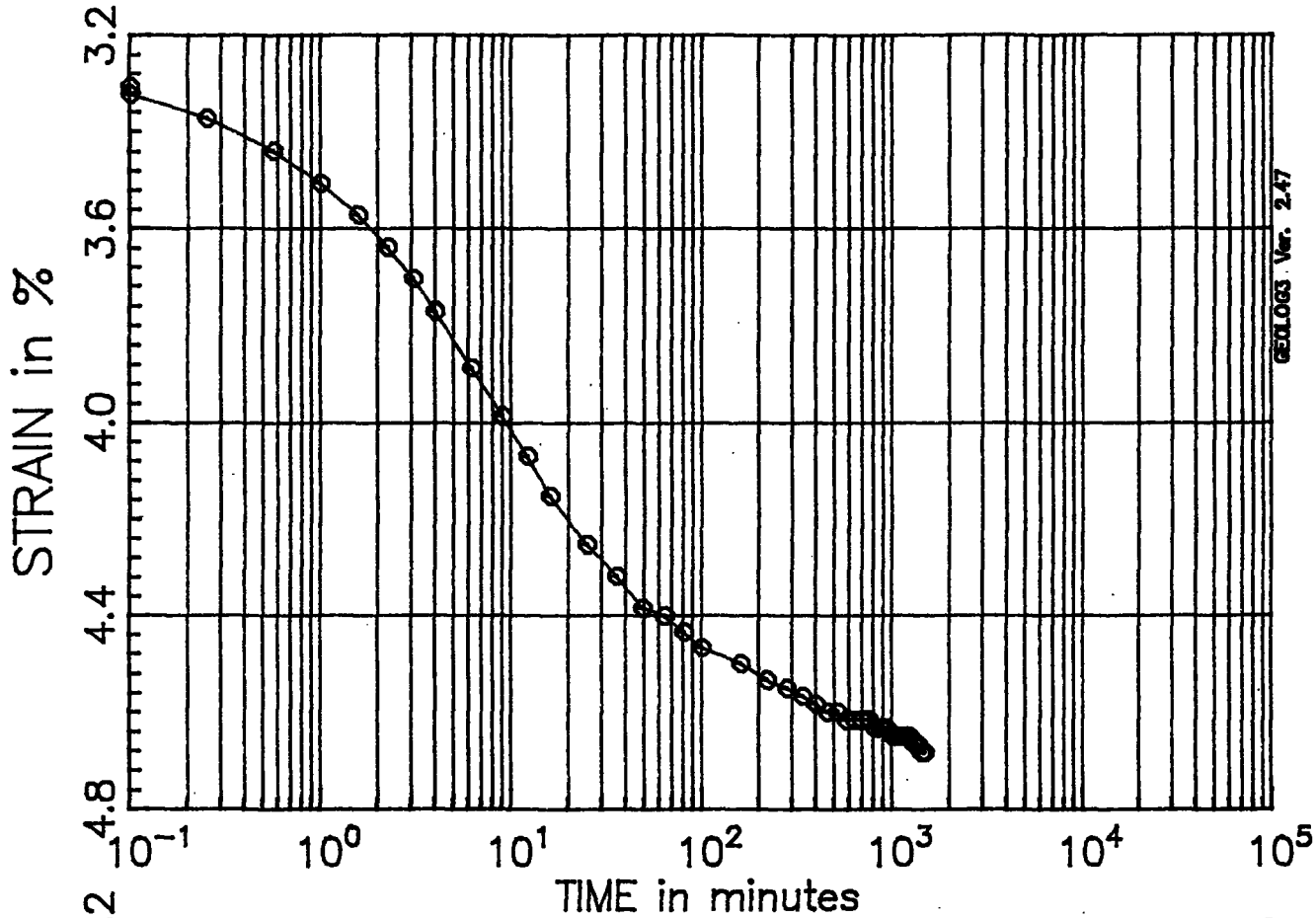
DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0097	0.671	1.55
		0.06	0.29	0.0105	0.669	1.68
		0.23	0.48	0.0108	0.668	1.73
		0.55	0.74	0.0112	0.667	1.80
		0.98	0.99	0.0118	0.665	1.89
		1.55	1.24	0.0122	0.664	1.95
		2.23	1.49	0.0126	0.663	2.01
		3.05	1.75	0.0129	0.662	2.06
		3.98	2.00	0.0132	0.661	2.11
		6.23	2.50	0.0139	0.659	2.23
		8.98	3.00	0.0145	0.658	2.33
		12.23	3.50	0.0152	0.656	2.43
		15.98	4.00	0.0156	0.655	2.49
		24.98	5.00	0.0164	0.653	2.63
		35.98	6.00	0.0168	0.651	2.69
		48.98	7.00	0.0172	0.650	2.76
		63.98	8.00	0.0173	0.650	2.78
		80.98	9.00	0.0175	0.650	2.79
		99.98	10.00	0.0176	0.649	2.81
		159.98	12.65	0.0177	0.649	2.83
		219.98	14.83	0.0178	0.649	2.84
		279.98	16.73	0.0178	0.649	2.84
		339.98	18.44	0.0179	0.649	2.86
		399.98	20.00	0.0179	0.649	2.86
		459.98	21.45	0.0180	0.648	2.88
		519.98	22.80	0.0181	0.648	2.89
		579.98	24.08	0.0181	0.648	2.89
		639.98	25.30	0.0180	0.648	2.88
		699.98	26.46	0.0181	0.648	2.89
		759.98	27.57	0.0182	0.648	2.91
		819.98	28.64	0.0182	0.648	2.91
		879.98	29.66	0.0182	0.648	2.91
		939.98	30.66	0.0182	0.648	2.91
		999.98	31.62	0.0182	0.648	2.91
		1059.98	32.56	0.0182	0.648	2.91
		1119.98	33.47	0.0182	0.648	2.91

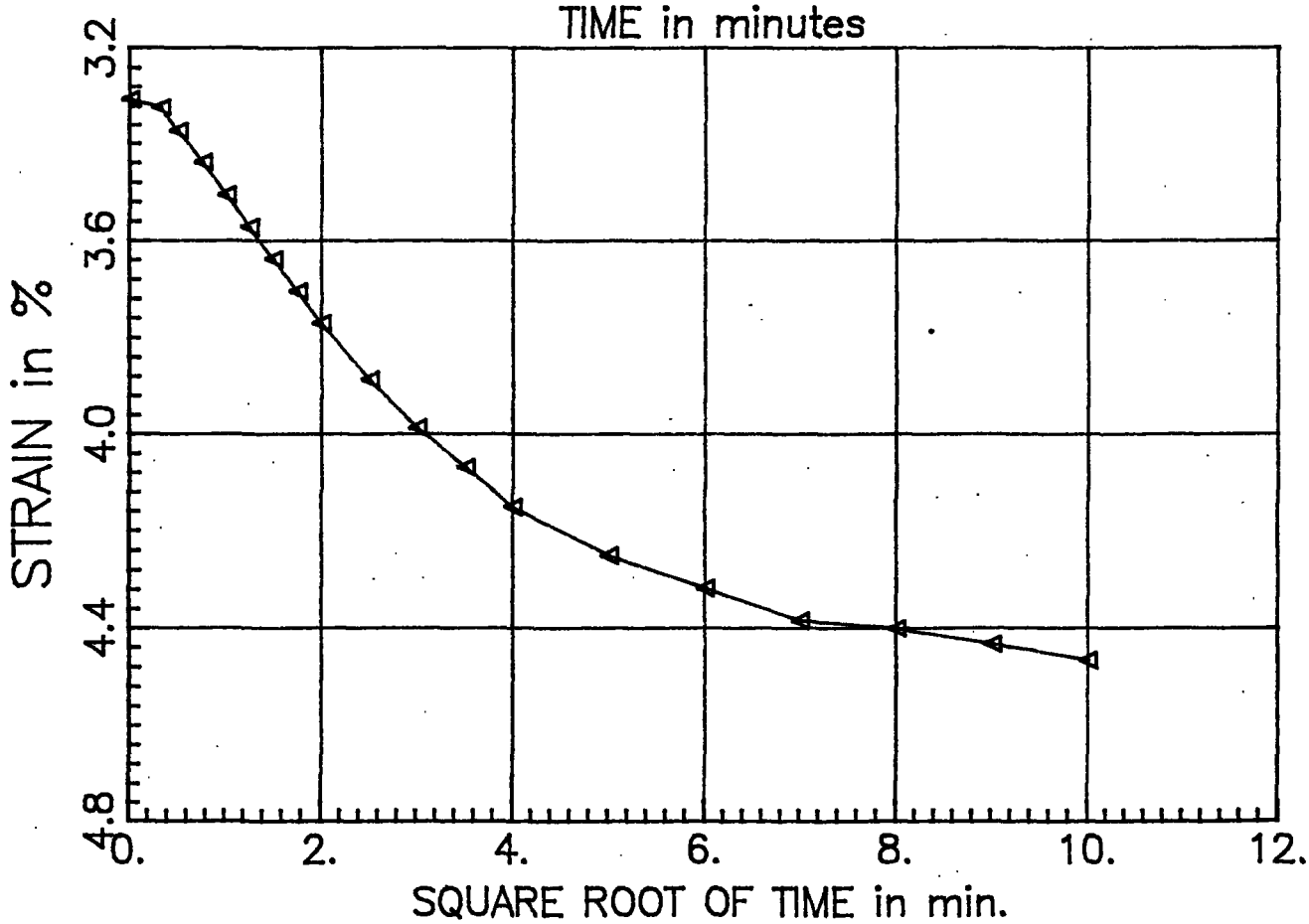
LOAD INCREMENT DATA

TEST NAME 1071-2 PAGE NO: 42
TEST NO: F-0152-24 TESTED BY: LHB

PRESSURE INCREMENT FROM 0 TSF TO .25 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1179.98	34.35	0.0182	0.648	2.91
		1239.98	35.21	0.0182	0.648	2.91
		1299.98	36.06	0.0182	0.648	2.91
		1359.98	36.88	0.0182	0.648	2.91





PRESSURE INCREMENT
FROM 0.25 TSF TO 0.50 TSF

Test No: F-0152-24
Testname: 1071-2

LOAD INCREMENT DATA

TEST NAME 1071-2 PAGE NO: 43
TEST NO: F-0152-24 TESTED BY: LHB

PRESSURE INCREMENT FROM .25 TSF TO .5 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0207	0.641	3.31
		0.10	0.32	0.0206	0.641	3.32
		0.25	0.50	0.0211	0.640	3.37
		0.57	0.75	0.0215	0.639	3.44
		1.00	1.00	0.0219	0.638	3.51
		1.57	1.25	0.0223	0.637	3.57
		2.25	1.50	0.0227	0.635	3.64
		3.07	1.75	0.0232	0.634	3.70
		4.00	2.00	0.0236	0.633	3.77
		6.25	2.50	0.0243	0.631	3.89
		9.00	3.00	0.0249	0.629	3.99
		12.25	3.50	0.0254	0.628	4.07
		16.00	4.00	0.0260	0.627	4.15
		25.00	5.00	0.0266	0.625	4.25
		36.00	6.00	0.0270	0.624	4.32
		49.00	7.00	0.0274	0.623	4.38
		64.00	8.00	0.0275	0.622	4.40
		81.00	9.00	0.0277	0.622	4.43
		100.00	10.00	0.0279	0.621	4.47
		160.00	12.65	0.0281	0.621	4.50
		220.00	14.83	0.0283	0.620	4.53
		280.00	16.73	0.0284	0.620	4.55
		340.00	18.44	0.0285	0.620	4.57
		400.00	20.00	0.0286	0.619	4.58
		460.00	21.45	0.0287	0.619	4.60
		520.00	22.80	0.0287	0.619	4.60
		580.00	24.08	0.0289	0.619	4.62
		640.00	25.30	0.0289	0.619	4.62
		700.00	26.46	0.0289	0.619	4.62
		760.00	27.57	0.0289	0.619	4.62
		820.00	28.64	0.0290	0.619	4.63
		880.00	29.66	0.0290	0.619	4.63
		940.00	30.66	0.0290	0.619	4.63
		1000.00	31.62	0.0291	0.618	4.65
		1060.00	32.56	0.0291	0.618	4.65
		1120.00	33.47	0.0291	0.618	4.65

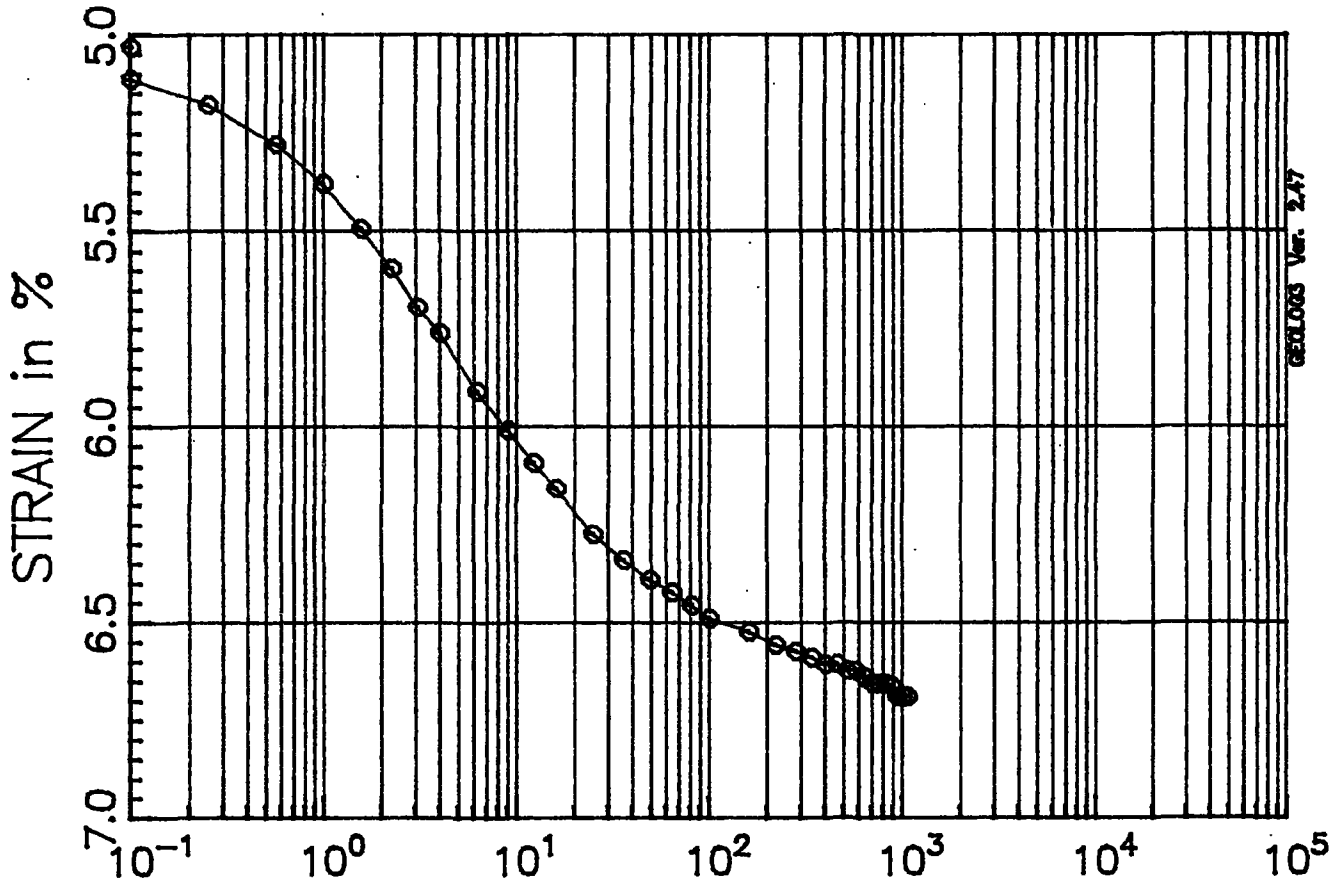
LOAD INCREMENT DATA

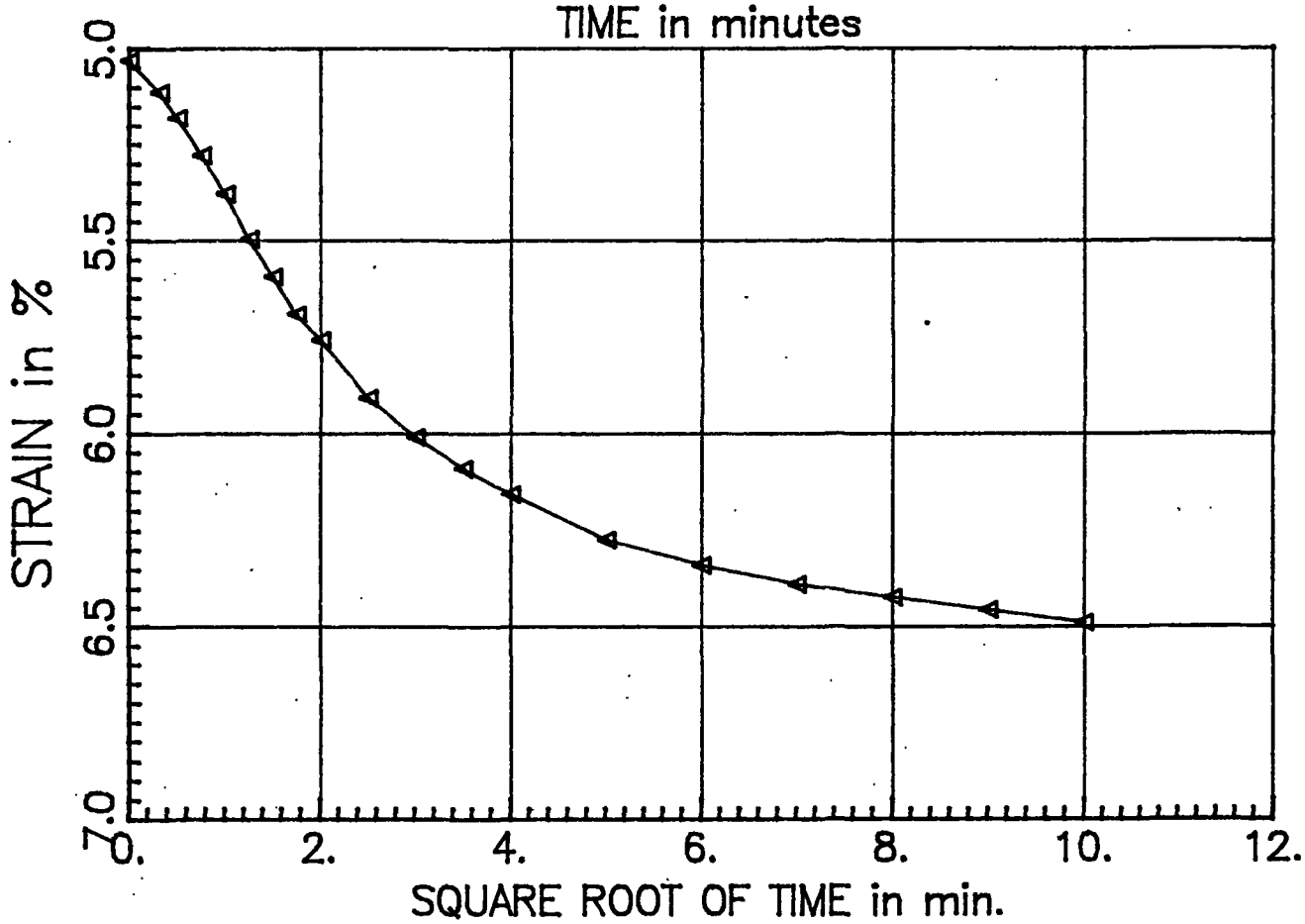
TEST NAME 1071-2 PAGE NO: 44

TEST NO: F-0152-24 TESTED BY: LHB

PRESSURE INCREMENT FROM .25 TSF TO .5 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1180.00	34.35	0.0291	0.618	4.65
		1240.00	35.21	0.0291	0.618	4.65
		1300.00	36.06	0.0292	0.618	4.67
		1360.00	36.88	0.0292	0.618	4.67
		1420.00	37.68	0.0293	0.618	4.68
		1480.00	38.47	0.0293	0.618	4.68





PRESSURE INCREMENT
FROM 0.50 TSF TO 1.00 TSF

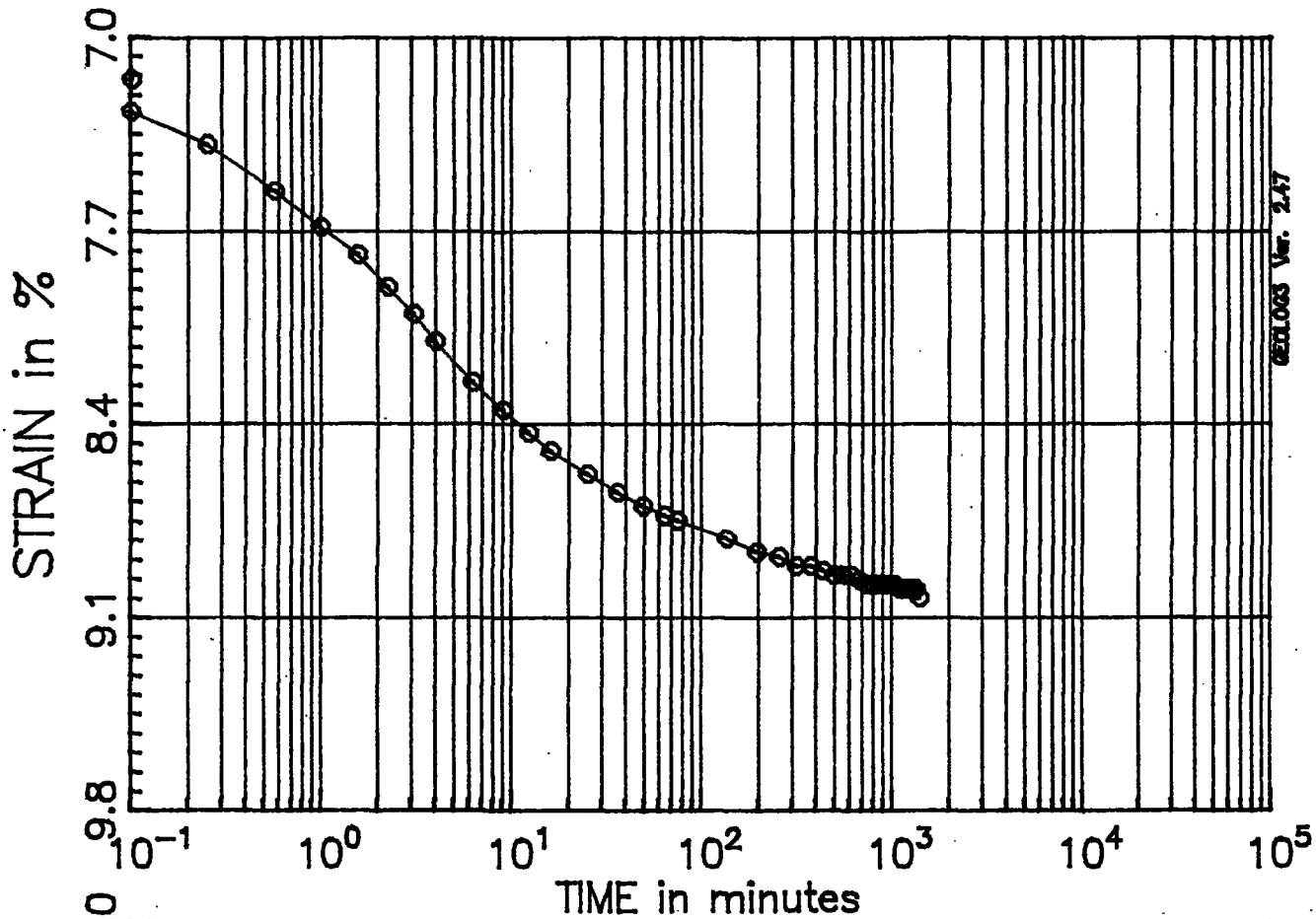
Test No: F--0152--24
Testname: 1071--2

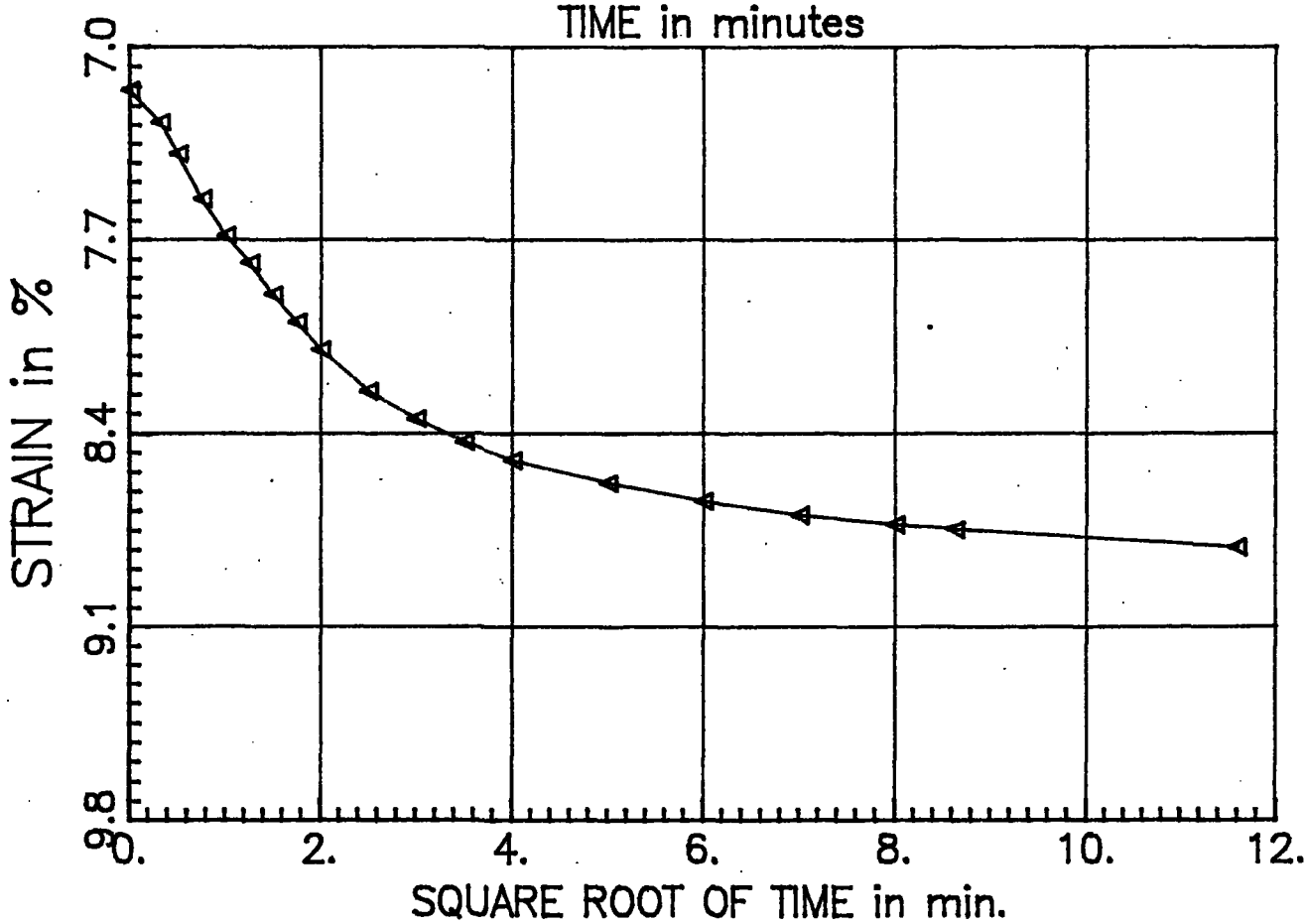
LOAD INCREMENT DATA

TEST NAME 1071-2 PAGE NO: 45
TEST NO: F-0152-24 TESTED BY: LHB

PRESSURE INCREMENT FROM .5 TSF TO 1 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0314	0.612	5.03
		0.10	0.32	0.0320	0.610	5.11
		0.25	0.50	0.0324	0.609	5.18
		0.57	0.75	0.0330	0.608	5.28
		1.00	1.00	0.0336	0.606	5.38
		1.57	1.25	0.0343	0.604	5.50
		2.25	1.50	0.0350	0.602	5.59
		3.07	1.75	0.0356	0.601	5.69
		4.00	2.00	0.0360	0.599	5.76
		6.25	2.50	0.0369	0.597	5.91
		9.00	3.00	0.0376	0.595	6.01
		12.25	3.50	0.0381	0.594	6.09
		16.00	4.00	0.0385	0.593	6.16
		25.00	5.00	0.0392	0.591	6.27
		36.00	6.00	0.0396	0.590	6.34
		49.00	7.00	0.0399	0.589	6.39
		64.00	8.00	0.0402	0.588	6.42
		81.00	9.00	0.0404	0.588	6.46
		100.00	10.00	0.0406	0.587	6.49
		160.00	12.65	0.0408	0.586	6.52
		220.00	14.83	0.0410	0.586	6.56
		280.00	16.73	0.0411	0.586	6.57
		340.00	18.44	0.0412	0.585	6.59
		400.00	20.00	0.0413	0.585	6.61
		460.00	21.45	0.0413	0.585	6.61
		520.00	22.80	0.0414	0.585	6.62
		580.00	24.08	0.0414	0.585	6.62
		640.00	25.30	0.0415	0.584	6.64
		700.00	26.46	0.0416	0.584	6.66
		760.00	27.57	0.0416	0.584	6.66
		820.00	28.64	0.0416	0.584	6.66
		880.00	29.66	0.0416	0.584	6.66
		940.00	30.66	0.0418	0.584	6.69
		1000.00	31.62	0.0418	0.584	6.69
		1060.00	32.56	0.0418	0.584	6.69





PRESSURE INCREMENT
FROM 1.00 TSF TO 2.00 TSF

Test No: F--0152-24
Testname: 1071-2

LOAD INCREMENT DATA

TEST NAME 1071-2 PAGE NO: 46
TEST NO: F-0152-24 TESTED BY: LHB

PRESSURE INCREMENT FROM 1 TSF TO 2 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0447	0.576	7.15
		0.10	0.32	0.0454	0.574	7.27
		0.25	0.50	0.0462	0.572	7.39
		0.57	0.75	0.0472	0.569	7.55
		1.00	1.00	0.0480	0.567	7.68
		1.57	1.25	0.0487	0.565	7.78
		2.25	1.50	0.0494	0.563	7.90
		3.07	1.75	0.0500	0.561	8.00
		4.00	2.00	0.0506	0.560	8.10
		6.25	2.50	0.0516	0.557	8.25
		9.00	3.00	0.0522	0.555	8.35
		12.25	3.50	0.0527	0.554	8.43
		16.00	4.00	0.0531	0.553	8.50
		25.00	5.00	0.0536	0.552	8.58
		36.00	6.00	0.0540	0.550	8.65
		49.00	7.00	0.0544	0.550	8.70
		64.00	8.00	0.0546	0.549	8.73
		74.45	8.63	0.0547	0.549	8.75
		134.45	11.60	0.0551	0.548	8.81
		194.45	13.94	0.0554	0.547	8.86
		254.45	15.95	0.0555	0.546	8.88
		314.45	17.73	0.0557	0.546	8.91
		374.45	19.35	0.0557	0.546	8.91
		434.45	20.84	0.0558	0.546	8.93
		494.45	22.24	0.0559	0.545	8.94
		554.45	23.55	0.0559	0.545	8.94
		614.45	24.79	0.0559	0.545	8.94
		674.45	25.97	0.0560	0.545	8.96
		734.45	27.10	0.0561	0.545	8.98
		794.45	28.19	0.0561	0.545	8.98
		854.45	29.23	0.0561	0.545	8.98
		914.45	30.24	0.0561	0.545	8.98
		974.45	31.22	0.0561	0.545	8.98
		1034.45	32.16	0.0561	0.545	8.98
		1094.45	33.08	0.0562	0.544	8.99
		1154.45	33.98	0.0562	0.544	8.99

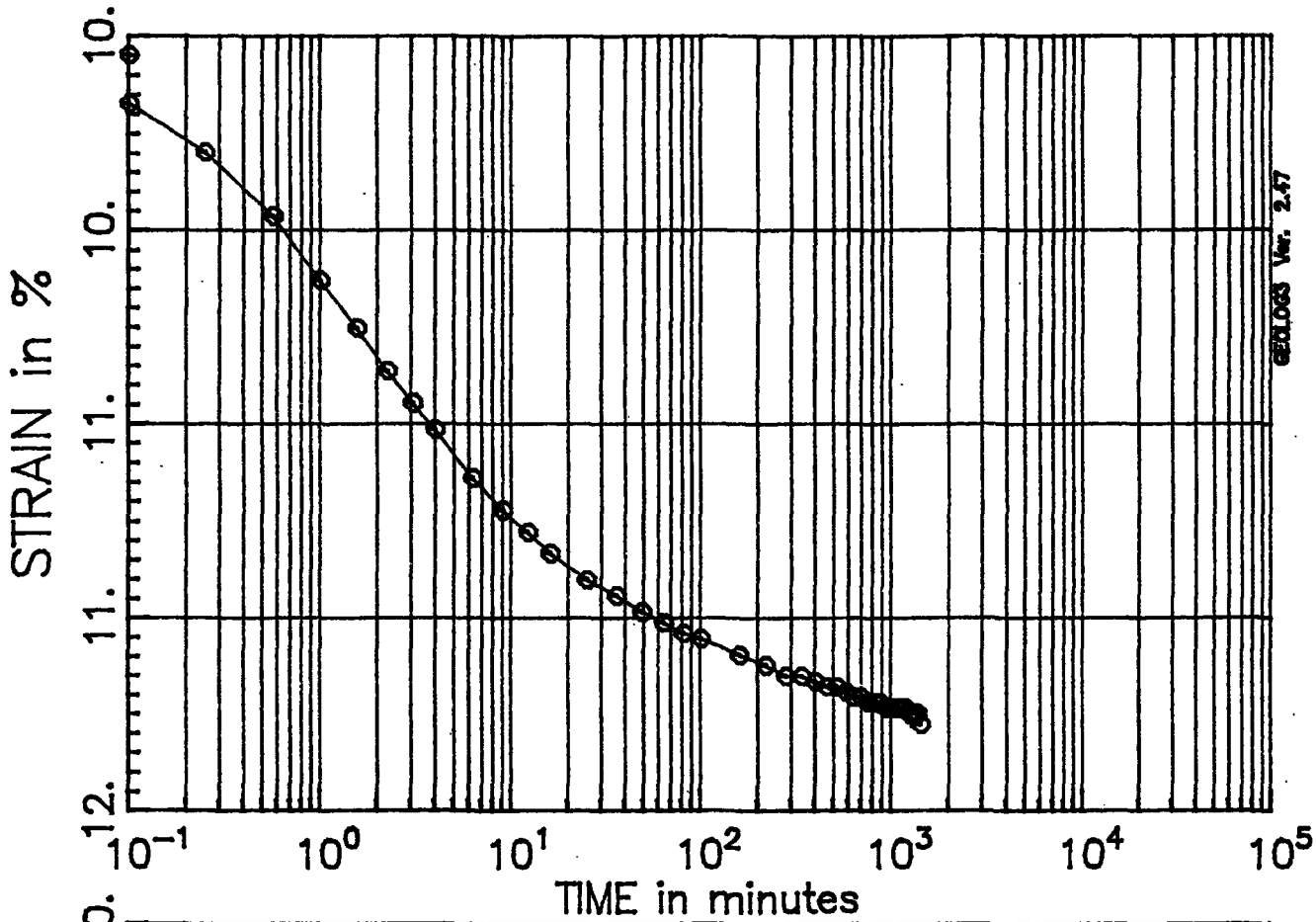
LOAD INCREMENT DATA

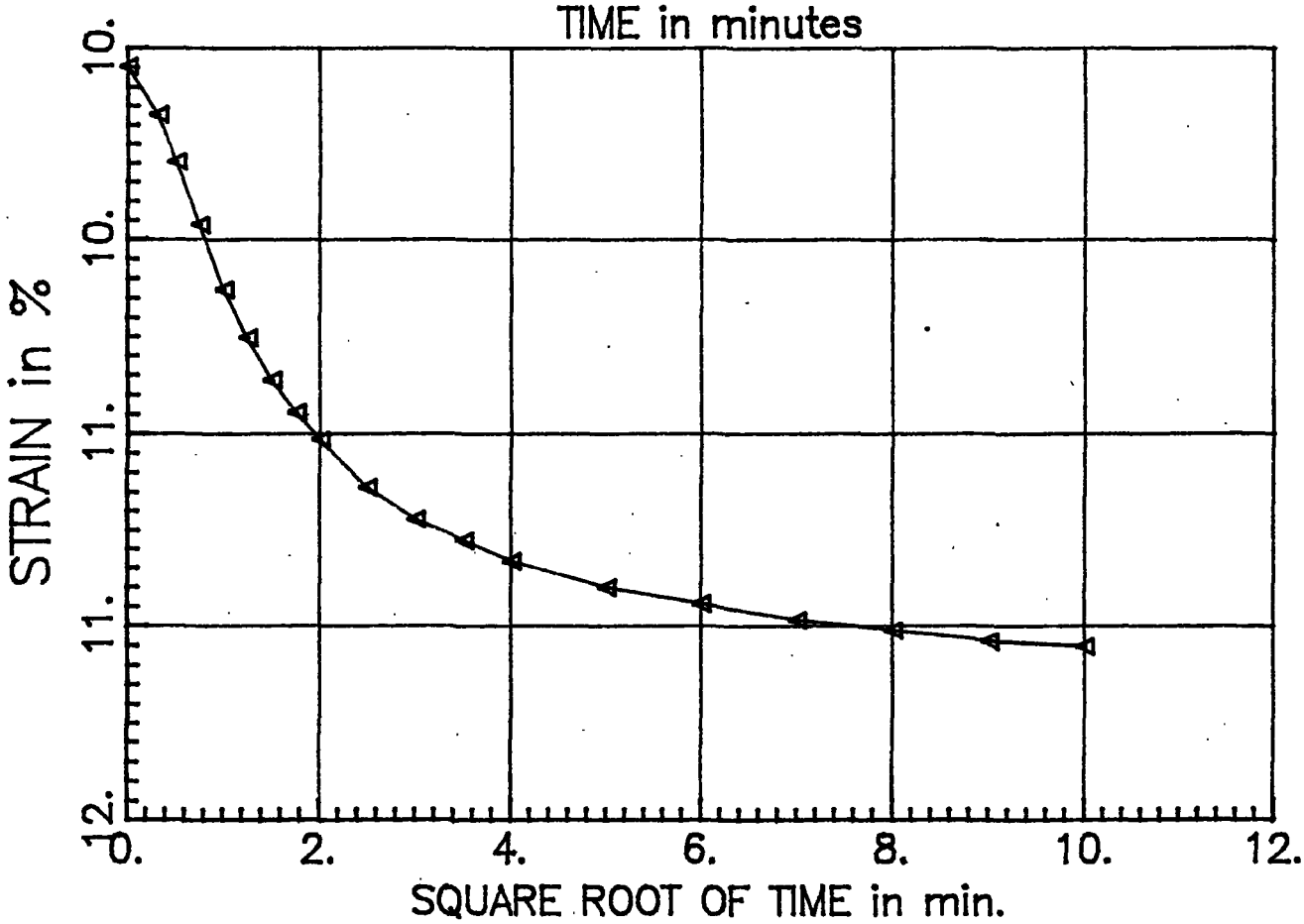
TEST NAME 1071-2 PAGE NO: 47

TEST NO: F-0152-24 TESTED BY: LHB

PRESSURE INCREMENT FROM 1 TSF TO 2 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1214.45	34.85	0.0562	0.544	8.99
		1274.45	35.70	0.0562	0.544	8.99
		1334.45	36.53	0.0562	0.544	8.99
		1394.45	37.34	0.0564	0.544	9.03





PRESSURE INCREMENT
FROM 2.00 TSF TO 4.00 TSF

Test No: F-0152-24
Testname: 1071-2

LOAD INCREMENT DATA

TEST NAME 1071-2 PAGE NO: 48
TEST NO: F-0152-24 TESTED BY: LHB

PRESSURE INCREMENT FROM 2 TSF TO 4 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0604	0.533	9.66
		0.10	0.32	0.0613	0.531	9.81
		0.25	0.50	0.0622	0.528	9.96
		0.57	0.75	0.0633	0.525	10.16
		1.00	1.00	0.0647	0.521	10.35
		1.57	1.25	0.0656	0.519	10.50
		2.25	1.50	0.0665	0.517	10.64
		3.07	1.75	0.0671	0.515	10.74
		4.00	2.00	0.0676	0.514	10.82
		6.25	2.50	0.0686	0.511	10.97
		9.00	3.00	0.0692	0.509	11.07
		12.25	3.50	0.0696	0.508	11.13
		16.00	4.00	0.0700	0.507	11.20
		25.00	5.00	0.0705	0.506	11.28
		36.00	6.00	0.0708	0.505	11.33
		49.00	7.00	0.0711	0.504	11.38
		64.00	8.00	0.0713	0.503	11.42
		81.00	9.00	0.0716	0.503	11.45
		100.00	10.00	0.0717	0.503	11.47
		160.00	12.65	0.0720	0.502	11.52
		220.00	14.83	0.0722	0.501	11.55
		280.00	16.73	0.0724	0.501	11.58
		340.00	18.44	0.0724	0.501	11.58
		400.00	20.00	0.0725	0.500	11.60
		460.00	21.45	0.0726	0.500	11.61
		520.00	22.80	0.0726	0.500	11.61
		580.00	24.08	0.0727	0.500	11.63
		640.00	25.30	0.0728	0.499	11.65
		700.00	26.46	0.0728	0.499	11.65
		760.00	27.57	0.0729	0.499	11.66
		820.00	28.64	0.0729	0.499	11.66
		880.00	29.66	0.0729	0.499	11.66
		940.00	30.66	0.0730	0.499	11.68
		1000.00	31.62	0.0730	0.499	11.68
		1060.00	32.56	0.0730	0.499	11.68
		1120.00	33.47	0.0730	0.499	11.68

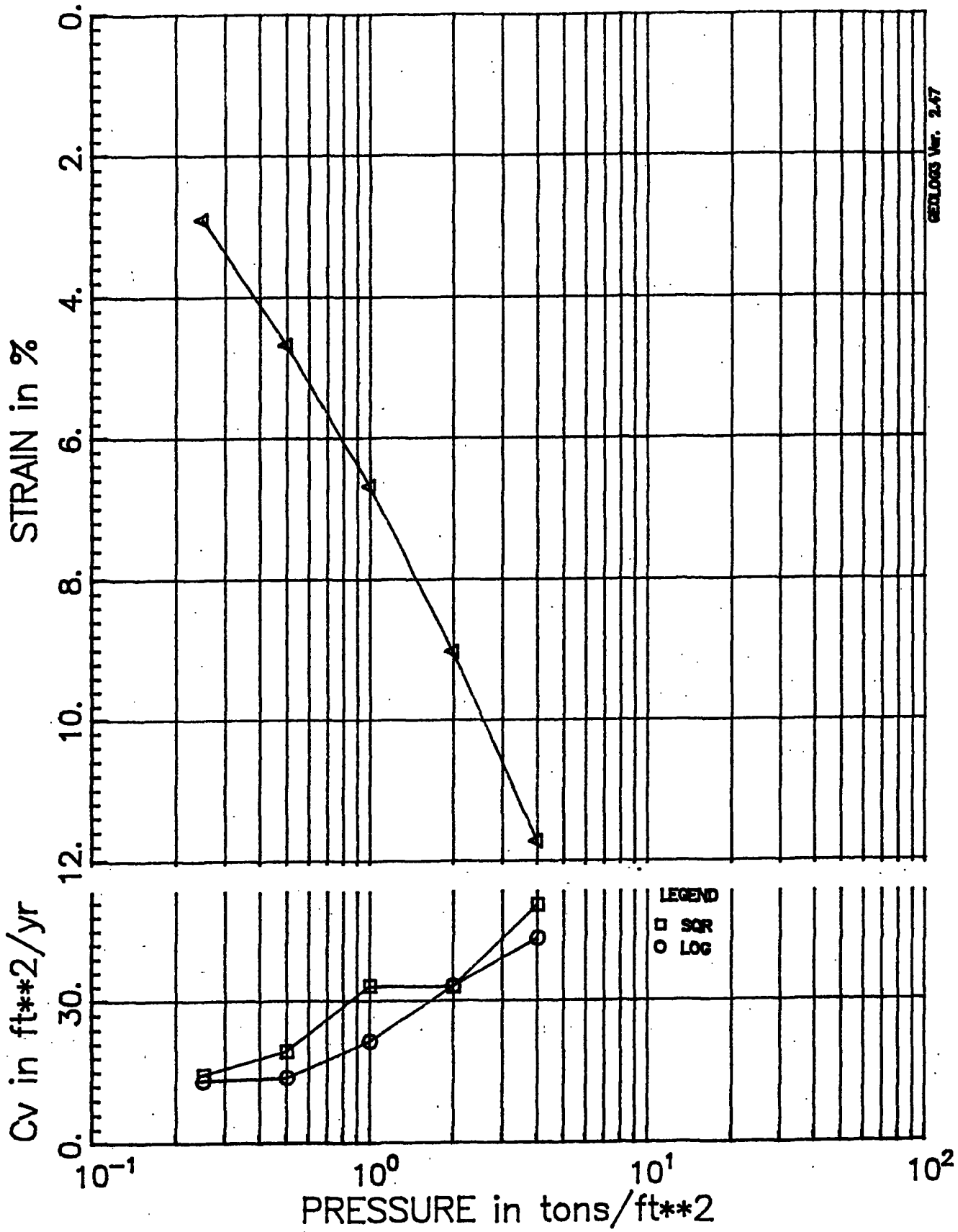
LOAD INCREMENT DATA

TEST NAME 1071-2 PAGE NO: 49

TEST NO: F-0152-24 TESTED BY: LHB

PRESSURE INCREMENT FROM 2 TSF TO 4 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1180.00	34.35	0.0730	0.499	11.68
		1240.00	35.21	0.0731	0.499	11.70
		1300.00	36.06	0.0731	0.499	11.70
		1360.00	36.88	0.0731	0.499	11.70
		1420.00	37.68	0.0733	0.498	11.73



SOIL DESCRIPTION: D.GRAY MOIST
FINE SANDY CLAY

BORING: H-1-92 SAMPLE: S-2 DEPTH: 63.5'

WATER CONTENT
NATURAL: 0.27
AFTER TEST: 0.23

INITIAL VOID RATIO: 0.70

PROJECT: NUGENT VICINITY BRIDGES
FILE NO: OL-1071
DATE: 2-19-93

CONSOLIDATION TEST NO: F-0152-24

Testname: 1071-2

WASHINGTON STATE DOT

CONSOLIDATION TEST SUMMARY

APPLIED PRESSURE in tsf	FINAL DISP. in in.	STRAIN AT END in %	FITTING TIME in min SQ.RT. T90	FITTING TIME in min LOG T50	COEF. OF CONSOLIDATION in sq. ft. per yr SQ.RT.	COEF. OF CONSOLIDATION in sq. ft. per yr LOG	COEF. OF CONSOLIDATION in sq. ft. per yr AVE.
0.25	.01818	2.908	20.30	5.20	14.46	13.11	13.79
0.50	.02927	4.683	14.40	4.70	19.43	13.83	16.63
1.00	.04181	6.689	8.10	2.90	33.19	21.54	27.37
2.00	.05642	9.028	7.80	1.80	32.90	33.12	33.01
4.00	.07332	11.731	4.80	1.30	50.58	43.38	46.98

TEST NAME: 1071-2
PROJECT: NUGENT VICINITY BRIDGES
FILE NO.: OL-1071
TEST NO.: F-0152-24
DATE: 2-19-93
TESTED BY: LHB
CHECKED BY: DC

WASHINGTON STATE DOT

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-18-92

Page 1 of 3

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Nugents Corner bridge replacement
SR No. 542 Sub-Section

Station & Offset 407+00 60 FT. LT. Hole # TH-2-92

F-0165 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-1	D-1	4.0' to 5.5'			LK F-0152-5
-2	D-2	9.0' to 10.5'			LK F-0152-5
					INCR GRAVEL
-3	D-3	14.0' to 15.5'			LK F-0152-5
					INCR GRAVEL
-4	D-4	19.0' to 20.5'	MC= 23.0%	CL	PI
-5	D-5	24.0' to 25.5'			LK F-0152-7
-6	D-6	29.0' to 30.5'			LK F-0152-7
-7	D-7	34.0' to 35.5'			LK-F-0152-8
-8	D-8	39.0' to 40.5'			LK F-0152-10
-9	D-9	44.0' to 45.5'			LK F-0152-10

1 copy with samples
1 copy to addressee

HQ LAB SEP 01 '92

Yours very truly,

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-31-92

Page 2 of 3

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. OL 1071 Section Vic Nugent Br Replace SR No. 542 Sub-Section

Station & Offset 407+00 60.0' LL Hole # TH-2-92

F-0165 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-11	D-11	-54.0 to -55.5	MC= 25.5%	CL	PI
-12	D-12	-59.0' to -60.5			LK F-0165-11 w/ SEAT
					SBMLL C SAND
-13	D-13	-66.0' to -67.5'			LK F-0165-14
-14	D-14	-69.0' to -70.5'	MC= 12.2%	CL	PI
-15	D-15	-74.0' to -75.5			LK F-0165-14
-16	D-16	-79.0' to -80.5'	MC= 18.6%	MC	ONLY LK - F-0165-14
-10	D-10	49.0' to 50.5'			LK F-0152-10

1 copy with samples
1 copy to addressee

Yours very truly,
ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134
Inspector.

HQ LAB SEP 01 '92

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-18-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Nugent's Vicinity bridge replacement SR No. 542 Sub-Section

Station & Offset 407+00 60 FT LT Hole # TH-2-92

F-0165 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-17	S-1	56.0' to 58.0'	MC = 20.4%	CL	
-18	S-2	64.0 to 66.0'			Not Received

1 copy with samples
1 copy to addressee

Yours very truly,

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0165-4
HOLE NO.:	TH-2-92
DATE:	2-17-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	53.4g
WET WT.:	65.7g
% H_2O:	23.0%
WT. OF SAMPLE:	330.8g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	27.9g	100.0
-#4	5.2g	91.6
-#10	10.2g	90.0
-#40	26.8g	86.9
-#200	260.7g	78.8

SAMPLE DESCRIPTION

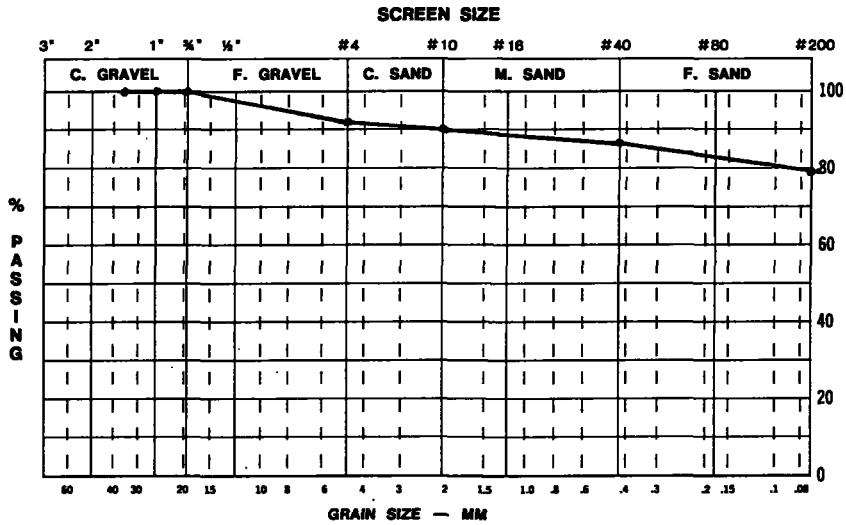
CLASS. CL

Olive Gray, Moist, Gravelly, Fine To Medium Sandy Clay.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓		✓
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

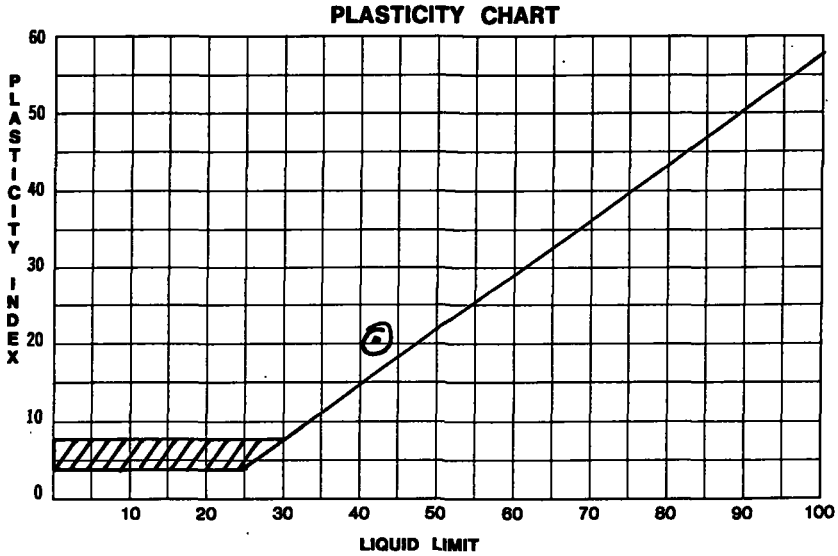
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	5				12
Wet Wt.	25.3g				8.4g
Dry Wt.	17.8g				6.9g
% H_2O	41.9				PL= 21.7
Blows	24				PI= 20.2

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0165-11
HOLE NO.:	TH-2-92
DATE:	2-17-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

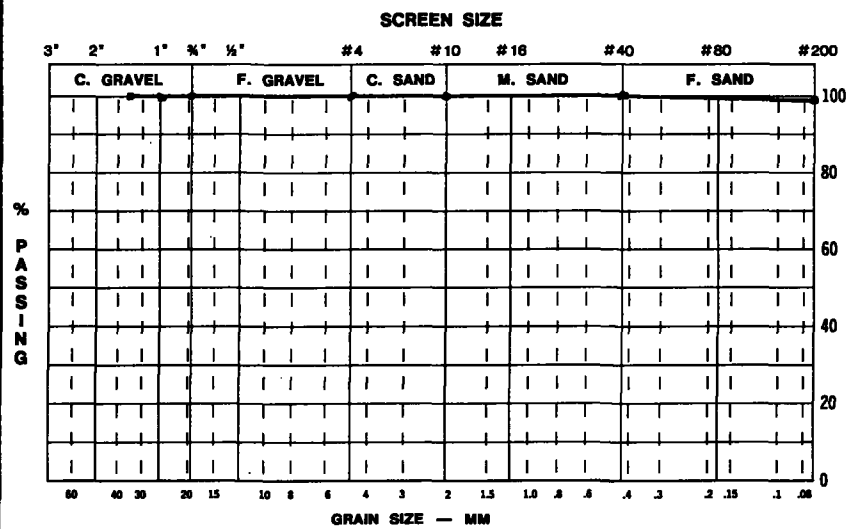
TEST	GRAVEL	SAND	SILT	CLAY
VISUAL				✓
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

SIEVE ANALYSIS

DRY WT.:	46.3g
WET WT.:	58.1g
% H_2O:	25.5%
WT. OF SAMPLE:	241.0g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	∅	100.0
-#4	∅	100.0
-#10	0.1g	100.0
-#40	3.0g	100.0
-#200	237.9g	98.7

GRAIN SIZE CURVE



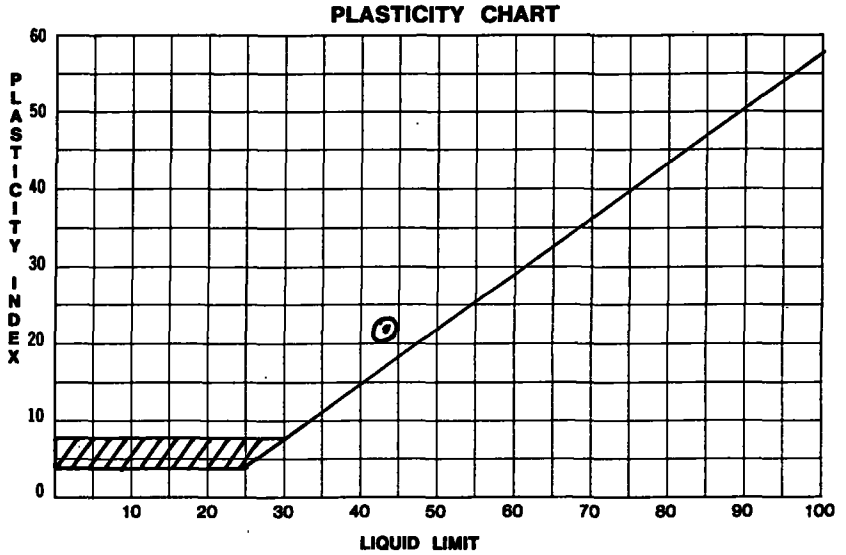
SAMPLE DESCRIPTION

CLASS.	
CL	Gray, Moist, Clay.

LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	37				43
Wet Wt.	25.8g				7.9g
Dry Wt.	17.9g				6.5g
% H_2O	43.5				PL= 21.5
Blows	22				PI= 21.9

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0165-14
HOLE NO.:	TH-2-92
DATE:	2-17-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

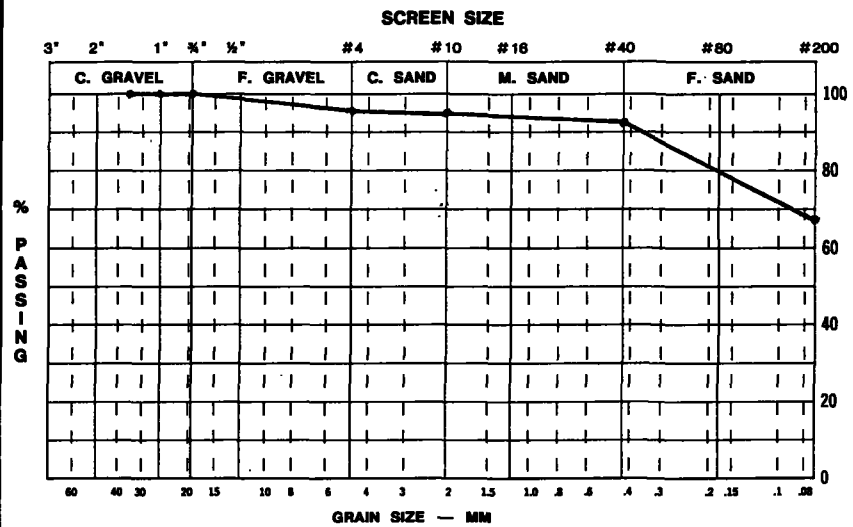
TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓		✓
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

SIEVE ANALYSIS

DRY WT.:	68.1g
WET WT.:	76.4g
% H_2O:	12.2%
WT. OF SAMPLE:	374.2g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	14.9g	100.0
-#4	3.3g	96.0
-#10	11.1g	95.1
-#40	93.3g	92.2
-#200	251.6g	67.2

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

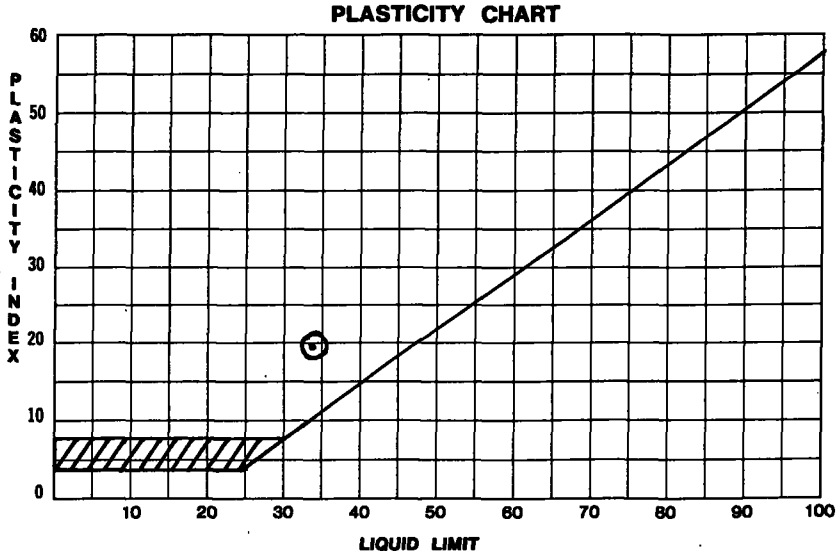
	LIQUID LIMIT				PLASTIC LIMIT
Can No.	27				48
Wet Wt.	23.2g				8.2g
Dry Wt.	17.3g				7.2g
% H_2O	33.8				PL= 13.9
Blows	23				PI= 19.9

SAMPLE DESCRIPTION

CLASS. CL

Gray, Moist, Gravelly, Fine To Medium Sandy Clay.

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0165-16
HOLE NO.:	TH-2-92
DATE:	1-29-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	50.6g
WET WT.:	60.0g
% H_2O:	18.6%
WT. OF SAMPLE:	N/A

	WT.	% PASS
-1½"		
-1"		
-¾"		
-#4		
-#10		
-#40		
-#200		

Moisture Content Only

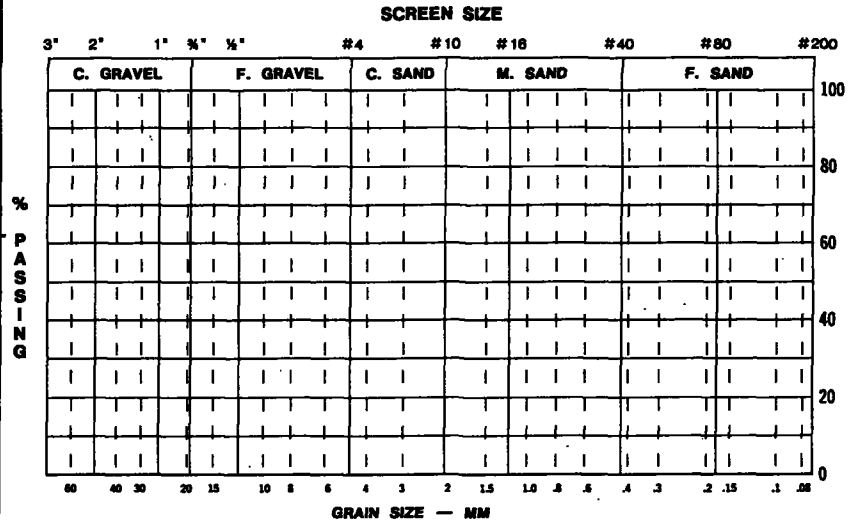
SAMPLE DESCRIPTION

CLASS.	

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL				
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

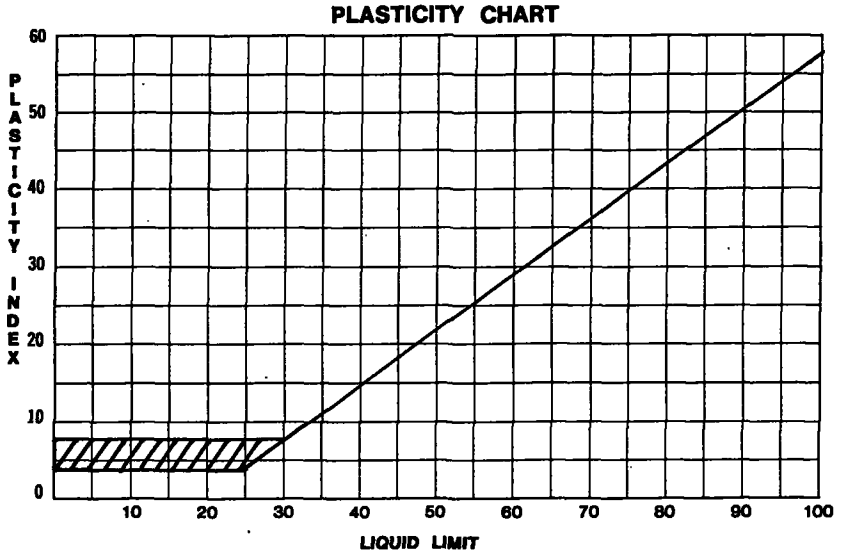
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0165-17
HOLE NO.:	TH-2-92
DATE:	2-25-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	582.0g
WET WT.:	700.5g
% H_2O:	20.4%
WT. OF SAMPLE:	345.2g

	WT.	% PASS
-1½"	ϕ	100.0
-1"	ϕ	100.0
-¾"	14.9g	100.0
-#4	3.6g	95.7
-#10	0.8g	94.6
-#40	46.5g	94.4
-#200	279.4g	80.9

SAMPLE DESCRIPTION

CLASS. CL

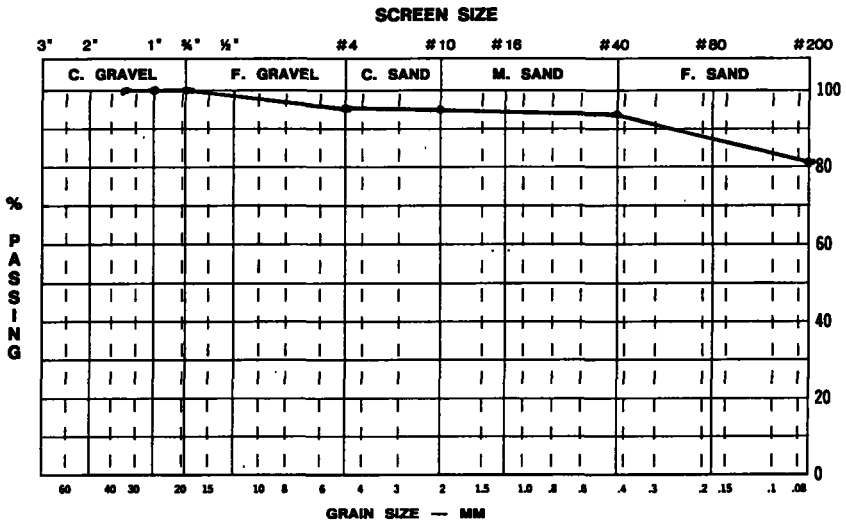
Gray, Moist, Gravelly, Fine Sandy Clay.

Consol Test #1071-3
Drive #S-1, Depth: 56.5'
wt. of Wet Soil & Tube: 1,738.9g
wt. of Tube: 431.8g
wt. of wet Soil: 1,307.1g
wt. of Dry Soil: 1,085.6g
γ Wet = 129.5 pcf
γ Dry = 107.6 pcf

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓		✓
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

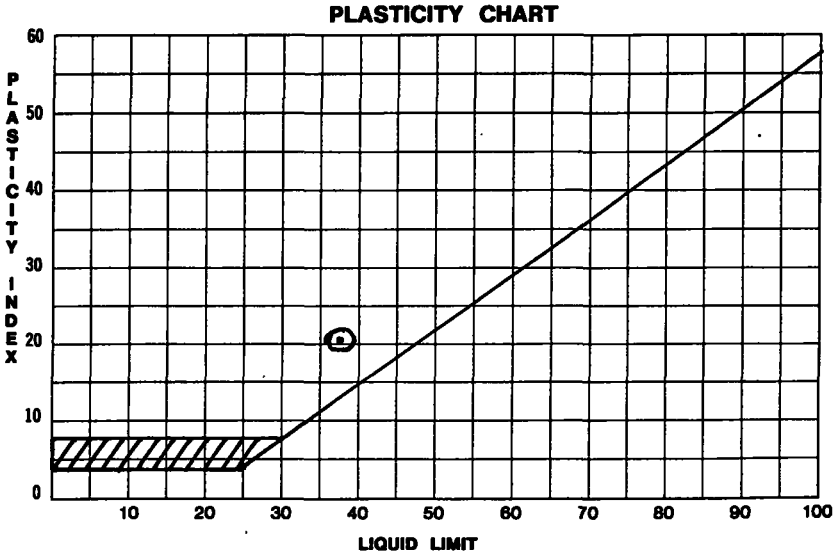
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	8				18
Wet Wt.	20.7g				8.2g
Dry Wt.	15.0g				7.0g
% H_2O	37.4				PL= 17.1
Blows	22				PI= 20.3

PLASTICITY CHART



DOT FORM 351-019 REVISED 4/87 -1272-

CONSOLIDATION TEST DATA

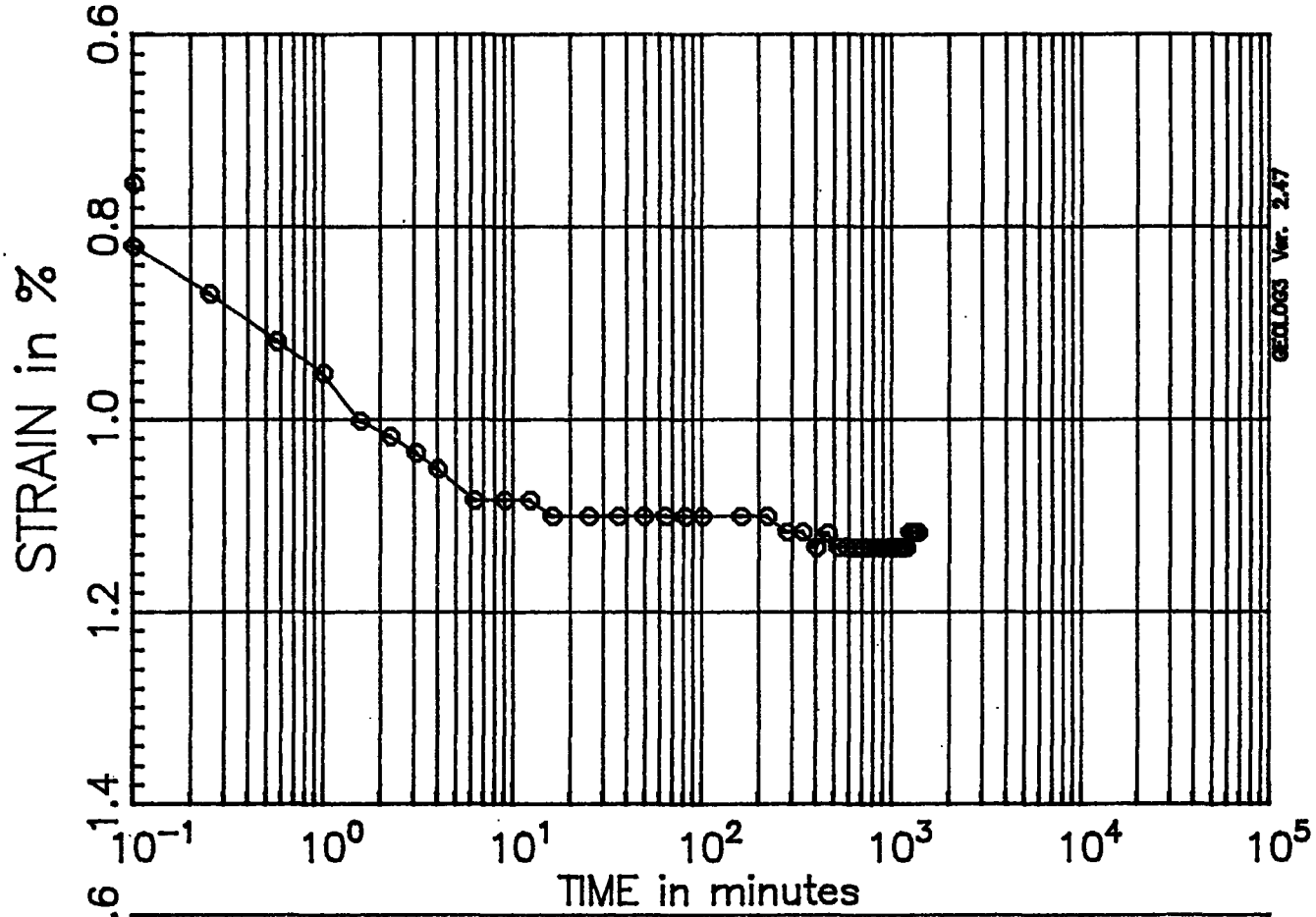
SOIL SAMPLE: GRAY MOIST
GRVLY F.SAN CLAY
LOCATION: 407+00 60'LT
BORING NO: H-2-92
SAMPLE NO: S-1 DEPTH: 56.5'

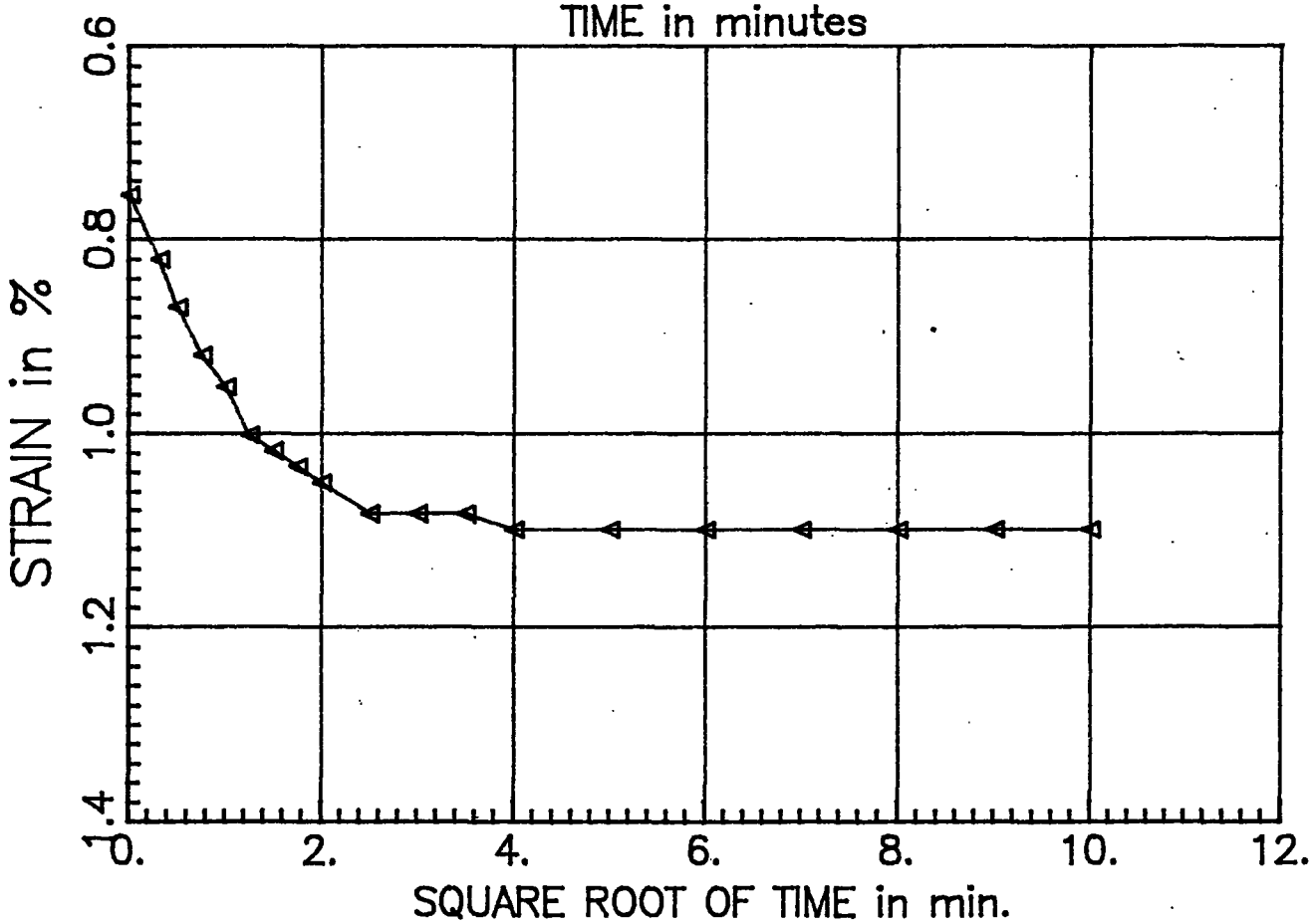
SPECIFIC GRAVITY OF SOLIDS: 2.65
HEIGHT OF SOLIDS: 0.3684 in.
SAMPLE DIAMETER: 1.91 in.
CALIBRATION FACTOR: .10544
INITIAL DISP. READING: -9.940001E-01

	TRIMMINGS	SPECIMEN + RING BEFORE	SPECIMEN + RING AFTER	AFTER
CONTAINER NO		RING	RING	
WT CONTAINER + WET SOIL gm	784.900	479.700	479.800	97.100
WT CONTAINER + DRY SOIL gm	666.400	467.600	467.600	84.900
WT CONTAINER gm	84.400	419.300	419.300	36.600
WT DRY SOIL gm	582.000	48.300	48.300	48.300
WATER CONTENT %	20.361	25.052	25.259	25.259
VOID RATIO	----------	0.609	0.494	----------
DEGREE OF SATURATION %	----------	108.955	135.463	----------

PROJECT: NUGENT VICINTY
BRIDGES
FILE NO.: OL-1071 TEST NO.: F-0165-17
DATE: 2-19-93
TESTED BY: LHB
CHECKED BY: DC

WASHINGTON STATE DOT





PRESSURE INCREMENT
FROM 0.00 TSF TO 0.25 TSF

Test No: F-0165-17
Testname: 1071-3

LOAD INCREMENT DATA

TEST NAME 1071-3 PAGE NO: 51
TEST NO: F-0165-17 TESTED BY: LHB

PRESSURE INCREMENT FROM 0 TSF TO .25 TSF

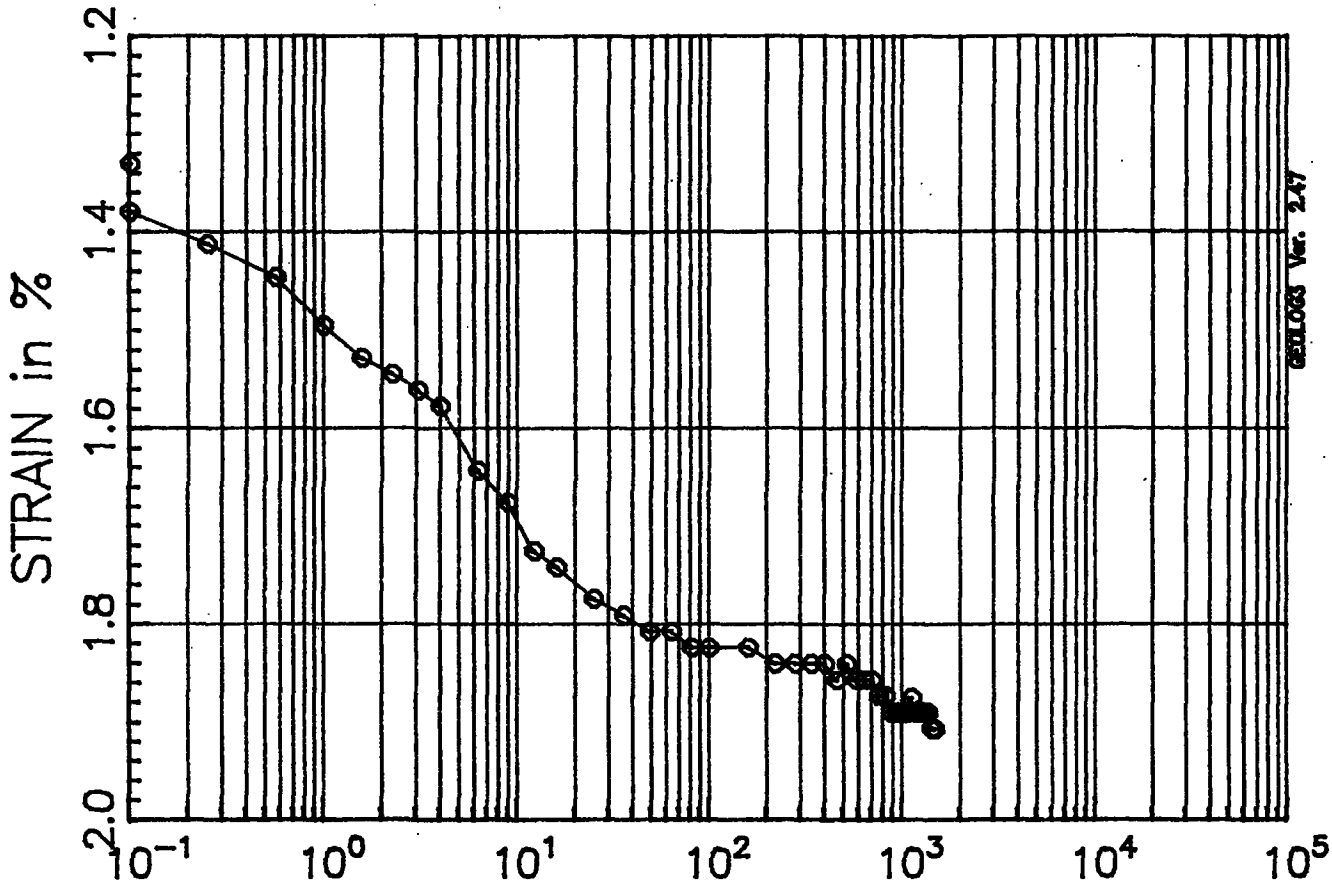
DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0047	0.597	0.75
		0.10	0.32	0.0051	0.596	0.82
		0.25	0.50	0.0054	0.595	0.87
		0.57	0.75	0.0057	0.595	0.92
		1.00	1.00	0.0060	0.594	0.95
		1.57	1.25	0.0063	0.593	1.00
		2.25	1.50	0.0064	0.593	1.02
		3.07	1.75	0.0065	0.593	1.03
		4.00	2.00	0.0066	0.592	1.05
		6.25	2.50	0.0068	0.592	1.08
		9.00	3.00	0.0068	0.592	1.08
		12.25	3.50	0.0068	0.592	1.08
		16.00	4.00	0.0069	0.592	1.10
		25.00	5.00	0.0069	0.592	1.10
		36.00	6.00	0.0069	0.592	1.10
		49.00	7.00	0.0069	0.592	1.10
		64.00	8.00	0.0069	0.592	1.10
		81.00	9.00	0.0069	0.592	1.10
		100.00	10.00	0.0069	0.592	1.10
		160.00	12.65	0.0069	0.592	1.10
		220.00	14.83	0.0069	0.592	1.10
		280.00	16.73	0.0070	0.591	1.12
		340.00	18.44	0.0070	0.591	1.12
		400.00	20.00	0.0071	0.591	1.13
		460.00	21.45	0.0070	0.591	1.12
		520.00	22.80	0.0071	0.591	1.13
		580.00	24.08	0.0071	0.591	1.13
		640.00	25.30	0.0071	0.591	1.13
		700.00	26.46	0.0071	0.591	1.13
		760.00	27.57	0.0071	0.591	1.13
		820.00	28.64	0.0071	0.591	1.13
		880.00	29.66	0.0071	0.591	1.13
		940.00	30.66	0.0071	0.591	1.13
		1000.00	31.62	0.0071	0.591	1.13
		1060.00	32.56	0.0071	0.591	1.13
		1120.00	33.47	0.0071	0.591	1.13

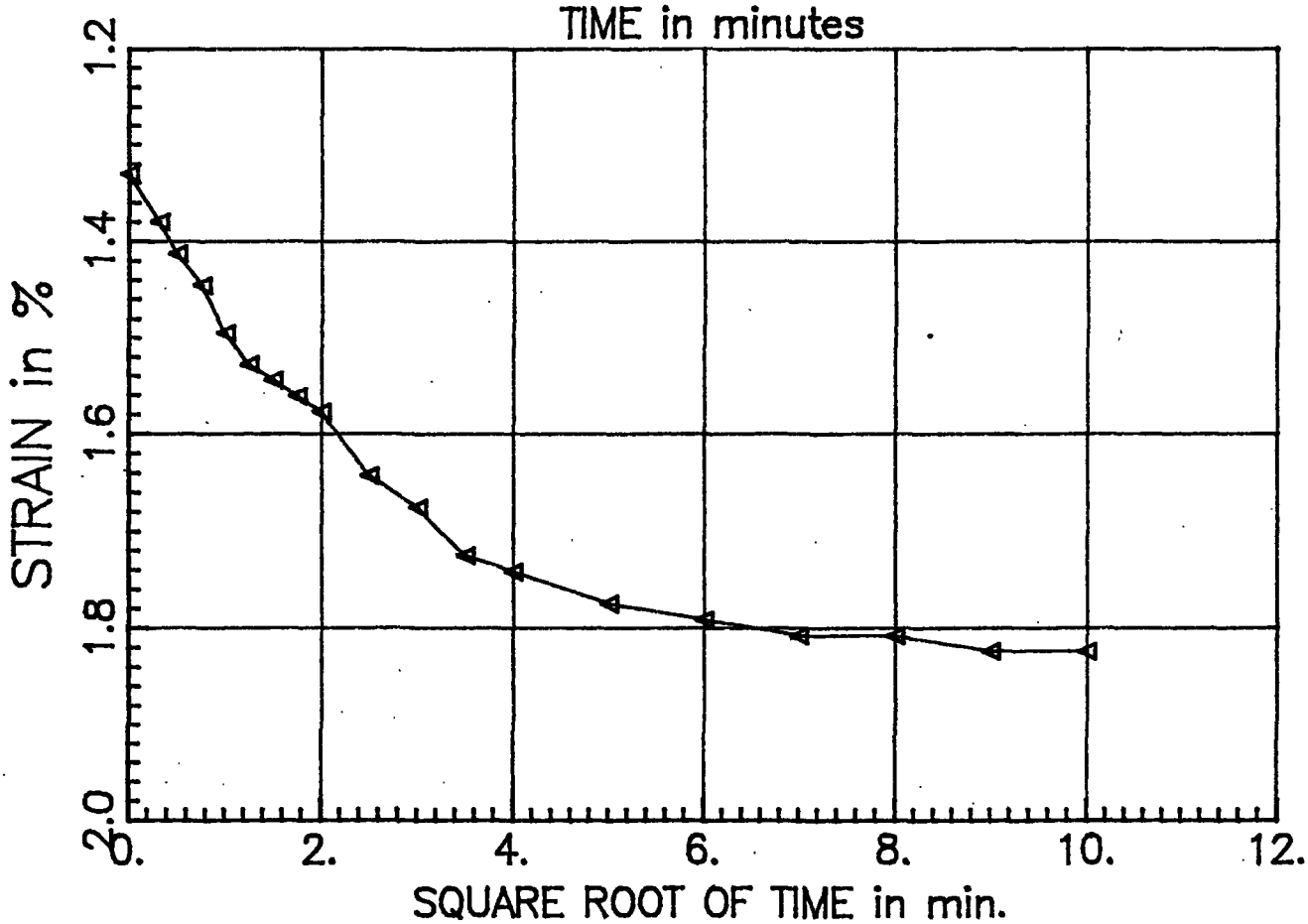
LOAD INCREMENT DATA

TEST NAME 1071-3 PAGE NO: 52
TEST NO: F-0165-17 TESTED BY: LHB

PRESSURE INCREMENT FROM 0 TSF TO .25 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1180.00	34.35	0.0071	0.591	1.13
		1240.00	35.21	0.0070	0.591	1.12
		1300.00	36.06	0.0070	0.591	1.12
		1360.00	36.88	0.0070	0.591	1.12





PRESSURE INCREMENT
FROM 0.25 TSF TO 0.50 TSF

Test No: F-0165-17
Testname: 1071-3

LOAD INCREMENT DATA

TEST NAME 1071-3 PAGE NO: 53
TEST NO: F-0165-17 TESTED BY: LHB

PRESSURE INCREMENT FROM .25 TSF TO .5 TSF

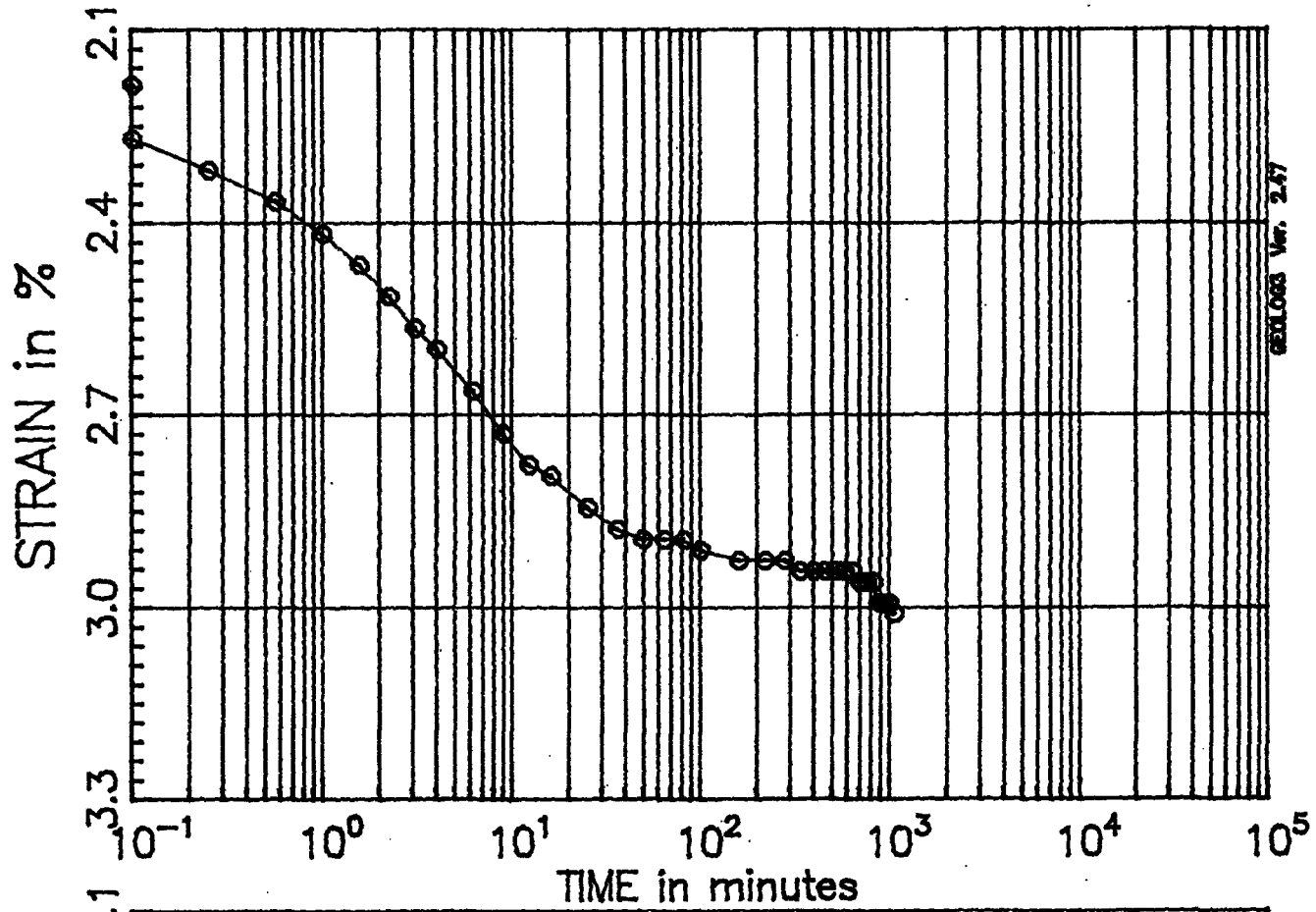
DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0083	0.588	1.33
		0.10	0.32	0.0086	0.587	1.38
		0.25	0.50	0.0088	0.587	1.41
		0.57	0.75	0.0090	0.586	1.45
		1.00	1.00	0.0093	0.585	1.50
		1.57	1.25	0.0096	0.585	1.53
		2.25	1.50	0.0097	0.584	1.54
		3.07	1.75	0.0098	0.584	1.56
		4.00	2.00	0.0099	0.584	1.58
		6.25	2.50	0.0103	0.583	1.64
		9.00	3.00	0.0105	0.582	1.68
		12.25	3.50	0.0108	0.582	1.73
		16.00	4.00	0.0109	0.581	1.74
		25.00	5.00	0.0111	0.581	1.78
		36.00	6.00	0.0112	0.580	1.79
		49.00	7.00	0.0113	0.580	1.81
		64.00	8.00	0.0113	0.580	1.81
		81.00	9.00	0.0114	0.580	1.82
		100.00	10.00	0.0114	0.580	1.82
		160.00	12.65	0.0114	0.580	1.82
		220.00	14.83	0.0115	0.580	1.84
		280.00	16.73	0.0115	0.580	1.84
		340.00	18.44	0.0115	0.580	1.84
		400.00	20.00	0.0115	0.580	1.84
		460.00	21.45	0.0116	0.579	1.86
		520.00	22.80	0.0115	0.580	1.84
		580.00	24.08	0.0116	0.579	1.86
		640.00	25.30	0.0116	0.579	1.86
		700.00	26.46	0.0116	0.579	1.86
		760.00	27.57	0.0117	0.579	1.87
		820.00	28.64	0.0117	0.579	1.87
		880.00	29.66	0.0118	0.579	1.89
		940.00	30.66	0.0118	0.579	1.89
		1000.00	31.62	0.0118	0.579	1.89
		1060.00	32.56	0.0118	0.579	1.89
		1120.00	33.47	0.0117	0.579	1.88

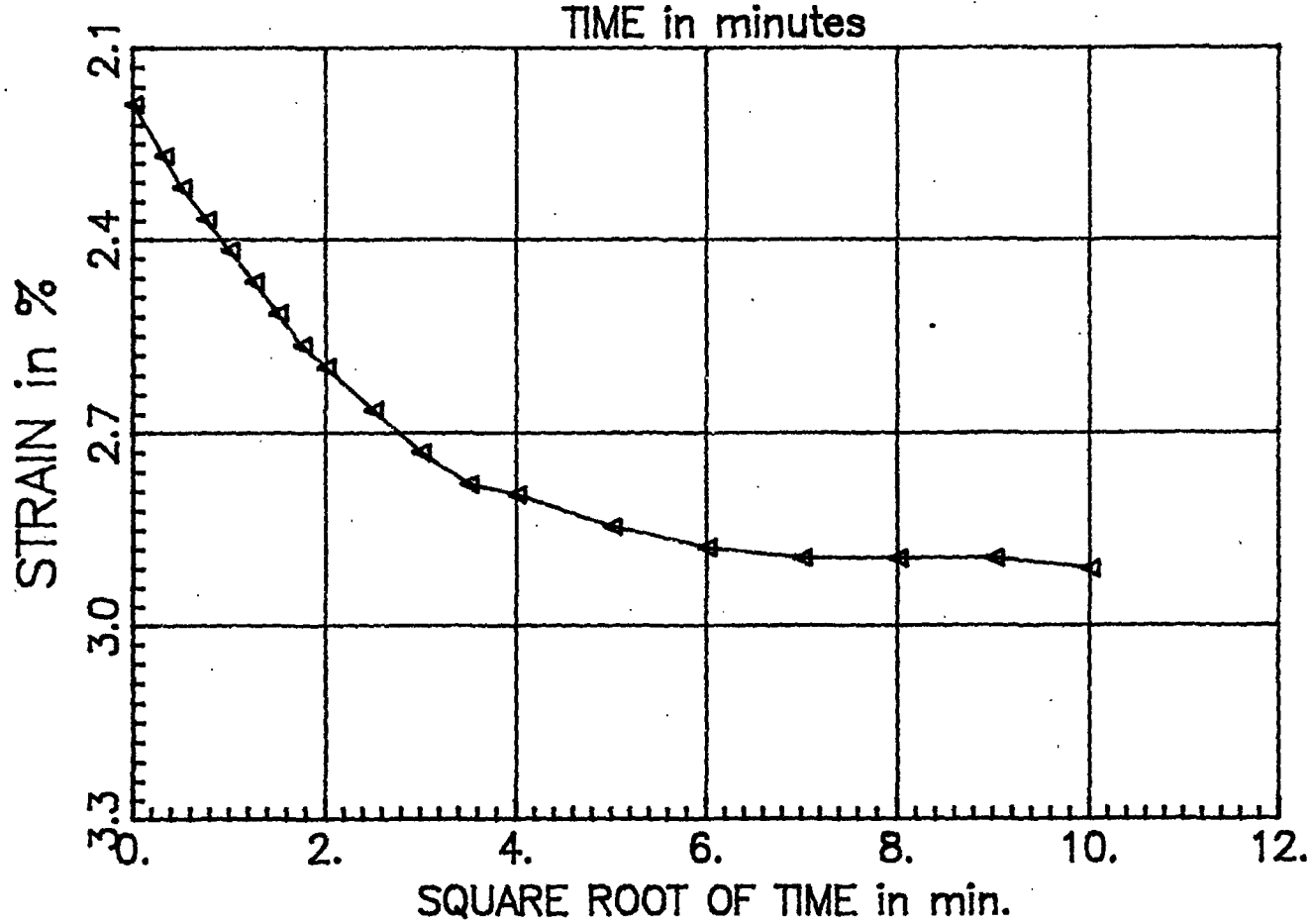
LOAD INCREMENT DATA

TEST NAME 1071-3 PAGE NO: 54
TEST NO: F-0165-17 TESTED BY: LHB

PRESSURE INCREMENT FROM .25 TSF TO .5 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1180.00	34.35	0.0118	0.579	1.89
		1240.00	35.21	0.0118	0.579	1.89
		1300.00	36.06	0.0118	0.579	1.89
		1360.00	36.88	0.0118	0.579	1.89
		1420.00	37.68	0.0119	0.579	1.91
		1480.00	38.47	0.0119	0.579	1.91





PRESSURE INCREMENT
FROM 0.50 TSF TO 1.00 TSF

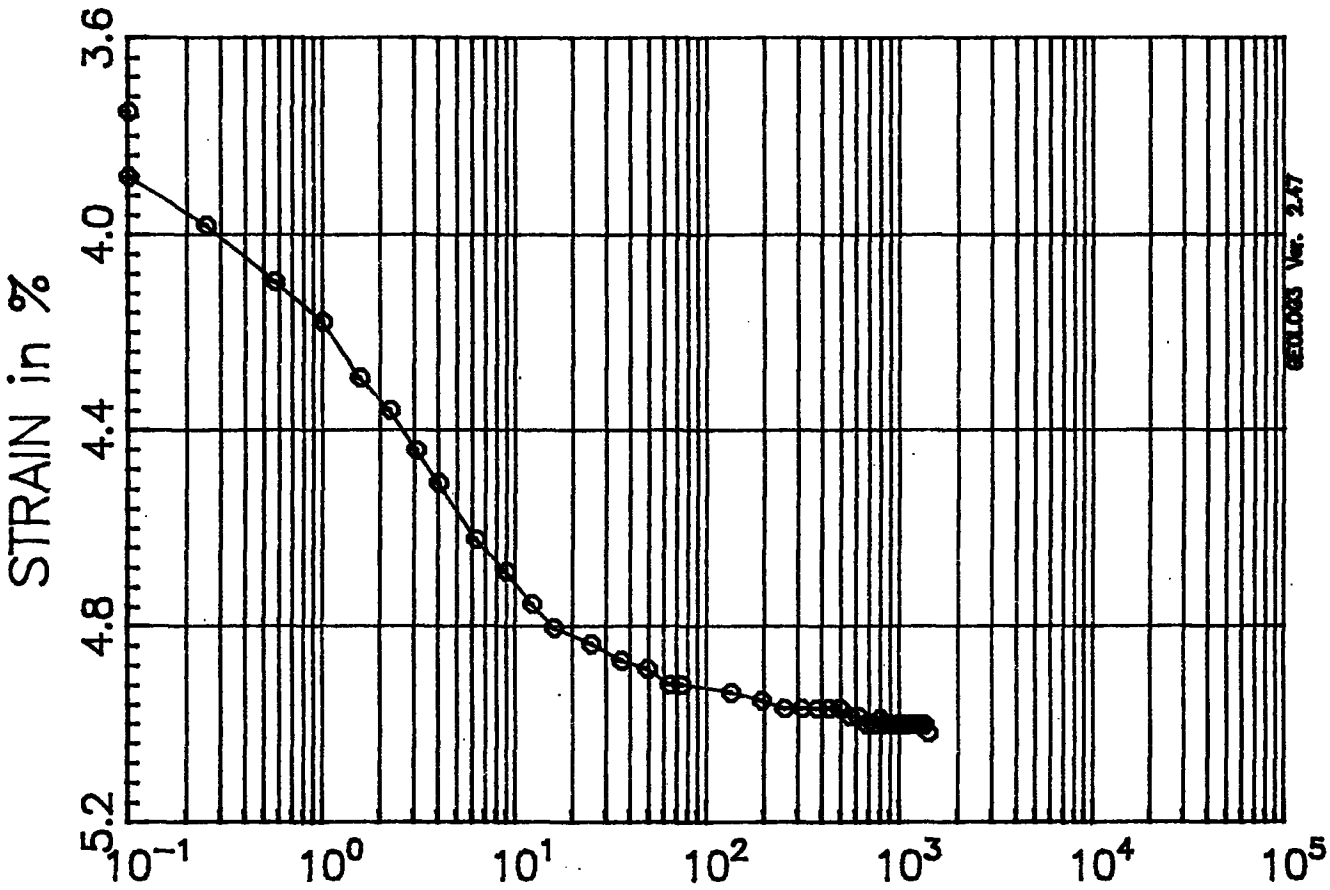
Test No: F-0165-17
Testname: 1071-3

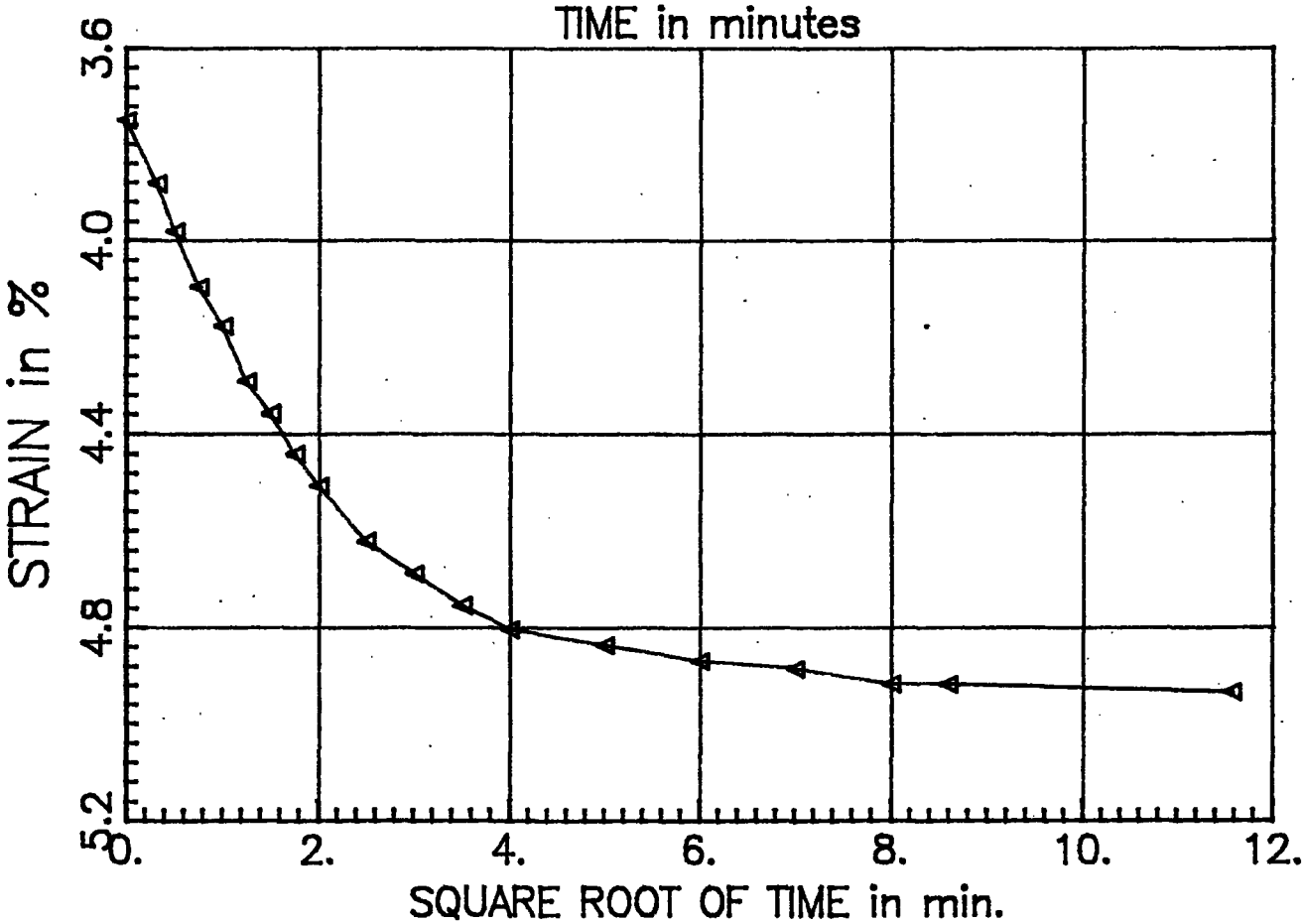
LOAD INCREMENT DATA

TEST NAME 1071-3 PAGE NO: 55
TEST NO: F-0165-17 TESTED BY: LHB

PRESSURE INCREMENT FROM .5 TSF TO 1 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0137	0.574	2.19
		0.10	0.32	0.0142	0.573	2.27
		0.25	0.50	0.0145	0.572	2.32
		0.57	0.75	0.0148	0.571	2.37
		1.00	1.00	0.0151	0.570	2.42
		1.57	1.25	0.0154	0.570	2.47
		2.25	1.50	0.0157	0.569	2.52
		3.07	1.75	0.0160	0.568	2.57
		4.00	2.00	0.0162	0.567	2.60
		6.25	2.50	0.0166	0.566	2.66
		9.00	3.00	0.0171	0.565	2.73
		12.25	3.50	0.0174	0.565	2.78
		16.00	4.00	0.0175	0.564	2.80
		25.00	5.00	0.0178	0.564	2.84
		36.00	6.00	0.0180	0.563	2.88
		49.00	7.00	0.0181	0.563	2.89
		64.00	8.00	0.0181	0.563	2.89
		81.00	9.00	0.0181	0.563	2.89
		100.00	10.00	0.0182	0.562	2.91
		160.00	12.65	0.0183	0.562	2.93
		220.00	14.83	0.0183	0.562	2.93
		280.00	16.73	0.0183	0.562	2.93
		340.00	18.44	0.0184	0.562	2.94
		400.00	20.00	0.0184	0.562	2.94
		460.00	21.45	0.0184	0.562	2.94
		520.00	22.80	0.0184	0.562	2.94
		580.00	24.08	0.0184	0.562	2.94
		640.00	25.30	0.0184	0.562	2.94
		700.00	26.46	0.0185	0.562	2.96
		760.00	27.57	0.0185	0.562	2.96
		820.00	28.64	0.0185	0.562	2.96
		880.00	29.66	0.0187	0.561	2.99
		940.00	30.66	0.0187	0.561	2.99
		1000.00	31.62	0.0187	0.561	2.99
		1060.00	32.56	0.0188	0.561	3.01





PRESSURE INCREMENT
FROM 1.00 TSF TO 2.00 TSF

Test No: F-0165-17
Testname: 1071-3

LOAD INCREMENT DATA

TEST NAME 1071-3 PAGE NO: 56
TEST NO: F-0165-17 TESTED BY: LHB

PRESSURE INCREMENT FROM 1 TSF TO 2 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0234	0.549	3.75
		0.10	0.32	0.0243	0.547	3.88
		0.25	0.50	0.0249	0.545	3.98
		0.57	0.75	0.0256	0.543	4.10
		1.00	1.00	0.0261	0.542	4.18
		1.57	1.25	0.0268	0.540	4.29
		2.25	1.50	0.0272	0.539	4.36
		3.07	1.75	0.0278	0.538	4.44
		4.00	2.00	0.0282	0.537	4.51
		6.25	2.50	0.0289	0.535	4.62
		9.00	3.00	0.0293	0.534	4.69
		12.25	3.50	0.0297	0.533	4.75
		16.00	4.00	0.0300	0.532	4.80
		25.00	5.00	0.0302	0.531	4.84
		36.00	6.00	0.0304	0.531	4.87
		49.00	7.00	0.0305	0.531	4.89
		64.00	8.00	0.0307	0.530	4.92
		73.78	8.59	0.0307	0.530	4.92
		133.78	11.57	0.0308	0.530	4.94
		193.78	13.92	0.0309	0.530	4.95
		253.78	15.93	0.0311	0.529	4.97
		313.78	17.71	0.0311	0.529	4.97
		373.78	19.33	0.0311	0.529	4.97
		433.78	20.83	0.0311	0.529	4.97
		493.78	22.22	0.0311	0.529	4.97
		553.78	23.53	0.0312	0.529	4.98
		613.78	24.77	0.0312	0.529	4.98
		673.78	25.96	0.0313	0.529	5.00
		733.78	27.09	0.0313	0.529	5.00
		793.78	28.17	0.0312	0.529	4.99
		853.78	29.22	0.0313	0.529	5.00
		913.78	30.23	0.0313	0.529	5.00
		973.78	31.21	0.0313	0.529	5.00
		1033.78	32.15	0.0313	0.529	5.00
		1093.78	33.07	0.0313	0.529	5.00
		1153.78	33.97	0.0313	0.529	5.00

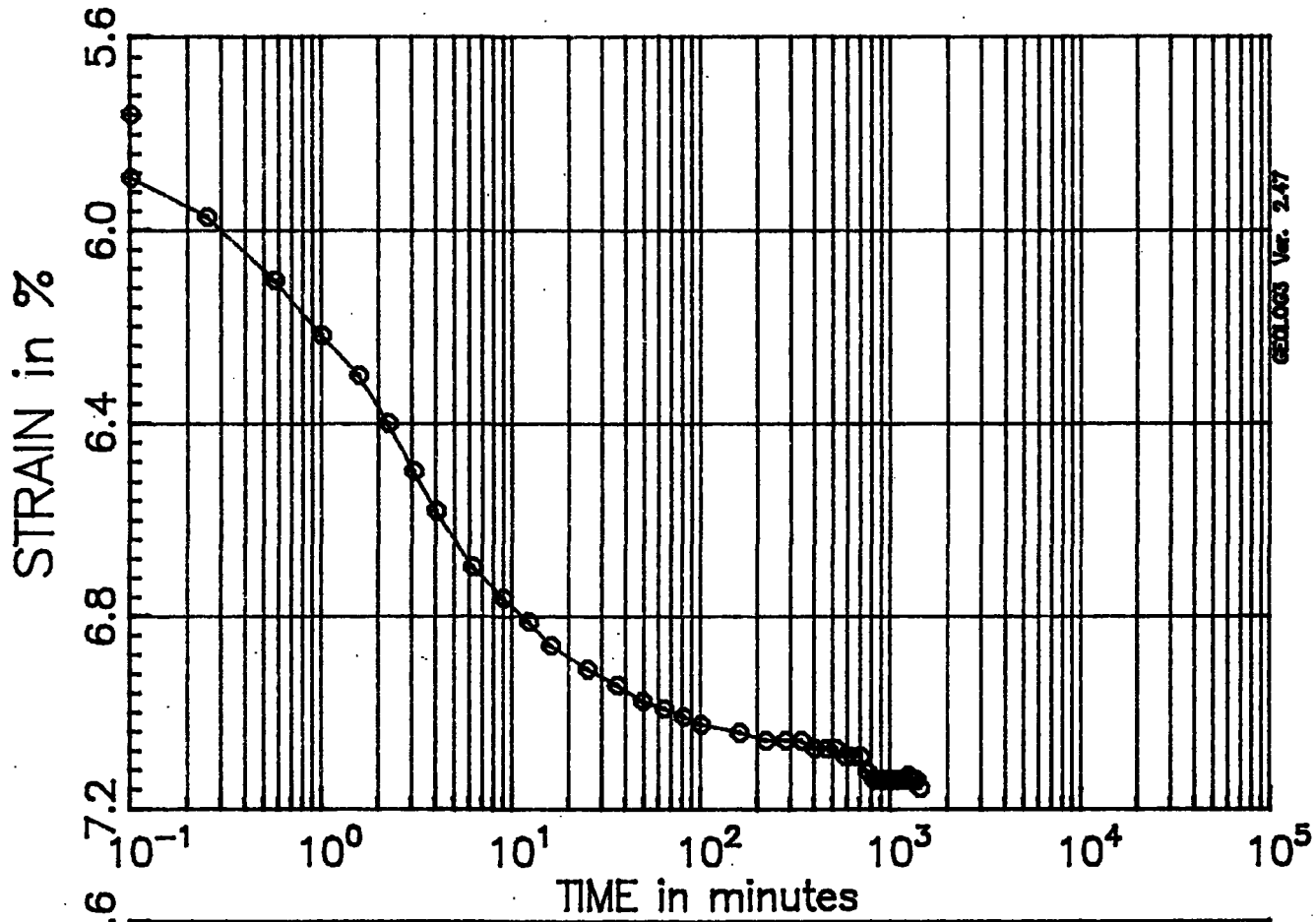
LOAD INCREMENT DATA

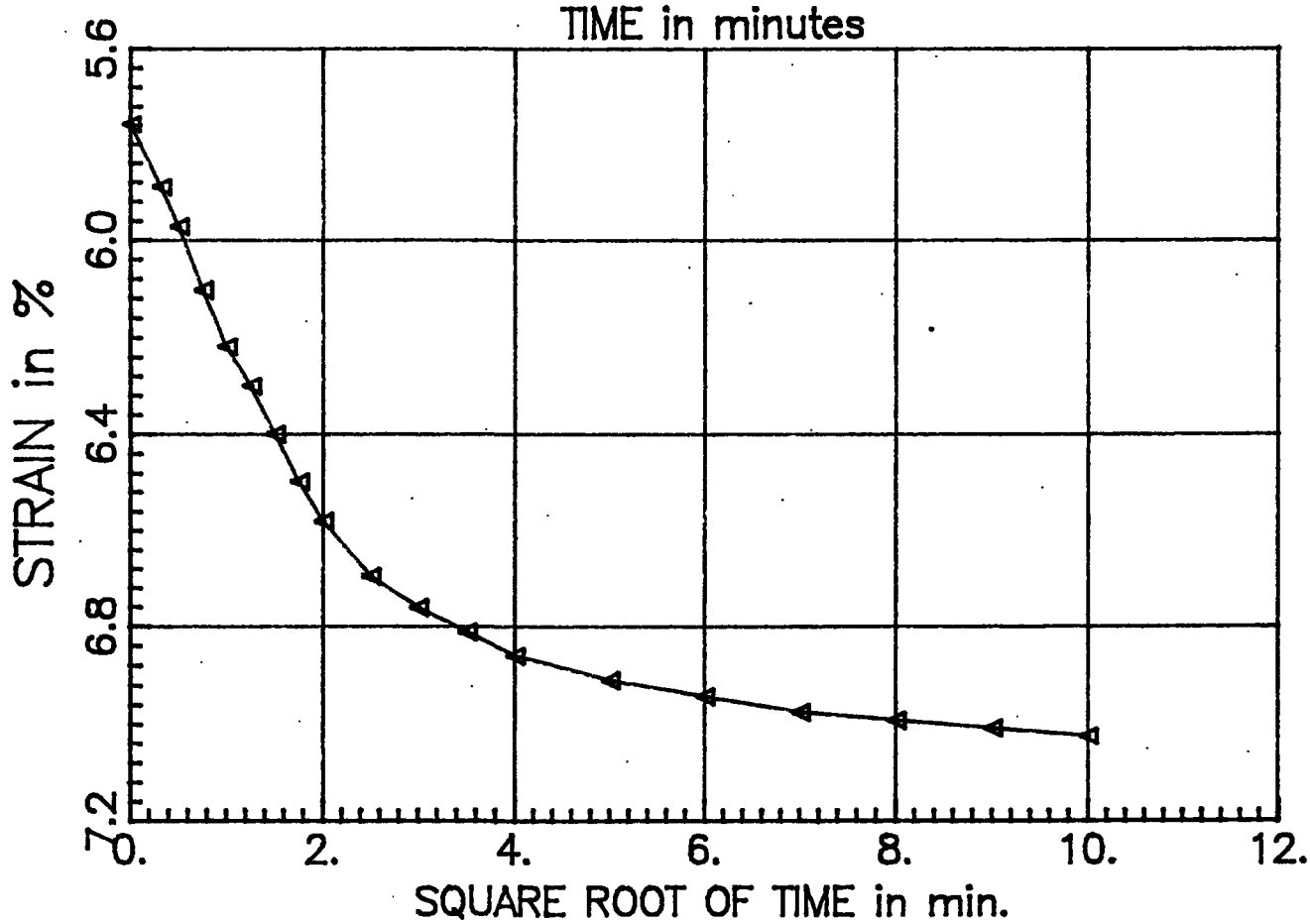
TEST NAME 1071-3 PAGE NO: 57

TEST NO: F-0165-17 TESTED BY: LHB

PRESSURE INCREMENT FROM 1 TSF TO 2 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1213.76	34.84	0.0313	0.529	5.00
		1273.78	35.69	0.0313	0.529	5.00
		1333.76	36.52	0.0313	0.529	5.00
		1393.73	37.33	0.0314	0.529	5.02





PRESSURE INCREMENT
FROM 2.00 TSF TO 4.00 TSF

Test No: F-0165-17
Testname: 1071-3

LOAD INCREMENT DATA

TEST NAME 1071-3 PAGE NO: 58
TEST NO: F-0165-17 TESTED BY: LHB

PRESSURE INCREMENT FROM 2 TSF TO 4 TSF

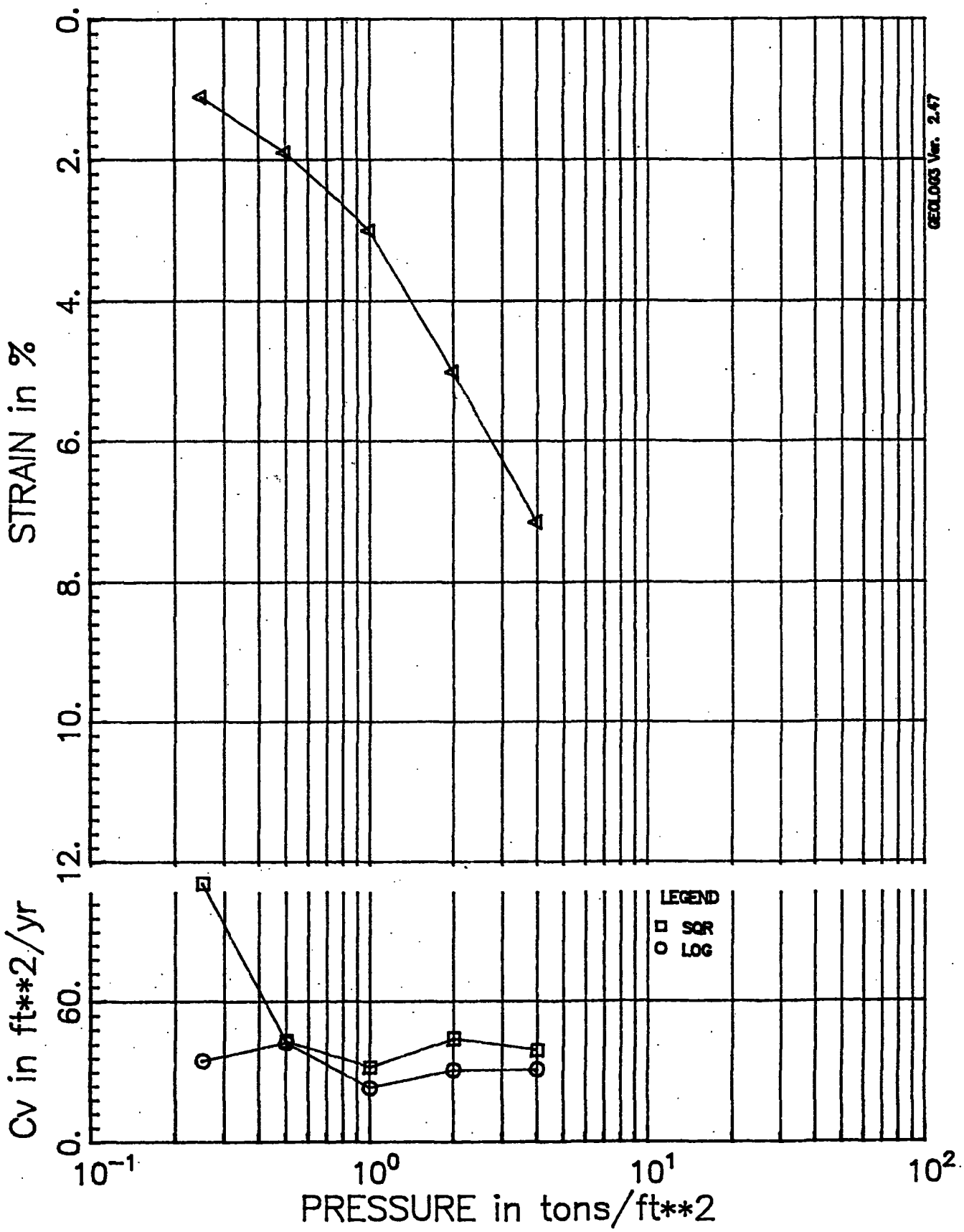
DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0360	0.517	5.76
		0.10	0.32	0.0368	0.515	5.89
		0.25	0.50	0.0373	0.513	5.97
		0.57	0.75	0.0381	0.511	6.10
		1.00	1.00	0.0389	0.509	6.22
		1.57	1.25	0.0394	0.508	6.30
		2.25	1.50	0.0400	0.506	6.40
		3.07	1.75	0.0406	0.505	6.50
		4.00	2.00	0.0411	0.503	6.58
		6.25	2.50	0.0419	0.502	6.70
		9.00	3.00	0.0423	0.500	6.76
		12.25	3.50	0.0426	0.500	6.81
		16.00	4.00	0.0429	0.499	6.86
		25.00	5.00	0.0432	0.498	6.91
		36.00	6.00	0.0434	0.498	6.94
		49.00	7.00	0.0436	0.497	6.98
		64.00	8.00	0.0437	0.497	6.99
		81.00	9.00	0.0438	0.497	7.01
		100.00	10.00	0.0439	0.496	7.03
		160.00	12.65	0.0440	0.496	7.04
		220.00	14.83	0.0441	0.496	7.06
		280.00	16.73	0.0441	0.496	7.06
		340.00	18.44	0.0441	0.496	7.06
		400.00	20.00	0.0442	0.495	7.07
		460.00	21.45	0.0442	0.495	7.07
		520.00	22.80	0.0442	0.495	7.07
		580.00	24.08	0.0443	0.495	7.09
		640.00	25.30	0.0443	0.495	7.09
		700.00	26.46	0.0443	0.495	7.09
		760.00	27.57	0.0445	0.495	7.12
		820.00	28.64	0.0446	0.494	7.14
		880.00	29.66	0.0446	0.494	7.14
		940.00	30.66	0.0446	0.494	7.14
		1000.00	31.62	0.0446	0.494	7.14
		1060.00	32.56	0.0446	0.494	7.14
		1120.00	33.47	0.0446	0.494	7.14

LOAD INCREMENT DATA

TEST NAME 1071-3 PAGE NO: 59
TEST NO: F-0165-17 TESTED BY: LHB

PRESSURE INCREMENT FROM 2 TSF TO 4 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1180.00	34.35	0.0446	0.494	7.14
		1240.00	35.21	0.0446	0.495	7.13
		1300.00	36.06	0.0446	0.494	7.14
		1360.00	36.88	0.0446	0.494	7.14
		1420.00	37.68	0.0447	0.494	7.16



SOIL DESCRIPTION: GRAY MOIST
GRVLY F.SAN CLAY

BORING: H-2-92 SAMPLE: S-1 DEPTH: 56.5'

WATER CONTENT
NATURAL: 0.25
AFTER TEST: 0.25

INITIAL VOID RATIO: 0.61

PROJECT: NUGENT VICINTY BRIDGES
FILE NO: OL-1071
DATE: 2-19-93

CONSOLIDATION TEST NO: F-0165-17

Testname: 1071-3

WASHINGTON STATE DOT

CONSOLIDATION TEST SUMMARY

APPLIED PRESSURE in tsf	FINAL DISP. in in.	STRAIN AT END in %	FITTING TIME in min SQ.RT. T90	FITTING TIME in min LOG T50	COEF. OF CONSOLIDATION in sq. ft. per yr SQ.RT.	COEF. OF CONSOLIDATION in sq. ft. per yr LOG	COEF. OF CONSOLIDATION in sq. ft. per yr AVE.
0.25	.00698	1.117	2.70	2.00	110.70	34.72	72.71
0.50	.01192	1.907	6.80	1.60	43.12	42.57	42.84
1.00	.01981	3.010	9.00	2.90	31.95	23.04	27.50
2.00	.03136	5.018	6.30	2.10	44.20	30.91	37.51
4.00	.04473	7.157	6.80	2.00	39.20	30.97	35.08

TEST NAME: 1071-3
PROJECT: NUGENT VICINTY BRIDGES
FILE NO.: GL-1071
TEST NO.: F-0165-17
DATE: 3-19-93
TESTED BY: LMB
CHECKED BY: DC

WASHINGTON STATE DOT

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-20-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. QL-1071 Section Nugents Corner bridge Replacement
SR No. 542 Sub-Section

Station & Offset 410+00 50 FT. LT. Hole # TH-3-92

F-0178 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-1	D-1	0.0' to 1.5'	MC = 11.7%	SM	
-2	D-2	3.0' to 4.5'			LK - F-0178-S
-3	D-3	8.0' to 9.5'			LK F-0178-S
—	D-4	13.0' to 14.5'			Sample Not Received
-4	D-5	18.0' to 19.5'			LK F-0178-S INCL GRVL
-5	D-6	23.0' to 24.5'	MC = 1.9%	SP-SM	
-6	D-7	28.0' to 29.5'			LK F-0178-S
-7	D-8	33.0' to 31.5'			LK F-0166-11
-8	D-9	38.0' to 40.0'			LK F-0166-11

copy with samples
1 copy to addressee

Yours very truly,

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0178-1
HOLE NO.:	TH-3-92
DATE:	1-29-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	44.5g
WET WT.:	49.7g
% H_2O:	11.7%
WT. OF SAMPLE:	335.4g

	WT.	% PASS
-1½"	∅	100.0
-1"	15.7g	100.0
-¾"	33.6g	95.3
-#4	12.0g	85.3
-#10	103.1g	81.7
-#40	117.0g	51.0
-#200	54.0g	16.1

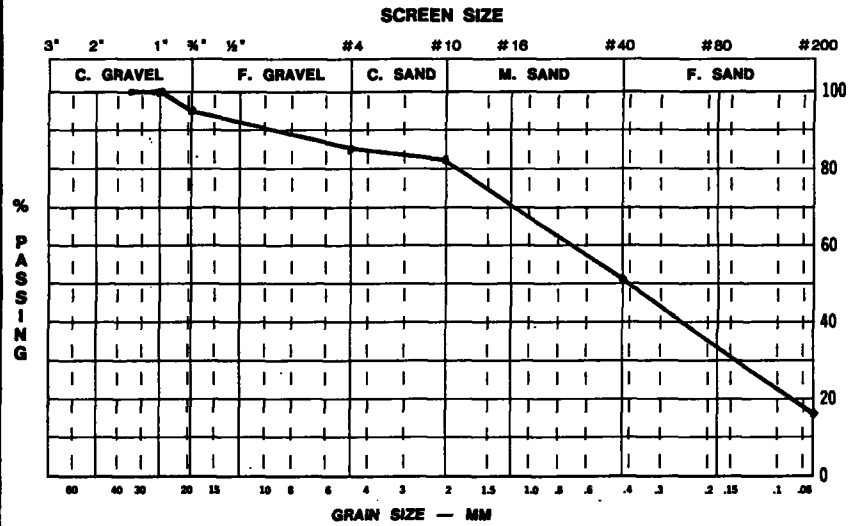
SAMPLE DESCRIPTION

CLASS. SM Light Olive Brown, Moist, Gravelly, Silty Fine To Coarse Sand w/Root Hairs.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

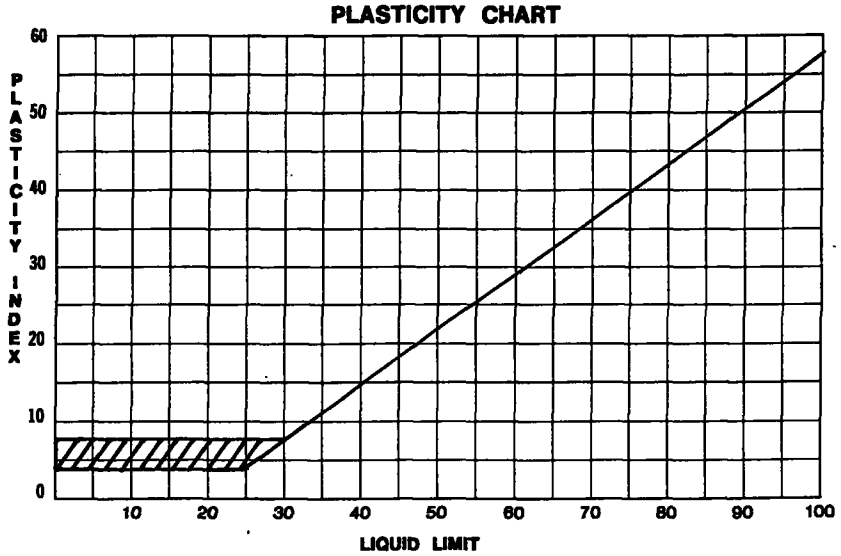
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	02-1071
SAMPLE NO.:	F-0178-5
HOLE NO.:	TH-3-92
DATE:	1-29-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	74.6g
WET WT.:	76.0g
% H_2O:	1.9%
WT. OF SAMPLE:	802.3g

	WT.	% PASS
-1½"	27.1g	100.0
-1"	29.2g	96.6
-¾"	268.9g	93.0
-#4	110.9g	59.5
-#10	177.1g	45.6
-#40	133.6g	23.6
-#200	55.5g	6.9

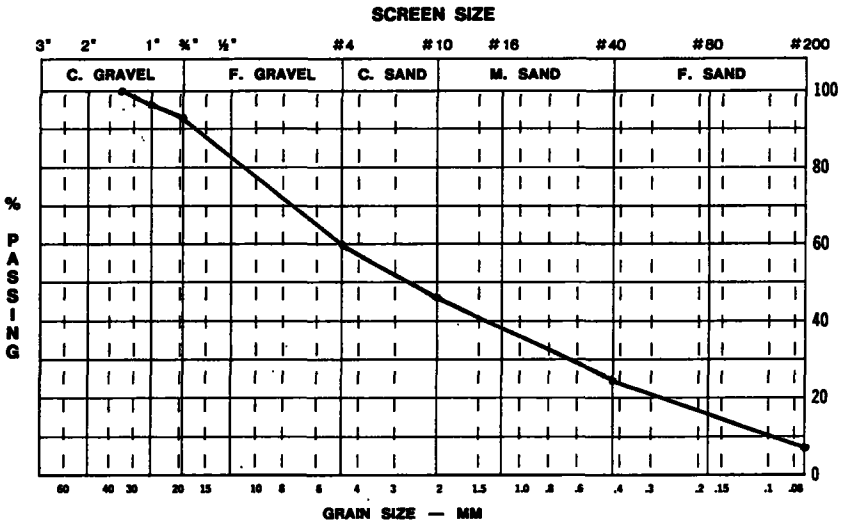
SAMPLE DESCRIPTION

CLASS. SP-SM Olive, Dry, Silty, Gravelly Fine To Coarse Sand.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

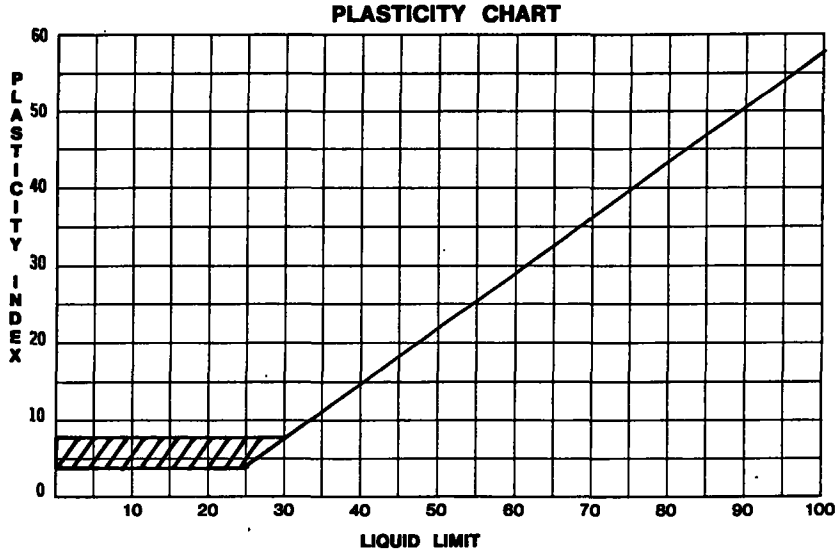
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-27-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Nugents Vicinity bridge replacement
SR No. 542 Sub-Section

Station & Offset 410+00 10 FT. RT. Hole # TH-4-92

F-0166 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-1	D-1	0.5' 2.0'	MC = 0.9%	SW-SM	
-2	D-2	4.0' to 5.5'			LK F-0166-1
-3	D-3	9.0' to 10.5'			LK F-0166-1
-4	D-4	14.0' to 15.5'			LK F-0166-1
-5	D-5	19.0' to 20.5'			Poor Sample GRVL & SAND
-6	D-6	24.0' to 25.5'			LK F-0178-5
-7	D-7	29.0' to 30.0'			LK F-0178-5
-8	D-8	34.0' to 35.5'			LK F-0178-5 INCR GRVL
-9	D-9	39.0' to 40.0'			LK F-0166-11

1 copy with samples
1 copy to addressee

Yours very truly,

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134
Inspector.

HQ LAB SEP 01 '92

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-27-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Nugent's Vicinity bridge replacement SR No. 542 Sub-Section

Station & Offset 410+00 10 FT RT Hole # TH-4-92

F-0166 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-10	D-10	44.0' to 45.5'			LK F-0166-1'
-11	D-11	49.0' to 50.5'	MC = 6.3%	SW	
-12	D-12	54.0' to 55.5'			LK F-0166-11 INCR GRN

1 copy with samples
1 copy to addressee

Yours very truly,

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

HQ LAB SEP 01 '92

Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0166-1
HOLE NO.:	TH-4-92
DATE:	1-29-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	65.4g
WET WT.:	66.0g
% H_2O:	0.9%
WT. OF SAMPLE:	574.8g

	WT.	% PASS
-1½"	ø	100.0
-1"	16.1g	100.0
-¾"	169.5g	97.2
-#4	94.1g	67.2
-#10	155.3g	51.3
-#40	101.0g	24.3
-#200	38.8g	6.8

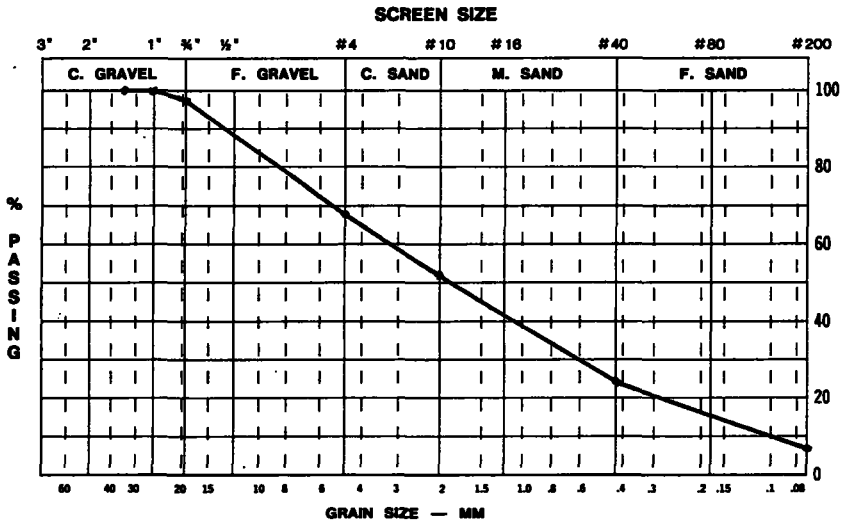
SAMPLE DESCRIPTION

CLASS. SW-SM Olive Gray, Dry, Silty, Gravelly Fine To Coarse Sand.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

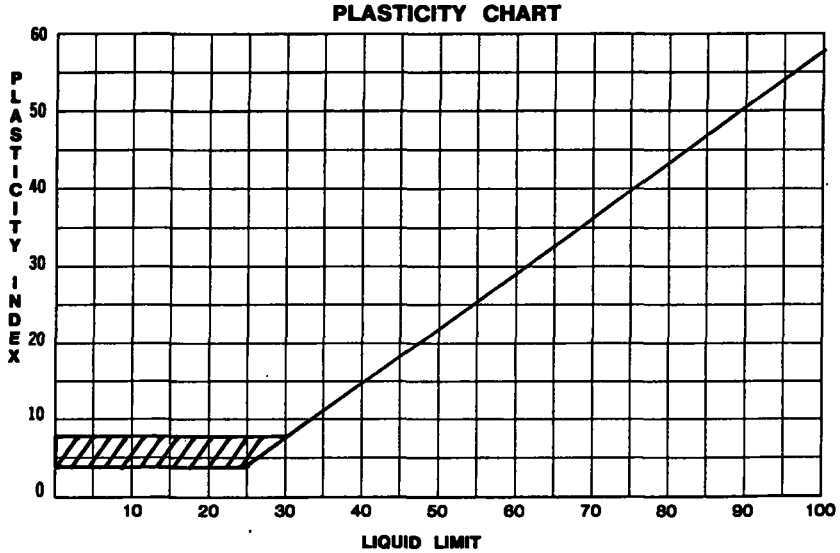
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0166-11
HOLE NO.:	TH-4-92
DATE:	1-29-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	79.4g
WET WT.:	84.4g
% H_2O:	6.3%
WT. OF SAMPLE:	691.0g

	WT.	% PASS
-1½"	31.5g	100.0
-1"	86.4g	95.4
-¾"	179.3g	82.9
-#4	125.9g	57.0
-#10	168.3g	38.8
-#40	76.1g	14.4
-#200	23.5g	3.4

SAMPLE DESCRIPTION

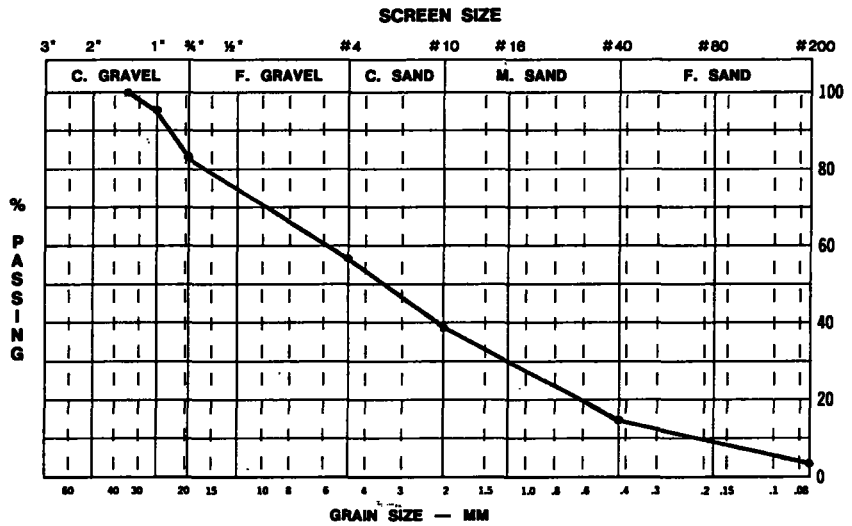
CLASS. SW

Olive Gray, Dry, Slightly Silty, Gravelly, Fine To Coarse Sand.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

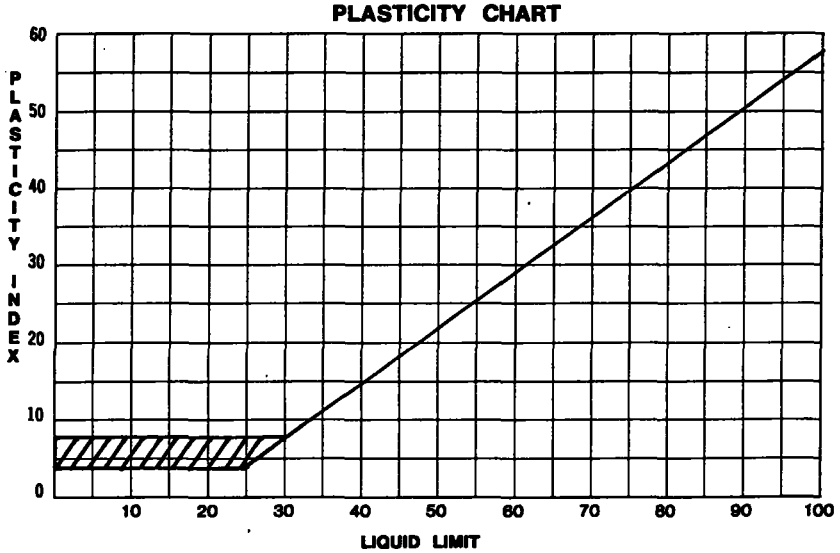
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-24-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Horton vicinity bridge replacement SR No. 542 Sub-Section

Station & Offset 418+00 35 FT LT Hole # TH-592

F-0169 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-1	D-1	0.0' to 1.5'			LK F-0180-3 w/ root hairs
-2	D-2	4.0' to 5.5'			LK - F-0180-3
-3	D-3	9.0' to 10.5			LK F-0169-4 w/ coarse subrounded gravel
-4	D-4	16.0' to 17.5'	MC= 14.8%	SP-SM	
-5	D-5	19.0' to 20.5	MC= 2.0%	SW	
-6	D-6	24.0' to 25.5'			LK F-0169-5
-7	D-7	29.0' to 30.5'			LK F-0169-5
-8	D-8	34.0' to 35.0'			LK F-0169-5
-9	D-9	39.0' to 40.0'			LK F-0169-5 DECR SILT
-10	D-10	44.0' to 45.0'	MC= 4.6%	SW	

1 copy with samples
1 copy to addressee

Yours very truly,

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

Inspector.

DOT FORM 351-002 REVISED 2/80

HQ LAB SEP 01 '92

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-24-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Horton/Yeerty bridge replacement
SR No. 542 Sub-Section

Station & Offset 418+00 35 FT LT Hole # TH-5-92

F-0169 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-11	U-1	16.4" to 16.8"	B		
-12	U-1	16.8" to 17.0'	C		

1 copy with samples
1 copy to addressee

Yours very truly,

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0169-4
HOLE NO.:	TH-5-92
DATE:	1-29-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	76.1g
WET WT.:	87.4g
% H_2O:	14.8%
WT. OF SAMPLE:	740.1g

	WT.	% PASS
-1½"	Ø	100.0
-1"	38.1g	100.0
-¾"	65.8g	94.9
-#4	31.7g	86.0
-#10	32.9g	81.7
-#40	488.1g	77.2
-#200	83.5g	11.3

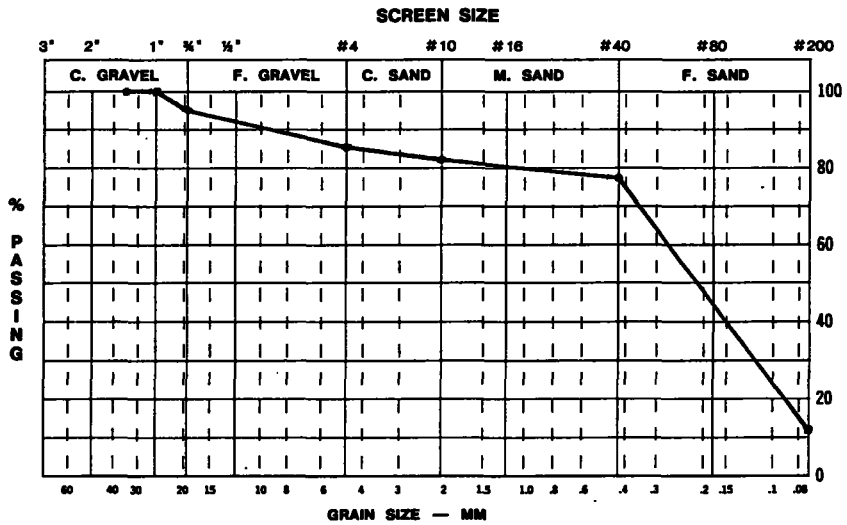
SAMPLE DESCRIPTION

CLASS. SP-SM Dark Grayish Brown, Silty, Gravelly Fine To Coarse Sand.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

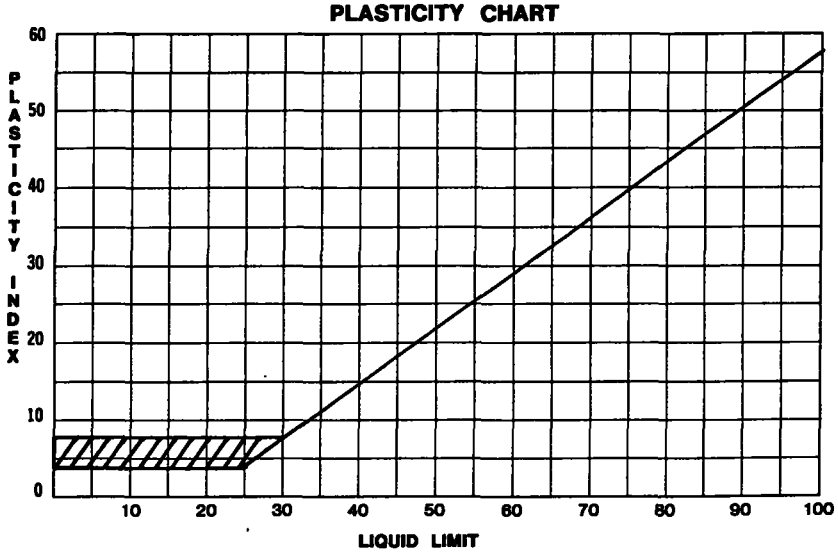
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0169-5
HOLE NO.:	TH-5-92
DATE:	1-29-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	74.0g
WET WT.:	75.5g
% H_2O:	2.0%
WT. OF SAMPLE:	787.6g

	WT.	% PASS
-1½"	147.4g	100.0
-1"	7.7g	81.3
-¾"	193.7g	80.3
-#4	168.4g	55.7
-#10	163.2g	34.3
-#40	71.4g	13.6
-#200	35.8g	4.5

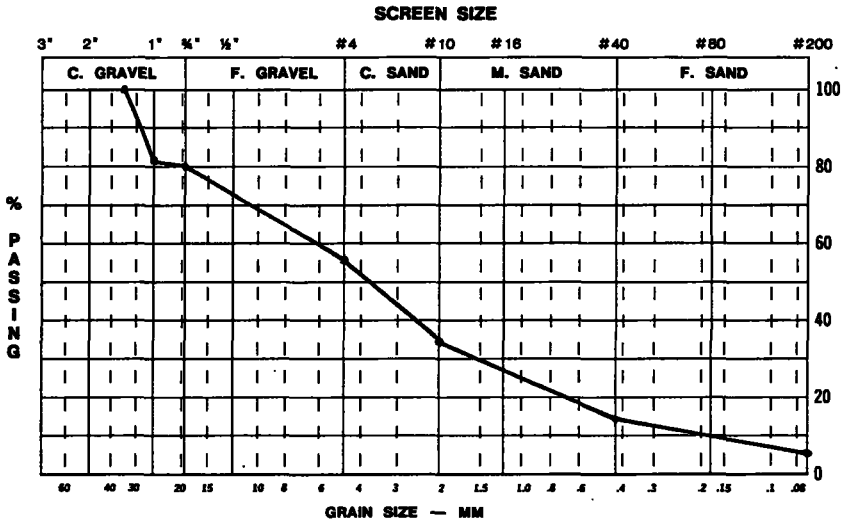
SAMPLE DESCRIPTION

CLASS. SW Dark Yellowish Brown, Dry, Slightly Silty, Gravelly Fine To Coarse Sand.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

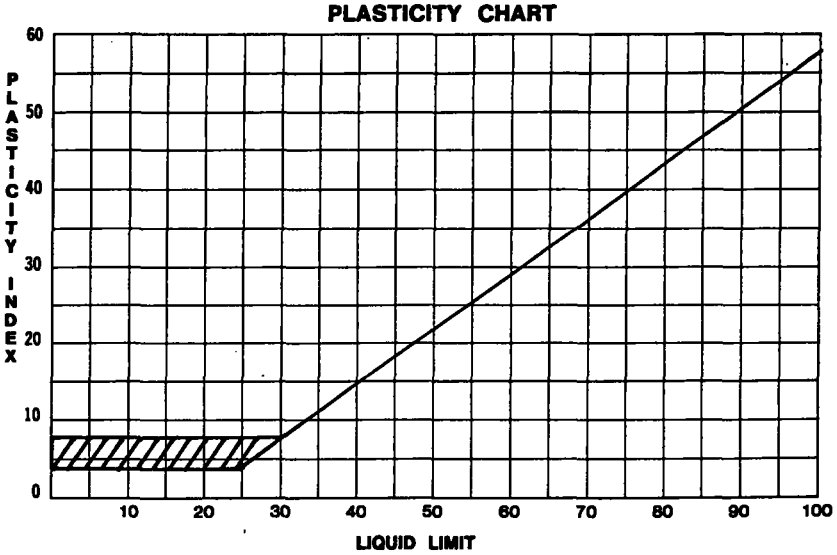
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0169-10
HOLE NO.:	TH-5-92
DATE:	1-29-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

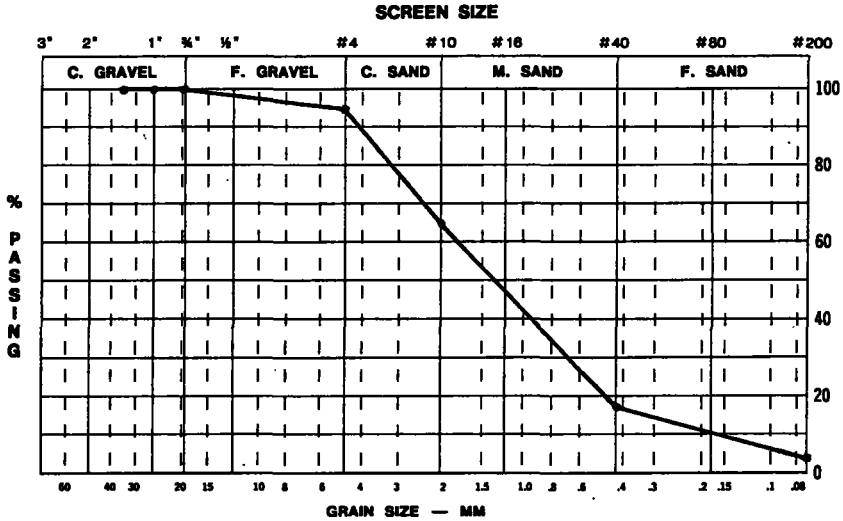
TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

SIEVE ANALYSIS

DRY WT.:	100.2g
WET WT.:	104.8g
% H_2O:	4.6%
WT. OF SAMPLE:	375.5g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	20.6g	100.0
-#4	115.7g	94.5
-#10	174.6g	63.7
-#40	50.4g	17.2
-#200	14.2g	3.8

GRAIN SIZE CURVE



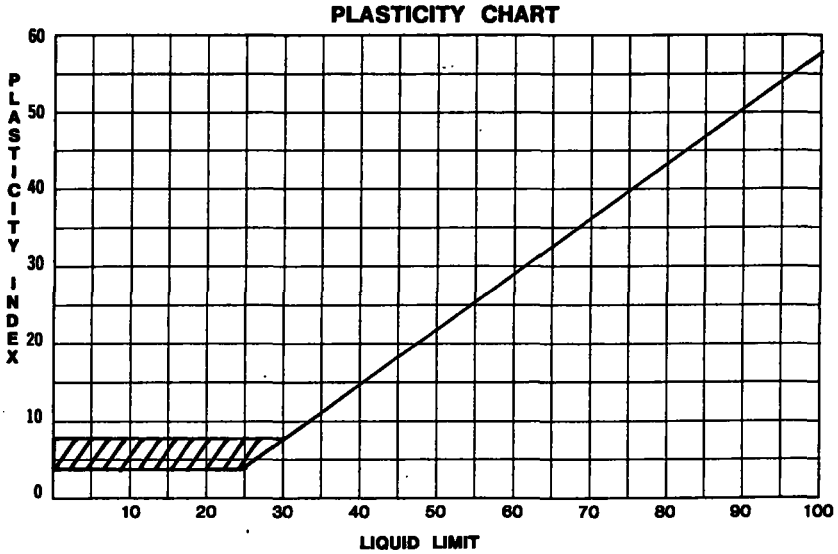
LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

SAMPLE DESCRIPTION

CLASS. SW Dark Olive Brown, Dry, Silightly Silty, Gravelly Fine To Coarse Sand.

PLASTICITY CHART



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 8-26-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Nugent's Vicinity bridge replacement SR No. 542 Sub-Section

Station & Offset 419+75 20FT LT Hole # TH-6-92

F-0170 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-1	D-1	3.0' to 4.5'			LK F-0169-4
-2	D-2	8.0' to 9.5'			LK F-0169-5
-3	D-3	13.0' to 14.5'			LK F-0169-5
-4	D-4	18.0' to 19.5'			LK F-0169-5
-5	D-5	23.0' to 24.5'			LK F-0179-6
-6	D-6	28.0' to 29.5'			LK F-0179-6
-7	D-7	33.0' to 34.5'			LK F-0179-6 INCR GRAVEL
-8	D-8	38.0' to 39.5'			LK F-0179-6 DECR SILT
-9	D-9	43.0' to 44.5'			LK F-0179-6 NO SILT

1 copy with samples
1 copy to addressee

TO LAB SEP 01 '92

Yours very truly,

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 9-1-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Nugents Vicinity bridge replacement SR No. 542 Sub-Section

Station & Offset 431+25 5FT RT Hole # TH-7-92

F-0179 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-1	D-1	3.0' to 4.5'			LK F-0179-2
-2	D-2	8.0' to 9.5'	MC= 45.3%	ML	PI
-3	D-3	13.0' to 14.5'			LK F-0179-6 NO SILT INCR GRAVEL
-4	D-4	18.0' to 19.5'			LK F-0179-6 INCR GRAVEL
-5	D-5	23.0' to 24.5'			LK F-0179-6 INCR GRAVEL
-6	D-6	28.0' to 29.5	MC= 9.8%	GW-GM	
-7	D-7	33.0' to 34.5'			LK F-0179-6 DCS SILT
-8	D-8	38.0' To 39.5'	MC= 9.7%	CL	PI
-9	D-9	43.0' to 44.5'			LK F-0179-6

1 copy with samples
1 copy to addressee

Yours very truly,
ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0179-2
HOLE NO.:	TH-7-92
DATE:	2-17-92
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	63.1g
WET WT.:	91.7g
% H_2O:	45.3%
WT. OF SAMPLE:	289.4g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	∅	100.0
-#4	0.2g	100.0
-#10	0.2g	99.9
-#40	48.5g	99.9
-#200	240.5g	83.1

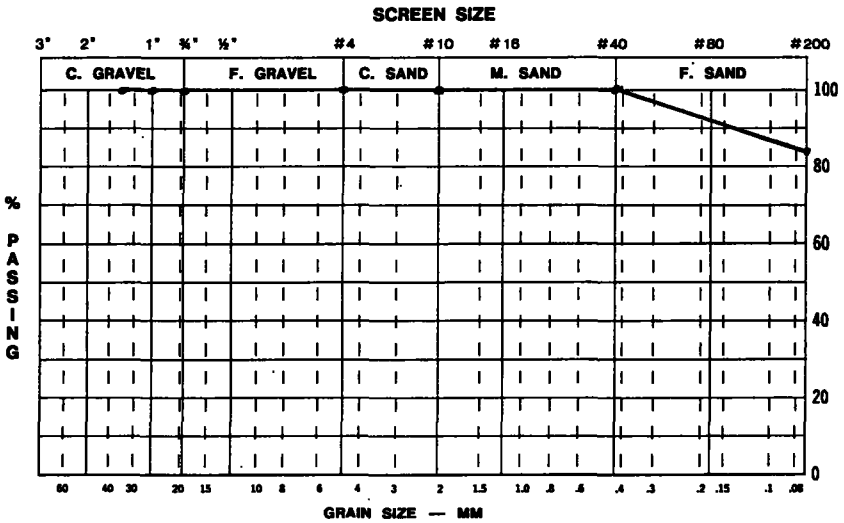
SAMPLE DESCRIPTION

CLASS. ML Dark Gray, Wet, Fine Sandy Silt.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL		✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

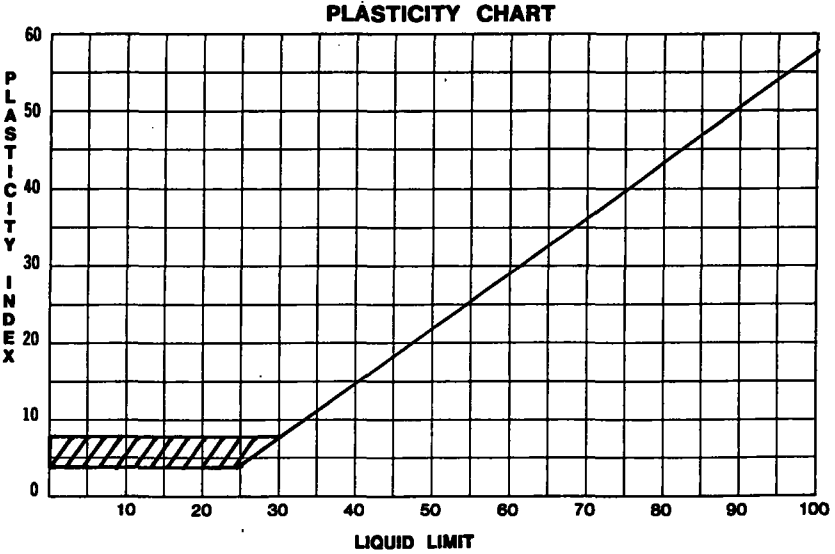
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.	Non-Plastic				
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0179-6
HOLE NO.:	TH-7-92
DATE:	1-29-93
LAB. TECH.:	LHB

SOIL FIELD IDENTIFICATION

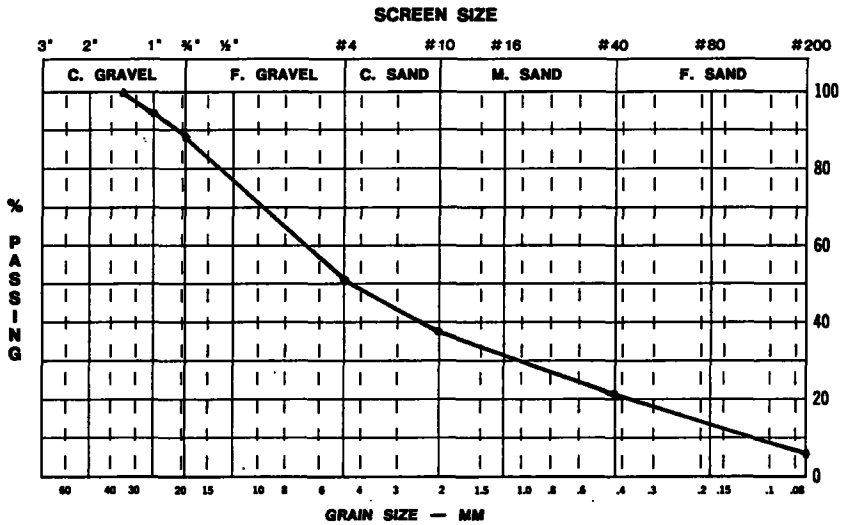
TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

SIEVE ANALYSIS

DRY WT.:	84.9g
WET WT.:	93.2g
% H_2O:	9.8%
WT. OF SAMPLE:	558.1g

	WT.	% PASS
-1½"	32.3g	100.0
-1"	32.0g	94.2
-¾"	212.1g	88.5
-#4	75.2g	50.5
-#10	91.2g	37.0
-#40	85.8g	20.7
-#200	29.5g	5.3

GRAIN SIZE CURVE



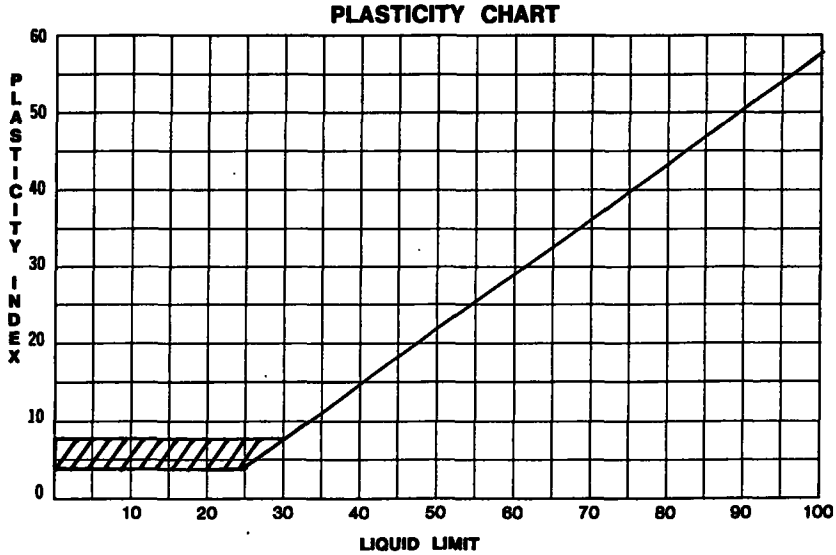
LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

SAMPLE DESCRIPTION

CLASS. GW-GM Dark Yellowish Brown, Dry, Slightly Silty, Fine To Coarse Sandy Gravel.

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0179-8
HOLE NO.:	TH-7-92
DATE:	2-17-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	80.5g
WET WT.:	88.3g
% H_2O:	9.7%
WT. OF SAMPLE:	412.0g

	WT.	% PASS
-1½"	Ø	100.0
-1"	56.0g	100.0
-¾"	41.4g	86.4
-#4	9.7g	76.4
-#10	6.9g	74.0
-#40	35.2g	72.3
-#200	262.8g	63.8

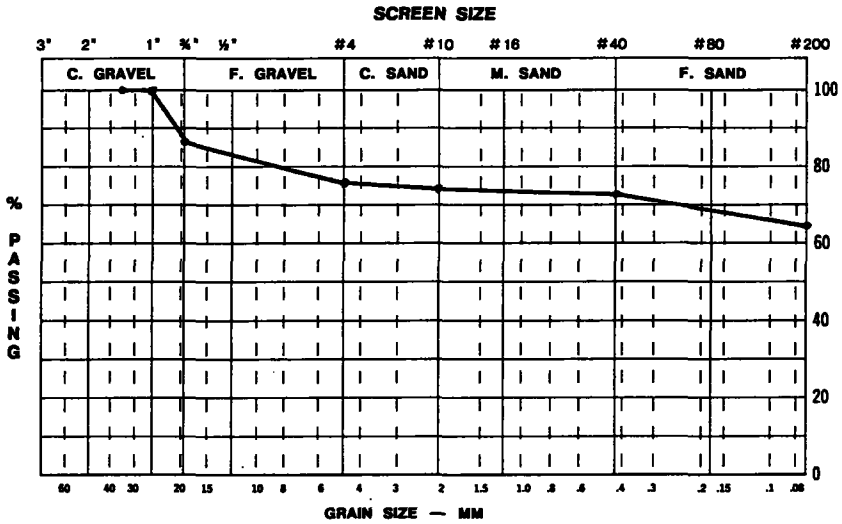
SAMPLE DESCRIPTION

CLASS. CL Dark Olive Brown, Dry, Fine To Coarse Sandy, Gravelly Clay.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL	✓	✓		✓
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

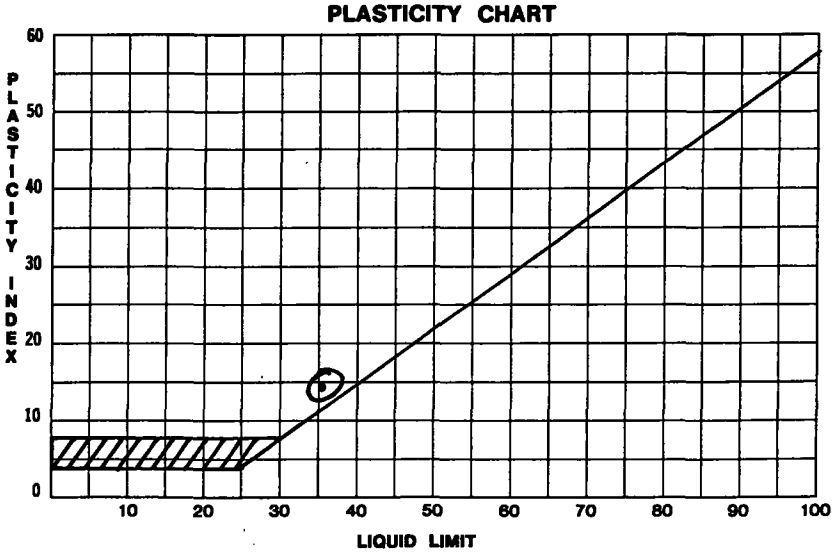
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	21				18
Wet Wt.	16.7g				7.6g
Dry Wt.	12.3g				6.3g
% H_2O	35.2				PL= 20.6
Blows	22				PI= 14.6

PLASTICITY CHART



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Sea Hle
Date 9-1-92

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Nugent's Vicenity bridge replacement SR No. 542 Sub-Section

Station & Offset 433+00 Hole # 5FT. LT. TH-8-92

F-0180 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-1	D-1	0.0' to 1.5'			LK F-0180-3 w/ root hairs
-2	D-2	3.0' to 4.5'			LK-F-0180-3
-3	D-3	8.0' to 9.5'	MC= 11.2%	SM	
-4	D-4	15.0' to 16.5'	MC= 42.2%	ML	PI Non Plastic
-5	D-5	18.0' to 19.5'			LK F-0169-4 with coarse SAND w/ some gravel
-6	D-6	23.0' to 24.5'			LK F-0169-4 with increased gravel
-7	D-7	28.0' to 29.5'			LK F-0179-6
-8	D-8	33.0' to 34.5'			LK F-0179-6 DECR FINE MATERIAL
-9	D-9	38.0' to 39.5'			Poor Sample sandy GRAVEL

I copy with samples
I copy to addressee

Yours very truly,

ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Seattle
Date 5-1-92

Page 2 of 2

Dear Sir:

I have forwarded by today's Delivery the following Foundation Samples.

Contract or Job No. OL-1071 Section Nugent's Vicinity Bridge replacement SR No. 542 Sub-Section

Station & Offset 433+00 5 FT. LT. Hole # TH-8-92

F-0180 Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
-10	D-10	43.0' to 44.5'			LK F-0179-6
-11	D-11	48.0' to 49.5'			LK F-0179-6
-12	S-1	13.0' to 15.0'	M.C.= 43.1%	ML	

copy with samples
copy to addressee

Yours very truly,
ALLEN E. STILES, P.E.
MATERIALS LABORATORY
450 SOUTH SPOKANE STREET
SEATTLE, WA 98134
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0180-3
HOLE NO.:	TH-8-92
DATE:	1-29-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	41.1g
WET WT.:	45.7g
% H_2O:	11.2%
WT. OF SAMPLE:	455.3g

	WT.	% PASS
-1½"	Ø	100.0
-1"	Ø	100.0
-¾"	0.7g	100.0
-#4	7.0g	99.8
-#10	157.2g	98.3
-#40	204.4g	63.8
-#200	86.0g	18.9

SAMPLE DESCRIPTION

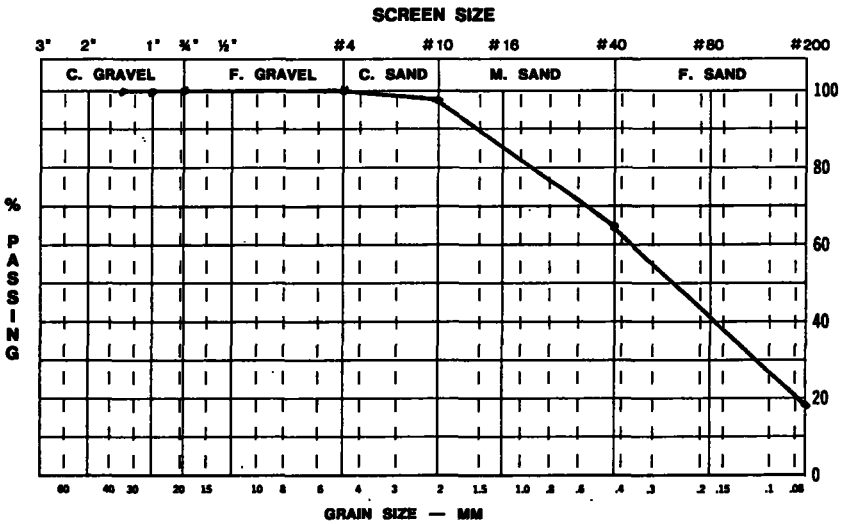
CLASS. SM

Dark Yellowish Brown, Moist, Silty Fine To Medium Sand.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL		✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

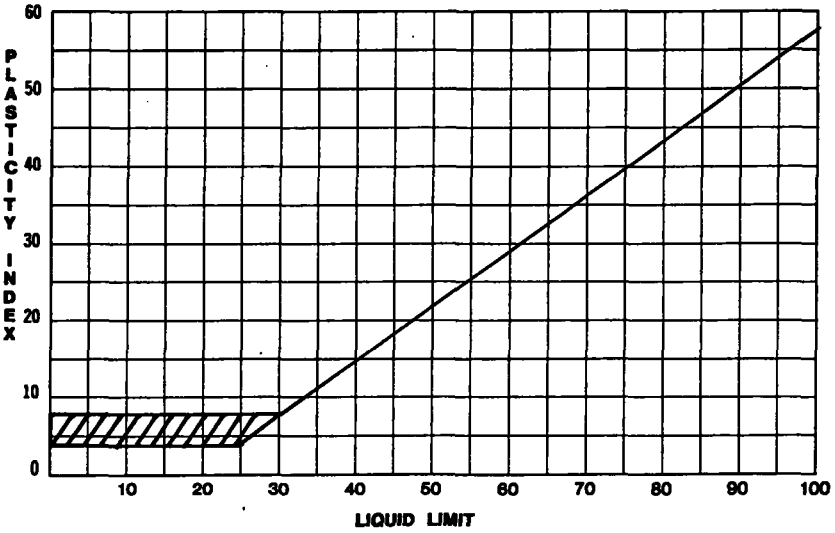
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0180-4
HOLE NO.:	TH-8-92
DATE:	2-17-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	50.9g
WET WT.:	72.4g
% H_2O:	42.2%
WT. OF SAMPLE:	284.3g

	WT.	% PASS
-1½"	ϕ	100.0
-1"	ϕ	100.0
-¾"	ϕ	100.0
-#4	ϕ	100.0
-#10	0.1g	100.0
-#40	85.2g	100.0
-#200	199.0g	70.0

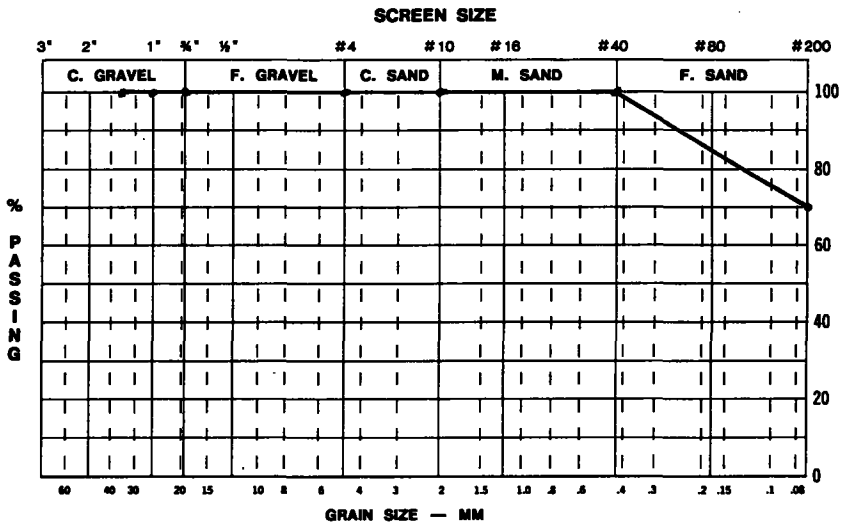
SAMPLE DESCRIPTION

CLASS. ML Dark Gray, Wet, Fine Sandy Silt.

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL		✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

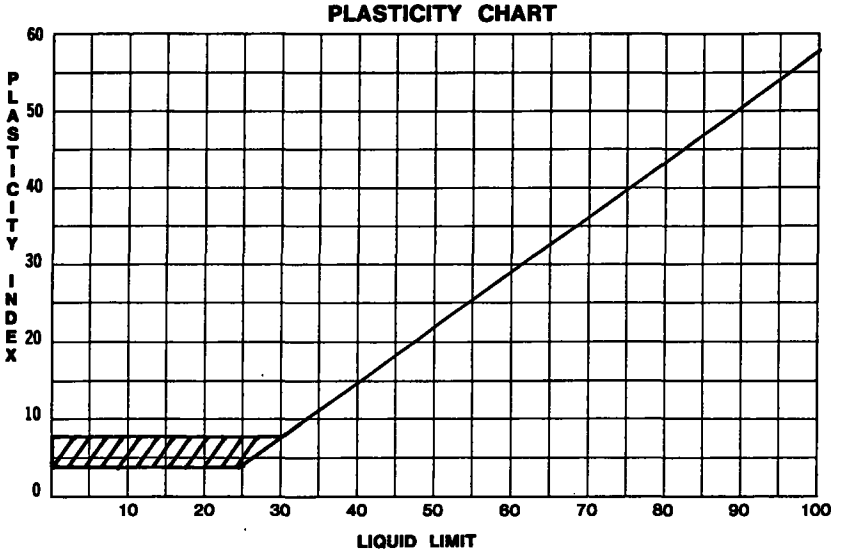
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.	Non-Plastic				
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

JOB NO.:	OL-1071
SAMPLE NO.:	F-0180-12
HOLE NO.:	TH-8-92
DATE:	2-25-93
LAB. TECH.:	LHB

SIEVE ANALYSIS

DRY WT.:	491.8g
WET WT.:	703.7g
% H_2O:	43.1%
WT. OF SAMPLE:	281.4g

	WT.	% PASS
-1½"	∅	100.0
-1"	∅	100.0
-¾"	∅	100.0
-#4	∅	100.0
-#10	0.2g	100.0
-#40	18.5g	99.9
-#200	262.7g	93.4

SAMPLE DESCRIPTION

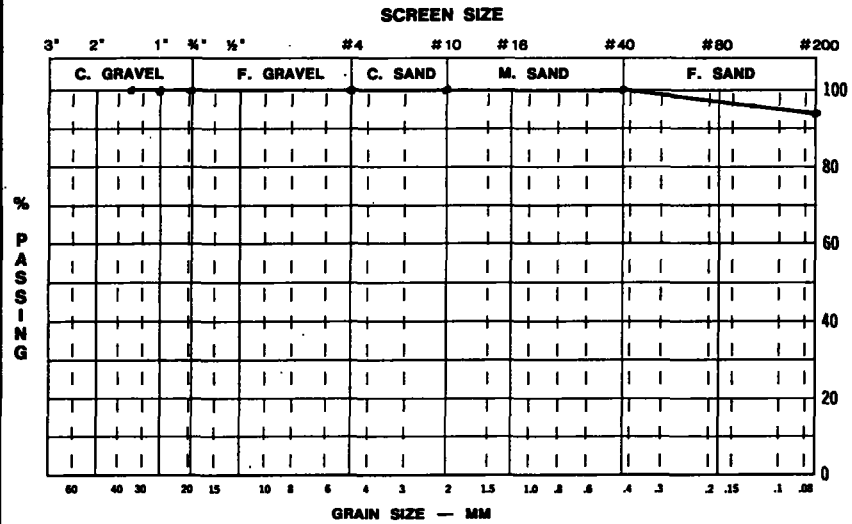
CLASS. ML Gray, Wet, Fine Sandy Silt.

Consol Test # 1071-1
Drive # S-1, Depth: 13.5'
Wt. of Wet Soil & Tube: 1,611.3g
Wt. of Tube: 450.6g
Wt. of Wet Soil: 1,160.7g
Wt. of Dry Soil: 811.1g
γ Wet = 111.3 pcf
γ Dry = 77.8 pcf

SOIL FIELD IDENTIFICATION

TEST	GRAVEL	SAND	SILT	CLAY
VISUAL		✓	✓	
DRIED CAST				
DILITANCY				
BITE				
TOUGHNESS				

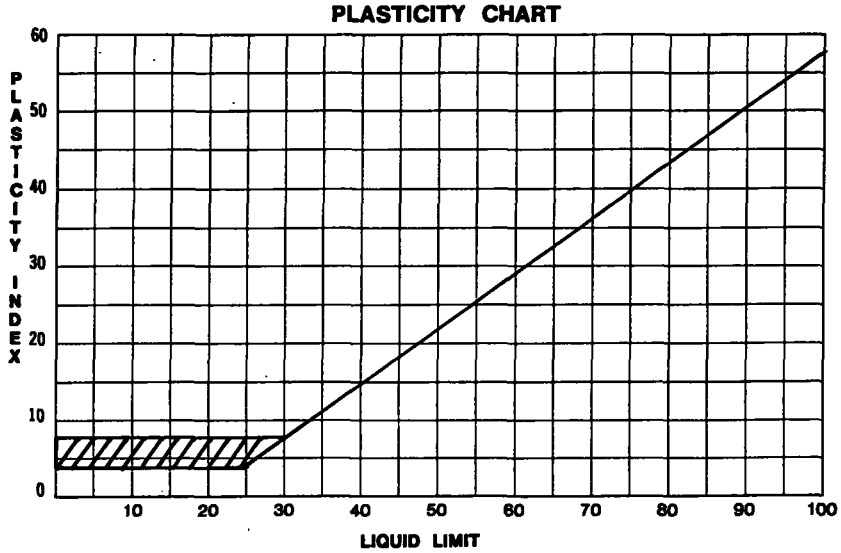
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.	Non-Plastic				
% H_2O					PL=
Blows					PI=

PLASTICITY CHART



CONSOLIDATION TEST DATA

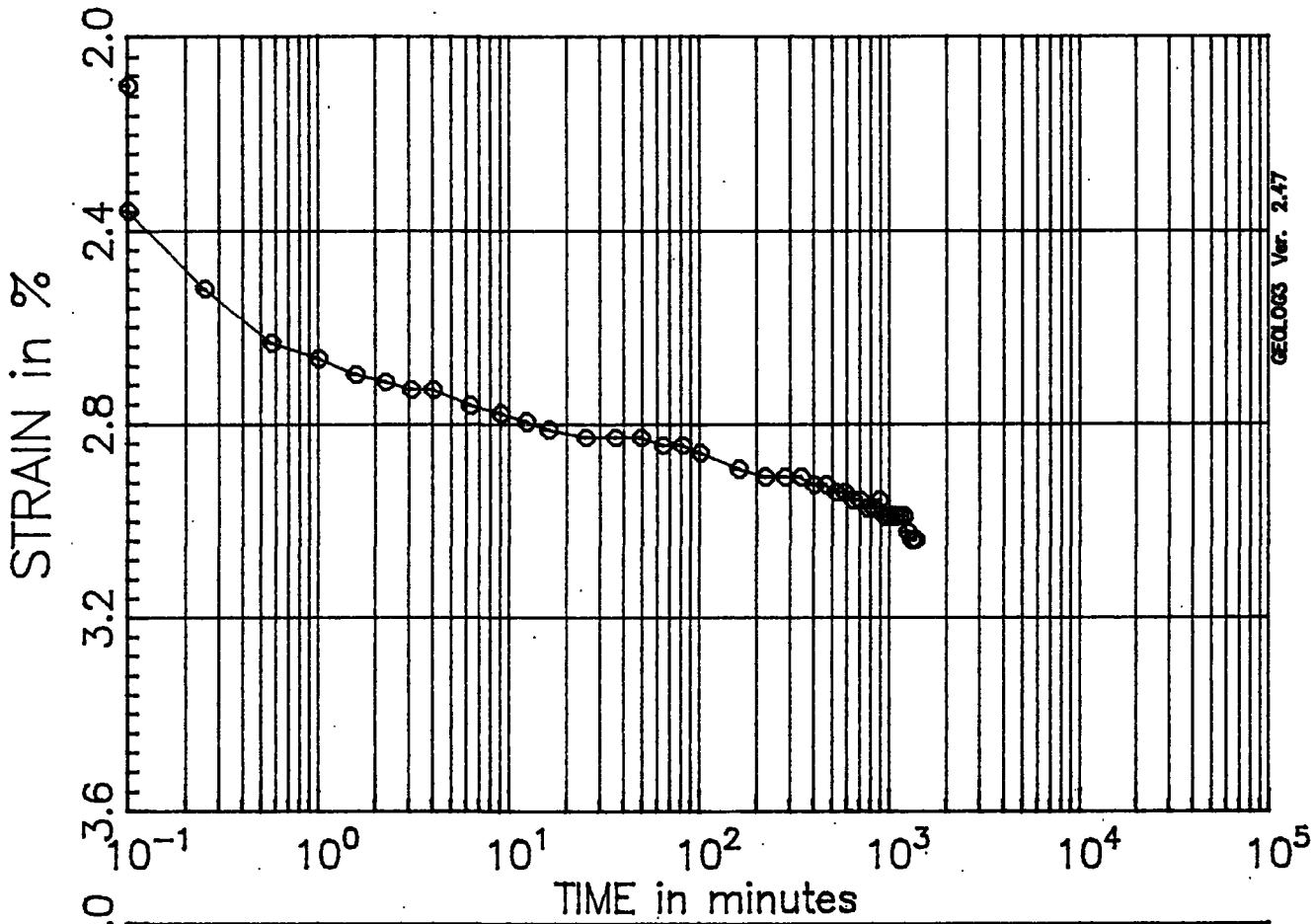
SOIL SAMPLE: GRAY WET FINE SANDY SILT
LOCATION: 433+00
BORING NO: H-S-92
SAMPLE NO: S-1 DEPTH: 13.5'

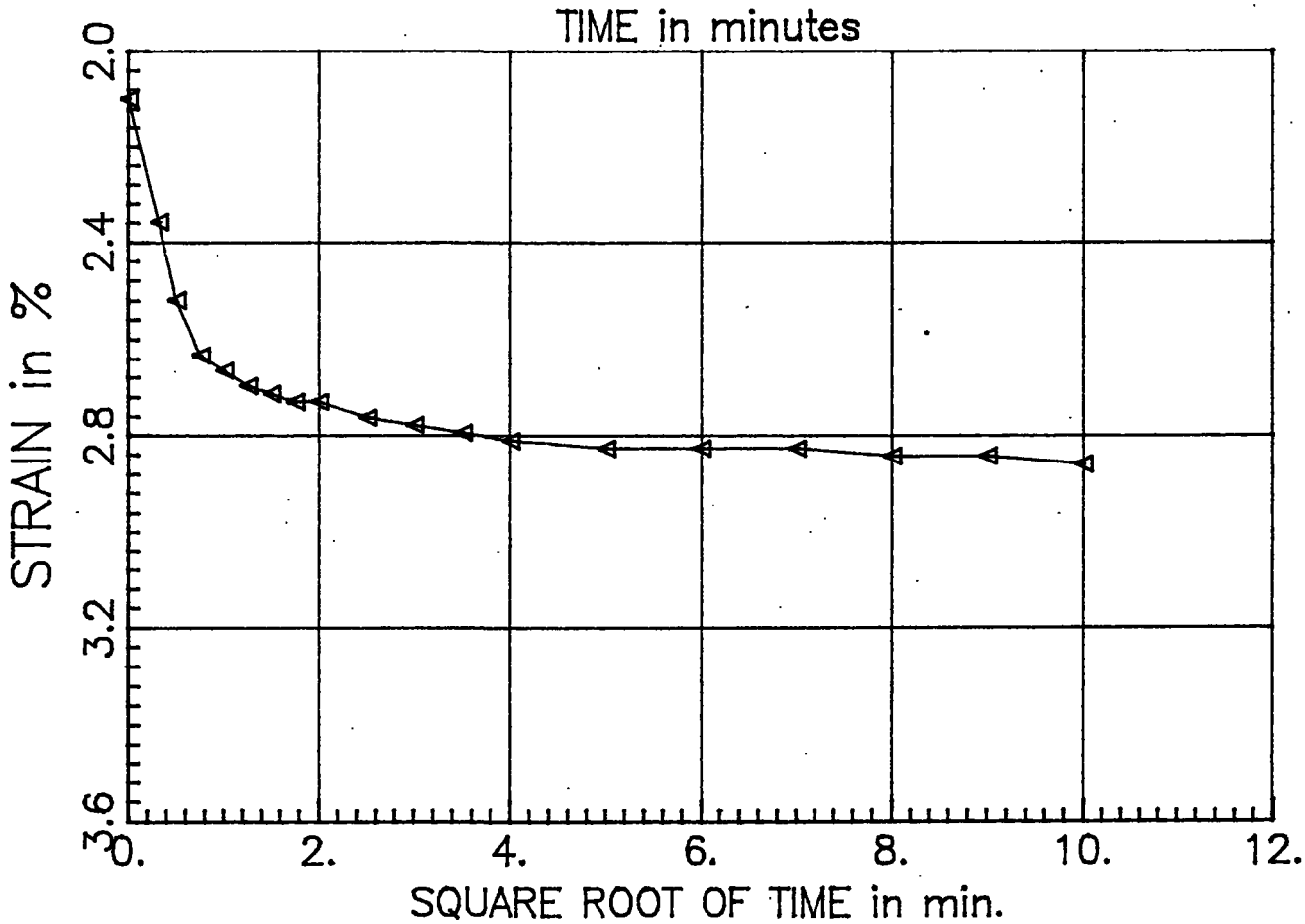
SPECIFIC GRAVITY OF SOLIDS: 2.65
HEIGHT OF SOLIDS: 0.2951 in.
SAMPLE DIAMETER: 1.91 in.
CALIBRATION FACTOR: .10362
INITIAL DISP. READING: -.631

	TRIMMINGS	SPECIMEN + RING BEFORE	SPECIMEN + RING AFTER	AFTER
CONTAINER NO		RING	RING	
WT CONTAINER + WET SOIL gm	789.200	470.600	488.400	86.900
WT CONTAINER + DRY SOIL gm	577.300	455.400	455.400	73.900
WT CONTAINER gm	85.500	418.700	418.700	37.200
WT DRY SOIL gm	491.800	36.700	36.700	36.700
WATER CONTENT %	43.087	41.417	35.422	35.422
VOID RATIO	----------	1.118	0.940	----------
DEGREE OF SATURATION %	----------	98.173	111.766	----------

PROJECT: NUGENT VICINTY BRIDGES .
FILE NO.: OL-1071 TEST NO.: F-0180-12
DATE: 2-19-93
TESTED BY: LHB
CHECKED BY: DC

WASHINGTON STATE DOT





PRESSURE INCREMENT
FROM 0.00 TSF TO 0.25 TSF

Test No: F-0180-12
Testname: 1071-1

LOAD INCREMENT DATA

TEST NAME 1071-1 PAGE NO: 31
TEST NO: F-0180-12 TESTED BY: LHB

PRESSURE INCREMENT FROM 0 TSF TO .25 TSF

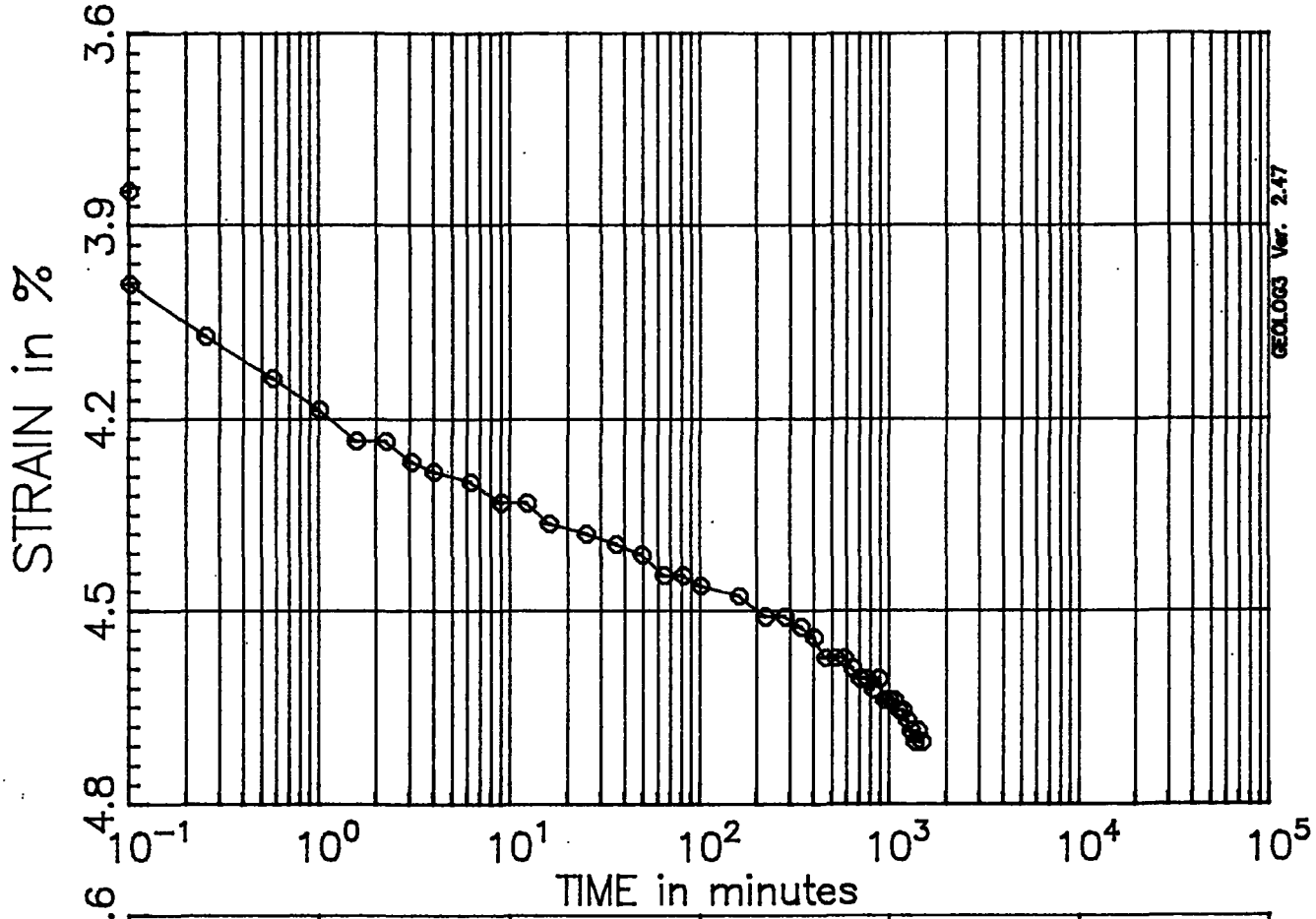
DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0131	1.074	2.10
		0.10	0.32	0.0147	1.068	2.36
		0.25	0.50	0.0157	1.065	2.52
		0.57	0.75	0.0165	1.062	2.63
		1.00	1.00	0.0167	1.062	2.67
		1.57	1.25	0.0169	1.061	2.70
		2.25	1.50	0.0170	1.060	2.71
		3.07	1.75	0.0171	1.060	2.73
		4.00	2.00	0.0171	1.060	2.73
		6.25	2.50	0.0173	1.059	2.76
		9.00	3.00	0.0174	1.059	2.78
		12.25	3.50	0.0175	1.059	2.79
		16.00	4.00	0.0176	1.058	2.81
		25.00	5.00	0.0177	1.058	2.83
		36.00	6.00	0.0177	1.058	2.83
		49.00	7.00	0.0177	1.058	2.83
		64.00	8.00	0.0178	1.058	2.84
		81.00	9.00	0.0178	1.058	2.84
		100.00	10.00	0.0179	1.057	2.86
		160.00	12.65	0.0181	1.057	2.89
		220.00	14.83	0.0182	1.056	2.91
		280.00	16.73	0.0182	1.056	2.91
		340.00	18.44	0.0182	1.056	2.91
		400.00	20.00	0.0183	1.056	2.92
		460.00	21.45	0.0183	1.056	2.92
		520.00	22.80	0.0184	1.056	2.94
		580.00	24.08	0.0184	1.056	2.94
		640.00	25.30	0.0185	1.055	2.96
		700.00	26.46	0.0185	1.055	2.96
		760.00	27.57	0.0186	1.055	2.97
		820.00	28.64	0.0186	1.055	2.97
		880.00	29.66	0.0185	1.055	2.96
		940.00	30.66	0.0187	1.055	2.99
		1000.00	31.62	0.0187	1.055	2.99
		1060.00	32.56	0.0187	1.055	2.99
		1120.00	33.47	0.0187	1.055	2.99

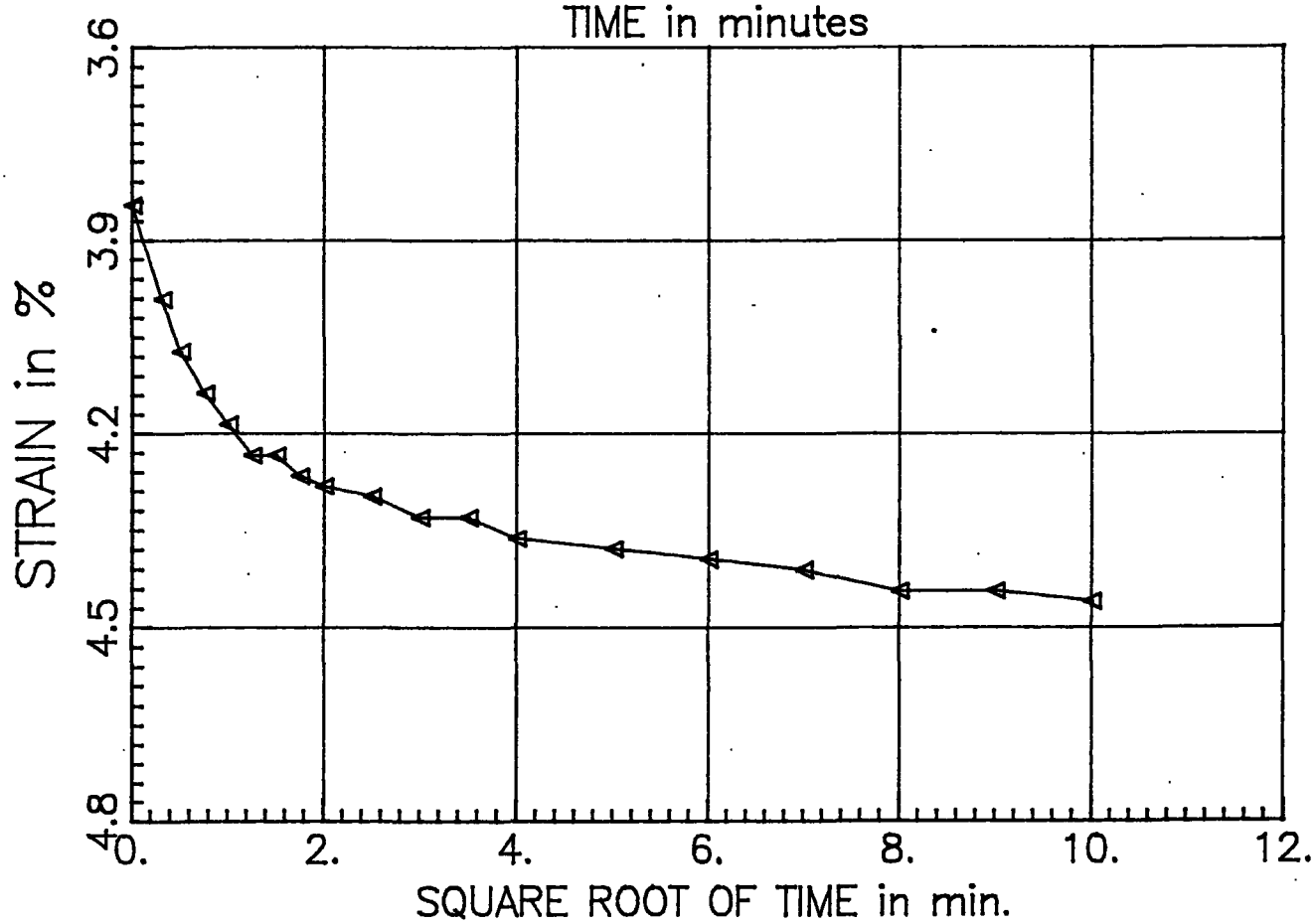
LOAD INCREMENT DATA

TEST NAME 1071-1 PAGE NO: 32
TEST NO: F-0180-12 TESTED BY: LHB

PRESSURE INCREMENT FROM 0 TSF TO .25 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1180.00	34.35	0.0187	1.055	2.99
		1240.00	35.21	0.0189	1.054	3.02
		1300.00	36.06	0.0190	1.054	3.04
		1360.00	36.88	0.0190	1.054	3.04





PRESSURE INCREMENT
FROM 0.25 TSF TO 0.50 TSF

Test No: F-0180-12
Testname: 1071-1

LOAD INCREMENT DATA

TEST NAME 1071-1 PAGE NO: 33
TEST NO: F-0180-12 TESTED BY: LHB

PRESSURE INCREMENT FROM .25 TSF TO .5 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0240	1.037	3.85
		0.10	0.32	0.0249	1.033	3.99
		0.25	0.50	0.0255	1.032	4.07
		0.57	0.75	0.0259	1.030	4.14
		1.00	1.00	0.0262	1.029	4.19
		1.57	1.25	0.0265	1.028	4.23
		2.25	1.50	0.0265	1.028	4.23
		3.07	1.75	0.0267	1.028	4.27
		4.00	2.00	0.0268	1.027	4.28
		6.25	2.50	0.0269	1.027	4.30
		9.00	3.00	0.0271	1.026	4.33
		12.25	3.50	0.0271	1.026	4.33
		16.00	4.00	0.0273	1.026	4.36
		25.00	5.00	0.0274	1.025	4.38
		36.00	6.00	0.0275	1.025	4.40
		49.00	7.00	0.0276	1.025	4.41
		64.00	8.00	0.0278	1.024	4.44
		81.00	9.00	0.0278	1.024	4.44
		100.00	10.00	0.0279	1.023	4.46
		160.00	12.65	0.0280	1.023	4.48
		220.00	14.83	0.0282	1.022	4.51
		280.00	16.73	0.0282	1.022	4.51
		340.00	18.44	0.0283	1.022	4.53
		400.00	20.00	0.0284	1.022	4.54
		460.00	21.45	0.0286	1.021	4.57
		520.00	22.80	0.0286	1.021	4.57
		580.00	24.08	0.0286	1.021	4.57
		640.00	25.30	0.0287	1.021	4.59
		700.00	26.46	0.0288	1.020	4.61
		760.00	27.57	0.0288	1.020	4.61
		820.00	28.64	0.0289	1.020	4.62
		880.00	29.66	0.0288	1.020	4.61
		940.00	30.66	0.0290	1.020	4.64
		1000.00	31.62	0.0290	1.020	4.64
		1060.00	32.56	0.0290	1.020	4.64
		1120.00	33.47	0.0291	1.019	4.65

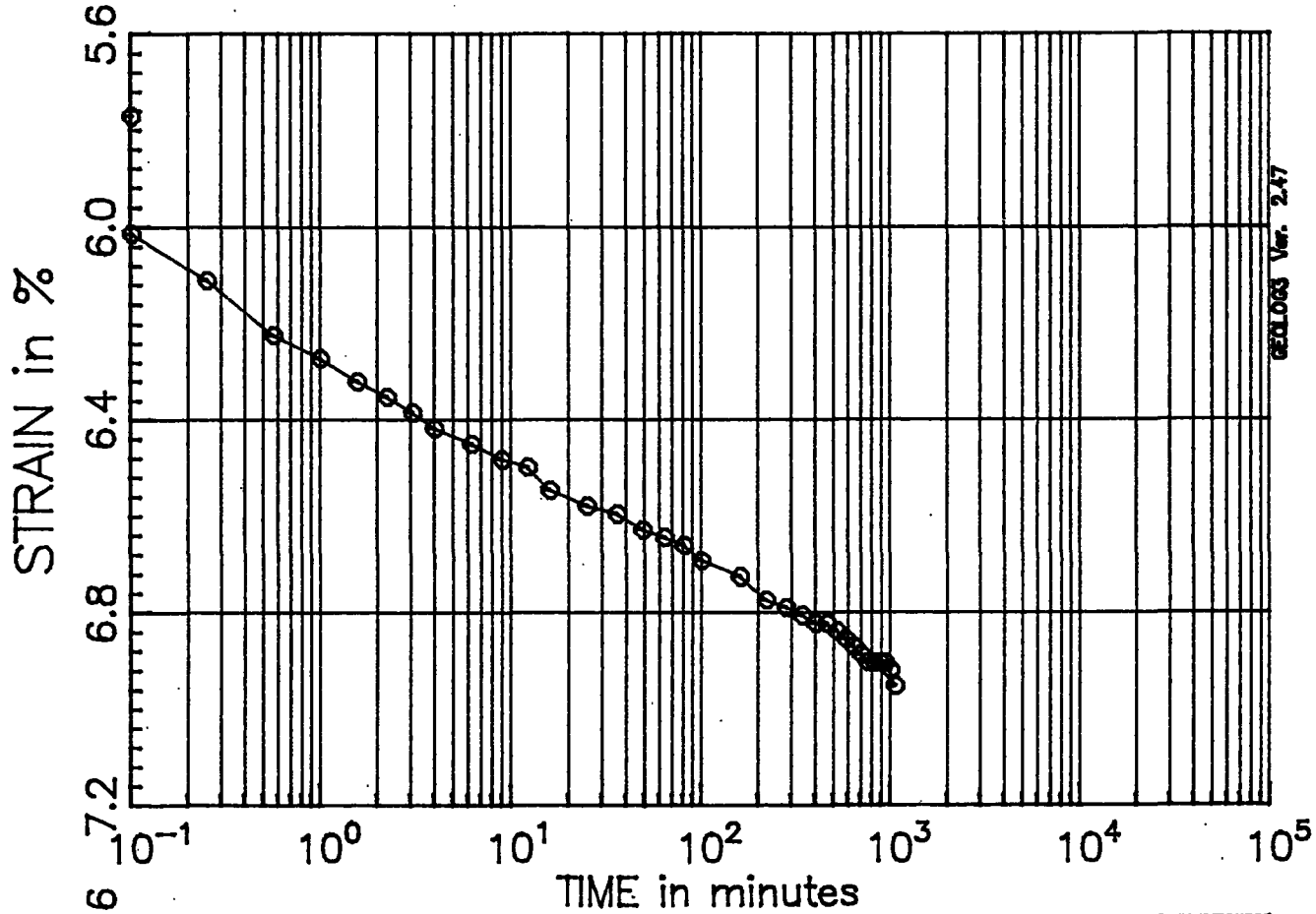
LOAD INCREMENT DATA

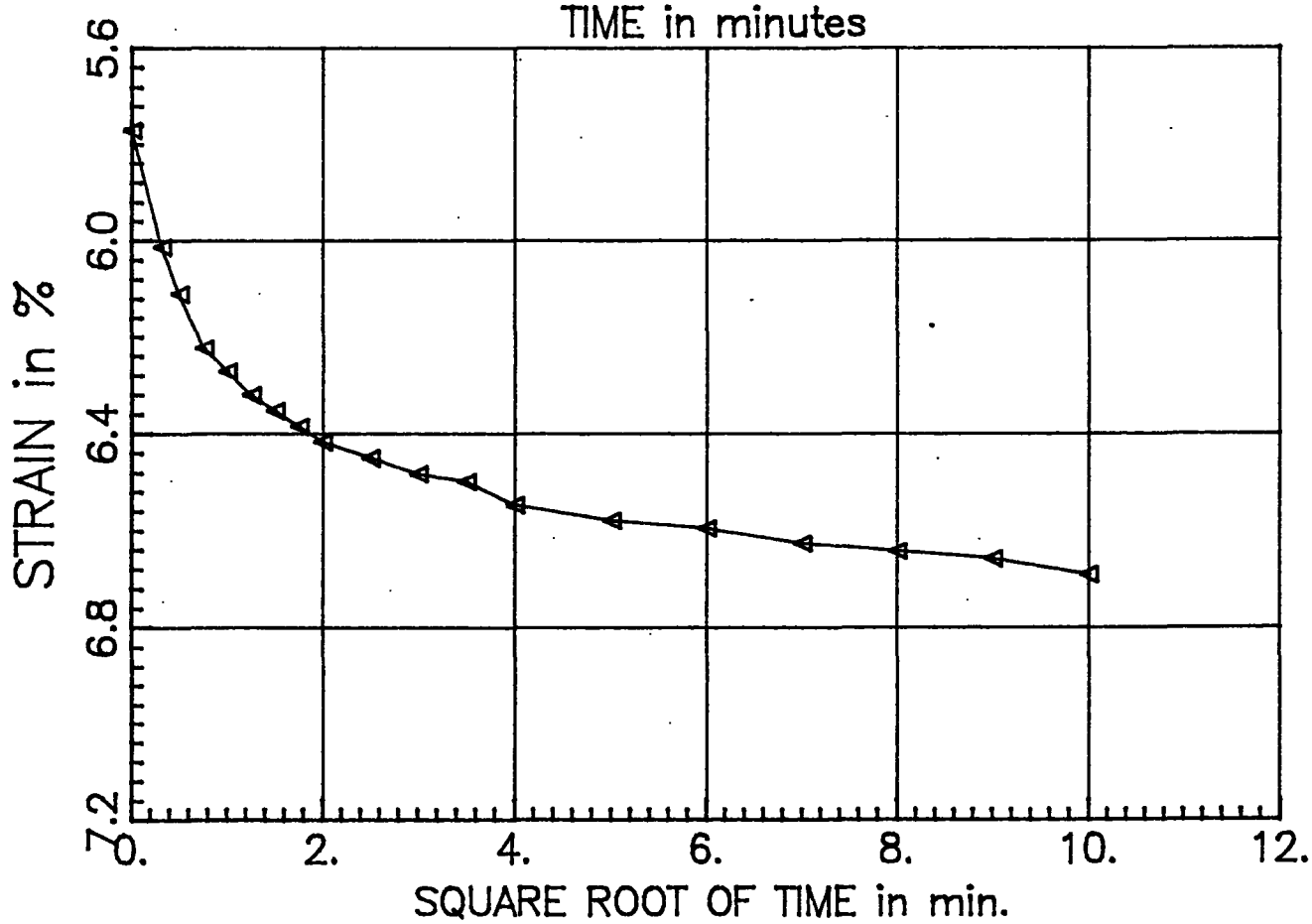
TEST NAME 1071-1 PAGE NO: 34

TEST NO: F-0180-12 TESTED BY: LHB

PRESSURE INCREMENT FROM .25 TSF TO .5 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1180.00	34.35	0.0291	1.019	4.65
		1240.00	35.21	0.0292	1.019	4.67
		1300.00	36.06	0.0293	1.019	4.69
		1360.00	36.88	0.0294	1.018	4.70
		1420.00	37.68	0.0293	1.019	4.69
		1480.00	38.47	0.0294	1.018	4.70





PRESSURE INCREMENT
FROM 0.50 TSF TO 1.00 TSF

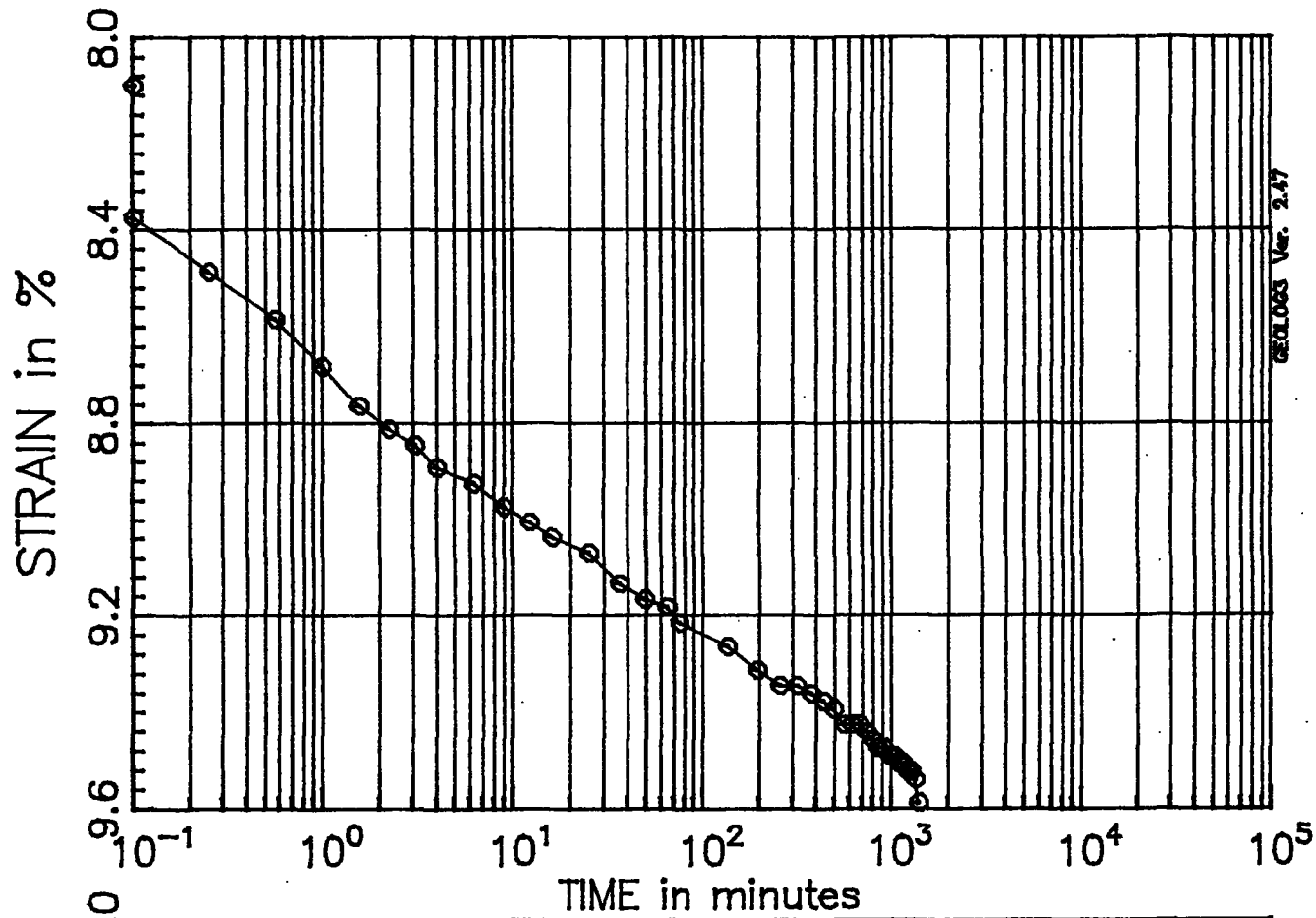
Test No: F-0180-12
Testname: 1071-1

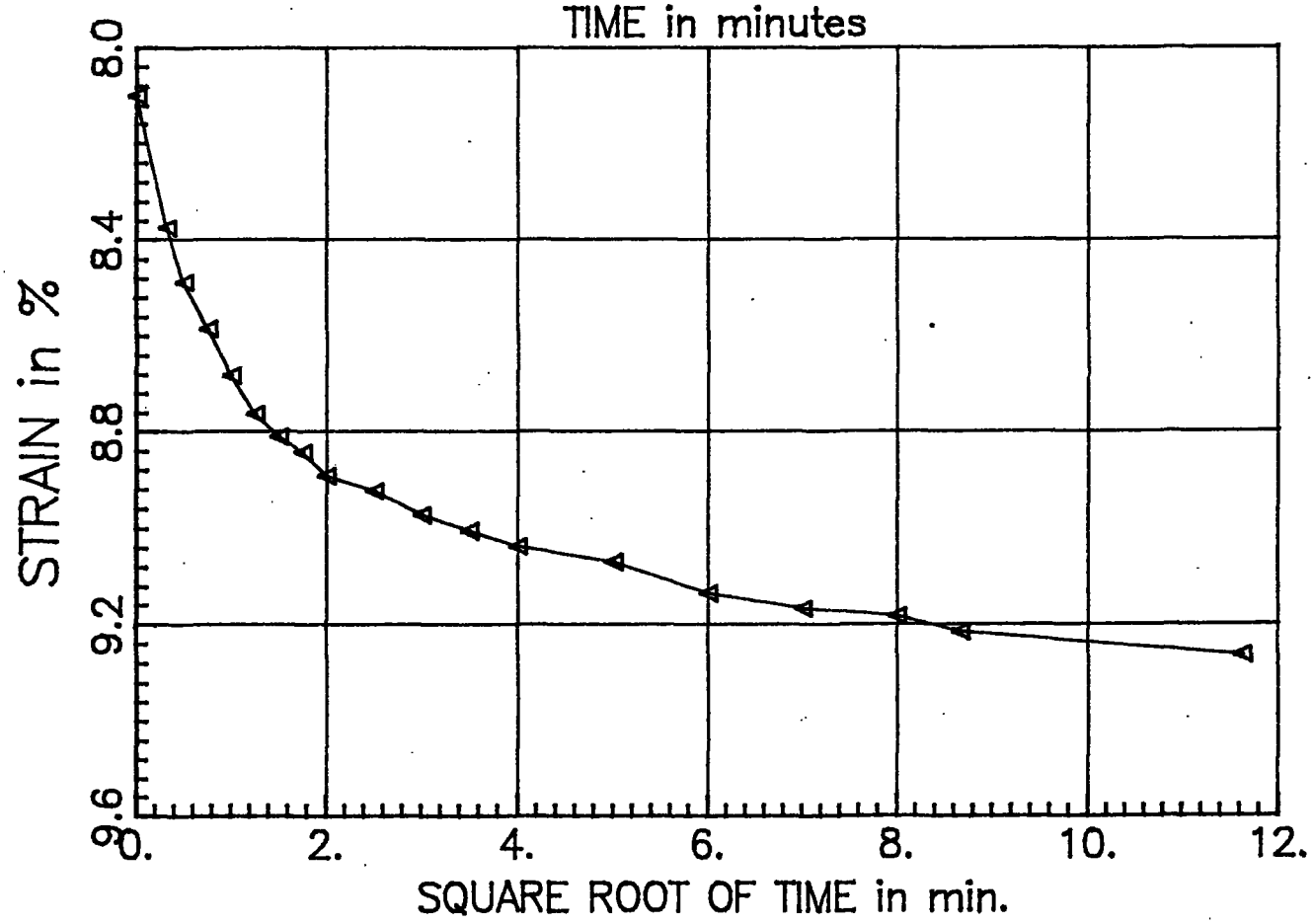
LOAD INCREMENT DATA

TEST NAME 1071-1 PAGE NO: 35
TEST NO: F-0180-12 TESTED BY: LHB

PRESSURE INCREMENT FROM .5 TSF TO 1 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0361	0.996	5.77
		0.10	0.32	0.0376	0.991	6.01
		0.25	0.50	0.0382	0.989	6.11
		0.57	0.75	0.0389	0.986	6.22
		1.00	1.00	0.0392	0.985	6.27
		1.57	1.25	0.0395	0.984	6.32
		2.25	1.50	0.0397	0.983	6.35
		3.07	1.75	0.0399	0.983	6.39
		4.00	2.00	0.0401	0.982	6.42
		6.25	2.50	0.0403	0.981	6.45
		9.00	3.00	0.0405	0.981	6.48
		12.25	3.50	0.0406	0.980	6.50
		16.00	4.00	0.0409	0.979	6.55
		25.00	5.00	0.0411	0.979	6.58
		36.00	6.00	0.0412	0.978	6.60
		49.00	7.00	0.0414	0.978	6.63
		64.00	8.00	0.0415	0.977	6.64
		81.00	9.00	0.0416	0.977	6.66
		100.00	10.00	0.0418	0.976	6.69
		160.00	12.65	0.0420	0.976	6.73
		220.00	14.83	0.0423	0.975	6.77
		280.00	16.73	0.0424	0.974	6.79
		340.00	18.44	0.0425	0.974	6.81
		400.00	20.00	0.0426	0.973	6.82
		460.00	21.45	0.0426	0.973	6.82
		520.00	22.80	0.0427	0.973	6.84
		580.00	24.08	0.0428	0.973	6.85
		640.00	25.30	0.0429	0.972	6.87
		700.00	26.46	0.0430	0.972	6.89
		760.00	27.57	0.0431	0.972	6.90
		820.00	28.64	0.0431	0.972	6.90
		880.00	29.66	0.0431	0.972	6.90
		940.00	30.66	0.0431	0.972	6.90
		1000.00	31.62	0.0432	0.971	6.92
		1060.00	32.56	0.0434	0.971	6.95





PRESSURE INCREMENT
FROM 1.00 TSF TO 2.00 TSF

Test No: F-0180-12
Testname: 1071-1

LOAD INCREMENT DATA

TEST NAME 1071-1 PAGE NO: 36
TEST NO: F-0180-12 TESTED BY: LHB

PRESSURE INCREMENT FROM 1 TSF TO 2 TSF

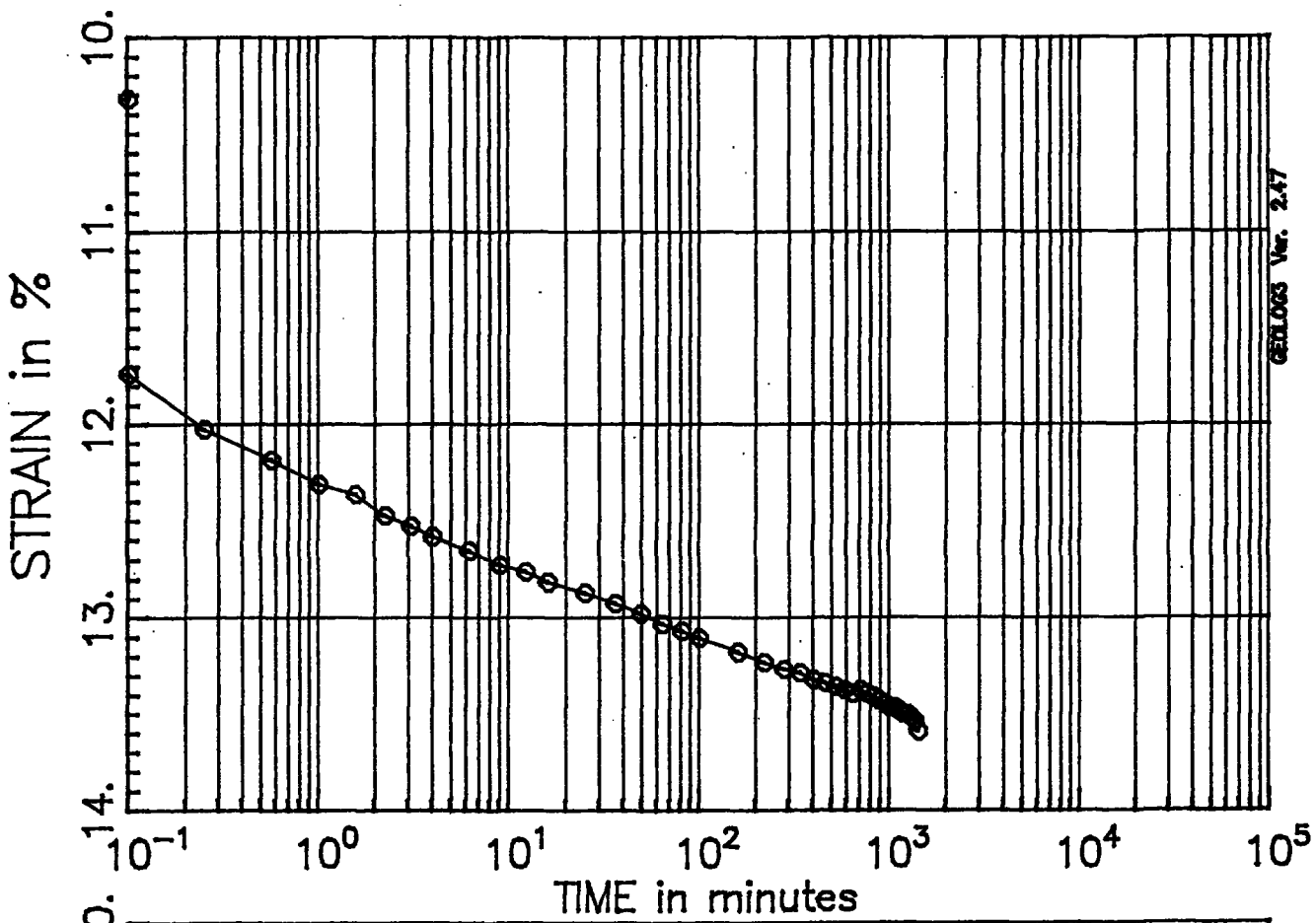
DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0506	0.946	8.10
		0.10	0.32	0.0523	0.941	8.37
		0.25	0.50	0.0531	0.938	8.49
		0.57	0.75	0.0537	0.936	8.59
		1.00	1.00	0.0543	0.934	8.68
		1.57	1.25	0.0548	0.932	8.76
		2.25	1.50	0.0551	0.931	8.81
		3.07	1.75	0.0553	0.931	8.84
		4.00	2.00	0.0556	0.930	8.89
		6.25	2.50	0.0558	0.929	8.92
		9.00	3.00	0.0561	0.928	8.97
		12.25	3.50	0.0563	0.927	9.01
		16.00	4.00	0.0565	0.927	9.04
		25.00	5.00	0.0567	0.926	9.07
		36.00	6.00	0.0571	0.924	9.14
		49.00	7.00	0.0573	0.924	9.17
		64.00	8.00	0.0574	0.923	9.18
		75.13	8.67	0.0576	0.923	9.22
		135.13	11.62	0.0579	0.922	9.26
		195.13	13.97	0.0582	0.921	9.31
		255.13	15.97	0.0584	0.920	9.35
		315.13	17.75	0.0584	0.920	9.35
		375.13	19.37	0.0585	0.920	9.36
		435.13	20.86	0.0586	0.919	9.38
		495.13	22.25	0.0587	0.919	9.39
		555.13	23.56	0.0589	0.918	9.43
		615.13	24.80	0.0589	0.918	9.43
		675.13	25.98	0.0589	0.918	9.43
		735.13	27.11	0.0590	0.918	9.44
		795.13	28.20	0.0591	0.918	9.46
		855.13	29.24	0.0592	0.917	9.47
		915.13	30.25	0.0592	0.917	9.47
		975.13	31.23	0.0593	0.917	9.49
		1035.13	32.17	0.0593	0.917	9.49
		1095.13	33.09	0.0594	0.917	9.51
		1155.13	33.99	0.0594	0.917	9.51

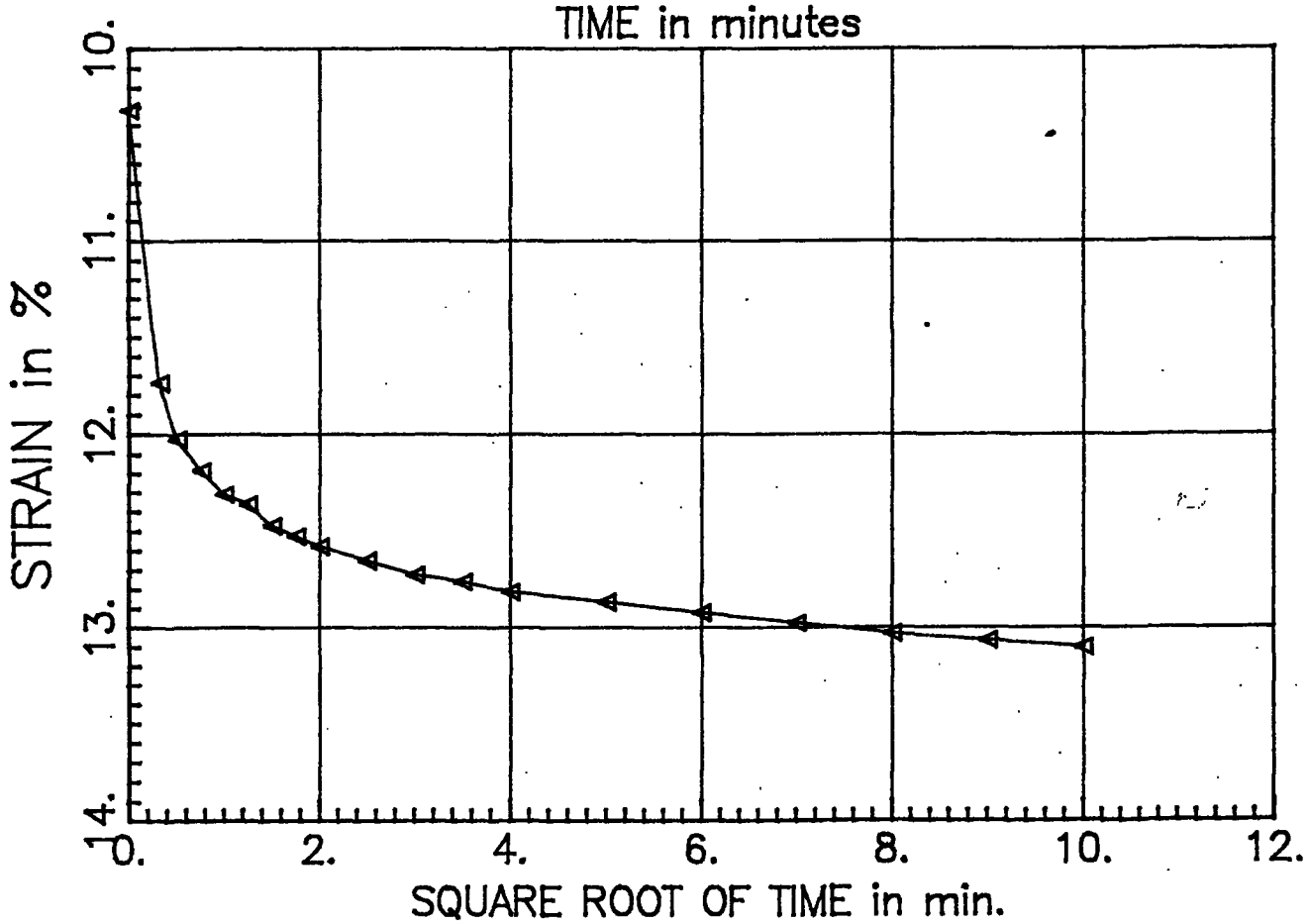
LOAD INCREMENT DATA

TEST NAME 1071-1 PAGE NO: 37
TEST NO: F-0180-12 TESTED BY: LHB

PRESSURE INCREMENT FROM 1 TSF TO 2 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1215.13	34.86	0.0595	0.916	9.52
		1275.13	35.71	0.0595	0.916	9.52
		1335.13	36.54	0.0596	0.916	9.54
		1395.13	37.35	0.0599	0.915	9.59





PRESSURE INCREMENT
FROM 2.00 TSF TO 4.00 TSF

Test No: F-0180-12
Testname: 1071-1

LOAD INCREMENT DATA

TEST NAME 1071-1 PAGE NO: 38
TEST NO: F-0180-12 TESTED BY: LHB

PRESSURE INCREMENT FROM 2 TSF TO 4 TSF

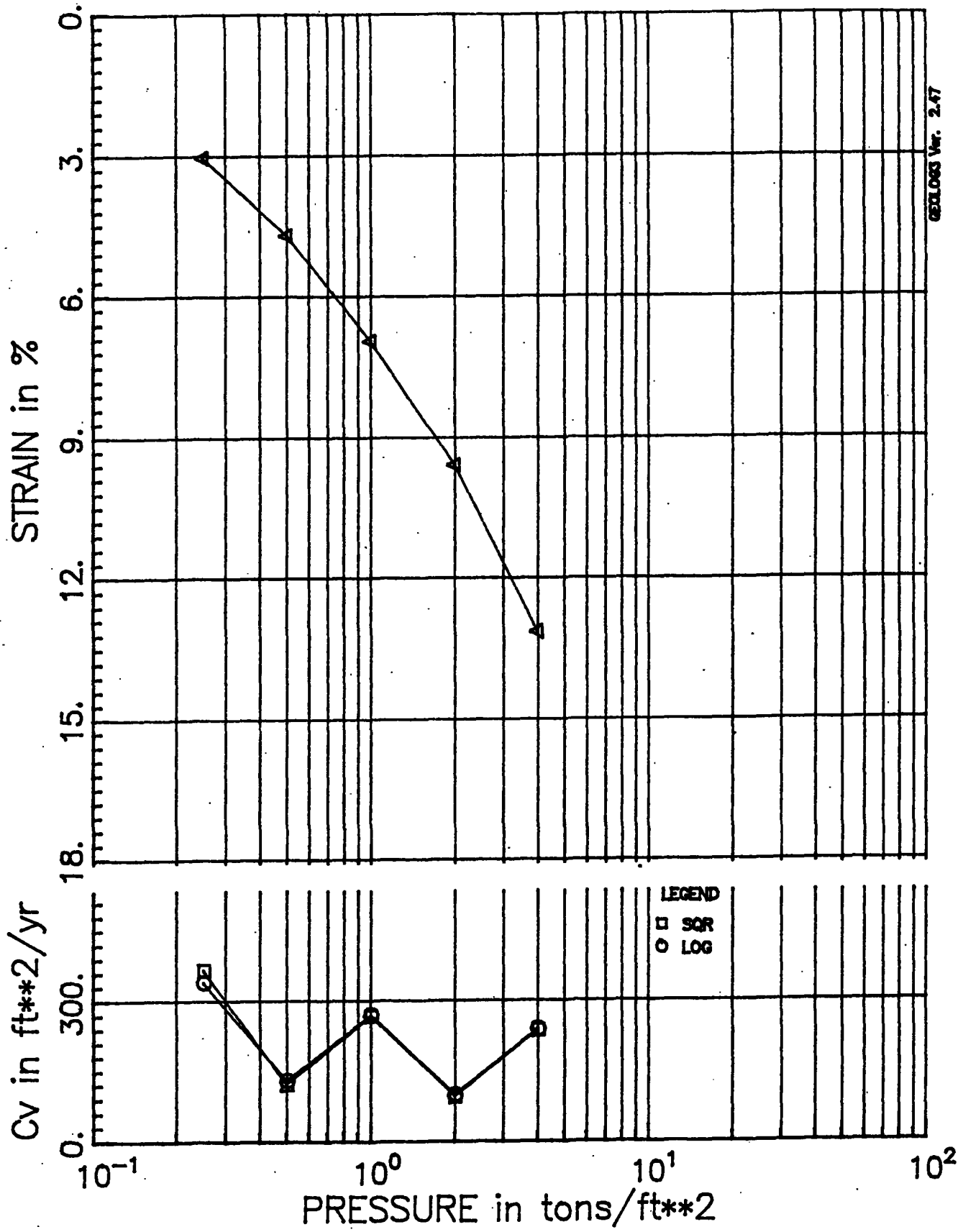
DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		0.00	0.00	0.0637	0.902	10.19
		0.10	0.32	0.0717	0.875	11.46
		0.25	0.50	0.0733	0.870	11.72
		0.57	0.75	0.0742	0.867	11.87
		1.00	1.00	0.0749	0.864	11.98
		1.57	1.25	0.0752	0.863	12.03
		2.25	1.50	0.0758	0.861	12.13
		3.07	1.75	0.0761	0.860	12.18
		4.00	2.00	0.0764	0.859	12.22
		6.25	2.50	0.0768	0.858	12.29
		9.00	3.00	0.0772	0.856	12.35
		12.25	3.50	0.0774	0.856	12.39
		16.00	4.00	0.0777	0.855	12.43
		25.00	5.00	0.0780	0.854	12.48
		36.00	6.00	0.0783	0.853	12.53
		49.00	7.00	0.0786	0.852	12.58
		64.00	8.00	0.0789	0.850	12.63
		81.00	9.00	0.0791	0.850	12.66
		100.00	10.00	0.0793	0.849	12.69
		160.00	12.65	0.0797	0.848	12.76
		220.00	14.83	0.0800	0.847	12.81
		280.00	16.73	0.0802	0.846	12.84
		340.00	18.44	0.0803	0.846	12.86
		400.00	20.00	0.0805	0.845	12.89
		460.00	21.45	0.0806	0.845	12.90
		520.00	22.80	0.0808	0.844	12.92
		580.00	24.08	0.0809	0.844	12.94
		640.00	25.30	0.0810	0.844	12.95
		700.00	26.46	0.0809	0.844	12.94
		760.00	27.57	0.0810	0.844	12.95
		820.00	28.64	0.0811	0.843	12.97
		880.00	29.66	0.0812	0.843	12.98
		940.00	30.66	0.0813	0.843	13.00
		1000.00	31.62	0.0814	0.842	13.02
		1060.00	32.56	0.0814	0.842	13.02
		1120.00	33.47	0.0815	0.842	13.03

LOAD INCREMENT DATA

TEST NAME 1071-1 PAGE NO: 39
TEST NO: F-0180-12 TESTED BY: LHB

PRESSURE INCREMENT FROM 2 TSF TO 4 TSF

DATE	TIME	ELAPSED TIME (min)	SQ RT OF TIME(min)	CHANGE IN HEIGHT (in)	VOID RATIO	STRAIN in %
		1180.00	34.35	0.0816	0.842	13.05
		1240.00	35.21	0.0816	0.842	13.05
		1300.00	36.06	0.0817	0.841	13.07
		1360.00	36.88	0.0818	0.841	13.08
		1420.00	37.68	0.0821	0.840	13.13



SOIL DESCRIPTION: GRAY WET FINE SANDY SILT

BORING: H-8-92 SAMPLE: S-1 DEPTH: 13.5'

WATER CONTENT
NATURAL: 0.41
AFTER TEST: 0.35

INITIAL VOID RATIO: 1.12

PROJECT: NUGENT VICINTY BRIDGES
FILE NO: OL-1071
DATE: 2-19-93

CONSOLIDATION TEST NO: F-0180-12

Testname: 1071-1

WASHINGTON STATE DOT

CONSOLIDATION TEST SUMMARY

APPLIED PRESSURE in tsf	FINAL DISP. in in.	STRAIN AT END in %	FITTING TIME in min SQ.RT. T90	FITTING TIME in min LOG T50	COEF. OF CONSOLIDATION in sq. ft. per yr SQ.RT.	COEF. OF CONSOLIDATION in sq. ft. per yr LOG	COEF. OF CONSOLIDATION in sq. ft. per yr AVE.
0.25	.01898	3.037	0.80	0.20	366.44	340.52	353.46
0.50	.02940	4.703	2.30	0.50	121.44	129.78	125.61
1.00	.04345	6.952	1.00	0.23	268.06	270.76	269.41
2.00	.05993	9.588	2.70	0.60	94.20	98.48	96.34
4.00	.08206	13.130	1.00	0.23	237.50	239.88	238.69

TEST NAME: 1071-1
PROJECT: NUGENT VICINTY BRIDGES
FILE NO.: OL-1071
TEST NO.: F-0180-12
DATE: 2-19-93
TESTED BY: LHB
CHECKED BY: DC

WASHINGTON STATE DOT