prepared for:

Delaware Solid Waste Authority
1128 S. Bradford Street
Dover, Delaware 19903

Volume 4: Geotechnical Characterization Report: Appendices G - N

Cherry Island Landfill Expansion Project Wilmington, Delaware

prepared by:

GEOSYNTEC CONSULTANTS
10015 Old Columbia Road
Columbia, Maryland 21046

Project No. ME0250
April 2003 -
Revised September 2003
Revised June 2004

EXISTING BORING LOGS

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 1 OF 5

PROJECT: DSWA W.O. 06-7390-002 SITE AREA Cherry Island DRILL HOLE NO. P-1

CONTRACTOR: Delmarva Drilling Co. COORDINATES _____ ELEVATION 31.9

DRILLER: C. Wallace GWL 0 HRS 31.0

CLASSIFIED BY: B. W. Benvish DATE: 9/9/81 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 In. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION (Density (or Consistency), Color; Rock Or Soil Type - Accessories)	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS (Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.)
0					0 - 5 Brown clayey silt, some reddish brown silty clay, trace of sand					DREDGE SPOIL
5					5 - 8 As above					
10					8 - 15 Dark gray silty clay micaceous, sticky streaks of black organics, trace to little vegetation fibers					
15					15 - 20 As above					
20					20 - 25 As above					
25					25 - 30 As above					
30					30 - 35 As above					
35					35 - 40 As above					
40					40 - 45 Green gray silty clay micaceous, some black organic streaks, some brown vegetation fibers					RECENT
45					45 - 51 Increase in vegetation fibers					
50										

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 2 OF 5

PROJECT: DSWA W.O. 06-7390-002 SITE AREA Cherry Island DRILL HOLE NO. P-1

CONTRACTOR: Delmarva Drilling Co. COORDINATES _____ ELEVATION _____

DRILLER: C. Wallace GWL 0 HRS _____

CLASSIFIED BY: B. W. Benyish DATE: 9/9/81 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 In. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION (Density (or Consistency), Color; Rock Or Soil Type - Accessories)	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Grain Shape	Core Run / Rec. Core	REMARKS (Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.)
50					51 - 55 Multi-color fine to coarse sand, some gravel, some green gray silty clay					
55					55 - 65 Multi-color sandy gravel Sand: Fine to coarse Gravel: Fine to medium subangular quartz, trace of silt micaceous					
60										
65					65 - 70 As above; gravel to .75 inch in dia., trace of light red clay					
70					70 - 75 As above					
75					75 - 80 As above; with sand lenses					
80					80 - 87 As above					
85										
90					87 - 92 Gray to yellow silty clay					
95					92 - 97 Green gray fine to medium sand					
100										

PLEISTOCENE

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 3 OF 5

PROJECT: DSWA W.O. 06-7390-002 SITE AREA Cherry Island DRILL HOLE NO. P-1

CONTRACTOR: Delmarva Drilling Co. COORDINATES _____ ELEVATION _____

DRILLER: C. Wallace GWL 0 HRS _____

CLASSIFIED BY: B. W. Benyish DATE: 9/9/81 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 In. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION (Density (or Consistency), Color; Rock Or Soil Type - Accessories)	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS (Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.)
100					97 - 105 Silty clay; colors: red, white, gray, and brown with quartz gravel					
105					105 - 112 As above; less gravel at 110 - 112					
110					112 - 119 Green gray clayey fine sand - fine sandy clay					
115					119 - 125 Red and gray sandy silty clay, trace of gravel					
120					125 - 130 As above					
125					130 - 135 Red and gray silty clay with little green gray fine sand					
130					135 - 142 As above					
135					142 - 145 Silty sand with some red gray clay					
140					145 - 150 Silty clay - clayey silt; color: red, gray, white, with some sand					
145										
150										

POTOMAC

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 4 OF 5

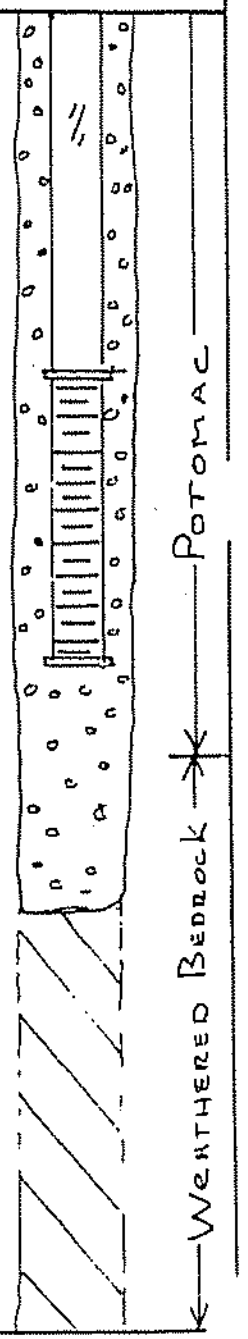
PROJECT: DSWA W.O. 06-7390-002 SITE AREA Cherry Island DRILL HOLE NO. P-1

CONTRACTOR: Delmarva Drilling Co. COORDINATES _____ ELEVATION _____

DRILLER: C. Wallace GWL 0 HRS _____

CLASSIFIED BY: B. W. Benyish DATE: 9/10/81 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/ 6 In. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION (Density (or Consistency), Color; Rock Or Soil Type - Accessories)	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS (Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.)
150					150 - 155 As above: increase in fine sand					
155					155 - 162 As above					
160					162 - 165 Silty fine sand to fine sandy silt; color: red, gray, brown					
165					165 - 169 Silty fine to medium sand; color: red, gray, white					
170					169 - 175 As above; with some dark gray clayey silt layers					
175					175 - 180 Dark green gray silty clay-to-clayey silt					
180					180 - 185 Green gray silt, fine to coarse sand, some clay					
185					185 - 190 As above; sand less coarse, less clay					
190					194 - Bedrock, hard, quartz					
195					Total Depth 194'					
200										



SOIL AND ROCK CLASSIFICATION SHEET

SHEET 5 OF 5

PROJECT: DSWA W.O. 06-7390-002 SITE AREA Cherry Island DRILL HOLE NO. P-1

CONTRACTOR: Delmarva Drilling Co. COORDINATES _____ ELEVATION _____

DRILLER: C. Wallace GWL 0 HRS _____

CLASSIFIED BY: B. W. Benyish DATE: 9/10/81 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/ 6 In. 6 12 18	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.
					Drilling Notes:					
					1 - Set 4" PVC screen 162 - 172'					
					2 - Gravel pack 150 - 180'					
					3 - Developed - 5 gpm clear					
					4 - Bentonite seal - 3 - 150'					
					5 - Installed protector casing and cap					
					Notes: Single Point Electric Log					
					1 - Mr. John Tulley - Delaware Geol. Survey Logger					
					2 - Formation breaks from log:					
					a - Dredge spoil/recent - 0 - 50'					
					b - Pleistocene 50 - 92'					
					c - Potomac 92 - 172'					
					d - Weathered bedrock 172 - 194'					

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 1 OF 4

PROJECT: DSWA W.O. 06-7390-002 SITE AREA Cherry Island DRILL HOLE NO. P-2

CONTRACTOR: Delmarva Drilling Co. COORDINATES _____ ELEVATION 35.13

DRILLER: C. Wallace GWL 0 HRS _____

CLASSIFIED BY: B. W. Benyish DATE: 9/11/81 24 HRS 31.0'

Depth Ft.	Sample No.	SPT Blows/6 In. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION (Density (or Consistency), Color; Rock Or Soil Type - Accessories)	U.S.C.S.	R.D.D.	Soil Or Rock: Range Size / Grain Shape	Core Run / Rec. Core	REMARKS (Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.)
0					0 - 7 Brown clayey silt, micaceous					DREDGE SPOIL
5					7 - 10 Gray green silty clay, slightly micaceous, vegetation fibers					
10					10 - 15 As above					
15					15 - 20 Gray silty clay, micaceous, vegetation fibers					
20					20 - 25 As above; with brown silt lenses					
25					25 - 30 As above					
30					30 - 35 As above; increased vegetation fibers, black organic streaks					
35					35 - 40 As above					
40					40 - 45 As above					
45					45 - 50 As above					
50										

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 2 OF 4

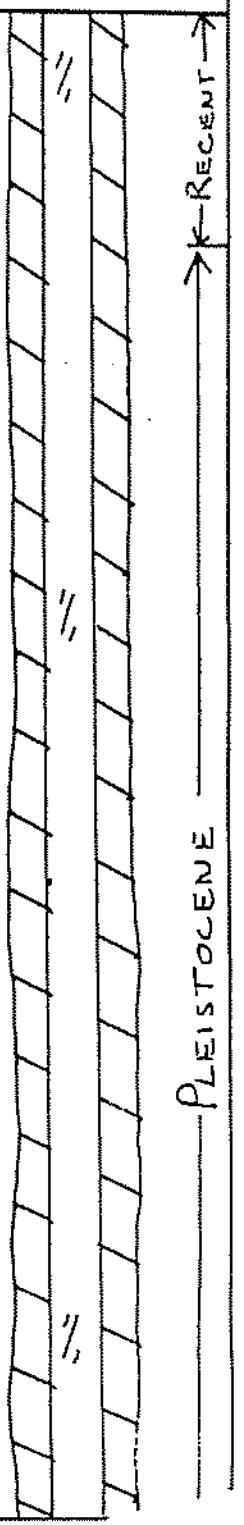
PROJECT: DSWA W.O. 06-7390-002 SITE AREA Cherry Island DRILL HOLE NO. P-2

CONTRACTOR: Delmarva Drilling Co. COORDINATES _____ ELEVATION _____

DRILLER: C. Wallace GWL 0 HRS _____

CLASSIFIED BY: B. W. Benyish DATE: 9/11/81 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 In. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION (Density (or Consistency), Color; Rock Or Soil Type - Accessories)	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS (Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.)
50					50 - 58 Gray clayey silt with brown vegetation lenses, some sand, micaceous					
55										
60					58 - 60 Green gray clayey silty fine to medium sand, dome gray clay, micaceous					
					60 - 65 Green gray fine to coarse sand, micaceous; sand: quartz, trace to little silt, trace of quartz gravel					
65					65 - 70 As above					
70					70 - 75 Green gray gravelly fine to coarse sand; gravel: fine subangular quartz micaceous					
75					75 - 80 As above					
80					80 - 85 Green gray fine to medium sand trace to little					
85					85 - 90 As above					
90					90 - 95 As above					
95					95 - 100 As above					
100										



SOIL AND ROCK CLASSIFICATION SHEET

SHEET 3 OF 4

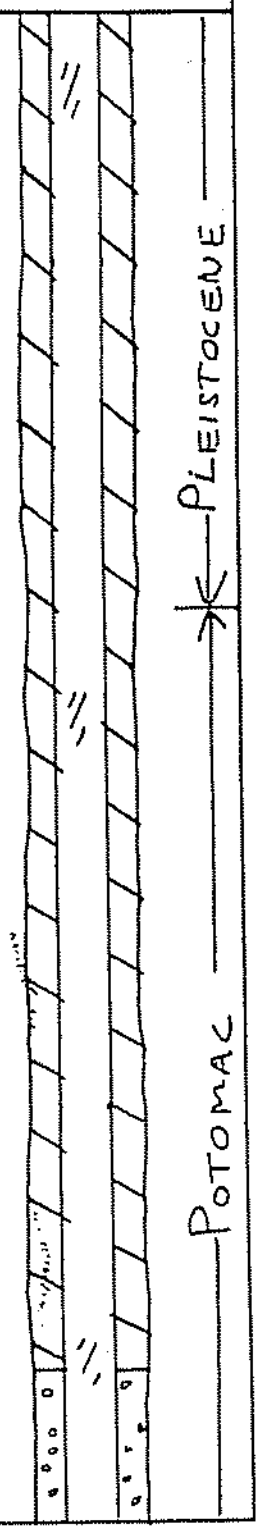
PROJECT: DSWA W.O. 06-7390-002 SITE AREA Cherry Island DRILL HOLE NO. P-2

CONTRACTOR: Delmarva Drilling Co. COORDINATES ELEVATION

DRILLER: C. Wallace GWL 0 HRS

CLASSIFIED BY: B. W. Benvish DATE: 9/12/81 24 HRS

Depth Ft.	Sample No.	SPT Blows/6 in. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION (Density (or Consistency), Color; Rock Or Soil Type - Accessories)	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Grain Shape	Core Run / Rec. Core	REMARKS (Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.)
100					100 - 105 Green gray gravelly fine to coarse sand; gravel: fine subangular quartz, trace of silt					
105					105 - 110 Red tan clayey sand, some quartz gravel, some silt, micaceous					
110					110 - 115 Red silty fine to medium sand, some clay					
115					115 - 120 As above					
120					120 - 125 Silty clay; color: red, cream, white, dark gray, some fine sand					
125					125 - 130 As above					
130					130 - 135 Sandy silt; color: red, brown, cream, with some clay					
135					135 - 140 Silty clay - clayey silt color: red, white, dark gray, some fine sand lenses					
140					140 - 145 As above					
145					145 - 150 As above					
150										



SOIL AND ROCK CLASSIFICATION SHEET

SHEET 4 OF 4

PROJECT: DSWA W.O. 06-7390-002 SITE AREA Cherry Island DRILL HOLE NO. P-2

CONTRACTOR: Delmarva Drilling Co. COORDINATES _____ ELEVATION _____

DRILLER: C. Wallace GWL 0 HRS _____

CLASSIFIED BY: B. W. Benyish DATE: 9/14/81 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 In. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.
150					150 - 157 As above					
155					157 - 160 Red brown silty fine sand, slightly micaceous					
160					160 - 167 Red brown silty clayey fine to medium sand Note: Drilled hard, possible boulder, talus, etc.					
165					167 - 170 Note: Drilled hard, possible boulder, talus, etc.					
170					Total Depth 170'					

Drilling Notes:

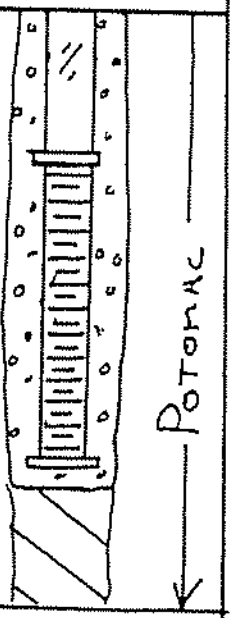
1 - Set 4" PVC screen 155 - 165'

2 - Gravel pack 145 - 165'

3 - Developed 2 gpm clear

4 - Bentonite seal 2 - 145'

5 - Installed protector casing and cap



GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 1 OF 2

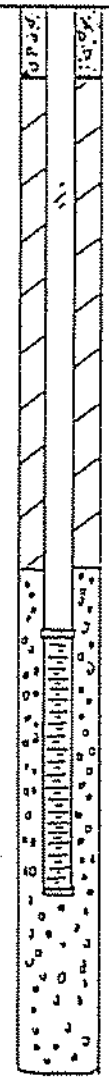
PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-10

CONTRACTOR: A. C. Schultes COORDINATES ELEVATION 15.6

DRILLER: C. Kramer GWL 0 HRS

CLASSIFIED BY: D. J. Stanislawczyk DATE: 8-3-83 24 HRS

Depth Ft.	Sample No.	SPT Blows/6 In. 6	12	18	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock Range Size / Core Run	Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc. TOC +15.75'
0												
5	1	2	1	1	1		Black - clayey silt - trace of mica, sticky.					
10	2	1	1	1	1		As above - w/trace of light grey silty fine sand @ 12.0'					
15	3	1	2	2	3		As above, w/laminae of light grey sandy silt to silty fine sand					
20	4	1	2	4	4		Peat - dark brown fiberous					
25							25.0'					
	5	7	8	10	11		Medium dense - brown silty fine sand with trace of clay, micaceous					
30	6	2	3	3	7		As above w/thin layers of rust brown fine sand					
35	7	13	1	1	16		As above w/thin layer of grey clay					
40	8	3	8	20	70		Dense layered orange silty clay and brown sandy silt, no rock chips					
							TOTAL DEPTH 42'					



GAI - 227 9/7

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 2 OF 2

PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-1P

CONTRACTOR: A. C. Schultes COORDINATES _____ ELEVATION _____

DRILLER: C. Kramer GWL 0 HRS _____

CLASSIFIED BY: D. J. Stanislawczyk DATE: 8-3-83 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 In. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Grain Shape	Core Run / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.
					NOTES:					
					1) Set 4" diameter No. 10 slot PVC screen from 25' to 35'.					
					2) Gravel pack w/No. 1 Morie gravel 22'-8" to 42'.					
					3) Bentonite seal 3'-20'.					
					4) Develop 5 gpm.					
					5) Set protector casing and cap.					

GAI - 227

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 1 OF 1

PROJECT: DSWA W.O. 04-5196-00D SITE AREA Cherry Island DRILL HOLE NO. C-101

CONTRACTOR: A.C. Shultes COORDINATES ELEVATION 35.2

DRILLER: C. Kramer GWL 0 HRS

CLASSIFIED BY: D.J. Stanislawczyk DATE: 8-8-83 24 HRS

Depth Ft.	Sample No.	SPT Blows/6 in. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION (Density (or Consistency), Color; Rock Or Soil Type - Accessories)	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS (Chemical Comp., Geologic Data, Ground Water, Construction Problems, etc.)
0					0 - 6 Brown silty sand to sandy silt					
10					6 - 10 Brown medium to coarse sand & fine gravel					
20					10 - 20 Dark brown to black clayey silt					
30					20 - 30 As above					
40					30 - 40 As above - more					
50					40 - 50 As above, with some fiberous organic material					
60					50 - 60 Dark grey to black clayey silt					
70					60 - 70 Dark brown fine to coarse sand w/rounded quartz gravel					
					70 - 72 Sandy silt					
80					TOTAL DEPTH 72'					

Notes:

1) Set 4" PVC screen from 60 - 70' No. 10 slot size.
2) Gravel pack 50 - 70'.
3) Bentonite seal 3 - 50'.
4) Develop 60 gpm.
5) Set protector casing & cap.

TOC 39.72

GAI - 227 9/72

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 1 OF 1

PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-107

CONTRACTOR: A.C. Schultes COORDINATES ELEVATION 26.3

DRILLER: C. Kramer GWL 0 HRS

CLASSIFIED BY: D. J. Stanislawczyk DATE: 7-13-83 24 HRS

Depth Ft.	Sample No.	SPT Blows/6 in. 6	12	18	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc. TOC 29.50'
0												
	1	2	1	1	3		Black Dredge Spoil - Clayey silt small gravel, layer					
10												
	2	2	1	1	1		Dredge Spoil - Soft black clayey silt					
	3	1	1	2	1		Dredge Spoil - Clayey silt, black, soft, low plasticity, organic material					
20												
	4	2	1	1	1		Black clayey silt with organic material					
	5	1	2	2	4		As above					
30												
	6	3	50	-	-		As above w/cobble @ 31.0'					
	7	-	-	-	-		No sample - cobble obstruction - very coarse sand & gravel 37' - 40'					
40												
	8	2	2	3	3		Wash sample - of silt - in coarse sand					
50							Set Screen in Sand 46' - 56'					
60							60 - 70 Over drill to allow coarse cuttings to settle					
70												
							TOTAL DEPTH 70.0'					

Notes:

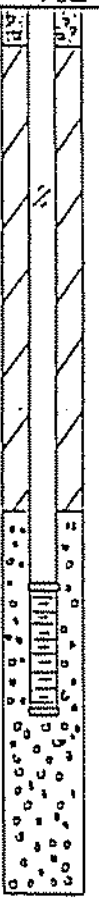
1) Set 4" PVC screen No. 10 slot 46' - 56'.

2) Gravel pack - 40' - 70'.

3) Develop 5 gpm.

4) Bentonite seal - 3' - 40'.

5) Set protector casing & cap.



GAI - 227 9/

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island

CONTRACTOR: A.C. Schultes COORDINATES

DRILLER: C. Kramer

CLASSIFIED BY: D.J. Stanislawczyk DATE: 7-29-83

SHEET 1 OF 1

DRILL HOLE NO. C-103

ELEVATION 11.1

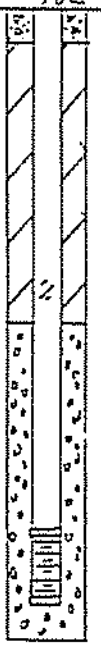
GWL 0 HRS

24 HRS

Depth Ft.	Sample No.	SPT Blows/6 In. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION (Density (or Consistency), Color; Rock Or Soil Type - Accessories)	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Grain Shape	Core Run / Rec. Core	REMARKS (Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.) TOC 14.8
0					0 - 10 Dredge Spoil - dark gray silty clay					
10					10 - 20 Dredge Spoil - drak gray silty clay					
20					20 - 30 Dredge Spoil - dark gray silty clay					
30					30 - 40 As above					
40					40 - 50 Trace of sand in between 42 - 45' - small thin layer					
50					TOTAL DEPTH 50'					

Noces:

1) Set 5' of 4" I.D. No. 10 sloc PVC screen 42' - 47'.
2) Casing to 42' (4" PVC).
3) Gravel pack 25' - 50'.
4) Bentonite seal - 3' - 25'.
5) Develop 1½ gpm.



GAI - 227 3/72

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

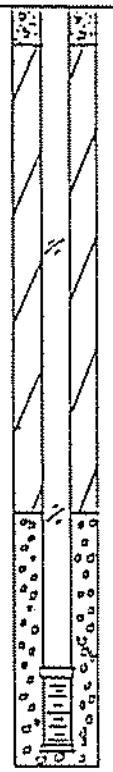
SHEET 1 OF 1

PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-104

CONTRACTOR: A.C. Schultes COORDINATES _____ ELEVATION _____

DRILLER: C. Kramer GWL 0 HRS _____

CLASSIFIED BY: D.J. Stanislawczyk DATE: 7-27-83 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 in. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc. TOC 13.30'
0					0 - 10 Dredge Spoil - brownish black clayey silt, soft					
10					10 - 20 Dredge Spoil - brownish black clayey silt, soft					
20					20 - 30 Dredge Spoil - brownish black clayey silt, soft					
30					30 - 40 Dredge Spoil - brownish black clayey silt, soft					
40					40 - 50 Dredge Spoil - slightly sand w/organic material					
50					52 - 60 Dark grey sand - fine to medium grained with fine gravel					
60					TOTAL DEPTH 60'					

NOTES:

1) Set 5' of 4" diameter PVC w/No. 10 slot from 53' - 58' and 4" diameter PVC casing to 58' w/3' stickup.

2) Gravel pack 40' - 60'.

3) Develop 5 gpm.

4) Seal 3' - 40'.

5) Set proteccor casing and cap.

GAI - 227 9/

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 1 OF 2

PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-105

CONTRACTOR: A.C. Schultes COORDINATES _____ ELEVATION 21.4

DRILLER: C. Kramer GWL 0 HRS _____

CLASSIFIED BY: D.J. Stanislawczyk DATE: 7-25-83 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 In. 6	12	18	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc. TOC 24.90'
0												
5	1	1	1	1	1		Dredge Spoil - black silty clay - clayey silt w/organic material, soft.					
10	2	2	1	2	2		Dredge Spoil - black silty clay - clayey silt w/organic material, soft.					
15	3	1	1	1	1		Dredge Spoil - black silty clay - clayey silt w/organic material, soft.					
20	4	1	1	1	1		Dredge Spoil - black silty clay - clayey silt w/organic material, soft.					
25	5	1	1	1	1		As above, slightly micaceous.					
30	6	1	1	1	1		Black to brownish black silty fine sand to sandy silt, micaceous, soft.					
35	7	1	1	1	1		Black - dark brown clayey silt, micaceous, soft.					
40	8	1	1	1	2		Dark grey silt fine sand, micaceous, wet, very loose.					
45	9	1	1	2	3		As above, w/light gray sandy laminae.					
50												

GAI - 227 9/72

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 2 OF 2

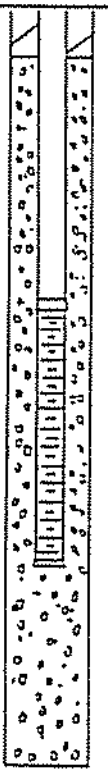
PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-1C

CONTRACTOR: A.C. Schultes COORDINATES ELEVATION 21.4

DRILLER: C. Kramer GWL 0 HRS

CLASSIFIED BY: D.J. Stanislawczyk DATE: 7-25-83 24 HRS

Depth Ft.	Sample No.	SPT Blows/6 in. 6	12	18	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.
50												
	10	1	1	1	2		Black - soft - clayey silt w/ sandy silt laminae, wet.					
55												
	11	1	1	1	3		As above, w/black organic material, very soft.					
60												
	12	2	1	3	4		Soft, silty clay - clayey silt, trace of organics.					
65												
	13	12	24	30	37		Dark gray - fine to coarse sand and gravel, gravel up to 1/2" and rounded, very dense.					
70												
75							Overdrill to allow cuttings to settle, 72' - 80'.					
80							TOTAL DEPTH 80'					



NOTES:

1) Set 4" PVC screen (62' - 72') and 4" casing (Screen No. 10 slot).

2) Gravel pack 52' - 80'.

3) Seal 3' - 52' w/bentonite.

4) Develop 50 gpm.

5) Set protector casing and cap.

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 1 OF 2

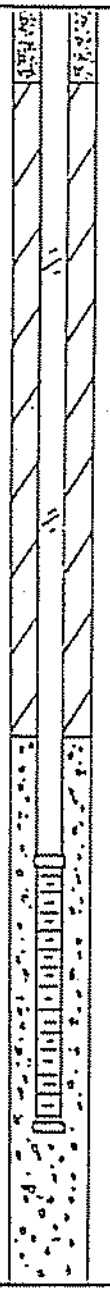
PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-106

CONTRACTOR: A.C. Schultes COORDINATES _____ ELEVATION 27.6

DRILLER: C. Kramer GWL 0 HRS _____

CLASSIFIED BY: D.J. Stanislawczyk DATE: 7-20-83 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 In. 6	12	18	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc. TOC 30.18'
0												
5	1	3	1	2	1		Dredge Spoil - Soft, clayey silt to silty clay, micaceous, traces of organic material.					
10	2	2	1	1	1		As above					
15	3	3	3	3	3		As above					
20	4	1	1	1	2		As above					
25	5	2	2	2	3		As above, trace of very fine sand.					
30	6	2	3	3	4		As above, micaceous.					
35	7	4	5	20	26		Dense-dark gray silty sand and gravel - gravel up to 1".					
40												
45							45 - 50 Medium to coarse sand and gravel.					
50												



GAI - 227 9/72

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 2 OF 2

PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-10

CONTRACTOR: A.C. Schultes COORDINATES _____ ELEVATION 27.6

DRILLER: C. Kramer GWL 0 HRS _____

CLASSIFIED BY: D.J. Stanislawczyk DATE: 7-20-83 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 In. 6 12 18	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type + Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.
50					50 - 60 Gray sandy silt to silty clay - overcut to allow for cuttings to settle.					
55										
60					TOTAL DEPTH 60'					

NOTES:

1) Set 4" PVC No. 10 slot screen 34' - 44'.

2) Gravel pack w/No. 1 Morie gravel 29' - 60'.

3) Seal with bentonite 3' - 29'.

4) Develop 5 gpm.

5) Set protector casing and cap.

GAI - 227 5.

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 1 OF 1

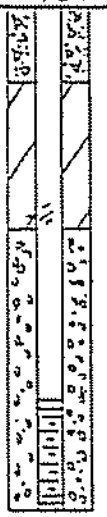
PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-107

CONTRACTOR: A.C. Schultes COORDINATES ELEVATION 10.3

DRILLER: C. Kramer GWL 0 HRS

CLASSIFIED BY: D.J. Stanislawczyk DATE: 8-2-83 24 HRS

Depth Ft.	Sample No.	SPT Blows/6 in. (6 12 18)	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type • Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Soil Or Rock: Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc. TOC 13.25'
0										
5					0 – 10 Sand – Fill					
10										
15					10 – 20 Grey Clay – silty					
20					TOTAL DEPTH 20'					
25					NOTES: 1) Screen 16' – 20' (4" PVC). 2) Gravel 14' – 20' (No. 1 Morie) 3) Seal 3' – 14' (Bentonite). 4) Develop 1/4 gpm. 5) Set protector casing and cap.					



GAI - 227 9/72

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 1 OF 2

PROJECT: DSWA W.O. 04-5196-000 SITE AREA Cherry Island DRILL HOLE NO. C-108

CONTRACTOR: A.C. Schultes COORDINATES _____ ELEVATION 27.2

DRILLER: C. Kramer GWL 0 HRS _____

CLASSIFIED BY: D. J. Stanislawczyk DATE: 7-18-83 24 HRS _____

Depth Ft.	Sample No.	SPT Blows/6 in. 6	12	18	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Grain Shape	Core Run / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc. TOC 30.52
0												
5	1	5	6	11	8		Brown - soft clayey silt w/some fine sand					
10	2	1	1	1	2		Black - very soft clayey silt w/some organic material					
15	3	1	2	2	3		Dredge Spoil - soft, black clayey silt w/organic material					
20	4	2	3	5	4		Dredge Spoil - as above, trace very fine sand, slightly micaceous					
25	5	3	2	2	6		Dark Brownish Gray - clayey silt w/trace very fine sand, organic, slightly micaceous, soft					
30	6	7	16	23	18		Dense-Brown - fine coarse sand and gravel, wet					
35							30 - 40 - As above, w/more fine gravel					
40							40 - 50 - Silty, sand and gravel					
45												
50							TOTAL DEPTH 50'					

GAI - 227 9/

GILBERT ASSOCIATES, INC.

SOIL AND ROCK CLASSIFICATION SHEET

SHEET 2 OF 2

PROJECT: DSWA W.O. 04-9196-000 SITE AREA Cherry Island DRILL HOLE NO. C-108

CONTRACTOR: A.C. Schultes COORDINATES ELEVATION 27.2

DRILLER: C. Kramer GWL 0 HRS

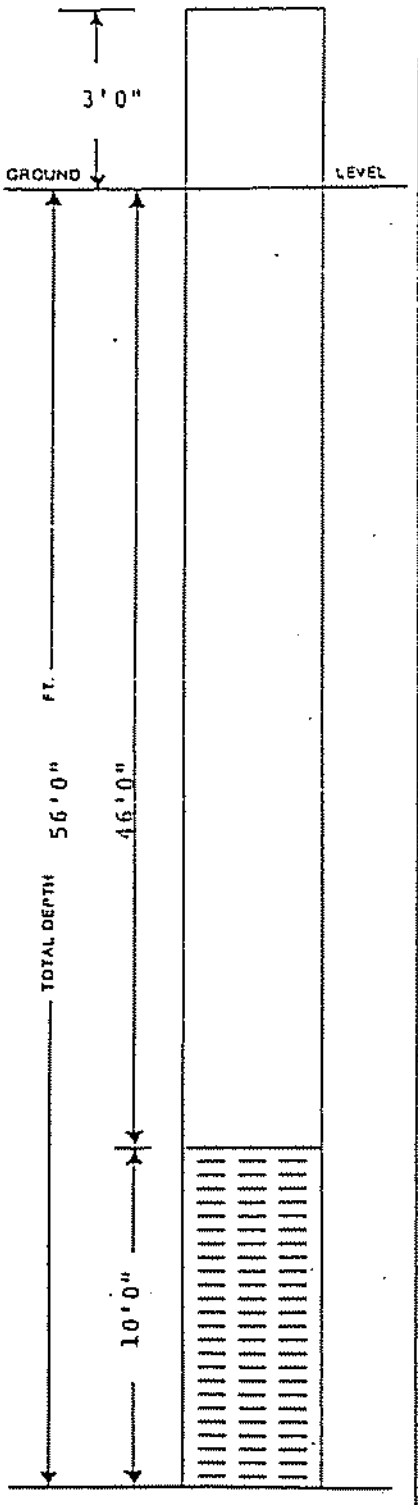
CLASSIFIED BY: D. J. Stanislawczyk DATE: 7-18-83 24 HRS

Depth Ft.	Sample No.	SPT Blows/6 in. 6	12	18	Ft. Rec.	Profile	DESCRIPTION Density (or Consistency), Color Rock Or Soil Type - Accessories	U.S.C.S.	R.Q.D.	Soil Or Rock: Range Size / Core Run	Grain Shape / Rec. Core	REMARKS Chemical Comp, Geologic Data, Ground Water, Construction Problems, etc.
							NOTES: 1) Set 4" PVC screen (No. 10 slot) from 28' - 38'. Hole caved, couldn't get casing to 40'. 2) Gravel pack w/No. 1 Morie gravel 23 - 38'. 3) Bentonite seal 3 - 23'. 4) Develop 10 - 15 gpm. 5) Set protector casing and cap.					

GAI - 227 9/72

A.C. SCHULTES & SONS, INC.

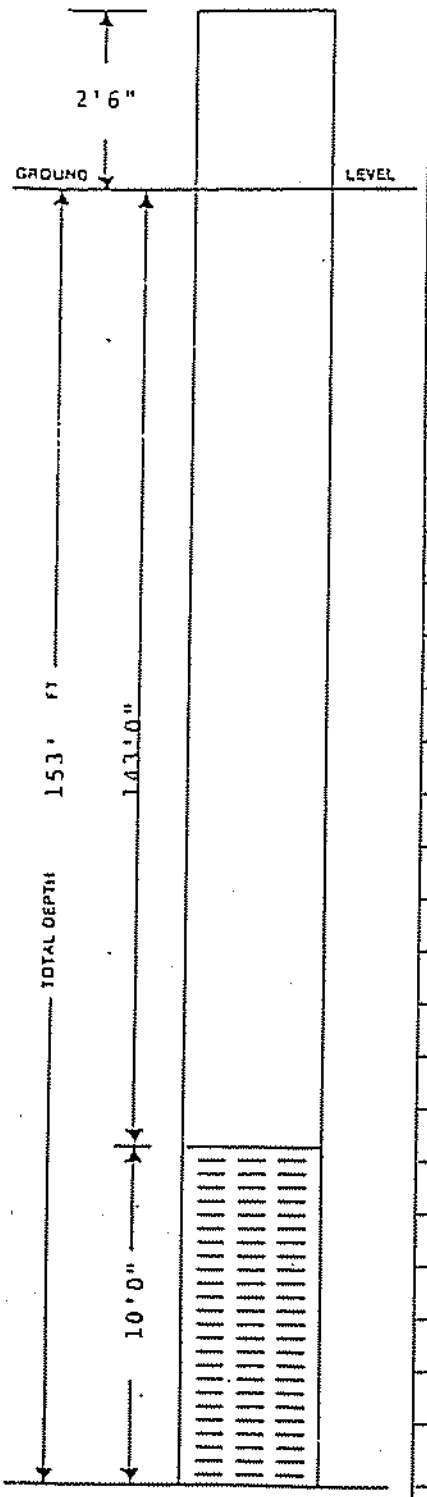
SINGLE CASED WELL



WELL LOG	FEET FROM GROUND SURFACE	NAME OF OWNER
Brown clay	0 to 2	Delaware Solid Waste
Gray clay, soft	2 - 21	Location Cherry Island, DE
Peat	21 - 24	Well No P-100
Silty sand	24 - 35	State Permit
Clay white	35 - 40	Job No 19531
Green clay, hard	40 - 50	Test Pumped (hrs) Blew 1 Hour
Sand yellow, hard	50 - 61	Capacity (GPM) 5
Orange clay	61 - 70	Static Level 13.25
Chips rock		Pumping Level
Silt	70 - 75	Datum
Fine white sand	75 - 95	Specific Capacity
Silt, green clay	95 - 103	Diameter of Casing 4"
Rock	103 - 110	Depth of Well (Ground) 56'0"
		Depth to Gravel 40'0"
		Gravel Size 1
		Length of Casing & Screen 59'
		Screen Material PVC
		Screen Mfg.
		Screen Dia. 4"
		Length of Screen 10'0"
		Top of Screen Fitting Couple
		Bottom of Screen Fitting Cap
		Slot Size .010
		Seal Material Bentonite
		Quantity 2 Bags
		Depth of Seal Material 3-40
		Drilling Machine 6B
		Date Well Completed August 3, 1983
		Driller C. Krammer

A.C. SCHULTES & SONS INC.

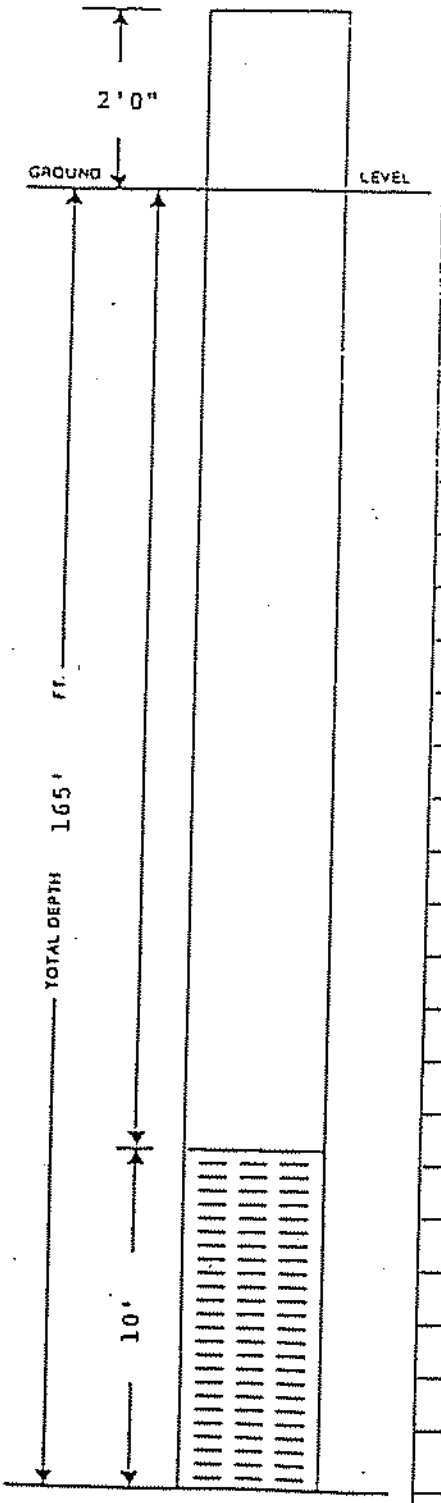
SINGLE CASED WELL



WELL LOG	FEET FROM GROUND SURFACE	NAME OF OWNER
Brown clay	0 to 4	Delaware Solid Waste
Gray clay, soft	4 - 6	Location Cherry Island, DE
White gravel	6 - 10	Well No P-101
Gray clay	10 - 58	State Permit
Sand & gravel white	58 - 73	Job No. 19531
Silty sand	73 - 82	Test Pumped (Hrs.) Blew 1 Hour
Sand & gravel	82 - 98	Capacity (GPM) 5
Hard layer	98 - 99	Static Level 34-2
Sand white, med	99 - 105	Pumping Level
Silt	105 - 110	Datum
Red clay, hard	110 - 125	Specific Capacity
Silty sand, red	125 - 130	Diameter of Casing 4"
Blue-green clay	130 - 133	Depth of Well (Ground) 153
Silty sand	133 - 140	Depth to Gravel 135'
White fine sand hard packed	140 - 151	Gravel Size 1
Sand streaks clay	151 - 163	Length of Casing & Screen 156'
Silty green clay	163 - 165	Screen Material PVC
Yellow clay, hard	165 - 170	Screen Mfg.
Sand clay layers	170 - 185	Screen Dia. 4"
Weather Zone	185 - 200	Length of Screen 10'0"
		Top of Screen Fitting Couple
		Bottom of Screen Fitting Cap
		Slot Size .010
		Seal Material Bentonite
		Quantity 5 Bags
		Depth of Seal Material 3-135
		Drilling Machine 6B
		Date Well Completed August 5, 1983
		Driller C. Krammer

A.C. SCHULTES & SONS, INC.

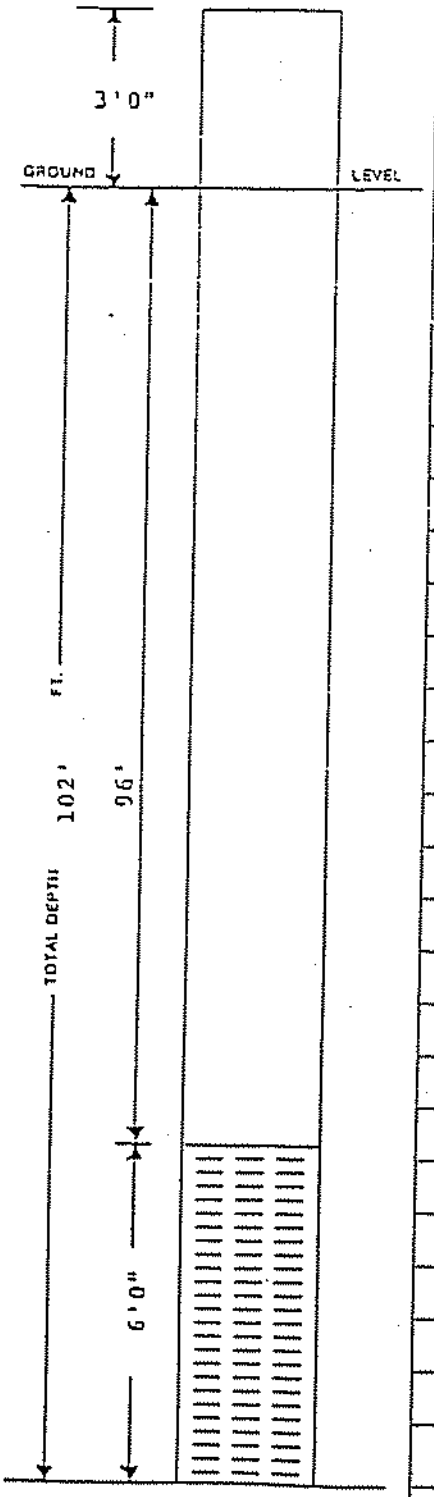
SINGLE CASED WELL



WELL LOG	FEET FROM GROUND SURFACE	NAME OF OWNER
Sand & stones	Dia 2	Delaware Solid Waste
Gray silt, soft	2 - 34	Location Cherry Island, D
Sand, rocks, white	34 - 45	Well No P-102
Clay layers rocks	45 - 80	State Permit
Rocks	80 - 92	Job No 19531
Clay silt rocks	92 -107	Test Pumped (Hrs.) Slew 1 hou
Clay yellow hard	107 -115	Capacity (GPM) 1.5
Red clay, hard	115 -133	Static Level 25.2
Red clay hard layers	133 -150	Pumping Level
Sand silty	150 -189	Datum
Green clay	189 -218	Specific Capacity
		Diameter of Casing 4"
		Depth of Well (Ground) 165
		Depth to Gravel 145
		Gravel Size 1
		Length of Casing & Screen 167'
		Screen Material PVC
		Screen Mfg.
		Screen Dia. 4"
		Length of Screen 10'0"
		Top of Screen Fitting Couple
		Bottom of Screen Fitting Cap
		Slot Size .010
		Seal Material Bentonite
		Quantity 5 Bags
		Depth of Seal Material 3-145
		Drilling Machine 6B
		Date Well Completed July 12, 1983
		Driller

A.C. SCHULTES & SONS INC.

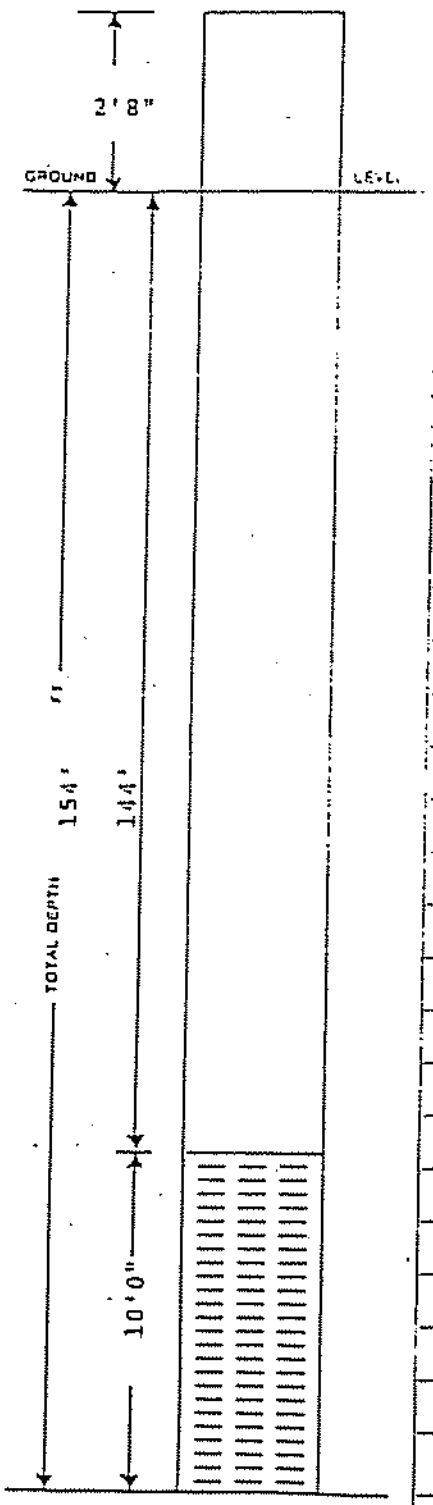
SINGLE CASED WELL



WELL LOG	FEET FROM GROUND SURFACE	NAME OF OWNER	
Brown clay	0 to 5	Delaware Solid Waste	
Gray clay, soft	5- 98	Location	Cherry Island, D
Sand & gravel, white	98-103	Well No	P-103
Silty red clay	103-105	State Permit	
Red clay, hard	105-107	Job No	19531
Green clay, hard	107-109	Test Pumped (Hrs)	Blew 1 Hour
Weather Zone	109-130	Capacity (GPM)	50
		Static Level	9.5
		Pumping Level	
		Datum	
		Specific Capacity	
		Diameter of Casing	4"
		Depth of Well (Ground)	102'
		Depth to Gravel	86
		Gravel Size	1
		Length of Casing & Screen	105'
		Screen Material	PVC
		Screen Mfg.	
		Screen Dia.	4"
		Length of Screen	6'0"
		Top of Screen Fitting	Couple
		Bottom of Screen Fitting	Cap
		Slot Size	010
		Seal Material	Bentonite
		Quantity	3 Bags
		Depth of Seal Material	3 - 86
		Drilling Machine	62
		Date Well Completed	July 28, 1983
		Driller	C. Krammer

A.C. SCHULTES & SONS, INC.

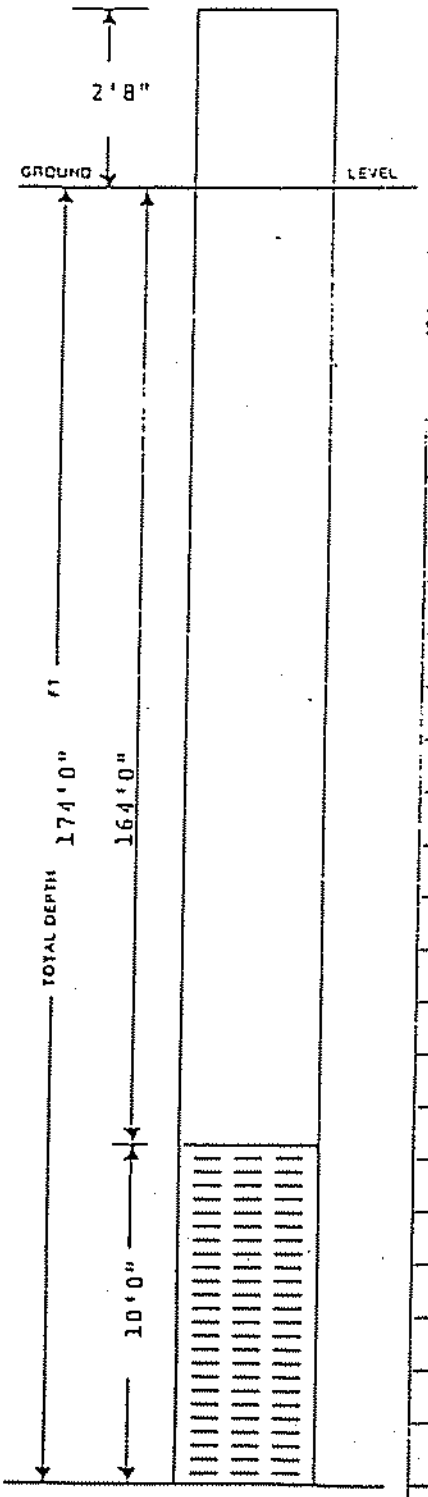
SINGLE CASED WELL



WELL LOG	FEET FROM GROUND SURFACE	NAME OF OWNER
Brown clay	0 to 7	Delaware Solid Waste
Gray clay, soft	7 - 58	Location Cherry Island, D
Sand white, med.	58 - 66	Well No P-104
Gray clay, soft	66 - 100	State Permit
Brown silty clay	100 - 110	Job No 19531
Clay white, hard	110 - 120	Test Pumping Hrs Blew 1 Hou
Clay red, hard	120 - 130	Capacity (GPM) 25
Silty sand	130 - 133	Static Level 9.1
Silty red clay	133 - 140	Pumping Level
Fine sand, white	140 - 145	Datum G.L.
Sand streaks clay	145 - 155	Specific Capacity
Yellow		Diameter of Casing 4"
Green clay, hard	155 - 162	Depth of Well (Ground) 154'
Silty sand	162 - 165	Depth to Gravel 135'
Silty clay	165 - 173	Gravel Size 1
Weather Zone	173 - 195	Length of Casing & Screen 156'
		Screen Material PVC
		Screen Mfg.
		Screen Dia 4"
		Length of Screen 10'0"
		Top of Screen Fitting Couple
		Bottom of Screen Fitting Cap
		Slot Size .010
		Seal Material Bentonite
		Quantity 5 Bags
		Depth of Seal Material 3 - 135
		Drilling Machine 6B
		Date Well Completed July 27, 1983
		Driller

A.C. SCHULTES & SONS INC.

SINGLE CASED WELL

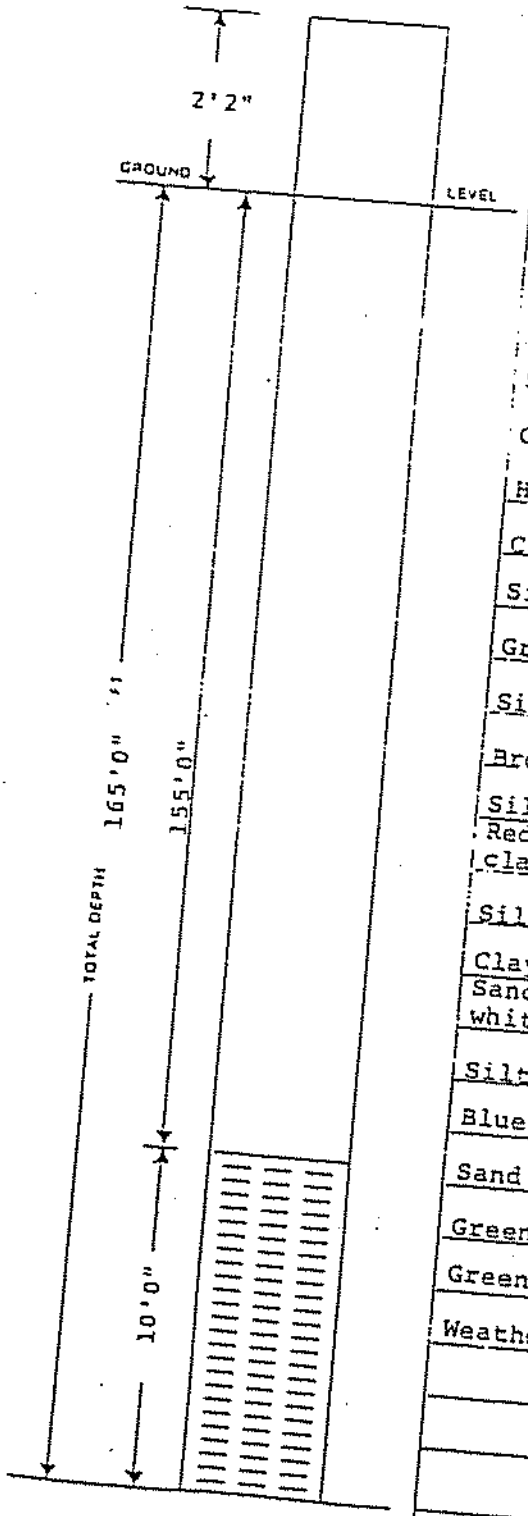


WELL LOG	FEET FROM GROUND SURFACE
Brown clay	0 to 6
Gray clay, soft	6- 63
Sand & gravel white	63- 75
Red & white clay hard	75- 79
Stone layers red clay	79- 81
Fine white sand	81- 88
Sand hard layers	88- 95
Silty sand brown	95-104
White clay & Silty sand	104-108
Sand & stones	108-125
White clay, hard	125-130
Sand fine white	130-134
Purple clay/ steak sand	134-144
Sand fine white	144-146
Red clay	146-149
Silty sand Layers red clay	149-158
Red clay Yellow hard	158-163
Silty sand, hard	163-177
Red & white clay, hard	177-184
Sand silty	184-194
Mixed clay, hard	194-220

Name of Owner	Delaware Solid Waste
Location	Cherry Island, DE
Well No.	P-105
Static Pressure	
Job No	19531
Test Pumped (Hrs.)	Blew 1 Hour
Capacity (GPM)	3
Static Level	20.0
Pumping Level	
Datum	G.L.
Specific Capacity	
Diameter of Casing	4"
Depth of Well (Ground)	174'0"
Depth to Gravel	150
Gravel Size	1
Length of Casing & Screen	177'
Screen Material	PVC
Screen Mfg.	
Screen Dia.	4"
Length of Screen	10'0"
Top of Screen Fitting	Couple
Bottom of Screen Fitting	Cap
Slot Size	.010
Seal Material	Bentonite
Quantity	6 Bags
Depth of Seal Material	3-150
Drilling Machine	6B
Date Well Completed	July 22, 1983
Driller	C. Krammer

A.C. SCHULTES & SONS INC.

SINGLE CASED WELL

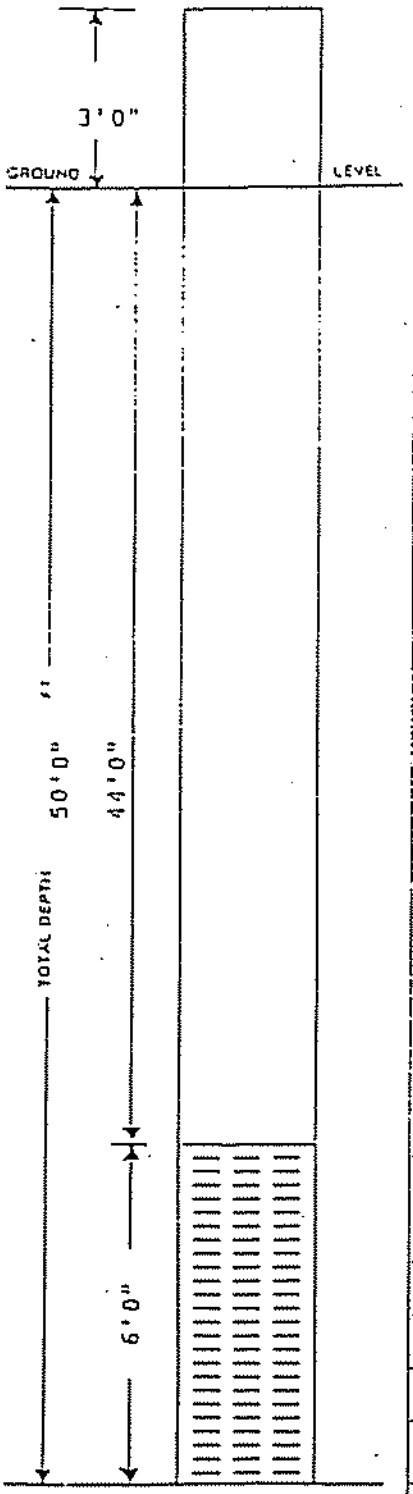


WELL LOG	FEET FROM GROUND SURFACE
Brown clay	0 to 5
Green silty clay	5- 34
Rocks & gravel	34- 45
Silty white clay	45- 83
Stones	83- 86
Green clay, hard	86- 96
Hard layers	96- 98
Clay	98-100
Silty clay	100-104
Green silty clay	104-113
Silty sand	113-116
Brown silty clay	116-120
Silty sand	120-135
Red & white clay hard	135-174
Silty sand	174-180
Clay hard	180-184
Sand hard white packed	184-195
Silty green clay	195-210
Blue clay, hard	210-215
Sand hard packed	215-219
Green silty clay	219-236
Green clay, hard	236-250
Weather Zone	250-255

NAME OF OWNER	Delaware Solid Wast
Location	Cherry Island,
Well No	P-106
State Permit	
Job No	19531
Test Hole Completed	Blew 1 Hou
Capacity (GPM)	5
Static Level	28.3
Pumping Level	
Datum	G.L.
Specific Capacity	
Diameter of Casing	4"
Depth of Well (Ground)	165'
Depth to Gravel	139'
Gravel Size	1
Length of Casing & Screen	167'
Screen Material	PVC
Screen Mfg.	
Screen Dia	4"
Length of Screen	10'0"
Top of Screen Fitting	Couple
Bottom of Screen Fitting	Cap
Slot Size	.010
Seal Material	Bentonite
Quantity	6 Bags
Depth of Seal Material	3-138
Drilling Machine	63
Date Well Completed	July 21, 1983
Driller	C. Kramer

A.C. SCHULTES & SONS, INC.

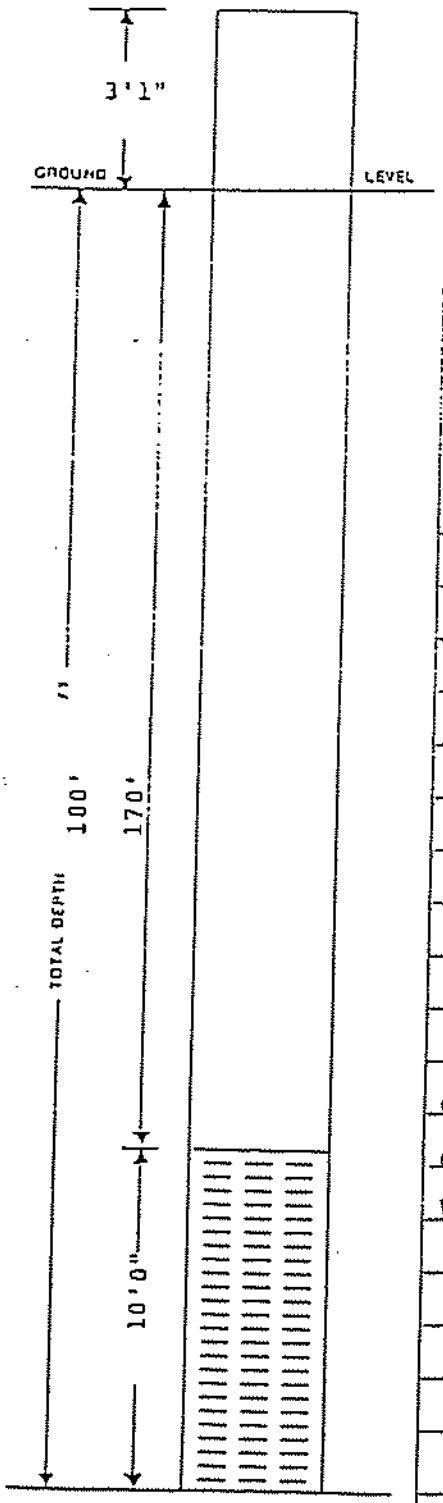
SINGLE CASED WELL



WELL LOG	FEET FROM GROUND SURFACE	NAME OF OWNER
Sand & fill	0 to 7	Delaware Solid Waste
Gray clay, soft	7 - 44	Location: Cherry Island, DE
Sand & gravel	44 - 52	Well No.: P-107
Weather zone	52 - 61	Date Drilled:
Red clay, hard	61	Job No.: 19531
		Test Pumped (hrs.): Blew 1 Hour
		Capacity (GPM): 30
		Static Level: 8'0"
		Pumping Level:
		Datum:
		Specific Capacity:
		Diameter of Casing: 4"
		Depth of Well (Ground): 50'0"
		Depth to Gravel: 39'0"
		Gravel Size: 1
		Length of Casing & Screen: 53'0"
		Screen Material: PVC
		Screen Mfg.:
		Screen Dia.: 4"
		Length of Screen: 6'0"
		Top of Screen Fitting: Couple
		Bottom of Screen Fitting: Cap
		Slot Size: .010
		Seal Material: Bentonite
		Quantity: 2 Bags
		Depth of Seal Material: 3-39
		Drilling Machine: 6B
		Date Well Completed: August 2, 1981
		Driller: C. Krammer

A.C. SCHULTES & SONS, INC.

SINGLE CASED WELL



WELL LOG	FEET FROM GROUND SURFACE	NAME OF OWNER
Brown clay	0 to 7	Delaware Solid Waste
Gray clay silty	7 - 30	Location Cherry Island, DE
Sand med white	30 - 31	Well No. P-108
Rocks & gravel	31 - 43	State Permit
Silty sand	43 - 55	Job No. 19531
Rocks	55 - 58	Test Pumping (hrs.) Blew 1 Hour
Silty sand	58 - 62	Capacity (GPM) 4
Sand med. white	62 - 85	Static Level 26.25
Silty sand, gravel	85 - 115	Pumping Level
Brown clay	115 - 127	Datum G.L.
Hard layer	127 - 128	Specific Capacity
Brown clay, hard	128 - 135	Diameter of Casing 4"
Yellow clay, hard	135 - 141	Depth of Well (Ground) 183'
White clay, hard	141 - 145	Depth to Gravel 160'
Silty sand	145 - 155	Gravel Size 1
Red, white clay	155 - 174	Length of Casing & Screen 180
Hard layers	174 - 175	Screen Material PVC
Red clay, hard	175 - 195	Screen Mfg
Cemented sand	195 - 202	Screen Dia. 4"
Green yellow clay	202 - 225	Length of Screen 10'0"
Weather zone	225 - 230	Top of Screen Fitting Couple
		Bottom of Screen Fitting Cap
		Slot Size .010
		Seal Material Bentonite
		Quantity 7 Bags
		Depth of Seal Material 3-160
		Drilling Machine 6B
		Date Well Completed July 18, 1983
		Driller C. Krammer

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Job No. 19531

FOUNDATION TESTING and SOIL SAMPLING RECORD

E: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

LE NO. G-1 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/7 To 7/8 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA				
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. 6" ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
0.0' 3.0'	Gray silt, some sand and organics	1	1.0' 2.5'	1-1 2	1.3'	Damp, soft
		2	5.0' 6.5'	2-2 2	1.3'	Damp, soft
3.0' 5.0'	Sand and gravel	U1	10.0' 12.0'		2.0'	Pushed Shelby
		V1	13.5'	Vane	Shear Test	
5.0' 15.0'	Gray silt with sand lenses and organics	3	15.0' 16.5'	WOH-1-1	1.5'	Moist, soft
		4	20.0' 21.5'	WOH-1 1	1.5'	Damp, soft
15.0' 35.0'	Gray silt with organics	5	25.0' 26.5'	WOH-WOH-1	1.5'	Damp, soft
		V2	28.0'	Vane	Shear Test	
35.0' 40.0'	Gray silty sand	6	30.0' 31.5'	WOH-1 3	1.5'	Damp, soft
		U2	35.0' 37.0'		2.0'	Pushed Shelby
40.0' 45.0'	Gray silty sand, trace gravel	7	40.0' 41.5'	5-16 19	1.5'	Moist, medium dense
		8	45.0' 46.5'	15-25 25	1.0'	Moist, dense
45.0' 51.5'	Gray sand with gravel	9	50.0' 51.5'	14-8 7	0.8'	Wet, medium dense

BLOWS ON CASING

0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE
6.75'	3:00	7/8

ater level before
gers pulled.

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP 30 INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER 140 LBS.
CASING SIZE _____ INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

TE: "Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller William Levering Jr.

Helper Ronald Dowdy

Helper _____

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Cherry Island
Job No. 19531

FOUNDATION TESTING and SOIL SAMPLING RECORD

E: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

LE NO. G-2 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/6 To 7/7 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6 IN SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS. REMARKS *
0.0' 3.0'	Brown silt	1	1.0' 2.5'	1-2 2	1.0'	Damp, soft
		2	5.0' 6.5'	1-0 1	0.6'	Damp, soft
3.0' 20.0'	Gray silt with organics	3	10.0' 11.5'	1-2 1	0.8'	Moist, soft
		U-1	15.0' 17.0'		2.0'	Pushed Shelby
20.0' 30.0'	Gray silt with sand lenses	V-1	18.5'	Vane Shear Test		
		4	20.0' 21.5'	1-1 2	1.5'	Damp, soft
30.0' 35.0'	Gray silt and peat	5	25.0' 26.5'	1-1 1	1.5'	Moistt, soft
		6	30.0' 31.5'	WOH-WOH-2	1.5'	Damp, soft
35.0' 39.0'	Gray sandy silt	7	35.0' 36.5'	1-4 5	1.5'	Damp, firm
		V-2	38.0'	Vane Shear Test		
39.0' 43.0'	Gray silt sand	8	40.0' 41.5'	7-12 14	1.5'	Moist, medium dense
		9	45.0'			Running sand, sample taken inside Auger Flight with permission of inspector.
43.0' 45.0'	Gray sand, trace gravel					

BLOWS ON CASING: 0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100, 100-101, 101-102

AUGERS

GROUND WATER DEPTH	HOUR	DATE
7'	5:00	7/7
Water level after augers pulled.		
Next day hole collapsed.		

PIPE AND CASING LEFT IN HOLE SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP 30 INCH
DRIVE HAMMER ____ LBS.
SPOON HAMMER 140 LBS.
CASING SIZE ____ INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT ____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc. at depth encountered.

Driller William Levering Jr.
Helper Ronald Dowdy
Helper

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Job No. 19531

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schlutes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP-3 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/5 To 7/11 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL (Based On Samples Recovered Plus Observation Of Material Returned Between Samples)	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS. REMARKS *	BLOWS ON CASING
0.0' 12.0'	Fill	1	0.0' 1.5'	2-3	1.3'		0-1 10; 1-2 10; 2-3 20; 3-4 25; 4-5 40; 5-6 45; 6-7 50; 7-8 55; 8-9 50; 9-10 52; 10-11 50; 11-12 55; 12-13 60; 13-14 65; 14-15 40; 15-16; 16-17; 17-18; 18-19; 19-20; 20-21; 21-22; 22-23; 23-24; 24-25; 25-26; 26-27; 27-28; 28-29; 29-30; 30-31; 31-32; 32-33; 33-34; 34-35; 35-36; 36-37; 37-38; 38-39; 39-40; 40-41; 41-42; 42-43; 43-44; 44-45; 45-46; 46-47; 47-48; 48-49; 49-50; 50-51
		2	5.0' 6.5'	1-2	1.5'		
12.0' 53.0'	Soft, silty marsh		7.0' 9.0'	Attempted Shelby Tube Sample— No recovery			
		U1	9.0' 11.0'		1.9'	Shelby Tube Sample	
53.0' 63.0'	Soft silt	3	11.0' 12.5'	3-3	1.5'		
		4	12.5' 14.0'	4-4	1.5'		
63.0' 92.5'	Sand, gravel - hard	U2	15.0' 17.0'		2.0'	Shelby Tube Sample	
		5	17.0' 18.5'	WOH	1.5'		
92.5' 11.5'	Medium clay, brown to red	V1	20.0'	Vane Shear Test			
		6	20.0' 21.5'	0-2	1.5'		
		U3	25.0' 27.0'		2.0'	Shelby Tube Sample	
		7	27.0' 28.5'	WOH	1.5'		
		U4	30.0' 32.0'		2.0'	Shelby Tube Sample	
		8	32.0' 33.5'	1-2	1.5'		
		V2	35.0'	Vane Shear Test			
		9	40.0' 41.5'	1-1	1.5'		
		10	45.0' 46.5'	5-4	1.5'		
		11	50.0' 51.5'	1-1	1.5'		
		12	55.0' 56.5'	2-5	1.5'		
		13	60.0' 61.5'	5-6	1.5'		

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4" PVC pipe	45.5'	Piezometer
4	Piezometer casing	

DISTANCE HAMMER DROP 30 INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE 5 INCH
SPOON SIZE 1 INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Doug Nelson
Helper George Gares
Helper _____

301

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NE: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

LE NO. GP-3 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/5 To 7/11 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
		14	65.0 66.5	28-50 40	1.0	
		15	70.0 71.5	50-50 48	1.0	
		16	75.0 76.5	54-57 55	0.8	
		17	80.0 81.5	28-58 106	No Rec.	Very big gravel
		18	85.0 86.5	16-28 30	No Rec.	Very big gravel
		19	90.0 91.5	100	No Rec.	Took wash samples
		20	95.0 96.5	6-7 6	No Rec.	
		21	100.0 101.5	11-14 20	No Rec.	

BLOWS ON CASIN	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

TE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock. Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Doug Nelson

Helper George Geres

Helper _____

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Job No. 19551

FOUNDATION TESTING and SOIL SAMPLING RECORD

IE: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

LE NO. GP3A SURFACE ELEVATION _____ RIG NO. ____ DATE: From 7/11 To 7/12 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
0.0' 9.0'	Fill, marsh					No Samples
9.0' 26.9'	Soft silt and marsh	V1	13.5'	Vane Shear Test		
		V2	25.0'	Vane Shear Test		

Casing to 10.0'

BLOWS ON CASING: 0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100, 100-101, 101-102

GROUND WATER		
DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE		
SIZE	AMOUNT	REASON
3/4"PVC	25.7'	Piezometer
pipe		
	1	Piezometer
	casing	

DISTANCE HAMMER DROP ____ INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER ____ LBS.
CASING SIZE 8 INCH
SPOON SIZE ____ INCH
SIZE OF CORE BIT ____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc.. at depth encountered.

Driller Doug Nelson

Helper George Gares

Helper _____

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Cherry Island
Job No. 19531

FOUNDATION TESTING and SOIL SAMPLING RECORD

E: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

LE NO. GP-4 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/8 To 7/13 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
0.0' 5.0'	Brown silt, trace organics	1	1.0' 2.5'	2-2 4	1.5'	Damp, firm
		2A	5.0' 5.5'	1	0.5'	Damp, soft
5.0' 5.5'	Gray silt with organics	2B	5.5' 6.5'	10-15	1.0'	Damp, medium dense
		3A	10.0' 11.0'	9-4	1.0'	Moist, medium dense
5.5' 11.0'	Gray sand with gravel	3B	11.0' 11.5'	1	0.5'	Damp, soft
		U1	15.0' 17.0'		2.0'	Pushed Shelby
11.0' 35.0'	Gray silt with organics	V1	18.5'	Vane	Shear	Test
		4	20.0' 21.5'	WOH-1-1	1.5'	Damp, soft
35.0' 35.5'	Gray silty sand	5	25.0' 26.5'	WOH-WOH WOH	1.5'	Damp, soft
		V2	28.0'	Vane	Shear	Test
35.5' 40.0'	Gray silt with sand lenses	U2	30.0' 32.0'		2.0'	Pushed Shelby
		6A	35.0' 35.5'	WOH	0.5'	Wet, soft
40.0' 55.0'	Gray silt with sand lenses and organics	6B	35.5' 36.5'	1-1	1.0'	Damp, soft
		V3	38.0'	Vane	Shear	Test
55.0' 58.0'	Pinkish-gray silt with trace of sand	7	40.0' 41.5'	WOH-WOH-2	1.5	Damp, soft
		8	45.0' 46.5'	2-2 2	1.5	Damp, soft
58.0' 59.0'	Gray silty sand with gravel	9	50.0' 51.5'	WOH-WOH-3	1.5	Damp, soft
		10	55.0' 56.5'	4-4 6	1.5	Damp, form
59.0' 74.0'	Pinkish-gray silty sand with gravel	11	58.5' 60.0'	24-21 30	1.2	Moist, dense
		12	64.0' 65.5'	13-35 22	1.0	Wet, dense

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

Blows to 55.0' BK Cobble to 11.0' Blows required

GROUND WATER

DEPTH	HOUR	DATE
20		7/14

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4 PVC	45.7	Piezometer
Pipe	4	
	1 piezometer	
	casing	

DISTANCE HAMMER DROP 24-30 INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE 2½ INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

TE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller William Levering Jr.
Helper Ronald Dowdy
Helper _____

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

E NO. GP-4 SURFACE ELEVATION _____ RIG NO. ____ DATE: From 7/8 To 7/13 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					
EPTH OM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
4.0' 9.0'	Brown-gray silty sand	13	69.0 20.5	21-24 24	0.9'	Wet, dense
		14	74.0 75.5	11-17 22	1.0'	Wet, dense
9.0' 4.0'	Gray silty sand with gravel	15	79.0 80.5	10-12 15	1.0'	Wet, medium dense
		16	84.0 85.5	9-12 15	0.9'	Wet, medium dense
4.0' 9.0'	Red-brown silty sand	17	89.0 90.5	19-13 12	0.9'	Wet, medium dense
		18	93.5 95.0	23-30 35	0.7'	Damp, dense
9.0' 0.5'	Red and gray clay	19	99.0 100.5	14-9 13	0.5'	Wet, 2nd attempt ~~medium dense~~
		20	104.0 105.5	15-8 10	0.7'	Damp, medium dense
		21	109.0 110.5	11-20 23	1.5'	Damp, stiff

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER		
DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE		
SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP ____ INCH
DRIVE HAMMER ____ LBS.
SPOON HAMMER ____ LBS.
CASING SIZE ____ INCH
SPOON SIZE ____ INCH
SIZE OF CORE BIT ____ INCH

TE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller William Levering Jr.

Helper Ronald Dowty

Helper _____

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Cassity Island
Job No. 19531

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP4A SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/14 To 7/14 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS. REMARKS *
0.0' 20.0'	Overburden		Non-Sample		Hole	
		V1	11.5'	Vane Shear Test		

BLOWS ON CASING

0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

Auger

GROUND WATER

DEPTH	HOUR	DATE
16'		7/14

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4"PVC	17.2'	Piezometer
None		
"	1	Piezometer
	Casing	

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller William Lewering Jr.
Helper Ronald Dowdy
Helper _____

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Cherry Island, Pa.
Job No. 19551

FOUNDATION TESTING and SOIL SAMPLING RECORD

E: A.C.Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

LE NO. GP-5 SURFACE ELEVATION _____ RIG NO. ____ DATE: From 7/12 To 7/18 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA				
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FOOT 6" SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
0.0 10.0'	Fill, silt	1	0.0 1.5	2-3 4	1.5'	
		2	5.0 6.5	2-2 2	1.5'	
10.0' 63.0'	Soft silt	3	10.0 11.5'	1-1 1	1.5'	
		4	15.0 16.5'	1-1 1	1.5'	
63.0' 115.0'	Sand and gravel	U1	20.0' 22.0'		2.0' Shelby Tube Sample	
		V1	23.5'	Vane Shear Test		
115.0' 118.5'	Red clay	5	25.0' 26.5'	WOH	1.5'	
		U2	30.0' 32.0'		2.0' Shelby Tube Sample	
		V2	33.5'	Vane Shear Test		
		6	35.0' 36.5'	WOH	1.5'	
		7	40.0' 41.5'	WOH	1.4'	
		V3	43.5'	Vane Shear Test		
		8	45.0' 46.5'	1-2 3	1.5'	
		9	50.0' 51.5'	1-1 2	1.5'	
		10	55.0' 56.5'	0-1 0	1.5'	
		11	60.0' 61.5'	1-1 2	1.5'	
		12	65.0' 66.5'	16-35 65	1.0'	
		13	70.0' 70.5'	32-40 40	0.8'	
		14	75.0' 76.5'	31-50 50	1.0'	
		15	80.0' 81.0'	75-75	0.5'	

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4" PVC pipe	30.1'	Piezometer
	1 Piezometer	
	casing	

DISTANCE HAMMER DROP 30 INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE 6 INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

TE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Doug Nelson
Helper George Gamas
Helper _____

301

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

E: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

LE NO. CP-5 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/13 To 7/18 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS. REMARKS *
		16	85.0 86.5	21-29 37	1.0	Used 300 lb. hammer
		17	90.0 91.5	18-17 20	1.0	
		18	95.0 96.5	30-20 21	1.0	
		19	100.0 101.5	13-15 17	0.6	
		20	105.0 106.5	17-17 16	1.0	
		21	110.0 111.5	16-25 24	1.0	
		22	115.5 117.0	34-22 16	1.5	
		23	117.0 118.5	9-22 30	1.5	

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

E: "Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Doug Nelson

Helper George Geras

Helper _____

SPRAGUE & HENWOOD, Inc
SCRANTON, PA.

Job Order No. 19551

FOUNDATION TESTING and SOIL SAMPLING RECORD

E: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

E NO. G25A SURFACE ELEVATION _____ RIG NO. ____ DATE: From 7/18 To 7/19 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS ON CASING
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *	0-1 / 1-2 / 2-3 / 3-4 / 4-5 / 5-6 / 6-7 / 7-8 / 8-9 / 9-10 / 10-11 / 11-12 / 12-13 / 13-14 / 14-15 / 15-16 / 16-17 / 17-18 / 18-19 / 19-20 / 20-21 / 21-22 / 22-23 / 23-24 / 24-25 / 25-26 / 26-27 / 27-28 / 28-29 / 29-30 / 30-31 / 31-32 / 32-33 / 33-34 / 34-35 / 35-36 / 36-37 / 37-38 / 38-39 / 39-40 / 40-41 / 41-42 / 42-43 / 43-44 / 44-45 / 45-46 / 46-47 / 47-48 / 48-49 / 49-50 / 50-51
0.0' 10.0'	Fill, silt						
10.0' 30.8'	Soft silt	U-1	15.0' 17.0'		2.0'	Shelby Tube Sample	
		V1	18.5'	Vane		Shear Test	
		V2	28.5'	Vane		Shear Test	

GROUND WATER			PIPE AND CASING LEFT IN HOLE		
DEPTH	HOUR	DATE	SIZE	AMOUNT	REASON
			3/4"PVC Pipe	27.6'	Piezometer
				1	Piezometer
					Casing

DISTANCE HAMMER DROP ____ INCH
DRIVE HAMMER ____ LBS.
SPOON HAMMER ____ LBS.
CASING SIZE ____ INCH
SPOON SIZE ____ INCH
SIZE OF CORE BIT ____ INCH

TE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Doug Nelson
Helper George Gates
Helper

301

Cherry Island

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP-6 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/10 To 8/12 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	Sample RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
0.0' 30.0'	Gray organic silt	1	5.0' 6.5'	Push	1.5'	
		2	10.0' 11.5'	Push	0.5'	
30.0' 35.0'	Gray silt (sandy)	U5	15.0' 17.0'		2.0'	Shelby Tube
		4	20.0' 21.5'	Push	1.5'	
35.0' 50.0'	Gray silt	U6	25.0' 27.0'		2.0'	Shelby Tube
		6	30.0' 31.5'	5-4 4	1.2'	
50.0' 55.5'	Gray silt and peat	7	35.0' 36.5'	2-1 1	1.5'	
55.5' 60.0'	Clayey silt	U8	40.0' 42.0'		2.0'	Shelby Tube
		9	45.0' 46.5'	Push	1.5'	
60.0' 75.5'	Sand and gravel					
		10	50.0' 51.5'	2-2 4	1.5'	
		11	55.0' 56.5'	5-6 8	1.5'	
		12	60.0' 61.5'	10-21 55	1.5'	
		13	66.0' 67.5'	21-35 36	0.6'	Used 300 lb. hammer
		14	71.0' 72.5'	18-25 20	0.25'	Used 300 lb. hammer
			75.5'	Refusal 100 blows		Used 300 lb. hammer

BLOWS ON CASING

0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE
100 of ground		

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4"	42.2'	Piezometer
		Point

DISTANCE HAMMER DROP 24-30 INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE _____ INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Carl Ward

Helper Ronald Dowdy

Helper George Geres

301

Contract # 19991
Cherry Island

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP-6A SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/15 To 8/15 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS. REMARKS *
0.0' 30.0'	Grey organic silt		No Samples Required			
			20.5' - Took Vane Shear Test (Bottom of Vane)			

BLOWS ON CASING			
0-1		51-52	
1-2		52-53	
2-3		53-54	
3-4		54-55	
4-5		55-56	
5-6		56-57	
6-7		57-58	
7-8		58-59	
8-9		59-60	
9-10		60-61	
10-11		61-62	
11-12		62-63	
12-13		63-64	
13-14		64-65	
14-15		65-66	
15-16		66-67	
16-17		67-68	
17-18		68-69	
18-19		69-70	
19-20		70-71	
20-21		71-72	
21-22		72-73	
22-23		73-74	
23-24		74-75	
24-25		75-76	
25-26		76-77	
26-27		77-78	
27-28		78-79	
28-29		79-80	
29-30		80-81	
30-31		81-82	
31-32		82-83	
32-33		83-84	
33-34		84-85	
34-35		85-86	
35-36		86-87	
36-37		87-88	
37-38		88-89	
38-39		89-90	
39-40		90-91	
40-41		91-92	
41-42		92-93	
42-43		93-94	
43-44		94-95	
44-45		95-96	
45-46		96-97	
46-47		97-98	
47-48		98-99	
48-49		99-100	
49-50		100-101	
50-51		101-102	

GROUND WATER

DEPTH	HOUR	DATE
Top of	Ground	

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4"	29.6'	Piezometer
		Point

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Carl Ward
Helper Ronald Dowdy
Helper George Gares

301

Cherry Island

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

AME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

OLE NO. GP-7 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/16 To 8/19 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS ON CASING
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	Sample D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE / RECOV'D	CORE RECOV'D — NO. PCS. REMARKS *	0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51 / 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100, 100-101, 101-102
0.0' 47.0'	Gray organic silt	1	5.0' 6.5'	Push	1.5'		
		2	10.0' 11.5'	Push	1.5'		
47.0' 60.0'	Gray sandy silt	3	15.0' 16.5'	Push	1.5'		
		U4	20.0' 22.0'		2.0'	Shelby Tube	
60.0' 111.5'	Sand and gravel	5	25.0' 26.5'	Push	1.5'		
		U6	30.0' 32.0'		2.0'	Shelby Tube	
111.5' 113.0'	Red clay	7	35.0' 36.5'	Push	1.5'		
			37.5'	- Vane Shear Test			
		8	40.0' 41.5'	Push	1.5'		
		U9	45.0' 47.0'		2.0'	Shelby Tube	
			48.5'	- Vane Shear Test			
		10	50.0' 51.5'	1-2 3	1.5'		
		U11	55.0' 57.0'		2.0'	Shelby Tube	
		12	60.0' 61.5'	34-41 38	1.5'		
		13	65.5' 67.0'	23-19 12		Used 300 lb. hammer	
			Lost sample, drove spoon to 68.0', recovered sample				
			At 70- recovered wash sample				
			81.0' 82.5'	26-22 23		Used 300 lb. hammer	
			Lost sample - recovered wash				
		14	86.0' 87.5'	28-25 20		Used 300 lb. hammer	

GROUND WATER

DEPTH	HOUR	DATE
top of ground		

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4"	45.0'	Piezometer
		Point

DISTANCE HAMMER DROP 24-30 INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE _____ INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

OTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Carl Ward

Helper Ronald Dowdy

Helper _____

301

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington Delaware

HOLE NO. GP-7 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/16 To 8/19 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	RECOV'D	REMARKS *
		15	91.0' 92.5'	10-8 7		Used 300 lb. hammer
			Lost sample- recovered wash			
		16	96.0' 97.5'	37-35 45	0.25'	Used 300lb. hammer
		17	101.0' 102.5'	32-39 45	0.3'	Used 300 lb. hammer
		18	106.0' 107.5'	25-15 13	0.3'	Used 300 lb. hammer
			111.5' 113.0'	Drilled with roller bit		
				hit red clay at 111.5' to 113.0'		
						1/2 Hour delay time
						backfill in Marsh section.

Sample: D=DRY U=UNDISTURBED T=TRAP W=WASH R=RQD C=CORE

CORE RECOV'D — NO. PCS.

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft, seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Carl Ward

Helper Ronald Dowdy

Helper George Geres

Cherry Island

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP7A SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/22 To 8/22 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA				
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
0.0' 26.5'	Gray organic silt		No SampleS Required			
			16.5' - Took Vane Shear Test (Bottom of Vane)			
			26.5' - Took Vane Shear Test (Bottom of Vane)			

BLOWS ON CASING			
0-1	Sly Cobble to 15.0' Mobbed to Bit to 25.0'	51-52	
1-2		52-53	
2-3		53-54	
3-4		54-55	
4-5		55-56	
5-6		56-57	
6-7		57-58	
7-8		58-59	
8-9		59-60	
9-10		60-61	
10-11		61-62	
11-12		62-63	
12-13		63-64	
13-14		64-65	
14-15		65-66	
15-16		66-67	
16-17		67-68	
17-18		68-69	
18-19		69-70	
19-20		70-71	
20-21		71-72	
21-22		72-73	
22-23		73-74	
23-24		74-75	
24-25		75-76	
25-26		76-77	
26-27		77-78	
27-28		78-79	
28-29		79-80	
29-30		80-81	
30-31		81-82	
31-32		82-83	
32-33		83-84	
33-34		84-85	
34-35		85-86	
35-36		86-87	
36-37		87-88	
37-38		88-89	
38-39		89-90	
39-40		90-91	
40-41		91-92	
41-42		92-93	
42-43		93-94	
43-44		94-95	
44-45		95-96	
45-46		96-97	
46-47		97-98	
47-48		98-99	
48-49		99-100	
49-50		100-101	
50-51		101-102	

GROUND WATER		
DEPTH	HOUR	DATE
Top of ground		

PIPE AND CASING LEFT IN HOLE		
SIZE	AMOUNT	REASON
3/4"	21.0'	Piezometer Point

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE DW INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground

Driller Carl Ward

Helper Ronald Dowdy

Helper George Gares

301

Contract # [illegible]
Cherry Island

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

AME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

OLE NO. GP-8 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/23 To 8/25 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA				
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. 6" XX ON SAMPLES	Sample: DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; ~~RECOV'D~~ CORE RECOV'D — NO. PCS.	REMARKS *
0.0' 40.0'	Gray organic silt	1	5.0' 6.5'	Push	1.5'	
		2	10.0' 11.5'	Push	1.5'	
40.0' 70.0'	Gray silt with sand lenses	3	15.0' 16.5'	Push	1.5'	
		4	20.0' 21.5'	Push	1.5'	
70.0' 73.0'	Clayey silt	U5	25.0' 27.0'		2.0'	Shelby Tube
		6	30.0' 31.5'	Push	1.5'	
73.0' 94.5'	sand and gravel		33.0'	- Vane Shear Test		
		U7	35.0' 37.0'		2.0'	Shelby Tube
94.5' 98.0'	Red clay	8	40.0' 41.5'	6-1 2	1.5'	
			43.0'	- Vane Shear Test		
		U9	45.0' 47.0'		2.0'	Shelby Tube
		10	50.0' 52.0'	Dropped rods and spoon 50.0' to 51.0' 4-2	1.5'	
		U11	55.0' 57.0'		2.0'	Shelby Tube
			58.5'	- Vane Shear Test		
		12	60.0' 62.0'	Pushed 60.0' to 61.0' 6-3	2.0'	
		13	65.0' 66.5'	2-1 3	1.5'	
		14	70.0' 71.5'	3-5 7	1.5'	
		15	80.0' 81.5'	13-15 20	0.7'	Used 300 lb. hammer
		16	86.0' 87.5'	9-15 18	0.0'	Used 300lb. hammer Lost sample

BLOWS ON CASING

0-1		51-52	
1-2		52-53	
2-3	SW Casing to 15.0'	53-54	
3-4		54-55	
4-5		55-56	
5-6		56-57	
6-7		57-58	
7-8		58-59	
8-9		59-60	
9-10		60-61	
10-11		61-62	
11-12		62-63	
12-13		63-64	
13-14		64-65	
14-15		65-66	
15-16	NW Casing to 95.0'	66-67	
16-17		67-68	
17-18		68-69	
18-19		69-70	
19-20		70-71	
20-21		71-72	
21-22		72-73	
22-23		73-74	
23-24		74-75	
24-25		75-76	
25-26		76-77	
26-27		77-78	
27-28		78-79	
28-29		79-80	
29-30		80-81	
30-31		81-82	
31-32		82-83	
32-33		83-84	
33-34		84-85	
34-35		85-86	
35-36		86-87	
36-37		87-88	
37-38		88-89	
38-39		89-90	
39-40		90-91	
40-41		91-92	
41-42		92-93	
42-43		93-94	
43-44		94-95	
44-45		95-96	
45-46		96-97	
46-47		97-98	
47-48		98-99	
48-49		99-100	
49-50		100-101	
50-51		101-102	

GROUND WATER

DEPTH	HOUR	DATE
Top of ground		

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4"	47.8'	Piezometer Point

DISTANCE HAMMER DROP 2[illegible] INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE SW-NW INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Carl Ward

Helper Ronald Dowdy

Helper George Gates

301

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP-8 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/23 To 8/25 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	Sample D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE / ROCK CORE RECOV'D	CORE RECOV'D — NO. PCS. REMARKS *	
		17	91.0 92.5	13-58 15	0.25	Used 300 lb. hammer	
		18	96.5 98.0	7-14 17	1.5	Used 300 lb. hammer	

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground

Driller Carl Ward

Helper Ronald Dowdy

Helper George Gares

Cherry Island

301

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP8A SURFACE ELEVATION _____ RIG NO. ____ DATE: From 8/26 To 8/26 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS ON CASING	
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS. REMARKS *	0-1	51-52
0.0' 25.0'	Grey organic silt		No Samples Required				1-2	52-53
							2-3	53-54
							3-4	54-55
							4-5	55-56
							5-6	56-57
							6-7	57-58
							7-8	58-59
							8-9	59-60
							9-10	60-61
							10-11	61-62
							11-12	62-63
							12-13	63-64
							13-14	64-65
							14-15	65-66
							15-16	66-67
							16-17	67-68
							17-18	68-69
							18-19	69-70
							19-20	70-71
							20-21	71-72
							21-22	72-73
							22-23	73-74
							23-24	74-75
							24-25	75-76
							25-26	76-77
							26-27	77-78
							27-28	78-79
							28-29	79-80
							29-30	80-81
							30-31	81-82
							31-32	82-83
							32-33	83-84
							33-34	84-85
							34-35	85-86
							35-36	86-87
							36-37	87-88
							37-38	88-89
							38-39	89-90
							39-40	90-91
							40-41	91-92
							41-42	92-93
							42-43	93-94
							43-44	94-95
							44-45	95-96
							45-46	96-97
							46-47	97-98
							47-48	98-99
							48-49	99-100
							49-50	100-101
							50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE
Ground surface		

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4"	16.7'	Piezometer Point

DISTANCE HAMMER DROP ____ INCH
DRIVE HAMMER ____ LBS.
SPOON HAMMER ____ LBS.
CASING SIZE SW INCH
SPOON SIZE ____ INCH
SIZE OF CORE BIT ____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Carl Ward
Helper Ronald Dowdy
Helper George Gares

301

Contract # 19321
Cherry Island

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP-9 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/30 To 9/2 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	RECOV'D	REMARKS* (Sample: D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS.)
0.0' 38.0'	Gray organic silt	1	5.0' 6.5'	Push	1.5'	
		2	10.0' 11.5'	Push	1.5'	
38.0' 60.0'	Gray sandy silt	3	15.0' 16.5'	Push	1.5'	
		U4	20.0' 22.5'		2.5'	Shelby Tube
60.0' 60.5'	Fine silty sand	U5	25.0' 27.0'		2.0'	Shelby Tube
		6	30.0' 31.5'	Push	1.5'	
60.5' 94.0'	Sand and gravel		33.0'	- Vane Shear Test		
		U7	35.0' 37.0'		2.0'	Shelby Tube
94.0' 100.5'	Brown sand and traces of clay	U8	40.0' 42.0'		1.8'	Shelby Tube
			43.5'	- Vane Shear Test		
		9	45.0' 46.5'	3-2 2	1.5'	Tried Shelby tube 50.0' - 52.0', lost sample
		U10	52.0' 54.0'		1.0'	Shelby Tube
			55.5'	- Vane Shear Test		
		11	60.0' 61.5'	3-23 43	1.5'	
		12	66.0' 67.5'	14-16 20	0.3'	Used 300 lb. hammer
		13	76.0' 77.5'	40-55 60	0.4'	Used 300 lb. hammer
	1 Hour delay time- backfill marsh section.	14	86.0' 87.5'	33-43 49	0.4'	Used 300 lb. hammer
		15	92.0' 93.5'	20-14 17	No Rec.	Used 300 lb. hammer Lost Sample
		16	99.0' 100.5'	17-20 23		Lost sample, picked up sample with trap. Used 300 lb. hammer.

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

Sw Casing to 13.0', NT Casing to 95.0', NT Casing to 98.0'

GROUND WATER

DEPTH	HOUR	DATE
Top of Ground		

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4	49.0'	Piezometer Point

DISTANCE HAMMER DROP 24-30 INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE 3" INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seams or broken Rock, Caving, Cavities, unusual Ground

Driller Carl Ward

Helper Ronald Dowdy

301

Contract # 19551
Cherry Island

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP9A SURFACE ELEVATION _____ RIG NO. _____ DATE: From 9/2 To 9/6 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS ON CASING
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	O=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *	
0.0' 26.5'	Gray organic silt		No Samples		Required		
			16.5'	- Vane Shear Test			
			26.5'	- Vane Shear Test			

BW Casing to 15.0'

0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE
Top of ground		

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4"	22.4	Piezometer Point

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Carl Ward
Helper Ronald Dowdy
Helper George Gares

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Chesapeake Ashland
Job No. 19531

FOUNDATION TESTING and SOIL SAMPLING RECORD

A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

E NO. G-10 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/15 To 7/18 19 83

BORING LOG: DEPTH ON—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS. REMARKS *
0.0' 20.0'	Gray silt with organics	1	1.0' 2.5'	1-0 1	1.0'	Damp, soft
		U1	5.0' 7.0'		2.0'	Pushed Shelby
20.0' 25.0'	Gray silt with sand lenses and organics	V1	8.5'	Vane	Shear	Test
		2	10.0' 11.5'	WOH-WOH WOH	1.5'	Moist, soft
25.0' 30.0'	Gray silt with organics	V2	13.0'	Vane	Shear	Test
		3	15.0' 16.5'	1-0 1	1.5'	Moist, soft
30.0' 32.0'	Brown peat	V3	18.0'	Vane	Shear	Test
		4	20.0' 21.5'	1-1 1	1.5'	Moist, soft
.0' 61.0'	Gray silt with organics	5	25.0' 26.5'	WOH-WOH-1	1.5'	Moist, soft
		V4	28.0'	Vane	Shear	Test
61.0' 75.0'	Gray silty sand, trace gravel		Attempted Shelby Tube Sample- recovery- 10.7			
		U2	35.0' 37.0'		2.0'	Pushed Shelby
75.0' 79.0'	Orange-brown and brown silt, some sand	V5	38.5'	Vane	Shear	Test
		6	40.0' 41.5'	WOH-WOH-2	1.5	Damp, soft
79.0' 81.5'	Orange-brown and gray sand, little silt	7	45.0' 46.5'	WOH-WOH WOH	1.5	Damp, soft
		8	50.0' 51.5'	WOH-WOH WOH	1.5'	Damp, soft
		9	55.0' 56.5'	WOH-2-2	1.5'	Damp, soft
		10A	60.0' 61.0'	1-2	1.0'	Damp, soft
		10B	61.0' 61.5'	5	0.25'	Moist, medium dense
		11	65.0' 66.5'	13-15 16	0.75'	Moist, dense

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

Augerhole to 50.0' Cap'ing to 30.0' Hole Grouted

GROUND WATER

DEPTH	SOUNDED	DATE
ter level before ers pulled		

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP 24-30 INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE 5x INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground

Driller William Levering Jr.
Helper Ronald Dowdy
Helper

301

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. G10 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/15 To 7/18 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS. REMARKS *
		12	70.0' 71.6'	16-17 13	0.7	Moist, dense
		13	75.0' 76.5'	12-6 8	1.1	Moist, firm second attempt
		14	80.0' 81.5'	9-12 10	1.5	Moist, medium dense

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc. at depth encountered.

Driller William Levering Jr.

Helper Ronald Dowdy

Helper _____

301

Contract # 1991
Cherry Island

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP-11 SURFACE ELEVATION _____ RIG NO. ____ DATE: From 9/6 To 9/12 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	Sample RECOV'D	CORE RECOV'D — NO. PCS. REMARKS* (D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE)
0.0' 55.0'	Grey organic silt	1	5.0' 6.5'	Push	1.5'	
		2	10.0' 11.5'	Push	1.5'	
55.0' 62.5'	Grey sandy silt	3	15.0 16.5	Push	1.5'	
		4	20.0 21.5	Push	1.5'	
62.5' 116.5'	Sand and gravel	U5	25.0 27.0		1.8'	Shelby Tube
		6	30.0 31.5	Push	1.5'	
116.5' 120.0'	Red and white clay	7	35.0 36.5	Push	1.5'	
			38.0	- Vane Shear Test		
		U8	40.0 42.0		2.0'	Shelby Tube
		9	45.0 46.5	5-5 4	1.5'	
			48.0	- Vane Shear Test		
		U10	50.0 52.0		2.0'	Shelby Tube
		11	55.0 56.5	WOR-5 5	1.5'	
		12	60.0 61.5	3-2 4	1.5'	
		13	65.0 66.5	20-28 38	0.4'	Used 300 lb. hammer
		14	76.0 77.5	24-28 20		Used 300 lb. hammer Lost sample, recovered wash sample.
		15	81.0 82.5	80-60 65	No Rec.	Used 300 lb. hammer
		16	86.5 88.5	33-38 28-70	No Rec.	Used 300 lb. hammer
			96.0			Tried to sample, couldn't get spoon out of casing

BLOWS ON CASING	
0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

0' - 15' 5" Casing
15' - 116' 4" Casing
116' - 117' 3" Casing

GROUND WATER

DEPTH	HOUR	DATE
1.5'	2:00PM	9/12

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON
3/4	67.7	Piezometer Point

DISTANCE HAMMER DROP 24-30 INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE 5"-4" INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seam or broken Rock, Caving, Cavities, unusual Ground

Driller Carl Ward
Helper Ronald Dowdy
Helper James Dowdy

301

SPRAGUE & HENWOOD, Inc
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

AME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

OLE NO. CP-11 SURFACE ELEVATION _____ RIG NO. ____ DATE: From 9/6 To 9/12 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS ON CASING	
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	~~RQD~~ RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *	0-1	51-52
			96.0' 120.0'			Drilled ahead of casing with roller bit. Hit red and white clay at 116.5' to 120.0'	1-2	52-53
							2-3	53-54
							3-4	54-55
							4-5	55-56
							5-6	56-57
							6-7	57-58
							7-8	58-59
							8-9	59-60
							9-10	60-61
							10-11	61-62
							11-12	62-63
							12-13	63-64
						48.1' of granular soil backfill.	13-14	64-65
							14-15	65-66
							15-16	66-67
							16-17	67-68
							17-18	68-69
							18-19	69-70
							19-20	70-71
							20-21	71-72
							21-22	72-73
							22-23	73-74
							23-24	74-75
							24-25	75-76
							25-26	76-77
							26-27	77-78
							27-28	78-79
							28-29	79-80
							29-30	80-81
							30-31	81-82
							31-32	82-83
							32-33	83-84
							33-34	84-85
							34-35	85-86
							35-36	86-87
							36-37	87-88
							37-38	88-89
							38-39	89-90
							39-40	90-91
							40-41	91-92
							41-42	92-93
							42-43	93-94
							43-44	94-95
							44-45	95-96
							45-46	96-97
							46-47	97-98
							47-48	98-99
							48-49	99-100
							49-50	100-101
							50-51	101-102

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

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Driller Carl Ward

Helper Ronald Dowdy

Helper James Dowdy

301

Cherry Island

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP-12 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 9/15 To 9/20 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS ON CASING
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	Sample D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE / ~~PORT CORE~~ RECOV'D	CORE RECOV'D — NO. PCS. REMARKS *	
0.0' 45.0'	Gray organic silt	1	5.0' 6.5'	Push	1.5'		
		2	10.0' 11.5'	Push	1.5'		
45.0' 50.0'	Gray silt with sand layers	3	15.0' 16.5'	Push	1.5'		
		U4	20.0' 22.0'		1.7'	Shelby Tube	
50.0' 51.0'	Sand, some gravel	5	25.0' 26.5'	Push	1.5'		
		U6	30.0' 32.0'		2.0'	Shelby Tube	
51.0' 89.0'	Gray sandy silt	7	35.0' 36.5'	Push	1.5'		
		8	40.0' 41.5'	Push-1' 4	1.5'		
89.0' 117.0'	Sand and gravel	U9	45.0' 47.0'		2.0'	Shelby Tube	
			48.0'	- Vane Shear Test			
117.0' 120.0'	Gray medium sand	10	50.0' 51.5'	17-12 8	1.2'		
		11	55.0' 56.5'	2-2 4	No Rec.		
		U12	60.0' 62.0'		2.0'	Shelby Tube	
		13	65.0' 66.5'	4-8 7	1.5'		
		14	70.0' 71.5'	4-3 5	1.5'		
		15	75.0' 76.5'	2-1 3	1.5'		
		16	80.0' 81.5'	5-5 6	1.5'		
		17	85.0' 86.5'	4-4 6	1.5'		
		18	89.0' 90.5'	17-14 17	1.5'	Used 300 lb. hammer	

BLOWS ON CASING		
0-1	SW Casing to 15.0', NX Casing to 100.0', used mud 100.0' to 120.0'	51-52
1-2		52-53
2-3		53-54
3-4		54-55
4-5		55-56
5-6		56-57
6-7		57-58
7-8		58-59
8-9		59-60
9-10		60-61
10-11		61-62
11-12		62-63
12-13		63-64
13-14		64-65
14-15		65-66
15-16		66-67
16-17		67-68
17-18		68-69
18-19		69-70
19-20		70-71
20-21		71-72
21-22		72-73
22-23		73-74
23-24		74-75
24-25		75-76
25-26		76-77
26-27		77-78
27-28		78-79
28-29		79-80
29-30		80-81
30-31		81-82
31-32		82-83
32-33		83-84
33-34		84-85
34-35		85-86
35-36		86-87
36-37		87-88
37-38		88-89
38-39		89-90
39-40		90-91
40-41		91-92
41-42		92-93
42-43		93-94
43-44		94-95
44-45		95-96
45-46		96-97
46-47		97-98
47-48		98-99
48-49		99-100
49-50		100-101
50-51		101-102

GROUND WATER

DEPTH	HOUR	DATE
1	8:00 AM	9/20

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP 24-30 INCH
DRIVE HAMMER 300 LBS.
SPOON HAMMER 140 LBS.
CASING SIZE SW-NX INCH
SPOON SIZE 2 INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Carl Ward

Helper Ronald Dowdy

Helper James Dowdy

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. GP-12 SURFACE ELEVATION _____ RIG NO. ____ DATE: From 9/15 To 9/20 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS ON CASING	
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER 6" ON SAMPLES	Sample RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *	0-1	51-52
							1-2	52-53
							2-3	53-54
							3-4	54-55
							4-5	55-56
		19	102.0 104.0	10-20 17-13	0.3'	Used 300 lb. hammer	5-6	56-57
							6-7	57-58
		20	114.0 116.0	14-18 25-20	0.2'	Used 300 lb. hammer	7-8	58-59
							8-9	59-60
		21	117.0 120.0	14-18-24 26-26-27	1.5'	Used 300 lb. hammer	9-10	60-61
							10-11	61-62
							11-12	62-63
							12-13	63-64
							13-14	64-65
							14-15	65-66
							15-16	66-67
							16-17	67-68
							17-18	68-69
							18-19	69-70
							19-20	70-71
							20-21	71-72
							21-22	72-73
							22-23	73-74
							23-24	74-75
							24-25	75-76
							25-26	76-77
							26-27	77-78
							27-28	78-79
							28-29	79-80
							29-30	80-81
							30-31	81-82
							31-32	82-83
							32-33	83-84
							33-34	84-85
							34-35	85-86
							35-36	86-87
							36-37	87-88
							37-38	88-89
							38-39	89-90
							39-40	90-91
							40-41	91-92
							41-42	92-93
							42-43	93-94
							43-44	94-95
							44-45	95-96
							45-46	96-97
							46-47	97-98
							47-48	98-99
							48-49	99-100
							49-50	100-101
							50-51	101-102

GROUND WATER		
DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE		
SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Carl Ward

Helper Ronald Dowdy

Helper James Dowdy

301

Cherry Island

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

AME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

OLE NO. AB-1 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/31 To 8/31 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS ON CASING
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *	
0.0' 15.0'	Gray river silt	1	0.0' 5.0'			Took samples from	
		2	5.0' 10.0'			Auger Flight	
		3	10.0' 15.0'				

BLOWS ON CASING		
0-1	Auger	51-52
1-2		52-53
2-3		53-54
3-4		54-55
4-5		55-56
5-6		56-57
6-7		57-58
7-8		58-59
8-9		59-60
9-10		60-61
10-11		61-62
11-12		62-63
12-13		63-64
13-14		64-65
14-15		65-66
15-16		66-67
16-17		67-68
17-18		68-69
18-19		69-70
19-20		70-71
20-21		71-72
21-22		72-73
22-23		73-74
23-24		74-75
24-25		75-76
25-26		76-77
26-27		77-78
27-28		78-79
28-29		79-80
29-30		80-81
30-31		81-82
31-32		82-83
32-33		83-84
33-34		84-85
34-35		85-86
35-36		86-87
36-37		87-88
37-38		88-89
38-39		89-90
39-40		90-91
40-41		91-92
41-42		92-93
42-43		93-94
43-44		94-95
44-45		95-96
45-46		96-97
46-47		97-98
47-48		98-99
48-49		99-100
49-50		100-101
50-51		101-102

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE Auger INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seam or broken Rock, Caving, Cavities, unusual Ground

Driller Joseph Dowdy

Helper James Dowdy

Helper William Levering

301

Contract No. 19991
Cherry Island

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. A3-2 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/31 To 8/31 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
0.0' 15.0'	Gray river silt	1	0.0' 5.0'			Took samples from
		2	5.0' 10.0'			Auger Flights
		3	10.0' 15.0'			

BLOWS ON CASING		
0-1		51-52
1-2		52-53
2-3		53-54
3-4		54-55
4-5		55-56
5-6		56-57
6-7		57-58
7-8		58-59
8-9		59-60
9-10		60-61
10-11		61-62
11-12		62-63
12-13		63-64
13-14		64-65
14-15		65-66
15-16		66-67
16-17		67-68
17-18		68-69
18-19		69-70
19-20		70-71
20-21		71-72
21-22		72-73
22-23		73-74
23-24		74-75
24-25		75-76
25-26		76-77
26-27		77-78
27-28		78-79
28-29		79-80
29-30		80-81
30-31		81-82
31-32		82-83
32-33		83-84
33-34		84-85
34-35		85-86
35-36		86-87
36-37		87-88
37-38		88-89
38-39		89-90
39-40		90-91
40-41		91-92
41-42		92-93
42-43		93-94
43-44		94-95
44-45		95-96
45-46		96-97
46-47		97-98
47-48		98-99
48-49		99-100
49-50		100-101
50-51		101-102

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE Auger INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller Joseph Dowdy
Helper James Dowdy
Helper William Levering

301

Cherry Island

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. AB-3 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 8/31 To 8/31 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS ON CASING
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *	0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100, 100-101, 101-102
0.0' 15.0'	Gray river silt	1	0.0' 5.0'			Took samples from	
		2	5.0' 10.0'			Auger Flights	
		3	10.0' 15.0'				

Auger

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE Auger INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: "Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground

Driller Joseph Dowdy

Helper James Dowdy

... William Levering

30b

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Cherry Island
Job Order No. 19531

FOUNDATION TESTING and SOIL SAMPLING RECORD

...: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

LE NO. AB-4 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/5 To 7/5 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
0.0' 5.0'	Gray silt	1	0.0' 5.0'			Damp
		2	5.0' 10.0'			Moist
		3	10.0' 15.0'			Moist
						NOTE: Samples taken off Auger Flights

BLOWS ON CASING			
0-1		51-52	
1-2		52-53	
2-3		53-54	
3-4		54-55	
4-5		55-56	
5-6		56-57	
6-7		57-58	
7-8		58-59	
8-9		59-60	
9-10		60-61	
10-11		61-62	
11-12		62-63	
12-13		63-64	
13-14		64-65	
14-15		65-66	
15-16		66-67	
16-17		67-68	
17-18		68-69	
18-19		69-70	
19-20		70-71	
20-21		71-72	
21-22		72-73	
22-23		73-74	
23-24		74-75	
24-25		75-76	
25-26		76-77	
26-27		77-78	
27-28		78-79	
28-29		79-80	
29-30		80-81	
30-31		81-82	
31-32		82-83	
32-33		83-84	
33-34		84-85	
34-35		85-86	
35-36		86-87	
36-37		87-88	
37-38		88-89	
38-39		89-90	
39-40		90-91	
40-41		91-92	
41-42		92-93	
42-43		93-94	
43-44		94-95	
44-45		95-96	
45-46		96-97	
46-47		97-98	
47-48		98-99	
48-49		99-100	
49-50		100-101	
50-51		101-102	

GROUND WATER		
DEPTH	HOUR	DATE
7	3:00PM	7/5

PIPE AND CASING LEFT IN HOLE		
SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller William Levering Jr.
Helper Ronald Dowdy
Helper _____

301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Cherry Island
Job Order No. 19531

FOUNDATION TESTING and SOIL SAMPLING RECORD

...E: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

...LE NO. AB-5 SURFACE ELEVATION _____ RIG NO. _____ DATE: From 7/5 To 7/5 19 83

BORING LOG: DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Removed Plus Observation Of Material Returned Between Samples	SPOON SAMPLE AND CORE DATA: SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE; CORE RECOV'D — NO. PCS. REMARKS *
0.0' 5.0'	Grey silt	1	0.0' 5.0'			Moist
		2	5.0' 10.0'			Moist
		3	10.0' 15.0'			Moist
						NOTE: Samples taken off Auger Flights

BLOWS ON CASING: 0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100, 100-101, 101-102

Auger

GROUND WATER DEPTH	HOUR	DATE
5'	5:30	7/5

PIPE AND CASING LEFT IN HOLE SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground

Driller William Levering Jr.
Helper Ronald Dowdy

- 301

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

Cherry Island
Job No. 19551

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: A.C. Schultes & Sons, Inc. LOCATION: Wilmington, Delaware

HOLE NO. AB-6 SURFACE ELEVATION _____ RIG NO. ____ DATE: From 7/6 To 7/6 19 83

BORING LOG		SPOON SAMPLE AND CORE DATA					
DEPTH FROM—TO	DESCRIPTION OF MATERIAL Based On Samples Recovered Plus Observation Of Material Returned Between Samples	SAMPLE NUMBER	DEPTH FROM—TO	BLOWS PER FT. ON SAMPLES	ROCK CORE RECOV'D	D=DRY U=UNDISTURBED T=TRAP W=WASH R=ROD C=CORE CORE RECOV'D — NO. PCS. REMARKS *
0.0' 15.0'	Grey silt	1	0.0' 5.0'			Moist
		2	5.0' 10.0'			Moist
		3	10.0' 15.0'			Moist
						NOTE: Samples taken off Auger Flights

BLOWS ON CASING

0-1	51-52
1-2	52-53
2-3	53-54
3-4	54-55
4-5	55-56
5-6	56-57
6-7	57-58
7-8	58-59
8-9	59-60
9-10	60-61
10-11	61-62
11-12	62-63
12-13	63-64
13-14	64-65
14-15	65-66
15-16	66-67
16-17	67-68
17-18	68-69
18-19	69-70
19-20	70-71
20-21	71-72
21-22	72-73
22-23	73-74
23-24	74-75
24-25	75-76
25-26	76-77
26-27	77-78
27-28	78-79
28-29	79-80
29-30	80-81
30-31	81-82
31-32	82-83
32-33	83-84
33-34	84-85
34-35	85-86
35-36	86-87
36-37	87-88
37-38	88-89
38-39	89-90
39-40	90-91
40-41	91-92
41-42	92-93
42-43	93-94
43-44	94-95
44-45	95-96
45-46	96-97
46-47	97-98
47-48	98-99
48-49	99-100
49-50	100-101
50-51	101-102

BLOWS

GROUND WATER

DEPTH	HOUR	DATE
Dry	12:00	7/6

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

DISTANCE HAMMER DROP _____ INCH
DRIVE HAMMER _____ LBS.
SPOON HAMMER _____ LBS.
CASING SIZE _____ INCH
SPOON SIZE _____ INCH
SIZE OF CORE BIT _____ INCH

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under Remarks mention kind of Bit, loss of sample, loss of Drilling water, soft seamy or broken Rock, Caving, Cavities, unusual Ground water conditions, etc., at depth encountered.

Driller William Levering Jr.
Helper Ronald Dowdy
Helper

WALTON CORPORATION

Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME Cherry Island ..... PROJECT NO. .....

Wilmington, DE ..... SUPERVISOR .....

BORING NO.	DRILLER	DATE
A#1	G. Truver	11-13-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Cold & Cloudy		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0	1.0	Gray Silt w/Tr. Sand & Gravel			
1	1.0	2.5	1.0	3.5	Dk. Gray Silt w/Some Veg. & Tr.	2	3	2
					Sand & Gravel			
2	4.0	5.5	3.5	5.5	Gray Silty F Sand w/Tr. Organic	3	3	2
					& Mica			
3	6.0	7.5	5.5	8.D	Gray Clayey Silt w/Tr. Sand &	2	1	2
					Mica			
4	9.0	10.5	8.0	10.5	Gray Clayey Silt w/Some Sand &	W/H	1	1
					Tr. Mica			
V.S.1	10.5	12.0	10.5		Vane Shear Test			
S#1	12.5	14.5			Gray Clayey Silt w/Tr. Sand &	SHELBY		
					Mica Rec. 24"			
5	14.5	16.0		17.0	Same	W/H	1	2
6	19.0	20.5	17.0	21.5	Gray Clay w/Little Silt & Tr.	W/H	1	2
					Sand, Organics & Mica			
7	24.0	25.5	21.5		Brn. Peat	W/H	1	2
V.S.2	25.5	27.0			Vane Shear Test			
S#2	27.5	29.5		29.0	Same Rec. 22"	SHELBY		
			29.0		Gray F Sand w/Some Silt & Tr. Mica			
8	29.5	31.0		37.5	Same	3	4	3
9	34.0	35.5	32.5	37.0	Brownish Gray Silty F Sand w/Tr.	2	4	5
					Mica			

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
5- 6
6- 7
7- 8
8- 9
9-10
10-11
11-12
12-13
13-14
14-15
15-16
16-17
17-18
18-19
19-20
20-21
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42-43
43-44
44-45
45-46
46-47
47-48
48-49
49-50
50-51
51-52
52-53
53-54
54-55
55-56
56-57
57-58
58-59
59-60

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: .....

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GROUND WATER

WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME ...Cherry..Island..... .....PROJECT NO. .....

..Wilmington, DE.....SUPERVISOR .....

BORING NO.	DRILLER	DATE
A#1	G. Truver	11-13-83
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
10	39.0	40.5	37.0	40.5	Gray F/C Sand w/Some Gravel &	12	21	23
					& Little Silt & Tr. Mica			

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
5- 6
6- 7
7- 8
8- 9
9-10
10-11
11-12
12-13
13-14
14-15
15-16
16-17
17-18
18-19
19-20
20-21
21-22
22-23
23-24
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32-33
33-34
34-35
35-36
36-37
37-38
38-39
39-40
40-41
41-42
42-43
43-44
44-45
45-46
46-47
47-48
48-49
49-50
50-51
51-52
52-53
53-54
54-55
55-56
56-57
57-58
58-59
59-60

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: .....

.....

GROUND WATER

WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME ....Cherry Island.....PROJECT NO. .....

....Wilmington, DE.....SUPERVISOR .....

BORING NO.	DRILLER	DATE
TB A-2	G. Truver	11-29-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Clear & Breezy		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
1	1.0	2.5	0	1.7	Brn. Silt w/Little Sand & Tr.	2	2	3
			1.7	3.0	Brn. F Sand w/Some Silt & Tr.			
					Gravel			
2	4.0	5.5	3.0	5.5	Dk. Gray Silt w/Tr. Sand,Gravel	1	2	2
					& Mica			
3	6.0	7.5	5.5	8.0	Dk. Gray Silt w/Tr. Sand & Mica	W/H	W/H	1
4	9.0	10.5	8.0	11.0	Dk. Gray Silt w/Tr. Sand,Mica	W/H	W/H	W/H
					& Gravel			
V.S.1	10.5	12.0			Vane Shear Test			
S#1	12.0	14.0	11.0		Dk. Gray Silt w/Tr. Sand,Mica &	SHELBY		
					Organics (Rec. 20")			
5	14.0	15.5			Same	W/H	W/H	W/H
6	19.0	20.5		23.0	Same	W/H	W/H	1
7	24.0	25.5	23.0		Peat & Gray Silt w/Tr. Sand & Mica	1	1	2
V.S.2	25.5	27.0			Vane Shear Test			
S#2	27.0	29.0		29.0	Same Rec. 24"	SHELBY		
8	29.0	30.5	29.0		Dk. Gray Silt w/Some Organics	W/H	1	2
					& Tr. Mica			
9	34.0	35.5		38.0	Same	1	1	2
10	39.0	40.8	38.0		Gray F/C Sand w/Little Gravel &	11	18	20
					Tr. Silt			
11	44.0	45.5		45.0	Same	12	17	13
			45.0	45.5	Gray F Sand w/Little Silt & Gravel			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: .....

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GROUND WATER

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
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WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME: Cherry Island

PROJECT NO.:

Wilmington, DE

SUPERVISOR:

BORING NO.	DRILLER	DATE
TB#A2A	G. Truver	12-1-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Clear & Chilly		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0	14.0	Augered			
V.S.1	14.0	15.5	14.0	15.5	Vane Shear Test			
			15.5	20.0	Augered			
					Piezometer set @ 18.5			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: .....

GROUND WATER

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
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WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME .....Cherry Island..... .....PROJECT NO. .....

.....Wilmington, DE.....SUPERVISOR .....

BORING NO.	DRILLER	DATE
TB#3	G. Truver	12-2-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Overcast & Mild		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
1	4.0	5.5	0		Gray Silt & Organics, w/Tr. Sand	2	2	2
					and Mica			
2	9.0	10.5		10.0	Same	2	2	1
			10.0	12.5	Gray Silt w/Tr. Sand & Mica			
3	14.0	15.5	12.5		Dk. Gray Silt & Organics w/Tr.	W/H	W/H	1
					Sand & Mica			
4	19.0	20.5			Same	1	1	2
~~S#1~~	~~24.0~~	~~26.0~~			Same Rec. 22"	SHELBY		
V.S.1	26.0	27.5			Vane Shear Test			
S#2	29.0	31.0		30.5	Dk. Gray Silt & Organics w/Tr	SHELBY		
					Sand & Mica Rec. 24"			
			30.5	32.0	Gray Silt w/Tr. Sand			
V.S.2	31.0	32.5	32.0		Vane Shear Test			
5	34.0	35.5		35.5	Gray F/C Sand & Gravel w/Silt &	6	12	15
					Mica			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: .....

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GROUND WATER

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
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WALTON CORPORATION

Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME .....Cherry Island..... .....PROJECT NO. .....

.....SUPERVISOR .....

BORING NO.	DRILLER	DATE
A-3A	G. Truver	12-2-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Cold		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0	16.0	Augered			

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
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*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: .....

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GROUND WATER

WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME .....Cherry Island..... PROJECT NO. .....

.....Wilmington, DE..... SUPERVISOR .....

BORING NO.	DRILLER	DATE
TB#4	G. Truver	12-7-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Windy & Cold		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
1	4.0	5.5	0		Gray Silt w/Tr. Sand, Organics &	1	1	1
					Mica			
2	9.0	10.5		12.0	Same	1	1	1
3	14.0	15.5	12.0	17.5	Gray Silt w/Little Organics &	W/H	2	1
					Tr. Sand & Mica			
4	19.0	20.5	17.5		Gray Silt w/Tr. Sand, Mica &	W/H	W/H	1
					Organics			
S#1	21.0	23.0			Same 17" Rec	SHELBY		
VST	23.0	24.5			Vane Shear Test			
S#2	26.0	28.0		28.0	Same 24" Rec	SHELBY		
5	31.0	32.5	28.0		Brn. Peat	1	1	1
S#3	34.0	36.0		38.0	Same	SHELBY		
6	39.0	40.5	38.0	73.0	Gray Silty F Sand w/Little Mica	W/H	W/H	3
7	44.0	45.5	43.0	45.4	Gray Mica F Sand w/Little Silt	3	5	0
			45.4	45.5	Gray Mica F Sand w/Little Silt &			
					Some Gravel			

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
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*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: .....

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GROUND WATER

WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME Cherry Island PROJECT NO.

Wilmington, DE SUPERVISOR

BORING NO.	DRILLER	DATE
A-4A	G. Truver	12-8-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Cold & Clear		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0	14.0	Augered			
S#1	14.0	16.0	14.0	16.0	Dk. Gray Silt	SHELBY		
					Rec. 19"			
			16.0	19.0	Augered			
					Set Piezometer 17.3			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS:

GROUND WATER

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
5- 6
6- 7
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WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME Cherry Island PROJECT NO.

Wilmington, DE SUPERVISOR

BORING NO.	DRILLER	DATE
TB#5	G. Truver	12-20-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Cold & Breezy		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
1	5.0	6.5	0	8.5	Grayish Silt w/Some F Sand & Veg.	2	2	2
					& Tr. Mica			
2	10.0	11.5	8.5		Gray Silt w/Little Veg. & Tr. F	2	1	1
					Sand & Mica			
S#1	15.0	17.0			Same 24" Rec.	SHELBY		
3	20.0	21.5			Same	W/H	W/H	W/
S#2	25.0	27.0		27.5	Same 21" Rec.	SHELBY		
4	30.0	31.5	27.5	33.0	Brn. Peat	W/H	1	1
5	35.0	36.5	33.0		Dark Gray Silt w/Tr. Peat,Mica	1	1	2
					& Sand			
6	40.0	41.5		40.8	Same			
			40.8	41.0	Gray F Sand w/Little Silt & Tr.	1	5	5
					Mica			
7	43.5	45.0	41.0	45.0	Gray F/M Sand & Gravel	35	29	35
					Piezometer set @ 32.0			

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
5- 6
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*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS:

GROUND WATER

WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME .....Cherry Island..... .....PROJECT NO. .....

.....Wilmington, DE.....SUPERVISOR .....

BORING NO.	DRILLER	DATE
TB#5A	G. Truver	12-21-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Cloudy & Cold		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0	20.0	Augered			
V.S.1	20.0	21.5	20.0	21.5	Vane Shear Test			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: .....

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GROUND WATER

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
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WALTON CORPORATION

Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME Cherry Island PROJECT NO.

Wilmington, DE SUPERVISOR

BORING NO.	DRILLER	DATE
TB #6	G. Truver	12-19-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Sunny & Mild		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
1	3.5	5.0			Dk. Brn. Silt, Tr. F Sand, Tr. Mica	2	1	2
2	8.5	10.0			Dk. Brn. & Dk. Gray Silt Tr. F Sand, Tr. Fib. Veg	1	1	2
3	13.5	15.0			Same	W/H	W/H	W/H
4	18.5	20.0			Dk. Gray & Blk. Silt, Tr. F Sand & Mica, Tr. Fib. Veg.	W/H	1	1
5	23.5	25.0			Dk. Gray & Blk. Silt Tr. F Sand & Fib. Veg.	1	1	1
6	28.5	30.0			Dk. Gray Silt Tr. F Sand & Mica	W/H	2	1
7	33.5	35.0			Same	W/H	1	2
8	38.5	40.0		41.5	Dk. Gray Silt w/little Org. & Tr. F Sand & Mica	1	2	2
9	43.5	45.0	41.5	46.0	Gray Misc. F Sand w/Some Silt	4	5	10
10	48.5	50.0	46.0	50.0	Gray Misc. F/M Sand & Gravel w/ Little Silt	25	40	75

BLOWS ON CASING B
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*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS:

GROUND WATER

WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME Cherry Island PROJECT NO.

Wilmington, DE SUPERVISOR

BORING NO.	DRILLER	DATE
T8#7	G. Truver	12-9-83
WEATHER	**SURFACE ELEVATION**	**DATUM**
Sunny & Mild		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
1	1.0	2.5	0	3.0	Gray Silt & Organics w/Tr. Sand and Mica	2	3	4
2	4.0	5.5	3.0		Gray Silt w/Some Organics & Tr. Sand & Mica	1	1	2
3	9.0	10.5			Same	W/H	W/H	W/H
4	14.0	15.5			Same	W/H	W/H	1
S#1	19.0	21.0		22.0	Same 24" Rec.	SHELBY		
5	24.0	25.5	22.0		Gray Silt & Peat w/Tr. Sand & Mica	W/H	1	1
S#2	29.0	30.5			Same 24" Rec.	SHELBY		
6	34.0	35.5			Same	1	2	3
7	39.0	40.5		41.5	Same	W/H	W/H	1
8	44.0	45.5	41.5	49.0	Gray Silt w/Little Peat & Tr. Sand & Mica	2	2	2
9	49.0	50.5	49.0	53.0	Gray Mica, Sand & Gravel w/Tr. Silt	7	19	26

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: .....

GROUND WATER

BLOWS ON CASING B
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1- 2
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Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-1
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-22-86 FINISH 7-23-86 INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN _____
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown moist silty clay w/ grass		1-1-1	1	DS	1.3	Water at 3.0' 24 hrs. 4.4' Backfilled
		3.0	WOH	2	DS	1.3	
	Brown moist silty clay		WOH	3	DS	1.0	
		5	WOH	4	DS	1.0	
			WOH	5 *	DS	0.3	
			WOH-1	6	DS	1.0	
		10	TUBE	1	PT	1.5	
		15					
		16.5	WOH-1-1	7	DS	1.5	
	Brown moist silty clay w/grass (org)		WOH-WOH-1	8	DS	1.5	
		20	TUBE	2	PT	2.0	
		25					
			WOH-1-1	9	DS	1.5	
			WOH	10	DS	1.5	
		30					
			WOH-WOH-1	11	DS	1.5	
		34.0	WOH-1-1	12	DS	1.5	
	Brown gray moist silty clayey sand	35					
			2-1-2	13	DS	1.5	
			7-6-5	14	DS	1.5	
		39.0					
		40					

LEGEND

DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-1
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. ____ DATE: START ____ FINISH ____ INSPECTOR ____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD ____ FOREMAN ____
BORING METHOD HSA ROCK CORE DIA ____ MISC. ____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown gray moist silty clay		1-2-2	15	DS	1.5	
			2-3-3	16	DS	1.5	
		44.0					
	Black moist silty clay w/grass (org)	45	2-2-4	17	DS	1.5	
			2-3-4	18	DS	1.5	
		50					
		51.5	1-2-3	19	DS	1.5	
	Brown moist silty clay						
		54.0	WOH-3-3	20	DS	1.4	
	Brown moist silty sand w/sand & gravel	55	2-2-3	21	DS	1.5	
		59.0	11-17-22	22	DS	1.5	
	Bottom of hole 59.0'	60					
		65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION ____ CAVED ____
AT HRS. ____ CAVED ____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-2 1 of 2
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START _____ FINISH _____ INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN M. Ebert
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown moist silty clay		2-5-5-5	1	DS	2.0	Water at 7.5' At completion 17.5' backfilled
			2-2-2-2	2	DS	2.0	
		5	1-1-1-1	3	DS	2.0	
			2-2-3-3	4	DS	1.0	
		10	2-2-2-2	5	DS	1.5	
			TUBE	1	PT	1.5	
		15	1-1-1	6	DS	1.0	
			1-1-1	7	DS	1.5	
		20	TUBE	2	PT	2.0	
		25	1-1-1	8	DS	1.5	
			1-1-2	9	DS	1.5	
		30	1-2-1	10	DS	1.5	
			2-2-2	11	DS	1.5	
		35	2-2-2	12	DS	1.5	
			2-2-2	13	DS	1.5	
		40					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-2
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. ____ DATE: START ____ FINISH ____ INSPECTOR ____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD ____ FOREMAN M.Ebert
BORING METHOD HSA ROCK CORE DIA ____ MISC. ____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown moist silty clay	41.5	2-2-3	14	DS	1.5	
	Tan & brown moist silty clay (org)	44.0	2-2-3	15	DS	1.5	
	Brown moist silty clay (org)	45	3-3-3	16	DS	1.5	
			3-3-3	17	DS	1.5	
		50	4-4-4	18	DS	1.5	
		55	4-4-6	19	DS	1.5	
			4-17	20	DS	1.0	
		58.5					
	Brown green moist silty sand	60	22	20A	DS	0.5	
		61.5	5-17-24	21	DS	1.0	
	Bottom of hole 61.5'						
		65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION ____ CAVED ____
AT HRS. ____ CAVED ____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-3
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-21-86 FINISH 7-21-86 INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN T. Zeiler
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown moist sandy silt w/roots & gravel	3.0	5-7-10	1	DS	1.2	GF-3 Auger refusal 7.5'
	Brown moist sandy silt	4.5	3-3-3	2	DS	1.0	offset hole 20'
	Brown moist silty clay	6.0	2-2-3	3	DS	1.0	southwest GF-3A
	Brown moist silty sand & gravel	9.0	1-1-1	4	DS	1.4	Drove spoon to 9.0'
	Bottom of hole 9.0'		8-12-40	5	DS	1.3	
			20-22-23	6	DS	1.2	hole dry & backfilled

5 10 15 20 25 30 35 40

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-3A 1 of 2
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-21-86 FINISH 7-21-86 INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN T. Zeiler
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown moist silty clay w/grass	1.5	2-3-3	1	DS	1.2	Water at 15.0' at completion 14.6'
	Brown moist silty clay w/roots		2-2-2	2	DS	1.2	
		5	2-2-2	3	DS	1.2	
		7.5	1-2-2	4	DS	1.2	
	Dark brown moist silty clay		2-1-2	5	DS	1.1	
		10	1-1-1	6	DS	0.0	
			1-1-2	7	DS	1.1	
			TUBE	1	PT	0.8	
		15	1-1-1	9	DS	1.4	
			1-1-1	10	DS	1.5	
		20	1-1-1	11	DS	1.5	
		24.0	1-1-1	12	DS	1.2	
	Dark brown moist silty clay	25	1-2-2	13	DS	1.2	
			1-1-2	14	DS	1.5	
		30	1-1-2	15	DS	1.5	
		34.0	1-WOH-1	16	DS	1.4	
	Brown moist clayey silty sand w/gravel	35	2-2-3	17	DS	1.5	
		39.0	4-4-6	18	DS	1.5	
		40					

LEGEND

DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-3A
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-21-86 FINISH 7-21-86 INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN T. Zeiler
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Dark brown black moist silty clay w/grass (org)		2-2-2	19	DS	1.4	
			WOH-2-2-	20	DS	1.5	
		45					
			1-2-3	21	DS	1.5	
		49.0	2-2-3	22	DS	1.5	
	Dark brown black moist silty clay	50					
		51.5	3-3-3	23	DS	1.5	
	Dark brown black moist silty clay w/grass(org)	54.0	2-4-5	24	DS	1.5	
	Brown moist silty claye sand w/gravel	55					
			2-6-7	25	DS	1.5	
		59.0	8-17-25	26	DS	1.5	
	Bottom of hole 59.0'	60					
		65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-5 1 of 2
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-22-86 FINISH 7-22-86 INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN M. Ebert
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown moist silty clay w/grass	2.0	1-1-1-2	1	DS	1.5	water at 6.0' backfilled
	Brown moist silty clay		1-1-1-1	2	DS	1.0	
		5	1-1-1-1	3	DS	2.0	
			1-1-1-1	4	DS	2.0	Last sample 57.5-59.0 still in hole poss. gravel
		10	1-1-1-1	5	DS	2.0	
			1-1-1	6	DS	1.5	
		15	1-1-1	7	DS	1.5	
			1-1-1	8	DS	1.5	
		20	1-1-1	9	DS	1.5	
	Brown moist silty clay w/grass (org)	21.5	1-1-1	10	DS	1.5	
		25	1-1-1	11	DS	1.5	
		29.0	2-3-4	12	DS	1.5	
	Brown moist silty clay w/sand & gravel	30 30.5	1	13	DS	0.5	
	Black moist silty clay	31.5	1-1	13A	DS	1.0	
			2-2-2	14	DS	1.5	
	Brown moist silty clay w/sand & gravel	35 34.0	2-1-2	15	DS	1.5	
	Brown moist silty clay w/grass (org)		1-1-1	16	DS	1.5	
		40					

LEGEND

DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-5
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-22-86 FINISH 7-22-86 INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN M. Ebert
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown moist silty clay w/grass (org)		2-2-2	17	DS	1.5	
			2-2-2	18	DS	1.5	
		45					
		46.5	2-3-3	19	DS	1.5	
	Black moist silty clay w/grass (org) sand & gravel		2-2-4	20	DS	1.0	
		50	3-3-3	21	DS	1.5	
			4-4-5	22	DS	1.5	
		55	4-5-5	23	DS	1.5	
		59.0					
	Bottom of hole 59.0'	60					
		65					
		70					
		75					
		80					

LEGEND

OS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-6 1 of 2
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-23-86 FINISH 7-24-86 INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN T. Zeiler
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Black moist silty clay	1.5	2-2-2	1	DS	1.2	water at 6.5' backfilled
	Brown moist silty clay w/grass	4.0	1-1-1	2	DS	1.5	
	Brown moist silty clay	5					
			TUBE	1	PT	1.8	
			WOH	3	DS	1.0	
			WOH	4	DS	1.2	
		10					
			WOH -1-1	5	DS	1.0	
			WOH	6	DS	1.5	
			WOH	7	DS	1.2	
		15					
			TUBE	2	PT	2.0	
		20					
			WOH	8	DS	1.5	
			WOH	9	DS	1.5	
		25					
			TUBE	3	PT	2.0	
			WOH	10	DS	1.5	
		30					
			WOH	11	DS	1.5	
			WOH-1-1	12	DS	1.5	
		34.0					
	Dark brown moist silty clay	35	WOH-1-1	13	DS	1.5	
			WOH-1-1	14	DS	1.5	
		40					

LEGEND

DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-6
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-23-86 FINISH 7-24-86 INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN T. Zeiler
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Dark brown moist silty clay		1-1-1	15	DS	1.5	
			WOH-WOH-1	16	DS	1.5	
		45					
			1-1-1	17	DS	1.5	
			WOH	18	DS	1.5	
		50					
			WOH-2-2-	19	DS	1.5	
		52.0					
	Brwon, black moist silty clay (org)		WOH-1-2	20	DS	1.5	
		55					
			1-1-2	21	DS	1.5	
			1-1-1	22	DS	1.5	
		60					
		61.5	1-2-4	23	DS	1.5	
	Brown moist silty clay		3-4-6	24	DS	1.5	
		64.0					
	Bottom of hole 64.0'	65					
		70					
		75					
		80					

LEGEND

DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-7
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START _____ FINISH _____ INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN M. Ebert
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown moist silty clay w/grass		1-1-1-1	1	DS	1.8	Installed well-point 27.0' w/ 3' of stickup
			1-1-1-1	2	DS	1.5	
		3.0					
	Brown moist silty clay		1-1-1-1	3	DS	1.5	hole backfilled
		5	1-WOH-WOH	4	DS	1.5	
			1-1-1-1	5	DS	1.5	
		10	1-1-1-1	6	DS	1.5	
			TUBE	1	PT	1.8	
		15					
			1-1-1	7	DS	1.5	
			1-1-1	8	DS	1.5	
		20					
			TUBE	2	PT	2.0	
		25					
			1-1-1	9	DS	1.5	
			1-1-2	10	DS	1.5	
		30					
			2-2-2	11	DS	1.5	
			2-1-1	12	DS	1.5	
		34.0					
	Dark brown moist silty clay	35					
			1-1-1	13	DS	1.5	
			1-1-1	14	DS	1.5	
		40					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-7
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START _____ FINISH _____ INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN M. Ebert
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Dark brown moist silty clay		2-2-2	15	DS	1.5	
			2-1-2	16	DS	1.5	
		45					
			2-2-2	17	DS	1.5	
			2-3-3	18	DS	1.5	
		49.0					
	Dark brown moist silty clay w/grass org.	50					
			2-2-2	19	DS	1.5	
			2-2-2-	20	DS	1.5	
		55					
		56.5	2-2-2	21	DS	1.5	
	Tan brown moist sandy silty clay		4-6-10	22	DS	1.5	
		59.0					
	Brown moist silty clayey sand w/gravel	60					
		61.5	22-26-36	23	DS	1.5	
	Dark brown moist sandy silty clay w/gravel		20-22-23	24	DS	1.0	
		65					
		66.1	10-12-20	25	DS	0.5	
	Bottom of hole 66.1'						
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-8
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-16-86 FINISH 7-18-86 INSPECTOR D. Collins
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN T. Zeiler
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Dark brown moist silty clay	3.0	1-1-2	1	DS	1.2	
			1-1-1	2	DS	1.0	
	Wet gray black moist silty clay	4.5	1-1-1	3	DS	1.0	
	Dark brown moist silty clay	8.5	TUBE	1	PT	1.2	
	Wet blue brown moist silty clay w/occ. organics		1-1-1	4	DS	1.5	
		10	1-1-1	5	DS	1.5	
			WOH-WOH-WOH	6	DS	1.3	
			WOH-WOH WOH	7	DS	1.5	
		15	WOH-1-1	8	DS	1.5	
			1-1-1	9	DS	1.5	
		20	WOH-WOH WOH	10	DS	1.5	
			WOH-WOH	11	DS	1.5	
		25	TUBE	2	PT	2.0	
			1-1-1	12	DS	1.5	
		30.0 30					
	Wet blue brown moist sandy silty clay w/ occ. organics		WOH-1-1	13	DS	1.5	
		31.5	1-WOH-1	14	DS	1.5	Gas pocket 33.0
	Blue brown wet moist black silty clay w/ occ. organics	35					
			2-1-1	15	DS	1.5	
			WOH-1-1	16	DS	1.0	Gas pocket 39.0
		40					

LEGEND

DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-8
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-16-86 FINISH 7-18-86 INSPECTOR D. Collins
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN T. Zeiler
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Blue brown wet moist black silty clay w/ occ. organics		WOH-2-2	17	DS	1.0	
			WOH-WOH-2	18	DS	1.5	
		45	WOH-WOH WOH	19	DS	1.5	
		49.0	WOH-WOH-WOH	20	DS	1.0	
	Blue brown black moist wet silty clay w/larger quantity organics (poss. peat)	50	1-2-2	21	DS	1.5	
		54.0	2-3-3	22	DS	1.5	
	Tan gray moist wet sandy clay	55 58.0	4-4-4	23	DS	1.5	
	Dark brown moist sandy gravel		10-13-15	24	DS	1.5	Gas pocket -59.0 large cavity
		60 61.5	6-11-14	25	DS	1.5	
	Bottom of hole 61.5'						
		65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
RS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

Earth Engineering & Sciences, Inc.

BORING LOG

PROJECT Delaware Solid Waste Authority
Northern Solid Waste Facility - 2

BORING No. GF-15
PROJECT No. 86-123

LOCATION OF BORING Wilmington, Delaware

ELEV. _____ DATE: START 7-24-86 FINISH 7-24-86 INSPECTOR _____
HAMMER Wt. 140 HAMMER DROP 7" SPOON OD _____ FOREMAN T. Zeller
BORING METHOD HSA ROCK CORE DIA _____ MISC. _____

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown moist sitly clay		4-4-6	1	DS	1.2	Dry & backfilled
			WOH-1-1	2	DS	1.3	
		4.0					
	Dark brown moist silty clay w/grass	5	WOH-1-1	3	DS	1.5	
		8.0	WOH-WOH-1	4	DS	1.0	
	Bottom of hole 8.0'						
		10					
		15					
		20					
		25					
		30					
		35					
		40					

LEGEND

DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS CAVED

HSA HOLLOW S
DC DRIVEN CASING
MD MUD DRILLING

National Foundation Engineering, Inc. NFE

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BORING LOG (1 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-101

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-12-89 FINISH 10-12-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike Kalandros

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown silt with mica		2-2-8-11	1	DS		Water encountered at 45.0 ft.
			5-7-13-14	2	DS		
	Grey silty clay	5	4-5-11-11	3	DS		
			8-11-10-14	4	DS		
			4-4-3-4	5	DS		
		10					
		15	2-2-3	6	DS		
		20	WOH-2-1	7	DS		
		25	WOH-2-1	8	DS		
		30	WOH-1-2	9	DS		
		35	1-1-3	10	DS		
		40	WOH-WOH- 3	11	DS		

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION 45.0' CAVED 18.0'
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG (2 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-101

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-12-89 FINISH 10-12-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike Kalandros

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Grey silty clay						
		45	1-1-3	12	DS		
		50	1-1-1	13	DS		
		55	1-1-2	14	DS		
		60	2-3-6	15	DS		
		65	3-4-5	16	DS		
	Gray coarse silty sand with some gravel	70	2-2-2	17	DS		
		75	10-14-15	18	DS		
	Bottom of Boring at 75.0 feet.	80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION 45.0' CAVED 18.0'
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG (1 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-102

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-10-89 FINISH 10-10-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike/Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Dark brown silty sandy clay		1-3-6-8	1	DS		
	Gray silty clay		10-13-16-18	2	DS		
		5		3	PT		
	Black silty clay		2-2-2-3	4	DS		
		10	4-2-1-1	5	DS		
		15	WOH-1-1	6	DS		
		20	WOH-WOH-1	7	DS		
		25	2-1-1	8	DS		
		30	WOH-WOH-1	9	DS		
		35	WOH-WOH-WOH	10	DS		
				11	ST		
	Black silty clay	40	WOH-2-2	12	DS		

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION _____ CAVED _____
AT HRS. _____ CAVED _____

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG (2 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-102

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-10-89 FINISH 10-10-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike/Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Black silty clay	45	2-2-2	13	DS		
	Grey-black silty sandy clay	50	2-2-3	14	DS		
		55	3-3-4	15	DS		
		60	4-3-5	16	DS		
	Grey sandy silt with gravel	65	3-3-6	17	DS		
	Grey sandy silty clay	70	7-4-6	18	DS		
	Bottom of Boring at 70.5 feet.	75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION CAVED
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
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BORING LOG (1 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-103

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-9-89 FINISH 10-9-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike/Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown clayey silt		4-6-8-10	1	DS		Water encountered at 7.0 ft.
	Gray silt		9-12-11-9	2	DS		
	Moist gray silt	5	1-1-1-2	3	DS		
			3-3-4-9	4	DS		
	Gray silt	10	9-11-13-12	5	DS		
		15	WOH-1-1	6	DS		
				7	ST		
	Gray clayey silt	20	2-2-2	8	DS		
		25	3-3-4	9	DS		
		30	2-2-2	10	DS		
		35	2-2-3	11	DS		
		40	2-3-3	12	DS		

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION 7.0' CAVED 7.7'
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG (2 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-103

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-9-89 FINISH 10-9-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike/Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6".	No.	TYPE	REC	REMARKS
				13	ST		Only 3" recovery tube sample discarded
	Gray silt	45	2-2-3	14	DS		
				15	ST		
	Gray silt	50	3-3-4	16	DS		
	Bottom of Boring at 50.0 feet.	55					
		60					
		65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION 7.0' CAVED 7.7'
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG

PROJECT Cherry Island - Phase II

Gannett Fleming

BORING No. GF-104

PROJECT No. 89-2350

LOCATION OF BORING

ELEV. DATE: START 11-8-89 FINISH 11-9-89 INSPECTOR

HAMMER 140 lb. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN M. Kalandr

BORING METHOD Tripod ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Dredge spoils, wet (grey black clayey silt)		WOH	1			
			WOH	2			
		5	WOH	3			
			WOH	4			
		10	WOH-1-1-3	5			
		15	2-2-1	6			
		20	1-1-WOH	7			
		25	WOH-1-2	8			
		30	WOH-WOH-WOH	9			
		35	WOH.	10			
	Bottom of hole 35.0'						
		40					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE

GROUND WATER
AT COMPLETION CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING

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BORING LOG

PROJECT Cherry Island - Phase II

Gannett Fleming

BORING No. GF-104A

PROJECT No. 89-2350

LOCATION OF BORING

ELEV. DATE: START 11-9-89 FINISH 11-9-89 INSPECTOR

HAMMER 140 lb. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN M. Kalandro

BORING METHOD Tripod ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
		5					
			SHELBY TUBE	U-1		13"/24"	
		10					
		15					
			SHELBY TUBE	U-2		100%	
		20					
			SHELBY TUBE	U-3		18"/24"	
		25					
		30					
		35					
			SHELBY TUBE	U-4		100%	
		40					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION CAVED
AT HRS. CAVED

HSA HOLLOW STEM AUGER
OC DRIVEN CASING
MD MUD DRILLING

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BORING LOG

PROJECT Cherry Island - Phase II

Gannett Fleming

BORING No. GF-105

PROJECT No. 89-2350

LOCATION OF BORING

ELEV. DATE: START ~~11-15-89~~ FINISH ~~11-15-89~~ INSPECTOR

HAMMER 140 lb. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN M. Kalandr

BORING METHOD Tripod ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Dredge spoils, wet (grey black clayey silt)		WOR-WOR	1			
			WOH-WOH	2			
		5	SHELBY TUBE	U-1		100%	
			WOR-WOH	4			
		10	WOH-WOH	5			
		15	WOH-1-1	6			
		20	SHELBY TUBE	U-2		100%	
		25	1/18"	8			
		30	WOH-WOH	9			
				10			
	Bottom of hole 35.0'	35					
		40					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE

GROUND WATER
AT COMPLETION CAVED

HSA HOLLOW STEM AUGER
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BORING LOG

PROJECT Cherry Island - Phase II BORING No. GF-106

Gannett Fleming PROJECT No. 89-2350

LOCATION OF BORING

ELEV. DATE: START 12-6-89 FINISH 12-6-89 INSPECTOR

HAMMER 140 lb. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN M. Kalandro

BORING METHOD Tripod ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Dark brown silty clay		WOH	1		1.5	
			WOH	2		0.5	
		5	1-1-2-2	3		1.0	
			WOH/2	4		1.5	
	Dark brown clay silt	10	SHELBY TUBE	5	PT	2.0	
	Dark brown clay organic silt	15	WOH	6		1.5	
		20	WOH	7	PT	2.0	
	Brown to black organic silt	25	WOH	8		1.5	
	Moist silty clay w/ tr. of organic material	30	WOH	9		1.5	
		35	WOH	10		1.5	
		40	WOH	11		1.5	

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION CAVED
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG

PROJECT Cherry Island - Phase II BORING No. GF-106 pg 2 (

Gannett Fleming PROJECT No. 89-2350

LOCATION OF BORING

ELEV. DATE: START 12-6-89 FINISH 12-6-89 INSPECTOR

HAMMER 140 lb HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN M. Kalandros

BORING METHOD Tripod ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Moist silty clay w/ tr. of organic material						
		45	1/WOH	12		1.5	
		50	1-2-3	13			
		55	1-1-2	14			
	Bottom of hole 55.0'						
		60					
		65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE

GROUND WATER
AT COMPLETION CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING

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BORING LOG (1 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-107

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-11-89 FINISH 10-11-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Tan sandy silt		3-3-9-16	1	DS		
	Grey silty clay		8-12-9-13	2	DS		
		5	2-3-3-4	3	DS		
			4-3-3-7	4	DS		
		10	3-5-7-8	5	DS		
		15	2-2-2	6	DS		
		20	1-1-2	7	DS		
				8	ST		
	Grey silty clay	25	2-1-2	9	DS		
		30	WOH-1-2	10	DS		
		35	WOH-2-2	11	DS		
		40	1-2-2	12	DS		

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION CAVED
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG (2 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-107

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-11-89 FINISH 10-11-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Grey silty clay						
		45	2-2-3	13	DS		
		50	3-3-4	14	DS		
		55	3-4-3	15	DS		
				16	ST		
		60	5-6-6	17	DS		
	Bottom of Boring at 60.0 feet.						
		65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION CAVED
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG

PROJECT Cherry Island - Phase II BORING No. GF-108

Gannett Fleming PROJECT No. 89-2350

LOCATION OF BORING

ELEV. DATE: START 12-27-89 FINISH 12-27-89 INSPECTOR

HAMMER 140 lb. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN M. Kalandro

BORING METHOD Tripod ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Saturated black silt w/ tr. of clay		WOH	1			
			WOH	2		0.8	
		5	WOH	3		1.0	
			WOH	4		1.0	
	Black clay silt	10	SHELBY TUBE	5	PT	1.0	
		15	SHELBY TUBE	6	PT	2.0	
		20	WOH	7			
	Organic silty clay	25	WOH	8		1.3	
		30	SHELBY TUBE	9	PT	2.0	
		35	WOH	10		1.5	
		40	WOH	11		1.5	

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION CAVED
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG

PROJECT Cherry Island - Phase II

Gannett Fleming

BORING No. GF-108 pg 2 c

PROJECT No. 89-2350

LOCATION OF BORING

ELEV. DATE: START 12-27-89 FINISH 12-27-89 INSPECTOR

HAMMER 140 lb. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN M. Kalandros

BORING METHOD Tripod ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Organic silty clay	45	WOH	12		1.5	
		50	SHELBY TUBE	13			
	Bottom of hole 51.0'	55					
		60					
		65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE

GROUND WATER
AT COMPLETION CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING

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BORING LOG

PROJECT Cherry Island - Phase II

Gannett Fleming

BORING No. GF-109

PROJECT No. 89-2350

LOCATION OF BORING

ELEV. DATE: START FINISH INSPECTOR

HAMMER 140 lb. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN M. Kalandro

BORING METHOD Tripod ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Black saturated silt		WOH	1		0.2	
			WOH	2		0	
		5	WOH	3		0	
			WOH	4		0	
			WOH	5		0.3	
		10					
	Black silt						
			SHELBY TUBE	6		1.5	
		15					
			SHELBY TUBE	7		2.0	
		20					
	Black silt w/some organic material	25	WOH	8		1.0	
		30	WOH	9		1.0	
		35	WOH	10		1.2	
		40	WOH	11		2.0	

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE

GROUND WATER
AT COMPLETION CAVED
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG

PROJECT Cherry Island - Phase II

Gannett Fleming

BORING No. GF-109 pg 2

PROJECT No. 89-2350

LOCATION OF BORING

ELEV. DATE: START FINISH INSPECTOR

HAMMER 140 lb. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN M. Kalandros

BORING METHOD Tripod ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Black silt w/some organic material	45	WOH	12		1.5	
		50	WOH	13		1.1	
		55	TUBE	14		2.0	
	Bottom of hole 55.5'	60					
		65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE

GROUND WATER
AT COMPLETION CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING

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BORING LOG (1 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-110

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-10-89 FINISH 10-10-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike/Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown clayey silt		2-2-4-4	1	DS		Water encountered at 15.0 ft.
			4-4-3-4	2	DS		
	Grey clayey silt	5	1-1-2-1	3	DS		
			4-4-4-3	4	DS		
		10	1-2-2-2	5	DS		
				6	ST		
	Grey clayey silt	15	WOH-1-2	7	DS		
		20	1-1-1	8	DS		
		25	1-1-1	9	DS		
				10	ST		
		30	1-1-1	11	DS		
		35	1-1-1	12	DS		
		40	2-2-3	13	DS		

LEGEND
OS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION 15.0' CAVED 18.0'
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

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BORING LOG (2 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-110

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-10-89 FINISH 10-10-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike/Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Grey clayey silt						
		45	2-2-3	14	DS		
		50	2-3-3	15	DS		
		55	3-2-3	16	DS		
		60	5-4-3	17	DS		
	Grey sand		4-8-8-8	18	DS		
	Bottom of Boring at 65.5 feet.	65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION 15.0' CAVED 18.0'
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-200	DRILLER M. Beck	DATE 06-5-90
WEATHER	SURFACE ELEVATION .	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
1	0.0	2.0	0.0	1.5	(F-M) Sand w/Gravel Base	7	11	10	9
2	2.5	4.5	1.5	.	Drk Gr Silt w/Tr Peat	3	2	3	4
3	5.0	7.0			Same w/Tr Sand	WH	1	2	2
4	7.5	9.5			Same w/Organics	1	1	1	1
SH1	10.0	12.0		12.5	100% Recovery	S H	E L	B	Y
5	12.5	14.5	12.5		Blk Silt w/Some Gray	1	WH	WH	WH
6	15.0	17.0			Same	1	1	1	1
7	17.5	19.5			Same	1	1	1	2
SH2	20.0	22.0		22.5	100% Recovery	S H	E L	B	Y
8	22.5	24.5	22.5		Drk Gr Clayey Silt w/Tr	1	1	1	1
					Organics				
9	25.0	27.0		27.0	Same w/Peat	WH	1	1	1
10	27.5	29.5	27.0		Peat	WH	1	2	2
SH3	30.0	32.0		33.0	100% Recovery	S H	E L	B	Y
11	32.5	34.5	33.0	35.0	(M) Gr Silt w/(F-M) Sand	4	5	5	6
12	35.0	37.0	35.0	37.0	White & Lt Gr (F-M)	5	5	6	11
					Sand w/Tr Silt				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-201	DRILLER M. Beck	DATE 06-6-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A			
1	0.0	2.0			Drk Gr & Brn (F-M) Sand &	10	15	9	10	
					Gravel Fill					
2	2.5	4.5			Drk Br Silt w/Tr (F-M)	1	3	2	4	
					Sand & Tr Organics					
3	5.0	7.0			Drk Gr Silt w/Tr	2	2	2	2	
					(F-M) Sand & Organics					
4	7.5	9.5			Same w/Tr Clay	1	1	1	2	
SH1	10.0	12.0				S H	E L	B	Y	
5	12.5	14.5			Gr & Blk Silt	WH	WH	WH	WH	
6	15.0	17.0			Light & Drk Gr Silty	WH	1	2	1	
					Clay					
7	17.5	19.5			Same	WH	WH	1	2	
SH2	20.0	22.0				S H	E L	B	Y	
8	22.5	24.5			Stone	1	1	1	1	
9	25.0	27.0			Drk Gr Silty Clay w/Tr	WH	WH	WH	1	
					Organics					
10	27.5	29.5			Peat	1	WH	WH	1	
SH3	30.0	32.0				S H	E L	B	Y	
11	32.5	34.5			Gr Silty Clay w/Tr Peat	WH	1	1	1	
12	35.0	37.0			Peat & Light Gr Sandy Silt	2	2	2	2	
13	37.5	39.5			Drk Gr Sand & Silt	2	3	2	3	
14	40.5	42.5		42.5	Same	WH	3	6	6	

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME: Delaware Solid Waste Authority, Edgemoor PROJECT NO.: Phase 1A

SUPERVISOR:

BORING NO. GF-202	DRILLER M. Beck	DATE 05-31-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
1	0.0	2.0	0.0	2.5	Limestone Base & Sand	12	13	10	10
			2.5		Tr Of Silt				
2	2.5	4.5			Br & Blk Silty Clay & (F)	3	1	3	5
					Sand & Lenses Organic w/				
				6.5	Weathered Wood				
3	5.0	7.0	6.5		Blk & Gr Organic Silt, Tr	4	7	3	1
					(F-M) Sand & Tr Fibers				
4	7.5	9.5			Same	1	1	1	1
SH1	10.0	12.0			100% Recovery	S H	E L	B Y	
5	12.5	14.5			Same	WH	WH	WH	WH
SH2	15.0	17.0			100% Recovery	S H	E L	B Y	
6	17.5	19.5			Blk Clayey Silt Tr (F)	1	WH	2	1
					Sand & Lenses of Fibers				
SH3	20.0	22.0		22.0	100% Recovery	S H	E L	B Y	

BLOWS ON CASING B
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2-3
3-4
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5-6
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*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 1 1/2 Bags Benseal

GROUND WATER

WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-203	DRILLER M. Beck	DATE 06-07-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
			0.0	1.0	Black Top				
			1.0	2.0	Limestone Base				
1	2.5	4.5	2.0		Lt & Drk Gr Silt w/(F-M)	3	4	5	5
					Sand				
2	5.0	7.0			Same	3	15	8	9
3	7.5	9.5			Same w/Small Gravels	3	4	2	WH
SH1	10.0	12.0		13.0	100% Recovery	S H	E L	B	Y
4	12.5	14.5	13.0		Drk Gr Silt w/Tr Clay	WH	1	WH	1
5	15.0	17.0			Same	WH	1	WH	1
6	17.5	19.5			Same	WH	WH	1	1
SH2	20.0	22.0		22.5	100% Recovery	S H	E L	B	Y
7	22.5	24.5	22.5		M Drk Gr Silt w/(F-M)	WH	WH	2	3
					Sand				
8	25.0	27.0			Same	1	1	1	1
9	27.5	29.5			Same	1	1	1	2
SH3	30.0	32.0		32.0	100% Recovery	S H	E L	B	Y
10	32.5	34.5	32.0		Peat w/Tr Silt, Tr (F)Sand	1	2	3	3
11	35.0	37.0		38.0	Same	1	1	1	3
12	37.5	39.5	38.0	39.5	(F-M) Sand & Gr Silt				
					Mixture				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-204	DRILLER M. Beck	DATE 06-20-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0.0	1.0	Top Soil			
			1.0		Trash			
				28.0	Auger Refusal - 28.0 Offset			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 1 1/2 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-204-A	DRILLER M. Beck	DATE 06-21,22-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
			0.0	1.0	Same				
			1.0		Trash				
1	33.0	35.0	33.0		No Rec 3" Spoon		55/6		
2	35.0	37.0		38.5	Trash 3" Spoon 13		18	18	15
SH#1	38.0	40.0	38.5		Blk Silt (Gray) Tube S H	E	L	B	Y
					85% Recovery				
SH#2	41.0	43.0			Gr & Blk Silt Tube S H	E	L	B	Y
					86% Rec				
SH#3	44.5	46.5		46.5	Tube S H	E	L	B	Y
					86% Rec				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 2 Bags Benseal

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-205	DRILLER M. Beck	DATE 06-21-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0.0	1.0	Top Soil			
			1.0	7.0	Trash			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: Broken Auger Offset 7.0

2 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-205A	DRILLER M. Beck	DATE 06-25,26-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
			0.0	1.0	Top Soil				
			1.0		Trash				
1	32.5	34.5			Trash	15	13	13	12
2	35.0	37.0		36.0	Same	4	11	12	12
3	37.5	39.5	36.0		Br (F-C) Sand w/Some	2	2	2	4
					Blk Silt & Few Small				
					Gravels & Mica Flakes				
					(Wet & Soft)				
S#1	40.0	42.0			Same 0% Recovery	S H	E L	B	Y
S#2	42.0	44.0			Same Blk Silt 100% Rec	S H	E L	B	Y
S#3	44.0	46.0		46.0	Same	S H	E L	B	Y

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 2 Bags Benseal - 5 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-206	DRILLER M. Beck	DATE 06-01,04-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
1	0.0	2.0	0.0	2.5	Br & Gr Sandy Silt w/	17	14	12	6
					Organics & Gravel				
2	2.5	4.5	2.5		Drk Gr Silt w/Tr Sand	3	2	3	1
3	5.0	7.0			Same	1	1	3	4
4	7.5	9.5			Same	WH	WH	1	3
SH1	10.0	12.0		12.0	Recovery 23"	S H	E L	B	Y
5	12.5	14.5	12.0		Blk & Drk Gr clayey Silt	WH	WH	1	1
					w/ (F-M) Sand & Tr Organics				
6	15.0	17.0			Same	WH	WH	WH	1
7	19.5	19.5			Same	1	1	1	1
SH2	20.0	22.0			100% Recovery	S H	E L	B	Y
8	22.5	24.5			Same	1	1	1	1
9	25.0	27.0		27.0	Same	1	1	1	2
10	27.5	29.5	27.0		Peat	1	1	2	2
SH3	30.0	32.0			100% Recovery	S H	E L	B	Y
11	32.5	34.5			Peat	1	1	1	2
12	35.0	37.0			Same	1	1	1	2
13	37.5	39.5		38.0	Peat	1	1	2	2
14	40.0	42.0	38.0	42.0	White & Lt Gr (F-C) Sand	10	15	10	13
					w/Tr Silt & Few Gravels				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-207	DRILLER M. Beck	DATE 06-08-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
			0.0	0.7	Black Top				
			0.7	1.7	Limestone Base				
1	2.5	4.5	1.7		Gr & Blk Silt w/Tr (F-M)	2	4	5	6
				4.5	Sand & Sm Gravel w/Organics				
2	5.0	7.0	4.5		Blk Silt w/Tr Organics &	3	2	1	3
					(F) Sand				
3	7.5	9.5			Same	WH	WH	WH	WH
SH1	10.0	12.0			100% Recovery	S H	E L	B	Y
4	12.5	14.5			Same	WH	WH	WH	1
5	15.0	17.0			Same	WH	WH	1	1
6	17.5	19.5			Gr-Blk Silt w/Tr (F) Sand	WH	1	1	WH
SH2	20.0	22.0			Same - 100% Recovery	S H	E L	B	Y
7	22.5	24.5			Same	WH	WH	WH	WH
8	25.0	27.0			Same	WH	WH	1	2
9	27.5	29.5			Same	WH	WH	WH	WH
SH3	30.0	32.0		34.0	Same 100% Recovery	S H	E L	B	Y
10	32.5	34.5	34.0		Gr & Br Peat	WH	1	2	2
11	35.0	37.0		36.5	Same	WH	1	1	2
12	37.5	39.5	36.5		Gr Clay w/Organics &	1	1	2	3
					Br Peat w/(F) Sand Lenses				
13	40.0	42.0		42.0	White & Lt Gr (F) Sand w/	1	3	3	4
					Light Tr Silt				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 1/2 Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-208	DRILLER M. Beck	DATE 06-15,18-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A			
			0.0	1.0	Misc Fill					
			1.0		Trash					
1	25.5	27.5			Trash	50/.0				
2	30.0	32.0			Same	20	12	10	15	
3	32.0	35.0		34.0	Trash (Used 3" Spoon)	34	20	12	13	
4	35.0	38.0	34.0		Blk Silt w/(V/F) Sand	4	5	3	5	6
					Lenses					
SH1	38.0	40.0			0% Recovery	S H	E L	B	Y	
SH2	41.0	43.0			0% Recovery	S H	E L	B	Y	
SH3	44.5	46.5		46.5	0% Recovery	S H	E L	B	Y	

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 2 1/3 Bags Quickgel - 2 Bags Benseal - 6 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
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5-6
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-208A	DRILLER M. Beck	DATE 06-19,20-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
			0.0	1.0	Top Soil				
			1.0		Trash				
1	33.5	35.5			No Rec 3" Spoon	28	18	15	17
2	35.5	37.5			Same 3" Spoon	20	11	17	23
SH#1	38.0	40.0			18% Rec	S H	E L	B	Y
SH#2	40.5	42.5			Same, Blk Silt 0% Rec	S H	E L	B	Y
SH#3	42.5	44.5			Same,Blk & Gr Silt	S H	E L	B	Y
					100% Recovery				
SH#4	44.5	46.5			Same w/Mica Flakes	S H	E L	B	Y
					100% Recovery				
SH#5	49.0	51.0		51.0	Same w/Organic	S H	E L	B	Y
					78% Recovery				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 1 Bag Quickgel - 2 Benseal - 3 1/2 Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-209	DRILLER M. Beck	DATE 06-12,14-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
			0.0	1.0	Misc Fill & Stones				
			1.0		Trash w/Some Silt				
				32.0					
1	32.0	34.0	32.0		No Recovery	15	11	4	5
2	34.0	36.0			Same	15	10	9	12
3	36.0	38.0		38.0	Misc Fill (Trash) Paper	6	3	6	3
					Steel Shoes, Springs Etc.				
4	38.0	40.0			Drk Blk & gr Clayey Silt	3	1	2	2
					w/Ltl Organic & (V/F)				
					Sand Lenses				
5	40.0	42.0			Same	3	2	2	2
SH#1	42.0	44.0			Recovery 21"	S H	E L	B Y	
SH#2	47.0	49.0			Recovery 18"	S H	E L	B Y	
SH#3	49.0	51.0		51.0	Recovery 22"	S H	E L	B Y	

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 1 Bag Quick Gel - 10 - Hole Plug - 5 Benseal

GROUND WATER

BLOWS ON CASING B
0-1
1-2
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-209A	DRILLER M. Beck	DATE 06-26-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0.0		Cover Material Black			
				4.0				
			4.0		Trash			
				23.0	Auger Resistance (Hard)			
			23.0					
1	30.0	32.0		32.5	Trash 50/	4		
2	32.0	34.0			No Recovery 12	10	9	15
3	34.0	37.0		37.0	Push 3" Spoon - Wood &			
					Silty Clay w/(F) Sand Lenses			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 7 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-210	DRILLER M. Beck	DATE 06-11,12-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
1	0.0	2.0			Drk Br Silt w/Tr Gravel	5	5	3	4
					& Fill				
2	2.5	4.5			Drk Gr Silt w/ Fill	3	2	3	4
3	5.0	7.0			Drk Br Clayey Silt	2	2	2	2
4	7.5	9.5			Drk Gr Clayey Silt	2	1	1	1
SH1	10.0	12.0			20" Recovery	S H	E L	B	Y
5	12.5	14.5			Drk Gr Silt w/Tr	WH	1	WH	
					Organics				
6	15.0	17.0			Same				
7	17.5	19.5			Same	1	WH	WH	WH
SH2	20.0	22.0				S H	E L	B	Y
8	22.5	24.5			Drk & Light Gr Silt	WH	WH	WH	WH
9	25.0	27.0			Light Gr Silt &	1	WH	WH	WH
10	27.5	29.5			Same	1	WH	WH	WH
11	30.0	32.0			Same	1	WH	WH	WH
12	32.5	34.5			Light & Drk Gr Silt w/Tr	WH	WH	WH	2
					(V/F) Sand				
13	35.0	37.0			Same - Changed to Peat	2	2	2	2
SH3	37.5	39.5				S H	E L	B	Y
14	40.0	42.0			Peat	1	2	2	4
15	42.5	44.5			Peat	2	3	2	3
16	45.0	47.0			Peat	1	2	3	3

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS:

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority PROJECT NO. .....

SUPERVISOR .....

BORING NO.	DRILLER	DATE
OF 210 Cont.		6/11/90
WEATHER	SURFACE ELEVATION	DATUM Page 2 of 2

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
17	47.5	49.5			Light Gr Clayey Silt	WH	1	5	5
18	50.0	52.0		52.0	(F-M) Sand & Gravel	3	8	15	20

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 6 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-211	DRILLER M. Beck	DATE 06-04,05-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
1	0.0	2.0	0.0	3.5	Br Sand w/Gravel Mixture	10	10	8	8
2	2.5	4.5	3.5		Same	2	2	4	4
3	5.0	7.0			Drk Gr Silt w/Tr (V/F)	1	2	2	3
					Sand				
4	7.5	9.8			Same	1	1	5	6
SH1	10.0	12.0			Recovery 20"	S H	E L	B	Y
5	12.5	14.5			Same w/Clay	1	1	1	1
6	15.0	17.0			Same	1	1	2	2
7	17.5	19.5			Same	1	1	1	1
SH2	20.0	22.0			100% Recovery	S H	E L	B	Y
8	22.5	24.5			Same	WH	1	1	2
9	25.0	27.0			Same	WH	1	1	2
10	27.5	29.5			Same	WH	1	1	2
SH3	30.0	32.0			100% Recovery	S H	E L	B	Y
11	32.5	34.5			Same	WH	Wh	1	2
12	35.0	37.0		38.0	Same	1	1	2	3
13	37.5	35.5	38.0		Drk & Light Gr Silty Clay	1	5	5	6
					w/(F-M) Sand				
14	40.0	42.0		42.0	Drk & Light Gr (F-C) Sand	5	10	13	15
					w/Some Silt				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
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National Foundation Engineering, Inc. NFE

3401 CARLINS PARK DRIVE • BALTIMORE, MARYLAND 21215

BORING LOG (1 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-110

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-10-89 FINISH 10-10-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike/Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Brown clayey silt		2-2-4-4	1	DS		Water encountered at 15.0 ft.
			4-4-3-4	2	DS		
	Grey clayey silt	5	1-1-2-1	3	DS		
			4-4-4-3	4	DS		
		10	1-2-2-2	5	DS		
				6	ST		
	Grey clayey silt	15	WOH-1-2	7	DS		
		20	1-1-1	8	DS		
		25	1-1-1	9	DS		
				10	ST		
		30	1-1-1	11	DS		
		35	1-1-1	12	DS		
		40	2-2-3	13	DS		

LEGEND
OS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION 15.0' CAVED 18.0'
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

National Foundation Engineering, Inc. NFE

3401 CARLINS PARK DRIVE • BALTIMORE, MARYLAND 21215

BORING LOG (2 of 2)

PROJECT Cherry Island - Phase I

BORING No. GF-110

PROJECT No. 89-275

LOCATION OF BORING

ELEV. DATE: START 10-10-89 FINISH 10-10-89 INSPECTOR

HAMMER 140 lbs. HAMMER DROP 30 in. SPOON OD 2 in. FOREMAN Mike/Taylor

BORING METHOD HSA ROCK CORE DIA MISC.

ELEV.	SOIL DESCRIPTION	DEPTH	BLOWS 6"	No.	TYPE	REC	REMARKS
	Grey clayey silt						
		45	2-2-3	14	DS		
		50	2-3-3	15	DS		
		55	3-2-3	16	DS		
		60	5-4-3	17	DS		
	Grey sand		4-8-8-8	18	DS		
	Bottom of Boring at 65.5 feet.	65					
		70					
		75					
		80					

LEGEND
DS DRIVEN SPOON
ST SHELBY TUBE
PS PISTON SAMPLE
RC ROCK CORE

GROUND WATER
AT COMPLETION 15.0' CAVED 18.0'
AT HRS. CAVED

HSA HOLLOW STEM AUGER
DC DRIVEN CASING
MD MUD DRILLING

WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-200	DRILLER M. Beck	DATE 06-5-90
WEATHER	SURFACE ELEVATION .	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
1	0.0	2.0	0.0	1.5	(F-M) Sand w/Gravel Base	7	11	10	9
2	2.5	4.5	1.5	.	Drk Gr Silt w/Tr Peat	3	2	3	4
3	5.0	7.0			Same w/Tr Sand	WH	1	2	2
4	7.5	9.5			Same w/Organics	1	1	1	1
SH1	10.0	12.0		12.5	100% Recovery	S H	E L	B	Y
5	12.5	14.5	12.5		Blk Silt w/Some Gray	1	WH	WH	WH
6	15.0	17.0			Same	1	1	1	1
7	17.5	19.5			Same	1	1	1	2
SH2	20.0	22.0		22.5	100% Recovery	S H	E L	B	Y
8	22.5	24.5	22.5		Drk Gr Clayey Silt w/Tr	1	1	1	1
					Organics				
9	25.0	27.0		27.0	Same w/Peat	WH	1	1	1
10	27.5	29.5	27.0		Peat	WH	1	2	2
SH3	30.0	32.0		33.0	100% Recovery	S H	E L	B	Y
11	32.5	34.5	33.0	35.0	(M) Gr Silt w/(F-M) Sand	4	5	5	6
12	35.0	37.0	35.0	37.0	White & Lt Gr (F-M)	5	5	6	11
					Sand w/Tr Silt				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-201	DRILLER M. Beck	DATE 06-6-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A			
1	0.0	2.0			Drk Gr & Brn (F-M) Sand &	10	15	9	10	
					Gravel Fill					
2	2.5	4.5			Drk Br Silt w/Tr (F-M)	1	3	2	4	
					Sand & Tr Organics					
3	5.0	7.0			Drk Gr Silt w/Tr	2	2	2	2	
					(F-M) Sand & Organics					
4	7.5	9.5			Same w/Tr Clay	1	1	1	2	
SH1	10.0	12.0				S H	E L	B	Y	
5	12.5	14.5			Gr & Blk Silt	WH	WH	WH	WH	
6	15.0	17.0			Light & Drk Gr Silty	WH	1	2	1	
					Clay					
7	17.5	19.5			Same	WH	WH	1	2	
SH2	20.0	22.0				S H	E L	B	Y	
8	22.5	24.5			Stone	1	1	1	1	
9	25.0	27.0			Drk Gr Silty Clay w/Tr	WH	WH	WH	1	
					Organics					
10	27.5	29.5			Peat	1	WH	WH	1	
SH3	30.0	32.0				S H	E L	B	Y	
11	32.5	34.5			Gr Silty Clay w/Tr Peat	WH	1	1	1	
12	35.0	37.0			Peat & Light Gr Sandy Silt	2	2	2	2	
13	37.5	39.5			Drk Gr Sand & Silt	2	3	2	3	
14	40.5	42.5		42.5	Same	WH	3	6	6	

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
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1-2
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME: Delaware Solid Waste Authority, Edgemoor PROJECT NO.: Phase 1A

SUPERVISOR:

BORING NO. GF-202	DRILLER M. Beck	DATE 05-31-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
1	0.0	2.0	0.0	2.5	Limestone Base & Sand	12	13	10	10
			2.5		Tr Of Silt				
2	2.5	4.5			Br & Blk Silty Clay & (F)	3	1	3	5
					Sand & Lenses Organic w/				
				6.5	Weathered Wood				
3	5.0	7.0	6.5		Blk & Gr Organic Silt, Tr	4	7	3	1
					(F-M) Sand & Tr Fibers				
4	7.5	9.5			Same	1	1	1	1
SH1	10.0	12.0			100% Recovery	S H	E L	B Y	
5	12.5	14.5			Same	WH	WH	WH	WH
SH2	15.0	17.0			100% Recovery	S H	E L	B Y	
6	17.5	19.5			Blk Clayey Silt Tr (F)	1	WH	2	1
					Sand & Lenses of Fibers				
SH3	20.0	22.0		22.0	100% Recovery	S H	E L	B Y	

BLOWS ON CASING B
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1-2
2-3
3-4
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5-6
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*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 1 1/2 Bags Benseal

GROUND WATER

WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-203	DRILLER M. Beck	DATE 06-07-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
			0.0	1.0	Black Top				
			1.0	2.0	Limestone Base				
1	2.5	4.5	2.0		Lt & Drk Gr Silt w/(F-M)	3	4	5	5
					Sand				
2	5.0	7.0			Same	3	15	8	9
3	7.5	9.5			Same w/Small Gravels	3	4	2	WH
SH1	10.0	12.0		13.0	100% Recovery	S H	E L	B	Y
4	12.5	14.5	13.0		Drk Gr Silt w/Tr Clay	WH	1	WH	1
5	15.0	17.0			Same	WH	1	WH	1
6	17.5	19.5			Same	WH	WH	1	1
SH2	20.0	22.0		22.5	100% Recovery	S H	E L	B	Y
7	22.5	24.5	22.5		M Drk Gr Silt w/(F-M)	WH	WH	2	3
					Sand				
8	25.0	27.0			Same	1	1	1	1
9	27.5	29.5			Same	1	1	1	2
SH3	30.0	32.0		32.0	100% Recovery	S H	E L	B	Y
10	32.5	34.5	32.0		Peat w/Tr Silt, Tr (F)Sand	1	2	3	3
11	35.0	37.0		38.0	Same	1	1	1	3
12	37.5	39.5	38.0	39.5	(F-M) Sand & Gr Silt				
					Mixture				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-204	DRILLER M. Beck	DATE 06-20-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0.0	1.0	Top Soil			
			1.0		Trash			
				28.0	Auger Refusal - 28.0 Offset			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 1 1/2 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-204-A	DRILLER M. Beck	DATE 06-21,22-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
			0.0	1.0	Same				
			1.0		Trash				
1	33.0	35.0	33.0		No Rec 3" Spoon		55/6		
2	35.0	37.0		38.5	Trash 3" Spoon 13		18	18	15
SH#1	38.0	40.0	38.5		Blk Silt (Gray) Tube S H	E	L	B	Y
					85% Recovery				
SH#2	41.0	43.0			Gr & Blk Silt Tube S H	E	L	B	Y
					86% Rec				
SH#3	44.5	46.5		46.5	Tube S H	E	L	B	Y
					86% Rec				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 2 Bags Benseal

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-205	DRILLER M. Beck	DATE 06-21-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0.0	1.0	Top Soil			
			1.0	7.0	Trash			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: Broken Auger Offset 7.0

2 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-205A	DRILLER M. Beck	DATE 06-25,26-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
			0.0	1.0	Top Soil				
			1.0		Trash				
1	32.5	34.5			Trash	15	13	13	12
2	35.0	37.0		36.0	Same	4	11	12	12
3	37.5	39.5	36.0		Br (F-C) Sand w/Some	2	2	2	4
					Blk Silt & Few Small				
					Gravels & Mica Flakes				
					(Wet & Soft)				
S#1	40.0	42.0			Same 0% Recovery	S H	E L	B	Y
S#2	42.0	44.0			Same Blk Silt 100% Rec	S H	E L	B	Y
S#3	44.0	46.0		46.0	Same	S H	E L	B	Y

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 2 Bags Benseal - 5 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
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4-5
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-206	DRILLER M. Beck	DATE 06-01,04-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
1	0.0	2.0	0.0	2.5	Br & Gr Sandy Silt w/	17	14	12	6
					Organics & Gravel				
2	2.5	4.5	2.5		Drk Gr Silt w/Tr Sand	3	2	3	1
3	5.0	7.0			Same	1	1	3	4
4	7.5	9.5			Same	WH	WH	1	3
SH1	10.0	12.0		12.0	Recovery 23"	S H	E L	B	Y
5	12.5	14.5	12.0		Blk & Drk Gr clayey Silt	WH	WH	1	1
					w/ (F-M) Sand & Tr Organics				
6	15.0	17.0			Same	WH	WH	WH	1
7	19.5	19.5			Same	1	1	1	1
SH2	20.0	22.0			100% Recovery	S H	E L	B	Y
8	22.5	24.5			Same	1	1	1	1
9	25.0	27.0		27.0	Same	1	1	1	2
10	27.5	29.5	27.0		Peat	1	1	2	2
SH3	30.0	32.0			100% Recovery	S H	E L	B	Y
11	32.5	34.5			Peat	1	1	1	2
12	35.0	37.0			Same	1	1	1	2
13	37.5	39.5		38.0	Peat	1	1	2	2
14	40.0	42.0	38.0	42.0	White & Lt Gr (F-C) Sand	10	15	10	13
					w/Tr Silt & Few Gravels				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Hole Plug

GROUND WATER

BLOWS ON CASING B
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-207	DRILLER M. Beck	DATE 06-08-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
			0.0	0.7	Black Top				
			0.7	1.7	Limestone Base				
1	2.5	4.5	1.7		Gr & Blk Silt w/Tr (F-M)	2	4	5	6
				4.5	Sand & Sm Gravel w/Organics				
2	5.0	7.0	4.5		Blk Silt w/Tr Organics &	3	2	1	3
					(F) Sand				
3	7.5	9.5			Same	WH	WH	WH	WH
SH1	10.0	12.0			100% Recovery	S H	E L	B	Y
4	12.5	14.5			Same	WH	WH	WH	1
5	15.0	17.0			Same	WH	WH	1	1
6	17.5	19.5			Gr-Blk Silt w/Tr (F) Sand	WH	1	1	WH
SH2	20.0	22.0			Same - 100% Recovery	S H	E L	B	Y
7	22.5	24.5			Same	WH	WH	WH	WH
8	25.0	27.0			Same	WH	WH	1	2
9	27.5	29.5			Same	WH	WH	WH	WH
SH3	30.0	32.0		34.0	Same 100% Recovery	S H	E L	B	Y
10	32.5	34.5	34.0		Gr & Br Peat	WH	1	2	2
11	35.0	37.0		36.5	Same	WH	1	1	2
12	37.5	39.5	36.5		Gr Clay w/Organics &	1	1	2	3
					Br Peat w/(F) Sand Lenses				
13	40.0	42.0		42.0	White & Lt Gr (F) Sand w/	1	3	3	4
					Light Tr Silt				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 1/2 Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-208	DRILLER M. Beck	DATE 06-15,18-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A			
			0.0	1.0	Misc Fill					
			1.0		Trash					
1	25.5	27.5			Trash	50/.0				
2	30.0	32.0			Same	20	12	10	15	
3	32.0	35.0		34.0	Trash (Used 3" Spoon)	34	20	12	13	
4	35.0	38.0	34.0		Blk Silt w/(V/F) Sand	4	5	3	5	6
					Lenses					
SH1	38.0	40.0			0% Recovery	S H	E L	B	Y	
SH2	41.0	43.0			0% Recovery	S H	E L	B	Y	
SH3	44.5	46.5		46.5	0% Recovery	S H	E L	B	Y	

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 2 1/3 Bags Quickgel - 2 Bags Benseal - 6 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-208A	DRILLER M. Beck	DATE 06-19,20-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
			0.0	1.0	Top Soil				
			1.0		Trash				
1	33.5	35.5			No Rec 3" Spoon	28	18	15	17
2	35.5	37.5			Same 3" Spoon	20	11	17	23
SH#1	38.0	40.0			18% Rec	S H	E L	B	Y
SH#2	40.5	42.5			Same, Blk Silt 0% Rec	S H	E L	B	Y
SH#3	42.5	44.5			Same,Blk & Gr Silt	S H	E L	B	Y
					100% Recovery				
SH#4	44.5	46.5			Same w/Mica Flakes	S H	E L	B	Y
					100% Recovery				
SH#5	49.0	51.0		51.0	Same w/Organic	S H	E L	B	Y
					78% Recovery				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 1 Bag Quickgel - 2 Benseal - 3 1/2 Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-209	DRILLER M. Beck	DATE 06-12,14-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
			0.0	1.0	Misc Fill & Stones				
			1.0		Trash w/Some Silt				
				32.0					
1	32.0	34.0	32.0		No Recovery	15	11	4	5
2	34.0	36.0			Same	15	10	9	12
3	36.0	38.0		38.0	Misc Fill (Trash) Paper	6	3	6	3
					Steel Shoes, Springs Etc.				
4	38.0	40.0			Drk Blk & gr Clayey Silt	3	1	2	2
					w/Ltl Organic & (V/F)				
					Sand Lenses				
5	40.0	42.0			Same	3	2	2	2
SH#1	42.0	44.0			Recovery 21"	S H	E L	B Y	
SH#2	47.0	49.0			Recovery 18"	S H	E L	B Y	
SH#3	49.0	51.0		51.0	Recovery 22"	S H	E L	B Y	

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 1 Bag Quick Gel - 10 - Hole Plug - 5 Benseal

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-209A	DRILLER M. Beck	DATE 06-26-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0.0		Cover Material Black			
				4.0				
			4.0		Trash			
				23.0	Auger Resistance (Hard)			
			23.0					
1	30.0	32.0		32.5	Trash 50/	4		
2	32.0	34.0			No Recovery 12	10	9	15
3	34.0	37.0		37.0	Push 3" Spoon - Wood &			
					Silty Clay w/(F) Sand Lenses			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 7 Bags Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-210	DRILLER M. Beck	DATE 06-11,12-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A			
1	0.0	2.0			Drk Br Silt w/Tr Gravel	5	5	3	4
					& Fill				
2	2.5	4.5			Drk Gr Silt w/ Fill	3	2	3	4
3	5.0	7.0			Drk Br Clayey Silt	2	2	2	2
4	7.5	9.5			Drk Gr Clayey Silt	2	1	1	1
SH1	10.0	12.0			20" Recovery	S H	E L	B	Y
5	12.5	14.5			Drk Gr Silt w/Tr	WH	1	WH	
					Organics				
6	15.0	17.0			Same				
7	17.5	19.5			Same	1	WH	WH	WH
SH2	20.0	22.0				S H	E L	B	Y
8	22.5	24.5			Drk & Light Gr Silt	WH	WH	WH	WH
9	25.0	27.0			Light Gr Silt &	1	WH	WH	WH
10	27.5	29.5			Same	1	WH	WH	WH
11	30.0	32.0			Same	1	WH	WH	WH
12	32.5	34.5			Light & Drk Gr Silt w/Tr	WH	WH	WH	2
					(V/F) Sand				
13	35.0	37.0			Same - Changed to Peat	2	2	2	2
SH3	37.5	39.5				S H	E L	B	Y
14	40.0	42.0			Peat	1	2	2	4
15	42.5	44.5			Peat	2	3	2	3
16	45.0	47.0			Peat	1	2	3	3

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS:

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority PROJECT NO. .....

SUPERVISOR .....

BORING NO.	DRILLER	DATE
OF 210 Cont.		6/11/90
WEATHER	SURFACE ELEVATION	DATUM Page 2 of 2

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
17	47.5	49.5			Light Gr Clayey Silt	WH	1	5	5
18	50.0	52.0		52.0	(F-M) Sand & Gravel	3	8	15	20

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 6 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
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WALTON CORPORATION

Drilling Contractor

P.O. BOX 1097, NEWARK, DELAWARE 19715

BORING LOG

NAME Delaware Solid Waste Authority, Edgemoor PROJECT NO. Phase 1A

SUPERVISOR

BORING NO. GF-211	DRILLER M. Beck	DATE 06-04,05-90
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials		*Blows A		
1	0.0	2.0	0.0	3.5	Br Sand w/Gravel Mixture	10	10	8	8
2	2.5	4.5	3.5		Same	2	2	4	4
3	5.0	7.0			Drk Gr Silt w/Tr (V/F)	1	2	2	3
					Sand				
4	7.5	9.8			Same	1	1	5	6
SH1	10.0	12.0			Recovery 20"	S H	E L	B	Y
5	12.5	14.5			Same w/Clay	1	1	1	1
6	15.0	17.0			Same	1	1	2	2
7	17.5	19.5			Same	1	1	1	1
SH2	20.0	22.0			100% Recovery	S H	E L	B	Y
8	22.5	24.5			Same	WH	1	1	2
9	25.0	27.0			Same	WH	1	1	2
10	27.5	29.5			Same	WH	1	1	2
SH3	30.0	32.0			100% Recovery	S H	E L	B	Y
11	32.5	34.5			Same	WH	Wh	1	2
12	35.0	37.0		38.0	Same	1	1	2	3
13	37.5	35.5	38.0		Drk & Light Gr Silty Clay	1	5	5	6
					w/(F-M) Sand				
14	40.0	42.0		42.0	Drk & Light Gr (F-C) Sand	5	10	13	15
					w/Some Silt				

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: 4 Bags Benseal - 1 Bag Hole Plug

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-1
Job No.	2477-03-01	Surface Elevation	47.8
Date Drilled	4/24 and 4/27/92	Boring Method	HSA: 0-15' MR: 15'-BTB
Drilling Co.	Walton Corp.	Completion Depth	83.5 ft.
Drill Foreman	M. Beck	Location	See Figure 3-2
Logged By	J. Vitale (RFW)		

Groundwater Level Date	Depth
4/24/92	-13.5'

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S1	SS	WOH-2-1	3	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		8		
	S2	SS	WOH-WOH-WOH	0			0		
					(Dredge spoils underlain by recent deposits)				
	ST1	ST					21½		C
10									
	ST2	ST					25¾		K, MC, OC, B
20									
	S3	SS	WOH-WOH-WOH	0			18		
	ST3	ST					0		
30	ST4	ST					0		
	ST5	ST					26½		
	S4	SS	WOH-1-1	2			18	ML	SH, MC
	ST6	ST					21¾		
40									
	S5	SS	WOH-WOH-WOH	0			0		
	ST7	ST					24½		
50									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-1 (Cont.)
Job No.		Surface Elevation	
Date Drilled		Boring Method	
Drilling Co.		Completion Depth	
Drill Foreman		Location	
Logged By			

Groundwater Level

Date	Depth

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
					Black, very soft to soft clayey silt with little organics and trace fine sand, wet.				
	ST8	ST					25½		
60									
	ST9	ST					0		
	S7	SS	1-2-3	5	- Becoming medium stiff at -67'		18	ML	AL, MC
70									
	S7	SS			-75.5'	-27.7	0		
	S8	SS	36-25-30	55	Gray and tan, dense coarse to fine sand with little coarse to fine gravel, wet. (Granular Deposits)		10		
80									
	S9	SS	27-29-33	62		-35.7	10		
					Bottom of Test Boring at -83.5'				
90									
100									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Conten, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-2
Job No.	2477-03-01	Surface Elevation	47.7
Date Drilled	4/16 to 4/21/92	Boring Method	HSA: 0-14' MR: 14' - BTB
Drilling Co.	Walton Corp.	Completion Depth	84.5 ft.
Drill Foreman	M. Beck	Location	See Figure 3-2
Logged By	J. Vitale (RFW)		

Groundwater Level Date	Depth
4/16/92	-7.5'

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S1	SS	WOH-WOH-1	1	Black, very soft to soft clayey silt with little organics and trace fine sand, wet. (Dredge spoils underlain by recent deposits)		12		
	S2	SS	WOR-WOR-WOR	0			0		
10	S3	SS	WOR-WOR-WOR	0			15		
	ST1	ST					24½		K, MC, B
20	S4	SS	WOR-WOR-WOR	0			18		
30	ST2	ST					17¾		C
	S5	SS	WOR-WOR-WOR	0			0		
40	S6	SS	WOH-WOH-2	2			18		
50	ST3	ST					15¾		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name DSWA- Phase IV	Boring No. TB-2 (Cont.)	Groundwater Level	
Job No.	Surface Elevation	Date	Depth
Date Drilled	Boring Method		
Drilling Co.	Completion Depth		
Drill Foreman	Location		
Logged By			

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S7	SS	WOR-WOR-WOR	0	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		18		
60									
	S8	SS	1-WOH-WOH	0			0		
	S9	SS	2-4-5	9	- Becoming medium stiff at -68'		18		
70									
	S10	SS	4-2-4	6			18		
					-78.5'	-30.8			
	S11	SS	14-24-29	53	Gray and tan, dense, coarse to fine sand with little coarse to fine gravel, wet.		18		
80									
	S12	SS	19-18-20	38	(Granular Deposits)	-36.8	8		
					Bottom of Test Boring at -84.5'				
90									
100									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Cont, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA-Phase IV	Boring No.	TB-3
Job No.	2477-03-1	Surface Elevation	47.8
Date Drilled	4/29/92	Boring Method	HSA: 0 to -11 MR: -11' to BTB
Drilling Co.	Walton Corp.	Completion Depth	84 Ft.
Drill Foreman	M. Beck	Location	See Figure 3-2
Logged By	J. Vitale (RFW)		

Groundwater Level

Date	Depth
Not measured due to mud rotary operations.	

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S1	SS	1-1-1	2	Black, very soft to soft clayey silt with little organics and trace fine sand, wet		18		
	S2	SS	WOR-WOR-WOR	0			1		MC, OC
	ST1	ST			(Dredge spoils underlain by recent deposits)		$20\frac{3}{4}$		
10									
	S3	SS	WOR-WOR-WOR	0			0		
	ST2	ST					24		CIU
20									
	S4	SS	WOH-WOH WOH	0			18		
	ST3	ST					$22\frac{3}{4}$		K,B,MC,OC
30									
	S5	SS	WOH-WOH -WOH	0			0		
	ST4	ST					$23\frac{3}{4}$		
40									
	S6	SS	WOH-3-2	5	-Medium Stiff at -42'		12	MH	MC, AL
	ST5	ST					0		
50									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name: DSWA - Phase IV	Boring No.: TB-3 (Cont.)	Groundwater Level	
Job No.	Surface Elevation	Date	Depth
Date Drilled	Boring Method		
Drilling Co.	Completion Depth		
Drill Foreman	Location		
Logged By			

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	ST 6	ST					24½		UU
	S7	SS	WOH - 1-2	3	Black, soft clayey silt with little organics and trace fine sand, wet		18		MC, SH
	ST 7	ST					0		
60	ST 8	ST					0		
	S8	SS	WOR-1-1	2			0		
70	ST9	ST					25½		UU, C
	S9	SS	1-2-3	5	-Becoming medium stiff at -70' -74'	-26.2	0		
80	S10	SS	10-12-16	28	Gray and tan, dense coarse to fine sand with little coarse to fine gravel, wet. (Granular Deposits)		10		MC,S,SG
	S11	SS	21-17-20	37		-36.2	10		
					Bottom of Test Boring at -84 ft.				
90									
100									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Con., B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-4
Job No.	2744-03-01	Surface Elevation	48.1
Date Drilled	4/10 and 4/14/92	Boring Method	HSA
Drilling Co.	Walton Corp.	Completion Depth	73.5 ft.
Drill Foreman	M. Beck	Location	See Figure 3-2
Logged By	J. Vitale (RFW)		

Groundwater Level Date	Depth
4/10/92	-8'

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S1	SS	1-1-1	2	Black, very soft to soft clayey silt with little organics and trace fine sand, wet. (Dredge spoils underlain by recent deposits)		18		
	S2	SS	WOR-WOH-WOH	0			6		
10	S3	SS	WOR-WOH WOH	0			18	MH	MC, AL
	S4	SS	WOR-WOR WOR	0			18		
20	S5	SS	WOH-1-1	2			18		
	ST1	ST					26 3/4		MC, OC, C, SG
30	S6	SS	1-1-1	2			18		
	S7	SS	WOH-WOH-WOH	0			18		
40	S8	SS	WOH-WOH-WOH	0			18		
	ST2	ST					24 1/2		K,MC,B,OC
50	S9	SS	WOH-1-2	3			0		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name DSWA - Phase IV	Boring No. TB-4 (Cont.)	Groundwater Level	
Job No.	Surface Elevation	Date	Depth
Date Drilled	Boring Method		
Drilling Co.	Completion Depth		
Drill Foreman	Location		
Logged By			

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S10	SS	WOH-2-3	5	Black, soft clayey silt with little organics and trace fine sand, wet.		18		
	S11	SS	4-3-3	6			18	ML	MC, AL
60	ST3	ST					24		K,MC,B,OC
					-67.5'	-19.4			
	S12	SS	10-9-13	22	Gray and tan, dense coarse to fine sand with little coarse to fine gravel, wet. (Granular Deposits)		18		
70	S13	SS	15-13-8	21		-25.4	8		
					Bottom of Test Boring at -73.5'				
80									
90									
100									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Cont., B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-5
Job No.	2477-03-01	Surface Elevation	42.5
Date Drilled	4/6/92	Boring Method	HSA
Drilling Co.	Walton Corp.	Completion Depth	75.5 ft.
Drill Foreman	M. Beck	Location	See Figure 3-2
Logged By	J. Vitale (RFW)		

Groundwater Level

Date	Depth
Not measured due to washing operations.	

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
						40.5			
	S1	SS	7/10/11	21	Reddish-brown dense sand and (fill)-2' gravel, moist		18		
	S2	SS	2-1-WOH	1	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		0		
10	S3	SS	WOH-1-1	2	(Dredge spoils underlain by recent deposits)		18		MC,SH
	S4	SS	WOH-1-1	2			18		
20	ST1	ST							
	S5	SS	WOH-1-1	2			18		
30	S6	SS	WOH-WOH-2	2			18		
	S7	SS	WOH-1-2	3			18		OC
	S8	SS	WOH-1-2	3			18		
40	ST2	ST					27½		
	S9	SS	1-1-WOH	1			18		
	S10	SS	1-2-2	4			18		
50									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WILSON

Soil Boring Log

Job Name: DSWA - Phase IV	Boring No. TB-5 Cont'd.	Groundwater Level	
Job No.	Surface Elevation	Date	Depth
Date Drilled	Boring Method		
Drilling Co.	Completion Depth		
Drill Foreman	Location		
Logged By			

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S11	SS	WOH-1-2	3	Black, soft to medium stiff clayey silt with little organics and trace fine sand, wet.		18		
	S12	SS	3-4-5	9					
60	ST3	ST					18		
	S13	SS	5-9-19	28	-63.5	-21.0	0 12		
					Gray and tan, dense course to fine sand with little coarse to fine gravel, wet.(Granular Deposits)				
70	S14	SS	11-27-22	49			12		S
	S15	SS	7-26-29	55			12		
					Bottom of Test Boring at - 75.5 ft.				
80									
90									
100									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Cont., B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-7
Job No.	2477-03-01	Surface Elevation	26.6
Date Drilled	4/24 to 4/30/92	Boring Method	HSA: 0-21.5' MR: 21.5'-BTB
Drilling Co.	Walton Corp.	Completion Depth	125 ft.
Drill Foreman	W. Patterson	Location	See Figure 3-2
Logged By	J. Wartman (RFW)		

Groundwater Level Date	Depth
4/24/92	-12'-8"
4/27/92	-21'-6"
5/1/92	-17'-0"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S1	SS	2-3-3	6	Dark brown silt with some organics and rootmass, damp. (Berm Fill) -6'	20.6	6		
	S2	SS	2-2-3	5			2		
	ST1	ST			Black, soft clayey silt with little organics and trace fine sand and small roots, damp to wet. (Dredge spoils or recent deposits)		15½		UU, CIU
10	ST2	ST					18		
	ST3	SS	1-1-3	4			18		MC, SH
	S4	SS	WOH-1-2	3			18	ML	MC, AL
	ST3	ST					26¾		UU, CIU
20									
	S5	SS	WOH-1-1	2	-27.5'	-0.9	18		
	S6	SS	2-4-14-20	18	Multi-colored, dense coarse to medium sand with some coarse to fine gravel, wet. - Gravel component varies within stratum.		10	SW/GW	S
30	S7	SS	9-11-8	19			8		
	S8	SS	5-6-4	10			6		
40	S9	SS	15-7-9	16			8		
	S10	SS	4-4-7	11			12		
50					(Continued on next sheet)				

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-7 (Cont.)
Job No.		Surface Elevation	
Date Drilled		Boring Method	
Drilling Co.		Completion Depth	
Drill Foreman		Location	
Logged By			

Groundwater Level

Date	Depth

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S11	SS	23-14-9	23	-55'	-28.4			
	S12	SS	3-3-4	7	Black, stiff clayey silt with occ. laminations (1/8-in.) of black, medium to fine sand, wet. (Recent deposits)		18		
60	S13	SS	3-6-5	11			18		
	ST4	ST					20½		UU
	S14	SS	3-3-4	7			18		
70	S15	SS	3-3-8	11			18		
	ST5	ST			-76'	-49.4	19¾		
	S16	SS	14-24-19	43	Multi-colored, very dense coarse to medium sand with some fine gravel, wet. (Granular Deposits)				
80	S17	SS	6-29-32	61			7	SW	S
	S18	SS	100/6"	+100			8		
90	S19	SS	6-8-8-13	16			18		
	S20	SS	4-4-7	11			16		MC
100					(Continued on next sheet)				

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Job Name DSWA - Phase IV
Job No.
Boring No. TB-7 (Cont.)
Surface Elevation

Groundwater Level
Date Depth

Date Drilled
Drilling Co.
Drill Foreman
Logged By
Boring Method
Completion Depth
Location

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
					- Becoming tan and olive-green and medium to fine at -103'				
	S21	SS	3-2-15-17	32			24		
110	S22	SS	9-15-19	34			9		
	S23	SS	3-4-7	11	Black, stiff, clayey silt with little fine sand, wet.		13		
120	S24	SS	9-10-14	24			10		
					-123'	-96.4			
	S25	SS	32-47-56	103	Very dense, coarse to fine gravel with tan, coarse to fine sand, wet.	-98.4	10		
					Bottom of Test Boring at -125'				
130									
140									
150									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

OC- Organic Content
B-Bulk Density

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WALTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-7A
Job No.	2477-03-01	Surface Elevation	26.6
Date Drilled	4/30/92	Boring Method	HSA
Drilling Co.	Walton Corp.	Completion Depth	22 Ft.
Drill Foreman	W. Patterson	Location	See Figure 3-2
Logged By	J. Wartman		

Groundwater Level Date	Depth
Not Encountered	

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	ST1	ST			Brownish-gray to black, soft to medium stiff clayey silt with little organics and fine sand, damp.		21		
	S1	SS	2-2-4	6			12		MC, SH
	ST2	ST					24		
10	S2	SS	1-1-1	2			14	MH	MC, AL
	ST3	ST					25		
	S3	SS	1-1-2	3			18		
	ST4	ST					24		
20	S4	SS	1-1-1	2			18		
					Bottom of Test Boring at -22'				

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Cont., B-Bulk Density

* ASTM D-1586 Standard Penetr. Test

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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-8
Job No.	2477-03-01	Surface Elevation	48.8
Date Drilled	4/13 and 4/14/92	Boring Method	HSA: 0-20' MR: 20'-BTB
Drilling Co.	Walton Corp.	Completion Depth	81.5 ft.
Drill Foreman	W. Patterson	Location	See Figure 3-2
Logged By	J. Wartman (RFW)		

Groundwater Level Date	Depth
4/13/92	-14.5'
4/14/92	-9'

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S1	SS	WOH-2-2	4	Black, soft clayey silt with little organics and trace fine sand. (Dredge spoils underlain by recent deposits.)		1		
	S2	SS	WOH-WOH-WOH	0			2		
10	S3	SS	WOR-WOH-WOH	0			0		
	S4	SS	WOH-WOH-1	1			18		
20	ST1	ST					25 3/4		UU
	S5	SS	WOR-WOH-WOH	0			24		
30	S6	SS	WOR-WOH-1	1			24		
	S7	SS	WOH-WOH-WOH	0			24		
40	ST2	ST					26		UU
	S8	SS	WOH-WOH-WOH	0			24		
50	S9	SS	WOH-2-1	3			24		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

OC- Organic Content

B-Bulk Density

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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-8 (Cont.)
Job No.		Surface Elevation	

Groundwater Level	
Date	Depth

Date Drilled		Boring Method	
Drilling Co.		Completion Depth	
Drill Foreman		Location	
Logged By			

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
					- Same				
	S10	SS	2-2-3	5	- Becoming firm at -55'.		0		
60	ST3	ST					18		CIU
	S11	SS	WOH-2-2	4			18		
	S12	SS	1-2-3	5			18		
					-70.5'	-21.7			
70	S13	SS	1-4-5	9	Loose to very loose brown fine to coarse clayey sand.		18		
	S14	SS	2-4-2	6	-78'	-29.2	18		
					Soft brown clayey silt with thin fine sand lenses.				
80	S15	SS	1-1-2	3		-32.7			
					Bottom of Test Boring at 81.5'				

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Con[illegible], B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA - Phase IV	Boring No.	TB-9
Job No.	2477-03-01	Surface Elevation	53.1
Date Drilled	4/21 to 4/23/92	Boring Method	MSA: 0-25' MR: 25-B7B
Drilling Co.	Walton Corp.	Completion Depth	107.5 ft.
Drill Foreman	W. Patterson	Location	See Figure 3-2
Logged By	J. Wartman (RFW)		

Groundwater Level Date	Depth
4/23/92	10'-2"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S1	SS	4-7-5	12	Dark brown silt with some organics and small roots, dry (Berm fill)		2		
	S2	SS	1-4-5	9			6	ML/MH	MC,SH
10					-14'	39.1			
	S3	SS	WOH-2-2	4	Black, soft clayey silt with little fine sand, wet (Dredge spoils underlain by recent deposits)		18		
20	ST1	ST					23½		UU
	S4	SS	1-1-2	3			16		
30									
	S5	SS	1-1-2	3			18	MH	MC,AL
40	ST2	ST					22		CIU
	S6	SS	WOH-2-2	4	-Trace wood fragments and rootmass at 45'		18		
50									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name: DSWA - Phase IV	Boring No.: TB-9 (cont)	Groundwater Level	
Job No.	Surface Elevation	Date	Depth
Date Drilled	Boring Method		
Drilling Co.	Completion Depth		
Drill Foreman	Location		
Logged By			

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S7	SS	1-2-3	5	Black, medium stiff clayey silt with trace ogranics, wet (recent deposits)		18	MH	MC,AL
					59'	-5.9			
60	S8	SS	4-4-7-9	11	Multi-colored, dense coarse sand and coarse to fine gravel, wet		10		
	S9	SS	8-8-9-8	17			3		S
70	S10	SS	7-14-8	22			14		
					-73'	-19.9			
	S11	SS	4-4-4	8	Black, medium stiff to stiff clayey silt		14		
80	ST4	ST					26½		
					-85'	-31.9			
	S12	SS	3-4-6	10	Black, medium to fine sand with some gravel, wet		18		
90	S13	SS	3-3-4	7			18		
	S14	SS	2-3-4	7	-Becoming more silty at -95'		18		MC,SH
100									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Con, B-Bulk Density

* ASTM D-1586 Standard Penet Test

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Job Name: DSWA - Phase IV	Boring No.: TB-9 (cont)	Groundwater Level	
Job No.	Surface Elevation	Date	Depth
Date Drilled	Boring Method		
Drilling Co.	Completion Depth		
Drill Foreman	Location		
Logged By			

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S15	SS	1-3-4	7				18	
	S16	SS	6-100/6"	+100	-Rock fragments (gravel?) at -105'	-54.4		6	
					Bottom of Test Boring at -107.5'				
10									
20									
30									
40									
50									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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Job Name	DSWA - Phase IV	Boring No.	TB-10
Job No.	2477-03-01	Surface Elevation	47.8
Date Drilled	4/8 and 4/9/92	Boring Method	HSA
Drilling Co.	Walton Corp.	Completion Depth	70 ft.
Drill Foreman	M. Beck	Location	See Figure 3-2
Logged By	J. Vitale (RFW)		

Groundwater Level Date	Depth
4/8/92	-8'

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
	S1	SS	WOH-1-WOH	1	Black, soft clayey silt with little organics and trace fine sand, wet (Dredge spoils underlain by recent deposits)		12		
	S2	SS	WOH-1-3	4	- Medium stiff at -8 to -15 ft.		6		
10	S3	SS	WOH-4-5	9			17		
	S4	SS	4-4-5	9			12		
20	S5	SS	1-1-2	3			18		MC,SH
	ST1	ST					26		
30	S6	SS	1-1-1	2			8		
	S7	SS	WOH-WOH-WOH	0			12		MC,AL
40	S8	SS	WOH-WOH-2	2			18		
	ST2	ST					25		
50	S9	SS	WOH-WOH-WOH	0			24		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Conte, B-Bulk Density

* ASTM D-1586 Standard Penetrat. Test

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Job Name: DSWA - Phase IV
Job No.:
Boring No.: TB-10 (cont)
Surface Elevation:

Groundwater Level
Date | Depth

Date Drilled:
Drilling Co.:
Drill Foreman:
Logged By:
Boring Method:
Completion Depth:
Location:

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	INCHES Recovery	USCS CLASS	Laboratory Test Results
					Same				
	S10	SS	WOH-WOH-3	3			18		MC
60	ST3	ST					26		
	S11	SS	WOH-3-4	7	-Becoming medium stiff at -63'		18		OC
	S12	SS	-	-		-22.2	-		
70					Bottom of Test Boring at - 70'				

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC- Organic Content, B-Bulk Density

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA PHASE V	Boring No.	TB-11
Job No.	02477-004-001-0021	Surface Elevation	46.17
Date Drilled	6-21-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	81'-6"
Drill Foreman	A.W. Feldmann	Location	N627835.415
Logged By	S. Strazzella (RFW)		E471596.003

Groundwater Level Date	Depth

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	1-1-2	3	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		6"		MC, SH
5	S2	SS	1-1-H	1	Sand, wet.		0"		
10	S3	SS	H-H-H	0	(Dredge spoils underlain by recent deposits)		0"		
15	ST-1	ST					20"		MC
	S4	SS	R-2-1	3			18"		
20	S5	SS	R-R-R	0			12"		OC
25	S6	SS	1-1-1	2			18"		B
30	ST-2	ST							
	S7	SS	1-1-1	2			18"		
35	S8	SS	1-1-1	2			18"		pH
40	S9	SS	4-1-2	3			18"		
45	S10	SS	1-1-1	2			16"		
50	S11	SS	1-1-2				18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, B-Bulk Density, QC-Organic Content

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-11
Job No.	02477-004-001-0021	Surface Elevation	46.17
Date Drilled	6-22-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	81'-6"
Drill Foreman	A.W. Feldman	Location	N627835.415
Logged By	S. Strazzella (RFW)		E471596.003

Groundwater Level Date	Depth

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S12	SS	2-1-2	3			12"		
60	S13	SS	1-2-2	4	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		16"		MC
65	S15	SS	1-2-2	4			14"		
70	S15	SS	1-2-3	5	Becoming firm.		16"		MC
75	S16	SS	24-24-29	55	-76 ft.	-29.88	8"		S
					Gray dense coarse to fine gravel and sand, trace silt, wet.				
80	S17	SS	7-18-16	34	(Granular Deposits)	-35.33			
					End of Boring @ -81.5 ft.				
85									
90									
95									
100									
105									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-12
Job No.	02477-004-001-0021	Surface Elevation	47.79
Date Drilled	6-24-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	86'-6"
Drill Foreman	A.W. Feldman	Location	N627499.883 E472500.047
Logged By	S. Strazzella (RFW)		

Groundwater Level Date	Depth
6-24-93	10'-0"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	R-H-H	0	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		2"		
5	S2	SS	H-H-H	0			2"		AL
10	S3	SS	H-1-1	2			12"		
	ST-1	ST			(Dredge spoils underlain by recent deposits)		F		
15	S4	SS	H-H-H	0			18"		
20	S5	SS	H-H-H	0			18"		AL
25	S6	SS	H-H-H	0			18"		SH
30	ST-2	ST					F		
	S7	SS	H-H-H	0			16"		
35	S8	SS	R-H-H	0			18"		
40	S9	SS	R-H-H	0			18"		
45	S10	SS	R-H-H	0			18"		
50	S11	SS	R-H-H	0			18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetratio Test

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WESTON

Soil Boring Log

Job Name	DSWA	Boring No.	TB-12
Job No.	02477-004-001-0021	Surface Elevation	47.79
Date Drilled	6-25-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	
Drill Foreman	A.W. Feldmann	Location	N627499.883
Logged By	S. Strazzella (RFW)		E472500.047

Groundwater Level Date	Depth
6-24-93	10'-0"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
55	S12	SS	R-H-H	0	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		18"		
60	S13	SS	R-H-2	2			18"		
65	S14	SS	H-H-3	3			18"		
70	S15	SS	1-2-2	4			18"		
75	S16	SS	1-2-2	4			18"		
80	S17	SS	1-14-22	36	-80.5 ft.	-32.71	10"		
85	S18	SS	18-15-17	32	Gray and tan, dense coarse to fine sand with little coarse to fine gravel, wet. (granular deposits)	-38.71	8"		S
					End of boring @ -86.5 ft.				
90									
95									
100									
105									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-13
Job No.	02477-004-001-0021	Surface Elevation	47.77 (±)
Date Drilled	7-1-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	101' - 6"
Drill Foreman	A.W. Feldmann	Location	N627194.544
Logged By	SSStrazzella (RFW)		E473091.785

Groundwater Level Date	Depth
7-1-93	18'-0"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	1-2-2	4	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		3"		MC
5	S2	SS	1-H-1	1			0"		
10	ST-1	ST					F		
	S3	SS	H-H-H	0	(Dredge spoils underlain by recent deposits)		8"		
15	S4	SS	H-H-H	0			12"		MC
20	S5	SS	H-H-H	0			18"		
25	S6	SS	H-H-H	0			18"		
30	ST-2	ST					F		
	S7	SS	H-H-H	0			18"		MC
35	S8	SS	H-H-H	0			18"		
40	S9	SS	H-H-H	0			18"		SH
45	S10	SS	H-H-H	0			18"		MC
50	S11	SS	H-H-1	1			18"		pH

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetratio Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-13
Job No.	02477-004-001-0021	Surface Elevation	47.77 (±)
Date Drilled	7-1-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	101' - 6"
Drill Foreman	A.W. Feldmann	Location	N627194.544
Logged By	S. Strazzella (RFW)		E473091.785

Groundwater Level Date	Depth
7-1-93	18' - 0"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S12	SS	H-H-1	1	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		18"		
60	S13	SS	H-H-2	2			18"		MC
65	S14	SS	R-H-2	2			18"		OC
70	ST3	ST					No Rec.		
75									
80	S15	SS	1-1-2	3			12"		
85	S16	SS	1-1-1	2			18"		MC
90	S17	SS	2-8-4	12	Becoming stiff.		10"		
95	S18	SS	4-4-7	11			18"		
100					-99 ft.	-51.23			
	S19	SS	1-4-10	14	Gray and tan, loose coarse to fine sand and gravel, wet. (granular deposits)	-53.73	12"		
105					End of boring @ -101.5 ft.				

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-14
Job No.	02477-004-001-0021	Surface Elevation	47.34
Date Drilled	6-22-93/6-23-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	86' - 6"
Drill Foreman	A.W. Feldmann	Location	N627172.718
Logged By	S. Strazzella (RFW)		E472039.952

Groundwater Level Date	Depth
6-22-93	9' - 6"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	R-1-1	2	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		4"		MC
5	S2	SS	1-H-1	1			4"		
10	ST-1	ST					F		
	S3	SS	H-H-H	0	(Dredge spoils underlain by recent deposits)		18"		
15	S4	SS	H-H-H	0			14"		MC
20	S5	SS	H-H-H	0			16"		
25	S6	SS	H-1-2	3			16"		
30	S7	SS	H-H-H	0			18"		MC
35	ST-2	ST					F		
	S8	SS	1-1-1	2			18"		
40	S9	SS	R-H-H	0			18"		OC
45	S10	SS	R-R-H	0			18"		MC
50	S11	SS	R-H-H	0			18"		AL

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity, OC-Organic Content

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-14
Job No.	02477-004-001-0021	Surface Elevation	47.34
Date Drilled	6-22-93/6-23-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	86' - 6"
Drill Foreman	A.W. Feldmann	Location	N627172.718
Logged By	S. Strazzella (RFW)		E472039.952

Groundwater Level Date	Depth
6-22-93	9' - 6"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
55	S12		H-H-H	0	Black, very soft to soft clayey silt with little organics and trace fine sand, wet.		18"		SH
60	ST-3	ST					F		
	S13	SS	H-2-2	4			18"		MC
65	S14	SS	R-R-2	2			18"		
70	S15	SS	1-2-3	5	Becoming firm.		18"		pH
75	S16	SS	2-2-4	6			18"		MC
80					-79 ft.	-31.66			
	S17	SS	R5'-8-7	15	Gray and tan, loose becoming medium dense coarse to fine sand with little coarse to fine gravel, wet.		18"		
85	S18	SS	14-14-16	30	(Granular Deposits)		10"		MC
					End of boring @ - 86.5 ft.	-39.16			
90									
95									
100									
105									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-15
Job No.	02477-004-001-0021	Surface Elevation	48.26
Date Drilled	6-29-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	101' - 6"
Drill Foreman	A.W. Feldmann	Location	N626547.145
Logged By	S. Strazzella (RFW)		E473004.939

Groundwater Level Date	Depth

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	1-3-3	6	Black, very soft to firm clayey silt with little organics and trace fine sand, wet.		8"		
5	S2	SS	H-H-H	0			0"		
10	S3	SS	H-H-H	0	(Dredge soils underlain by recent deposits)		0"		pH
15	ST-1	ST					F		
	S4	SS	H-H-H	0			18"		
20	S5	SS	1-1-1	2			18"		
25	S6	SS	R-H-H	0			18"		
30	S7	SS	1-H-1	1			18"		
35	S8	SS	H-H-H	0			18"		
40	S9	SS	H-1-2	3			18"		
45	S10	SS	1-3-4	7			18"		
50	ST-2						F		
	S11	SS	2-2-3	5			18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetratio Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-15
Job No.	02477-004-001-0021	Surface Elevation	48.26
Date Drilled	6-29-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	101' - 6"
Drill Foreman	A.W. Feldmann	Location	N626547.145
Logged By	S. Strazzella (RFW)		E473004.939

Groundwater Level
Date Depth

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
55	S12	SS	1-2-3	5	Black, very soft to firm clayey silt with little organics and trace fine sand, wet.		18"		
60	S13	SS	1-4-4	8			18"		
65	S14	SS	1-3-3	6			18"		
70	S15	SS	2-2-4	6			18"		B
75	S16	SS	2-2-3	5			18"		AL
80	S17	SS	2-2-4	6			18"		SH
85	S18	SS	2-2-4	6			18"		
90	S19	SS	4-4-5	9	Becoming stiff.		18"		
95	S20	SS	3-5-7	12			18"		
					-98 ft	-49.74			
100	S21	SS	9-27-64	91	Gray and tan, dense coarse to fine sand and gravel, wet. (Granular deposits)	-53.24	18"		
					End of boring@-101.5 ft.				
105									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-16
Job No.	02477-003-001-0021	Surface Elevation	41.39
Date Drilled	6-23-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	75' - 6"
Drill Foreman		Location	N627779.589 E471205.951
Logged By	J. Wartmen (RFW)		

Groundwater Level Date	Depth
6-23-93	13'-6"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	3-3-2	5	Black, very soft to stiff clayey silt with little organics and trace fine sand, wet.		9"		
5	S2	SS	2-2-2	3			11"		
10	S3	SS	1-1-2	3			15"		
15	S4	SS	4-3-4	7	(Dredge spoils underlain by recent deposits)		9"		
20	S5	SS	1-4-6	10			12"		
25	S6	SS	H-1-2	3			18"		
30	ST-1	ST					F		
	S7	SS	1-1-2	3			14"		
35	S8	SS	R-H-H	0			18"		
40	S9	SS	1-1-2	3			14"		
45	ST-2	ST					F		
	S10	SS	2-2-4	6			18"		
50	S11	SS	1-2-2	4			18"		
	S12	SS	1-2-3	5			18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-16
Job No.	02477-003-001-0021	Surface Elevation	41.39
Date Drilled	6-23-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	75' - 6"
Drill Foreman		Location	N627779.589
Logged By	J. Wartman (RFW)		E471205.951

Groundwater Level Date	Depth
6-23-93	13'-6"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
					Black, stiff silt with little organics and trace fine sand, wet.				
60	ST-3	ST					24"		
	S13	SS	2-4-4	8			18"		
65	S14	SS	2-3-8	11			18"		
					-68 ft.	-26.61			
70	S15	SS	3-5-18	23	Gray, medium dense to dense, coarse to fine sand and gravel, wet. (Granular deposits)		8"		
75	S16	SS	22-20-18	38		-34.11	8"		
					End of boring @ -75.5 ft.				
80									
85									
90									
95									
100									
105									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-17
Job No.	02477-003-001-0021	Surface Elevation	23.81
Date Drilled	6-10-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	92'-0"
Drill Foreman	J. Foley	Location	N627100.040
Logged By	J. Wartman (RFW)		E471278.437

Groundwater Level Date	Depth
6-10-93	14'-10"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	3-5-2	7	Black, very soft to firm clayey silt with little organics and trace fine sand, wet.		8"		MC
5	S2	SS	1-1-1	2	(Dredge spoils underlain by recent deposits)		10"		
10	ST-1	ST					F		
	S3	SS	R-H-H	0			18"		
15	S4	SS	H-H-H	0			18"		
20	S5	SS	H-H-H	0			18"		MC
25	S6	SS	H-H-H	0			18"		
30	ST-2	ST					24"		
	S7	SS		2			18"		AL
35	S8	SS	1-1-1	2			18"		SH
40	S9	SS	H-H-2	2			18"		
45	S10	SS	1-1-1	2			18"		MC
50	S11	SS	1-1-1	2			18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-17
Job No.	02477-003-001-0021	Surface Elevation	23.81
Date Drilled	6-10-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	92'-0"
Drill Foreman	J. Foley	Location	N627100.040
Logged By	J. Wartman (RFW)		E471278.437

Groundwater Level Date	Depth
6-10-93	14'-10"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
					Black, very soft to firm clayey silt with little organics and trace fine sand, wet.				
55	S12	SS	1-1-1	2			18"		
60	S13	SS	H-1-2	3			18"		
65					-66ft.	-42.19			
	S14	SS	12-17-11	28	Gray and tan, medium dense to dense coarse to fine sand with little coarse to fine gravel, wet.		18"		
70	S15	SS	6-10-13-15	23	(Granular deposits)		16"		MC
75	S16	SS	26-39-36	75			18"		
80	S17	SS	21-28-21-38	49			2"		
85					-84 ft.	-60.19			
	S18	SS	8-12-18-35	30	Gray and white dense, coarse to fine clayey sand, wet.		4"		MC
90	S19	SS	13-19-22-25	41		-68.19	2"		
					End of boring @-92 ft.				
95									
100									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-18
Job No.	02477-003-001-0021	Surface Elevation	42.56
Date Drilled	6-22-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	90'-6"
Drill Foreman	J. Foley	Location	N626810.144
Logged By	J. Wartman (RFW)		E471831.066

Groundwater Level Date	Depth
6-23-93	13'-6"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	4-4-6	10	Black, very soft to stiff clayey silt with little organics and trace fine sand, wet.		9"		
5	S2	SS	2-2-2	4			12"		AL
10	S3	SS	1-2-2	4			14"		SH
15	S4	SS	1-1-1	2	(Dredge spoils underlain by recent deposits)		18"		
20	ST1	ST					23"		
	S5	SS	1-1-1	2			18"		
25	S6	SS	1-1-1	2			18"		OC
3[illegible]	S7	SS	1-2-2	4			18"		
35	S8	SS	1-1-3	4			18"		
40	S9	SS	H-1-2	3			18"		
45	S10	SS	H-1-3	4			18"		
50	S11	SS	R-H-H	0			18"		
	S12	SS	H-1-2	3			18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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OC = Organic Content

WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-18
Job No.	02477-003-001-0021	Surface Elevation	42.56
Date Drilled	6-22-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	90'-6"
Drill Foreman	J. Foley	Location	N626819.144
Logged By	J. Wartman (RFW)		E471831.066

Groundwater Level Date	Depth
6-23-93	13'-6"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
					Black, soft clayey silt with little organics and trace fine sand, wet.				
60	ST-2	ST							
	S13	SS	H-2-2	4			18"		
65	S14	SS	R-H-2	2			18"		SH
70	S15	SS	R-H-2	2			18"		
75	S16	SS	R-H-3	3			18"		
80	S17	SS	R-H-3	3			18"		
					-84 ft.	-41.44			
85	S18	SS	7-7-13	20	Gray, medium dense coarse to fine sand, some gravel, trace silt, wet. (Granular deposits)		8"		
90	S19	SS	20-16-17	33		-47.94			
					End of boring @-90.5 ft.				
95									
100									
105									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetr Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-19
Job No.	02477-003-001-0021	Surface Elevation	29.29
Date Drilled	6-14-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	76'-6"
Drill Foreman	J. Foley	Location	N626302.035
Logged By	J. Wartman (RFW)		E472504.524

Groundwater Level Date	Depth
6-14-93	8'-10"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	7-7-5	12	Black, very soft to stiff clayey silt with little organics and trace fine sand, wet.		12"		MC
5	S2	SS	H-1-3	4					
10	S3	SS	H-1-1	2	(Dredge spoils underlain by recent deposits)				
15									
	S4	SS	1-1-1-1	2			18"		AL
20	S5	SS	1-1-1	2			18"		MC
25	S6	SS	1-1-2	3			18"		SH
30	ST1	ST					F		
	S7	SS	1-2-3	5			18"		
35	S8	SS	1-1-2	3			18"		
40	S9	SS	H-1-2	3			18"		
45	ST-2	ST					F		
	S10	SS	2-2-4	6			18"		MC
50	S11	SS	2-2-4	6			18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetratio Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-19
Job No.	02477-003-001-0021	Surface Elevation	29.29
Date Drilled	6-14-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	76'-6"
Drill Foreman	J. Foley	Location	N626302.035
Logged By	J. Wartman (RFW)		E472504.524

Groundwater Level Date	Depth
6-14-93	8'-10"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
					Black, soft clayey silt with little organics and trace fine sand, wet.				
55	S12	SS	22-18-6	24	Very stiff at 55' BGS.		18"		
60	S13	SS	2-2-2	4			18"		
65	S14	SS	3-4-4	8			18"		MC
					-71 ft.	-41.71			
70	S15	SS	10-9-11	20	Gray, medium dense to very dense coarse to fine sand and gravel, wet.		6"		
75	S16	SS	35-35-24	59	(Granular Deposits)	-47.21	10"		MC
					End of boring @-76.5 ft.				
80									
85									
90									
95									
100									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WALTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-20
Job No.	02477-003-001-021	Surface Elevation	43.29
Date Drilled	6-21-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	95'-6"
Drill Foreman	J. Foley	Location	N626381.858
Logged By	J. Wartman (RFW)		E472981.330

Groundwater Level Date	Depth
6-21-93	32'-6"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	6-10-11	21	Black, soft to very stiff clayey silt with little organics and trace fine sand, wet.		4"		
5	S2	SS	2-2-2	4			6"		
					(Dredge spoils underlain by recent deposits)				
10	ST-1	ST					24"		
	S3	SS	H-2-2	4			18"		
15	S4	SS	1-2-2	4			18"		
20	S5	SS	1-1-2	3			18"		
25	S6	SS	2-1-2	3			18"		
30	S7	SS	H-2-2	4			18"		
35	S8	SS	1-2-2	4			18"		
40	S9	SS	2-1-2-2	3			18"		
45	S10	SS	2-2-4	6			18"		
50	ST-2	ST					24"		
	S11	SS	1-2-2	4			18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-20
Job No.	02477-003-001-0021	Surface Elevation	43.29
Date Drilled	6-21-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	95' -6"
Drill Foreman	J. Foley	Location	N626381.858
Logged By	J. Wartman (RFW)		E472981.330

Groundwater Level Date	Depth
6-21-93	32'-6"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
55	S12	SS	3-4-7	11	Black, soft clayey silt with little organics and trace fine sand, wet.		18"		OC
60	S13	SS	7-4-6	10			18"		
65	S14	SS	4-5-6				18"		AL
70	S15	SS	4-5-5				18"		
	ST-3	ST					24"		
75	S16	SS	4-6-5	11			18"		SH
80	S17	SS	2-3-4	7			18"		
85	S18	SS	1-2-4	6			18"		
90	S19	SS	7-3-5				18"		
					-94 ft.	-50.71			
95	S20	SS	6-8-15	23	Graymedium dense coarse to fine sand and gravel wet. (Granular Deposits)	-52.21	14"		
					End of boring @ -95.5 ft.				
100									
105									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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OC = Organic Content

WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-21
Job No.	02477-003-001-0021	Surface Elevation	27.62
Date Drilled	6-15-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	85' -6"
Drill Foreman	J. Foley	Location	N626305.834
Logged By	J. Wartman (RFW)		E473363.200

Groundwater Level Date	Depth
6-15-93	4'-8"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	6-7-7	14	Black, very soft to very stiff silt with little organics and trace fine sand, wet.		2"		
5	S2	SS	8-4-2	6			6"		MC
10	S3	SS	H-H-1	1			18"		
15	ST-1	ST			(Dredge spoils underlain by recent deposits)		24"		
	S4	SS	H-1-1	2			18"		MC
20	S5	SS	H-H-1	1			18"		
25	S6	SS	H-H-1	1			18"		
30	ST2	ST					24"		
	S7	SS	H-2-4	6			18"		
35	S8	SS	2-2-3	5			9"		
40	S9	SS	2-6-7	13			18"		AL
45	S10	SS	11-5-6	11			18"		MC
50	S11	SS	1-3-4	7			18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-21
Job No.	02477-003-001-0021	Surface Elevation	27.62
Date Drilled	6-15-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	85'-6"
Drill Foreman	J. Foley	Location	N626305.834
Logged By	J. Wartman (RFW)		E473363.200

Groundwater Level Date	Depth
6-15-93	4'-8"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
					Black, soft clayey silt with little organics and trace fine sand, wet.				
55	ST3	ST							
	S12	SS	20-14-14	28	with red rock fragments		18"		
60	S13	SS	37-18-7-7	25			1"		
65	S14	SS	2-2-4	6			18"		
70	S15	SS	3-3-3	6			18"		MC
75	S16	SS	2-3-4	7			18"		GS
80	S17	SS	2-7-24	31	-81 ft.	-53.38	18"		
					Gray, very dense coarse to fine sand and gravel, wet. (Granular deposits)				
85	S18	SS	34-51-71	100		-57.88	18"		MC
					End of boring @ -85.5 ft.				
90									
95									
100									

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetration Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-22
Job No.	02477-003-001-0021	Surface Elevation	50-59
Date Drilled	6-17-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	110'-6"
Drill Foreman	J. Foley	Location	N626770.549
Logged By	J. Wartman (RFW)		E473447.623

Groundwater Level Date	Depth
6-17-93	64'-3"
6-18-93	63'-6"

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
	S1	SS	3-4-5	9	Black, soft to stiff clayey silt with little organics and trace fine sand, wet.		3"		
5	S2	SS	2-3-4	7			1"		MC
10	S3	SS	2-2-2	4			0		SH
					(Dredge spoils underlain by recent deposits)				
15	S4	SS	1-1-2	3			18"		
20	ST1	ST					18"		MC
	S5	SS	H-2-2-2	4			2"		
25	S6	SS	H-1-2	3			18"		B
30	S7	SS	H-1-2	3			18"		
35	S8	SS	H-2-2	4			18"		
40	ST2	ST					24"		
	S9	SS	1-1-2	3			18"		
45	S10	SS	1-2-3	5			18"		MC
50	S11	SS	1-2-3	5			18"		SH

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL- Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetrat Test

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WESTON

Soil Boring Log

Job Name	DSWA Phase V	Boring No.	TB-22
Job No.	02477-003-001-0021	Surface Elevation	50.59
Date Drilled	6-17-93	Boring Method	HSA/MR
Drilling Co.	Walton Corp.	Completion Depth	110'-6"
Drill Foreman	J. Foley	Location	N626770.549
Logged By	J. Wartman (RFW)		E473447.623

Groundwater Level Date	Depth
6-17-93	64'-3"
6-18-93	63'-6'

Depth (Feet)	Sample No.	Sample Type	Sample Blow Counts* (per 6 in.)	N Value	Visual Description	Stratum Elevation	% Recovery	% RQD	Laboratory Test Results
55	S12	SS	1-3-4	7	Black, soft clayey silt with little organics and trace fine sand, wet.		12"		
60	S13	SS	1-2-3	5			18"		
65	S14	SS	2-2-4	6			18"		
70	S15	SS	2-2-4	6			18"		MC
75	S16	SS	3-2-4	6	Trace of medium to fine sands.		18"		
80	S17	SS	5-6-6	12			18"		
85	S18	SS	2-2-3	5			18"		OC
90	S19	SS	1-2-3	5			18"		
95	S20	SS	1-2-5	7			18"		MC
100	S21	SS	1-2-5	7			18"		
105	S22	SS	15-18-12	30	Gray, medium dense to dense coarse to fine sand and gravel trace silt, wet. (Granular deposits)	-51.9	18"		S
	S23	SS	18-35-20	55	End of boring @ -110.5 ft.	-59.9	18"		

Sample Type: SS-Split Spoon, ST-Shelby Tube, RC-Rock Core

Laboratory Tests: MC-Moisture Content, AL-Atterberg Limits, S-Sieve Analysis, SH-Sieve/Hydrometer Analysis, SG-Specific Gravity, C-Consolidation, UU-Unconsolidated Undrained Triaxial, CIU-Consolidated Undrained Triaxial, UCS-Unconfined Compression Strength, K-Hydraulic Conductivity

* ASTM D-1586 Standard Penetr Test

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CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: LC101A	MARCOR ENVIRONMENTAL	See Figure 2-1 for location
PERMIT #: 106907	DATE: 01 February 1996	
DRILLING METHOD/RIG: Hollow Stem Auger		
DRILLED BY: MARCOR	GEOLOGIST: Joe Casey	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: .010 Slot PVC	
FEET RISER: 76.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): 71	TOTAL DEPTH (ft): 84
OTHER: 2.5 ft stickup manway		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
0	N/A	N/A	N/A		0-13.0 Dredge Spoils Silt (ML): Lt. gray, slightly moist, very clayey, massive, soft, organic odor 13.0-18.0 Same as above increasing clay content slightly more moist.
10					
20					18.0-71.0 Dredge Spoils Clay (CL): Medium gray high plasticity, saturated, massive, runny, organic odor.
30					
40					
50					
60					
70					Bottom of Dredge Spoils 71.0-84.0 Columbia Fm. Sand (SP): Orange to Light Brown, Arkosic, Slight Moist, Loose,Micaceous Minor Subrounded Coarse Clasts (<10%) (The description above is inferred from well siteLC102A sand was not returned to the surface. Contact is confirmed by hard drilling characteristics.) Boring terminated at 84 ft bgs
80					

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: P101A	MARCOR ENVIRONMENTAL	See Figure 2-1 for location
PERMIT #: 106903	DATE: 23 March 1996	
DRILLING METHOD/RIG: Mud Rotary		
DRILLED BY: MARCOR	GEOLOGIST: Jeff Walsh/Bob Byer	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: .010 Slot PVC	
FEET RISER: 157.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): NM	TOTAL DEPTH (ft): 169
OTHER: 2.5 ft stick up manway		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
0	N/A	N/A	N/A		0.0-17.0 Artificial Fill (AFU) Dredge Spoils (with some clayey silt)
10					
20					22.0-66.0 Artificial Fill (AFU) Dredge Spoils with Coarse White Sand, & Fine Gravel (GC) and Sands In Some Intervals
30					
40					
50					
60					End of Artificial Fill (AFU)
70					Columbia Formation - Contact encountered between 64 ft bgs and 66 ft bgs. 64.0 - 135.0 Silty Sands and Sandy Silts (SP) Brown to Light Brown, with some Intervals Having Fine Gravels or Woody Fragments. Some of the Sand & Gravels are Micaceous.
80					

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: P101A	MARCOR ENVIRONMENTAL	See Figure 2-1 for location
PERMIT #: 106903	DATE: 23 March 1996	
DRILLING METHOD/RIG: Mud Rotary		
DRILLED BY: MARCOR	GEOLOGIST: Jeff Walsh/Bob Byer	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: .010 Slot PVC	
FEET RISER: 157.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): NM	TOTAL DEPTH (ft): 169
OTHER: 2.5 ft stick up manway		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
80					82.0-82.5 Hard Gravel
	N/A	N/A	N/A		82.5-88.0 Brown & White Coarse Sand (SP) Micaceous
90					88.0-112.0 Light Brown, Dk. Brown, Dk. Green, and Gray Silty Fine Sands (SP) with Occasional Gravel < Few Inches Thick.
100					Below ~ 100 Sands Have Coarsened to Predominantly a Medium Sand
110					112.0-112.5 Hard Gravel - No Recovery 112.5-118.0 Same as above Hard Gravel
120					118.0-125.0 Red Silty Clay (CL) coarsening with (SP) sand down to 125 ft bgs.
130					125.0-126.0 Sand (SP) Coarse, White, Orange, Brown, Micaceous 126.0-135.0 Clayey Sand (SC), Orange Change in drilling @ 133 ft bgs, clay reddens, dense-hard. End of Columbia Formation
140					Top of Potomac Formation 135.0-150.0 Sandy Clay (SC), Red 140.0-141.0 Same as above, dark grey @144 ft bgs Same as above, light brown
150					153.0-154.0 As above with white sand
160					154.0-169.0 Silty Sand (SM) medium, yellow, orange, brown, dark grey. Boring terminated at 169 ft bgs

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: UC102A	MARCOR ENVIRONMENTAL	See Figure 2-1 for location.
PERMIT #: 106908	DATE: 31 January 1996	
DRILLING METHOD/RIG: Hollow Stem Auger		
DRILLED BY: MARCOR	GEOLOGIST: Joe Casey	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: .010 Slot PVC	
FEET RISER: 37.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): 37	TOTAL DEPTH (ft): 45
OTHER: 2.5 ft stick up manway		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
0	N/A	N/A	N/A		0 – 15.0 Artificial Fill: Dredge Spoils Clay (CL): Gray to black, organics rich, moist, massive, plastic, slight odor. @15.0 – Localized gravel lense (?) based on drill rig rattle, no cutting return. @20.0 – Same as above, soft, plastic, organic, moist @25.0 – Same as above, black grading to gray. @30.0 – Same as above, gray to light green to gray mottled highly organic/strong methane odor End of Artificial Fill: Dredge Spoils
40					33.0-45.0 Columbia Formation Sand (SP): Orange, Arkosic, slightly moist, massive, loose, micaceous, minor subrounded coarse fraction (<10%). Boring terminated at 45 ft bgs
50					
60					
70					
80					

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: P102A	MARCOR ENVIRONMENTAL	See Figure 2-1 for location.
PERMIT #: 106904	DATE: 14 February 1996	
DRILLING METHOD/RIG: Hollow Stem Auger (0-18)/Mud Rotary (18-167)		
DRILLED BY: MARCOR	GEOLOGIST: Bob Byer/Jeff Walsh	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: N/A	
FEET RISER: 157.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): N/A	TOTAL DEPTH (ft): 167
OTHER:		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
0	N/A	N/A	N/A		0 - 34.0 Artificial Fill (AF) Silty Clay (CL), Dark brown, crusher run, trace Dredge Spoil (AF) at 5' Silty Clay (OH), gray to black, moist. Wetter with depth.
10					
20					
30					End of Artificial Fill (AF)
					Top of Columbia Formation 34.0-43.0 Sand (SP), Coarse, White, Brown, Red, Subangular - Subrounded
40					
					43.0-49.0 Clay (CL), Dark gray to dark green, plastic
50					49.0-52.0 Sand (SP), Coarse, Gravelly, White, Brown, Red
					52.0-62.0 Sand and Subrounded Gravel (SP) Brown. Layers of Gray (CL) Clay. Clay is Silty and Sandy (Fine Sand)
60					62.0-80.0 (CL) Silty Clay and Fine Sand, Grey Some angular gravel at 67 ft bgs (10%)
70					
80					

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: P102A	MARCOR ENVIRONMENTAL	See Figure 2-1 for location.
RMIT #: 106904	DATE: 14 February 1996	
DRILLING METHOD/RIG: Hollow Stem Auger (0-18)/Mud Rotary (18-169)		
DRILLED BY: MARCOR	GEOLOGIST: Bob Byer/Jeff Walsh	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: N/A	
FEET RISER: 157.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): NM	TOTAL DEPTH (ft): 167
OTHER:		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
80					80.0-82.0 Brown to Red Clay (CL) Silty and Subrounded Gravel. (Columbia Fm)
	N/A	N/A	N/A		82.0-92.0 Brown/Gray Subrounded Gravel (GP) Fine & Coarse Gravel, Poorly Sorted
90					92.0-105.0 Brown/Gray Subrounded Fine Gravel (GP) and Gray Clay (CL). Some Silt and Sand.
100					
					105.0-108.0 Gravel has become finer - mostly a Coarse Sand (SP)
					108.0-109.0 Brown Fine & Crs. Gravel (GP) hard
110					109.0-110.0 Red Clay and Gravel (GC) - Hard
					110.0-140.0 Red Clay and Gravel (GP)
					Gradual coarsening of unit from 120 - 140
					@116.0 Clay is now a green/gray color
120					@121.0 Clay is now red in color.
130					
140					@ 140.0 Fine Gravel (GP) and Red Clay.
					@ 142.0 Some very light gray mottling within the red clay. End of Columbia Fm
					Top of Potomac Formation
					144.0-146.0 Red Clay (CL) with white mottling.
150					146.0-167.0 Lt. Brown Silty and Clayey Fine Sand (SP)
					@ 150 Red Silty and Clayey Fine Sand (SP)
					@ 153 Alternating beds of Lt. Brown and Red
160					159.0 - 160.0 Coarse Sand (SP)
					160.0 - 167.0 Light Lavender Silty and

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: LC113	MARCOR ENVIRONMENTAL	See Figure 2-1 for location (Note: this well was abandoned)
PERMIT #: 106909	DATE: 06 February 1996	
DRILLING METHOD/RIG: Hollow Stem Auger		
DRILLED BY: MARCOR	GEOLOGIST: Joe Casey	
SAMPLING: Cont. Split Spoon	ELEVATION: Not Surveyed	
RISER TYPE: N/A	SCREEN TYPE: N/A	
FEET RISER: N/A	FEET SCREEN: N/A	
WELL DIAMETER (in): N/A	SCREEN DIAMETER: N/A	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): N/A	TOTAL DEPTH (ft): 75
OTHER: See Page 3 of 3 for pre-abandonment well construction		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
0		NA			Dredge Spoils
					Artificial Fill (AFU):
4	4-3-2-3	NC	NA		Clay (CL): Gray to green mottled, plastic, some silt, massive, moist, organic, micaceous, roots, black organic stringers.
	2-2-2-5	NR	NA		
8	7-3-4-4	NR	NA		
	3-3-3-5	NR	NA		As above, minor silty lenses
12	1-2-1-3	NR	NA		As above, grading silty, blocky, texture, roots (reeds)
	1-2-1-4	NR	NA		
16	2-2-3-3	NR	NA		As above, abundant roots, grading more green, black organic stringers
	2-1-3-3	NR	NA		
20	1-2-3-3	6"	NA		As above, odorous
	2-2-2-4	9.6"	NA		
24	2-1-3-7	NR	NA		Abundant root fragments, (100% recovery with sand catcher)
	2-1-2-4	24"	NA		
28	4-4-7-8	24"	NA		
	2-2-2-3	24"	NA		Sand lens 6 inch thick 34 - 34.5 saturated, dry to moist clay below
32	3-4-4-8	24"	NA		

CLIENT: DSWA
MARCOR JOB #: EX-00911-001
WELL/BORING #: LC113

MARCOR ENVIRONMENTAL

PERMIT #: 106909	DATE: 06 February 1996	See Figure 2-1 for location (Note: this well was abandoned)
DRILLING METHOD/RIG: Hollow Stem Auger		
DRILLED BY: MARCOR	GEOLOGIST: Joe Casey	
SAMPLING: Cont. Split Spoon	ELEVATION: Not Surveyed	
RISER TYPE: N/A	SCREEN TYPE: N/A	
FEET RISER: N/A	FEET SCREEN: N/A	
WELL DIAMETER (in): N/A	SCREEN DIAMETER: N/A	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): NR	TOTAL DEPTH (ft): 75

OTHER: See page 3 of 3 for pre-abandonment well construction

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
34	2-0-1-3	100%	NA		
	2-6-5-9	NA	NA		37.0-61.0 Dredge Spoils/Artificial Fill (AFU): Sand (SP): Lt. Gray, Medium Green, Massive, Loose, Saturated, 5% silt and clay, organic, reeds (bottom contact could be higher, no sample collected)
38	NC	NC	NC		
	NC	NC	NC		
42	NC	NC	NC		
	3-5-5-8	100%	NA		
46	NC	NC	NC		
	5-5-6-7	100%	NA		
50	3-5-6-9	NA	NA		
	4-4-4-8	100%	NA		
54	3-5-6-10	100%	NA		
	3-3-6-7	100%	NA		
56	3-4-6-8	100%	NA		
	3-5-13-21	NA	NA		
60	10-14-30-43	NA	NA		61.0 End of Dredge Spoils/Artificial Fill (AFU) 61.0-75.0 Columbia Formation Sand (SP): dark brown/grey, massive, loose, micaceous, 10-15% fine gravel, quartzite, angular
	12-13-32-50	NA	NA		
64	13-33-	40%	NA		

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: LC113	MARCOR ENVIRONMENTAL	See Figure 2-1 for location (Note: this well was abandoned)
PERMIT #: 106909	DATE: 06 February 1996	
DRILLING METHOD/RIG: Hollow Stem Auger		
DRILLED BY: MARCOR	GEOLOGIST: Joe Casey	
SAMPLING: Cont. Split Spoon	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: N/A	
FEET RISER: N/A	FEET SCREEN: N/A	
WELL DIAMETER (in): N/A	SCREEN DIAMETER: N/A	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): NR	TOTAL DEPTH (ft): 75
OTHER: See below for pre-abandonment well construction		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
66	13-33-35-50	9.6"	NA		As above (Columbia Fm)
	17-37-38-50	9.6"	NA		As above, continued coarse sands and fine gravels
70	29-49-50-NA	0.6"	NA		Dense quartzite fragments, coarse
	13-34-47-48	11.5"	NA		
74					Auger to 75 ft bgs
					Boring terminated at 75 ft bgs

Note: Monitoring well LC-113 was abandoned due to the development of artesian conditions. Monitoring well construction prior to abandonment are as follows:

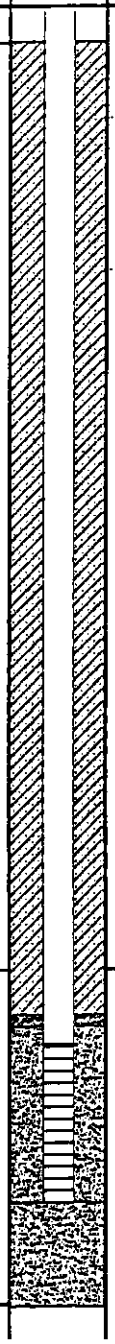
Riser: Schedule 40 PVC, 4" Diameter from +2.5ft bgs to 63 ft bgs
Screen: 0.010 slot, 4" Diameter, Schedule 40 PVC, from 63 ft bgs to 75 ft bgs
Filter Pack: #1 Morie Sand from 64 ft bgs to 75 ft bgs
Plug: #00 Morie Sand from 63 ft bgs to 64 ft bgs
Grout: Portland bentonite mix from ground surface to 63 ft bgs
Manway: Not installed

For further information concerning reasons for well abandonment see Section 2.3.2 of the "Summary Report for Monitoring Well Installation, Abandonment, Redevelopment and Repair at Pigeon Point and Cherry Island Landfills (Contract DSWA-352)" By MARCOR, for DSWA, Dated May 01, 1996.

Monitoring well LC-113A serves as the replacement well for LC-113.

CLIENT: DSWA/MARCOR MARCOR JOB #: EX-00911-001 WELL/BORING #: LC113A	MARCOR ENVIRONMENTAL	See Figure 2-1 for location (Note: this well replaced LC113)
RMIT #: 107241	DATE: 27 March 1996	
DRILLING METHOD/RIG: Mud Rotary		
DRILLED BY: MARCOR	GEOLOGIST: Joe Casey	
SAMPLING: Cont. Split Spoon	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: .010 Slot PVC	
FEET RISER: 67.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): 59.5	TOTAL DEPTH (ft): 81
OTHER:		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
0					0-59.5 Dredge Spoils
10					
20					
30					
40					
50					
					End of Dredge Spoils
60					59.5-81.0 Columbia Formation Encountered distinct gravels at 65-66 and 78-81
70					Note: See Borehole log for Monitoring Well LC-113 for further lithologic description.
80					



CLIENT: DSWA/MARCOR MARCOR JOB #: EX-00911-001 WELL/BORING #: LC114	MARCOR ENVIRONMENTAL	See Figure 2-1 for location.
RMIT #: 106906	DATE: 09 February 1996	
DRILLING METHOD/RIG: Mud Rotary		
DRILLED BY: MARCOR	GEOLOGIST: Jeff Walsh/Bob Byer	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: N/A	
FEET RISER: 126.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): NM	TOTAL DEPTH (ft): 138
OTHER: 2.5 ft stick up manway		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
0	N/A	N/A	N/A		0 - 37.0 Dredge Spoils, Artificial Fill (AFU) Clay (CL) Gray to Dark Green, mottled plastic, some silt, massive, moist, organic, micaceous, roots. @ 9 ft bgs same as above and wet
10					
20					
30					End of Dredge Spoils, Artificial Fill (AFU)
40					37.0 Top of Columbia Formation 37.0-65.0 Gravel, poorly sorted clasts and sand Sand (SP) Sand (SP) and gravels with beds* of clay and clayey silts (dark green). *Interbeds
50					
60					
70					65.0-76.0 Clay (CL) Dark Green Silty and Sandy (Fine)
					77.0-78.0 Gravel subrounded
80					78.0-84.0 Clay (CL) Green

CLIENT: DSWA/MARCOR MARCOR JOB #: EX-00911-001 WELL/BORING #: LC114	MARCOR ENVIRONMENTAL	See Figure 2-1 for location.
PERMIT #: 106906	DATE: 09 February 1996	
DRILLING METHOD/RIG: Mud Rotary		
DRILLED BY: MARCOR	GEOLOGIST: Jeff Walsh/Bob Byer	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: N/A	
FEET RISER: 126.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): NM	TOTAL DEPTH (ft): 138
OTHER: 2.5 ft stick up manway		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
80					78.0-84.0 Clay (CL) Green
					84.0-87.0 Gravel (GP) subangular to subrounded white, brown, red, trace mica
					87.0-111.0 Green Clay (CL)
90					@92.0 Interbeds of Sand (SP), medium to coarse, white, brown, red
100					@102.0 Micaceous Silty Clay, brown
110					111.0-118.0 Silty Sand (SM)
					118.0-119.0 Silty Clay (SC), Orange and Sand
120					119.0-123.0 Silty Sand (SM) and Clayey Sand (SC) brown and green
					128.0-134.0 Silty Gravel (GM+GC)
130					@ 132 Clay (CL) Red End of Columbia Formation
					Top of Potomac @134.0 134.0-138.0 Clay (CL) white, red, orange
140					Boring terminated at 138 ft bgs
150					
160					

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: LC115	MARCOR ENVIRONMENTAL	See Figure 2-1 for location.
PERMIT #: 106905	DATE: 21 February 1996	
DRILLING METHOD/RIG: Mud Rotary		
DRILLED BY: MARCOR	GEOLOGIST: Jeff Walsh	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: N/A	
FEET RISER: 148.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): N/A	TOTAL DEPTH (ft): 157
OTHER: 2.5 ft stick up manway		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
0	N/A	N/A	N/A		0 - 31.0 Artificial Fill (AFU): Dredge Spoils Medium Gray Clay (CL), High Plasticity.
10					
20					
30					End of Artificial Fill (AFU) Top of Columbia Formation @ 31.0 ft bgs 31.0-44.0 Lt. Brown Coarse Sand (SP) and some Fine Gravel
40					
50					44.0-53.0 Clay (CL) Gray Silty, Sandy (Fine)
60					53.0-67.0 Silty, Sandy Clay (GC) Gravel and Gray
70					67.0-85.0 Gray Silty Clay (CL) (@79 ft bgs, some fine gravel)
80					

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: LC115	MARCOR ENVIRONMENTAL	See Figure 2-1 for location.
RMIT #: 106905	DATE: 21 February 1996	
DRILLING METHOD/RIG: Mud Rotary		
DRILLED BY: MARCOR	GEOLOGIST: Jeff Walsh	
SAMPLING: Cuttings	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: N/A	
FEET RISER: 148.5 feet	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): N/A	TOTAL DEPTH (ft): 157
OTHER:		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
80	N/A	N/A	N/A		
90					85.0-103.0 Lt. Gray to Yellowish Orange Gravel (GP) (Fine and Coarse) @89 ft bgs, some silty gray clay (CL) @98 ft bgs, very hard drilling
100					
110					103.0-127.0 Greenish Gray Silty Clay and Medium Sand (SC) Sand gradually coarsening downward
120					
130					127.0-128.0 Coarse Gravel and Woody Fragments (GP) (Hard) 128.0-135.0 Fine Gravel and Coarse Sands with Woody Fragments (GP)
140					135.0-145.0 Silty Clays (CL) Brown, Yellow, Lt. Lavender with Little Medium Sand - Hard
150					145.0-157.0 Lt. Gray Silty Fine Sand (SM) 152.0-157.0 Same as above, with dark woody pieces
160					Boring terminated at 157 ft bgs

CLIENT: DSWA MARCOR JOB #: EX-00911-001 WELL/BORING #: LC116	MARCOR ENVIRONMENTAL	See Figure 2-1 for location
PERMIT #: 106910	DATE: 02 February 1996	
DRILLING METHOD/RIG: Hollow Stem Auger		
DRILLED BY: MARCOR	GEOLOGIST: Jeff Walsh/Joe Casey	
SAMPLING: Cont. Split Spoon	ELEVATION: Not Surveyed	
RISER TYPE: Sch 40 PVC	SCREEN TYPE:0.010 slot/Sch40 PVC	
FEET RISER: 54.5	FEET SCREEN: 10	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): NM	TOTAL DEPTH (ft): 64
OTHER:		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
0					Dredge Spoils (AFU): Silt (ML): Lt. Gray, Moist, Massive, Roots, dense, center of a road bed. Same as above with 5-10% coarse angular sand and pea gravel
	39-22-47-59	NA	NA		
	10-14-20-27	3"	NA		
4	4-9-7-9	3"	NA		
	6-4-3-4	3"	NA		
8	3-3-3-3	2.3"	NA		9.0-22.0 Clay (CL): Lt. Gray to green, plastic, partially, saturated, organic.
	7-5-5-5	6"	NA		
12	4-4-4-7	12"	NA		
	6-5-3-4	3"	NA		
16	3-3-2-3	12"	NA		
	1-3-3-4	12"	NA		
20	2-3-4-7	18"	NA		Mottled green to gray, grass and reeds, odorous very wet
	3-8-6-25	19"	NA		22.0-25.0 Sand (SP) Gray to dark gray, arkosic, wet, loose, silty, minor gravel <10% subrounded clasts, poorly sorted.
24	6-8-9-9	24"	NA		25.0-26.5 Gravel (GP) gray, micaceous, wet, poorly sorted, subrounded clasts
	1-2-3-6	24"	NA		26.5-42.5 Clay (CL) Dark gray to dark green, plastic, wet, minor stems, organic, massive, some odor - Hnu "Non Detect"
28	2-1-1-6	24+"	NA		
	2-4-5-7	24+"	NA		
32	3-5-9-9	5"	NA		

CLIENT: DSWA/MARCOR MARCOR JOB #: EX-00911-001 WELL/BORING #: LC116	MARCOR ENVIRONMENTAL	See Figure 2-1 for location
PERMIT #: 106910	DATE: 02 February 1996	
DRILLING METHOD/RIG: Hollow Stem Auger		
DRILLED BY: MARCOR	GEOLOGIST: Jeff Walsh/Joe Casey	
SAMPLING: Cont. Split Spoon	ELEVATION: Not Surveyed	
RISER TYPE: 4" PVC	SCREEN TYPE: .010 Slot PVC	
FEET RISER: 75.5 feet	FEET SCREEN: 11	
WELL DIAMETER (in): 4	SCREEN DIAMETER: 4	BOREHOLE DIAMETER(in): 8 1/4
DEPTH TO BEDROCK (ft): N/A	DEPTH TO WATER (ft): NM	TOTAL DEPTH (ft): 64
OTHER: 2.5 ft stick up manway		

DEPTH (FEET)	BLOW COUNT	SAMPLE RECOV.	O.V.A./ P.I.D. READING	WELL CON.	LITHOLOGY DESCRIPTION
36					
	3-5-6-9	24"	NA		
	3-4-8-10	24+"	NA		
40					
	3-3-7-12	24+"	NA		
	3-34-39-49	24"	NA		End of Dredge Spoils Top of Columbia Formation 42.5-64.0 Sand (SP) Light gray to brown coarse, poorly sorted, wet, loose, micatious, gravelly in zones of high blow counts. Note: Augered through 58-60 interval
44					
	15-36-47-57	24"	NA		
	13-35-50/3	24"	NA		
48					
	8-30-45-50/1	9"	NA		
	4-10-32-38	24"	NA		
52					
	15-20-25-26	24"	NA		
	5-15-45-50/3	24"	NA		
56					
	10-12-50-50/1	24"	NA		
	NA	NA	NA		
60					
	13-40-49-50/4	24"	NA		
	9-34-50-50/2	24"	NA		
64					Boring terminated at 64 ft bgs
68					

ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE
STATE RT. NO.: SECT.: SEGMENT: OFFSET:
NORTHING: EASTING:
STATION: OFFSET FROM CENTERLINE:
INSPECTOR: M. McCullough DRILLER'S NAME/COMPANY D. Taylor/Walton Corp.
EQUIPMENT USED: CME Rubber Tire ATV
DRILLING METHODS: 4-1/4" ID HSA, Acker Geared Drive Box (Vane Shear Test)
CASING SIZE: 4-1/4"ID ; DEPTH: 48.2' WATER: DEPTH: X TIME: 0 hr DATE: 9/17/97
CHECKED BY: MLM ; DATE: 1/98 DEPTH: TIME: DATE:
NOT ENCOUNTERED X

BORING NO.: P3-12
SHEET 1 OF 2
DATE: START: 9/16/97
FINISH: 9/17/97
ELEVATION: 44.6'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								Sandy SILT (ml), brown to black, dry to moist (DREDGE SPOILS)	vane shear tests 1-9 used D=3-5/8' Vane with a geared box. Friction tests 1-4 used a ½" diameter rod with out a Vane and a geared drive box
7.0	-				ml	d-m		6'-7': Augers grinding. Possibly with Gravel. Approx. Bottom of Layer at 7.0'. 7.0'	El. 37.6'
								Elastic SILT (mh), little mica, black, moist. (DREDGE SPOILS).	BA = bottom of Augers
									9.1'Vane BA
								12'-12.6'with coarse sand, little fine gravel.	12.6'Vane 1 tip 12.6'-15.2': friction 1
								15.6'-16.6'Driller felt soft layer while pushing Vane 2.	14.1'= Vane 2 BA
								17.0'-17.6'. Little organics (root fibers), trace of sand	17.6' = Vane 2 tip
								22.0' - 22.6': Trace organics	22.6'-25.2' Friction 2
								26.0' Driller felt a change in resistance while pushing Vane 4 softer below 26'. 27.0'-27.6'. Trace organics.	27.6' = Vane 4 tip
33.0	-				mh	m		32.0' -32.6': Trace sand. Approx. Bottom of layer 33.0' 33.0'	32.6'-35.2. Friction # 3 El. 11.6'
36.0	-				mh	w		Elastic SILT (mh), little mica, little sand, trace of fine gravel, black, wet. (DREDGE SPOIL) Approx. Bottom of layer 36.0' 36.0'	El. 8.6'
42.0	-				mh	m-w		Elastic SILT (mh) with organics, little mica, black, moist to wet. (DREDGE SPOILS) Approximate Bottom of Layer = 42'	

ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-12
STATE RT. NO.: SECT.: SEGMENT: OFFSET: SHEET 2 OF 2
NORTHING: EASTING:
STATION: OFFSET FROM CENTERLINE:

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
42.2	-							42.0'	El. 2.6'
44.2	ST-1	-	2.0	100%	ML	m-w		SILT (ML), micaceous, black, moist to wet, (DREDGE SPOIL). ST-1: Lab Classified 42.2'-46.2': Little gravel, trace of sand.	42.2 = Vane 7 Tip
46.2	ST-2	-	2.0	100%	ml	m			46.2' = Vane 8 BA
								49'- 49.7' No organics, wet, trace sand.	48.2 = Vane 9 BA
51.7	-				ml	m-w		51.0'-51.7': Little fine sand, trace organics. 51.7'	El. -7.1'
								Bottom of Boring = 51.7 Ft.	

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-12A
STATE RT. NO.: SECT.: SEGMENT: OFFSET: SHEET 1 OF 1
NORTHING: EASTING: DATE: START: 9/9/97
STATION: OFFSET FROM CENTERLINE: FINISH: 9/11/97
INSPECTOR: M. McCullough DRILLER'S NAME/COMPANY G. Truver/Walton Corp. ELEVATION: 44.6'
EQUIPMENT USED: CME Truck mounted rig, Acker Geared Drive Box (Vane Tests) INCLINATION: Vertical
DRILLING METHODS: 4-1/4" ID HSA
CASING SIZE: 4-1/4" ; DEPTH: 30' WATER: DEPTH: X TIME: 0 Hr DATE: 9/11/97
CHECKED BY: MLM ; DATE: 1/98 DEPTH: Grouted TIME: DATE: x
NOT ENCOUNTERED X

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								Sandy SILT (ml) brown to black, dry to moist, (DREDGE SPOILS).	Vane test 1-4 used D-3-5/8" vane with geared drive box. Friction test 1 used a D-1/2" diameter rod with a vane and geared drive box. BA = bottom Augers 9.1'-vane 1 BA
								4.0': Difficult to auger, possible MSW	
8.5	-				ml	d-m		8.5'	El. 36.1'
								Elastic SILT (MH), little organics, trace mica, dark grey, moist (DREDGE SPOILS). 8.5': Driller felt change from stiff to soft.	12.6' = Vane 1 tip 14.1' = Vane 2 BA 17.6' = Vane 2 tip
									17.6'-20.2' Friction1
								19.1'-20.6': Hit stiff layer with attempting to pusch a Vane. Driller thinks is wood, not stiff soil. 20.0'-26.5': Organics including wood fragments (2-4mm). 20.6'-26.1': Soil feels stiff during augering	
									23.0' = Vane 3 BA
								26.0'-26.5': Slightly higher plasticity.	26.5' = Vane 3 tip & Vane 4 BA
30.0	-				MH	m			
								ST-1: Lab Classified 31.0'	30.0' = Vane 4 tip El. 13.6'
32.0	ST-1	-	2.0	100%	MH	m		Elastic SILT with fine Sand (mh), little mica, grey, moist. (DREDGE SPOILS). 32.0'	El. 12.6'
								Bottom of Boring = 32.0 Ft.	

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometers COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-13
STATE RT. NO.: SECT.: SEGMENT: OFFSET: SHEET 1 OF 2
NORTHING: EASTING: DATE: START: 8/24/97
STATION: OFFSET FROM CENTERLINE: FINISH: 8/26/97
INSPECTOR: M. McCullough DRILLER'S NAME/COMPANY Gary/Walton Corp. ELEVATION: 43.3'
EQUIPMENT USED: CME Truck Mounted Rig, Snap-on Torgometer wrench INCLINATION: Vertical
DRILLING METHODS: 4-1/4" ID HSA
CASING SIZE: 4-1/4"ID ; DEPTH: 47.3' WATER: DEPTH: 20.5 TIME: 0 hr DATE: 8/26/97
CHECKED BY: MLM ; DATE: 1/98 DEPTH: TIME: DATE:
NOT ENCOUNTERED X

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
3.0					ml	d-m		SILT (ml) little Sand, brown, dry to moist. (FILL). 3.0'	Vane tests 1-4 used D= 1.5" Vane with 0-600 in-lb in the torqometer.
								Elastic SILT (mh), trace mica, dark grey, moist to wet. (DREDGE SPOILS) 3'-24': Trace mica	BA = Bottom of Augers. Friction tests 1-7 used AW rods with 0-600 in-lb torqometer. 2.8' = Vane1 BA El. 40.3'
								9.0': Driller felt a stiff layer when pushing Vane 2. Bottom uncertain.	6.3' = Vane 1 tip 7.8' Vane 2 BA. 11.3' = Vane 2 tip and friction 1 BA. 11.3'-13.3' Friction 1 12.8' = Vane 3 BA
								16'-23.3': Trace Sand	16.3' = Vane 3 tip 17.8' = Vane 4 BA
								20.5': Drill rods are wet 20.5'-47.3': wet	21.3' = Vane 4 tip and friction 2 BA
								23.3'-24': With Gravel, wet	21.3'-23.3' = friction 2 23.3'-24: Diller felt a stiff layer some rounded gravel came up in cuttings. 25' friction 3 BA
								28'-28.5': Sandy	25'- 28.5' = friction 3
								31.3'-33.3': With Sand	31.3 = friction 4 BA 31.3'-33.3' = friction 33.3' = friction 5 BA
								36.3'-47.3': Some organics (grass/thin roots)	33.3'-36.8' friction 5

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometers COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-13
STATE RT. NO.: SECT.: SEGMENT: OFFSET: SHEET 2 OF 2
NORTHING: EASTING:
STATION: OFFSET FROM CENTERLINE:

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								42.8'43.3': Trace Sand. 46.3'-46.8': Little Sand.	41.3' = friction 6 BA 41.3'-43.3' = friction 6 43.3' = friction 7 BA 43.3'-46.8' = friction 7
47.3					mh	m-w		47.3'	
								Bottom of Boring = 47.3 Ft.	El. -4.0'

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer
COUNTY: New Castle Co,Wilmington,DE
BORING NO.: P3-13A
STATE RT. NO.: ____ SECT.: ____ SEGMENT: ____ OFFSET: ____
SHEET 1 OF 2
NORTHING: ____ EASTING: ____
DATE: START: 8/20/97
STATION: ____ OFFSET FROM CENTERLINE: ____
FINISH: 8/21/97
INSPECTOR: M. McCullough
DRILLER'S NAME/COMPANY Gary/Walton Corp.
ELEVATION: 43.3'
EQUIPMENT USED: CME Truck mounted rig, Snap-on Torqometer Wrench
INCLINATION: Vertical
DRILLING METHODS: 4-1/4" ID HSA
CASING SIZE: 4-1/4"ID ; DEPTH: 47.3'
WATER: DEPTH: 19' TIME: 24Hr DATE: 8/22/97
CHECKED BY: MLM ; DATE: 1/98
DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED __

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
3.0	-	-			ml	d-m		SILT (ml) little Sand, brown, dry to moist. (FILL). 3.0'	Vane tests 1-4 used D= 3 5/8" vane with 0-600 in-lb in the torqometer.
								Elastic SILT (MH), dark grey, micaceous, moist to wet. (DREDGE SPOILS)	BA = Bottom of Augers. 2.8' = Vane 1 BA El. 40.3' 6.3' = Vane 1 tip
								10.0'-11.3': Little fine Sand, dry to moist	7.8' = Vane 2 BA 11.3' = Vane 2 tip 12.8' = Vane 3 BA 16.3' = Vane 3 tip 17.8' = Vane 4 BA 21.3' = Vane 4 tip
								23.8'-24.3': Little Sand, stiff	Augered to 22.8' for Vane 5. Drove Vane 5 to 23.8' and it bent. Repaired vane by hammering it flat. Driller felt bottom of stiff layer at 24.3'
								26.0- 26.3': With Sand, wet	
31.3	-	-			mh	m			Vane test 5-9 used D= 2" Vane with 0-600 in-lb torqometer.
33.3	ST-1	-	2.0	100%	MH	w		ST-1: Lab Classified 31'-31.3': Little Sand, wet, stiff 33.3' Trace organics (grass) wet.(bottom of ST-1)	
								36.0'-36.3': Little Sand, wet	24.3' = Vane 5 BA 26.3' = Vane 5 tip 27.8' = Vane 6 BA 31.3' = Vane 6 tip and Vane 7 BA 36.3' = Vane 7 tip 37.8' = Vane 8 BA
								41.0'-41.3': Trace Sand, wet, stiff	41.3' =

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-13A
STATE RT. NO.: _____ SECT.: _____ SEGMENT: _____ OFFSET: _____ SHEET 2 OF 2
NORTHING: _____ EASTING: _____
STATION: _____ OFFSET FROM CENTERLINE: _____

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
43.3	-	-			mh	m-w		43.3': Trace mica wet stiff 45.3' Little mica, wet, more stiff than 43.3'	43.3 = Vane 9 BA 47.3' = Vane 9 tip and friction test BA 47.3'-49.3' friction test with AW rods.
45.3	ST-2	-	2.0	100%	mh	w		47.0'-47.3': Little mica, wet, less stiff than 43.3'	
47.3	–				mh	w		47.3'	
								Bottom of Boring = 47.3 Ft.	El. -4.0'

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometers COUNTY: New Castle Co,Wilmington,DE
STATE RT. NO.: SECT.: SEGMENT: OFFSET:
NORTHING: EASTING:
STATION: OFFSET FROM CENTERLINE:
INSPECTOR: M. McCullough DRILLER'S NAME/COMPANY Gary/Walton Corp.
EQUIPMENT USED: CME Truck mounted rig, Acker Geared Drive Box Vane test-1
DRILLING METHODS: 4-1/4" ID HSA
CASING SIZE: 4-1/4"ID ; DEPTH: 44.2' WATER: DEPTH: 28' TIME: 0Hr DATE: 11/11/97
CHECKED BY: MLM ; DATE: 1/98 DEPTH: TIME: DATE:
NOT ENCOUNTERED

BORING NO.: P3-13B
SHEET 1 OF 2
DATE: START: 11/10/97
FINISH: 11/11/97
ELEVATION: 43.0'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								Top Soil 0.5'	El. 42.5'
								Elastic SILT (mh)dark grey, moist to wet (DREDGE SPOIL).	vane tests performed with a D= 3 5/8" Vane and geared drive box. Friction tests performed with a D= ½"rod & geared drive box
									BA = bottom of Auger 7.5' = Vane 1 BA
								10.5'- 11':With Sand	11' = Vane 1 tip & Friction 1 BA 13.6' friction tip and Vane 2 BA
								16.6'-17.1':Little mica, little organics	17.1' = Vane 2 tip and Vane 3 BA
								20.1'-20.6':Little Sand and Gravel, micaceous 20.6'-23.8':Little Sand, micaceous	20.6' = Vane 3 tip and Vane 4 BA 23.3' = Vane 4 tip
								23.8'-24.8':Stiff layer	6'-31.
								27.6'-31.1':With Sand 27.6'-47.7':Moist to wet	Friction 2 = 27. 6'-31.
									31.1' = Vane 5 BA
									34.6' = Vane 5 tip and Vane 6 BA
									Friction 3 38.1'-40.7' 40.7' = Vane 7 BA
								40.2'-47.7' With organics	

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometers COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-138
STATE RT. NO.: SECT.: SEGMENT: OFFSET: SHEET 2 OF 2
NORTHING: EASTING:
STATION: OFFSET FROM CENTERLINE:

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
									44.2' = Vane 7 tip and Vane 8 BA
					mh	m-w		47.2'-47.7':Trace of Sand	47.7' = Vane 8 tip
								47.7' Bottom of Boring = 47.7 Ft.	El. -4.7'

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-103DE
STATE RT. NO.: ____ SECT.: ____ SEGMENT: ____ OFFSET: ____ SHEET 1 OF 2
NORTHING: ____ EASTING: ____ DATE: START: 10\08\97
STATION: ____ OFFSET FROM CENTERLINE: ____ FINISH: 10/14/97
INSPECTOR: M. McCullough DRILLER'S NAME/COMPANY D.Taylor /Walton Corp. ELEVATION: 63.0'
EQUIPMENT USED: CME Rubber tire ATV/Acker geared drive box (Vane Test) INCLINATION: Vertical
DRILLING METHODS: 4-1/4" ID HSA in MSW, 6" casing in Dredge
CASING SIZE: 6" ; DEPTH: 69' WATER: DEPTH: x TIME: x DATE: x
CHECKED BY: MLM ; DATE: 1/98 DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED X

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								Silty SAND with Gravel (sm) tan dry (FILL) 0.3'	El. 62.7'
								MSW (includes plastic, paper, cloth, soil, wood)	Soil sample monitered with a PID BC = bottom of casing. Vane test performed with a D= 3-5/8" Vane and geared drive box. Friction tests performed with a D=1/2" rod and geared drive box.
18.0	-								
								Approx. bottom of layer 18.5'. 18.5'	S-1: 26 ppm (PID)
20.0	S-1	4-4-6-5	1.2	60%	sp	m		SAND (sp) Trace Silt, black, moist (drainage layer) 20'-21.5':With Clay Little MSW	El. 44.5'
22.0	S-2	6-6-4-3	1.3	65%	sp	m		21.5'	El. 41.5'
								Elastic SILT (MH), dark grey, moist to wet, micaceous. (DREDGE SPOIL) 25.0'-30.7':With Sand	ST-1: 12.8ppm (PID)
25.2	-				mh	m			
27.2	ST-1	-	0.8	40%	MH	m		ST-1:Low recovery discarded tube. Saved Jar sample. Lab Classified.	
29.2	ST-2	-	0.0	0%					27.2' = Vane 1 BC
32.3	-				mh	m-w		30.1'-32.3':Friction test # 1 results indicate very low strength soils.	30.7' = Vane 1 tip 30.7'-32.3' friction 1
34.3	ST-3	-	0.0	0%					34.3' = vane 2 BC
								Approx. bottom of layer 35' 35.0'	36.8' = Vane 2 tip
36.8	-	——			mh	m-w		Elastic SILT (MH) little organics, dark grey, moist to wet. (DREDGE SPOILS)	El. 28.0'
38.8	ST-4	-	1.5	75%	MH	w		36'-38.8':With Sand and one piece of metal. (1/2" wide) ST-4: Lab Classified 38.8'-40' ±: Sandy	ST-4 0 ppm(PID) 38.8' = Vane 3 BC
40.8	ST-5	-	2.0	100%	mh	w			
									42.3' =

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-103DE
STATE RT. NO.: SECT.: SEGMENT: OFFSET: SHEET 2 OF 2
NORTHING: EASTING:
STATION: OFFSET FROM CENTERLINE:

DEPTH (FT.)	SAMPLE/ CORE #	BLDWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								41.8'-43.5': Little Sand	Vane 4 BC 44.8' Vane 4 tip
								43.5'-48.0': With Sand and organics, trace Gravel	44.8'-46.4' Friction 2 46.4' = Vane 5 BC 48.9 = Vane 5 tip
48.9	-	------			mh	m-w		48.4'-48.9': With Sand	
								ST-6: Lab Classified	ST-6 0 ppm(PID) 50.9' = Vane 6 BC.
50.9	ST-6	-	2.0	100%	MH	w		50.4'-50.9': With organics, little sand, trace Gravel.	ST-7 0 ppm(PID)
52.9	ST-7	-	2.0	100%	MH	m-w		ST-7: Lab Classified 52.4'-52.9':Little Sand.	
									54.4' = Vane 8 tip 54.4'-58.0' Friction 3 56.0' = Vane 7 BC 58.5' = Vane 7 tip
58.5	-				mh	m-w			
									58.5' = Vane 7 tip and Vane 8 BC ST8 0 ppm (PID) 62' = Vane 8 tip
60.5	ST-8	-	2.0	100%	mh	m-w			
								60'-62':Trace Sand.	
62.0	-				mh	m-w			
								ST-9: Lab Classified 62.0'-64.0': With organics.	ST9 0 ppm (PID) 66' = Vane 9 BC 66-67.6' Friction 4 68.5' = Vane 9 tip ST10 0ppm (PID)
64.0	ST-9	-	2.0	100%	MH	m-w			
								64.0'-66.0': Trace Sand	
66.0	ST-10	-	2.0	100%	mh	m-w		66.0'	
								Bottom of Boring = 66.0 Ft.	El. -3.0'

45 50 55 60 65 70 75 80 85

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE
STATE RT. NO.: _____ SECT.: _____ SEGMENT: _____ OFFSET: _____
NORTHING: _____ EASTING: _____
STATION: _____ OFFSET FROM CENTERLINE: _____
INSPECTOR: M. McCullough DRILLER'S NAME/COMPANY D. Taylor/Walton Corp.
EQUIPMENT USED: CME Rubber Tire ATV/Acker Geared Drive Box (Vane Test)
DRILLING METHODS: 4-1/4" ID HSA in MSW, 8" casing in Dredge
CASING SIZE: 8" ; DEPTH: 66.5' WATER: DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: MLM ; DATE: 1/98 DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED __

BORING NO.: P3-104DE
SHEET 1 OF 2
DATE: START: 10/1/97
FINISH: 10/8/97
ELEVATION: 66.5'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
0.5	-				sm			Silty SAND with Gravel (sm) (FILL) 0.5'	El. 66.0'
								MSW (Wood, plastic, metal, soil, paper)	
21.5	-							Approximate bottom of layer 21.5' 21.5'	21.5': Driller felt a layer change. El. 45.0'
23.0	-				sm	w		Silty SAND (sm), black, wet, (Sand drainage layer). Approximate bottom of layer 23.0'. 23.0'	El. 43.5'
								Elastic SILT (mh), dark grey, moist to wet.	
								23.0'-62.5': Augered. No soil samples or vane tests.	

0 5 10 1 20 25 30 35 40

ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-104DE
STATE RT. NO.: _____ SECT.: _____ SEGMENT: _____ OFFSET: _____ SHEET 2 OF 2
NORTHING: _____ EASTING: _____
STATION: _____ OFFSET FROM CENTERLINE: _____

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
									BC = bottom of casing. Vane and friction tests used a geared drive box. Used D = 3-5/8" vane and D = 1/2" rod for friction tests.
62.5	-				mh	m-w			
64.5	ST-9	-	0.0	100%					
66.5	ST-10	-	0.0	100%					
68.0	-				mh	m-w		66.5'-68.0': Cleaned out with roller bit. 68.0'	66.5'-68.0' Friction test 4
								Bottom of Boring = 68.0 Ft.	68.5 = Vane 9 BC. 68.7 = Vane tip El. -1.5'

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60
65
70
75
80
85

ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE
STATE RT. NO.: SECT.: SEGMENT: OFFSET:
NORTHING: EASTING:
STATION: OFFSET FROM CENTERLINE:
INSPECTOR: M. McCullough DRILLER'S NAME/COMPANY O. Tailor/Walton Corp.
EQUIPMENT USED: CME Rubber Tire ATV, Acker geared Drive Box (Vane TST)
DRILLING METHODS: 4-1/4" ID HSA in MSW , 6' Casing in Dredge
CASING SIZE: 6" ; DEPTH: 82.5' WATER: DEPTH: TIME: DATE:
CHECKED BY: MLM ; DATE: 1/98 DEPTH: TIME: DATE:
NOT ENCOUNTERED

BORING NO.: P3-104DE-A
SHEET 1 OF 2
DATE: START: 9/22/97
FINISH: 9/30/97
ELEVATION: 83.5'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
0.5	-				sm			Silty SAND with Gravel (sm) (FILL) 0.5'	El. 83.0'
								MSW (wood, plastic, metal, soil, paper)	0'-20' Steam escaping during augering. 0-100 ppm (PID) at ground 0 ppm in breathing space. Jar and Shelby tube samples monitered with a PID.
								10.0': Difficult augering 11.0': Driller felt a change in drilling resistance (easier).	BC = bottom of casing. Vane tests performed with a D = 3-5/8" Vane and geared drived box. Friction tests performed with a D = 1/2" rod and geared drive box.
19.8	-	30-12/0.3	0.8	100%	m			Approximate Bottom of Layer = 20.0' 20.0'	El. 43.5'
19.8	S-1							Silty SAND (sm), black, wet, (Sand drainage layer).	
22.0	-				sm	w		Approximate Bottom of Layer = 23.0' 23.0'	El. 40.5'
24.0	S-2	11-8-2-3	1.0	50%	sm	w		Elastic SILT (MH) with wood, dark grey, wet. (DREDGE SPOILS)	
25.7	-				mh	w			
27.7	ST-1	------	0.0	0%	MH	w		ST-1: No recovery, but some silt with wood coated inside tube. ST-1 and ST-2: Lab Classified	
29.7	ST-2	------	2.0	100%	MH	w		29.7'	27.7' = Vane 1 BC ST-2 = 3.3 ppm (PID) El. 33.8'
32.8	-				mh	w		Elastic SILT with wood (MH), little Sand, dark grey, wet (DREDGE SPOILS) 30.7'-31.2': Few pieces of metal, 1" max width	31.2' = Vane 1 tip 31.2'-32.8' Friction 1
34.8	ST-3	-	2.0	100%	MH	w		ST-3 and ST-4: Lab Classified	ST-3 = 16.5' ppm (PID) 34.8' = Vane 2 BC
37.3	-				mh	w			37.3' = Vane 2 tip
39.3	ST-4	-	2.0	100%	MH	w			ST-4 = 8 ppm (PID) 39.3' = Vane 3 BC
41.3	ST-5	-	2.0	100%	MH	w		ST-5: Lab Classified 39.3'-82.5': Hard to drive casing with hammer. Casing above 39.3' was pushed.	ST-5 = 22 ppm (PID) 42.8' = Vane

ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE BORING NO.: P3-104DE-A
STATE RT. NO.: _____ SECT.: _____ SEGMENT: _____ OFFSET: _____ SHEET 2 OF 2
NORTHING: _____ EASTING: _____
STATION: _____ OFFSET FROM CENTERLINE: _____

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
46.0	-				mh	w		42.3'-45.3': Little wood, trace plastic bag. 44.8'-45.3': Trace Sand Approximate bottom of layer 46.0' 46.0'	3 tip and Vane 4 BC 45.3' = Vane 4 tip 45.3' 46.9' friction 2 El. 17.5'
49.4	-				mh	w		Elastic SILT (MH), trace Sand, dark grey, wet. (DREDGE SPOILS). 48.9'-49.4': Little wood smaller than 1/4" diamer, trace plastic bag material.	48.5' = Vane 4 BC 49.4' = Vane 5 tip
51.4	ST-6	-	2.0	100%	MH	w		ST-6 and ST-7: Lab Classified	51.4' = Vane 6 BC
53.4	ST-7	-	2.0	100%	MH	w			54.9' = Vane 6 tip 54.9-56.5' Friction 3 56.5' = Vane 7 BC 59' = Vane 7 tip
59.0	-				mh	w		53.4'-58.5': No Sand	
61.0	ST-8	-	2.0	100%	MH	w		ST-8: Lab Classified	61' = Vane 8 BC
62.5	-				mh	w		62.0'-62.5': Trace Gravel 62.5' Bottom of Boring = 62.5 Ft.	62.5' = Vane 8 tip Dropped and lost rod @ 62.5' Abandoned hole and grouted Replaced with P3-104 DE El. 1.0'

45 50 55 60 65 70 75 80 85

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: Cherry Island Piezometer COUNTY: New Castle Co,Wilmington,DE
STATE RT. NO.: ____ SECT.: ____ SEGMENT: ____ OFFSET: ____
NORTHING: ____ EASTING: ____
STATION: ____ OFFSET FROM CENTERLINE: ____
INSPECTOR: M. McCullough DRILLER'S NAME/COMPANY D. Taylor/Walton Corp.
EQUIPMENT USED: CME rubber tire, ATV
DRILLING METHODS: 4-1/4" ID Auger through MSW Casing Through Dredge
CASING SIZE: 4" ; DEPTH: 33' WATER: DEPTH: X TIME: 0 Hr DATE: 9/22/97
CHECKED BY: MLM ; DATE: 1/98 DEPTH: ____ TIME: ____ DATE: x
NOT ENCOUNTERED X

BORING NO.: P3-105D
SHEET 1 OF 1
DATE: START: 9/18/97
FINISH: 9/22/97
ELEVATION: 63.5'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								Sludge (Cover Soil) 1.0'	El. 62.5'
								MWS (includes plastic, glass, wood, soil, paper).	
19.5	--							Approximate Bottom of layer 20' 20.0'	El. 43.5'
20.5	S-1	4	0.3	30%	sm	w		Silty SAND (sm), black, wet. (Sand Drainage Layer)	
21.0	S-2	4-3	0.5	100%	sm	w			
22.0	--				sm	w			
22.5	S-3	-	0.5	100%	sm	w			Auger 21'-22. Auger 22.5'-24'.
24.0	--				sm	w		24.0'	El. 39.5'
25.0	S-4	2-2	0.0	0%	mh	w		Elastic SILT with Sand (MH), little fine gravel, little organics, black, wet, micaceous. (DREDGE SPOILS)	Soil from S-4 recovered from S-5.
26.0	S-5	2-2	1.0	100%	mh	w			
28.0	ST-1	-	2.0	100%	MH	w		ST-1: Lab Classified 26.0'-34.0': Little to trace Sand	ST-1: 6.2'-20 ppm (PID)
30.0	--							28.0;-30.0': Pushed a Shelby tube no recovery	28.0':100% LEL. Install drillers mud (bentonite grout) to line hole from 0'to 28'. 0% LEL afterwards. Hole caved at 32.7' Cleared out hole and pushed casing to 33' for piezometer installation
32.0	--							30.0'-32.0': Pushed a Shelby tube no recovery	
34.0	S-6	-	1.0	50%	MH	w		S-6: Lab Classified 32.0'-34.0': Pushed a Shelby tube with piston. Did not keep jarred sample. 34.0'	
								Bottom of Boring = 34.0 Ft.	El. 29.5'

0 5 10 20 25 30 35 40

ENGINEER'S FIELD BORING LOG

PROJECT NAME: DSWA Cherry Island Ph IV COUNTY: Wilmington, DE
STATE RT. NO.: SECT.: SEGMENT: OFFSET:
NORTHING: 627540 EASTING: 473742
STATION: OFFSET FROM CENTERLINE: 13.5' West of Stake
INSPECTOR: Michael Berry DRILLER'S NAME/COMPANY K. Huber/Hardin Huber,Inc
EQUIPMENT USED: Mobil B61
DRILLING METHODS: 4 1/4" ID HSA
CASING SIZE: 4 1/4"ID ; DEPTH: 106.5 WATER: DEPTH: TIME: DATE:
CHECKED BY: MLM ; DATE: 8/29/98 DEPTH: TIME: DATE:
NOT ENCOUNTERED

BORING NO.: GF4-1
SHEET 1 OF 3
DATE: START: 06/09/98
FINISH: 06/15/98
ELEVATION: 50.3'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								Cobble FILL 1.0'	Auger to 3.5' El. 49.3'
3.5	–							Elastic SILT (MH), grey, dry to wet, very soft to stiff (DREDGE SPOILS).	
5.5	S-1	4-5-4-4	0.7	33%	mh	d			
7.5	–								
9.5	S-2	0-0-1-1	1.2	62%	mh	m		7.5'-9.5': Moist	Auger to 7.5'
13.5	–								Auger to 10' 10': Vane 2
15.5	ST-1		1.7		MH	d		ST-1: Lab Classified	13.5': Vane 2 Tip
								15.5': With Mica, trace Sand 15.5-19': Ran vane test #3. Vanes damaged during test. (stiff)	15.5': Vane 3
								18.75'-19.0': Wet, with Mica	19': Vane 3 Tip, Vane 4
								19-22.5': Ran vane test #4. Vanes damaged during test. (stiff)	22.5': Vane 4 Tip 22.5-25.5': Friction Test #2 25.5': Vane 5
29.0	–								
31.0	ST-2		2.0		mh	w			29': Vane 5 Tip
								31.0': Wet	31': Vane 6
								34.25'-34.5': Wet	34.5': Vane 6 Tip, Vane 7
								37.75'-38.0': Wet	38': Vane 7 Tip 38-41': Friction Test #3 41': Vane 8

0 5 10 15 20 25 30 35 40

ENGINEER'S FIELD BORING LOG

PROJECT NAME: DSWA Cherry Island Ph IV COUNTY: Wilmington, DE
STATE RT. NO.: SECT.: SEGMENT: OFFSET:
NORTHING: 627540 EASTING: 473742
STATION: OFFSET FROM CENTERLINE: 13.5' West of Stake
INSPECTOR: Michael Berry DRILLER'S NAME/COMPANY K. Huber/Hardin Huber,Inc
EQUIPMENT USED: Mobil 861
DRILLING METHODS: 4 1/4" ID HSA
CASING SIZE: 4 1/4"ID ; DEPTH: 106.5 WATER: DEPTH: TIME: DATE:
CHECKED BY: MLM ; DATE: 8/29/98 DEPTH: TIME: DATE:
NOT ENCOUNTERED

BORING NO.: GF4-1
SHEET 2 OF 3
DATE: START: 06/09/98
FINISH: 06/15/98
ELEVATION: 50.3'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
44.5	–								
46.5	ST-3		2.0		MH	d		ST-3: Lab Classified	44.5': Vane 8 Tip 46.5': Vane 9
								49.75'-50.0': Moist	50': Vane 9 Tip, Vane 10
								56.5-60': Attempted vane test. Soil too stiff to push vane through required 3.5'. (stiff).	53.5': Vane 10 Tip 53.5-56.5': Friction Test #4
63.5	–							60-62': Attempted to collect shelby tube. Tube crushed at bottom. Sample discarded. 62-63.5: Attempted vane test. Soil too stiff to push vane past 63.5'.	60-62': ST-9 Tube crushed, sampled discarded
								63.5'	El. -13.2'
65.5	S-3	1-1-2-2	0.7	33%	gm-gc	w		Silty Clayey GRAVEL (gm-gc), brown, wet, very loose.	Auger to 63.5' Augers grinding
								72-75.5': Ran vane test #14. Attempted to remould soil. Unable to turn vane.	Auger to 69'
75.5	–							75.0'	68-72': Friction Test #5
77.5	ST-5		2.0		ml	d		Sandy SILT (ML), grey, dry to moist (RECENT DEPOSITS).	72': Vane 14
								77.5': Dry 77.5-81': Ran vane test #15. Attempted to remould soil. Unable to turn vane.	75.5': Vane 14 Tip El. -24.7'
								80.75'-81.0': Moist	77.5': Vane 15 81': Vane 15 Tip, Vane 16

45 50 55 60 65 70 75 80

ENGINEER'S FIELD BORING LOG

PROJECT NAME: DSWA Cherry Island Ph IV COUNTY: Wilmington, DE
STATE RT. NO.: SECT.: SEGMENT: OFFSET:
NORTHING: 627540 EASTING: 473742
STATION: OFFSET FROM CENTERLINE: 13.5' West of Stake
INSPECTOR: Michael Berry DRILLER'S NAME/COMPANY K. Huber/Hardin Huber,inc
EQUIPMENT USED: Mobil B61
DRILLING METHODS: 4 1/4" ID HSA
CASING SIZE: 4 1/4"ID ; DEPTH: 106.5 WATER: DEPTH: TIME: DATE:
CHECKED BY: MLM ; DATE: 8/29/98 DEPTH: TIME: DATE:
NOT ENCOUNTERED

BORING NO.: GF4-1
SHEET 3 OF 3
DATE: START: 06/09/98
FINISH: 06/15/98
ELEVATION: 50.3'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								84.25'-84.5': Moist	84.5': Vane 16 Tip 84.5-87.5': Friction Test #6
91.0	–								
								90.75'-91.0': Moist, with Sand ST-8: Lab Classified	87.5': Vane 17 91.0': Vane 17 Tip
93.0	ST-6		2.0		ML	d			
								93.0': Clayey Silt (ml), black, dry	93.0': Vane 18
								96.25'-96.5': Silt, black, moist	96.5': Vane 18 Tip, Vane 19
									100': Vane 19 Tip 100-103': Friction Test #7
106.5	–							106.5'	El. -56.2'
108.5	S-4	14-8-5-18	1.0	50%	sp	w		Gravelly SAND (sp), brown, wet, medium dense. 103-106.5': Attempted vane test. Soil too stiff to push vane through required 3.5'. 108.5'	Auger to 106.5' Augers grinding El. -58.2'
								Bottom of Boring = 108.5 Ft.	

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ENGINEER'S FIELD BORING LOG

PROJECT NAME: DSWA Cherry Island Ph IV
COUNTY: Wilmington, DE
STATE RT. NO.: ____ SECT.: ____ SEGMENT: ____ OFFSET: ____
NORTHING: 627487
EASTING: 473900
STATION: ____
OFFSET FROM CENTERLINE: 13.5' West of Stake
INSPECTOR: Michael Berry
DRILLER'S NAME/COMPANY K. Huber/Hardin Huber,Inc
EQUIPMENT USED: Mobil B61
DRILLING METHODS: 4-1/4" ID HSA
CASING SIZE: 4 1/4 ID ; DEPTH: 89
WATER: DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: MLM ; DATE: 8/29/98
DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED __

BORING NO.: GF4-2
SHEET 1 OF 3
DATE: START: 06/18/98
FINISH: 06/18/98
ELEVATION: 27.8'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
								FILL	Augered to 8'
								3.0'	El. 24.8'
								SILT (ML), grey, dry, loose to dense, iron stained (DREDGE SPOILS).	
8.0	--								
10.0	S-1	3-2-4-6	2.0	100%	ml	d			10': Vane 1
16.5	--								13.5': Vane 1 tip Auger to 16.5'
18.5	ST-1		2.0		ML	d		ST-1: Lab Classified	
								18.5': Silty Clay (ml-cl), trace Mica, black, dry.	18.5-21.5': Friction Test #1
								22-25.5': Attempted vane test. Soil too dense to push vane through required 3.5'. (dense) 25.5-29': Ran vane test #5. Vanes damaged during test. (dense)	Auger to 25.5' 25.5': Vane 5
								28.75'-29.0': Gravelly Sand (sm-gw), brown, moist, poorly graded. 29-31': Attempted to collect shelby tube. Soil too dense to push tube through 2.0'.	29': Vane 5 Tip Auger to 32.5' Augers grinding
32.5	--							32.5'	El. -4.7'
34.5	S-2	4-7-7-3	1.9	95%	sm	m-w		Silty SAND with Gravel (sm), black, moist to wet, very loose to medium dense.	Large 1.5-2" dia. stone lodged in spoon tip. Auger to 35.5'
35.5	--								
37.5	S-3	3-5-5-5	1.5	75%	sm	m-w		35.5'-37.5': Gravelly.	
39.0	--								Auger to 39'
41.0	S-4	2-3-4-5	1.0	50%	sm	m-w			

0 5 10 20 25 30 35 40

ENGINEER'S FIELD BORING LOG

PROJECT NAME: DSWA Cherry Island Ph IV
COUNTY: Wilmington, DE
STATE RT. NO.: ____ SECT.: ____ SEGMENT: ____ OFFSET: ____
NORTHING: 627487
EASTING: 473900
STATION: ____
OFFSET FROM CENTERLINE: 13.5' West of Stake
INSPECTOR: Michael Berry
DRILLER'S NAME/COMPANY K. Huber/Hardin Huber,Inc
EQUIPMENT USED: Mobil B61
DRILLING METHODS: 4-1/4" ID HSA
CASING SIZE: 4 1/4 ID ; DEPTH: 89
WATER: DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: MLM ; DATE: 6/29/98
DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED __

BORING NO.: GF4-2
SHEET 2 OF 3
DATE: START: 06/18/98
FINISH: 06/18/98
ELEVATION: 27.8'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
44.0	S-5	6-2-2-2	1.6	80%	sm	w			Auger to 45'
45.0	--							42.0'-44.0': Wet. 45.0'	Auger to 45' El. -17.2'
47.0	S-6		2.0		ml	m-w		SILT (ml), trace Gravel, trace Mica, black, moist to wet, dense (RECENT DEPOSITS).	S-6: Rods fell 10.5" into sampling zone. Only last 2 blow counts noted "1" and "2".
53.0	--							47-50.5': Ran vane test #9. Vanes damaged during test. (dense) 53.0'	47': Vane 9 50.5': Vane 9 tip Auger to 53' Augers grinding El. -25.2'
55.0	S-7	4-4-5-7	2.0	100%	sm-sc	w		Silty-Clayey SAND (sm-sc), trace Gravel, poorly graded, black, wet, loose.	
56.0	--							56.0'	Auger to 56' Augers grinding El. -28.2'
58.0	S-8	2-3-8-10	1.9	95%	ml	m		SILT with Sand (ml), trace Gravel, trace Mica, black, wet, loose to medium dense (RECENT DEPOSITS). 57.7'-58.0': Silty Sand, black, wet.	
59.0	--								Auger to 59'
61.0	S-9	3-3-4-3	2.0	100%	ml	w			
63.0	--								Auger to 63'
65.0	S-10	4-4-4-5	2.0	100%	ml	d-m		63.0'-65.0': Trace sand, no gravel, dry to moist.	
77.0	--							74.75-75': wet 75-77': Attempted to collect shelby tube. Tube crushed at bottom. Sample discarded. 77.0'	65': Vane 13 68.5': Vane 13 Tip 68.5-71.5': Friction Test 4 71.5': Vane 14 75': Vane 14 Tip 75-77': ST-5, Tube crushed Sample discarded El. -49.2'
79.0	S-11	6-9-20-24	2.0	100%	gw	w		Sandy GRAVEL (gw), tan, moist, medium dense to dense. 77.0'-77.7': Silty Sand, black, wet, poorly graded, medium grained. 77.7'-78.2': Sand, clean, black, wet, poorly graded, coarse grained. 78.2'-78.5': Sandy Gravel, tan, wet, poorly graded. 78.5'-79.0': Sandy Gravel, tan, moist, well graded.	
80.0	--								
82.0	S-12	13-16-29-31	1.0	50%	gw	m			Auger to 80' Augers grinding
83.0	--							83.0'	El. -55.2'
								Gravelly SAND (sp), trace Mica, brown, moist	Auger to 83'

45 50 55 60 65 70 75 80

ENGINEER'S FIELD BORING LOG

PROJECT NAME: OSWA Cherry Island Ph IV COUNTY: Wilmington, DE
STATE RT. NO.: SECT.: SEGMENT: OFFSET:
NORTHING: 627487 EASTING: 473900
STATION: OFFSET FROM CENTERLINE: 13.5' West of Stake
INSPECTOR: Michael Berry DRILLER'S NAME/COMPANY K. Huber/Hardin Huber,Inc
EQUIPMENT USED: Mobil 861
DRILLING METHODS: 4-1/4" ID HSA
CASING SIZE: 4 1/4 ID ; DEPTH: 89 WATER: DEPTH: TIME: DATE:
CHECKED BY: MLM ; DATE: 8/29/98 DEPTH: TIME: DATE:
NOT ENCOUNTERED

BORING NO.: GF4-2
SHEET 3 OF 3
DATE: START: 08/18/98
FINISH: 08/18/98
ELEVATION: 27.8'
INCLINATION: Vertical

DEPTH (FT.)	SAMPLE/ CORE #	BLOWS/ 0.5 FT.	REC. (FT.)	REC.% & RQD%	USCS	W/C	POCKET PENET. (TSF)	DESCRIPTION	REMARKS
85.0	S-13	13-14-17-18	1.7	85%	sp	m		medium dense.	Augers grinding
86.0	--								Auger to 86'
88.0	S-14	9-11-13-15	1.0	50%	sp	m			
89.0	--								Auger to 89'
91.0	S-15	9-11-12-17	1.4	70%	sp	m		91.0'	El. -63.2'
								Bottom of Boring = 91.0 Ft.	

85 90 95 10 10 11 11 1

SCHNABEL ENGINEERING ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS TEST BORING LOG	Project: NORTHERN SOLID WASTE MGMT CTR CHERRY ISLAND LANDFILL WILMINGTON, DELAWARE	Contract Number: 985176 Boring Number: SEA-12 Sheet: 1 of 2

Boring Contractor: HARDIN-HUBER INC.
BALTIMORE, MARYLAND

Boring Foreman: R. RIDER

Drilling Method: 4¼" HOLLOW STEM AUGER

Drilling Equipment: MOBILE B-81

SEA Representative: M. GILL

Dates Started: 8/20/98 Finished: 8/21/98

Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 25.0±

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	8/21	7:30	41.0'	42.5'	--
Completion	8/21	3:30	21.0'	85.0'	--
Casing Pulled	8/24	9:30	16.5'	--	17.0'

DEPTH (FT.)	STRATA DESCRIPTION	CLASS.	ELEV. (FT.)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	W (%)	REMARKS
1.0	CRUSHED STONE FILL, GRAY		24.0					
	ELASTIC SILT, CONTAINS ORGANIC MATTER, MOIST TO WET - DARK GRAY	MH			5	2+1+1		
					10	VANE #1 @ 11 ft		Su = 470 psf
					15	FRIC #1 @ 15 ft		
					20	VANE #2 @ 20 ft		Su = 630 psf
					25	VANE #3 @ 25 ft		Su = 860 psf
				B	30			RECENT DEPOSITS
					35			
					40			
					45	VANE #4 @ 45 ft		Su = 990 psf
50.0	WELL GRADED SAND WITH GRAVEL, WET - GRAY AND BROWN	SW	-25.0		50			

continued on next page

Comments:
1. BACKFILLED UPON COMPLETION.

SCHNABEL ENGINEERING ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS TEST BORING LOG	Project: NORTHERN SOLID WASTE MGMT CTR CHERRY ISLAND LANDFILL WILMINGTON, DELAWARE	Contract Number: 985178 Boring Number: SEA-12 Sheet 2 of 2

DEPTH (FT.)	STRATA DESCRIPTION	CLASS.	ELEV. (FT.)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	W (%)	REMARKS
	WELL GRADED SAND WITH GRAEL, WET - GRAY AND BROWN	SW						
80.0			-35.0		59			
	ELASTIC SILT, CONTAINS SAND LENSES AND ORGANIC MATTER, MOIST - DARK GRAY	MH			64	VANE #5 @ 64 ft		Su = 2250 psf
				B	69	2+4+2		RECENT DEPOSITS
					74	2+3+2		
	DO, CONTAINS VEGETATIVE LAYER WITH LARGE WOOD FRAGMENTS				79	2+4+7		
83.0			-58.0					
	WELL GRADED SAND WITH GRAVEL, WET - BROWN	SW		C	84	13+17+20		COLUMBIA FM.
86.5			-61.5					
	BOTTOM OF BORING @ 86.5 FT.							

Comments:
L BACKFILLED UPON COMPLETION.

SCHNABEL ENGINEERING ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS TEST BORING LOG	Project: NORTHERN SOLID WASTE MGMT CTR CHERRY ISLAND LANDFILL WILMINGTON, DELAWARE	Contract Number: 985176 Boring Number: SEA-14 Sheet: 1 of 2

Boring Contractor: HARDIN-HUBER INC.
BALTIMORE, MARYLAND

Boring Foreman: R. RIDER

Drilling Method: 4¼" HOLLOW STEM AUGER

Drilling Equipment: MOBILE B-61

SEA Representative: M. GILL

Dates Started: 8/24/98 Finished: 8/25/98

Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 50.0±

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	8/25	12:30	75.0'	75.0'	--
Completion	8/25	1:45	25.0'	85.0'	--
Casing Pulled	8/25	3:00	DRY	--	5.0'

DEPTH (FT.)	STRATA DESCRIPTION	CLASS.	ELEV. (FT.)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	W (%)	REMARKS
	SANDY CLAY WITH GRAVEL FILL, MOIST - RED-BROWN AND WHITE	FILL		A	5	4+7+8		FILL
					10	5+6+7		
15.5	ELASTIC SILT, CONTAINS SAND LENSES AND ORGANIC MATTER, MOIST TO WET - DARK GRAY	MH	34.5	B	15	1+2+2		
					20	VANE #1 @ 20 ft		Su = 840 psf
					25	VANE #2 @ 25 ft		Su = 1050 psf
					30	FRIC #1 @ 30 ft		HYDRAULIC FILL
					35	VANE #3 @ 35 ft		Su = 1160 psf
					40	VANE #4 @ 40 ft		Su = 1300 psf
					45	VANE #5 @ 45 ft		Su = 1280 psf
					50			RECENT DEPOSITS

continued on next page

Comments:
1. BACKFILLED UPON COMPLETION.

SCHNABEL ENGINEERING ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS TEST BORING LOG	Project: NORTHERN SOLID WASTE MGMT CTR CHERRY ISLAND LANDFILL WILMINGTON, DELAWARE	Contract Number: 985178 Boring Number: SEA-14 Sheet: 2 of 2

DEPTH (FT.)	STRATA DESCRIPTION	CLASS.	ELEV. (FT.)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	W (%)	REMARKS
	ELASTIC SILT, CONTAINS SAND LENSES AND ORGANIC MATTER, MOIST TO WET - DARK GRAY	MH			59	VANE #6 @ 80 ft		Su = 1480 psf
					64	FRIC #1 @ 65 ft		RECENT DEPOSITS
				B	69	VANE #7 @ 70 ft		Su = 1770 psf
					74	3+3+3		
					79	2+3+3		
					84	2+3+4		
86.5	BOTTOM OF BORING @ 86.5 FT.		-36.5					

Comments:
1. BACKFILLED UPON COMPLETION.

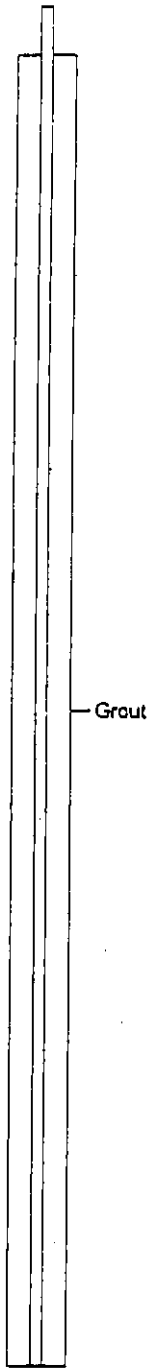
Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG LC-102

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/18/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/21/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
0	0	FL	SILT,black to dark gray, Dredge Material
5	-5	FL	SAND, gray, coarse grain
10	-10	FL	SILT, dark gray to black, stiff, Dredge Material
15	-15		
20	-20		split spoon sample collected 20-22 blows 2-2-2-1, recovery 2.0/2.0
25	-25		
30	-30		
35	-35	GP	GRAVEL, white to brown, poorly graded, with brown SAND, coarse grain, subangular
40	-40		
45	-45	CL	CLAY, green to gray, with gray SILT interbeds
50		GP	

Well: LC-102
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/21/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

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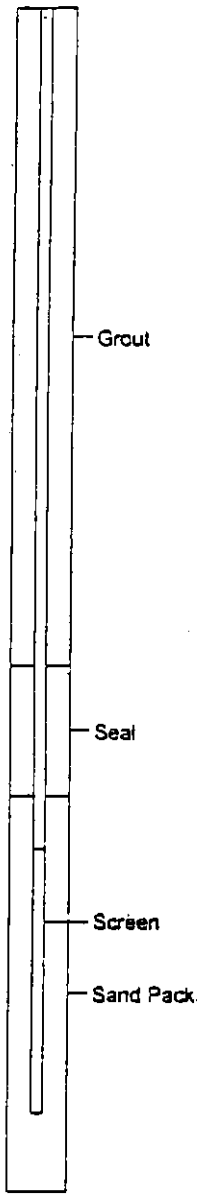
Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG LC-102

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/18/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/21/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
50	-50	GP	GRAVEL, poorly graded, SAND, brown, white, coarse grain
55	-55		
60	-60		
65	-65		
70	-70		
75	-75		
80	-80	CL	CLAY, red brown, massive
85	-85	GP	GRAVEL, gray and brown, with SAND, gray, medium grain split spoon sample collected 84-85 blows 50/.2, recovery .2/2.0
90	-90		
95	-95		
100			

Well: LC-102
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/21/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

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DRILLING LOG LC-104A

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/24/2001	DSWA Rep. : D. Fluman
	Date Completed	: 5/24/2001	Northing Coord. : N
	Hole Diameter	: 8 in	Easting Coord. : E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By :
Monitoring Well Construction	Sampling Method	:	Logged By : T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
0	0	FL	SILT,brown, Dredge Material
5	-5	FL	SILT,dark gray, Dredge Material
10	-10	FL	SILT, dark gray to olive brown, clayey, occasional rounded gravel, brown SILT and fine SAND lenses Dredge Material
15	-15		
20	-20		
25	-25		
30	-30		
35	-35		
40	-40		
45	-45		
50			

Well: LC-104A
ELEV.:

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/24/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot

SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

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Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG LC-104A

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/24/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/24/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
50	-50		
55	-55	FL	
60	-60	SM	SAND, gray brown to light gray, fine grain, very silty, increase in organic matter with depth, reed fragments
65	-65		
70	-70		
75	-75	ML	SILT, dark gray, sandy
80	-80		
85	-85	CL	CLAY,dark gray , thin SILT interbeds
90	-90		
95	-95	CL	CLAY,olive brown,soft
		CL	CLAY,dark gray to gray brown, soft
100			

Well: LC-104A
ELEV.:

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/24/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

06-18-2001 H:\JOBS\DSWA\003330\NSWMC2 DRILLING\DSWALC104A.BOR

Science Applications International Corporation
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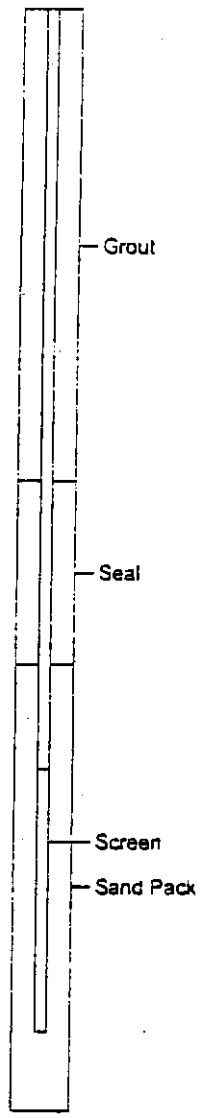
DRILLING LOG LC-104A

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/24/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/24/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
100	-100		
105	-105		
110	-110	CL	
115	-115		
120	-120		
125	-125	CL	CLAY,dark gray to brown, with white CLAY lenses
130	-130		
135	-135	SP	SAND, dark gray to brown, with GRAVELS
140	-140		
145	-145		
150			

Well: LC-104A
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/24/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

Science Applications International Corporation
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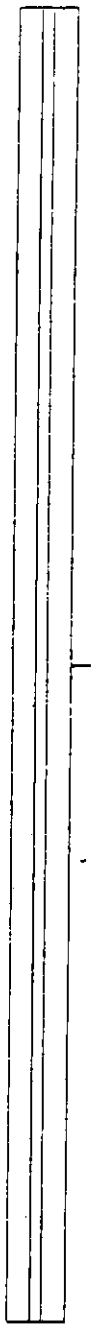
DRILLING LOG P-100A

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/17/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/17/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
0	0	FL	SILT,black to dark gray, Dredge Material
5	-5		
10	-10		
15	-15		
20	-20	CL	CLAY, dark gray, soft
25	-25	ML	SILT, dark gray, with peat and reed fragments, organic material
		CL	CLAY, gray to light gray with silt and fine SAND lenses
30	-30		
35	-35	SP	SAND, brown to light brown, medium grain, with GRAVEL and gray SILT
40	-40		
45	-45	CL	CLAY, gray and brown, no sand, drilling mud has a greenish hue
50		SM	

Well: P-100A
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/17/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

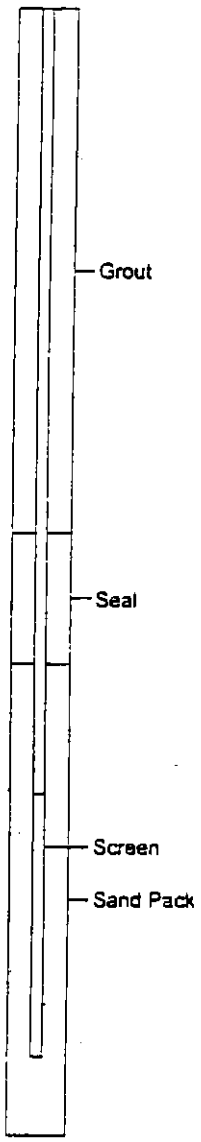
Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG P-100A

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/17/2001	DSWA Rep.	: O. Fluman
	Date Completed	: 5/17/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
50	-50	SM	SAND, orange to brown, medium grain, silty, with Gravel
55	-55		
60	-60	CL	CLAY, orange to brown
		CL	CLAY, blue green to olive, stiff, green CLAY
65	-65	ML	SILT, orange red to brown, increasing SAND with depth
70	-70		
75	-75	ML	SILT orange red, gray green mottles, silty split spoon sample collected 80-82 blow counts 2-10-30-28, recovery 2.0/2.0
80	-80	CL	CLAY, gray, lean, stiff
85	-85	SP	SAND, orange brown to gray, fine grain, lignite flecks split spoon sample collected 90-92 blow counts 10-18-50/6 recovery 1.8/2.0
90	-90	ML	SILT, dark gray and purple with SAND lenses, red orange with purple mottles, micaceous, stiff, with CLAY and SAND
95	-95		
100			

Well: P-100A
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/17/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG P-104A

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/23/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/24/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
0	0	FL	SILT, brown, Dredge Material
5	-5	FL	SILT,dark gray, Dredge Material
10	-10	FL	SILT, dark gray to olive brown, clayey, occasional rounded gravel, brown SILT and fine SAND interbeds, Dredge Material
15	-15		
20	-20		
25	-25		
30	-30		
35	-35		
40	-40		
45	-45		
50			

Well: P-104A
ELEV.:

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/25/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company/	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot

SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

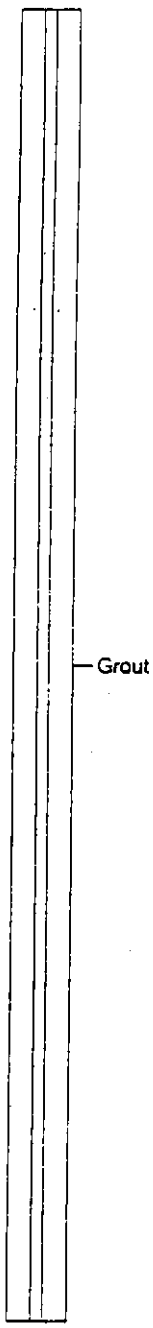
Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG P-104A

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/23/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/24/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
50	-50		
55	-55	FL	
60	-60	SM	SAND, gray brown to light gray, fine grain, very silty, increase in organic matter with depth, reed fragments
65	-65		
70	-70		split spoon sample collected 70-72 blow counts 4-4-4-4, recovery 2.0/2.0 split spoon sample collected 72-74 blow counts 4-3-4-2 , recovery 1.5/2.0
75	-75	ML	SILT, dark gray, sandy
80	-80		
85	-85	CL	CLAY,dark gray , thin SILT interbeds
90	-90		
95	-95	CL	CLAY, olive brown, soft
		CL	CLAY, dark gray to gray brown, soft
100			

Well: P-104A
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/25/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company/	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot

SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

06-18-2001 H:\JOBS\DSWA\003330\NSWMC2 DRILLING\DSWAP104A.BOR

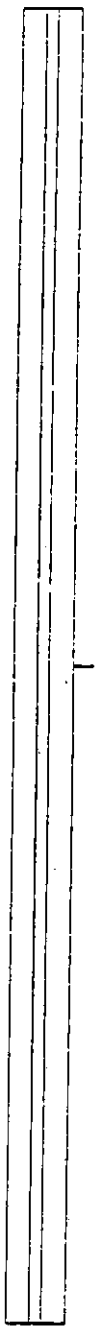
Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG P-104A

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/23/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/24/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
100	-100	CL	
105	-105		
110	-110		
115	-115		
120	-120		
125	-125	CL	CLAY, dark gray to brown, with white CLAY lenses
130	-130		
135	-135	SP	SAND, dark gray to brown, with GRAVEL split spoon sample collected 133-135 blow counts 6-10-12/5, recovery 1.3/2.0
140	-140	ML	SILT, red orange grading to gray blue, increasing SAND with depth
145	-145		
150			

Well: P-104A
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/25/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company/	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot

SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

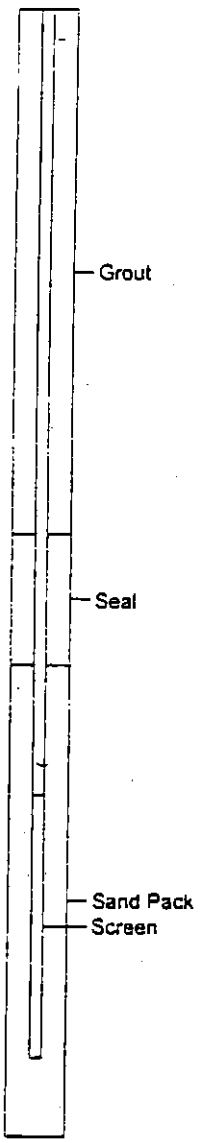
Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG P-104A

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/23/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/24/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
150	-150	ML	
155	-155	ML	SILT, gray blue, fine sand lenses, olive brown mottles split spoon sample collected 150-152 blow counts 8-20-19-50/0, recovery 1.5/2.0 split spoon sample collected 159-161 blow counts 12-22-20-50/3, recovery 1.8/2.0
160	-160		
165	-165	ML	SILT, red orange to gray, fine grain SAND lenses
170	-170		
175	-175	SM	SAND, gray, fine grain, gray SILT lenses and purple SILT lenses split spoon sample collected 183-85 blow counts 12-17-50/6, recovery 0.7/2.0
180	-180		
185	-185		
190	-190		
195	-195		
200			

Well: P-104A
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/25/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company/	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

08-18-200 r:\JOBS\DSWA\00333\NSWMC2 DRILLING\DSWAP104A.BOR

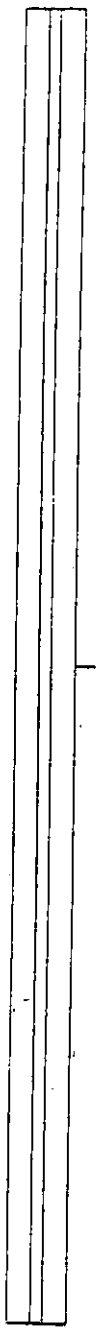
Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG P-113

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/14/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/17/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
0	0		SILT, black to dark gray, plastic sheeting fragments attributed to dredge material stabilization. Dredge Material
5	-5		
10	-10		
15	-15		
20	-20	FL	
25	-25		
30	-30		
35	-35		
40	-40		SILT, black to dark gray, clayey, with SAND lenses, gray , medium grain
45	-45	ML	plant fragments circulated up with drilling mud
50			

Well: P-113
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/17/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG P-113

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/14/2001	DSWA Rep. : D. Fluman
	Date Completed	: 5/17/2001	Northing Coord. : N
	Hole Diameter	: 8 in	Easting Coord. : E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By :
Monitoring Well Construction	Sampling Method	:	Logged By : T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
50	-50	ML	
55	-55	SM	SAND, dark brown to dark gray, medium grain, rounded, with SILT and traces of GRAVEL
60	-60		
65	-65		
70	-70		
75	-75		
80	-80	GP	GRAVEL, poorly graded, with brown SAND, medium grain
85	-85	SM	SAND and SILT interbeds, red brown to brown
90	-90		
95	-95	SP	SAND, brown, clear and white, poorly graded, coarse grain
100		CL	CLAY, dark gray, massive

Well: P-113
ELEV.:

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/17/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG P-113

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/14/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/17/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
100	-100	SP	split spoon sample collected 100-102 blow counts 27-24/4, recovery 0.2/2.0
105	-105	ML	SAND, with CLAY, stiff, green CLAY with gray SAND
110	-110	CL	CLAY, orange red to brown, stiff, lean, with SILT and SAND interbeds split spoon sample collected 110-112 blow counts 4-6-9-17, recovery 1.0/2.0
115	-115		
120	-120		
125	-125		
130	-130		
135	-135		
140	-140	ML	CLAY, red, gray green mottles,silty
145	-145		
150			

Well: P-113
ELEV.:

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/17/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

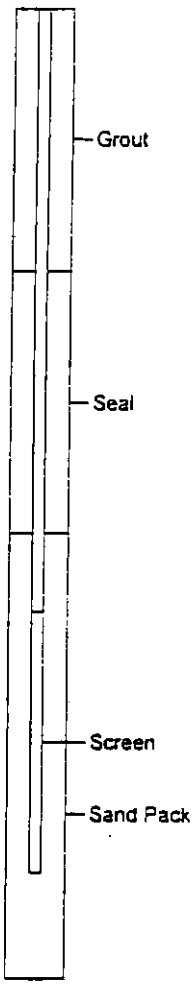
Science Applications International Corporation
An Employee-Owned Company

DRILLING LOG P-113

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/14/2001	DSWA Rep.	: D. Fluman
	Date Completed	: 5/17/2001	Northing Coord.	: N
	Hole Diameter	: 8 in	Easting Coord.	: E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By	:
Monitoring Well Construction	Sampling Method	:	Logged By	: T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
150	-150	ML	increasing SAND
155	-155		split spoon sample collected 160-162 blow counts 57/6, recovery 0.3/2.0
160	-160	CL	CLAY, red, massive, SAND and SILT lenses, lean, stiff
165	-165		
170	-170		
175	-175	SM	SAND, gray to white, fine grain, silty split spoon sample collected 175-177 blow counts 72/6, recovery 0.2/2.0
180	-180		
185	-185	ML	SILT, red orange with purple mottles, micaceous, stiff, with CLAY and SAND
190	-190		split spoon sample collected 185-187 blow counts 60/6, recovery 0.2/2.0
195	-195		
200			

Well: P-113
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/17/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot

SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

Science Applications International Corporation
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DRILLING LOG P-116

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/22/2001	DSWA Rep. : D. Fluman
	Date Completed	: 5/23/2001	Northing Coord. : N
	Hole Diameter	: 8 in	Easting Coord. : E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By :
Monitoring Well Construction	Sampling Method	:	Logged By : T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
0	0	FL	SAND and GRAVEL, gray and brown, pad placed to allow drilling
5	-5	FL	SILT, black to dark gray, clayey, with gray SAND lenses, some organic fragments, Dredge Material
10	-10		
15	-15		split spoon sample collected 14-16 blow counts- weight of hammer, recovery 2.0/2.0
20	-20		
25	-25	SP	SAND, dark brown, medium to fine grain, rounded, with SILT
		CL	CLAY, gray
30	-30	CL	CLAY, gray to dark gray, SILT and SAND interbeds, lignite flecks and purple mottling
35	-35		
40	-40		
45	-45	SP	SAND,white to light gray, poorly graded, coarse grain, with GRAVELS
50	-50	GP	GRAVEL, gray to brown, rounded to subangular, with SAND and COBBLES, pyrite and schist fragments
55			

Well: P-116
ELEV.:

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/23/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot
SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

Science Applications International Corporation
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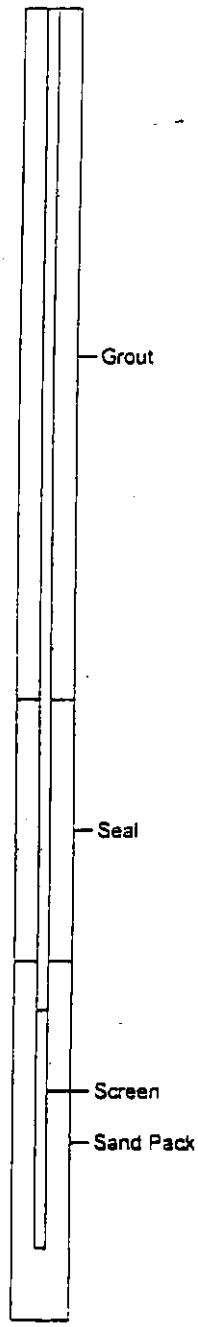
DRILLING LOG P-116

Delaware Solid Waste Authority Northern Solid Waste Managment Center Cherry Island (NSWMC-2)	Date Started	: 5/22/2001	DSWA Rep. : D. Fluman
	Date Completed	: 5/23/2001	Northing Coord. : N
	Hole Diameter	: 8 in	Easting Coord. : E
Wilmington Delaware	Drilling Method	: Mud Rotary	Survey By :
Monitoring Well Construction	Sampling Method	:	Logged By : T. Marrs

DEPTH Feet	ELEV.	LEGEND	DESCRIPTION
55	-55	GP	
60	-60		
65	-65		
70	-70		
75	-75		split spoon sample collected 75-77 blow counts 50/2, recovery 0.1/2.0
80	-80		
85	-85		
90	-90	ML	SILT, red brown to brown, clayey split spoon sample collected 90-92 blow counts 20-50/1, recovery 0.2/2.0
95	-95	ML	SILT, red to brown, with lenses of fine SAND
100	-100	SP	SAND, light gray to white, fine grain,with red SILT interbeds split spoon sample collected 97-99 blow counts 22-30/1, recovery 0.2/2.0
105	-105		
110		ML	Silt, red, clayey

Well: P-116
ELEV.:



Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 5/23/2001
Hole Diameter	: 8 in.
Drill. Method	: Mud Rotary
Drill. Company	: Uni-Tech

WELL CASING

Material	: PVC
Diameter	: 4 in.
Joints	: threaded

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Joints	: threaded
Opening	: .010 slot

SAND PACK	: #1 quartz
ANNULUS SEAL	: bentonite slurry

WELL SCREEN

Material	: PVC
Diameter	: 4 in.
Cap	: PVC

NOTES

Schnabel Engineering — TEST BORING LOG

Project: NORTHERN SOLID WASTE MGMT CTR
CHERRY ISLAND LANDFILL
WILMINGTON, DELAWARE

Boring Number: SEA-100V
Contract Number: 01151045
Sheet: 1 of 1

Boring Contractor: WALTON CORPORATION NEWARK, DELAWARE
Boring Foreman: D. TAYLOR
Drilling Method: 3¼" HOLLOW STEM AUGER
Drilling Equipment: CME-55
SEA Representative: S. KROCK/D. WILDER
Dates Started: 10/8/01 Finished: 10/9/01
Location: SEE IN SITU TEST LOCATION PLAN
Ground Surface Elevation: 78.0± (feet)

Groundwater Observations

Date	Time	Depth	Casing	Caved

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	MSW AUGER PROBE TO 39.0 FT.			A	5, 10, 15, 20, 25, 30, 35			MSW
39.0	ELASTIC SILT, CONTAINS ORGANIC MATTER AND MISC DEBRIS, MOIST TO WET - BLACK	MH	39.0	B	40	4+4+3*		
					45	1+1+WOH WOH+WOH+2	Vane #1 Friction Test #1	Su = 370 psf
					50		Vane Test #2	Su = 1090 psf
					55	WOH/18"		RECENT DEPOSITS
					60	WOR/18" WOR/18"	Vane Test #3	Su = 400 psf
					65	WOH/18" WOH/18"	Vane Test #4	Su = 780 psf
					70		Friction Test #2 Vane Test #5	Su = 820 psf
71.5	BOTTOM OF BORING @ 71.5 FT.		6.5			WOH/18"		

Comments:
1. BACKFILLED UPON COMPLETION.

Schnabel Engineering — TEST BORING LOG

Project: NORTHERN SOLID WASTE MGMT CTR
CHERRY ISLAND LANDFILL
WILMINGTON, DELAWARE

Boring Number: SEA-104V
Contract Number: 01151045
Sheet: 1 of 2

Boring Contractor: WALTON CORPORATION
NEWARK, DELAWARE

Boring Foreman: D. TAYLOR

Drilling Method: 3¼" HOLLOW STEM AUGER

Drilling Equipment: CME-55

SEA Representative: S. KROCK/D. WILDER

Dates Started: 10/17/01 Finished: 10/18/01

Location: SEE IN SITU TEST LOCATION PLAN

Ground Surface Elevation: 73.0± (feet)

Groundwater Observations	Date	Time	Depth	Casing	Caved

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	MSW AUGER PROBE TO 42.0 FT.			A	5, 10, 15, 20, 25, 30, 35, 40	6+4+4*		MSW
42.0	ELASTIC SILT, CONTAINS ORGANIC MATTER AND MISC DEBRIS, MOIST TO WET - BLACK	MH	31.0	B	45	WOR+1+1	Vane Test #1	Su = 650 psf
						WOR/18" WOR/18"		
					50		Friction Test #1 Vane Test #2	Su = 990 psf
						WOR/18"	Vane Test #3	Su = 1170 psf
					55	WOH/18"		
					60	WOR/18" WOH/18"	Vane Test #4	RECENT DEPOSITS Su = 790 psf
					65	WOH/18"		
					70		Friction Test #2 Vane Test #5	Su = 1100 psf
						WOH+WOH+3		
					75	WOR+WOH+2	Vane Test #6	Su = 510 psf
76.0	BOTTOM OF BORING @ 76.0 FT.		-3.0					

Comments:
1. BACKFILLED UPON COMPLETION.

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WP FORMS BORING LOGS

SOIL BORING LOG

Client: DSWA
Project No.:

Boring/Well No.: P104A
Location:
Surface Elevation:

T.O.C. Elev.:

Depth Feet	Blow Counts	Recovery (ft/ft)	Overburden/Lithologic Description	Sample ID/ OVA Screen	Graphic Log	Well Construction Graphic	Depth Feet	Well Construction Details
			SILT. BROWN					
5		0-5						
		5-7	SILT GRAY					
10		7-50	SILT CLAYEY W ROUNDED GRAVEL BROWN SILT STREAKS					
			DARK GRAY TO OLIVE BROWN (SPOIL)					
15								
20								
25								
30								
35								
40								
45								
50			TD ON 5/23/01					
			GRAY, CLAY & SILTY W OCCASIONAL BROWN STREAKS					
55								
60								
65								

Driller: UNITECH	Well Casing: 4 Dia. To	Seal Type: Quantity:
Drilling Type/Size: 8" DRAG BIT MUD ROT	Casing Type: PVC	Filter Pack Type: Quantity:
Logged By: TDM	Well Screen: 4 Dia. To	Static Water Level:
Drilling Started: 5/23/01	Screen Type: PVC	Date/Time:
Drilling Completed: 5/24/01	Slot Size: .010	Notes:
Well Construction: 5/24/01 - 5/25/01	Grout Type: TYPE II Quantity:	
Blown/Bailed Yield:		

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SOIL BORING LOG

Client: DWSA
Project No.:

Boring/Well No.: D104A
Location:
Surface Elevation:

T.O.C. Elev.:

Depth Feet	Blow Counts	Recovery (ft/ft)	Overburden/Lithologic Description	Sample ID/ OVA Screen	Graphic Log	Well Construction Graphic	Depth Feet	Well Construction Details
		~68	INCREASE IN SAND AND ORGANIC MATTER RECO FRAGMENTS					
70	4/4/4/4	2.0/2.0	SPOON 70-72					
	4/3/4/2	1.5/2	SPOON 72-74 MGRN - FGRN LIGHT GRAY SAND INTERBEDDED SAND AND CLAY					
75								
80			74-80 SILT DRK GRAY SANDY			78 80/PSIT CHATTER		
85			@ 85 CLAY DARK GRAY WITH MINOR SILT					
90								
95			@ 95 CLAY OLIVE BROWN					
100			97 CLAY OTHE GRAY BROWN					
105								
110								
115								
120								
125								
130								

Driller: UNITECH	Well Casing: 4" Dia. 180 To SURF	Seal Type: BENSEAL Quantity:
Drilling Type/Size: 8" DRAG BIT MUD ROT	Casing Type: SCHED 40 PVC	Filter Pack Type: #1 MORIE Quantity:
Logged By: TOM	Well Screen: 4" Dia. 190 To 180	Static Water Level:
Drilling Started: 5/23/01	Screen Type: SCHED 40 PVC	Date/Time:
Drilling Completed: 5/24/01	Slot Size: 1010	Notes:
Well Construction: 5/24/01 - 5/25/01	Grout Type: PORTLAND CMT Quantity:	
Blows/Bail...		

Science Applications International Corporation
An Employee-Owned Company

WPFORMS BORING LOGS XLS

SOIL BORING LOG

Client: DSWA
Project No.:

Boring/Well No.: P164 A
Location:
Surface Elevation:

T.O.C. Elev.:

Depth Feet	Blow Counts	Recovery (ft/ft)	Overburden/Lithologic Description	Sample ID/ OVA Screen	Graphic Log	Well Construction Graphic	Depth Feet	Well Construction Details
135			CLAY WITH WHITE PLACES AND MOTTLES @131 BIT CHATTER WHERE GRAVEL					
140	6 10 12/5	1.3/2.0	SAND IN DRILL MUD SPOON 133-134 SAND GRAVEL COARSE GRAY TO BROWN					
145			@137 RED SILT AND SAND					
150	8/20/19	1.5/2.0	SPOON 150-152 GRAY BLUE SILT AND FINE SAND OLIVE BROWN MOTTLES					
155								
160	12/22/20	1.8/2.0	SPOON 159-161 NO SAMPLE RETAINED AS ABOVE					
165			SILT RED & GRAY WITH SAND LAYER					
170								
175								
180							180	
185	12/17/50/6	.7/2.0	SPOON 185-185 SAND W SILT GRAY GREEN W PURPLE CLAY STRINGERS W GREEN					SCREEN 190-180 MORIE #1 193-175 MORIE #00 175-174 BENTSEAL 174-172
190							190	
195			TD @193					

Spoons verified by Mapogar P.G. to be Weathered with Complete

Driller: UNITECH	Well Casing: 4 Dia. 180 To SURF	Seal Type: BENTSEAL Quantity:
Drilling Type/Size: 8" DRAG BIT	Casing Type: PVC	Filter Pack Type: #1 MORIE Quantity:
Logged By: TOM	Well Screen: 4 Dia. 190 To 180	Static Water Level:
Drilling Started: 5/23/01	Screen Type: PVC	Date/Time:
Drilling Completed: 5/24/01	Slot Size: .010	Notes:
Well Construction: 5/24/01	Grout Type: TYPE PORTLAND Quantity:	

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An Employee-Owned Company

WP\FORMS\BORING LOGS

SOIL BORING LOG

Client: DSWA
Project No.:

Boring/Well No.: LC 104
Location:
Surface Elevation:

T.O.C. Elev.:

Depth Feet	Blow Counts	Recovery (ft/ft)	Overburden/Lithologic Description (FROM P104 LOG)	Sample ID/ OVA Screen	Graphic Log	Well Construction Graphic	Depth Feet	Well Construction Details
5			~~CLAY~~ SILT BROWN					
10			SILT GRAY SILT CLAYEY W ROUNDED GRAVEL BROWN STREAKS					
15								
20								
25								
30								
35								
40								
45								
50			CLAY GRAY SILTY WITH OCCASIONAL BROWN SILT STREAKS					
55								
60								
65								

Driller: UNITECH	Well Casing: 4" Dia. SURF To 129	Seal Type: BSNSEAL Quantity: 20 [illegible]
Drilling Type/Size: 8" DRAG BIT MUD ROTARY	Casing Type: SCHED 40 PVC	Filter Pack Type: #1 MORIE Quantity:
Logged By: TOM	Well Screen: 4" Dia. 129 To 139	Static Water Level:
Drilling Started: 5/25/01	Screen Type: SCHED 40 PVC	Date/Time:
Drilling Completed: 5/25/01	Slot Size: .010	Notes:
Well Construction: 5/25/01	Grout Type: TYP II CMT Quantity:	

Science Applications International Corporation
An Employee-Owned Company

WPFORMS BORING LOGS V1.5

SOIL BORING LOG

Client: DSWA
Project No.:

Boring/Well No.: LC 104 T.O.C. Elev.:
Location:
Surface Elevation:

Depth Feet	Blow Counts	Recovery (ft/ft)	Overburden/Lithologic Description	Sample ID/ OVA Screen	Graphic Log	Well Construction Graphic	Depth Feet	Well Construction Details
70			SILT W SAND AND ORGANIC MATERIAL					
75			SILT AND SAND					
80								
85			CLAY DARK GRAY WITH SILT					
90								
95			CLAY OLIVE BROWN					
100			CLAY GRAY BROWN					
105								
110								
115								
120								
125								
130								

Driller: UNITECH	Well Casing: 4" Dia. SCH 40 To 129	Seal Type: BENTONITE Quantity: 20 GAL
Drilling Type/Size:	Casing Type: SCHED 40 PVC	Filter Pack Type: #1 MORIE Quantity:
Logged By: TOM	Well Screen: 4" Dia. 129 To 139	Static Water Level:
Drilling Started: 5/25/01	Screen Type: SCHED 40 PVC	Date/Time:
Drilling Completed: 5/25/01	Slot Size: .010	Notes:
Well Construction: 5/25/01	Grout Type: TYPE I CMT Quantity:	

Science Applications International Corporation
An Employee-Owned Company

WPFORMS:BORING LOGS

SOIL BORING LOG

Client:
Project No.:

Boring/Well No.: LC104
Location:
Surface Elevation:

T.O.C. Elev.:

Depth Feet	Blow Counts	Recovery (ft/ft)	Overburden/Lithologic Description	Sample ID/ OVA Screen	Graphic Log	Well Construction Graphic	Depth Feet	Well Construction Details
135		@ 130	SAND & GRAVEL ROUNDED MGRN SAND WITH COARSE GRAVELS			TAT CHATTER		
140		@136'	- RED SILT & SAND					

Driller: UNITECH	Well Casing: 4" Dia. SCHED To 129	Seal Type: BENSEAL Quantity: 20 GAL
Drilling Type/Size: 8" DRAG BIT MUD ROT	Casing Type: SCHED 40 PVC	Filter Pack Type: #1 MORIE Quantity:
Logged By: TOM	Well Screen: 4" Dia. 129 To 139	Static Water Level:
Drilling Started: 5/25/01	Screen Type: SCHED 40 PVC	Date/Time:
Drilling Completed: 5/25/01	Slot Size: .010	Notes:
Well Construction: 5/25/01	Grout Type: TYP & CMT Quantity:	

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL LC - 101

NEW WELL PERMIT NUMBER _____ DATE 2/8/96

OWNER'S NAME DELAWARE SOLID WASTE

ADDRESS 1128 S. BRADFORD ST. / P.O. BOX 455
DOVER, DE 17903-04555

DEVELOPMENT/LOT # _____

REASON FOR ABANDONMENT (BE SPECIFIC) _____

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☐ BORED OR AUGERED ☐ JETTED ☒ OTHER, SPECIFY Pressure Grouting

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY _____

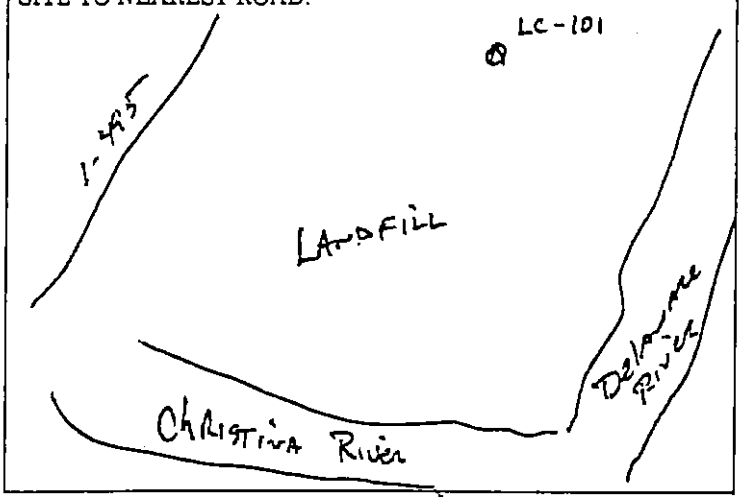
SIZE OF CASING 4" INCHES DEPTH OF ABANDONED WELL 83.5 FEET

WAS ANY CASING REMOVED? X YES ___ NO

IF YES, AMOUNT REMOVED 20' FEET

WAS CASING RIPPED OR PERFORATED? ___ YES X NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
#1 SAND	83.5	72.5
#00 SAND	71.5	72.5
Portland cement with Bentonite	0'	71.5

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR MARCOR ENVIRONMENTAL SERVI

LICENSE NUMBER 829

SIGNED [signature] 4/2/96 For Bill Walsh
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION.

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL P-101

NEW WELL PERMIT NUMBER _____ DATE 2/8/96

OWNER'S NAME Delaware Solid Waste

ADDRESS 1128 S Bradford St. / P.O. Box 455
Dover, DE. 17903-04555

DEVELOPMENT/LOT # _____

REASON FOR ABANDONMENT (BE SPECIFIC) _____

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☐ BORED OR AUGERED ☐ JETTED ☒ OTHER, SPECIFY Pressure Tremie grouted

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY _____

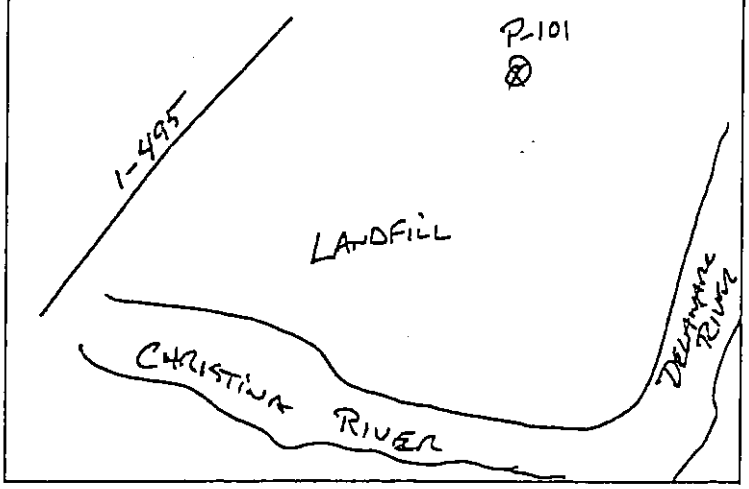
SIZE OF CASING 4 INCHES DEPTH OF ABANDONED WELL 166.5 FEET

WAS ANY CASING REMOVED? ___ YES ___ NO

IF YES, AMOUNT REMOVED _____ FEET

WAS CASING RIPPED OR PERFORATED? ___ YES ___ NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
#1 SAND	166.5	155.5
#00 SAND	155.5	154.5
Portland Cement with Bentonite	154.5	0

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR MARCOR ENVIRONMENTAL SERV

LICENSE NUMBER 829

SIGNED [signature] 4/2/96 for BILL WALSH
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL UC - 102

NEW WELL PERMIT NUMBER _____ DATE 2/8/96

OWNER'S NAME Delaware Solid Waste

ADDRESS 1128 S. Bradford St. / P.O. Box 455

Dover, DE 17903 - 04555

DEVELOPMENT/LOT # _____

REASON FOR ABANDONMENT (BE SPECIFIC) _____

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☐ BORED OR AUGERED ☐ JETTED ☒ OTHER, SPECIFY Pressure trenie grouter

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY _____

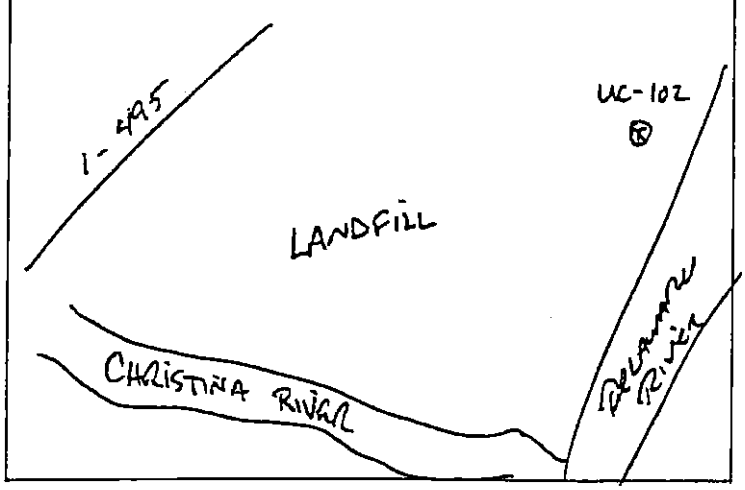
SIZE OF CASING 4" INCHES DEPTH OF ABANDONED WELL 57' FEET

WAS ANY CASING REMOVED? X YES ___ NO

IF YES, AMOUNT REMOVED 20' FEET

WAS CASING RIPPED OR PERFORATED? ___ YES X NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
#1 SAND	57'	46'
#00 SAND	45'	46'
Portland Cement with Bentonite	0'	45'

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR MARCOR ENVIRONMENTAL SERVIC

LICENSE NUMBER 829

SIGNED [signature] 4/2/96 for Bill Walsh
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL P-102

NEW WELL PERMIT NUMBER _____ DATE 2/8/96

OWNER'S NAME Delaware Solid Waste

ADDRESS 1128 S. Bradford St. / P.O. Box 455

Dover, DE 17903-0455

DEVELOPMENT/LOT # _____

REASON FOR ABANDONMENT (BE SPECIFIC) _____

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☐ BORED OR AUGERED ☐ JETTED ☒ OTHER, SPECIFY Pressure trikine grouted

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY _____

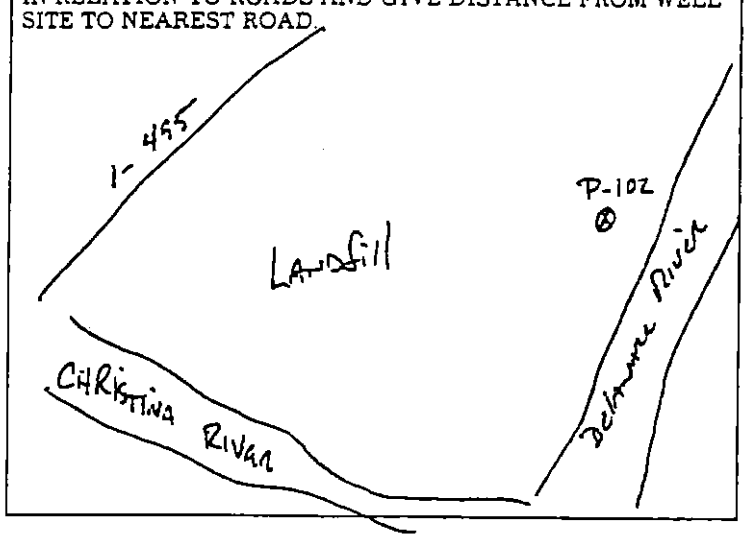
SIZE OF CASING 4" INCHES DEPTH OF ABANDONED WELL 177' FEET

WAS ANY CASING REMOVED? X YES ___ NO ~~Top 20'~~

IF YES, AMOUNT REMOVED 20' FEET

WAS CASING RIPPED OR PERFORATED? ___ YES X NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
#1 SAND	177'	166'
#00 SAND	165'	166'
Portland Cement with Bentonite	0'	166'

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR Mason Environmental Serv

LICENSE NUMBER 829

SIGNED [signature] 4/2/96 For Bill Wa
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL Permit # 106909 / LOCAL ID # LC-113

NEW WELL PERMIT NUMBER 107241 / LC-113A DATE 3/27/96

OWNER'S NAME DELAWARE SOLID WASTE AUTHORITY

ADDRESS 1128 S. BRADFORD ST. / P.O. BOX 455

DOVER, DE 17903-04555

DEVELOPMENT/LOT # N/A

REASON FOR ABANDONMENT (BE SPECIFIC) ARTESIAN WATER FLOW FROM WELL WAS CAUSING DE-WATERING AT LANDFILL

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☒ BORED OR AUGERED ☐ JETTED ☐ OTHER, SPECIFY

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY

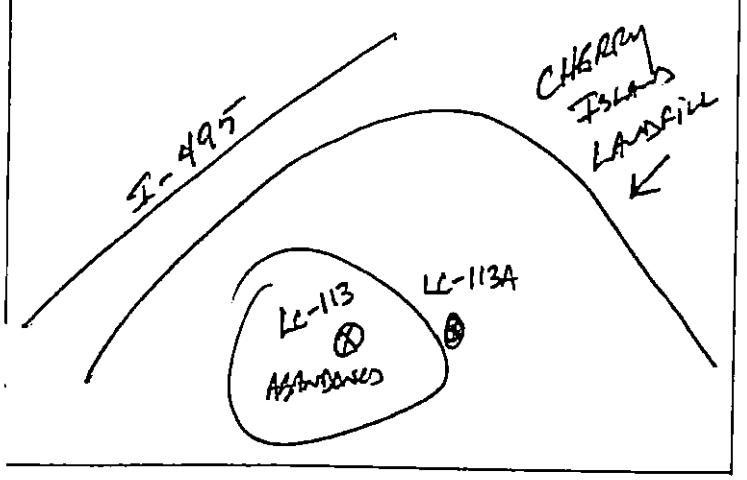
SIZE OF CASING 4" INCHES DEPTH OF ABANDONED WELL 75 FEET

WAS ANY CASING REMOVED? X YES ___ NO

IF YES, AMOUNT REMOVED 75' FEET

WAS CASING RIPPED OR PERFORATED? ___ YES X NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
PORTLAND CEMENT 7 BAGS	75'	0'
Bentonite		
Bentonite Hole Plug 3 BAGS		

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR MARCAR ENVIRONMENTAL SERVICE

LICENSE NUMBER 829

SIGNED (829) [signature]
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL P-104

NEW WELL PERMIT NUMBER _____ DATE 2/12/96

OWNER'S NAME DELAWARE SOLID WASTE

ADDRESS 1128 S. BRADFORD ST. | P.O. BOX 455
DOVER, DE. 17903 - 04555

DEVELOPMENT/LOT # _____

REASON FOR ABANDONMENT (BE SPECIFIC) _____

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☐ BORED OR AUGERED ☐ JETTED ☒ OTHER, SPECIFY Pressure Tremie Grouted

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY _____

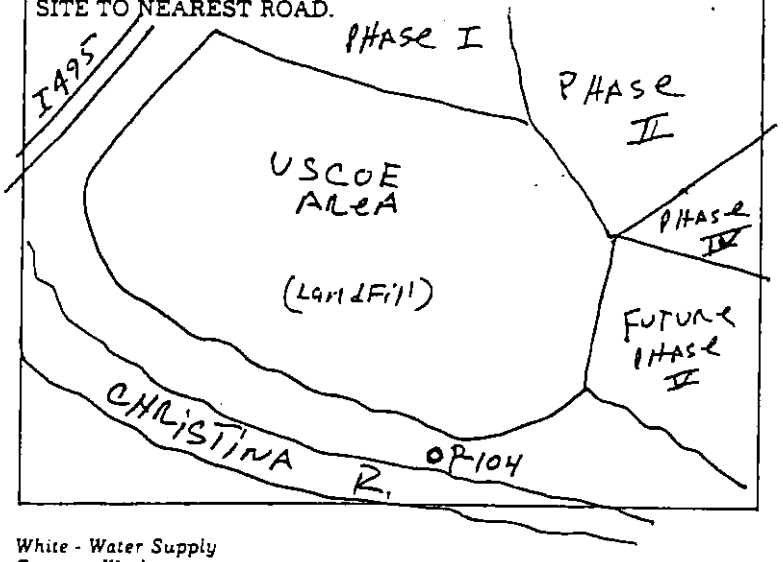
SIZE OF CASING 4" INCHES DEPTH OF ABANDONED WELL 160.0 FEET

WAS ANY CASING REMOVED? X YES ___ NO

IF YES, AMOUNT REMOVED 20 FEET

WAS CASING RIPPED OR PERFORATED? ___ YES ___ NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
#1 SAND	160	150
#00 SAND	150	148
PORTLAND CEMENT	148	0'
Bentonite		

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR _____

LICENSE NUMBER _____

SIGNED _____
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL LC - 103

NEW WELL PERMIT NUMBER _____ DATE 2/9/96

OWNER'S NAME Delaware Solid Waste

ADDRESS 1128 S. Bradford St. / P.O. Box 455
Dover, DE 17903 - 04555

DEVELOPMENT/LOT # _____

REASON FOR ABANDONMENT (BE SPECIFIC) _____

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☐ BORED OR AUGERED ☐ JETTED ☒ OTHER, SPECIFY Tremie pressure grouted

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY _____

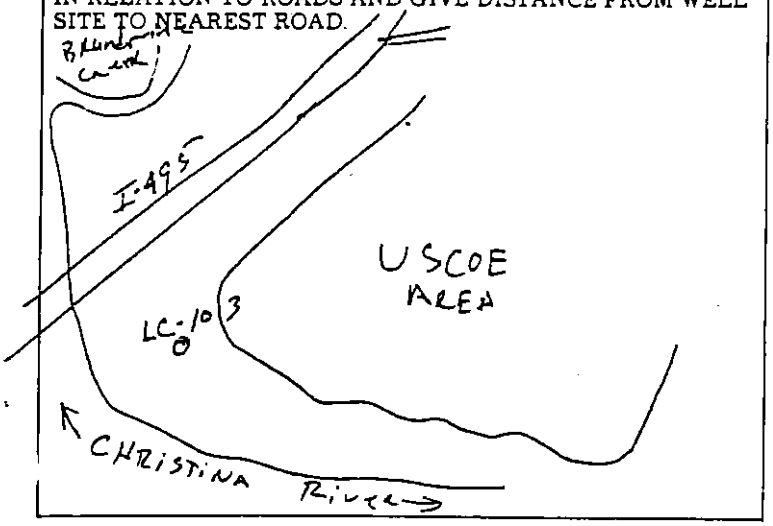
SIZE OF CASING 4" INCHES DEPTH OF ABANDONED WELL 50' FEET

WAS ANY CASING REMOVED? X YES ___ NO

IF YES, AMOUNT REMOVED 20' FEET

WAS CASING RIPPED OR PERFORATED? ___ YES X NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
#1 SAND	50'	40'
#00 SAND	40'	38'
Portland Cement with Bentonite	38'	0'

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR MARCOR ENVIRONMENTAL SERVICE

LICENSE NUMBER 829

SIGNED [signature] 4/2/96 for Bill Walsh
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

DOCUMENT NO. 40-08/87/02/03

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL B-103

NEW WELL PERMIT NUMBER _____ DATE 2/9/96

OWNER'S NAME DELAWARE SOLID WASTE

ADDRESS 1128 S BRADFORD ST. / P.O. BOX 455

DOVER, DE 19903 - 04555

DEVELOPMENT/LOT # _____

REASON FOR ABANDONMENT (BE SPECIFIC) _____

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☐ BORED OR AUGERED ☐ JETTED ☒ OTHER, SPECIFY Pressure tremie grouted

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY _____

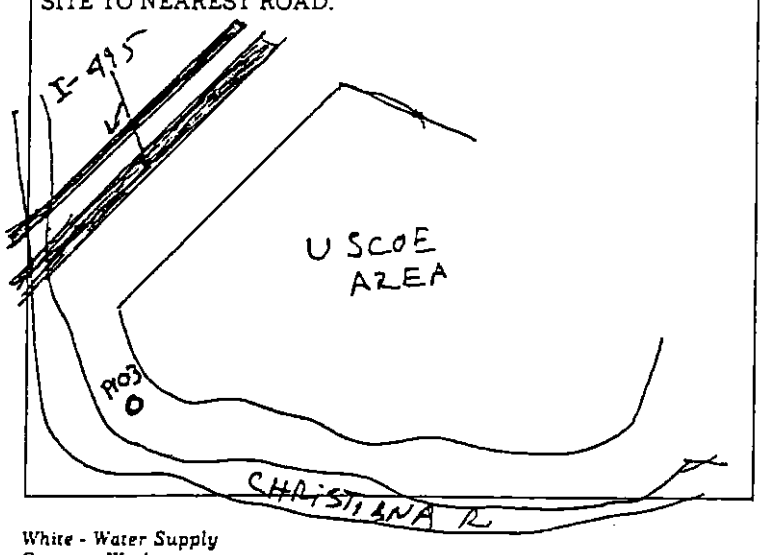
SIZE OF CASING 4" INCHES DEPTH OF ABANDONED WELL 103.5 FEET

WAS ANY CASING REMOVED? X YES ___ NO

IF YES, AMOUNT REMOVED 20 FEET

WAS CASING RIPPED OR PERFORATED? ___ YES X NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
#1 Sand	103	93
#00 Sand	93	92
Portland Cement with Bentonite	92	0'

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR _____

LICENSE NUMBER _____

SIGNED _____
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL LC - 107

NEW WELL PERMIT NUMBER _____ DATE 2/12/96

OWNER'S NAME DELAWARE SOLID WASTE

ADDRESS 1128 S. BRADFORD ST. / P.O. BOX 455
DOVER, DE 17903 - 04555

DEVELOPMENT/LOT # _____

REASON FOR ABANDONMENT (BE SPECIFIC) _____

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☐ BORED OR AUGERED ☐ JETTED ☐ OTHER, SPECIFY _____

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY _____

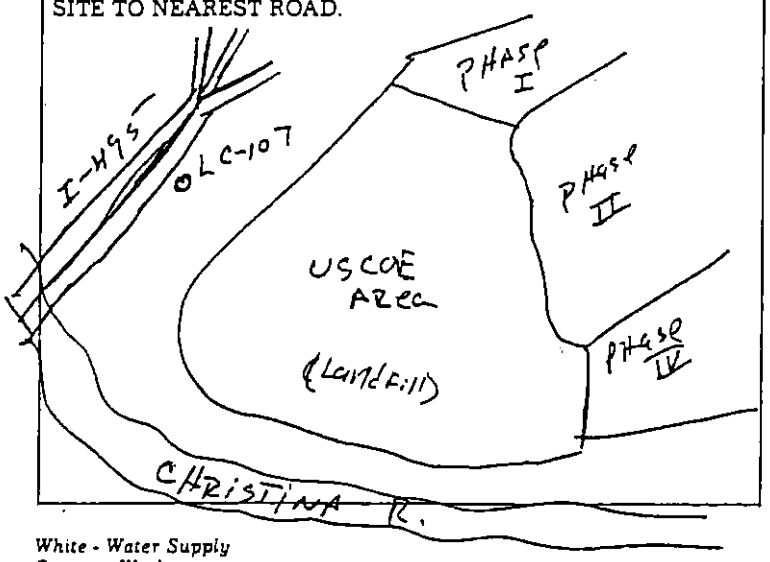
SIZE OF CASING 4 INCHES DEPTH OF ABANDONED WELL 37' FEET

WAS ANY CASING REMOVED? Y YES ___ NO

IF YES, AMOUNT REMOVED 20 FEET

WAS CASING RIPPED OR PERFORATED? ___ YES X NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
#1 SAND	37'	26'
#00 SAND	26'	25'
PORTLAND CEMENT + BENTONITE	25'	0'

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR MARCOR ENVIRONMENTAL SERV.

LICENSE NUMBER 829

SIGNED [signature] 4/2/96 for Bill Walsh
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL ABANDONMENT REPORT

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

AN ABANDONMENT REPORT MUST BE FILED WITH THE WATER SUPPLY BRANCH WITHIN THIRTY (30) DAYS AFTER ABANDONMENT OF THIS WELL. FAILURE TO DO SO MAY RESULT IN LICENSE SUSPENSION.

PLEASE PRINT OR TYPE

PERMIT OR LOCAL NUMBER OF ABANDONED WELL P-107

NEW WELL PERMIT NUMBER _____ DATE 2/12/96

OWNER'S NAME DELAWARE SOLID WASTE

ADDRESS 1128 S BRADFORD ST. / P.O. BOX 455
DOVER, DE 17903-04555

DEVELOPMENT/LOT # _____

REASON FOR ABANDONMENT (BE SPECIFIC) _____

ABANDONED WELL CONSTRUCTED BY WHICH METHOD

☐ DRILLED ☐ BORED OR AUGERED ☐ JETTED ☐ OTHER, SPECIFY _____

TYPE OF CASING USED IN ABANDONED WELL

☐ STEEL ☐ CONCRETE ☒ PLASTIC ☐ OTHER, SPECIFY _____

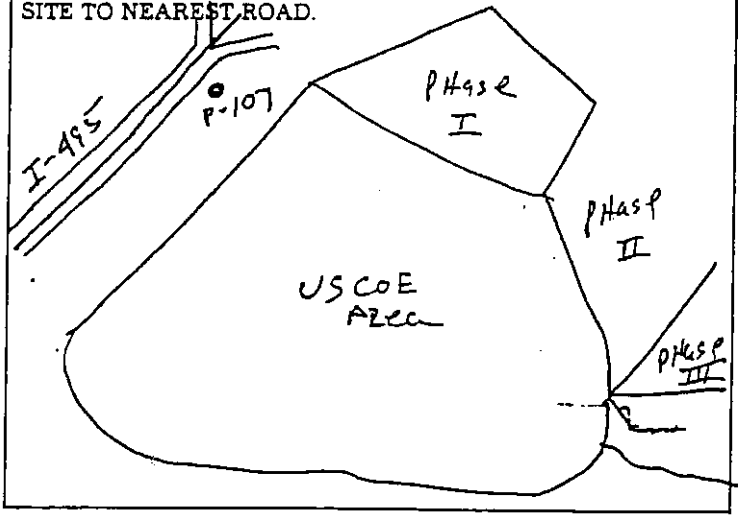
SIZE OF CASING 4" INCHES DEPTH OF ABANDONED WELL 85 FEET

WAS ANY CASING REMOVED? Y YES ___ NO

IF YES, AMOUNT REMOVED 20 FEET

WAS CASING RIPPED OR PERFORATED? ___ YES X NO

DRAW A SKETCH SHOWING LOCATION OF BOTH WELL(S) IN RELATION TO ROADS AND GIVE DISTANCE FROM WELL SITE TO NEAREST ROAD.



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
#1 Sand	85'	75'
#00 Sand	75'	74'
Portland Cement + Bentonite	74'	to 0'

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

WELL CONTRACTOR MARCOR ENVIRONMENTAL SERVICE

LICENSE NUMBER 829

SIGNED [signature] 4/2/96 for Bill Welsh
(LICENSED CONTRACTOR/WELL DRILLER)

White - Water Supply
Canary - Work
Pink - Owner
Goldenrod - Well Contractor

EXISTING CPT

SEA-1

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

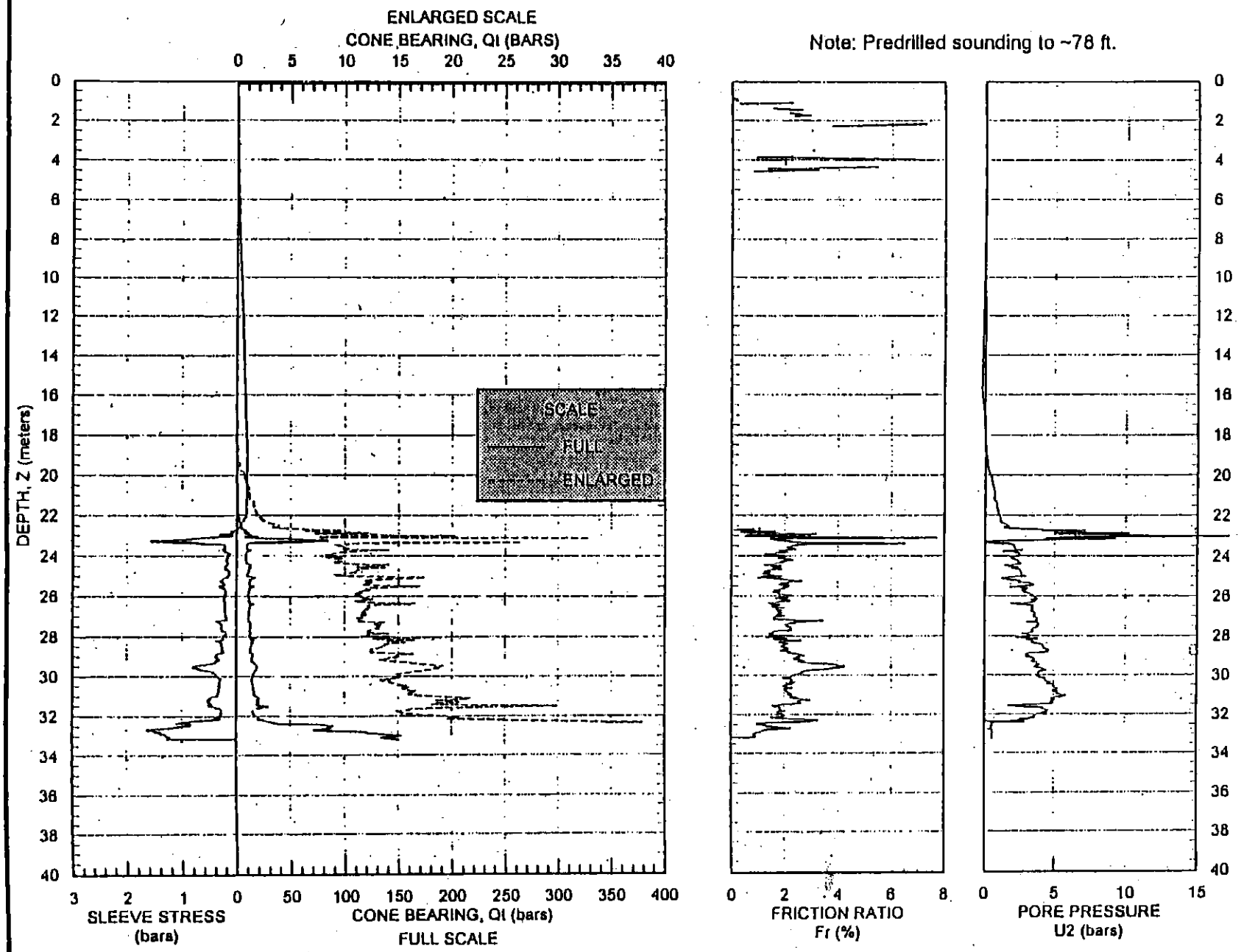
ELECTRIC CONE PENETROMETER RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 12-01-88

SOUNDING
CPT-1

Ground Surface Elev.:
Water Depth: Caved at 1.86 m

Note: Predrilled sounding to ~78 ft.

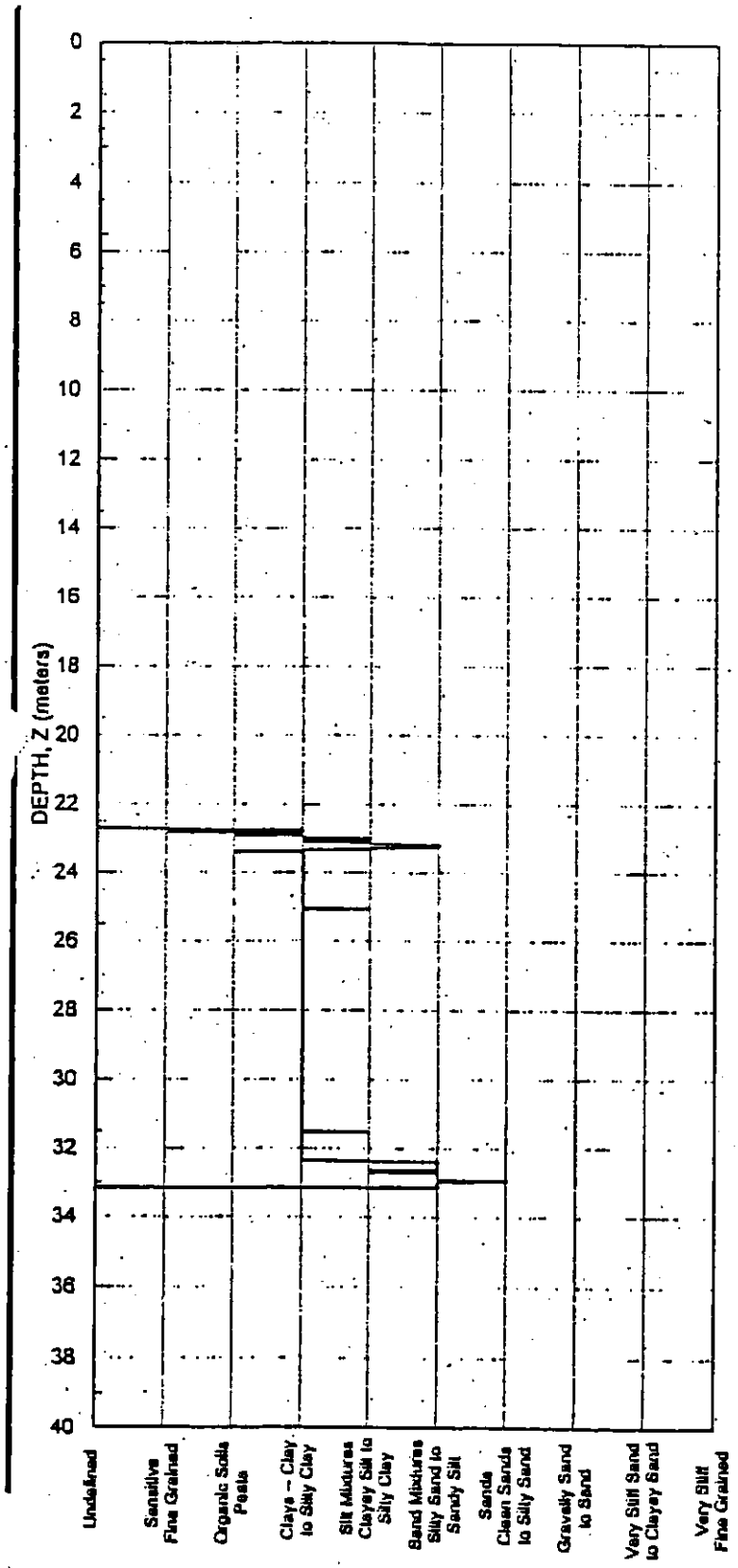


PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

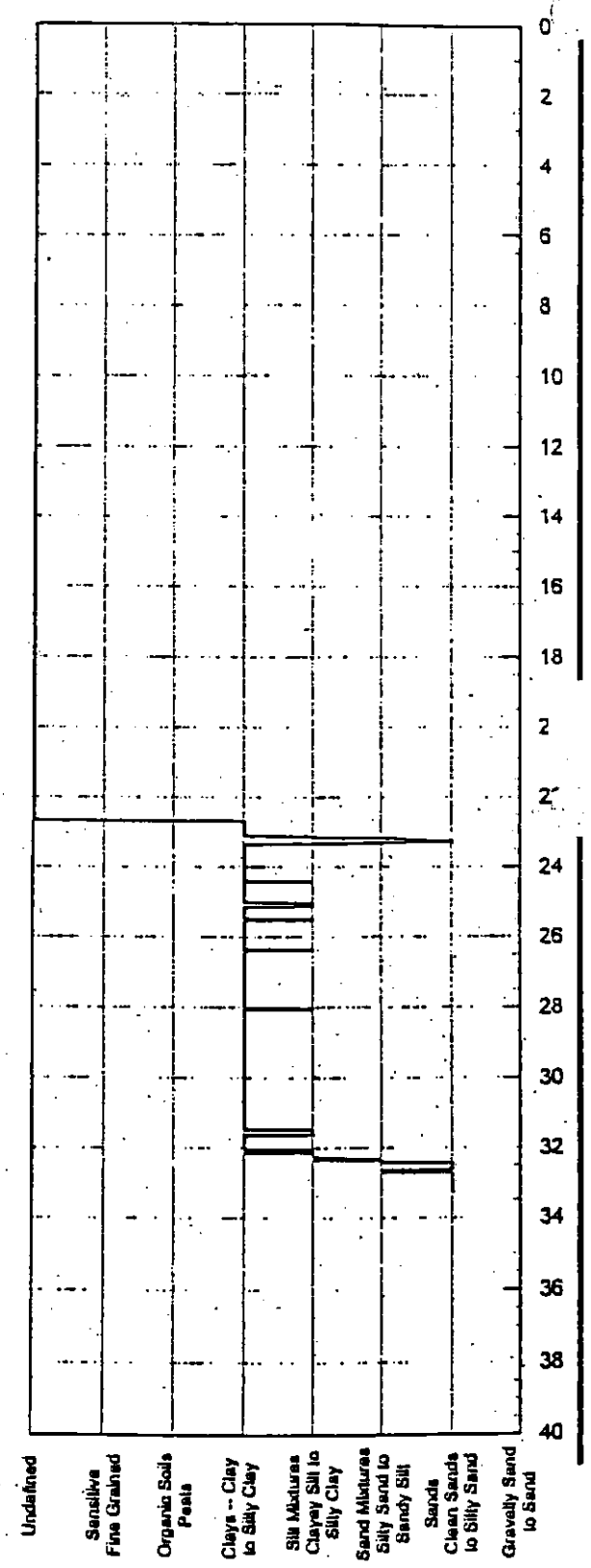
IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 12-01-98

SOUNDING
CPT-1

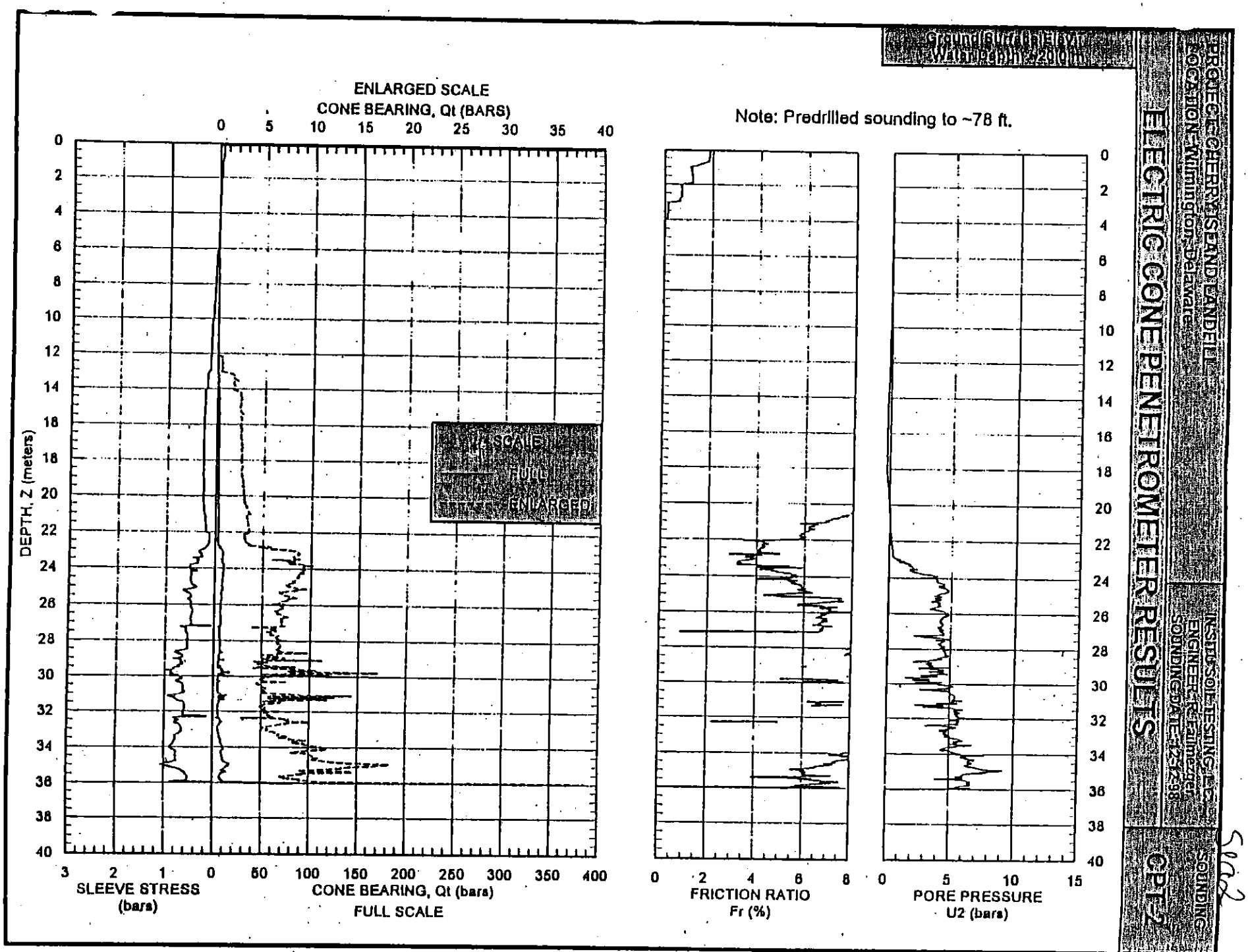
SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION



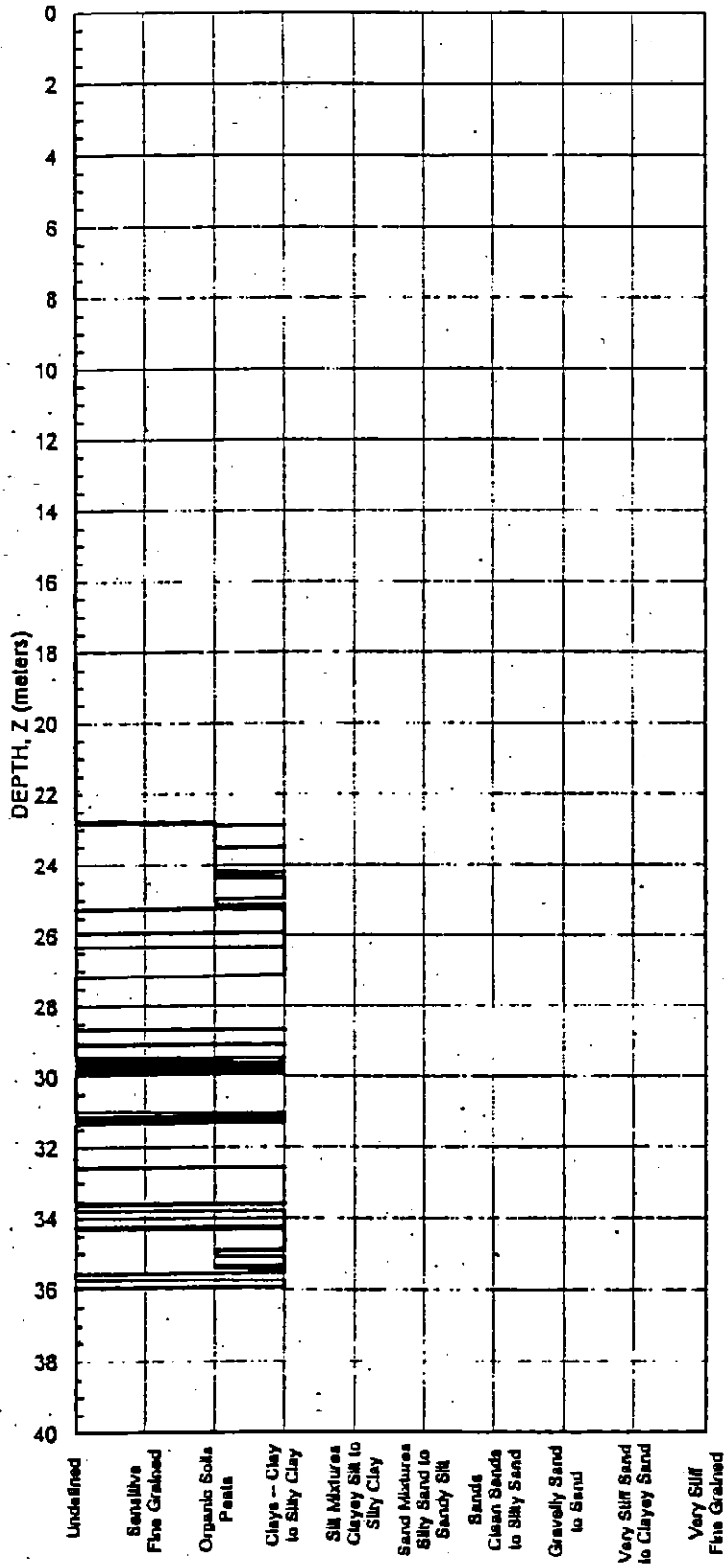
Ground Surface Elev.
Water Depth ~20.0 m
ENLARGED SCALE
CONE BEARING, Qt (BARS)
0 5 10 15 20 25 30 35 40
Note: Predrilled sounding to ~78 ft.
DEPTH, Z (meters)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SCALE
FULL
ENLARGED
3 2 1 0
SLEEVE STRESS (bars)
50 100 150 200 250 300 350 400
CONE BEARING, Qt (bars)
FULL SCALE
0 2 4 6 8
FRICTION RATIO
Fr (%)
0 5 10 15
PORE PRESSURE
U2 (bars)
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware
ELECTRIC CONE PENETROMETER RESULTS
IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 12-12-98
SOUNDING
CPT-2

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

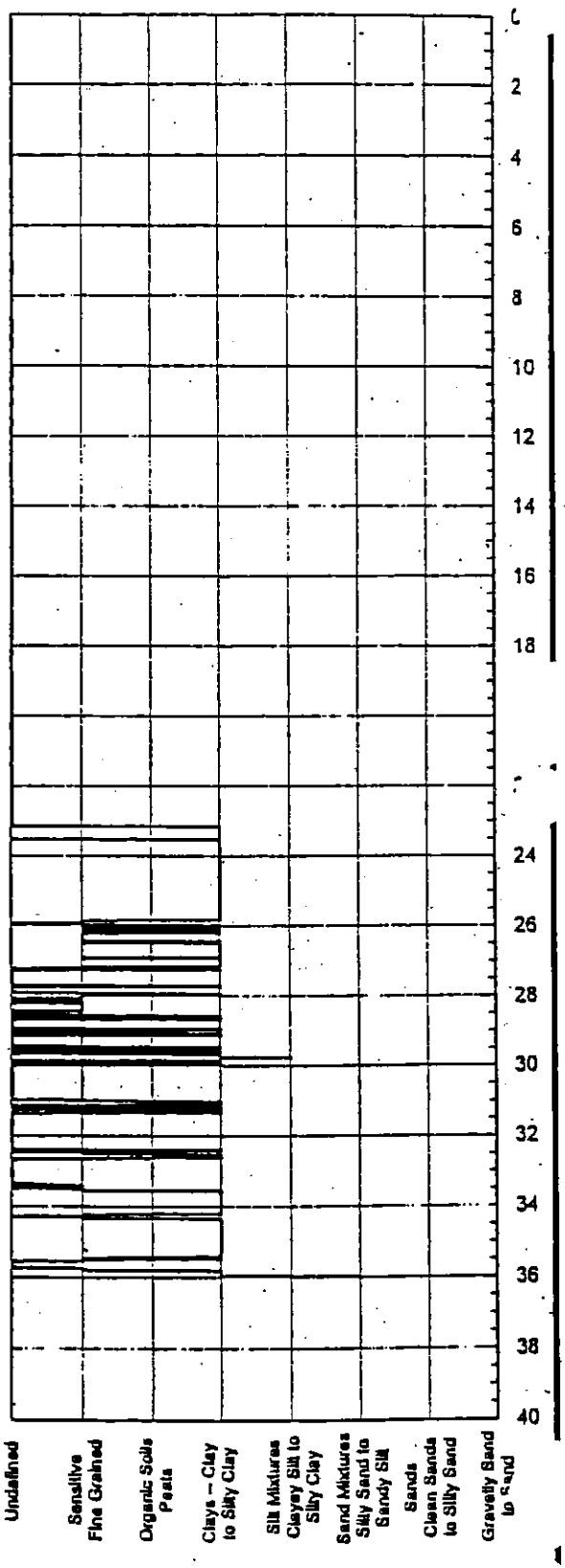
IN-SITU SOIL TESTING, INC.
ENGINEER: R. Tallmozzer
SOUNDING DATE: 12-12-98

SOUNDING: CPT-2

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



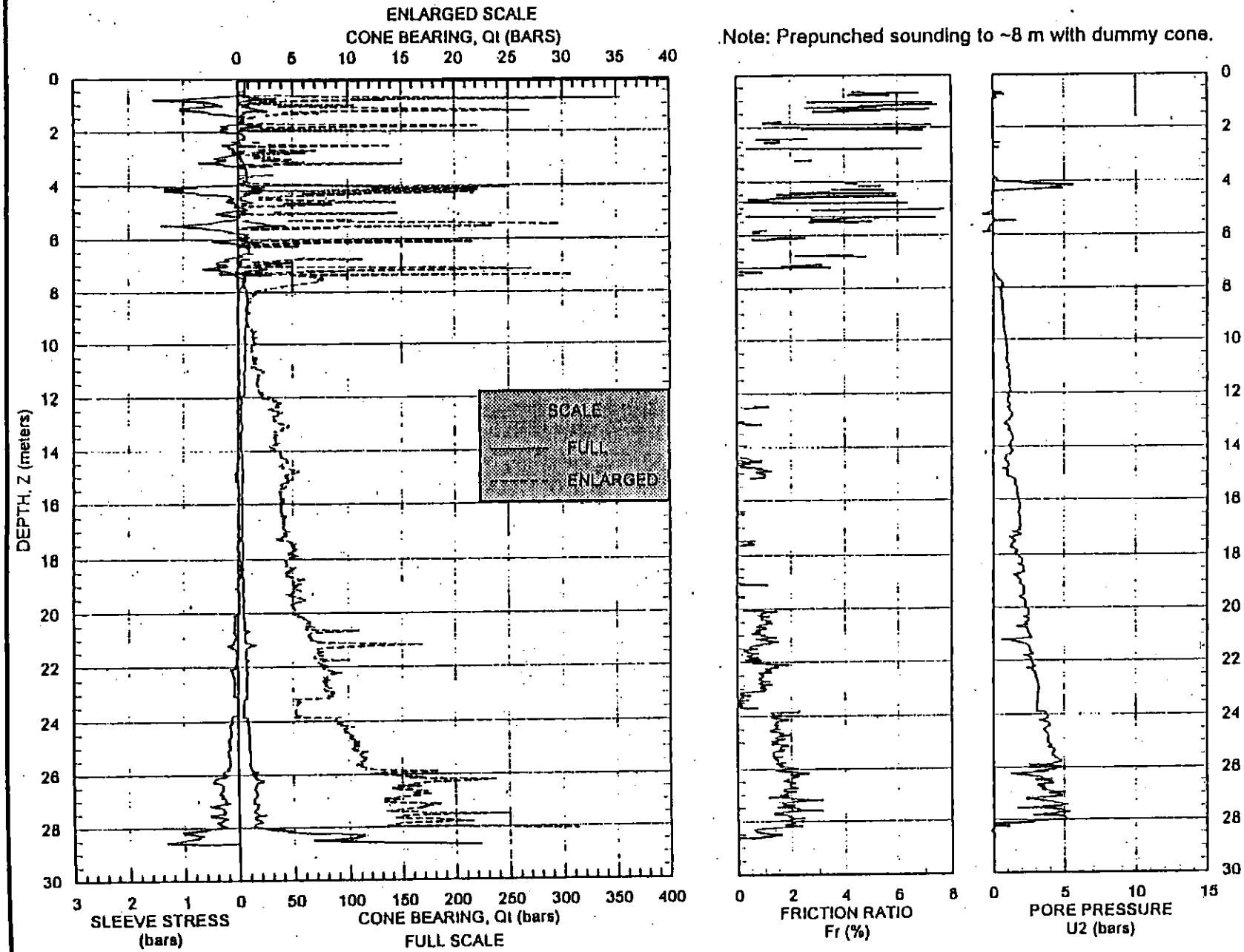
FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION

Ground Surface Elev.:
Water Depth: Caved at 2.39 m

Note: Prepunched sounding to ~8 m with dummy cone.



PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

ELECTRIC CONE PENETROMETER RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallnezger
SOUNDING DATE: 11-24-98

SOUNDING
CPT-3

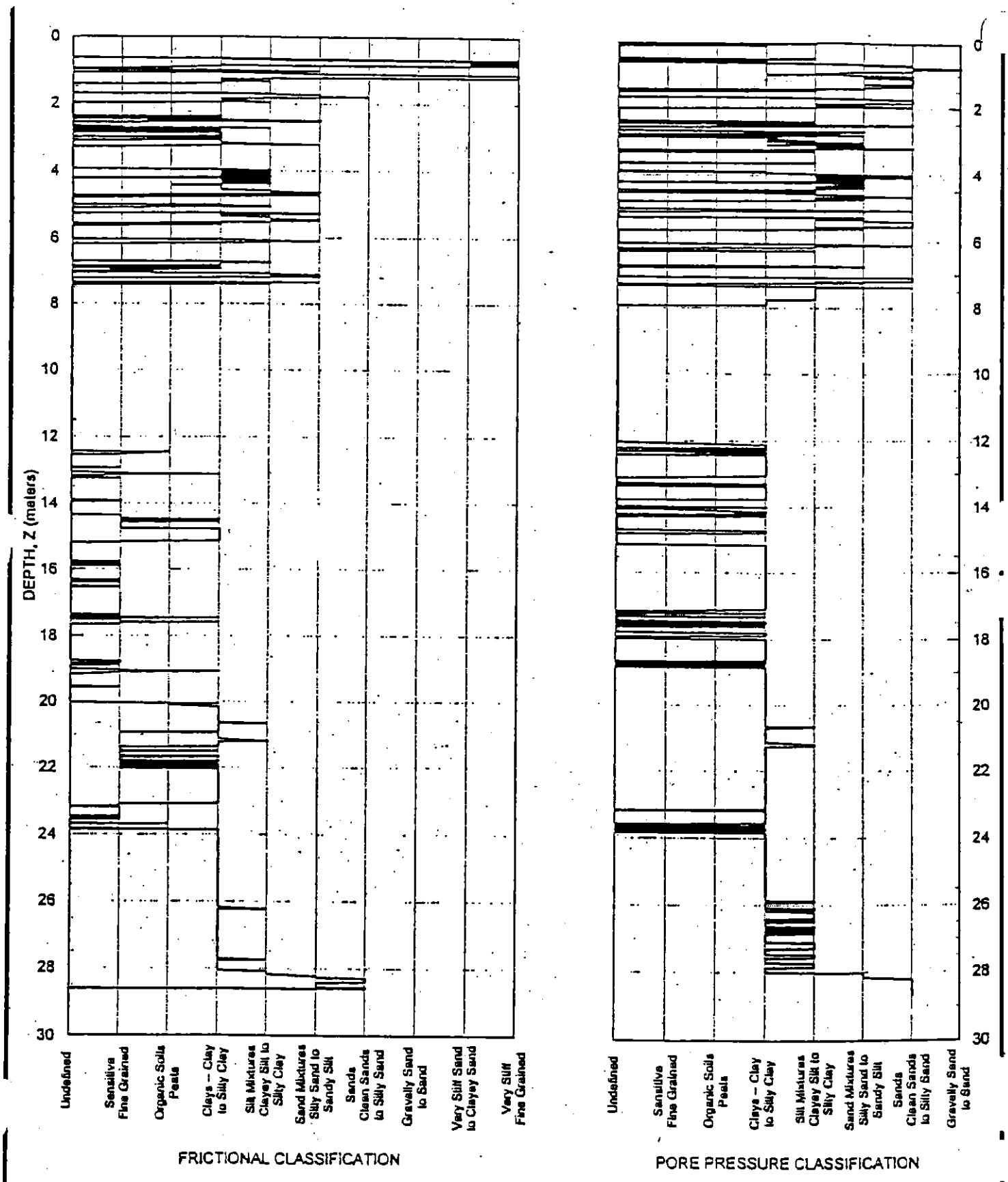
Sig 3

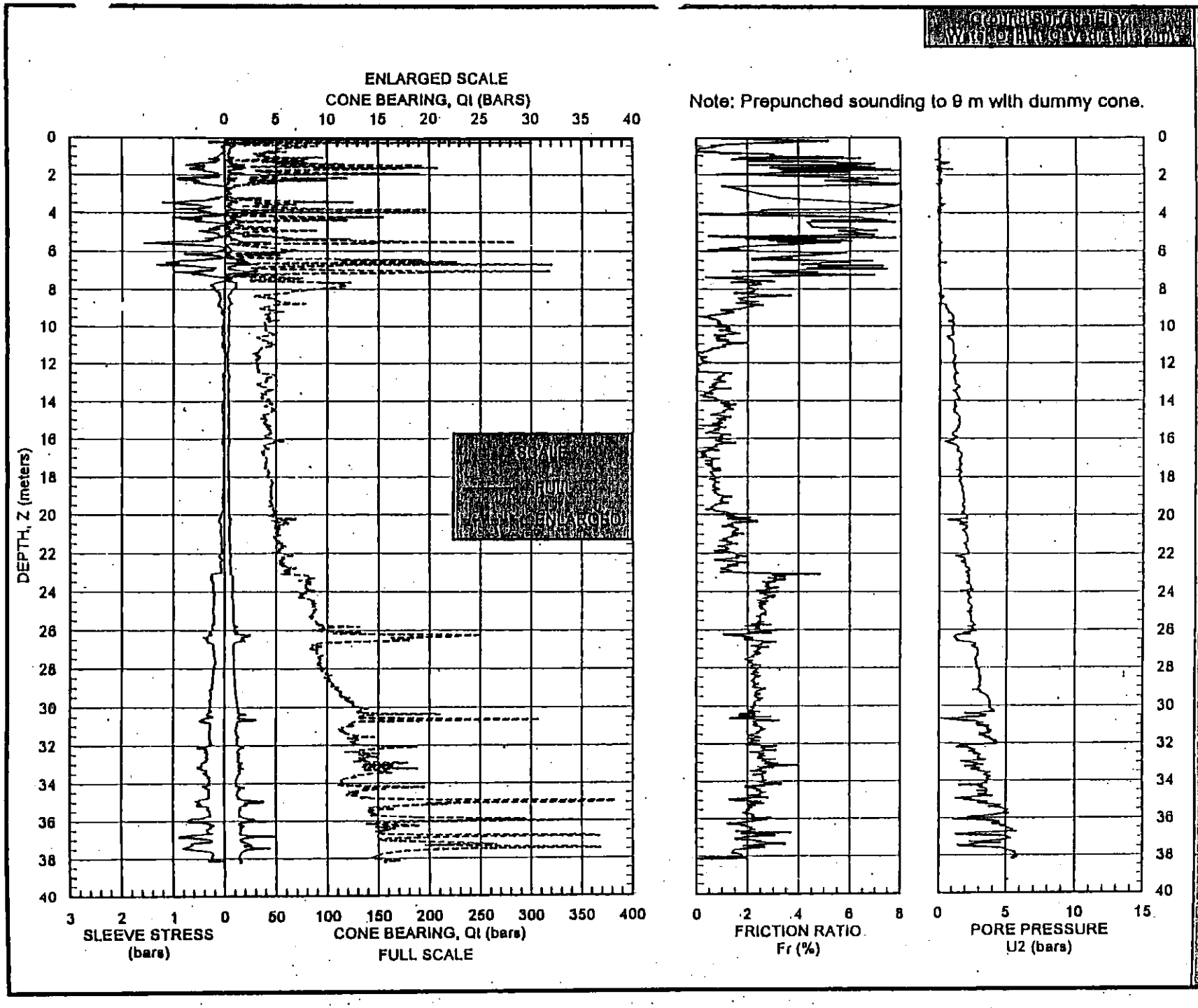
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Faitnezger
SOUNDING DATE: 11-24-98

SOUNDING
CPT-3

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)





Ground Surface Elev.
Water Depth Q Vessel 1.2 m

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

INSTITUTE OF SOIL TESTING, INC.
ENGINEER: R. Chaimezger
SOUNDING DATE: 11-23-98

ELECTRIC CONE PENETROMETER RESULTS

SOUNDING
CPT-4

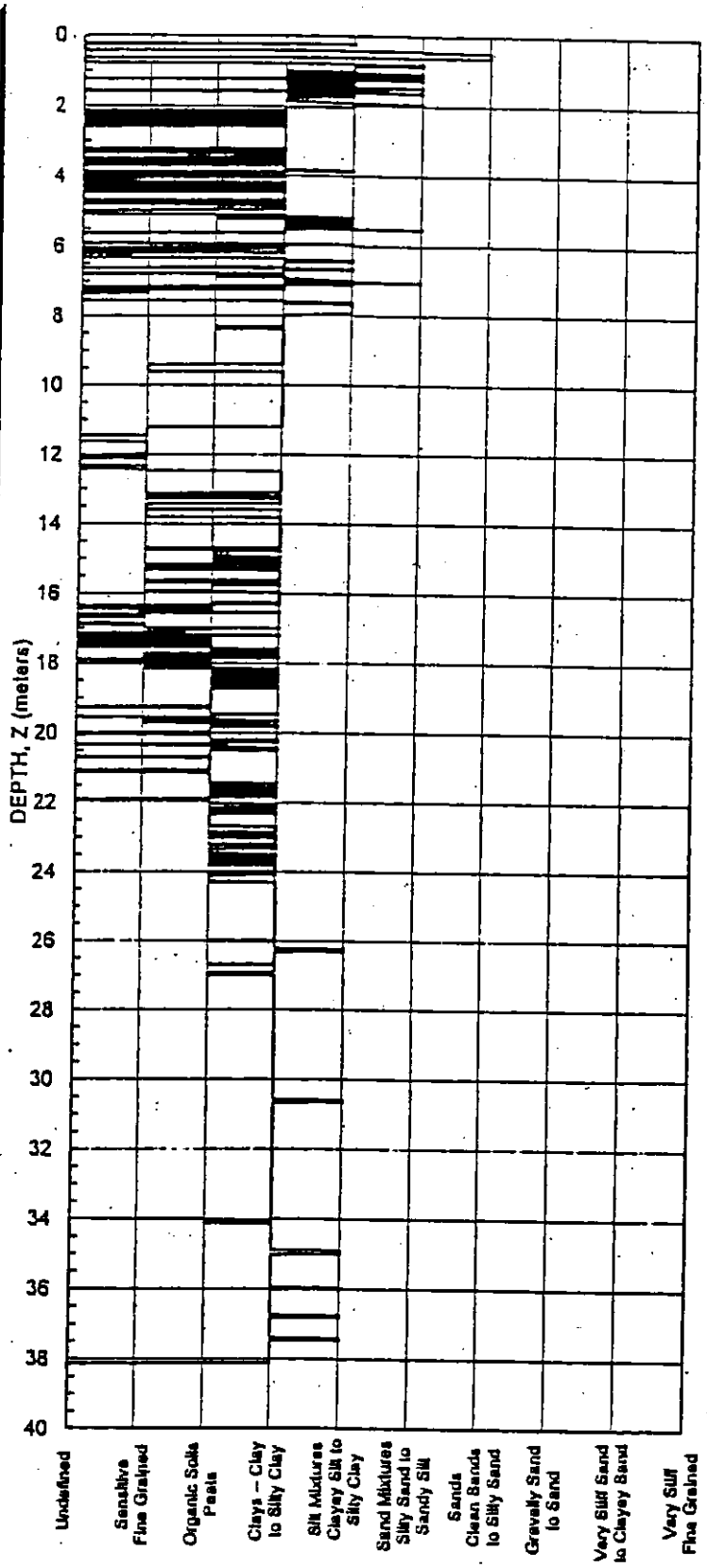
Sea 4

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

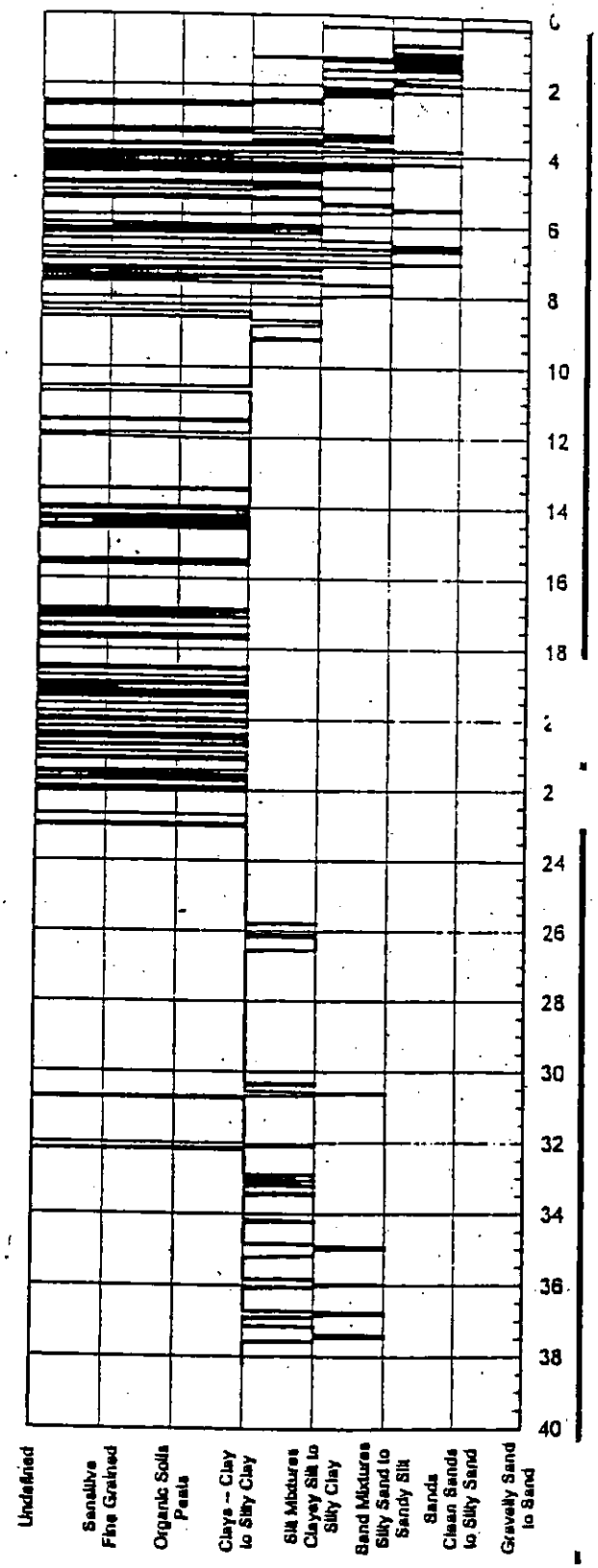
IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-23-98

SOUNDING
CPT-4

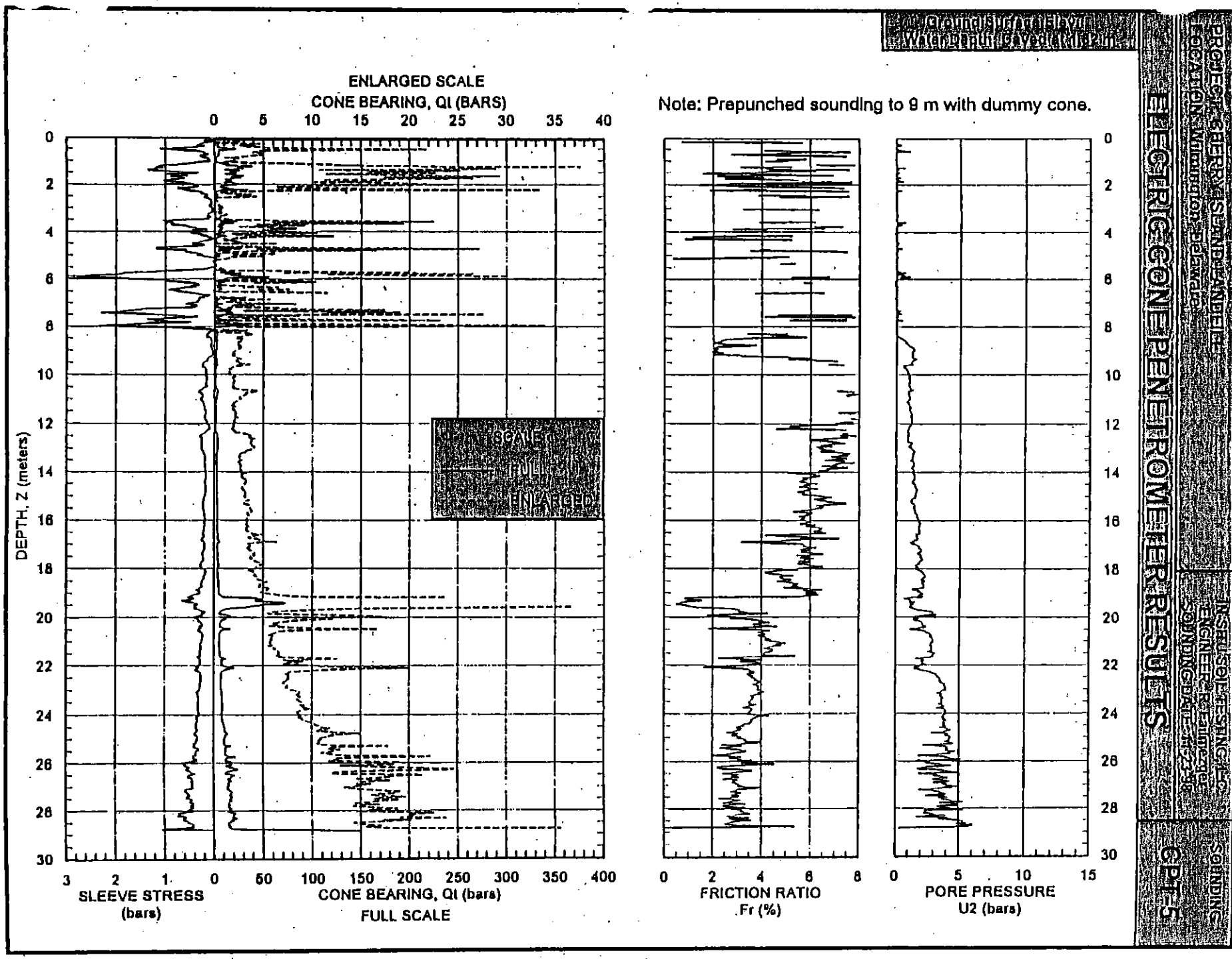
SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION



Ground Surface Elev.
Water Depth: Caved at 1.82 m
ENLARGED SCALE
CONE BEARING, Qt (BARS)
0 5 10 15 20 25 30 35 40
Note: Prepunched sounding to 9 m with dummy cone.
DEPTH, Z (meters)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
SCALE
FULL
ENLARGED
3 2 1 0
SLEEVE STRESS
(bars)
0 50 100 150 200 250 300 350 400
CONE BEARING, Qt (bars)
FULL SCALE
0 2 4 6 8
FRICTION RATIO
Fr (%)
0 5 10 15
PORE PRESSURE
U2 (bars)
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware
IN-SITU SOIL TESTING, LC
ENGINEER: R. Faulmezger
SOUNDING DATE: 11-23-98
ELECTRIC CONE PENETROMETER RESULTS
SOUNDING
CPT-5

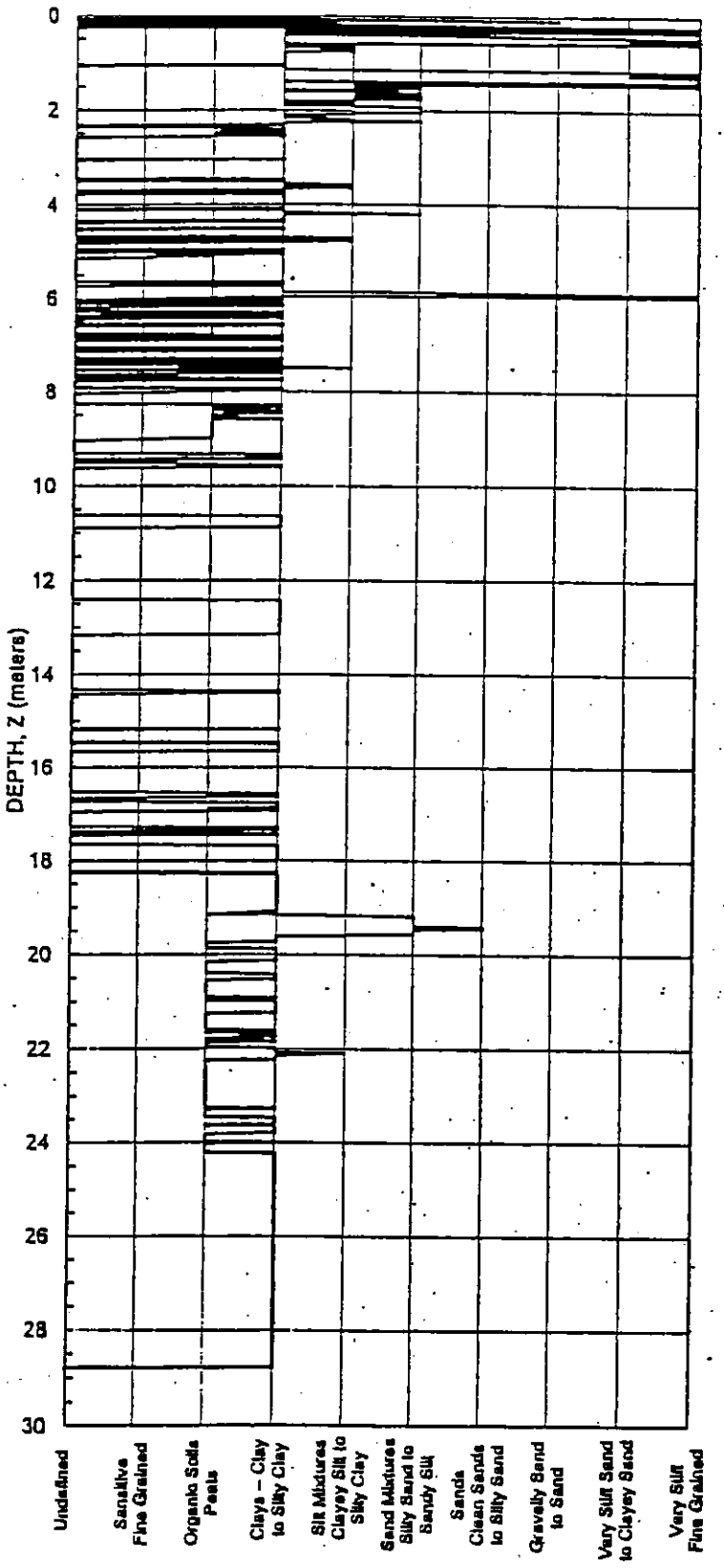
Sia 5

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

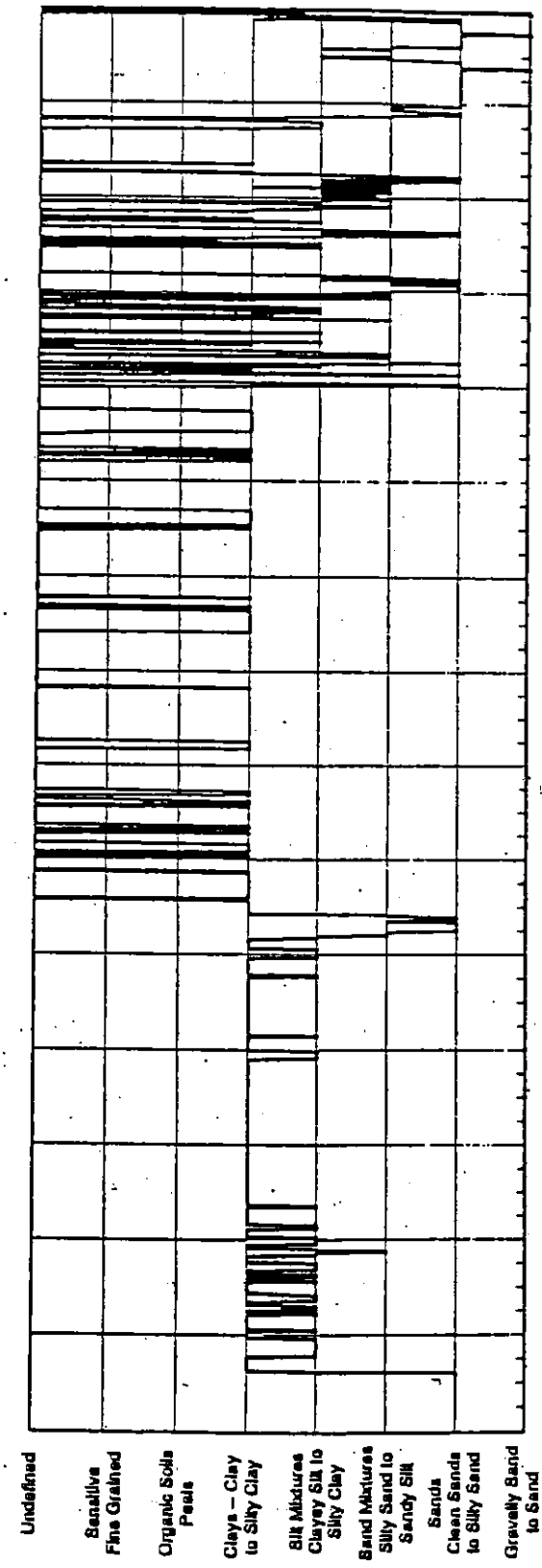
IN-SITU SOIL TESTING, INC.
ENGINEER: R. Fallmazger
SOUNDING DATE: 11-2-98

SOUNDING
CPT-5

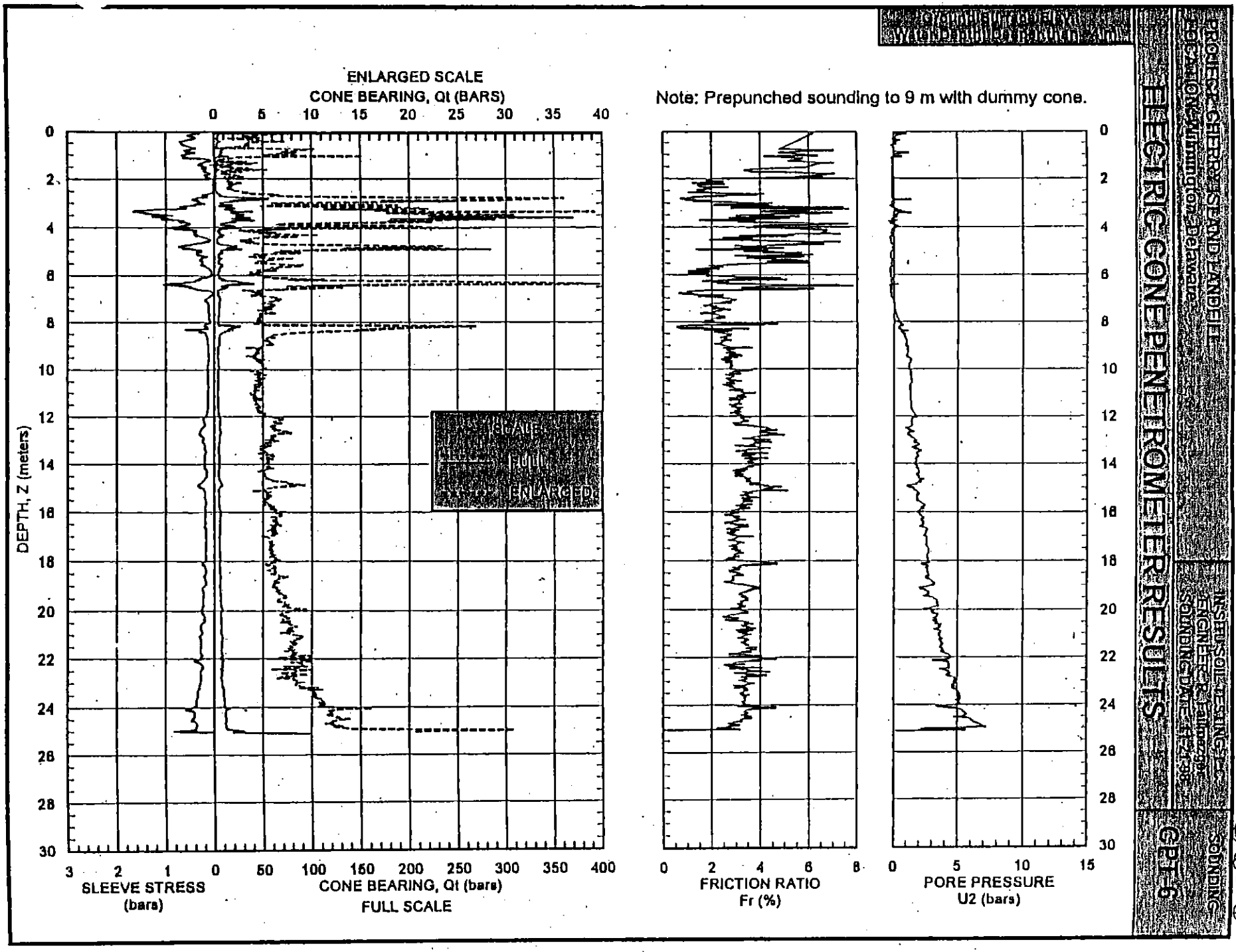
SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION



PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, INC.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-21-98

SOUNDING
GPT-6

ELECTRIC CONE PENETROMETER RESULTS

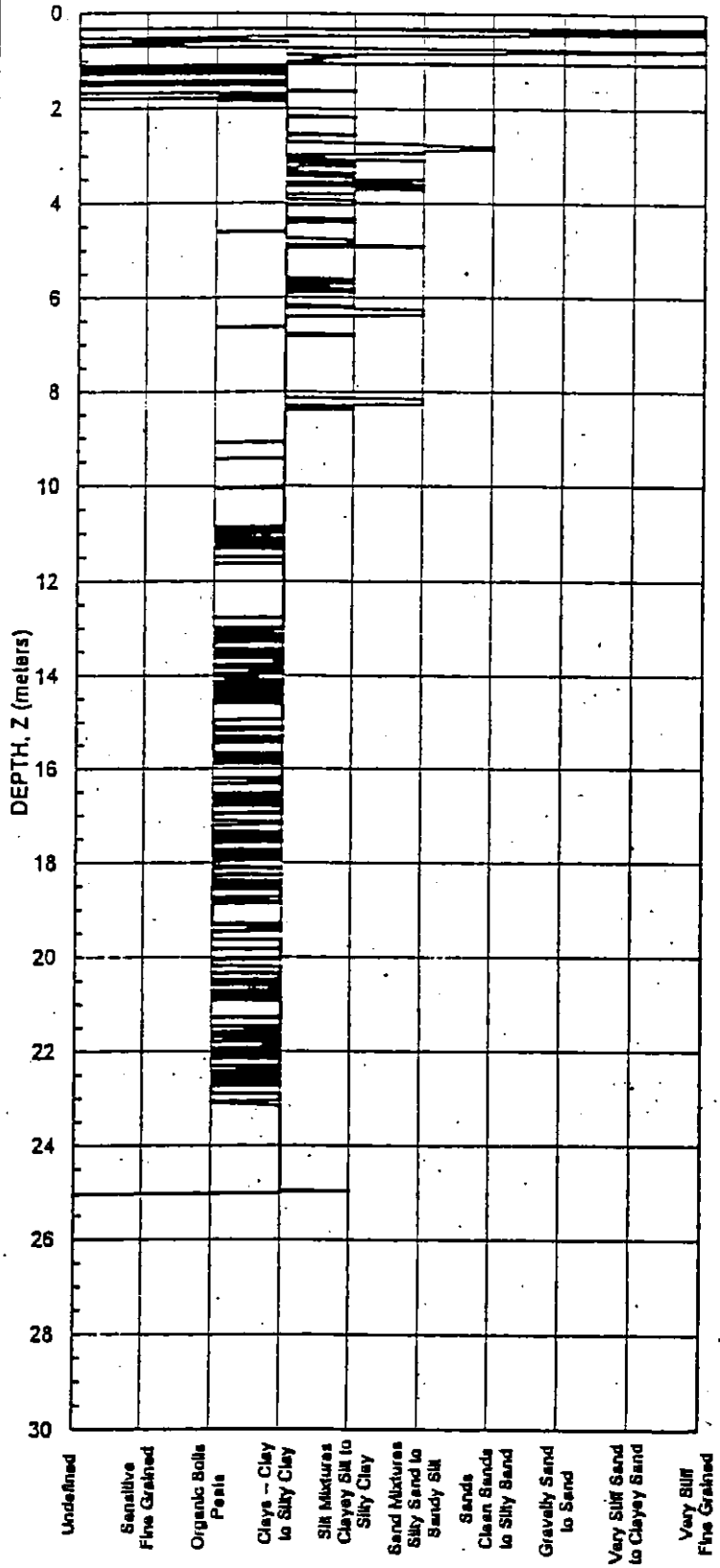
Sea 6

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

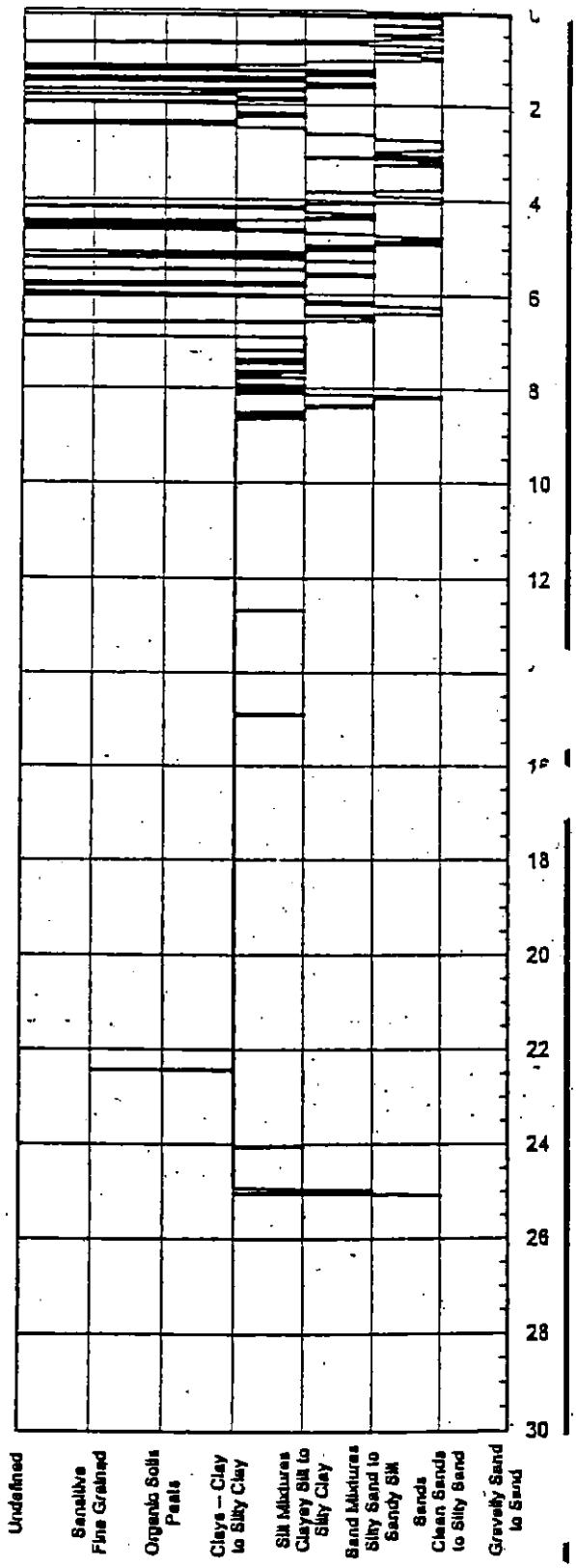
IN SITU SOIL TESTING, Inc.
ENGINEER: R. Fallmanger
SOUNDING DATE: 7/21/98

SOUNDING
CPT-6

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION

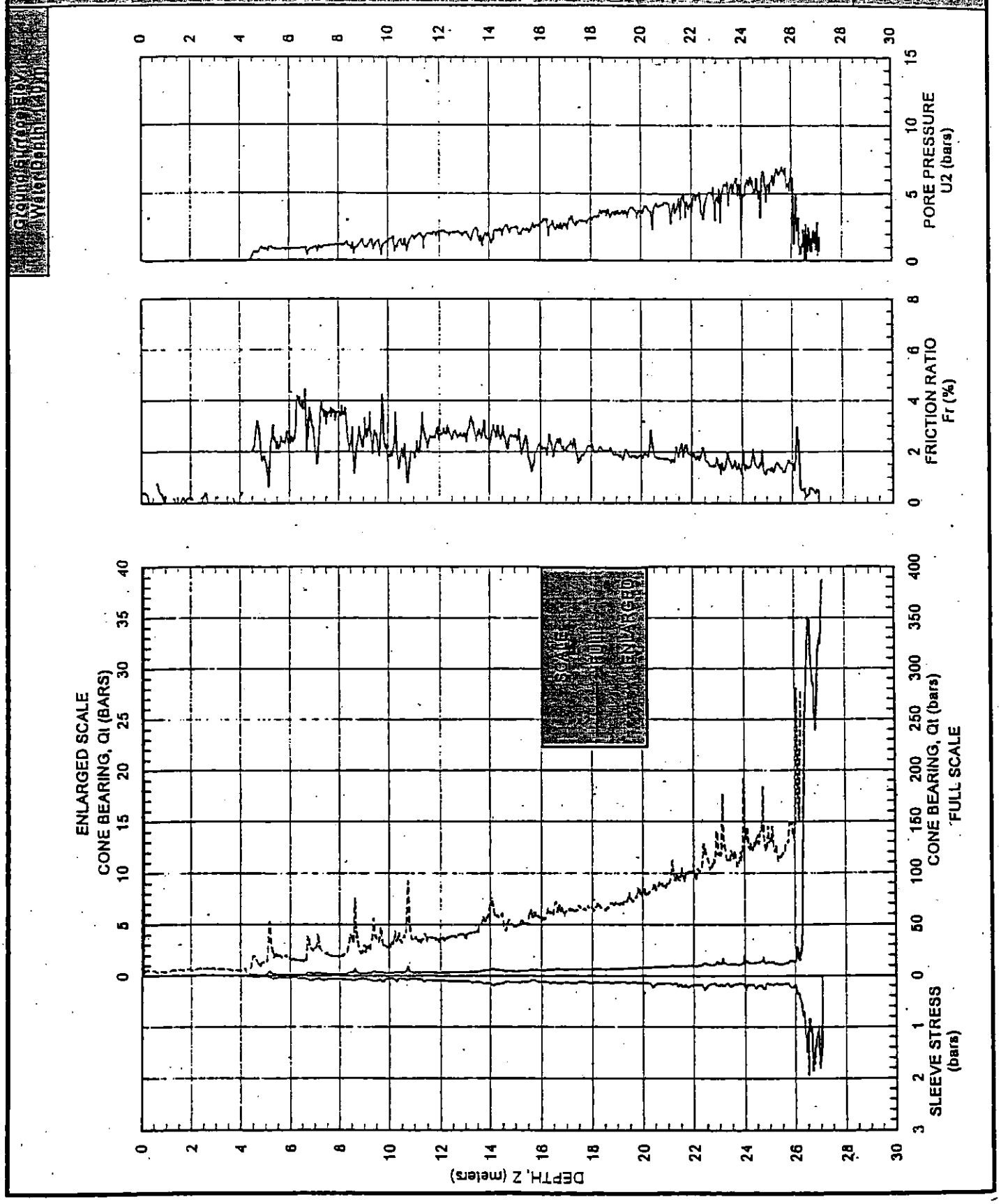
Sea 7

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 8-13-98

SOUNDING
CPT-7

ELECTRIC CONE PENETROMETER RESULTS

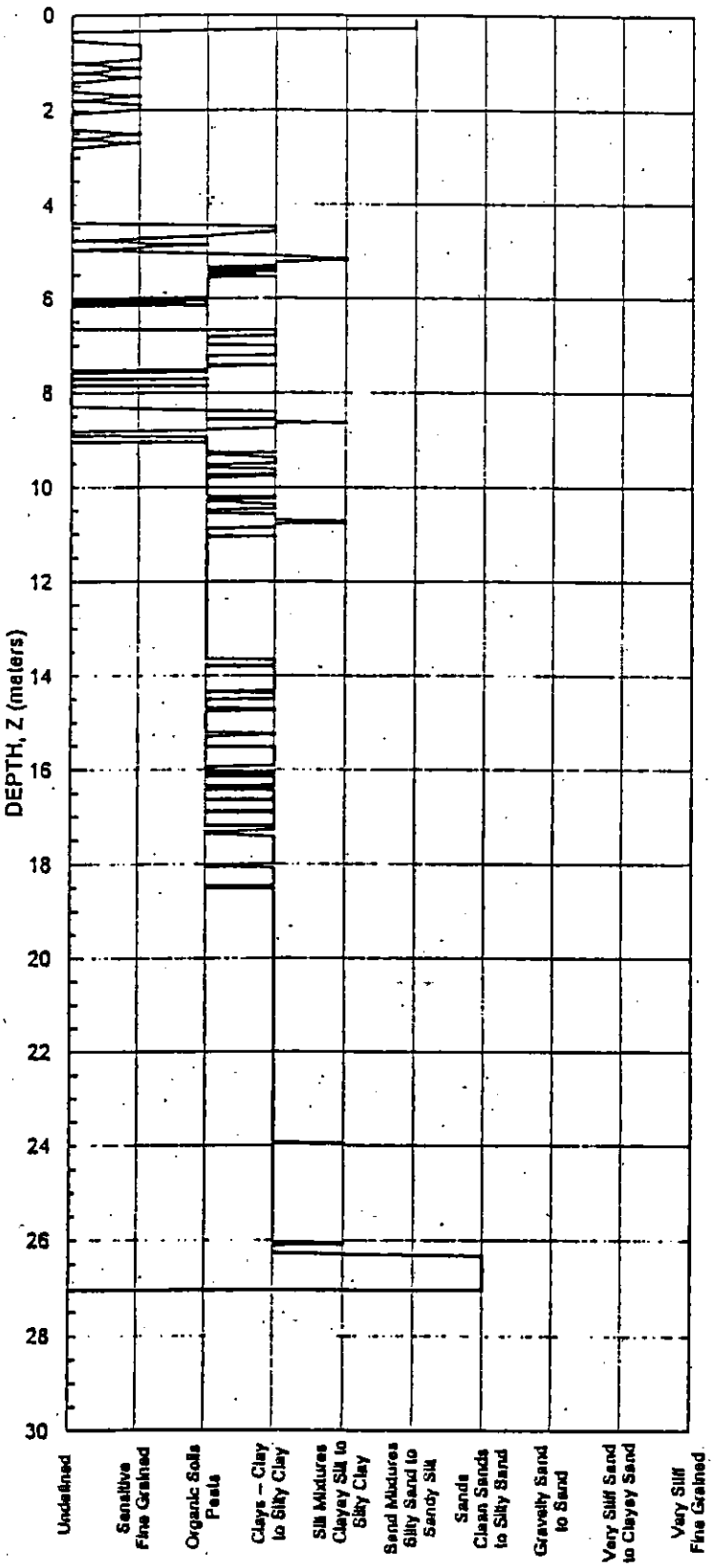


PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

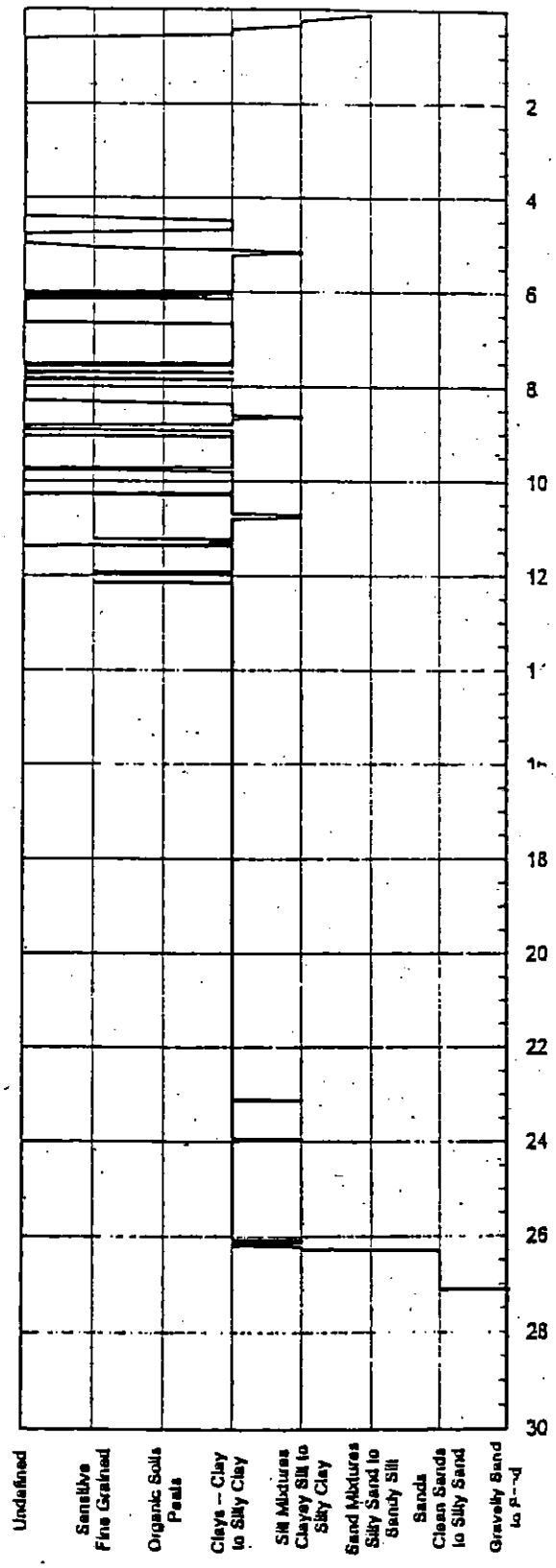
IN-SITU SOIL TESTING, Inc.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-13-98

SOUNDING
CPT 7

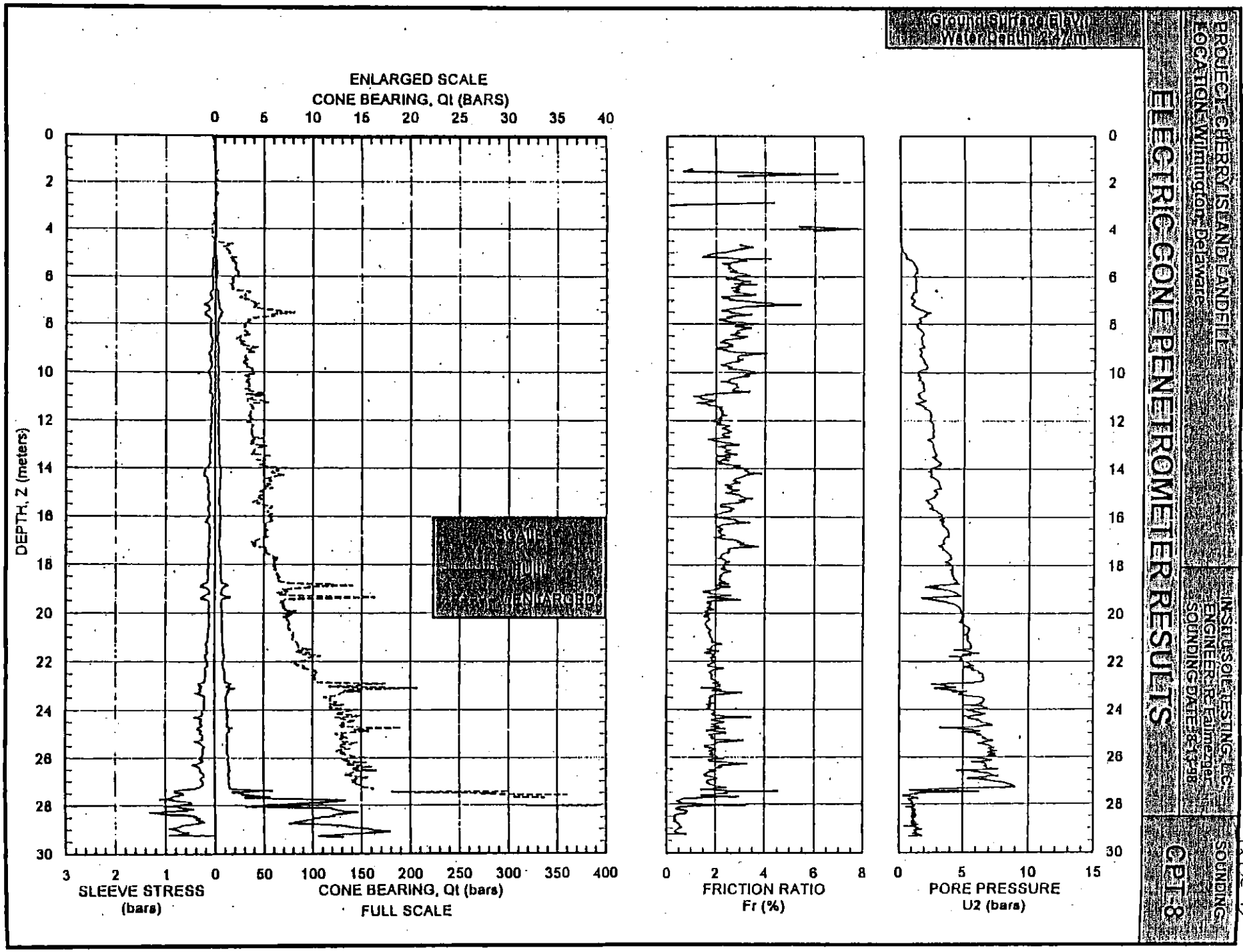
SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION



PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

ELECTRIC CONE PENETROMETER RESULTS

IN-SITU SOIL TESTING, LC
ENGINEER: R. Faimezger
SOUNDING DATE: 8-13-98

SOUNDING
CPT-8

Sea 8

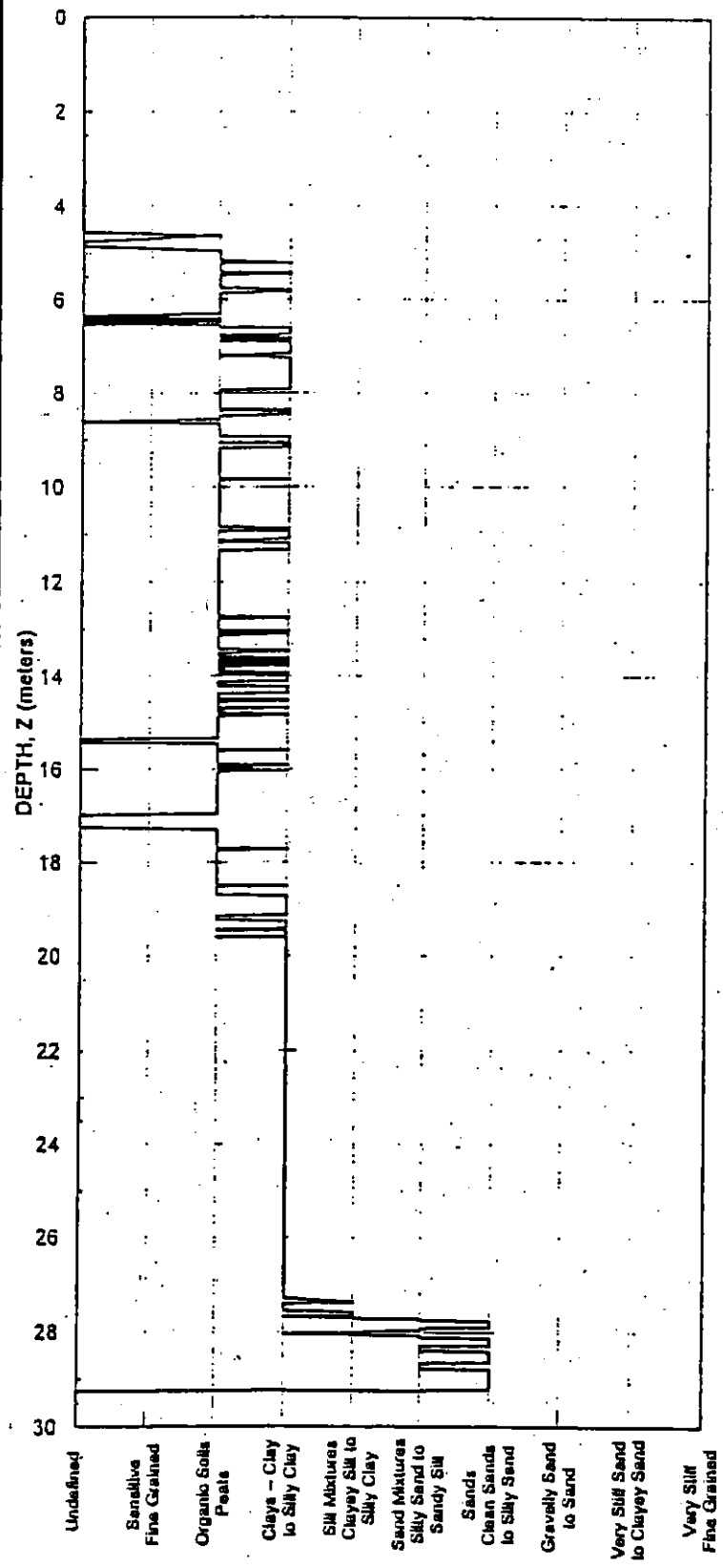
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 8-13-98

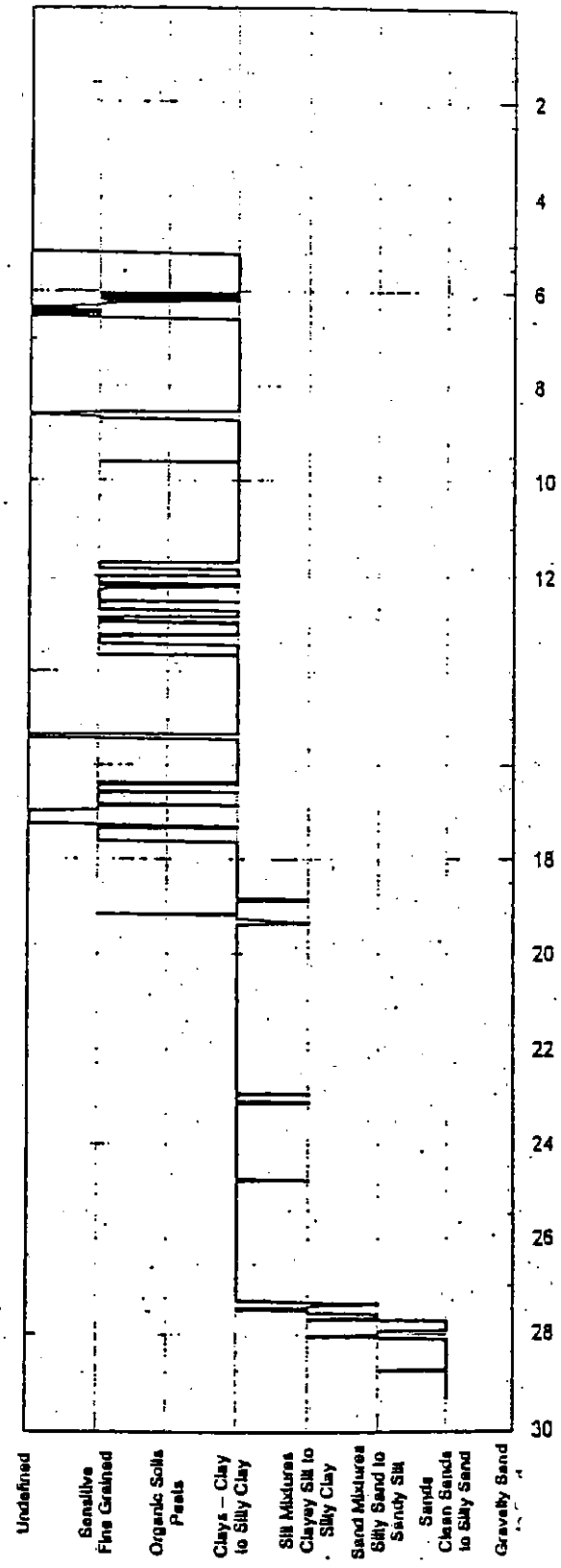
SOUNDING

CPT-8

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION

Sea 9

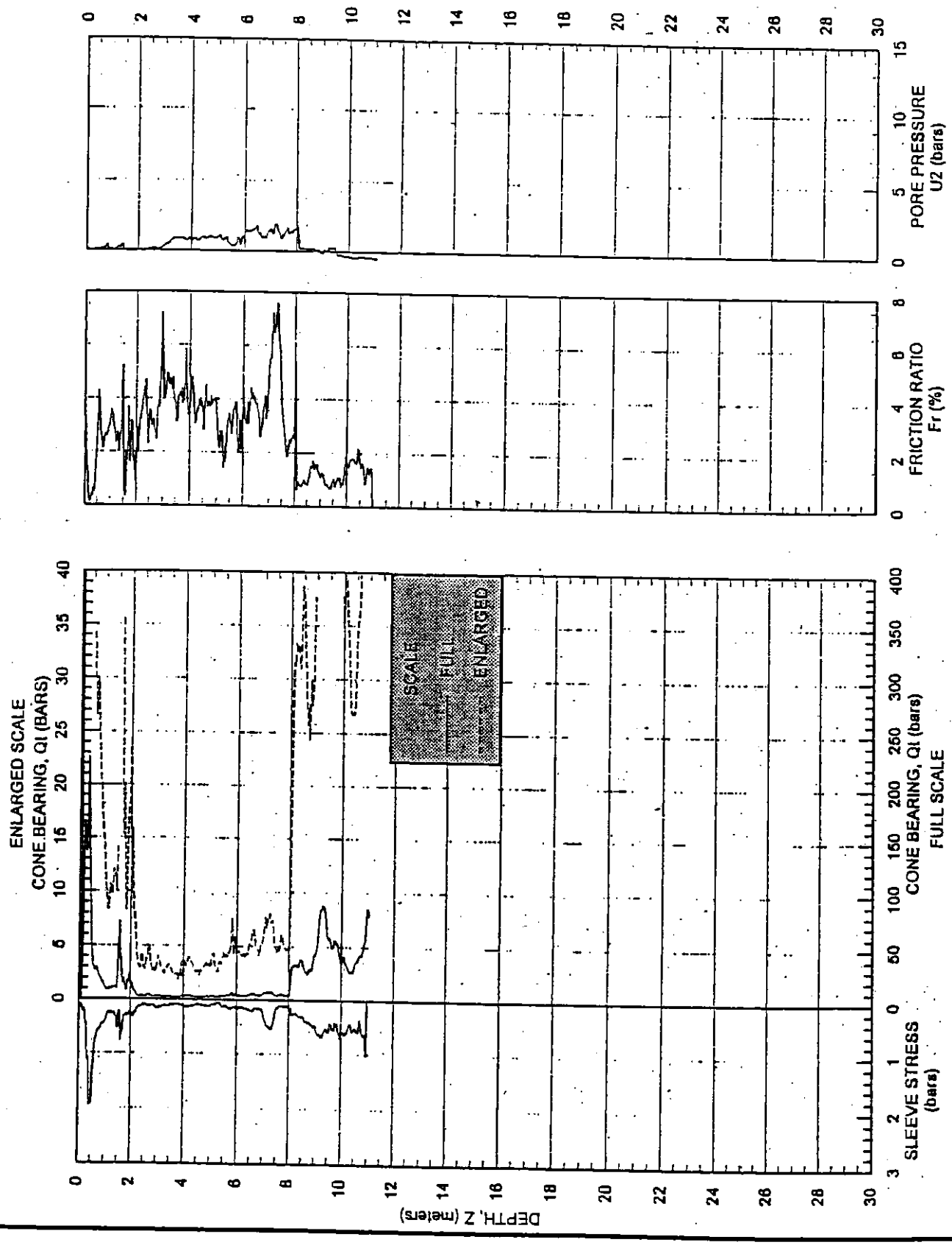
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 11-24-98

SOUNDING
CPT-9

ELECTRIC CONE PENETROMETER RESULTS

Ground Surface Elev.:
Water Depth: Caved at 4.01 m

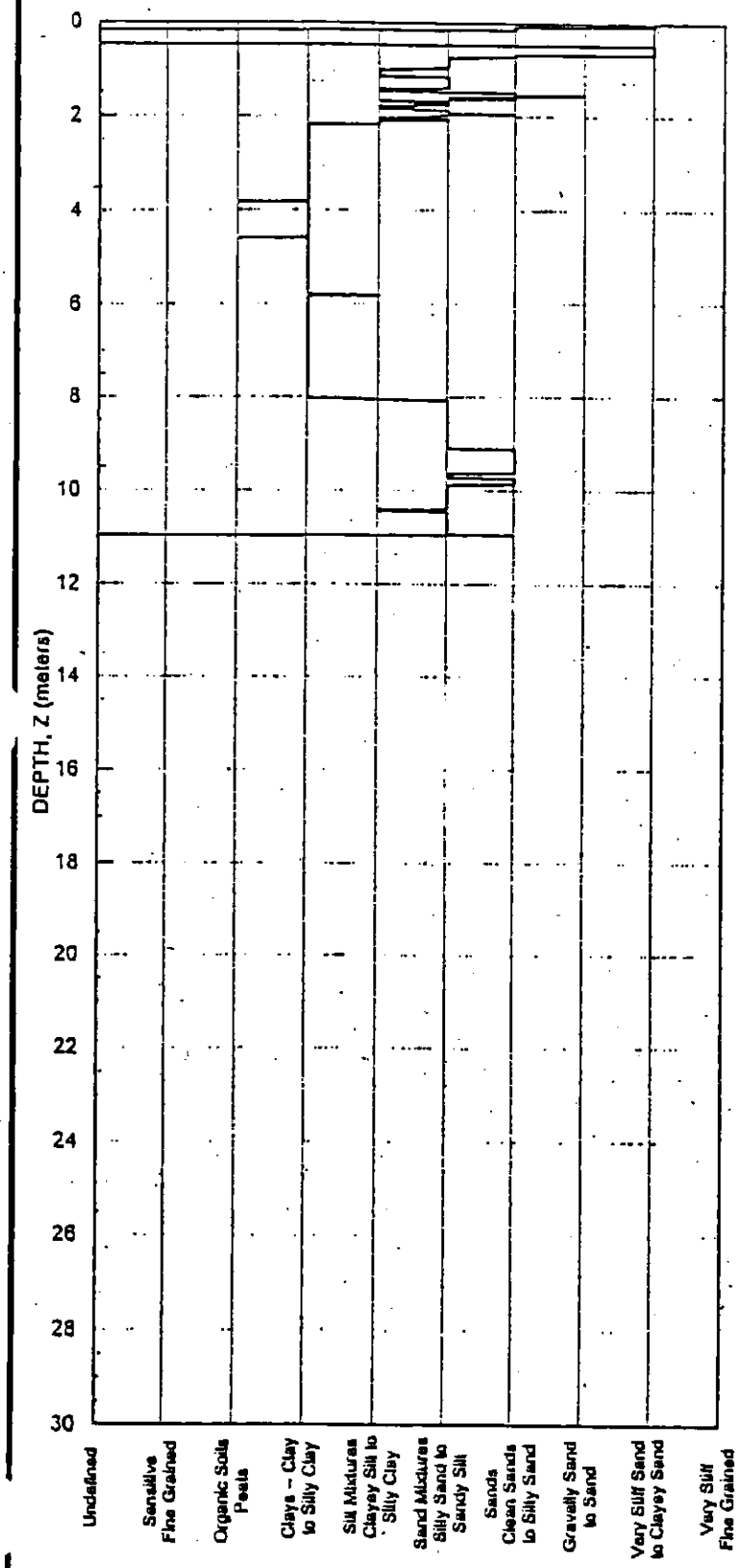


PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

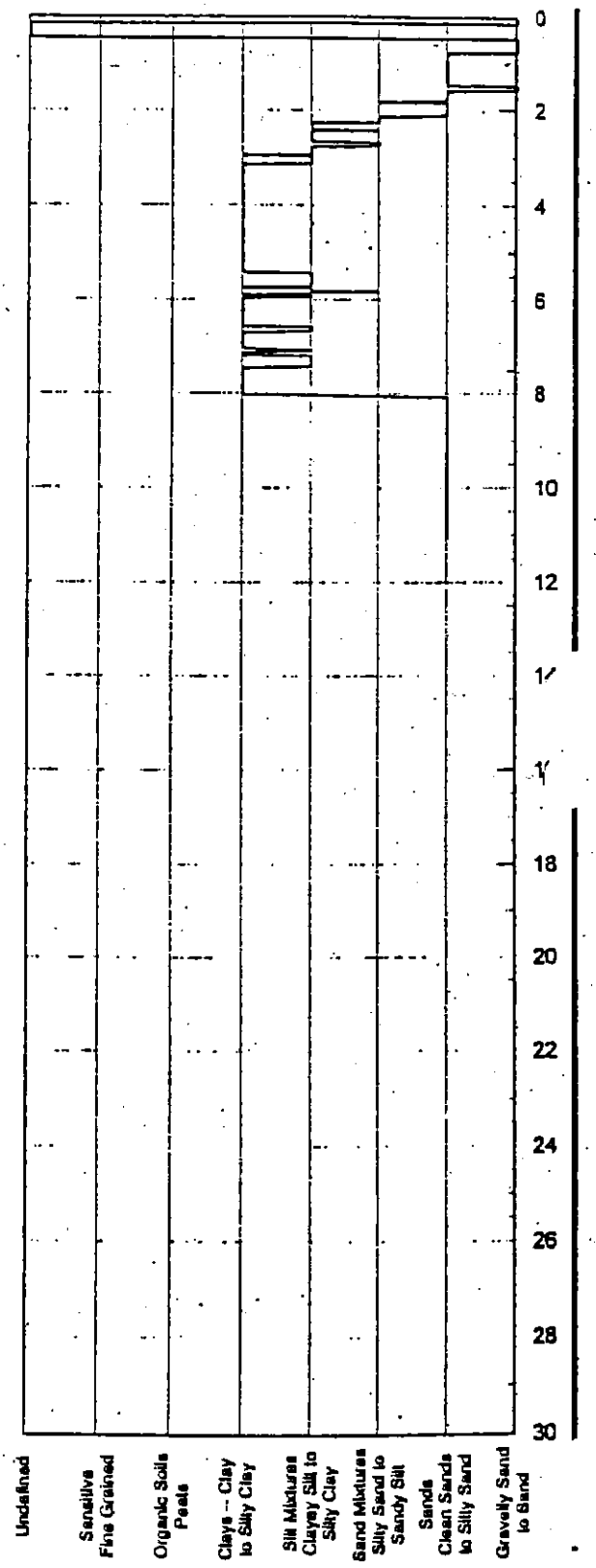
IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-24-98

SOUNDING
CPT-9

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)

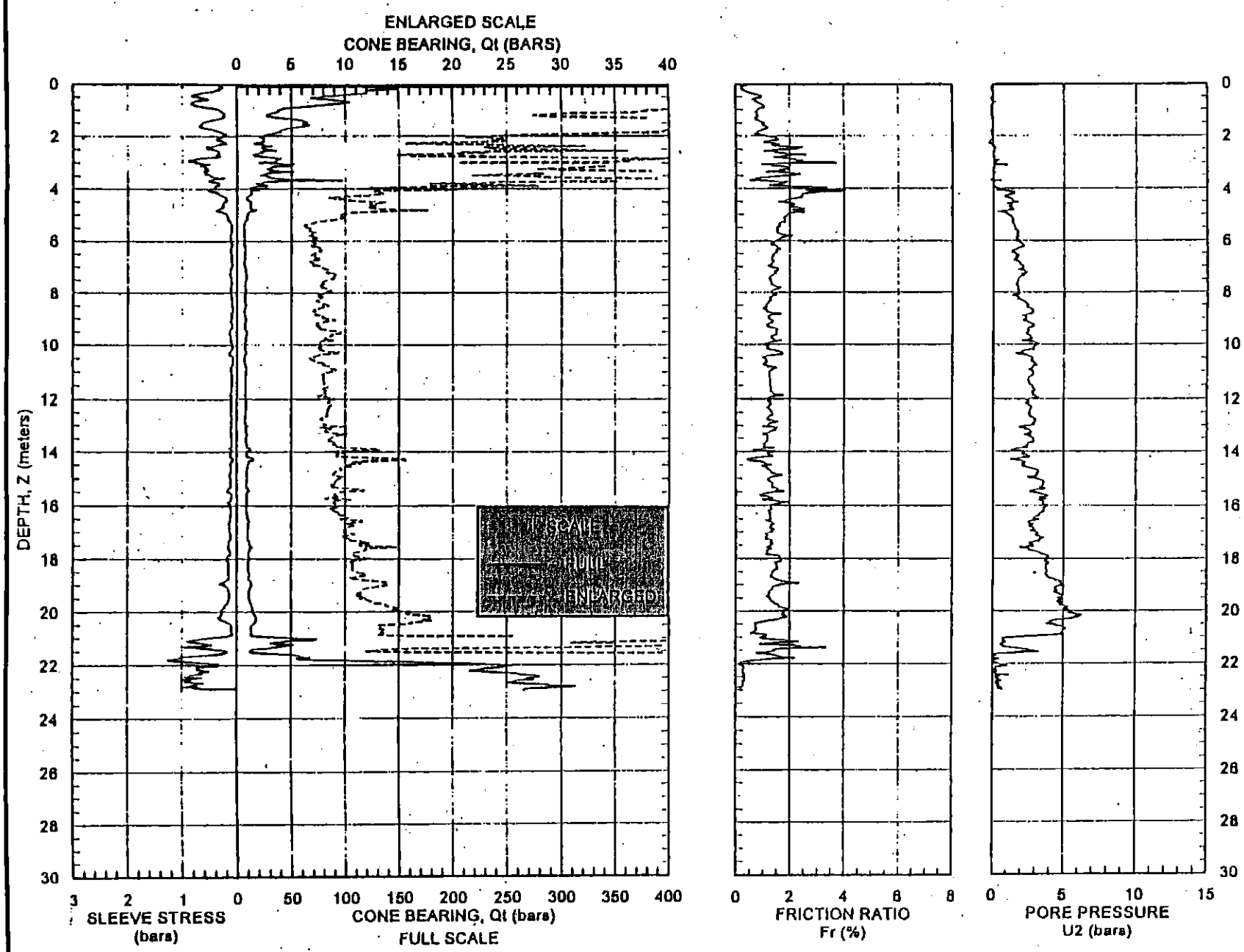


FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION

Ground Surface Elev.
Water Depth Daved 2.3m



PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

ELECTRIC CONE PENETROMETER RESULTS

IN-SITU SOIL TESTING, LLC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-21-98

SOUNDING
SCPT-10

Sea 10

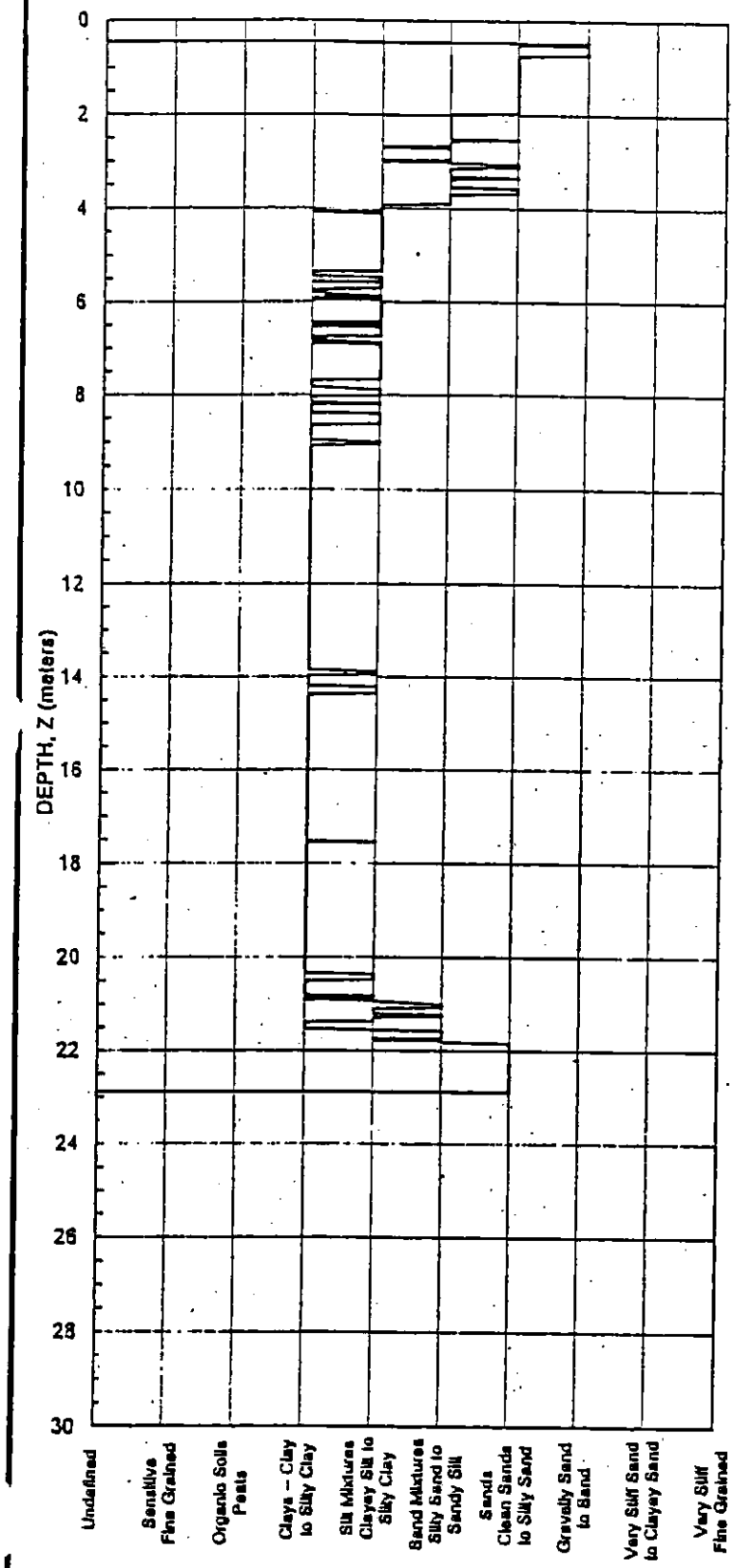
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN SITU SOIL TESTING, Inc.
ENGINEER: R. Fallmagger
SOUNDING DATE: 8-21-98

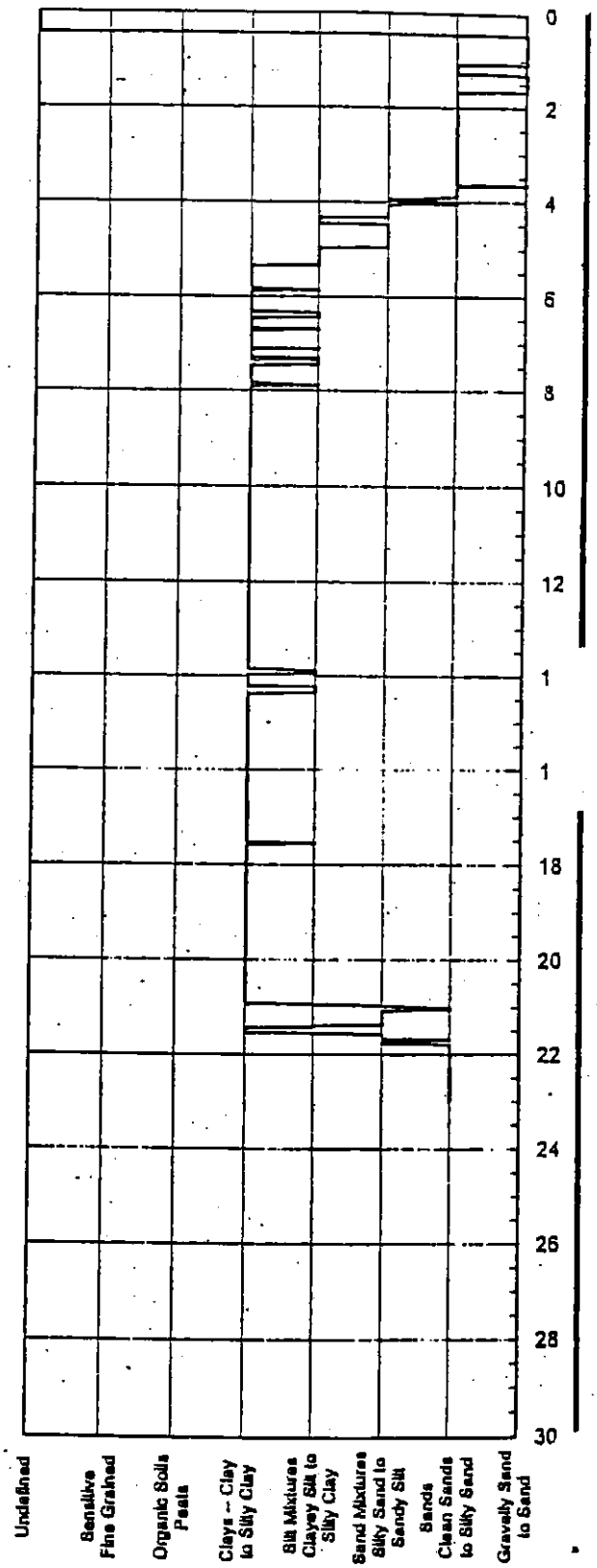
SOUNDING

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)

SCPT-1



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION

Sea 11

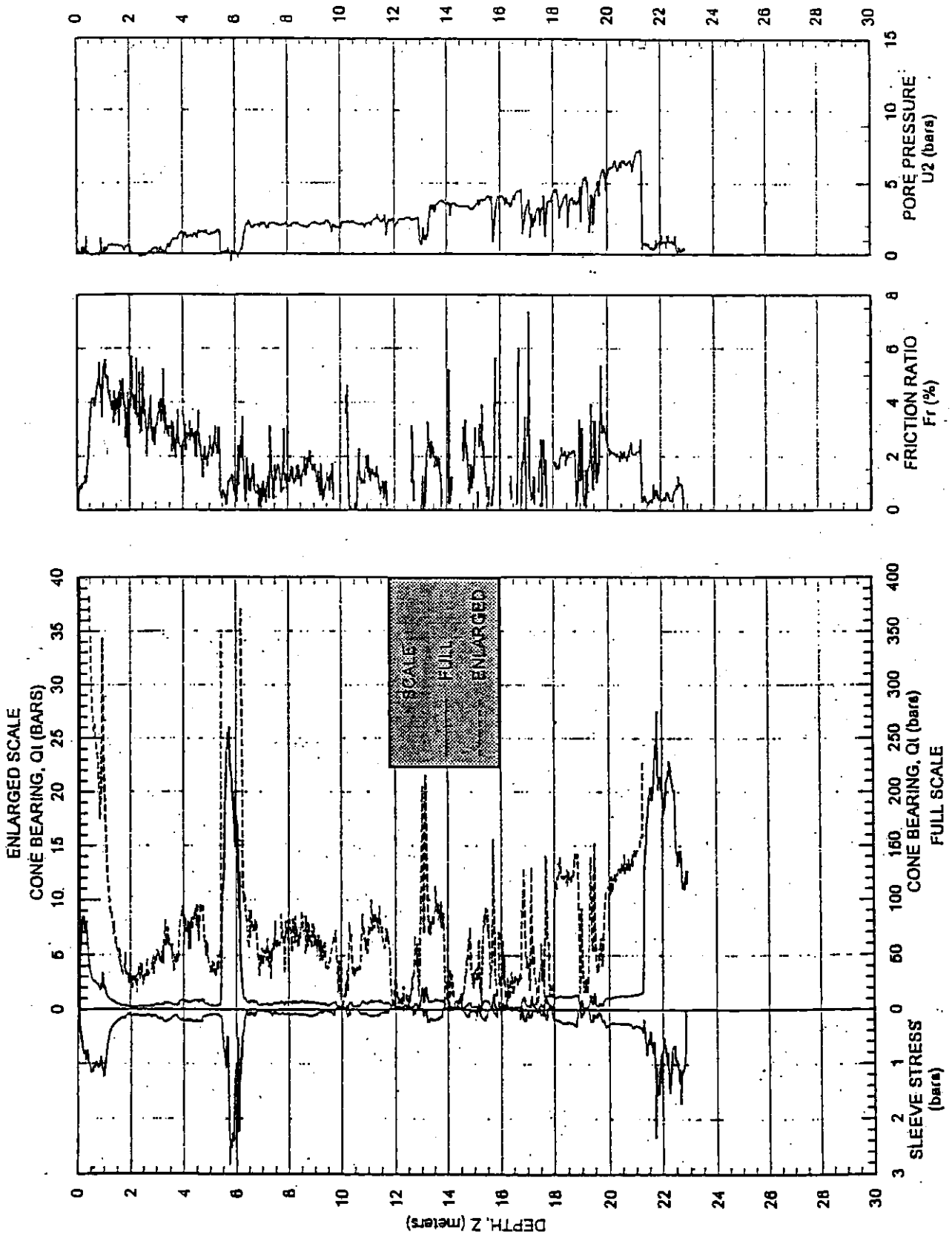
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-25-98

SOUNDING
CPT-11

ELECTRIC CONE PENETROMETER RESULTS

Ground Surface Elev.:
Water Depth: 3.96 m

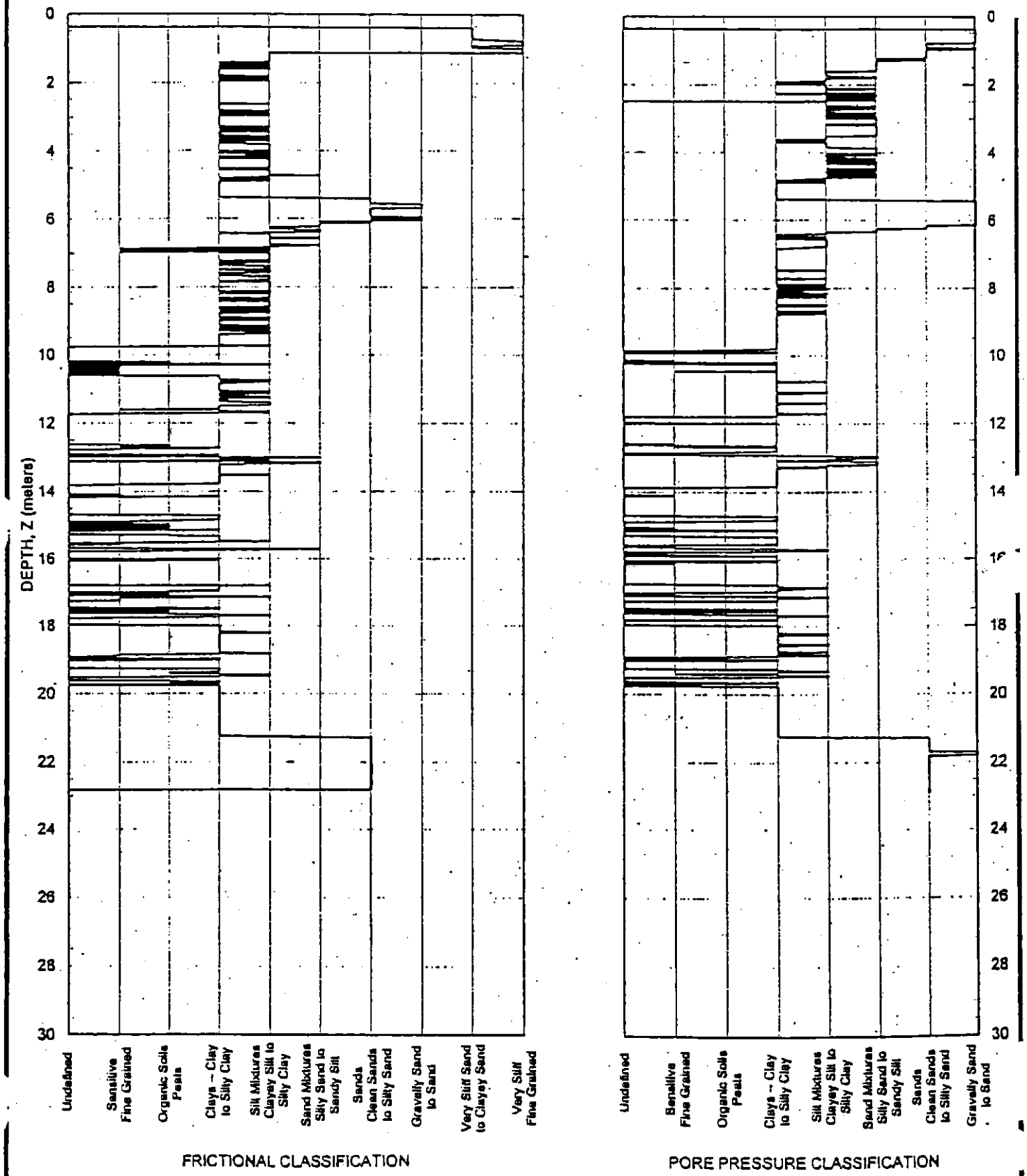


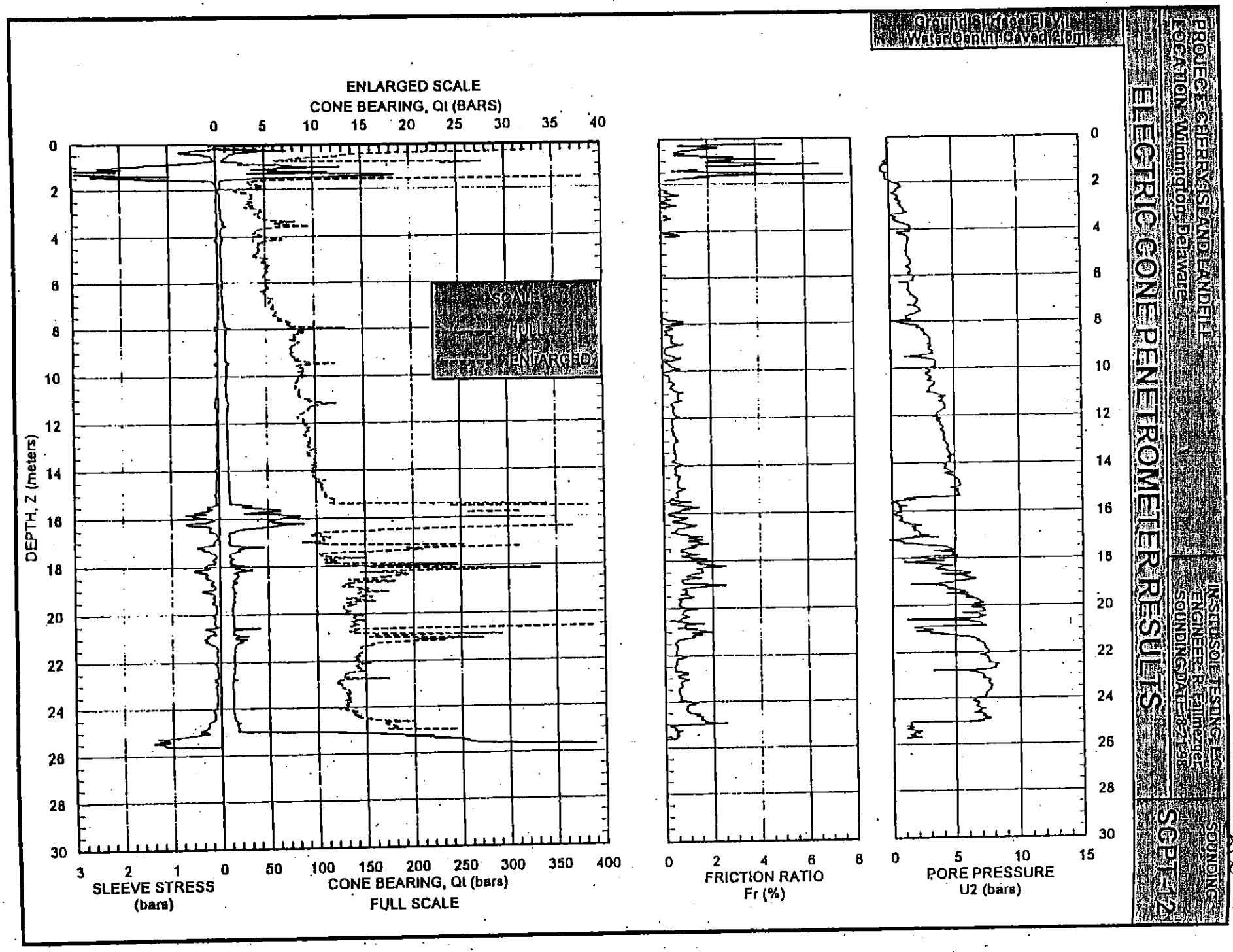
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Faltnezger
SOUNDING DATE: 11-25-98

SOUNDING
CPT-11

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)





Ground Surface Elev.
Water Depth Caved 2.5m

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

ELECTRIC CONE PENETROMETER RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-21-98

SOUNDING
SCPT-12

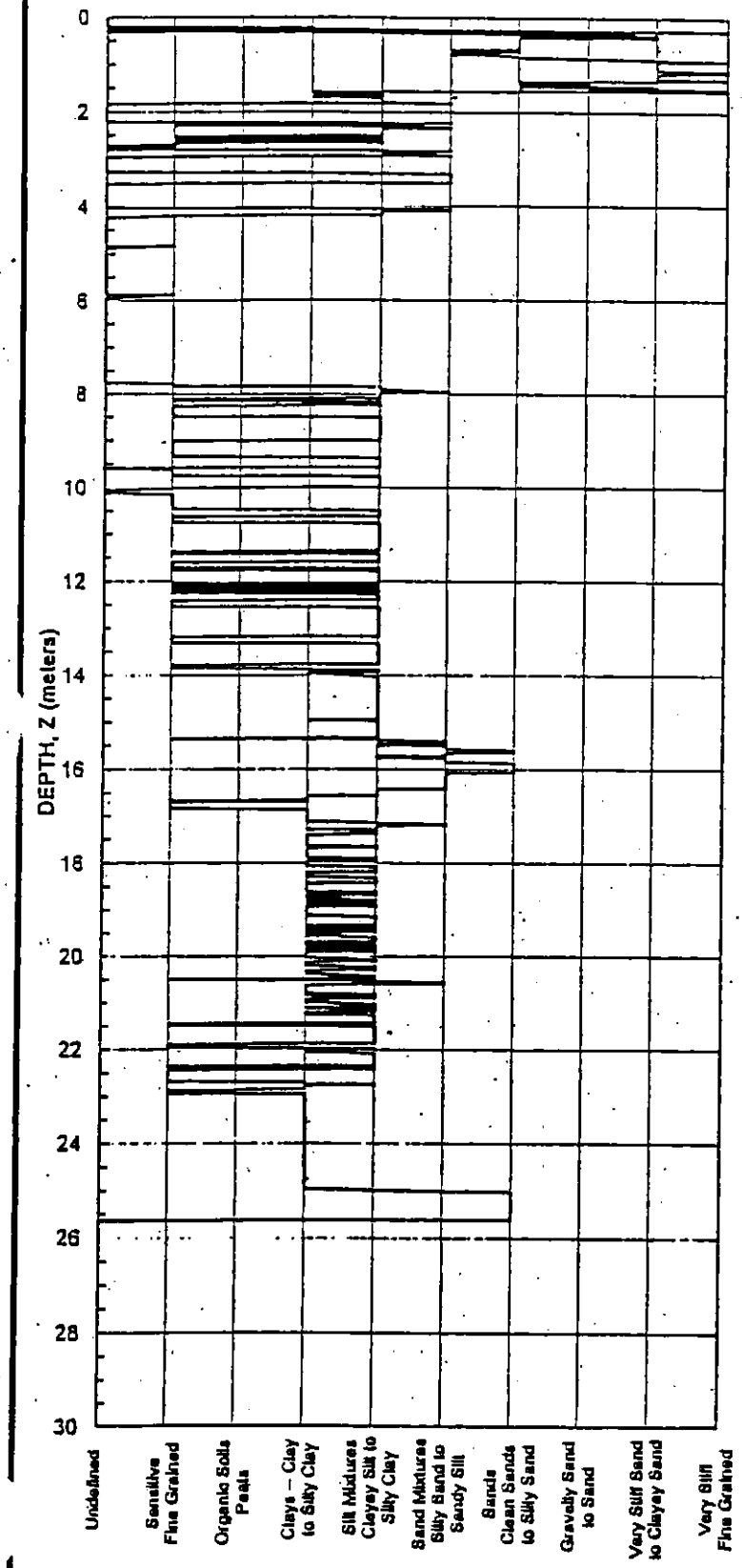
Sea 12

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

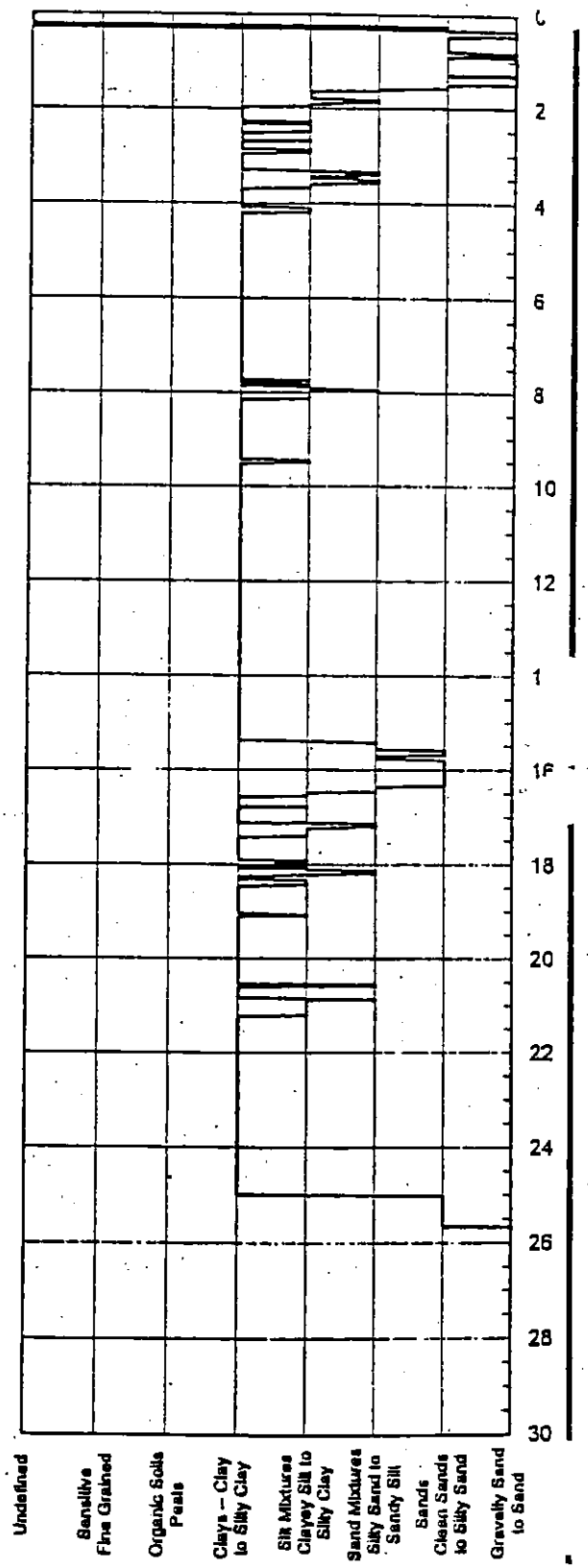
IN-SITU SOIL TESTING, LLC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-21-98

SOUNDING
SCPT-1

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION

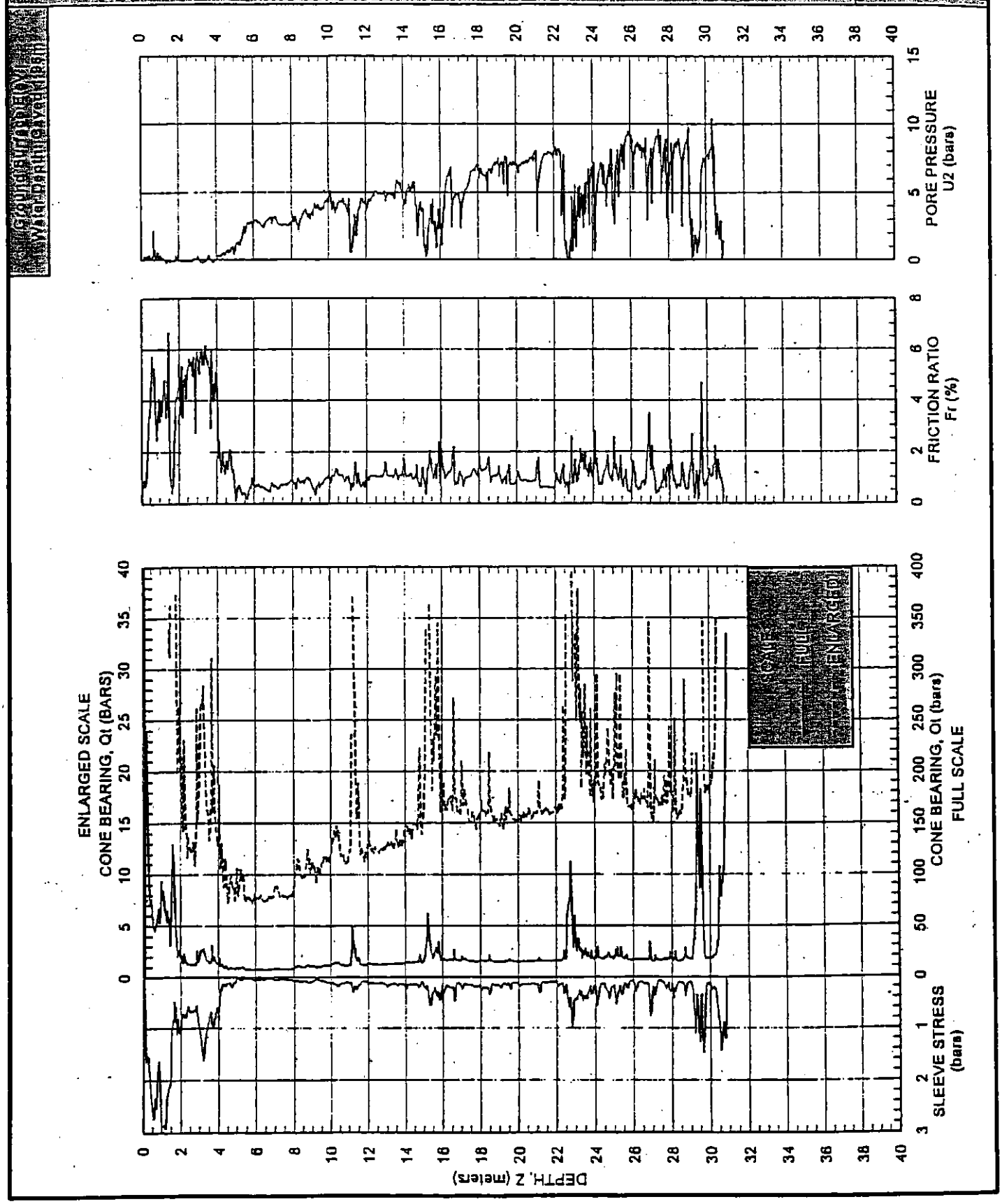
Sea 14

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, LC
ENGINEER: R. Failmezger
SOUNDING DATE: 8-21-98

SOUNDING
SCPT-14

ELECTRIC CONE PENETROMETER RESULTS

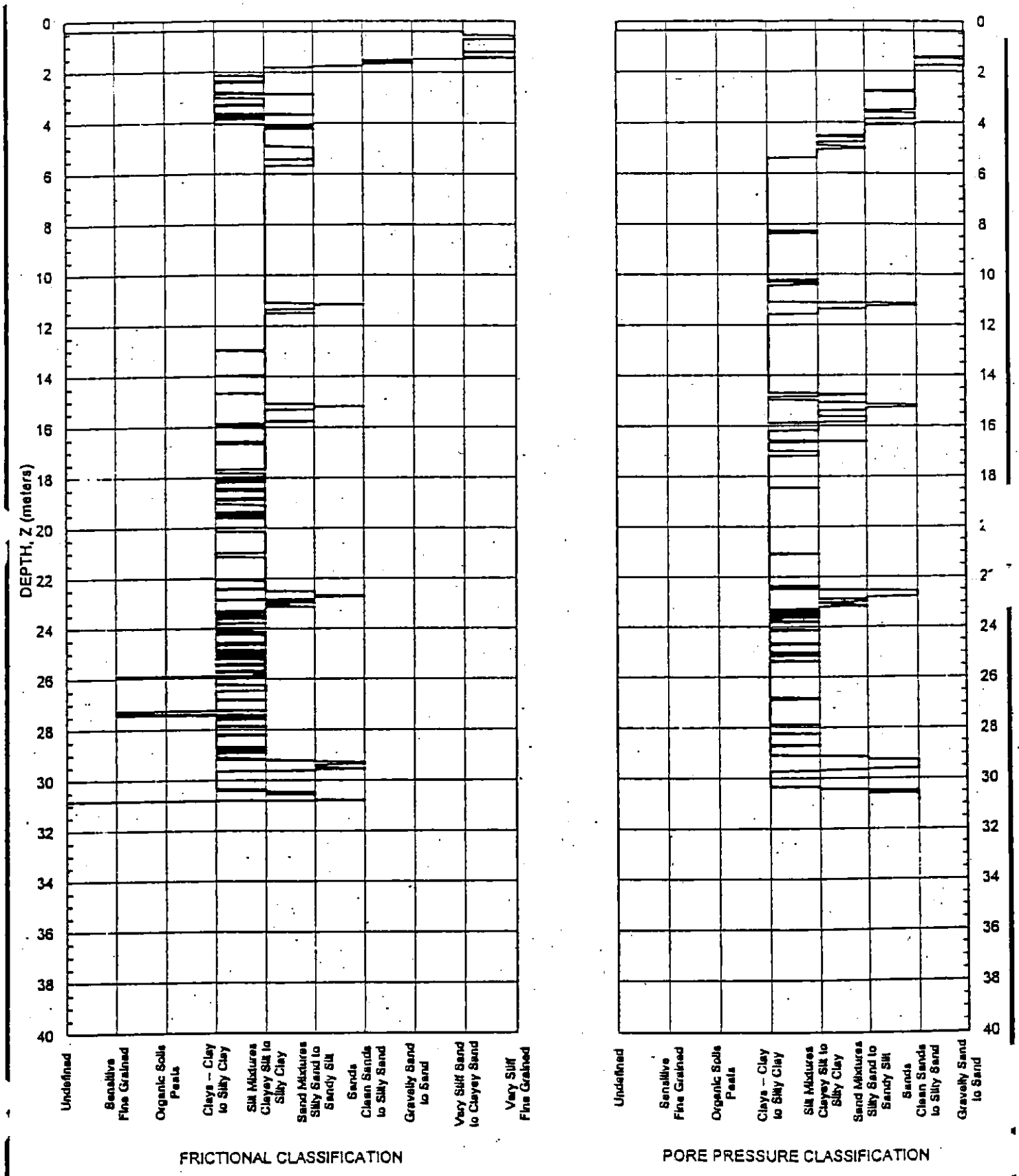


PROJECT: CHERRY LEAND LANDFILL
LOCATION: Wilmington, Delaware

IN SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-21-98

SOUNDING
SCPT-14

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



Sta 15

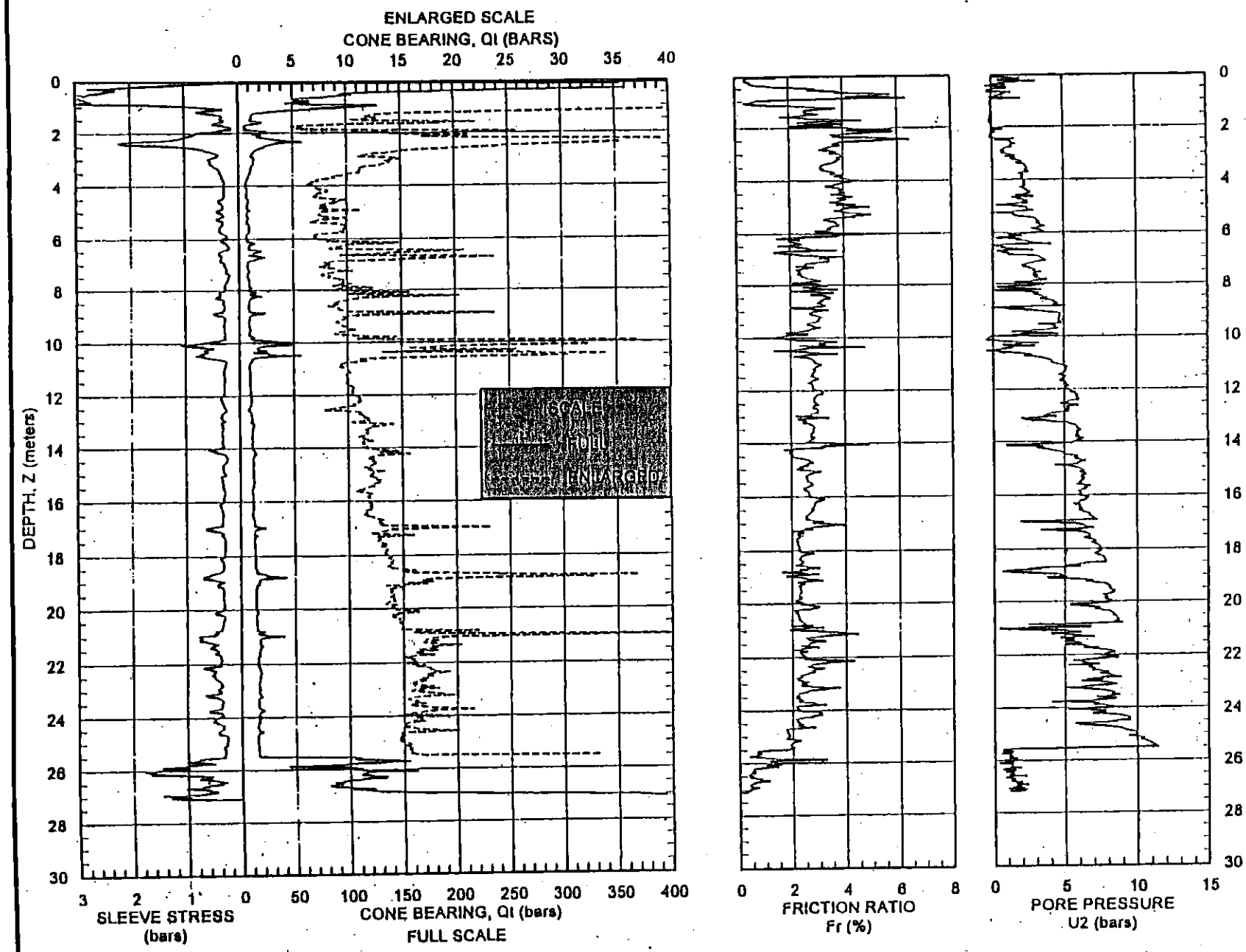
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

ELECTRIC CONE PENETROMETER RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-12-98

SOUNDING
CPT-15

Ground Surface Elev.
Water Depth: 10.38 m

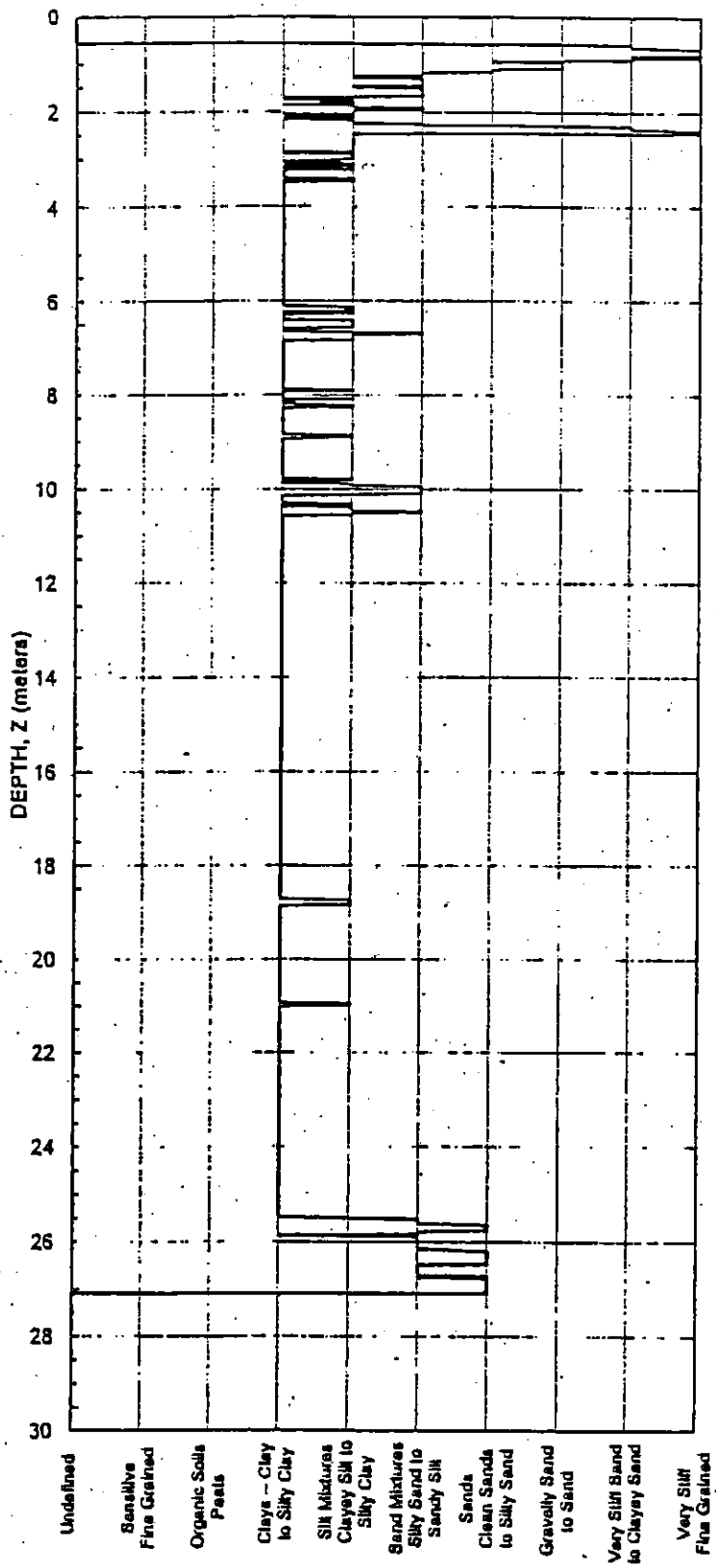


PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

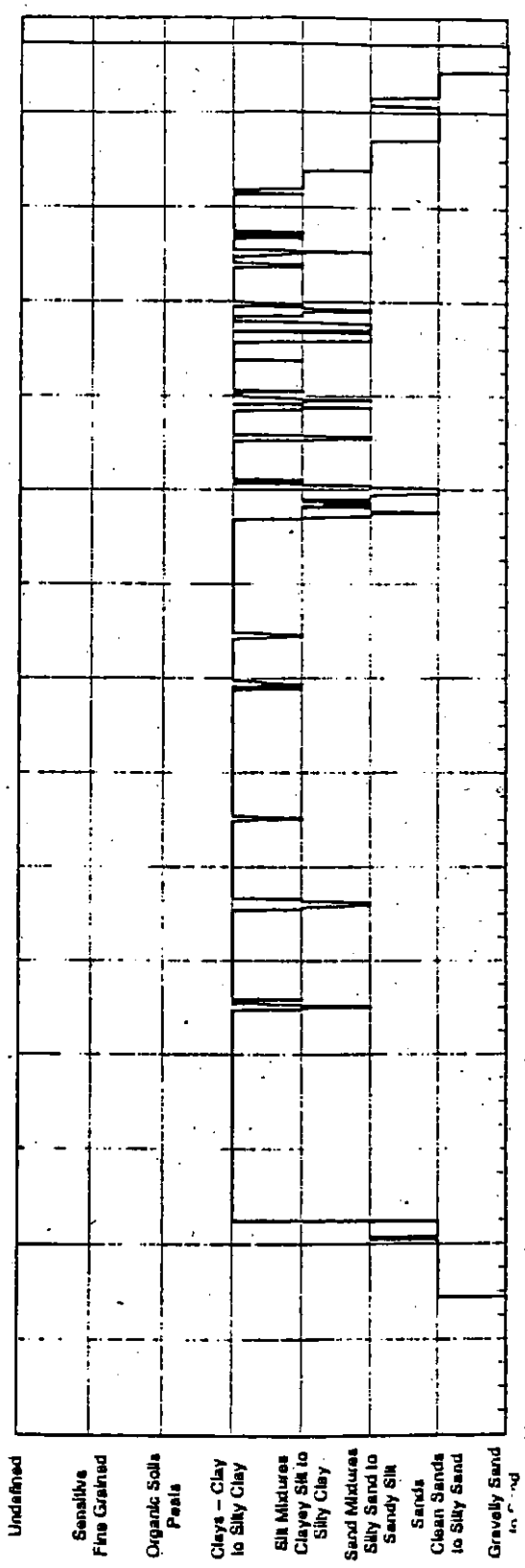
IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-12-98

SOUNDING: CPT-15

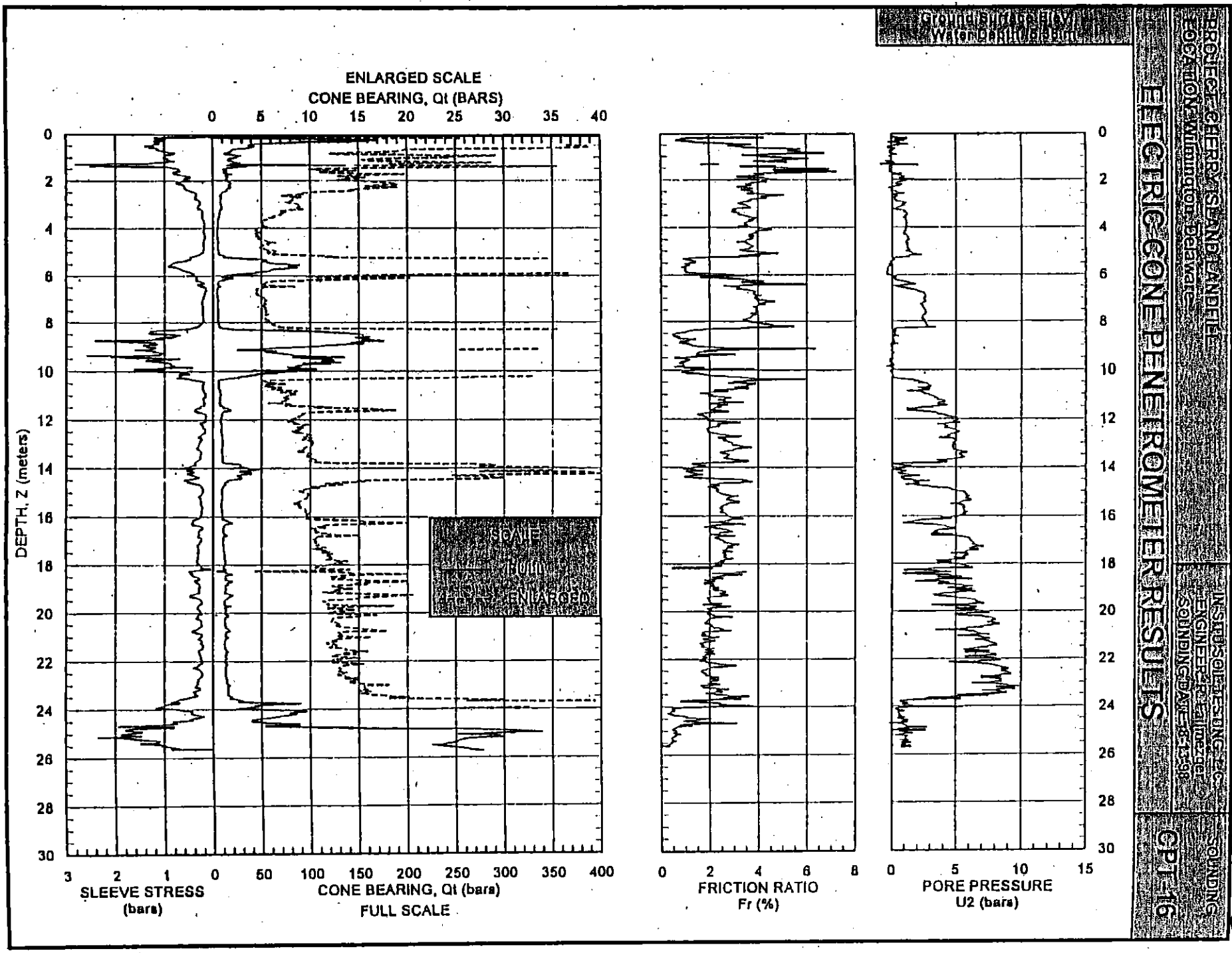
SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION

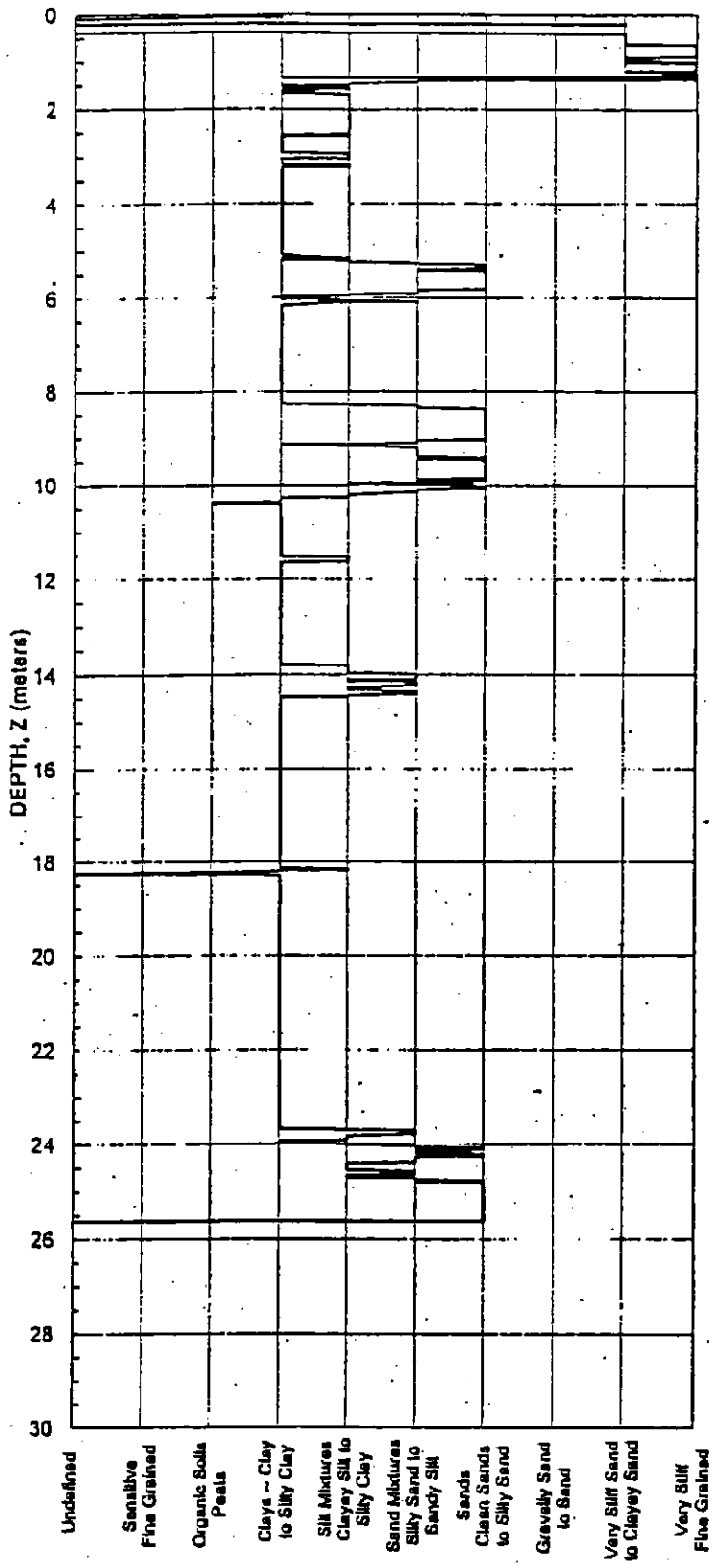

ENLARGED SCALE
CONE BEARING, Qt (BARS)
0 5 10 15 20 25 30 35 40
DEPTH, Z (meters)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
SCALE
FULL
ENLARGED
3 2 1 0
SLEEVE STRESS
(bars)
0 50 100 150 200 250 300 350 400
CONE BEARING, Qt (bars)
FULL SCALE
0 2 4 6 8
FRICTION RATIO
Fr (%)
0 5 10 15
PORE PRESSURE
U2 (bars)
ELECTRIC CONE PENETROMETER RESULTS
CPT-16

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

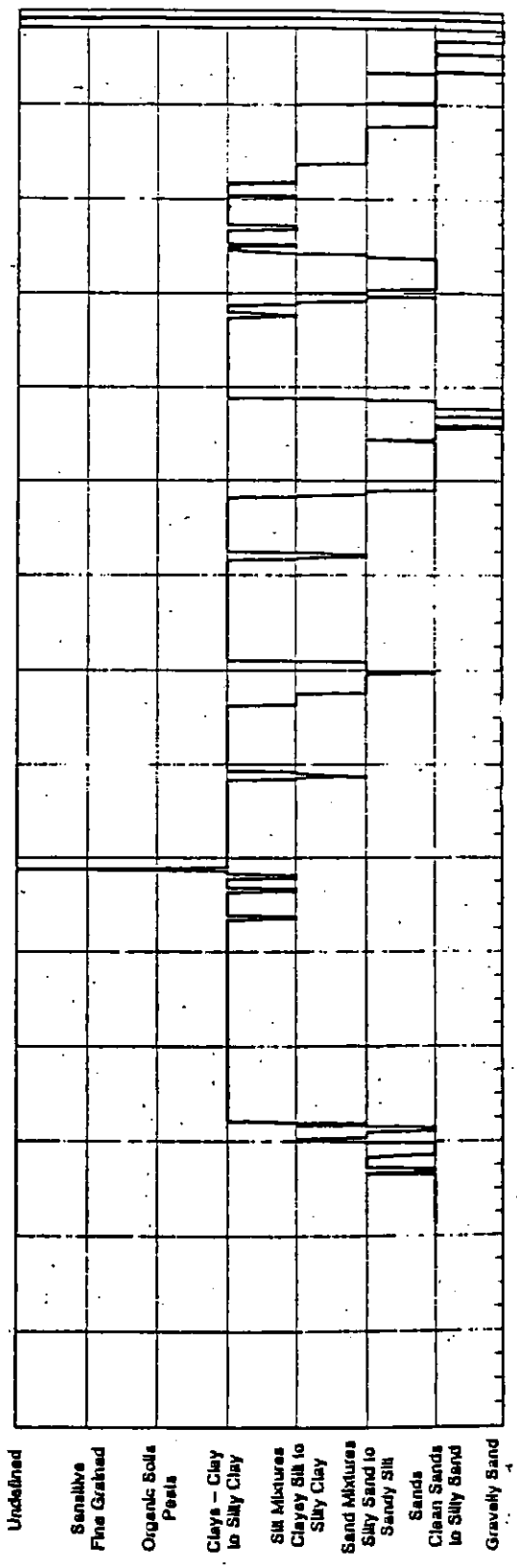
IN SITU SOIL TESTING, LLC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-13-98

SOUNDING
CPT-1

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION

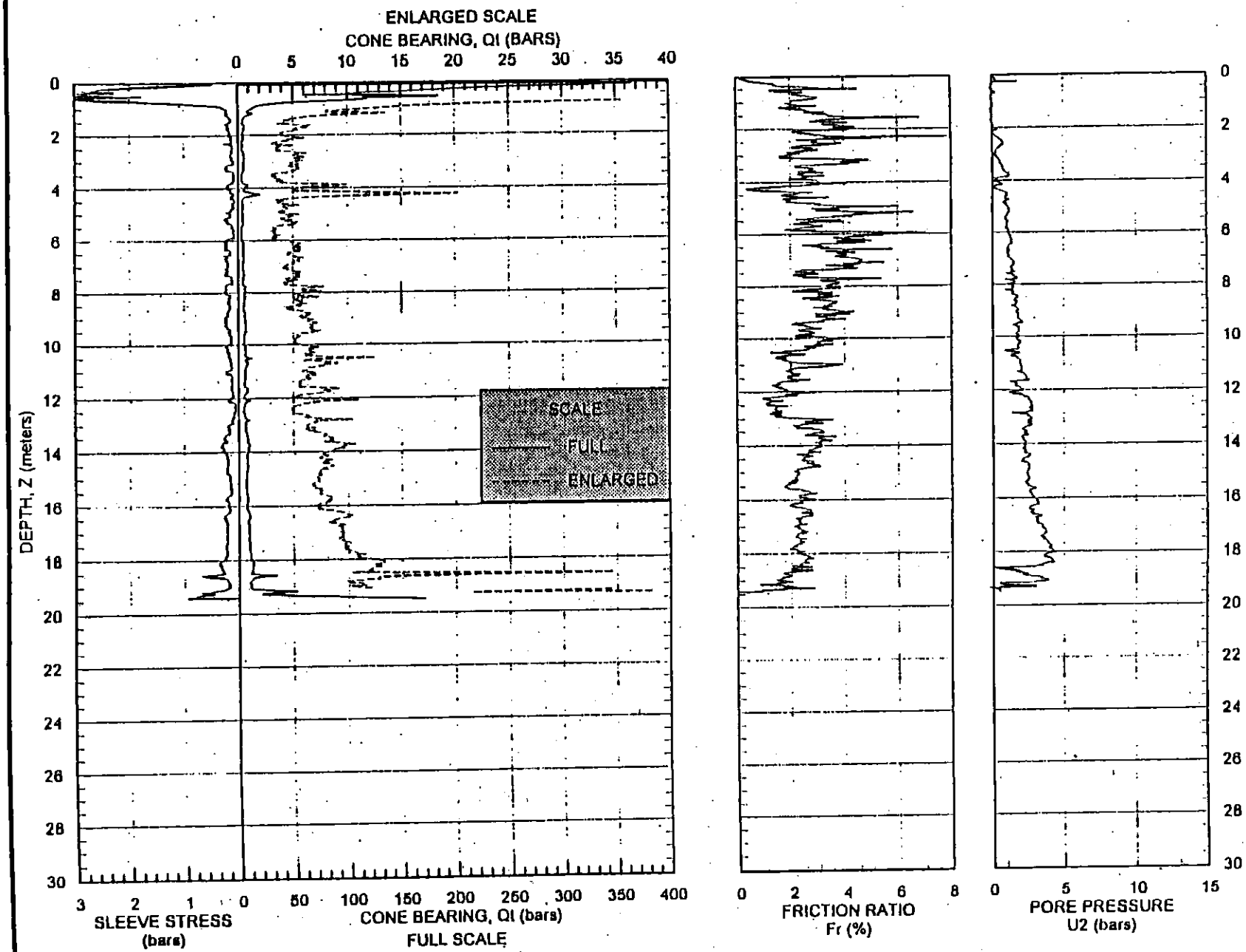
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

ELECTRIC CONE PENETROMETER RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-24-98

SOUNDING: CPT-17

Ground Surface Elev.:
Water Depth: Caved at 0.71 m



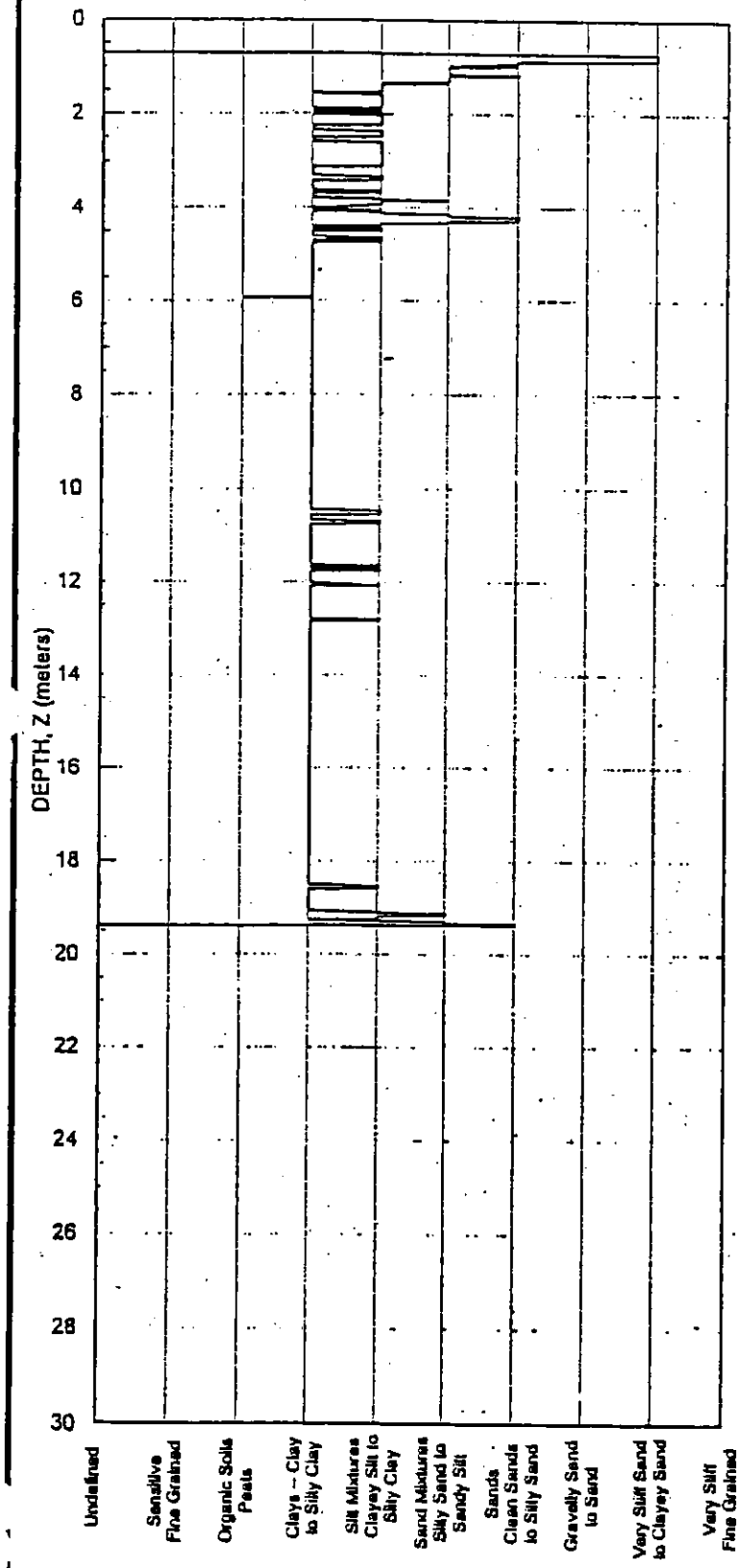
Sq 17

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

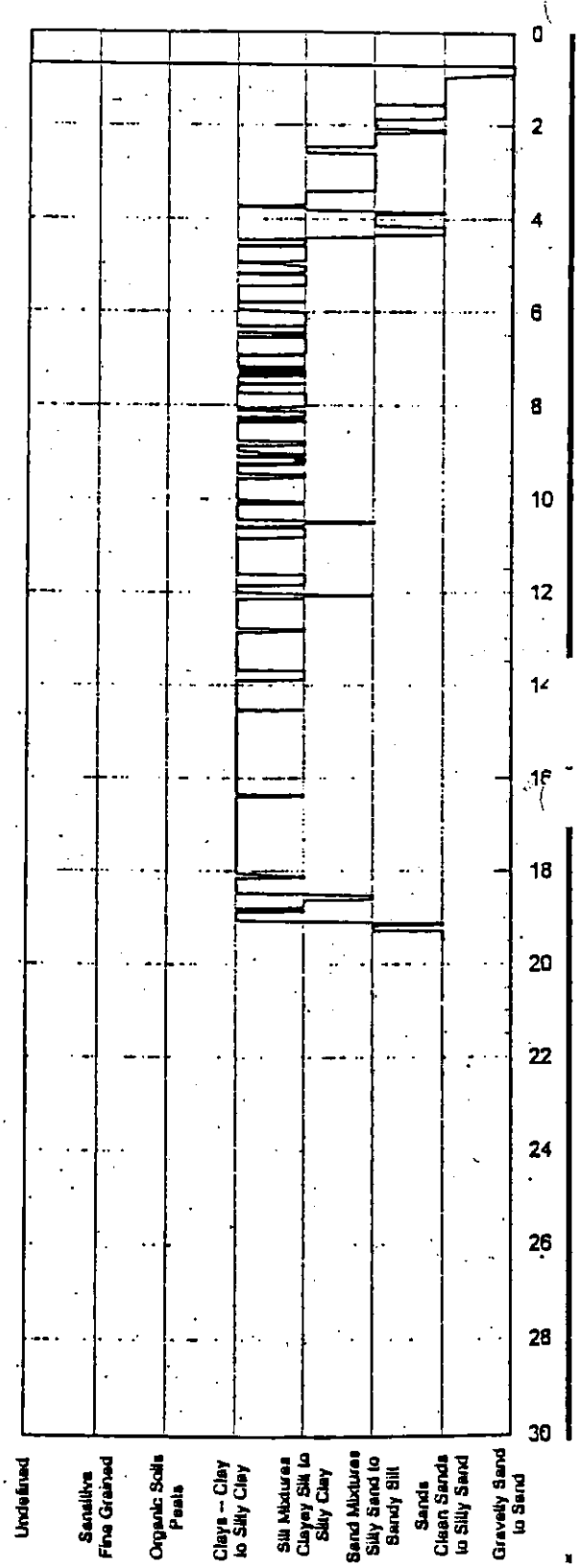
IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-24-98

SOUNDING
CPT-17

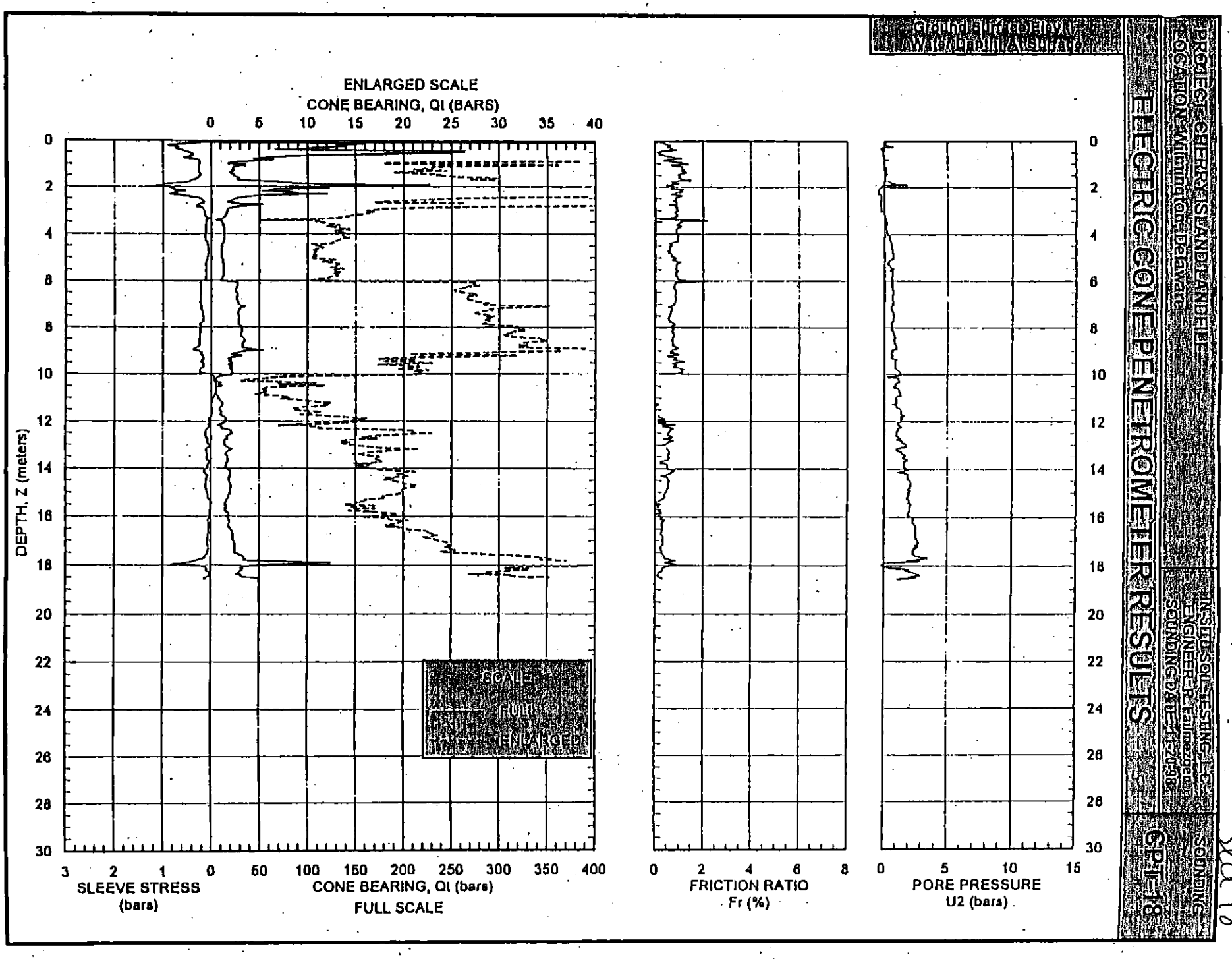
SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION



Ground Surface Elev.
Water Depth At Surface
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware
IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Faulmezger
SOUNDING DATE: 11-20-98
SOUNDING
CPT-18
ELECTRIC CONE PENETROMETER RESULTS
ENLARGED SCALE
CONE BEARING, Qt (BARS)
0 5 10 15 20 25 30 35 40
DEPTH, Z (meters)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
SCALE
FULL
ENLARGED
3 2 1 0
SLEEVE STRESS
(bars)
50 100 150 200 250 300 350 400
CONE BEARING, Qt (bars)
FULL SCALE
0 2 4 6 8
FRICTION RATIO
Fr (%)
0 5 10 15
PORE PRESSURE
U2 (bars)

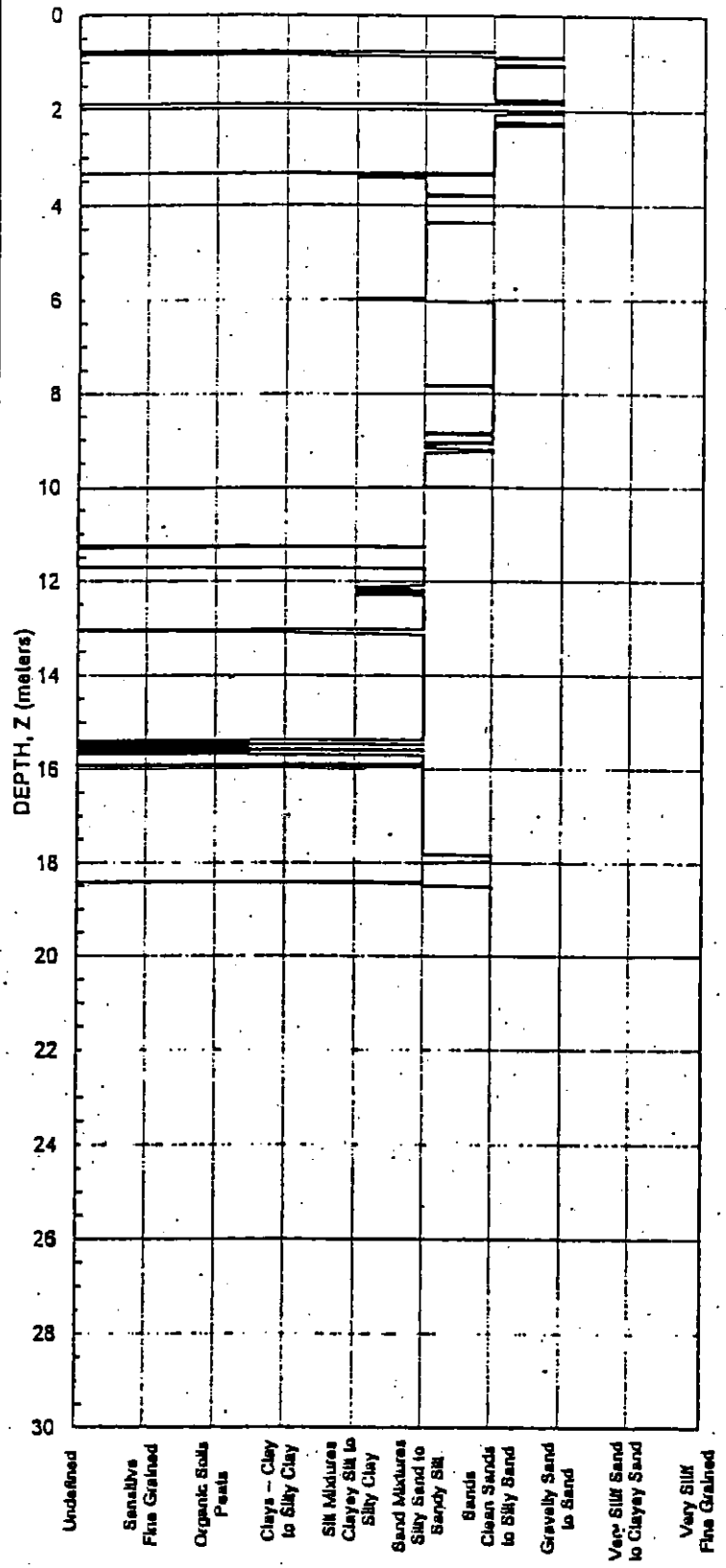
Sea 18

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

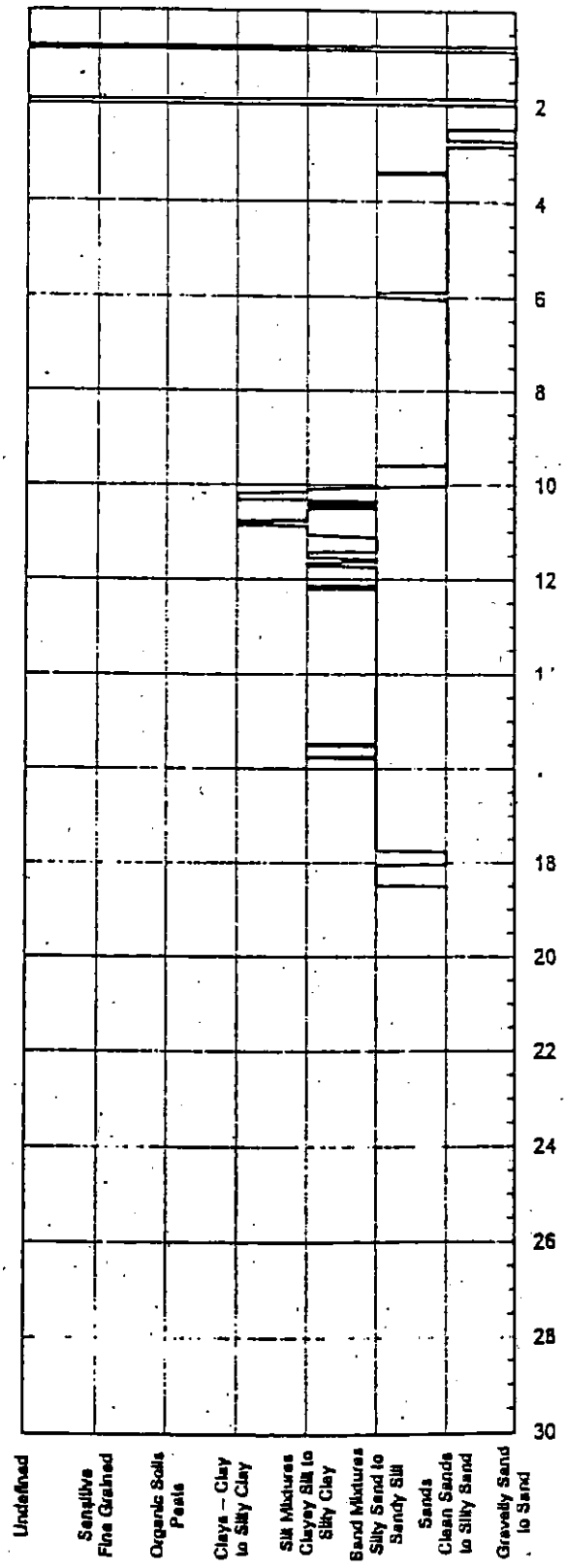
IN-SITU SOIL TESTING, INC.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-20-98

SOUNDING: CPT-18

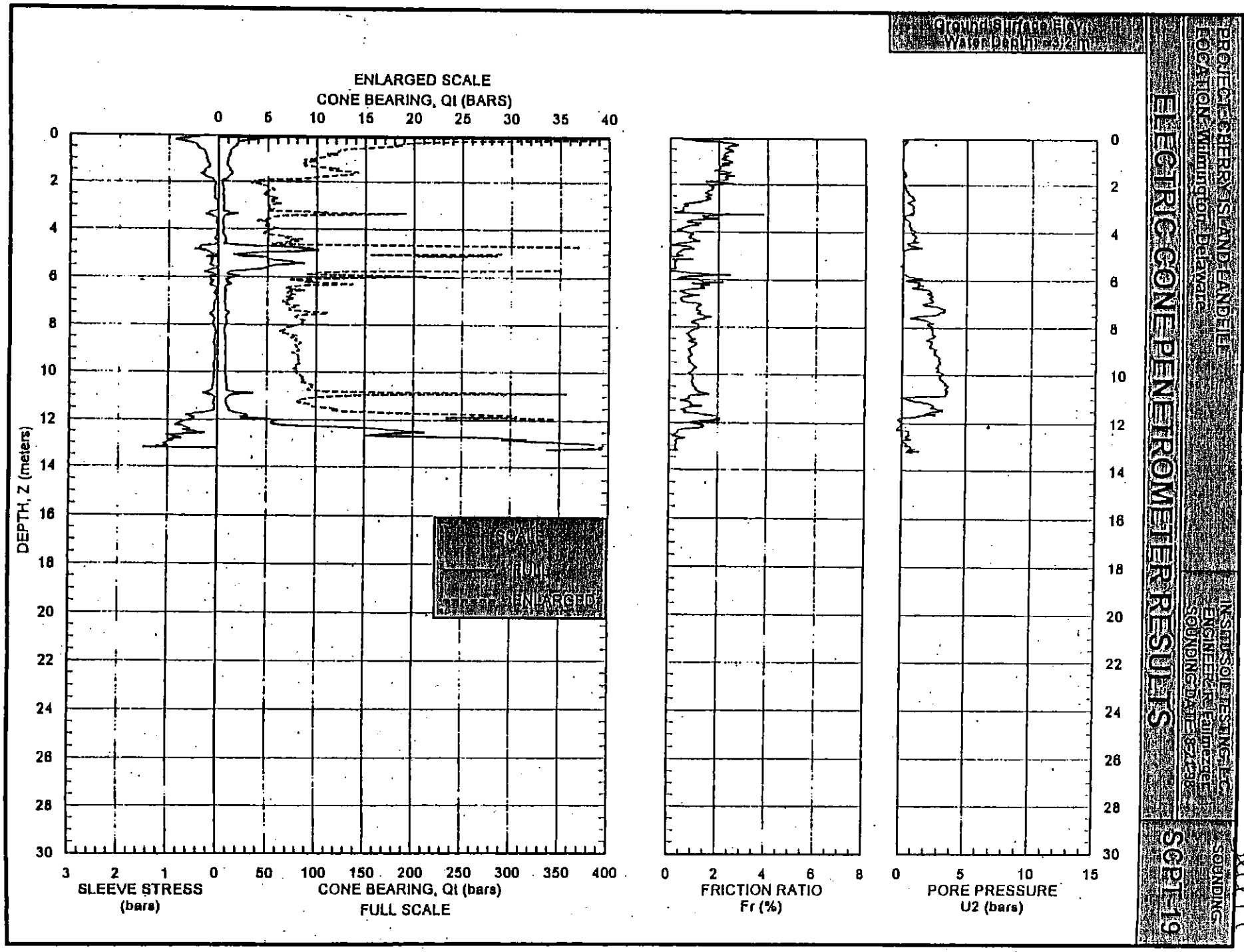
SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)



FRICTIONAL CLASSIFICATION



PORE PRESSURE CLASSIFICATION



PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, LLC
ENGINEER: R. Fairmezger
SOUNDING DATE: 8-21-98

SOUNDING
SCPT-19

ELECTRIC CONE PENETROMETER RESULTS

SCG19

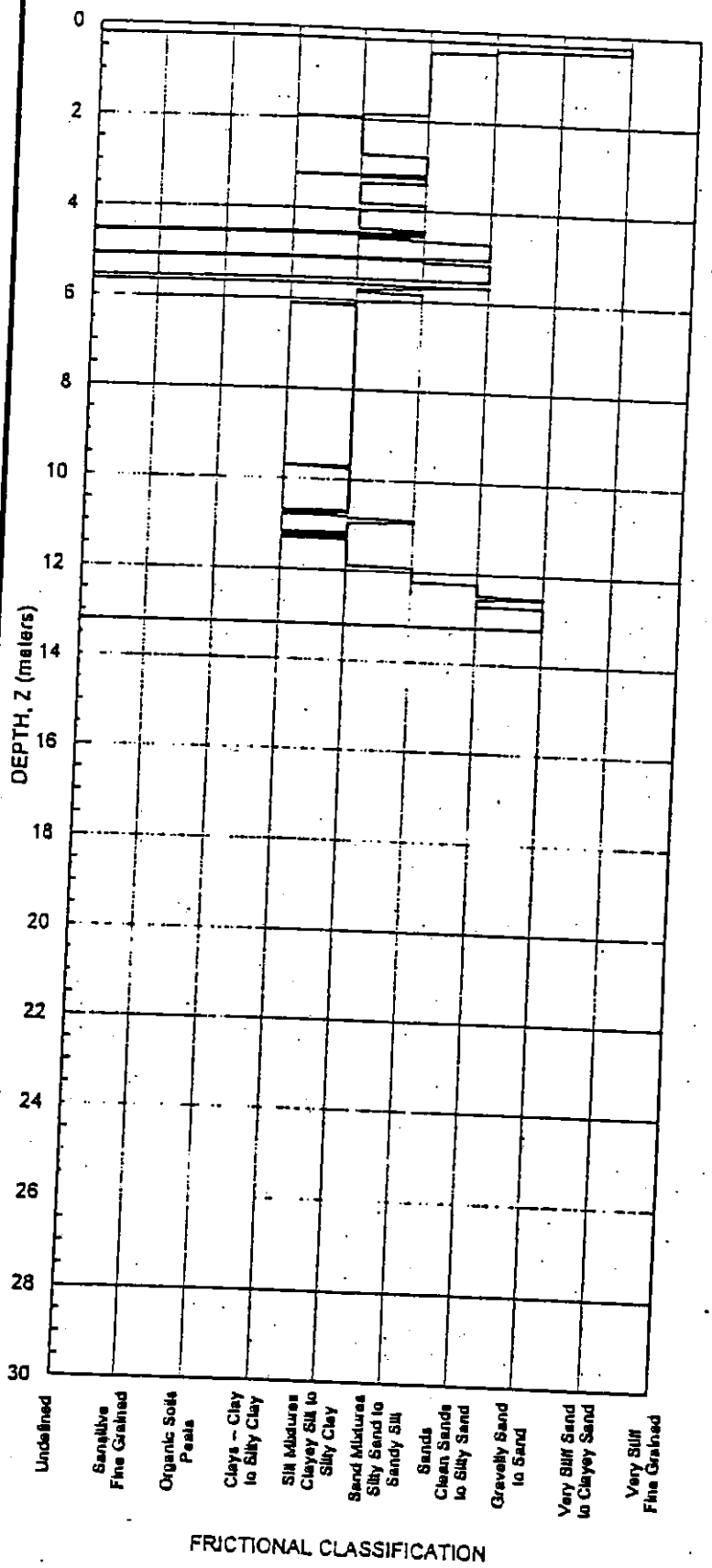
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

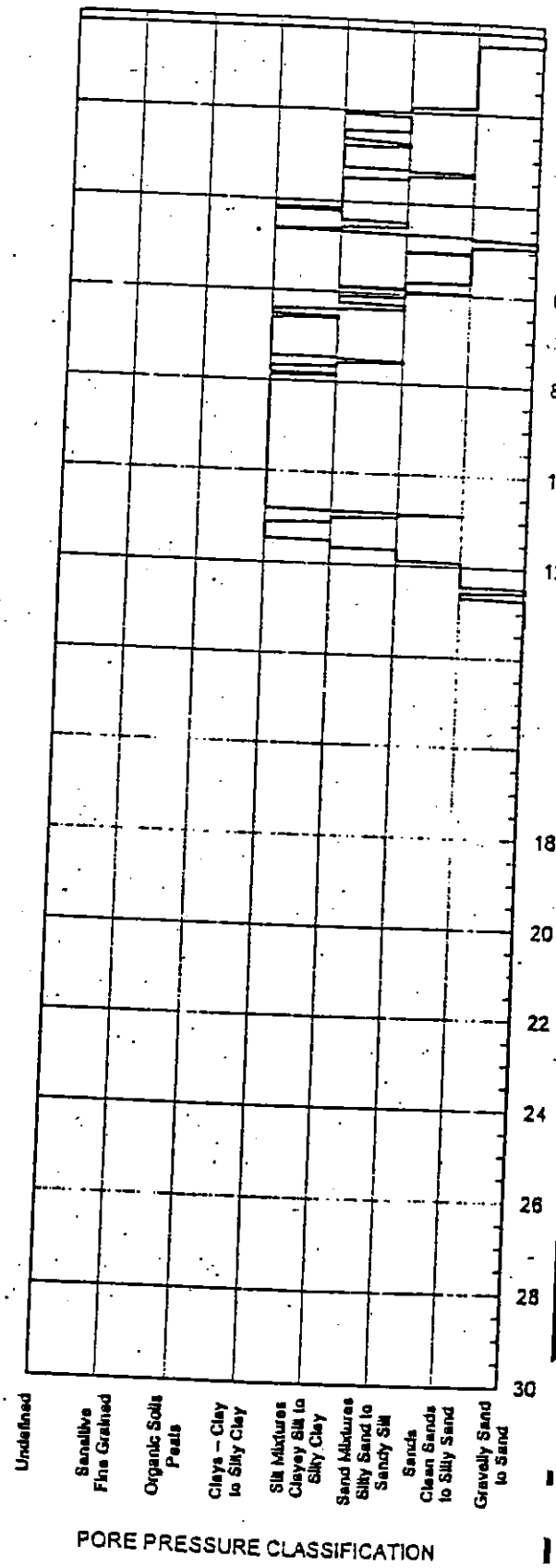
IN-SITU SOIL TESTING, LLC
ENGINEER: R. Fallmezgem
SOUNDING DATE: 8-21-98

SOUNDING

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON 1990)

SCPT





PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

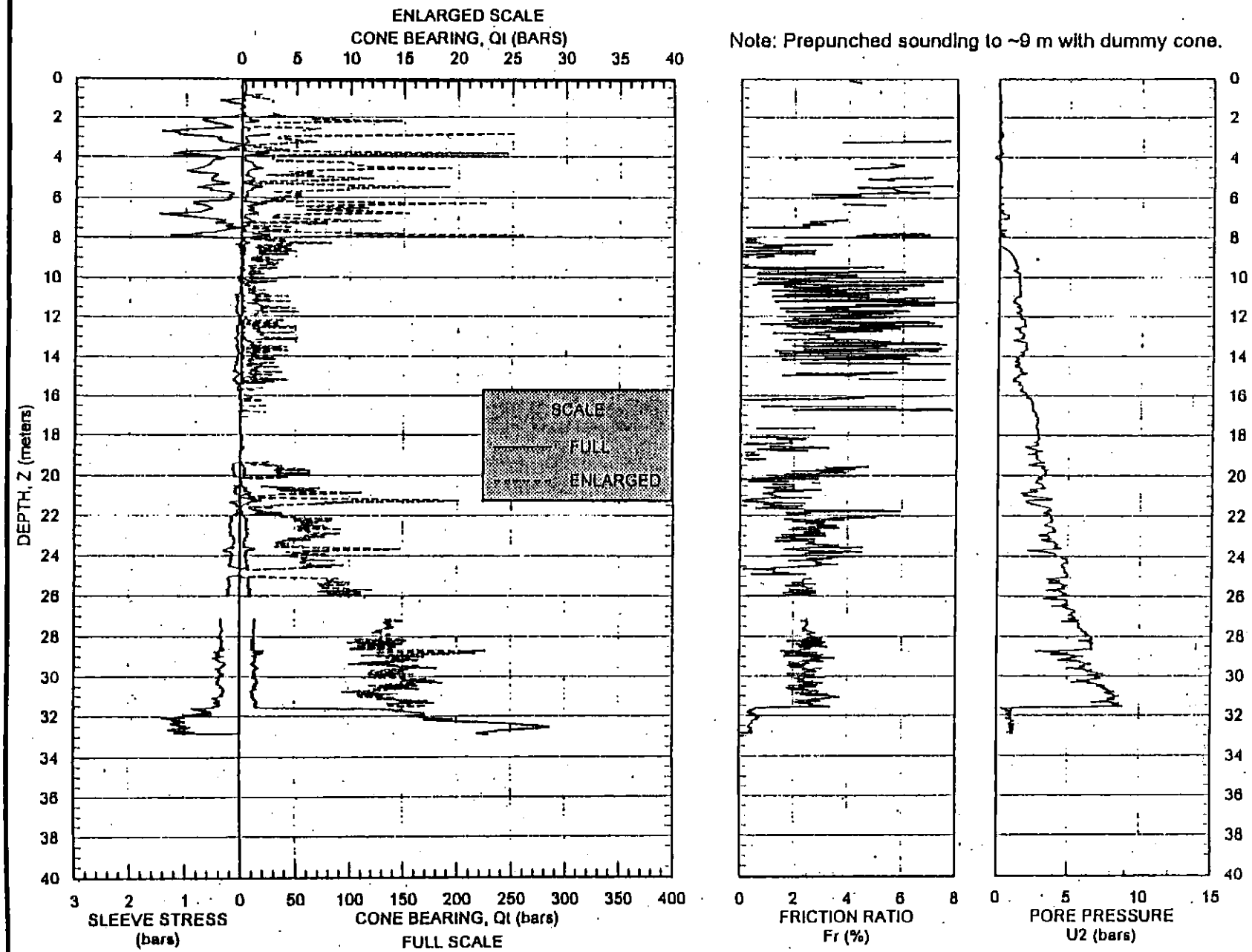
ELECTRIC CONE PENETROMETER RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-25-98

SOUNDING
CPT-20

Ground Surface Elev.:
Water Depth: Caved at 1.86 m

Note: Prepunched sounding to ~9 m with dummy cone.



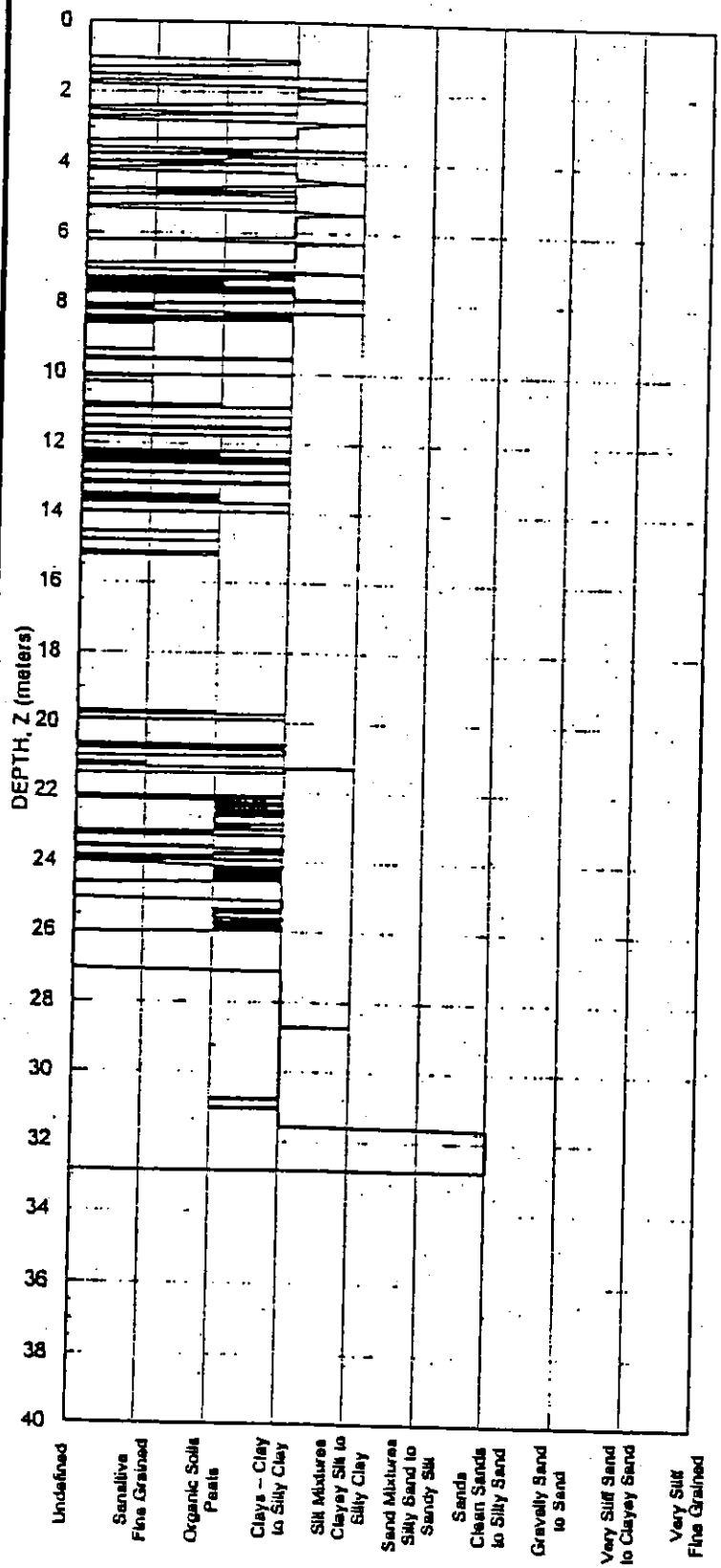
S0-20

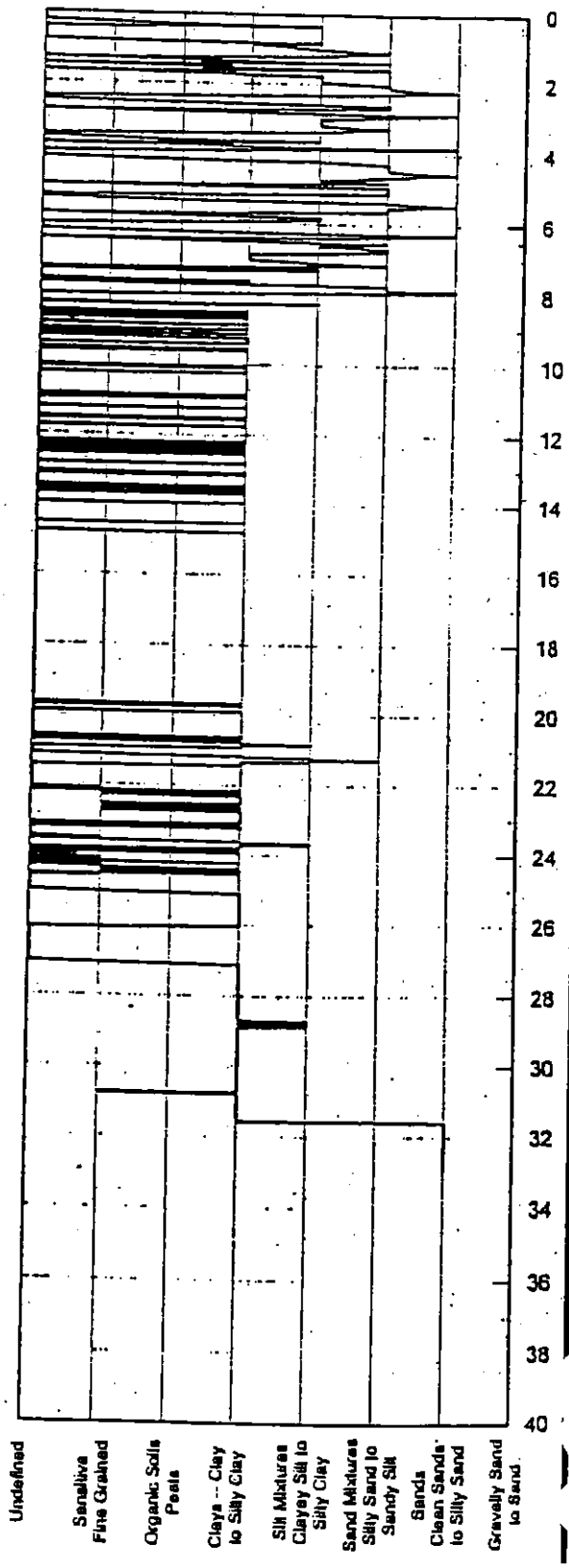
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-25-98

SOUNDING
CPT-20

SOIL BEHAVIOR CLASSIFICATION (ROBERTSON, 1990)





Cone Penetration Tests

A review of the CPT data contained in Appendix C shows that there is a general increase in corrected cone tip resistance, q_t, measured in the soft hydraulic fills and alluvial deposits as compared to CPT data measured previously. In general, the corrected cone tip resistance of these materials, obtained during October 2001, increased with depth. They ranged from a low of about 5,000 psf near the interface of the MSW, to a high of 40,000 psf. Due to the relatively high shear strength of the Columbia Formation, the CPT was not suitable for measuring strengths in this stratum.

CPT data was obtained in December of 1998 for our Composite Stability Analysis Report. Figures 5 through 10 compare the corrected cone tip resistance from October 2001 to the December 1998 results in terms of the *tip resistance ratio*. The tip resistance ratio is defined as the ratio between the present and past values of tip resistance measured at approximately the same elevation. A tip resistance ratio of one indicates that no increase in tip resistance has occurred. A tip resistance ratio greater than one suggests that the tip resistance has increased. The values of average tip resistance ratio for each CPT location are shown in Table 1.

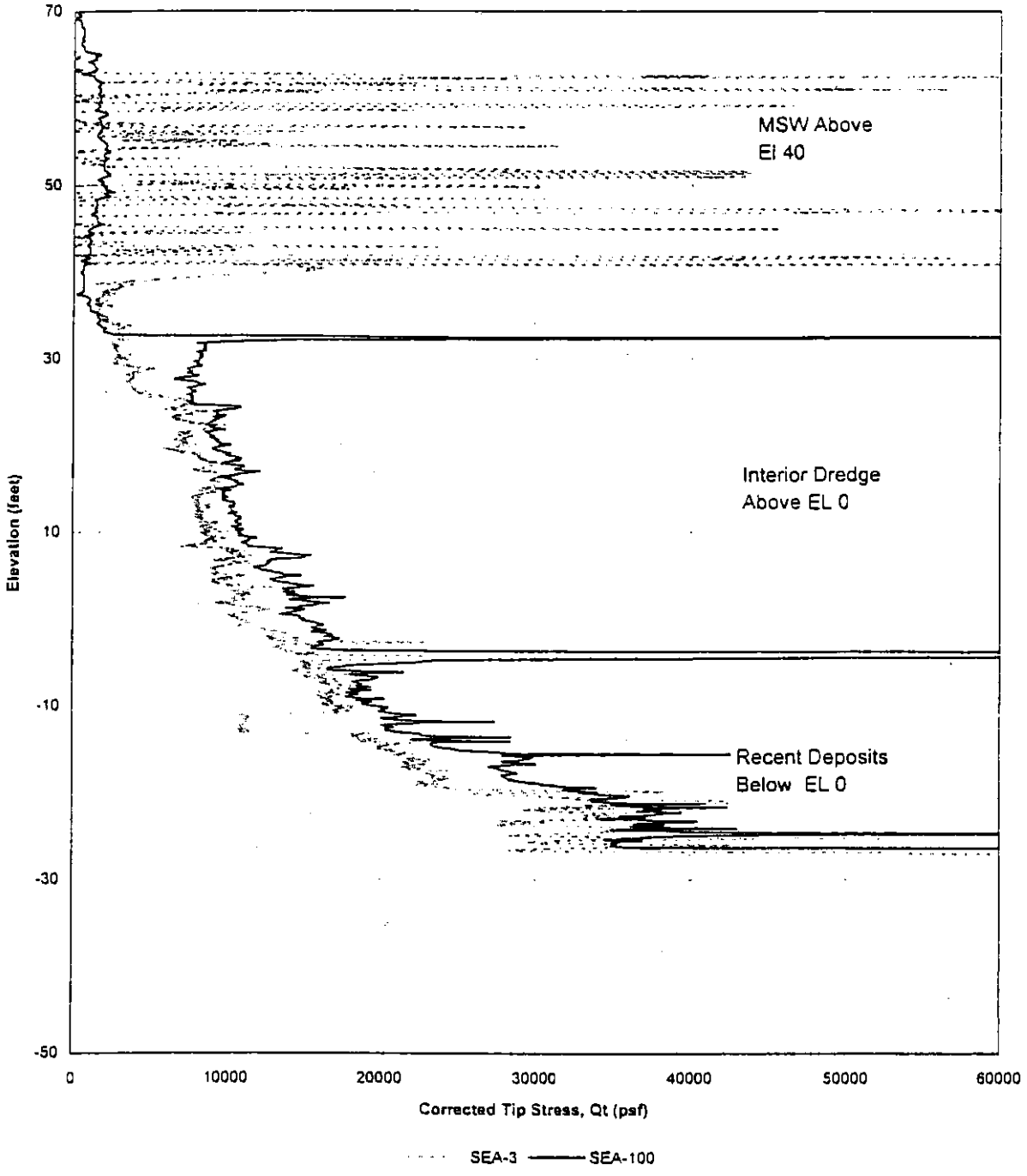
TABLE 1
Tip Resistance Ratio

Phase	October 2001 CPT No.	Adjacent December 1998 CPT No.	Location	Approximate Average Tip Stress Ratio
III	SEA-100	SEA-3	Interior	1.25
III	SEA-101	SEA-4	Interior	1.25
IV	SEA-102	SEA-5	Interior	1.25
IV	SEA-103	SEA-6	Interior	2.0
V	SEA-104	SEA-7	Interior	1.0
V	SEA-105	SEA-15	Perimeter	1.0

It can be seen that the values of cone penetration resistance measured at the interior of the landfill during this investigation are, in general, 25 percent larger than those measured during the December 1998 exploration. It can also be seen that the penetration resistance measured at the perimeter appears to be essentially the same as in December 1998.

The increase of the penetration resistance values at locations within the landfill may be due to the increase of undrained shear strength during consolidation of the hydraulic fill and recent alluvial deposits. At the perimeter of the landfill, consolidation may be essentially complete due to the presence of the wick drains, and the shear strength may not change significantly with time.

Cherry Island Landfill
Wilmington, DE
01151045



Corrected Tip Stress, Qt vs. Elevation for SEA-100
Interior Dredge Soils and Recent Deposits
Below about 40 ft of Waste

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045

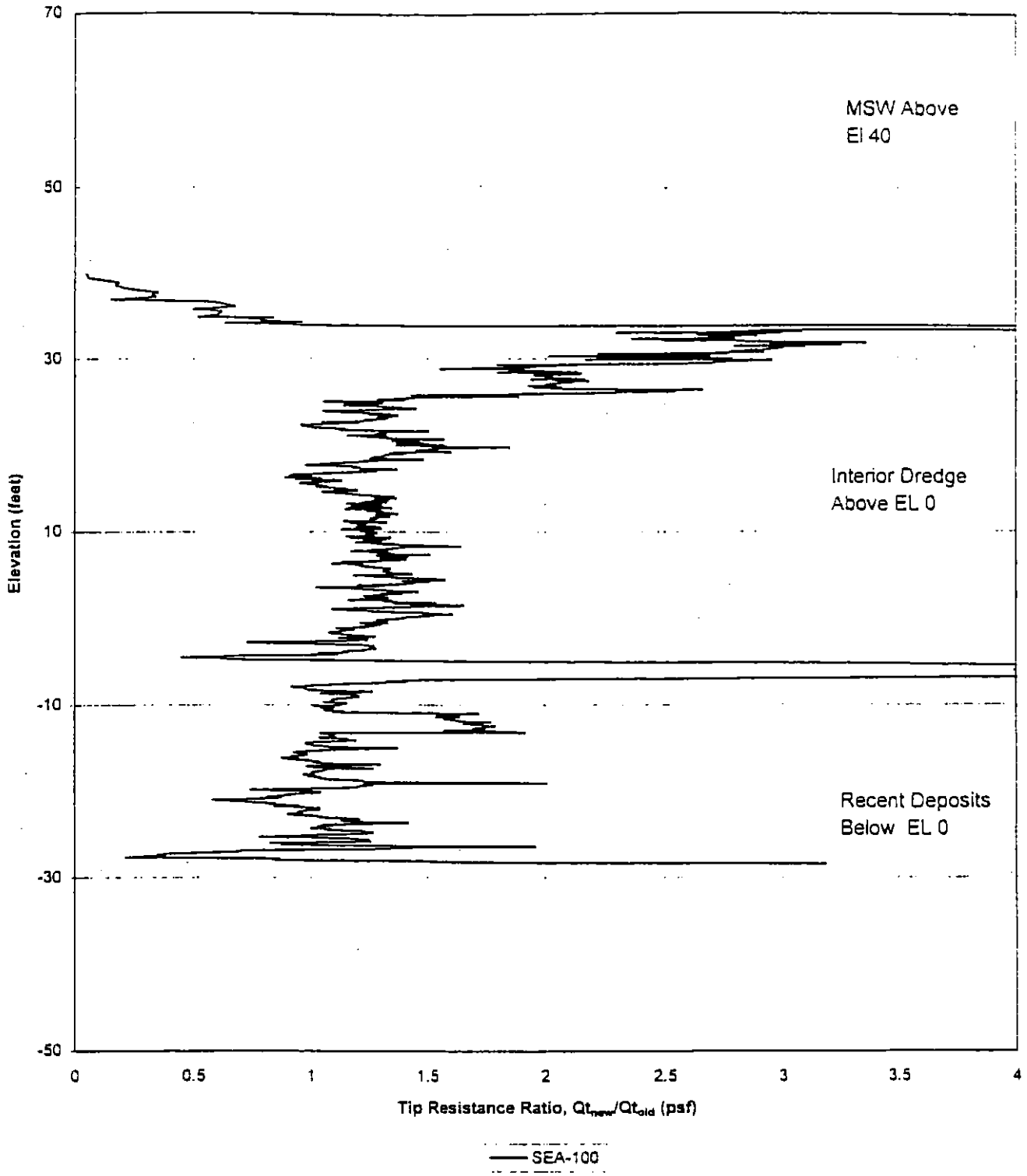
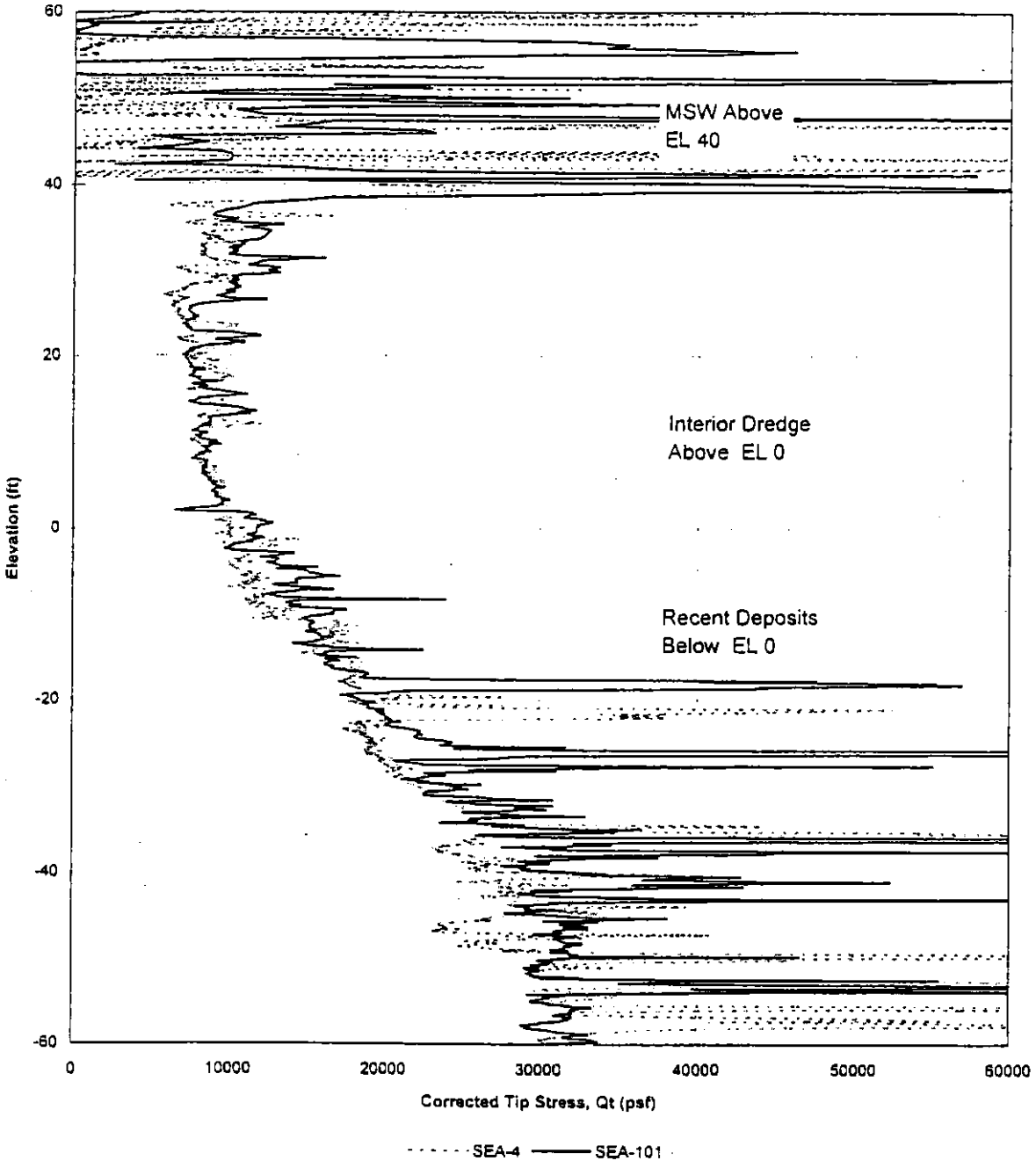


FIGURE 5
Tip Stress Ratio vs. Elevation SEA-100
Interior Dredge Soils and Recent Deposits
Below about 40 ft of Waste

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045



Corrected Tip Stress, Qt vs. Elevation for SEA-101
Interior Dredge Soils and Recent Deposits
Below about 20 ft of Waste

Schnabel Engineering

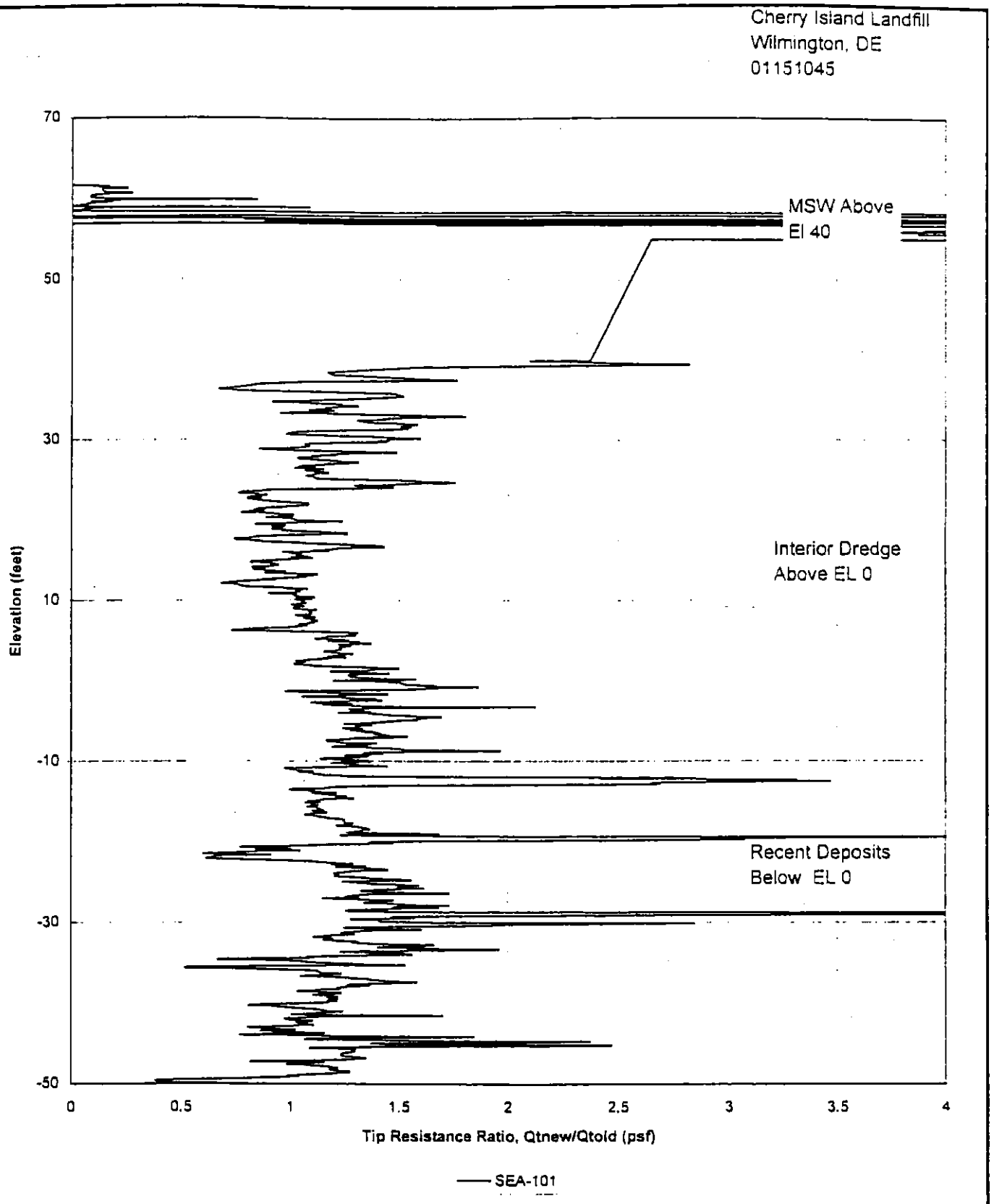
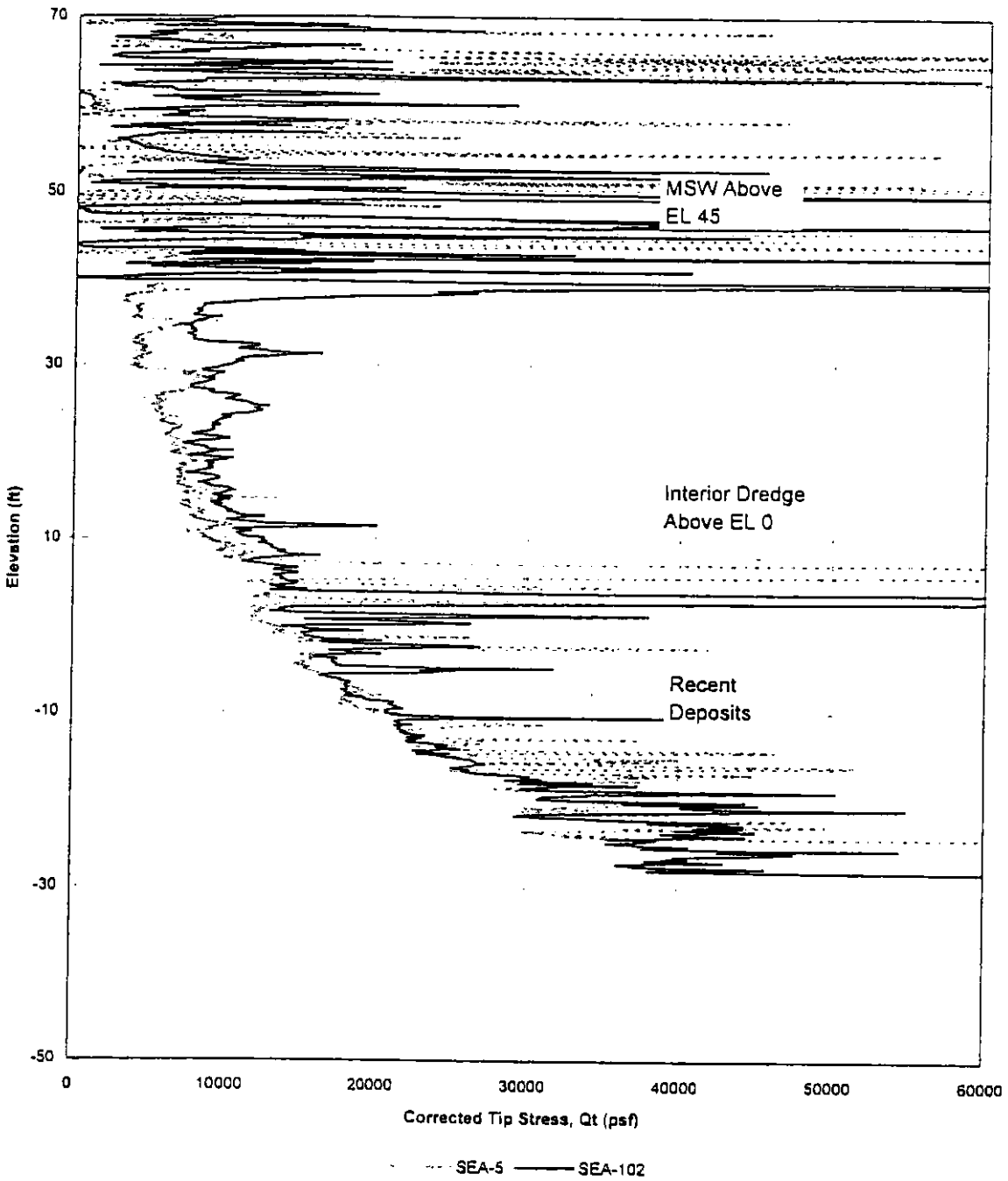


FIGURE 6
Tip Stress Ratio vs. Elevation SEA-101
Interior Dredge Soils and Recent Deposits
Below about 20 ft of Waste

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045



Corrected Tip Stress, Qt vs. Elevation for SEA-102
Interior Dredge Soils and Recent Deposits
Below about 30 ft of Waste

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045

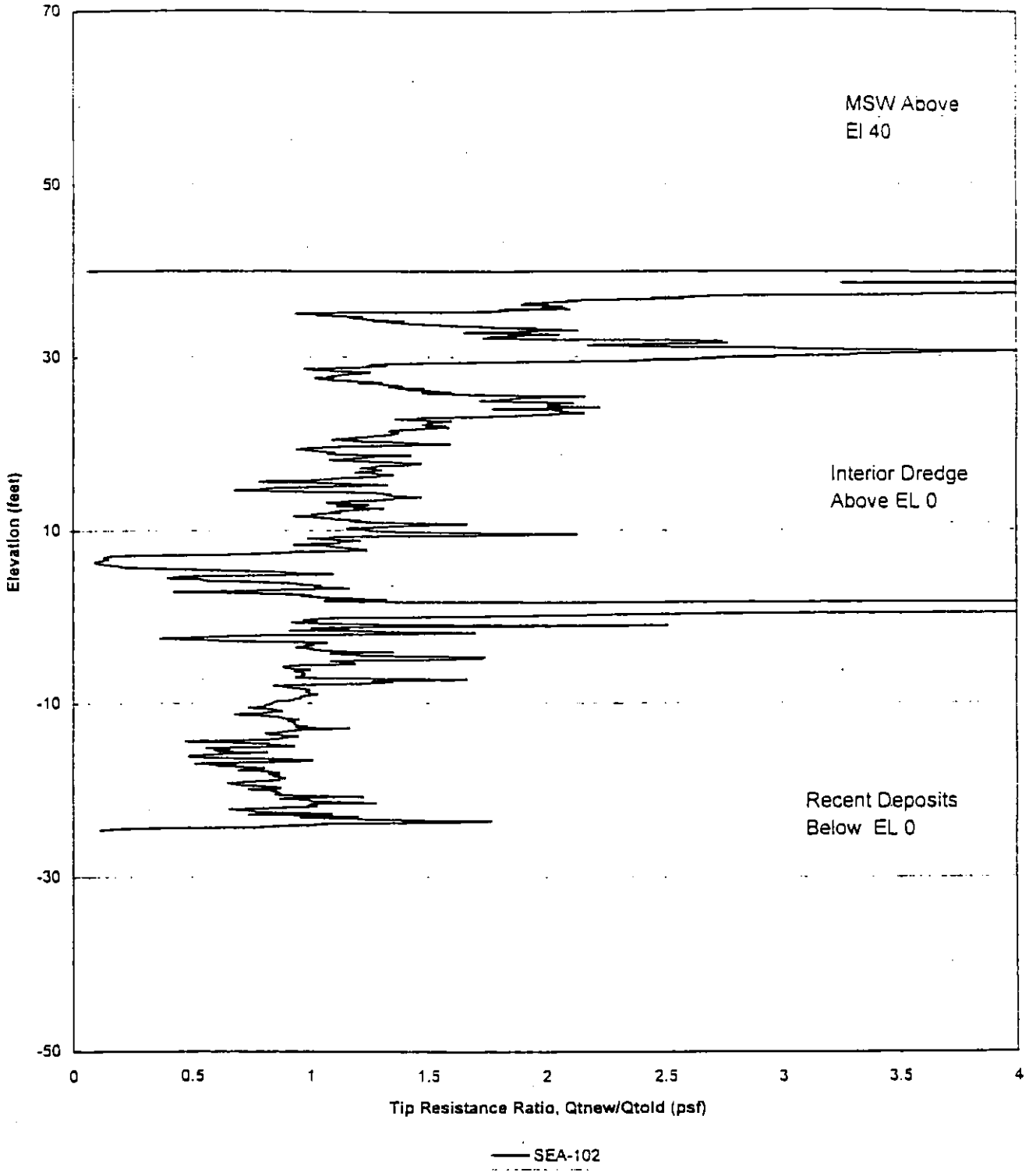
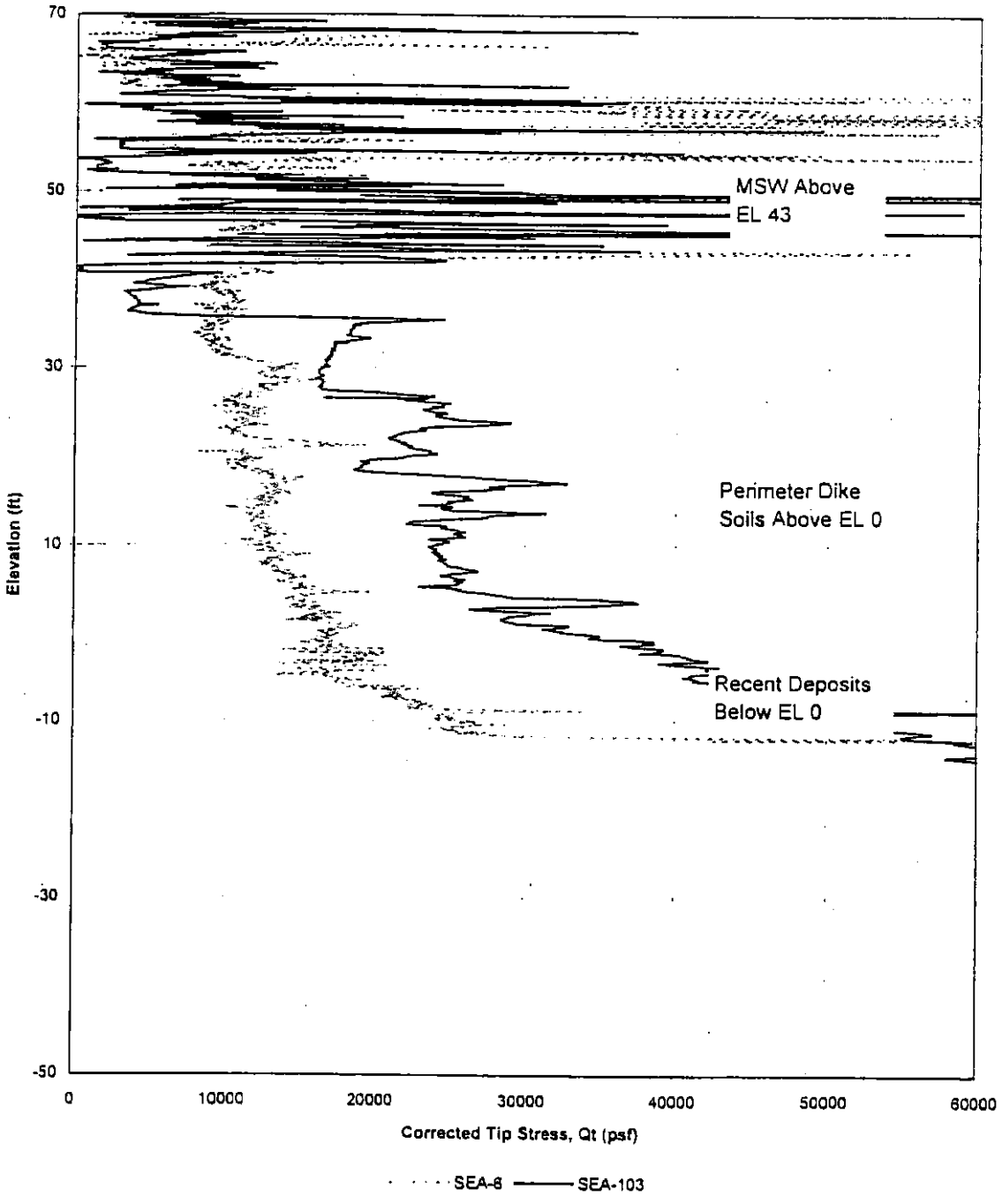


FIGURE 7
Tip Stress Ratio vs. Elevation SEA-102
Interior Dredge Soils and Recent Deposits
Below about 30 ft of Waste

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045



Corrected Tip Stress, Qt vs. Elevation for SEA-103
Interior Dredge Soils and Recent Deposits
Beneath About 35 ft of MSW

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045

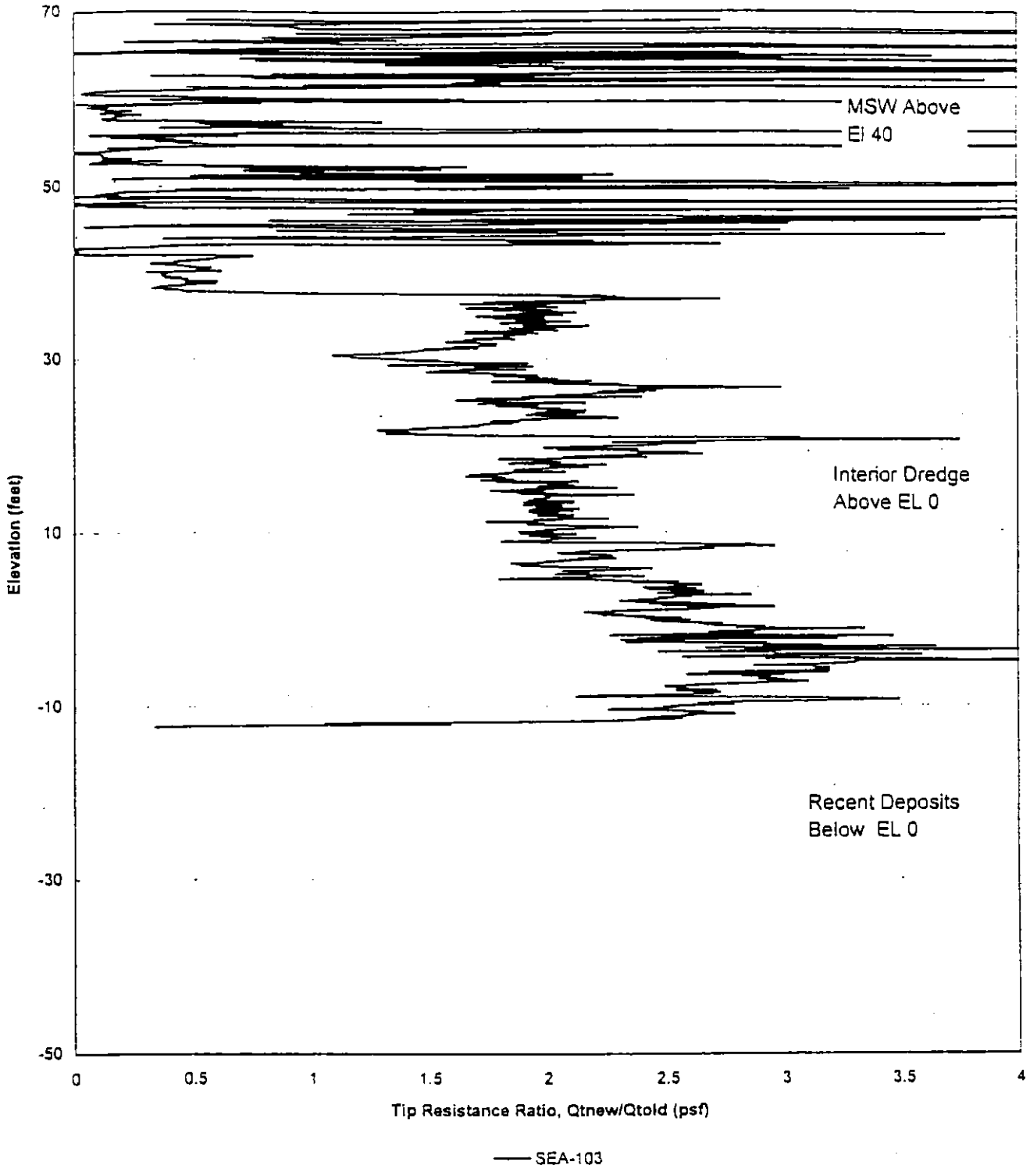
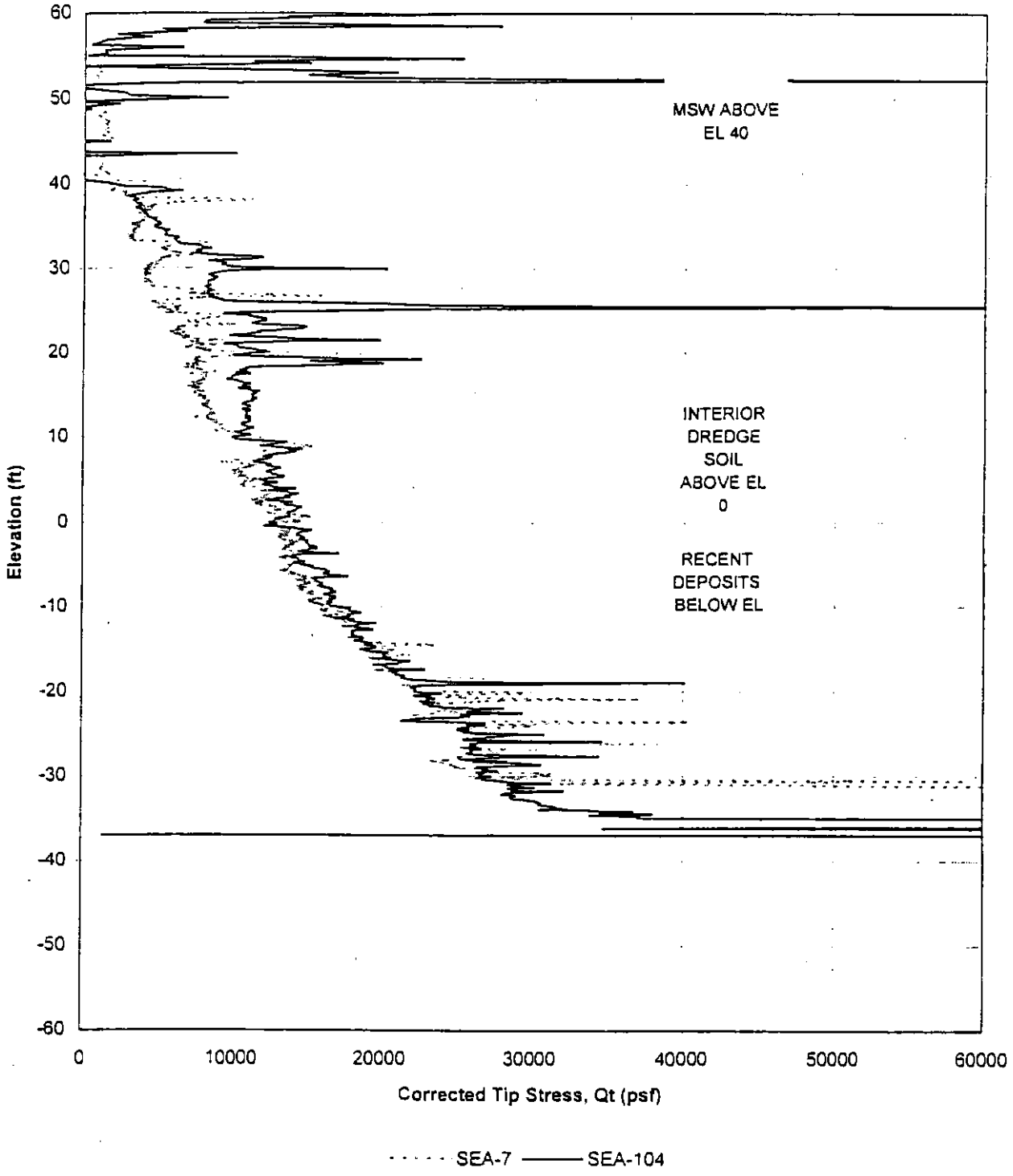


FIGURE 8
Tip Stress Ratio vs. Elevation SEA-103
Interior Dredge Soils and Recent Deposits
Below about 35 ft of Waste

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045



Corrected Tip Stress, Qt vs. Elevation for SEA-104
Interior Dredge Soils and Recent Deposits
Beneath About 35 ft of MSW

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045

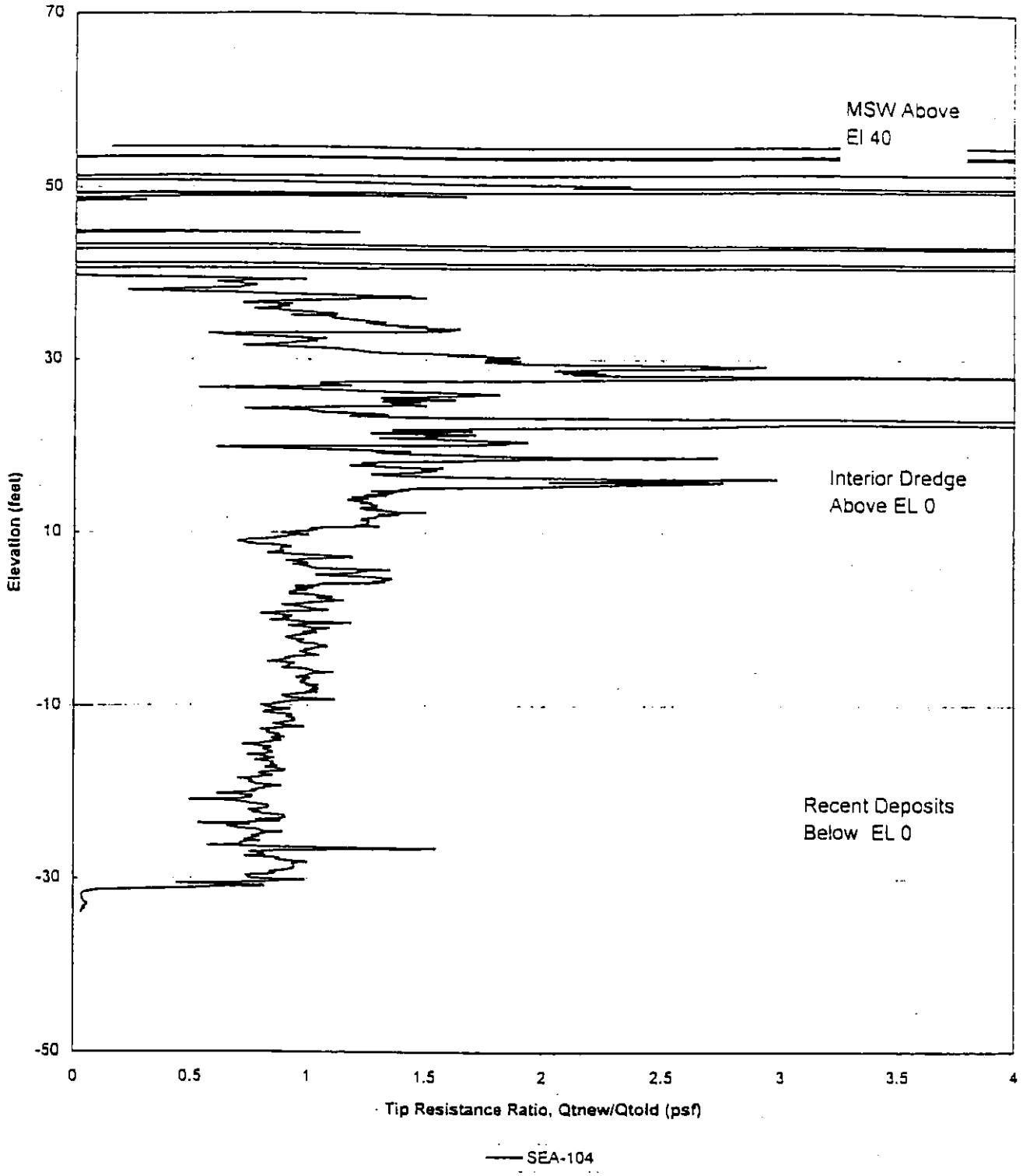
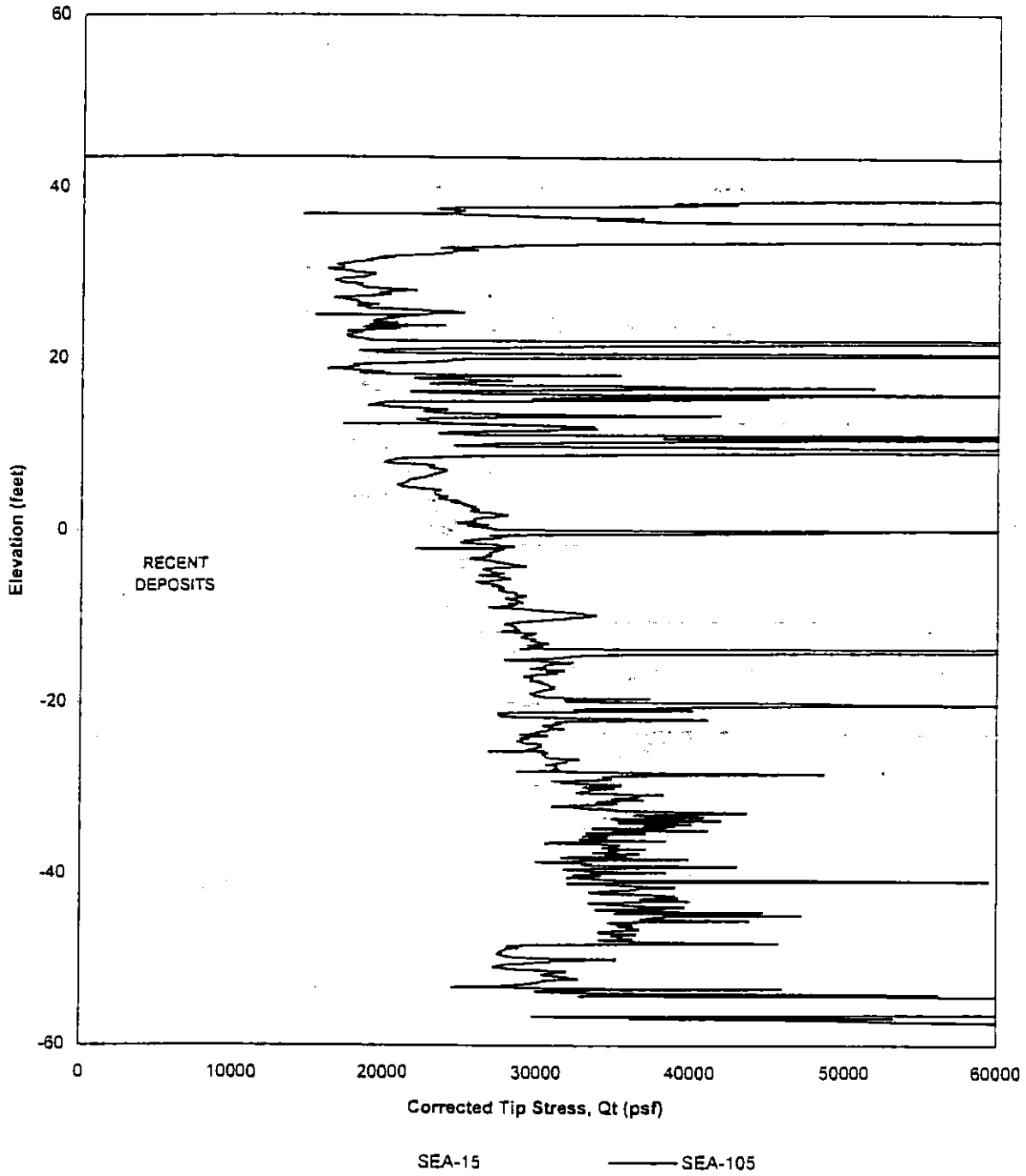


FIGURE 9
Tip Stress Ratio vs. Elevation SEA-104
Interior Dredge Soils and Recent Deposits
Below about 35 ft of Waste

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045



Corrected Tip Stress, Qt vs. Elevation for SEA-105
Perimeter Dike Soils and Recent Deposits
inside the Wick Drain Field

Schnabel Engineering

Cherry Island Landfill
Wilmington, DE
01151045

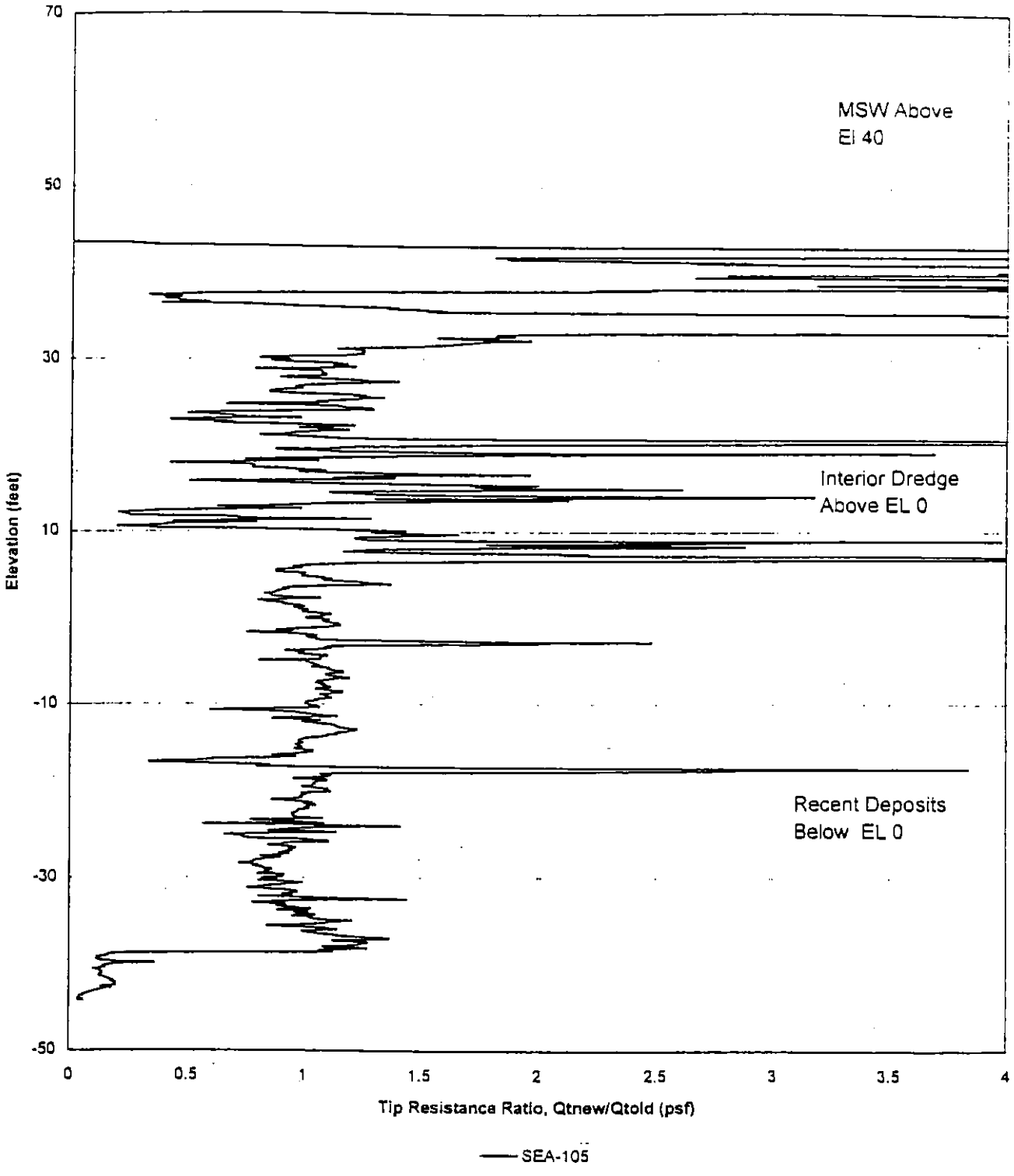


FIGURE 10
Tip Stress Ratio vs. Elevation SEA-105
Perimeter Dike Soils and Recent Deposits
Inside the Wick Drain Field

Schnabel Engineering

EXISTING VANE SHEAR TESTS

note : _ test date
calculate _ σ_v'

TABLE D-1-2

Summary of Field Vane Shear Data

Test Boring Number	Depth of Van Test (Ft.)	S (Field) (PSF)	Plasticity Index	Correction Factor	S (Design) (PSF)
G-1	13.5	408	25	0.94	384
	28.0	79	24*	0.94	74
G-2	18.5	408	21	0.97	396
	38.0	240	24*	0.94	226
GP-3	20.0	79	24	0.94	74
	35.0	23	26	0.93	21
GP-3A	18.5	340	24	0.94	320
	25.0	634	25	0.94	596
GP-4	18.5	566	29	0.92	521
	28.0	476	6	1.10	524
	38.0	589	6	1.10	648
GP-4A	11.5	385	27	0.92	354
GP-5	23.5	476	7	1.10	524
	33.5	227	38	0.85	193
	43.0	816	6	1.10	898
GP-5A	18.5	272	23	0.96	261
	26.5	54	38	0.85	46
GP-6A	20.5	295	46	0.80	236
GP-7	37.7	861	36	0.86	740
	48.5	915	8	1.09	997
GP-7A	16.5	326	40	0.84	274
	26.5	521	40	0.84	438
GP-8	33.0	462	23	0.95	439
	43.0	553	42	0.83	459
	58.5	816	14	1.04	849
GP-9	33.0	417	24	0.94	392
	43.5	748	19	0.99	741
	55.5	1201	21	0.97	1165
GP-9A	16.5	281	27	0.92	259
	26.5	521	24	0.94	490

Test Boring Number	Depth of Van Test (Ft.)	S (Field) (PSF)	Plasticity Index	Correction Factor	S (Design) (PSF)
G-10	8.5	204	9	1.08	220
	13.0	317	9	1.08	342
	18.0	181	9	1.08	195
	28.0	408	16	1.01	412
	38.5	249	16	1.01	251
GP-11	38.0	589	13	1.04	613
	48.0	1019	9	1.08	1101
G-12	48.0	Not Reported			
A-1	12.0	647	0	1.10	712
	27.5	3535	--	----	3535**
A-2	12.0	299	25	0.94	281
	27.0	568	24	0.94	534
A-2A	15.5	1394	25	0.94	1310
A-3	27.5	1593	25	0.94	1497
	32.5	1892	5	1.10	2081
A-4	24.5	1344	29	0.92	1236
	29.5	1394	17	1.01	1408
A-5A	21.5	2145	21	0.97	1208

23

* Assumed from data obtained at a comparable elevation.
** Fibrous Peat

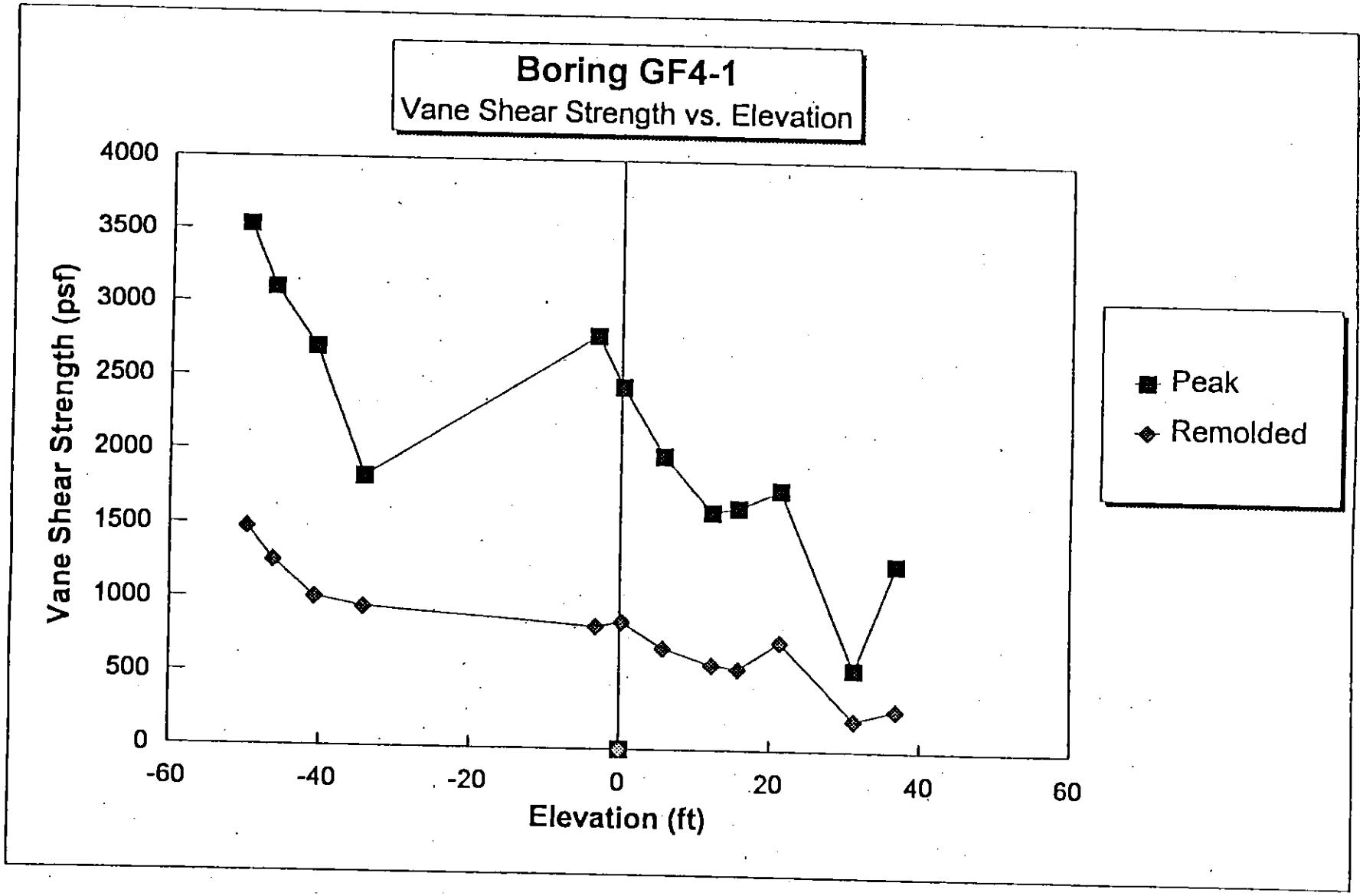
NOTES:

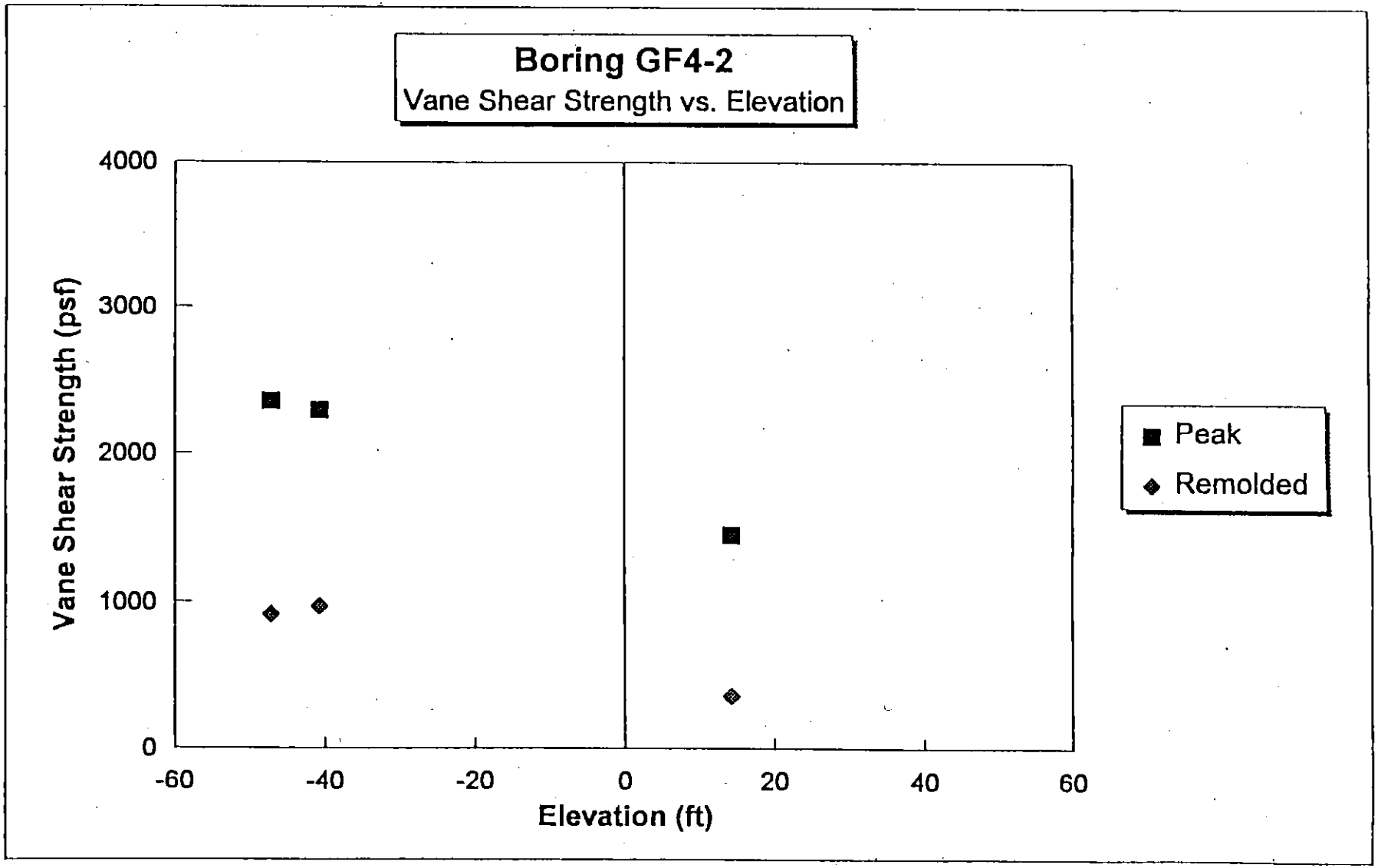
(1) S (Design) = S (Field) where S (Field) is field measured shear resistance, is a correction factor related to plasticity index.

(2) determined from Plasticity Index and chart presented by Bjerrum, "Specialty Conference on Performance of Earth and Earth Supported Structures", Vol. 2, 1972.

Vane Test Number	Applicable Friction Test Number	Vane Arm (IN)	Vane Diameter (IN)	Vane Coefficient k	Peak Vane Reading (LBS)	Uncorrected Torque (LBS-IN)	Friction Arm (IN)	Peak Friction Reading (LBS)	Friction Torque (LBS-IN)	Corrected Torque (LBS-IN)	Shear Strength (PSF)
PEAK VALUES											
GF4-1 V2	GF4-1 F2	12	3.625	0.905	149	1788	6	64	384	1404	1271
GF4-1 V3	GF4-1 F2	6	2	5.17	82	492	6	64	384	108	558
GF4-1 V5	GF4-1 F2	6	2	5.17	121	726	6	64	384	342	1768
GF4-1 V6	GF4-1 F3	6	2	5.17	107	642	6	54	324	318	1644
GF4-1 V7	GF4-1 F3	6	2	5.17	106	636	6	54	324	312	1613
GF4-1 V8	GF4-1 F3	6	2	5.17	118	708	6	54	324	384	1985
GF4-1 V9	GF4-1 F3	6	2	5.17	133	798	6	54	324	474	2451
GF4-1 V10	GF4-1 F3	6	2	5.17	144	864	6	54	324	540	2792
GF4-1 V16	GF4-1 F6	12	2	5.17	85	1020	6	111	666	354	1830
GF4-1 V17	GF4-1 F6	12	2	5.17	99	1188	6	111	666	522	2699
GF4-1 V18	GF4-1 F7	12	2	5.17	79	948	12	29	348	600	3102
GF4-1 V19	GF4-1 F7	12	2	5.17	86	1032	12	29	348	684	3536
GF4-2 V2	GF4-2 F1	12	2	5.17	42	504	12	18.5	222	282	1458
GF4-2 V13	GF4-2 F4	12	2	5.17	85	1020	12	48	576	444	2295
GF4-2 V14	GF4-2 F4	12	2	5.17	86	1032	12	48	578	456	2358
REMOLDED VALUES (1)											
GF4-1 V2	GF4-1 F2	12	3.625	0.905	33	396	6	64	85	311	281
GF4-1 V3	GF4-1 F2	6	2	5.17	31	186	6	64	145	41	211
GF4-1 V5	GF4-1 F2	6	2	5.17	50.5	303	6	64	160	143	738
GF4-1 V6	GF4-1 F3	6	2	5.17	36	216	6	54	109	107	553
GF4-1 V7	GF4-1 F3	6	2	5.17	38	228	6	54	116	112	578
GF4-1 V6	GF4-1 F3	6	2	5.17	41	246	6	54	113	133	690
GF4-1 V9	GF4-1 F3	6	2	5.17	47	282	6	54	114	168	866
GF4-1 V10	GF4-1 F3	6	2	5.17	43	258	6	54	97	161	834
GF4-1 V16	GF4-1 F6	6	2	5.17	88	528	6	111	345	183	947
GF4-1 V17	GF4-1 F6	12	2	5.17	37	444	6	111	249	195	1009
GF4-1 V18	GF4-1 F7	12	2	5.17	32	384	12	29	141	243	1257
GF4-1 V19	GF4-1 F7	12	2	5.17	36	432	12	29	146	286	1480
GF4-2 V2	GF4-2 F1	12	2	5.17	10.5	126	12	18.5	56	71	364
GF4-2 V13	GF4-2 F4	12	2	5.17	36	432	12	48	244	188	972
GF4-2 V14	GF4-2 F4	12	2	5.17	33.5	402	12	48	224	178	918

(1) Remolded Friction torque values are calculated as: (remolded uncorrected torque/peak uncorrected torque)* peak friction torque.
The direct values of friction arm*friction reading were not used because they resulted in very high friction values that resulted in calculation of negative shear strength values.


Boring GF4-1
Vane Shear Strength vs. Elevation
Vane Shear Strength (psf)
4000
3500
3000
2500
2000
1500
1000
500
0
-60
-40
-20
0
20
40
60
Elevation (ft)
Peak
Remolded


Boring GF4-2
Vane Shear Strength vs. Elevation
Vane Shear Strength (psf)
4000
3000
2000
1000
0
-60
-40
-20
0
20
40
60
Elevation (ft)
Peak
Remolded

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 20, 1998

BORING NUMBER:	B-12	TEST NUMBER:	VANE #1
GROUND SURFACE EL.:	25	VANE DIAMETER (in):	3.625
DEPTH TO VANE TIP (ft):	11	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 2.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	58	Time to Failure (min):	3
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	15

REMOLDED TEST:

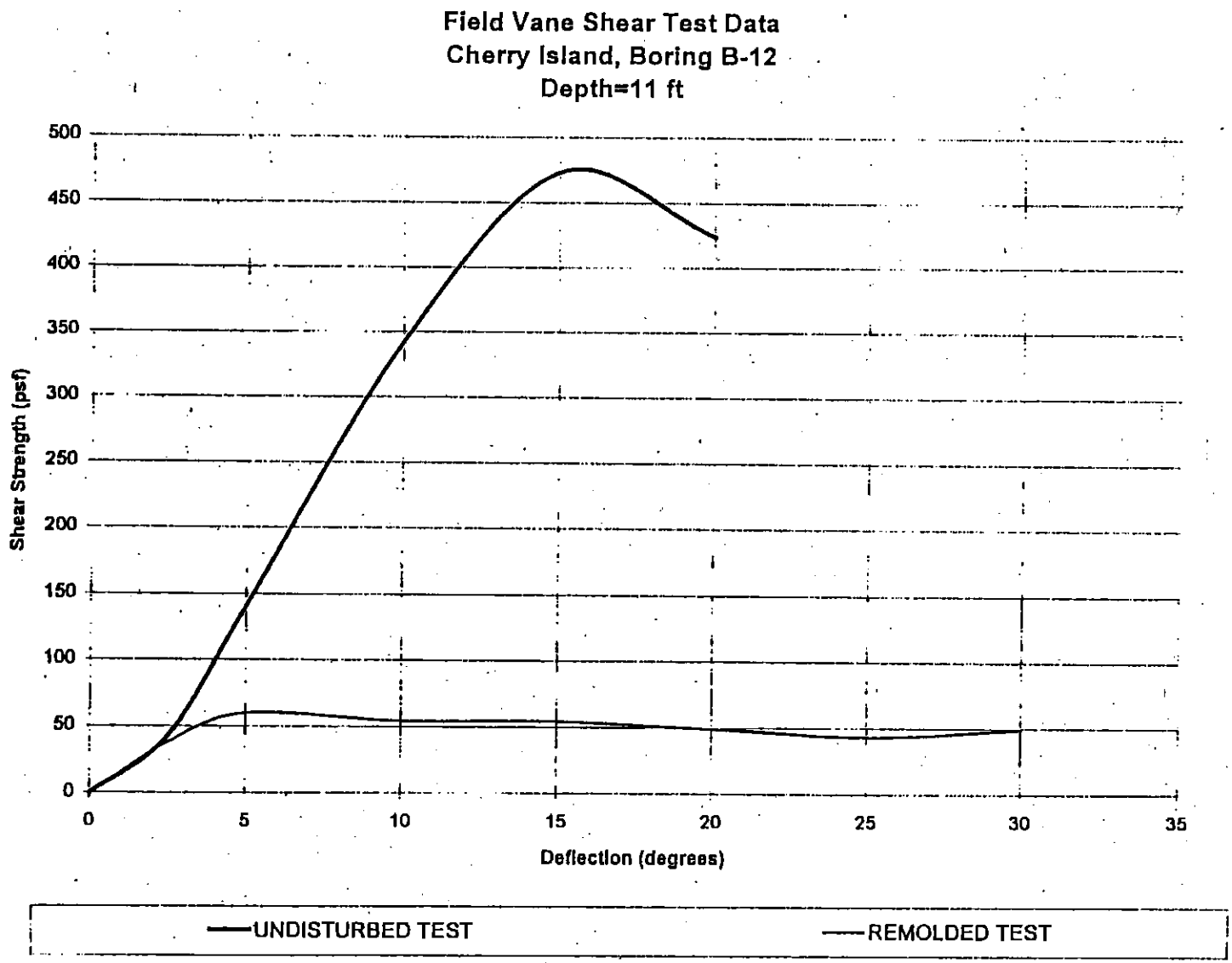
Maximum Torque (ft x lb):	11	Time to Failure (min):	12
Ave. Shear Rate (deg/sec):	0.09	Deflect. at Failure (deg):	63

Friction Correction (ft x lb):	14.5	from undisturbed friction test at 15 feet
	6	from remolded friction test at 15 feet

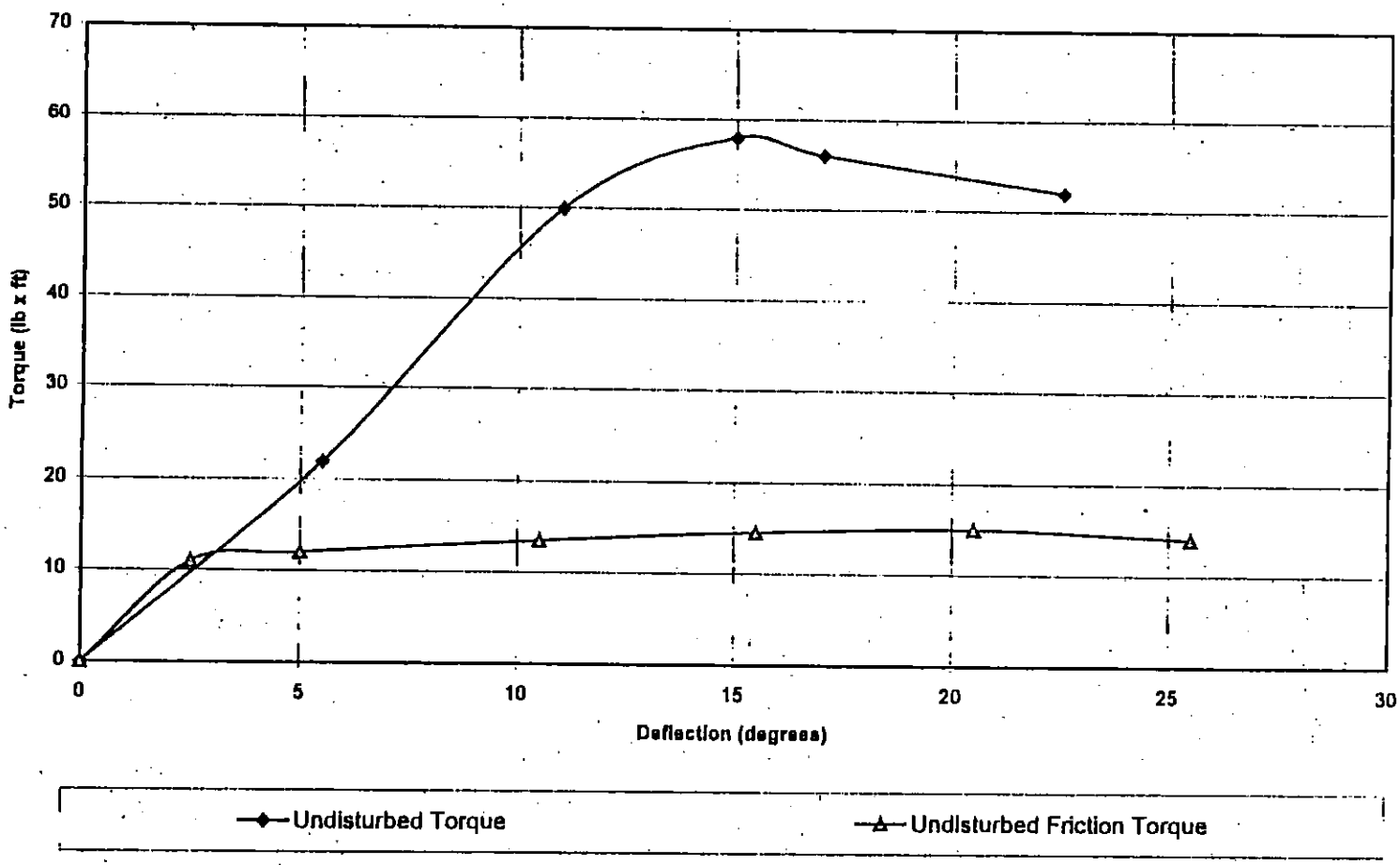
UNDISTURBED TEST:
Undrained Shear Strength: 470 psf

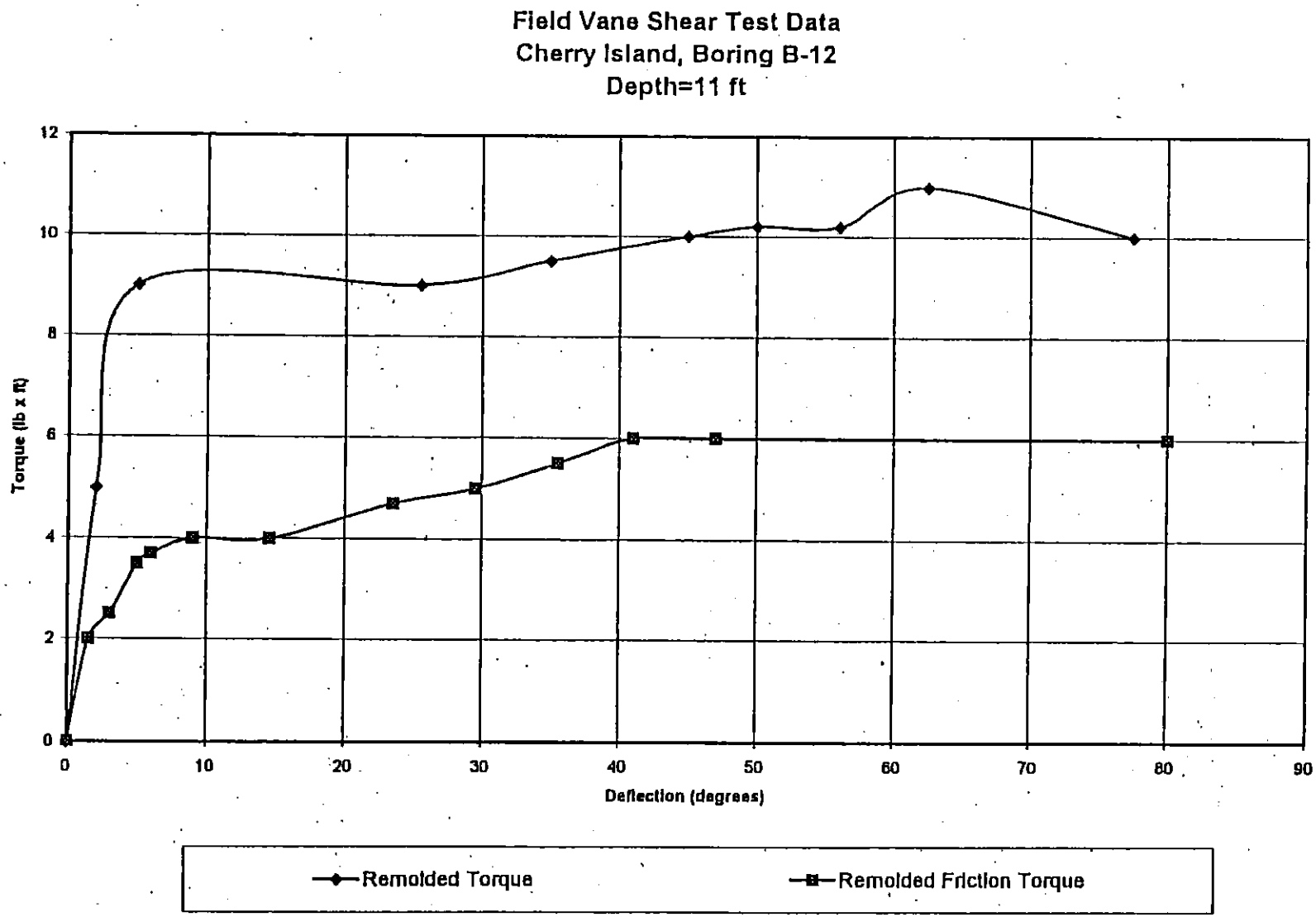
REMOLDED TEST:
Undrained Shear Strength: 50 psf

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=11 ft
Shear Strength (psf)
500
450
400
350
300
250
200
150
100
50
0
0
5
10
15
20
25
30
35
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=11 ft




Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=11 ft
Torque (lb x ft)
0
2
4
6
8
10
12
0
10
20
30
40
50
60
70
80
90
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 20, 1998

BORING NUMBER:	B-12	TEST NUMBER:	VANE #2
GROUND SURFACE EL.:	25	VANE DIAMETER (in):	3.625
DEPTH TO VANE TIP (ft):	20	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 2.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	72	Time to Failure (min):	6
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	31

REMOLDED TEST:

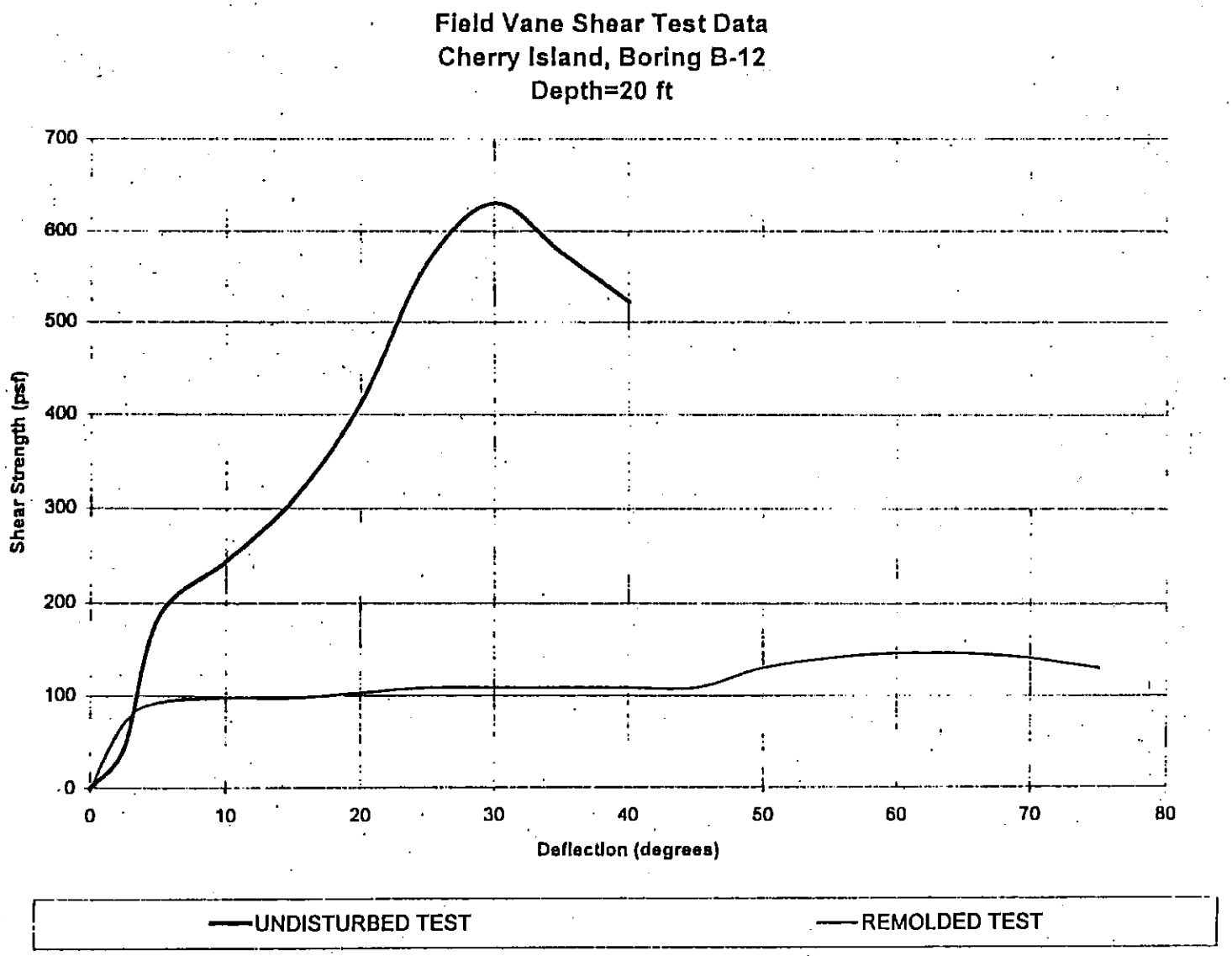
Maximum Torque (ft x lb):	19.5	Time to Failure (min):	12
Ave. Shear Rate (deg/sec):	0.09	Deflect. at Failure (deg):	63

Friction Correction (ft x lb):	14.5	from undisturbed friction test at 15 feet
	6	from remolded friction test at 15 feet

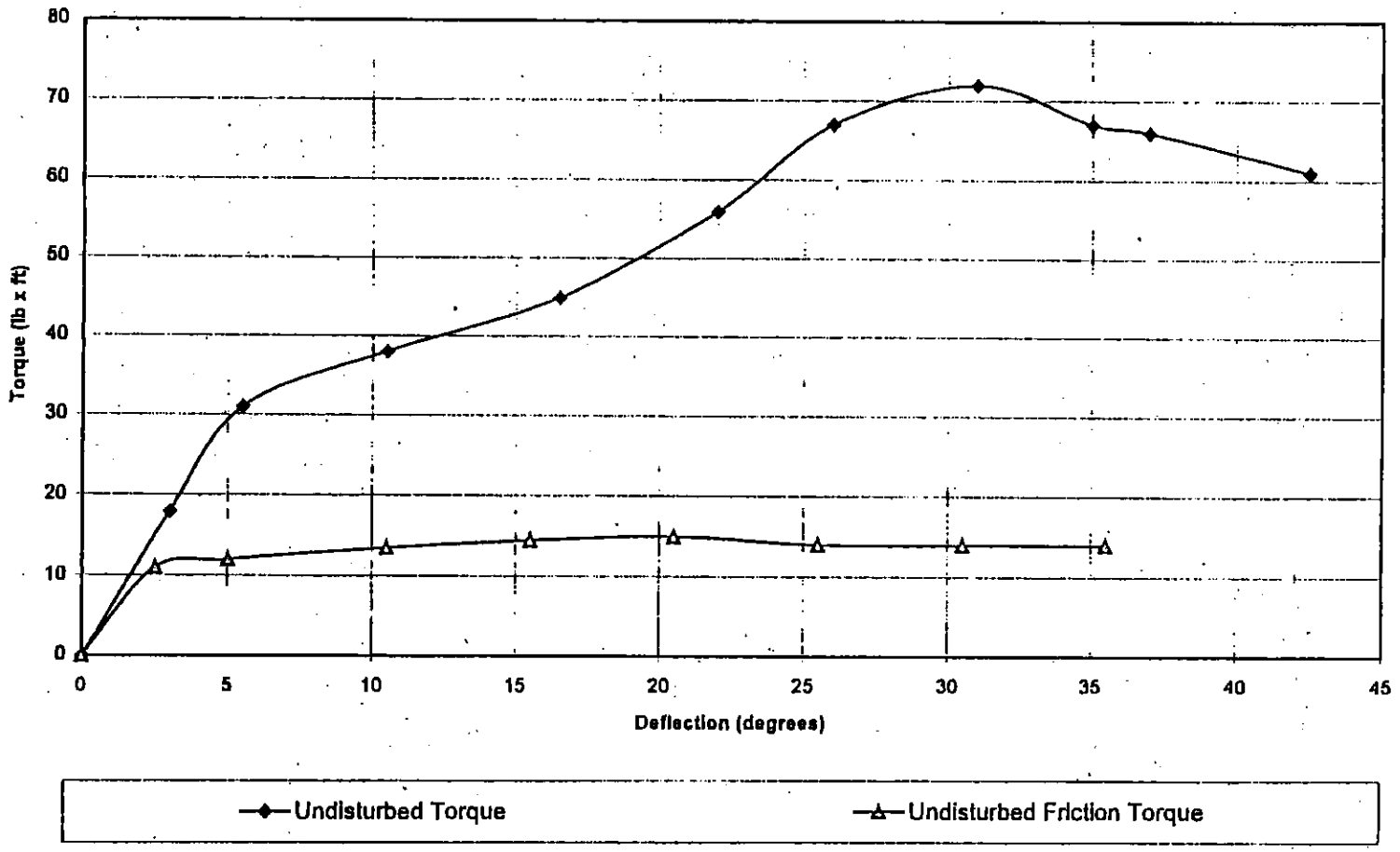
UNDISTURBED TEST:
Undrained Shear Strength: 630 psf

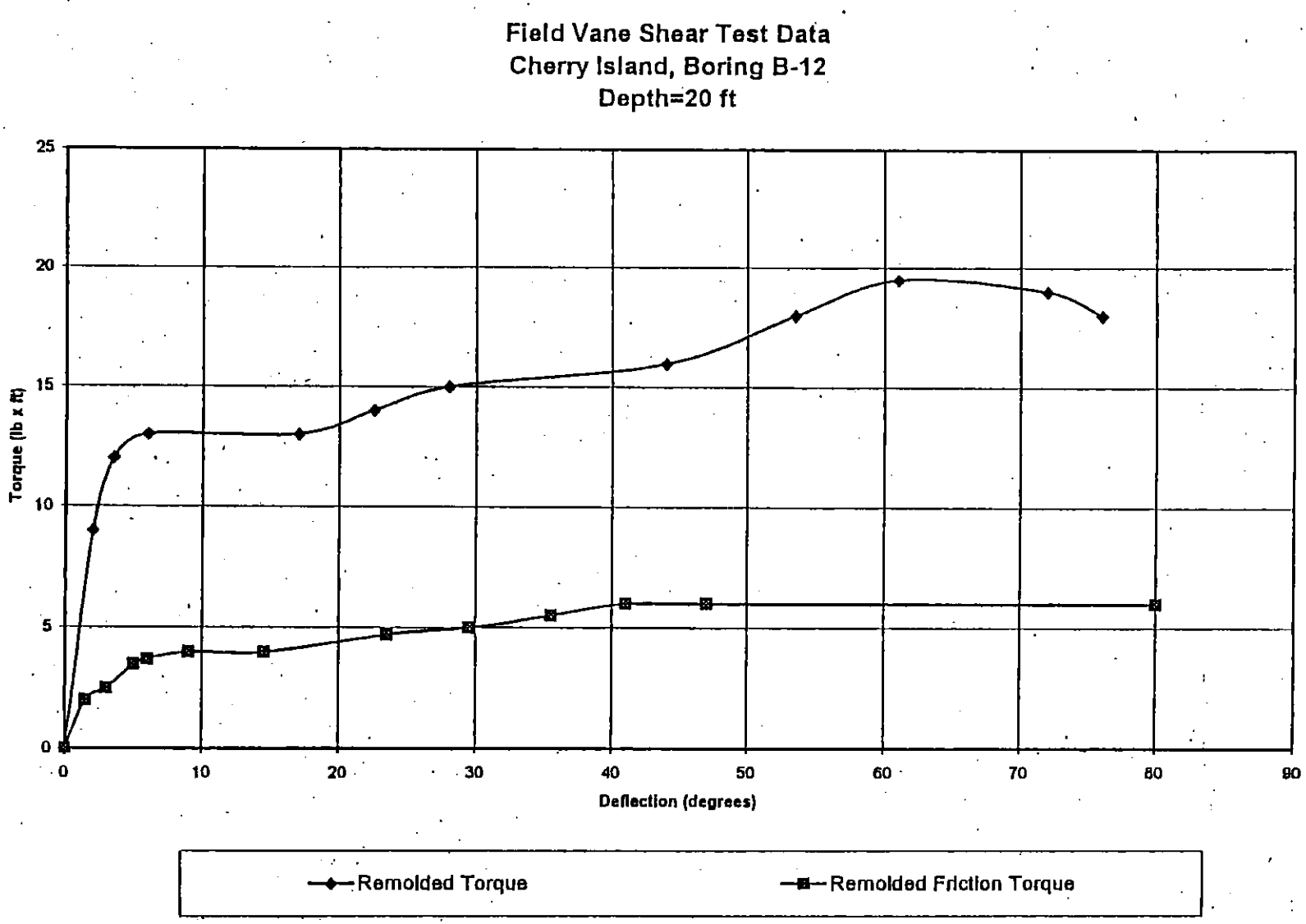
REMOLDED TEST:
Undrained Shear Strength: 150 psf

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=20 ft
Shear Strength (psf)
700
600
500
400
300
200
100
0
0
10
20
30
40
50
60
70
80
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=20 ft




Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=20 ft
Torque (lb x ft)
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
90
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 20, 1998

BORING NUMBER:	B-12	TEST NUMBER:	VANE #3
GROUND SURFACE EL.:	25	VANE DIAMETER (in):	3.625
DEPTH TO VANE TIP (ft):	25	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 2.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	94	Time to Failure (min):	7
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	36

REMOLDED TEST:

Maximum Torque (ft x lb):	29	Time to Failure (min):	12
Ave. Shear Rate (deg/sec):	0.09	Deflect. at Failure (deg):	60

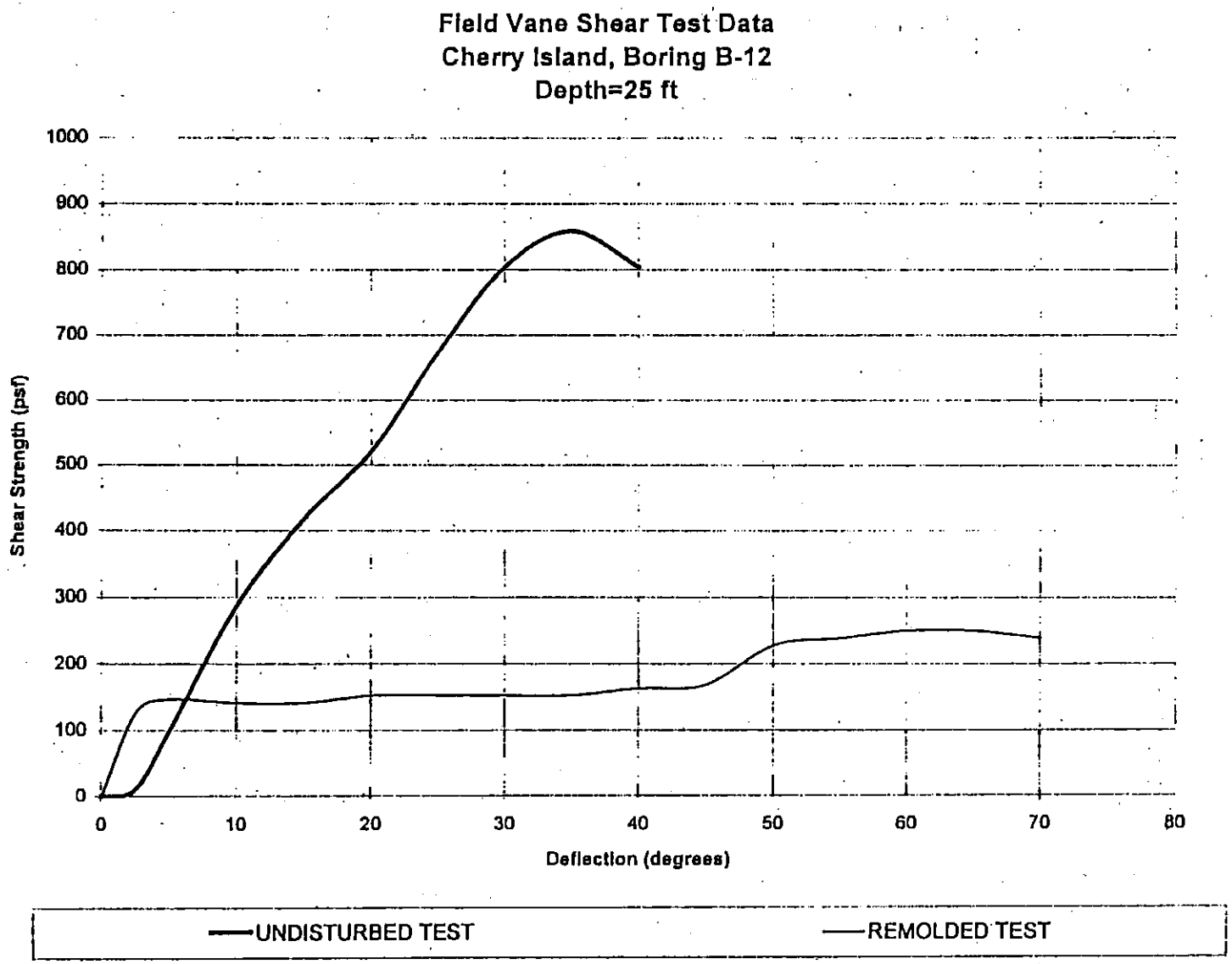
Friction Correction (ft x lb):	14.5	from undisturbed friction test at 15 feet
	6	from remolded friction test at 15 feet

UNDISTURBED TEST:
Undrained Shear Strength: 860 psf

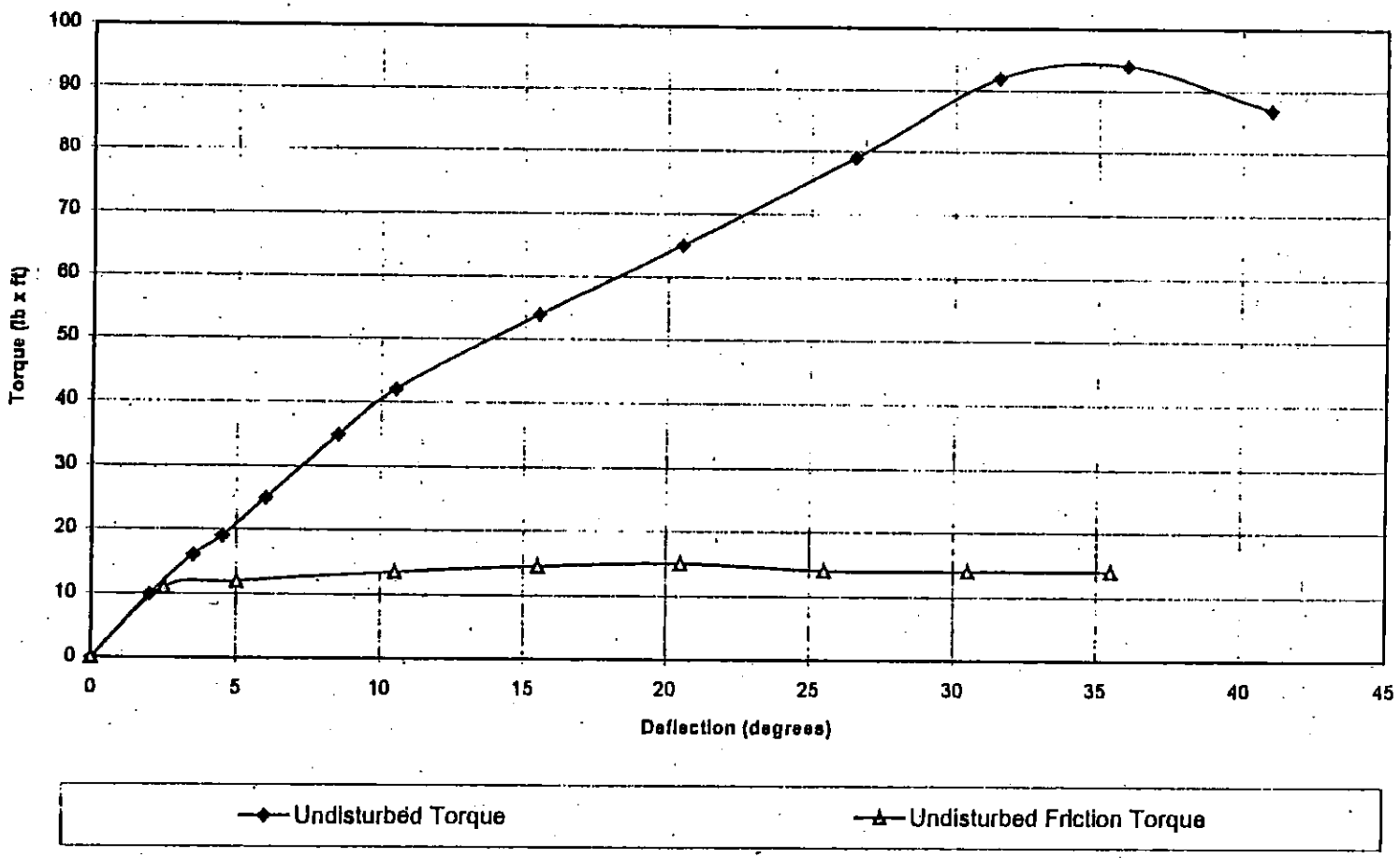
REMOLDED TEST:
Undrained Shear Strength: 250 psf

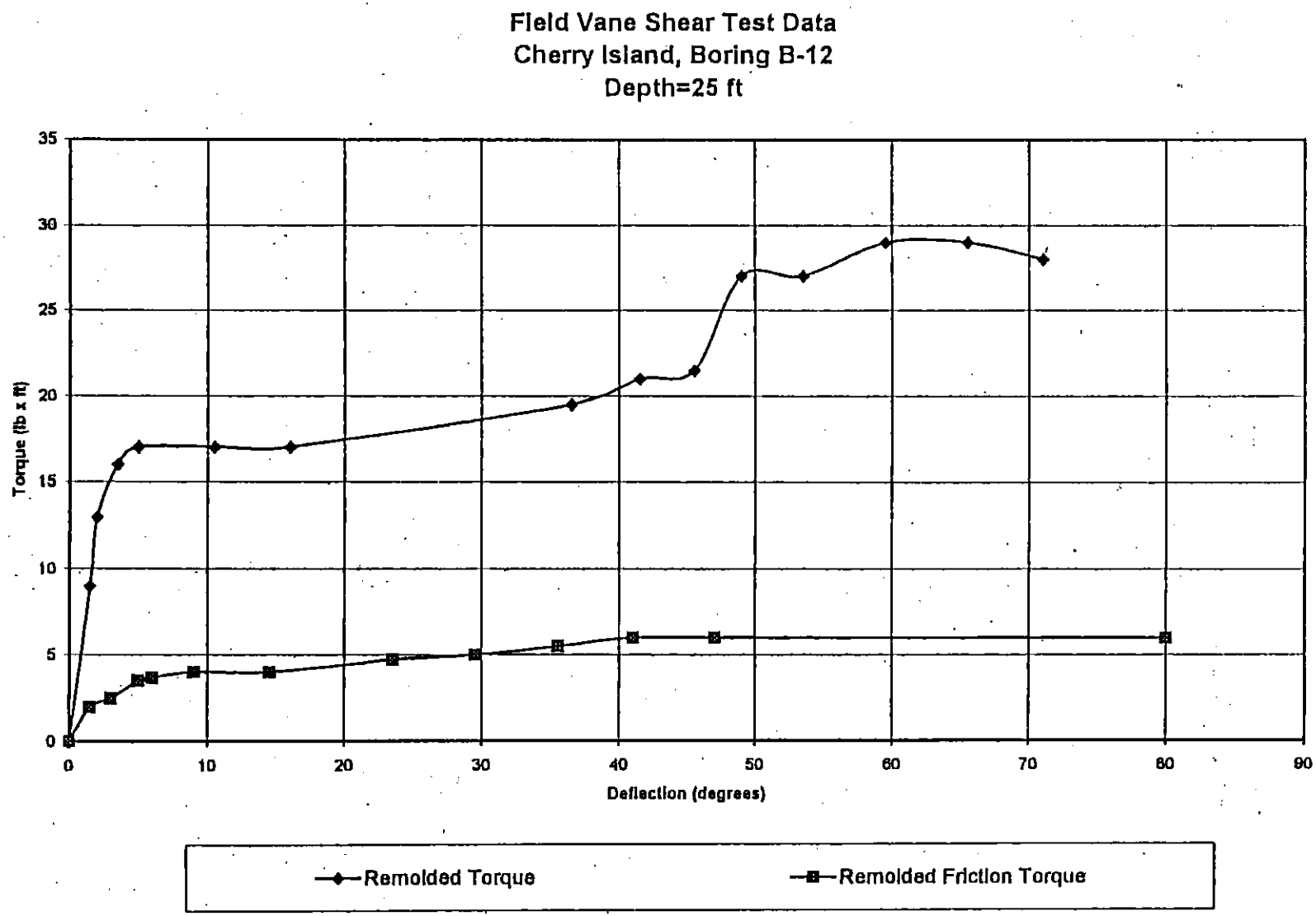
Comments: wood fragments on vane after test

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=25 ft
Shear Strength (psf)
1000
900
800
700
600
500
400
300
200
100
0
0
10
20
30
40
50
60
70
80
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=25 ft




Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=25 ft
Torque (lb x ft)
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
90
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 20, 1998

BORING NUMBER:	B-12	TEST NUMBER:	VANE #4
GROUND SURFACE EL.:	25	VANE DIAMETER (in):	3.625
DEPTH TO VANE TIP (ft):	45	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 2.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	105.5	Time to Failure (min):	6
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	31

REMOLDED TEST:

Maximum Torque (ft x lb):	18.5	Time to Failure (min):	16
Ave. Shear Rate (deg/sec):	0.09	Deflect. at Failure (deg):	89

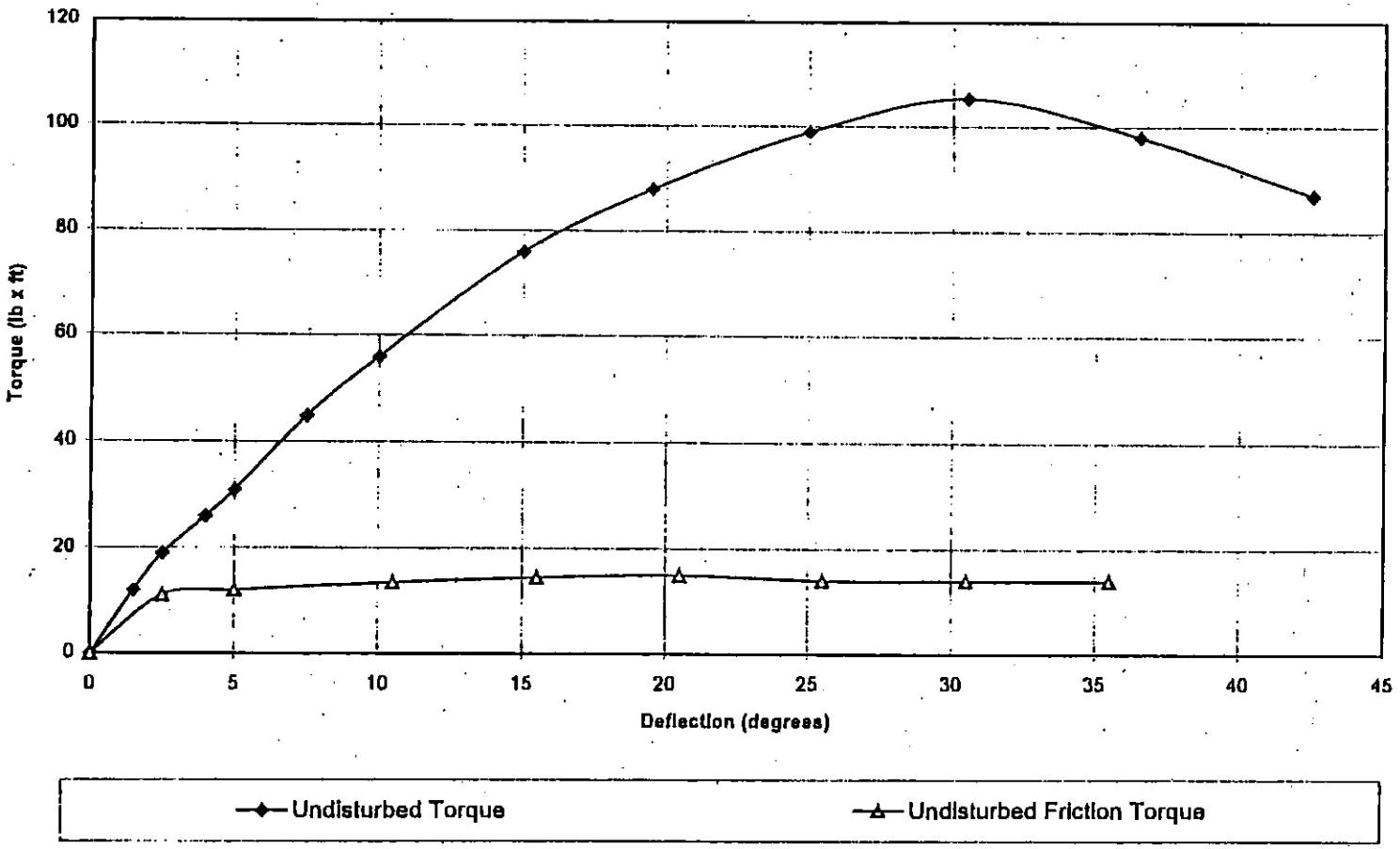
Friction Correction (ft x lb):	14.5	from undisturbed friction test at 15 feet
	6	from remolded friction test at 15 feet

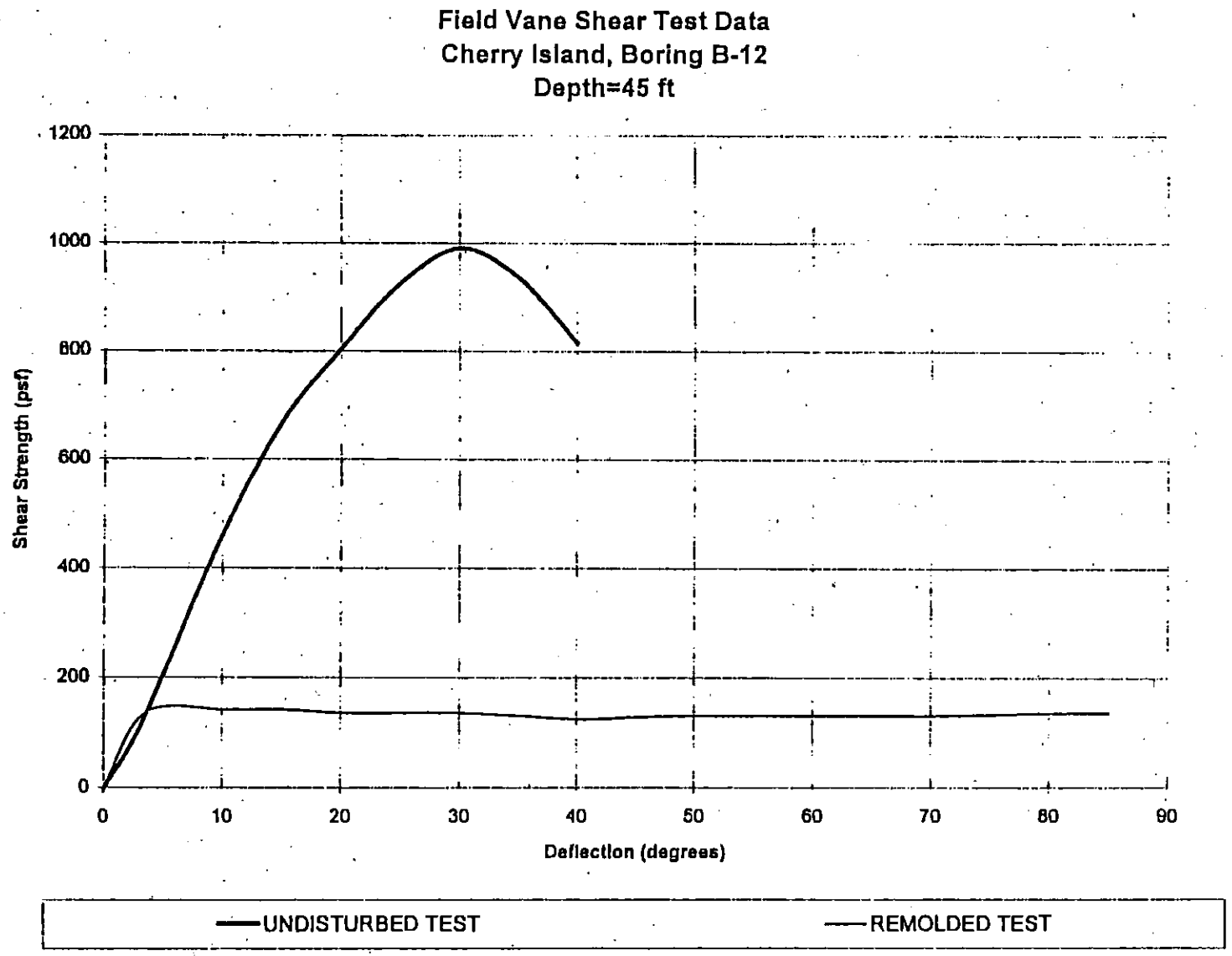
UNDISTURBED TEST:
Undrained Shear Strength: 990 psf

REMOLDED TEST:
Undrained Shear Strength: 140 psf

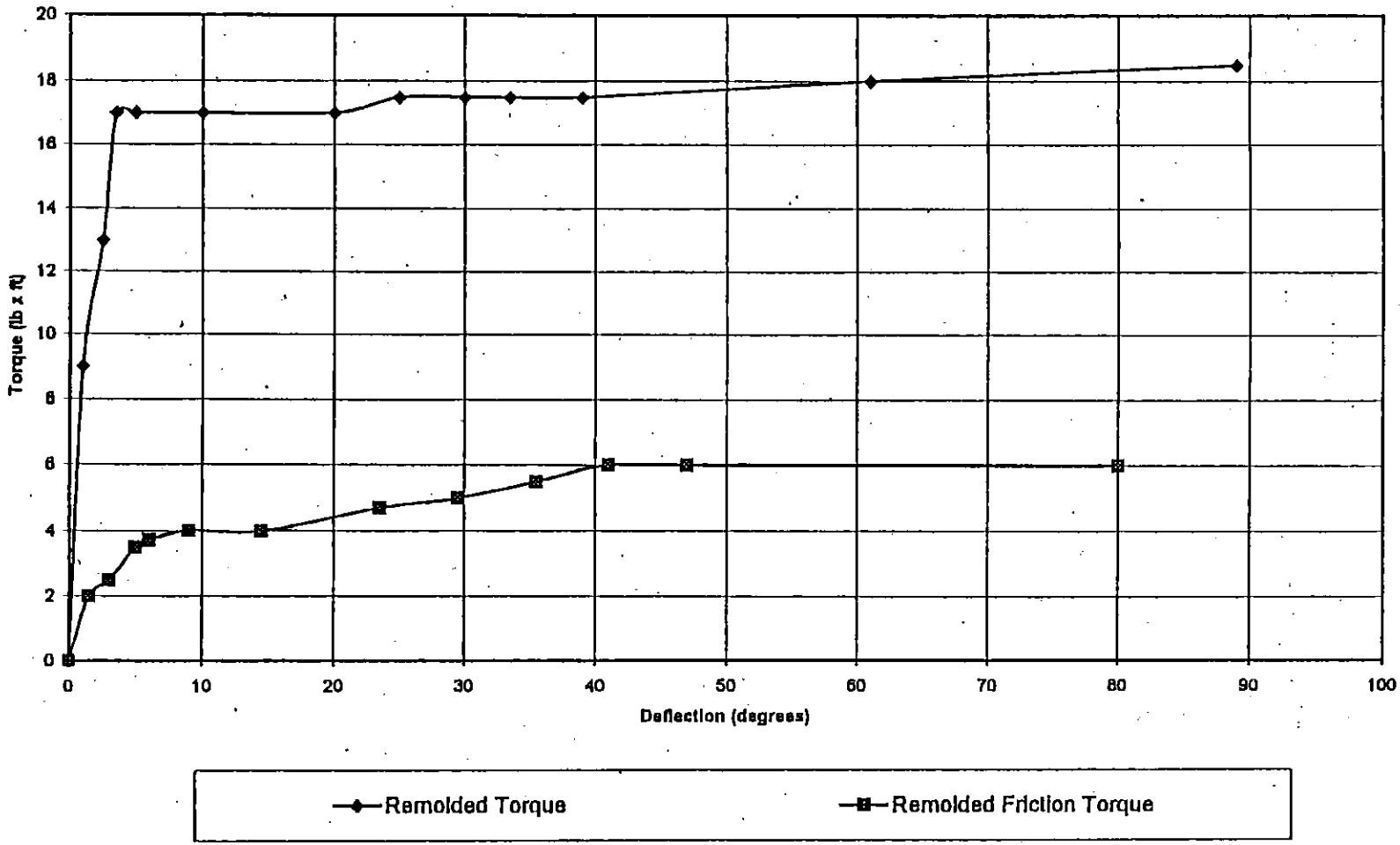
Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden

Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=45 ft




Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=45 ft
Shear Strength (psf)
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
70
80
90
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=45 ft



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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 21, 1998

BORING NUMBER:	B-12	TEST NUMBER:	VANE #5
GROUND SURFACE EL.:	25	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	64	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth. A non-housed vane was pushed to 2.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	87	Time to Failure (min):	10.5
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	55

REMOLDED TEST:

Maximum Torque (ft x lb):	39.5	Time to Failure (min):	16
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	55

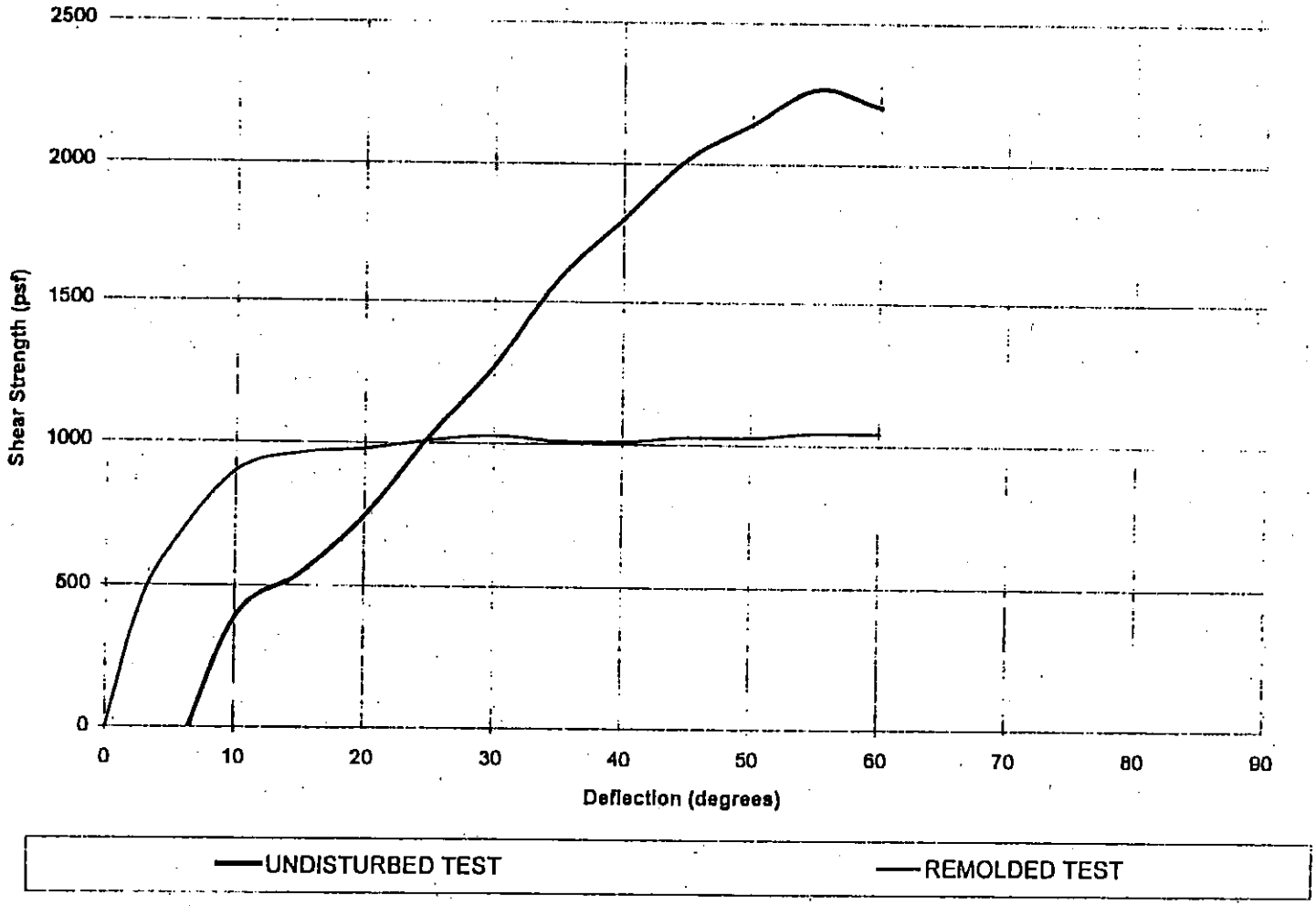
Friction Correction (ft x lb):	14.5	from undisturbed friction test at 15 feet
	6	from remolded friction test at 15 feet

UNDISTURBED TEST:
Undrained Shear Strength: 2250 psf

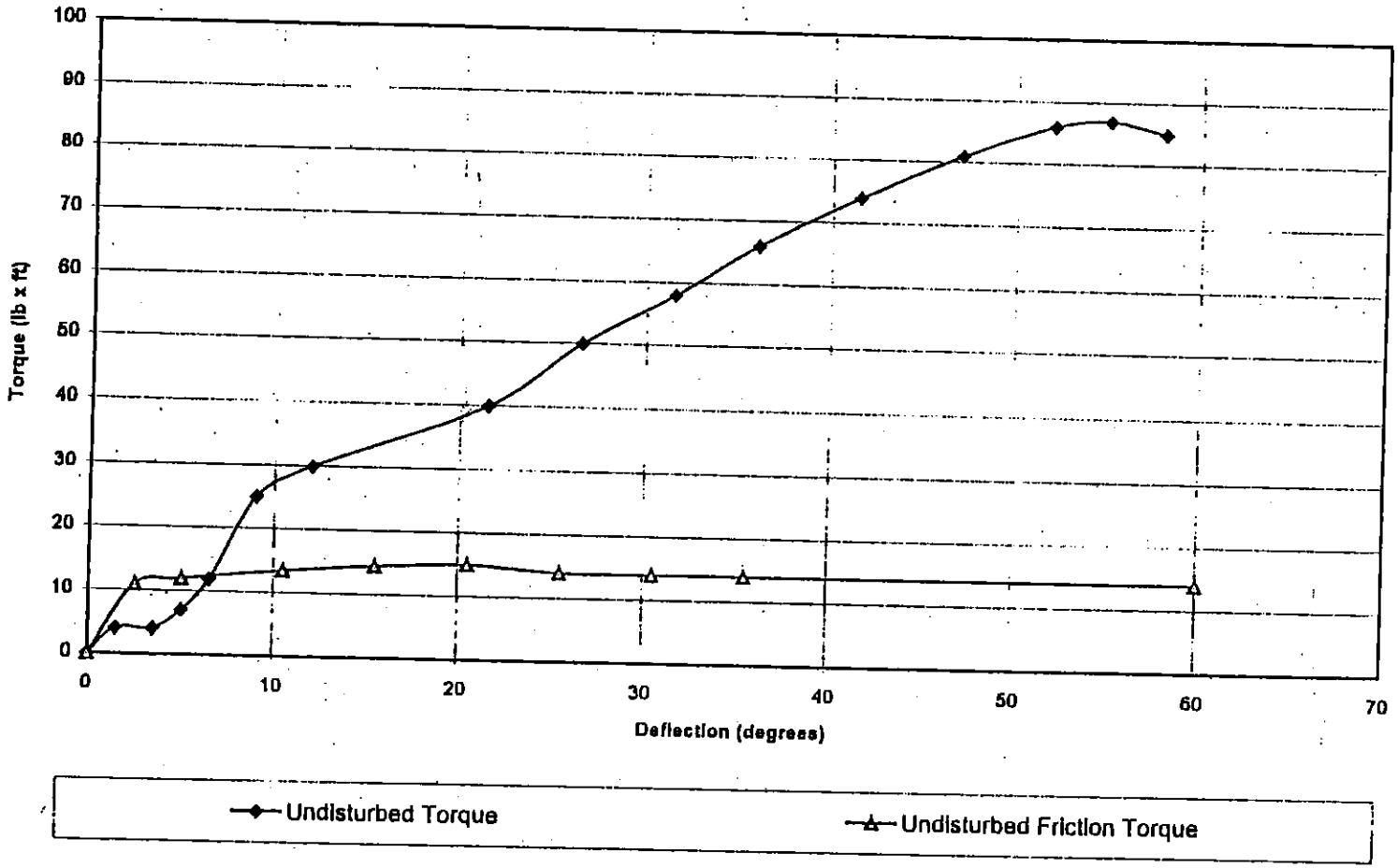
REMOLDED TEST:
Undrained Shear Strength: 1040 psf

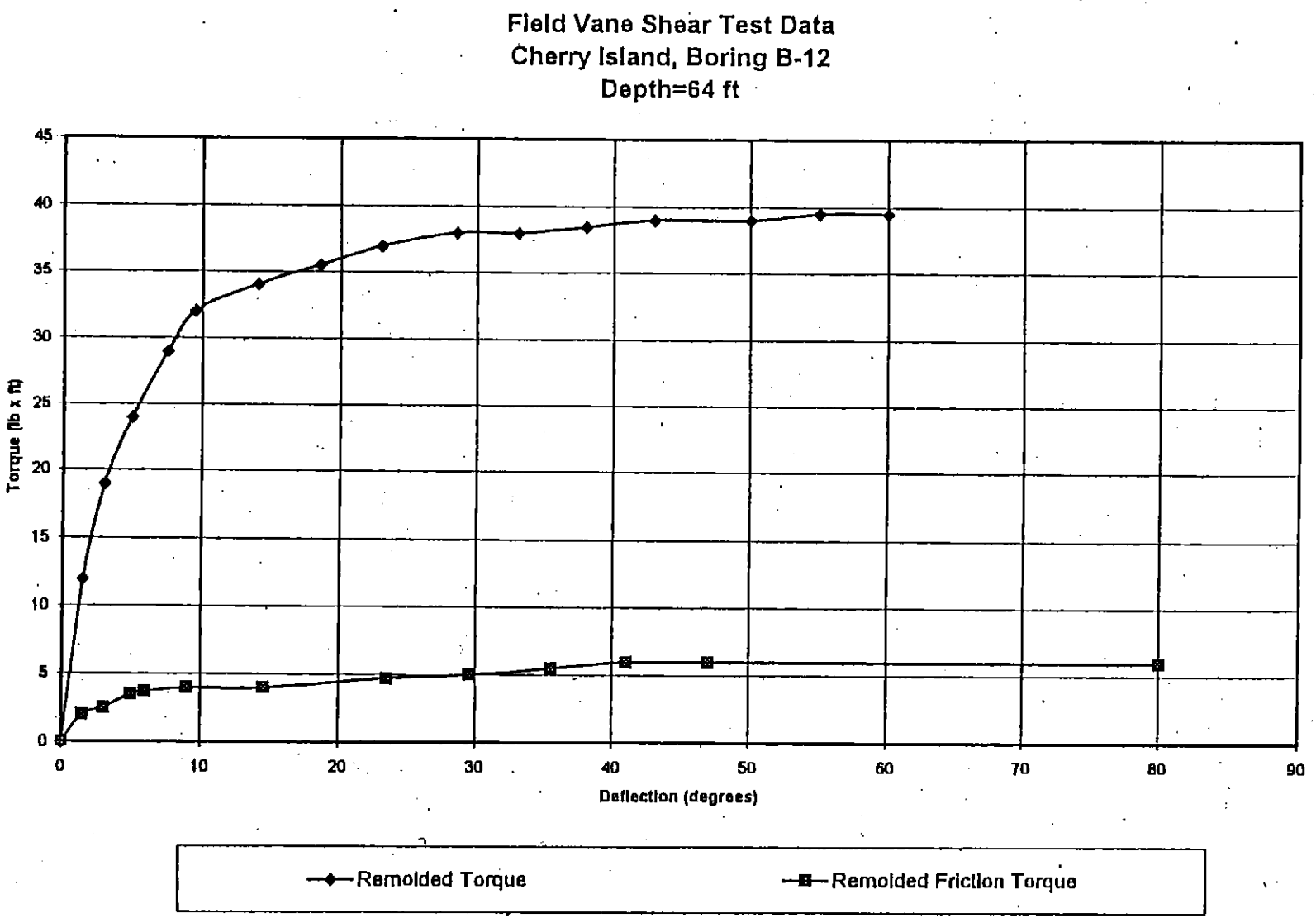
Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden

Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=64 ft



Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=64 ft




Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=64 ft
Torque (lb x ft)
45
40
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
90
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 21, 1998

BORING NUMBER:	B-12	TEST NUMBER:	VANE #6
GROUND SURFACE EL.:	25	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	68	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth. A non-housed vane was pushed to 2.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	144	Time to Failure (min):	16
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	93

REMOLDED TEST:

Maximum Torque (ft x lb):	50	Time to Failure (min):	10
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	57

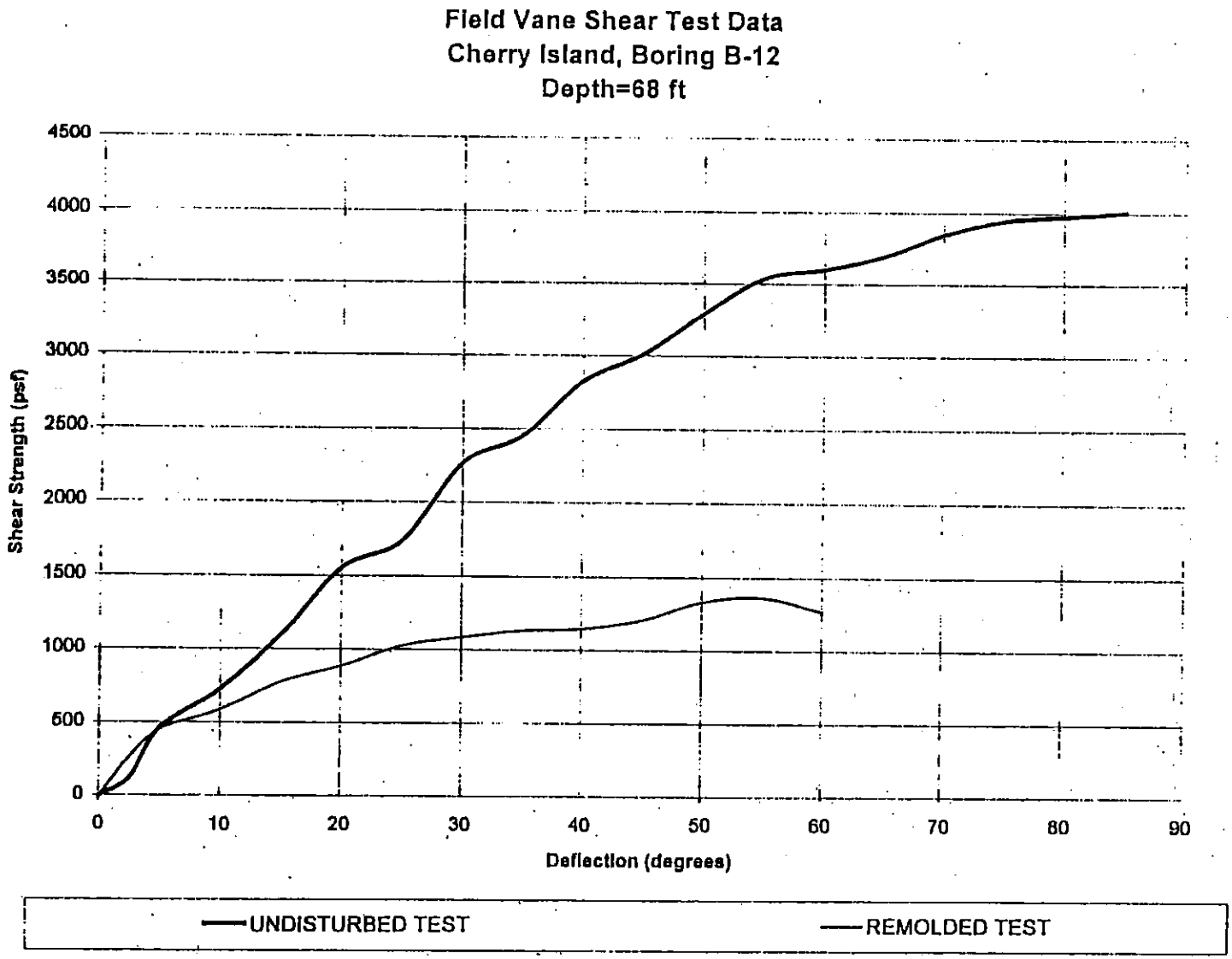
Friction Correction (ft x lb):	14.5	from undisturbed friction test at 15 feet
	6	from remolded friction test at 15 feet

UNDISTURBED TEST:
Undrained Shear Strength: 4030 psf*

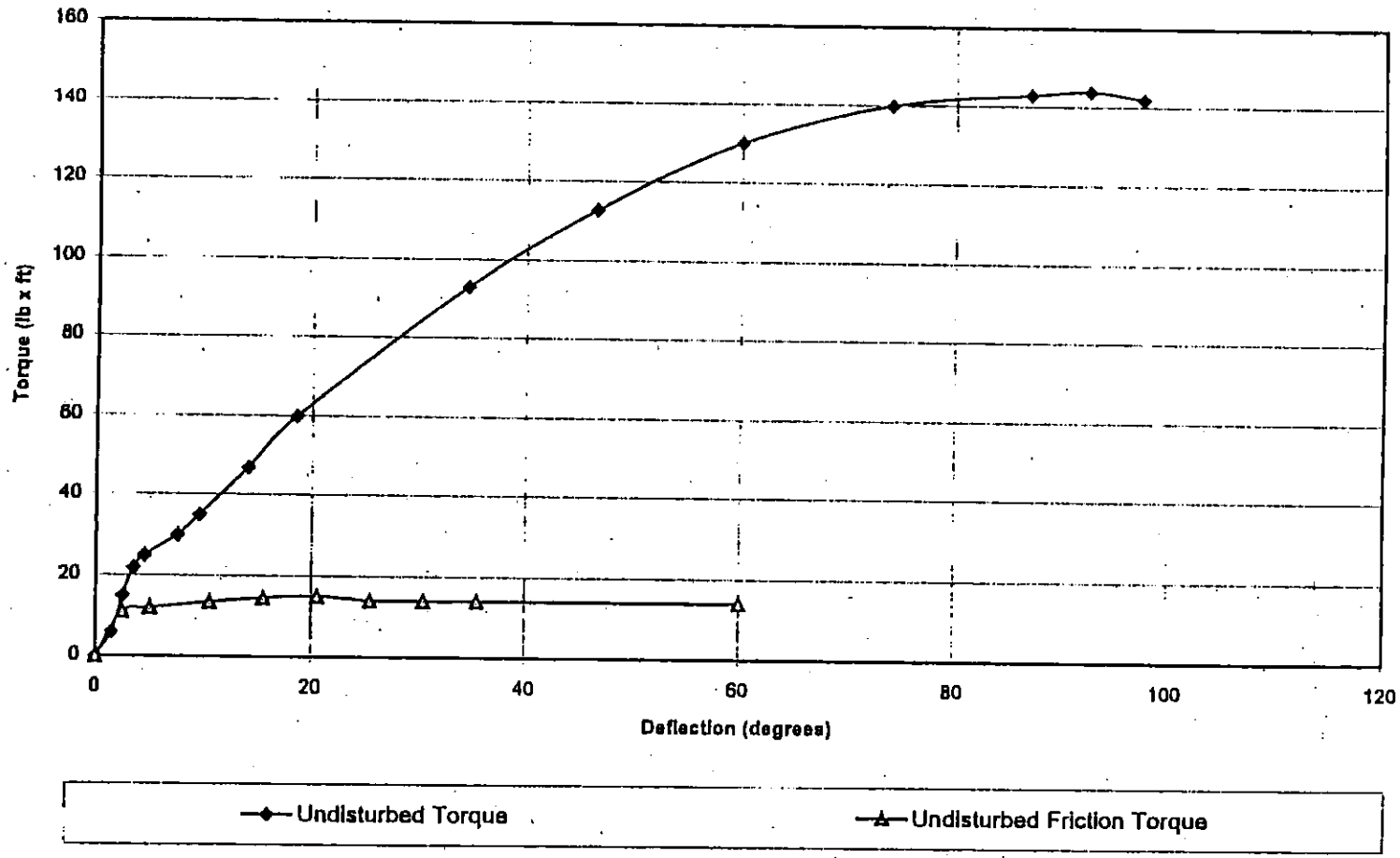
REMOLDED TEST:
Undrained Shear Strength: 1370 psf*

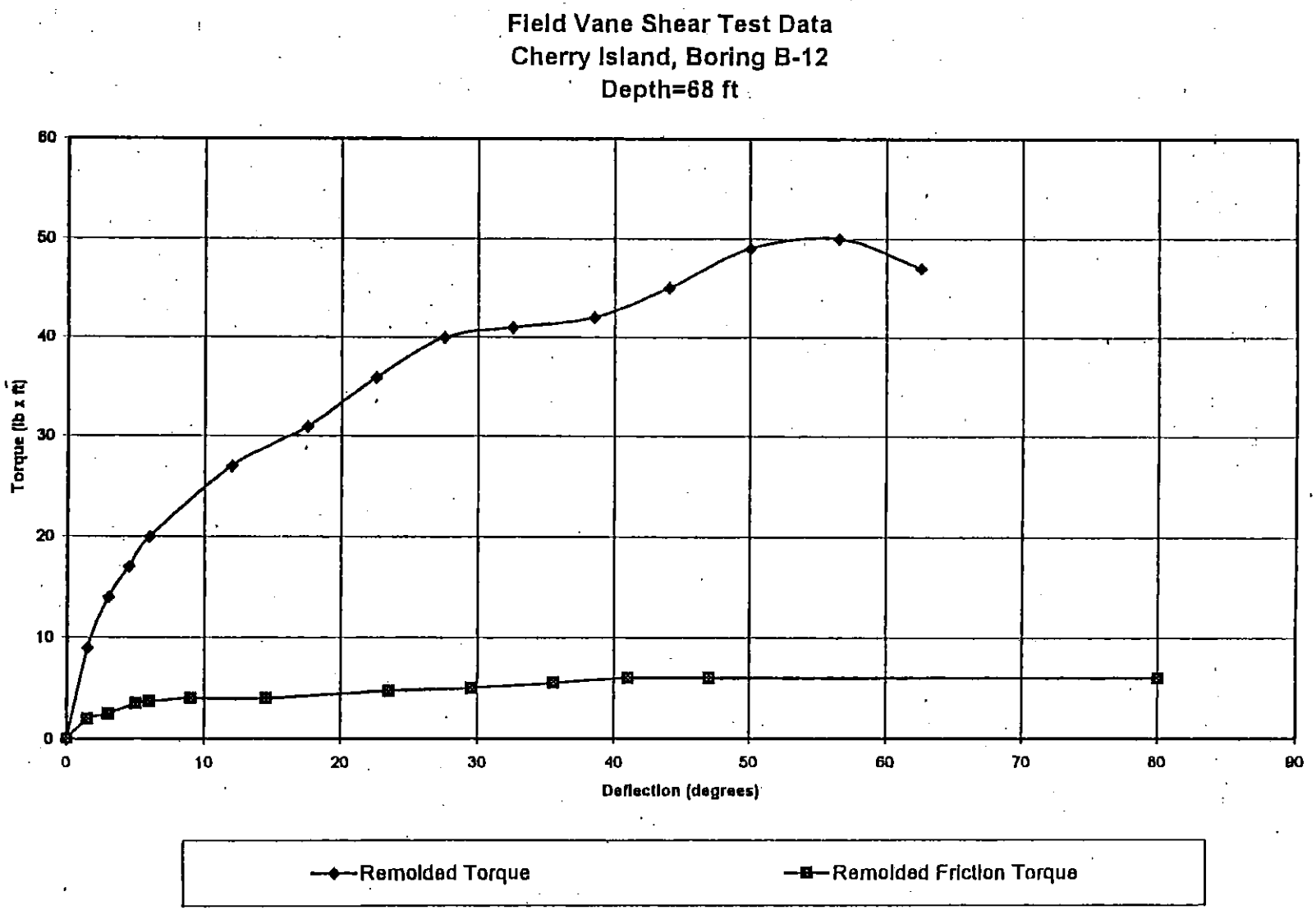
* Vane was crushed and sand and gravel was observed on the vane when extracted.

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=68 ft
Shear Strength (psf)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60
70
80
90
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=68 ft




Field Vane Shear Test Data
Cherry Island, Boring B-12
Depth=68 ft
Torque (lb x ft)
Deflection (degrees)
0
10
20
30
40
50
60
70
80
90
Remolded Torque
Remolded Friction Torque

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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 24, 1998

BORING NUMBER:	B-14	TEST NUMBER:	VANE #1
GROUND SURFACE EL.:	50	VANE DIAMETER (in):	3.625
DEPTH TO VANE TIP (ft):	20	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 2.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	95	Time to Failure (min):	8
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	37

REMOLDED TEST:

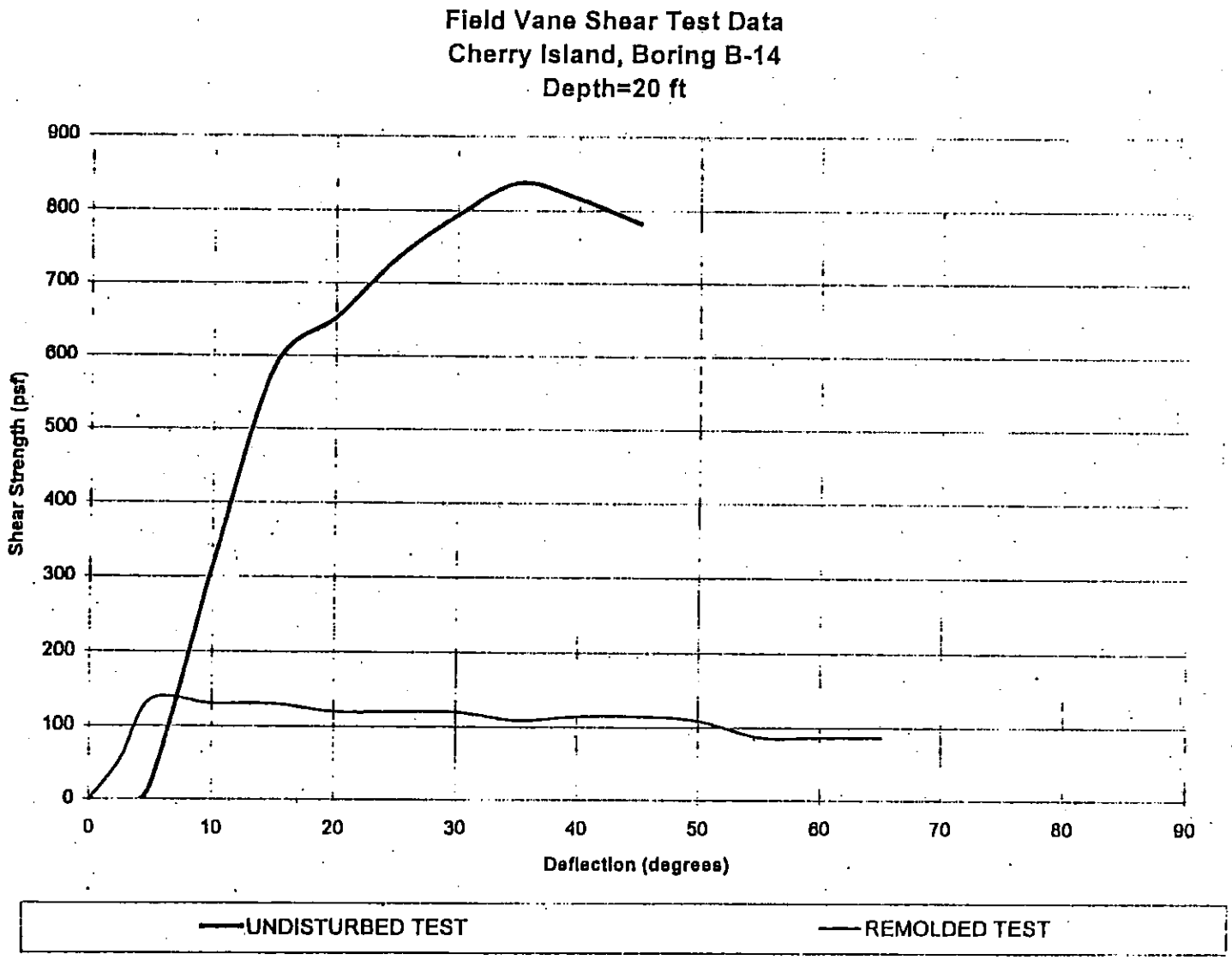
Maximum Torque (ft x lb):	19	Time to Failure (min):	8
Ave. Shear Rate (deg/sec):	0.11	Deflect. at Failure (deg):	53

Friction Correction (ft x lb):	18	from undisturbed friction test at 30 feet
	11	from remolded friction test at 30 feet

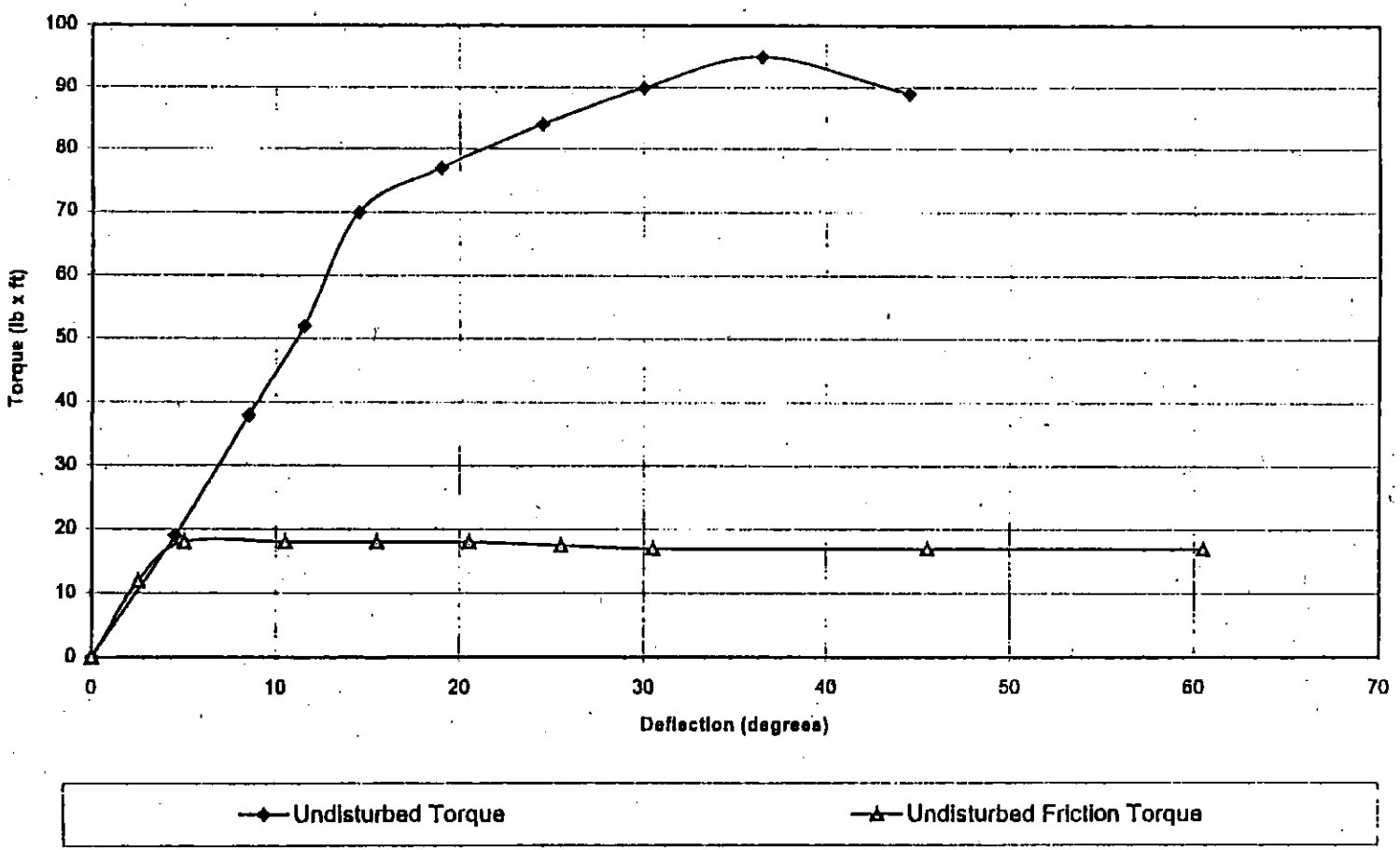
UNDISTURBED TEST:
Undrained Shear Strength: 840 psf

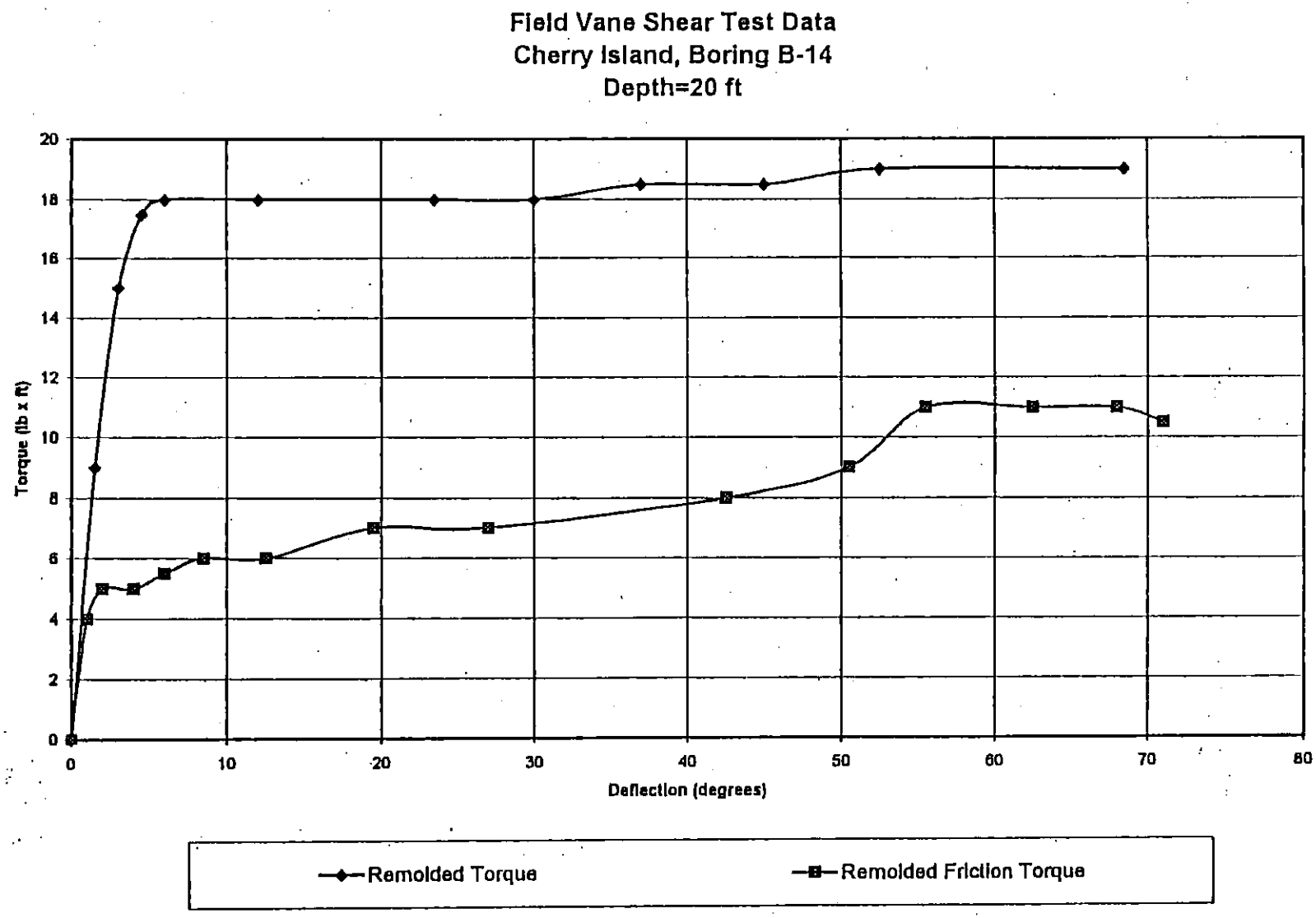
REMOLDED TEST:
Undrained Shear Strength: 140 psf

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=20 ft
Shear Strength (psf)
900
800
700
600
500
400
300
200
100
0
0
10
20
30
40
50
60
70
80
90
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=20 ft




Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=20 ft
Torque (lb x ft)
0
2
4
6
8
10
12
14
16
18
20
0
10
20
30
40
50
60
70
80
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 24, 1998

BORING NUMBER:	B-14	TEST NUMBER:	VANE #2
GROUND SURFACE EL.:	50	VANE DIAMETER (in):	3.625
DEPTH TO VANE TIP (ft):	25	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth. A non-housed vane was pushed to 2.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	115	Time to Failure (min):	6
Ave. Shear Rate (deg/sec):	0.09	Deflect. at Failure (deg):	32

REMOLDED TEST:

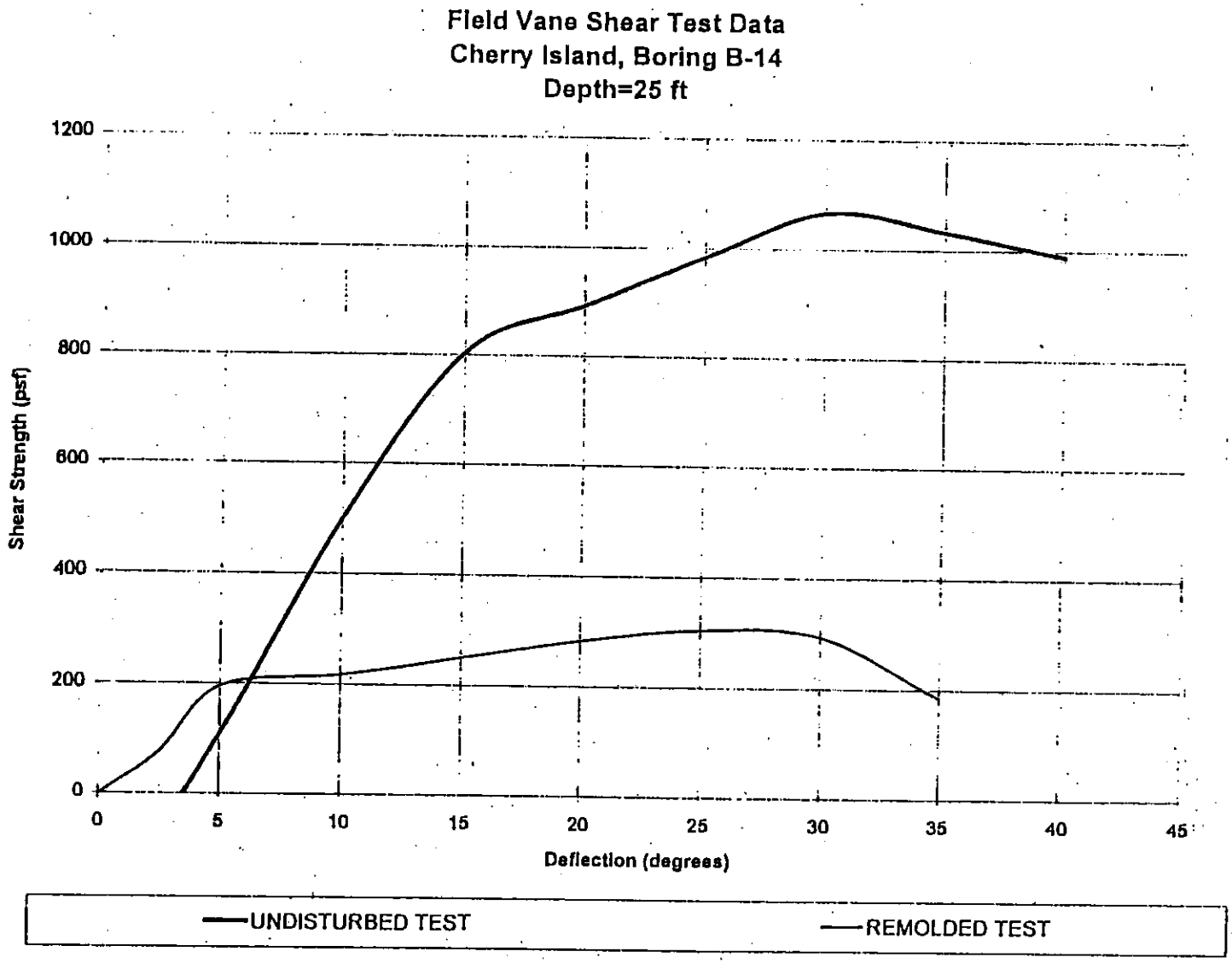
Maximum Torque (ft x lb):	35	Time to Failure (min):	5
Ave. Shear Rate (deg/sec):	0.09	Deflect. at Failure (deg):	28

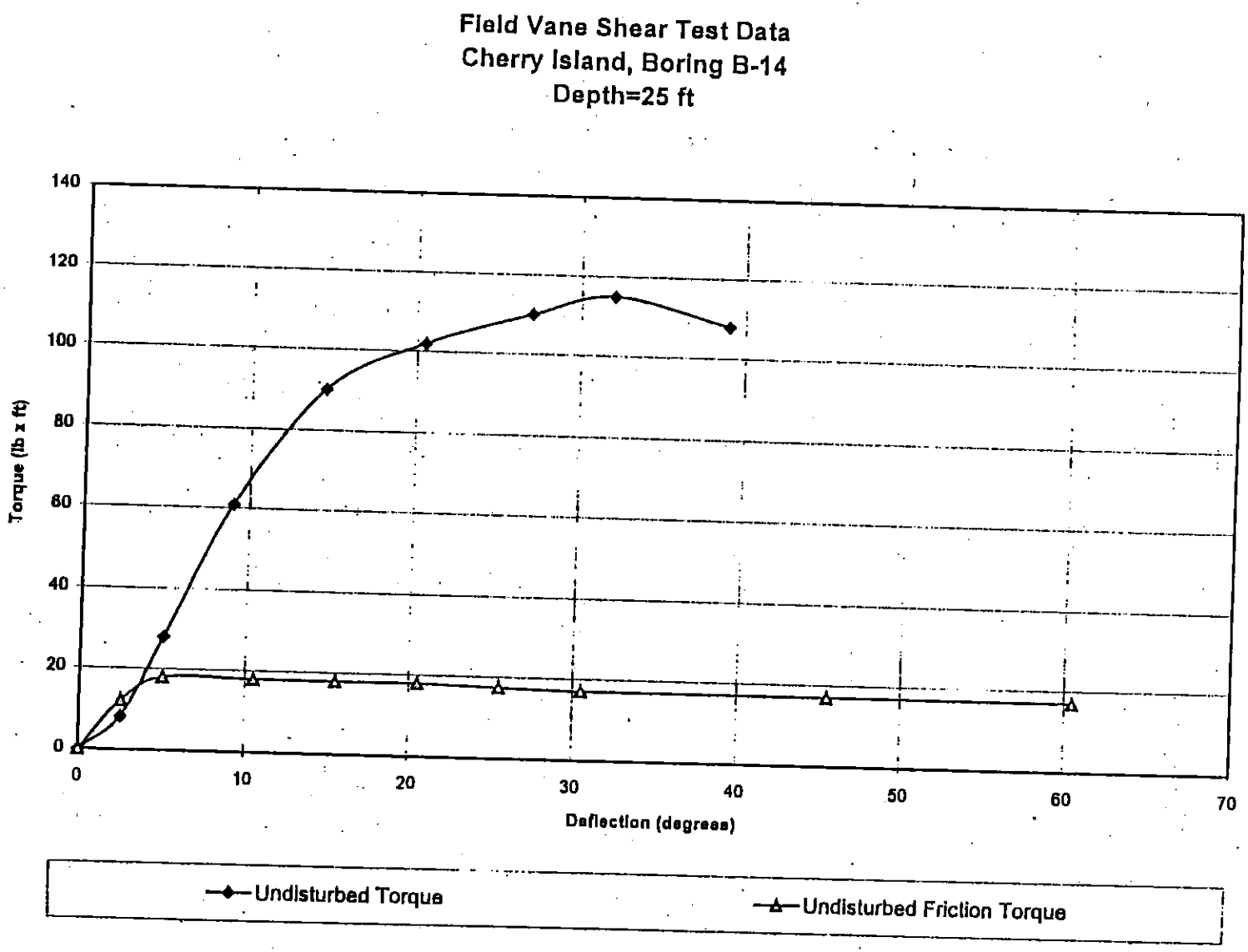
Friction Correction (ft x lb):	18	from undisturbed friction test at 30 feet
	11	from remolded friction test at 30 feet

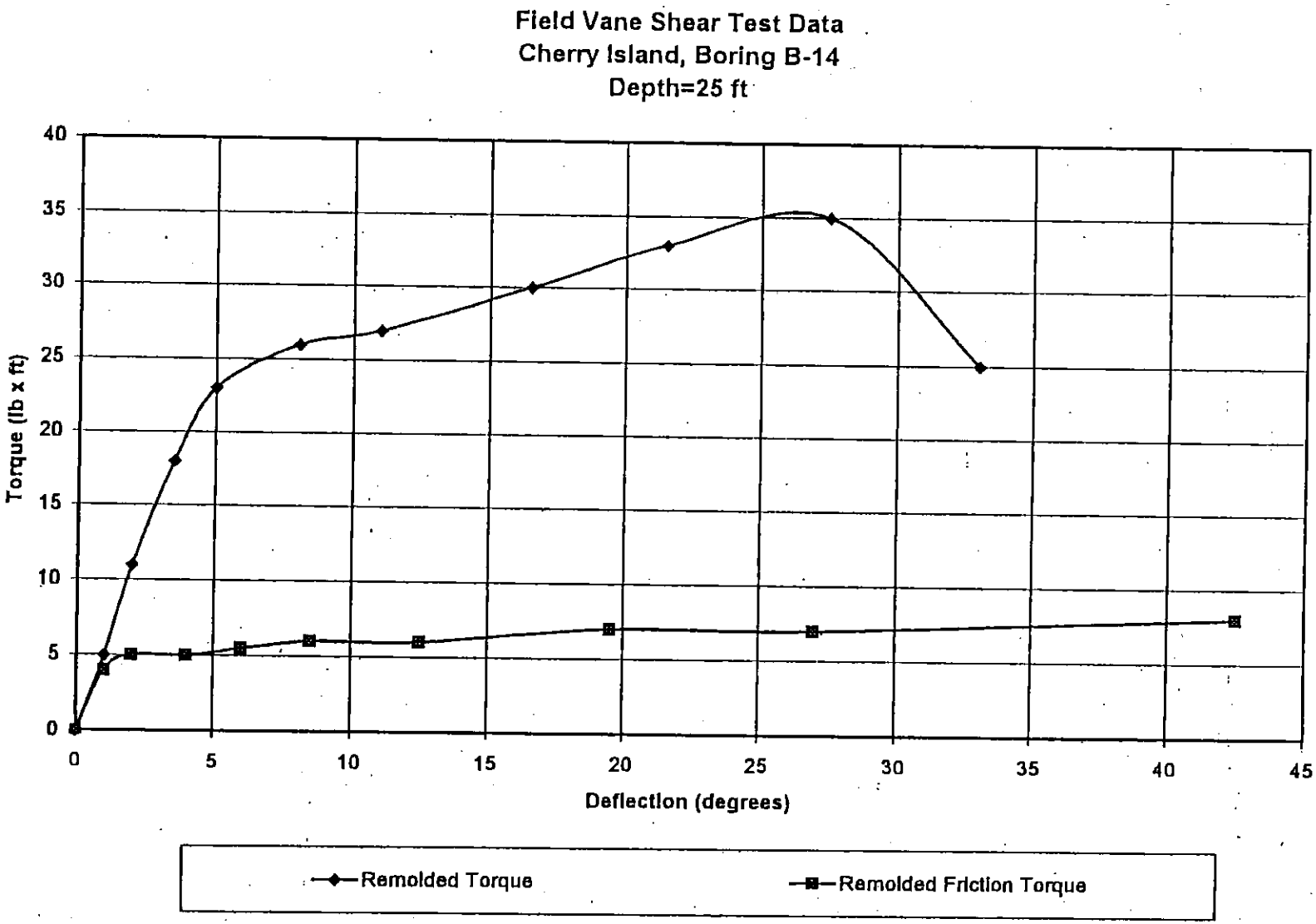
UNDISTURBED TEST:
Undrained Shear Strength: 1050 psf

REMOLDED TEST:
Undrained Shear Strength: 300 psf

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=25 ft
Shear Strength (psf)
1200
1000
800
600
400
200
0
0
5
10
15
20
25
30
35
40
45
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST


Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=25 ft
Torque (lb x ft)
140
120
100
80
60
40
20
0
0
10
20
30
40
50
60
70
Deflection (degrees)
Undisturbed Torque
Undisturbed Friction Torque


Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=25 ft
Torque (lb x ft)
40
35
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 24, 1998

BORING NUMBER:	B-14	TEST NUMBER:	VANE #3
GROUND SURFACE EL.:	50	VANE DIAMETER (in):	3.625
DEPTH TO VANE TIP (ft):	35	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth. A non-housed vane was pushed to 2.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	125	Time to Failure (min):	8
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	46

REMOLDED TEST:

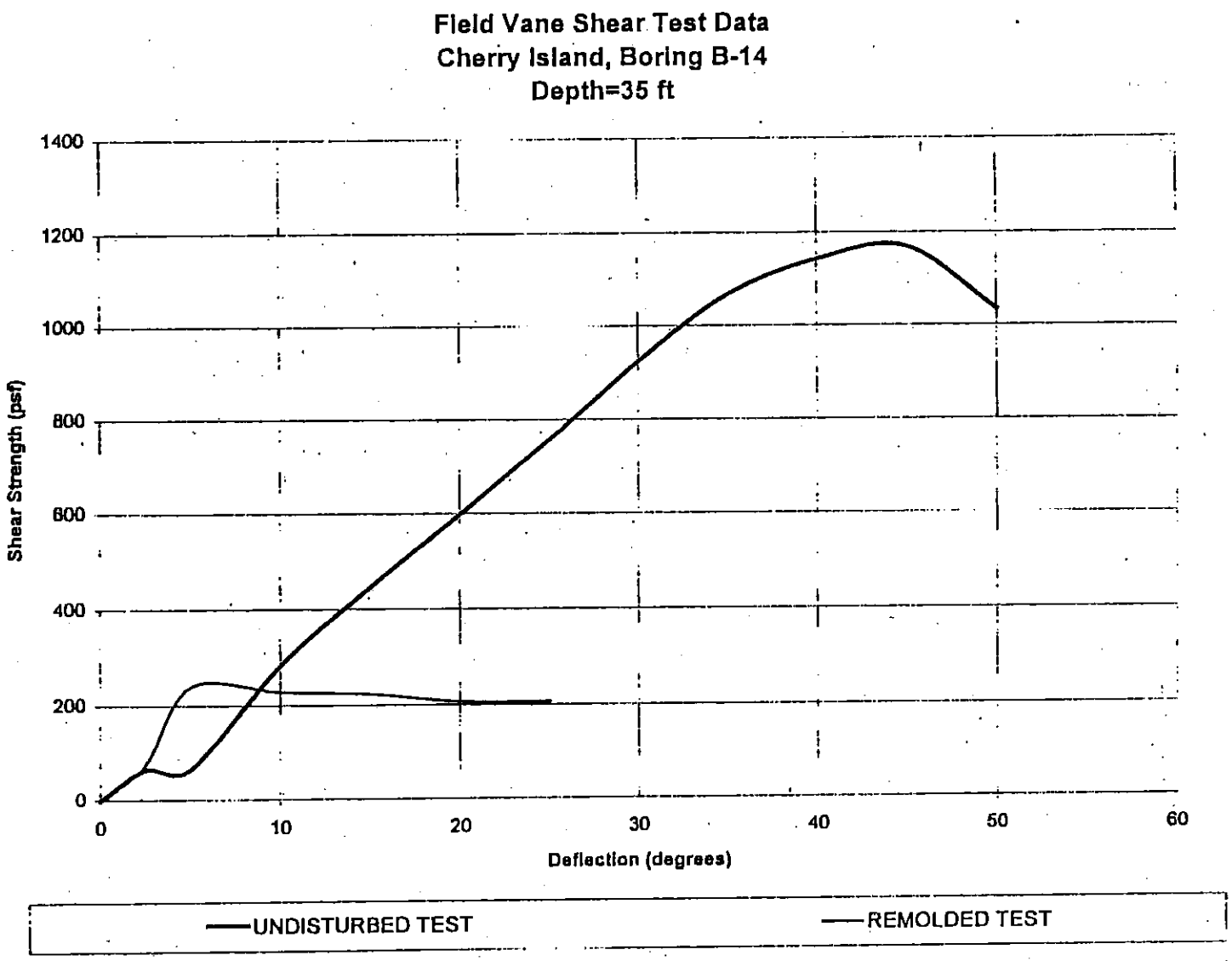
Maximum Torque (ft x lb):	28	Time to Failure (min):	1.5
Ave. Shear Rate (deg/sec):	0.09	Deflect. at Failure (deg):	9

Friction Correction (ft x lb):	18	from undisturbed friction test at 30 feet
	11	from remolded friction test at 30 feet

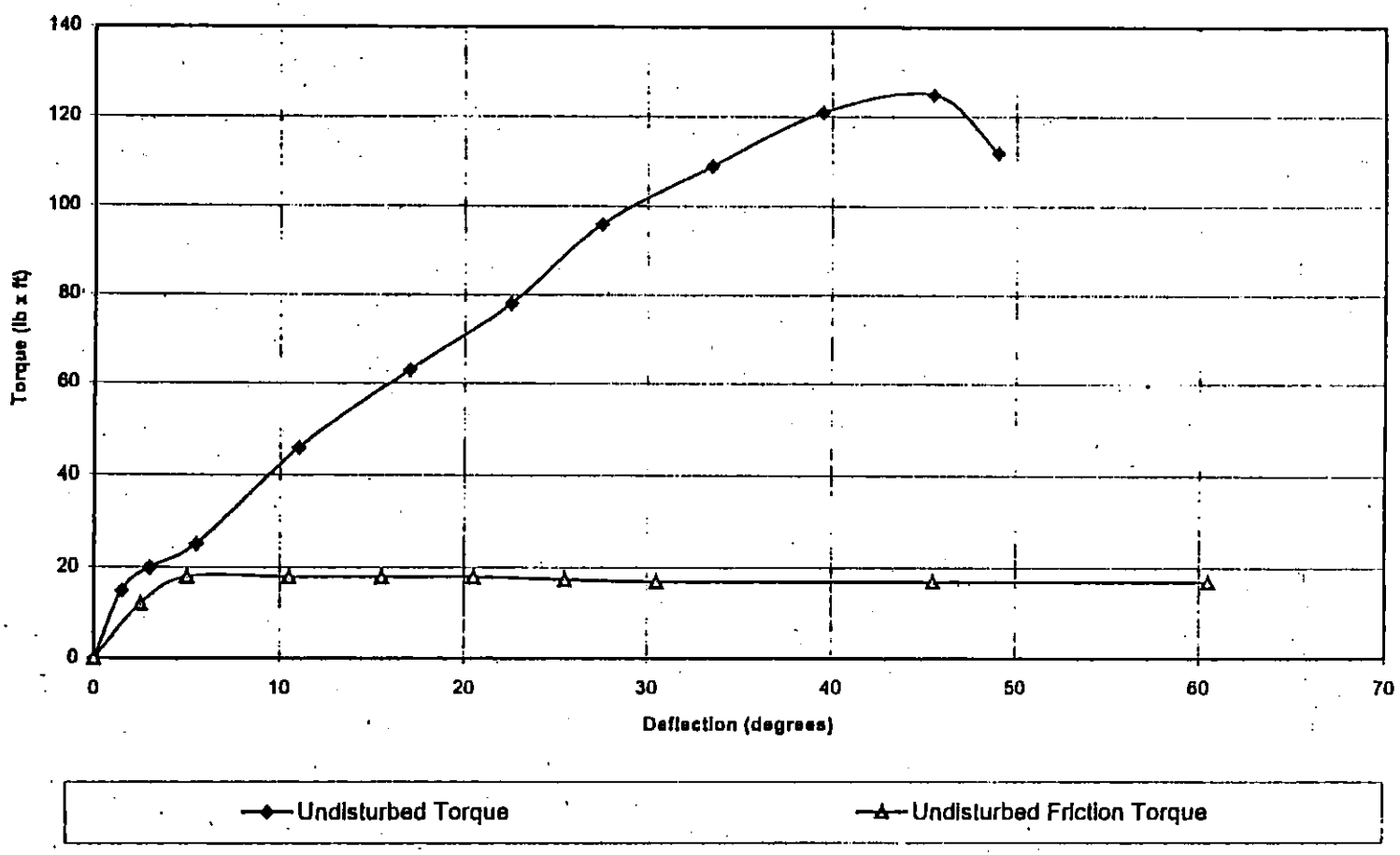
UNDISTURBED TEST:
Undrained Shear Strength: 1160 psf

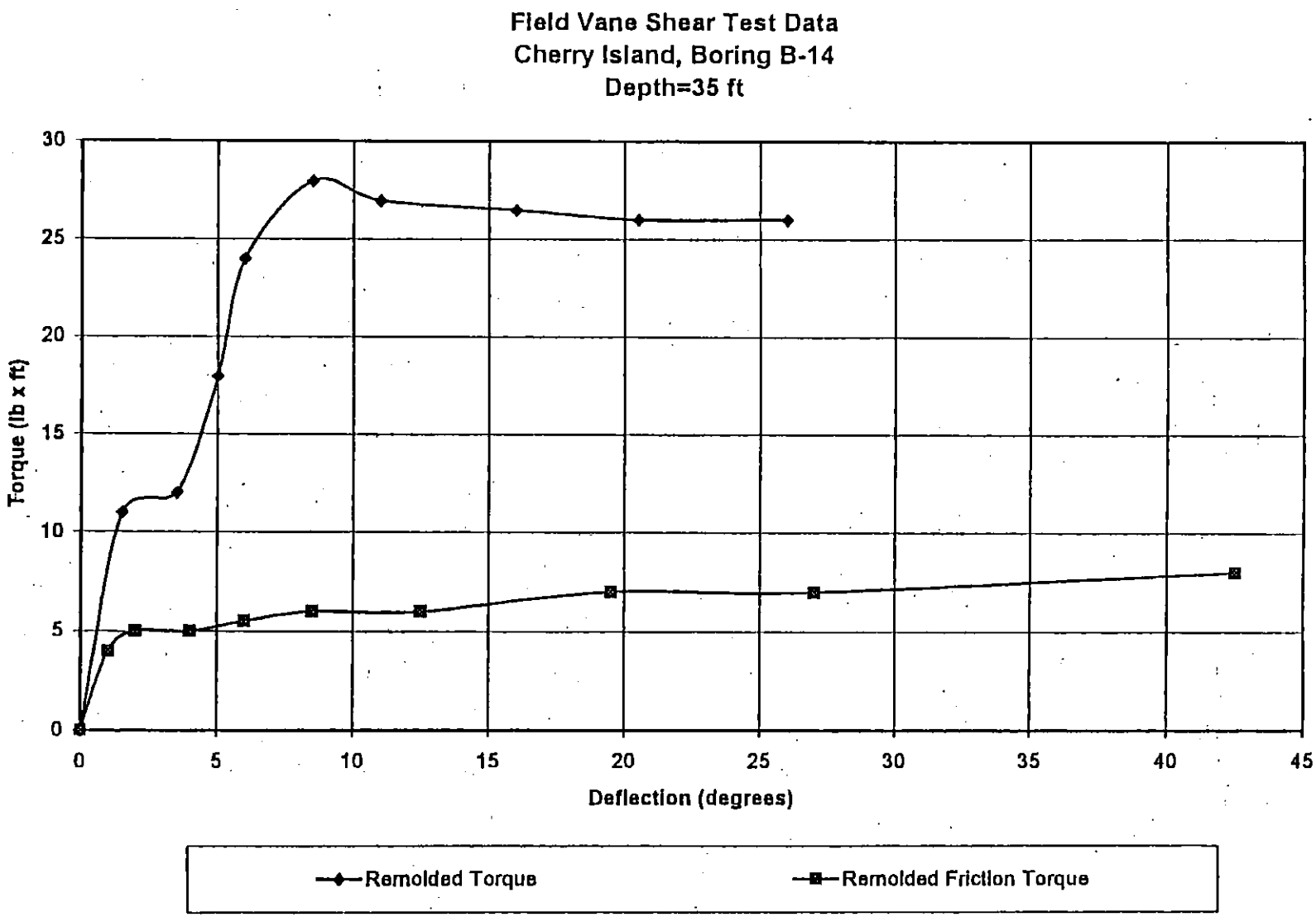
REMOLDED TEST:
Undrained Shear Strength: 240 psf

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=35 ft
Shear Strength (psf)
1400
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=35 ft




Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=35 ft
Torque (lb x ft)
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 24, 1998

BORING NUMBER:	B-14	TEST NUMBER:	VANE #4
GROUND SURFACE EL.:	50	VANE DIAMETER (in):	3.625
DEPTH TO VANE TIP (ft):	40	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 2.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	138	Time to Failure (min):	9
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	43

REMOLDED TEST:

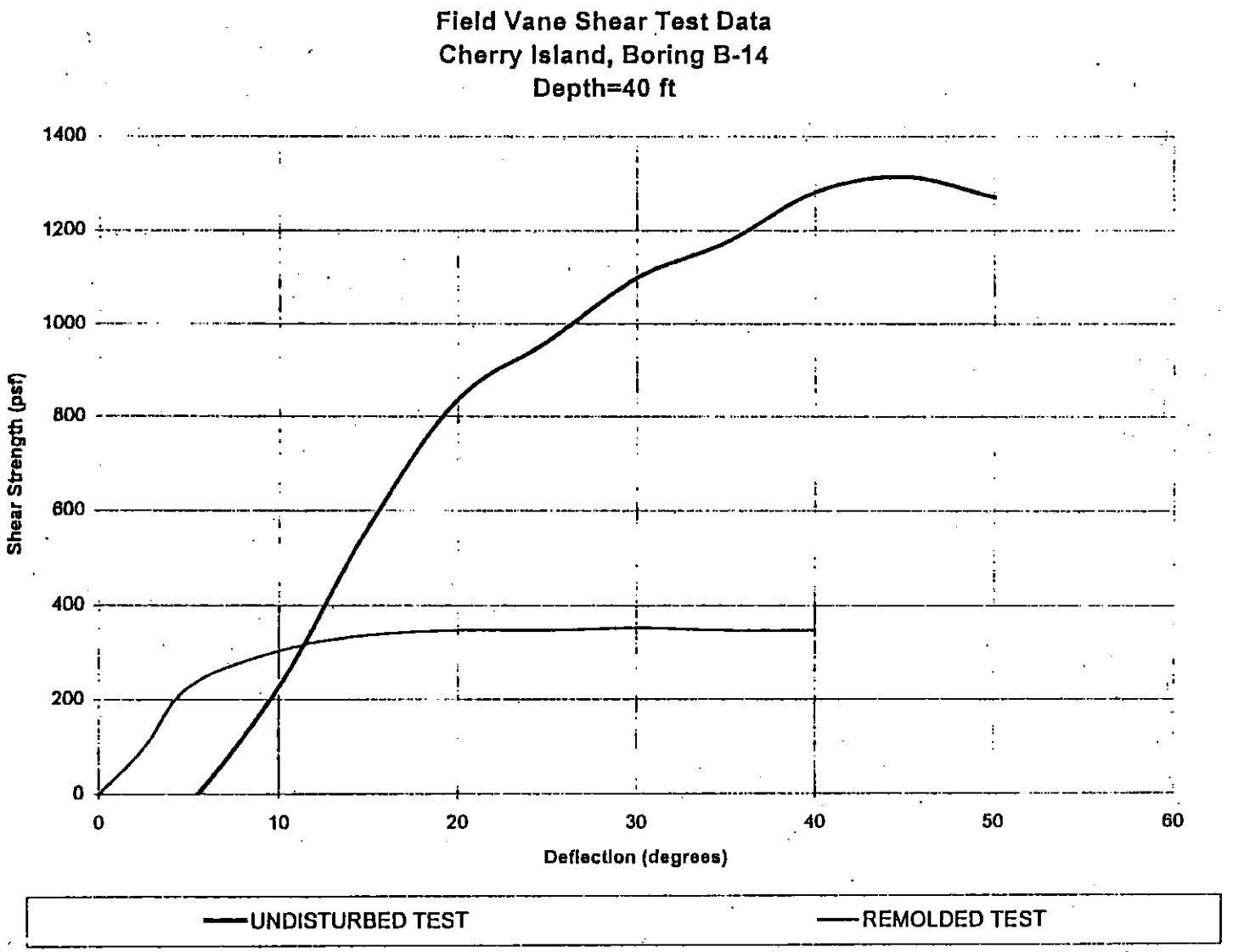
Maximum Torque (ft x lb):	45	Time to Failure (min):	12
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	62

Friction Correction (ft x lb):	18	from undisturbed friction test at 30 feet
	11	from remolded friction test at 30 feet

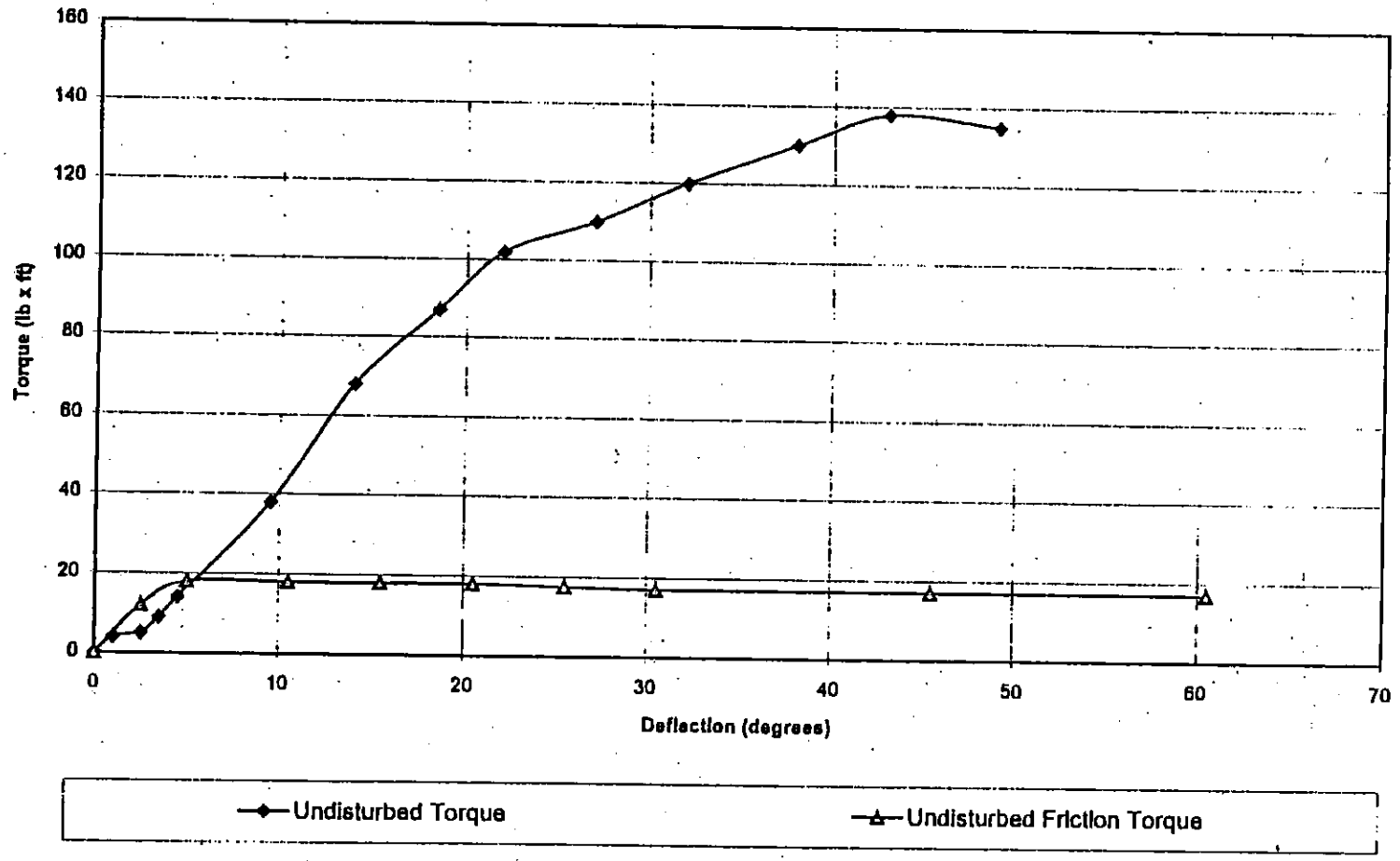
UNDISTURBED TEST:
Undrained Shear Strength: 1300 psf

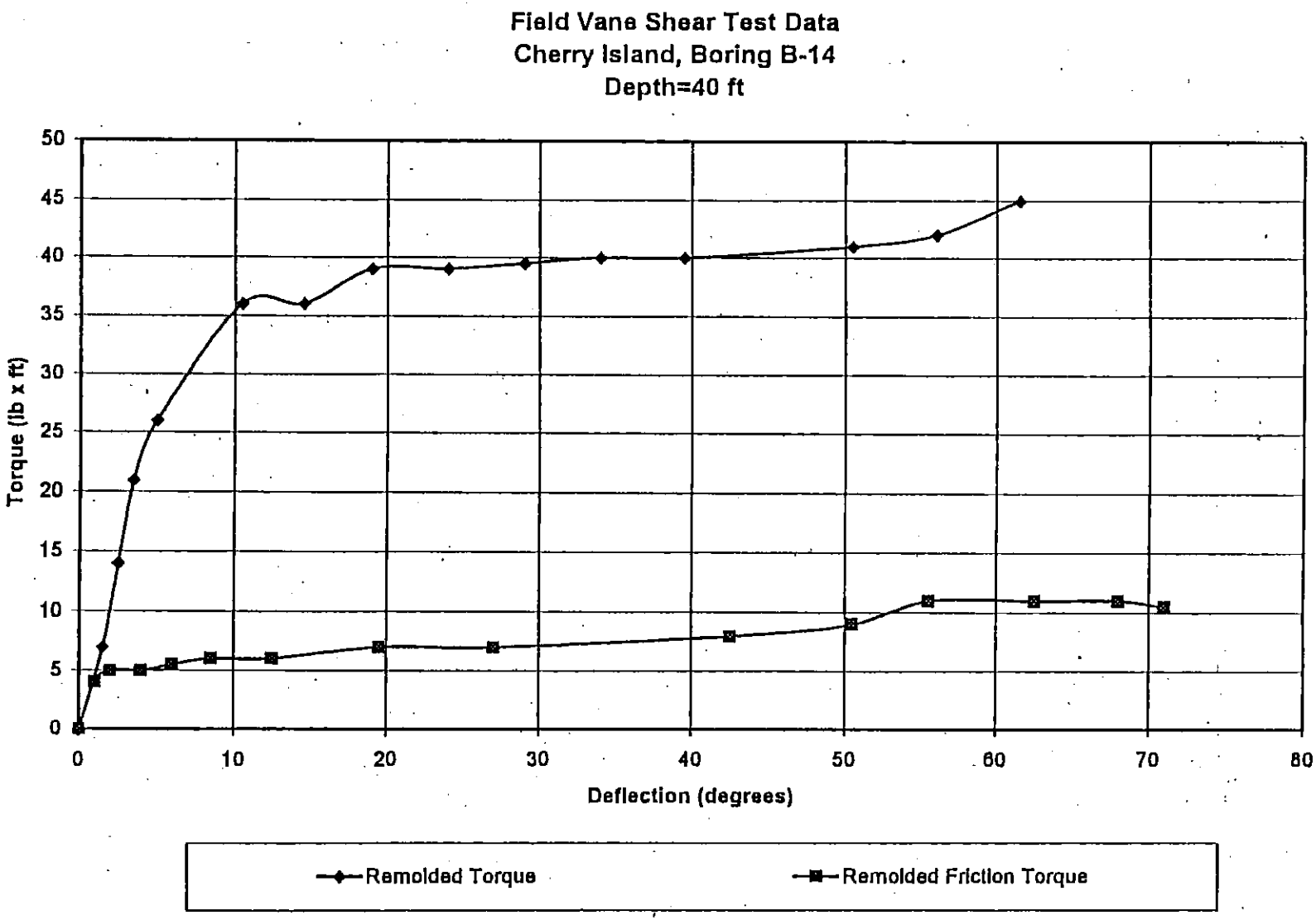
REMOLDED TEST:
Undrained Shear Strength: 370 psf

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=40 ft
Shear Strength (psf)
1400
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=40 ft




Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=40 ft
Torque (lb x ft)
50
45
40
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 25, 1998

BORING NUMBER:	B-14	TEST NUMBER:	VANE #5
GROUND SURFACE EL.:	50	VANE DIAMETER (in):	3.625
DEPTH TO VANE TIP (ft):	45	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 2.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	136	Time to Failure (min):	8
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	40

REMOLDED TEST:

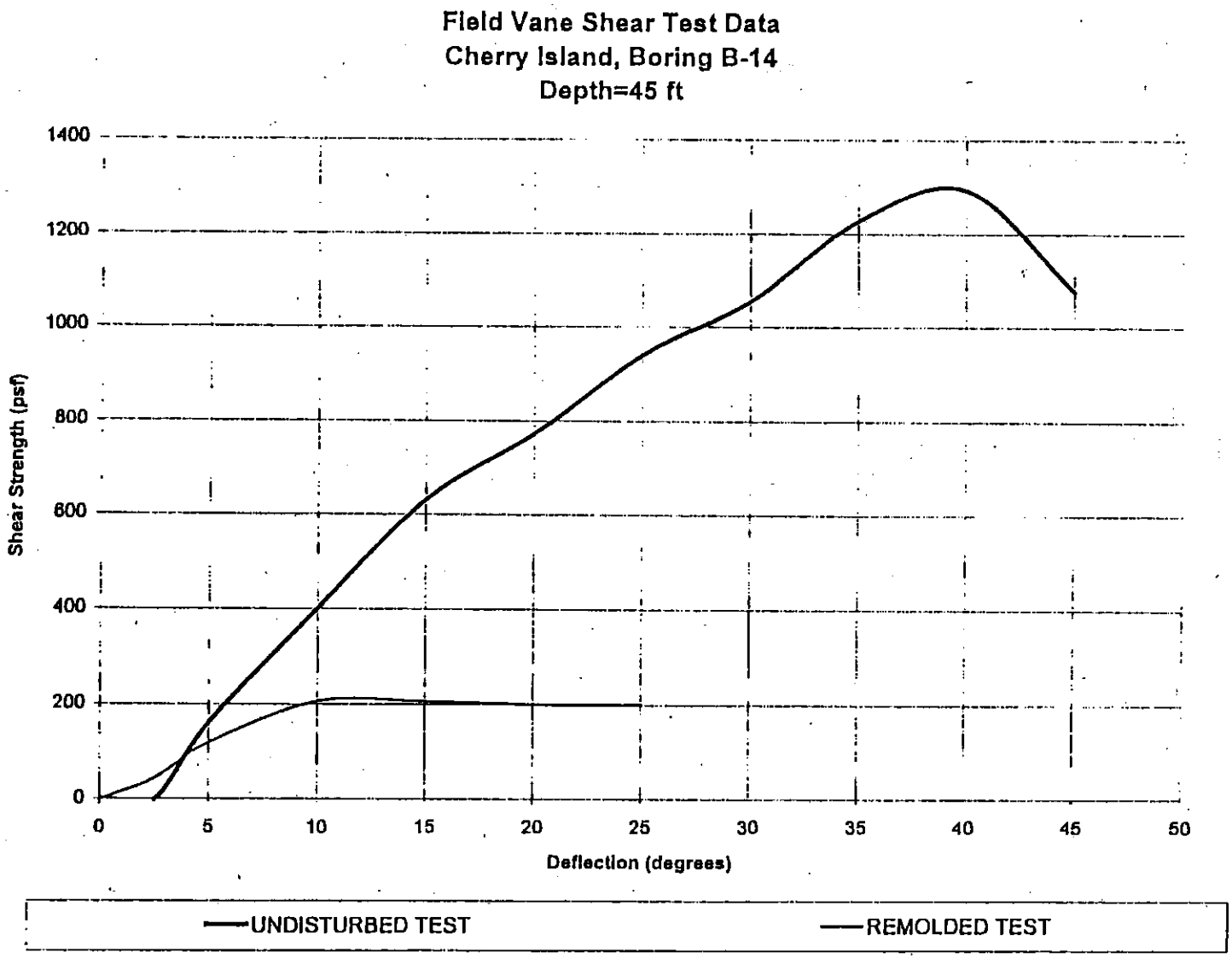
Maximum Torque (ft x lb):	25.5	Time to Failure (min):	5
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	26

Friction Correction (ft x lb):	18	from undisturbed friction test at 30 feet
	11	from remolded friction test at 30 feet

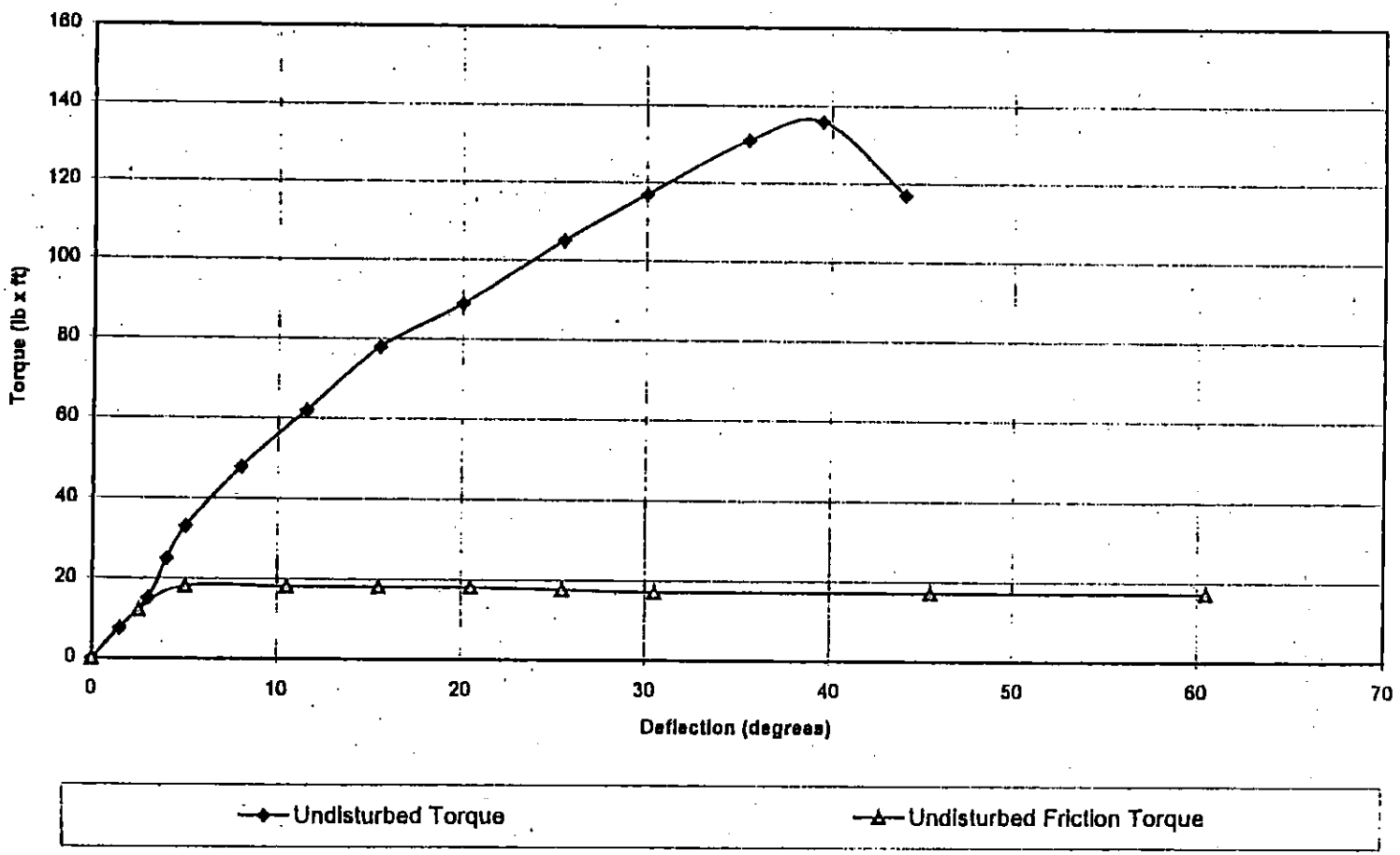
UNDISTURBED TEST:
Undrained Shear Strength: 1280 psf

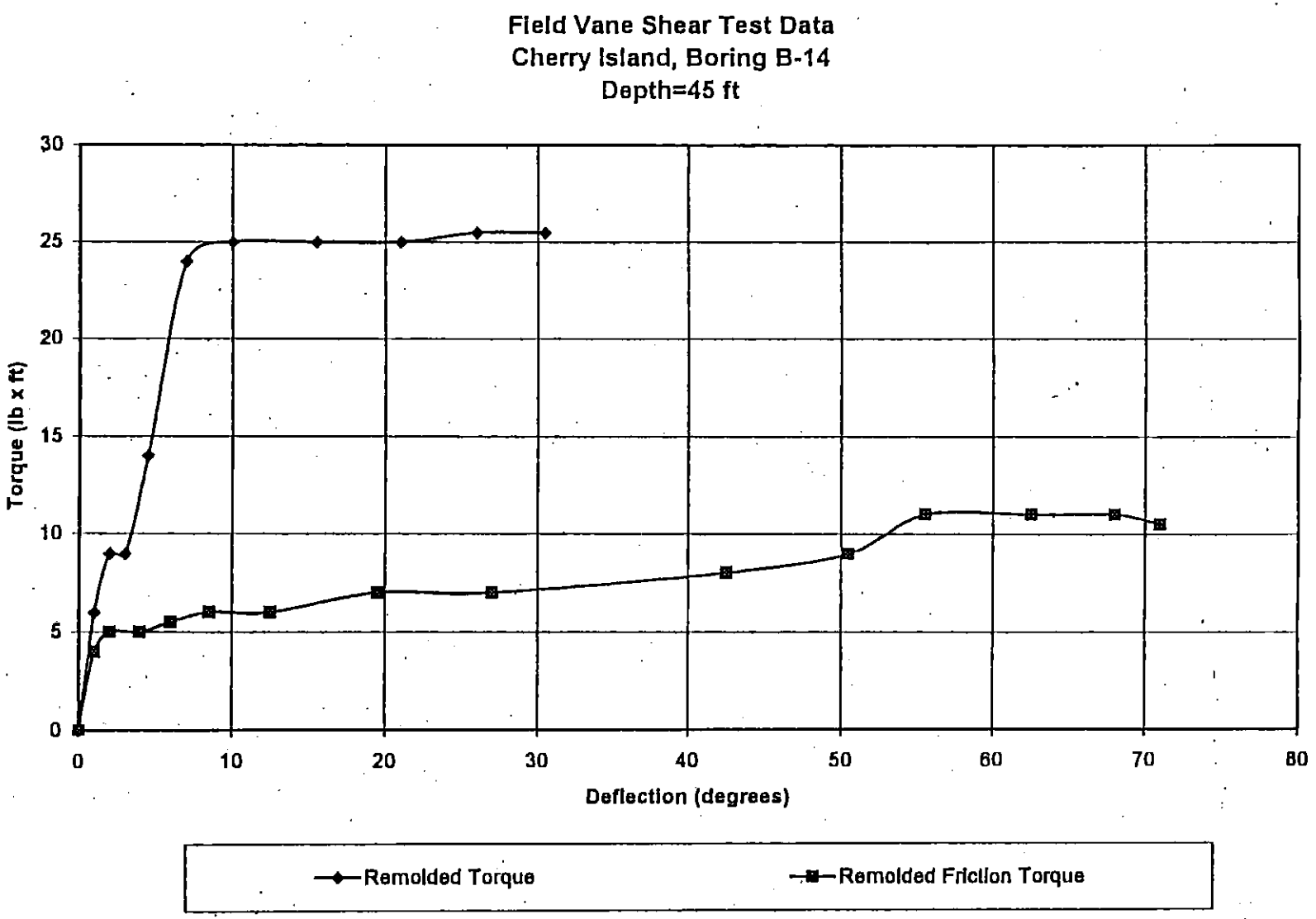
REMOLDED TEST:
Undrained Shear Strength: 200 psf

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=45 ft
Shear Strength (psf)
1400
1200
1000
800
600
400
200
0
0
5
10
15
20
25
30
35
40
45
50
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=45 ft




Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=45 ft
Torque (lb x ft)
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 25, 1998

BORING NUMBER:	B-14	TEST NUMBER:	VANE #6
GROUND SURFACE EL.:	50	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	60	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 2.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	64.5	Time to Failure (min):	5.5
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	30

REMOLDED TEST:

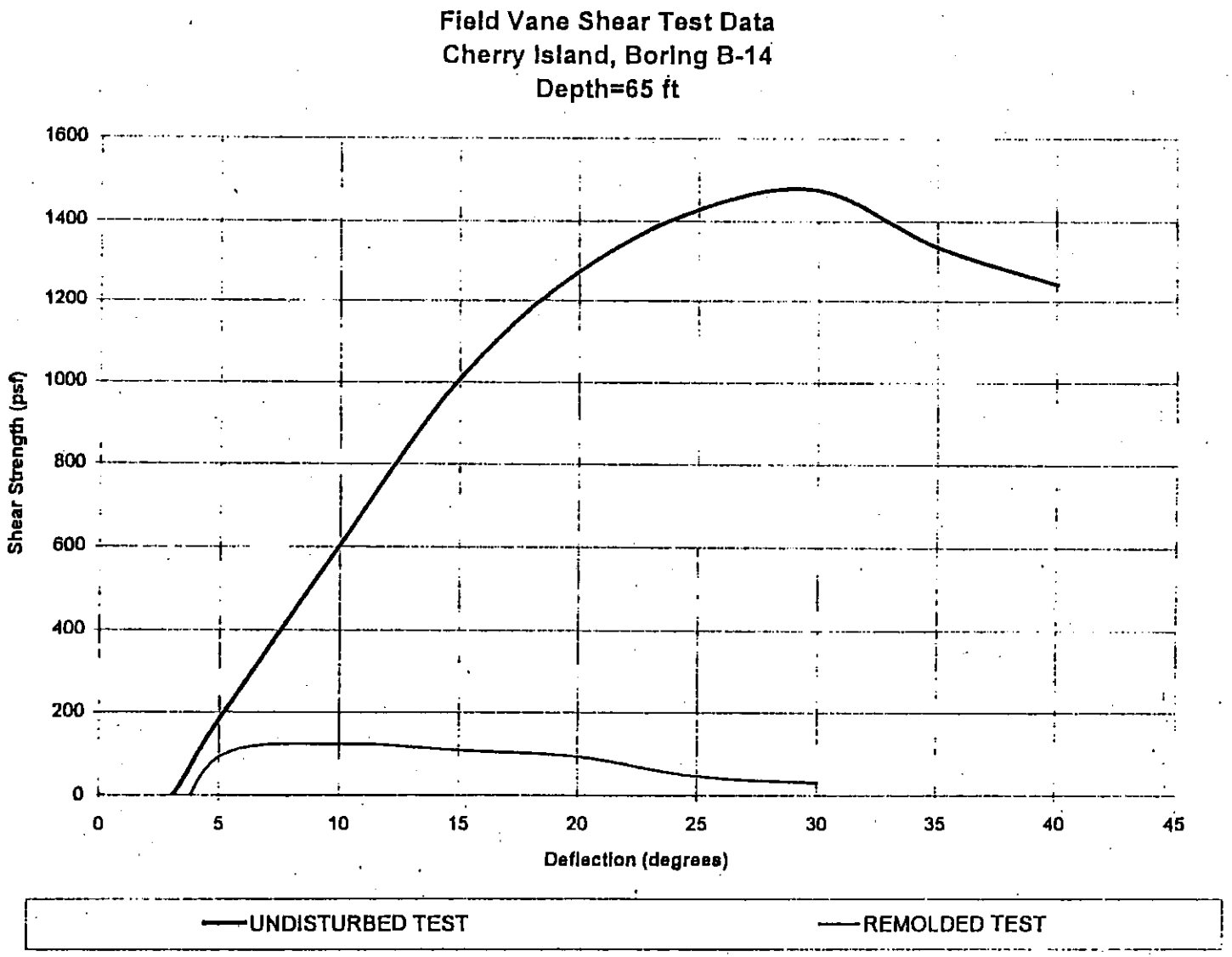
Maximum Torque (ft x lb):	23.5	Time to Failure (min):	3
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	18

Friction Correction (ft x lb):	26.5	from undisturbed friction test at 65 feet
	20	from remolded friction test at 65 feet

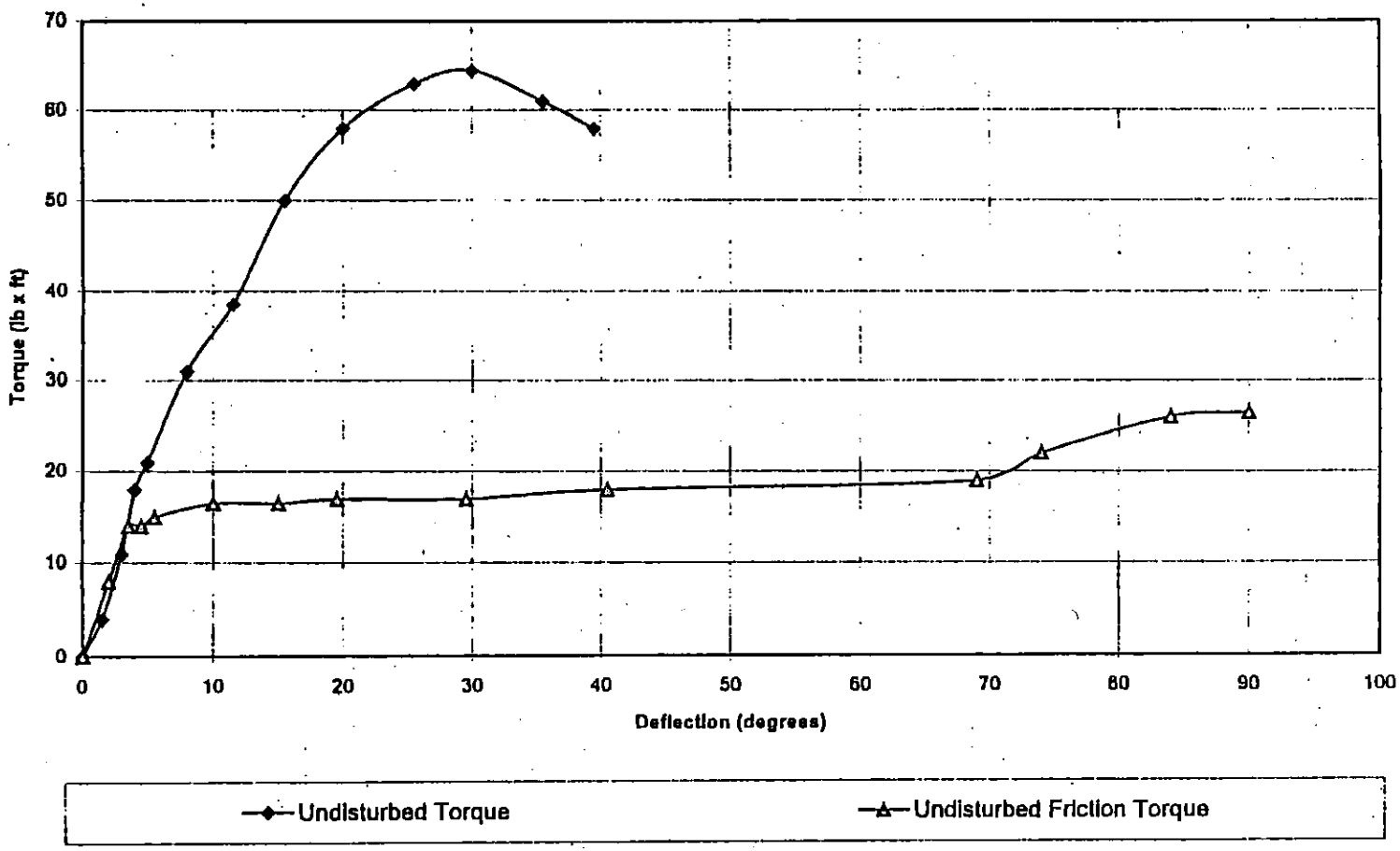
UNDISTURBED TEST:
Undrained Shear Strength: 1480 psf

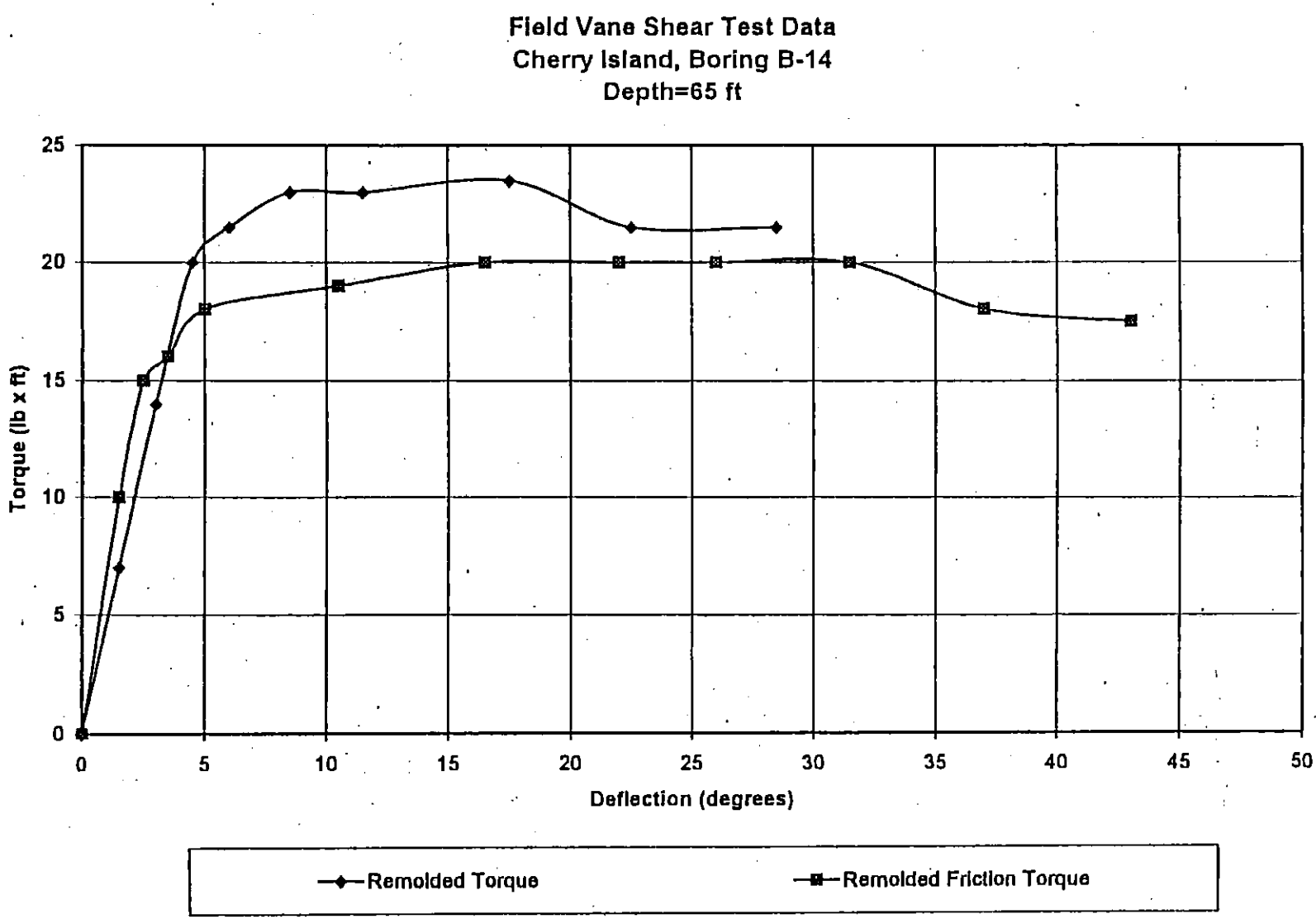
REMOLDED TEST:
Undrained Shear Strength: 120 psf

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=65 ft
Shear Strength (psf)
1600
1400
1200
1000
800
600
400
200
0
0
5
10
15
20
25
30
35
40
45
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=65 ft




Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=65 ft
Torque (lb x ft)
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 408
CONTRACT NUMBER:	985176
CONTRACTOR:	HARDIN-HUBER INC.
DATE:	August 25, 1998

BORING NUMBER:	B-14	TEST NUMBER:	VANE #7
GROUND SURFACE EL.:	50	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	70	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	2.5	ROD DIAMETER (in):	0.75

Description of test procedure: 4.25 inch I.D. auger was advanced to 2.5 feet above the desired vane tip depth. A non-housed vane was pushed to 2.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (ft x lb):	75	Time to Failure (min):	8.5
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	44

REMOLDED TEST:

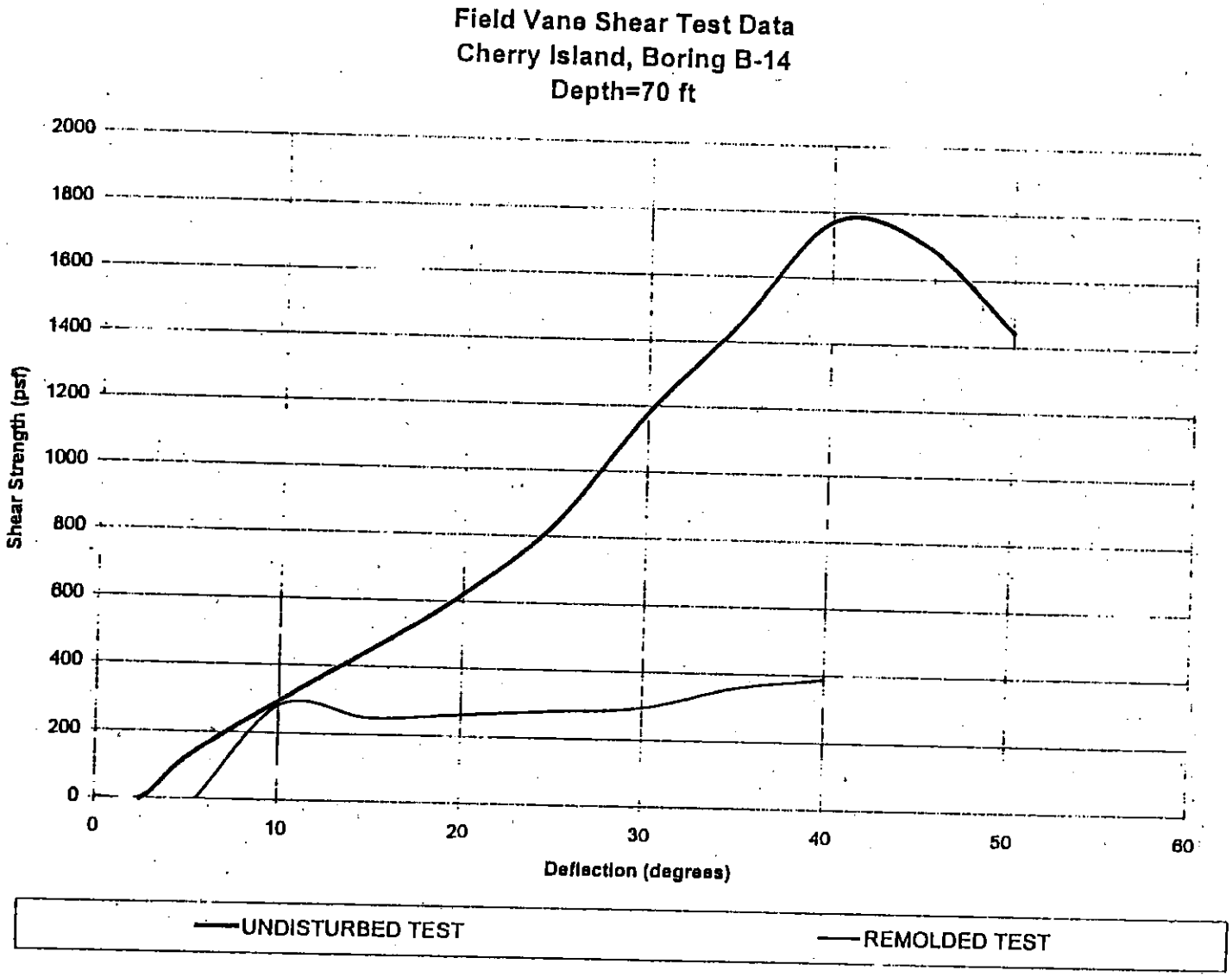
Maximum Torque (ft x lb):	30	Time to Failure (min):	8
Ave. Shear Rate (deg/sec):	0.08	Deflect. at Failure (deg):	43

Friction Correction (ft x lb):	26.5	from undisturbed friction test at 65 feet
	20	from remolded friction test at 65 feet

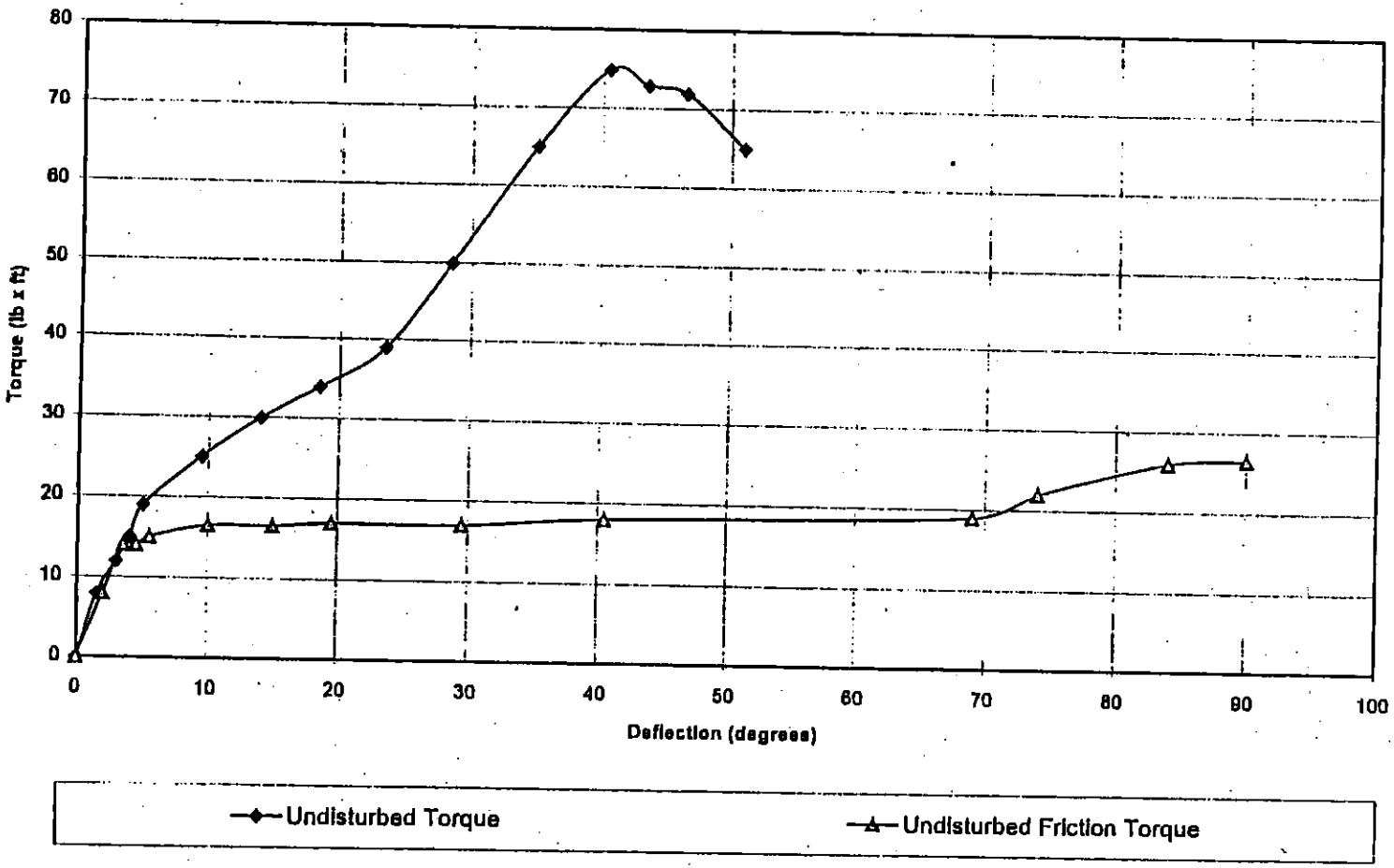
UNDISTURBED TEST:
Undrained Shear Strength: 1770 psf

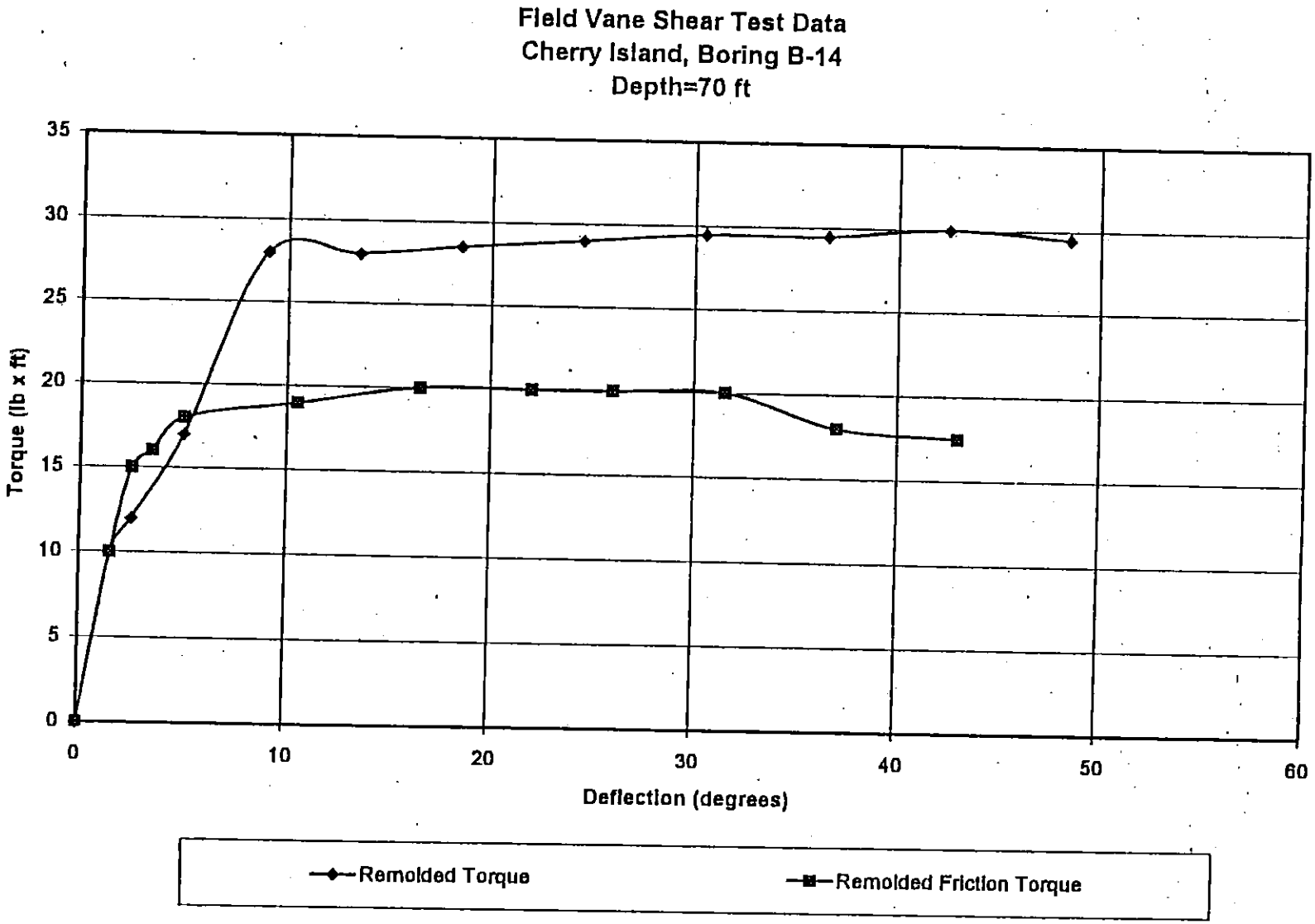
REMOLDED TEST:
Undrained Shear Strength: 400 psf

Drilling Foreman:	Rick Rider
Inspector:	Michael Gill
Supervising Engineer:	Allen Cadden


Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=70 ft
Shear Strength (psf)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
Deflection (degrees)
UNDISTURBED TEST
REMOLDED TEST

Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=70 ft




Field Vane Shear Test Data
Cherry Island, Boring B-14
Depth=70 ft
Torque (lb x ft)
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
Deflection (degrees)
Remolded Torque
Remolded Friction Torque

Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-100VB	TEST NUMBER:	Vane #1
GROUND SURFACE EL.:	78	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	43.5	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth. A non-housed vane was pushed to 1.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (in x lb):	168	Time to Failure (min):	5:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	31.5

REMOLDED TEST:

Maximum Torque (in x lb):	48	Time to Failure (min):	7:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	43.5

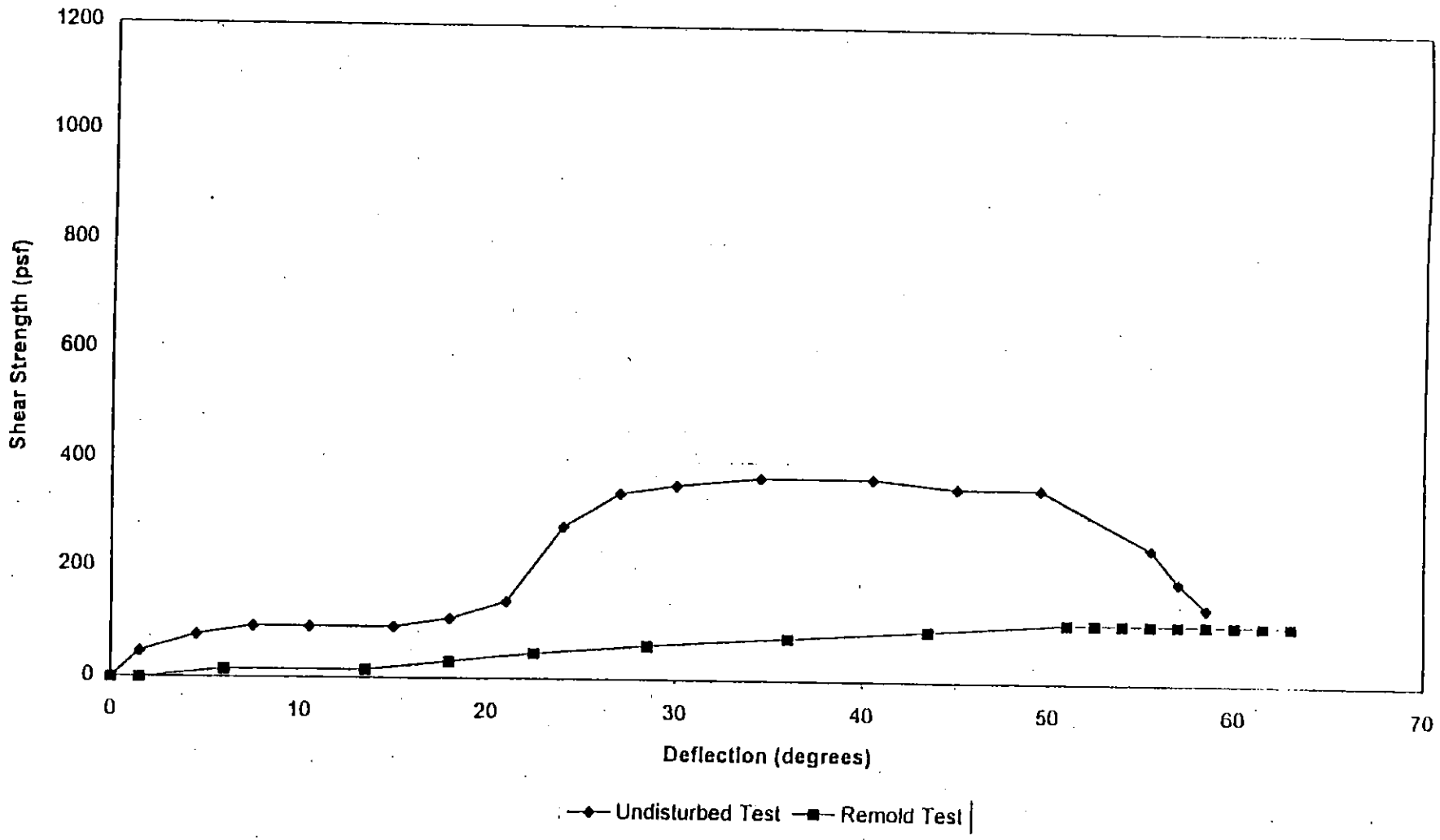
Friction Correction (in x lb):	24	from undisturbed friction test at 47 feet
	12	from remolded friction test at 47 feet

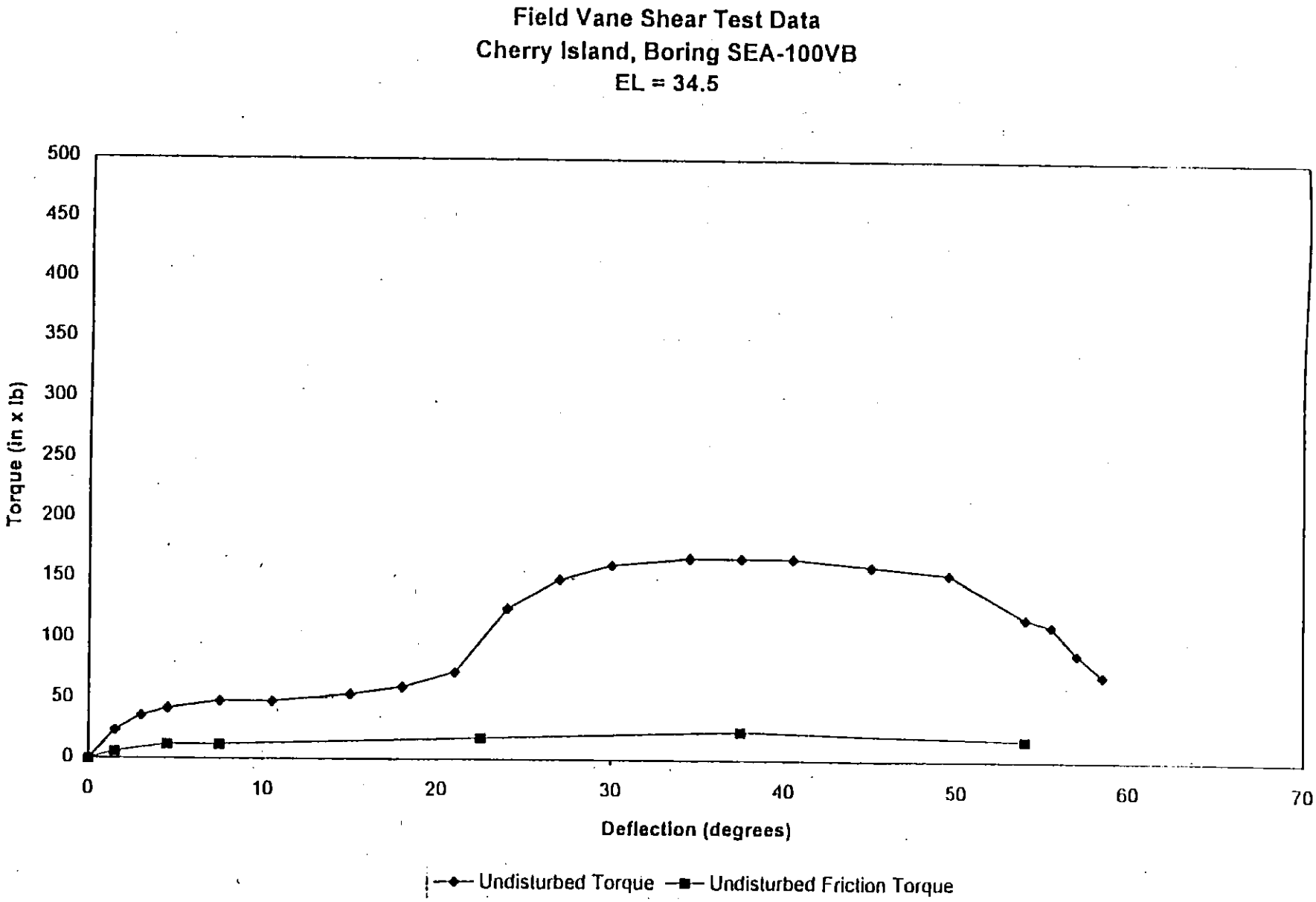
UNDISTURBED TEST:
Undrained Shear Strength: 370 psf

REMOLDED TEST:
Undrained Shear Strength: 90 psf

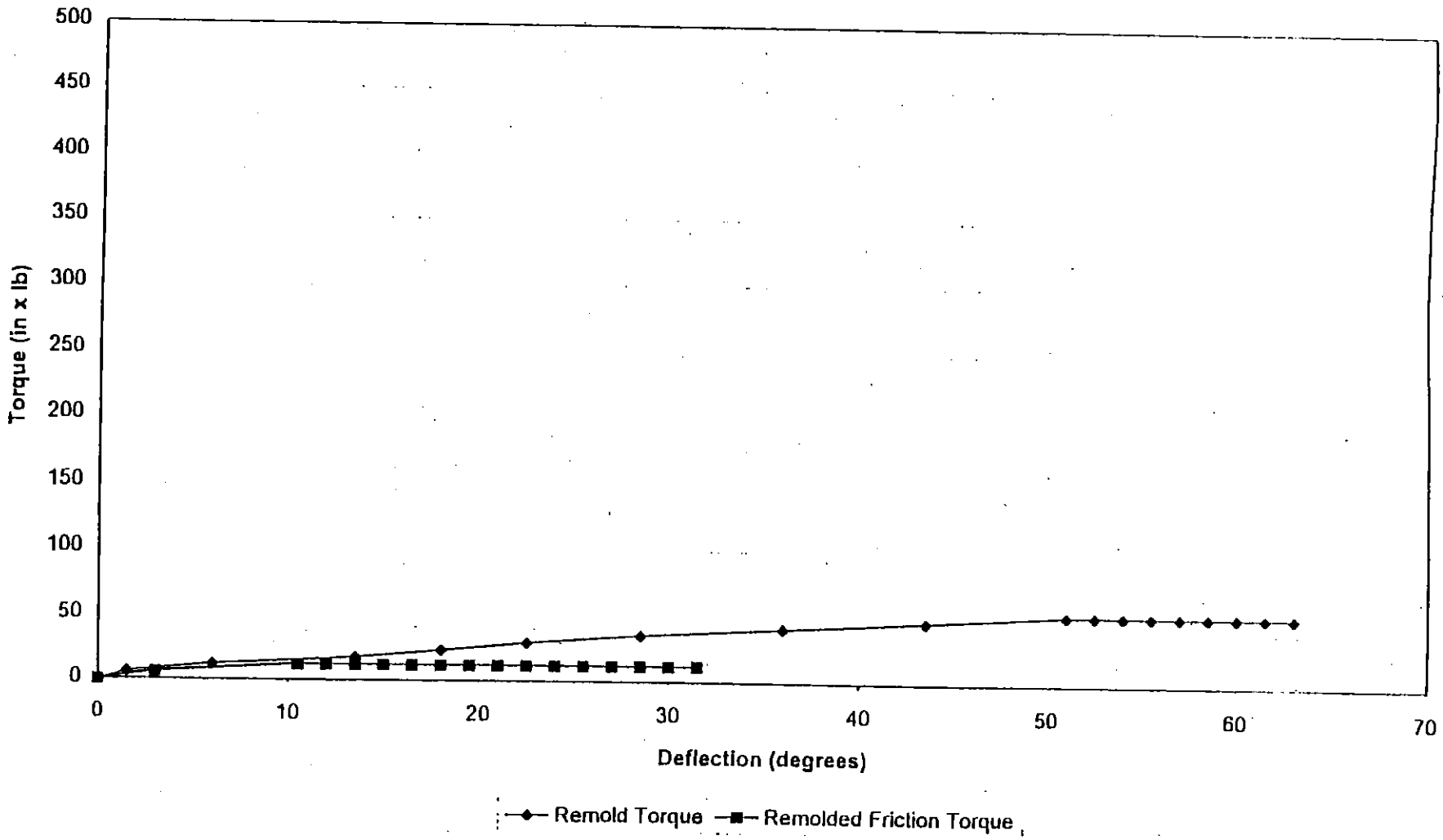
Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 34.5




Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 34.5
Torque (in x lb)
500
450
400
350
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
Deflection (degrees)
Undisturbed Torque
Undisturbed Friction Torque

Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 34.5



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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-100VB	TEST NUMBER:	Vane #2
GROUND SURFACE EL.:	78	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	48.5	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth. A non-housed vane was pushed to 1.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (in x lb):	438	Time to Failure (min):	3:45
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	22.5

REMOLDED TEST:

Maximum Torque (in x lb):	47	Time to Failure (min):	0:30
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	3

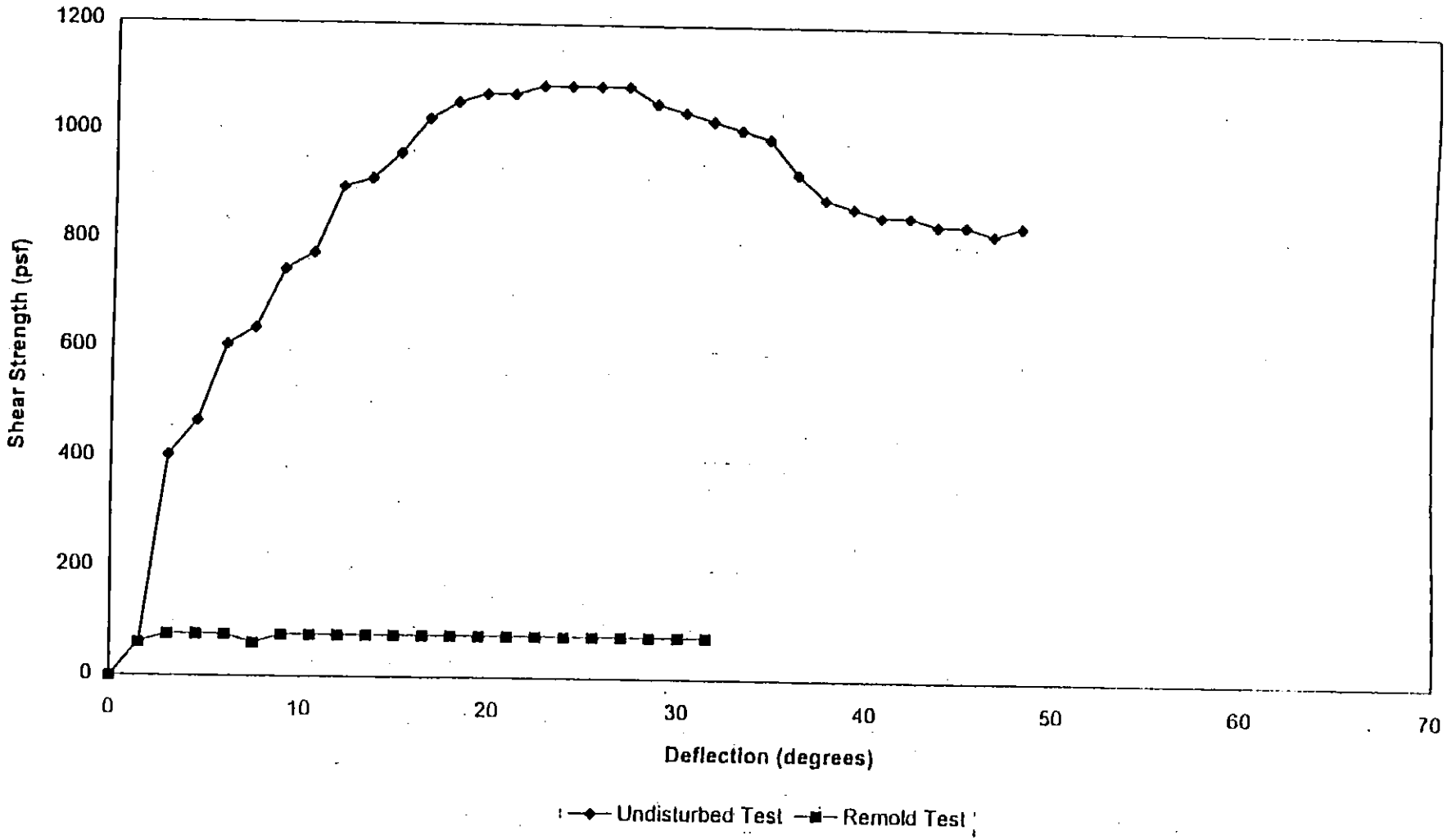
Friction Correction (in x lb):	18	from undisturbed friction test at 47 feet
	12	from remolded friction test at 47 feet

UNDISTURBED TEST:
Undrained Shear Strength: 1090 psf

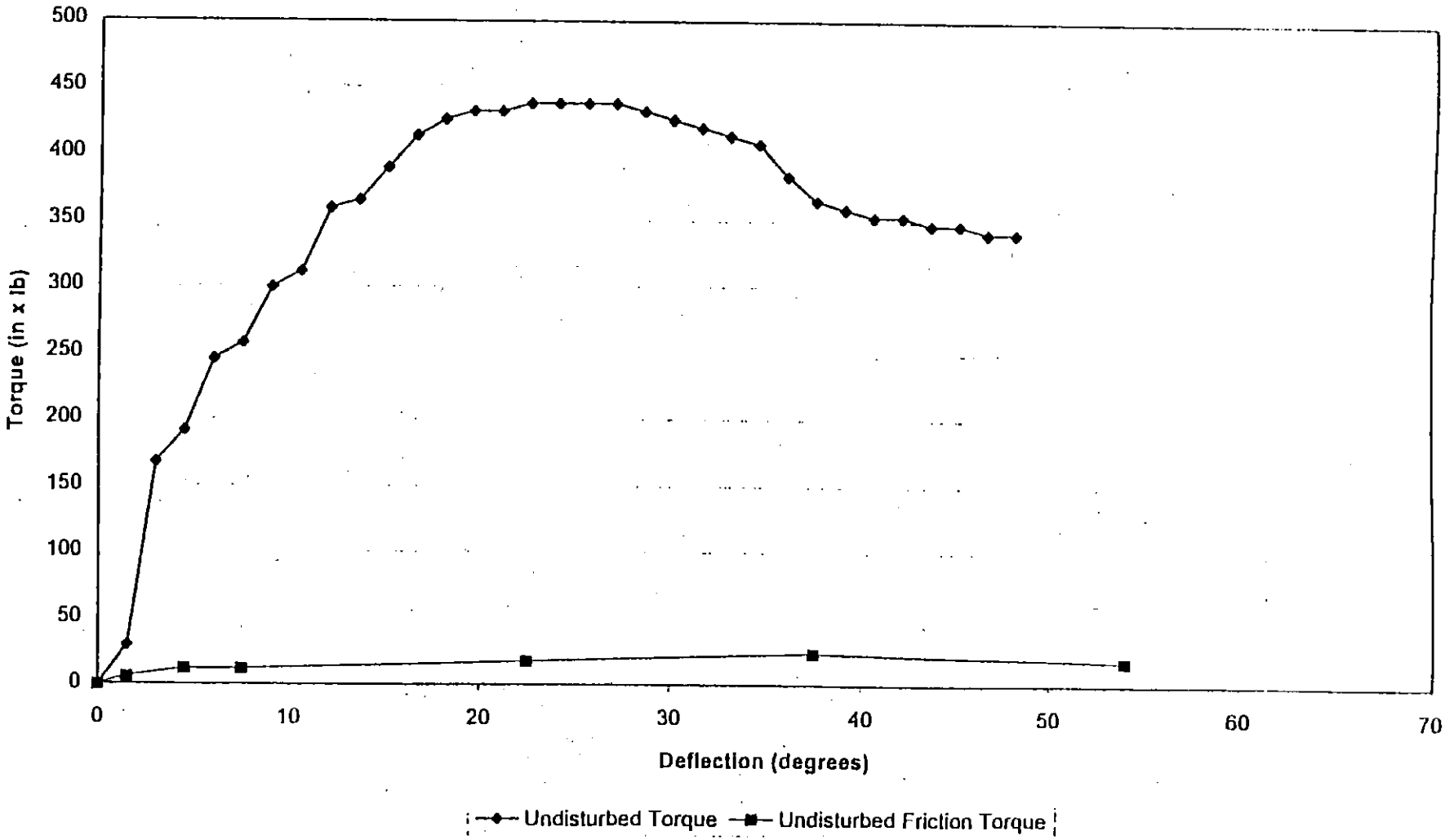
REMOLDED TEST:
Undrained Shear Strength: 90 psf

Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

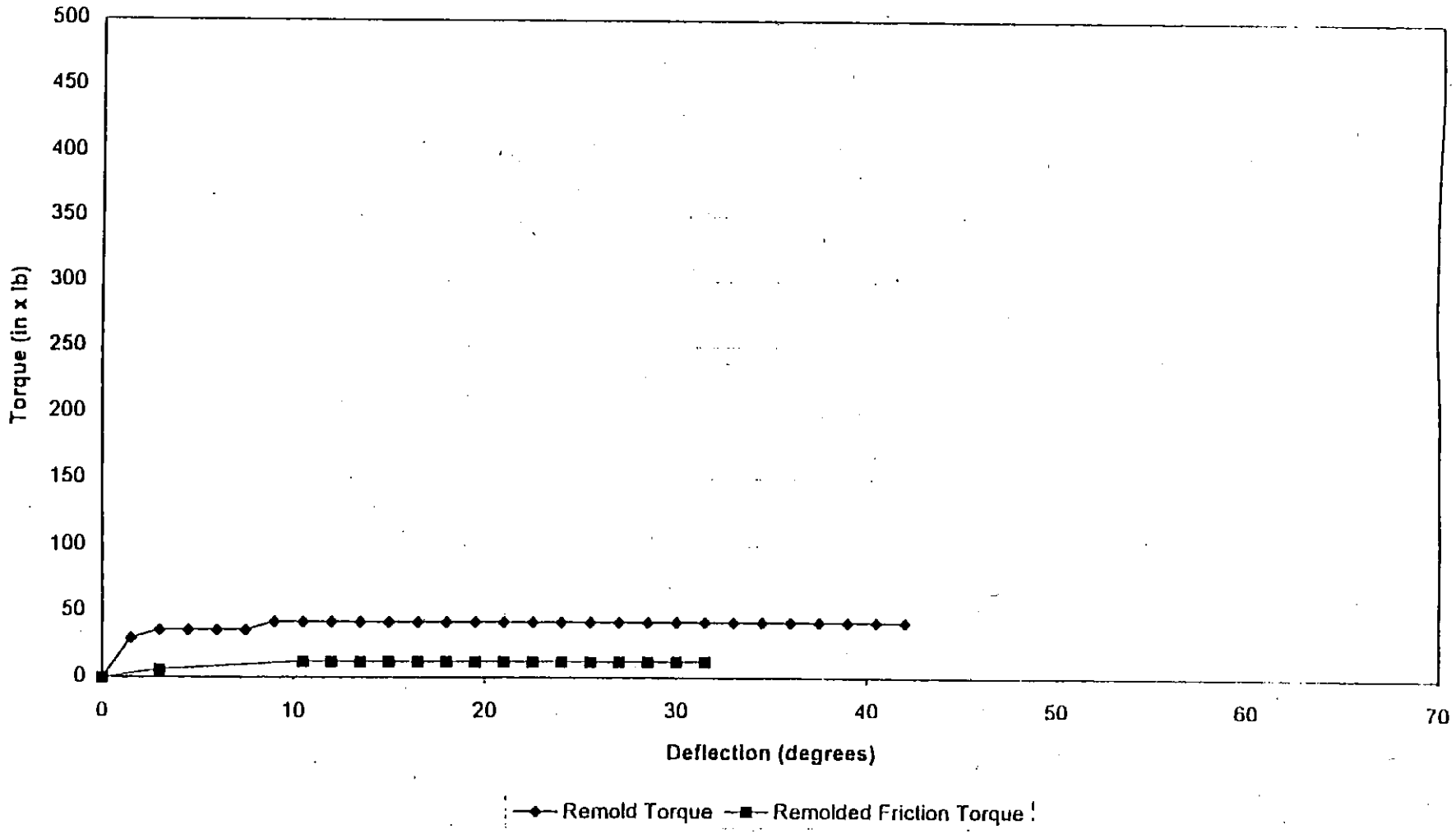
Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 29.5



Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 29.5



Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 29.5



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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-100V8	TEST NUMBER:	Vane #3
GROUND SURFACE EL.:	78	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	59.5	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 1.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (in x lb):	174	Time to Failure (min):	2:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	13.5

REMOLDED TEST:

Maximum Torque (in x lb):	72	Time to Failure (min):	1:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	7.5

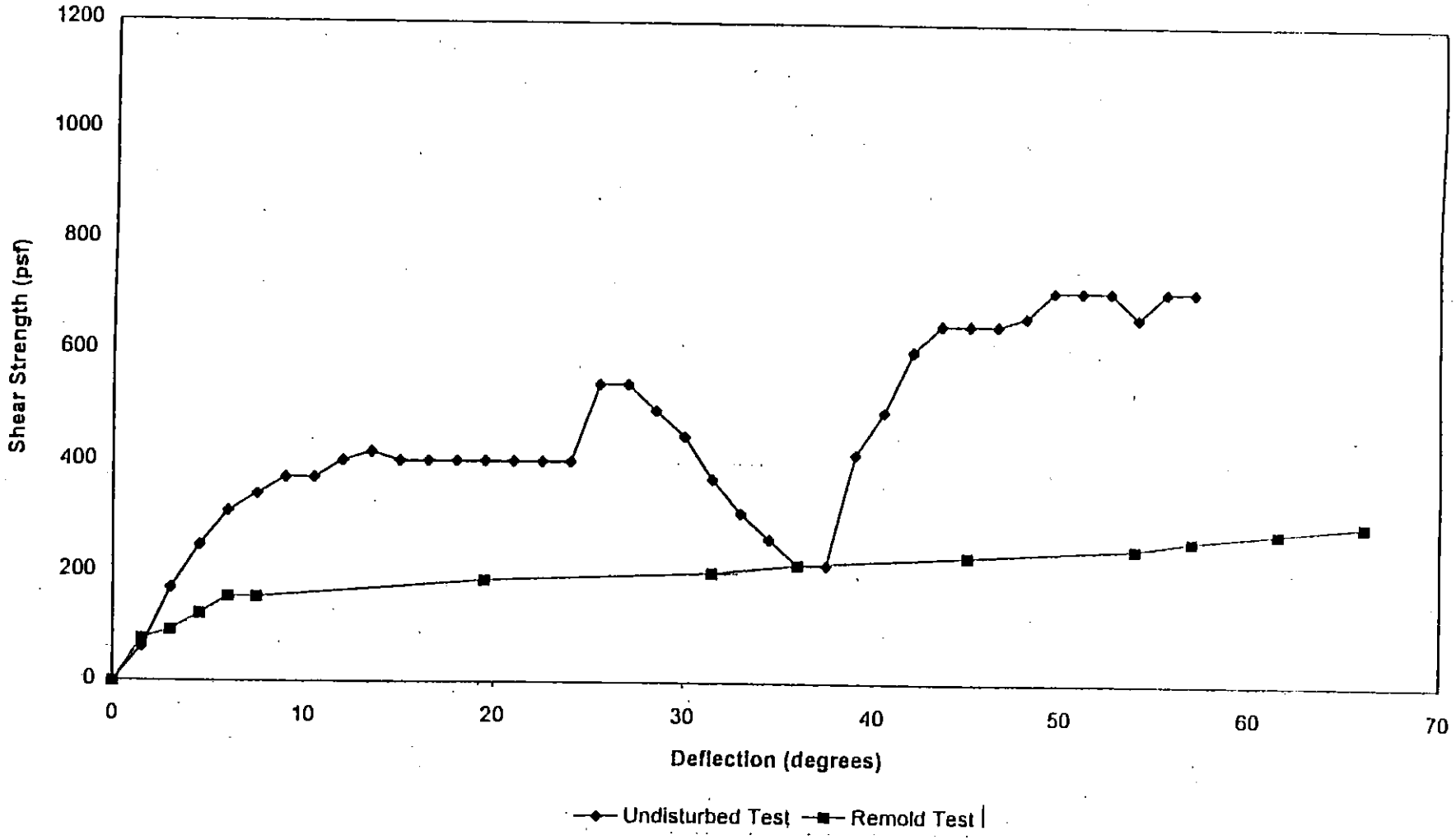
Friction Correction (in x lb):	18	from undisturbed friction test at 47 feet
	12	from remolded friction test at 47 feet

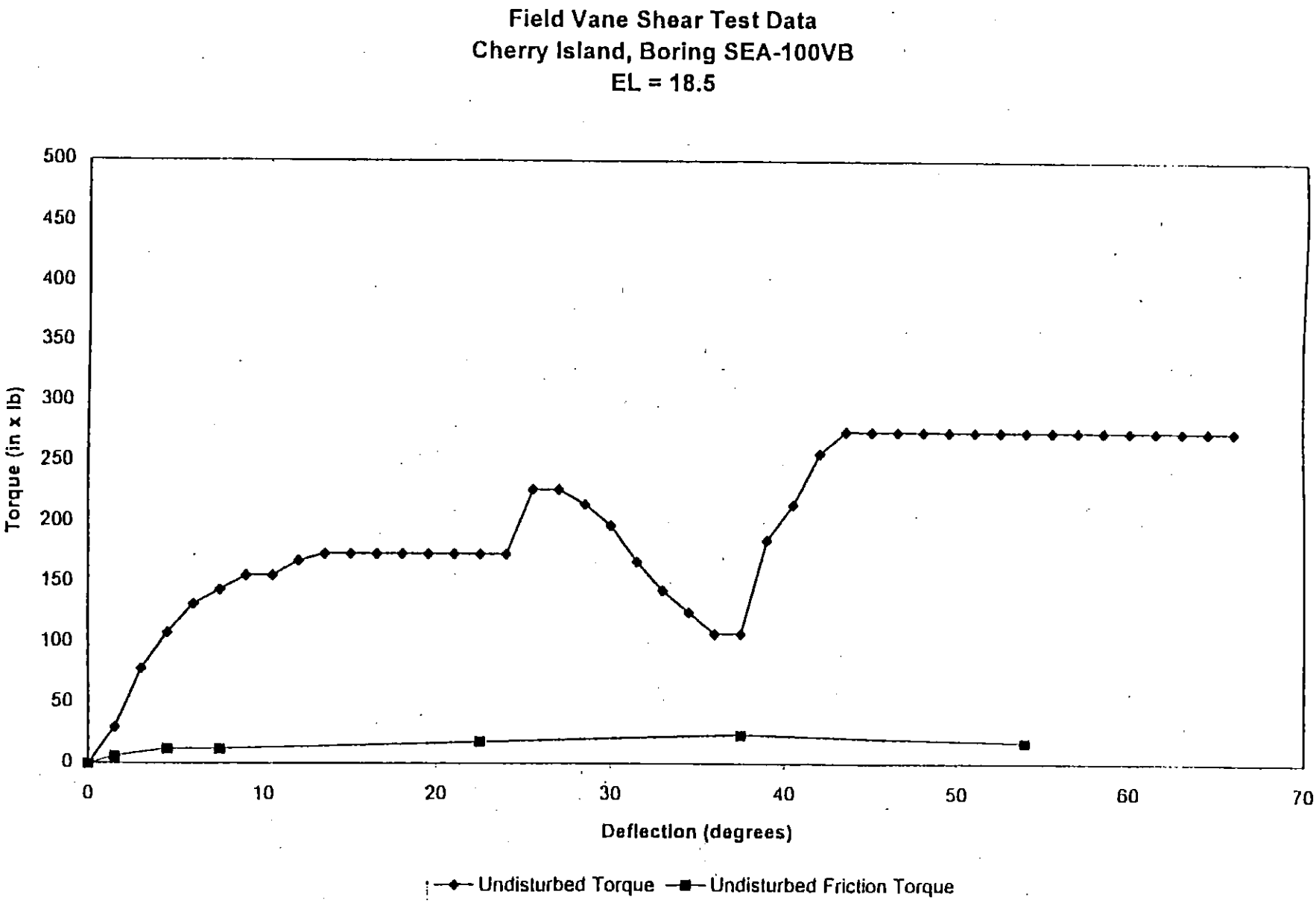
UNDISTURBED TEST:
Undrained Shear Strength: 400 psf

REMOLDED TEST:
Undrained Shear Strength: 160 psf

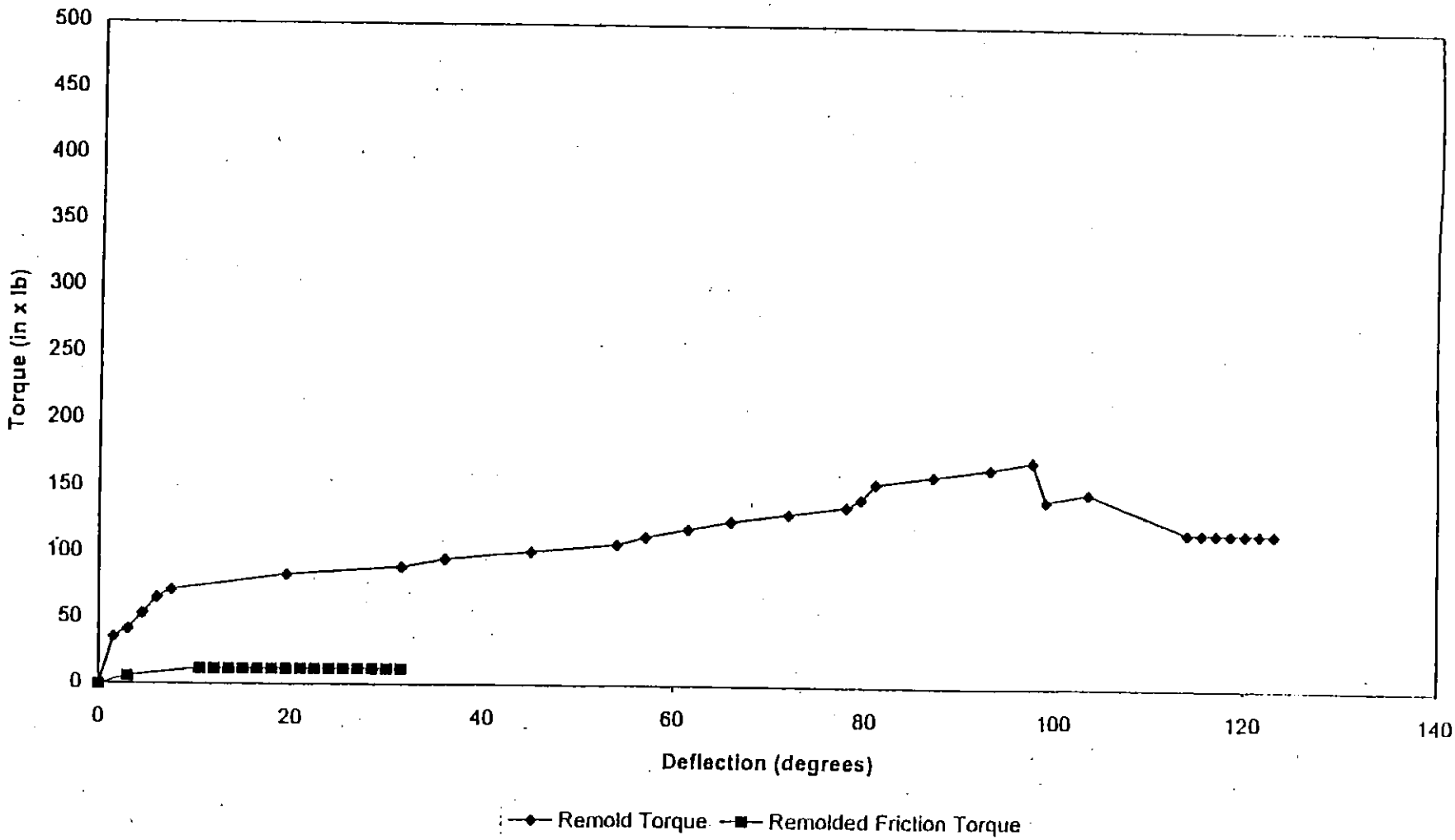
Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 18.5




Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 18.5
Torque (in x lb)
500
450
400
350
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
Deflection (degrees)
Undisturbed Torque
Undisturbed Friction Torque

Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 18.5



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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-100VB	TEST NUMBER:	Vane #4
GROUND SURFACE EL.:	78	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	64.5	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth. A non-housed vane was pushed to 1.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (in x lb):	336	Time to Failure (min):	2:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	13.5

REMOLDED TEST:

Maximum Torque (in x lb):	72	Time to Failure (min):	5:30
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	33

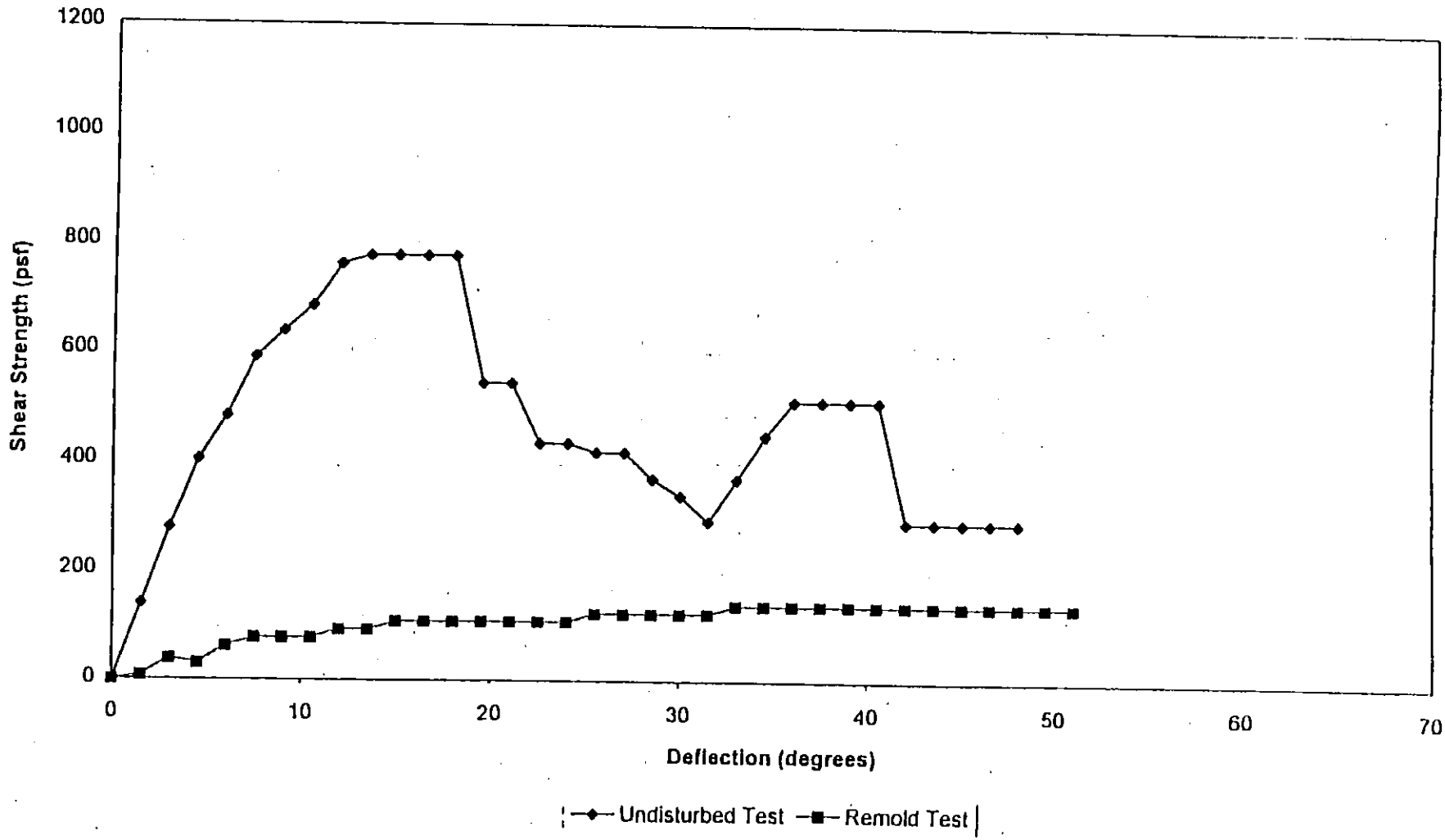
Friction Correction (in x lb):	36	from undisturbed friction test at 68.5 feet
	18	from remolded friction test at 68.5 feet

UNDISTURBED TEST:
Undrained Shear Strength: 780 psf

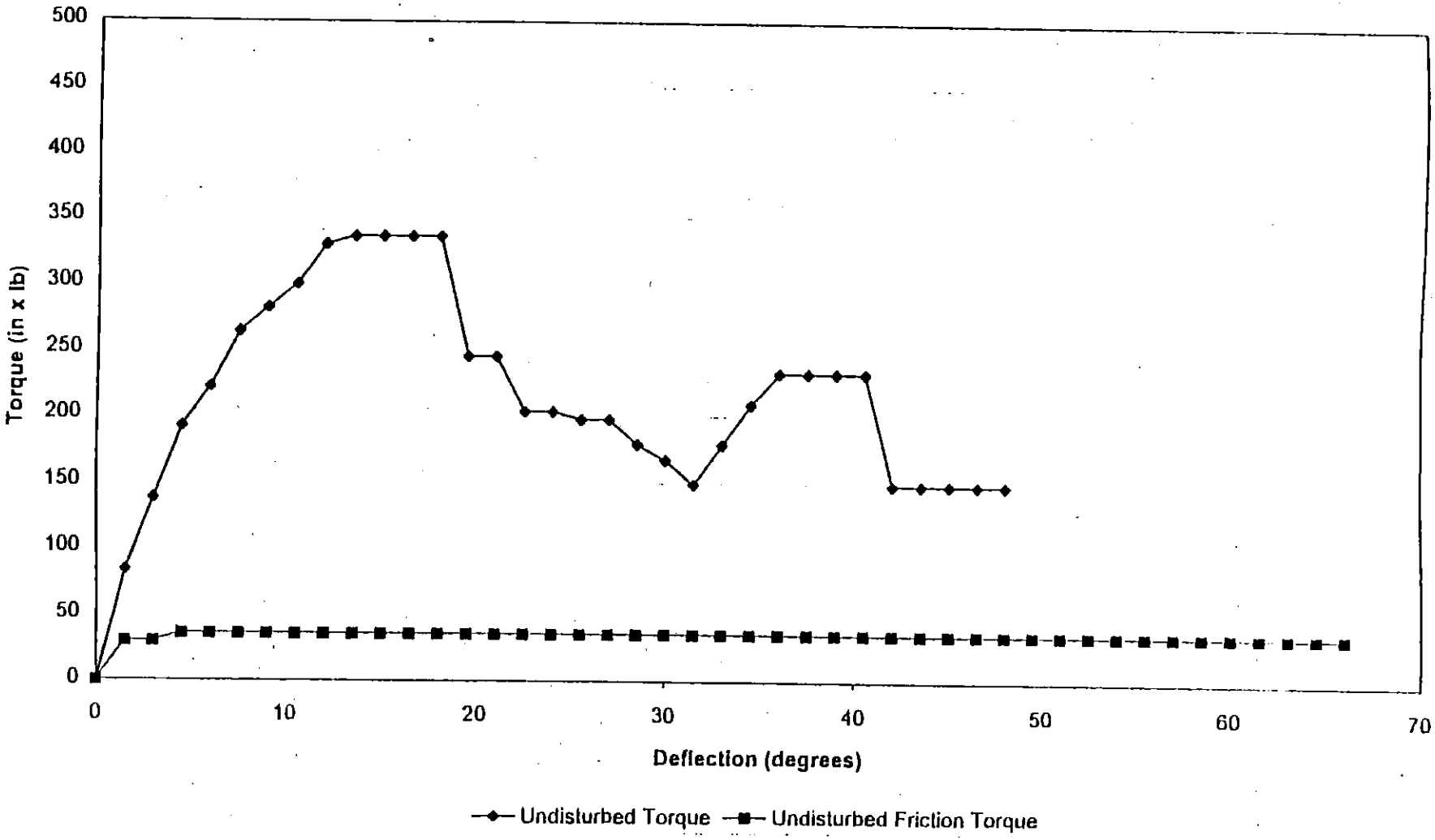
REMOLDED TEST:
Undrained Shear Strength: 140 psf

Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

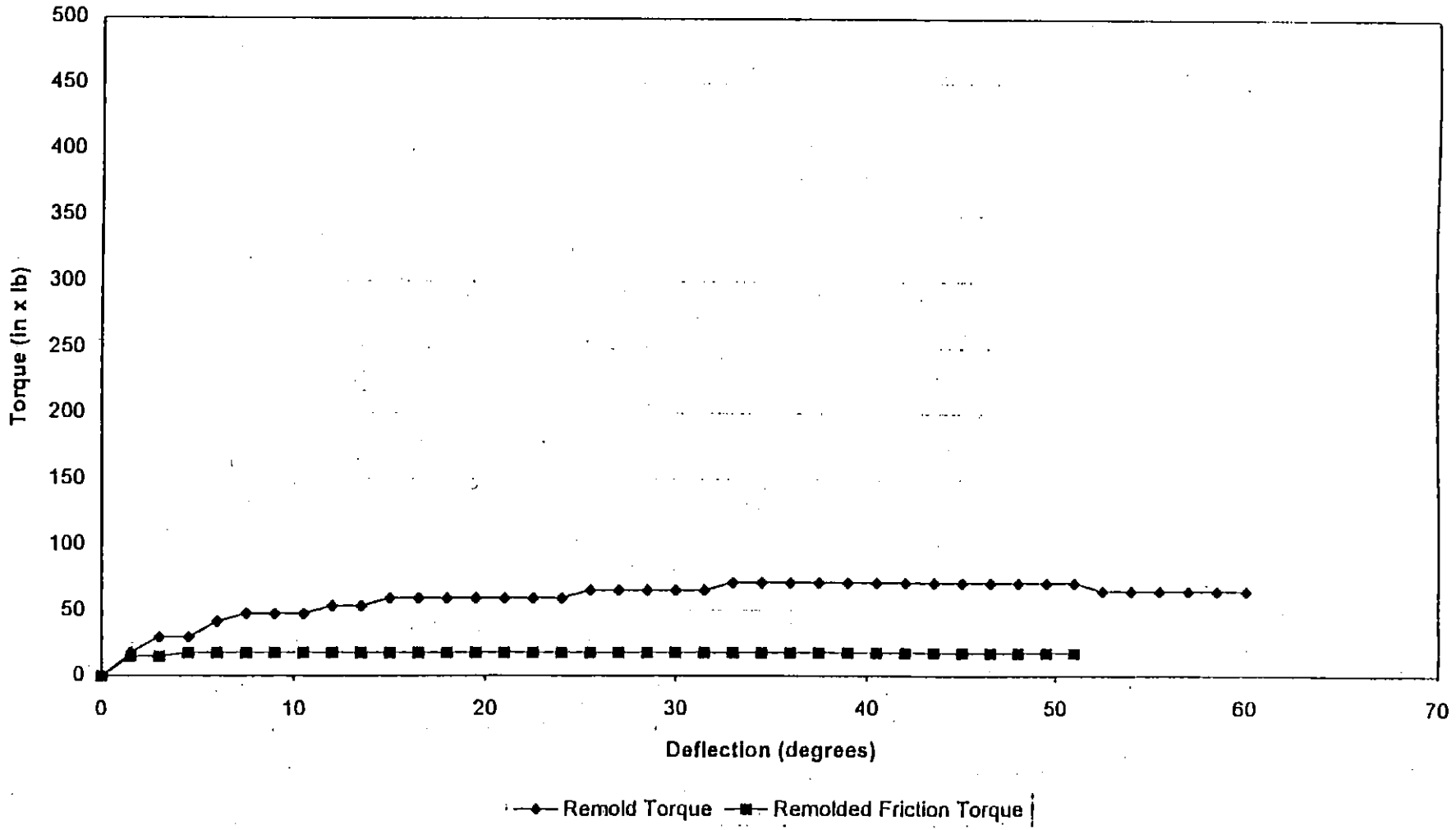
Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 13.5



Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 13.5



Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 13.5



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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE.	October 8, 2001

BORING NUMBER:	SEA-100VB	TEST NUMBER:	Vane #5
GROUND SURFACE EL.:	78	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	70	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 1.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (in x lb):	354	Time to Failure (min):	3:45
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	22.5

REMOLDED TEST:

Maximum Torque (in x lb):	108	Time to Failure (min):	3:00
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	18

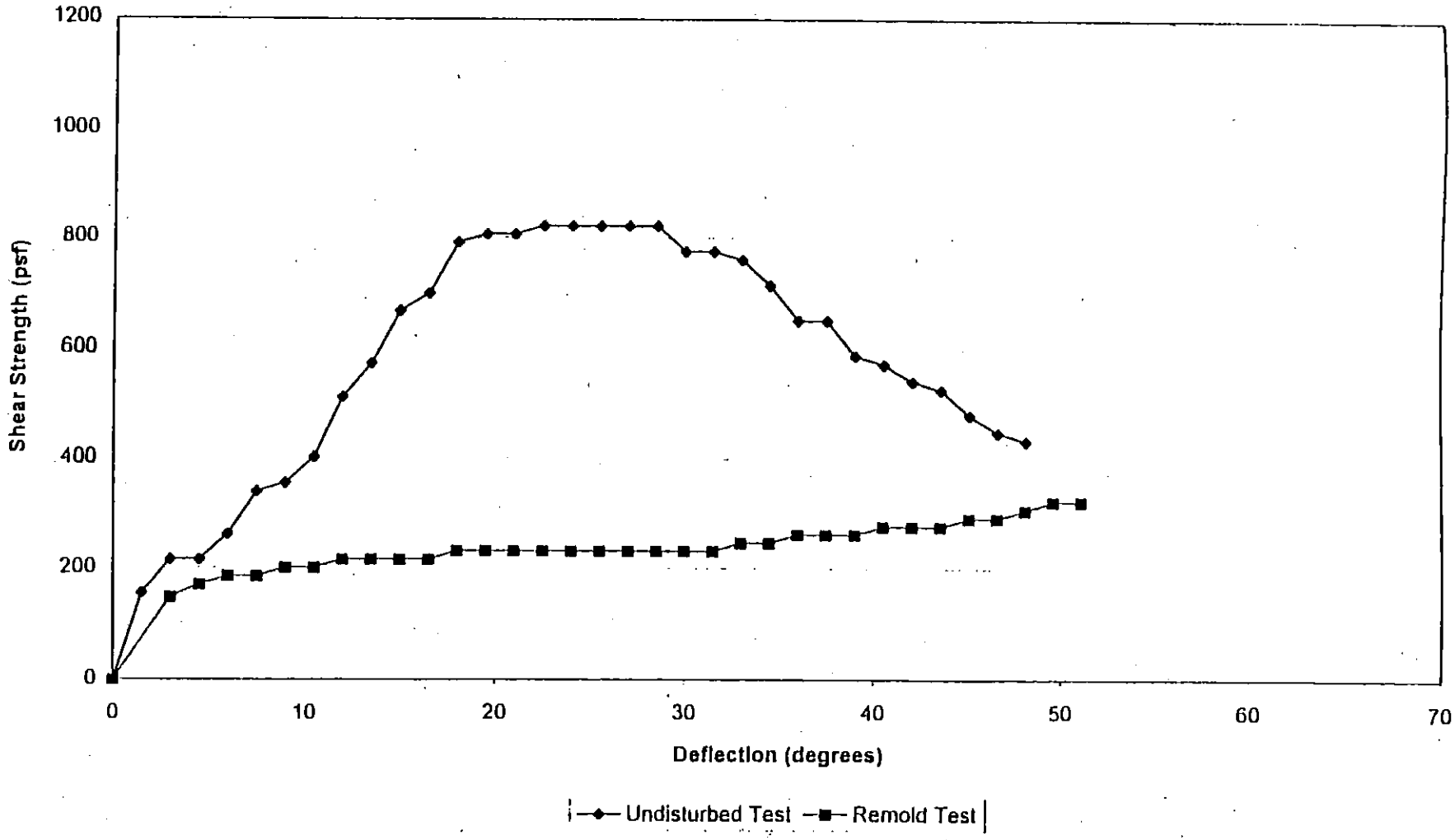
Friction Correction (in x lb):	36	from undisturbed friction test at 68.5 feet
	18	from remolded friction test at 68.5 feet

UNDISTURBED TEST:
Undrained Shear Strength: 820 psf

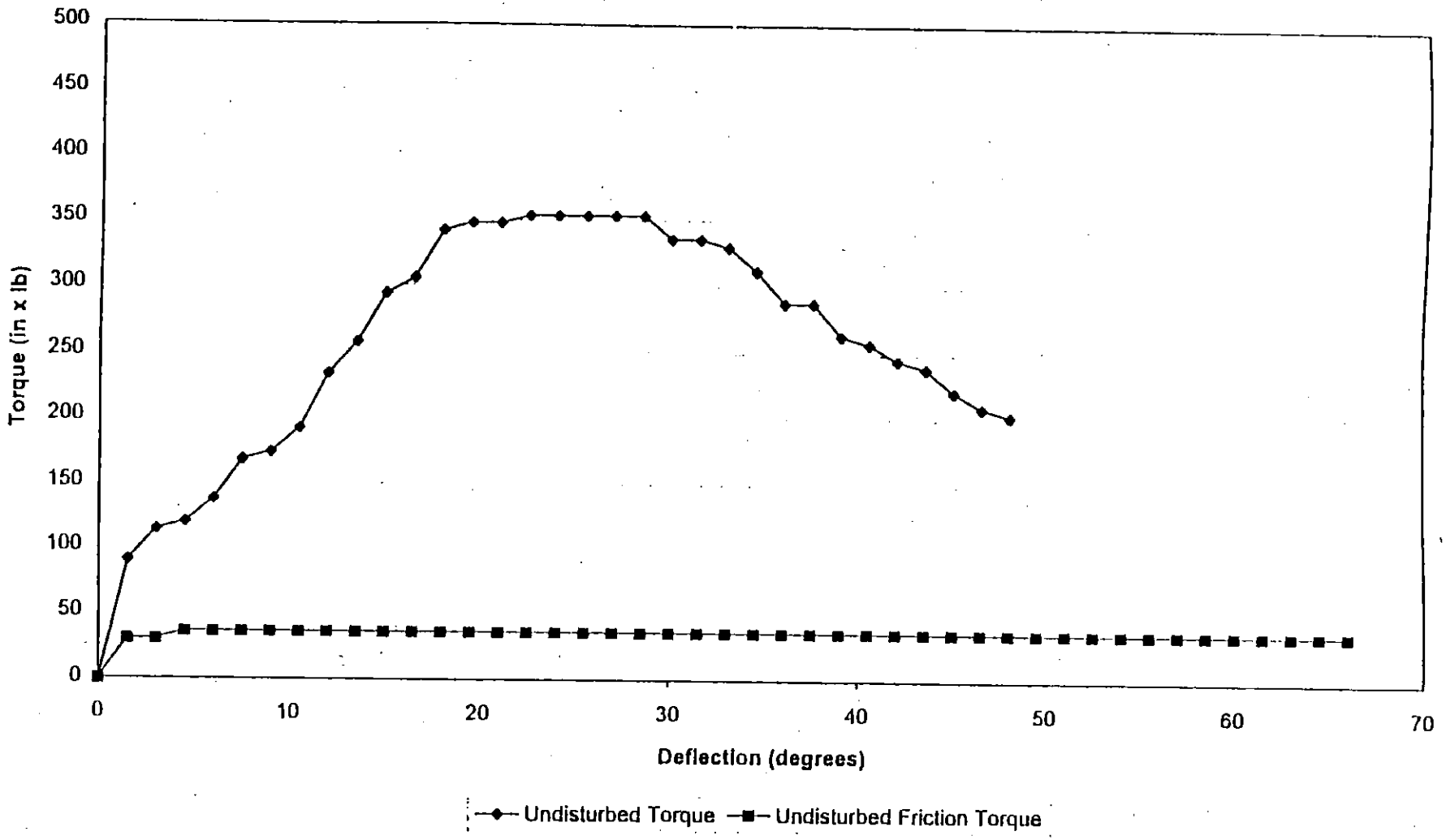
REMOLDED TEST:
Undrained Shear Strength: 230 psf

Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

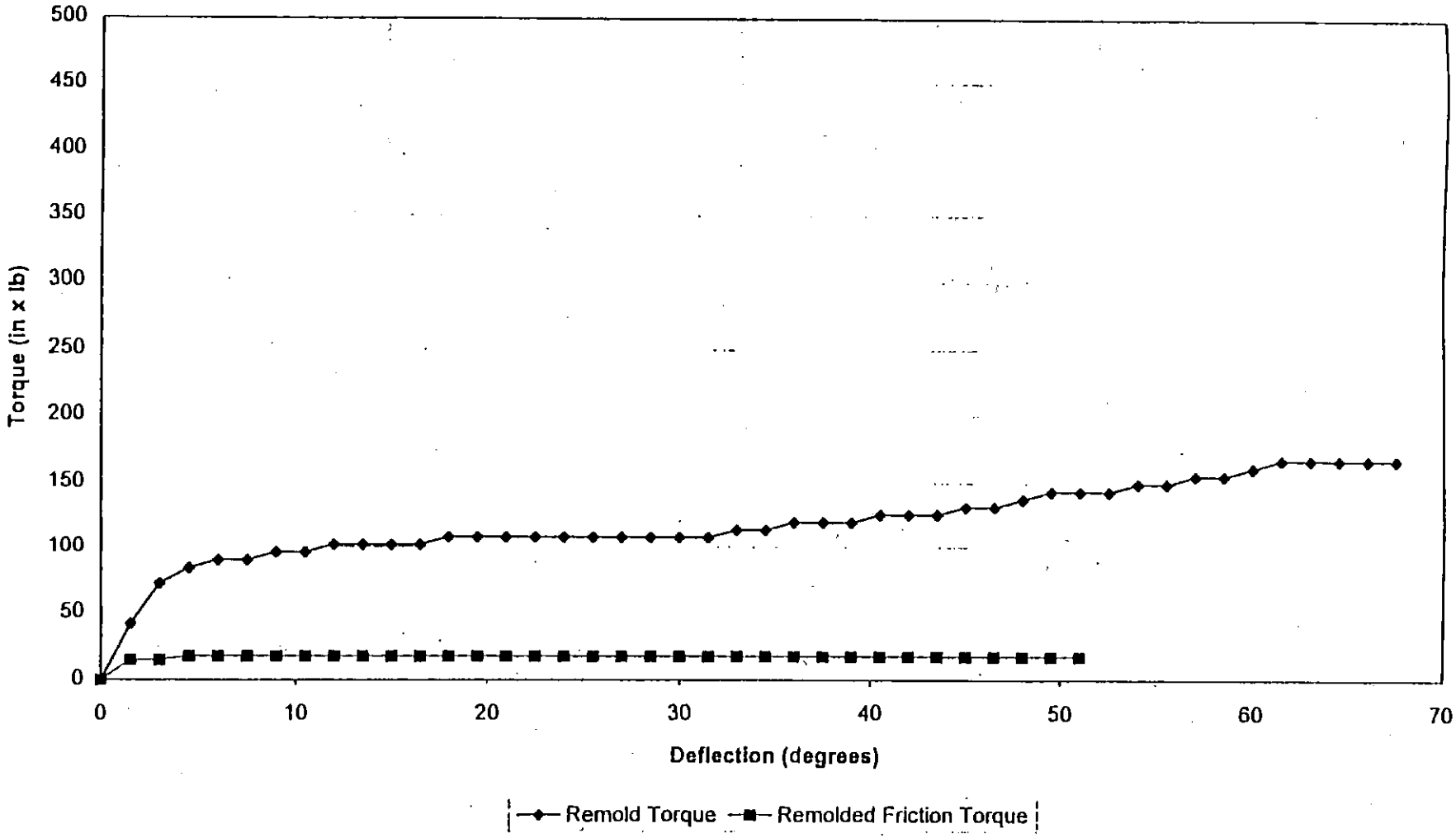
Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 8.0



Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 8.0



Field Vane Shear Test Data
Cherry Island, Boring SEA-100VB
EL = 8.0



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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-104V	TEST NUMBER:	Vane #1
GROUND SURFACE EL.:	73	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	45	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth. A non-housed vane was pushed to 1.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (in x lb):	312	Time to Failure (min):	4:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	25.5

REMOLDED TEST:

Maximum Torque (in x lb):	36	Time to Failure (min):	0:45
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	4.5

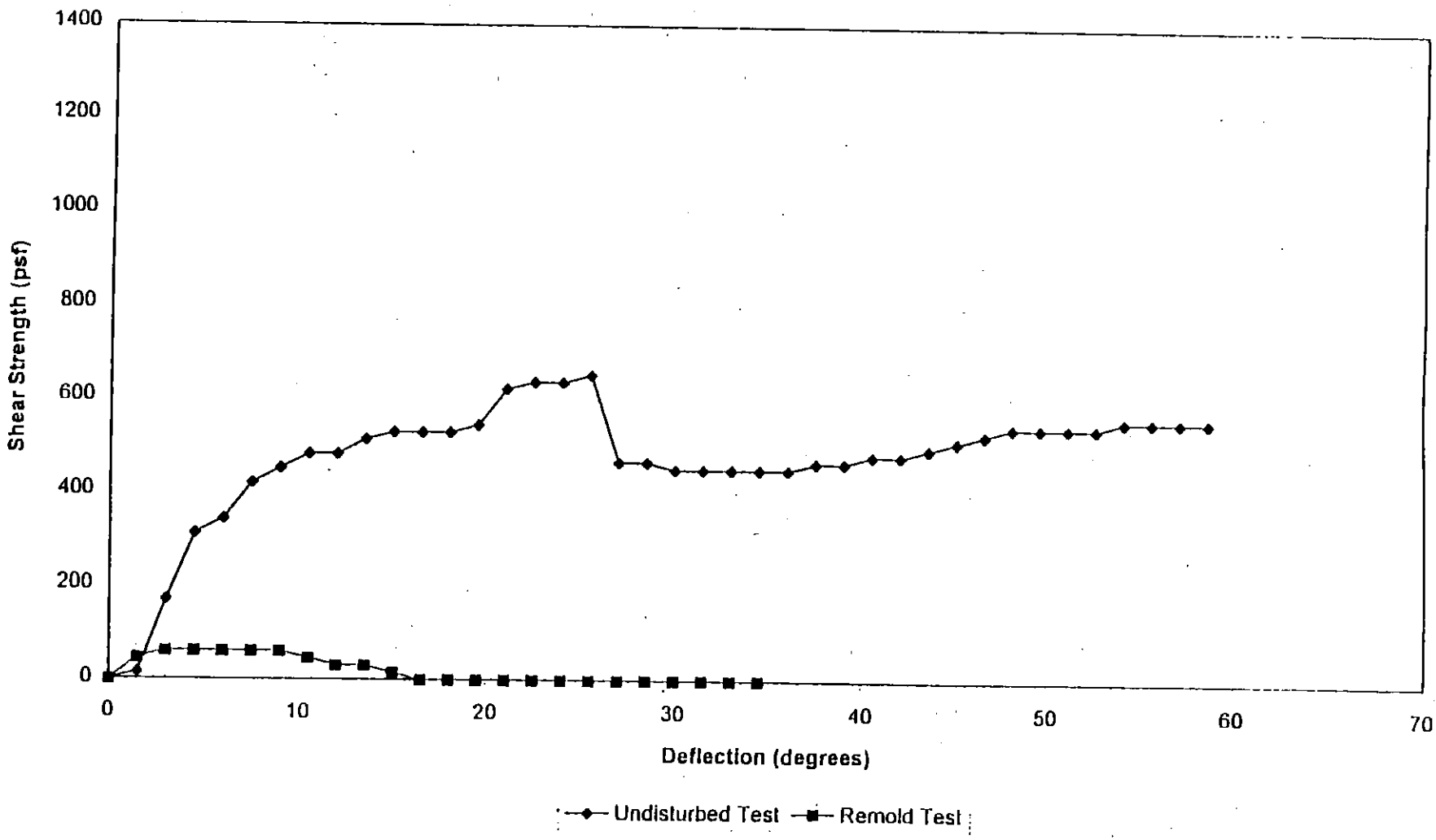
Friction Correction (in x lb):	60	from undisturbed friction test at 49 feet
	12	from remolded friction test at 49 feet

UNDISTURBED TEST:
Undrained Shear Strength: 650 psf

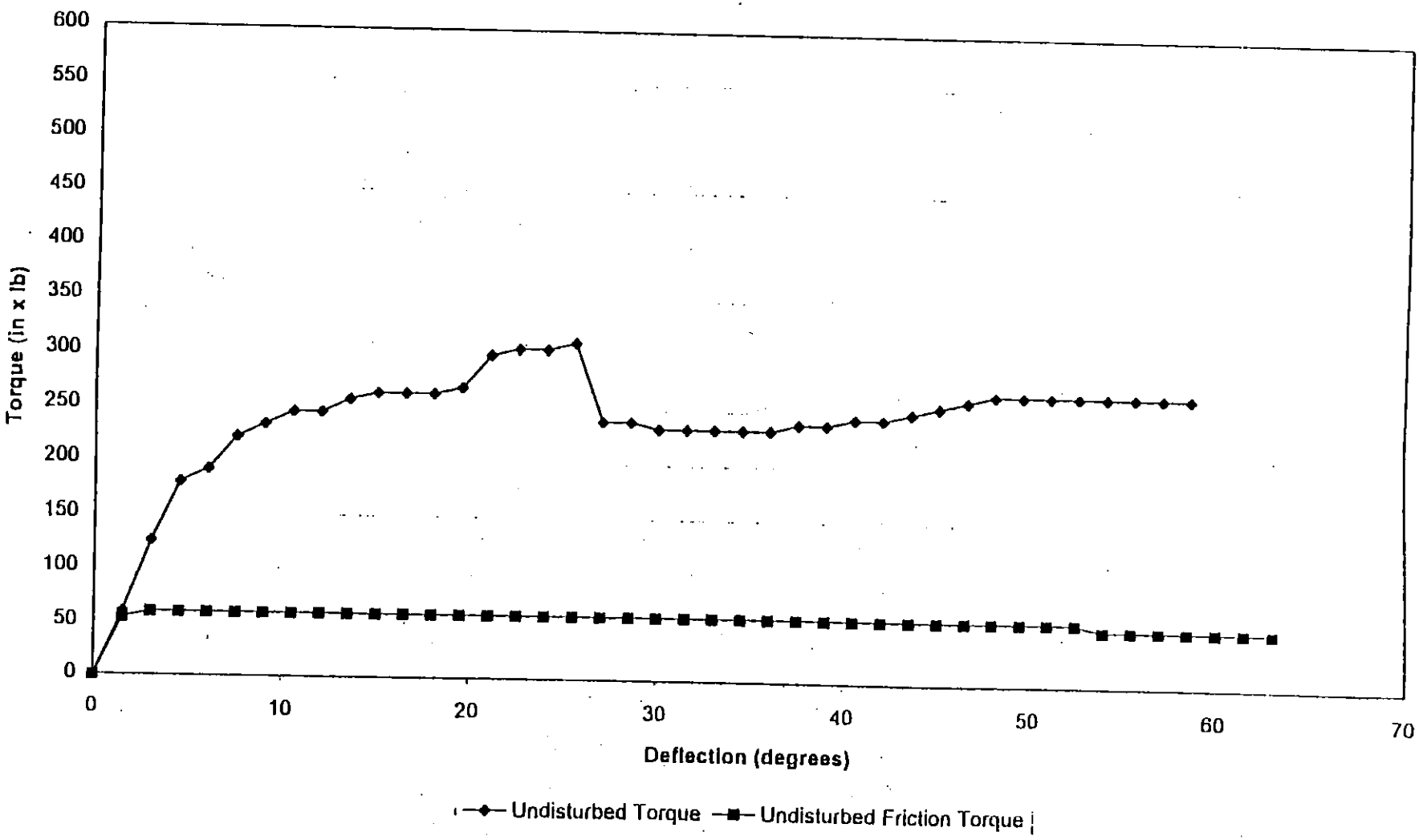
REMOLDED TEST:
Undrained Shear Strength: 60 psf

Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

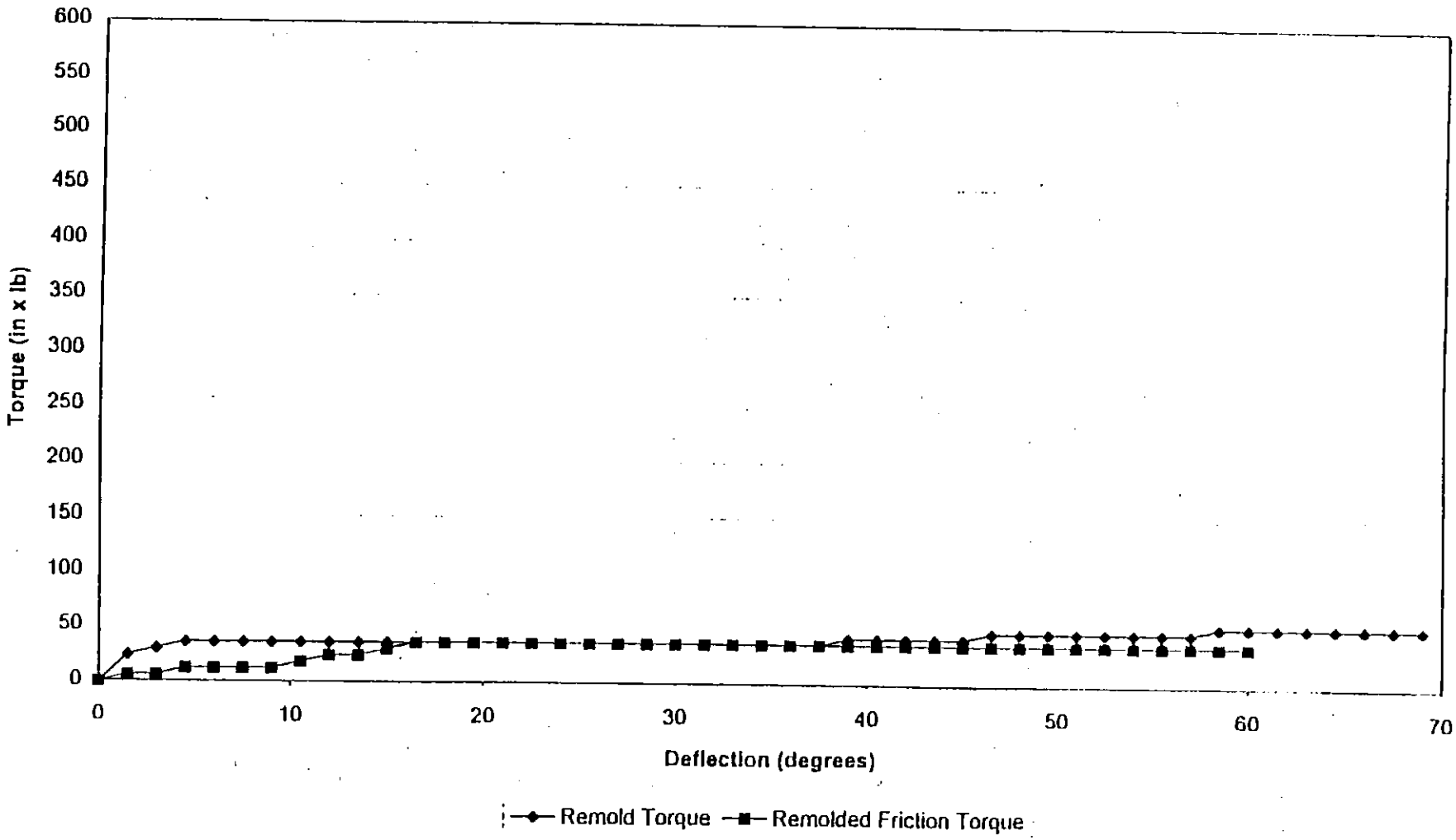
Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 28



Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 28



Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 28



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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-104V	TEST NUMBER:	Vane #2
GROUND SURFACE EL.:	73	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	50.5	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth. A non-housed vane was pushed to 1.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM 8

UNDISTURBED TEST:

Maximum Torque (in x lb):	444	Time to Failure (min):	6:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	37.5

REMOLDED TEST:

Maximum Torque (in x lb):	84	Time to Failure (min):	6:45
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	40.5

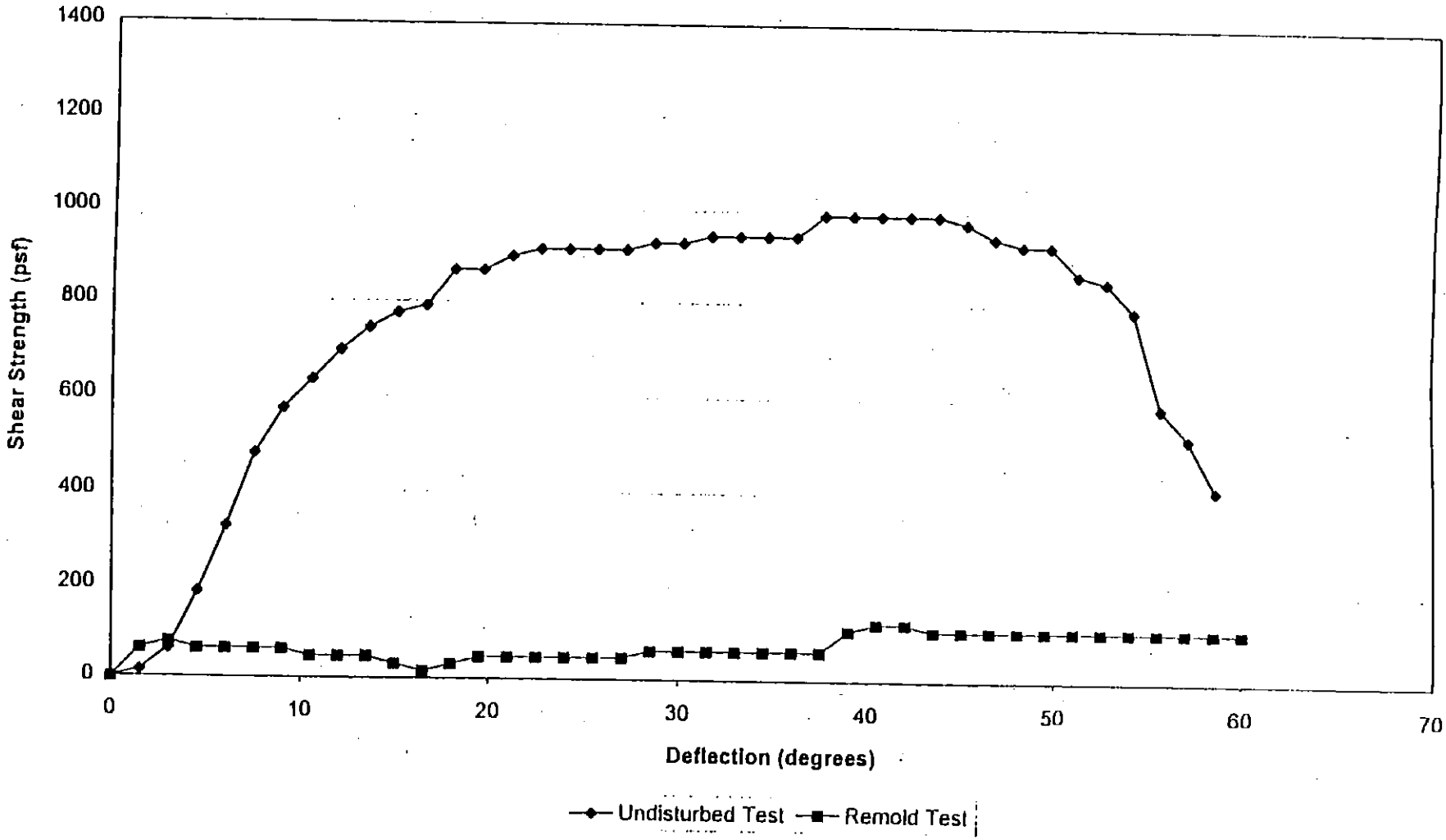
Friction Correction (in x lb):	60	from undisturbed friction test at 49 feet
	36	from remolded friction test at 49 feet

UNDISTURBED TEST:
Undrained Shear Strength: 990 psf

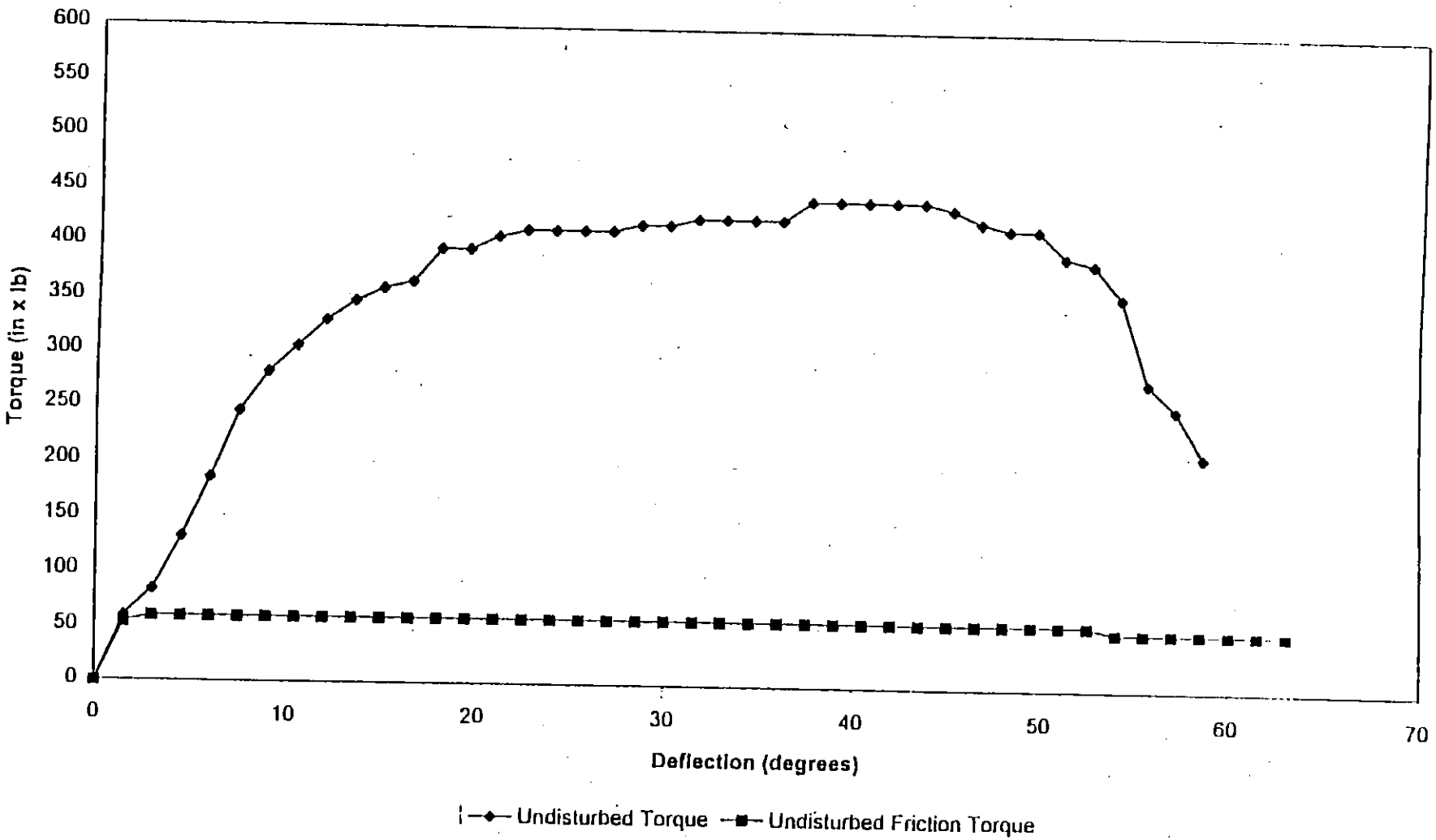
REMOLDED TEST:
Undrained Shear Strength: 120 psf

Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

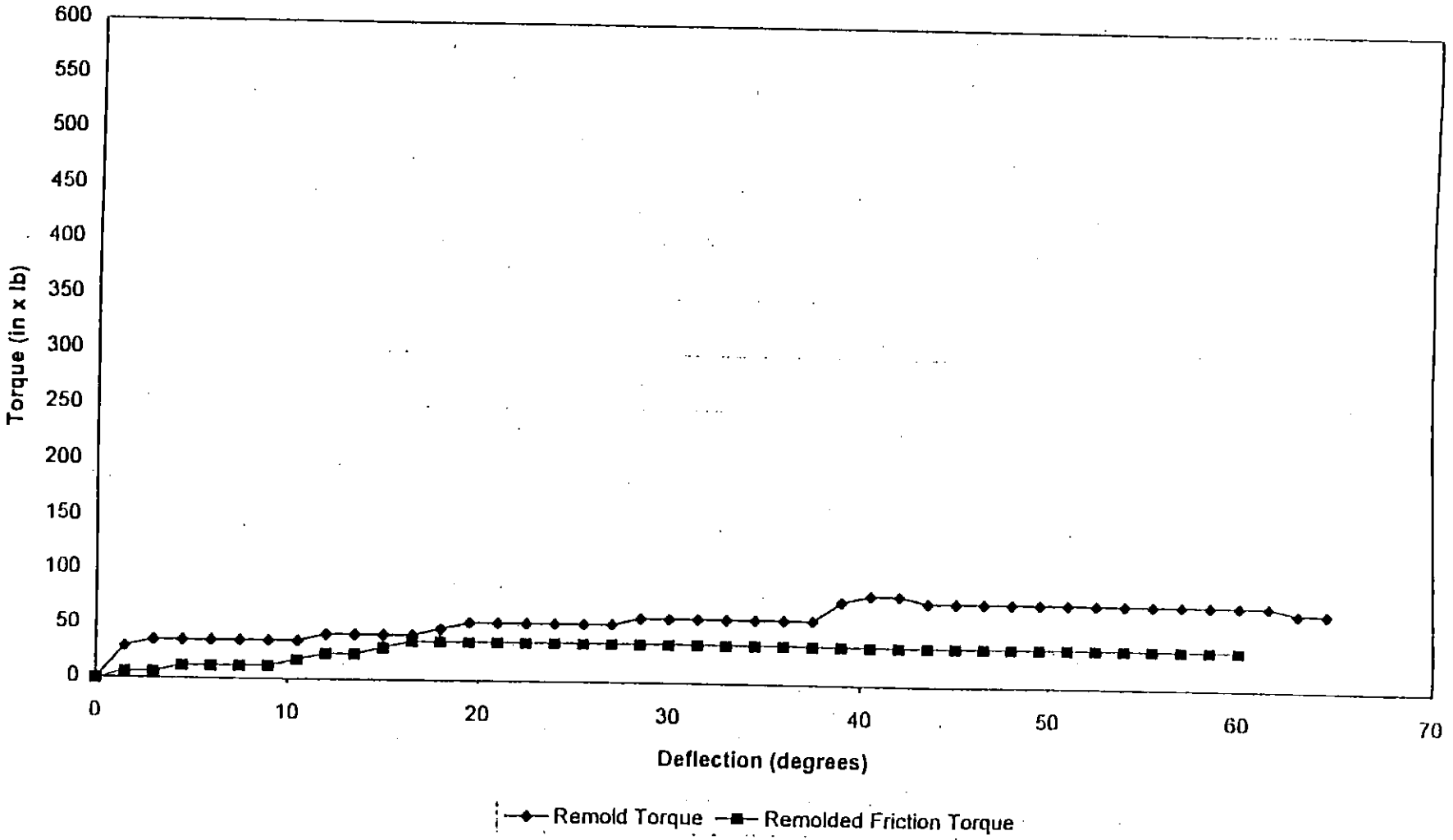
Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 22.5



Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 22.5



Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 22.5



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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-104V	TEST NUMBER:	Vane #3
GROUND SURFACE EL.:	73	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	54.5	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth. A non-housed vane was pushed to 1.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (in x lb):	510	Time to Failure (min):	1:45
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	10.5

REMOLDED TEST:

Maximum Torque (in x lb):	78	Time to Failure (min):	6:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	37.5

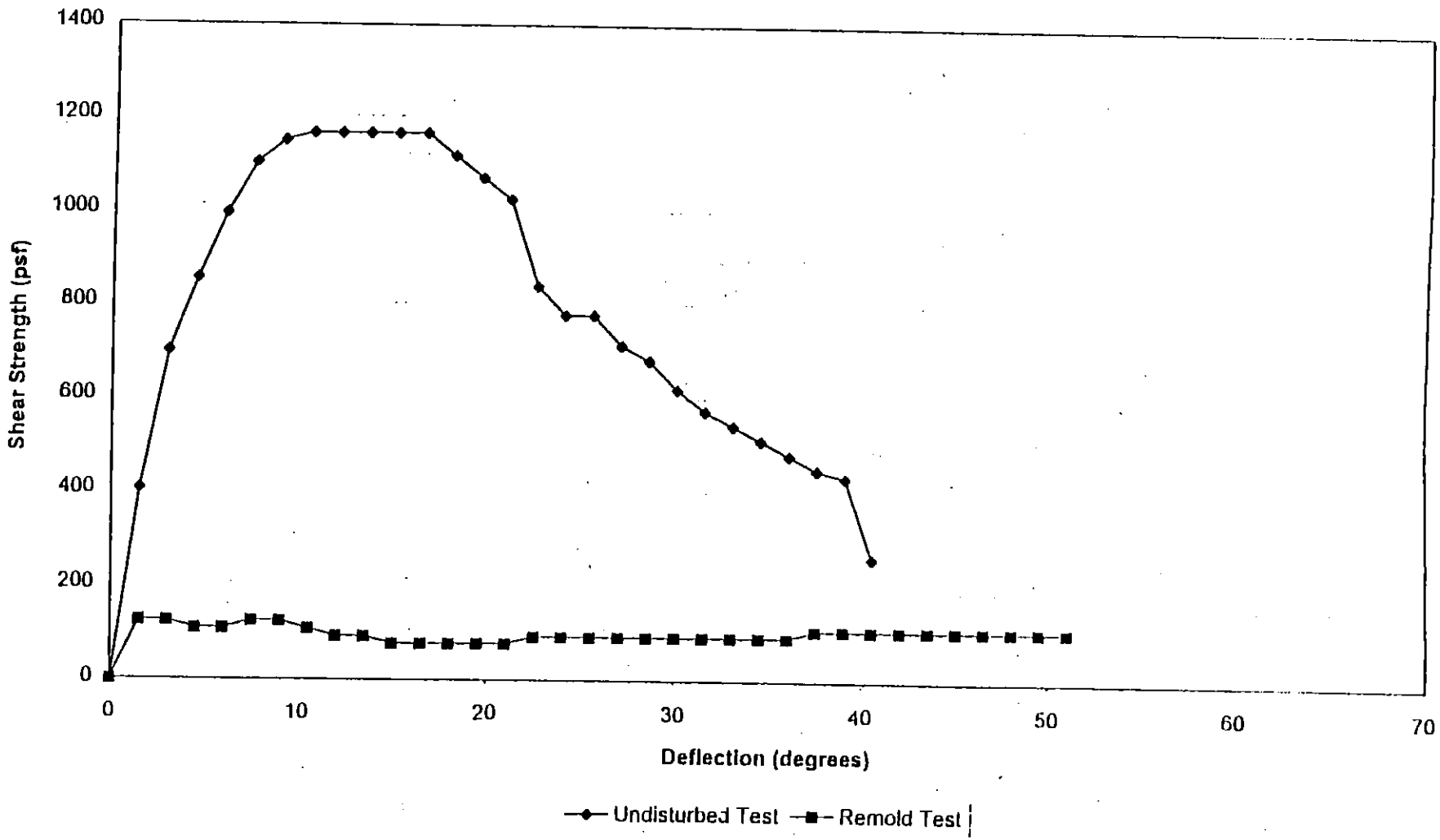
Friction Correction (in x lb):	60	from undisturbed friction test at 49 feet
	36	from remolded friction test at 49 feet

UNDISTURBED TEST:
Undrained Shear Strength: 1170 psf

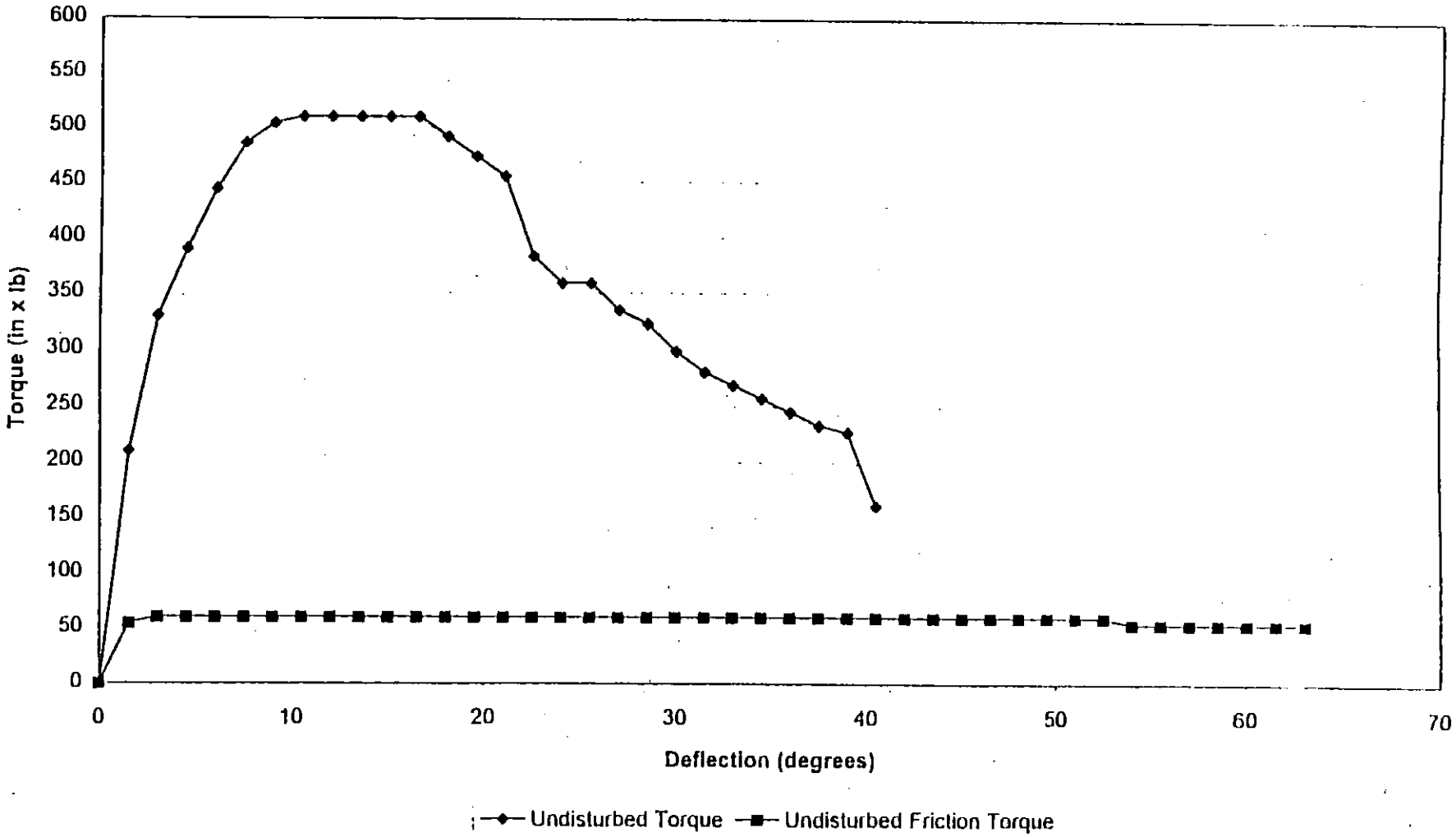
REMOLDED TEST:
Undrained Shear Strength: 110 psf

Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

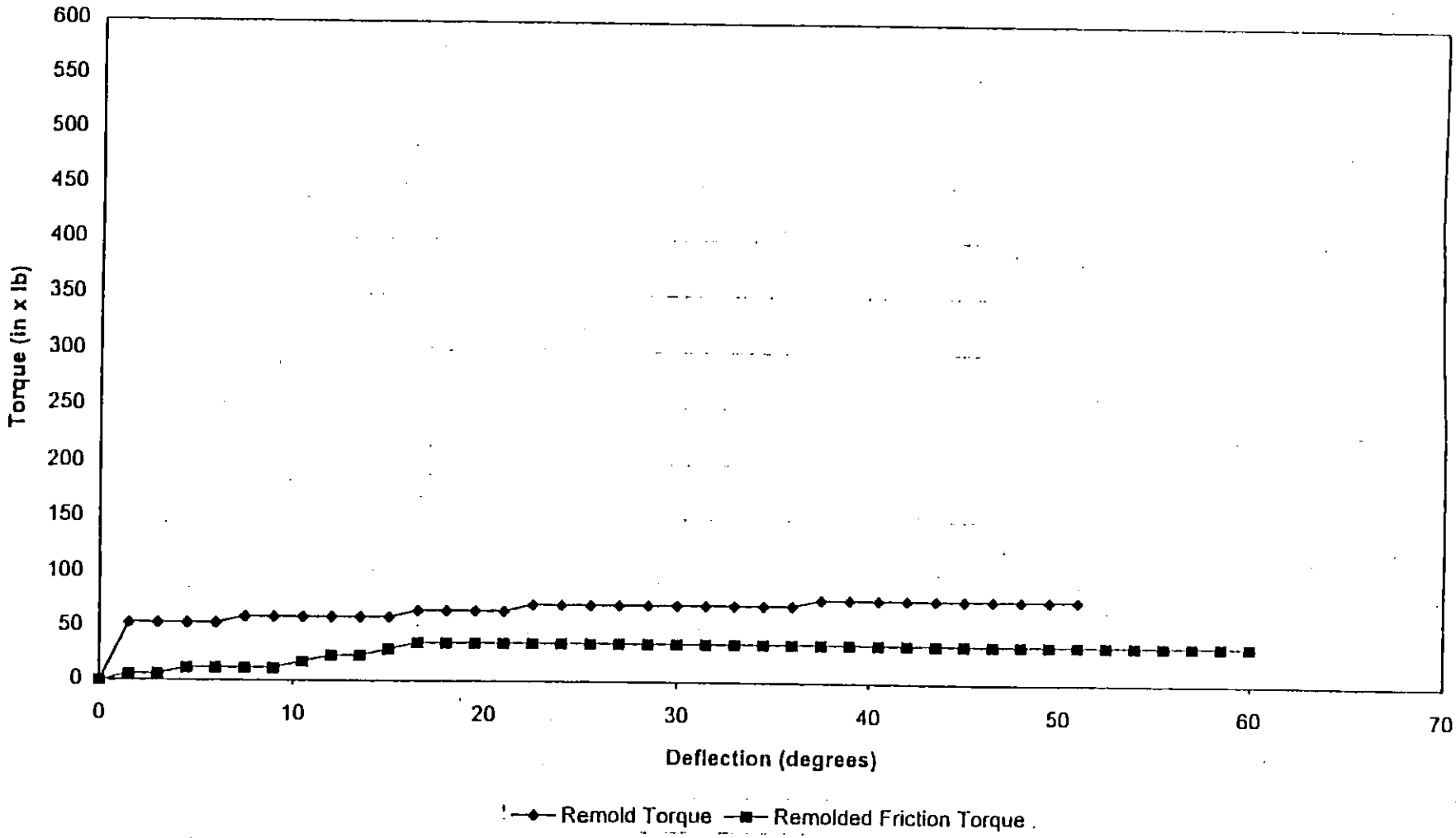
Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 18.5



Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 18.5



Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 18.5



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Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-104V	TEST NUMBER:	Vane #4
GROUND SURFACE EL.:	73	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	60.5	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth. A non-housed vane was pushed to 1.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (in x lb):	432	Time to Failure (min):	3:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	19.5

REMOLDED TEST:

Maximum Torque (in x lb):	54	Time to Failure (min):	6:30
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	39

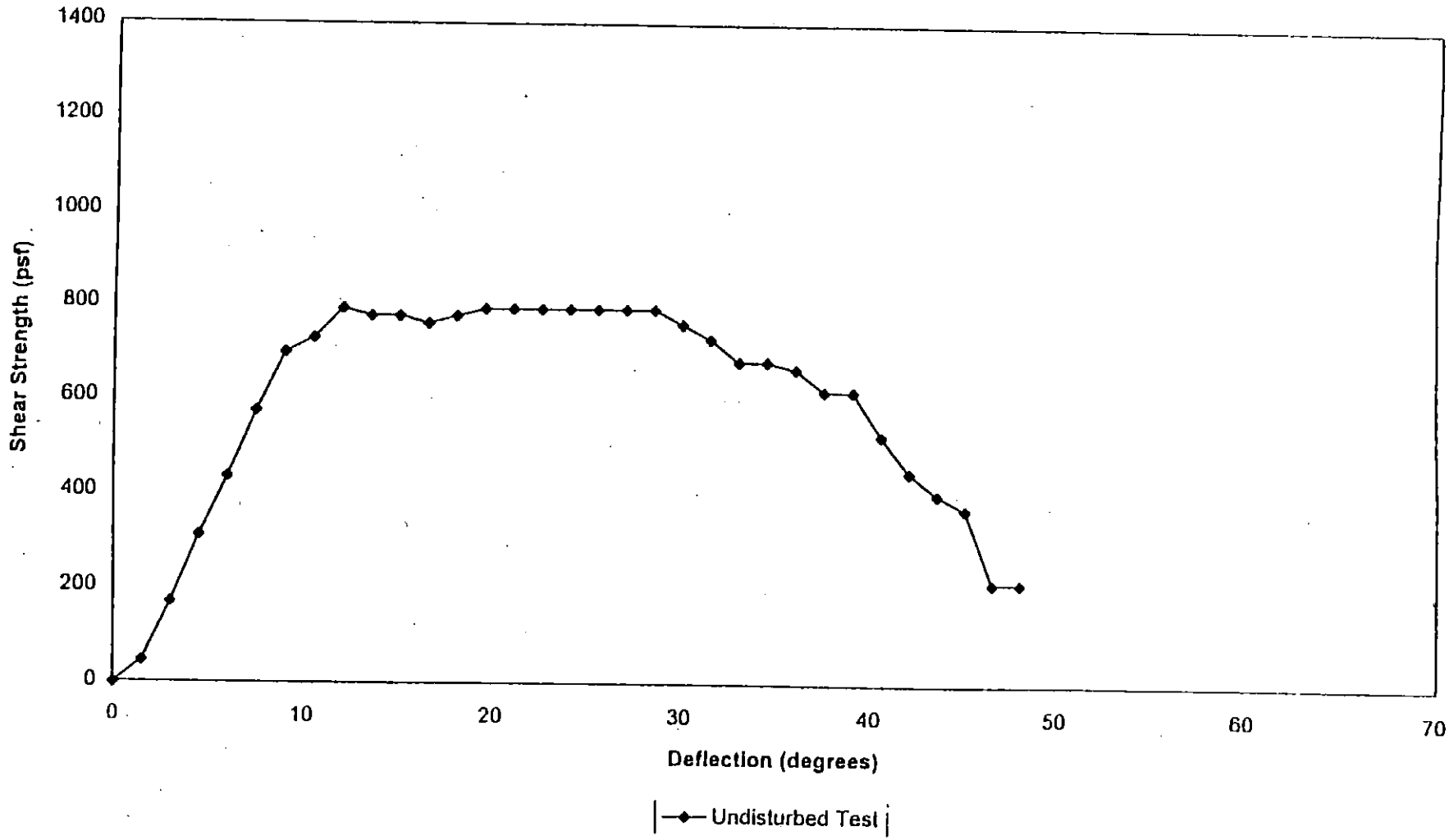
Friction Correction (in x lb):	126	from undisturbed friction test at 68.5 feet
	90	from remolded friction test at 68.5 feet

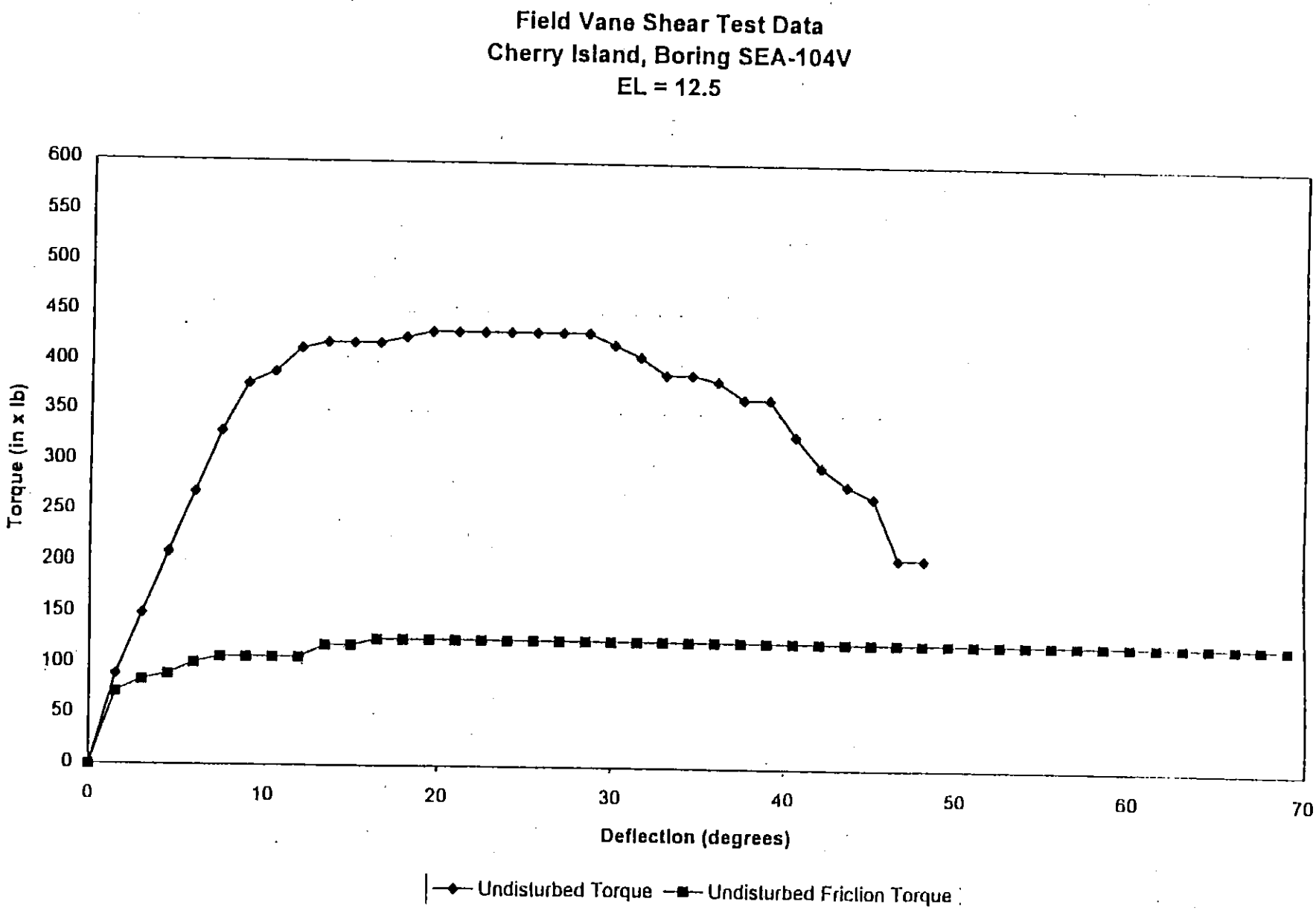
UNDISTURBED TEST:
Undrained Shear Strength: 790 psf

REMOLDED TEST:
Undrained Shear Strength: 0 psf

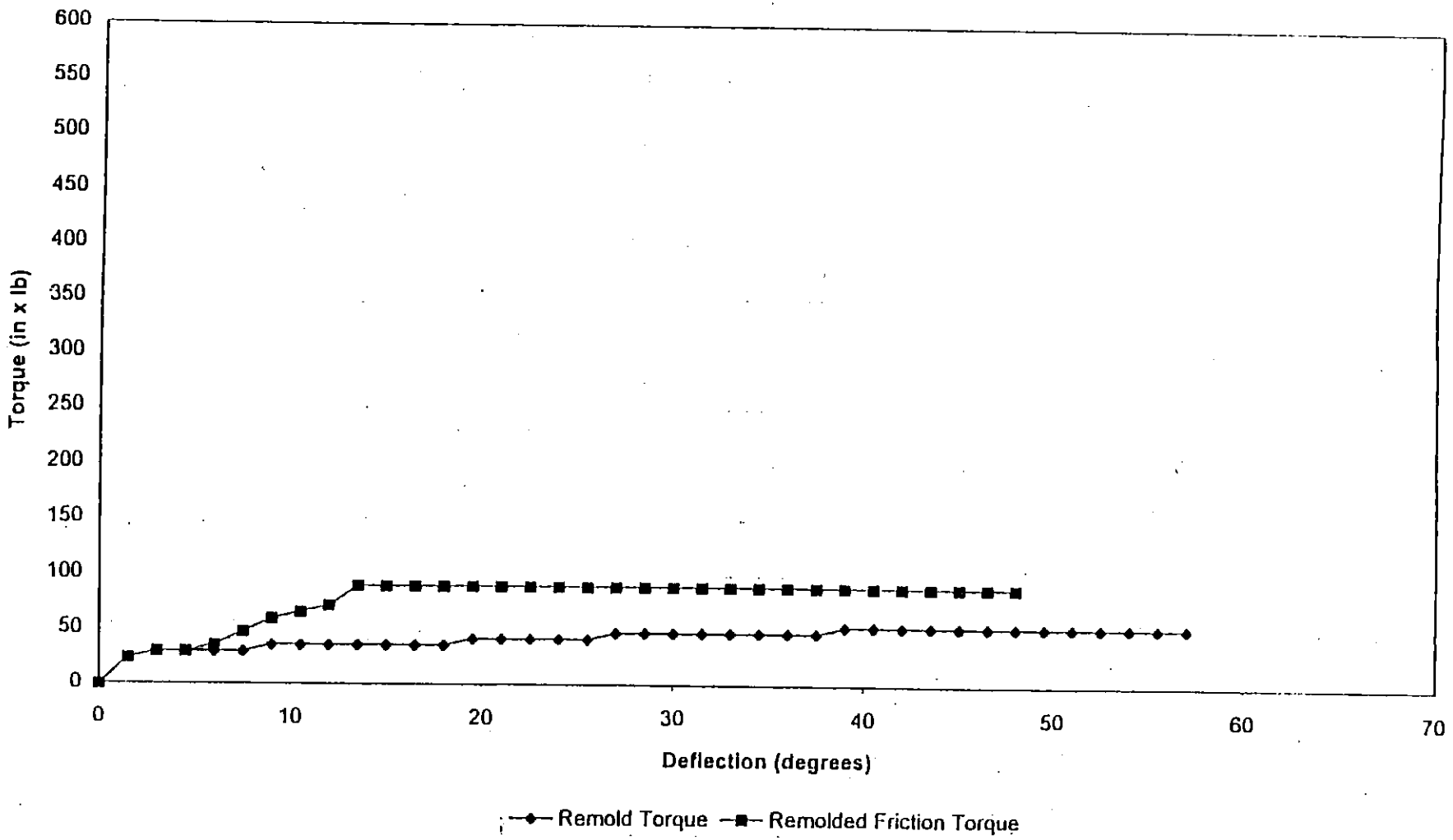
Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 12.5




Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 12.5
Torque (in x lb)
600
550
500
450
400
350
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
Deflection (degrees)
Undisturbed Torque
Undisturbed Friction Torque

Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 12.5



Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-104V	TEST NUMBER:	Vane #5
GROUND SURFACE EL.:	73	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	70	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth. A non-housed vane was pushed to 1.5 feet below the augers. The torque was applied manually by a hand crank that turned a geared drive. A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM B

UNDISTURBED TEST:

Maximum Torque (in x lb):	534	Time to Failure (min):	1:30
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	9

REMOLDED TEST:

Maximum Torque (in x lb):	60	Time to Failure (min):	0:15
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	1.5

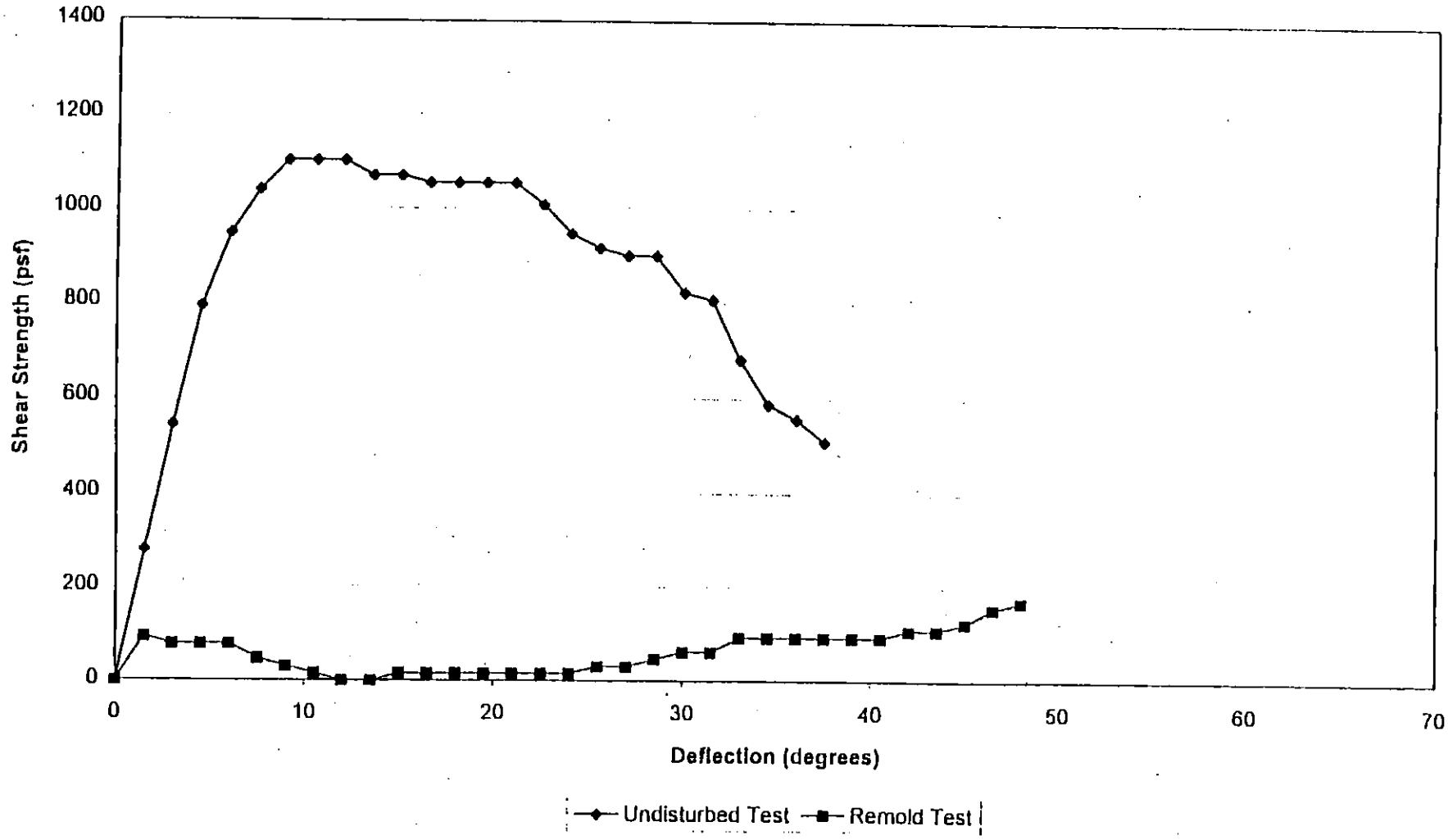
Friction Correction (in x lb):	108	from undisturbed friction test at 68.5 feet
	24	from remolded friction test at 68.5 feet

UNDISTURBED TEST:
Undrained Shear Strength: 1100 psf

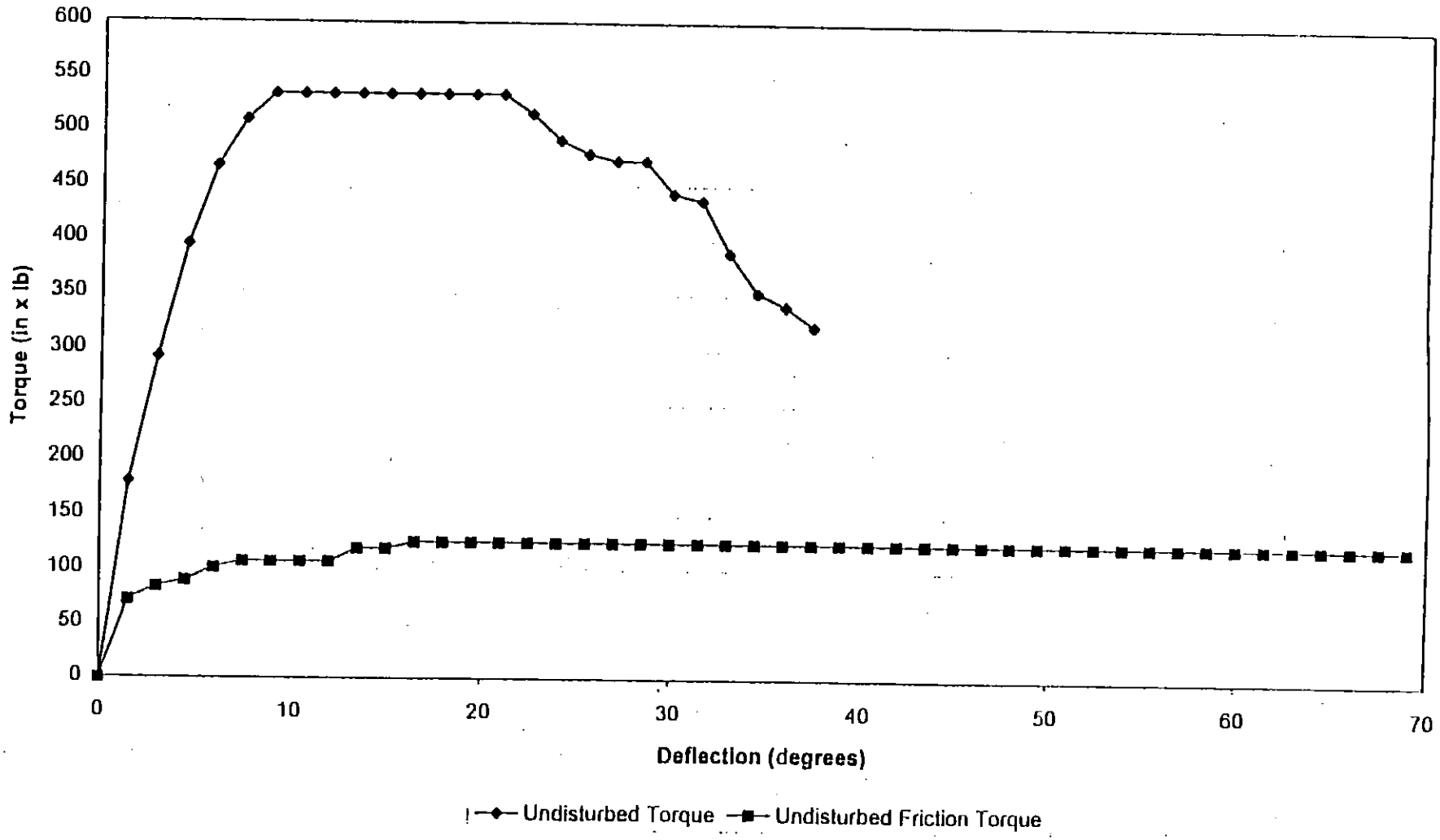
REMOLDED TEST:
Undrained Shear Strength: 90 psf

Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

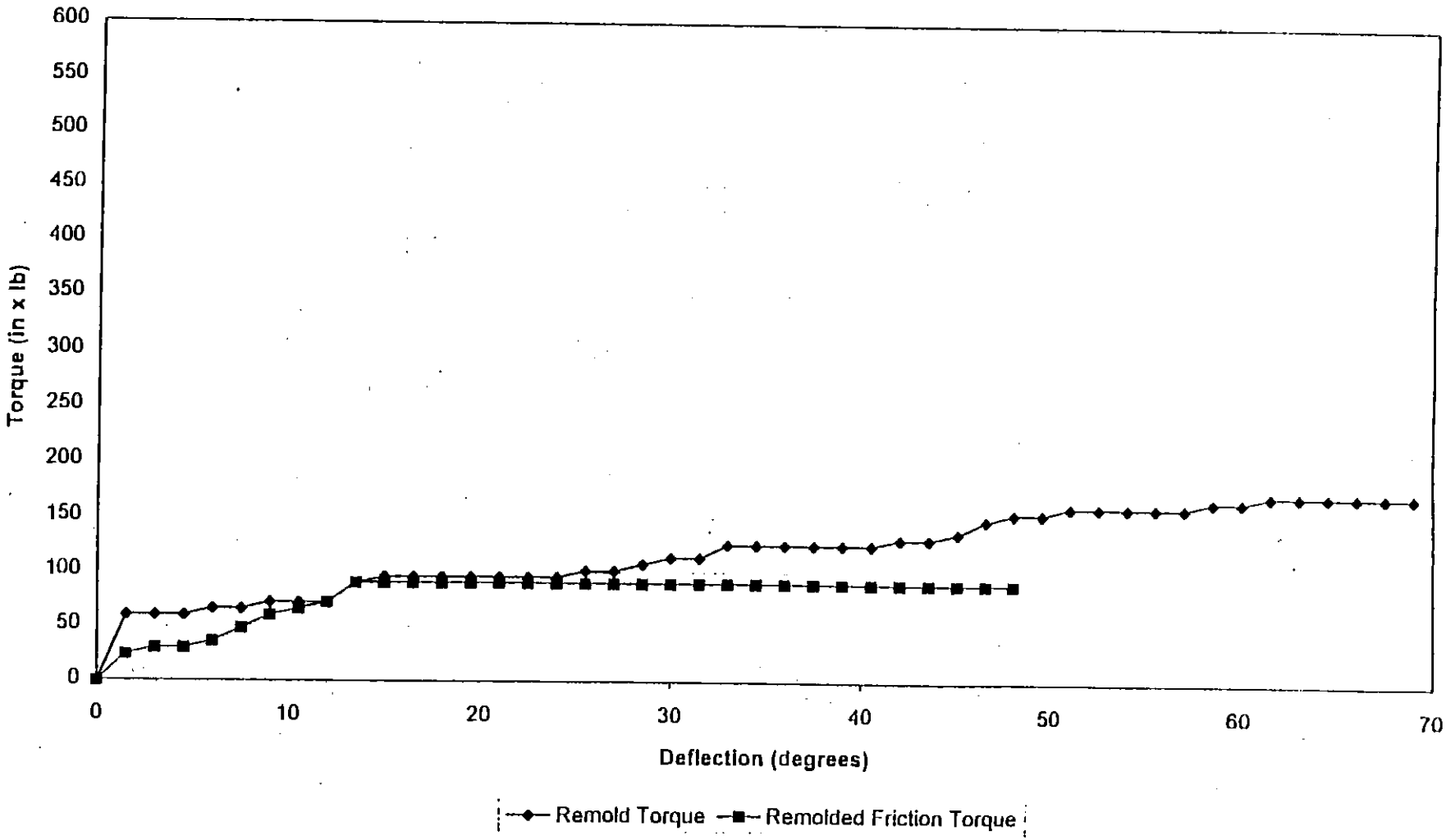
Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 3.0



Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 3.0



Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = 3.0



Schnabel Engineering

Field Vane Shear Test Log

PROJECT NAME:	CHERRY ISLAND LANDFILL - DSWA 458
CONTRACT NUMBER:	01151045
CONTRACTOR:	WALTON CORPORATION
DATE:	October 8, 2001

BORING NUMBER:	SEA-104V	TEST NUMBER:	Vane #6
GROUND SURFACE EL.:	73	VANE DIAMETER (in):	2.5
DEPTH TO VANE TIP (ft):	75	VANE SHAPE:	TAPERED
DEPTH BELOW AUGERS (ft):	1.5	ROD DIAMETER (in):	0.75

Description of test procedure: 3.25 inch I.D. auger was advanced to 1.5 feet above the desired vane tip depth.
A non-housed vane was pushed to 1.5 feet below the augers.
The torque was applied manually by a hand crank that turned a geared drive.
A force gauge set on a moment arm of known length measured the torque.

Time elapsed between vane insertion and shear testing = 10 minutes.

SOIL STRATUM TESTED: STRATUM 8

UNDISTURBED TEST:

Maximum Torque (in x lb):	324	Time to Failure (min):	4:00
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	24

REMOLDED TEST:

Maximum Torque (in x lb):	180	Time to Failure (min):	1:30
Ave. Shear Rate (deg/sec):	0.1	Deflect. at Failure (deg):	9

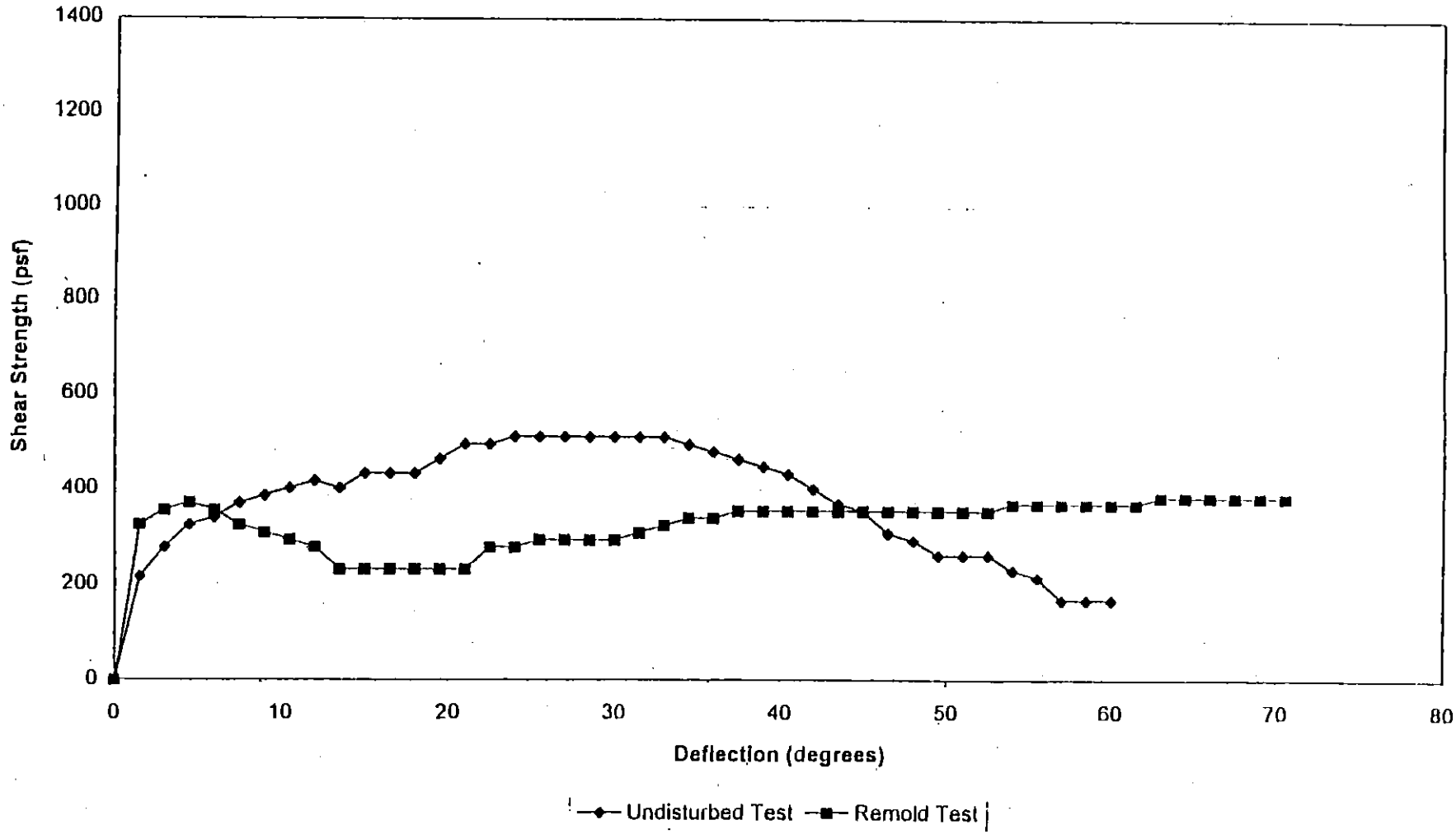
Friction Correction (in x lb):	126	from undisturbed friction test at 68.5 feet
	90	from remolded friction test at 68.5 feet

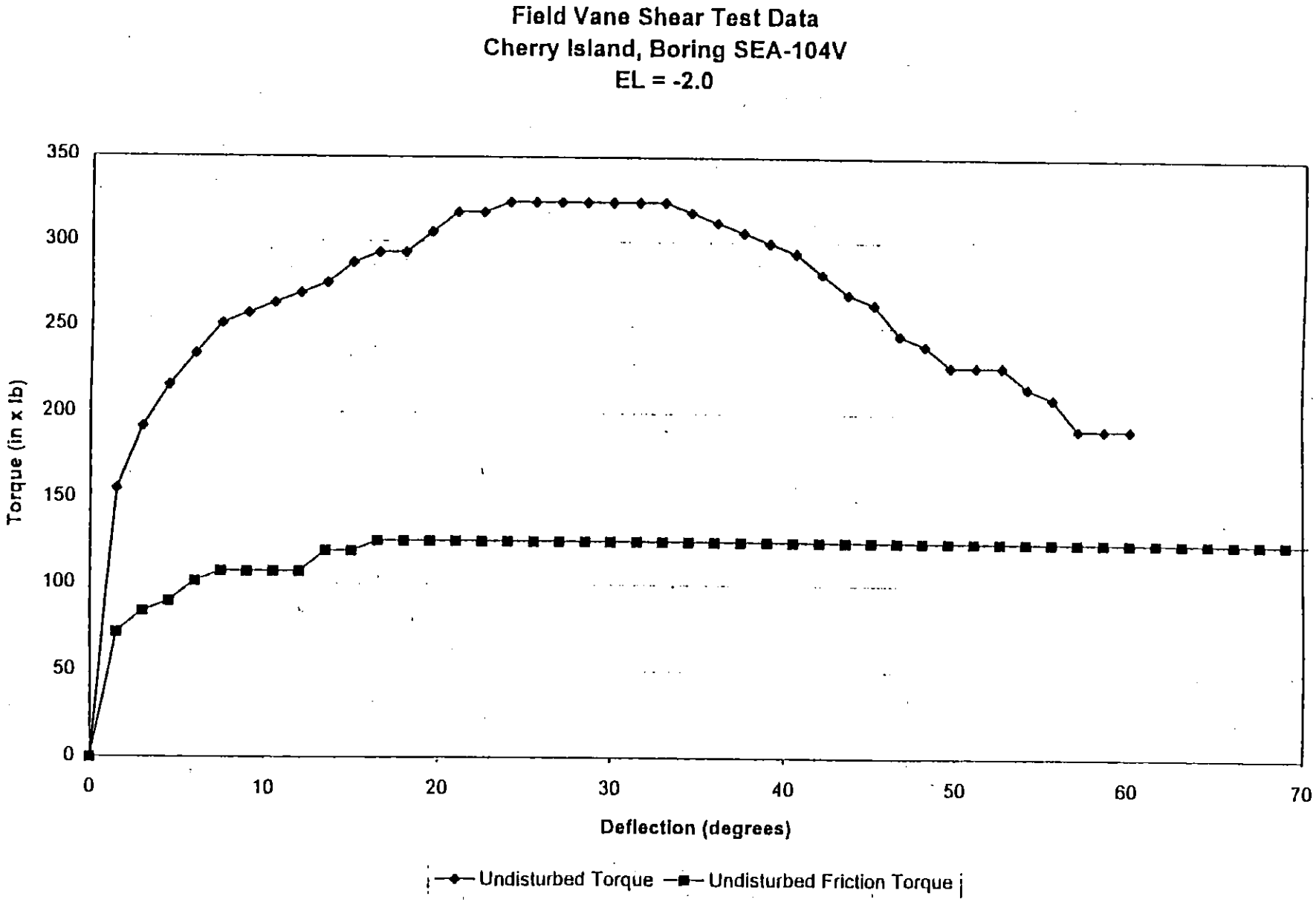
UNDISTURBED TEST:
Undrained Shear Strength: 510 psf

REMOLDED TEST:
Undrained Shear Strength: 230 psf

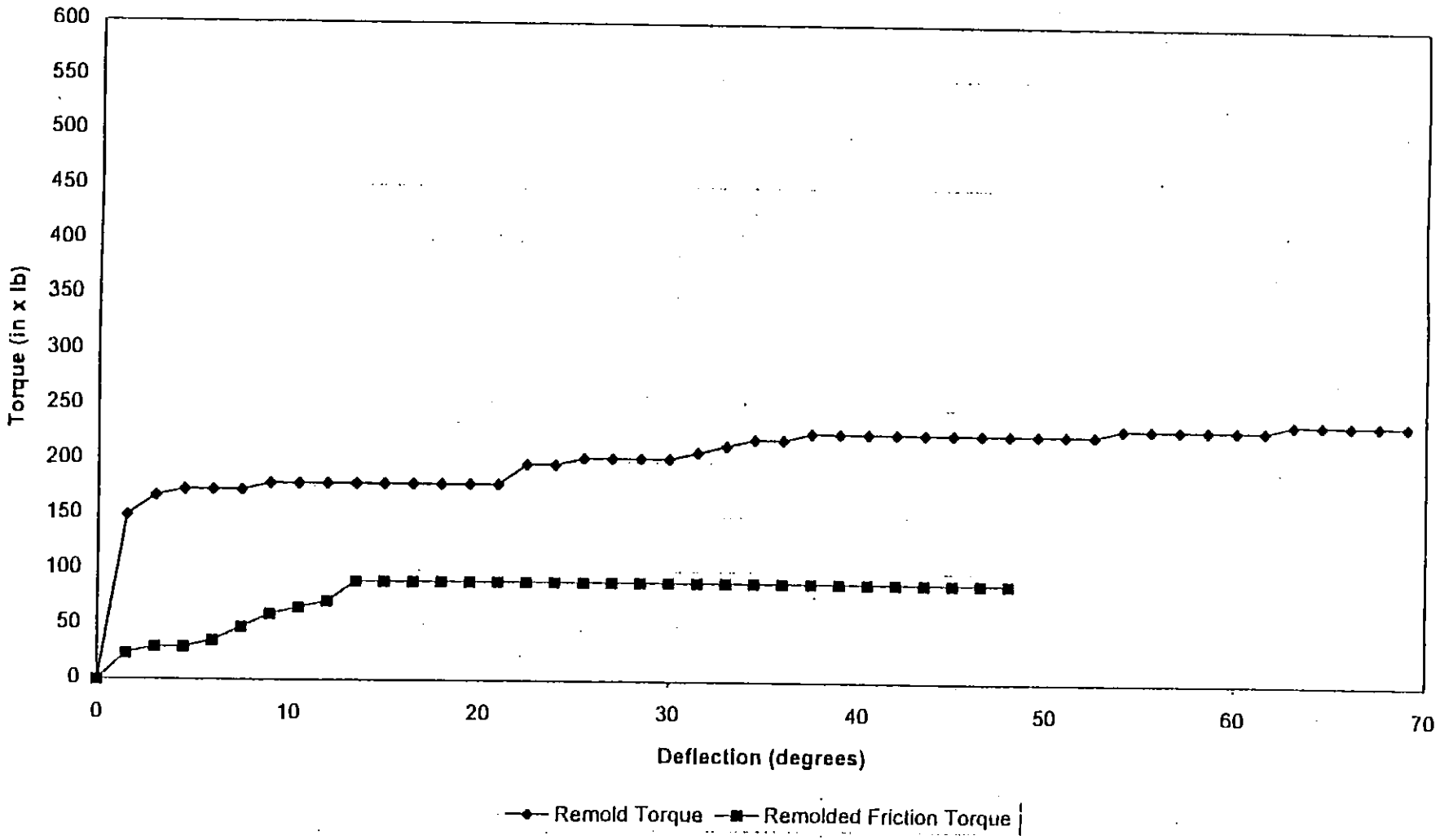
Drilling Foreman:	Dan Taylor
Inspector:	Darrell Wilder
Supervising Engineer:	Allen Cadden

Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = -2.0




Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = -2.0
Torque (in x lb)
350
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
Deflection (degrees)
Undisturbed Torque
Undisturbed Friction Torque

Field Vane Shear Test Data
Cherry Island, Boring SEA-104V
EL = -2.0



EXISTING DILATOMETER TESTS

EARTH ENGINEERING AND SCIENCES, INC. TEST NO. GF-113
FILE NAME: GANNETT-FLEMING
FILE NUMBER: 89-275

RECORD OF DILATOMETER TEST NO. GF-113
USING DATA REDUCTION PROCEDURES IN MARCHETTI (ASCE,J-GED,MARCH 80)
KO IN SANDS DETERMINED USING SCHMERTMANN METHOD (1983)

LOCATION: CHERRY ISLAND DISPOSAL AREA, DEL.
PERFORMED - DATE: 20 DEC 1989
BY: GRANT SLOAN

CALIBRATION INFORMATION:
DA= .10 BARS DB= .30 BARS ZM= .00 BARS ZW= 8.00 METERS

1 BAR = 1.019 KG/CM2 = 1.044 TSF = 14.51 PSI ANALYSIS USES H2O UNIT WEIGHT = 1.000 T/M3

Z (M)	THRUST (KG)	A (BAR)	B (BAR)	ED (BAR)	ID	KD	UO (BAR)	GAMMA (T/M3)	SV (BAR)	PC (BAR)	OCR	KO	CU (BAR)	PHI (DEG)	M (BAR)	SOIL TYPE
#####	######	#####	#####	#####	#####	#####	######	######	######	#####	#####	#####	#####	#####	######	############
3.05		.20	.80	7.	.72	.00	.000	1.500	######	.00	.00	-.60	.002		6.2	MUD
4.57		.80	1.40	7.	.24	.00	.000	1.500	######	.00	.00	-.59	.007		6.2	MUD
6.10		1.20	2.00	15.	.33	.00	.000	1.600	######	.00	.00	-.59	.011		12.4	CLAY
7.62		1.60	2.20	7.	.12	.00	.000	1.500	######	.00	.00	-.59	.016		6.2	MUD
9.15		1.60	2.20	7.	.13	.00	.113	1.500	######	.00	.00	-.59	.014		6.2	MUD
10.67		2.00	2.60	7.	.11	.00	.262	1.500	######	.00	.00	-.59	.017		6.2	MUD
12.20		2.20	2.80	7.	.11	.00	.412	1.500	######	.00	.00	-.59	.018		6.2	MUD
13.72		2.60	3.20	7.	.10	.00	.561	1.500	######	.00	.00	-.59	.021		6.2	MUD
15.24		3.60	6.80	102.	1.03	.00	.711	1.700	######	.01	.00	-.59			86.7	SILT
.00		.00	.00	-14.	-4.00		.000	P01 =	.12	P0 =	.10	P1 =	-.30			QUESTIONABLE

END OF SOUNDING

EARTH ENGINEERING AND SCIENCES, INC. TEST NO. GF - 111
FILE NAME: GANNETT-FLEMING
FILE NUMBER: JOB NUM 89-275

RECORD OF DILATOMETER TEST NO. GF - 111
USING DATA REDUCTION PROCEDURES IN MARCHETTI (ASCE,J-GED,MARCH 80)
KO IN SANDS DETERMINED USING SCHMERTMANN METHOD (1983)

LOCATION: CHERRY ISLAND
PERFORMED - DATE: 12-4-89
BY: AL MYERS

CALIBRATION INFORMATION:
DA= .20 BARS DB= 1.00 BARS ZM= .00 BARS ZW= 1.00 METERS

1 BAR = 1.019 KG/CM2 = 1.044 TSF = 14.51 PSI ANALYSIS USES H2O UNIT WEIGHT = 1.000 T/M3

Z (M)	THRUST (KG)	A (BAR)	B (BAR)	ED (BAR)	ID	KD	UO (BAR)	GAMMA (T/M3)	SV (BAR)	PC (BAR)	OCR	KO	CU (BAR)	PHI (DEG)	M (BAR)	SOIL TYPE
*****	******	*****	*****	*****	*****	*****	******	******	******	*****	*****	*****	*****	*****	******	**********
1.52		.30	1.30	-7.	-.45		.051	P01 =	.51	P0 =	.50	P1 =	.30			QUESTIONABLE
3.05		.40	1.50	-3.	-.25		.201	P01 =	.60	P0 =	.60	P1 =	.50			QUESTIONABLE
4.57		.90	2.20	4.	.14	7.55	.350	1.500	.099	.78	7.94	1.54	.114		8.1	MUD
6.10		1.50	3.40	26.	.63	6.43	.500	1.600	.181	1.12	6.18	1.38	.172		52.2	CLAYEY SILT
7.62		1.60	3.20	15.	.37	4.18	.650	1.600	.271	.85	3.15	1.02	.149		23.4	SILTY CLAY
9.15		2.00	3.40	7.	.15	3.94	.800	1.500	.353	1.02	2.87	.97	.181		11.3	MUD
10.67		2.20	3.30	-3.	-.07		.949	P01 =	2.40	P0 =	2.40	P1 =	2.30			QUESTIONABLE
12.20		2.20	3.70	11.	.24	2.56	1.099	1.500	.503	.74	1.47	.68	.150		12.0	MUD
13.72		2.50	4.00	11.	.22	2.49	1.248	1.500	.578	.81	1.41	.67	.167		11.7	MUD
15.24		2.80	4.60	22.	.40	2.38	1.397	1.600	.660	.87	1.32	.64	.181		22.5	SILTY CLAY

END OF SOUNDING

EARTH ENGINEERING AND SCIENCES, INC.
FILE NAME: BARNETT-FLEMING
FILE NUMBER: 89-275

TEST NO. GF-112A

RECORD OF DILATOMETER TEST NO. GF-112A
USING DATA REDUCTION PROCEDURES IN MARCHETTI (ASCE,J-GED,MARCH 80)
KO IN SANDS DETERMINED USING SCHMERTMANN METHOD (1983)

LOCATION: CHERRY ISLAND DISPOSAL AREA, DEL.
PERFORMED - DATE: 08 DEC 1989
BY: GRANT SLOAN

CALIBRATION INFORMATION:
DA= .20 BARS DB= 1.00 BARS ZM= .00 BARS ZW= 8.00 METERS

1 BAR = 1.019 KG/CM2 = 1.044 TSF = 14.51 PSI ANALYSIS USES H2O UNIT WEIGHT = 1.000 T/M3

Z (M)	THRUST (KG)	A (BAR)	B (BAR)	ED (BAR)	ID	KD	U0 (BAR)	GAMMA (T/M3)	SV (BAR)	PC (BAR)	OCR	KO	CU (BAR)	PHI (DEG)	M (BAR)	SOIL TYPE
1.22		.80	2.20	7.	.21	6.19	.000	1.500	.160	.93	5.82	1.35	.144		14.6	MUD
1.52		.80	2.00	0.	.00	4.90	.000	1.500	.204	.83	4.04	1.14	.138		.0	MUD
3.05		.80	1.60	-14.	-.40		.000	P01 =	1.02	P0 =	1.00	P1 =	.60			QUESTIONABLE
4.57		1.00	2.00	-7.	-.17		.000	P01 =	1.21	P0 =	1.20	P1 =	1.00			QUESTIONABLE
6.10		1.20	16.00	496.	19.83	.76	.000	1.800	.946	.26	.26	-.73		44.3	421.2	SAND
7.62		1.80	2.60	-14.	-.20		.000	P01 =	2.02	P0 =	2.00	P1 =	1.60			QUESTIONABLE
9.15		1.80	2.80	-7.	-.11		.113	P01 =	2.01	P0 =	2.00	P1 =	1.80			QUESTIONABLE
10.67		2.20	3.00	-14.	-.19		.262	P01 =	2.42	P0 =	2.40	P1 =	2.00			QUESTIONABLE
12.20		2.40	3.00	-21.	-.27		.412	P01 =	2.63	P0 =	2.60	P1 =	2.00			QUESTIONABLE
13.72		3.00	4.00	-7.	-.08		.561	P01 =	3.21	P0 =	3.20	P1 =	3.00			QUESTIONABLE
14.33		2.80	3.90	-3.	-.04		.621	P01 =	3.00	P0 =	3.00	P1 =	2.90			QUESTIONABLE
.00		.00	.00	-42.	-6.00		.000	P01 =	.26	P0 =	.20	P1 =	-1.00			QUESTIONABLE

END OF SOUNDING

EARTH ENGINEERING AND SCIENCES, INC.
FILE NAME: GANNETT-FLEMING
FILE NUMBER: 89-275

TEST NO. GF-112A

RECORD OF DILATOMETER TEST NO. GF-112A
USING DATA REDUCTION PROCEDURES IN MARCHETTI (ASCE,J-GED,MARCH 80)
KO IN SANDS DETERMINED USING SCHMERTMANN METHOD (1983)

LOCATION: CHERRY ISLAND DISPOSAL AREA, DEL.
PERFORMED - DATE: 08 DEC 1989
BY: GRANT SLOAN

CALIBRATION INFORMATION:
DA= .20 BARS DB= 1.00 BARS ZM= .00 BARS ZW= 8.00 METERS

1 BAR = 1.019 KG/CM2 = 1.044 TSF = 14.51 PSI ANALYSIS USES H2O UNIT WEIGHT = 1.000 T/M3

Z (M)	THRUST (KG)	A (BAR)	B (BAR)	ED (BAR)	ID	KD	UO (BAR)	GAMMA (T/M3)	SV (BAR)	PC (BAR)	OCR	KO	CU (BAR)	PHI (DEG)	M (BAR)	SOIL TYPE
1.22		.80	2.20	7.	.21	6.19	.000	1.500	.160	.93	5.82	1.55	.144		14.6	MUD
1.52		.90	2.00	0.	.00	4.90	.000	1.500	.204	.83	4.04	1.14	.138		.0	MUD
3.05		.80	1.60	-14.	-.40		.000	P01 =	1.02	P0 =	1.00	P1 =	.60			QUESTIONABLE
4.57		1.00	2.00	-7.	-.17		.000	P01 =	1.21	P0 =	1.20	P1 =	1.00			QUESTIONABLE
6.10		1.20	16.00	496.	19.83	.76	.000	1.800	.946	.26	.28	-.75		44.3	421.2	SAND
7.62		1.60	2.60	-14.	-.20		.000	P01 =	2.02	P0 =	2.00	P1 =	1.60			QUESTIONABLE
9.15		1.80	2.80	-7.	-.11		.113	P01 =	2.01	P0 =	2.00	P1 =	1.80			QUESTIONABLE
10.67		2.20	3.00	-14.	-.19		.262	P01 =	2.42	P0 =	2.40	P1 =	2.00			QUESTIONABLE
12.20		2.40	3.00	-21.	-.27		.412	P01 =	2.63	P0 =	2.60	P1 =	2.00			QUESTIONABLE
13.72		3.00	4.00	-7.	-.08		.561	P01 =	3.21	P0 =	3.20	P1 =	3.00			QUESTIONABLE
14.33		2.80	3.90	-3.	-.04		.621	P01 =	3.00	P0 =	3.00	P1 =	2.90			QUESTIONABLE
.00		.00	.00	-42.	-6.00		.000	P01 =	.26	P0 =	.20	P1 =	-1.00			QUESTIONABLE

END OF SOUNDING

EARTH ENGINEERING AND SCIENCES, INC.
FILE NAME: GARNETT-FLEMING
FILE NUMBER: 89-275

TEST NO. GF - 114

RECORD OF DILATOMETER TEST NO. GF - 114
USING DATA REDUCTION PROCEDURES IN MARCHETTI (ASCE,J-GED,MARCH 80)
KO IN SANDS DETERMINED USING SCHMERTMANN METHOD (1983)

LOCATION: CHERRY ISLAND DISPOSAL AREA, DEL.
PERFORMED - DATE: 05 JAN 1990
BY: GRANT SLOAN

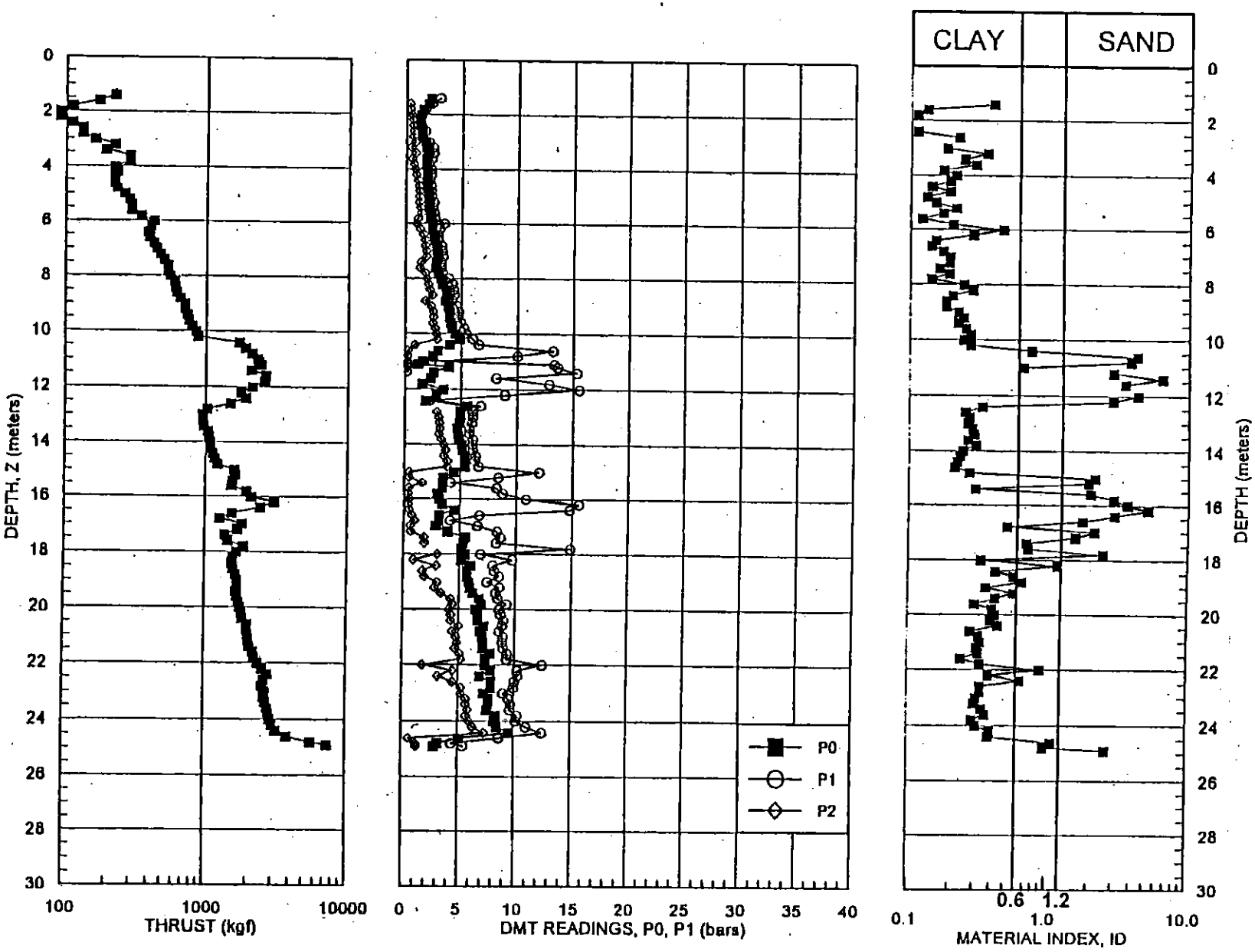
CALIBRATION INFORMATION:
DA= .20 BARS DB= .90 BARS ZM= .00 BARS ZW= 8.00 METERS

1 BAR = 1.019 KG/CM2 = 1.044 TSF = 14.51 PSI ANALYSIS USES H2O UNIT WEIGHT = 1.000 T/M3

Z (M)	THRUST (KG)	A (BAR)	B (BAR)	ID (BAR)	ID	KD	UO (BAR)	GAMMA (T/M3)	SV (BAR)	PC (BAR)	OCR	KO	CU (BAR)	PHI (DEG)	M (BAR)	SOIL TYPE
1.22		.30	1.40	0.	.00		.000	P01 =	.50	P0 =	.50	P1 =	.50			QUESTIONABLE
1.52		.30	1.40	0.	.00		.000	P01 =	.50	P0 =	.50	P1 =	.50			QUESTIONABLE
3.05		.80	1.40	-10.	-.38		.000	P01 =	.81	P0 =	.80	P1 =	.50			QUESTIONABLE
4.57		1.00	1.80	-10.	-.26		.000	P01 =	1.21	P0 =	1.20	P1 =	.90			QUESTIONABLE
6.10		1.20	2.20	-3.	-.07		.000	P01 =	1.40	P0 =	1.40	P1 =	1.30			QUESTIONABLE
7.62		1.40	2.60	4.	.07	1.68	.000	1.500	.942	.73	.77	.46	.168		3.1	MUD
9.15		1.40	2.40	-3.	-.07		.113	P01 =	1.60	P0 =	1.60	P1 =	1.50			QUESTIONABLE
10.67		2.20	3.20	-3.	-.05		.262	P01 =	2.40	P0 =	2.40	P1 =	2.30			QUESTIONABLE
12.20		2.20	3.80	18.	.27	1.60	.412	1.600	1.227	.87	.71	.43	.204		15.5	CLAY
.00		.00	.00	-38.	-5.50		.000	P01 =	.25	P0 =	.20	P1 =	-.90			QUESTIONABLE

END OF SOUNDING

Ground Surface Elev.:
Water Depth: ~6.0 m



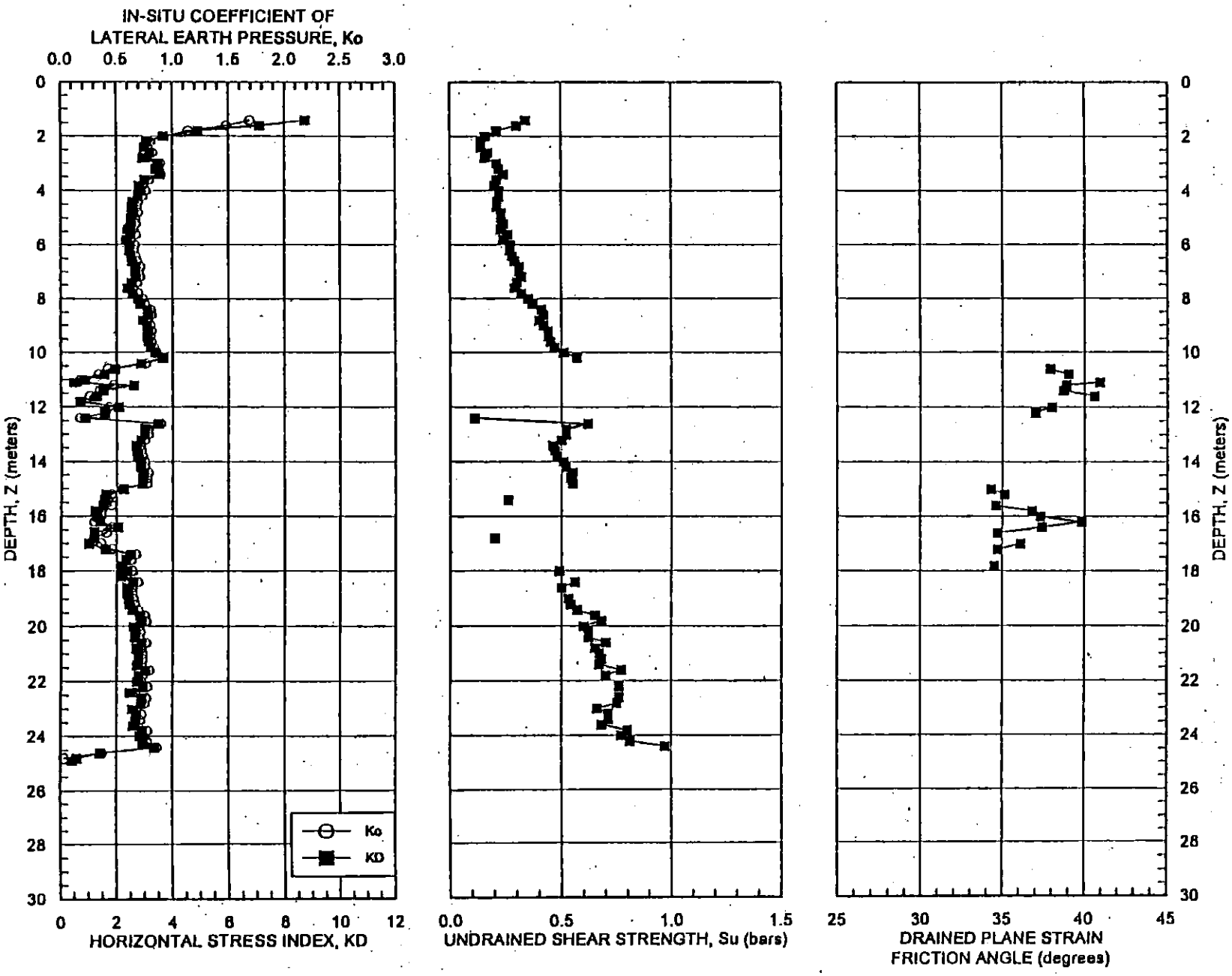
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

DILATOMETER RESULTS

IN-SITU SOIL TESTING, LLC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-14-98

SOUNDING
D-12

SEA-12



Ground Surface Elev.
Water Depth: 6.0 m

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

INTERPRETED DMT STRENGTH PARAMETERS

IN-SITU SOIL TESTING, LC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-14-98

SOUNDING
D-12

S&A-12

SEA-12

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

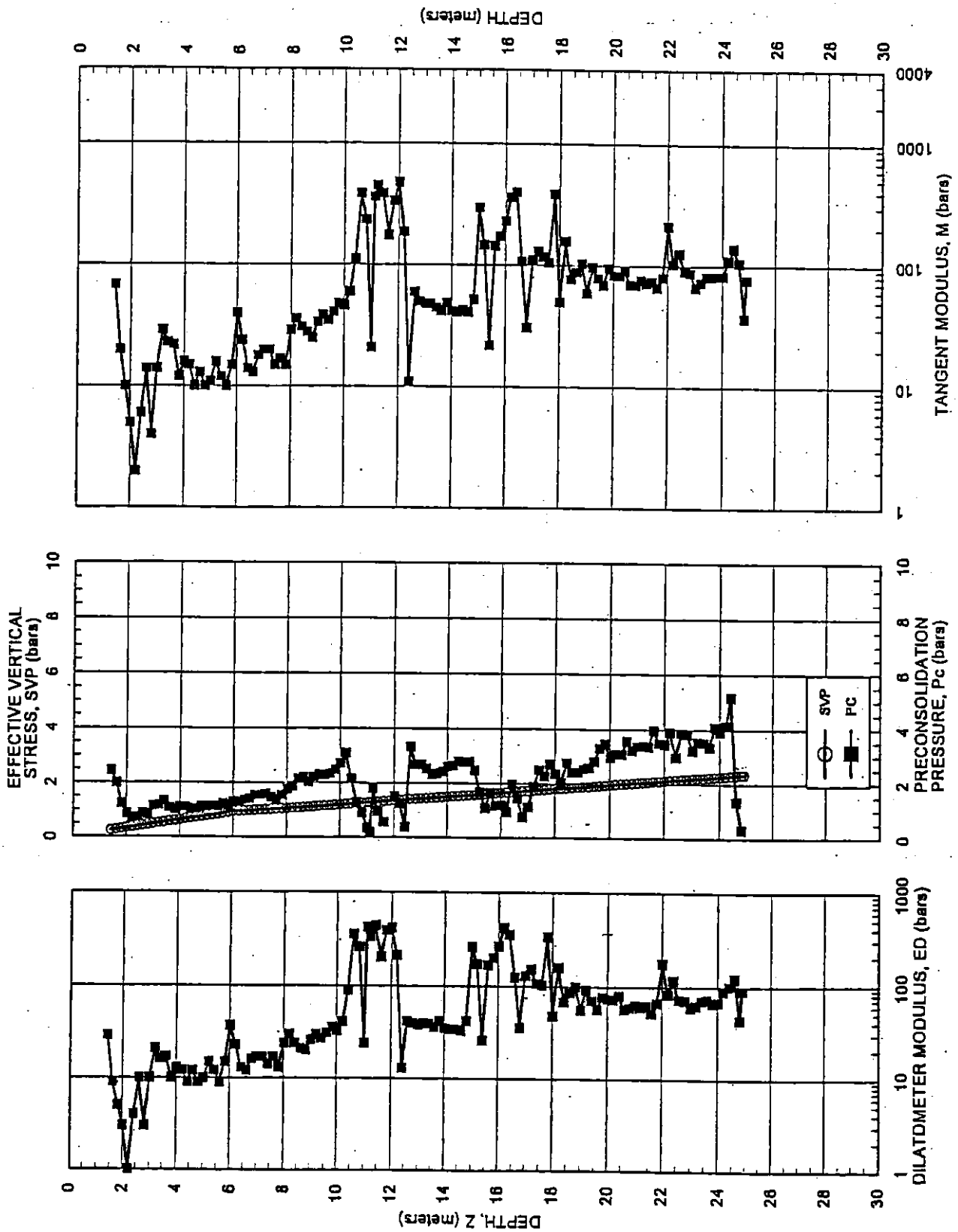
IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 8-14-98

SOUNDING

INTERPRETED DMT DEFORMATION PARAMETERS

D-12

Ground Surface Elev.
Water Depth: 8.0m



SEA-12

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-12
PAGE 1
FILE NO. : IST-9841

SNDG.DATE: 8-14-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 6.00 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.15 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.21 BARS
DELTA-B = 0.35 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	THRUST (KGF)	A (BAR)	B (BAR)	C (BAR)	DA (BAR)	DB (BAR)	ZMRNG (BAR)	ZMLO (BAR)	ZMHI (BAR)	ZMCAL (BAR)	P0 (BAR)	P1 (BAR)	P2 (BAR)	U0 (BAR)	GAMMA (T/M3)	SVP (BAR)
1.40	220.	1.99	3.34		0.21	0.35	10.00	0.02	0.15	0.00	2.14	2.97		0.000	1.60	0.245
1.60	170.	1.78	2.59	0.08	0.21	0.35	10.00	0.02	0.15	0.00	1.96	2.22	0.27	0.000	1.50	0.275
1.80	110.	1.31	2.02	0.11	0.21	0.35	10.00	0.02	0.15	0.00	1.49	1.65	0.30	0.000	1.50	0.305
2.00	90.	1.04	1.69	0.24	0.21	0.35	10.00	0.02	0.15	0.00	1.23	1.32	0.43	0.000	1.50	0.334
2.20	90.	0.93	1.53	0.33	0.21	0.35	10.00	0.02	0.15	0.00	1.12	1.16	0.52	0.000	1.50	0.364
2.40	110.	0.99	1.67	0.36	0.21	0.35	10.00	0.02	0.15	0.00	1.17	1.30	0.55	0.000	1.50	0.393
2.60	130.	1.17	2.01	0.42	0.21	0.35	10.00	0.02	0.15	0.00	1.35	1.64	0.61	0.000	1.50	0.423
2.80	130.	1.14	1.78	0.36	0.21	0.35	10.00	0.02	0.15	0.00	1.33	1.41	0.55	0.000	1.50	0.452
3.00	160.	1.50	2.34	0.60	0.21	0.35	10.00	0.02	0.15	0.00	1.68	1.97	0.79	0.000	1.50	0.482
3.20	220.	1.58	2.72	0.19	0.21	0.35	10.00	0.02	0.15	0.00	1.74	2.35	0.38	0.000	1.60	0.512
3.40	190.	1.76	2.76	0.61	0.21	0.35	10.00	0.02	0.15	0.00	1.93	2.39	0.80	0.000	1.60	0.543
3.60	280.	1.56	2.60	0.30	0.21	0.35	10.00	0.02	0.15	0.00	1.73	2.23	0.49	0.000	1.60	0.575
3.80	280.	1.51	2.35	0.46	0.21	0.35	10.00	0.02	0.15	0.00	1.69	1.98	0.65	0.000	1.50	0.605
4.00	220.	1.65	2.57	0.62	0.21	0.35	10.00	0.02	0.15	0.00	1.82	2.20	0.81	0.000	1.60	0.636
4.20	230.	1.66	2.56	0.69	0.21	0.35	10.00	0.02	0.15	0.00	1.83	2.19	0.88	0.000	1.60	0.667
4.40	220.	1.61	2.41	0.84	0.21	0.35	10.00	0.02	0.15	0.00	1.79	2.04	1.03	0.000	1.50	0.697
4.60	220.	1.66	2.56	0.94	0.21	0.35	10.00	0.02	0.15	0.00	1.83	2.19	1.13	0.000	1.60	0.728
4.80	230.	1.79	2.59	0.97	0.21	0.35	10.00	0.02	0.15	0.00	1.97	2.22	1.16	0.000	1.50	0.758
5.00	260.	1.80	2.64	0.96	0.21	0.35	10.00	0.02	0.15	0.00	1.98	2.27	1.15	0.000	1.50	0.788
5.20	280.	1.87	2.83	0.95	0.21	0.35	10.00	0.02	0.15	0.00	2.04	2.46	1.14	0.000	1.60	0.818
5.40	290.	1.86	2.75	1.07	0.21	0.35	10.00	0.02	0.15	0.00	2.03	2.38	1.26	0.000	1.60	0.850
5.60	290.	2.02	2.84	1.16	0.21	0.35	10.00	0.02	0.15	0.00	2.20	2.47	1.35	0.000	1.50	0.880
5.80	340.	1.95	2.92	0.84	0.21	0.35	10.00	0.02	0.15	0.00	2.12	2.55	1.03	0.000	1.60	0.910
6.00	420.	2.19	3.77	0.74	0.21	0.35	10.00	0.02	0.15	0.00	2.33	3.40	0.93	0.000	1.70	0.943
6.20	400.	2.18	3.36	1.06	0.21	0.35	10.00	0.02	0.15	0.00	2.34	2.99	1.25	0.020	1.60	0.956
6.40	380.	2.29	3.20	1.35	0.21	0.35	10.00	0.02	0.15	0.00	2.46	2.83	1.54	0.039	1.60	0.967
6.60	390.	2.37	3.25	1.50	0.21	0.35	10.00	0.02	0.15	0.00	2.54	2.88	1.69	0.059	1.50	0.978
6.80	420.	2.54	3.53	1.52	0.21	0.35	10.00	0.02	0.15	0.00	2.71	3.16	1.71	0.079	1.60	0.989
7.00	440.	2.57	3.61	1.64	0.21	0.35	10.00	0.02	0.15	0.00	2.74	3.24	1.83	0.098	1.60	1.001
7.20	470.	2.66	3.70	1.62	0.21	0.35	10.00	0.02	0.15	0.00	2.83	3.33	1.81	0.118	1.60	1.012
7.40	500.	2.55	3.50	1.14	0.21	0.35	10.00	0.02	0.15	0.00	2.72	3.13	1.33	0.137	1.60	1.024
7.60	530.	2.47	3.49	1.07	0.21	0.35	10.00	0.02	0.15	0.00	2.64	3.12	1.26	0.157	1.60	1.036
7.80	530.	2.71	3.64	1.57	0.21	0.35	10.00	0.02	0.15	0.00	2.88	3.27	1.76	0.177	1.60	1.048
8.00	550.	2.97	4.20	1.67	0.21	0.35	10.00	0.02	0.15	0.00	3.13	3.83	1.86	0.196	1.70	1.061
8.20	590.	3.13	4.51	1.81	0.21	0.35	10.00	0.02	0.15	0.00	3.28	4.14	2.00	0.216	1.70	1.074
8.40	600.	3.44	4.65	1.99	0.21	0.35	10.00	0.02	0.15	0.00	3.60	4.28	2.18	0.236	1.70	1.088
8.60	610.	3.54	4.69	2.20	0.21	0.35	10.00	0.02	0.15	0.00	3.70	4.32	2.39	0.255	1.70	1.102
8.80	650.	3.38	4.49	1.54	0.21	0.35	10.00	0.02	0.15	0.00	3.54	4.12	1.73	0.275	1.70	1.115
9.00	700.	3.61	4.89	2.07	0.21	0.35	10.00	0.02	0.15	0.00	3.76	4.52	2.26	0.294	1.70	1.129
9.20	700.	3.74	5.11	2.26	0.21	0.35	10.00	0.02	0.15	0.00	3.89	4.74	2.45	0.314	1.70	1.143
9.40	730.	3.75	5.05	2.28	0.21	0.35	10.00	0.02	0.15	0.00	3.90	4.68	2.47	0.334	1.70	1.157
9.60	750.	3.86	5.28	2.22	0.21	0.35	10.00	0.02	0.15	0.00	4.01	4.91	2.41	0.353	1.70	1.170
9.80	790.	4.04	5.58	2.44	0.21	0.35	10.00	0.02	0.15	0.00	4.18	5.21	2.63	0.373	1.70	1.184
10.00	840.	4.29	5.76	2.57	0.21	0.35	10.00	0.02	0.15	0.00	4.43	5.39	2.76	0.393	1.70	1.198
10.20	870.	4.70	6.39	2.62	0.21	0.35	10.00	0.02	0.15	0.00	4.83	6.02	2.81	0.412	1.70	1.212
10.40	1720.	3.89	6.92	0.64	0.21	0.35	10.00	0.02	0.15	0.00	3.96	6.55	0.83	0.432	1.80	1.226
10.60	1900.	3.16	13.65	0.03	0.21	0.35	10.00	0.02	0.15	0.00	2.86	13.15	0.22	0.451	1.90	1.243
10.80	2110.	2.61	10.50	0.02	0.21	0.35	10.00	0.02	0.15	0.00	2.44	10.00	0.21	0.471	1.90	1.261
11.00	2310.	1.42	2.65	0.02	0.21	0.35	10.00	0.02	0.15	0.00	1.58	2.28	0.21	0.491	1.60	1.275
11.10	2370.	1.50	13.80	0.02	0.21	0.35	10.00	0.02	0.15	0.00	1.11	13.30	0.21	0.500	1.80	1.282
11.20	2460.	4.16	14.10	0.02	0.21	0.35	10.00	0.02	0.15	0.00	3.89	13.60	0.21	0.510	1.90	1.291
11.40	2100.	2.94	15.80	0.02	0.21	0.35	10.00	0.02	0.15	0.00	2.52	15.30	0.21	0.530	1.90	1.308
11.60	2650.	2.33	8.50		0.21	0.35	10.00	0.02	0.15	0.00	2.24	8.13		0.550	1.80	1.325
11.80	2590.	1.85	13.35		0.21	0.35	10.00	0.02	0.15	0.00	1.50	12.85		0.569	1.80	1.341
12.00	2140.	3.79	16.00		0.21	0.35	10.00	0.02	0.15	0.00	3.40	15.50		0.589	1.90	1.357
12.20	1780.	2.86	9.28		0.21	0.35	10.00	0.02	0.15	0.00	2.76	8.91		0.608	1.90	1.375
12.40	1940.	1.65	2.58		0.21	0.35	10.00	0.02	0.15	0.00	1.82	2.21		0.628	1.60	1.390
12.60	1500.	5.41	6.91		0.20	0.14	10.00	0.02	0.15	0.00	5.53	6.75		0.648	1.70	1.403
12.80	1020.	4.78	6.21	2.66	0.20	0.14	10.00	0.02	0.15	0.00	4.91	6.05	2.84	0.667	1.70	1.416

CONTINUED ON NEXT PAGE

SEP-12

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL) SNDG. NO. D-12
IN-SITU SOIL TESTING, L.C. PAGE 2
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE FILE NO. : IST-9841
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER SNDG.DATE: 8-14-98
ANAL.BY : R. FAILMEZGER ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS: LO RANGE =10.00 BARS ROD DIAM. = 3.57 CM BL.THICK. = 15.0 MM SU FACTOR = 1.00
SURF.ELEV. = 10.00 M LO GAGE 0 = 0.02 BARS FR.ROD.DIA. = 4.00 CM BL.WIDTH = 96.0 MM PHI FACTOR = 1.00
WATER DEPTH = 6.00 M HI GAGE 0 = 0.15 BARS LIN.ROD WT. = 6.50 KGF/M DELTA-A = 0.21 BARS OCR FACTOR = 1.00
SP.GR.WATER = 1.000 CAL GAGE 0 = 0.00 BARS DELTA/PHI = 0.50 DELTA-B = 0.35 BARS M FACTOR = 1.00
MAX SU ID = 0.60 SU OPTION = MARCHETTI MIN PHI ID = 1.20 OCR OPTION= MARCHETTI KO FACTOR = 1.00
UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	THRUST (KGF)	A (BAR)	B (BAR)	C (BAR)	DA (BAR)	DB (BAR)	ZMRNG (BAR)	ZMLO (BAR)	ZMHI (BAR)	ZMCAL (BAR)	P0 (BAR)	P1 (BAR)	P2 (BAR)	U0 (BAR)	GAMMA (T/M3)	SVP (BAR)
13.00	950.	4.84	6.23	2.81	0.20	0.14	10.00	0.02	0.15	0.00	4.97	6.07	2.99	0.687	1.70	1.430
13.20	950.	4.71	6.14	2.91	0.20	0.14	10.00	0.02	0.15	0.00	4.84	5.98	3.09	0.707	1.70	1.444
13.40	970.	4.50	5.92	2.95	0.20	0.14	10.00	0.02	0.15	0.00	4.63	5.76	3.13	0.726	1.70	1.457
13.60	1030.	4.59	5.93	2.86	0.20	0.14	10.00	0.02	0.15	0.00	4.72	5.77	3.04	0.746	1.70	1.471
13.80	1050.	4.71	6.20	3.06	0.20	0.14	10.00	0.02	0.15	0.00	4.83	6.04	3.24	0.765	1.70	1.485
14.00	1070.	4.92	6.22	3.30	0.20	0.14	10.00	0.02	0.15	0.00	5.05	6.06	3.48	0.785	1.70	1.499
14.20	1080.	4.99	6.26	3.46	0.20	0.14	10.00	0.02	0.15	0.00	5.12	6.10	3.64	0.805	1.70	1.512
14.40	1120.	5.21	6.49	3.29	0.20	0.14	10.00	0.02	0.15	0.00	5.34	6.33	3.47	0.824	1.70	1.526
14.60	1160.	5.19	6.44	3.64	0.20	0.14	10.00	0.02	0.15	0.00	5.32	6.28	3.82	0.844	1.70	1.540
14.80	1220.	5.26	6.76	3.63	0.20	0.14	10.00	0.02	0.15	0.00	5.38	6.60	3.81	0.864	1.70	1.554
15.00	1600.	4.60	12.30	0.24	0.20	0.14	10.00	0.02	0.15	0.00	4.42	12.01	0.42	0.883	1.90	1.569
15.20	1630.	3.51	8.57	0.24	0.20	0.14	10.00	0.02	0.15	0.00	3.45	8.41	0.42	0.903	1.90	1.587
15.40	1560.	3.26	4.30	1.40	0.20	0.14	10.00	0.02	0.15	0.00	3.40	4.14	1.58	0.922	1.60	1.602
15.60	1530.	3.42	8.39	0.21	0.20	0.14	10.00	0.02	0.15	0.00	3.37	8.23	0.39	0.942	1.90	1.616
15.80	1960.	3.05	8.94	0.16	0.20	0.14	10.00	0.02	0.15	0.00	2.95	8.78	0.34	0.962	1.90	1.634
16.00	2120.	3.29	11.15	0.26	0.20	0.14	10.00	0.02	0.15	0.00	3.10	10.86	0.44	0.981	1.90	1.652
16.20	3070.	3.76	15.85	0.17	0.20	0.14	10.00	0.02	0.15	0.00	3.36	15.56	0.35	1.001	1.90	1.669
16.40	2450.	4.79	15.05	0.25	0.20	0.14	10.00	0.02	0.15	0.00	4.48	14.76	0.43	1.021	1.90	1.687
16.60	1550.	3.08	6.86	0.49	0.20	0.14	10.00	0.02	0.15	0.00	3.09	6.70	0.67	1.040	1.70	1.703
16.80	1270.	2.96	4.29	0.74	0.20	0.14	10.00	0.02	0.15	0.00	3.09	4.13	0.92	1.060	1.60	1.716
17.00	1830.	2.82	6.73	0.39	0.20	0.14	10.00	0.02	0.15	0.00	2.82	6.57	0.57	1.079	1.80	1.729
17.20	1700.	3.93	8.48	0.44	0.20	0.14	10.00	0.02	0.15	0.00	3.90	8.32	0.62	1.099	1.80	1.745
17.40	1380.	5.49	8.78	1.62	0.20	0.14	10.00	0.02	0.15	0.00	5.52	8.62	1.80	1.119	1.80	1.761
17.60	1450.	5.24	8.41	1.63	0.20	0.14	10.00	0.02	0.15	0.00	5.28	8.25	1.81	1.138	1.80	1.776
17.80	1870.	5.38	15.15		0.20	0.14	10.00	0.02	0.15	0.00	5.09	14.86		1.158	1.90	1.793
18.00	1670.	5.36	7.03	2.80	0.20	0.14	10.00	0.02	0.15	0.00	5.47	6.87	2.98	1.178	1.70	1.809
18.20	1570.	5.15	9.88	0.70	0.20	0.14	10.00	0.02	0.15	0.00	5.11	9.72	0.88	1.197	1.80	1.824
18.40	1550.	5.90	8.13	2.72	0.20	0.14	10.00	0.02	0.15	0.00	5.99	7.97	2.90	1.217	1.80	1.839
18.60	1580.	5.56	8.27	1.52	0.20	0.14	10.00	0.02	0.15	0.00	5.62	8.11	1.70	1.237	1.80	1.855
18.80	1650.	5.63	8.72	1.71	0.20	0.14	10.00	0.02	0.15	0.00	5.67	8.56	1.89	1.256	1.80	1.871
19.00	1700.	5.74	7.63	2.81	0.20	0.14	10.00	0.02	0.15	0.00	5.84	7.47	2.99	1.276	1.80	1.886
19.20	1700.	5.89	8.76	2.59	0.20	0.14	10.00	0.02	0.15	0.00	5.94	8.60	2.77	1.295	1.80	1.902
19.40	1650.	6.14	8.44	3.19	0.20	0.14	10.00	0.02	0.15	0.00	6.22	8.28	3.37	1.315	1.80	1.918
19.60	1690.	6.69	8.60	4.07	0.20	0.14	10.00	0.02	0.15	0.00	6.79	8.44	4.25	1.335	1.80	1.933
19.80	1740.	6.92	9.39	4.23	0.20	0.14	10.00	0.02	0.15	0.00	6.99	9.23	4.41	1.354	1.80	1.949
20.00	1780.	6.41	8.78	3.89	0.20	0.14	10.00	0.02	0.15	0.00	6.49	8.62	4.07	1.374	1.80	1.965
20.20	1830.	6.58	8.89	4.09	0.20	0.14	10.00	0.02	0.15	0.00	6.66	8.73	4.27	1.394	1.80	1.981
20.40	1860.	6.61	9.14	4.10	0.20	0.14	10.00	0.02	0.15	0.00	6.68	8.98	4.28	1.413	1.80	1.996
20.60	2010.	7.14	9.05	4.81	0.20	0.14	10.00	0.02	0.15	0.00	7.24	8.89	4.99	1.433	1.80	2.012
20.80	2000.	6.81	8.80	4.21	0.20	0.14	10.00	0.02	0.15	0.00	6.91	8.64	4.39	1.452	1.80	2.028
21.00	2040.	7.01	9.11	4.61	0.20	0.14	10.00	0.02	0.15	0.00	7.10	8.95	4.79	1.472	1.80	2.043
21.20	2060.	7.07	9.06	4.68	0.20	0.14	10.00	0.02	0.15	0.00	7.17	8.90	4.86	1.492	1.80	2.059
21.40	2100.	7.07	9.15	4.51	0.20	0.14	10.00	0.02	0.15	0.00	7.16	8.99	4.69	1.511	1.80	2.075
21.60	2220.	7.73	9.49	4.92	0.20	0.14	10.00	0.02	0.15	0.00	7.84	9.33	5.10	1.531	1.80	2.090
21.80	2280.	7.29	9.48	5.01	0.20	0.14	10.00	0.02	0.15	0.00	7.38	9.32	5.19	1.551	1.80	2.106
22.00	2410.	7.41	12.75	1.60	0.20	0.14	10.00	0.02	0.15	0.00	7.35	12.46	1.78	1.570	1.80	2.122
22.20	2570.	7.81	10.55	4.30	0.20	0.14	10.00	0.02	0.15	0.00	7.88	10.26	4.48	1.590	1.80	2.138
22.40	2820.	6.90	10.60	2.97	0.20	0.14	10.00	0.02	0.15	0.00	6.92	10.31	3.15	1.609	1.80	2.153
22.60	2650.	7.83	10.30	4.32	0.20	0.14	10.00	0.02	0.15	0.00	7.91	10.01	4.50	1.629	1.80	2.169
22.80	2570.	7.82	10.25	5.06	0.20	0.14	10.00	0.02	0.15	0.00	7.90	9.96	5.24	1.649	1.80	2.185
23.00	2710.	7.19	9.18	5.02	0.20	0.14	10.00	0.02	0.15	0.00	7.29	9.02	5.20	1.668	1.80	2.200
23.20	2660.	7.59	9.66	5.51	0.20	0.14	10.00	0.02	0.15	0.00	7.68	9.50	5.69	1.688	1.80	2.216
23.40	2730.	7.59	9.87	5.49	0.20	0.14	10.00	0.02	0.15	0.00	7.67	9.71	5.67	1.708	1.80	2.232
23.60	2820.	7.45	9.80	5.68	0.20	0.14	10.00	0.02	0.15	0.00	7.53	9.64	5.86	1.727	1.80	2.247
23.80	2870.	8.27	10.55	5.51	0.20	0.14	10.00	0.02	0.15	0.00	8.36	10.26	5.69	1.747	1.80	2.263
24.00	2940.	8.11	10.45	5.82	0.20	0.14	10.00	0.02	0.15	0.00	8.20	10.16	6.00	1.766	1.80	2.279
24.20	3050.	8.42	11.35	6.13	0.20	0.14	10.00	0.02	0.15	0.00	8.48	11.06	6.31	1.786	1.80	2.295
24.40	3260.	9.51	12.75	7.13	0.20	0.14	10.00	0.02	0.15	0.00	9.55	12.46	7.31	1.806	1.80	2.310
24.60	1870.	5.10	8.82	0.44	0.20	0.14	10.00	0.02	0.15	0.00	5.11	8.66	0.62	1.825	1.80	2.326

CONTINUED ON NEXT PAGE

SEA-12

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-12
PAGE 1
FILE NO. : IST-9841

SNDG.DATE: 8-14-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 6.00 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.15 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.21 BARS
DELTA-B = 0.35 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	THRUST (KGF)	A (BAR)	B (BAR)	C (BAR)	DA (BAR)	DB (BAR)	ZMRNG (BAR)	ZMLO (BAR)	ZMHI (BAR)	ZMCAL (BAR)	P0 (BAR)	P1 (BAR)	P2 (BAR)	U0 (BAR)	GAMMA (T/M3)	SVP (BAR)
24.80	5700.	3.06	4.61	1.04	0.20	0.14	10.00	0.02	0.15	0.00	3.18	4.45	1.22	1.845	1.60	2.340
24.90	7500.	2.79	5.62	1.09	0.20	0.14	10.00	0.02	0.15	0.00	2.85	5.46	1.27	1.855	1.70	2.346

END OF SOUNDING

(INTERPRETED SOIL PARAMETERS ON NEXT PAGE)

SGA-12

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-12
PAGE 4
FILE NO. : IST-9841

SNDG.DATE: 8-14-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 6.00 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.15 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.21 BARS
DELTA-B = 0.35 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	KD	ID	UD	ED (BAR)	KO	SU (BAR)	QD (BAR)	PHI (DEG)	SIGFF (BAR)	PHIO (DEG)	PC (BAR)	OCR	M (BAR)	SOIL TYPE
1.40	8.74	0.39	0.00	29.	1.69	0.34					2.44	10.0	68.	SILTY CLAY
1.60	7.11	0.13	0.14	9.	1.48	0.30					1.99	7.2	20.	MUD
1.80	4.90	0.11	0.20	5.	1.14	0.21					1.23	4.0	10.	MUD
2.00	3.67	0.08	0.35	3.	0.92	0.16					0.86	2.6	5.	MUD
2.20	3.07	0.04	0.47	1.	0.80	0.14					0.71	2.0	2.	MUD
2.40	2.99	0.11	0.47	4.	0.78	0.14					0.73	1.9	6.	MUD
2.60	3.18	0.22	0.45	10.	0.82	0.17					0.87	2.1	14.	MUD
2.80	2.93	0.06	0.41	3.	0.77	0.16					0.82	1.8	4.	MUD
3.00	3.48	0.18	0.47	10.	0.89	0.21					1.14	2.4	14.	MUD
3.20	3.40	0.35	0.22	21.	0.87	0.22					1.17	2.3	29.	CLAY
3.40	3.55	0.24	0.41	16.	0.90	0.24					1.33	2.4	23.	CLAY
3.60	3.00	0.29	0.28	17.	0.79	0.21					1.08	1.9	22.	CLAY
3.80	2.79	0.17	0.39	10.	0.74	0.20					1.01	1.7	12.	MUD
4.00	2.87	0.21	0.44	13.	0.76	0.22					1.11	1.8	16.	CLAY
4.20	2.75	0.19	0.48	12.	0.73	0.22					1.10	1.6	15.	CLAY
4.40	2.56	0.14	0.58	9.	0.69	0.21					1.03	1.5	10.	MUD
4.60	2.52	0.19	0.62	12.	0.68	0.21					1.04	1.4	13.	CLAY
4.80	2.60	0.13	0.59	9.	0.69	0.23					1.14	1.5	10.	MUD
5.00	2.51	0.15	0.58	10.	0.67	0.23					1.12	1.4	11.	MUD
5.20	2.49	0.21	0.56	15.	0.67	0.24					1.15	1.4	16.	CLAY
5.40	2.39	0.17	0.62	12.	0.65	0.23					1.12	1.3	12.	CLAY
5.60	2.50	0.12	0.61	9.	0.67	0.26					1.24	1.4	10.	MUD
5.80	2.33	0.20	0.49	15.	0.63	0.24					1.15	1.3	15.	CLAY
6.00	2.47	0.46	0.40	37.	0.66	0.27					1.31	1.4	40.	SILTY CLAY
6.20	2.43	0.28	0.53	23.	0.65	0.27					1.29	1.4	24.	CLAY
6.40	2.51	0.15	0.62	13.	0.67	0.28					1.37	1.4	14.	CLAY
6.60	2.54	0.14	0.66	12.	0.68	0.29					1.42	1.5	13.	MUD
6.80	2.66	0.17	0.62	16.	0.71	0.31					1.54	1.6	18.	CLAY
7.00	2.64	0.19	0.66	17.	0.70	0.31					1.54	1.5	20.	CLAY
7.20	2.68	0.19	0.62	17.	0.71	0.32					1.59	1.6	20.	CLAY
7.40	2.52	0.16	0.46	14.	0.68	0.30					1.47	1.4	15.	CLAY
7.60	2.39	0.19	0.44	17.	0.65	0.29					1.37	1.3	17.	CLAY
7.80	2.58	0.14	0.59	13.	0.69	0.32					1.56	1.5	15.	CLAY
8.00	2.76	0.24	0.57	24.	0.73	0.35					1.76	1.7	29.	CLAY
8.20	2.85	0.28	0.58	30.	0.75	0.37					1.87	1.7	36.	CLAY
8.40	3.09	0.20	0.58	24.	0.80	0.41					2.14	2.0	31.	CLAY
8.60	3.13	0.18	0.62	21.	0.81	0.42					2.21	2.0	28.	CLAY
8.80	2.93	0.18	0.45	20.	0.77	0.40					2.02	1.8	25.	CLAY
9.00	3.07	0.22	0.57	26.	0.80	0.42					2.21	2.0	34.	CLAY
9.20	3.13	0.24	0.60	30.	0.81	0.44					2.30	2.0	39.	CLAY
9.40	3.09	0.22	0.60	27.	0.80	0.44					2.28	2.0	35.	CLAY
9.60	3.12	0.25	0.56	31.	0.81	0.45					2.34	2.0	41.	CLAY
9.80	3.22	0.27	0.59	36.	0.83	0.47					2.48	2.1	48.	CLAY
10.00	3.37	0.24	0.59	33.	0.86	0.51					2.71	2.3	46.	CLAY
10.20	3.65	0.27	0.54	41.	0.92	0.57					3.10	2.6	60.	CLAY
10.40	2.87	0.74	0.11	90.	0.76						2.16	1.8	111.	CLAYEY SILT
10.60	1.94	4.27	-0.10	357.	0.42		78.5	37.9	2.01	37.4	1.29	1.0	384.	SAND
10.80	1.56	3.84	-0.13	262.	0.34		90.6	39.0	2.05	38.5	0.91	0.7	233.	SAND
11.00	0.85	0.65	-0.26	24.	0.17						0.34	0.3	21.	CLAYEY SILT
11.10	0.47	20.02	-0.48	423.	0.15		110.8	40.9	2.12	40.5	0.19	0.2	360.	SAND
11.20	2.62	2.88	-0.09	337.	0.47		98.7	38.9	2.10	38.5	1.80	1.4	446.	SILTY SAND
11.40	1.52	6.42	-0.16	441.	0.35		90.3	38.7	2.13	38.3	0.95	0.7	384.	SAND
11.60	1.28	3.49	-0.16	204.	0.26		117.3	40.6	2.19	40.2	0.57	0.4	174.	SAND
11.80	0.69	12.20	-0.16	394.									335.	SAND
12.00	2.07	4.30	-0.16	420.	0.43		87.7	38.0	2.19	37.6	1.52	1.1	476.	SAND
12.20	1.56	2.86	-0.16	214.	0.40		75.2	37.0	2.20	36.6	1.23	0.9	186.	SILTY SAND
12.40	0.86	0.33	-0.16	13.	0.17	0.11					0.37	0.3	11.	CLAY
12.60	3.48	0.25	-0.16	42.	0.89	0.62					3.33	2.4	60.	CLAY
12.80	2.99	0.27	0.51	40.	0.78	0.52					2.66	1.9	50.	CLAY

CONTINUED ON NEXT PAGE

SEA-12

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-12
PAGE 5
FILE NO. : IST-9841

SNDG.DATE: 8-14-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 6.00 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.15 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.21 BARS
DELTA-B = 0.35 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	KD	ID	UD	ED (BAR)	KO	SU (BAR)	QD (BAR)	PHI (DEG)	SIGFF (BAR)	PHIO (DEG)	PC (BAR)	OCR	M (BAR)	SOIL TYPE
13.00	2.99	0.26	0.54	38.	0.78	0.52					2.68	1.9	48.	CLAY
13.20	2.86	0.28	0.58	40.	0.75	0.50					2.52	1.7	48.	CLAY
13.40	2.68	0.29	0.62	39.	0.71	0.46					2.30	1.6	45.	CLAY
13.60	2.70	0.26	0.58	36.	0.72	0.47					2.35	1.6	42.	CLAY
13.80	2.74	0.30	0.61	42.	0.73	0.48					2.42	1.6	49.	CLAY
14.00	2.85	0.24	0.63	35.	0.75	0.51					2.60	1.7	42.	CLAY
14.20	2.86	0.23	0.66	34.	0.75	0.52					2.64	1.7	41.	CLAY
14.40	2.98	0.22	0.59	34.	0.78	0.55					2.81	1.8	43.	CLAY
14.60	2.91	0.21	0.66	33.	0.77	0.54					2.76	1.8	41.	CLAY
14.80	2.91	0.27	0.65	42.	0.77	0.55					2.79	1.8	52.	CLAY
15.00	2.25	2.15	-0.13	263.	0.55		61.2	34.3	2.45	34.1	2.47	1.6	296.	SILTY SAND
15.20	1.61	1.94	-0.19	172.	0.45		67.4	35.1	2.50	35.0	1.68	1.1	146.	SILTY SAND
15.40	1.55	0.30	0.26	26.	0.42	0.26					1.08	0.7	22.	CLAY
15.60	1.50	2.00	-0.23	169.	0.45		63.7	34.6	2.53	34.5	1.66	1.0	143.	SILTY SAND
15.80	1.22	2.93	-0.31	202.	0.36		85.5	36.8	2.61	36.7	1.17	0.7	172.	SILTY SAND
16.00	1.28	3.66	-0.26	269.	0.36		92.1	37.3	2.65	37.2	1.19	0.7	229.	SAND
16.20	1.41	5.17	-0.28	423.	0.30		134.3	39.8	2.74	39.8	0.94	0.6	360.	SAND
16.40	2.05	2.97	-0.17	357.	0.45		100.0	37.4	2.71	37.4	1.96	1.2	400.	SILTY SAND
16.60	1.20	1.76	-0.18	125.	0.41		66.9	34.7	2.67	34.6	1.44	0.8	107.	SANDY SILT
16.80	1.18	0.51	-0.07	36.	0.29	0.20					0.76	0.4	31.	SILTY CLAY
17.00	1.01	2.15	-0.29	130.	0.36		81.3	36.1	2.75	36.1	1.14	0.7	111.	SILTY SAND
17.20	1.60	1.58	-0.17	153.	0.46		70.1	34.7	2.74	34.7	1.89	1.1	130.	SANDY SILT
17.40	2.50	0.70	0.15	107.	0.67						2.50	1.4	117.	CLAYEY SILT
17.60	2.33	0.72	0.16	103.	0.63						2.26	1.3	105.	CLAYEY SILT
17.80	2.20	2.48	0.16	339.	0.53		72.3	34.5	2.81	34.6	2.71	1.5	384.	SILTY SAND
18.00	2.38	0.33	0.42	48.	0.64	0.49					2.36	1.3	50.	CLAY
18.20	2.15	1.18	-0.08	160.	0.58						2.04	1.1	157.	SILT
18.40	2.59	0.42	0.15	69.	0.69	0.56					2.76	1.5	77.	SILTY CLAY
18.60	2.36	0.57	0.11	86.	0.64	0.50					2.41	1.3	88.	SILTY CLAY
18.80	2.36	0.65	0.14	100.	0.64						2.42	1.3	103.	CLAYEY SILT
19.00	2.42	0.36	0.38	56.	0.65	0.53					2.54	1.3	59.	SILTY CLAY
19.20	2.44	0.57	0.32	92.	0.66	0.54					2.60	1.4	97.	SILTY CLAY
19.40	2.56	0.42	0.42	71.	0.69	0.57					2.82	1.5	79.	SILTY CLAY
19.60	2.82	0.30	0.53	57.	0.75	0.65					3.31	1.7	69.	CLAY
19.80	2.89	0.40	0.54	78.	0.76	0.68					3.47	1.8	95.	SILTY CLAY
20.00	2.60	0.42	0.53	74.	0.70	0.60					2.96	1.5	83.	SILTY CLAY
20.20	2.66	0.39	0.55	72.	0.71	0.62					3.09	1.6	82.	SILTY CLAY
20.40	2.64	0.44	0.54	80.	0.70	0.62					3.08	1.5	91.	SILTY CLAY
20.60	2.89	0.28	0.61	57.	0.76	0.70					3.57	1.8	70.	CLAY
20.80	2.69	0.32	0.54	60.	0.72	0.65					3.22	1.6	69.	CLAY
21.00	2.76	0.33	0.59	64.	0.73	0.67					3.37	1.6	76.	CLAY
21.20	2.76	0.31	0.59	60.	0.73	0.68					3.40	1.6	71.	CLAY
21.40	2.72	0.32	0.56	63.	0.72	0.67					3.36	1.6	74.	CLAY
21.60	3.02	0.24	0.57	52.	0.79	0.77					3.97	1.9	66.	CLAY
21.80	2.77	0.33	0.62	67.	0.73	0.70					3.49	1.7	80.	CLAY
22.00	2.72	0.89	0.04	177.	0.72						3.43	1.6	211.	CLAYEY SILT
22.20	2.94	0.38	0.46	83.	0.77	0.76					3.90	1.8	103.	SILTY CLAY
22.40	2.47	0.64	0.29	118.	0.66						2.98	1.4	126.	CLAYEY SILT
22.60	2.90	0.33	0.46	73.	0.76	0.76					2.86	1.8	90.	CLAY
22.80	2.86	0.33	0.57	71.	0.75	0.75					3.82	1.7	87.	CLAY
23.00	2.55	0.31	0.63	60.	0.68	0.66					3.22	1.5	66.	CLAY
23.20	2.71	0.30	0.67	63.	0.72	0.71					3.55	1.6	73.	CLAY
23.40	2.67	0.34	0.66	71.	0.71	0.71					3.51	1.6	81.	CLAY
23.60	2.58	0.36	0.71	73.	0.69	0.68					3.35	1.5	81.	SILTY CLAY
23.80	2.92	0.29	0.60	66.	0.77	0.80					4.09	1.8	82.	CLAY
24.00	2.82	0.31	0.66	68.	0.75	0.77					3.90	1.7	82.	CLAY
24.20	2.92	0.39	0.68	90.	0.77	0.81					4.13	1.8	111.	SILTY CLAY
24.40	3.35	0.38	0.71	101.	0.86	0.97					5.17	2.2	139.	SILTY CLAY
24.60	1.41	1.08	-0.37	123.	0.37						1.35	0.6	105.	SILT

CONTINUED ON NEXT PAGE

SEA-12

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-12
PAGE 6
FILE NO. : IST-9841

SNDG.DATE: 8-14-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 6.00 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.15 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.21 BARS
DELTA-B = 0.35 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
K0 FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	ID	ID	OD	ED (BAR)	K0	SU (BAR)	QD (BAR)	PHI (DEG)	SIGFF (BAR)	PHIO (DEG)	PC (BAR)	OCR	M (BAR)	SOIL TYPE
24.80	0.57	0.95	-0.47	44.	0.03						0.33	0.1	37.	SILT
24.90	0.42	2.64	-0.59	91.									77.	SILTY SAND

END OF SOUNDING

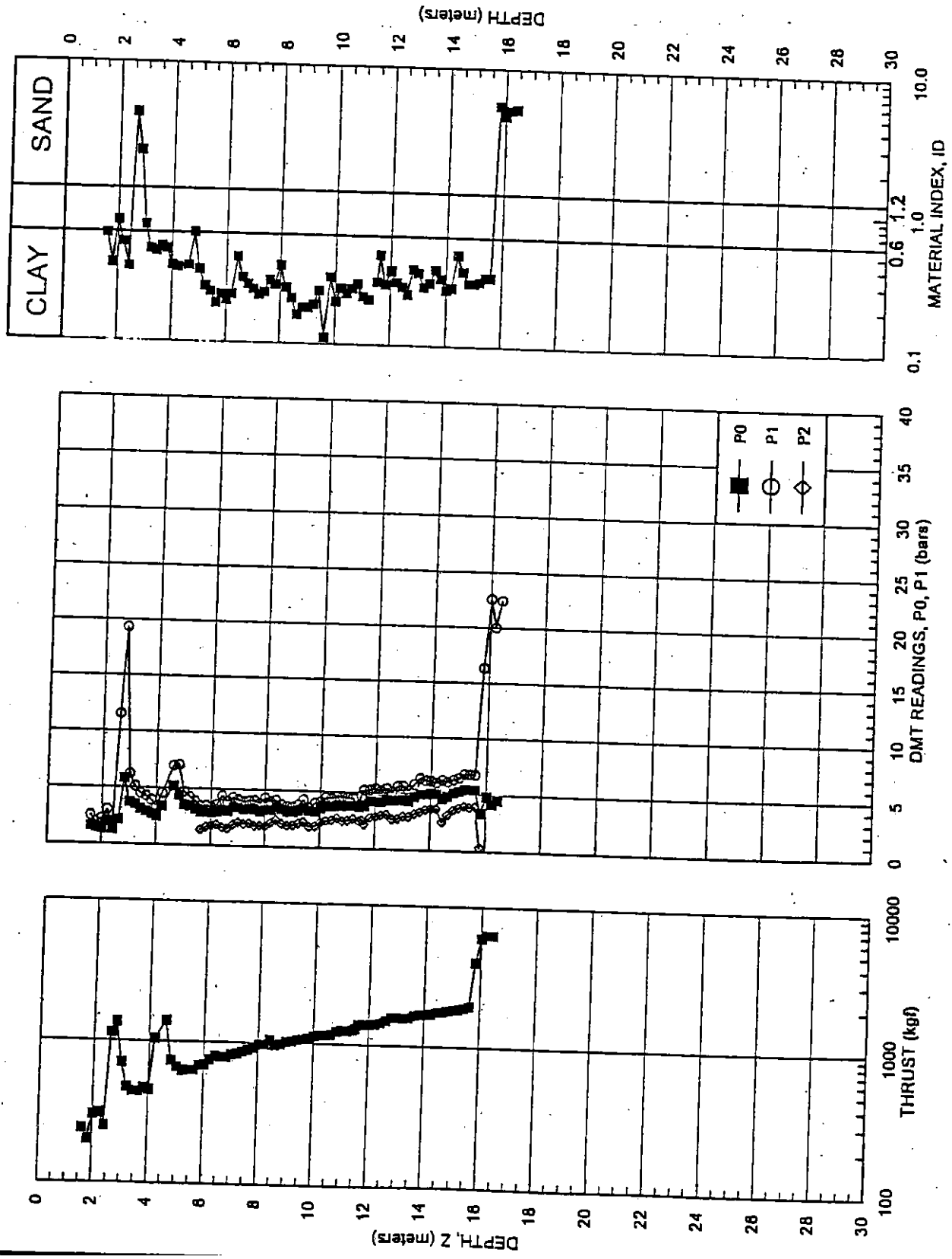
SEA-13

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

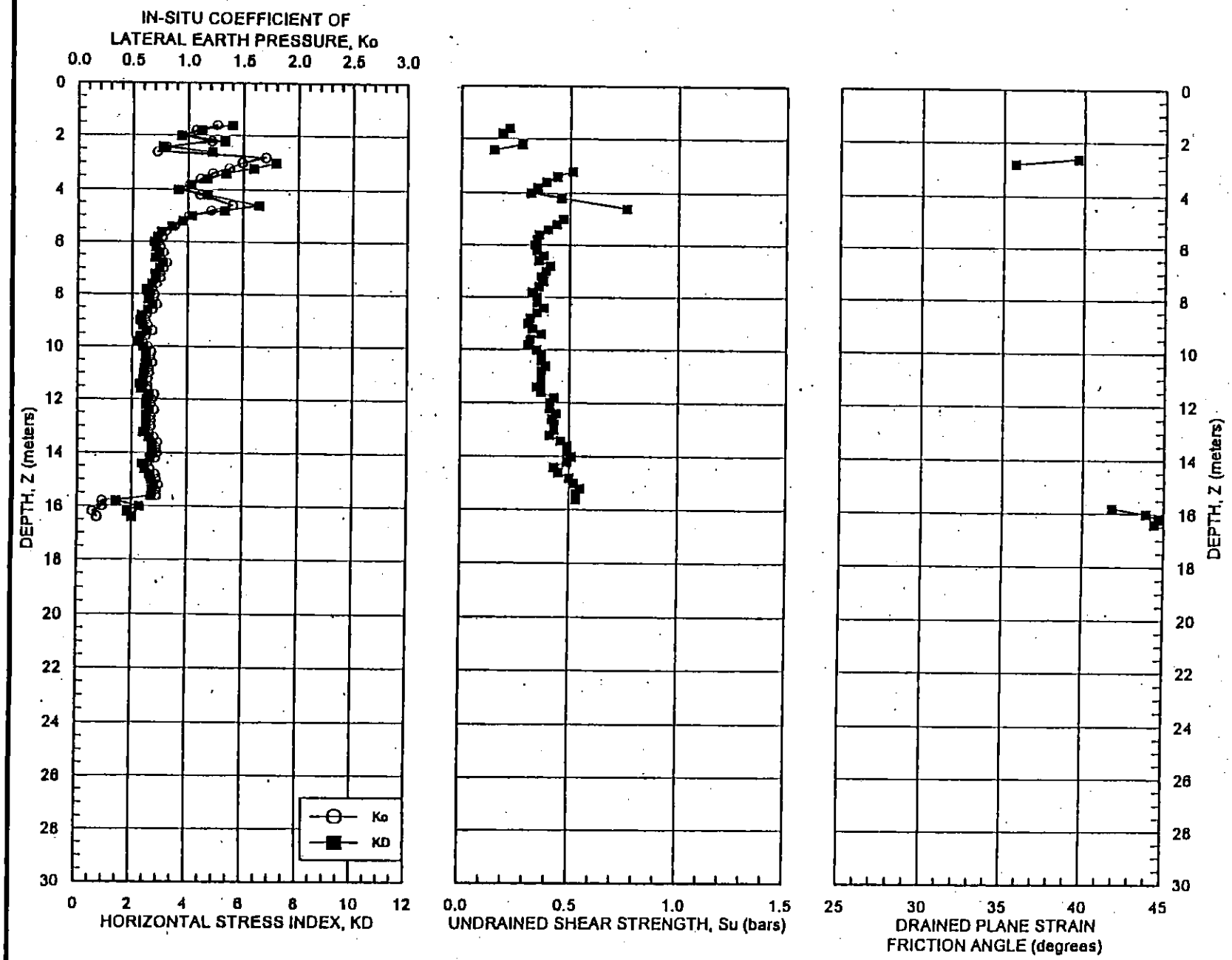
IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 8-17-98

SOUNDING
D-13

DILATOMETER RESULTS



Ground Surface Elev.
Water Depth: cavad at 2.0 m



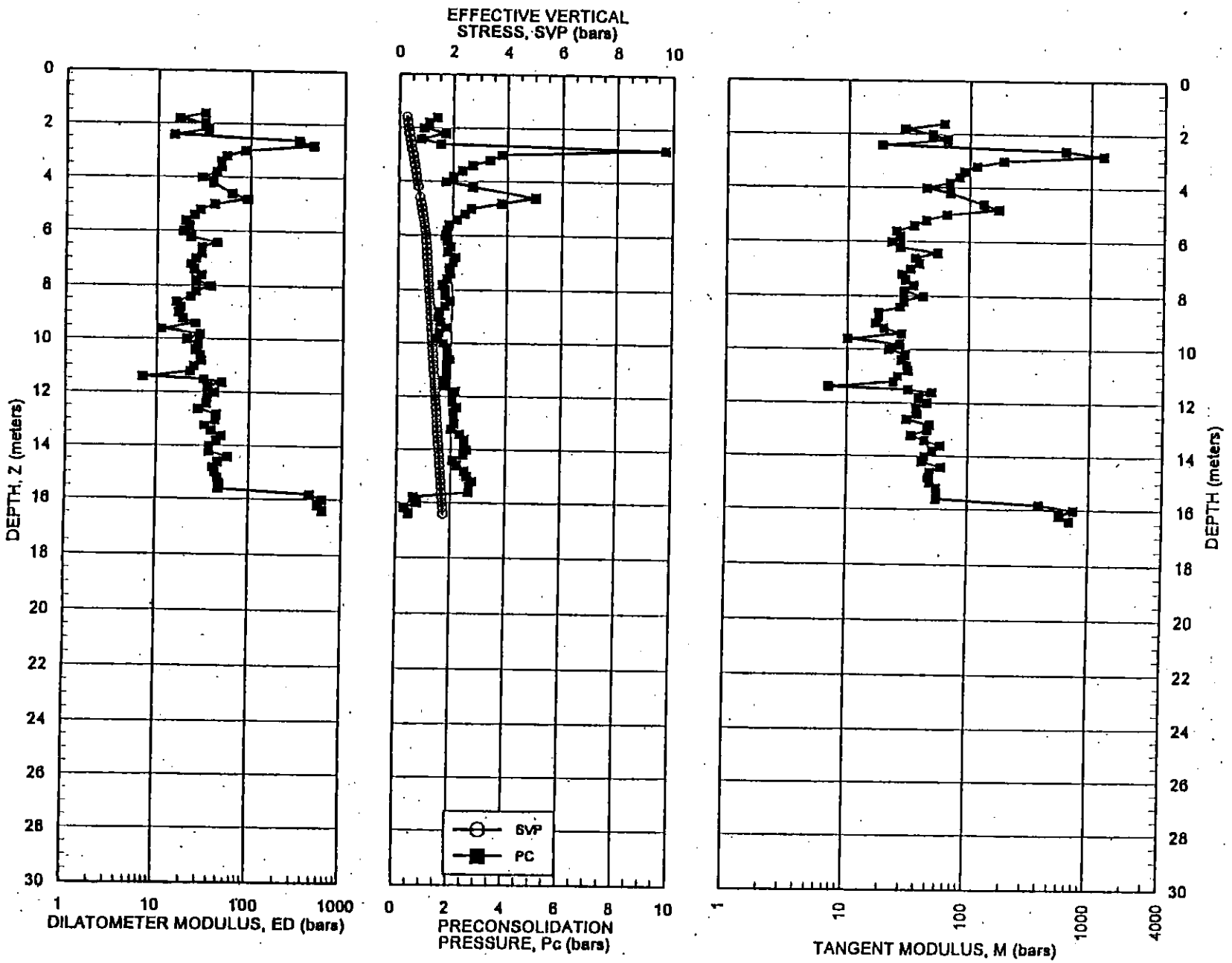
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, LC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-17-98

INTERPRETED DMT STRENGTH PARAMETERS

SOUNDING
D-13

SEA-13



Ground Surface Elev.
Water Depth, cayed at 2 m

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

INSITU SOIL TESTING, L.C.
ENGINEER: R. Falmezger
SOUNDING DATE: 8-17-98

INTERPRETED DMT DEFORMATION PARAMETERS

SOUNDING D-13

SEA-13

SEA-13

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL) SNDG. NO. D-13
IN-SITU SOIL TESTING, L.C. PAGE 1
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE FILE NO. : IST-9841
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER SNDG.DATE: 8-17-98
ANAL.BY : R. FAILMEZGER ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS: LO RANGE =10.00 BARS ROD DIAM. = 3.57 CM BL.THICK. = 15.0 MM SU FACTOR = 1.00
SURF.ELEV. = 10.00 M LO GAGE 0 = 0.02 BARS FR.RED.DIA. = 4.00 CM BL.WIDTH = 96.0 MM PHI FACTOR = 1.00
WATER DEPTH = 6.00 M HI GAGE 0 = 0.10 BARS LIN.ROD WT. = 6.50 KGF/M DELTA-A = 0.20 BARS OCR FACTOR = 1.00
SP.GR.WATER = 1.000 CAL GAGE 0 = 0.00 BARS DELTA/PHI = 0.50 DELTA-B = 0.35 BARS M FACTOR = 1.00
MAX SU ID = 0.60 SU OPTION = MARCHETTI MIN PHI ID = 1.20 OCR OPTION= MARCHETTI KO FACTOR = 1.00
UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	THRUST (KGF)	A (BAR)	B (BAR)	C (BAR)	DA (BAR)	DB (BAR)	ZMRNG (BAR)	ZMLO (BAR)	ZMHI (BAR)	ZMCAL (BAR)	P0 (BAR)	P1 (BAR)	P2 (BAR)	U0 (BAR)	GAMMA (T/M3)	SVP (BAR)
1.60	240.	1.43	2.86		0.20	0.35	10.00	0.02	0.10	0.00	1.57	2.49		0.000	1.60	0.280
1.80	200.	1.24	2.27		0.20	0.35	10.00	0.02	0.10	0.00	1.40	1.90		0.000	1.60	0.311
2.00	300.	1.15	2.59		0.20	0.35	10.00	0.02	0.10	0.00	1.29	2.22		0.000	1.60	0.343
2.20	310.	1.86	3.37		0.20	0.35	10.00	0.02	0.10	0.00	1.99	3.00		0.000	1.60	0.374
2.40	250.	1.09	2.04		0.20	0.35	10.00	0.02	0.10	0.00	1.25	1.67		0.000	1.60	0.406
2.60	1140.	2.41	11.95		0.20	0.35	10.00	0.02	0.10	0.00	2.14	11.50		0.000	1.90	0.440
2.80	1360.	6.26	19.75		0.20	0.35	10.00	0.02	0.10	0.00	5.80	19.30		0.000	2.00	0.478
3.00	700.	3.64	6.58		0.20	0.35	10.00	0.02	0.10	0.00	3.70	6.21		0.000	1.80	0.516
3.20	470.	3.40	5.47		0.20	0.35	10.00	0.02	0.10	0.00	3.50	5.10		0.000	1.70	0.550
3.40	440.	3.01	4.87		0.20	0.35	10.00	0.02	0.10	0.00	3.12	4.50		0.000	1.70	0.583
3.60	440.	2.78	4.64		0.20	0.35	10.00	0.02	0.10	0.00	2.89	4.27		0.000	1.70	0.617
3.80	470.	2.55	4.28		0.20	0.35	10.00	0.02	0.10	0.00	2.67	3.91		0.000	1.70	0.650
4.00	450.	2.35	3.72		0.20	0.35	10.00	0.02	0.10	0.00	2.49	3.35		0.000	1.70	0.683
4.20	1040.	3.24	4.89		0.20	0.35	10.00	0.02	0.10	0.00	3.36	4.52		0.000	1.70	0.717
4.60	1400.	4.96	6.92		0.31	-0.08	10.00	0.02	0.10	0.00	5.16	6.98		0.000	1.80	0.785
4.80	730.	4.21	7.00		0.31	-0.08	10.00	0.02	0.10	0.00	4.37	7.06		0.000	1.80	0.821
5.00	660.	3.31	4.66		0.31	-0.08	10.00	0.02	0.10	0.00	3.54	4.72		0.000	1.70	0.855
5.20	620.	3.14	4.17		0.31	-0.08	10.00	0.02	0.10	0.00	3.39	4.23		0.000	1.70	0.888
5.40	630.	2.91	3.83		0.31	-0.08	10.00	0.02	0.10	0.00	3.17	3.89		0.000	1.70	0.922
5.60	630.	2.65	3.42	1.05	0.31	-0.08	10.00	0.02	0.10	0.00	2.91	3.48	1.34	0.000	1.60	0.954
5.80	680.	2.61	3.44	1.34	0.31	-0.08	10.00	0.02	0.10	0.00	2.87	3.50	1.63	0.000	1.60	0.986
6.00	690.	2.58	3.34	1.45	0.31	-0.08	10.00	0.02	0.10	0.00	2.84	3.40	1.74	0.000	1.60	1.017
6.20	750.	2.69	3.54	1.55	0.31	-0.08	10.00	0.02	0.10	0.00	2.95	3.60	1.84	0.020	1.60	1.029
6.40	800.	2.91	4.34	1.29	0.31	-0.08	10.00	0.02	0.10	0.00	3.14	4.40	1.58	0.039	1.70	1.042
6.60	780.	2.79	3.85	1.20	0.31	-0.08	10.00	0.02	0.10	0.00	3.04	3.91	1.49	0.059	1.70	1.055
6.80	780.	3.14	4.19	1.56	0.31	-0.08	10.00	0.02	0.10	0.00	3.39	4.25	1.85	0.079	1.70	1.069
7.00	820.	3.06	4.01	1.79	0.31	-0.08	10.00	0.02	0.10	0.00	3.31	4.07	2.08	0.098	1.70	1.083
7.20	830.	2.95	3.82	1.64	0.31	-0.08	10.00	0.02	0.10	0.00	3.21	3.88	1.93	0.118	1.70	1.096
7.40	860.	3.04	3.95	1.73	0.31	-0.08	10.00	0.02	0.10	0.00	3.30	4.01	2.02	0.137	1.70	1.110
7.60	890.	2.94	3.99	1.49	0.31	-0.08	10.00	0.02	0.10	0.00	3.19	4.05	1.78	0.157	1.70	1.124
7.80	920.	2.79	3.74	1.53	0.31	-0.08	10.00	0.02	0.10	0.00	3.04	3.80	1.82	0.177	1.70	1.138
8.00	970.	2.96	4.22	1.48	0.31	-0.08	10.00	0.02	0.10	0.00	3.20	4.28	1.77	0.196	1.70	1.151
8.20	970.	2.96	3.91	1.81	0.31	-0.08	10.00	0.02	0.10	0.00	3.21	3.97	2.10	0.216	1.70	1.165
8.40	1050.	3.13	4.05	2.06	0.31	-0.08	10.00	0.02	0.10	0.00	3.45	4.11	2.35	0.236	1.70	1.179
8.60	960.	3.01	3.69	1.74	0.31	-0.08	10.00	0.02	0.10	0.00	3.28	3.75	2.03	0.255	1.60	1.192
8.80	980.	2.80	3.52	1.60	0.31	-0.08	10.00	0.02	0.10	0.00	3.07	3.58	1.89	0.275	1.60	1.203
9.00	1020.	2.79	3.50	1.63	0.31	-0.08	10.00	0.02	0.10	0.00	3.06	3.56	1.92	0.294	1.60	1.215
9.20	1030.	2.95	3.71	1.81	0.31	-0.08	10.00	0.02	0.10	0.00	3.21	3.77	2.10	0.314	1.60	1.227
9.40	1060.	3.21	4.15	1.96	0.31	-0.08	10.00	0.02	0.10	0.00	3.46	4.21	2.25	0.334	1.70	1.240
9.60	1070.	2.92	3.44	1.52	0.31	-0.08	10.00	0.02	0.10	0.00	3.20	3.50	1.81	0.353	1.50	1.252
9.80	1090.	2.87	3.89	1.60	0.31	-0.08	10.00	0.02	0.10	0.00	3.12	3.95	1.89	0.373	1.70	1.263
10.00	1130.	3.18	4.00	1.96	0.31	-0.08	10.00	0.02	0.10	0.00	3.44	4.06	2.25	0.393	1.70	1.277
10.20	1140.	3.38	4.38	2.10	0.31	-0.08	10.00	0.02	0.10	0.00	3.63	4.44	2.39	0.412	1.70	1.291
10.40	1150.	3.40	4.34	2.16	0.31	-0.08	10.00	0.02	0.10	0.00	3.65	4.40	2.45	0.432	1.70	1.305
10.60	1160.	3.54	4.56	2.37	0.31	-0.08	10.00	0.02	0.10	0.00	3.79	4.62	2.66	0.451	1.70	1.318
10.80	1220.	3.44	4.50	2.09	0.31	-0.08	10.00	0.02	0.10	0.00	3.69	4.56	2.38	0.471	1.70	1.332
11.00	1250.	3.48	4.40	2.16	0.31	-0.08	10.00	0.02	0.10	0.00	3.74	4.46	2.45	0.491	1.70	1.346
11.20	1240.	3.49	4.36	2.34	0.31	-0.08	10.00	0.02	0.10	0.00	3.75	4.42	2.63	0.510	1.70	1.359
11.40	1260.	3.35	3.77	2.14	0.31	-0.08	10.00	0.02	0.10	0.00	3.63	3.83	2.43	0.530	1.50	1.371
11.60	1300.	3.54	4.64	2.23	0.31	-0.08	10.00	0.02	0.10	0.00	3.79	4.70	2.52	0.540	1.70	1.377
11.60	1380.	3.54	5.13	1.85	0.31	-0.08	10.00	0.02	0.10	0.00	3.76	5.19	2.14	0.550	1.70	1.384
11.80	1390.	3.98	5.16	2.47	0.31	-0.08	10.00	0.02	0.10	0.00	4.22	5.22	2.76	0.569	1.70	1.398
12.00	1390.	3.91	5.29	2.56	0.31	-0.08	10.00	0.02	0.10	0.00	4.14	5.35	2.85	0.589	1.70	1.412
12.20	1400.	3.93	5.11	2.70	0.31	-0.08	10.00	0.02	0.10	0.00	4.17	5.17	2.99	0.608	1.70	1.425
12.40	1440.	4.15	5.31	2.79	0.31	-0.08	10.00	0.02	0.10	0.00	4.39	5.37	3.08	0.628	1.70	1.439
12.60	1500.	4.03	5.04	2.35	0.31	-0.08	10.00	0.02	0.10	0.00	4.28	5.10	2.64	0.648	1.70	1.453
12.80	1580.	4.10	5.54	2.41	0.31	-0.08	10.00	0.02	0.10	0.00	4.33	5.60	2.70	0.667	1.70	1.466
13.00	1580.	4.16	5.57	2.66	0.31	-0.08	10.00	0.02	0.10	0.00	4.39	5.63	2.95	0.687	1.70	1.480
13.20	1560.	4.04	5.17	2.62	0.31	-0.08	10.00	0.02	0.10	0.00	4.28	5.23	2.91	0.707	1.70	1.494

CONTINUED ON NEXT PAGE

SEA-13

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-13
PAGE 2
FILE NO. : IST-9841

SNDG.DATE: 8-17-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 6.00 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.10 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.20 BARS
DELTA-B = 0.35 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	THRUST (KGF)	A (BAR)	B (BAR)	C (BAR)	DA (BAR)	DB (BAR)	ZMRNG (BAR)	ZMLO (BAR)	ZMHI (BAR)	ZMCAL (BAR)	P0 (BAR)	P1 (BAR)	P2 (BAR)	U0 (BAR)	GAMMA (T/M3)	SVP (BAR)
13.40	1580.	4.44	5.73	2.89	0.31	-0.08	10.00	0.02	0.10	0.00	4.68	5.79	3.18	0.726	1.70	1.508
13.60	1640.	4.68	6.29	3.07	0.31	-0.08	10.00	0.02	0.10	0.00	4.90	6.35	3.36	0.746	1.70	1.521
13.80	1670.	4.69	6.12	3.29	0.31	-0.08	10.00	0.02	0.10	0.00	4.92	6.18	3.58	0.765	1.70	1.535
14.00	1680.	4.82	6.07	3.37	0.31	-0.08	10.00	0.02	0.10	0.00	5.06	6.13	3.66	0.785	1.70	1.549
14.20	1700.	4.71	5.95	3.39	0.31	-0.08	10.00	0.02	0.10	0.00	4.95	6.01	3.68	0.805	1.70	1.563
14.40	1750.	4.35	6.19	2.22	0.31	-0.08	10.00	0.02	0.10	0.00	4.56	6.25	2.51	0.824	1.70	1.576
14.60	1760.	4.54	6.03	2.86	0.31	-0.08	10.00	0.02	0.10	0.00	4.77	6.09	3.15	0.844	1.70	1.590
14.80	1800.	4.87	6.23	3.31	0.31	-0.08	10.00	0.02	0.10	0.00	5.10	6.29	3.60	0.864	1.70	1.604
15.00	1820.	5.00	6.40	3.51	0.31	-0.08	10.00	0.02	0.10	0.00	5.23	6.46	3.80	0.883	1.70	1.618
15.20	1850.	5.26	6.74	3.67	0.31	-0.08	10.00	0.02	0.10	0.00	5.49	6.80	3.96	0.903	1.70	1.631
15.40	1900.	5.18	6.73	3.56	0.31	-0.08	10.00	0.02	0.10	0.00	5.40	6.79	3.85	0.922	1.70	1.645
15.60	1950.	5.19	6.72	3.63	0.31	-0.08	10.00	0.02	0.10	0.00	5.41	6.78	3.92	0.942	1.70	1.659
15.80	4020.	3.68	16.35	0.04	0.31	-0.08	10.00	0.02	0.10	0.00	3.35	16.33	0.33	0.962	1.90	1.675
16.00	6000.	5.39	22.60		0.31	-0.08	10.00	0.02	0.10	0.00	4.83	22.58		0.981	2.00	1.693
16.20	6300.	4.62	20.05		0.31	-0.08	10.00	0.02	0.10	0.00	4.15	20.03		1.001	1.90	1.712
16.40	6300.	5.07	22.45		0.31	-0.08	10.00	0.02	0.10	0.00	4.51	22.43		1.021	2.00	1.730

END OF SOUNDING

(INTERPRETED SOIL PARAMETERS ON NEXT PAGE)

SEA-13

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL) SNDG. NO. D-13
IN-SITU SOIL TESTING, L.C. PAGE 3
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE FILE NO. : IST-9841
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER SNDG.DATE: 8-17-98
ANAL.BY : R. FAILMEZGER ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS: LO RANGE =10.00 BARS ROD DIAM. = 3.57 CM BL.THICK. = 15.0 MM SU FACTOR = 1.00
SURF.ELEV. = 10.00 M LO GAGE 0 = 0.02 BARS FR.RED.DIA. = 4.00 CM BL.WIDTH = 96.0 MM PHI FACTOR = 1.00
WATER DEPTH = 6.00 M HI GAGE 0 = 0.10 BARS LIN.ROD WT. = 6.50 KGF/M DELTA-A = 0.20 BARS OCR FACTOR = 1.00
SP.GR.WATER = 1.000 CAL GAGE 0 = 0.00 BARS DELTA/PHI = 0.50 DELTA-B = 0.35 BARS M FACTOR = 1.00
MAX SU ID = 0.60 SU OPTION = MARCHETTI MIN PHI ID = 1.20 OCR OPTION= MARCHETTI KO FACTOR = 1.00
UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	KD	ID	UD	ED (BAR)	KO	SU (BAR)	QD (BAR)	PHI (DEG)	SIGFF (BAR)	PHIO (DEG)	PC (BAR)	OCR	M (BAR)	SOIL TYPE
1.60	5.59	0.59	0.00	32.	1.26	0.22					1.39	5.0	61.	SILTY CLAY
1.80	4.48	0.36	0.00	17.	1.07	0.19					1.10	3.5	29.	SILTY CLAY
2.00	3.75	0.73	0.00	32.	0.94						0.91	2.7	49.	CLAYEY SILT
2.20	5.32	0.51	0.00	35.	1.21	0.28					1.72	4.6	65.	SILTY CLAY
2.40	3.08	0.34	0.00	15.	0.80	0.15					0.80	2.0	19.	CLAY
2.60	4.87	4.36	0.00	325.	0.72		41.7	39.6	0.72	37.5	1.53	3.5	609.	SAND
2.80	12.12	2.33	0.00	469.	1.70		33.4	35.7	0.76	33.5	9.75	20.4	1257.	SILTY SAND
3.00	7.18	0.68	0.00	87.	1.49						3.78	7.3	188.	CLAYEY SILT
3.20	6.37	0.46	0.00	55.	1.37	0.51					3.35	6.1	113.	SILTY CLAY
3.40	5.36	0.44	0.00	48.	1.22	0.44					2.71	4.7	89.	SILTY CLAY
3.60	4.69	0.48	0.00	48.	1.11	0.39					2.33	3.8	82.	SILTY CLAY
3.80	4.11	0.46	0.00	43.	1.01	0.35					2.00	3.1	68.	SILTY CLAY
4.00	3.64	0.35	0.00	30.	0.92	0.32					1.74	2.5	44.	CLAY
4.20	4.70	0.34	0.00	40.	1.11	0.46					2.71	3.8	69.	CLAY
4.60	6.57	0.35	0.00	63.	1.40	0.76					5.03	6.4	130.	SILTY CLAY
4.80	5.33	0.61	0.00	93.	1.21						3.78	4.6	173.	CLAYEY SILT
5.00	4.14	0.33	0.00	41.	1.01	0.47					2.66	3.1	65.	CLAY
5.20	3.82	0.25	0.00	29.	0.95	0.44					2.43	2.7	44.	CLAY
5.40	3.43	0.23	0.00	25.	0.88	0.40					2.14	2.3	35.	CLAY
5.60	3.05	0.19	0.46	20.	0.80	0.36					1.85	1.9	25.	CLAY
5.80	2.91	0.22	0.57	22.	0.77	0.35					1.77	1.8	27.	CLAY
6.00	2.80	0.20	0.61	19.	0.74	0.34					1.72	1.7	23.	CLAY
6.20	2.85	0.22	0.62	23.	0.75	0.35					1.79	1.7	27.	CLAY
6.40	2.98	0.41	0.50	44.	0.78	0.38					1.94	1.9	55.	SILTY CLAY
6.60	2.82	0.29	0.48	30.	0.75	0.36					1.81	1.7	36.	CLAY
6.80	3.10	0.26	0.54	30.	0.81	0.41					2.11	2.0	39.	CLAY
7.00	2.97	0.24	0.62	26.	0.78	0.39					2.01	1.9	33.	CLAY
7.20	2.82	0.22	0.59	23.	0.75	0.37					1.87	1.7	28.	CLAY
7.40	2.85	0.23	0.60	25.	0.75	0.38					1.92	1.7	30.	CLAY
7.60	2.70	0.28	0.54	30.	0.72	0.36					1.79	1.6	35.	CLAY
7.80	2.52	0.26	0.57	26.	0.68	0.33					1.63	1.4	29.	CLAY
8.00	2.61	0.36	0.52	38.	0.70	0.35					1.74	1.5	42.	SILTY CLAY
8.20	2.57	0.25	0.63	26.	0.69	0.35					1.73	1.5	29.	CLAY
8.40	2.73	0.21	0.66	23.	0.72	0.38					1.91	1.6	27.	CLAY
8.60	2.54	0.16	0.59	16.	0.68	0.35					1.73	1.4	18.	CLAY
8.80	2.32	0.18	0.58	18.	0.63	0.32					1.52	1.3	18.	CLAY
9.00	2.27	0.18	0.59	17.	0.62	0.31					1.48	1.2	17.	CLAY
9.20	2.36	0.19	0.62	19.	0.64	0.33					1.59	1.3	20.	CLAY
9.40	2.53	0.24	0.61	26.	0.68	0.37					1.78	1.4	28.	CLAY
9.60	2.27	0.11	0.51	11.	0.62	0.32					1.53	1.2	10.	MUD
9.80	2.17	0.30	0.55	29.	0.59	0.31					1.44	1.1	27.	CLAY
10.00	2.39	0.20	0.61	21.	0.64	0.35					1.68	1.3	22.	CLAY
10.20	2.49	0.25	0.61	28.	0.67	0.37					1.82	1.4	30.	CLAY
10.40	2.47	0.23	0.63	26.	0.66	0.37					1.81	1.4	28.	CLAY
10.60	2.53	0.25	0.66	29.	0.68	0.39					1.91	1.4	31.	CLAY
10.80	2.42	0.27	0.59	30.	0.65	0.37					1.79	1.3	32.	CLAY
11.00	2.41	0.22	0.60	25.	0.65	0.37					1.80	1.3	26.	CLAY
11.20	2.38	0.21	0.65	23.	0.64	0.37					1.79	1.3	24.	CLAY
11.40	2.26	0.06	0.61	7.	0.61	0.35					1.66	1.2	7.	MUD
11.50	2.36	0.28	0.61	32.	0.64	0.37					1.78	1.3	32.	CLAY
11.60	2.32	0.44	0.50	50.	0.63	0.37					1.75	1.3	50.	SILTY CLAY
11.80	2.61	0.27	0.60	35.	0.70	0.43					2.12	1.5	39.	CLAY
12.00	2.52	0.34	0.64	42.	0.68	0.41					2.02	1.4	46.	CLAY
12.20	2.50	0.28	0.67	35.	0.67	0.41					2.02	1.4	37.	CLAY
12.40	2.62	0.26	0.65	34.	0.70	0.44					2.19	1.5	38.	CLAY
12.60	2.50	0.23	0.55	28.	0.67	0.42					2.06	1.4	31.	CLAY
12.80	2.50	0.35	0.56	44.	0.67	0.43					2.07	1.4	48.	CLAY
13.00	2.50	0.33	0.61	43.	0.67	0.43					2.10	1.4	46.	CLAY
13.20	2.40	0.26	0.62	33.	0.65	0.41					1.98	1.3	34.	CLAY

CONTINUED ON NEXT PAGE

SEA-13

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-13
PAGE 4
FILE NO. : IST-9841

SNDG.DATE: 8-17-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 6.00 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.10 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.20 BARS
DELTA-B = 0.35 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	KD	ID	UD	ED (BAR)	KO	SU (BAR)	QD (BAR)	PHI (DEG)	SIGFF (BAR)	PHIO (DEG)	PC (BAR)	OCR	M (BAR)	SOIL TYPE
13.40	2.62	0.28	0.62	39.	0.70	0.46					2.30	1.5	44.	CLAY
13.60	2.73	0.35	0.63	50.	0.73	0.49					2.47	1.6	59.	CLAY
13.80	2.71	0.30	0.68	44.	0.72	0.49					2.46	1.6	51.	CLAY
14.00	2.76	0.25	0.67	37.	0.73	0.51					2.56	1.7	44.	CLAY
14.20	2.65	0.26	0.69	37.	0.71	0.49					2.43	1.6	42.	CLAY
14.40	2.37	0.45	0.45	59.	0.64	0.43					2.05	1.3	60.	SILTY CLAY
14.60	2.47	0.34	0.59	46.	0.66	0.45					2.21	1.4	49.	CLAY
14.80	2.64	0.28	0.65	41.	0.71	0.50					2.48	1.5	47.	CLAY
15.00	2.69	0.28	0.67	43.	0.72	0.52					2.57	1.6	49.	CLAY
15.20	2.81	0.29	0.67	46.	0.74	0.55					2.77	1.7	55.	CLAY
15.40	2.72	0.31	0.65	48.	0.72	0.53					2.66	1.6	56.	CLAY
15.60	2.70	0.31	0.67	47.	0.72	0.53					2.64	1.6	55.	CLAY
15.80	1.43	5.43	-0.26	450.	0.23		177.7	41.8	2.79	41.8	0.63	0.4	381.	SAND
16.00	2.28	4.60	-0.26	616.	0.23		259.6	43.9	2.87	44.0	0.75	0.4	748.	SAND
16.20	1.84	5.04	-0.26	551.	0.14		278.0	44.7	2.92	44.7	0.29	0.2	568.	SAND
16.40	2.01	5.14	-0.26	622.	0.18		275.9	44.4	2.94	44.5	0.45	0.3	689.	SAND

END OF SOUNDING

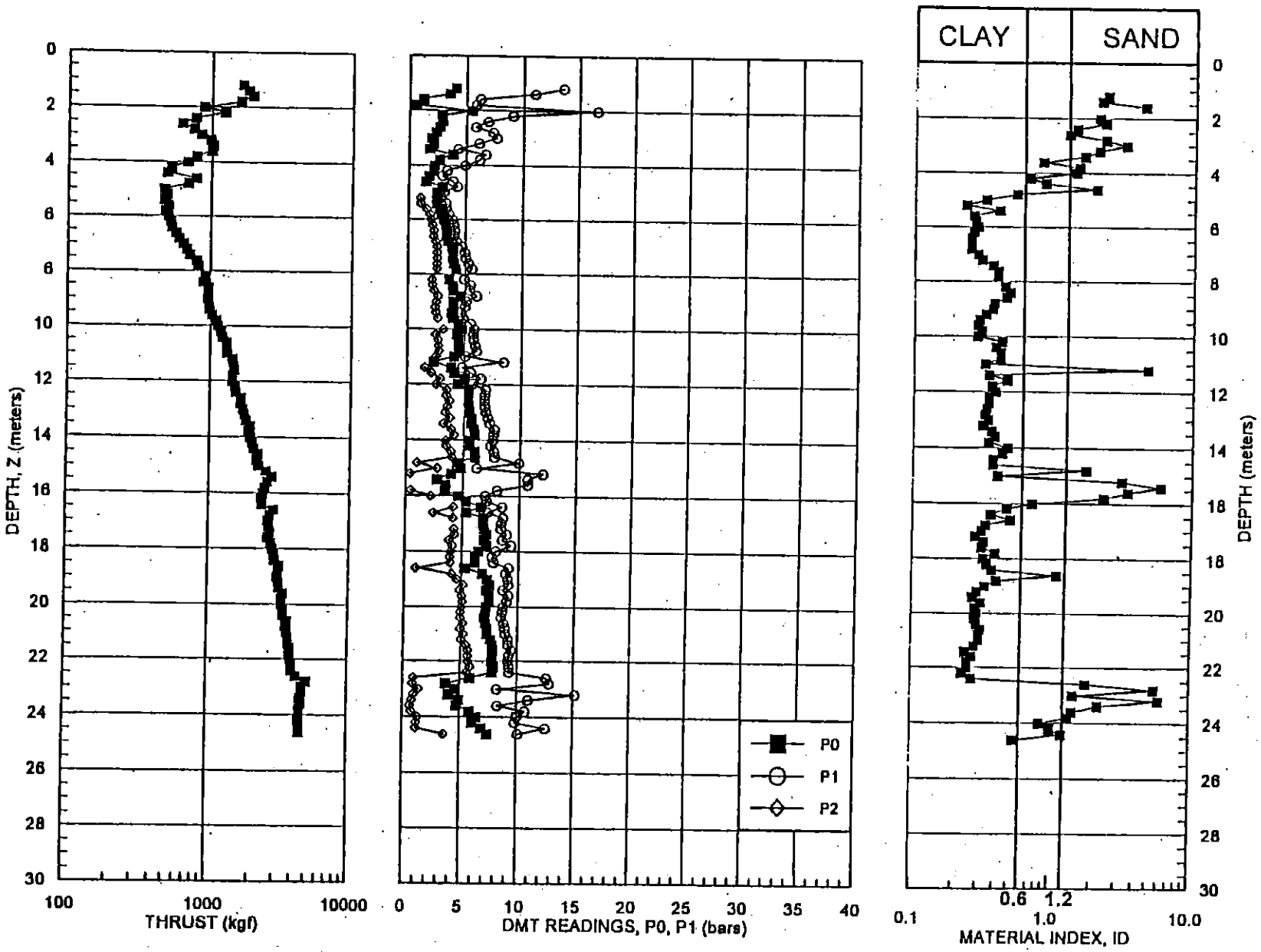
Ground Surface Elev.
Water Depth: -6.0 m

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

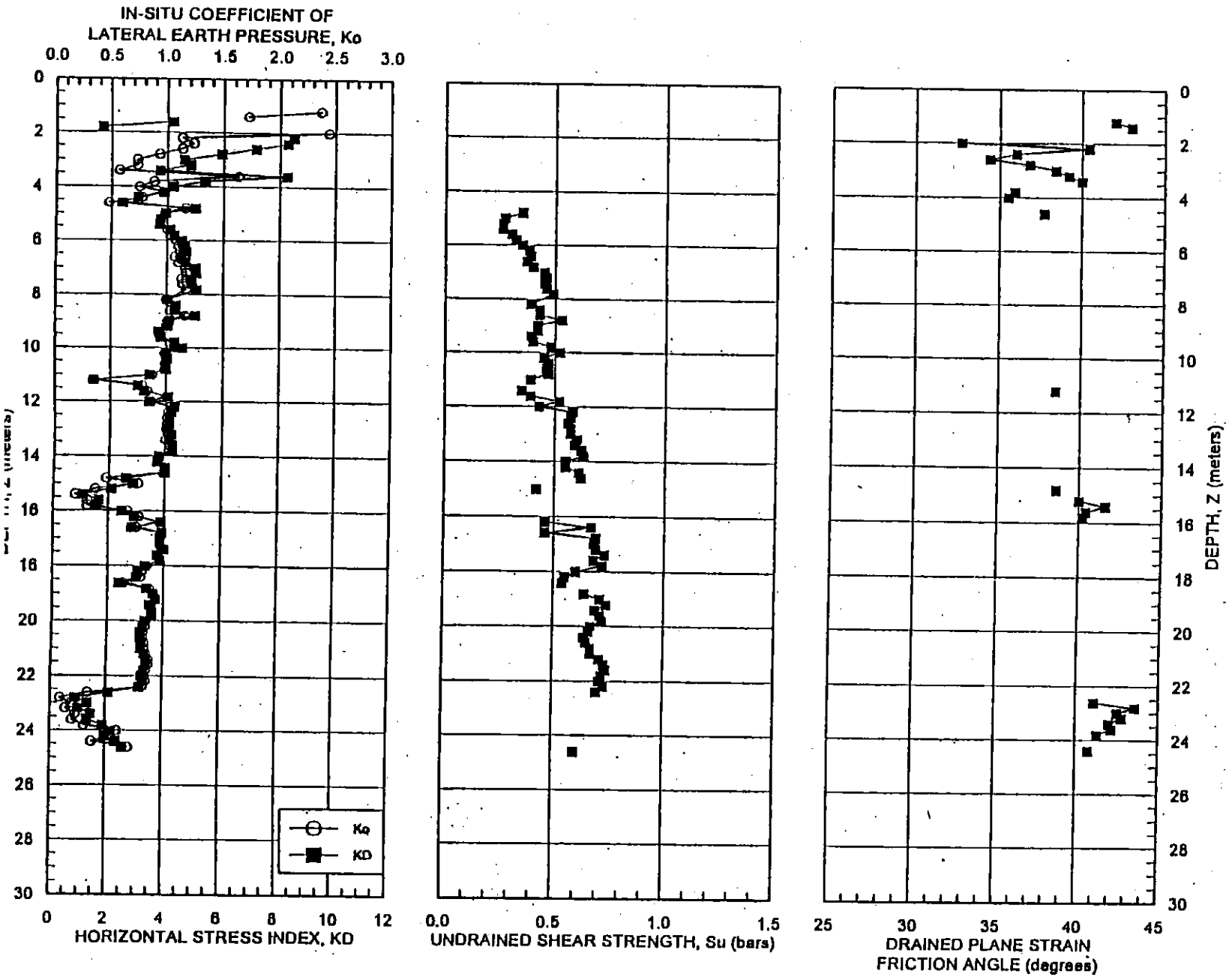
DILATOMETER RESULTS

INSTRUSOIL TESTING, LC
ENGINEER: R. Faimezger
SOUNDING DATE: 8-14-98

SOUNDING
D-14



SEA-14



Ground Surface Elev.
Water Depth: +3.2 m

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

INTERPRETED DMT STRENGTH PARAMETERS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-14-98

SOUNDING
D-14

SEA-14

SEA-14

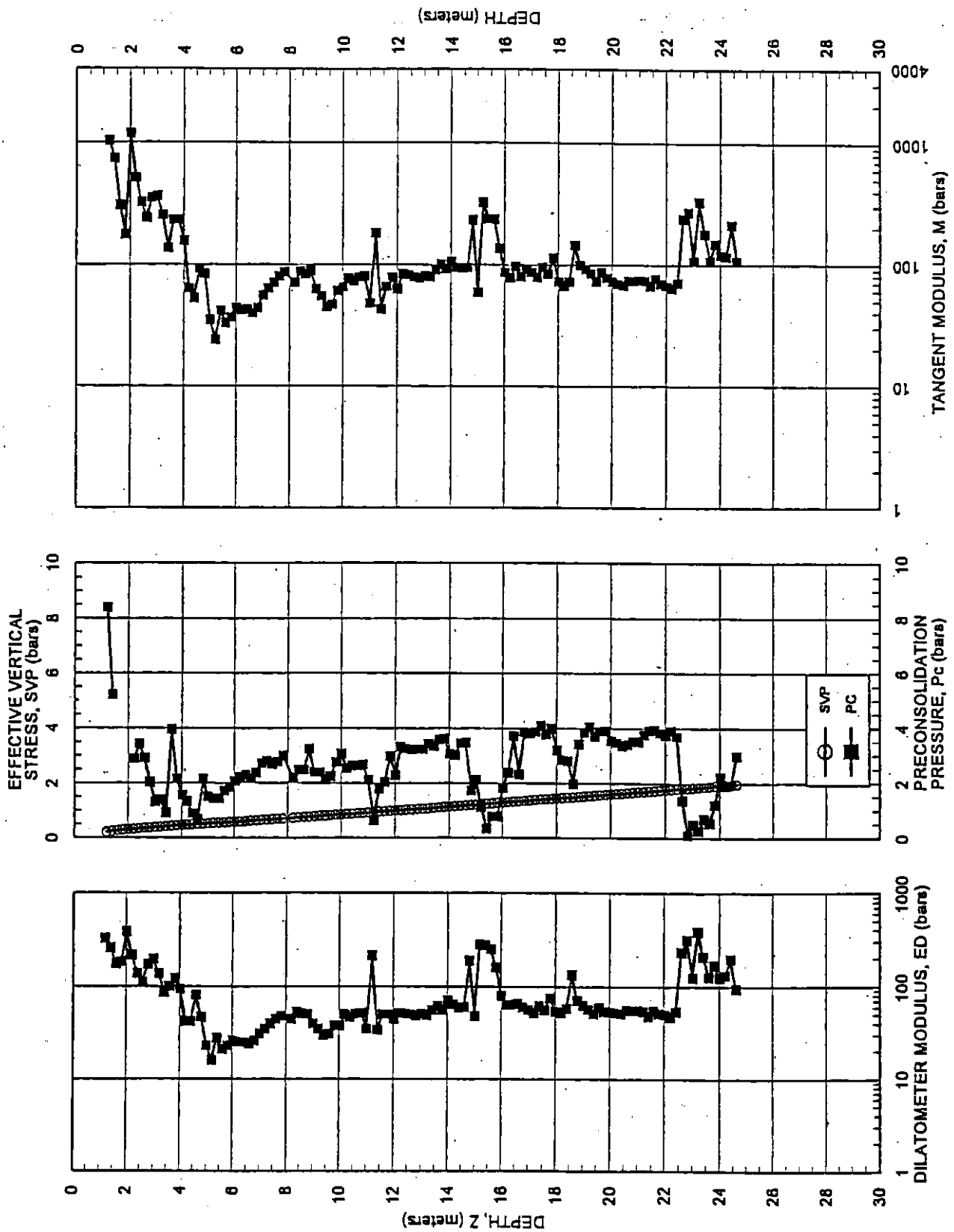
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 8-14-98

SOUNDING
D-14

INTERPRETED DMT DEFORMATION PARAMETERS

Ground Surface Elev.
Water Depth: 6 m



SEA-14

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-14
PAGE 1
FILE NO. : IST-9841

SNDG.DATE: 8-14-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 1.50 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.15 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.23 BARS
DELTA-B = 0.30 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	THRUST (KGF)	A (BAR)	B (BAR)	C (BAR)	DA (BAR)	DB (BAR)	ZMRNG (BAR)	ZMLO (BAR)	ZMHI (BAR)	ZMCAL (BAR)	P0 (BAR)	P1 (BAR)	P2 (BAR)	U0 (BAR)	GAMMA (T/M3)	SVP (BAR)
1.20	1640.	4.29	14.00		0.23	0.30	10.00	0.02	0.15	0.00	4.05	13.55		0.000	1.90	0.210
1.40	1790.	3.66	11.45		0.23	0.30	10.00	0.02	0.15	0.00	3.51	11.00		0.000	1.90	0.247
1.60	1940.	1.19	6.50		0.23	0.30	10.00	0.02	0.15	0.00	1.16	6.18		0.010	1.80	0.274
1.80	1590.	0.56	6.16		0.23	0.30	10.00	0.02	0.15	0.00	0.52	5.84		0.029	1.70	0.289
2.00	880.	5.79	17.05		0.23	0.30	10.00	0.02	0.15	0.00	5.47	16.60		0.049	2.00	0.305
2.20	1230.	2.91	9.39		0.23	0.30	10.00	0.02	0.15	0.00	2.82	9.07		0.069	1.90	0.324
2.40	770.	2.89	7.22		0.23	0.30	10.00	0.02	0.15	0.00	2.91	6.90		0.088	1.80	0.341
2.60	620.	2.59	6.15		0.23	0.30	10.00	0.02	0.15	0.00	2.65	5.83		0.108	1.70	0.355
2.80	750.	2.35	7.64		0.23	0.30	10.00	0.02	0.15	0.00	2.32	7.32		0.128	1.90	0.371
3.00	840.	1.99	7.96		0.23	0.30	10.00	0.02	0.15	0.00	1.93	7.64		0.147	1.80	0.388
3.20	980.	2.09	6.42		0.23	0.30	10.00	0.02	0.15	0.00	2.11	6.10		0.167	1.80	0.403
3.40	1020.	1.66	4.59		0.23	0.30	10.00	0.02	0.15	0.00	1.75	4.27		0.186	1.70	0.418
3.60	1000.	3.71	6.99		0.23	0.30	10.00	0.02	0.15	0.00	3.78	6.67		0.206	1.80	0.433
3.80	780.	2.57	6.46		0.23	0.30	10.00	0.02	0.15	0.00	2.61	6.14		0.226	1.70	0.447
4.00	680.	2.10	5.21		0.23	0.30	10.00	0.02	0.15	0.00	2.18	4.89		0.245	1.70	0.461
4.20	520.	1.95	3.62		0.23	0.30	10.00	0.02	0.15	0.00	2.10	3.30		0.265	1.60	0.474
4.40	490.	1.56	3.24		0.23	0.30	10.00	0.02	0.15	0.00	1.71	2.92		0.285	1.60	0.486
4.60	780.	1.39	4.14		0.23	0.30	10.00	0.02	0.15	0.00	1.49	3.82		0.304	1.70	0.499
4.80	690.	2.74	4.56		0.23	0.30	10.00	0.02	0.15	0.00	2.89	4.24		0.324	1.70	0.512
5.00	470.	2.23	3.38		0.23	0.30	10.00	0.02	0.15	0.00	2.41	3.06		0.343	1.60	0.525
5.20	490.	2.19	3.16	0.81	0.23	0.30	10.00	0.02	0.15	0.00	2.38	2.84	1.02	0.363	1.60	0.537
5.40	470.	2.25	3.56	0.83	0.23	0.30	10.00	0.02	0.15	0.00	2.42	3.24	1.04	0.383	1.60	0.549
5.60	500.	2.81	3.61	1.35	0.23	0.30	10.00	0.02	0.15	0.00	2.69	3.29	1.56	0.402	1.60	0.560
5.80	480.	2.67	3.82	1.64	0.23	0.30	10.00	0.02	0.15	0.00	2.85	3.50	1.85	0.422	1.60	0.572
6.00	500.	2.90	4.14	1.76	0.23	0.30	10.00	0.02	0.15	0.00	3.07	3.82	1.97	0.442	1.60	0.584
6.20	520.	3.05	4.26	1.89	0.23	0.30	10.00	0.02	0.15	0.00	3.23	3.94	2.10	0.461	1.70	0.597
6.40	530.	3.16	4.37	2.01	0.23	0.30	10.00	0.02	0.15	0.00	3.34	4.05	2.24	0.481	1.70	0.610
6.60	570.	3.10	4.29	2.00	0.23	0.30	10.00	0.02	0.15	0.00	3.28	3.97	2.21	0.500	1.60	0.623
6.80	600.	3.30	4.54	2.19	0.23	0.30	10.00	0.02	0.15	0.00	3.47	4.22	2.40	0.520	1.70	0.636
7.00	640.	3.63	5.02	2.29	0.23	0.30	10.00	0.02	0.15	0.00	3.80	4.70	2.50	0.540	1.70	0.650
7.20	680.	3.74	5.24	2.31	0.23	0.30	10.00	0.02	0.15	0.00	3.90	4.92	2.52	0.559	1.70	0.663
7.40	710.	3.70	5.34	2.30	0.23	0.30	10.00	0.02	0.15	0.00	3.85	5.02	2.51	0.579	1.70	0.677
7.60	790.	3.82	5.59	2.29	0.23	0.30	10.00	0.02	0.15	0.00	3.97	5.27	2.50	0.599	1.70	0.691
7.80	820.	4.04	5.89	2.29	0.23	0.30	10.00	0.02	0.15	0.00	4.18	5.57	2.50	0.618	1.70	0.705
8.20	920.	3.45	5.22	1.89	0.23	0.30	10.00	0.02	0.15	0.00	3.60	4.90	2.10	0.658	1.70	0.732
8.40	890.	3.76	5.76	1.90	0.23	0.30	10.00	0.02	0.15	0.00	3.90	5.44	2.11	0.677	1.70	0.746
8.60	960.	3.79	5.72	2.06	0.23	0.30	10.00	0.02	0.15	0.00	3.93	5.40	2.27	0.697	1.70	0.760
8.80	960.	4.44	6.34	2.41	0.23	0.30	10.00	0.02	0.15	0.00	4.58	6.02	2.82	0.716	1.70	0.773
9.00	950.	3.79	5.42	2.24	0.23	0.30	10.00	0.02	0.15	0.00	3.94	5.10	2.45	0.736	1.70	0.787
9.20	970.	3.61	5.31	2.15	0.23	0.30	10.00	0.02	0.15	0.00	3.97	4.99	2.36	0.756	1.70	0.801
9.40	980.	3.62	4.98	2.21	0.23	0.30	10.00	0.02	0.15	0.00	3.79	4.66	2.42	0.775	1.70	0.815
9.60	1020.	3.76	5.14	2.39	0.23	0.30	10.00	0.02	0.15	0.00	3.93	4.82	2.60	0.795	1.70	0.828
9.80	1090.	4.25	5.81		0.23	0.30	10.00	0.02	0.15	0.00	4.41	5.49		0.815	1.70	0.842
10.00	1120.	4.56	6.14	2.90	0.23	0.30	10.00	0.02	0.15	0.00	4.72	5.82	3.11	0.834	1.70	0.856
10.20	1180.	4.16	6.06	2.21	0.23	0.30	10.00	0.02	0.15	0.00	4.30	5.74	2.42	0.854	1.70	0.869
10.40	1220.	4.29	6.10	2.45	0.23	0.30	10.00	0.02	0.15	0.00	4.44	5.78	2.66	0.873	1.70	0.883
10.60	1300.	4.31	6.26	2.48	0.23	0.30	10.00	0.02	0.15	0.00	4.45	5.92	2.69	0.893	1.70	0.897
10.80	1300.	4.40	6.35	2.52	0.23	0.30	10.00	0.02	0.15	0.00	4.54	6.03	2.73	0.913	1.70	0.911
11.00	1310.	3.91	5.39	2.24	0.23	0.30	10.00	0.02	0.15	0.00	4.07	5.07	2.45	0.932	1.70	0.924
11.20	1430.	2.35	8.77		0.23	0.30	10.00	0.02	0.15	0.00	2.27	8.45		0.952	1.80	0.939
11.40	1460.	3.66	5.12	1.29	0.23	0.30	10.00	0.02	0.15	0.00	3.82	4.80	1.50	0.972	1.70	0.954
11.60	1480.	3.96	5.85	1.89	0.23	0.30	10.00	0.02	0.15	0.00	4.10	5.53	2.10	0.991	1.70	0.968
11.80	1430.	4.86	6.76	2.66	0.23	0.30	10.00	0.02	0.15	0.00	5.00	6.44	2.87	1.011	1.70	0.981
12.00	1430.	4.27	6.04	2.32	0.23	0.30	10.00	0.02	0.15	0.00	4.42	5.72	2.53	1.030	1.70	0.995
12.20	1490.	5.24	7.19	3.26	0.23	0.30	10.00	0.02	0.15	0.00	5.38	6.87	3.47	1.050	1.70	1.009
12.40	1520.	5.21	7.14	3.22	0.23	0.30	10.00	0.02	0.15	0.00	5.35	6.82	3.43	1.070	1.70	1.023
12.60	1660.	5.22	7.11	3.51	0.23	0.30	10.00	0.02	0.15	0.00	5.36	6.79	3.72	1.089	1.70	1.036
12.80	1640.	5.29	7.14	3.29	0.23	0.30	10.00	0.02	0.15	0.00	5.43	6.82	3.50	1.109	1.70	1.050
13.00	1710.	5.32	7.26	3.16	0.23	0.30	10.00	0.02	0.15	0.00	5.46	6.94	3.37	1.129	1.70	1.064

CONTINUED ON NEXT PAGE

SEA 74

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-14
PAGE 2
FILE NO. : IST-9841

SNDG.DATE: 8-14-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 1.50 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE -10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.15 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.23 BARS
DELTA-B = 0.30 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	THRUST (KGF)	A (BAR)	B (BAR)	C (BAR)	DA (BAR)	DB (BAR)	ZMRNG (BAR)	ZMLO (BAR)	ZMHI (BAR)	ZMCAL (BAR)	P0 (BAR)	P1 (BAR)	P2 (BAR)	U0 (BAR)	GAMMA (T/M3)	SVP (BAR)
13.20	1780.	5.54	7.42	3.57	0.23	0.30	10.00	0.02	0.15	0.00	5.68	7.10	3.78	1.148	1.70	1.078
13.40	1810.	5.51	7.59	3.02	0.23	0.30	10.00	0.02	0.15	0.00	5.64	7.27	3.23	1.168	1.80	1.092
13.60	1930.	5.76	8.00	3.67	0.23	0.30	10.00	0.02	0.15	0.00	5.88	7.68	3.88	1.187	1.80	1.108
13.80	1890.	5.84	7.92	3.94	0.23	0.30	10.00	0.02	0.15	0.00	5.97	7.60	4.15	1.207	1.80	1.124
14.00	1940.	5.41	7.88	3.22	0.23	0.30	10.00	0.02	0.15	0.00	5.52	7.56	3.43	1.227	1.80	1.139
14.20	2000.	5.40	7.68	3.27	0.23	0.30	10.00	0.02	0.15	0.00	5.52	7.36	3.48	1.246	1.80	1.155
14.40	2060.	5.82	7.98	3.70	0.23	0.30	10.00	0.02	0.15	0.00	5.95	7.66	3.91	1.266	1.80	1.171
14.60	2200.	5.89	8.07	3.76	0.23	0.30	10.00	0.02	0.15	0.00	6.02	7.75	3.97	1.286	1.80	1.186
14.80	2160.	4.50	10.35	0.71	0.23	0.30	10.00	0.02	0.15	0.00	4.45	9.90	0.92	1.305	1.80	1.202
15.00	2240.	4.67	6.52	2.50	0.23	0.30	10.00	0.02	0.15	0.00	4.81	6.20	2.71	1.325	1.70	1.217
15.20	2530.	4.11	12.50	0.16	0.23	0.30	10.00	0.02	0.15	0.00	3.93	12.05	0.37	1.344	1.90	1.233
15.40	2770.	2.88	11.15		0.23	0.30	10.00	0.02	0.15	0.00	2.71	10.70		1.364	1.80	1.249
15.60	2590.	3.61	11.15		0.23	0.30	10.00	0.02	0.15	0.00	3.48	10.70		1.384	1.90	1.266
15.80	2490.	3.40	8.32	0.22	0.23	0.30	10.00	0.02	0.15	0.00	3.39	8.00	0.43	1.403	1.80	1.283
16.00	2410.	4.54	7.25	1.96	0.23	0.30	10.00	0.02	0.15	0.00	4.64	6.93	2.17	1.423	1.70	1.297
16.20	2340.	5.15	7.40		0.23	0.30	10.00	0.02	0.15	0.00	5.27	7.08		1.443	1.70	1.311
16.40	2380.	6.48	8.76	3.96	0.23	0.30	10.00	0.02	0.15	0.00	6.60	8.44	4.17	1.462	1.80	1.326
16.60	2860.	5.16	7.51	2.20	0.23	0.30	10.00	0.02	0.15	0.00	5.28	7.19	2.41	1.482	1.70	1.341
16.80	2710.	6.67	8.86	3.93	0.23	0.30	10.00	0.02	0.15	0.00	6.80	8.54	4.14	1.501	1.80	1.355
17.00	2610.	6.66	8.74		0.23	0.30	10.00	0.02	0.15	0.00	6.79	8.42		1.521	1.80	1.371
17.20	2660.	6.76	8.72	4.04	0.23	0.30	10.00	0.02	0.15	0.00	6.90	8.40	4.25	1.541	1.80	1.387
17.40	2730.	7.01	9.24	4.13	0.23	0.30	10.00	0.02	0.15	0.00	7.13	8.92	4.34	1.560	1.80	1.402
17.60	2630.	6.76	8.84	3.62	0.23	0.30	10.00	0.02	0.15	0.00	6.89	8.52	3.83	1.580	1.80	1.418
17.80	2770.	7.03	9.61	3.94	0.23	0.30	10.00	0.02	0.15	0.00	7.14	9.29	4.15	1.600	1.80	1.434
18.00	2840.	6.29	8.29	3.81	0.23	0.30	10.00	0.02	0.15	0.00	6.43	7.97	4.02	1.619	1.80	1.449
18.20	2920.	5.98	7.95	3.72	0.23	0.30	10.00	0.02	0.15	0.00	6.12	7.63	3.93	1.639	1.70	1.464
18.40	2960.	5.98	8.09	3.77	0.23	0.30	10.00	0.02	0.15	0.00	6.11	7.77	3.98	1.658	1.80	1.479
18.60	3200.	5.22	9.44	0.74	0.23	0.30	10.00	0.02	0.15	0.00	5.25	9.12	0.95	1.678	1.80	1.495
18.80	3130.	6.70	9.18	3.89	0.23	0.30	10.00	0.02	0.15	0.00	6.81	8.86	4.10	1.698	1.80	1.510
19.00	3080.	7.12	9.39	4.39	0.23	0.30	10.00	0.02	0.15	0.00	7.24	9.07	4.60	1.717	1.80	1.526
19.20	3170.	7.34	9.44	4.95	0.23	0.30	10.00	0.02	0.15	0.00	7.47	9.12	5.16	1.737	1.80	1.542
19.40	3200.	7.04	8.98	4.61	0.23	0.30	10.00	0.02	0.15	0.00	7.18	8.66	4.82	1.757	1.80	1.557
19.60	3420.	7.27	9.45	4.82	0.23	0.30	10.00	0.02	0.15	0.00	7.40	9.13	5.03	1.776	1.80	1.573
19.80	3340.	7.31	9.32	4.89	0.23	0.30	10.00	0.02	0.15	0.00	7.45	9.00	5.10	1.796	1.80	1.589
20.00	3360.	7.02	9.01	4.81	0.23	0.30	10.00	0.02	0.15	0.00	7.16	8.69	5.02	1.816	1.80	1.605
20.20	3430.	6.98	8.94	4.71	0.23	0.30	10.00	0.02	0.15	0.00	7.12	8.62	4.92	1.835	1.80	1.620
20.40	3450.	6.90	8.84	4.71	0.23	0.30	10.00	0.02	0.15	0.00	7.04	8.52	4.92	1.855	1.80	1.636
20.60	3670.	7.00	9.07	4.97	0.23	0.30	10.00	0.02	0.15	0.00	7.13	8.75	5.18	1.874	1.80	1.652
20.80	3600.	7.14	9.19	4.72	0.23	0.30	10.00	0.02	0.15	0.00	7.27	8.87	4.93	1.894	1.80	1.667
21.00	3670.	7.16	9.23	5.03	0.23	0.30	10.00	0.02	0.15	0.00	7.29	8.91	5.24	1.914	1.80	1.683
21.20	3750.	7.45	9.47	4.80	0.23	0.30	10.00	0.02	0.15	0.00	7.59	9.15	5.01	1.933	1.80	1.699
21.40	3770.	7.63	9.48	5.28	0.23	0.30	10.00	0.02	0.15	0.00	7.77	9.16	5.49	1.953	1.80	1.714
21.60	3880.	7.71	9.76	5.42	0.23	0.30	10.00	0.02	0.15	0.00	7.84	9.44	5.63	1.973	1.80	1.730
21.80	3850.	7.63	9.56	5.41	0.23	0.30	10.00	0.02	0.15	0.00	7.77	9.24	5.62	1.992	1.80	1.746
22.00	3910.	7.58	9.47	5.41	0.23	0.30	10.00	0.02	0.15	0.00	7.72	9.15	5.62	2.012	1.80	1.762
22.20	3980.	7.77	9.59	5.66	0.23	0.30	10.00	0.02	0.15	0.00	7.92	9.27	5.87	2.031	1.80	1.777
22.40	4010.	7.62	9.62	5.31	0.23	0.30	10.00	0.02	0.15	0.00	7.76	9.30	5.52	2.051	1.80	1.793
22.60	4300.	5.95	13.05	0.69	0.23	0.30	10.00	0.02	0.15	0.00	5.84	12.60	0.90	2.071	1.80	1.809
22.80	5120.	3.95	13.30	0.64	0.23	0.30	10.00	0.02	0.15	0.00	3.73	12.85	0.85	2.090	1.90	1.825
23.00	4760.	4.55	8.52	1.16	0.23	0.30	10.00	0.02	0.15	0.00	4.59	8.20	1.37	2.110	1.70	1.841
23.20	4750.	4.31	15.60	0.69	0.23	0.30	10.00	0.02	0.15	0.00	3.99	15.15	0.90	2.130	1.90	1.857
23.40	4610.	4.99	11.45	0.56	0.23	0.30	10.00	0.02	0.15	0.00	4.91	11.00	0.77	2.149	1.90	1.874
23.60	4720.	4.64	8.62	0.41	0.23	0.30	10.00	0.02	0.15	0.00	4.68	8.30	0.62	2.169	1.70	1.890
23.80	4560.	5.84	11.15	0.52	0.23	0.30	10.00	0.02	0.15	0.00	5.82	10.70	0.73	2.188	1.80	1.905
24.00	4560.	6.40	10.45	1.09	0.23	0.30	10.00	0.02	0.15	0.00	6.44	10.00	1.30	2.208	1.80	1.920
24.20	4500.	6.01	10.30	0.98	0.23	0.30	10.00	0.02	0.15	0.00	6.04	9.85	1.19	2.228	1.80	1.936
24.40	4570.	6.94	13.00	0.94	0.23	0.30	10.00	0.02	0.15	0.00	6.88	12.55	1.15	2.247	1.80	1.952
24.60	4560.	7.32	10.60	3.40	0.23	0.30	10.00	0.02	0.15	0.00	7.40	10.15	3.61	2.267	1.80	1.968

END OF SOUNDING

(INTERPRETED SOIL PARAMETERS ON NEXT PAGE)

SEA-14

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-14
PAGE 3
FILE NO. : IST-9841

SNDG.DATE: 8-14-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 1.50 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.15 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.23 BARS
DELTA-B = 0.30 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	KD	ID	UD	ED (BAR)	KO	SU (BAR)	QD (BAR)	PHI (DEG)	SIGFF (BAR)	PHIO (DEG)	PC (BAR)	OCR	M (BAR)	SOIL TYPE
1.20	19.27	2.35	0.00	330.	2.37		51.4	42.0	0.35	38.9	8.40	40.0	1029.	SILTY SAND
1.40	14.21	2.13	0.00	260.	1.72		61.4	43.0	0.42	40.2	5.21	21.1	736.	SILTY SAND
1.60	4.20	4.36	0.00	174.									304.	SAND
1.80	1.69	10.93	0.00	185.									176.	SAND
2.00	17.76	2.05	0.00	386.	2.44		15.4	32.7	0.47	29.3	14.67	48.1	1176.	SILTY SAND
2.20	8.50	2.27	0.00	217.	1.13		41.6	40.4	0.53	37.9	2.88	8.9	510.	SILTY SAND
2.40	8.29	1.41	0.00	138.	1.23		21.8	36.0	0.54	33.2	3.42	10.0	321.	SANDY SILT
2.60	7.15	1.25	0.00	110.	1.13		17.1	34.4	0.56	31.5	2.91	8.2	240.	SANDY SILT
2.80	5.92	2.28	0.00	173.	0.93		24.1	36.8	0.59	34.1	2.03	5.5	350.	SILTY SAND
3.00	4.59	3.21	0.00	198.	0.73		30.3	38.4	0.63	36.0	1.31	3.4	362.	SILTY SAND
3.20	4.82	2.05	0.00	138.	0.73		35.7	39.2	0.66	36.8	1.41	3.5	252.	SILTY SAND
3.40	3.74	1.61	0.00	87.	0.57		39.6	40.0	0.69	37.8	0.91	2.2	136.	SANDY SILT
3.60	8.26	0.81	0.00	100.	1.63						3.96	9.1	231.	CLAYEY SILT
3.80	5.13	1.48	0.00	122.	0.88		25.1	35.9	0.71	33.5	2.14	4.8	232.	SANDY SILT
4.00	4.20	1.40	0.00	94.	0.75		23.0	35.5	0.73	33.1	1.55	3.4	156.	SANDY SILT
4.20	3.88	0.65	0.00	42.	0.96						1.33	2.8	64.	CLAYEY SILT
4.40	2.94	0.85	0.00	42.	0.77						0.89	1.8	53.	CLAYEY SILT
4.60	2.38	1.97	0.00	81.	0.48		31.5	37.7	0.80	35.7	0.68	1.4	93.	SILTY SAND
4.80	5.00	0.53	0.00	47.	1.18	0.35					2.14	4.2	84.	SILTY CLAY
5.00	3.93	0.32	0.00	23.	0.97	0.27					1.51	2.9	35.	CLAY
5.20	3.75	0.23	0.33	16.	0.94	0.26					1.43	2.7	24.	CLAY
5.40	3.72	0.40	0.32	28.	0.93	0.26					1.44	2.8	42.	SILTY CLAY
5.60	4.09	0.26	0.51	21.	1.00	0.30					1.71	3.0	33.	CLAY
5.80	4.24	0.27	0.59	23.	1.03	0.32					1.85	3.2	37.	CLAY
6.00	4.51	0.28	0.58	26.	1.08	0.35					2.08	3.6	44.	CLAY
6.20	4.83	0.26	0.59	25.	1.10	0.38					2.21	3.7	42.	CLAY
6.40	4.68	0.25	0.62	25.	1.11	0.39					2.30	3.8	43.	CLAY
6.60	4.46	0.25	0.62	24.	1.07	0.37					2.17	3.5	40.	CLAY
6.80	4.65	0.25	0.64	26.	1.10	0.40					2.37	3.7	44.	CLAY
7.00	5.01	0.28	0.60	31.	1.16	0.45					2.72	4.2	56.	CLAY
7.20	5.04	0.30	0.59	35.	1.17	0.46					2.80	4.2	64.	CLAY
7.40	4.84	0.36	0.59	40.	1.13	0.45					2.69	4.0	71.	SILTY CLAY
7.60	4.88	0.39	0.56	45.	1.14	0.46					2.78	4.0	80.	SILTY CLAY
7.80	5.06	0.39	0.53	48.	1.17	0.49					3.00	4.3	87.	SILTY CLAY
8.20	4.02	0.44	0.49	45.	0.99	0.39					2.17	3.0	71.	SILTY CLAY
8.40	4.32	0.48	0.45	54.	1.04	0.43					2.48	3.3	88.	SILTY CLAY
8.60	4.26	0.45	0.49	51.	1.03	0.43					2.47	3.2	83.	SILTY CLAY
8.80	5.00	0.37	0.49	50.	1.16	0.53					3.23	4.2	89.	SILTY CLAY
9.00	4.08	0.36	0.53	40.	1.00	0.42					2.39	3.0	63.	SILTY CLAY
9.20	4.02	0.32	0.50	35.	0.99	0.42					2.38	3.0	55.	CLAY
9.40	3.70	0.29	0.55	30.	0.93	0.39					2.13	2.6	45.	CLAY
9.60	3.78	0.28	0.58	31.	0.94	0.40					2.24	2.7	47.	CLAY
9.80	4.27	0.30	0.58	38.	1.03	0.48					2.75	3.3	61.	CLAY
10.00	4.54	0.28	0.53	38.	1.08	0.52					3.07	3.6	65.	CLAY
10.20	3.97	0.42	0.45	50.	0.98	0.45					2.53	2.9	77.	SILTY CLAY
10.40	4.03	0.38	0.50	47.	0.99	0.47					2.64	3.0	73.	SILTY CLAY
10.60	3.97	0.41	0.51	51.	0.98	0.46					2.61	2.9	79.	SILTY CLAY
10.80	3.98	0.41	0.50	52.	0.98	0.47					2.67	2.9	81.	SILTY CLAY
11.00	3.40	0.32	0.48	35.	0.87	0.39					2.11	2.3	48.	CLAY
11.20	1.40	4.71	0.48	219.	0.34		82.7	38.5	1.52	37.6	0.64	0.7	182.	SAND
11.40	2.99	0.34	0.19	34.	0.78	0.35					1.79	1.9	43.	CLAY
11.60	3.21	0.46	0.36	50.	0.83	0.39					2.03	2.1	66.	SILTY CLAY
11.80	4.07	0.36	0.47	50.	1.00	0.52					2.97	3.0	79.	SILTY CLAY
12.00	3.40	0.38	0.44	45.	0.87	0.43					2.28	2.3	63.	SILTY CLAY
12.20	4.29	0.34	0.56	52.	1.04	0.58					3.32	3.3	84.	CLAY
12.40	4.19	0.34	0.55	51.	1.02	0.57					3.24	3.2	82.	CLAY
12.60	4.12	0.33	0.62	50.	1.01	0.56					3.20	3.1	79.	CLAY
12.80	4.12	0.32	0.55	48.	1.01	0.57					3.24	3.1	77.	CLAY
13.00	4.07	0.34	0.52	51.	1.00	0.57					3.22	3.0	81.	CLAY

CONTINUED ON NEXT PAGE

SEA-14

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-14
PAGE 4
FILE NO. : IST-9841

SNDG.DATE: 8-14-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 1.50 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.15 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.ROD.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.23 BARS
DELTA-B = 0.30 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	KD	ID	UD	ED (BAR)	KO	SU (BAR)	QD (BAR)	PHI (DEG)	SIGFF (BAR)	PHIO (DEG)	PC (BAR)	OCR	M (BAR)	SOIL TYPE
13.20	4.21	0.31	0.58	49.	1.02	0.60					3.44	3.2	79.	CLAY
13.40	4.10	0.36	0.46	56.	1.00	0.59					3.34	3.1	90.	SILTY CLAY
13.60	4.24	0.38	0.57	62.	1.03	0.62					3.58	3.2	101.	SILTY CLAY
13.80	4.24	0.34	0.62	56.	1.03	0.63					3.63	3.2	92.	CLAY
14.00	3.77	0.47	0.51	71.	0.94	0.55					3.06	2.7	106.	SILTY CLAY
14.20	3.70	0.43	0.52	64.	0.93	0.55					3.02	2.6	94.	SILTY CLAY
14.40	4.00	0.37	0.56	59.	0.99	0.61					3.45	2.9	93.	SILTY CLAY
14.60	3.99	0.37	0.57	60.	0.98	0.62					3.48	2.9	94.	SILTY CLAY
14.80	2.62	1.73	-0.12	189.	0.48		87.0	38.6	1.95	38.0	1.73	1.4	232.	SANDY SILT
15.00	2.87	0.40	0.40	48.	0.76	0.42					2.13	1.8	59.	SILTY CLAY
15.20	2.10	3.13	-0.38	282.	0.38		107.0	40.0	2.03	39.6	1.12	0.9	322.	SILTY SAND
15.40	1.08	5.94	-0.38	277.	0.20		125.6	41.6	2.08	41.2	0.33	0.3	236.	SAND
15.60	1.65	3.45	-0.38	251.	0.31		112.9	40.4	2.09	40.0	0.78	0.6	235.	SAND
15.80	1.55	2.32	-0.49	160.	0.31		109.0	40.2	2.11	39.7	0.77	0.6	136.	SILTY SAND
16.00	2.48	0.71	0.23	79.	0.67						1.82	1.4	86.	CLAYEY SILT
16.20	2.92	0.47	0.23	63.	0.77	0.46					2.37	1.6	78.	SILTY CLAY
16.40	3.88	0.36	0.53	64.	0.96	0.67					3.72	2.8	97.	SILTY CLAY
16.60	2.83	0.50	0.24	66.	0.75	0.46					2.31	1.7	80.	SILTY CLAY
16.80	3.91	0.33	0.50	60.	0.97	0.69					3.85	2.6	93.	CLAY
17.00	3.85	0.31	0.50	56.	0.96	0.68					3.80	2.8	86.	CLAY
17.20	3.86	0.28	0.51	52.	0.96	0.69					3.87	2.8	79.	CLAY
17.40	3.98	0.32	0.50	62.	0.98	0.73					4.09	2.9	96.	CLAY
17.60	3.75	0.31	0.42	56.	0.94	0.68					3.77	2.7	84.	CLAY
17.80	3.86	0.39	0.46	75.	0.96	0.72					4.00	2.8	114.	SILTY CLAY
18.00	3.32	0.32	0.50	54.	0.85	0.60					3.19	2.2	73.	CLAY
18.20	3.06	0.34	0.51	52.	0.80	0.55					2.84	1.9	67.	CLAY
18.40	3.01	0.37	0.52	58.	0.79	0.54					2.80	1.9	73.	SILTY CLAY
18.60	2.39	1.09	-0.20	134.	0.64						1.97	1.3	145.	SILT
18.80	3.39	0.40	0.47	71.	0.87	0.64					3.43	2.3	99.	SILTY CLAY
19.00	3.62	0.33	0.52	63.	0.91	0.71					3.85	2.5	92.	CLAY
19.20	3.72	0.29	0.60	57.	0.93	0.74					4.06	2.6	85.	CLAY
19.40	3.48	0.27	0.56	51.	0.89	0.69					3.70	2.4	73.	CLAY
19.60	3.57	0.31	0.58	60.	0.90	0.71					3.89	2.5	87.	CLAY
19.80	3.56	0.28	0.58	54.	0.90	0.72					3.90	2.5	78.	CLAY
20.00	3.33	0.29	0.60	53.	0.85	0.67					3.55	2.2	73.	CLAY
20.20	3.26	0.28	0.58	52.	0.84	0.66					3.47	2.1	70.	CLAY
20.40	3.17	0.29	0.59	51.	0.82	0.64					3.35	2.1	68.	CLAY
20.60	3.18	0.31	0.63	56.	0.82	0.65					3.41	2.1	74.	CLAY
20.80	3.23	0.30	0.56	55.	0.83	0.67					3.52	2.1	74.	CLAY
21.00	3.20	0.30	0.62	56.	0.83	0.67					3.50	2.1	75.	CLAY
21.20	3.33	0.28	0.54	54.	0.85	0.71					3.76	2.2	74.	CLAY
21.40	3.40	0.24	0.61	48.	0.87	0.73					3.91	2.3	67.	CLAY
21.60	3.39	0.27	0.62	55.	0.87	0.74					3.95	2.3	77.	CLAY
21.80	3.31	0.25	0.63	51.	0.85	0.72					3.83	2.2	70.	CLAY
22.00	3.24	0.25	0.63	50.	0.84	0.71					3.74	2.1	67.	CLAY
22.20	3.31	0.23	0.65	47.	0.85	0.73					3.90	2.2	64.	CLAY
22.40	3.18	0.27	0.61	54.	0.82	0.70					3.70	2.1	71.	CLAY
22.60	2.08	1.79	-0.31	235.	0.34		183.8	41.1	3.00	41.3	1.38	0.8	238.	SANDY SILT
22.80	0.90	5.58	-0.76	317.	0.09		235.1	43.6	3.08	43.7	0.11	0.1	269.	SAND
23.00	1.35	1.46	-0.30	125.	0.19		213.1	42.5	3.08	42.6	0.50	0.3	107.	SANDY SILT
23.20	1.00	6.00	-0.66	387.	0.14		216.6	42.8	3.12	42.9	0.27	0.1	329.	SAND
23.40	1.47	2.21	-0.50	211.	0.23		204.9	42.0	3.13	42.2	0.70	0.4	180.	SILTY SAND
23.60	1.33	1.44	-0.62	126.	0.20		211.3	42.2	3.16	42.4	0.55	0.3	107.	SANDY SILT
23.80	1.91	1.35	-0.40	169.	0.31		197.1	41.3	3.16	41.6	1.22	0.6	149.	SANDY SILT
24.00	2.20	0.84	-0.21	124.	0.60						2.23	1.2	120.	CLAYEY SILT
24.20	1.97	1.00	-0.27	132.	0.54						1.89	1.0	116.	SILT
24.40	2.37	1.22	-0.24	197.	0.38		191.7	40.8	3.23	41.0	1.93	1.0	213.	SANDY SILT
24.60	2.61	0.54	0.26	95.	0.70	0.60					2.98	1.5	107.	SILTY CLAY

END OF SOUNDING

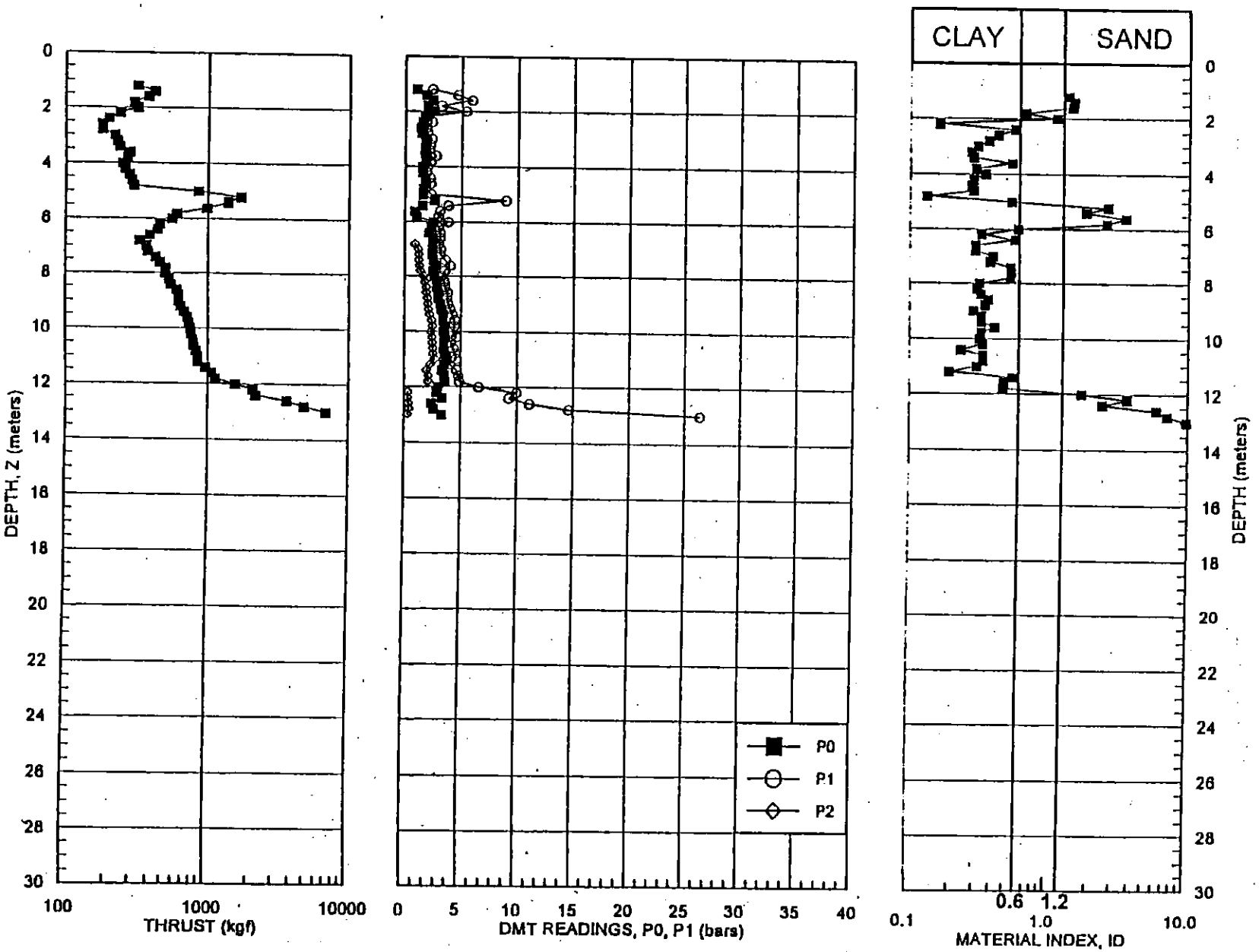
Ground Surface Elev.
Water Depth: ~3.2 m

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

DILATOMETER RESULTS

IN SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-17-98

SOUNDING
D-19



SEA-19

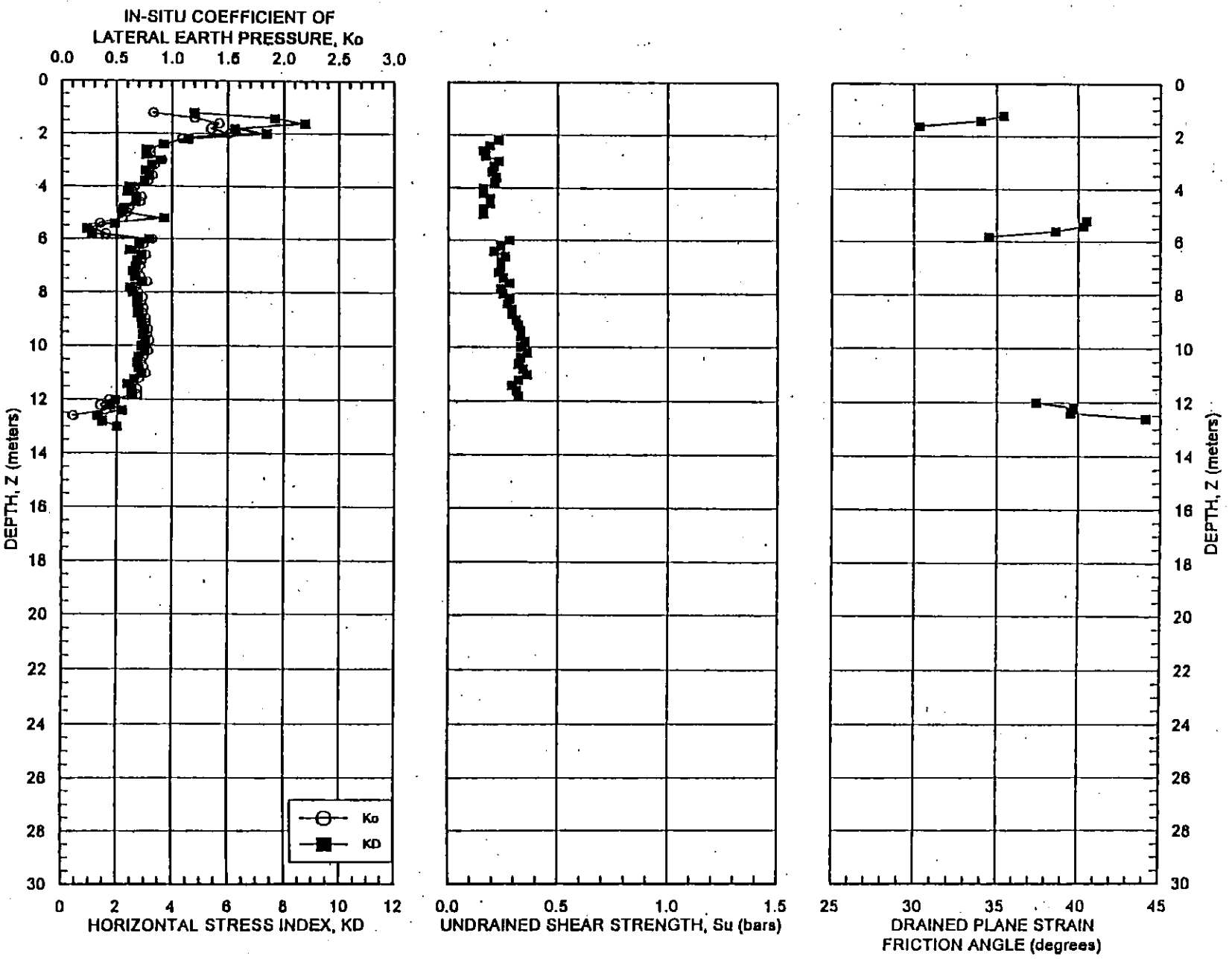
Ground Surface Elev.
Water Depth: cavad at 3.2 m

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

INTERPRETED DMT STRENGTH PARAMETERS

IN-SITU SOIL TESTING, I.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 8-17-98

SOUNDING
D-19



SEA 19

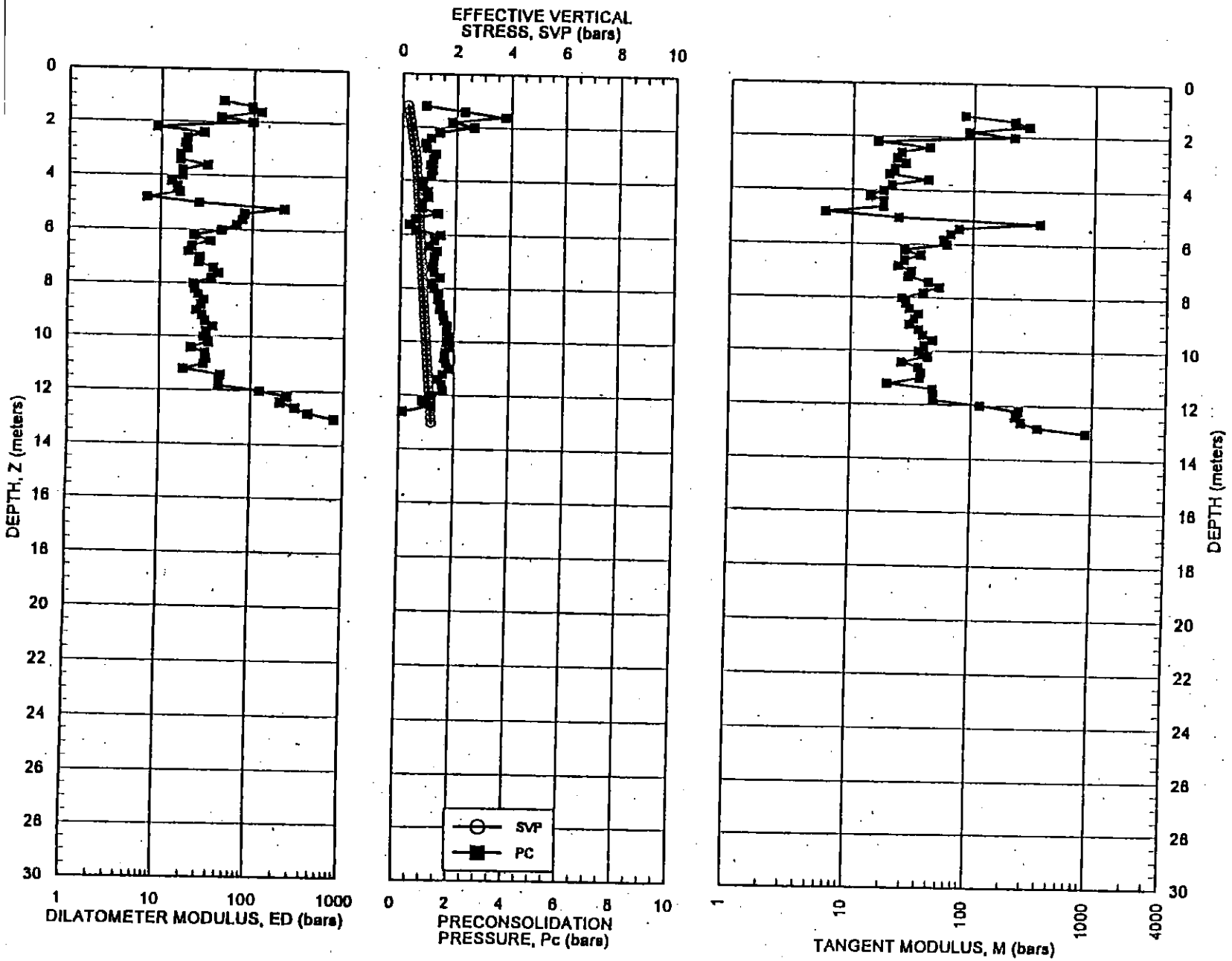
Ground Surface Elev.
Water Depth: 3.2m

PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

INTERPRETED DMT DEFORMATION PARAMETERS

IN-SITU SOIL TESTING, LC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-17-98

SOUNDING
D-19



SEA-19

SEA-91

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL) SNDG. NO. D-19
IN-SITU SOIL TESTING, L.C. PAGE 1
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE FILE NO. : IST-9841
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER SNDG.DATE: 8-17-98
ANAL.BY : R. FAILMEZGER ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS: LO RANGE =10.00 BARS ROD DIAM. = 3.57 CM BL.THICK. = 15.0 MM SU FACTOR = 1.00
SURF.ELEV. = 10.00 M LO GAGE 0 = 0.02 BARS FR.RED.DIA. = 4.00 CM BL.WIDTH = 96.0 MM PHI FACTOR = 1.00
WATER DEPTH = 3.20 M HI GAGE 0 = 0.10 BARS LIN.ROD WT. = 6.50 KGF/M DELTA-A = 0.22 BARS OCR FACTOR = 1.00
SP.GR.WATER = 1.000 CAL GAGE 0 = 0.00 BARS DELTA/PHI = 0.50 DELTA-B = 0.35 BARS M FACTOR = 1.00
MAX SU ID = 0.60 SU OPTION = MARCHETTI MIN PHI ID = 1.20 OCR OPTION= MARCHETTI K0 FACTOR = 1.00
UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	THRUST (KGF)	A (BAR)	B (BAR)	C (BAR)	DA (BAR)	DB (BAR)	ZMRNG (BAR)	ZMLO (BAR)	ZMHI (BAR)	ZMCAL (BAR)	P0 (BAR)	P1 (BAR)	P2 (BAR)	U0 (BAR)	GAMMA (T/M3)	SVP (BAR)
1.20	320.	0.87	2.74		0.22	0.35	10.00	0.02	0.10	0.00	1.00	2.37		0.000	1.60	0.210
1.40	420.	1.79	4.99		0.22	0.35	10.00	0.02	0.10	0.00	1.86	4.62		0.000	1.70	0.242
1.60	380.	2.38	6.26		0.22	0.35	10.00	0.02	0.10	0.00	2.41	5.89		0.000	1.70	0.276
1.80	300.	1.79	3.58		0.22	0.35	10.00	0.02	0.10	0.00	1.93	3.21		0.000	1.70	0.309
2.00	320.	2.46	5.71		0.22	0.35	10.00	0.02	0.10	0.00	2.53	5.34		0.000	1.70	0.342
2.20	240.	1.52	2.35		0.22	0.35	10.00	0.02	0.10	0.00	1.71	1.98		0.000	1.50	0.374
2.40	200.	1.33	2.69		0.22	0.35	10.00	0.02	0.10	0.00	1.49	2.32		0.000	1.60	0.404
2.60	180.	1.16	2.26		0.22	0.35	10.00	0.02	0.10	0.00	1.33	1.89		0.000	1.60	0.436
2.80	180.	1.25	2.31		0.22	0.35	10.00	0.02	0.10	0.00	1.43	1.94		0.000	1.60	0.467
3.00	220.	1.61	2.69		0.22	0.35	10.00	0.02	0.10	0.00	1.78	2.32		0.000	1.60	0.499
3.20	330.	1.55	2.56		0.22	0.35	10.00	0.02	0.10	0.00	1.73	2.19		0.000	1.60	0.530
3.40	240.	1.48	2.48		0.22	0.35	10.00	0.02	0.10	0.00	1.66	2.11		0.020	1.60	0.542
3.60	280.	1.64	3.09		0.22	0.35	10.00	0.02	0.10	0.00	1.80	2.72		0.039	1.60	0.553
3.80	270.	1.57	2.60		0.22	0.35	10.00	0.02	0.10	0.00	1.75	2.23		0.059	1.60	0.565
4.00	250.	1.31	2.34		0.22	0.35	10.00	0.02	0.10	0.00	1.49	1.97		0.079	1.60	0.577
4.20	260.	1.32	2.26		0.22	0.35	10.00	0.02	0.10	0.00	1.50	1.89		0.098	1.60	0.589
4.40	280.	1.56	2.55		0.22	0.35	10.00	0.02	0.10	0.00	1.74	2.18		0.118	1.60	0.601
4.60	290.	1.60	2.61		0.22	0.35	10.00	0.02	0.10	0.00	1.78	2.24		0.137	1.60	0.612
4.80	300.	1.37	2.12		0.22	0.35	10.00	0.02	0.10	0.00	1.56	1.75		0.157	1.50	0.623
5.00	850.	1.40	2.67		0.22	0.35	10.00	0.02	0.10	0.00	1.56	2.30		0.177	1.60	0.634
5.20	1700.	2.71	9.30		0.22	0.35	10.00	0.02	0.10	0.00	2.61	8.93		0.196	1.90	0.649
5.40	1380.	1.41	4.20		0.22	0.35	10.00	0.02	0.10	0.00	1.50	3.83		0.216	1.80	0.665
5.60	980.	0.77	3.45		0.22	0.35	10.00	0.02	0.10	0.00	0.86	3.08		0.236	1.70	0.680
5.80	600.	0.90	3.31		0.22	0.35	10.00	0.02	0.10	0.00	1.01	2.94		0.255	1.70	0.694
6.00	560.	1.38	4.21		0.22	0.35	10.00	0.02	0.10	0.00	2.52	3.84		0.275	1.70	0.708
6.20	460.	2.15	3.34		0.22	0.35	10.00	0.02	0.10	0.00	2.32	2.97		0.294	1.60	0.720
6.40	440.	1.97	3.50		0.22	0.35	10.00	0.02	0.10	0.00	2.12	3.13		0.314	1.60	0.732
6.60	390.	2.32	3.49		0.22	0.35	10.00	0.02	0.10	0.00	2.49	3.12		0.334	1.60	0.744
6.80	330.	2.24	3.37	0.66	0.22	0.35	10.00	0.02	0.10	0.00	2.41	3.00	0.86	0.353	1.60	0.756
7.00	370.	2.25	3.57	0.99	0.22	0.35	10.00	0.02	0.10	0.00	2.41	3.20	1.19	0.373	1.60	0.767
7.20	380.	2.23	3.51	1.03	0.22	0.35	10.00	0.02	0.10	0.00	2.39	3.14	1.23	0.393	1.60	0.779
7.40	430.	2.36	3.96	1.03	0.22	0.35	10.00	0.02	0.10	0.00	2.51	3.59	1.23	0.412	1.70	0.792
7.60	460.	2.64	4.39	1.09	0.22	0.35	10.00	0.02	0.10	0.00	2.78	4.02	1.29	0.432	1.70	0.806
7.80	500.	2.33	3.90	1.15	0.22	0.35	10.00	0.02	0.10	0.00	2.48	3.53	1.35	0.451	1.60	0.818
8.00	500.	2.44	3.65	1.48	0.22	0.35	10.00	0.02	0.10	0.00	2.61	3.28	1.68	0.471	1.60	0.830
8.20	530.	2.65	3.88	1.55	0.22	0.35	10.00	0.02	0.10	0.00	2.82	3.51	1.75	0.491	1.60	0.842
8.40	550.	2.66	3.94	1.71	0.22	0.35	10.00	0.02	0.10	0.00	2.82	3.57	1.91	0.510	1.60	0.854
8.60	600.	2.79	4.19	1.71	0.22	0.35	10.00	0.02	0.10	0.00	2.95	3.82	1.91	0.530	1.70	0.867
8.80	620.	2.80	4.14	1.81	0.22	0.35	10.00	0.02	0.10	0.00	2.96	3.77	2.01	0.550	1.60	0.879
9.00	620.	2.97	4.22	1.84	0.22	0.35	10.00	0.02	0.10	0.00	3.14	3.85	2.04	0.569	1.60	0.891
9.20	640.	3.05	4.42	1.89	0.22	0.35	10.00	0.02	0.10	0.00	3.21	4.05	2.09	0.589	1.70	0.904
9.40	680.	3.20	4.61	2.01	0.22	0.35	10.00	0.02	0.10	0.00	3.36	4.24	2.21	0.608	1.70	0.918
9.60	710.	3.21	4.82	2.18	0.22	0.35	10.00	0.02	0.10	0.00	3.36	4.45	2.38	0.628	1.70	0.931
9.80	730.	3.35	4.79	2.27	0.22	0.35	10.00	0.02	0.10	0.00	3.51	4.42	2.47	0.648	1.70	0.945
10.00	750.	3.27	4.65	2.12	0.22	0.35	10.00	0.02	0.10	0.00	3.43	4.28	2.32	0.667	1.70	0.959
10.20	760.	3.45	4.95	2.23	0.22	0.35	10.00	0.02	0.10	0.00	3.60	4.58	2.43	0.687	1.70	0.973
10.40	780.	3.27	4.44	2.26	0.22	0.35	10.00	0.02	0.10	0.00	3.44	4.07	2.46	0.707	1.60	0.985
10.60	790.	3.29	4.71	2.31	0.22	0.35	10.00	0.02	0.10	0.00	3.45	4.34	2.51	0.726	1.70	0.998
10.80	820.	3.40	4.85	2.33	0.22	0.35	10.00	0.02	0.10	0.00	3.56	4.48	2.53	0.746	1.70	1.012
11.00	840.	3.56	4.96	2.49	0.22	0.35	10.00	0.02	0.10	0.00	3.72	4.59	2.69	0.765	1.70	1.026
11.20	840.	3.32	4.39	2.06	0.22	0.35	10.00	0.02	0.10	0.00	3.49	4.02	2.26	0.785	1.60	1.038
11.40	960.	3.16	5.00	1.76	0.22	0.35	10.00	0.02	0.10	0.00	3.30	4.63	1.96	0.805	1.70	1.051
11.60	1060.	3.37	5.14	1.92	0.22	0.35	10.00	0.02	0.10	0.00	3.51	4.77	2.12	0.824	1.70	1.065
11.80	1130.	3.45	5.23	1.89	0.22	0.35	10.00	0.02	0.10	0.00	3.59	4.86	2.09	0.844	1.70	1.078
12.00	1560.	2.95	6.96		0.22	0.35	10.00	0.02	0.10	0.00	2.98	6.59		0.864	1.70	1.092
12.20	2070.	2.97	10.40	0.11	0.22	0.35	10.00	0.02	0.10	0.00	2.83	9.95	0.31	0.883	1.90	1.108
12.40	2180.	3.45	9.67	0.09	0.22	0.35	10.00	0.02	0.10	0.00	3.37	9.30	0.29	0.903	1.90	1.126
12.60	3630.	2.61	11.55	0.15	0.22	0.35	10.00	0.02	0.10	0.00	2.40	11.10	0.35	0.922	1.80	1.142
12.80	4850.	3.00	15.05	0.23	0.22	0.35	10.00	0.02	0.10	0.00	2.63	14.60	0.43	0.942	1.90	1.159

CONTINUED ON NEXT PAGE

SEA-19

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-19
PAGE 2
FILE NO. : IST-9841

SNDG.DATE: 8-17-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 3.20 M
SP.GR.WATER = 1.000
MAX SU ID = 0.50

LO RANGE =10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.10 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.22 BARS
DELTA-B = 0.35 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
K0 FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	THRUST (KGF)	A (BAR)	B (BAR)	C (BAR)	DA (BAR)	DB (BAR)	ZMRNG (BAR)	ZMLO (BAR)	ZMHI (BAR)	ZMCAL (BAR)	P0 (BAR)	P1 (BAR)	P2 (BAR)	U0 (BAR)	GAMMA (T/M3)	SVP (BAR)
13.00	6900.	4.21	26.80	0.10	0.22	0.35	10.00	0.02	0.10	0.00	3.31	26.35	0.30	0.962	1.90	1.177

END OF SOUNDING

(INTERPRETED SOIL PARAMETERS ON NEXT PAGE)

SEA-19

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-19
PAGE 3
FILE NO. : IST-9841

SNDG.DATE: 8-17-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS: LO RANGE -10.00 BARS ROD DIAM. = 3.57 CM BL.THICK. = 15.0 MM SU FACTOR = 1.00
SURF.ELEV. = 10.00 M LO GAGE 0 = 0.02 BARS PR.RED.DIA. = 4.00 CM BL.WIDTH = 96.0 MM PHI FACTOR = 1.00
WATER DEPTH = 3.20 M HI GAGE 0 = 0.10 BARS LIN.ROD WT. = 6.50 KGF/M DELTA-A = 0.22 BARS OCR FACTOR = 1.00
SP.GR.WATER = 1.000 CAL GAGE 0 = 0.00 BARS DELTA/PHI = 0.50 DELTA-B = 0.35 BARS M FACTOR = 1.00
MAX SU ID = 0.60 SU OPTION = MARCHETTI MIN PHI ID = 1.20 OCR OPTION= MARCHETTI KD FACTOR = 1.00
UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

Z (M)	KD	ID	UD	ED (BAR)	KO	SU (BAR)	QD (BAR)	PHI (DEG)	SIGFF (BAR)	PHIO (DEG)	PC (BAR)	OCR	M (BAR)	SOIL TYPE
1.20	4.79	1.36	0.00	47.	0.83		10.5	35.4	0.33	31.6	0.86	4.1	84.	SANDY SILT
1.40	7.67	1.49	0.00	96.	1.20		11.1	34.0	0.38	30.3	2.27	9.4	215.	SANDY SILT
1.60	8.76	1.44	0.00	121.	1.42		7.8	30.3	0.41	26.5	3.76	13.7	286.	SANDY SILT
1.80	6.24	0.66	0.00	44.	1.35						1.82	5.9	90.	CLAYEY SILT
2.00	7.38	1.11	0.00	98.	1.51						2.62	7.7	215.	SILT
2.20	4.57	0.16	0.00	9.	1.09	0.23					1.36	3.6	16.	MUD
2.40	3.69	0.56	0.00	29.	0.93	0.19					1.05	2.6	43.	SILTY CLAY
2.60	3.06	0.42	0.00	19.	0.80	0.16					0.85	1.9	25.	SILTY CLAY
2.80	3.05	0.36	0.00	18.	0.80	0.17					0.90	1.9	23.	SILTY CLAY
3.00	3.58	0.10	0.00	19.	0.91	0.23					1.24	2.5	27.	CLAY
3.20	3.26	0.27	0.00	16.	0.84	0.21					1.14	2.1	22.	CLAY
3.40	3.03	0.28	0.00	16.	0.79	0.20					1.03	1.9	20.	CLAY
3.60	3.17	0.53	0.00	32.	0.82	0.22					1.14	2.1	42.	SILTY CLAY
3.80	2.99	0.29	0.00	17.	0.78	0.21					1.06	1.9	21.	CLAY
4.00	2.44	0.34	0.00	17.	0.66	0.16					0.79	1.4	18.	CLAY
4.20	2.38	0.28	0.00	13.	0.64	0.16					0.77	1.3	14.	CLAY
4.40	2.70	0.27	0.00	15.	0.72	0.19					0.96	1.6	18.	CLAY
4.60	2.68	0.28	0.00	16.	0.71	0.19					0.97	1.6	18.	CLAY
4.80	2.25	0.13	0.00	7.	0.61	0.16					0.75	1.2	6.	MUD
5.00	2.19	0.53	0.00	26.	0.59	0.16					0.73	1.2	24.	SILTY CLAY
5.20	3.72	2.62	0.00	219.	0.55		66.6	40.5	1.07	39.1	1.34	2.1	355.	SILTY SAND
5.40	1.93	1.82	0.00	81.	0.35		58.8	40.3	1.10	38.8	0.52	0.8	76.	SILTY SAND
5.60	0.92	1.52	0.00	77.	0.28		44.3	38.6	1.10	37.1	0.31	0.5	65.	SAND
5.80	1.09	2.57	0.00	67.	0.40		26.4	34.5	1.09	32.8	0.55	0.8	57.	SILTY SAND
6.00	3.17	0.59	0.00	46.	0.82	0.28					1.45	2.1	61.	SILTY CLAY
6.20	2.81	0.32	0.00	23.	0.74	0.24					1.22	1.7	27.	CLAY
6.40	2.47	0.56	0.00	35.	0.66	0.21					1.02	1.4	37.	SILTY CLAY
6.60	2.90	0.29	0.00	22.	0.76	0.26					1.33	1.8	27.	CLAY
6.80	2.72	0.29	0.25	20.	0.72	0.24					1.22	1.6	24.	CLAY
7.00	2.66	0.39	0.40	27.	0.71	0.24					1.20	1.6	31.	SILTY CLAY
7.20	2.57	0.37	0.42	26.	0.69	0.23					1.15	1.5	29.	SILTY CLAY
7.40	2.65	0.52	0.39	38.	0.71	0.25					1.23	1.5	43.	SILTY CLAY
7.60	2.92	0.53	0.37	43.	0.77	0.28					1.45	1.8	53.	SILTY CLAY
7.80	2.48	0.52	0.44	36.	0.67	0.24					1.14	1.4	39.	SILTY CLAY
8.00	2.57	0.31	0.57	23.	0.69	0.25					1.23	1.5	26.	CLAY
8.20	2.76	0.30	0.54	24.	0.73	0.28					1.39	1.7	28.	CLAY
8.40	2.71	0.32	0.60	26.	0.72	0.27					1.37	1.6	30.	CLAY
8.60	2.79	0.36	0.57	30.	0.74	0.29					1.46	1.7	36.	SILTY CLAY
8.80	2.74	0.34	0.61	28.	0.73	0.29					1.44	1.6	33.	CLAY
9.00	2.86	0.28	0.57	25.	0.76	0.31					1.57	1.8	30.	CLAY
9.20	2.90	0.32	0.57	29.	0.76	0.32					1.61	1.8	36.	CLAY
9.40	3.00	0.32	0.58	31.	0.78	0.33					1.72	1.9	39.	CLAY
9.60	2.93	0.40	0.64	38.	0.77	0.33					1.69	1.8	47.	SILTY CLAY
9.80	3.03	0.32	0.64	32.	0.79	0.35					1.80	1.9	40.	CLAY
10.00	2.88	0.31	0.60	30.	0.76	0.33					1.69	1.8	36.	CLAY
10.20	3.00	0.33	0.60	34.	0.78	0.36					1.83	1.9	41.	CLAY
10.40	2.77	0.23	0.64	22.	0.74	0.33					1.64	1.7	26.	CLAY
10.60	2.73	0.33	0.66	31.	0.72	0.32					1.62	1.6	36.	CLAY
10.80	2.78	0.33	0.63	32.	0.74	0.34					1.69	1.7	38.	CLAY
11.00	2.88	0.30	0.65	30.	0.76	0.36					1.81	1.8	37.	CLAY
11.20	2.61	0.19	0.54	18.	0.70	0.32					1.57	1.5	20.	CLAY
11.40	2.37	0.54	0.46	46.	0.64	0.29					1.37	1.3	47.	SILTY CLAY
11.60	2.52	0.47	0.48	44.	0.68	0.31					1.53	1.4	48.	SILTY CLAY
11.80	2.55	0.46	0.45	44.	0.68	0.32					1.57	1.5	48.	SILTY CLAY
12.00	1.94	1.71	0.45	125.	0.43		64.7	37.4	1.76	36.7	1.18	1.1	117.	SANDY SILT
12.20	1.76	3.65	-0.29	247.	0.35		88.9	39.7	1.81	39.0	0.84	0.8	245.	SAND
12.40	2.19	2.41	-0.25	206.	0.40		91.0	39.5	1.84	38.9	1.16	1.0	211.	SILTY SAND
12.60	1.29	5.91	-0.39	302.	0.10		163.8	44.1	1.94	43.7	0.11	0.1	257.	SAND
12.80	1.46	7.09	-0.30	415.									353.	SAND

CONTINUED ON NEXT PAGE

SEA-19

DILATOMETER DATA LISTING & INTERPRETATION (BASED ON THE 1988 DILATOMETER MANUAL)
IN-SITU SOIL TESTING, L.C.
JOB FILE: CHERRY ISLAND LANDFILL -- WILMINGTON, DELAWARE
LOCATION: As Planned
SNDG.BY : R. FAILMEZGER
ANAL.BY : R. FAILMEZGER

SNDG. NO. D-19
PAGE 4
FILE NO. : IST-9841

SNDG.DATE: 8-17-98
ANAL.DATE: 8-17-98

ANALYSIS PARAMETERS:
SURF.ELEV. = 10.00 M
WATER DEPTH = 3.20 M
SP.GR.WATER = 1.000
MAX SU ID = 0.60

LO RANGE -10.00 BARS
LO GAGE 0 = 0.02 BARS
HI GAGE 0 = 0.10 BARS
CAL GAGE 0 = 0.00 BARS
SU OPTION = MARCHETTI

ROD DIAM. = 3.57 CM
FR.RED.DIA. = 4.00 CM
LIN.ROD WT. = 6.50 KGF/M
DELTA/PHI = 0.50
MIN PHI ID = 1.20

BL.THICK. = 15.0 MM
BL.WIDTH = 96.0 MM
DELTA-A = 0.22 BARS
DELTA-B = 0.35 BARS
OCR OPTION= MARCHETTI

SU FACTOR = 1.00
PHI FACTOR = 1.00
OCR FACTOR = 1.00
M FACTOR = 1.00
KO FACTOR = 1.00

UNIT CONVERSIONS: 1 BAR = 1.019 KGF/CM2 = 1.044 TSF = 14.51 PSI 1 M = 3.2808 FT

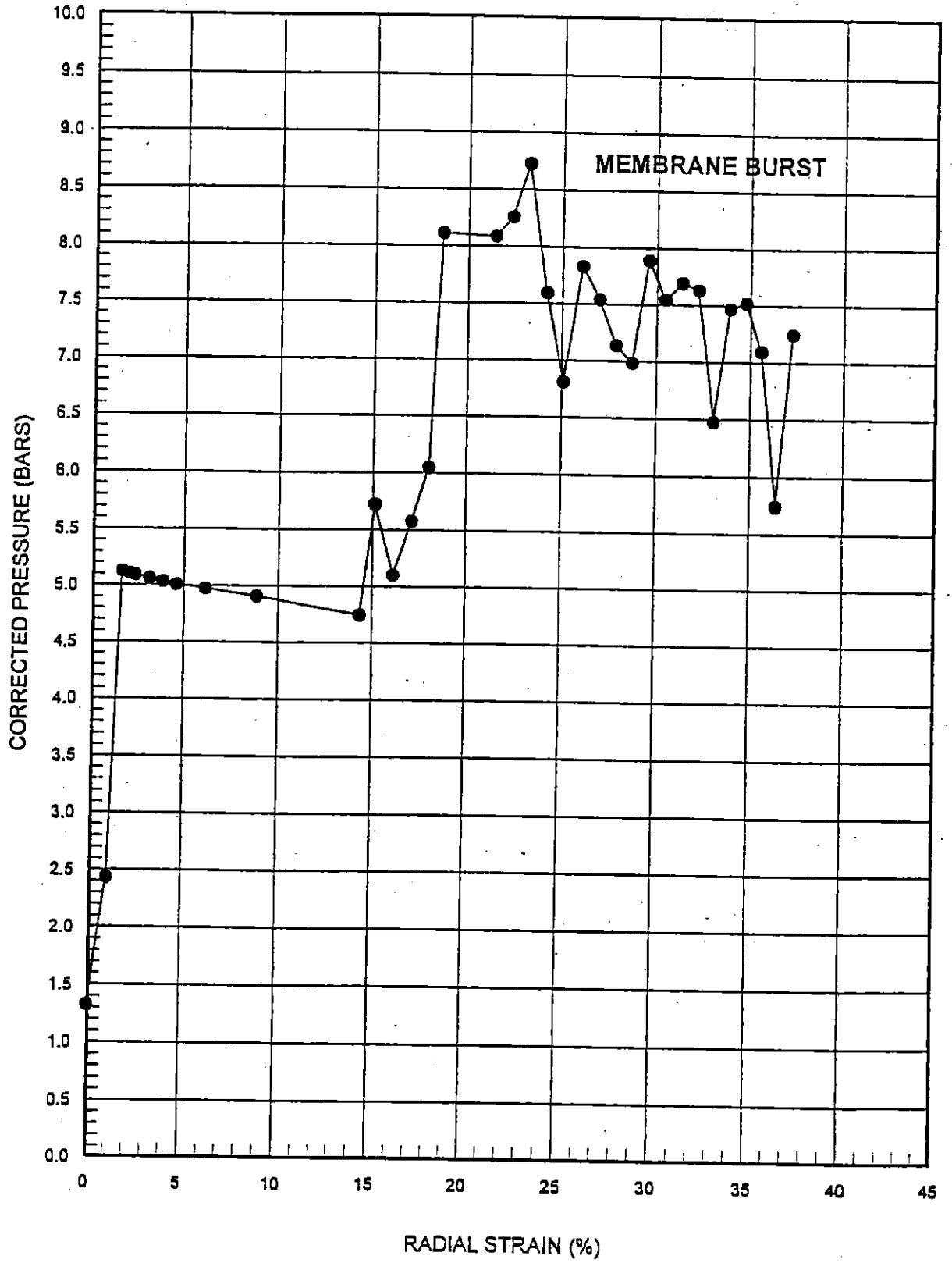
Z (M)	KD	ID	UD	ED (BAR)	KO	SU (BAR)	QD (BAR)	PHI (DEG)	SIGFF (BAR)	PHIO (DEG)	PC (BAR)	OCR	M (BAR)	SOIL TYPE
13.00	2.00	9.80	-0.28	799.									880.	SAND

END OF SOUNDING

EXISTING PRESSUREMETER TESTS

SEA-6

PROJECT: Cherry Island Landfill LOCATION: Wilmington, Delaware	IN SITU SOIL TESTING, LLC ENGINEER: R. Fallmezger TEST DATE: 11-19-98	BORING: CPT-6
PRESSUREMETER TEST RESULTS		DEPTH: 12.0 m



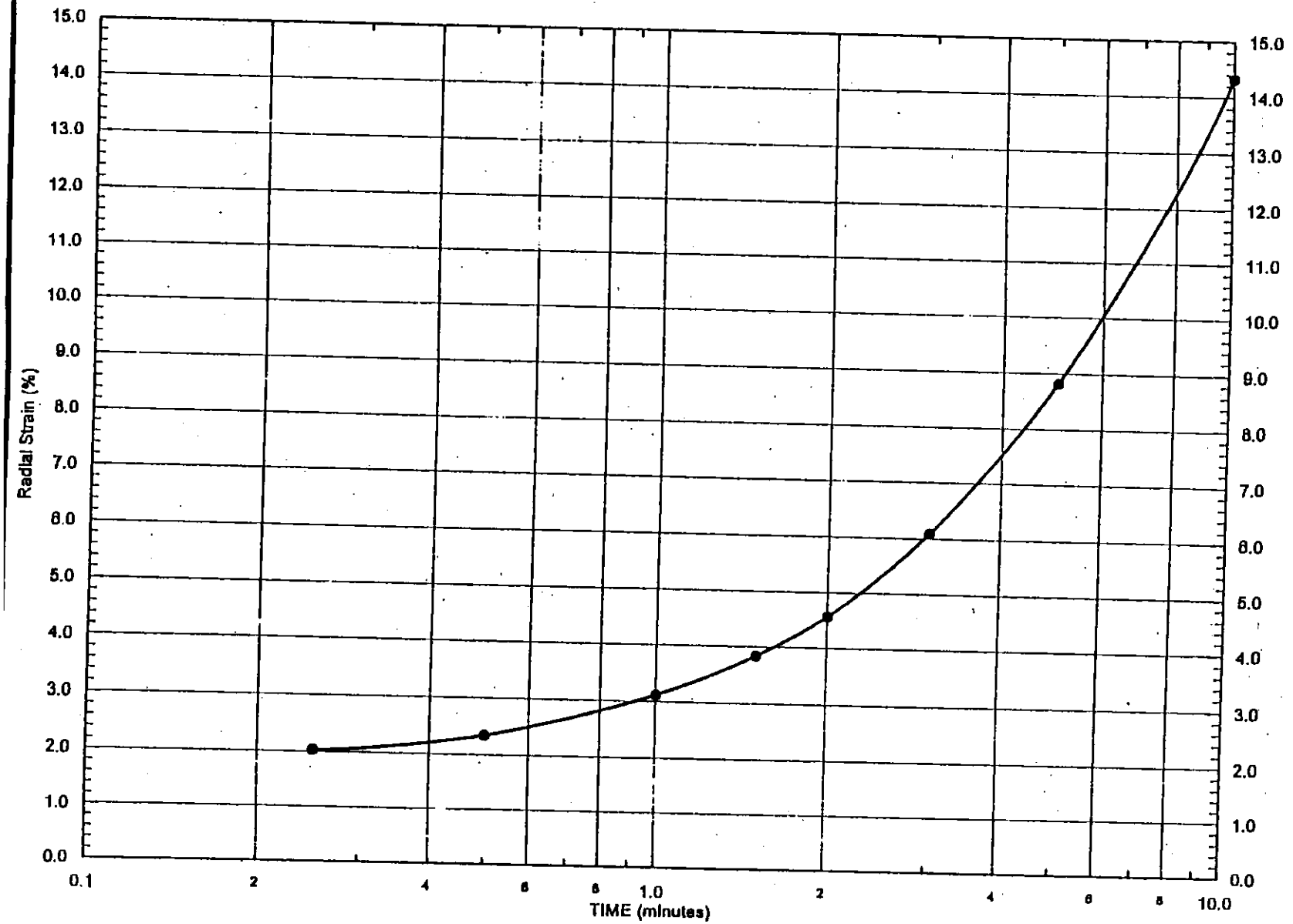
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

INSITU SOIL TESTING, LLC
ENGINEER: R. Palmerper
SOUNDING DATE: 11-7-98

SOUNDING
CPT-6

PRESSUREMETER CREEP TEST RESULTS

Depth = 12.0 m
Creep Pressure = 3.60 bars



SEA 76

Cherry Island CPT-6 -- 19.39ft. SEA-6

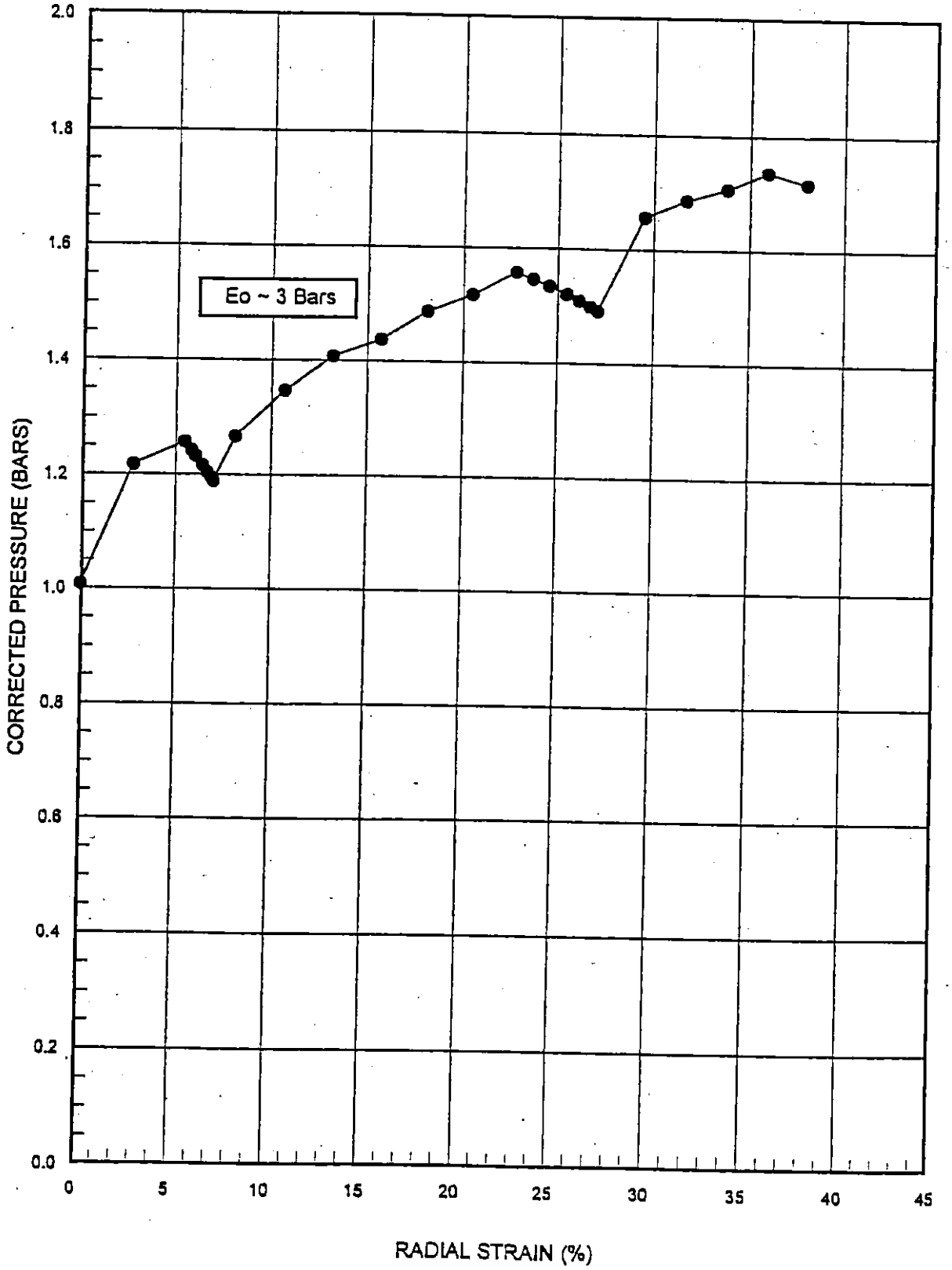
POINT NUMBER	VOLUME MEASUREMENT	PRESSURE MEASUREMENT	CORR. VOL. INCREASE (CM^3)	dR/Ro (%)	CORRECTED PRESSURE (BAR)
1	0.00	-0.300	0.000	0.00	1.324
2	20.00	0.860	16.752	0.95	2.432
3	40.00	3.600	29.080	1.64	5.120
4	47.00	3.600	36.080	2.03	5.102
5	52.90	3.600	41.980	2.35	5.088
6	66.80	3.600	55.880	3.12	5.060
7	80.00	3.600	69.080	3.84	5.034
8	93.40	3.600	82.480	4.57	5.007
9	121.80	3.600	110.880	6.10	4.972
10	173.30	3.600	162.380	8.82	4.907
11	281.80	3.600	270.880	14.33	4.746
12	300.00	4.600	286.280	15.09	5.724
13	320.00	4.000	306.280	16.07	5.100
14	340.00	4.500	326.560	17.06	5.576
15	360.00	5.000	345.160	17.96	6.046
16	380.00	7.100	359.280	18.63	8.110
17	440.00	7.150	419.140	21.46	8.084
18	460.00	7.350	438.580	22.36	8.258
19	480.00	7.850	457.180	23.22	8.726
20	500.00	6.750	477.180	24.14	7.594
21	520.00	6.000	497.180	25.05	6.812
22	540.00	7.050	519.420	26.05	7.830
23	560.00	6.800	539.420	26.95	7.538
24	580.00	6.450	559.420	27.84	7.136
25	600.00	6.350	579.420	28.72	6.984
26	620.00	7.300	598.720	29.57	7.890
27	640.00	7.000	618.720	30.44	7.546
28	660.00	7.200	639.000	31.32	7.694
29	680.00	7.200	659.000	32.18	7.634
30	700.00	6.100	679.000	33.04	6.474
31	720.00	7.150	699.140	33.89	7.472
32	740.00	7.250	718.860	34.73	7.520
33	760.00	6.850	738.860	35.57	7.094
34	780.00	5.500	758.860	36.40	5.744
35	800.00	7.000	779.560	37.26	7.244

Po = 1.40 BAR Pl = 7.50 BAR Pl* = 6.10 BAR
Eo = 311 BAR Er = 0 BAR Eo/Pl* = 51.0

58A-18

PROJECT: Cherry Island Landfill LOCATION: Wilmington, Delaware	INSITU SOIL TESTING, L.C. ENGINEER: R. Fallmezger TEST DATE: 11-19-98	BORING: CPT-18 DEPTH: 6.0 m

PRESSUREMETER TEST RESULTS



SEA-18

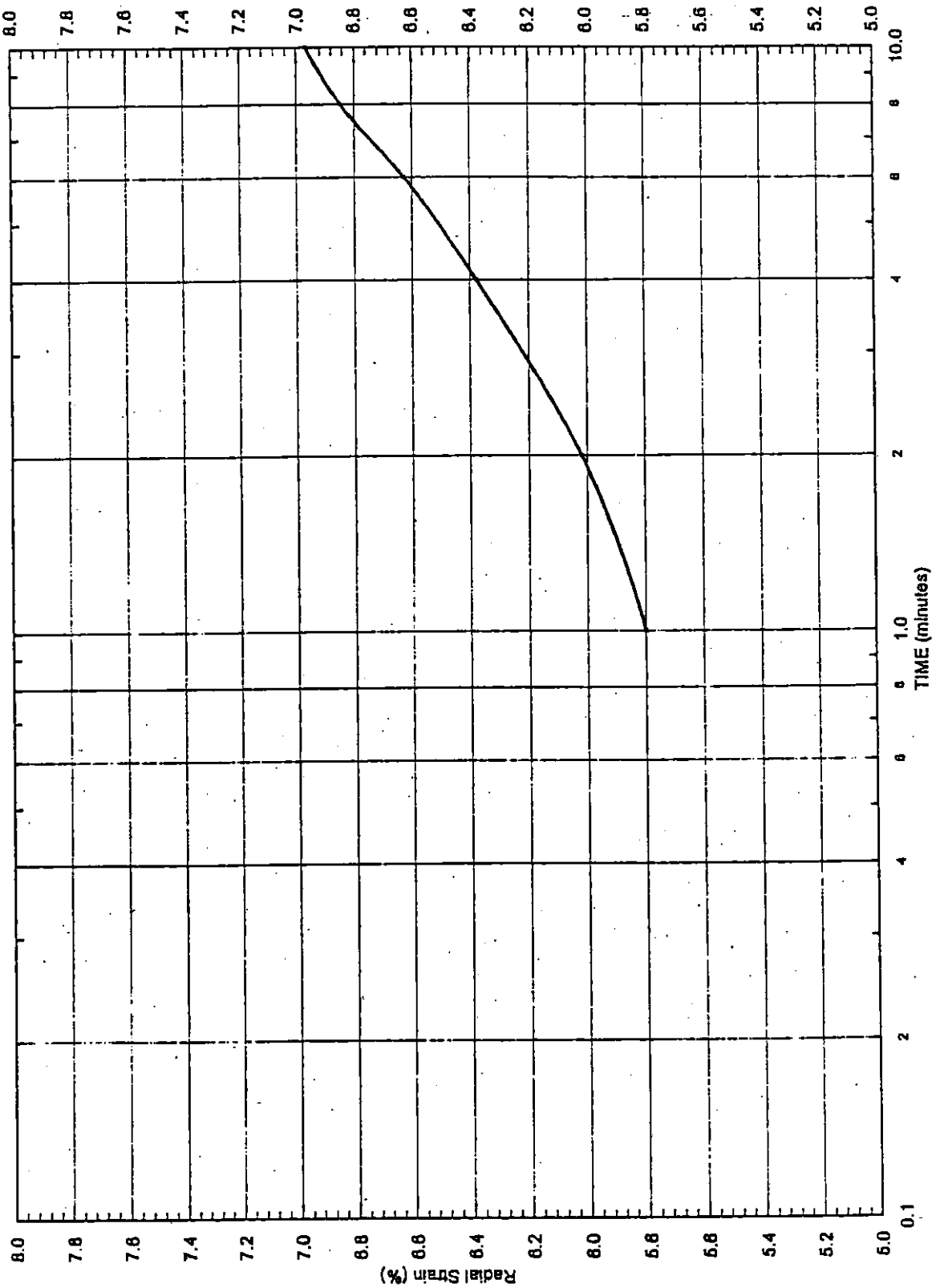
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-19-98

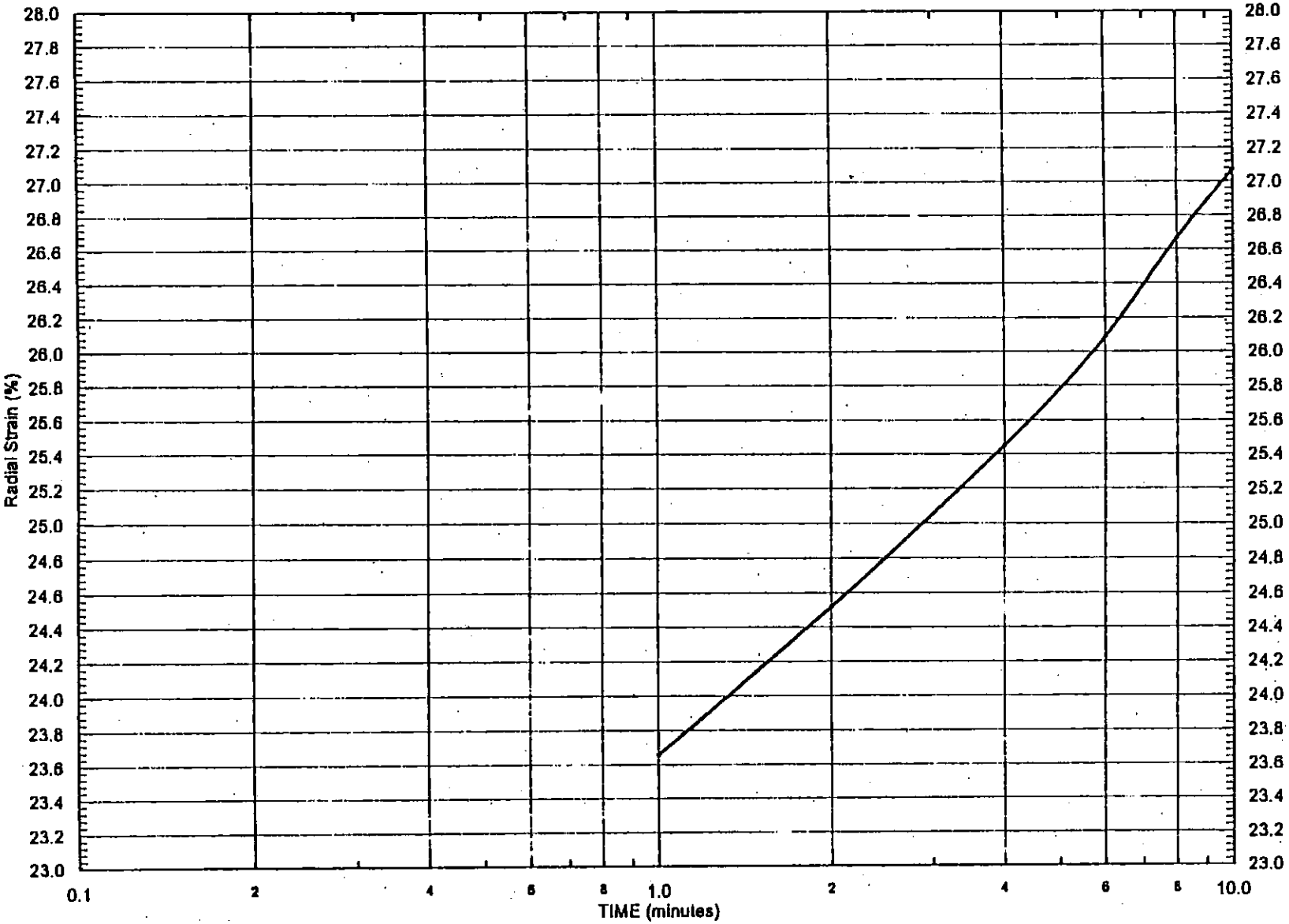
SOUNDING
CPT-18

PRESSUREMETER CREEP TEST RESULTS

Depth = 9.0 m
Creep Pressure = 0.76 bars



Depth = 6.0 m
Creep Pressure = 1.50 bars



PRESSUREMETER CREEP TEST RESULTS

PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-19-98

SOUNDING
CPT-18

SEA-18

SGA-18

Cherry Island CPT-18 -- 19.76ft

POINT NUMBER	VOLUME MEASUREMENT	PRESSURE MEASUREMENT	CORR. VOL. INCREASE (CM^3)	dR/Ro (%)	CORRECTED PRESSURE (BAR)
1	0.00	0.230	0.000	0.00	1.007
2	50.00	0.560	49.380	2.76	1.217
3	100.00	0.760	99.004	5.46	1.257
4	106.20	0.760	105.204	5.80	1.242
5	110.30	0.760	109.304	6.02	1.232
6	117.10	0.760	116.104	6.38	1.216
7	121.90	0.760	120.904	6.63	1.204
8	125.90	0.760	124.904	6.85	1.195
9	128.30	0.760	127.304	6.97	1.189
10	150.00	0.890	148.759	8.11	1.267
11	200.00	1.050	198.458	10.68	1.347
12	250.00	1.160	248.252	13.20	1.407
13	300.00	1.240	298.101	15.67	1.437
14	350.00	1.350	347.894	18.09	1.487
15	400.00	1.420	397.763	20.46	1.517
16	450.00	1.500	447.612	22.78	1.557
17	469.00	1.500	466.612	23.66	1.546
18	488.00	1.500	485.612	24.52	1.534
19	508.50	1.500	506.112	25.45	1.520
20	522.70	1.500	520.312	26.09	1.509
21	535.50	1.500	533.112	26.67	1.499
22	544.40	1.500	542.012	27.07	1.491
23	600.00	1.750	597.142	29.50	1.657
24	650.00	1.850	646.954	31.67	1.687
25	700.00	1.950	696.766	33.79	1.707
26	750.00	2.070	746.541	35.89	1.737
27	800.00	2.200	796.296	37.95	1.717

Po = 1.00 BAR P1 = 1.75 BAR P1* = 0.75 BAR

Eo = 3 BAR Er = 0 BAR Eo/P1* = 4.0

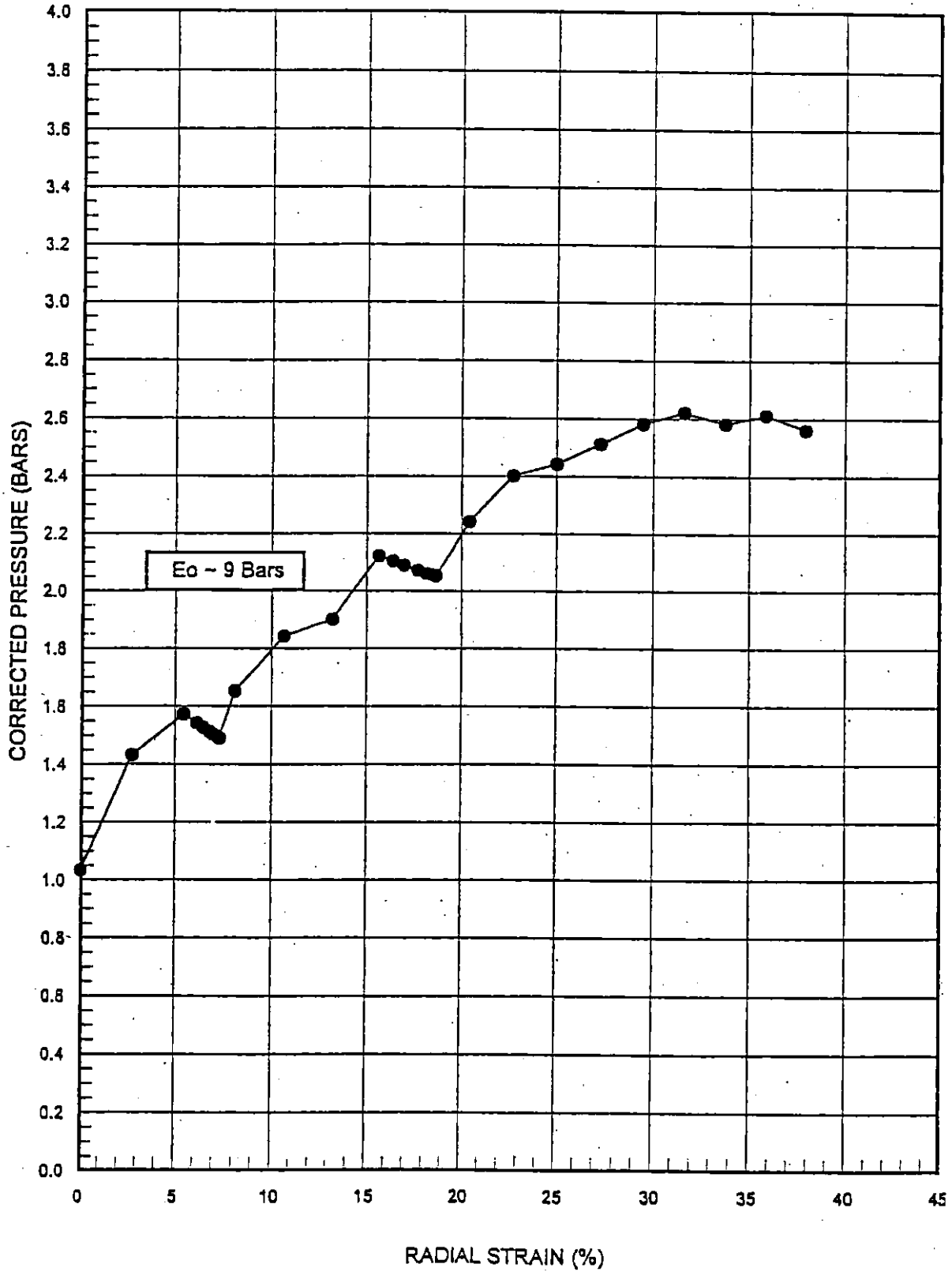
SEA-18

PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN SITU SOIL TESTING, P.C.
ENGINEER: R. Fallmezger
TEST DATE: 11-19-98

BORING: CPT-18
DEPTH: 9.0 m

PRESSUREMETER TEST RESULTS



SEA-18

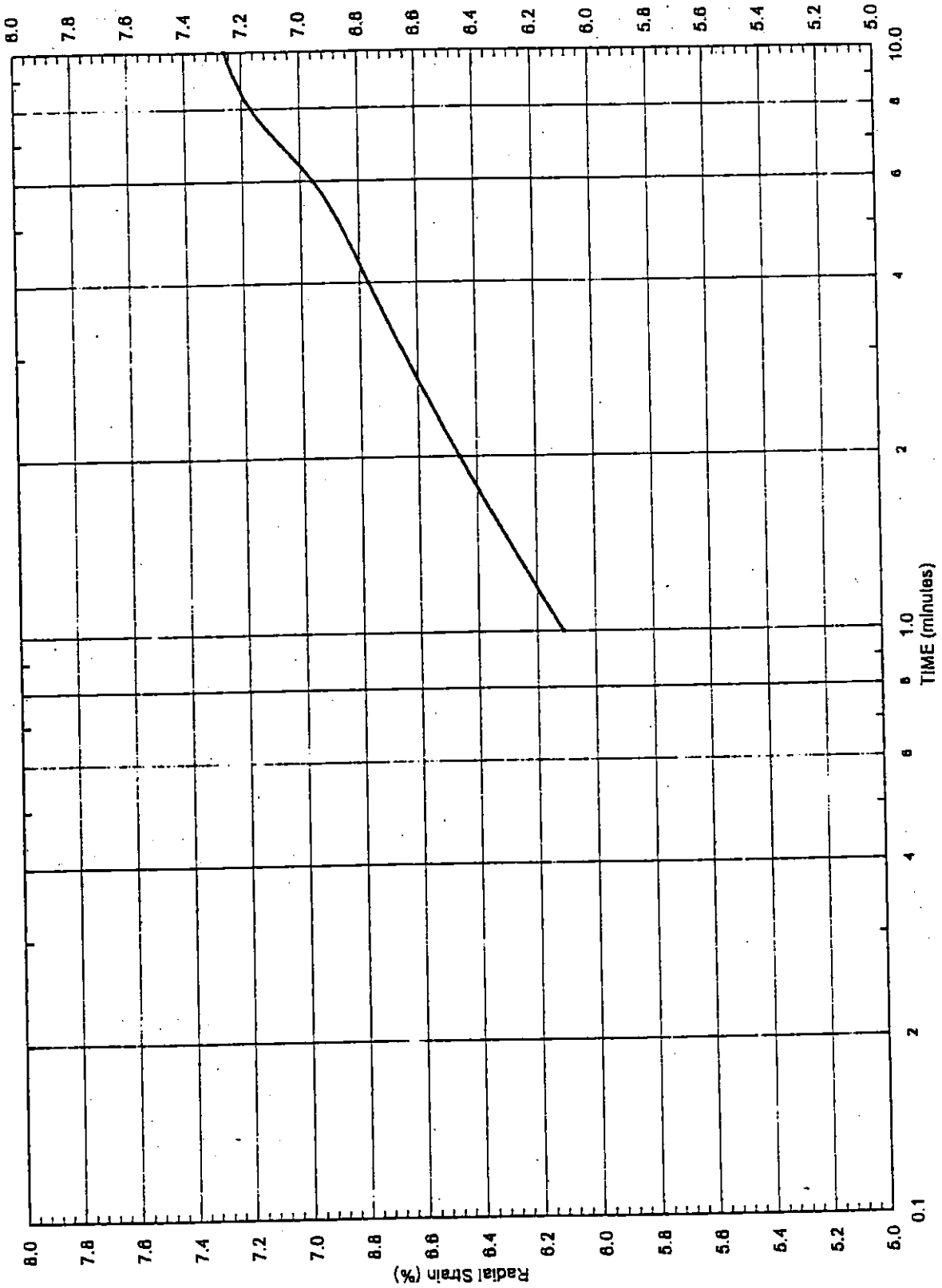
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 11-19-98

SOUNDING
CPT-18

PRESSUREMETER CREEP TEST RESULTS

Depth = 9.0 m
Creep Pressure = 1.20 bars



SEA-18

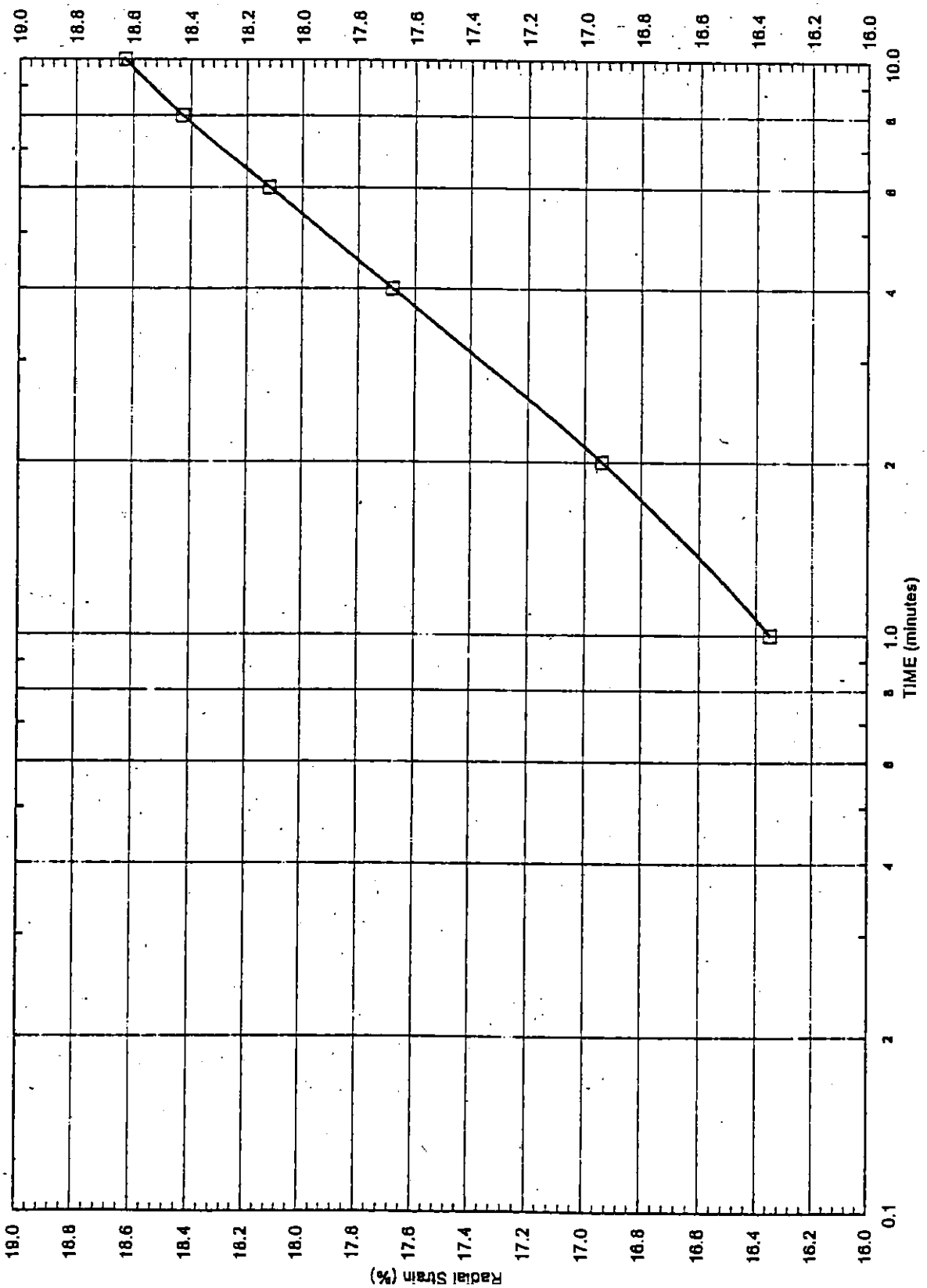
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-19-98

SOUNDING
CPT-18

PRESSUREMETER CREEP TEST RESULTS

Depth = 8.0 m
Creep Pressure = 2.05 bars



SEA 18

Cherry Island CPT-18 -- 29.63ft.

POINT NUMBER	VOLUME MEASUREMENT	PRESSURE MEASUREMENT	CORR. VOL. INCREASE (CM^3)	dR/Ro (%)	CORRECTED PRESSURE (BAR)
1	0.00	0.380	0.000	0.00	1.032
2	50.00	0.900	49.022	2.74	1.432
3	100.00	1.200	98.458	5.43	1.572
4	112.60	1.200	111.058	6.11	1.542
5	119.10	1.200	117.558	6.46	1.526
6	125.00	1.200	123.458	6.77	1.512
7	128.60	1.200	127.058	6.96	1.503
8	132.60	1.200	131.058	7.17	1.494
9	134.20	1.200	132.658	7.26	1.490
10	150.00	1.400	148.082	8.07	1.652
11	200.00	1.670	197.575	10.64	1.842
12	250.50	1.780	247.868	13.18	1.901
13	300.00	2.050	296.860	15.61	2.122
14	315.20	2.050	312.060	16.35	2.104
15	327.30	2.050	324.160	16.94	2.089
16	342.50	2.050	339.360	17.68	2.071
17	351.70	2.050	348.560	18.12	2.061
18	358.20	2.050	355.060	18.43	2.055
19	362.30	2.050	359.160	18.63	2.052
20	400.00	2.270	396.447	20.40	2.242
21	450.00	2.470	446.071	22.71	2.402
22	500.00	2.540	495.939	24.99	2.442
23	550.00	2.650	545.732	27.23	2.512
24	600.00	2.800	595.450	29.43	2.582
25	650.00	2.910	645.244	31.59	2.622
26	700.00	2.950	695.168	33.73	2.582
27	750.00	3.070	744.943	35.82	2.612
28	800.00	3.170	794.755	37.88	2.562

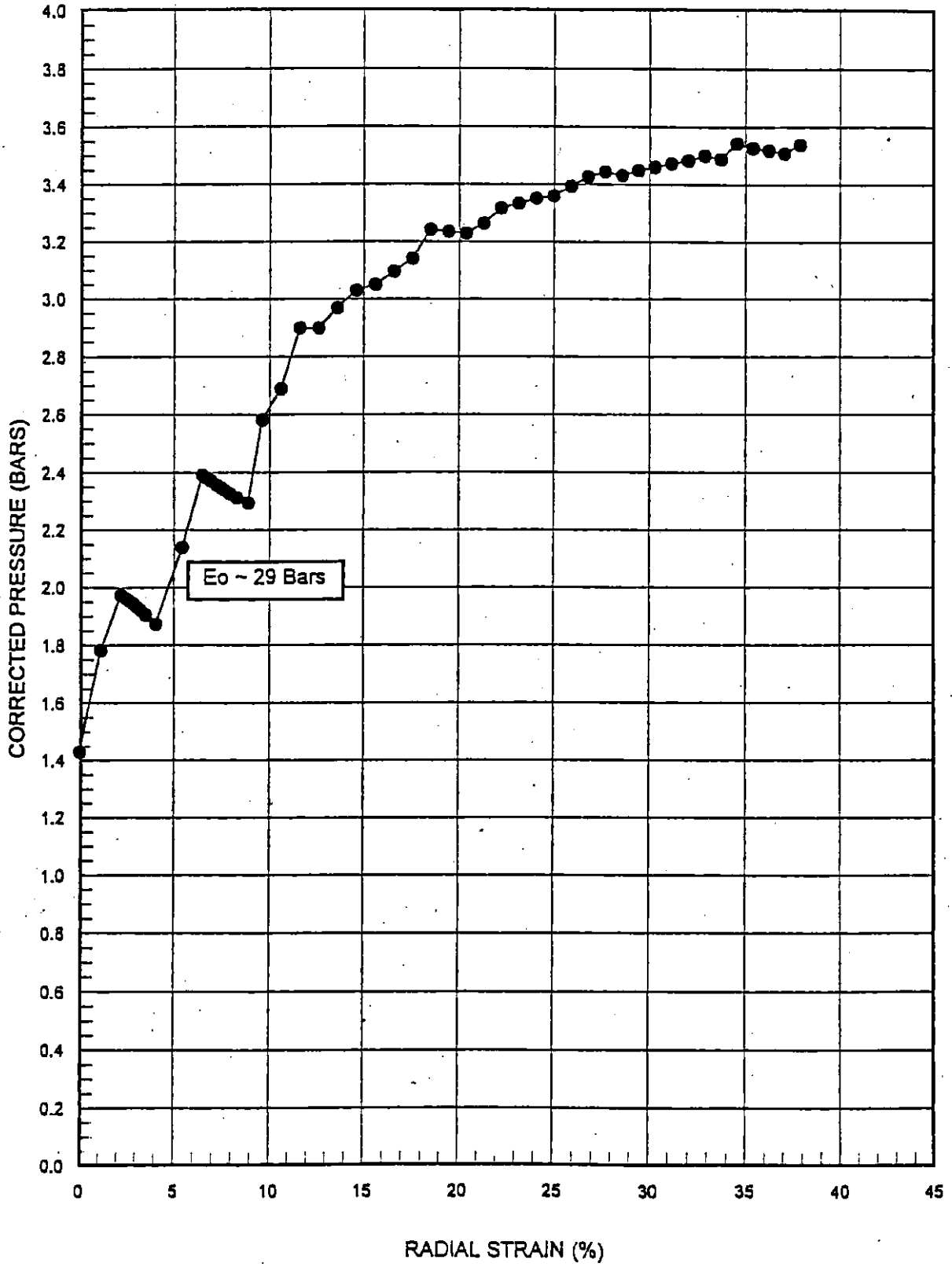
Po = 1.05 BAR Pl = 2.60 BAR Pl* = 1.55 BAR

Eo = 9 BAR Er = 0 BAR Eo/Pl* = 5.8

SEA-18

PROJECT: Cherry Island Landfill LOCATION: Wilmington, Delaware	IN-SITU SOIL TESTING, L.C. ENGINEER: R. Fallmezger TEST DATE: 11-19-98	BORING: CPT-18 DEPTH: 13.1 m

PRESSUREMETER TEST RESULTS



SEA 78

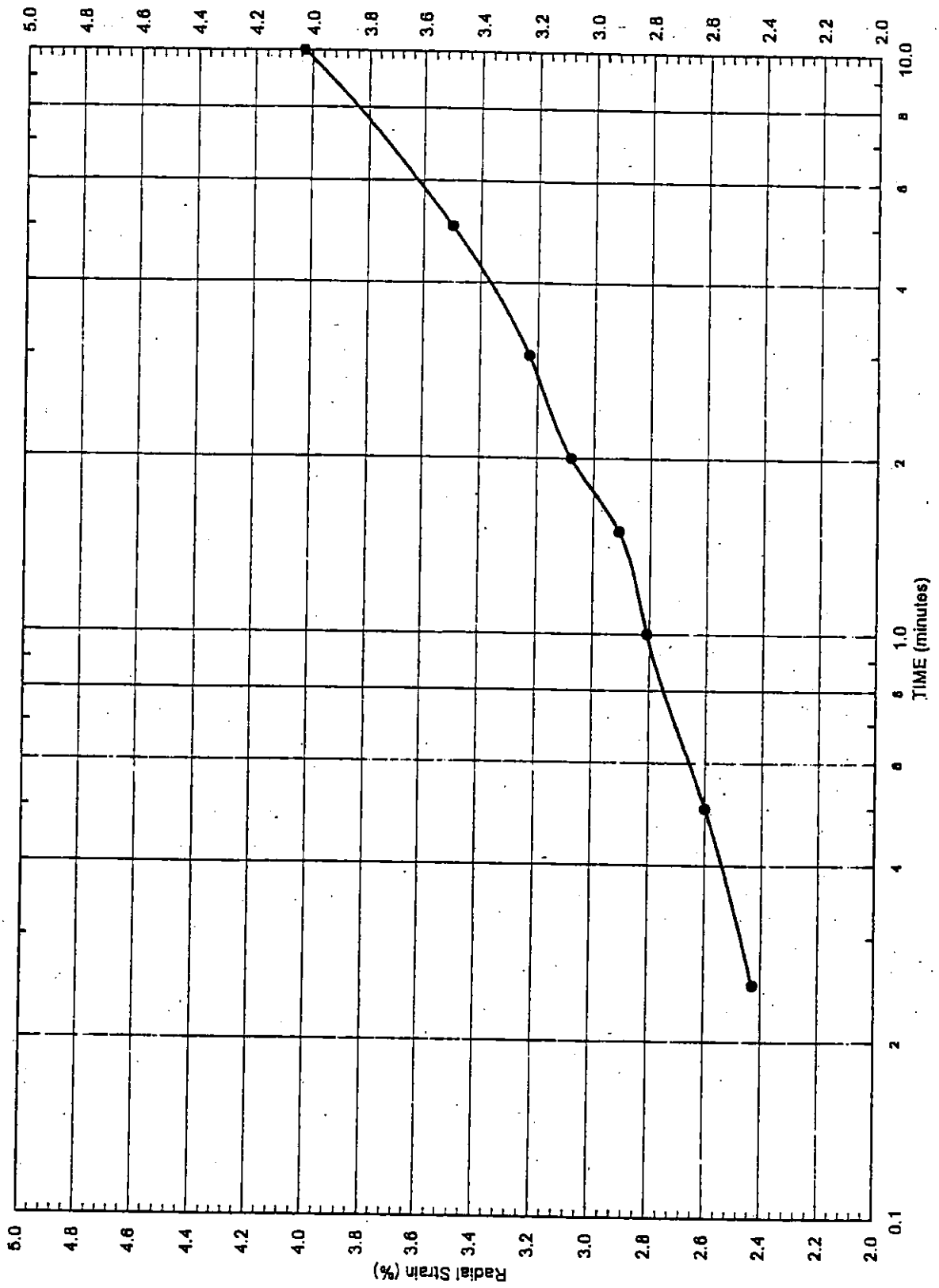
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, E.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-19-98

SOUNDING
CPT-18

PRESSUREMETER CREEP TEST RESULTS

Depth = 13.1 m
Creep Pressure = 1.46 bars



SEA 18

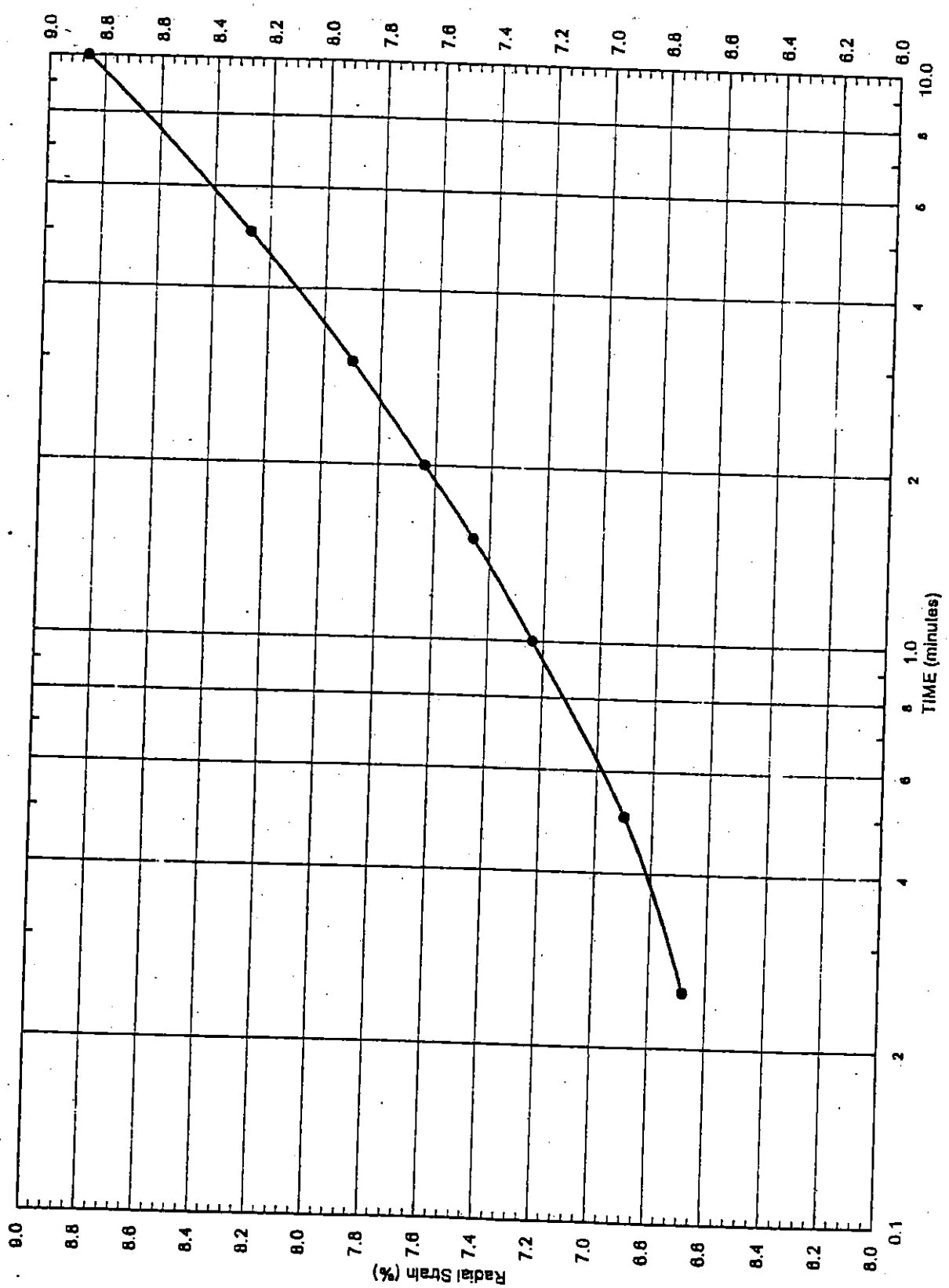
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-19-98

SOUNDING
CPT-18

PRESSUREMETER CREEP TEST RESULTS

Depth = 13.1 m
Creep Pressure = 2.1 bars



SEA-19

Cherry Island CPT-18 -- 42.91ft.

POINT NUMBER	VOLUME MEASUREMENT	PRESSURE MEASUREMENT	CORR. VOL. INCREASE (CM^3)	dR/Ro (%)	CORRECTED PRESSURE (BAR)
1	0.00	0.820	0.000	0.00	1.429
2	20.00	1.220	19.248	1.09	1.781
3	40.00	1.460	38.797	2.18	1.973
4	44.50	1.460	43.297	2.43	1.962
5	47.70	1.460	46.497	2.60	1.954
6	51.40	1.460	50.197	2.81	1.944
7	53.20	1.460	51.997	2.91	1.939
8	56.30	1.460	55.097	3.08	1.929
9	59.10	1.460	57.897	3.23	1.920
10	64.00	1.460	62.797	3.50	1.904
11	73.70	1.460	72.497	4.03	1.873
12	100.00	1.810	98.139	5.42	2.139
13	120.00	2.110	117.575	6.46	2.391
14	124.20	2.110	121.775	6.68	2.381
15	128.30	2.110	125.875	6.90	2.371
16	134.80	2.110	132.375	7.24	2.355
17	139.00	2.110	136.575	7.46	2.345
18	142.30	2.110	139.875	7.64	2.337
19	147.20	2.110	144.775	7.90	2.326
20	154.40	2.110	151.975	8.27	2.312
21	165.70	2.110	163.275	8.86	2.294
22	180.00	2.420	176.992	9.58	2.581
23	200.00	2.560	196.729	10.59	2.689
24	220.00	2.790	216.296	11.59	2.899
25	240.00	2.810	236.259	12.60	2.899
26	260.00	2.900	256.090	13.59	2.969
27	280.00	2.980	275.939	14.58	3.029
28	300.00	3.020	295.864	15.56	3.049
29	320.00	3.090	315.732	16.53	3.095
30	340.00	3.160	335.601	17.50	3.141
31	360.00	3.280	355.375	18.45	3.241
32	380.00	3.290	375.356	19.40	3.235
33	400.00	3.300	395.338	20.34	3.229
34	420.00	3.350	415.244	21.28	3.263
35	440.00	3.420	435.112	22.20	3.317
36	460.00	3.450	455.056	23.13	3.333
37	480.00	3.480	474.999	24.04	3.351
38	500.00	3.500	494.962	24.95	3.359
39	520.00	3.550	514.868	25.85	3.393
40	540.00	3.600	534.774	26.74	3.427
41	560.00	3.640	554.698	27.63	3.443
42	580.00	3.660	574.661	28.52	3.431
43	600.00	3.710	594.567	29.39	3.449
44	620.00	3.750	614.492	30.26	3.461
45	640.00	3.790	634.416	31.12	3.473
46	660.00	3.830	654.341	31.98	3.483
47	680.00	3.880	674.247	32.84	3.501
48	700.00	3.900	694.210	33.69	3.489
49	720.00	3.990	714.040	34.52	3.543
50	740.00	4.010	734.003	35.36	3.527
51	760.00	4.050	753.928	36.19	3.519
52	780.00	4.100	773.834	37.02	3.509
53	800.00	4.190	793.664	37.84	3.539

Po = 1.40 BAR P1 = 3.55 BAR P1* = 2.15 BAR

Eo = 29 BAR Er = 0 BAR Eo/P1* = 13.5

EXISTING DISSAPATION TESTS

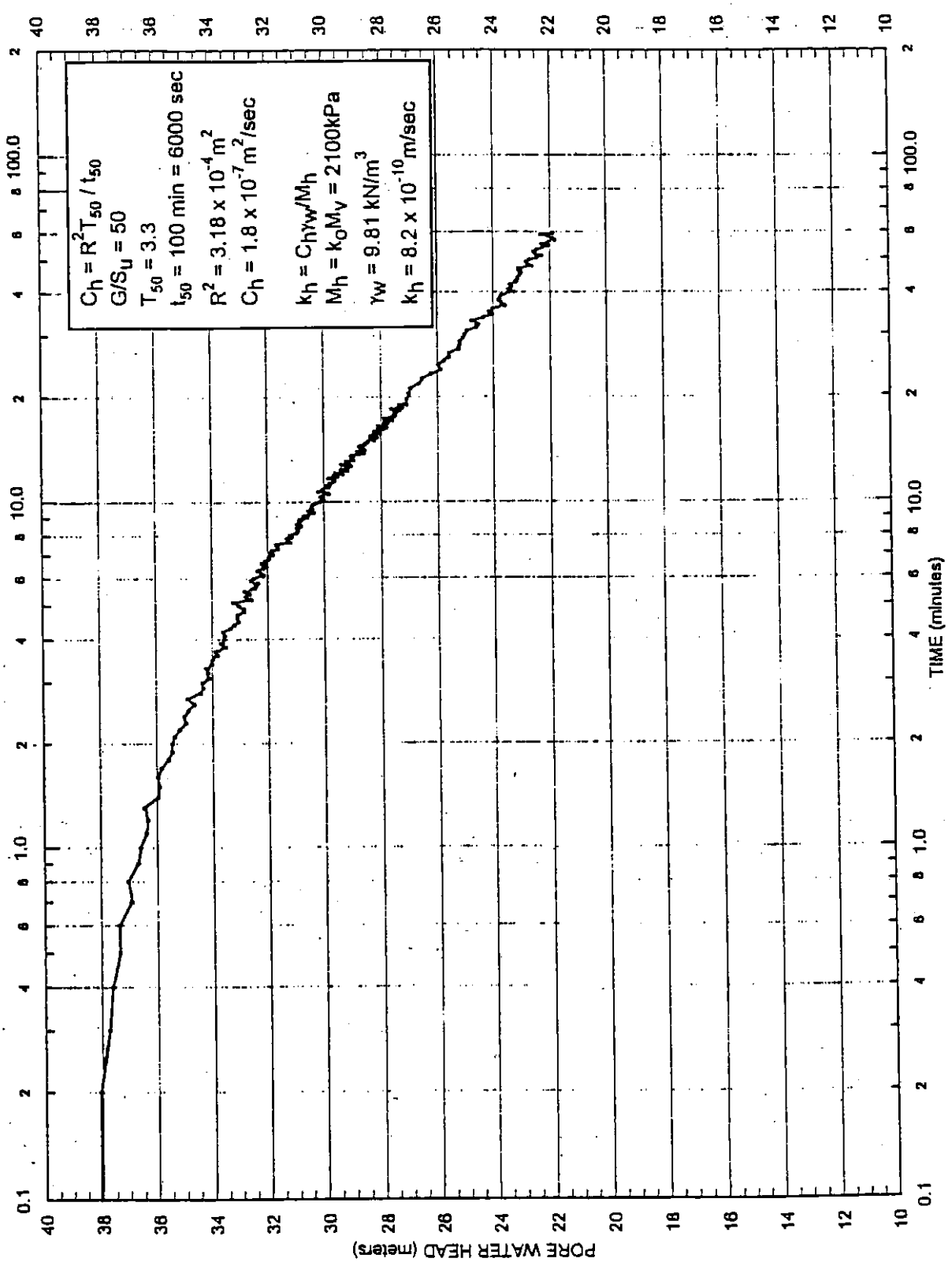
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 12-01-98

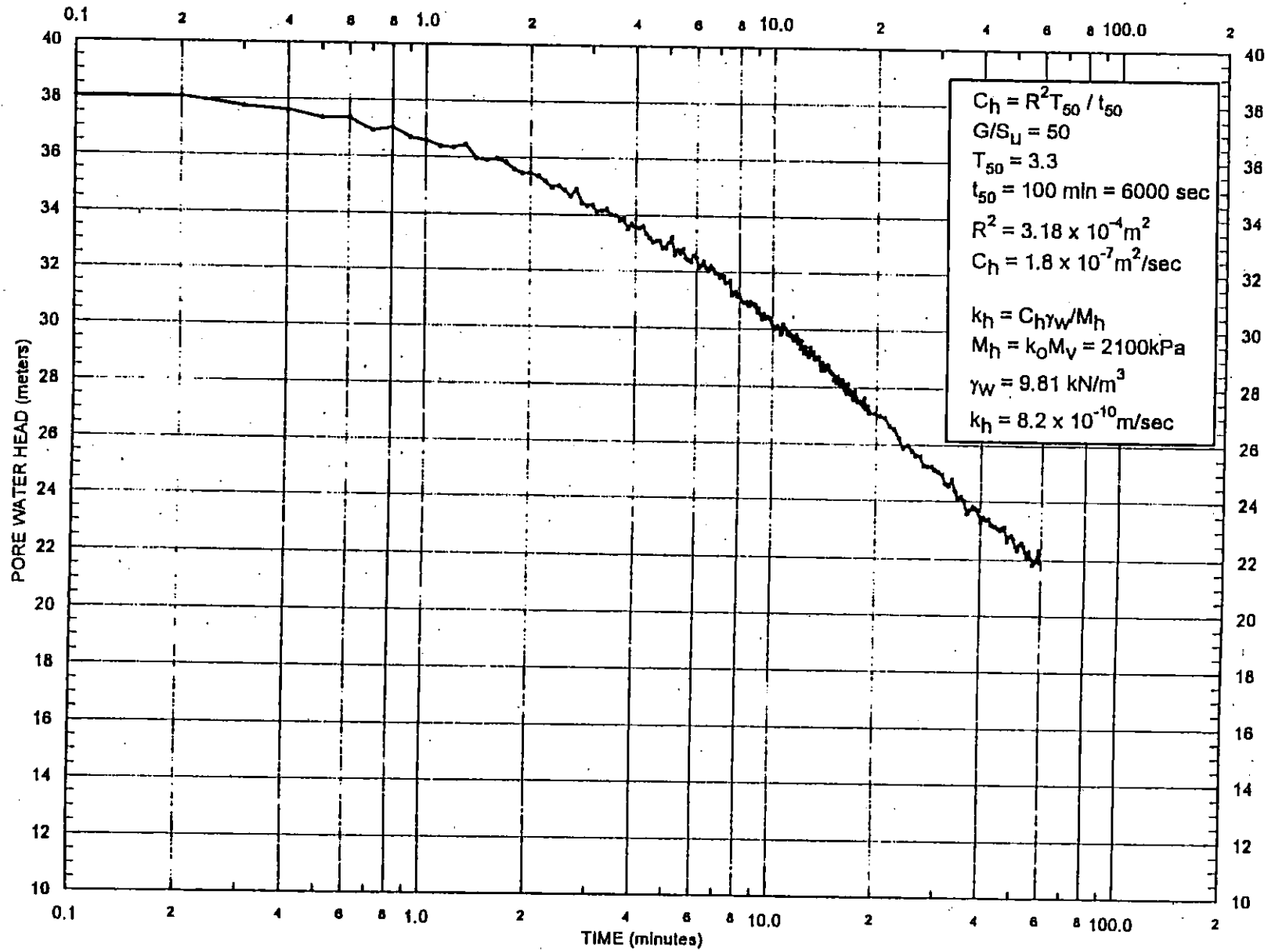
SOUNDING
CPT-1

CPT DISSIPATION TEST RESULTS

Depth = 21.1 m



Depth = 27.1 m



PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

CPT DISSIPATION TEST RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Faimezger
SOUNDING DATE: 12/01/98

SOUNDING
CPT-1

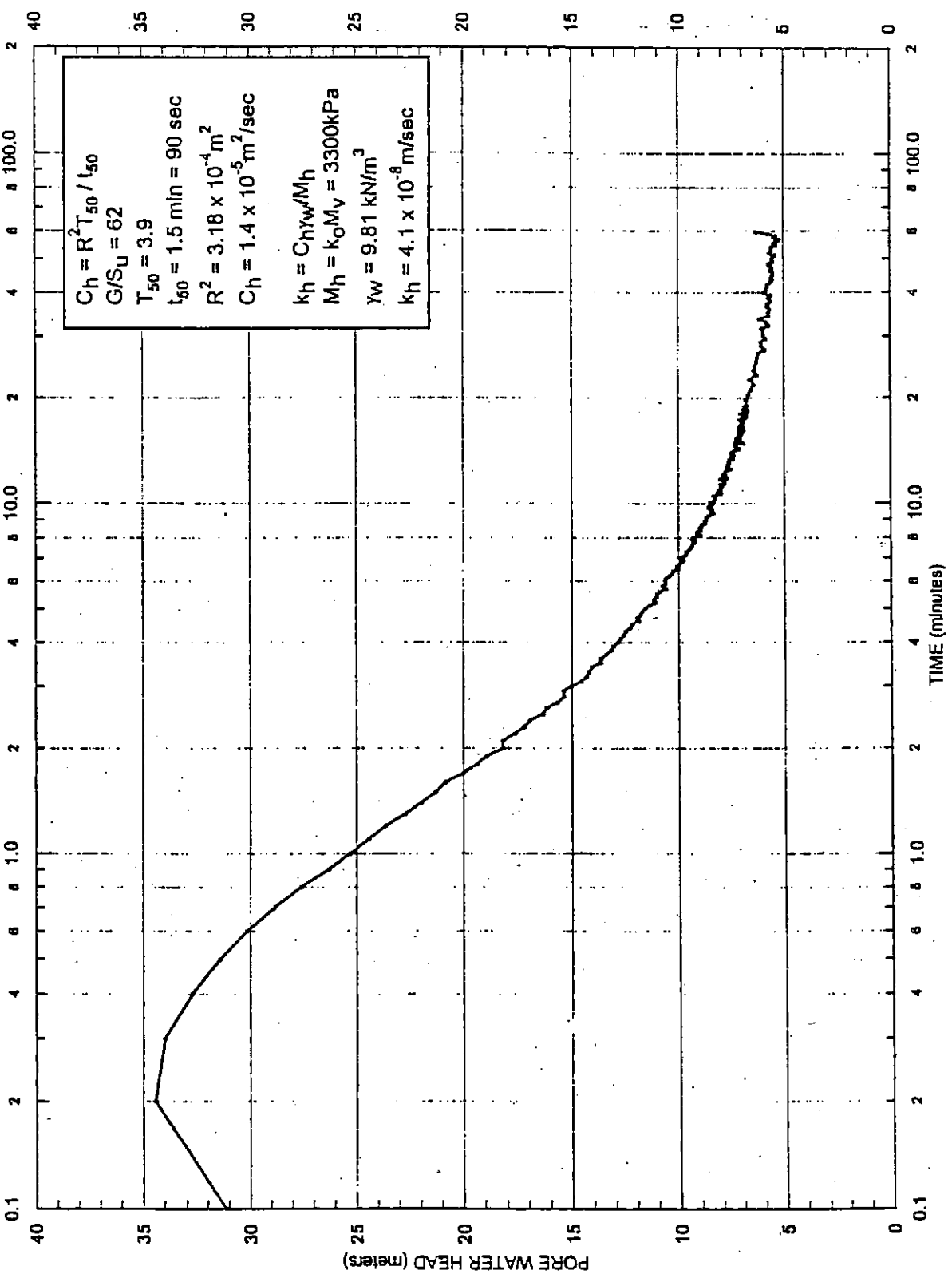
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Faitmezger
SOUNDING DATE: 12-01-98

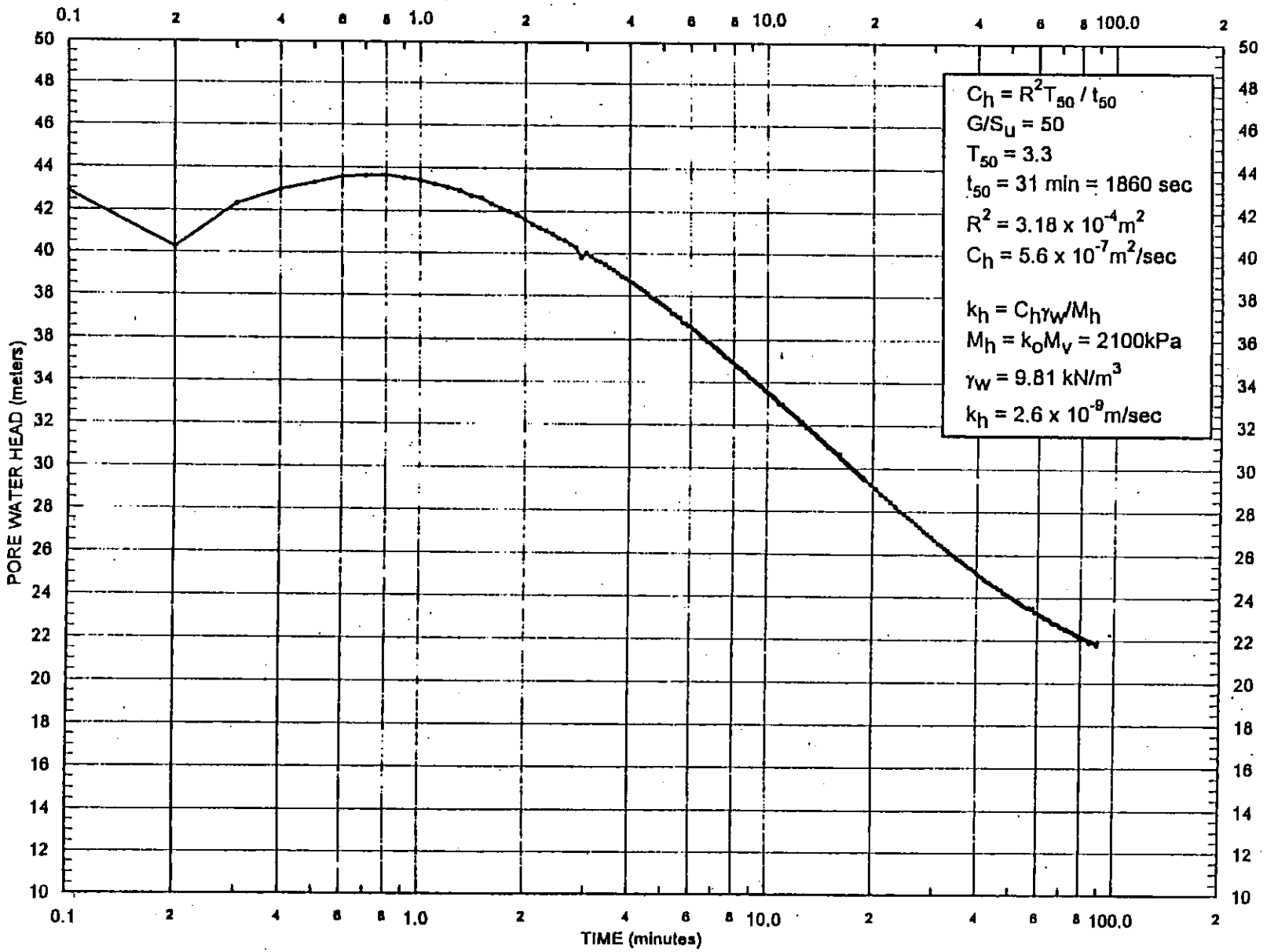
SOUNDING
CPT-1

CPT DISSIPATION TEST RESULTS

Depth = 92.3 m



Depth = 27.2 m



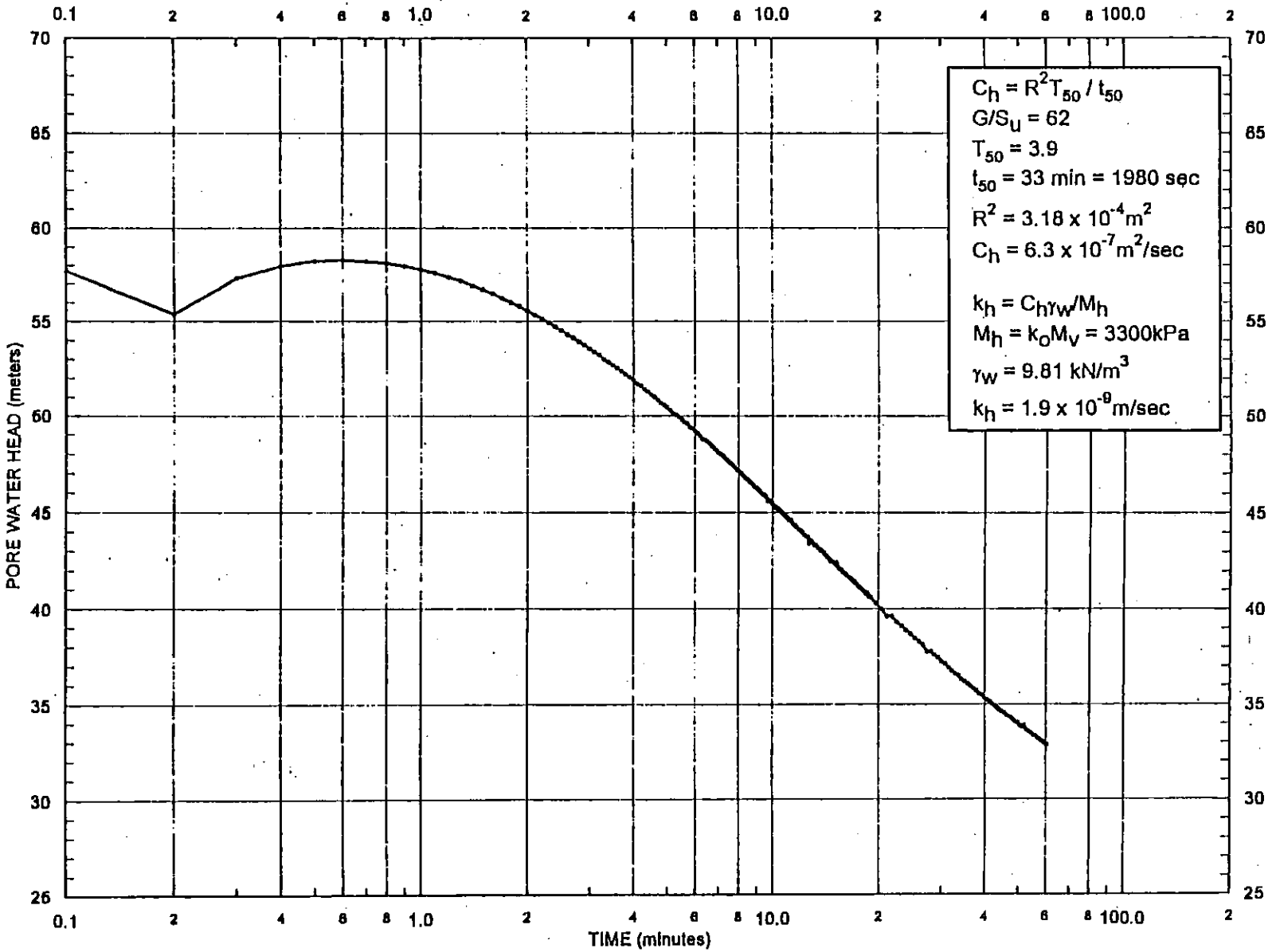
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

CPT DISSIPATION TEST RESULTS

IN-SITU SOIL TESTING, LC
ENGINEER: R. Faimezger
SOUNDING DATE: 12-12-98

SOUNDING
CPT-2

Depth = 32.3 m



PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

CPT DISSIPATION TEST RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 12-12-98

SOUNDING:
CPT-2

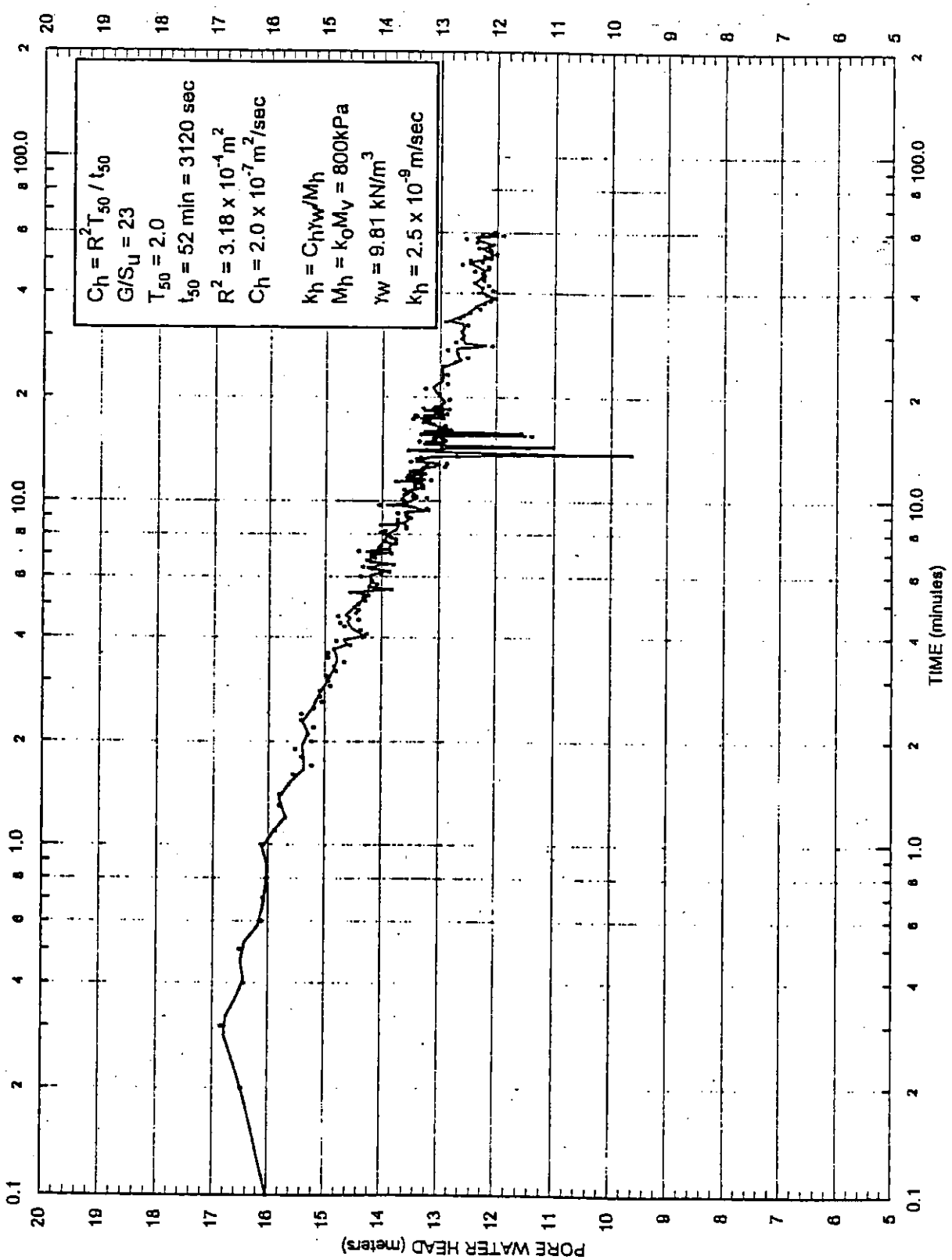
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-24-98

SOUNDING
CPT-3

CPT DISSIPATION TEST RESULTS

Depth = 12.5 m



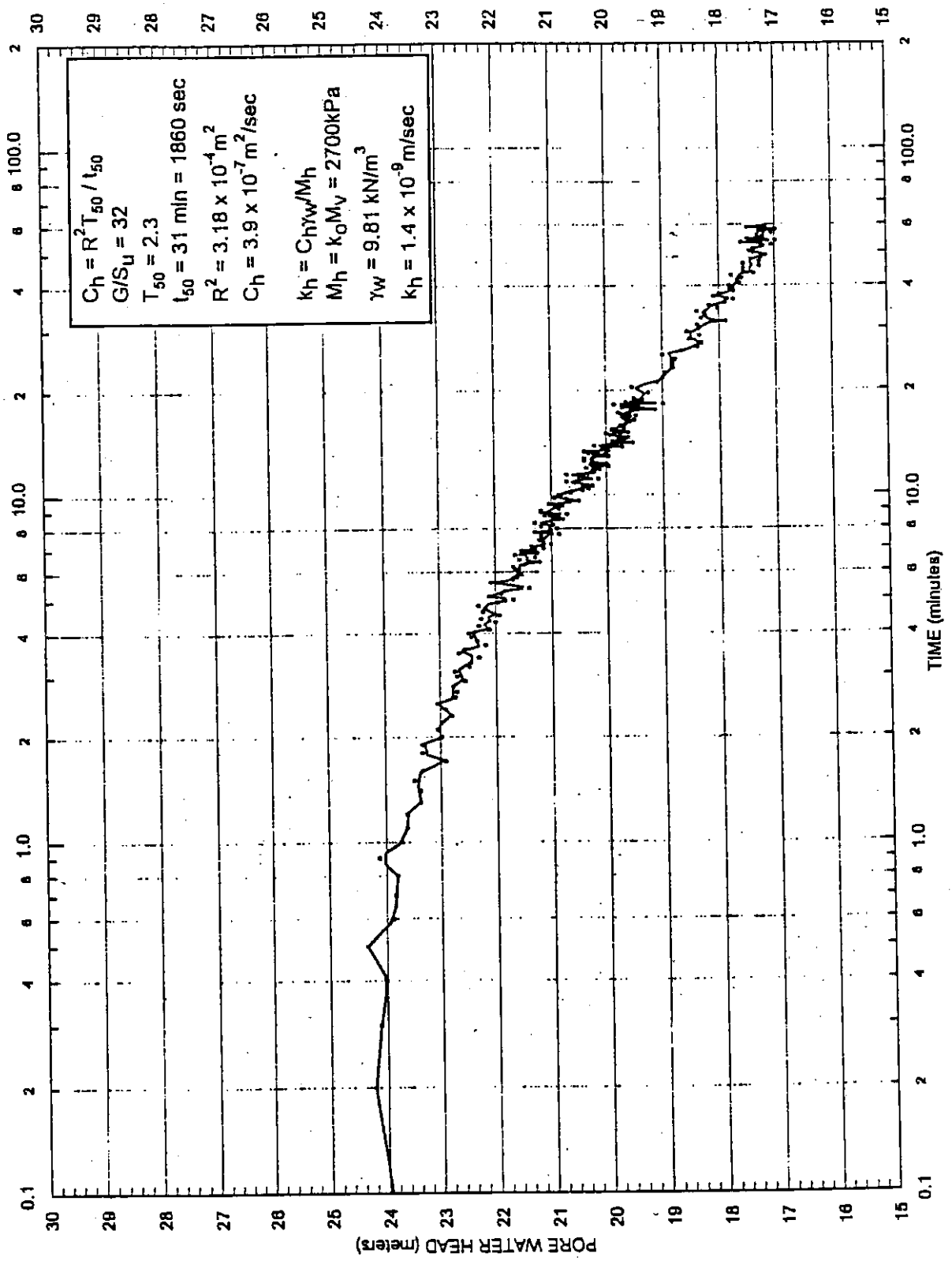
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 11-24-98

SOUNDING
CPT-3

CPT DISSIPATION TEST RESULTS

Depth = 17.1 m



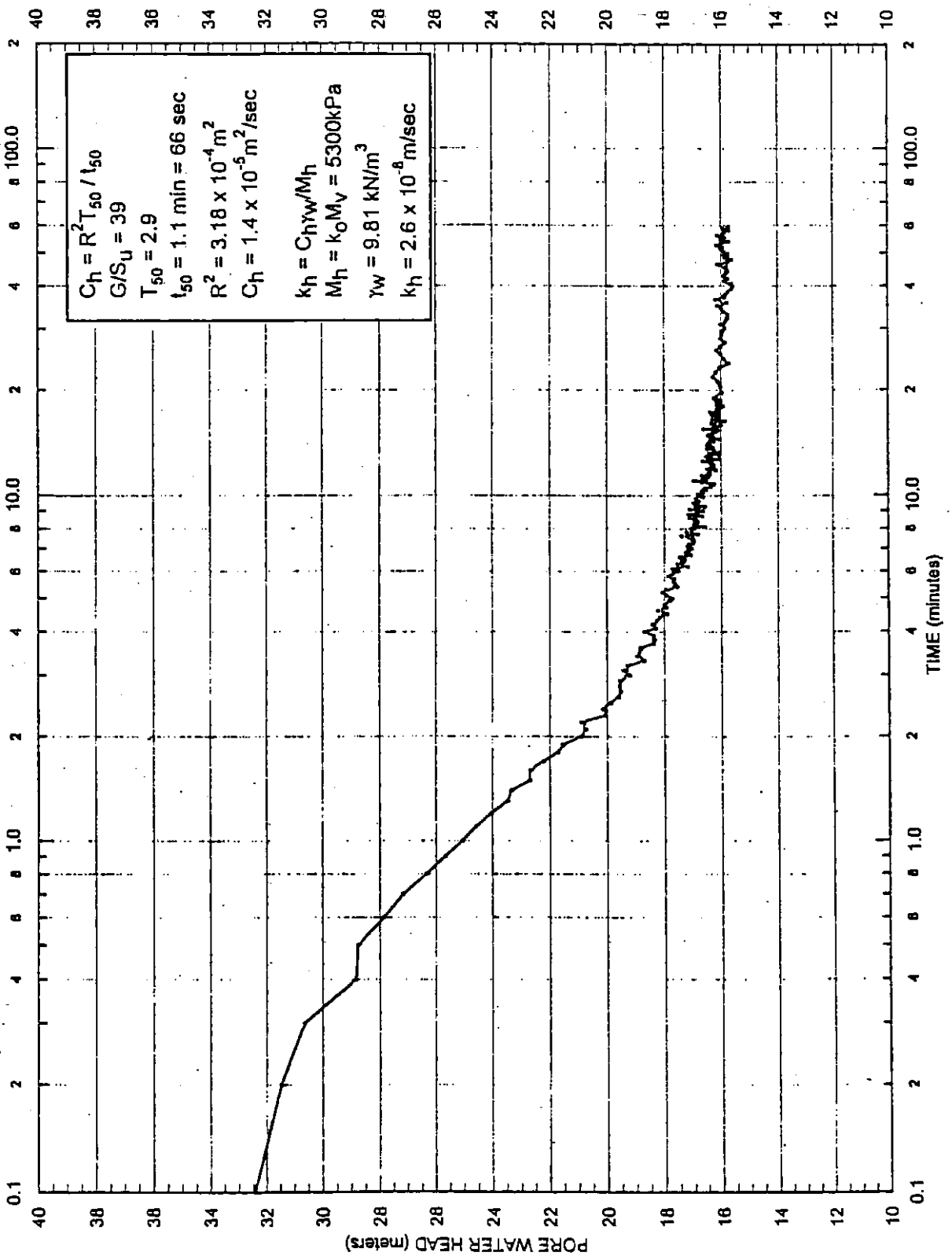
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 11-24-98

SOUNDING
CPT-3

CPT DISSIPATION TEST RESULTS

Depth = 21.1 m



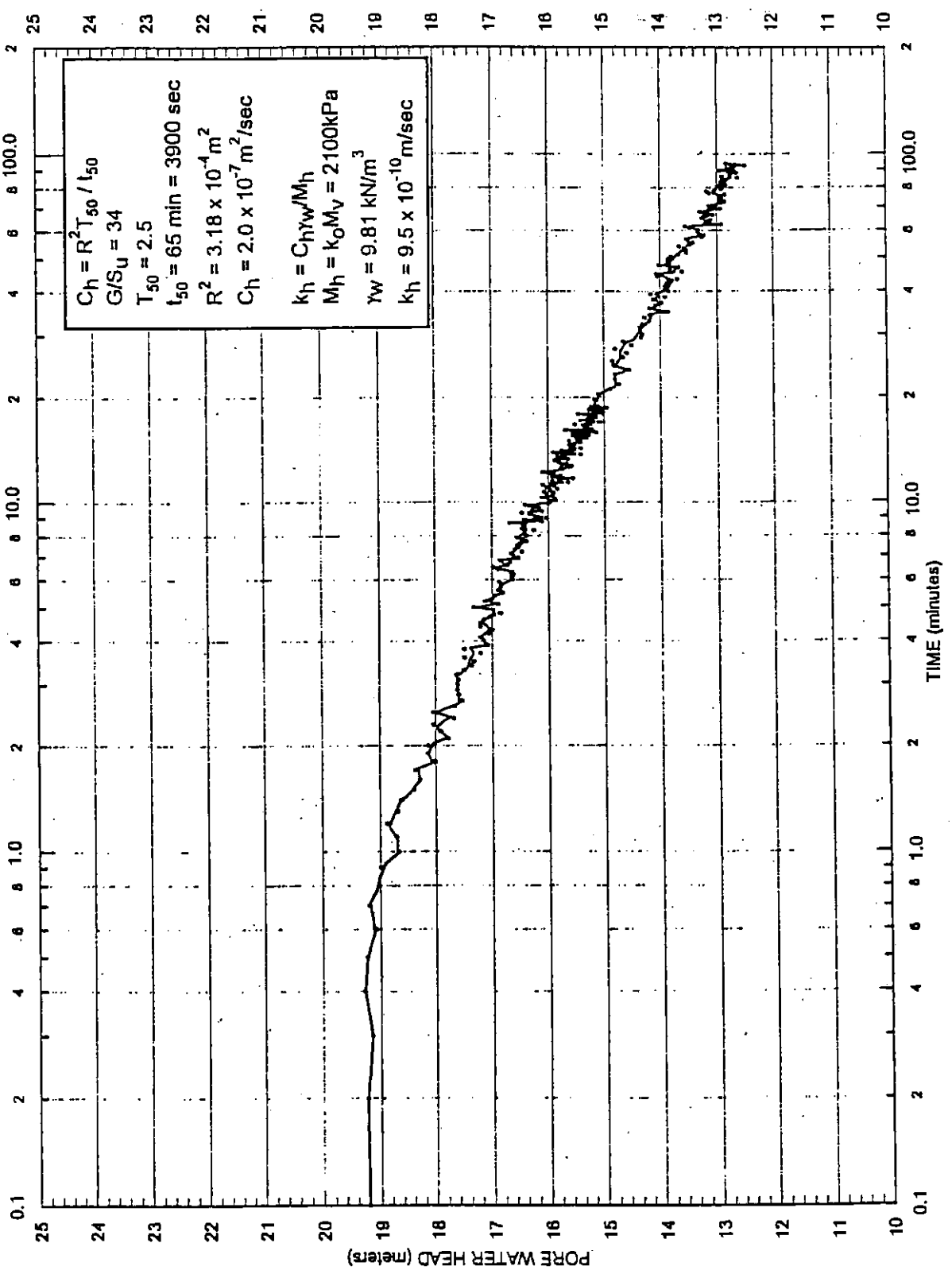
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 11-21-98

SOUNDING
CPT-6

CPT DISSIPATION TEST RESULTS

Depth = 13.0 m



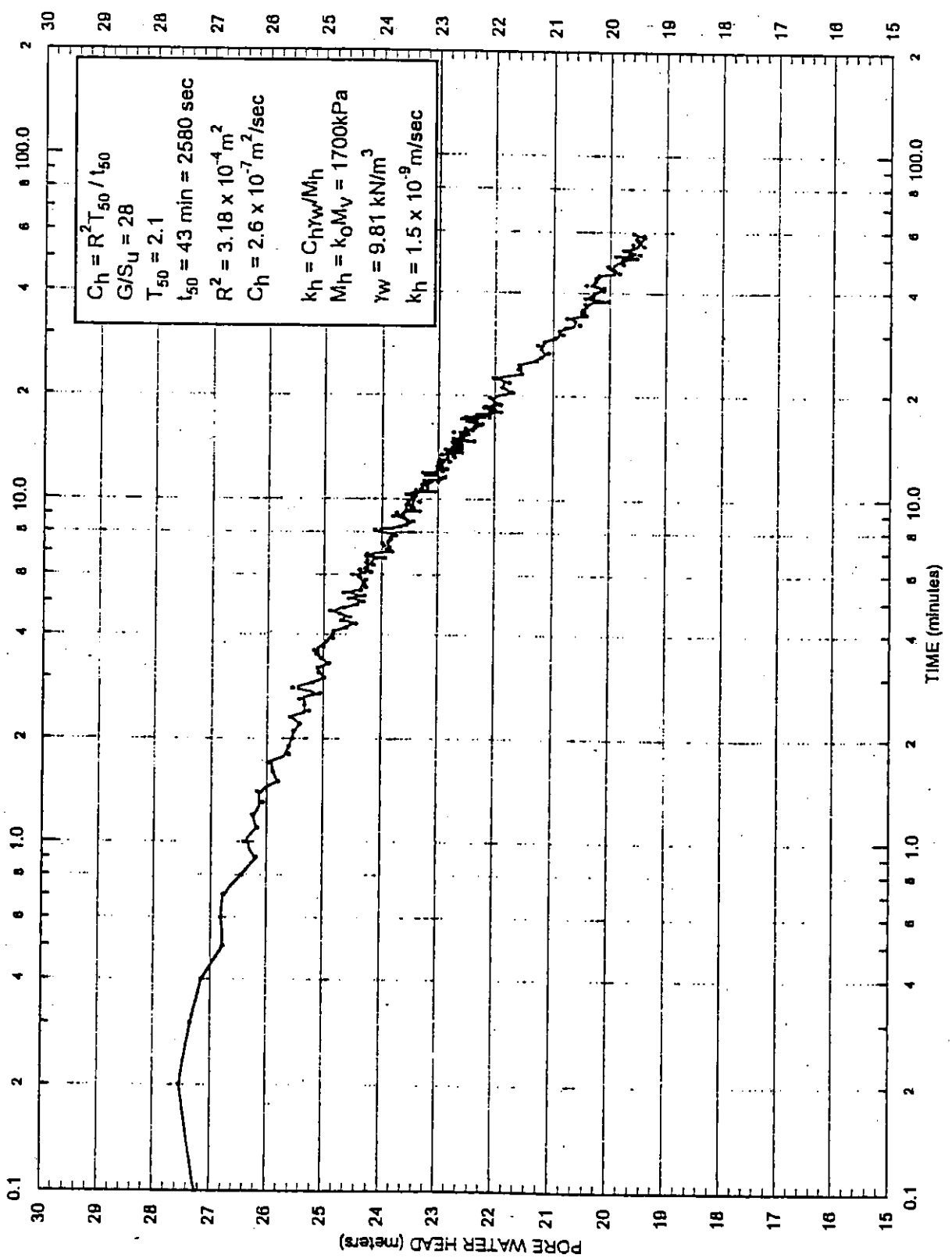
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Faltmezger
SOUNDING DATE: 11-21-98

SOUNDING
CPT-6

CPT DISSIPATION TEST RESULTS

Depth = 18.1 m



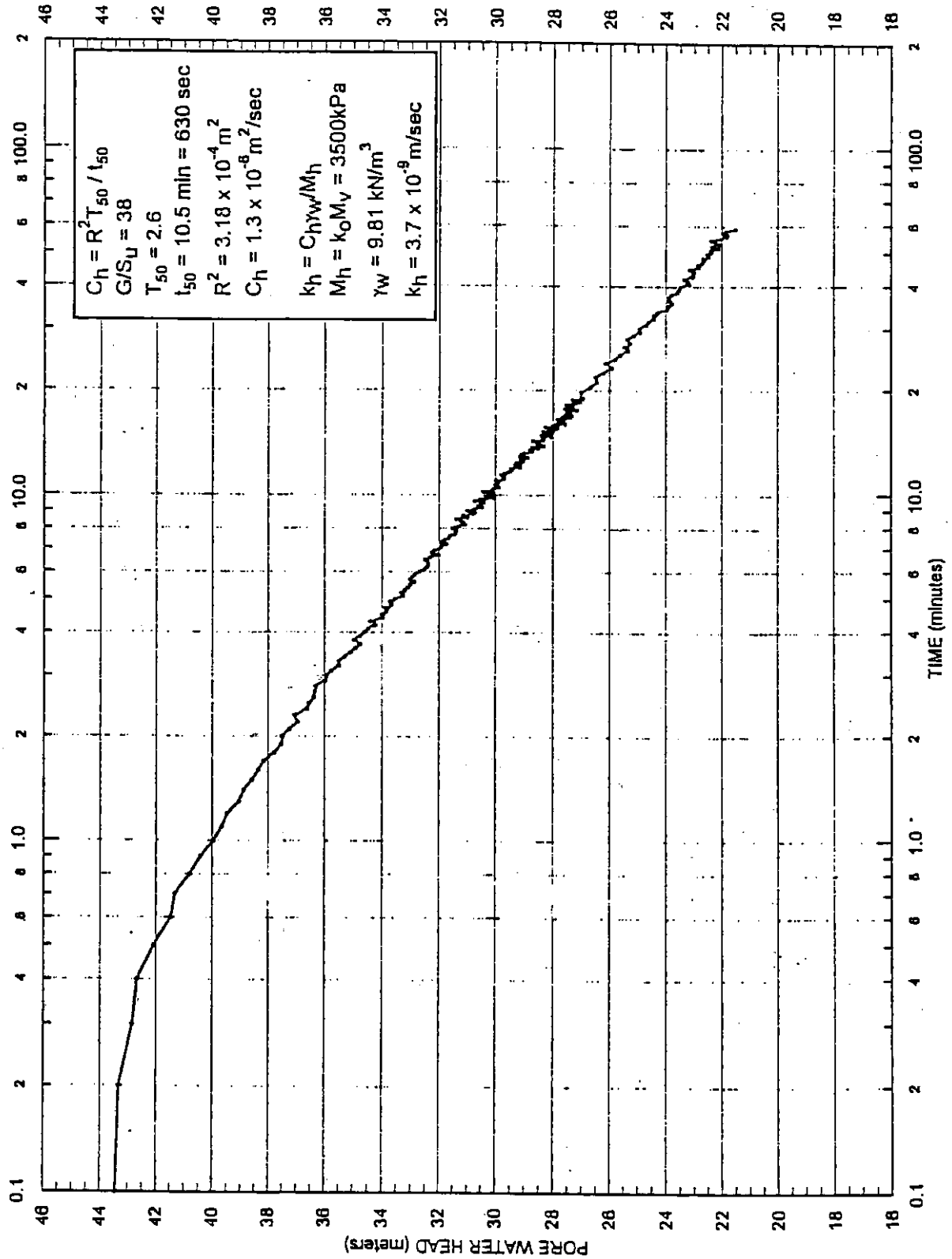
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 11-21-98

SOUNDING
CPT-6

CPT DISSIPATION TEST RESULTS

Depth = 22.1 m



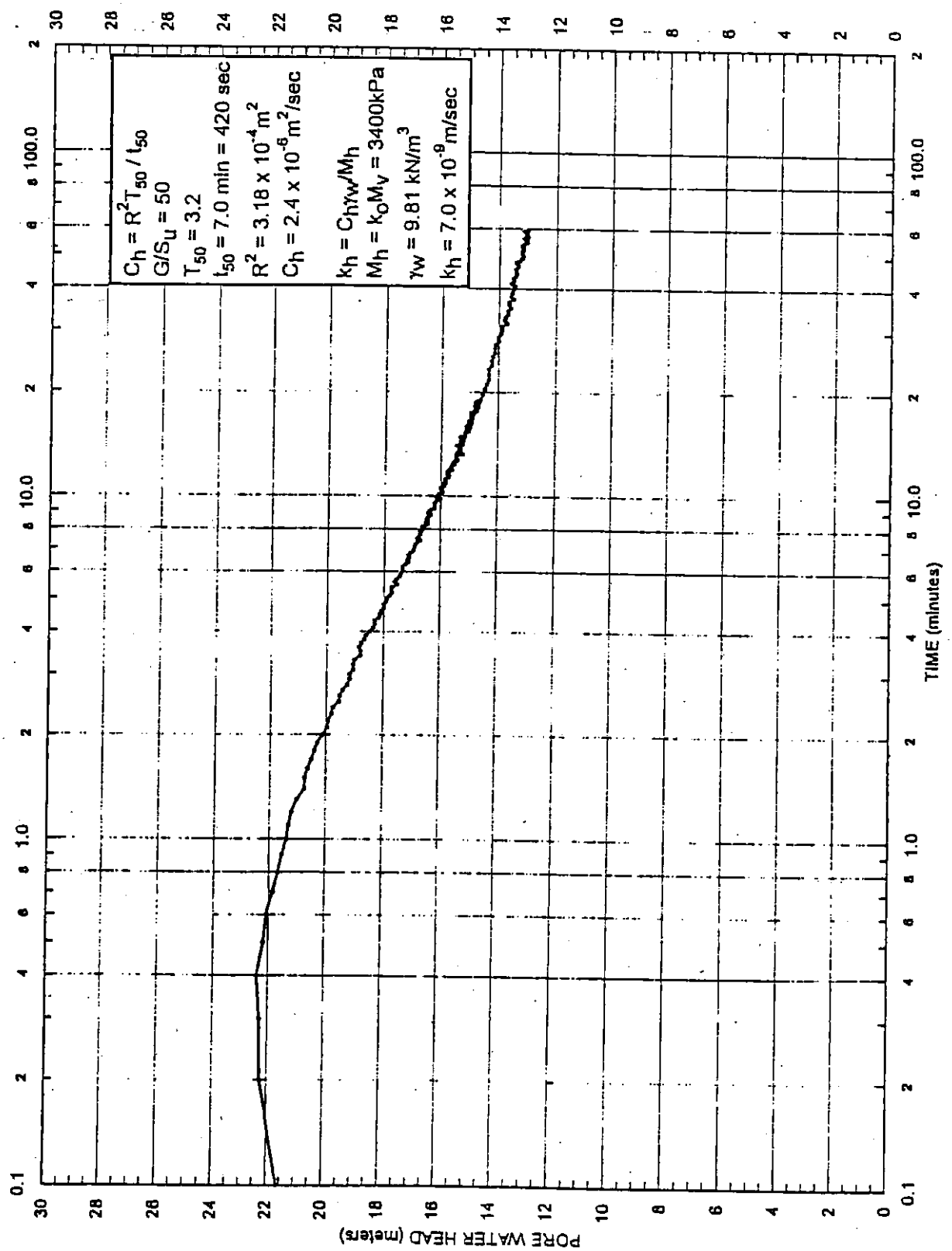
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 8-13-98

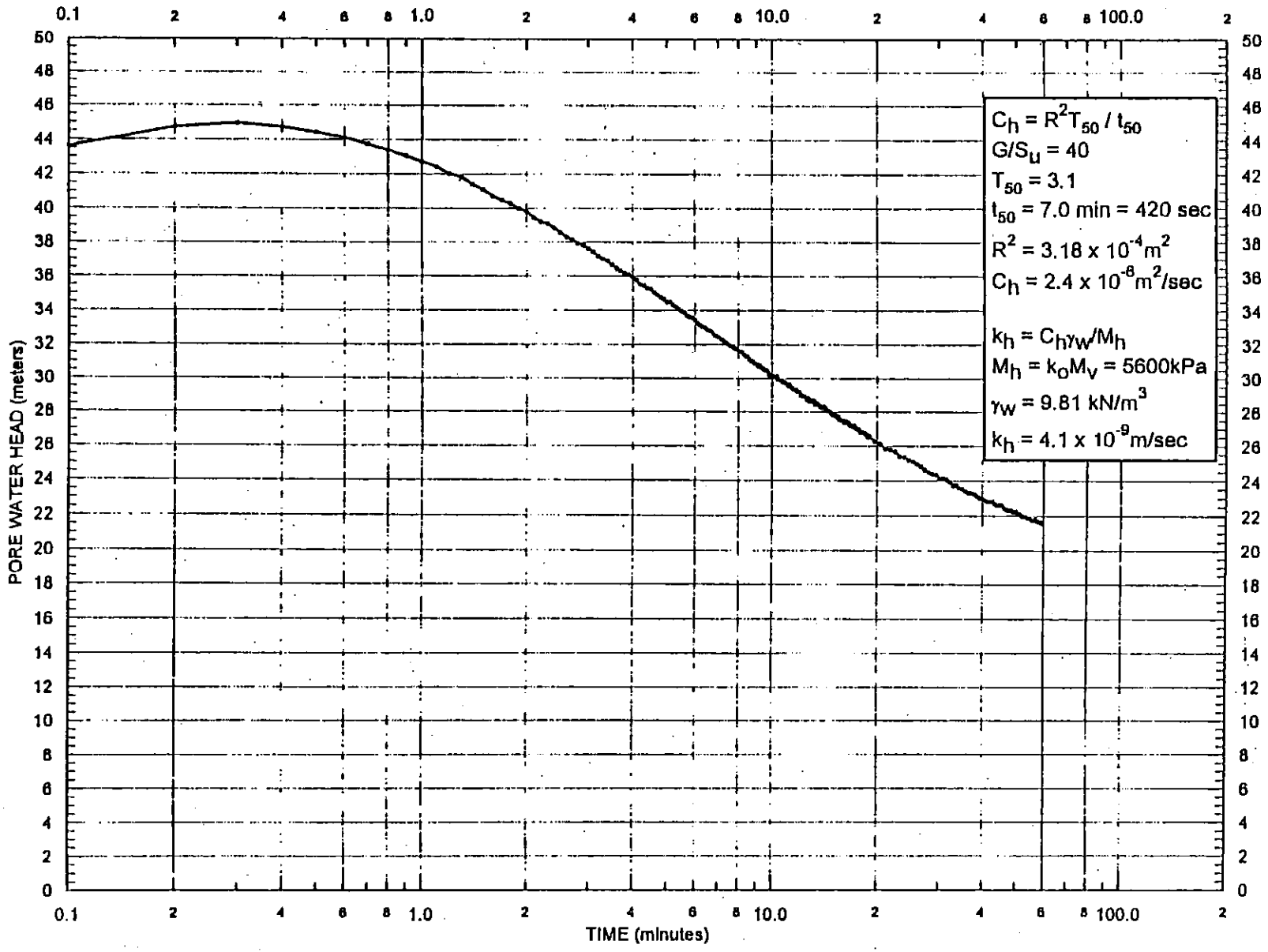
SOUNDING
CPT-7

CPT DISSIPATION TEST RESULTS

Depth = 11.3 m



Depth = 20.4 m



PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, LLC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-13-98

SOUNDING
CPT-7

CPT DISSIPATION TEST RESULTS

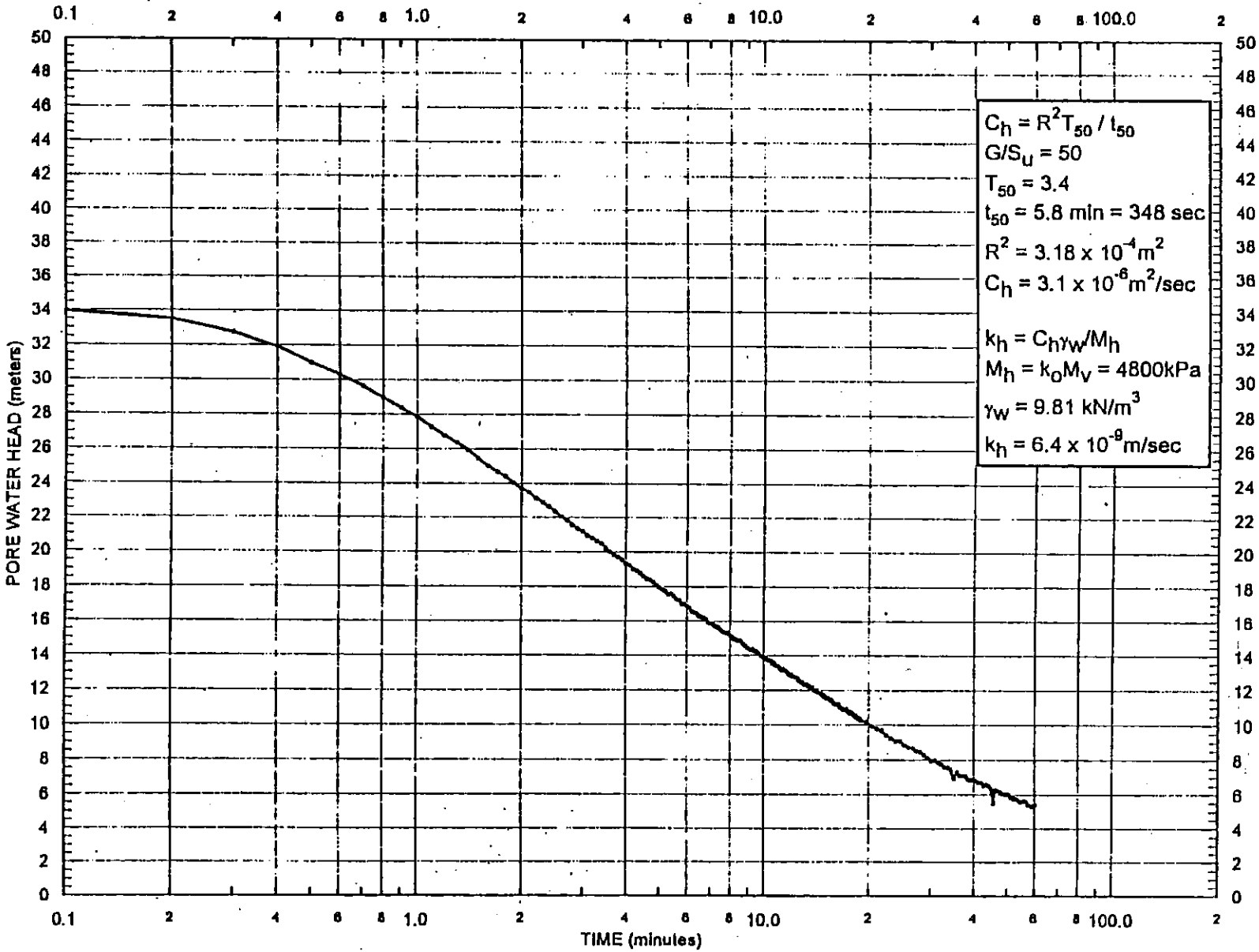
Depth = 6.0 m

PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

CPT DISSIPATION TEST RESULTS

IN-SITU SOIL TESTING, EC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-12-98

SOUNDING
CPT-15

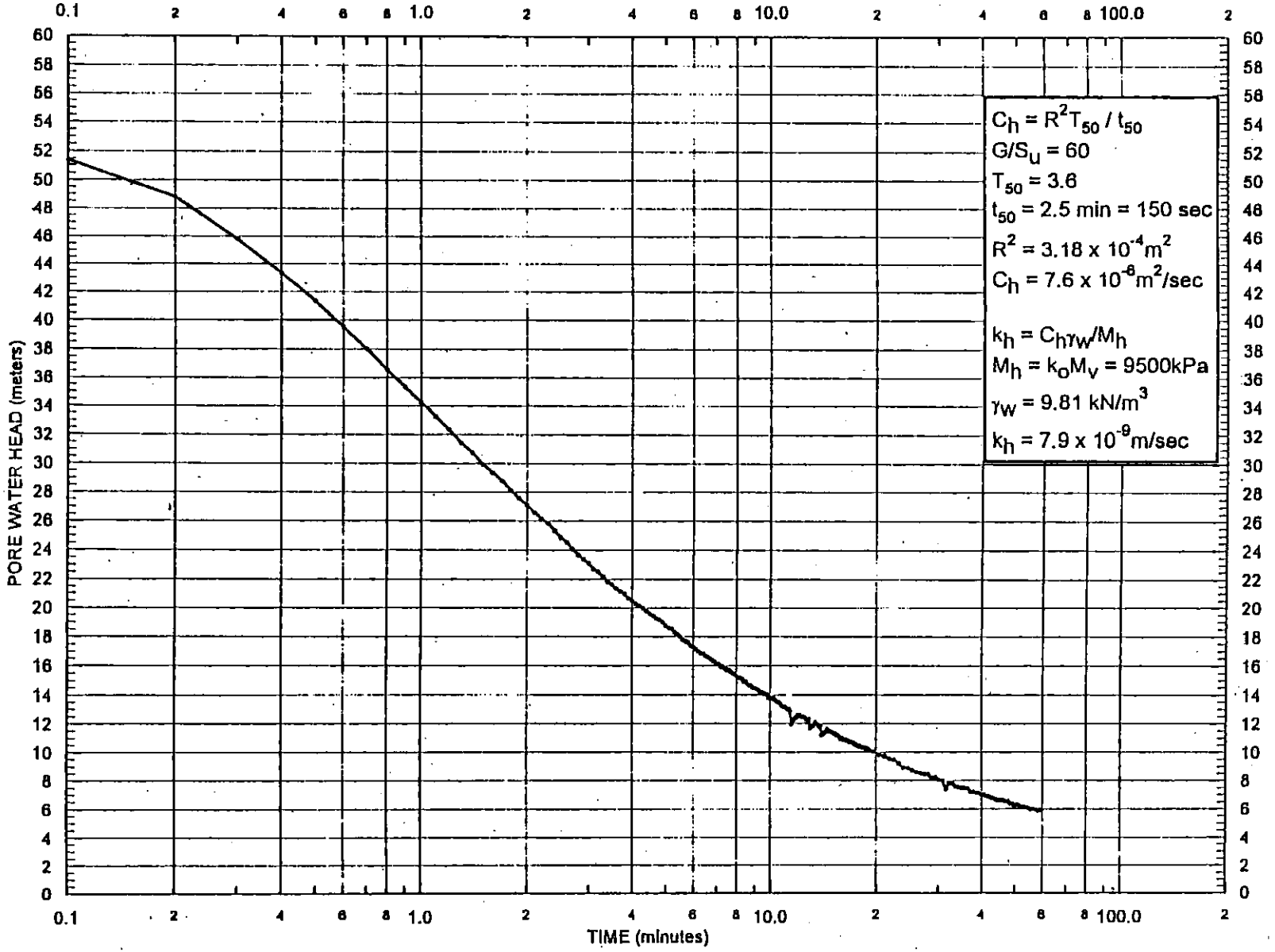


PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

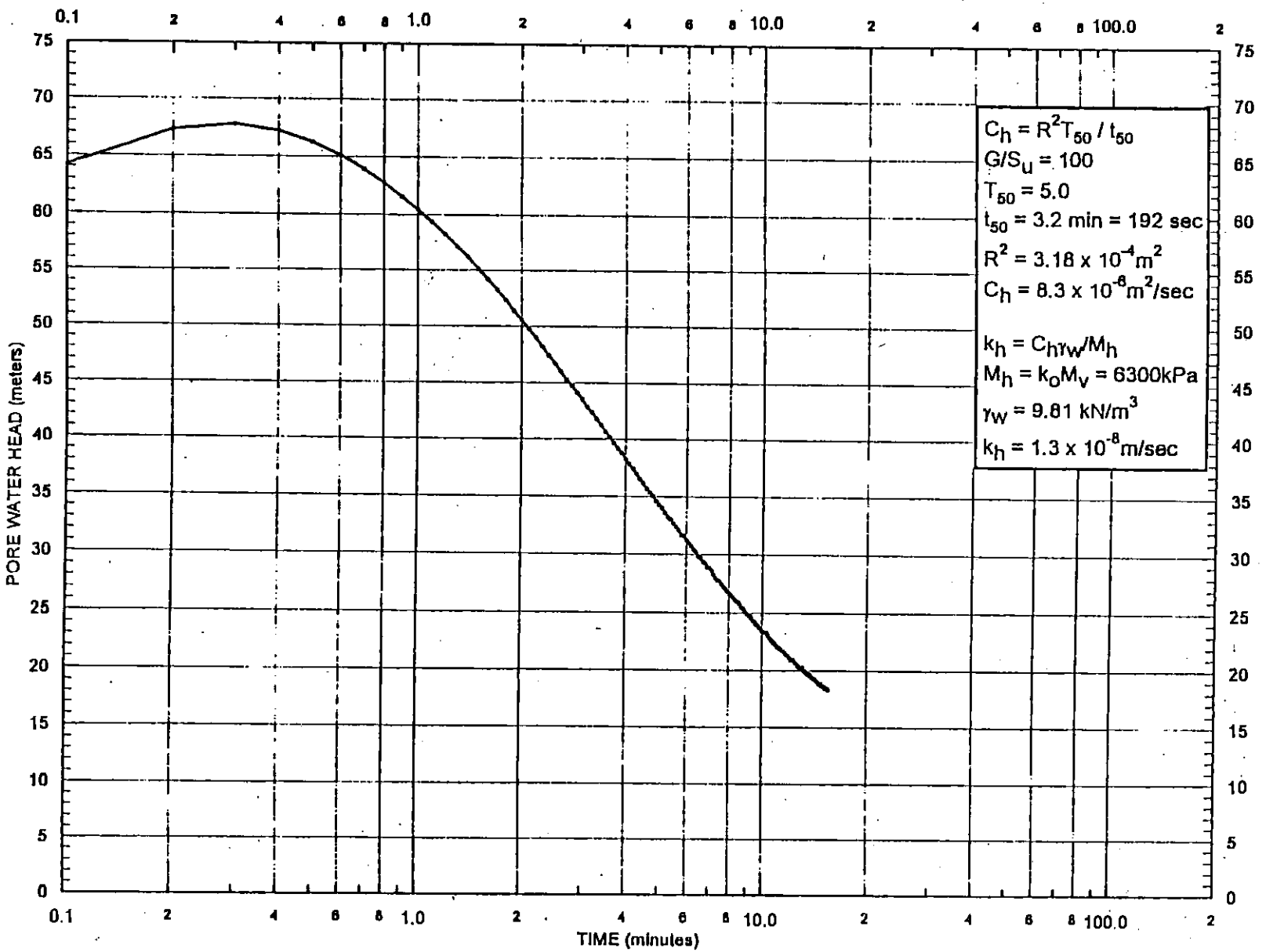
INSITU SOIL TESTING, LLC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-12-98

SOUNDING: CPT-15

CPT DISSIPATION TEST RESULTS



Depth = 21.2 m



PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

CPT DISSIPATION TEST RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-12-98

SOUNDING
CPT-15

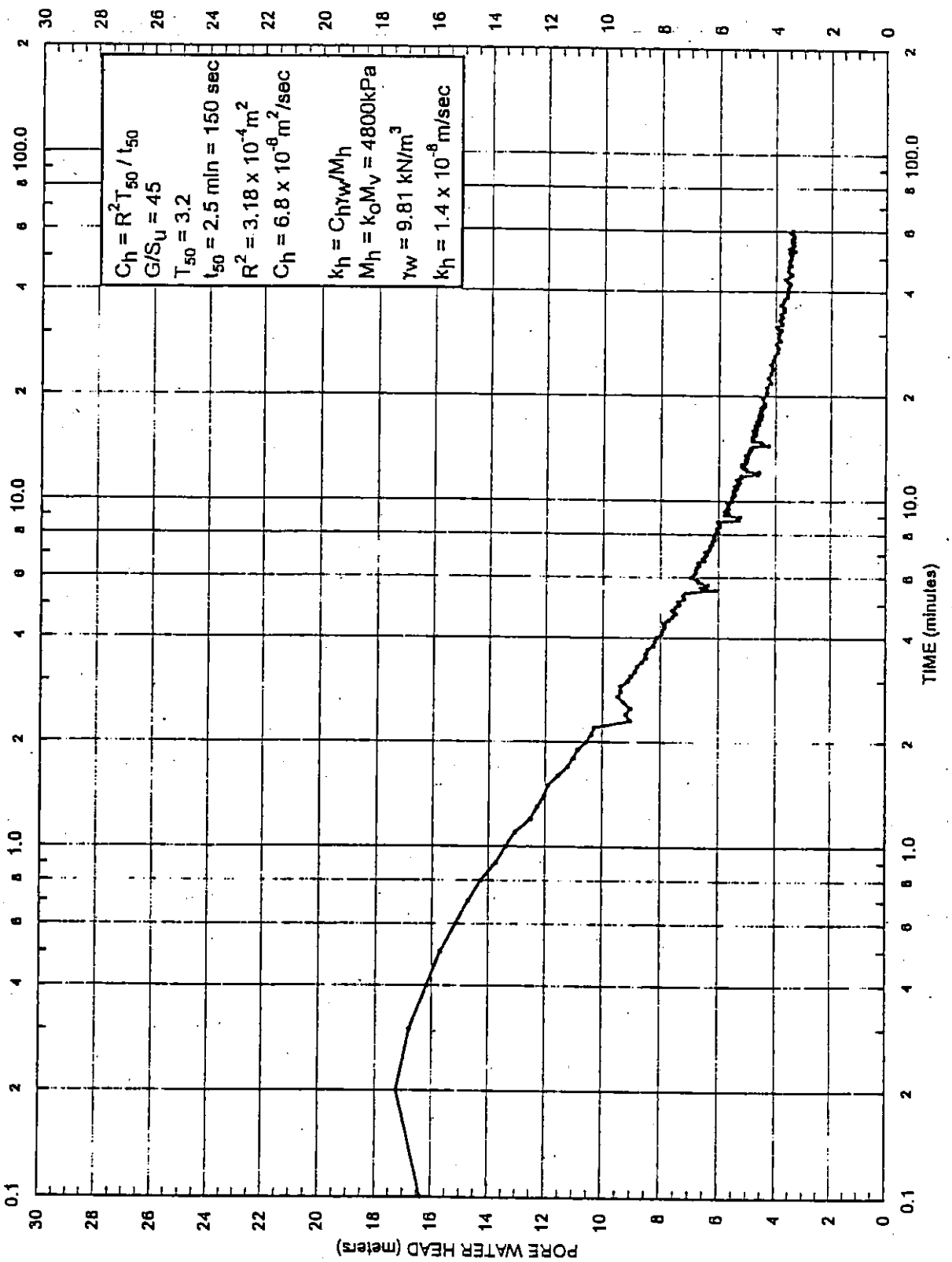
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 8-13-98

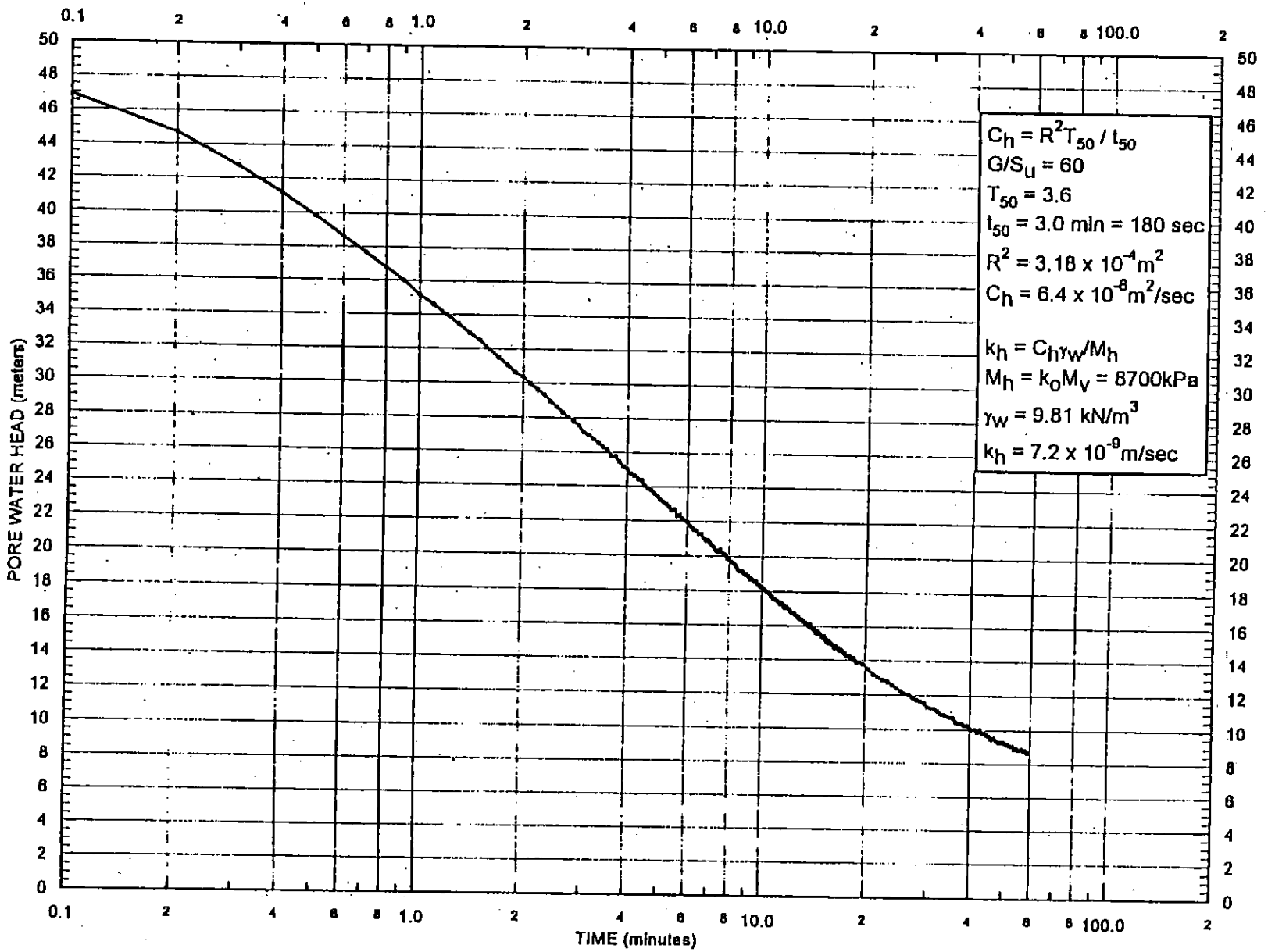
SOUNDING
CPT-16

CPT DISSIPATION TEST RESULTS

Depth = 6.4 m



Depth = 12.2 m



PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

CPT DISSIPATION TEST RESULTS

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-13-98

SOUNDING
CPT-16

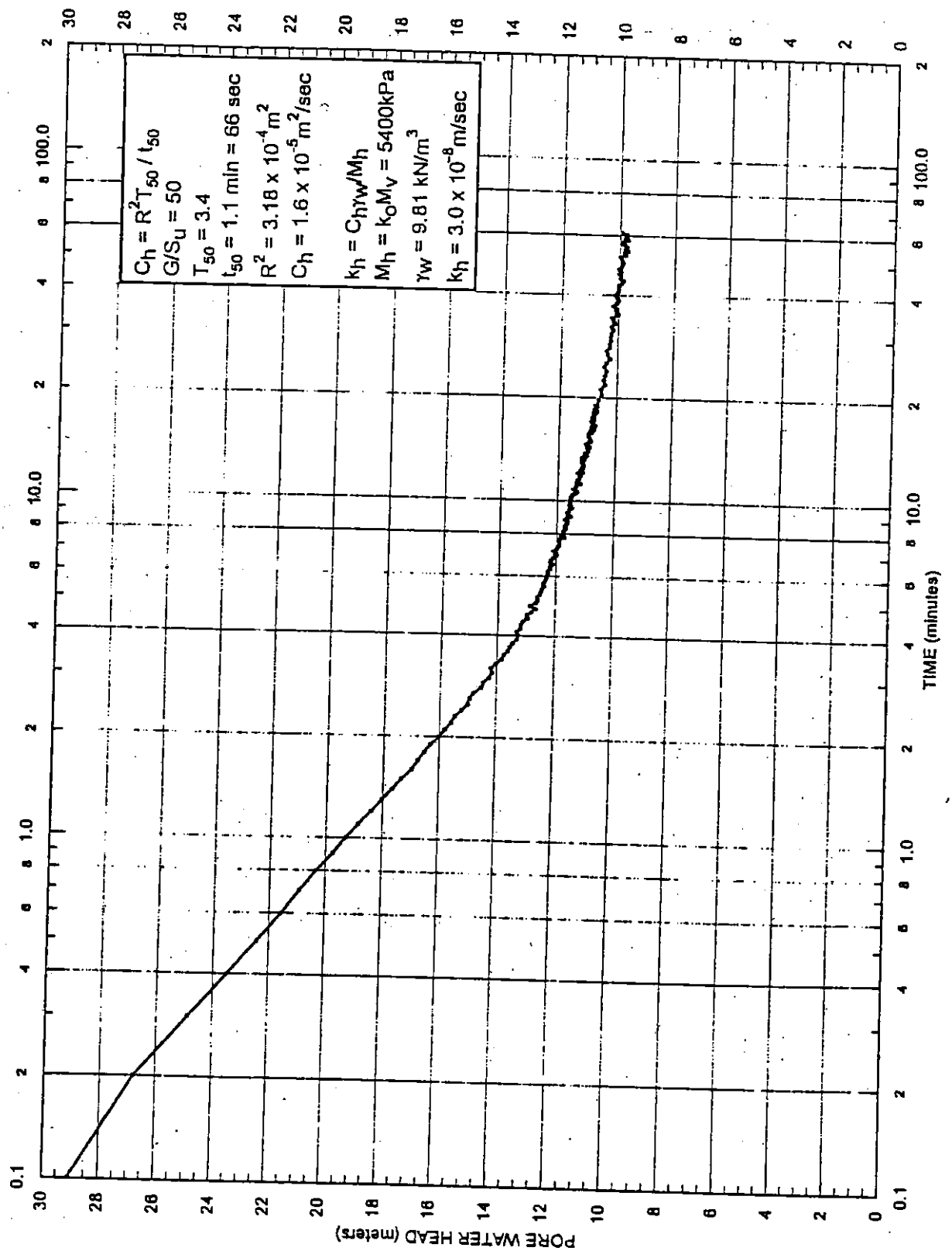
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-13-98

SOUNDING
CPT-16

CPT DISSIPATION TEST RESULTS

Depth = 18.2 m



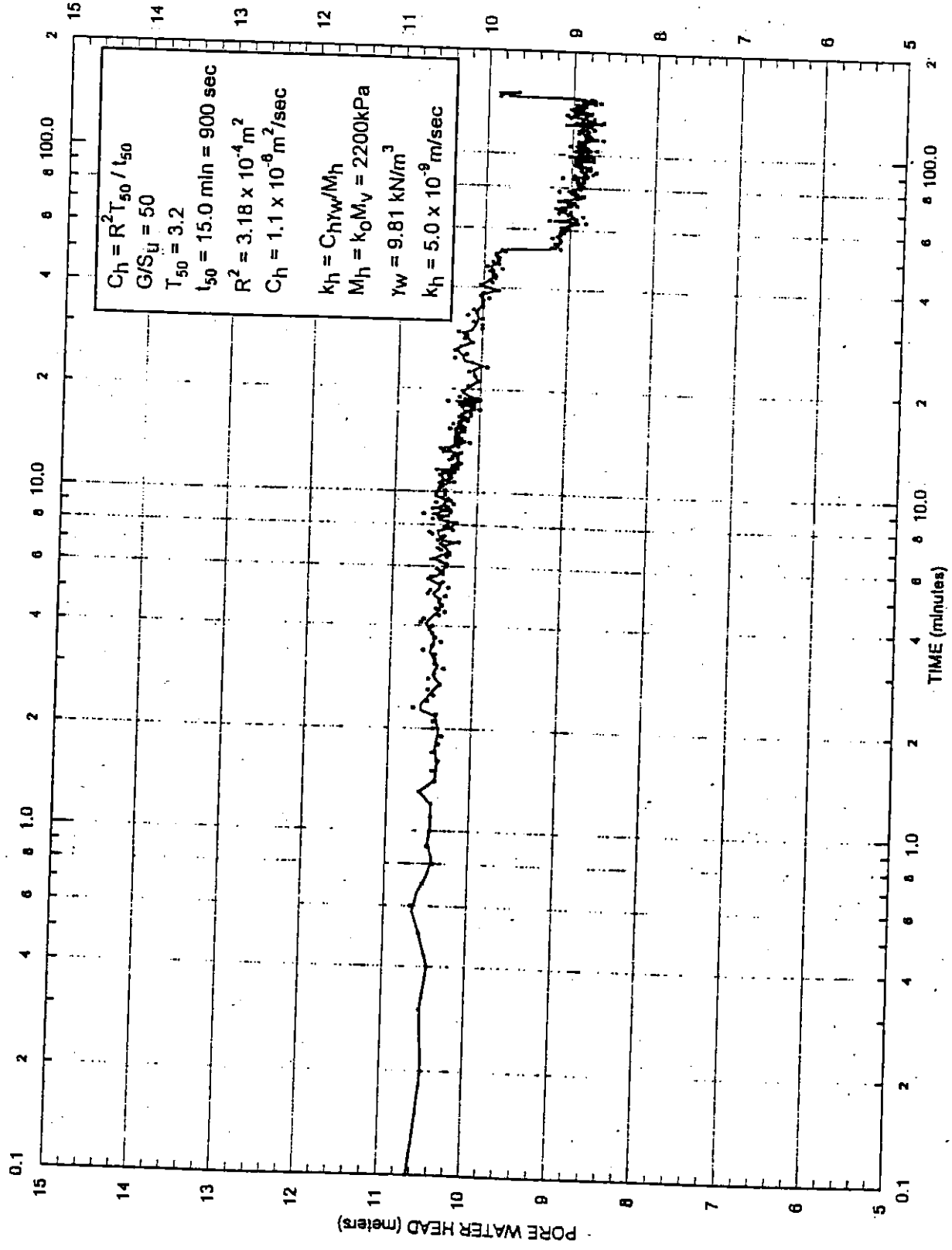
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Faltnezger
SOUNDING DATE: 11-20-98

SOUNDING
CPT-18

CPT DISSIPATION TEST RESULTS

Depth = 7.0 m



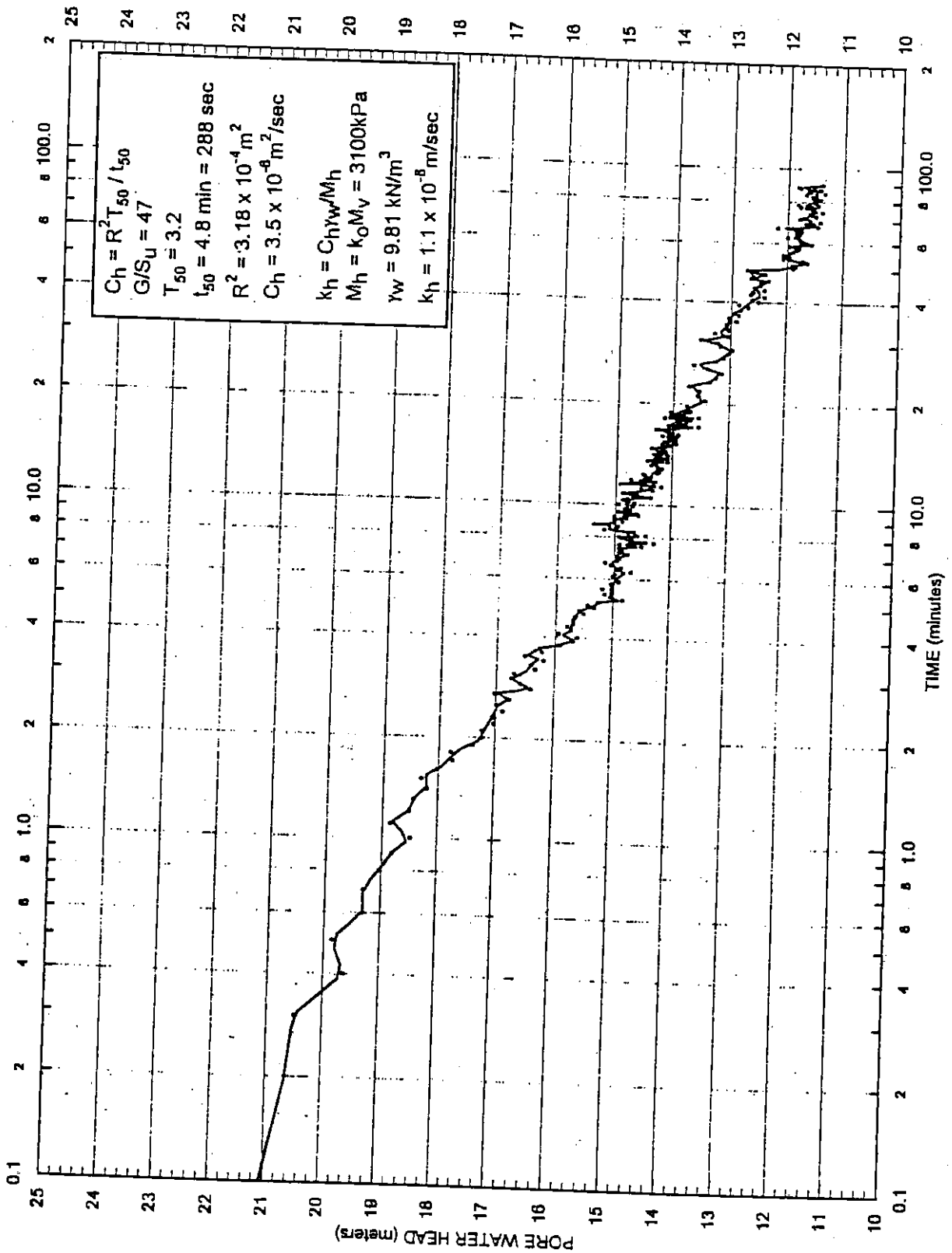
PROJECT: Cherry Island Landfill
LOCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 11-20-98

SOUNDING
CPT-18

CPT DISSIPATION TEST RESULTS

Depth = 10.1 m



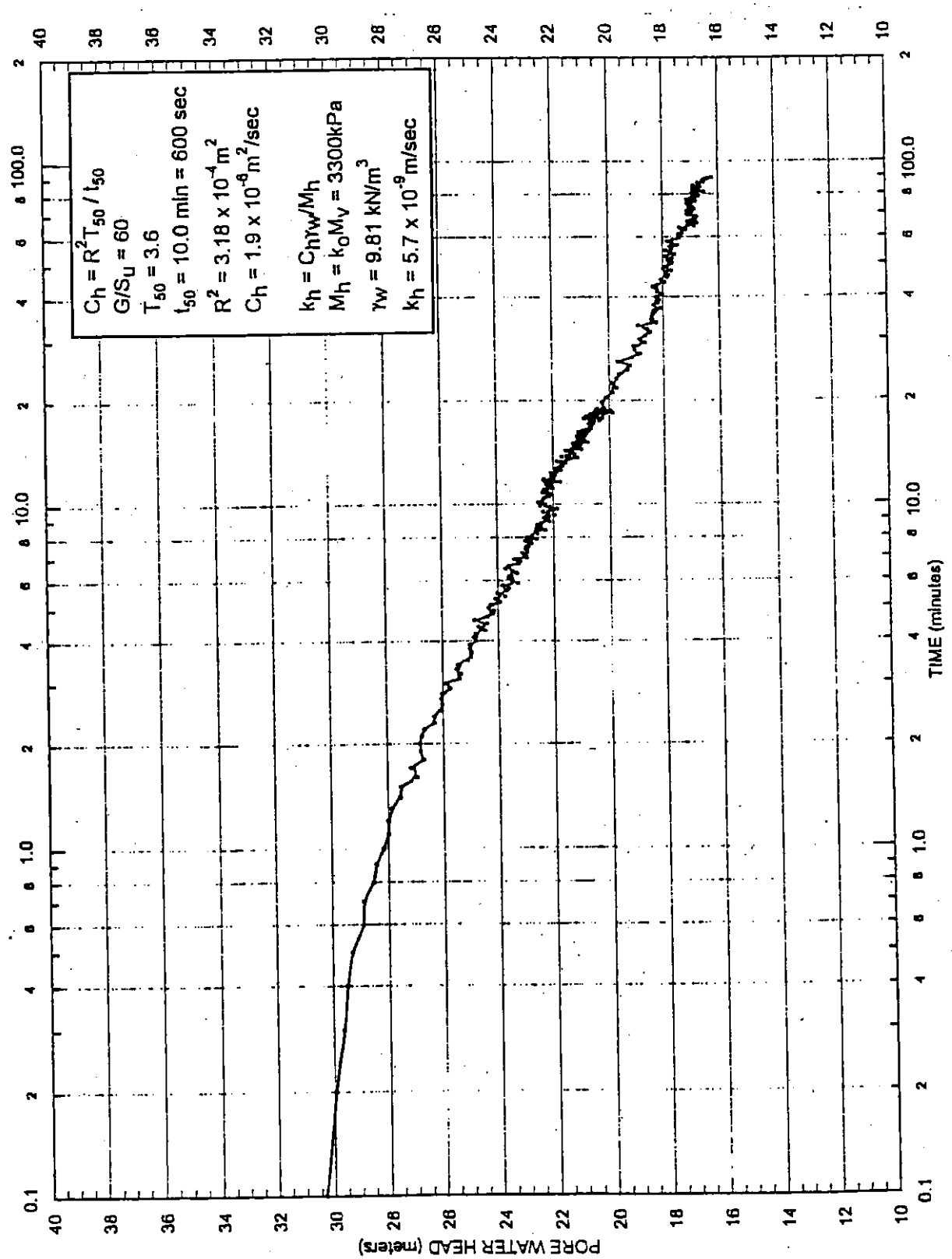
ROJECT: Cherry Island Landfill
OCATION: Wilmington, Delaware

IN-SITU SOIL TESTING, L.C.
ENGINEER: R. Failmezger
SOUNDING DATE: 11-20-98

SOUNDING
CPT-18

CPT DISSIPATION TEST RESULTS

Depth = 14.1 m



EXISTING GEOPHYSICAL INFORMATION

P-1
D.S.W.A.
CHERRY ISLAND

DELAWARE GEOLOGICAL SURVEY

ELECTRIC LOG

WELL Cd24-11

OWNER Delaware Solid Waste Authority

AREA Cherry Island

COUNTY New Castle STATE Delaware

EQUIP. USED: Logmaster

COORDINATES: _____

N _____

ELEVATION: _____

D.F. _____

K.B. _____

G.L. 11.9

LOG MEASURED FROM _____, _____ FT. ABOVE G.L.

	RUN NO. 1	RUN NO. 2	RUN NO. 3
DATE	9/10/81		
FIRST READING	5'		
LAST READING	194'		
FOOTAGE LOGGED	189'		
BOTTOM (DRILLER)	194'		
CASING (FROM LOG)			
CASING (DRILLER)			
CASING SIZE			
BIT SIZE:			
BIT SIZE:			

SURFACE TEMP.: _____ AT _____ R_m: _____

LOGGED BY J. Talley WITNESSED BY Bruce Benish

REMARKS _____

POTENTIAL +

50 mv/inch

TEMPERATURE LOG

____ °F/inch

RESISTIVITY

Single point _____ ohms/inch
16" normal _____ ohm-m/inch
64" normal _____ ohm-m/inch
6' lateral _____ ohm-m/inch
Differential S.P. 5 ohms/inch

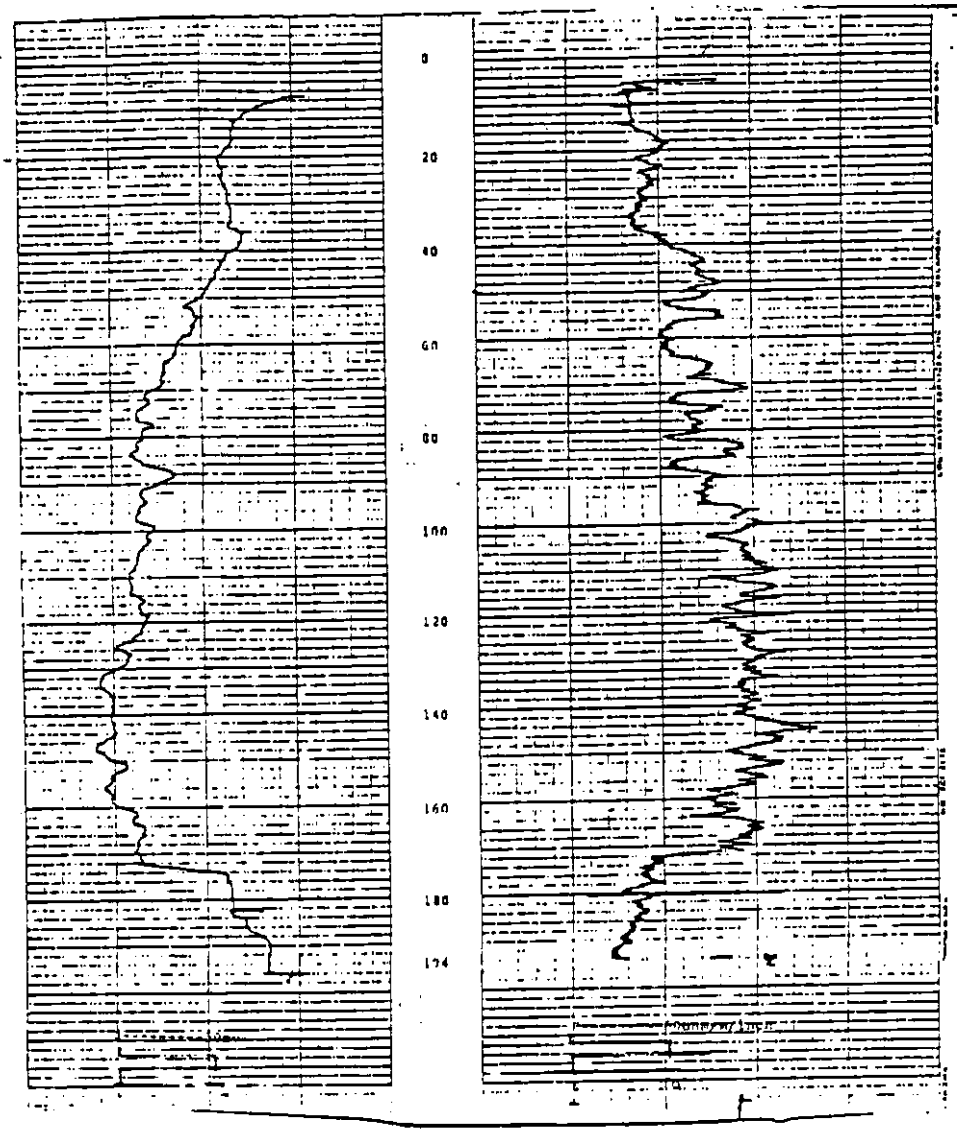


TABLE B-1

GE 'SICAL INTERPRETATIONS

GSE	Well No.	ation Contact Depth (feet) Recent[1]	Columbia	Potomac	Weathered Rock
16'	P-100	0 - 21	21 - 35	35 - 95	95
35'	P-101	6 - 60	60 - 104	104 - 162	162
26'	P-102	0 - 38	38 - 78	78 - 192	192
11'	P-103	0 - 98	98 - 103	103 - 109	109
~10'	P-104	0 - 52	52 - 120	120 - 158	158
21'	P-105	0 - 63	63 - 81	81 - 214	214
27.6'	P-106	0 - 28	28 - 80	80 - 224	224
10.5'	P-107	0 - 44	44 - 61	61	---
27.2'	P-108	0 - 31	31 - 80	80 - 223	223

~66 Based on P103 109

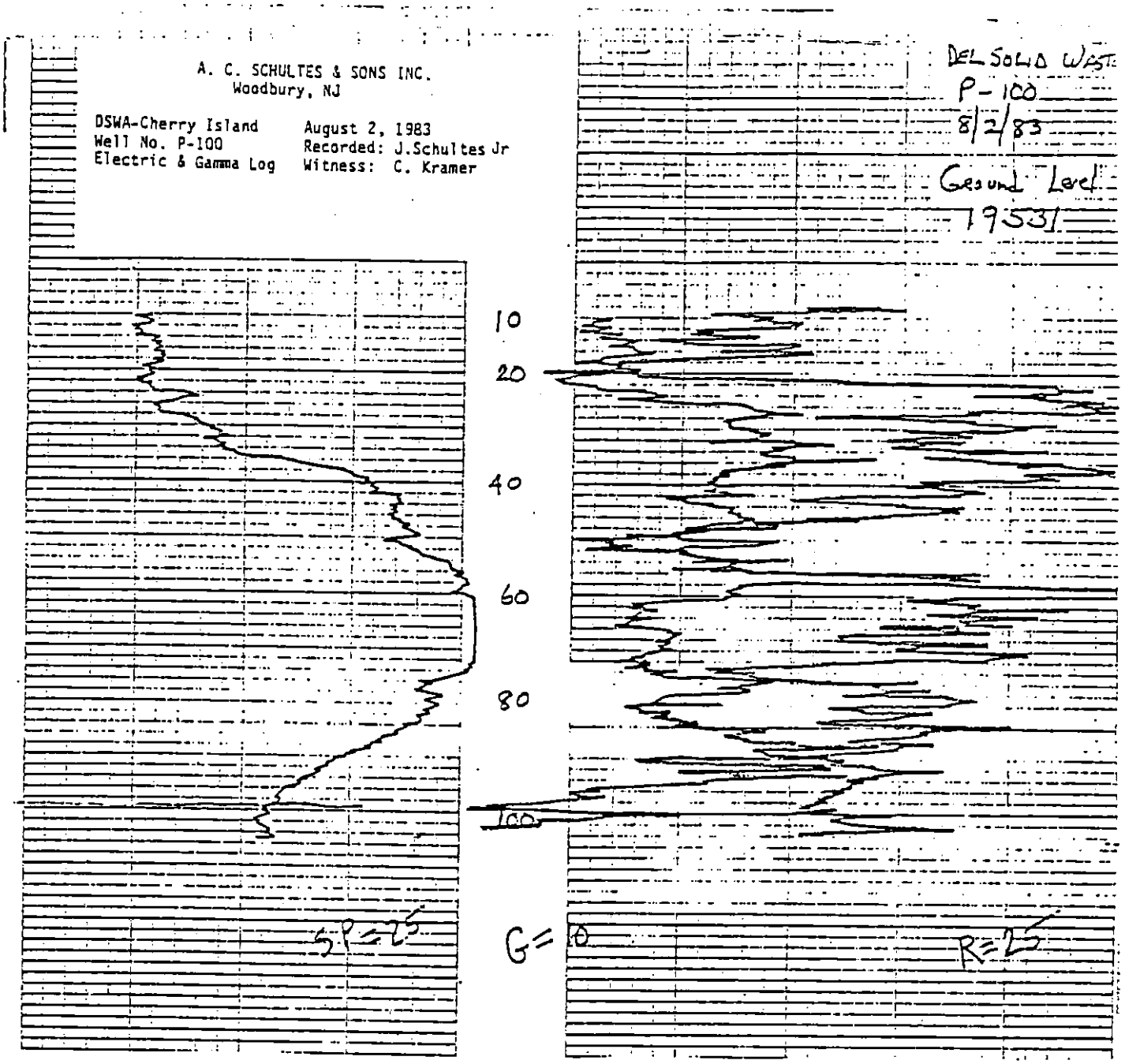
[1] Recent includes dredge spoil deposits

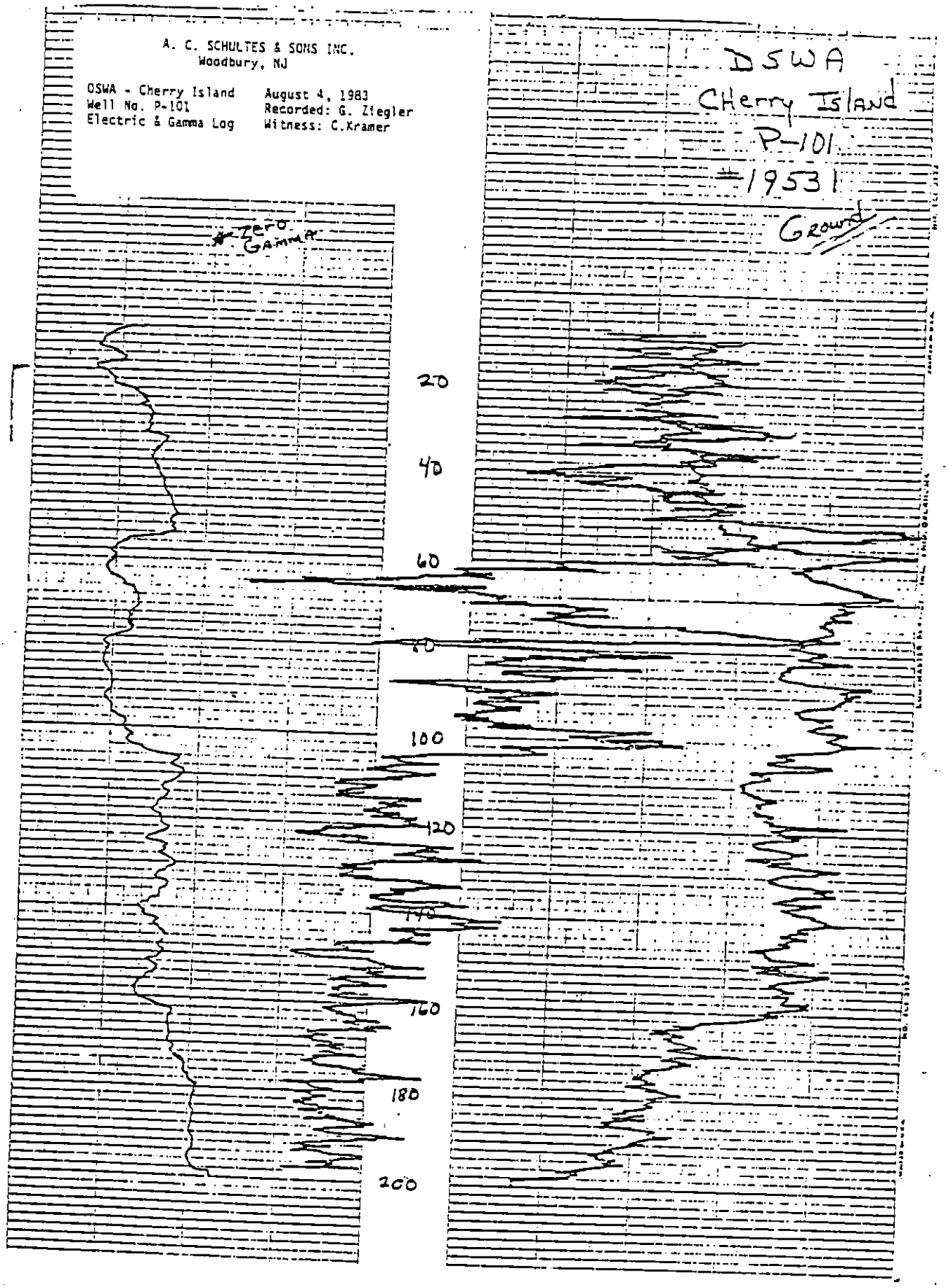
A. C. SCHULTES & SONS INC.
Woodbury, NJ

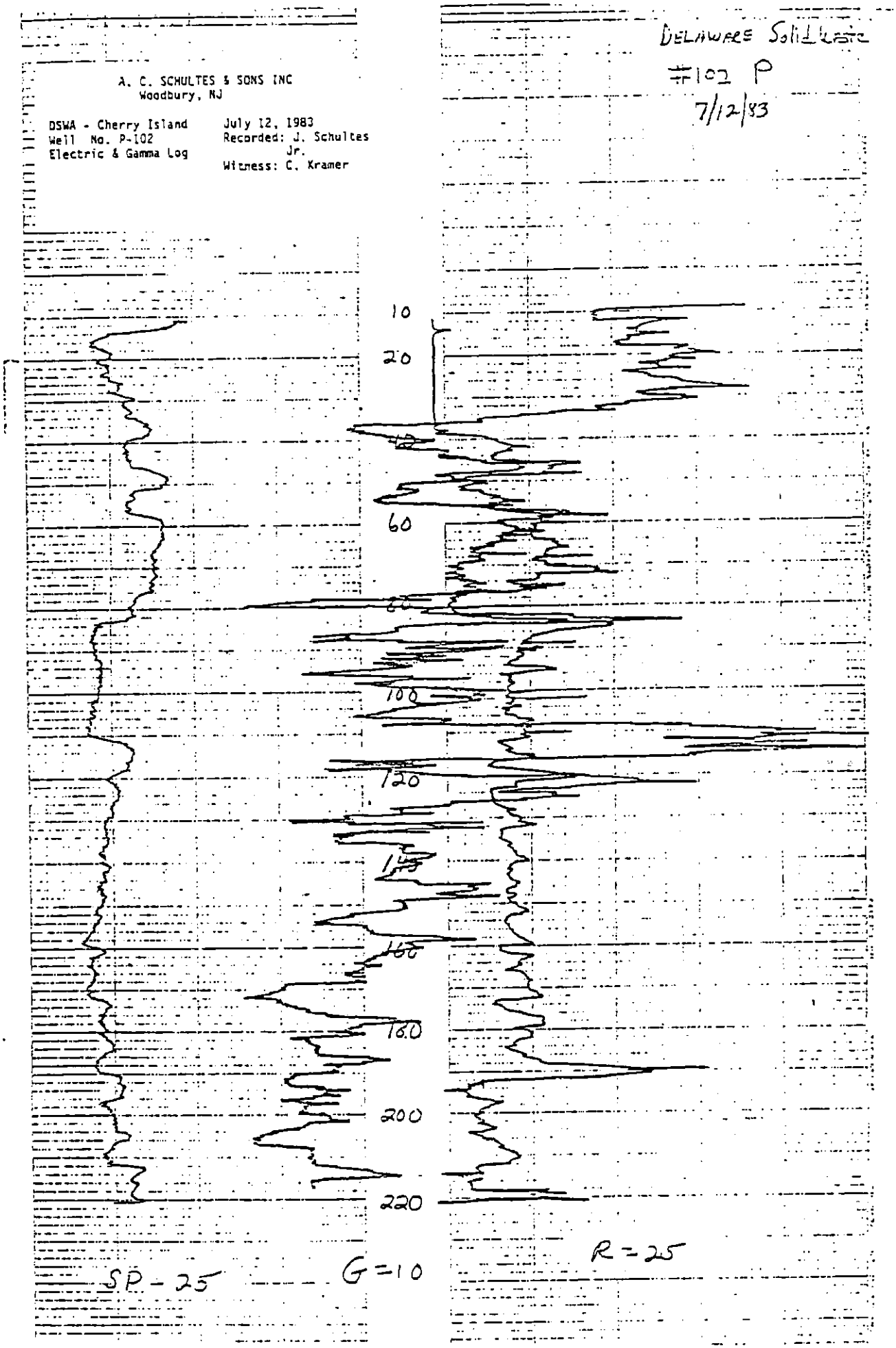
DSWA-Cherry Island
Well No. P-100
Electric & Gamma Log

August 2, 1983
Recorded: J.Schultes Jr
Witness: C. Kramer

DEL SOLID WASTE
P-100
8/2/83
Ground Level
19531




A. C. SCHULTES & SONS INC.
Woodbury, NJ
OSWA - Cherry Island
Well No. P-101
Electric & Gamma Log
August 4, 1983
Recorded: G. Ziegler
Witness: C.Kramer
DSWA
Cherry Island
P-101
#19531
Ground
Zero Gamma
20
40
60
80
100
120
140
160
180
200

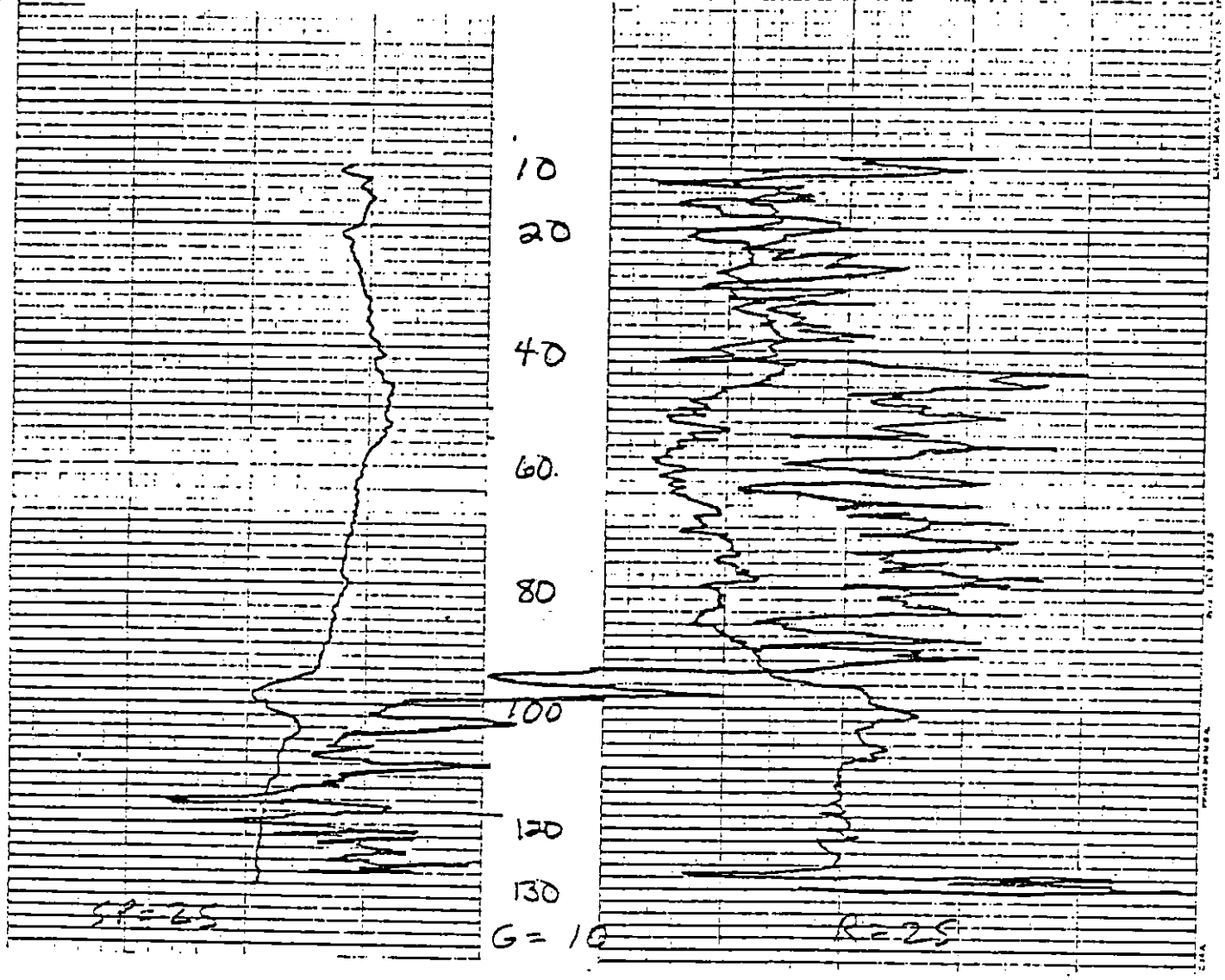

A. C. SCHULTES & SONS INC
Woodbury, NJ
DSWA - Cherry Island
Well No. P-102
Electric & Gamma Log
July 12, 1983
Recorded: J. Schultes Jr.
Witness: C. Kramer
DELAWARE Solid Waste
#102 P
7/12/83
10
20
60
100
120
160
200
220
SP - 25
G = 10
R = 25

A. C. SCHULTES & SONS INC
Woodbury, NJ

DSWA - Cherry Island
Well No. P-103
Electric & Gamma Log

July 28, 1983
Recorded: G. Ziegler
Witness: C. Kramer

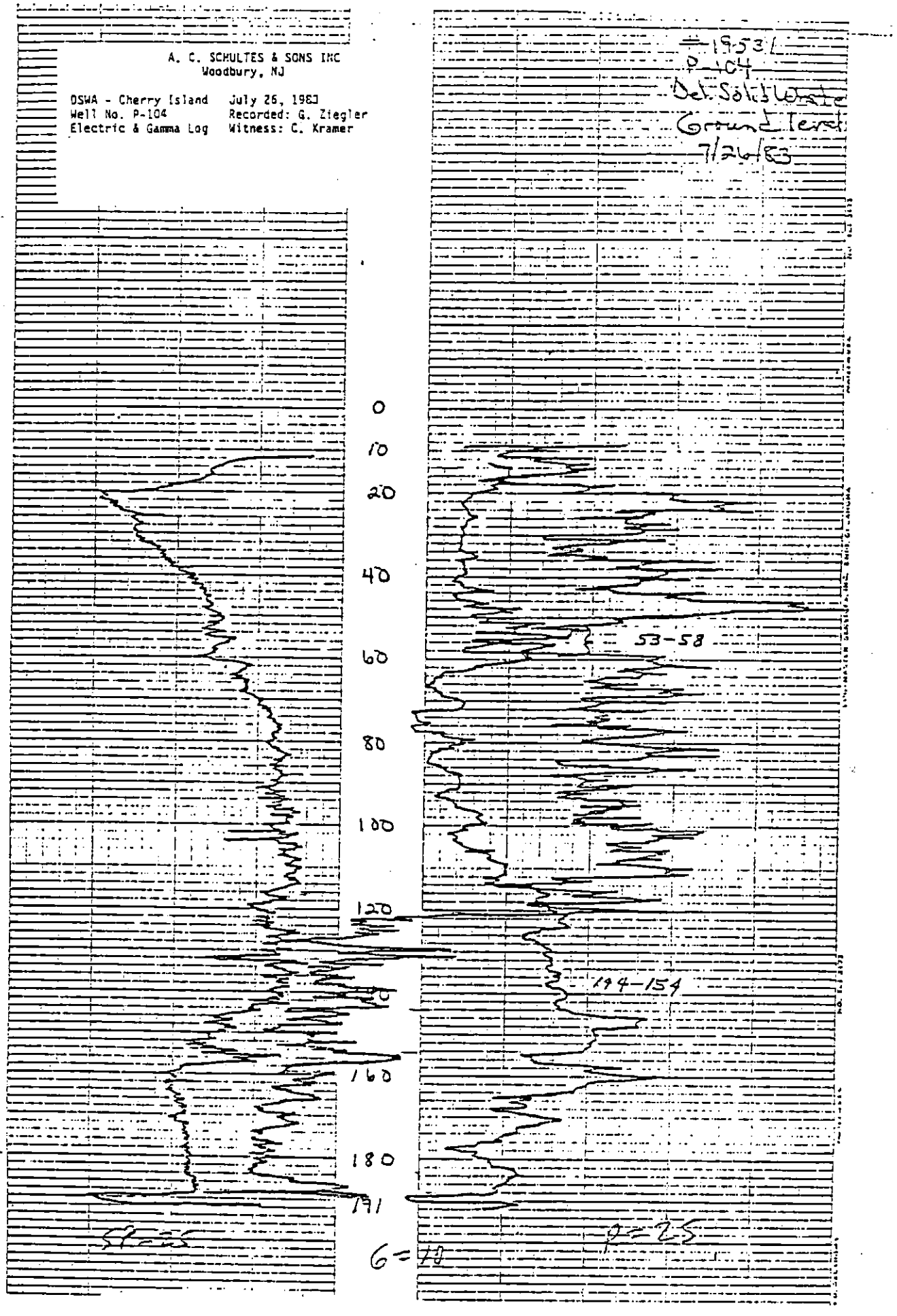
P-103
Del. Solid Waste Auth.
19531



A. C. SCHULTES & SONS INC
Woodbury, NJ

DSWA - Cherry Island
Well No. P-104
Electric & Gamma Log

July 26, 1983
Recorded: G. Ziegler
Witness: C. Kramer

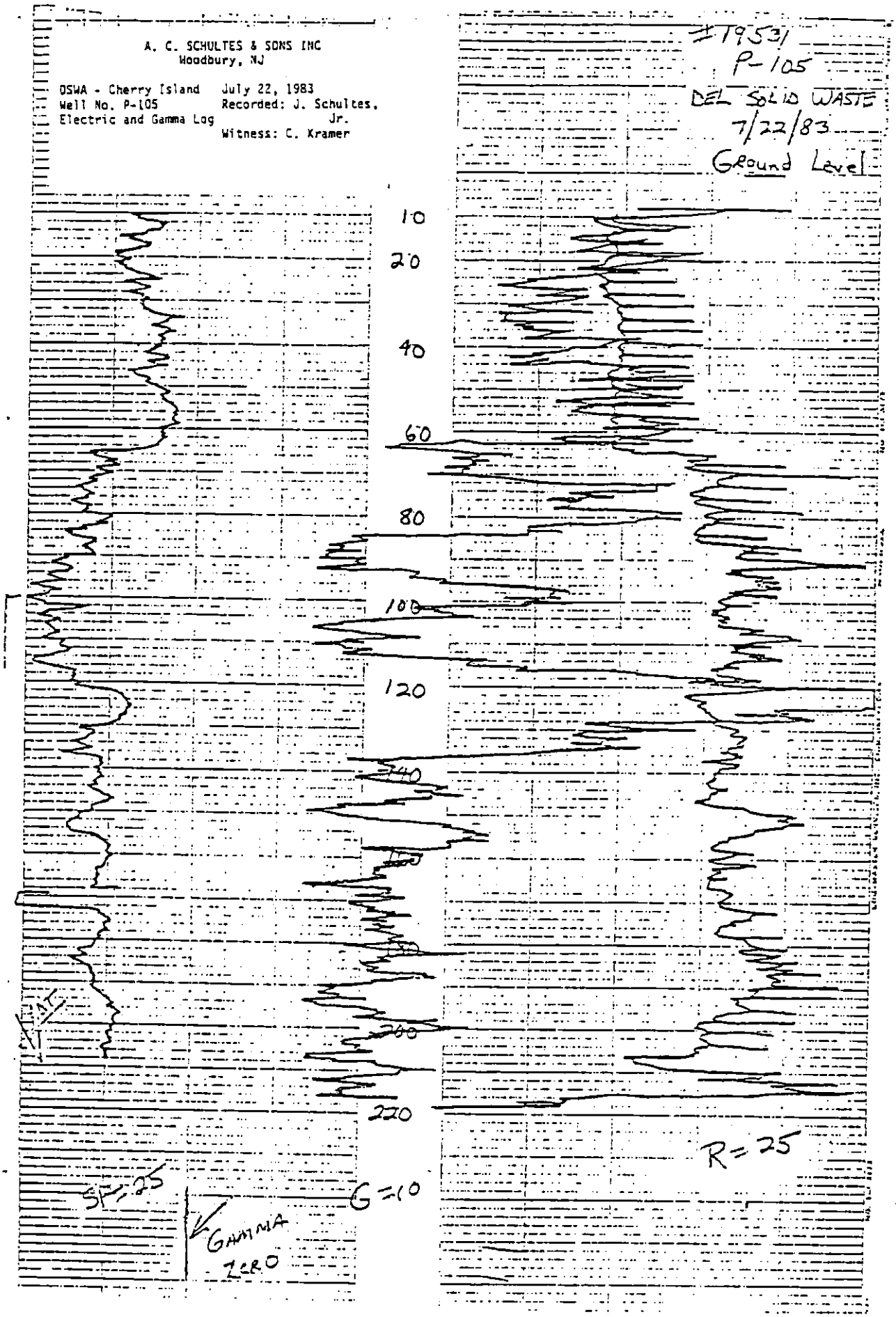


A. C. SCHULTES & SONS INC
Woodbury, NJ

OSWA - Cherry Island
Well No. P-105
Electric and Gamma Log

July 22, 1983
Recorded: J. Schultes, Jr.
Witness: C. Kramer

#19531
P-105
DEL SOLID WASTE
7/22/83
Ground Level

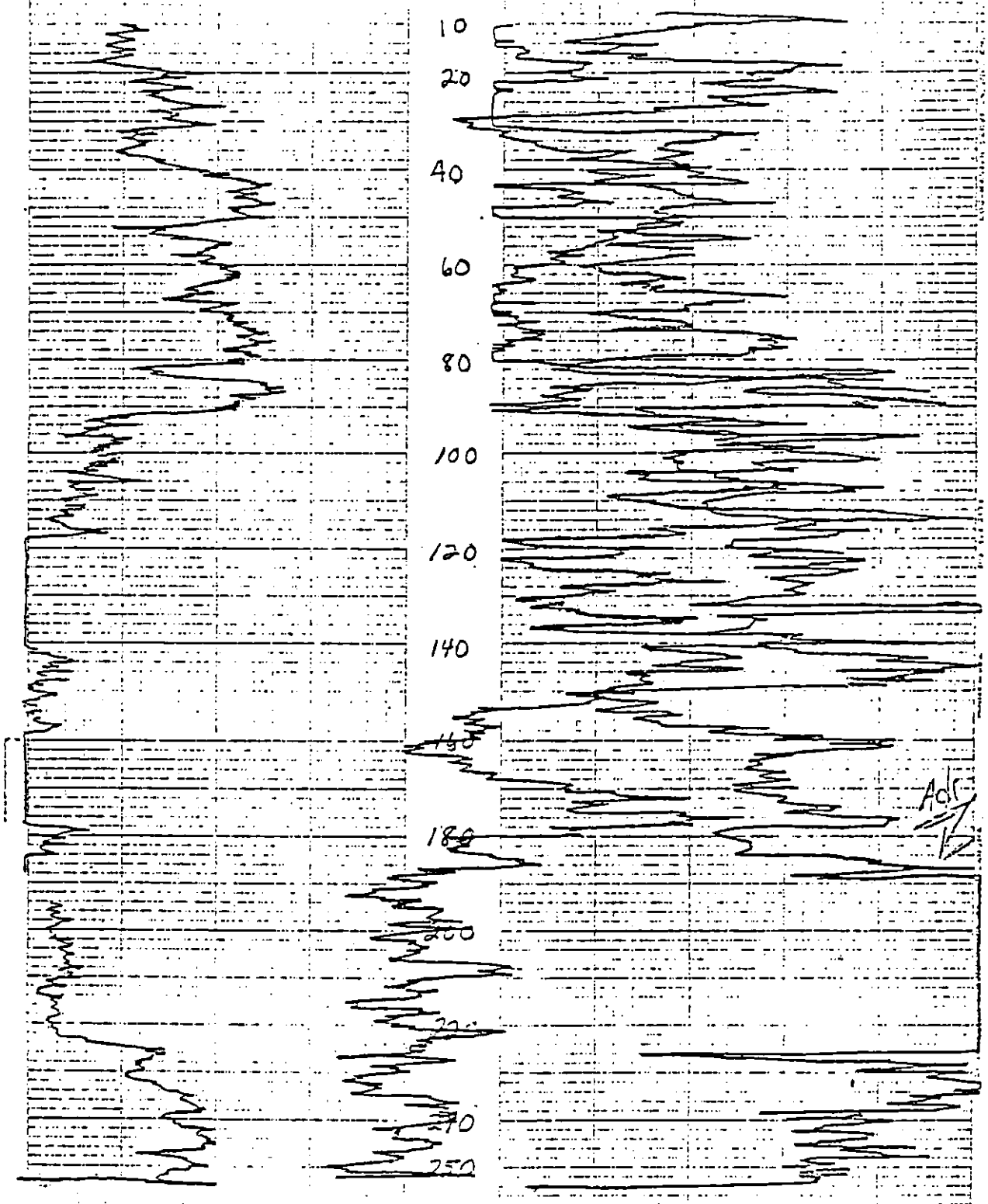


A. C. SCHULTES & SONS INC
Woodbury, NJ

DSWA - Cherry Island
Well No. P-106
Electric & Gamma Log

July 19, 1983
Recorded: J. Schultes, Jr.
Witness: C. Kramer

Delaware Schedule
P-106
7/19/83
(953)
Ground Level



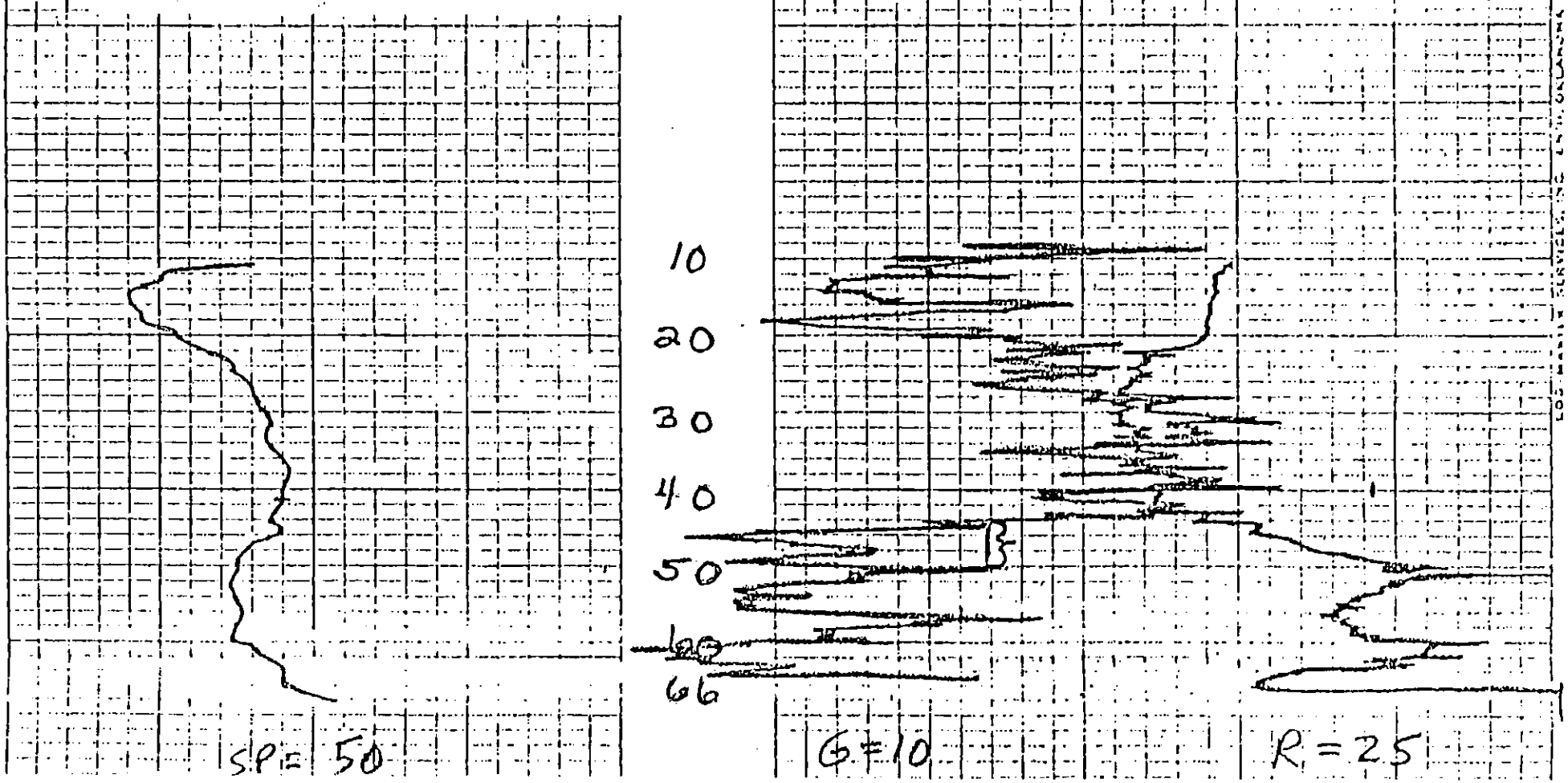
SP = 25 G = 10 R = 10

A. C. SCHULTES & SONS INC
Woodbury, NJ

DSWA - Cherry Island
Well no. P107
Electric & Gamma Log

August 1, 1983
Recorded: G.Ziegler
Witness: C. Kramer

Delaware Solid
19531
P-107
Ground Level
8/1/83

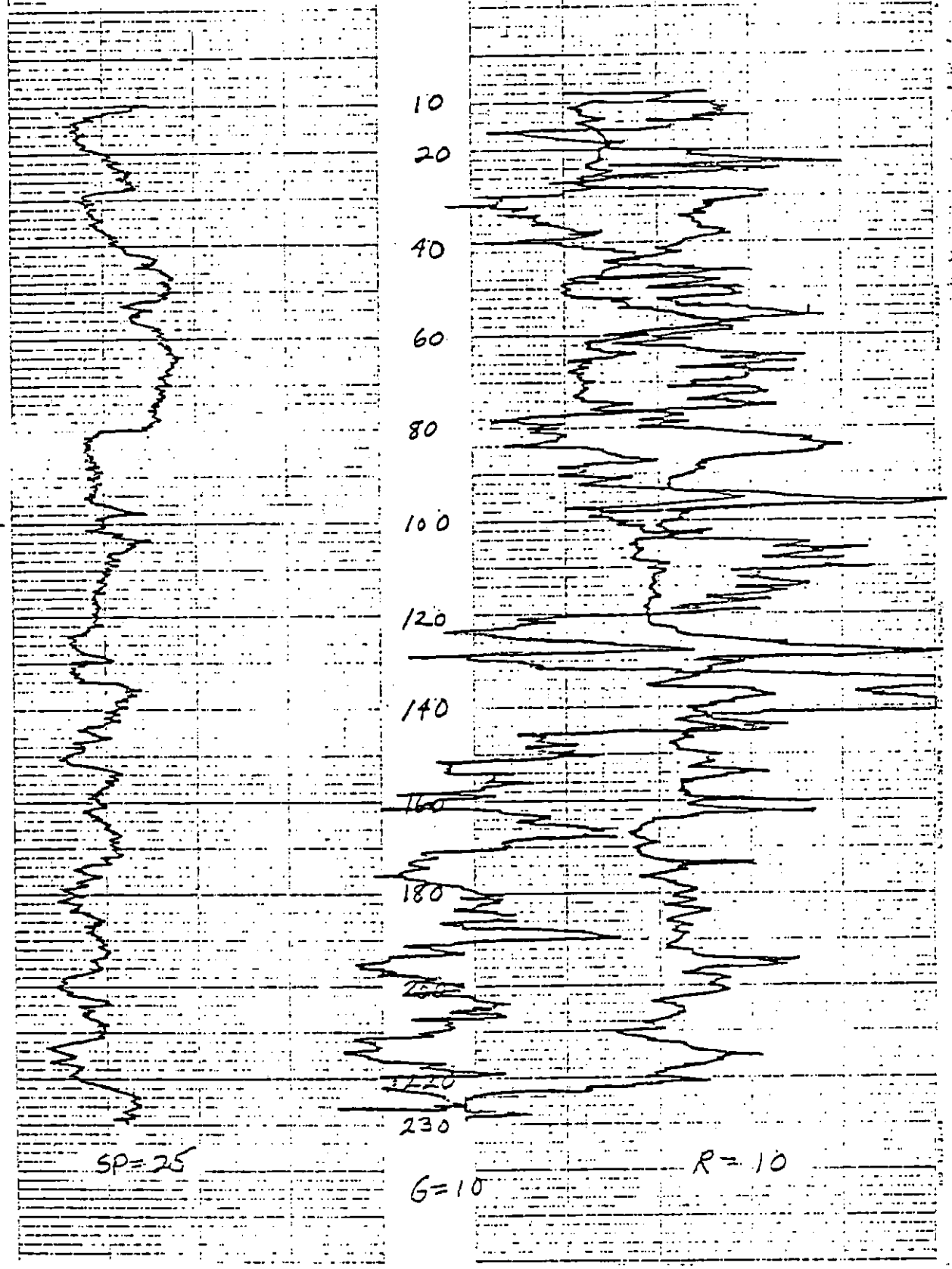


A. C. Schultes & Sons Inc
Woodbury, NJ

DSWA - Cherry Island
Well No. P-108
Electric & Gamma Log

July 14, 1983
Recorded: J. Schultes, Jr.
Witness: C. Kramer

P-108
DEL. SOLID WASTE
Cherry Island
Ground Level
7/14/83
19531



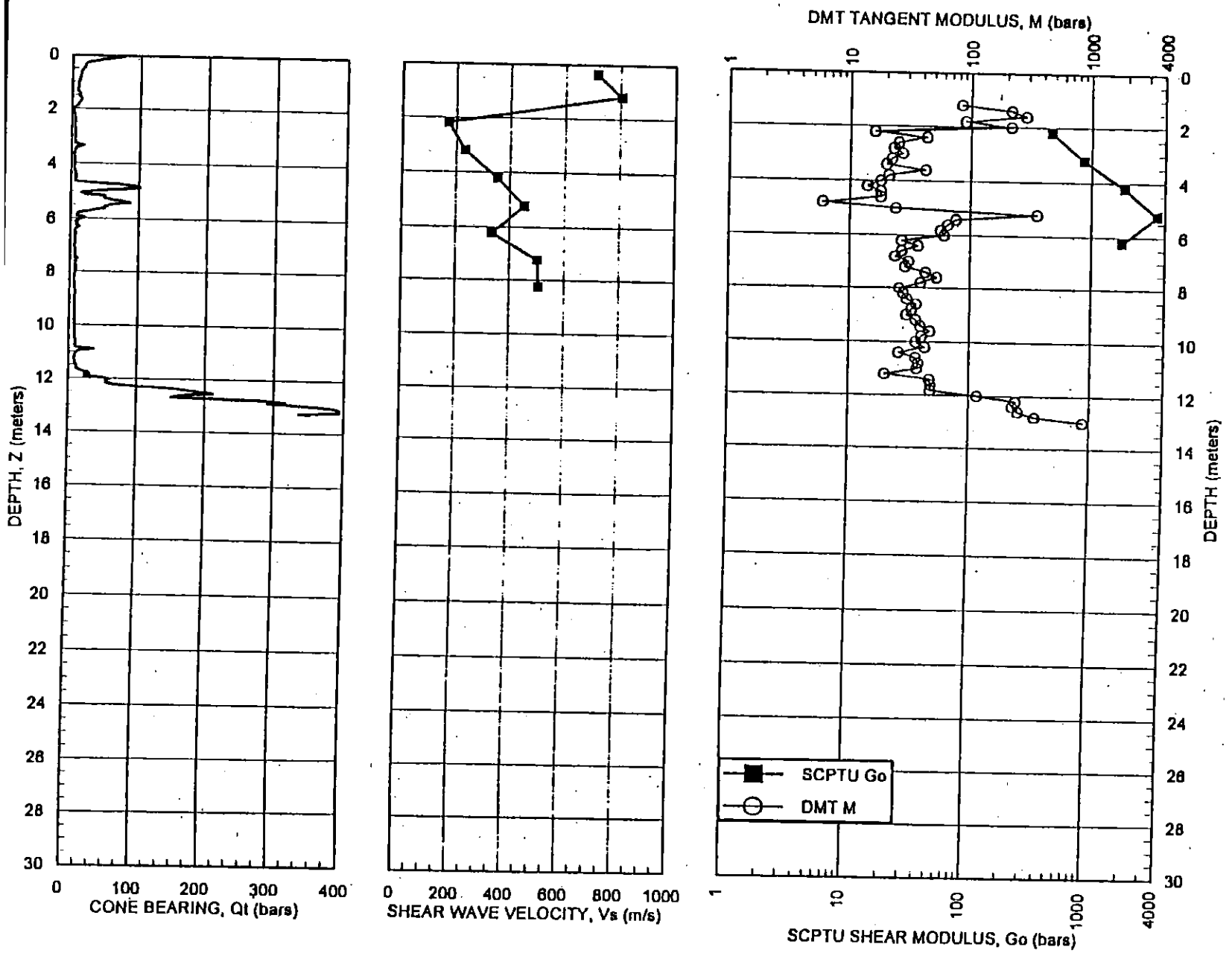
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

INSITU SOIL TESTING, L.C.
ENGINEER: R. Fallmeyer
SOUNDING DATE: 8-21-98

SOUNDING
SCPT-19

SEISMIC CONE TEST RESULTS

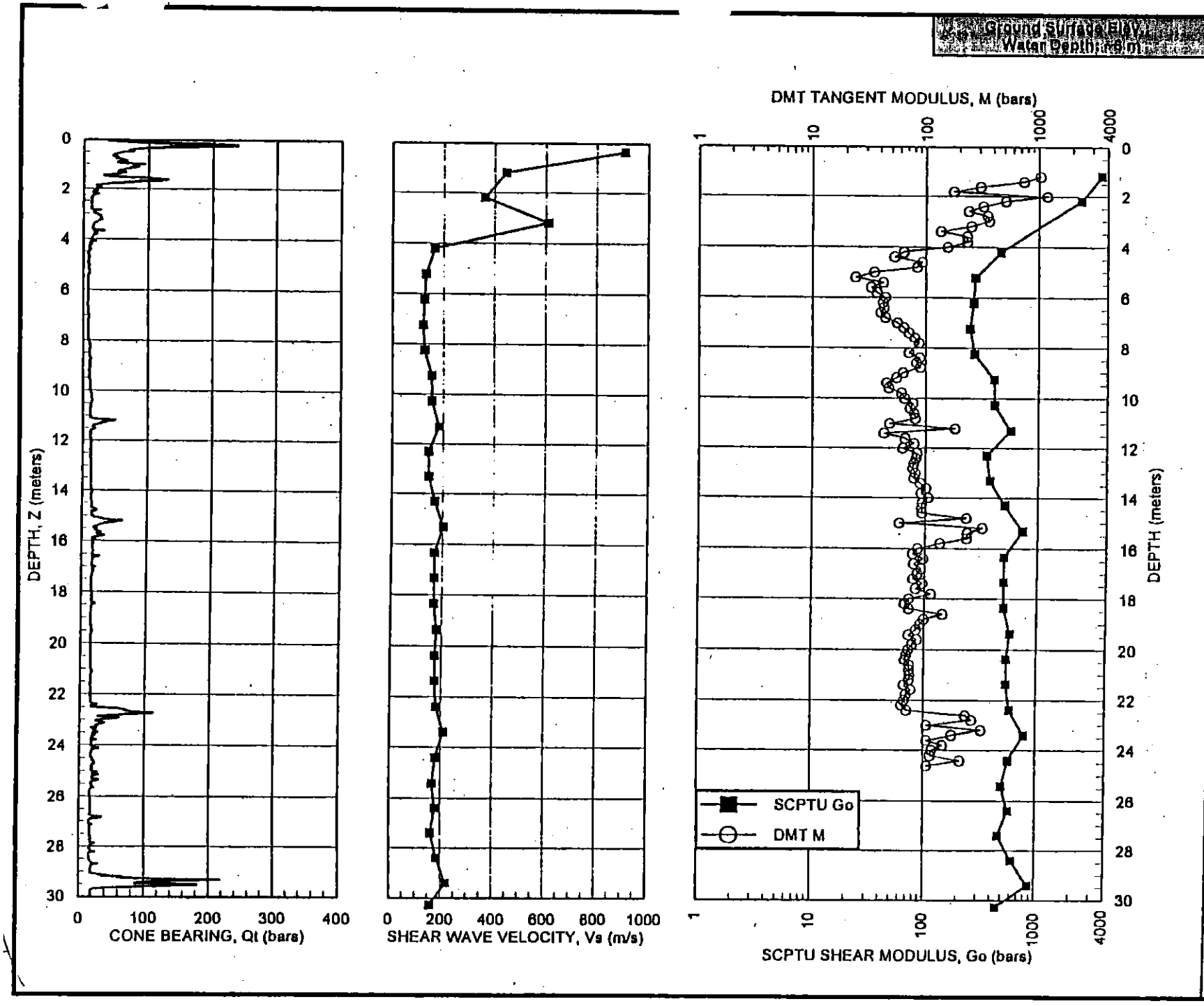
Ground Surface Elev.
Water Depth = 3.2 m



SEISMIC TESTS -- SOUNDING NO. SCPT-19 Cherry Island Landfill

Horizontal Distance for S-Wave 2.75 ft = 0.84 m
Distance of Geophones above Tip 0.67 ft = 0.20 m

Tip Depth (ft)	Tip Depth (m)	Unit Wt. (kN/m³)	S-Wave Distance (m)	S1 or S2 Wave Arrival Times (msec) First	Peak	Valley	Method (P,P,V)	Delta Time (msec)	Shear Wave Velocity (m/s)	Go (bars)	Average Vs (m/s)	Average Go (bars)
2.873	0.88	1.9	1.07	1.5			F	1.5	716	9741		
6.186	1.89	1.7	1.88	2.5	4.9		F	1	805	11007	751	9600
9.495	2.89	1.6	2.62	8	9.8		F	5.5	171	466		
12.801	3.90	1.6	3.79		14	18	P	4.2	232	860		
16.108	4.91	1.5	4.76			20.8	V	2.8	353	1869		
19.416	5.92	1.7	5.78			23	V	2.2	452	3480		
22.735	6.93	1.6	6.78			26	V	3	334	1787	277	1226
28.054	7.94	1.6	7.78			28	V	2	502	4039		
29.391	8.96	1.6	8.79			30	V	2	506	4096	504	4067



PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

SEISMIC CONE TEST RESULTS

IN-SITU SOIL TESTING, LLC
ENGINEER: R. Fallmezger
SOUNDING DATE: 8-21-98

SOUNDING
SCPT-14

SEISMIC TESTS -- SOUNDING NO. SCPT-14 Cherry Island Landfill

Horizontal Distance for S-Wave 2.83 ft = 0.86 m
Distance of Geophones above Tip 0.67 ft = 0.20 m

Tip Depth (ft)	Tip Depth (m)	ρ (kN/m³)	S-Wave Distance (m)	S1 or S2 Wave Arrival Times (msec) First	Peak	Valley	Method (F,P,V)	Delta Time (msec)	Shear Wave Velocity (m/s)	Go (bars)	Average Vs (m/s)	Average Go (bars)
2.86	0.87	1.9	1.09	1.2			F	1.2	909	15708		
6.19	1.89	1.8	1.89	3			F	1.8	444	3543		
9.51	2.90	1.8	2.83	5.6	8.6		F	2.6	361	2345		
12.82	3.91	1.8	3.80	8.8	10.2	19.6	P	1.6	610	6689	442	3521
16.13	4.92	1.7	4.79			25.6	V	6	165	461		
19.44	5.93	1.6	5.79			33.2	V	7.6	131	274		
22.75	6.94	1.7	6.79			41.2	V	8	125	265		
26.06	7.94	1.7	7.79			49.5	V	8.3	120	247		
29.39	8.96	1.7	8.80			57.5	V	8	126	271	132	295
32.70	9.97	1.7	9.80			64	V	6.5	155	406		
36.02	10.98	1.7	10.81			70.5	V	6.5	155	409		
39.33	11.99	1.7	11.82			76	V	5.5	183	568		
42.63	12.99	1.7	12.82			83	V	7	143	350		
45.94	14.00	1.8	13.83			90	V	7	144	373	155	431
49.26	15.01	1.8	14.84			96	V	6	168	509		
52.57	16.02	1.8	15.84			101	V	5	202	731		
55.88	17.03	1.8	16.85			107	V	6	168	508		
59.19	18.04	1.8	17.86			113	V	6	168	508		
62.51	19.05	1.8	18.87			119	V	6	168	509	174	544
65.82	20.06	1.8	19.88			124.6	V	5.6	180	583		
69.13	21.07	1.8	20.88			130.4	V	5.8	174	545		
72.45	22.08	1.8	21.89			136.2	V	5.8	174	546		
75.76	23.09	1.8	22.90			141.8	V	5.6	180	583		
79.05	24.10	1.8	23.91			146.6	V	4.8	209	786	183	600
82.34	25.10	1.8	24.91			152.2	V	5.6	179	575		
85.62	26.10	1.8	25.91			158.2	V	6	167	502		
88.91	27.10	1.8	26.91			163.8	V	5.6	179	575		
92.20	28.10	1.8	27.91			170	V	6.2	162	470		
95.48	29.10	1.8	28.91			175.4	V	5.4	185	616	174	543
98.80	30.11	1.8	29.92			180	V	4.6	220	870		
101.40	30.91	1.8	30.71			185	V	5	159	453	179	579

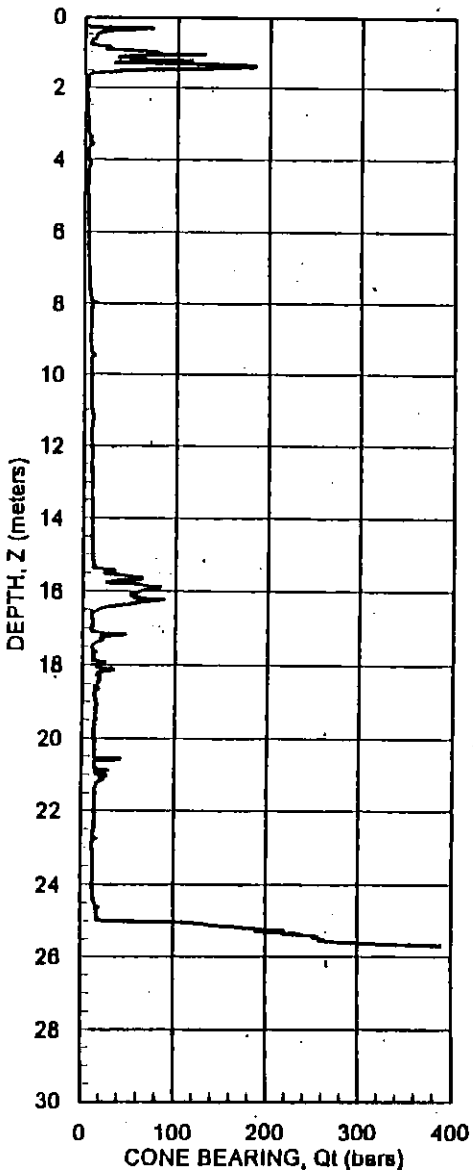
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

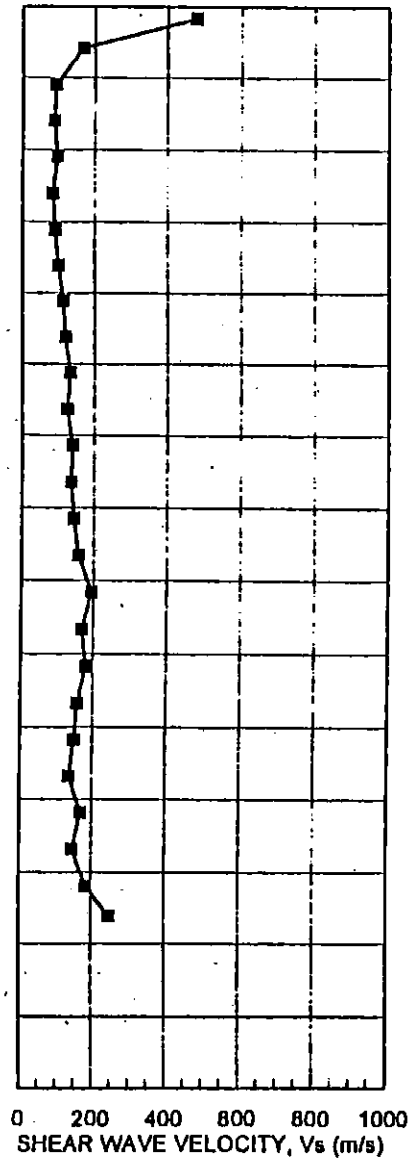
SEISMIC CONE TEST RESULTS

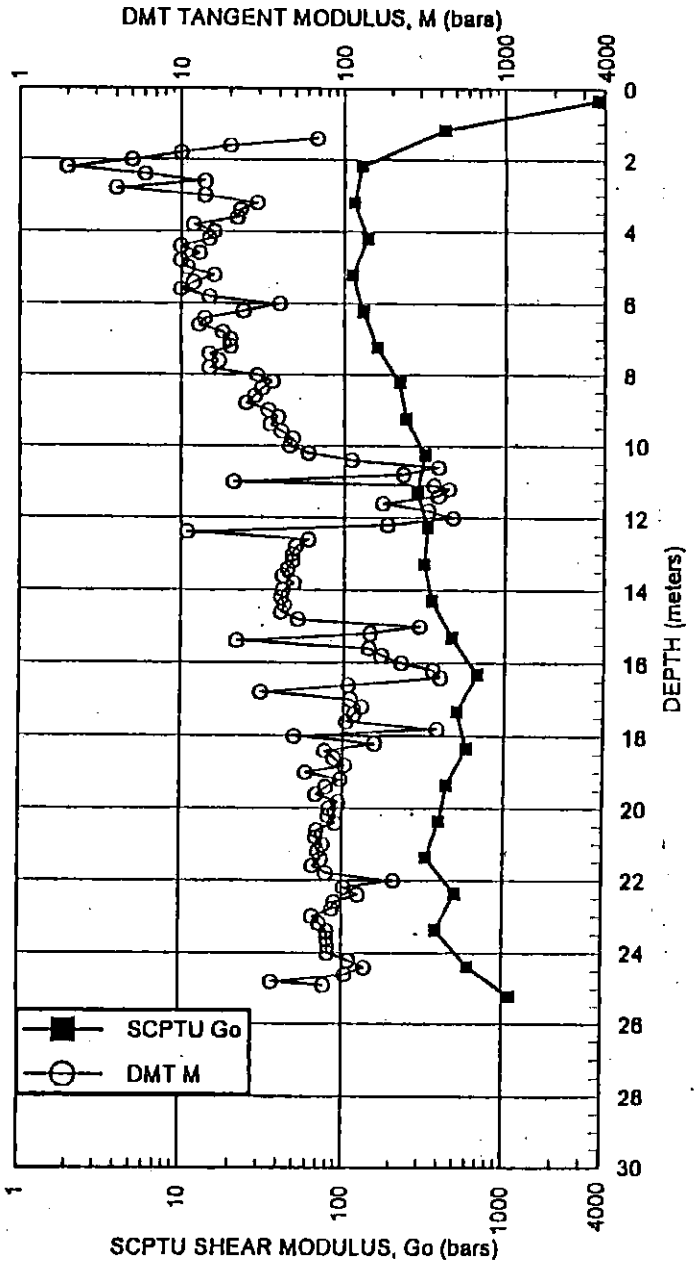
INSITU SOIL TESTING, LLC
ENGINEER: R. Fallmyer
SOUNDING DATE: 8-2-98

SOUNDING
SCPT-12

Ground Surface Elev.:
Water Depth: Dryed at 2.5 m







SEISMIC TESTS -- SOUNDING NO. SCPT-12 Cherry Island Landfill

Horizontal Distance for S-Wave 3.1 ft = 0.94 m
Distance of Geophones above Tip 0.67 ft = 0.20 m

Tip Depth (ft)	Tip Depth (m)	Tip (kN/m²)	S-Wave Distance (m)	S1 or S2 Wave Arrival Times (msec) First	Peak	Valley	Method (F,P,V)	Delta Time (msec)	Shear Wave Velocity (m/s)	Go (bars)	Average Vs (m/s)	Average Go (bars)
2.806	0.86	1.6	1.15	2.4	10.4		F	2.4	478	3657		
6.146	1.87	1.5	1.92	7	13.4		F	4.6	168	421	274	1126
9.468	2.89	1.5	2.84		23.4		P	10	93	128		
12.778	3.89	1.5	3.81		34.4		P	11	88	116		
16.086	4.90	1.5	4.79		44.6		P	10.2	98	139		
19.389	5.91	1.6	5.78		56.4		P	11.8	84	113		
22.697	6.92	1.6	6.78		67.4	74	P	11	91	131	90	130
26.003	7.93	1.6	7.78			84	V	10	100	160		
29.311	8.93	1.7	8.78			92.8	V	8.8	114	220		
32.615	9.94	1.7	9.78			101.2	V	8.4	119	242		
35.944	10.96	1.8	10.79			108.8	V	7.6	133	318		
39.255	11.97	1.8	11.80			116.8	V	8	126	284	117	247
42.561	12.97	1.7	12.80			124	V	7.2	140	331		
45.876	13.98	1.7	13.81			131.4	V	7.4	136	315		
49.194	14.99	1.7	14.82			138.4	V	7	144	353		
52.503	16.00	1.9	15.83			144.8	V	6.4	157	470		
55.822	17.01	1.8	16.84			150	V	5.2	194	679	152	415
59.136	18.02	1.8	17.85			156	V	6	168	509		
62.449	19.03	1.8	18.85			161.6	V	5.6	180	584		
65.746	20.04	1.8	19.86			168	V	6.4	157	443		
69.072	21.05	1.8	20.87			174.8	V	6.8	149	399		
72.382	22.06	1.8	21.88			182.2	V	7.4	136	334	157	441
75.692	23.07	1.8	22.89			188.2	V	6	168	508		
78.972	24.07	1.8	23.89			195	V	6.8	147	388		
82.249	25.07	1.8	24.88			200.4	V	5.4	185	615		
84.369	25.72	1.8	25.53			203	V	2.6	248	1110	176	555

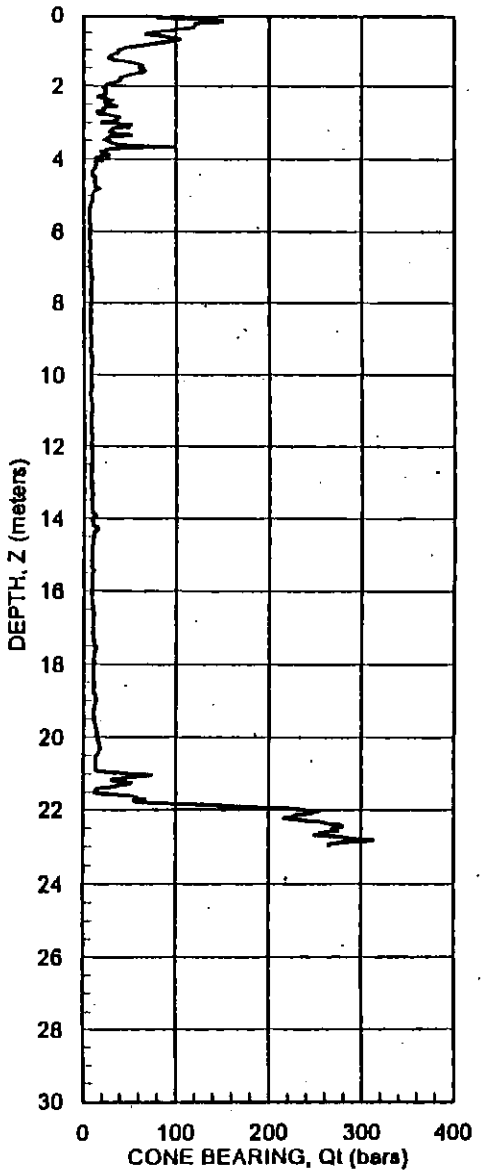
PROJECT: CHERRY ISLAND LANDFILL
LOCATION: Wilmington, Delaware

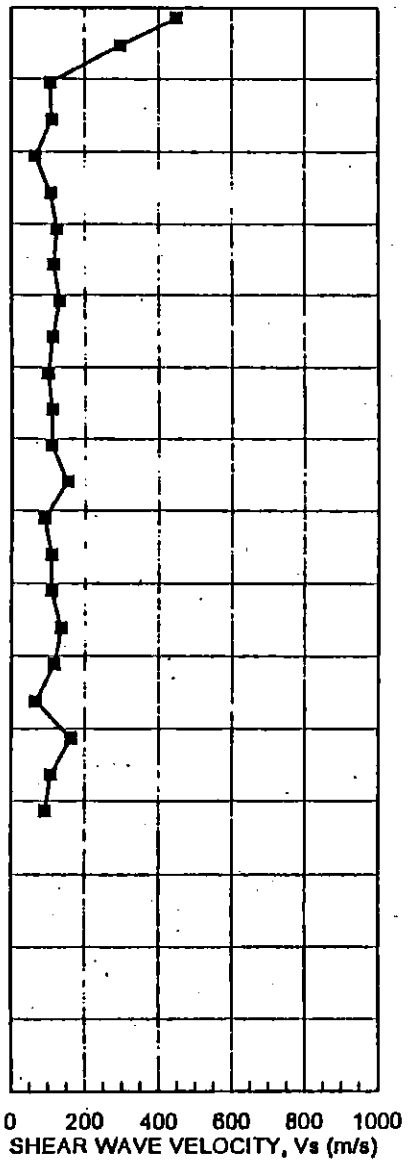
INSITUSOIL TESTING, LLC
ENGINEER: R. Palmerazzo
SOUNDING DATE: 8-21-98

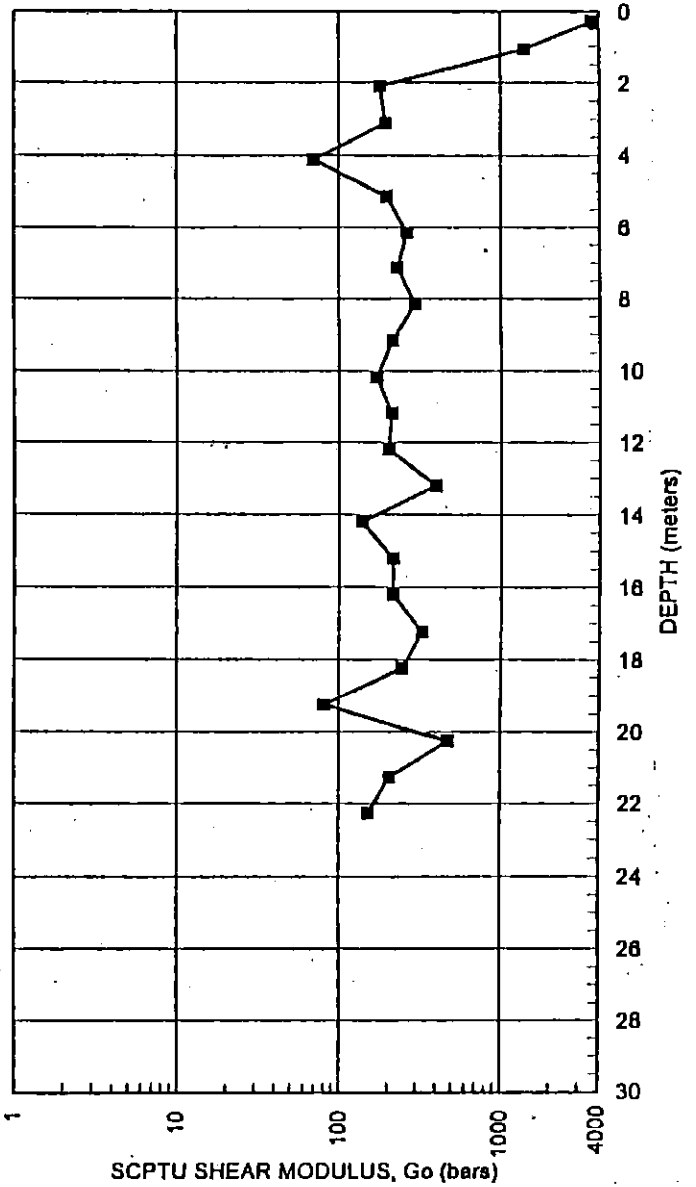
SOUNDING
SCPT-10

SEISMIC CONE TEST RESULTS

Ground Surface Elev.: [illegible]
Water Depth: Dayed 2.3 m







SEISMIC TESTS -- SOUNDING NO. SCPT-10 Cherry Island Landfill

Horizontal Distance for S-Wave 2.82 ft = 0.86 m
Distance of Geophones above Tip 0.67 ft = 0.20 m

Tip Depth (ft)	Tip Depth (m)	Tip Gamma (kN/m³)	S-Wave Distance (m)	S1 or S2 Wave Arrival Times (msec) First	Peak	Valley	Method (F,P,V)	Delta Time (msec)	Shear Wave Velocity (m/s)	Go (bars)	Average Vs (m/s)	Average Go (bars)
2.531	0.77	1.8	1.03	2.3			F	2.3	448	3609		
5.85	1.78	1.6	1.80	4.9	5.8		F	2.6	295	1395	367	2154
9.177	2.80	1.6	2.73		14.6		P	8.6	106	180		
12.491	3.81	1.6	3.70		23.4	29.2	P	8.8	111	195		
15.816	4.82	1.6	4.70		38.6	44.2	V	15	66	70		
19.117	5.83	1.7	5.69			53.4	V	9.2	108	198		
22.422	6.83	1.7	6.69			61.4	V	8	125	264	80	108
25.726	7.84	1.7	7.69			70	V	8.6	116	230		
29.031	8.85	1.7	8.69			77.6	V	7.6	132	295		
32.356	9.86	1.7	9.70			86.6	V	9	112	214		
35.657	10.87	1.7	10.70			96.6	V	10	100	171		
38.957	11.87	1.7	11.70			105.6	V	9	111	211	113	219
42.256	12.88	1.7	12.70			114.8	V	9.2	109	202		
45.562	13.89	1.7	13.71			121.4	V	6.6	152	395		
48.881	14.90	1.7	14.72			132.6	V	11.2	90	138		
52.186	15.91	1.8	15.73			141.8	V	9.2	109	215		
55.49	16.91	1.8	16.73			151	V	9.2	109	215	111	221
58.847	17.94	1.8	17.75			158.6	V	7.6	134	325		
62.152	18.94	1.8	18.76			167.2	V	8.6	117	246		
65.459	19.95	1.8	19.77			182.2	V	15	67	81		
68.765	20.96	1.8	20.77			188.4	V	6.2	162	475		
72.07	21.97	1.8	21.76		190.4	197.8	V	9.4	107	206		
75.386	22.98	1.8	22.79			208.8	V	11	92	152	100	181

EXISTING LABORATORY RESULTS

axial		Consolidat.				Moist/Dens			Permeab.		Org	Ash
		C,J	C	1								
		C										
		C						C	C	2	C	
			C	1								
		C	C	1		C	1	C	C	2	C	
		J	C	1					C	2	C	
		J	C	1					C	1		
		J	C	1		C	1	C	C	2	C	
								C	C	1		
		C							C	1		
B	1							B	B	1		
B	1	B	B	2				B				
			A	4					A	4		
A	1		A	1					A	1		
					B	B	1					
					B	B	1					
		B	B	2								
E	1 (U,U)		E	1		E	BULK	E	E	1		
						E	BULK				E	E
			E	1		E	BULK		E	1		
E	3 (U,U), 1(C,U)		E	1		E	BULK	E	E	1	E	E
E	1 (C,U)		E	1		E	BULK	E	E	2	E	E
						E	BULK				E	E
						E	BULK					
E	3 (U,U), 1(C,U)					E	BULK					
E	2 (U,U), 1(C,U)					E	BULK					
E	3 (U,U), 1(C,U)					E	BULK				E	E
E	2 (U,U), 1(C,U)					E	BULK					
H	2											

REFERENCES:

A:	SITE SUITABILITY REPORT HYDROGEOLOGICAL AND GEOTECHNICAL EVALUATION OF THE CHERRY ISLAND SITE VOL 1 (Report) & VOL 2 (Oversize Drawings) **TERRAQUA RESOURCES / DUFFIELD**	JANUARY 1984
B:	NORTHERN SOLID WASTE FACILITY – 2 PHASE II AREA LANDFILL DESIGN REPORT **GANNETT FLEMING**	DECEMBER 1986
C:	NORTHERN SOLID WASTE FACILITY – 2 CHERRY ISLAND, WILMINGTON, DELAWARE . PHASE III GEOTECHNICAL REPORT **GANNETT FLEMING**	MARCH 1990 (REV. AUG. 1990)
D:	NORTHERN SOLID WASTE FACILITY – 2 CHERRY ISLAND, WILMINGTON, DELAWARE PHASE IA GEOTECHNICAL REPORT **GANNETT FLEMING**	AUGUST 1990 (REV. SEPT. 1990)
E:	NORTHERN SOLID WASTE MANAGEMENT CENTER - CHERRY ISLAND LANDFILL PHASE IV DISPOSAL AREA HYDROGEOLOGIC, GEOTECHNICAL & LANDFILL CAPPING REPORT VOL 1 (Final Report) & VOL 2 (Appendices) **WESTON**	AUGUST 1992
F:	NORTHERN SOLID WASTE MANAGEMENT CENTER - CHERRY ISLAND LANDFILL PHASE V DISPOSAL AREA HYDROGEOLOGICAL & GEOTECHNICAL REPORT VOL 1 (Final Report) & VOL 2 (Appendices) **WESTON**	MARCH 1995
G:	SUMMARY REPORT FOR MONITORING WELL INSTALLATION, ABANDONMENT, REDEVELOPMENT & REPAIR AT PIGEON POINT & CHERRY ISLAND LANDFILLS **MARCOR**	MAY 1996
H:	NSWMC-2 CHERRY ISLAND PHASE IV STABILITY ANALYSIS **GANNETT FLEMING**	JULY 1998
I:	NOT USED	
J:	COMPOSITE STABILITY ANALYSIS, NORTHERN SOLID WASTE MANAGEMENT CENTER AT CHERRY ISLAND (NSWMC-2), WILMINGTON, DELAWARE (IN DSWA RFP, JUNE 2001) **SCHNABEL**	JANUARY 2000
K:	MONITORING WELL INSTALLATION REPORT FOR THE CHERRY ISLAND LANDFILL (IN LETTER TO DAN FLUMAN, DSWA, JUNE 14, 2001) **SCIENCE APPLICATIONS INTERNATIONAL (SAIC)**	MAY 2001
L:	QUARTERLY GEOTECHNICAL MONITORING REPORT FOR THE NORTHERN SOLID WASTE MANAGEMENT CENTER AT CHERRY ISLAND (DATED SEPT 2001) **SCHNABEL**	JULY 2001
M:	QUARTERLY GEOTECHNICAL MONITORING REPORT FOR THE NORTHERN SOLID WASTE MANAGEMENT CENTER AT CHERRY ISLAND (DATED DEC 2001) **SCHNABEL**	OCTOBER 2001

GRADATION

Gilbert/Commonwealth engineers and consultants

GILBERT ASSOCIATES, INC., P. O. Box 1498, Reading, PA 19603/Tel. 215 775-2600

LABORATORY SERVICE

CERTIFICATE OF ANALYSIS

LABORATORY NO: 11761 RECEIVED: 9/16/81 REPORTED: 9/28/81

CLIENT: Cherry Island - WO 06-7390-002

SAMPLE DESCRIPTION: Soil Sample
P-1 5.0'
Sampled 9/16/81

- - - - - - - -

PARTICLE SIZE DETERMINATION
SIEVE ANALYSIS

SIEVE SIZE	% RETAINED
No. 10 Mesh	0.0
No. 30 Mesh	3.7
No. 50 Mesh	14.3
No. 100 Mesh	13.8
No. 200 Mesh	10.4
Pass No. 200 Mesh	57.8

HYDROMETER ANALYSIS

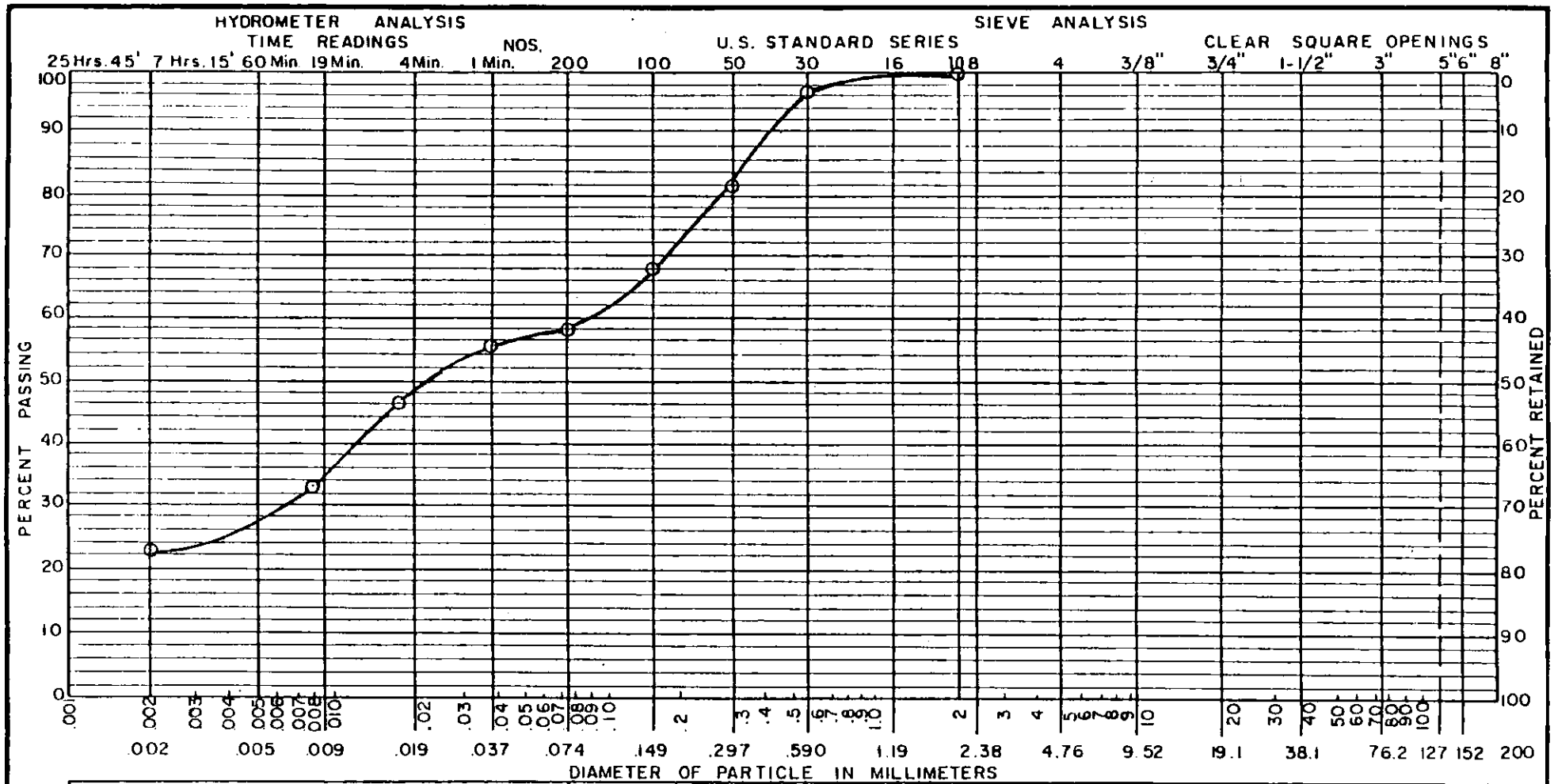
DIAM (Millimeter)	PASSING
.074	57.8
.036	55.4
.017	46.2
.008	33.3
.002	22.2

Respectfully submitted,

C. J. Wummer, Supervisor
Laboratory Services

MAH
cc: D. Stanislaw (2)

CHERRY ISLAND SITE
WELL NO. P-1
GRADATION CURVE



CLAY (PLASTIC) TO SILT (NON PLASTIC)	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

Sample No.	Elev. or Depth	Classification	Nat WC	LL	PL	PI	
	5 ft.	Sandy clayey silt					

GILBERT ASSOCIATES, INC.
GRADATION TEST

Gilbert/Commonwealth engineers and consultants

GILBERT ASSOCIATES, INC., P. O. Box 1498, Reading, PA 19603/Tel. 215 775-2600

LABORATORY SERVICE

CERTIFICATE OF ANALYSIS

LABORATORY NO: 11762 RECEIVED: 9/16/81 REPORTED: 9/28/81

CLIENT: Cherry Island - WO 06-7390-002

SAMPLE DESCRIPTION: Soil Sample
P-2 5.0'
Sampled 9/16/81

- - - - - -

PARTICLE SIZE DETERMINATION
SIEVE ANALYSIS

SIEVE SIZE	% RETAINED
No. 10 Mesh	0.0
No. 30 Mesh	1.3
No. 50 Mesh	9.2
No. 100 Mesh	13.4
No. 200 Mesh	9.6
Pass No. 200 Mesh	66.5

HYDROMETER ANALYSIS

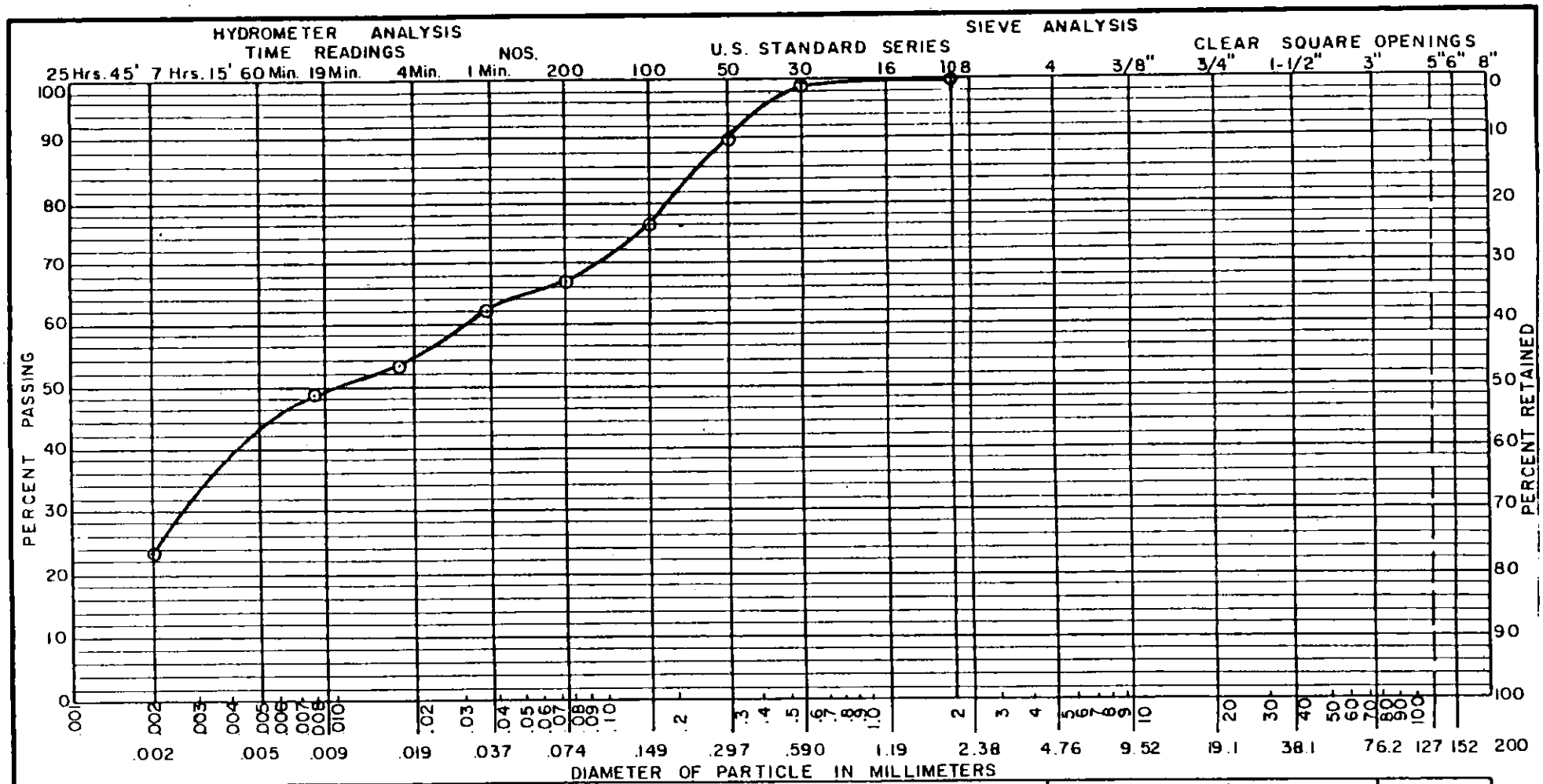
DIAM. (Millimeters)	% PASSING
.074	66.5
.036	61.9
.017	53.4
.008	38.4
.002	23.5

Respectfully submitted,

C. J. Wummer, Supervisor
Laboratory Services

MAH
cc: D. Stanislaw (2)

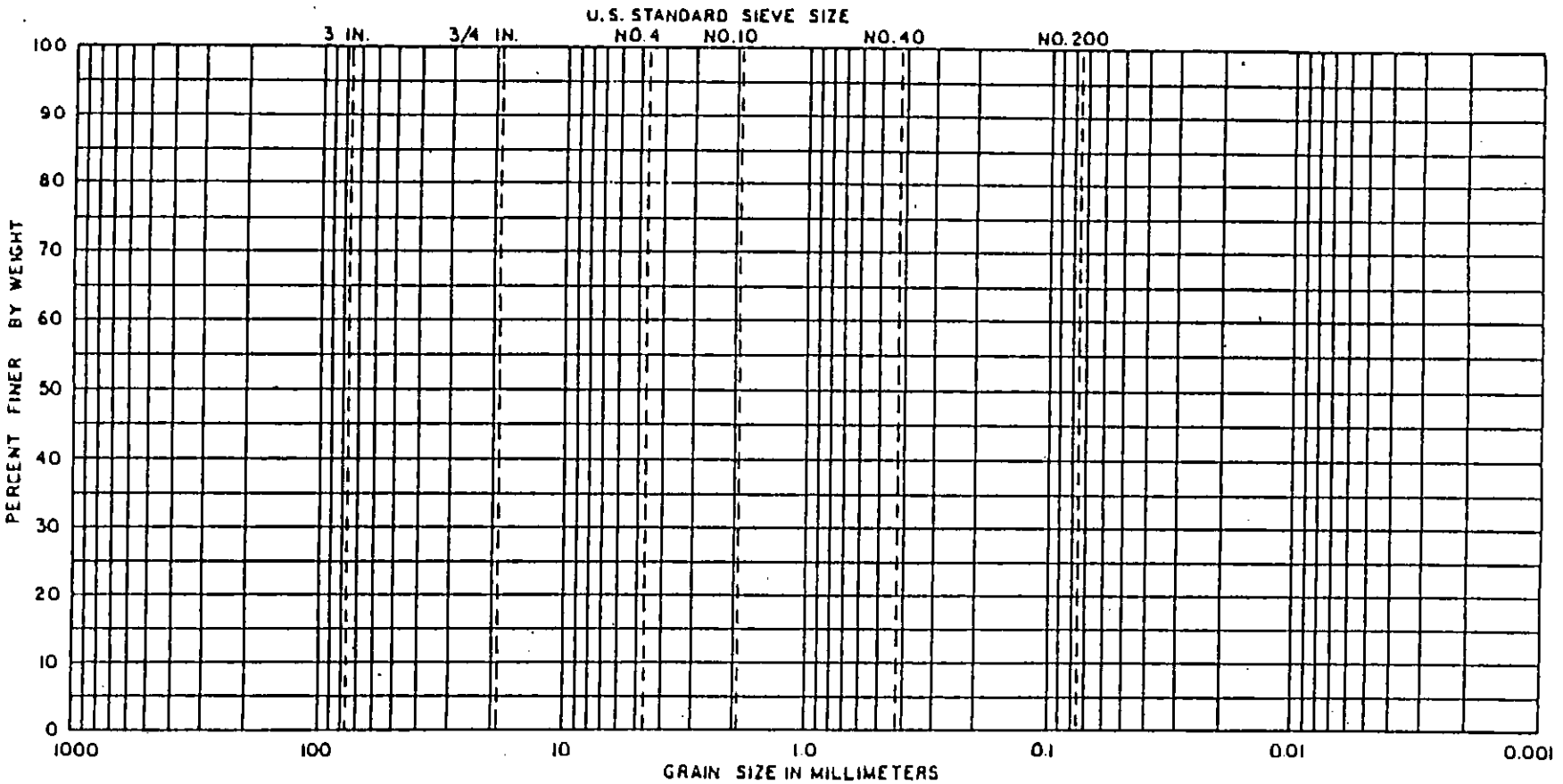
CHERRY ISLAND SITE
WELL NO. P-2
GRADATION CURVE



CLAY (PLASTIC) TO SILT (NON PLASTIC)	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

Sample No.	Elev. or Depth	Classification	Nat WC	LL	PL	PI
	5 ft/	Sandy clayey silt				

GILBERT ASSOCIATES, INC.
GRADATION TEST



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
GF-1/ S-7	10.0-12.0'	MH	69.1	62.4	46.3	16.1	

Description and Comments: Gray Elastic Silt.

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY - 2

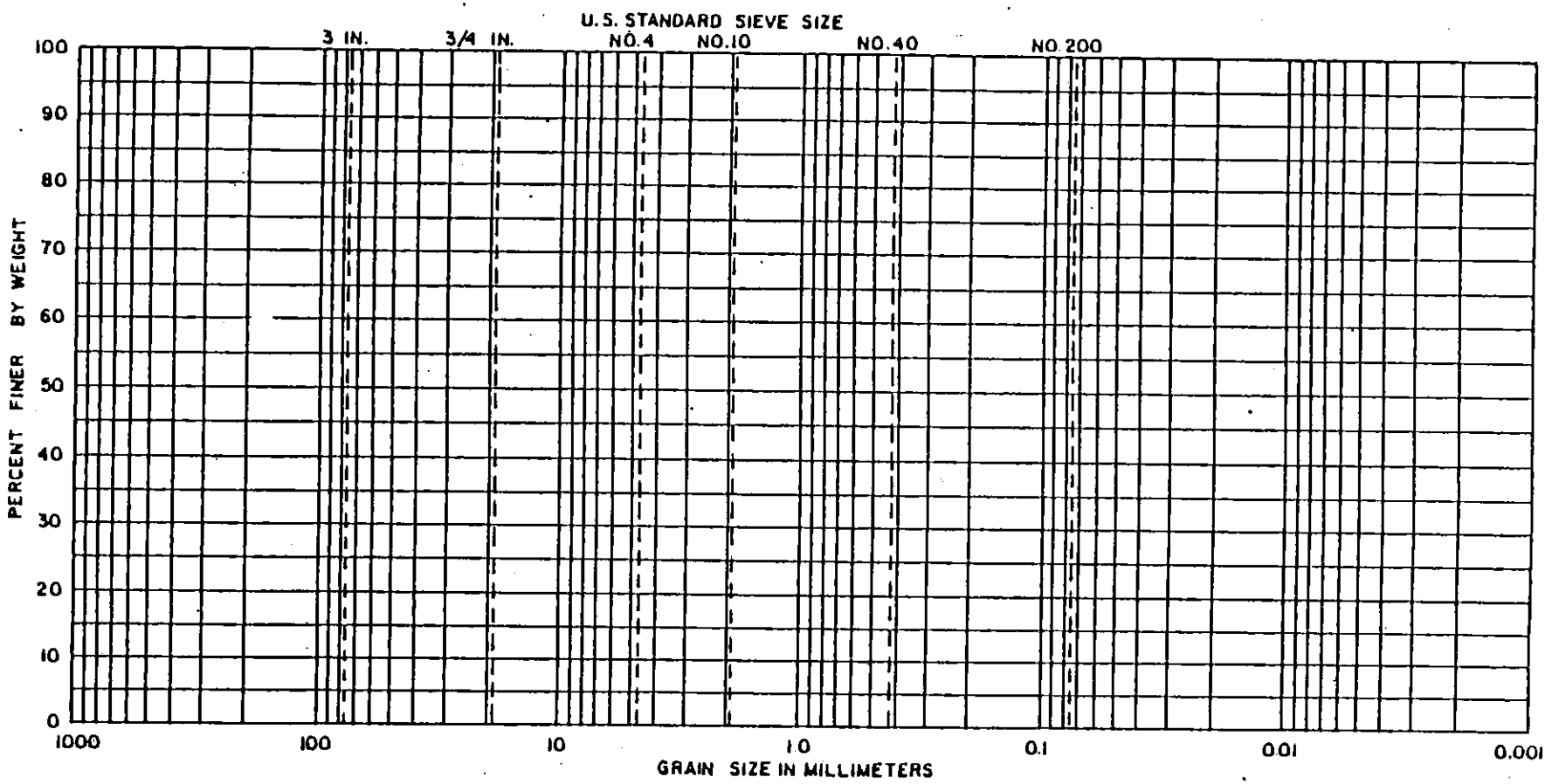
Area: WILMINGTON, DE.

Boring No: GF-1 / S-7

Date: 8/20/86

Tested By: Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
GF-1/S-10	20.0-22.0'	MH	80.8	62.8	44.7	18.1	
			67.9				

Description and Comments: Gray Elastic Silt.

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY - 2

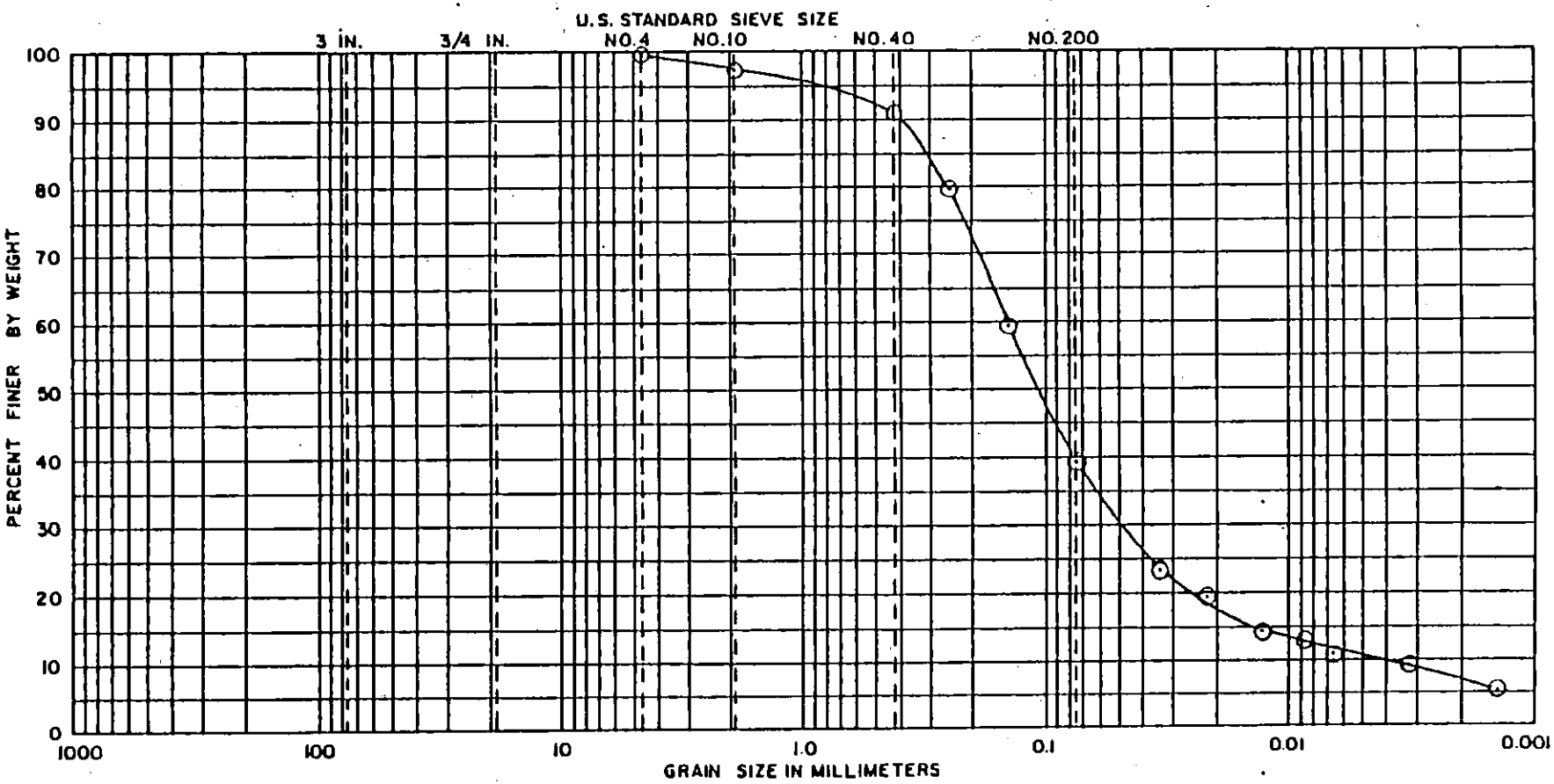
Area: WILMINGTON, DE.

Boring No: GF-1 / S-10

Date: 8/20/86

Tested By: Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-1/S-15 & 16	--	ML	33.8	N/P	N/P	--	2.63

Description and Comments: Gray Sandy Silt.

CLASSIFICATION TEST-GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

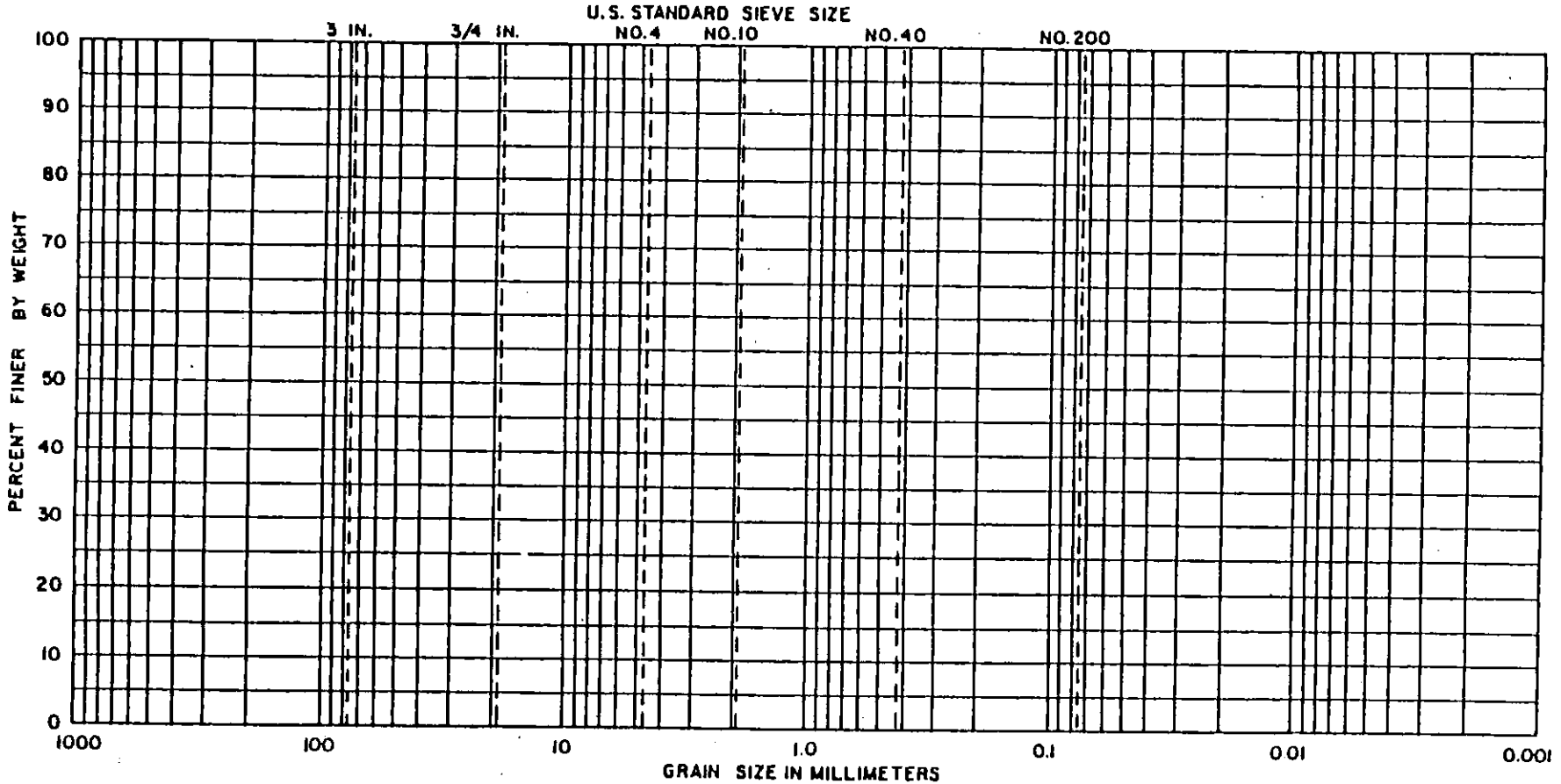
Project: DELAWARE SOLID WASTE FACILITY - 2

Area: Wilmington, DE.

Boring No: GF-1 / S-15 & 16

Date: Aug.. 20/86

Tested By: Abdolos



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
F-1/S-19&	---	OH	109.0	89.1	N/P	--	
20		Oven-dried LL =		67.7			

Description and Comments: 1) Gray Organic Silt.

$$\frac{\text{LL Oven-dried}}{\text{LL Air-dried}} = .752$$

GANNETT FLEMING GEOTECHNICAL LABORATORY

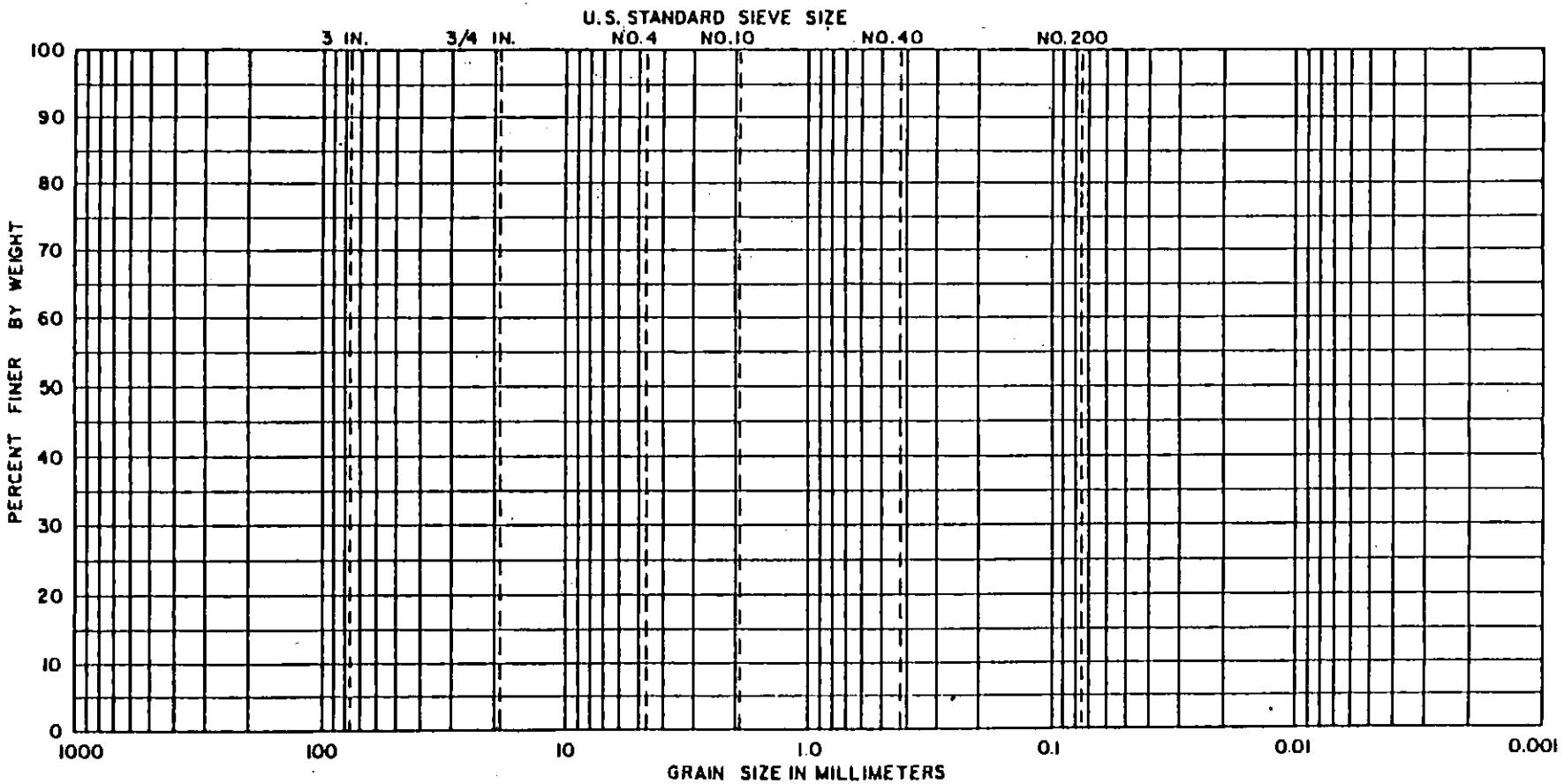
Project: DELAWARE SOLID WASTE FACILITY - 2

Area: WILMINGTON, DE.

Boring No: GF-1 / S-19 & 20

Date: 8/20/86 Tested By: Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
GF-3-A /S-5 & 6	---	MH	59.7	62.5	46.7	15.8	--

Description and Comments: Gray Elastic Silt.

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY - 2

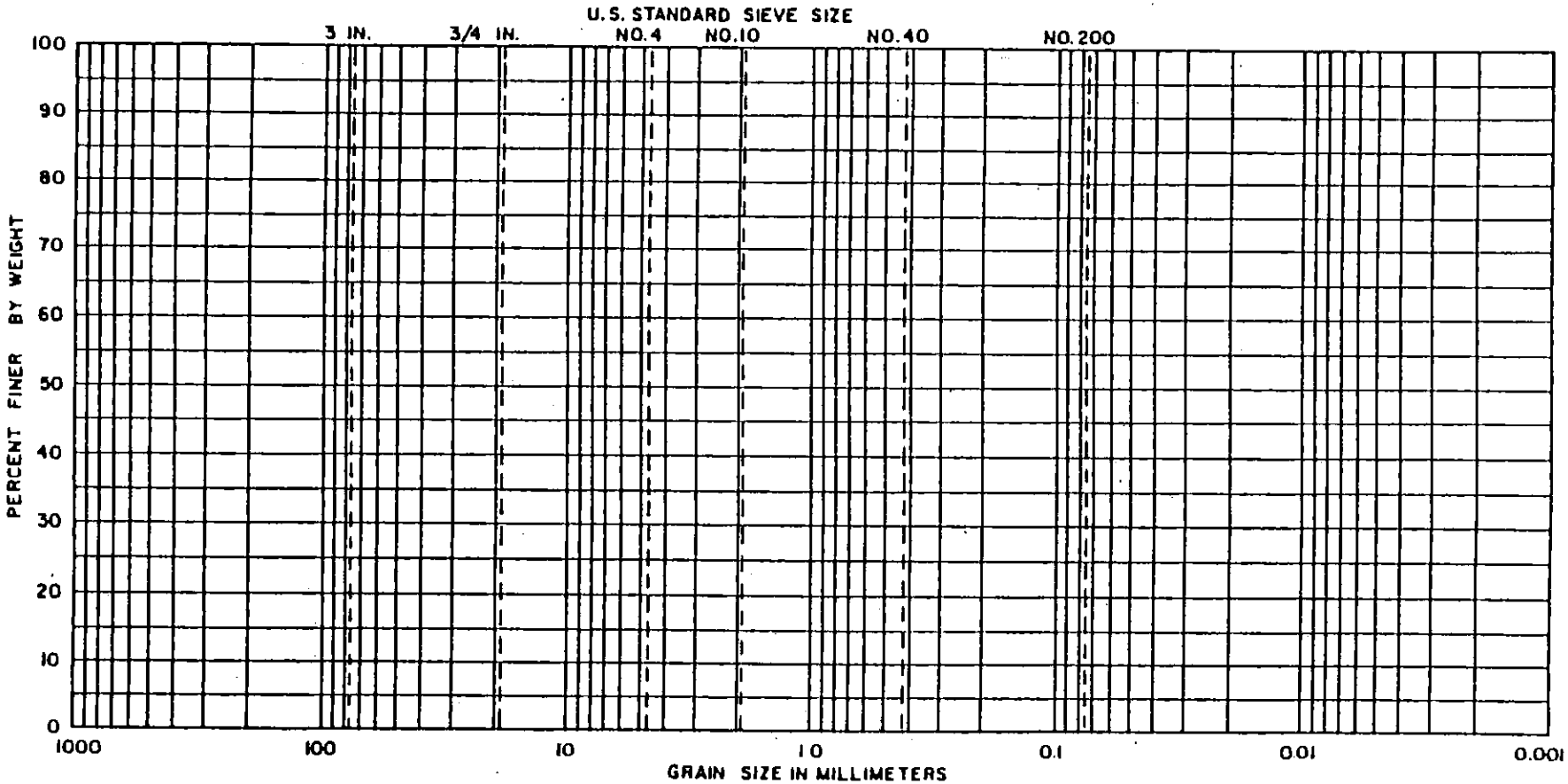
Area: WILMIMGTON, DE.

Boring No: GF-3-A / S - 5 & 6.

Date: 8/20/86

Tested By: Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
F-3-A/ S-10 & 11	--	MH	78.5	67.6	49.9	17.7	--

Description and Comments: Gray Elastic Silt.

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY - 2

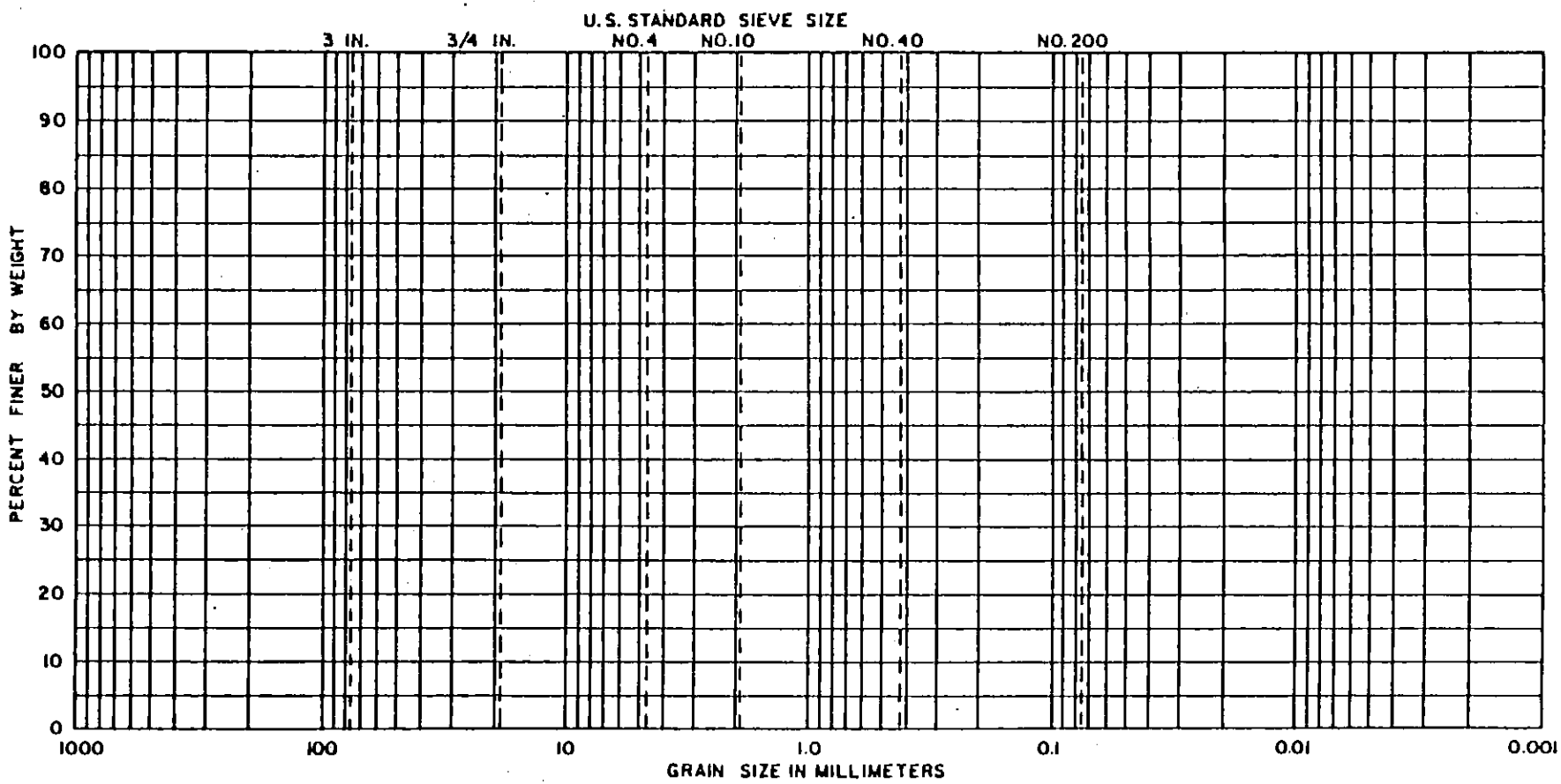
Area: WILMINGTON, DE.

Boring No: GF-3-A / S - 10 & 11.

Date: 8/20/86

Tested By: Abdolos

CLASSIFICATION TEST—GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-3-A /S-15 & 16	--	ML	42.6	46.8	32.8	14.0	---

Description and Comments: Gray Silt.

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY - 2

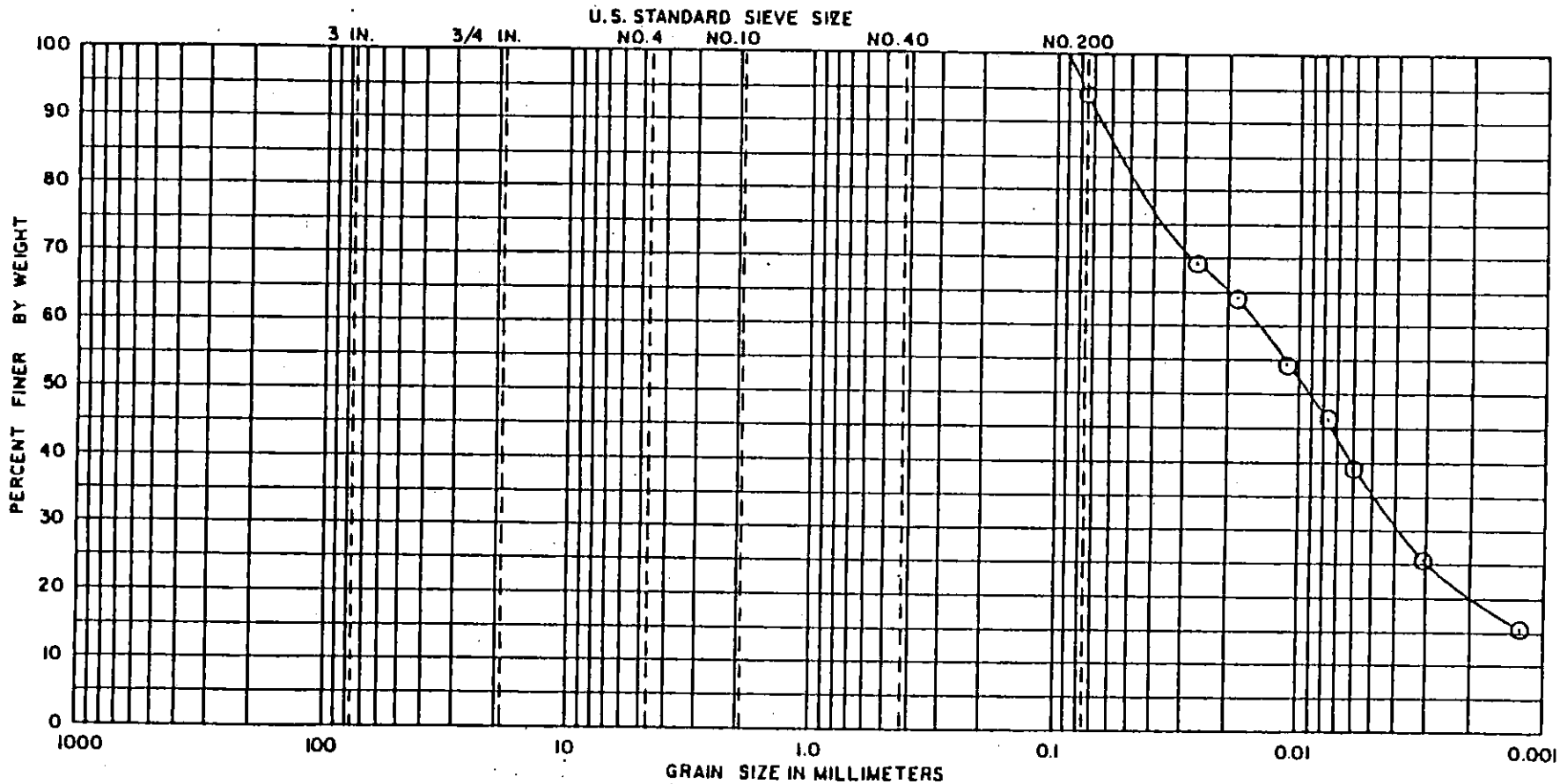
Area: WILMINGTON, DE.

Boring No: GF-3-A / S - 15 & 16.

Date: 8/20/86

Tested By: Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
F-5/S-4-5	6.0' - 10.0'	MH	66.7	53.0	36.5	16.5	2.61

Description and Comments: Gray Elastic Silt.

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY - 2

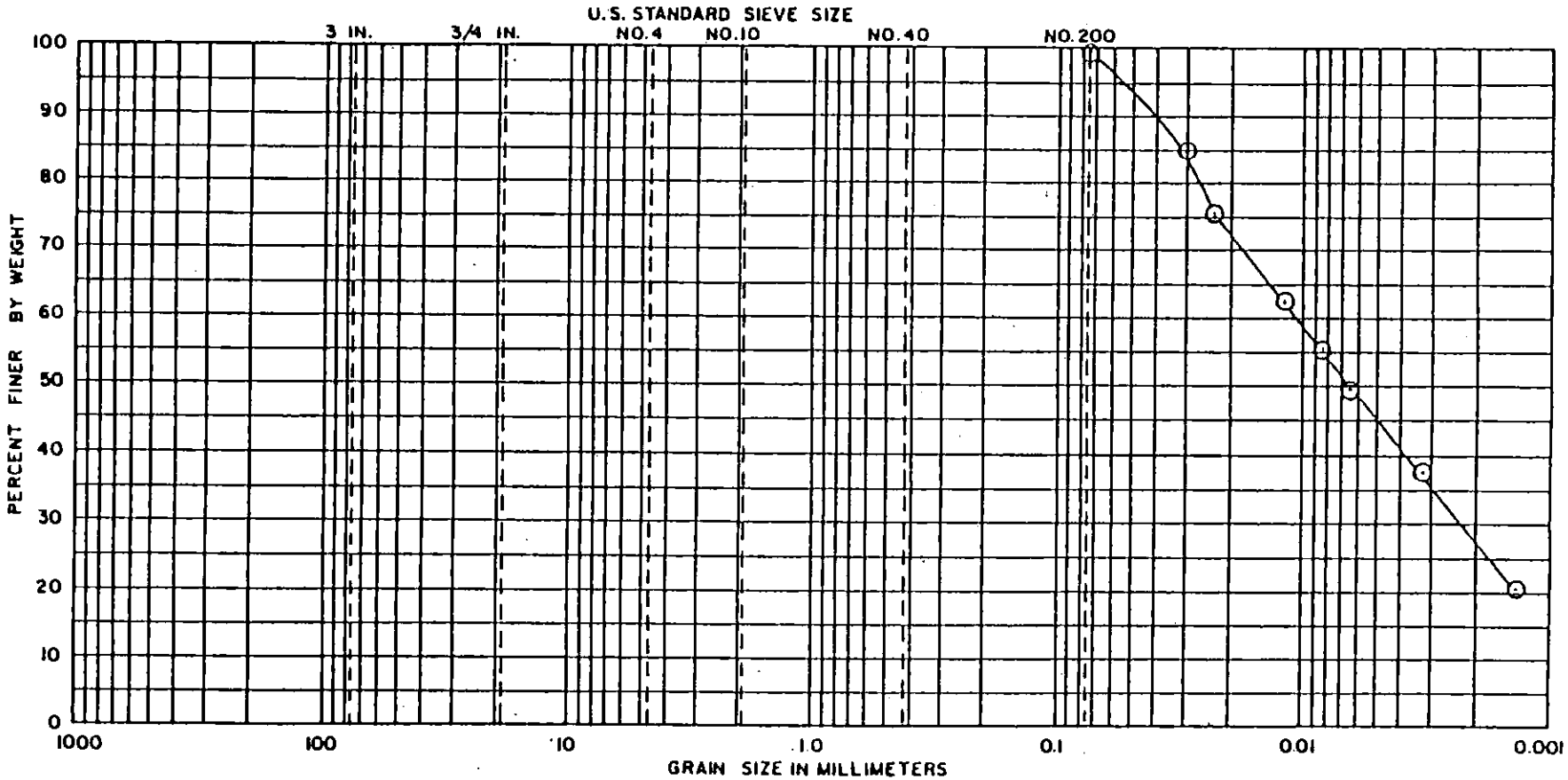
Area: WILMINGTON, DE.

Boring No: GF-5 / S-4 & 5

Date: 8/20/86

Tested By: Abdolos

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-5/S-9&10	20.0'-24.0'	MH	85.6	62.1	44.2	17.9	2.40

Description and Comments: Gray Elastic Silt.

GANNETT FLEMING GEOTECHNICAL LABORATORY

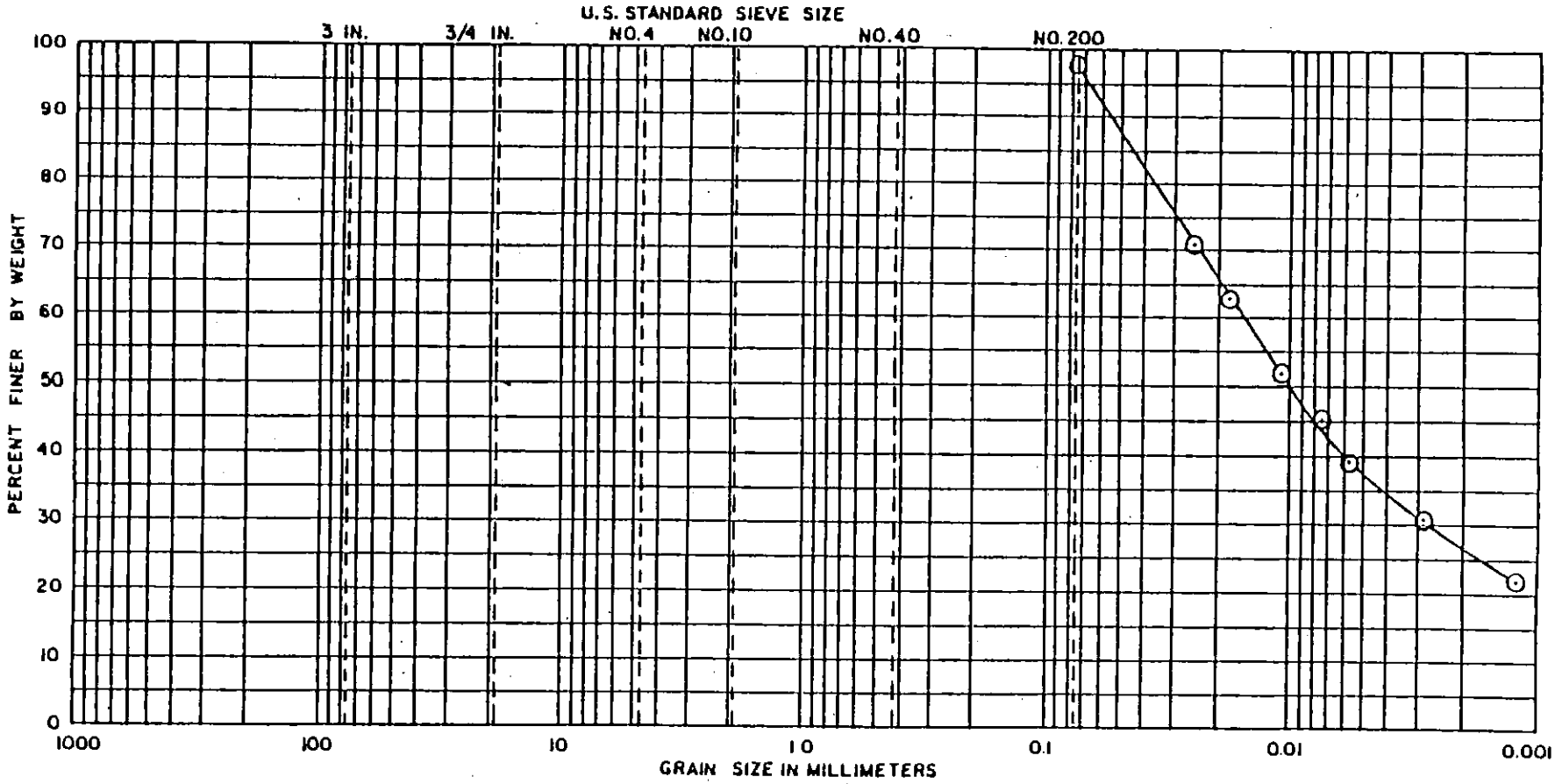
Project: DELAWARE SOLID WASTE FACILITY - 2

Area: WILMINGTON, DE.

Boring No: GF-5 / S-9 & 10.

Date: 8/20/86 Tested By: Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
GF-6/ S-3	5- 7'	OH	103.6	70.8	43.1	27.8	2.66
		oven-dried		47.3			

Description and Comments: Gray organic clay ;soil had a slightly fibrous texture

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY-2

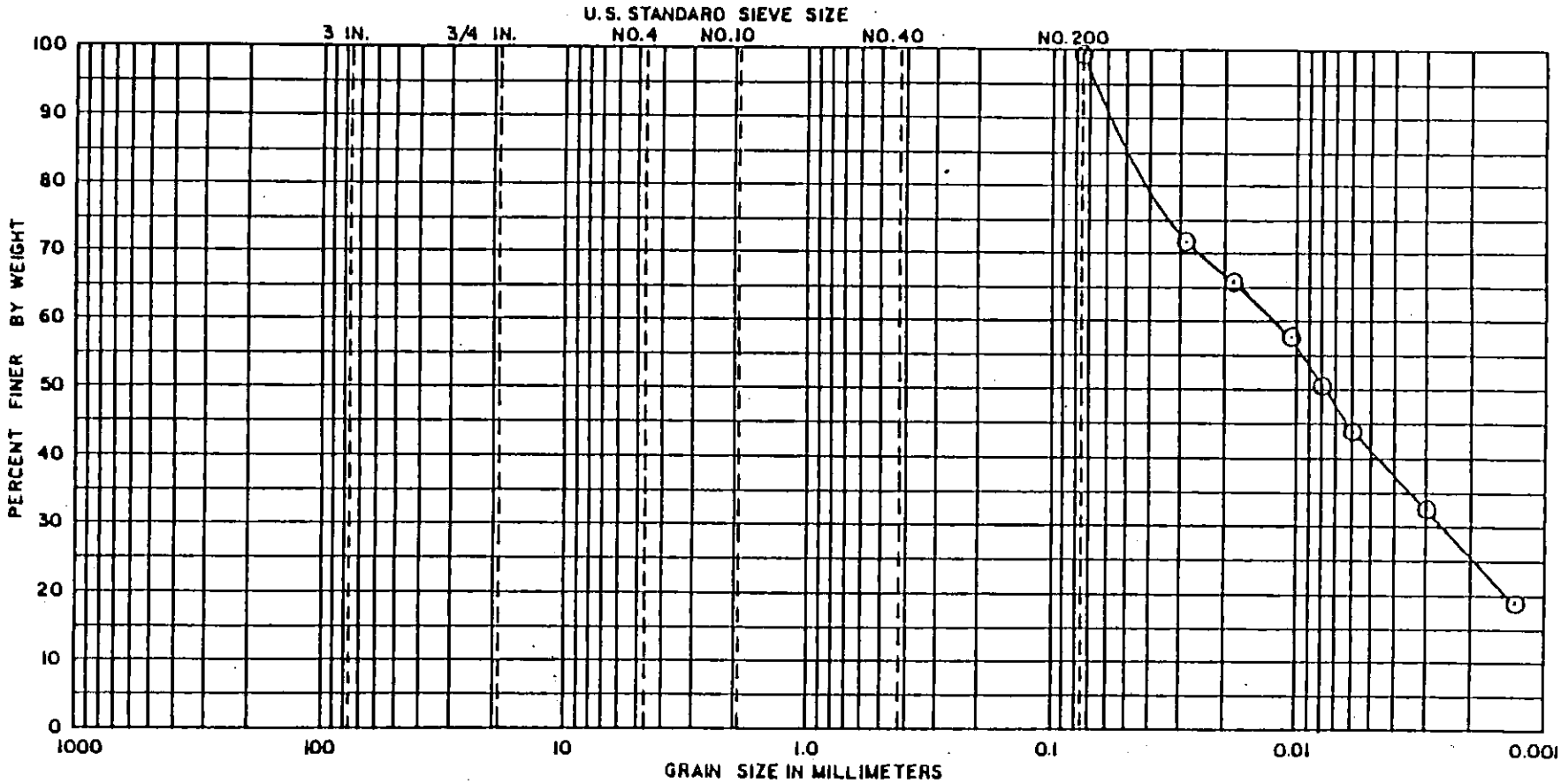
Area: WILMINGTON, DELAWARE

Boring No: GF-6/ S-3

Date: 8/ 86

Tested By: AB

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-6/ S-12		OH	85.4	73.1	46.7	26.4	

Description and Comments: Gray organic clay; soil had a slighly fibrous texture

CLASSIFICATION TEST-GRADATION CURVES

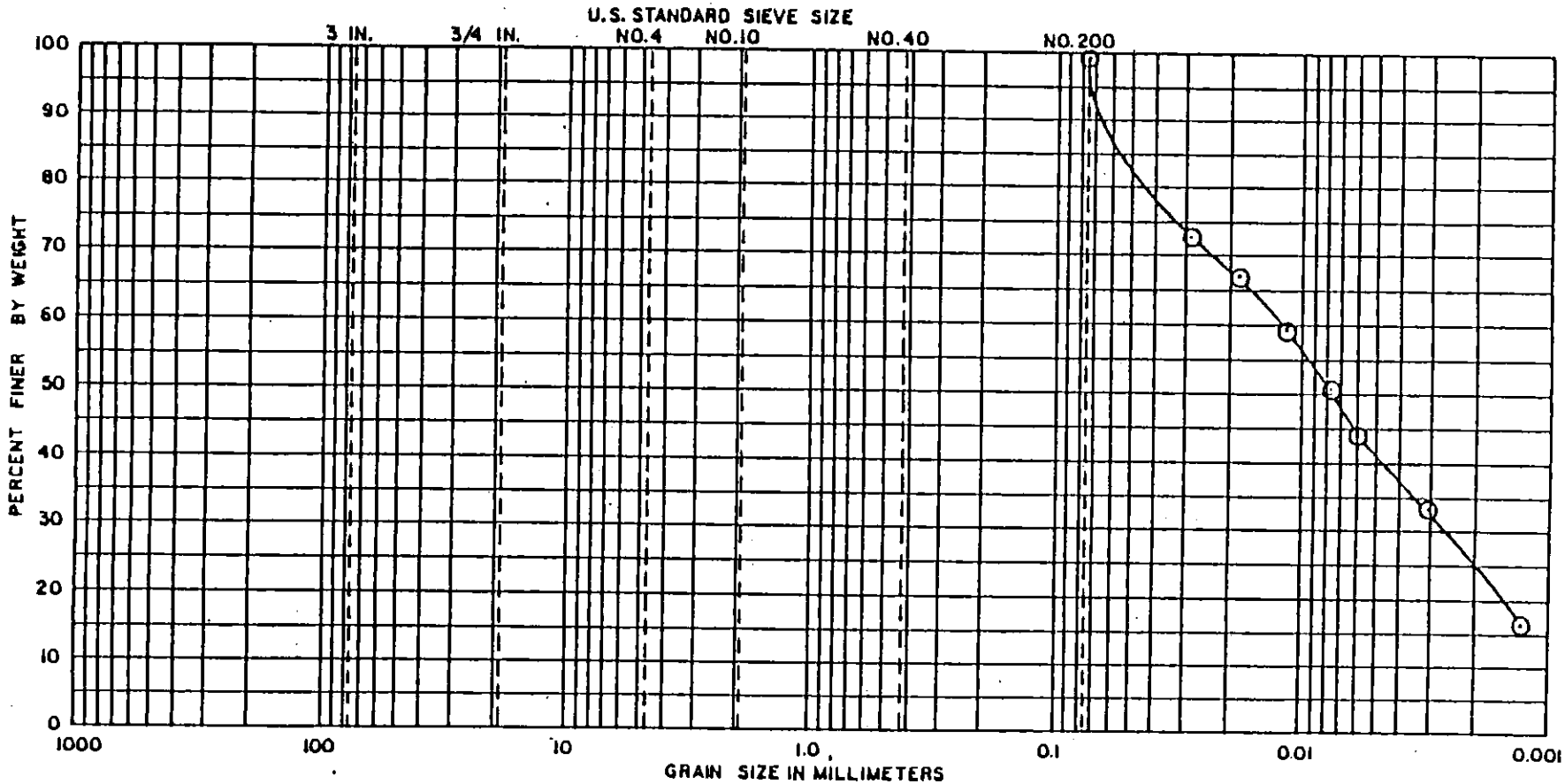
GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY-2

Area: WILMINGTON, DELAWARE

Boring No: GF-6/ S-12

Date: 8/ 86 Tested By: AB



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
GF-7/ ST-1	20- 22'	OH	91.3	76.5	47.9	28.6	
		oven-dried		53.4			

Description and Comments: Gray organic clay ; soil had a slightly fibrous texture

CLASSIFICATION TEST-GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

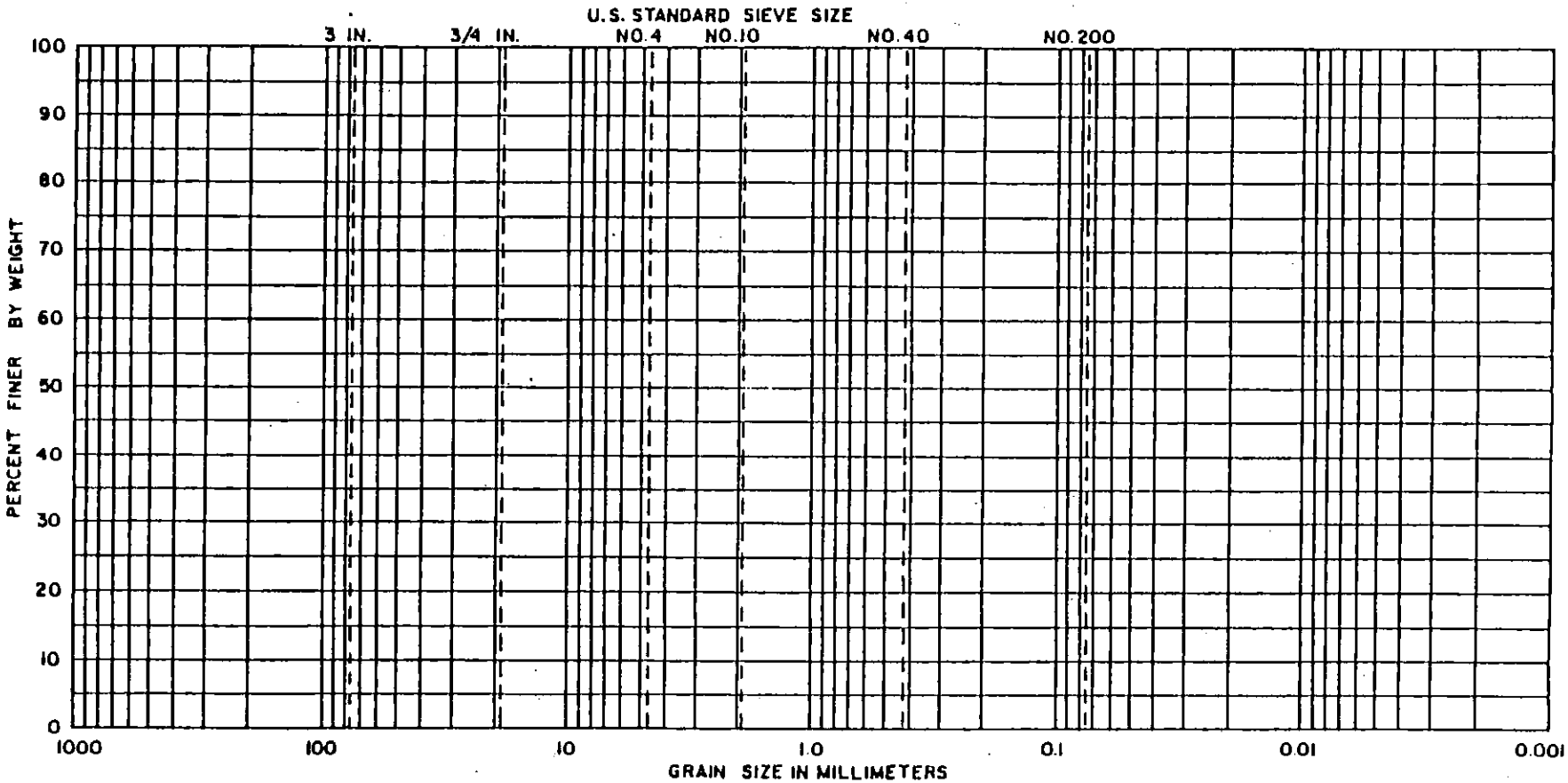
Project: DELAWARE SOLID WASTE FACILITY-2

Area: WILMINGTON, DELAWARE

Boring No: GF-7/ ST-1

Date: 8/ 86

Tested By: AB



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-7/S-20	---	MH	78.7	68.2	51.4	16.8	---
& 21		LL Oven-dried	=	52.6			

Description and Comments: Dark Gray Elastic Silt. $\frac{\text{LL Oven-dried}}{\text{LL Air-dried}} = .772$

CLASSIFICATION TEST-GRADATION CURVES

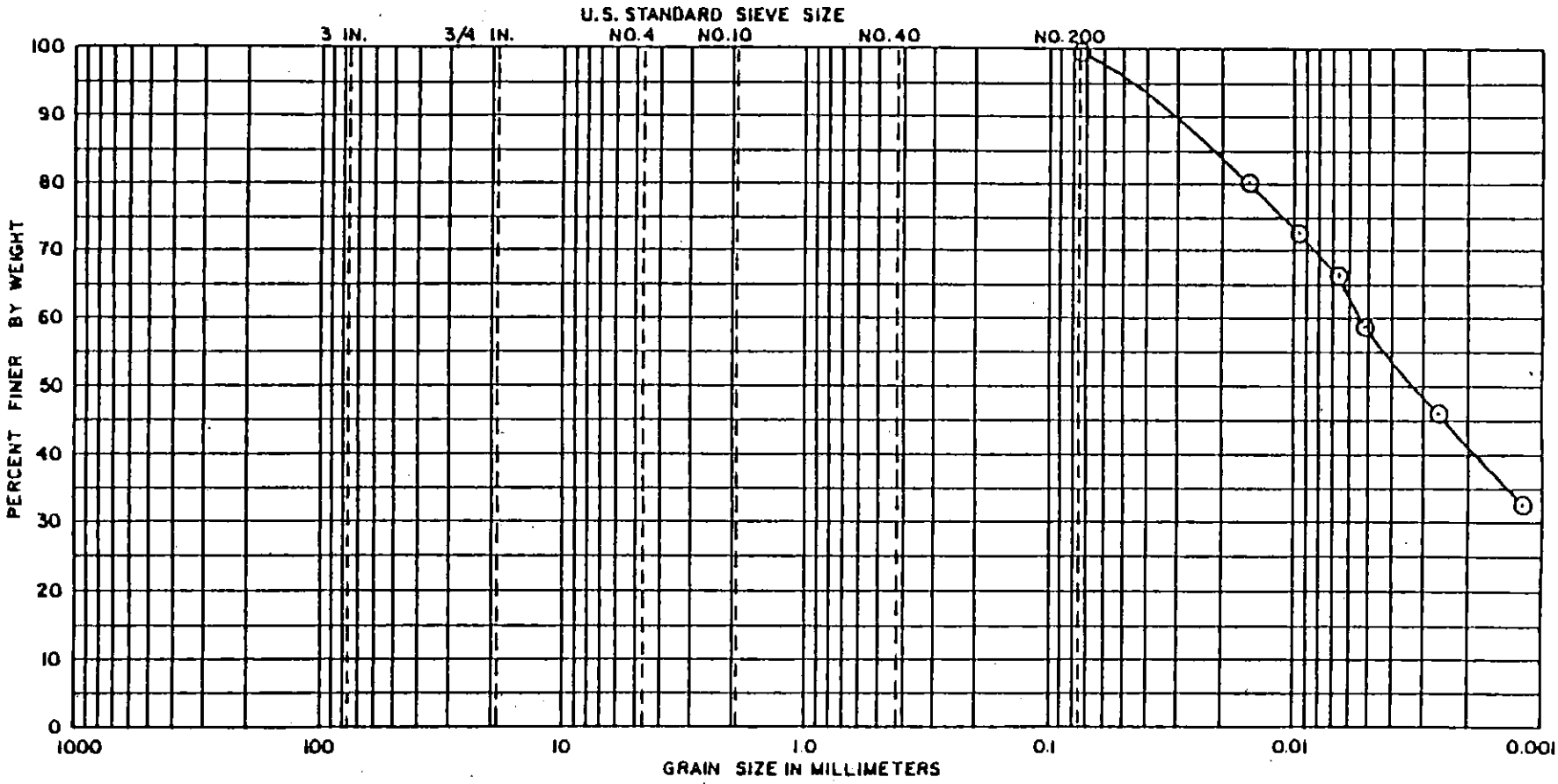
GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY - 2

Area: WILMINGTON, DE.

Boring No: GF-7 / S-20 & 21.

Date: 8/20/86 Tested By: Abdolos



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
GF-8/ S-4	5- 7'	OH	118.4	74.6	48.6	26.0	

Description and Comments: Gray organic clay; soil had a slightly fibrous texture

GANNETT FLEMING GEOTECHNICAL LABORATORY

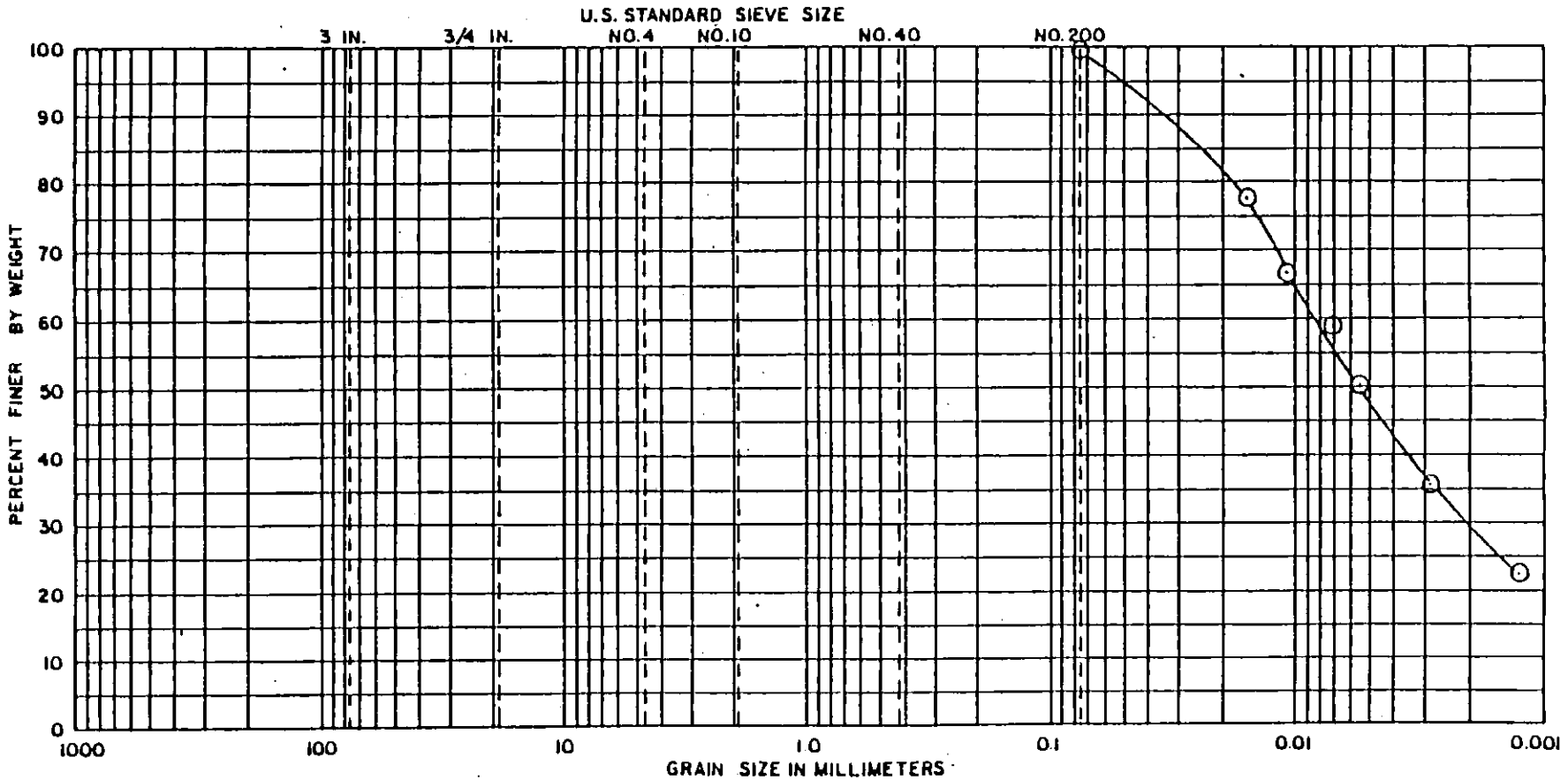
Project: DELAWARE SOLID WASTE FACILITY-2

Area: WILMINGTON, DELAWARE

Boring No: GF-8/ S-4

Date: 8/ 86 Tested By: AB

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	L.L.	P.L.	P.I.	Gs
GF-8/S-13	25.0'-27.0'	MH	89.6	65.9	42.4	23.5	2.56
		LL Oven-dried =		54.1			

Description and Comments: Gray Elastic Silt. $\frac{\text{LL Oven-dried}}{\text{LL Air-dried}} = .795$

GANNETT FLEMING GEOTECHNICAL LABORATORY

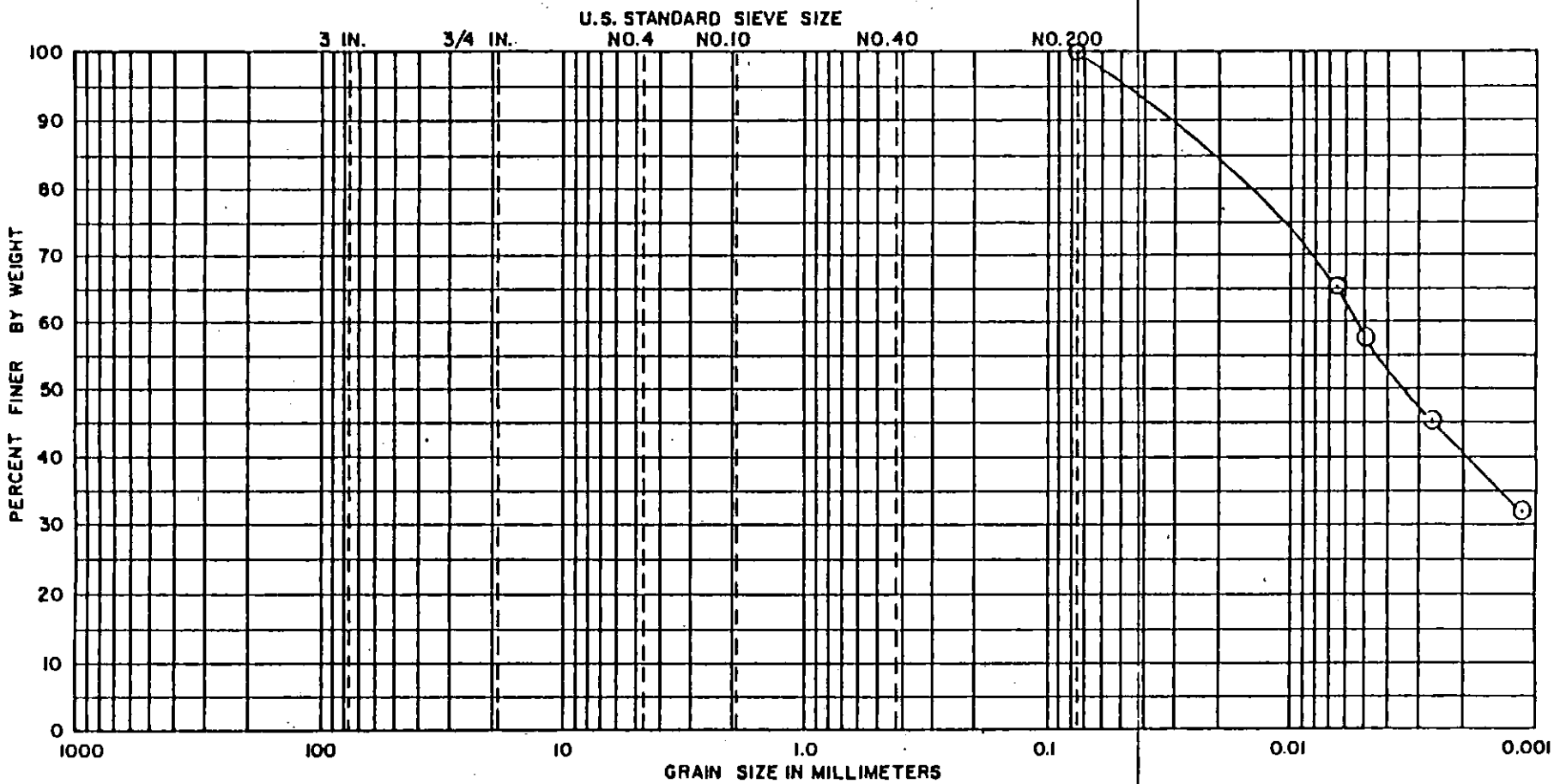
Project: DELAWARE SOLID WASTE FACILITY - 2

Area: WILMINGTON, DE.

Boring No: GF-8 / S-13

Date: 8/11/86 Tested By: Abdolos

CLASSIFICATION TEST—GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
Bulk	0-2'	OH	86.2	76.6	48.4	28.2	--
		LL Oven-dried		54.3			

Description and Comments: Gray Organic Silt. $\frac{\text{LL Oven-dried}}{\text{LL Air-dried}} = 0.709$

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY-2

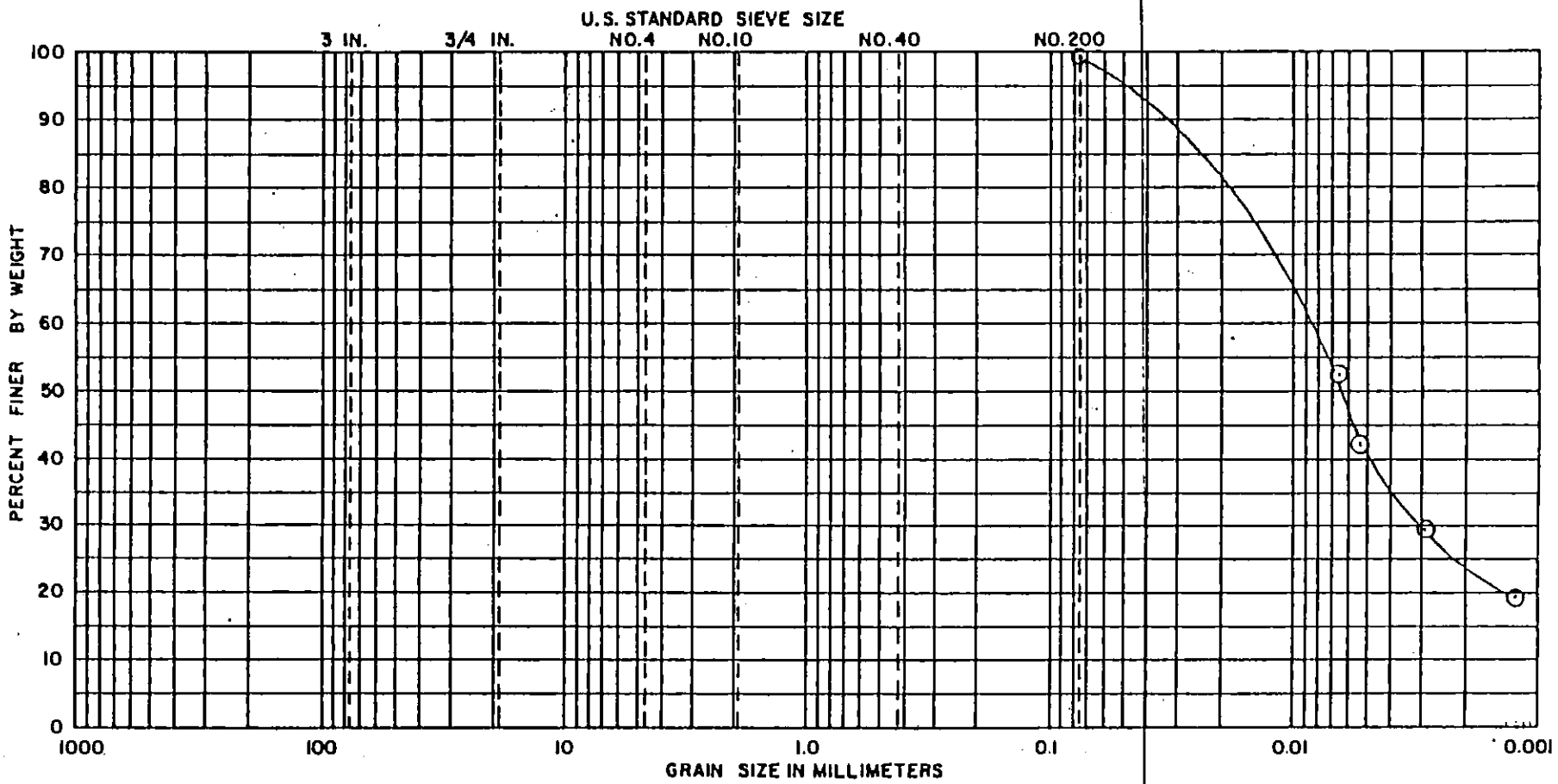
Area: WILMINGTON, DELAWARE

Boring No: GF-10

Date: 9/ 86

Tested By: AB

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
Bulk	0- 2'	OH	82.5	78.7	53.4	25.3	--
		LL Oven-dried		57.3			

Description and Comments: Gray Organic Silt.

$\frac{\text{LL Oven-dried}}{\text{LL Air-dried}} = 0.728$

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE FACILITY

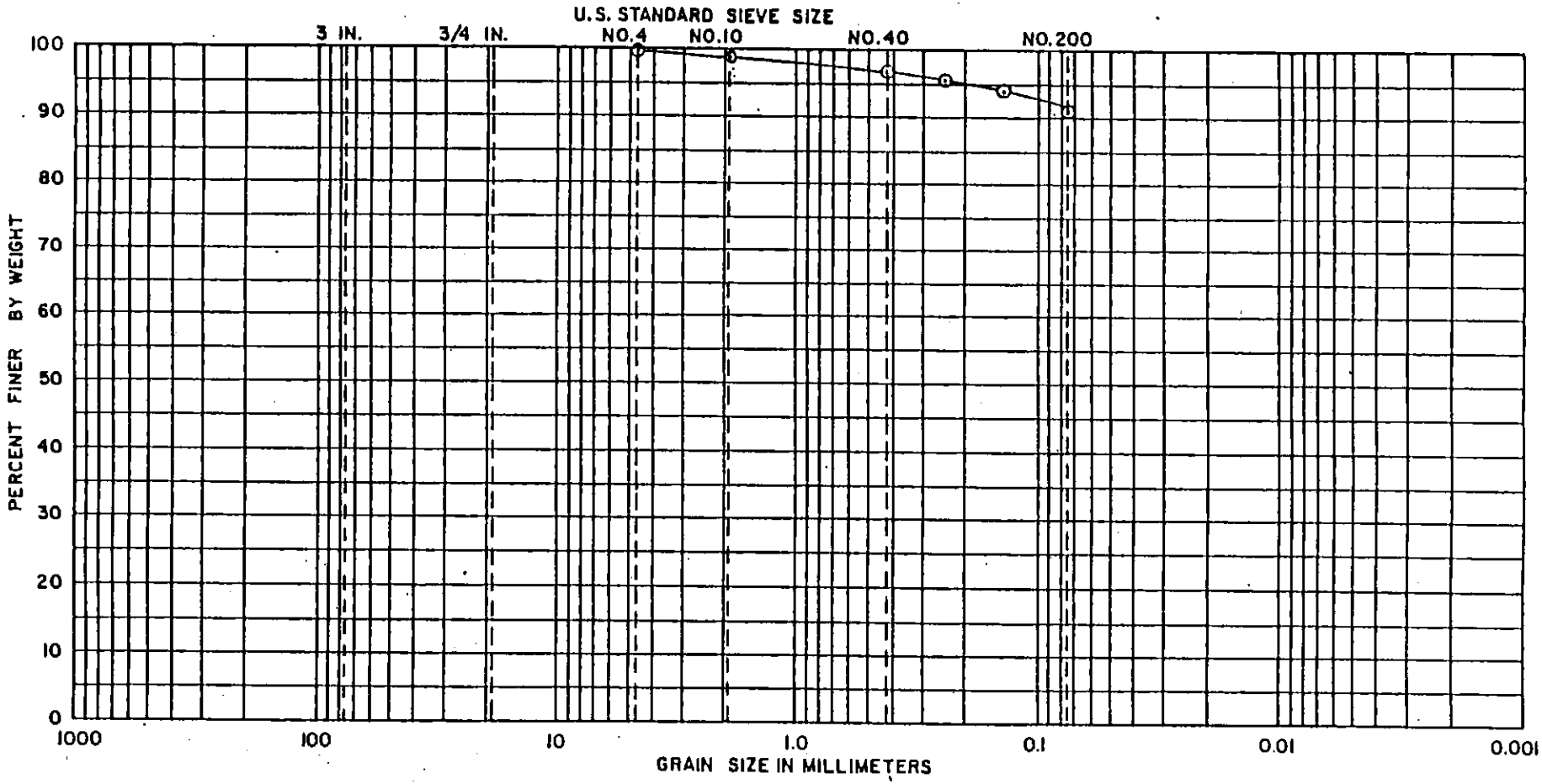
Area: WILMINGTON, DELAWARE

Boring No: GF-11

Date: 9/ 86

Tested By: AB

CLASSIFICATION TEST—GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S3,S4,S5	4.0'-10.0'	MH	44.8	50.6	39.1	11.5	-

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

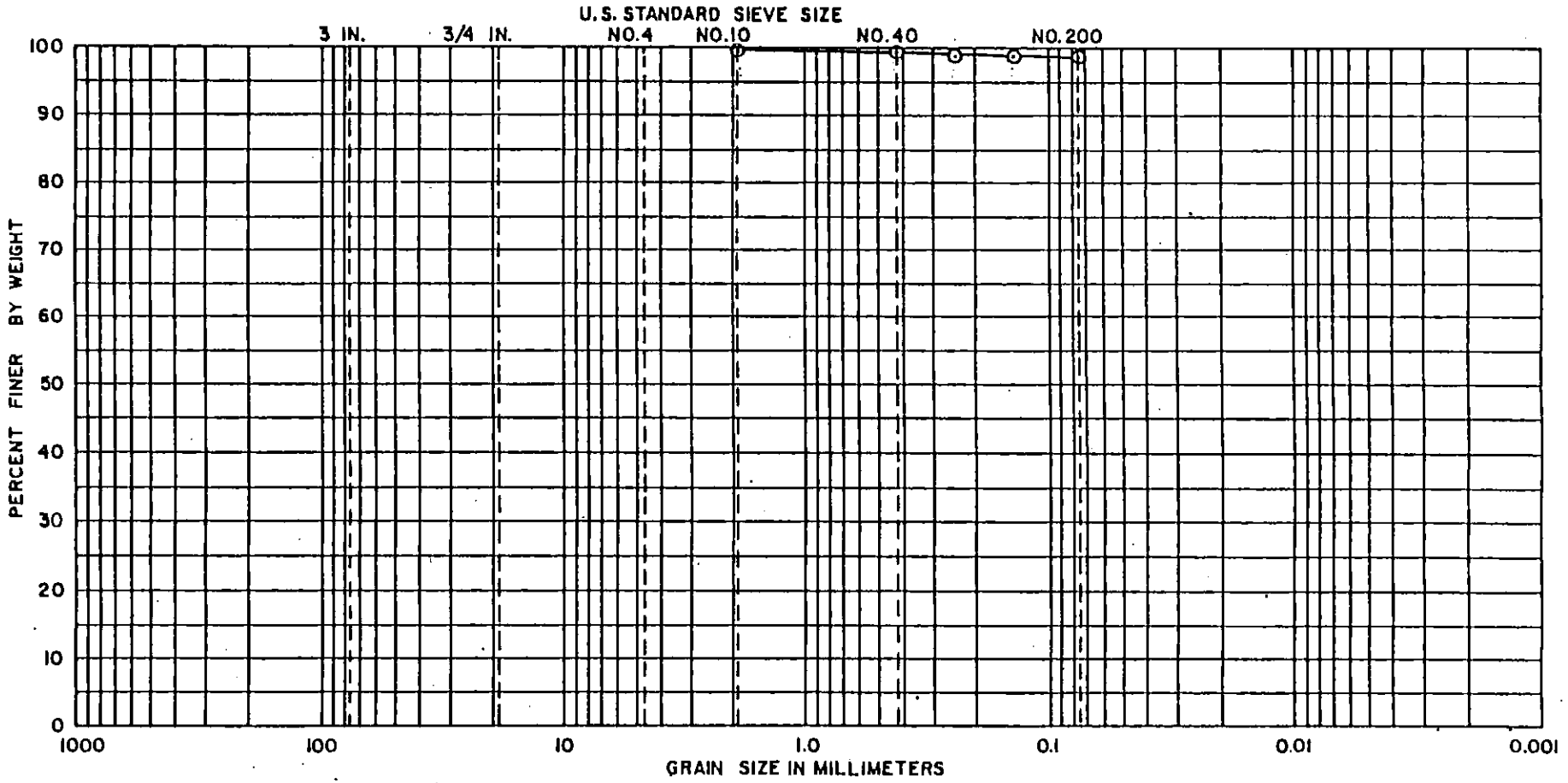
Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON , DE

Boring No: GF-101

Date: 10/27/89 Tested By: DKN

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S7,S8	18.5'-25.0'	MH	74.9	60.6	41.9	18.7	-

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

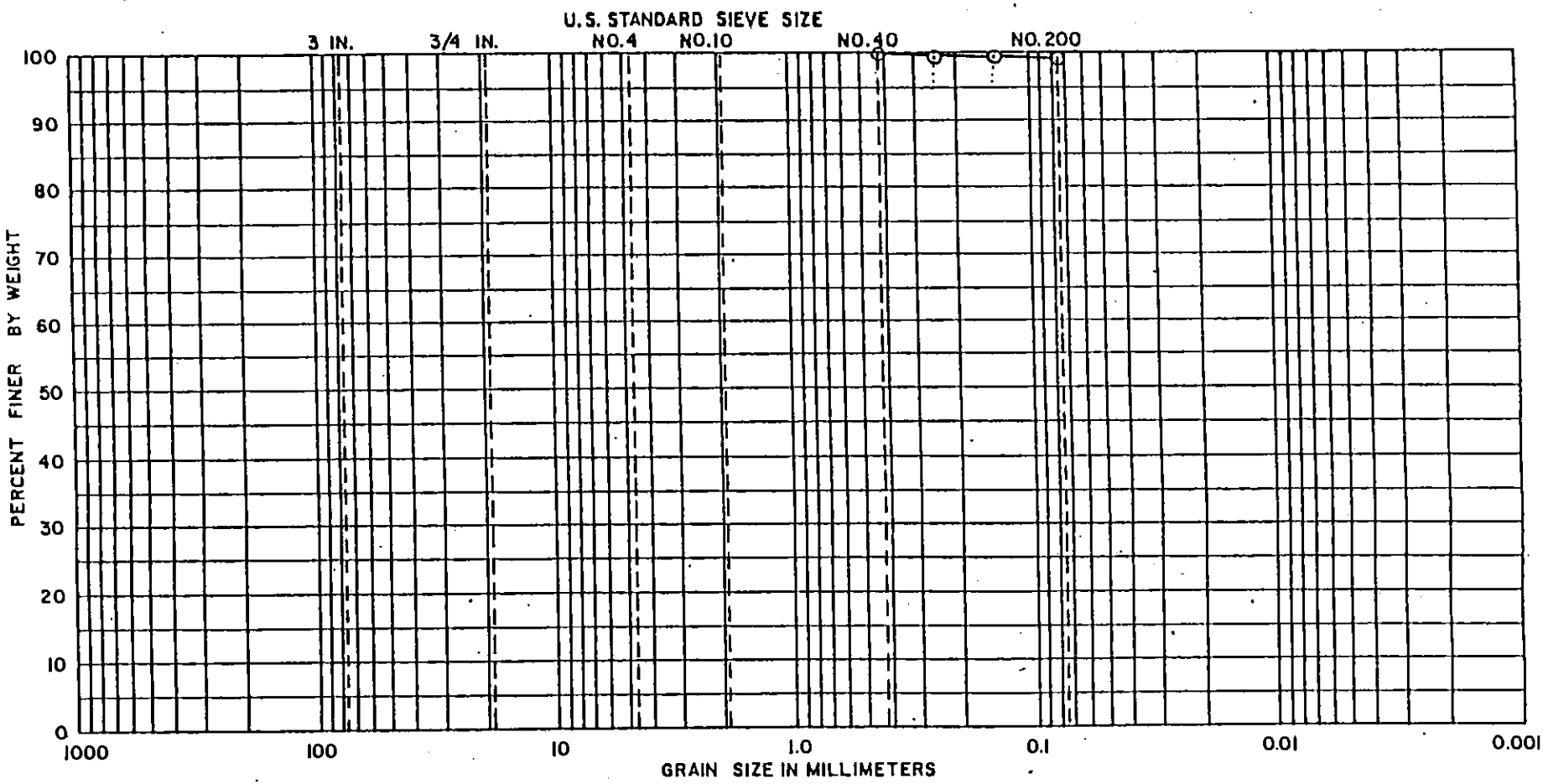
Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON , DE

Boring No: GF-101

Date: 10/27/89 Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S11,S12	38.5'-45.0'	MH	76.0	63.2	43.2	20.0	-

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

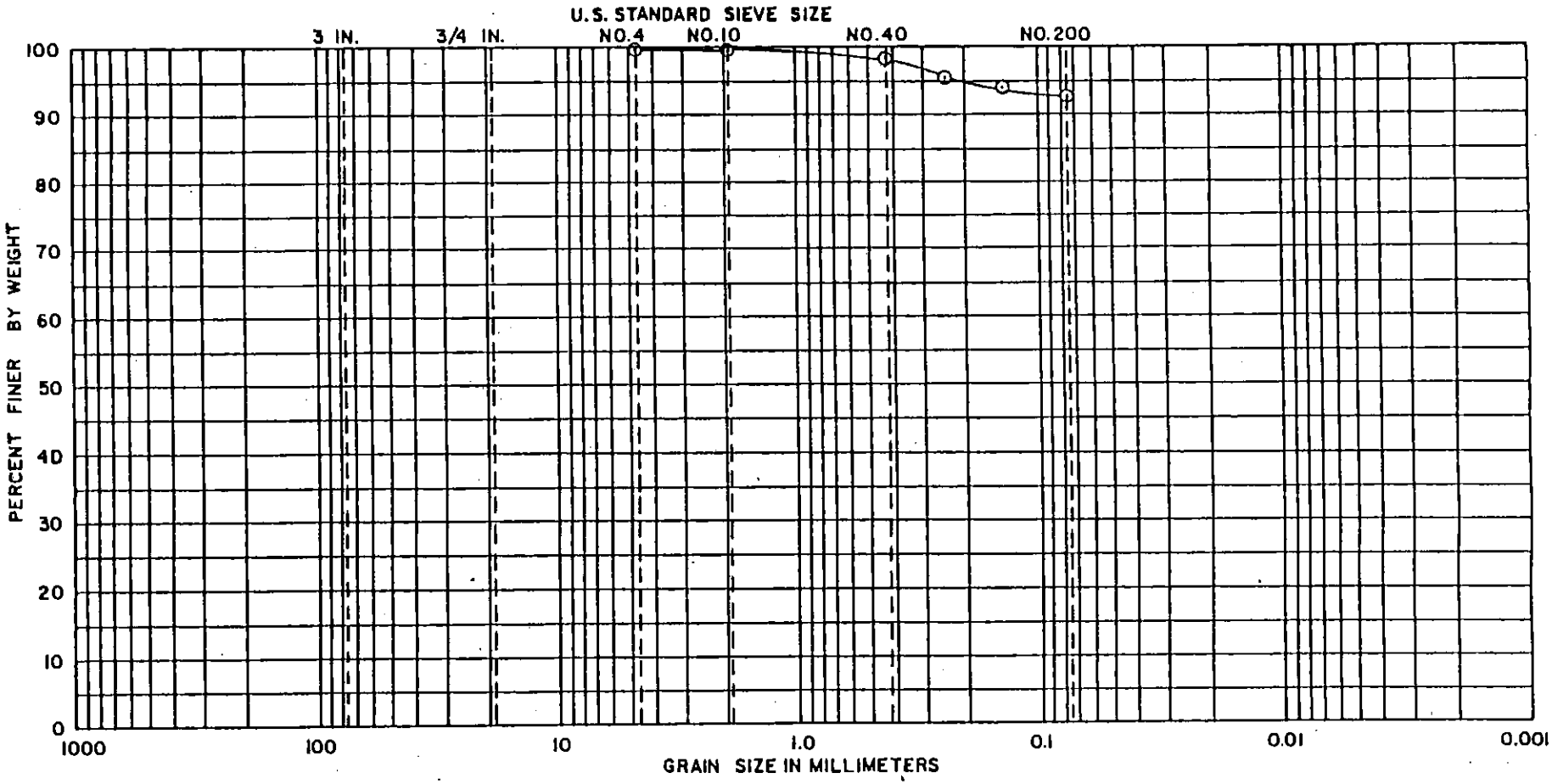
Area: WILMINGTON , DE

Boring No: GF-101

Date: 10/27/89

Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S16,S17	63.5'-70.0'	ML	47.5	42.2	26.8	15.4	-

Description and Comments: Gray Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

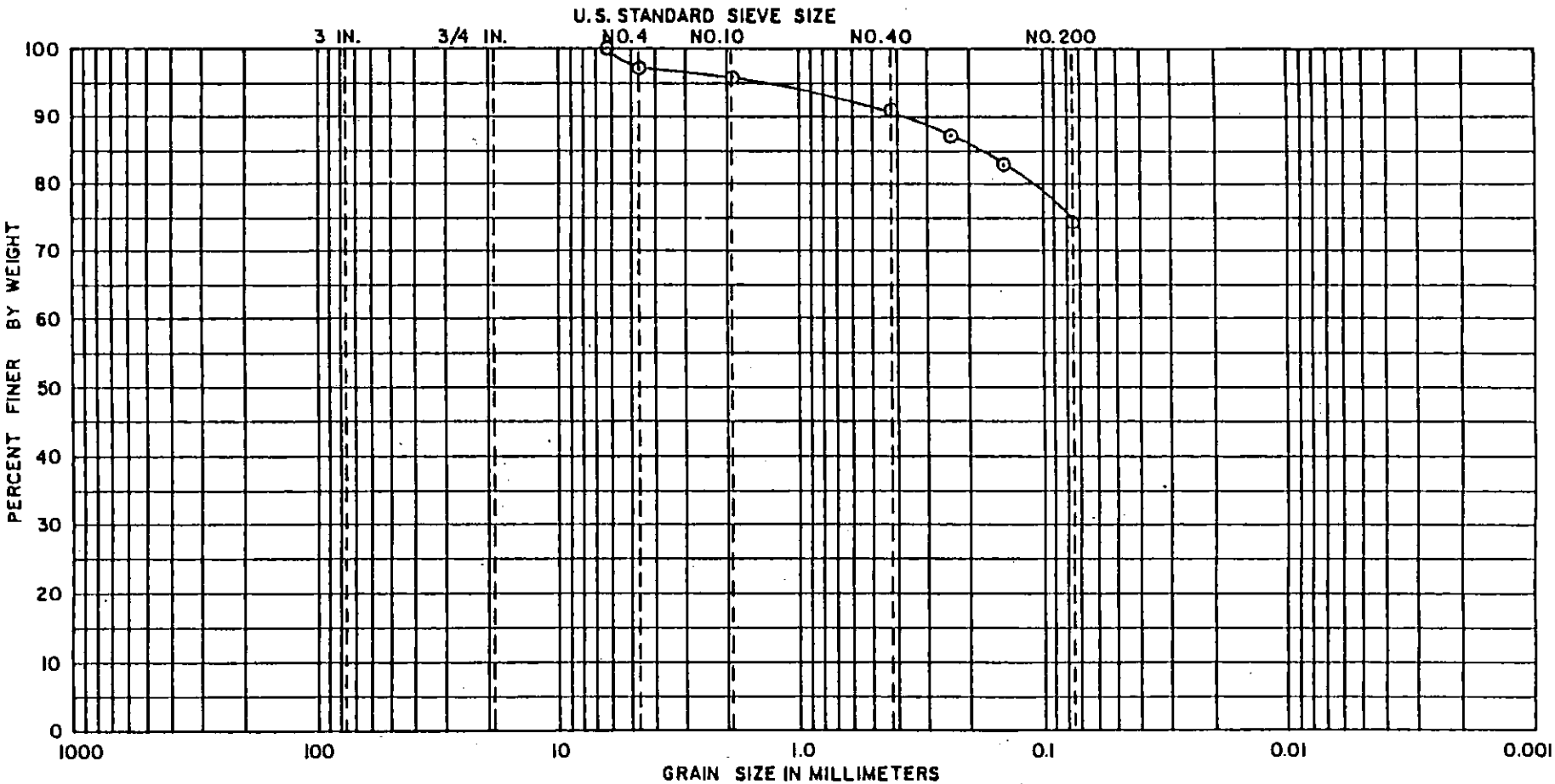
Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON , DE.

Boring No: GF-101

Date: 10/27/89 Tested By: DKN

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	4.0'-6.0'	ML	43.7	37.7	31.0	6.7	-

Description and Comments: Gray Silt With Sand / Max. Grain Size 0.25"
Sample No. 1 Dry Density = 54pcf/W Content=49.2%
Sample No. 2 Dry Density = 62pcf/W Content=44.5%

CLASSIFICATION TEST-GRADATION CURVES

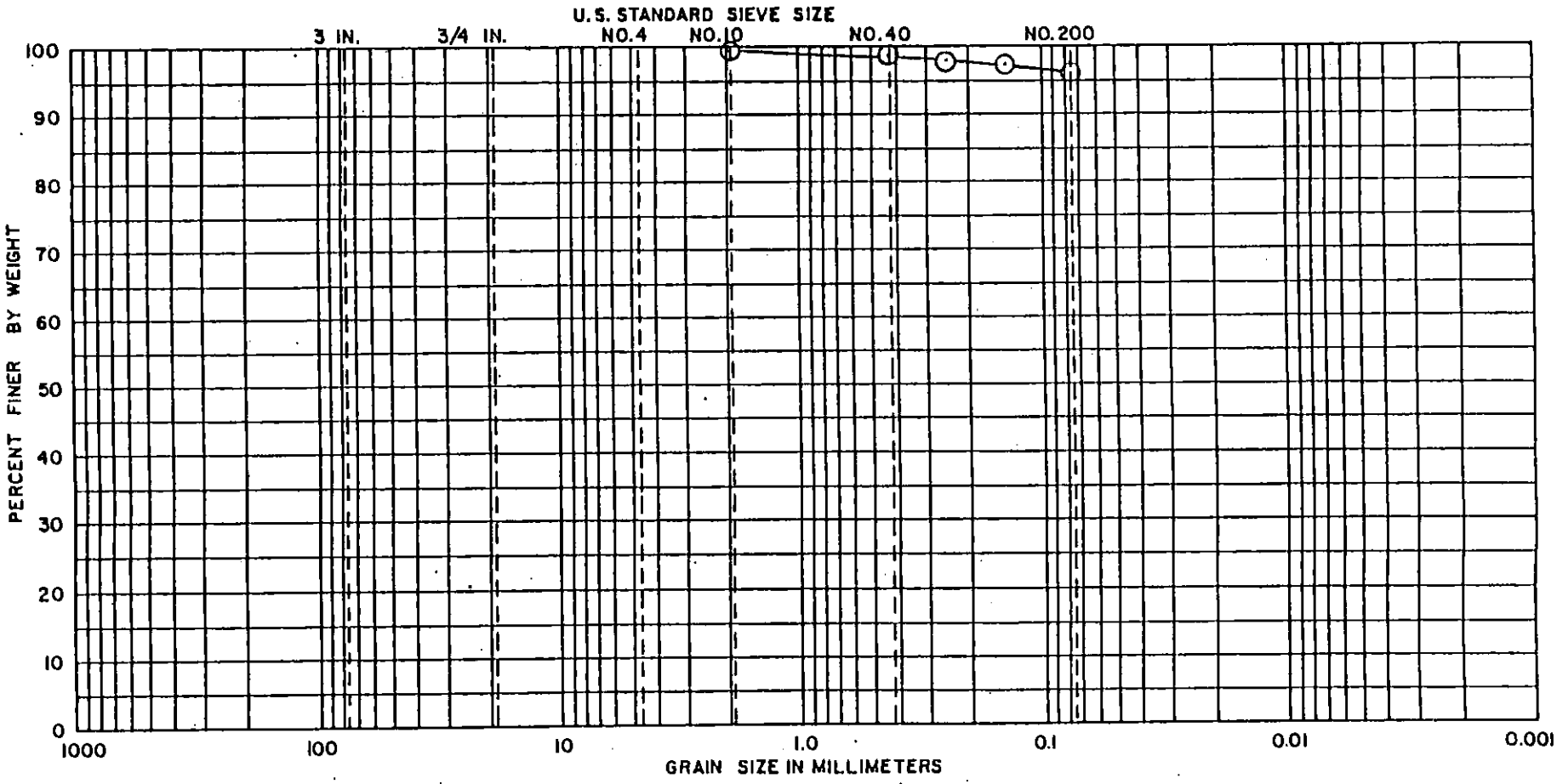
GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON , DE

Boring No: GF-102

Date: 11/3/89 Tested By: DKN



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-102/S6,7	13.5'-20.0'	MH	69.7	57.6	39.1	18.5	--

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWA - 2 PHASE III

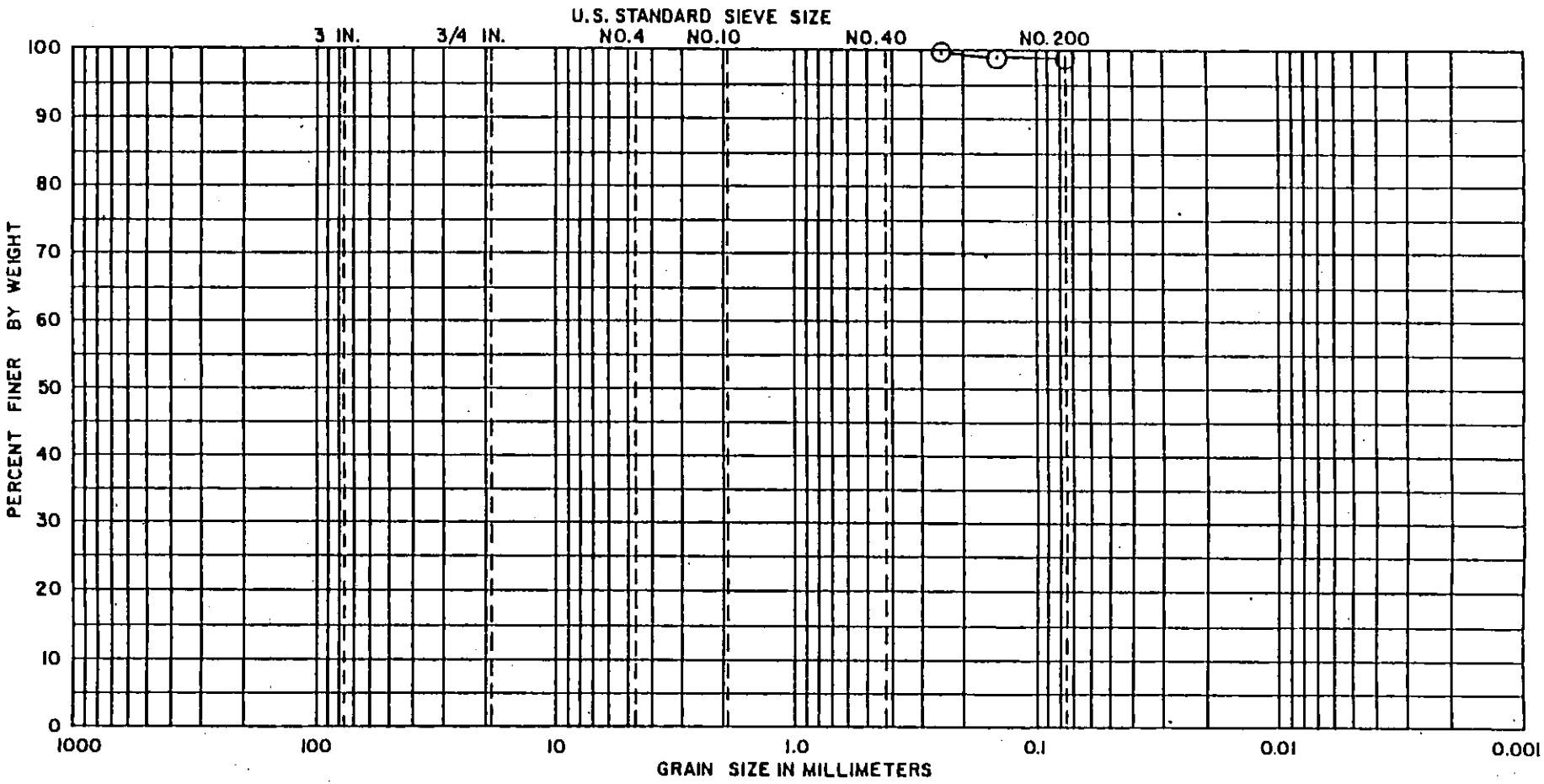
Area: WILMINGTON, DE

Boring No: GF-102 / S-6 & S-7

Date: Oct. 27, 1989

Tested By: K.A.Abdolos

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-102/S-9	28.5'-35.0'	MH	92.8	66.3	46.2	20.1	--
S-10							

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

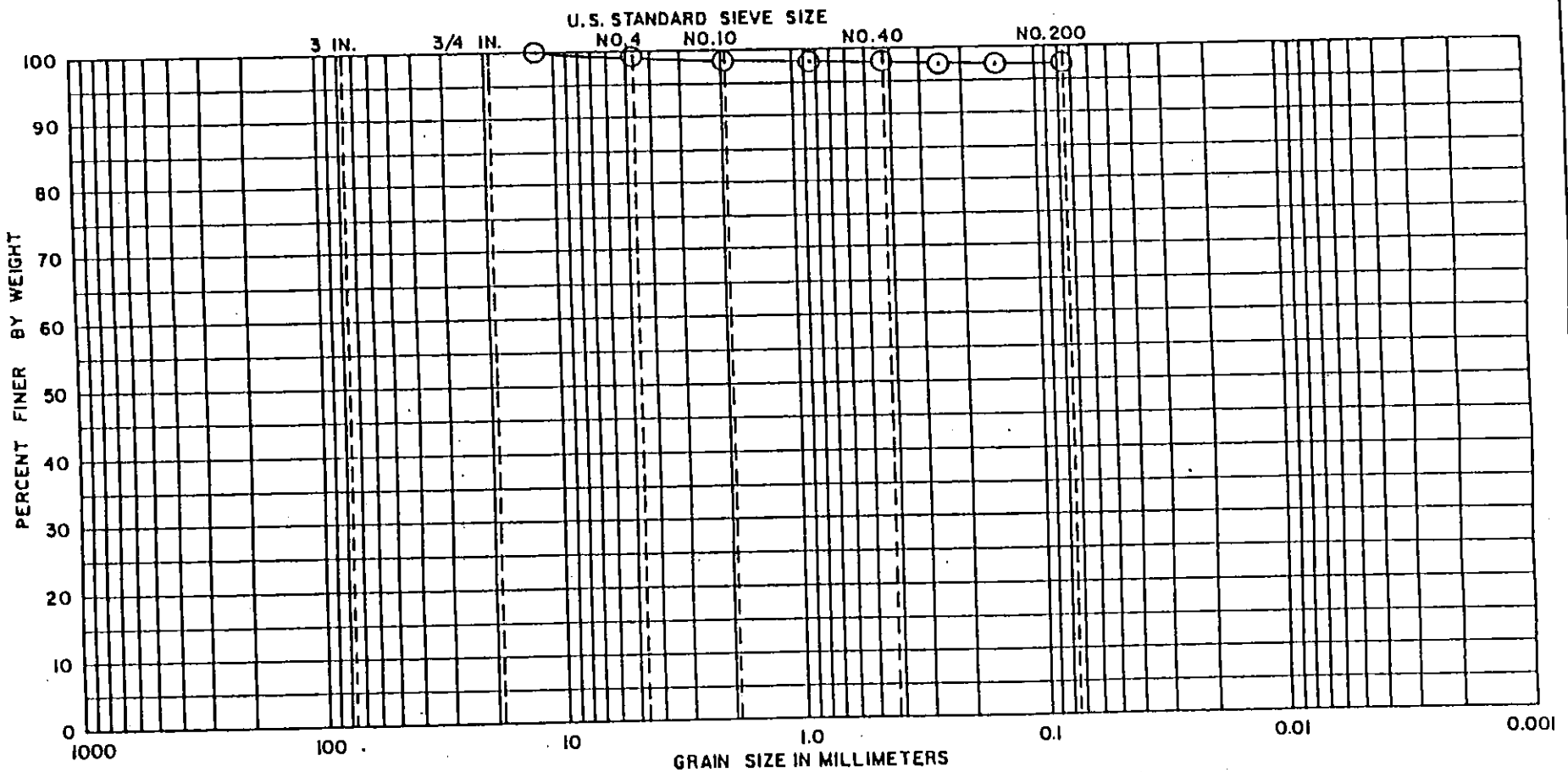
Area: WILMINGTON, DE.

Boring No: GF-102 / S-9 & S-10

Date: Oct. 27, 1989

Tested By: K.A. Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	35'-37'	MH	91.2	69.3	47.8	21.5	--
		(LL OVEN DRYED)	=	58.8			

Description and Comments:
1) BROWN-ELASTIC SILT.
2) LL OD / LL AD = .85

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF, PHASE III

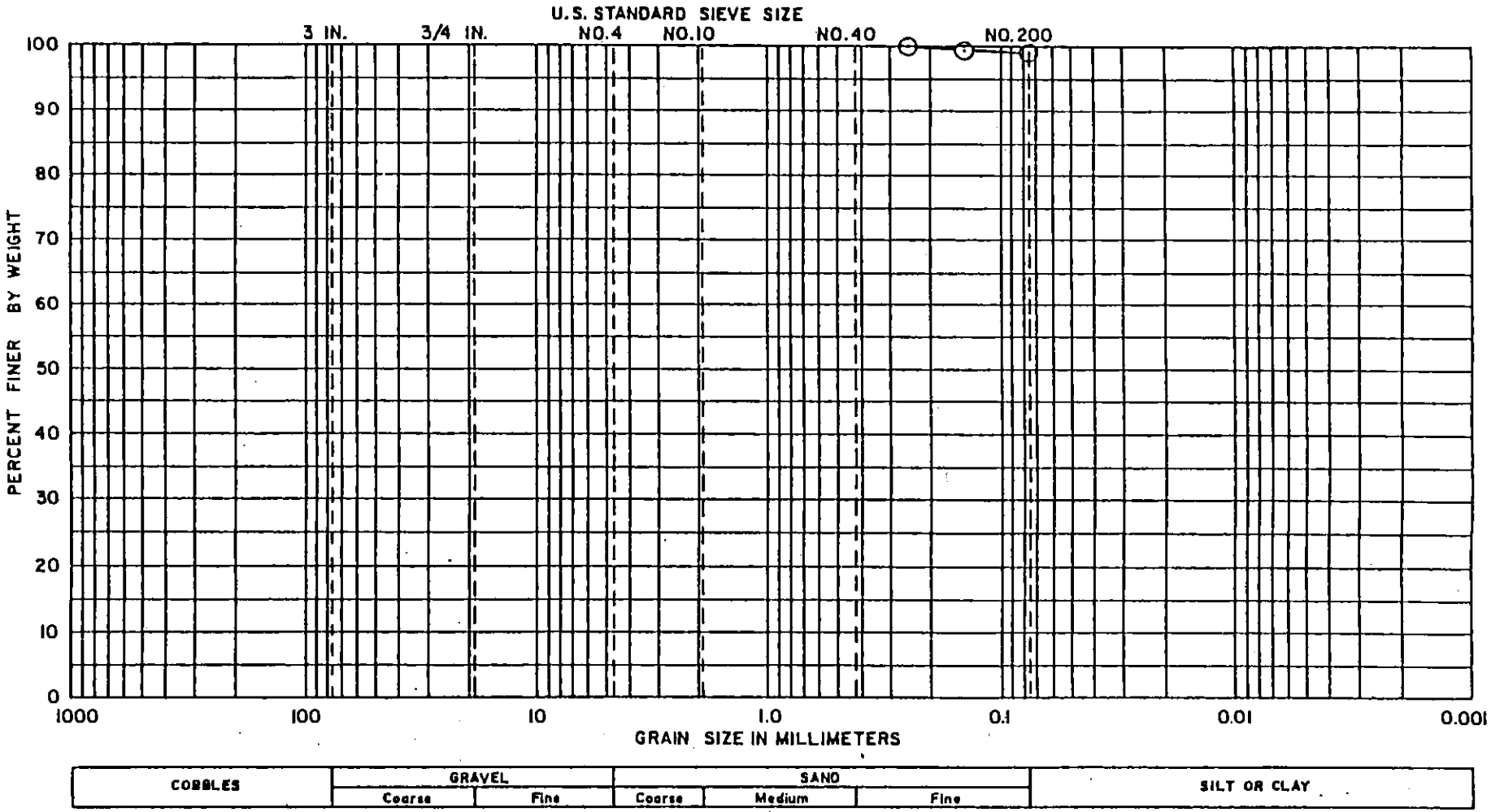
Area: WILMINGTON, DE

Boring No: GF-102

Date: 2/1/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-102/S-14	48.5'-55.0'	ML	63.0	46.5	33.0	13.5	--
S-15							

Description and Comments: Gray Silt

CLASSIFICATION TEST - GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

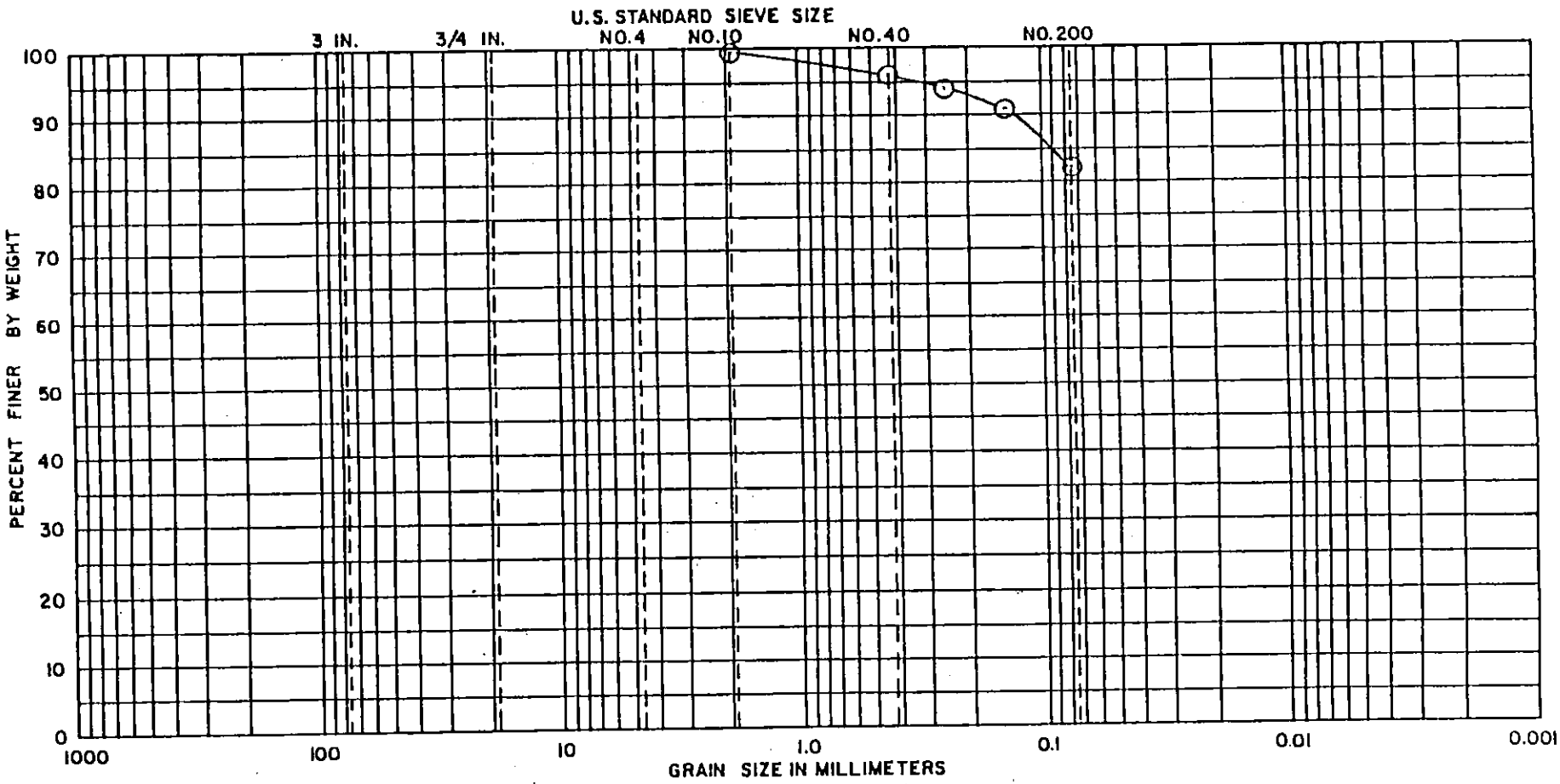
Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON, DE.

Boring No: GF-102 / S-14 & S-15

Date: Oct: 27,1989

Tested By: K.A.Abdolos



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-103/S-2, S-3 & S-4	2.0' - 8.0'	ML	47.8	--	N/P	--	--

Description and Comments: Gray Silt with Sand

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

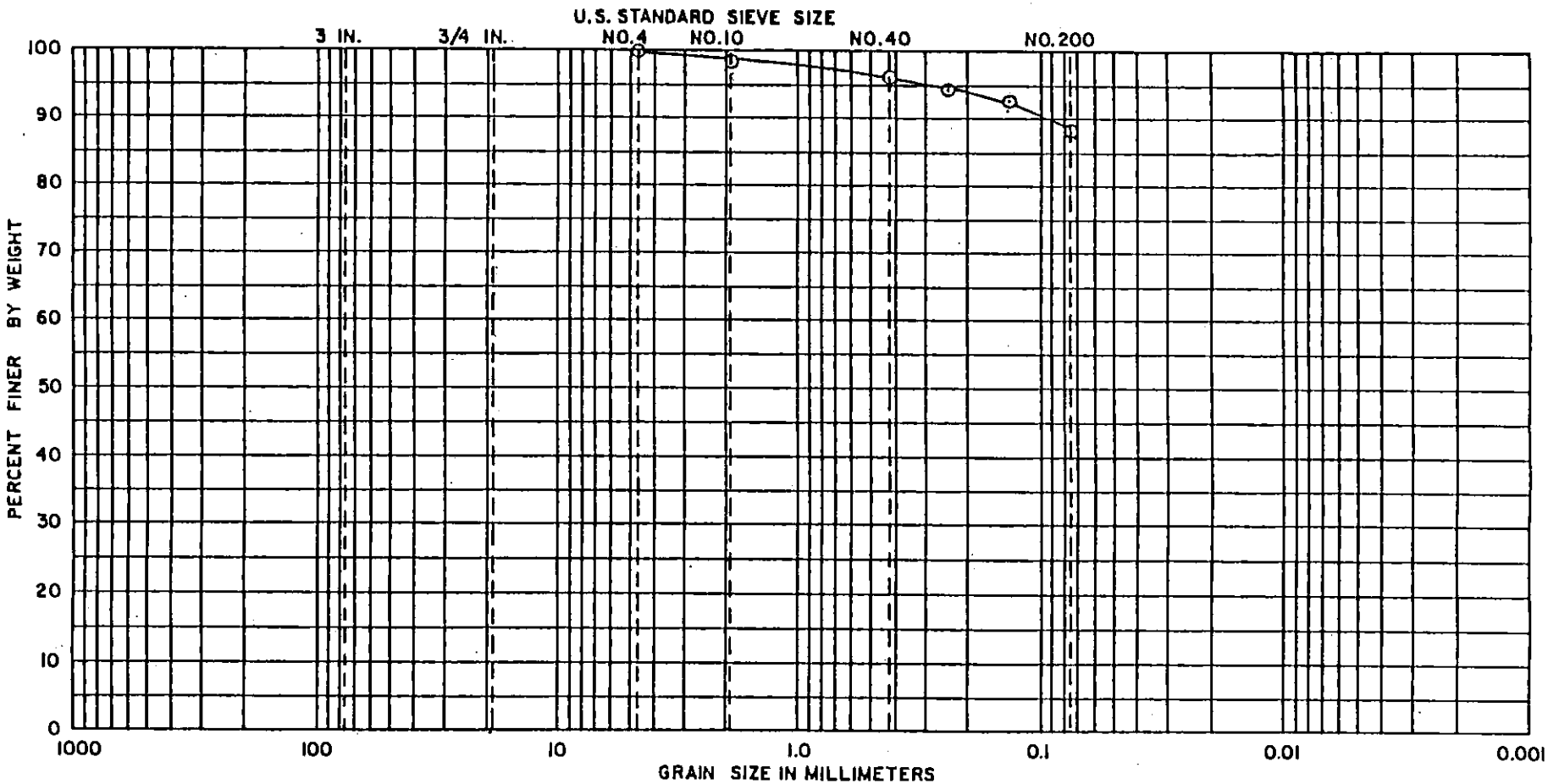
Area: WILMINGTON, DE.

Boring No: GF-103 / S-2 , S-3 & S-4

Date: Oct. 27, 1989

Tested By: K.A. Abdolos

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	15.0'-17.0'	ML	94.2	43.7	43.5	0.2	-

Description and Comments: Gray Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

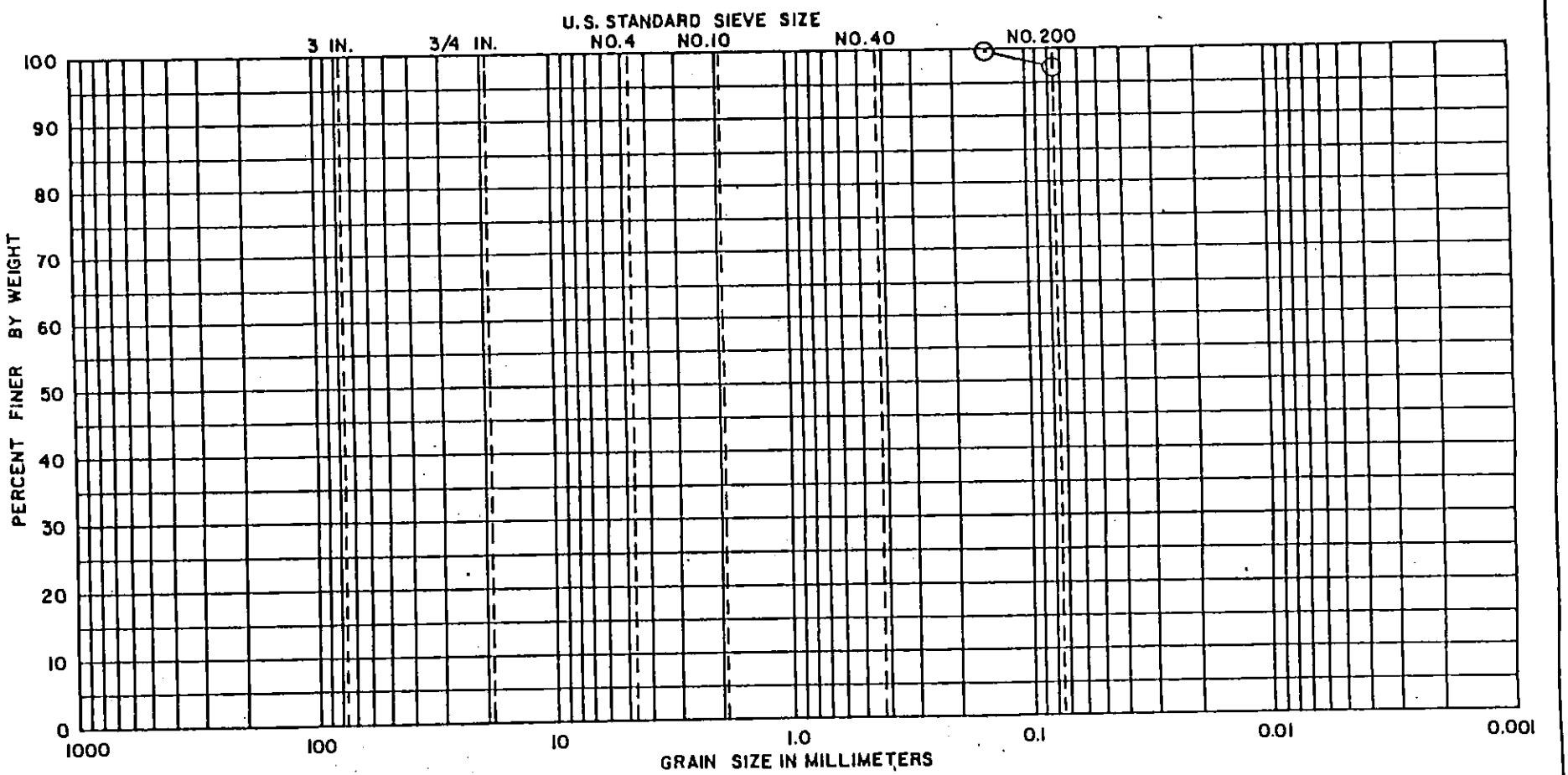
Area: WILMINGTON , DE

Boring No: GF-103

Date: 11/3/89

Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-103/S-8, S-9	23.5'-30.0'	ML	65.8	48.2	34.0	14.2	--

Description and Comments: Brown Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

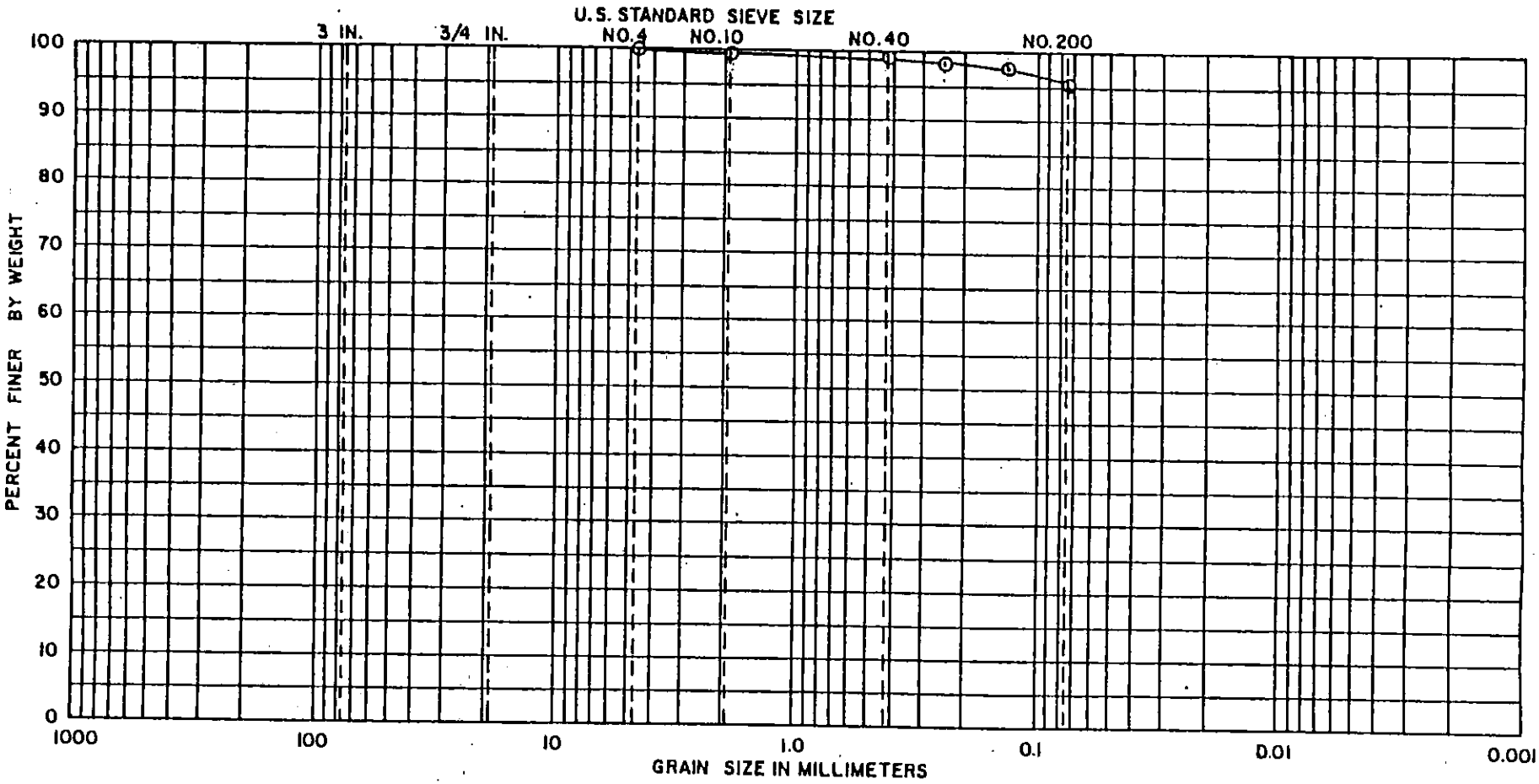
Area: WILMINGTON, DE.

Boring No: GF-103 / S-8 & S-9

Date: Oct. 27, 1989

Tested By: K.A. Abdolos

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
U-2	45.0'-47.0'	ML	61.4	47.4	33.5	13.9	-

Description and Comments: Gray Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

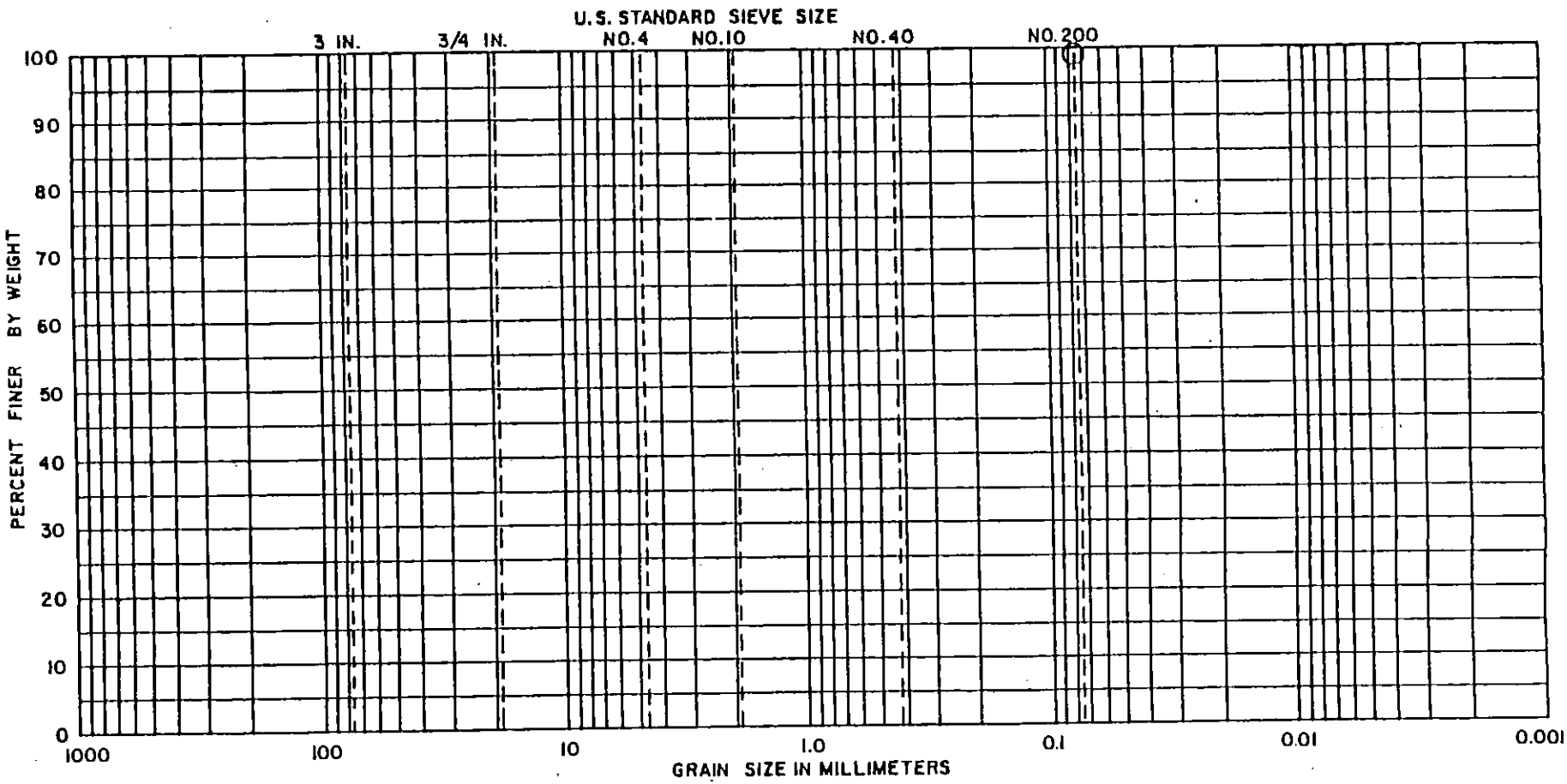
Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON , DE

Boring No: GF-103

Date: 11/3/89 Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
BAG	0 - 1'	MH		79.9	54.6	25.3	--
		(LL OVEN DRYED)	=	66.3			

Description and Comments:
1) GRAYISH BLACK-ELASTIC SILT.
2) LL OD / LL AD = .83

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF, PHASE III

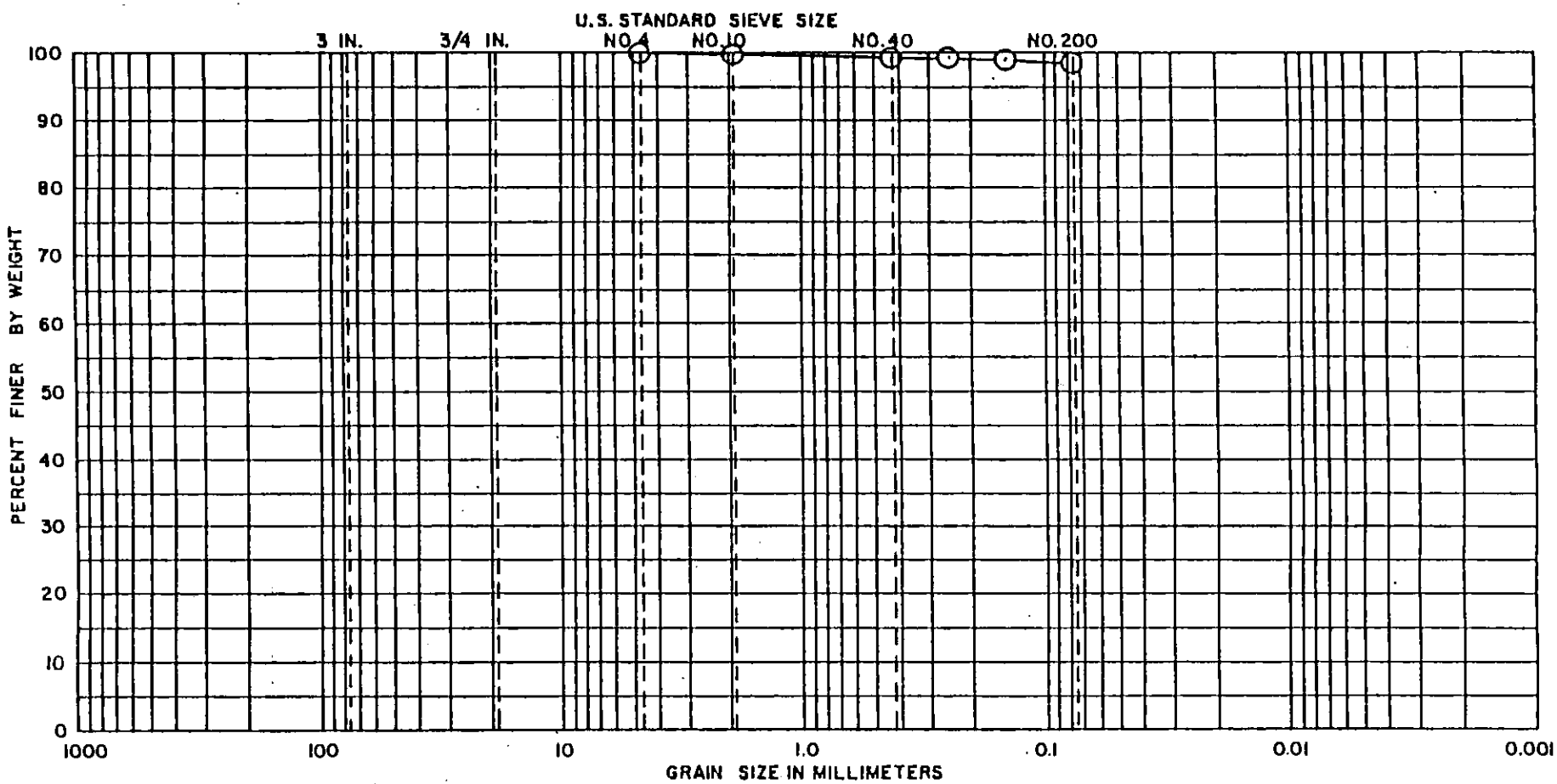
Area: WILMINGTON, DE

Boring No: GF-104

Date: 2/16/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S1,2,3	0-6'	MH	141.0	75.2	49.0	26.2	-

Description and Comments: DK. GRAYISH BROWN-ELASTIC SILT.

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF-2 PHASE III

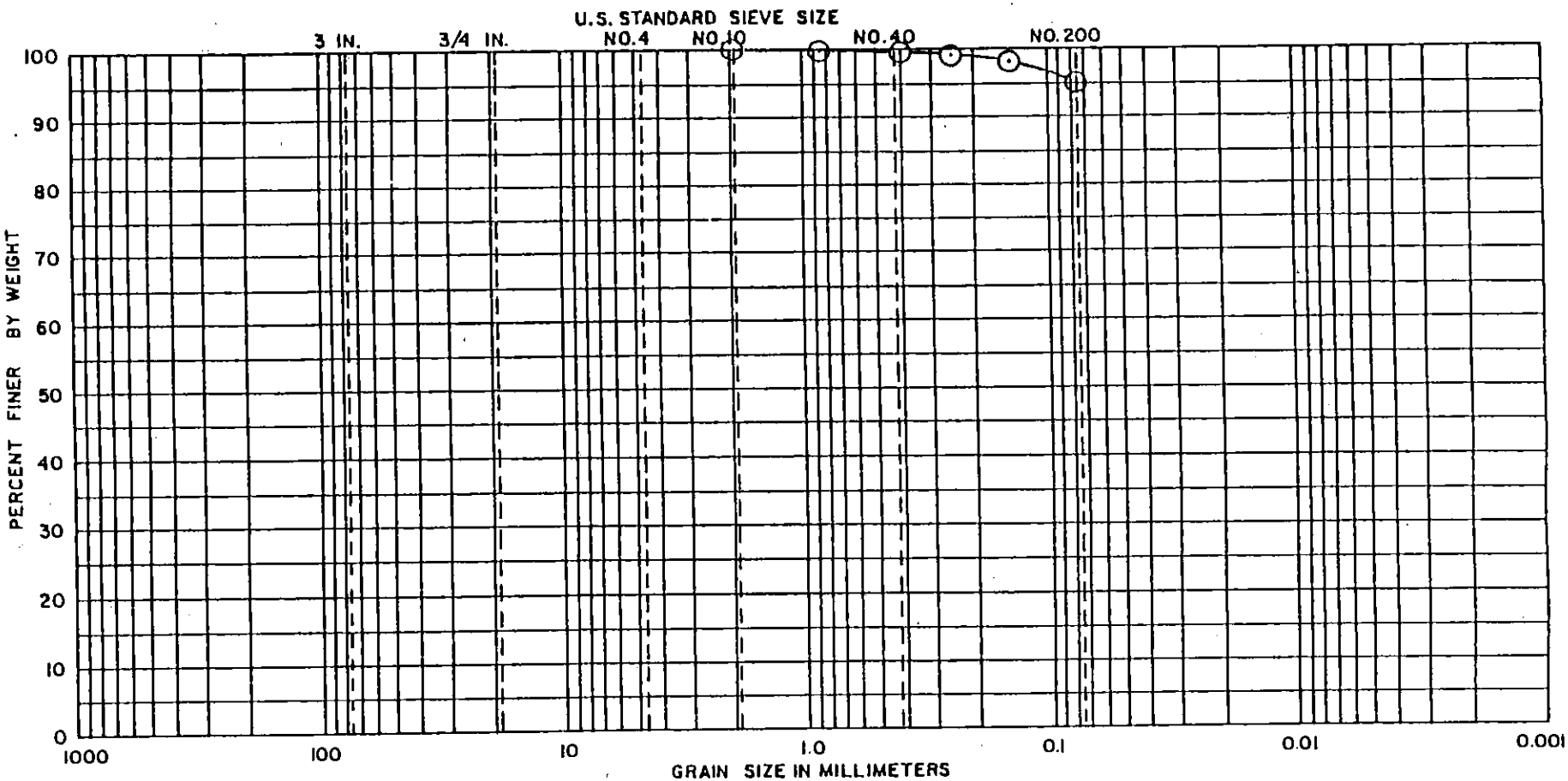
Area: WILMINGTON, DE

Boring No: GF-104

Date: 12/13/89

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	6.5-8.5'	MH		65.9	40.9	25.0	--
		(LL OVEN DRYED)	=	52.0			

Description and Comments:
1) BROWN-ELASTIC SILT.
2) LL OD/LL AD = .79

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF, PHASE III

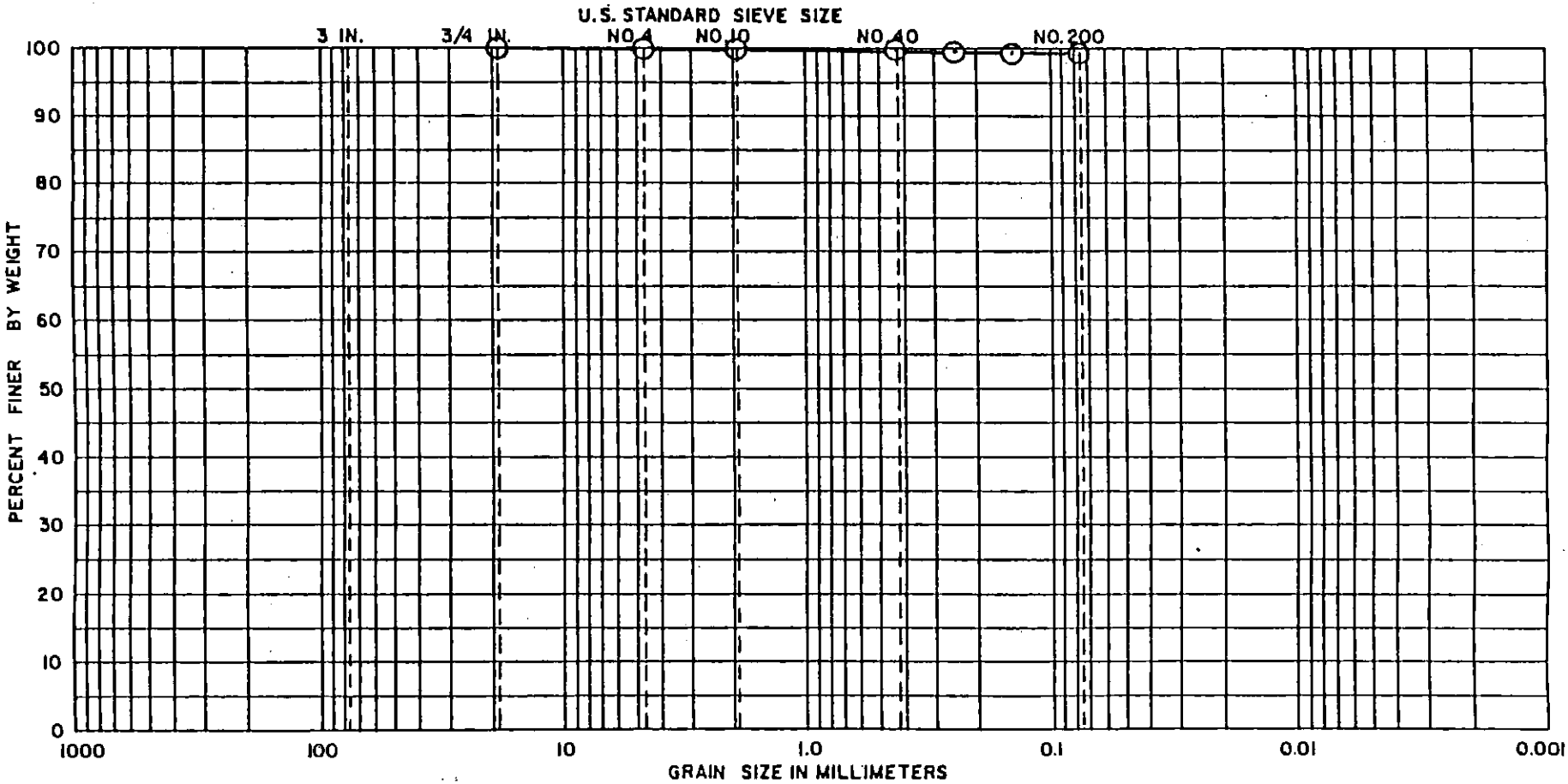
Area: WILMINGTON, DE

Boring No: GF-104

Date: 1/24/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S8,9	23.5'-30'	MH	95.2	68.4	47.1	21.3	--

Description and Comments: DK. GRAYISH BROWN-ELASTIC SILT.

GANNETT FLEMING GEOTECHNICAL LABORATORY

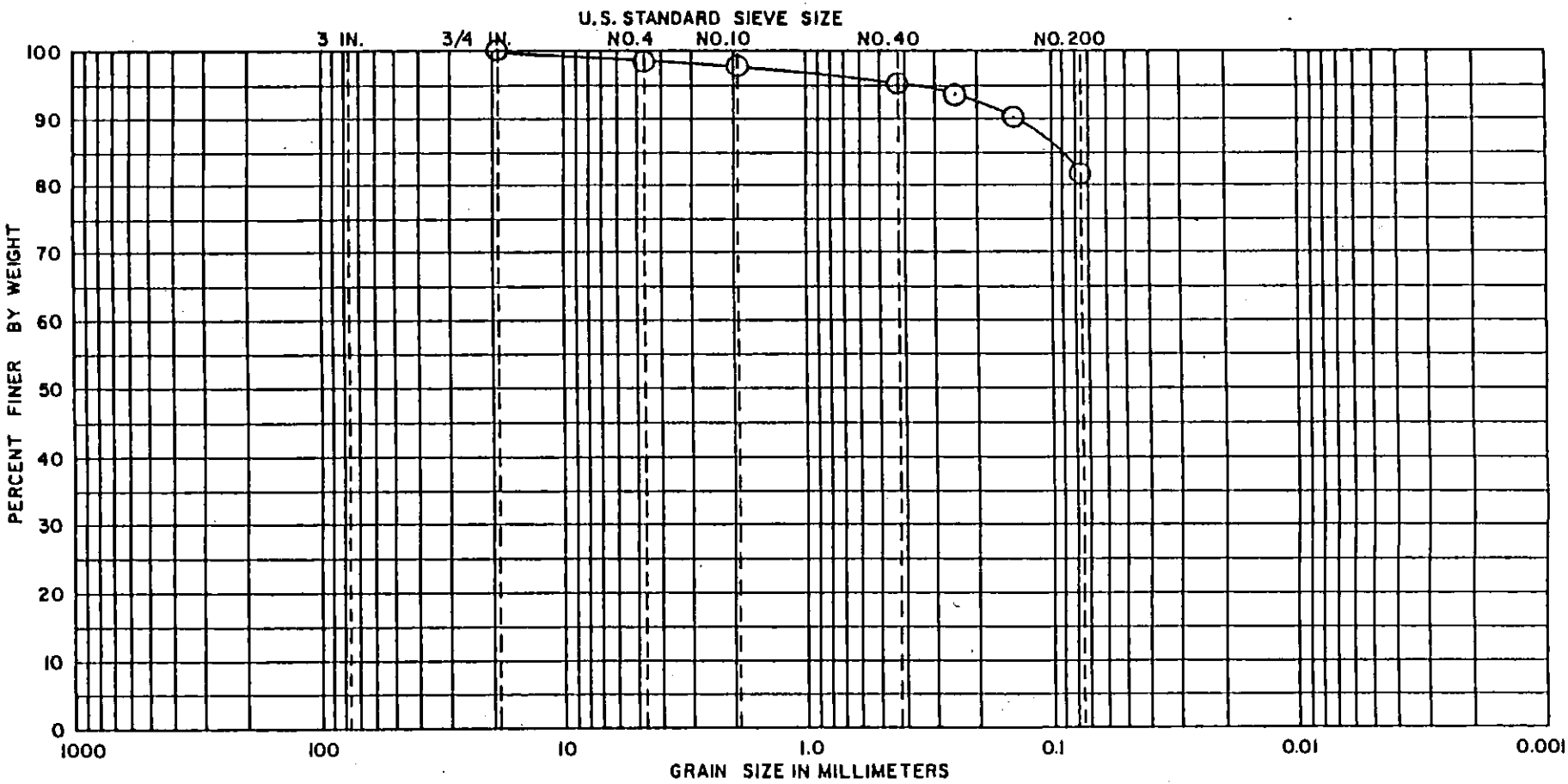
Project: DSWA NSWF-2 PHASE III

Area: WILMINGTON, DE

Boring No: GF-104

Date: 12/13/89 Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
U-2	16.5'-18.5	ML	55.1	--	N/P	--	-

Description and Comments: GRAY-SILT WITH SAND.

GANNETT FLEMING GEOTECHNICAL LABORATORY

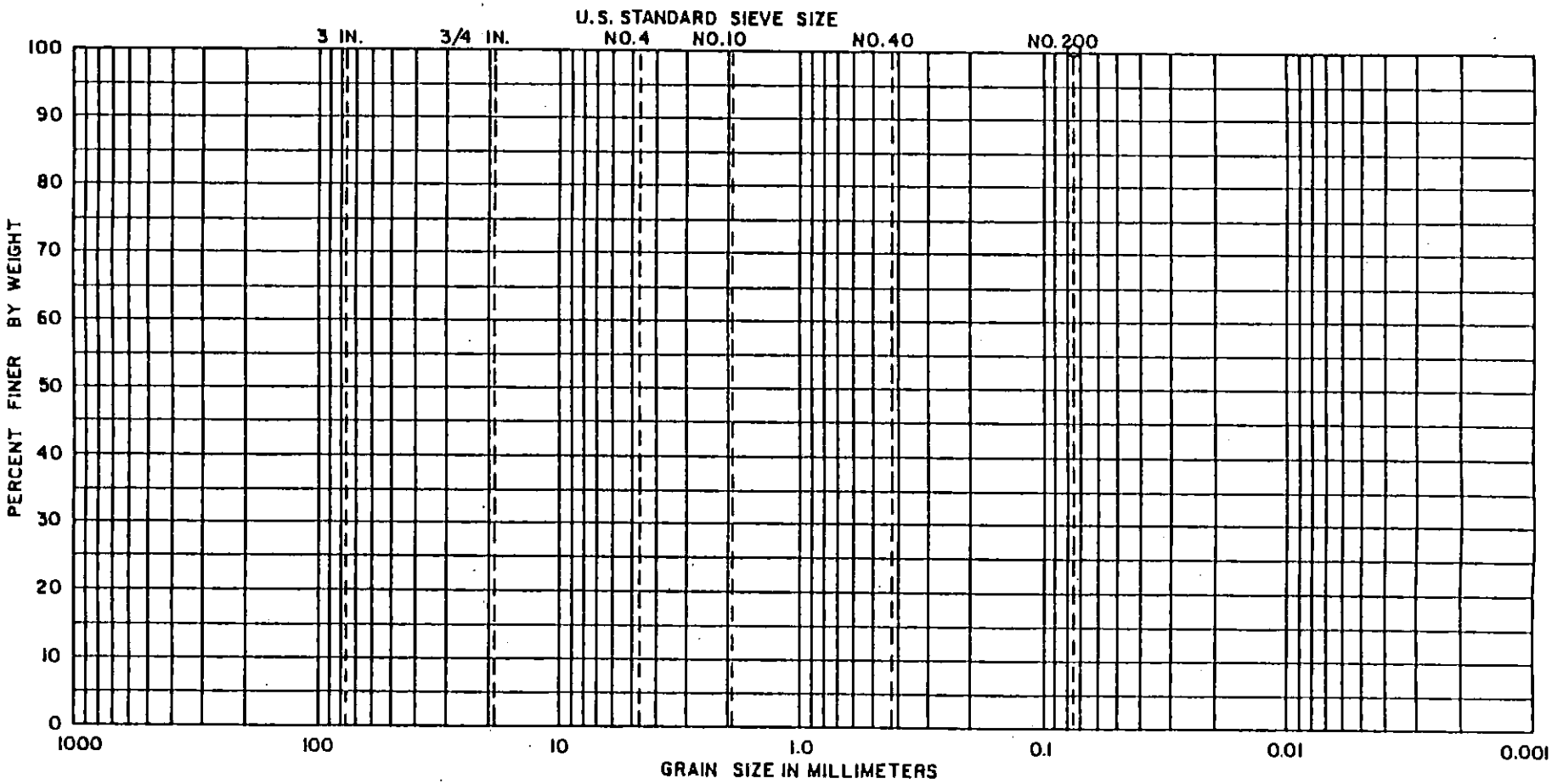
Project: DSWA NSWF-2 PHASE III

Area: WILMINGTON, DE

Boring No: GF-104A

Date: 12/13/89 Tested By: KLM

CLASSIFICATION TEST—GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-4	35.0'-37.0'	MH	94.2	74.1	48.0	26.1	-

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

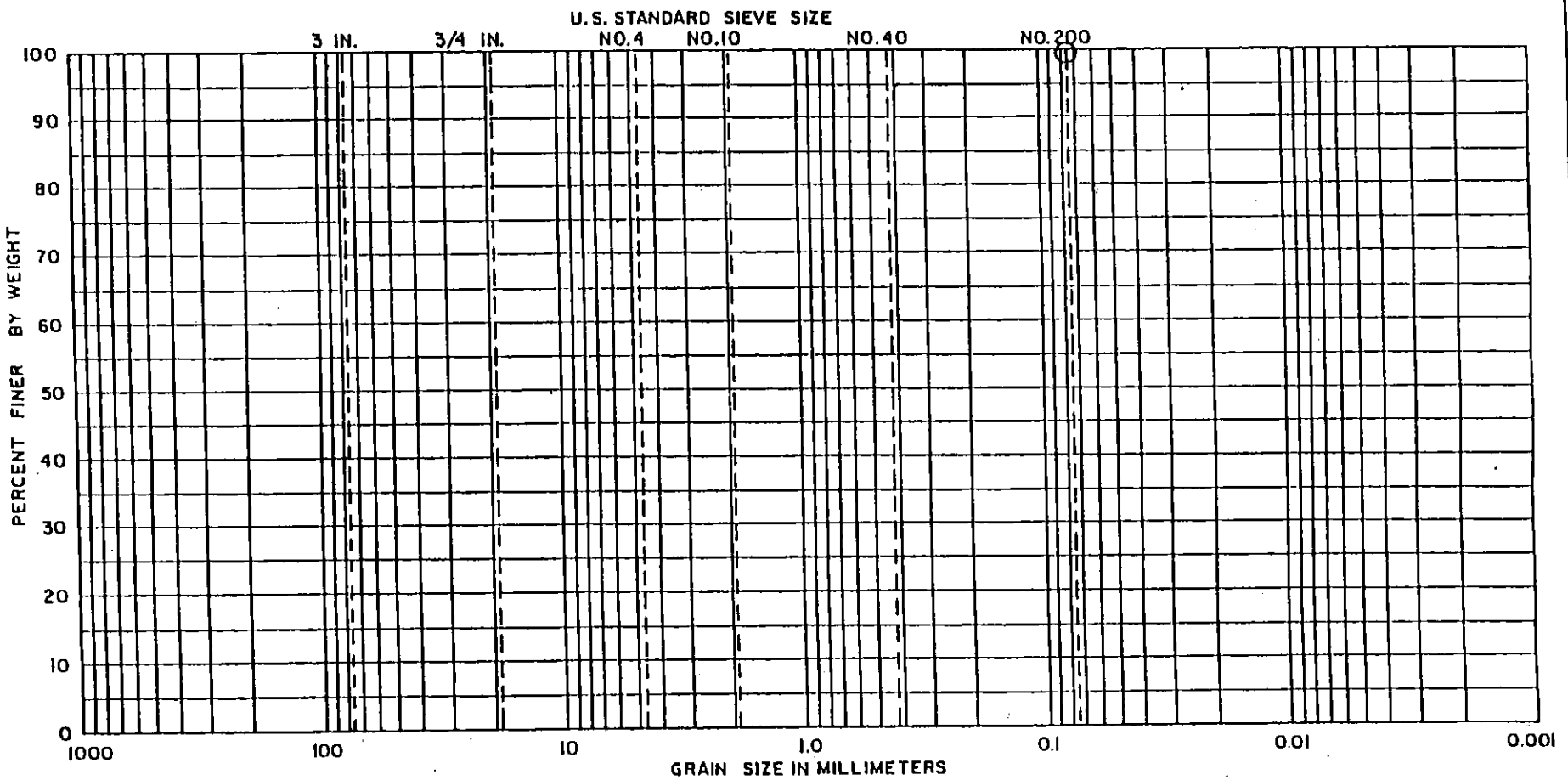
Area: WILMINGTON , DE.

Boring No: GF - 104A

Date: 11/27/89

Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
BAG	0 - 1'	MH		71.2	49.5	21.7	---
		(LL OVEN DRYED)	=	59.8			

Description and Comments:
1) BROWN-ELASTIC SILT.
2) LL OD / LL AD = .84

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF, PHASE III

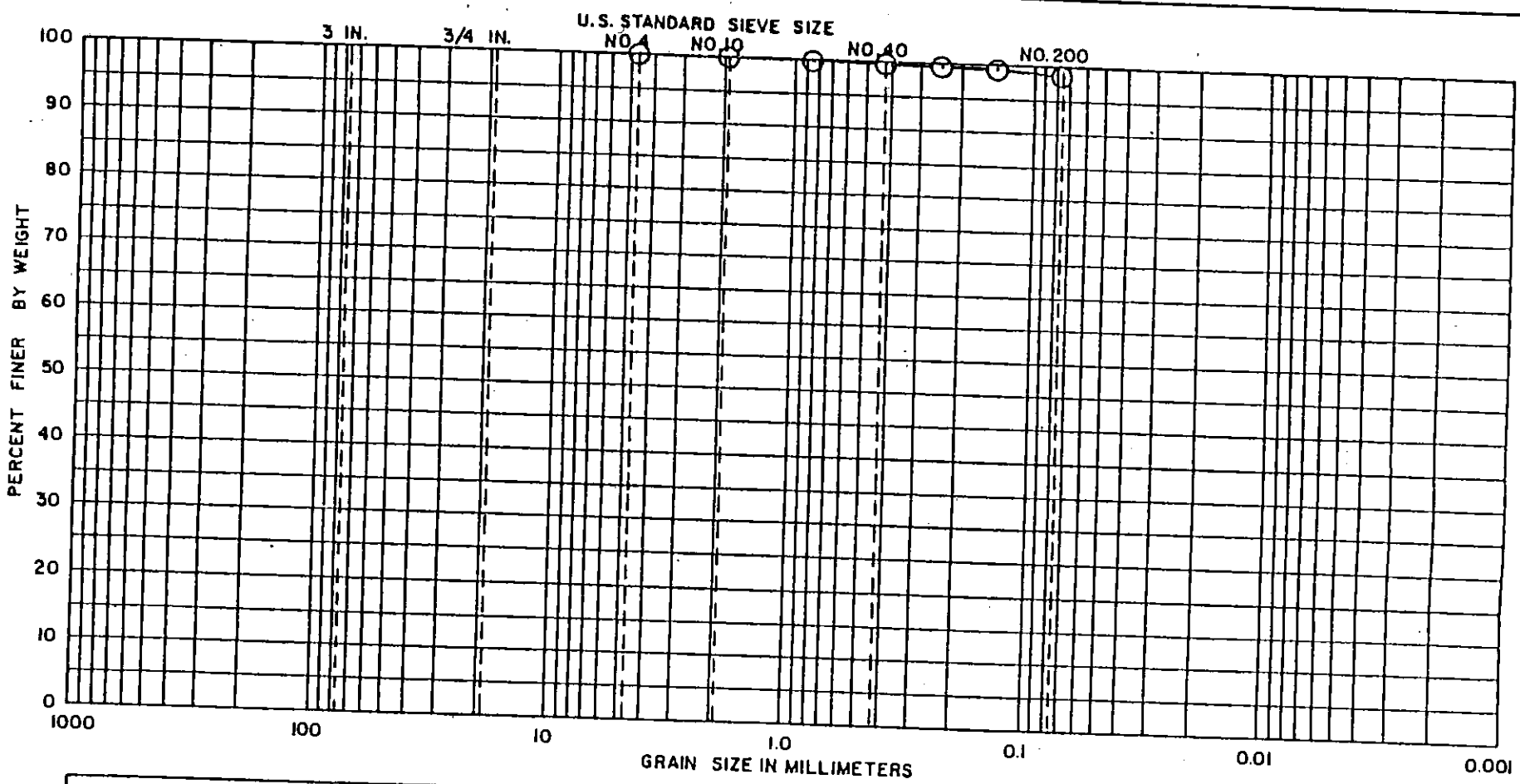
Area: WILMINGTON, DE

Boring No: GF-105

Date: 2/9/90

Tested By: KLM

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	5 - 7'	MH		69.5	42.2	27.3	---
		(LL OVEN DRYED)	=	51.8			

Description and Comments:
1) BROWN-ELASTIC SILT.
2) LL OD/LL AD = .75

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF, PHASE III

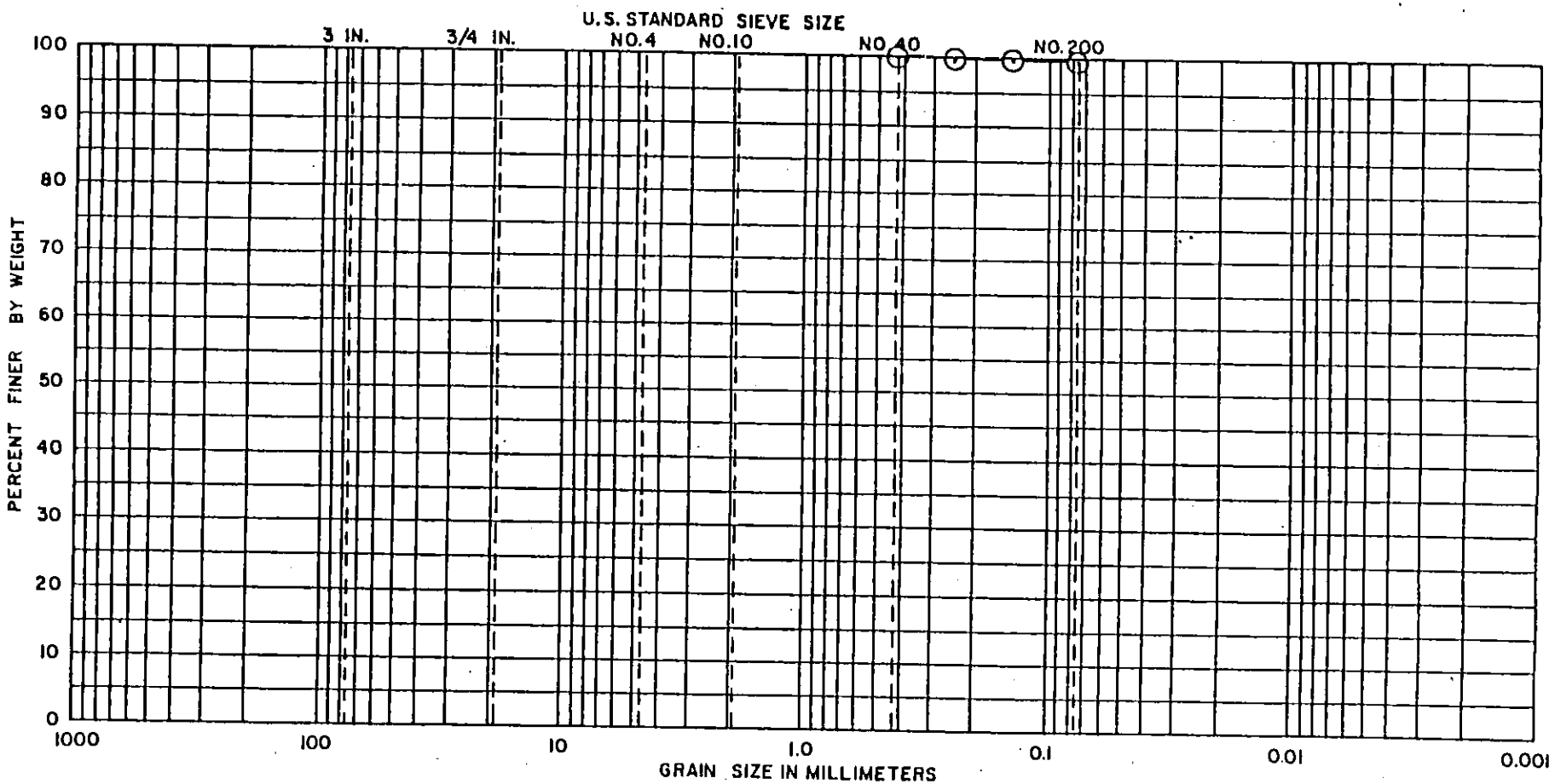
Area: WILMINGTON, DE

Boring No: GF-105

Date: 1/24/89

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	18.5-20.5'	MH		75.5	45.1	30.4	-
		(LL OVEN DRYED) =		58.8			

Description and Comments:
1) BROWN-ELASTIC SILT.
2) LL OD/LL AD = .78

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA,NSWF, PHASE III

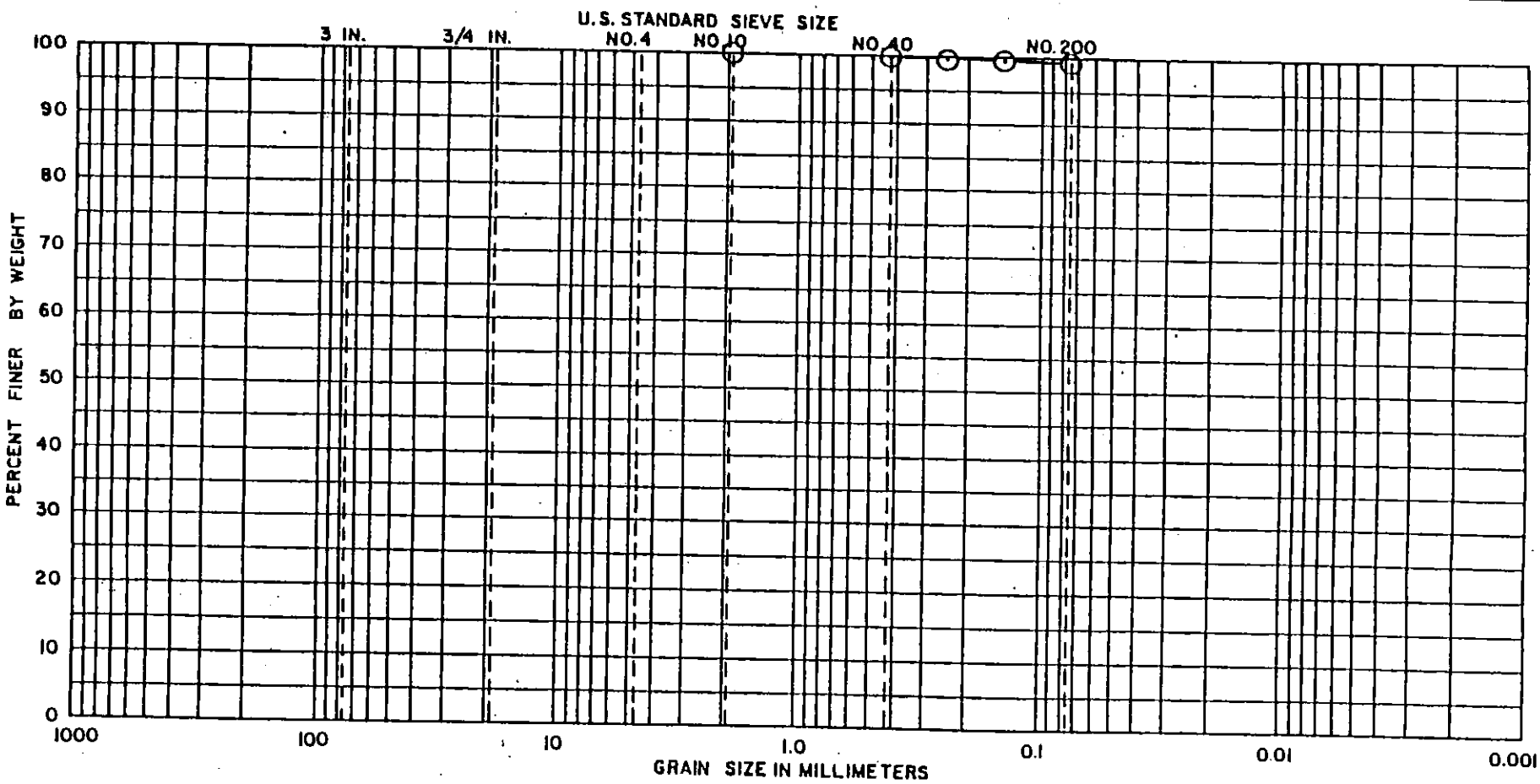
Area: WILMINGTON, DE

Boring No: GF-105

Date: 1/24/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S2,3	2' - 6'	MH	103.6	70.2	46.2	24.0	--

Description and Comments: DK. GRAYISH BROWN-ELASTIC SILT.

GANNETT FLEMING GEOTECHNICAL LABORATORY

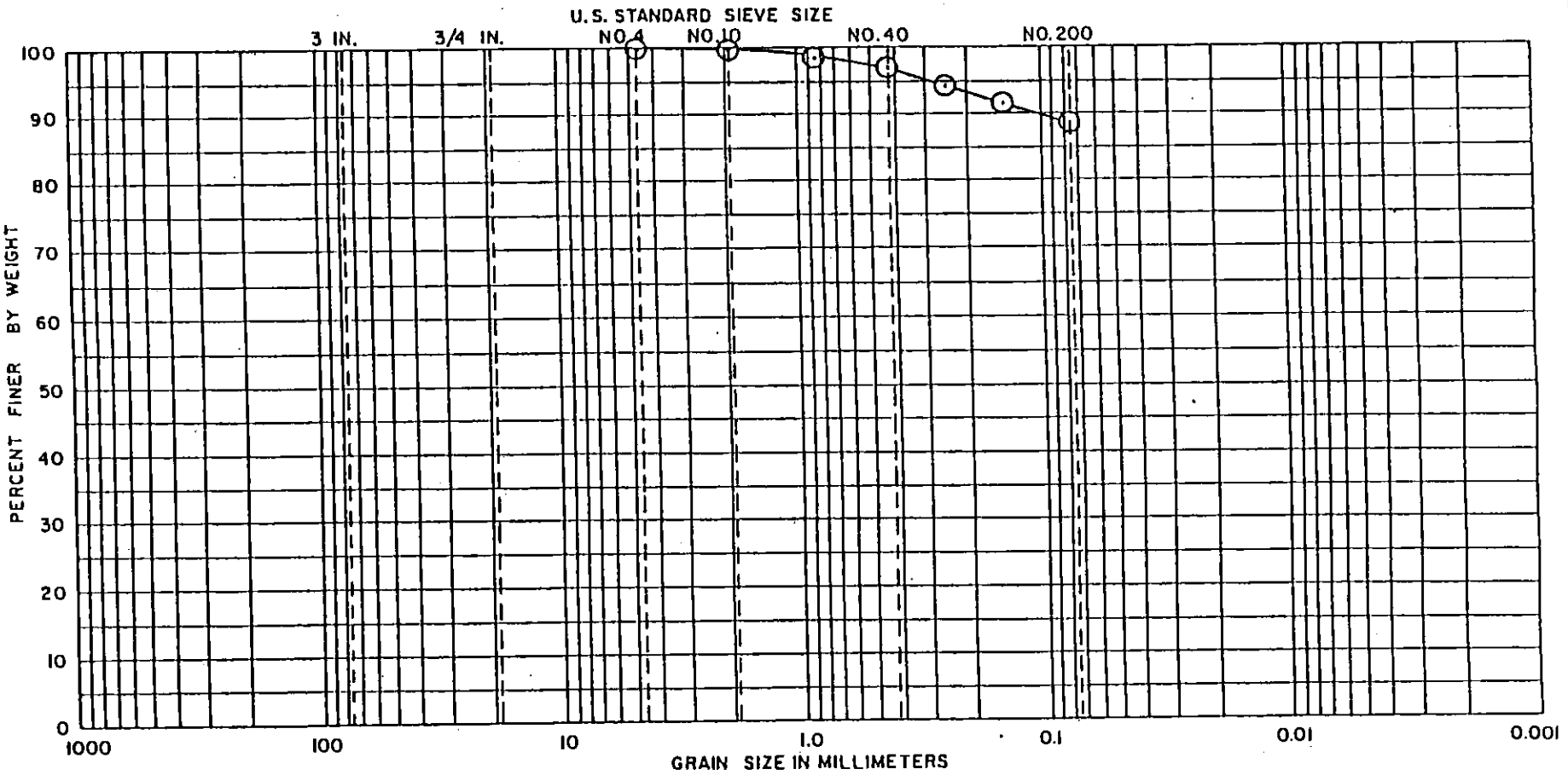
Project: DSWA,NSWF, PHASE III

Area: WILMINGTON, DE

Boring No: GF-106

Date: 12/19/89 Tested By: KLM

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
BAG	0 - 1'	MH		53.2	38.1	15.1	-
		(LL OVEN DRYED)	-	44.7			

Description and Comments:
1) BROWN-ELASTIC SILT.
2) LL OD / LL AD = .84

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF, PHASE III

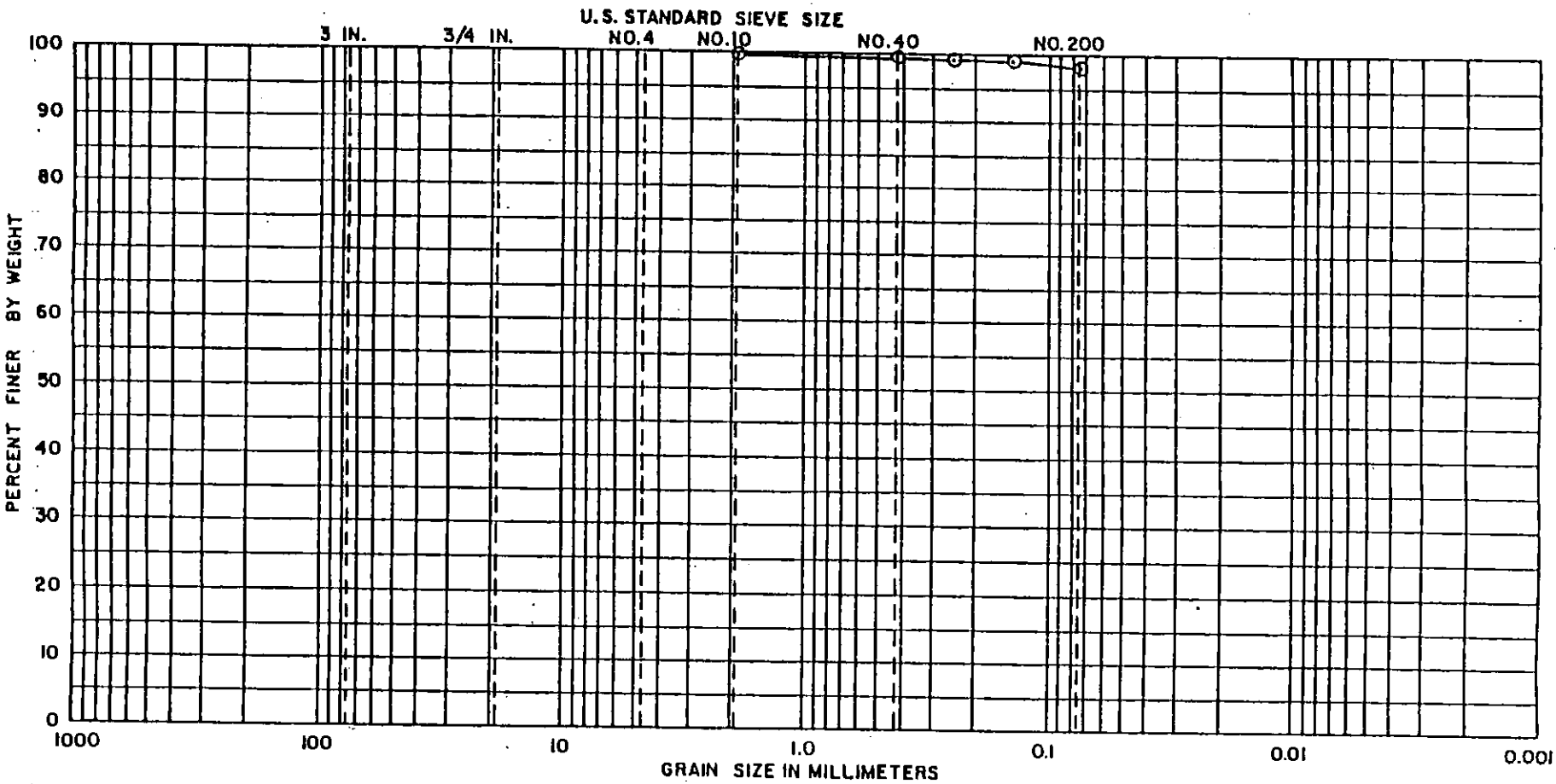
Area: WILMINGTON, DE

Boring No: GF-106

Date: 2/9/90

Tested By: KLM

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
U-1	8.0'-10.0'	MH	-	72.0	40.4	31.6	-

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

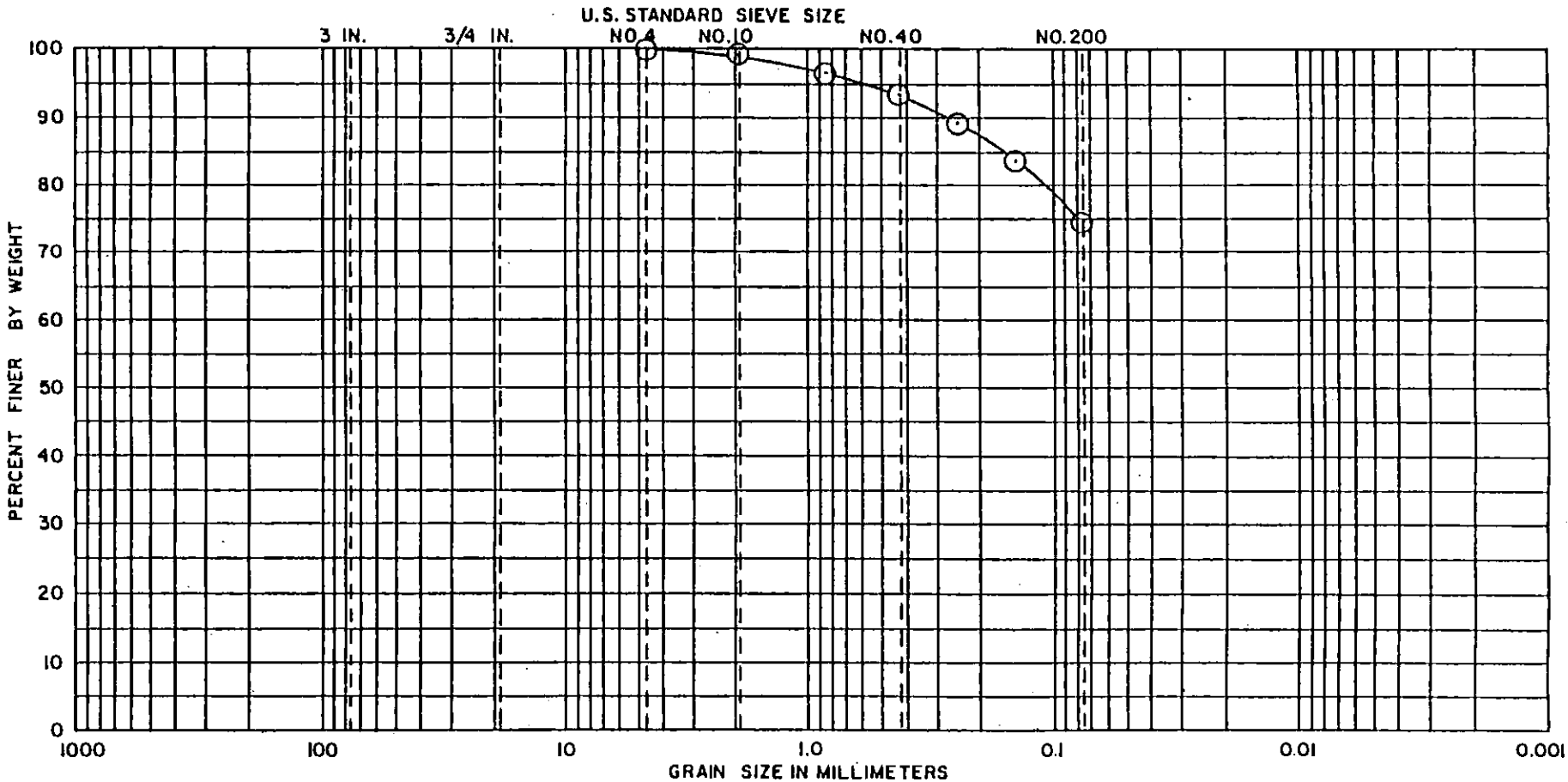
Project: DSWA NSWF PHASE III

Area: WILMINGTON , DE

Boring No: GF - 106

Date: 12/15/89 Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	8' - 10'	ML		-	N/P	-	--
(PERM.)							

Description and Comments: 1) BLACK-SILT WITH SAND.

CLASSIFICATION TEST-GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

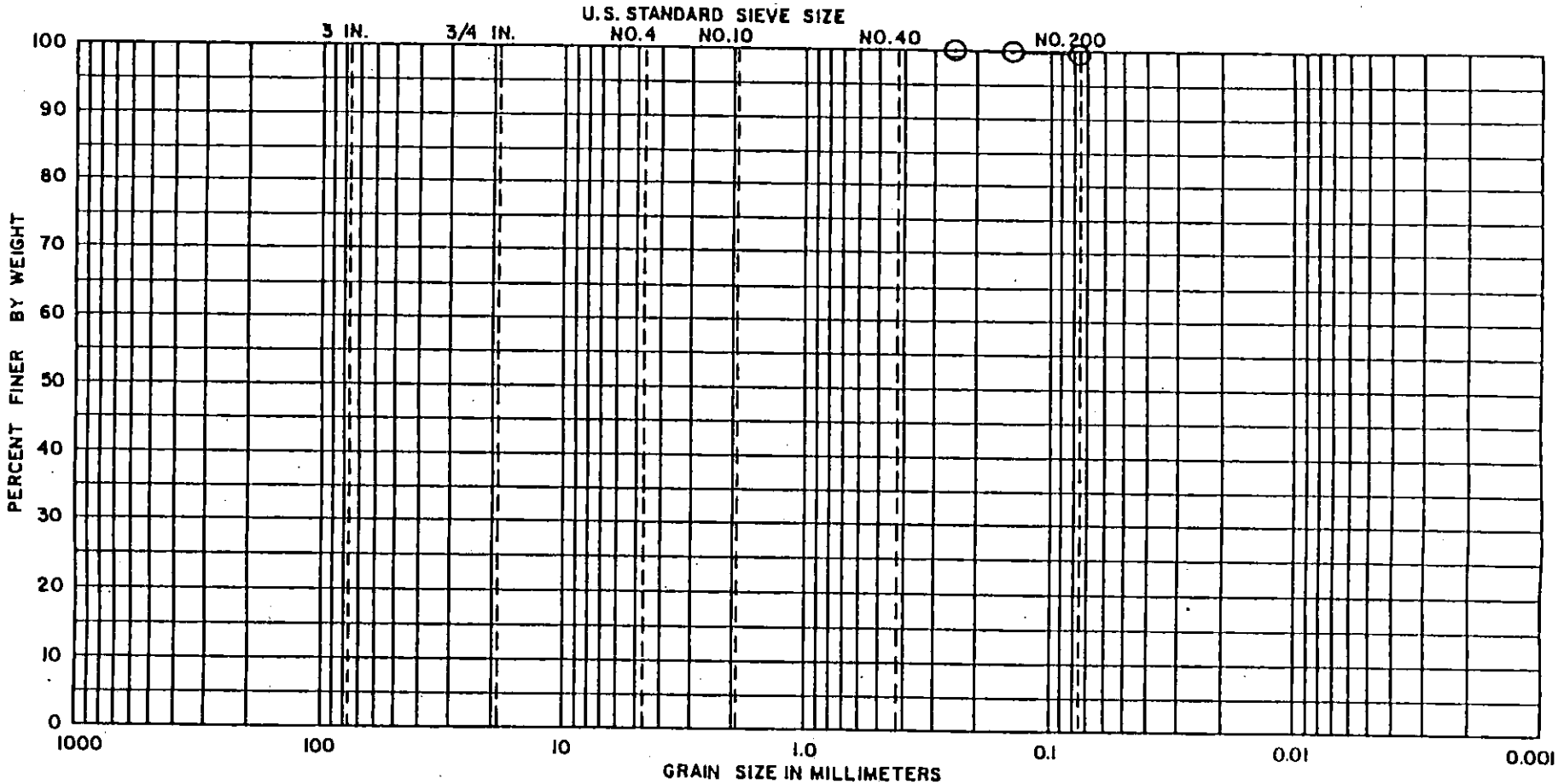
Project: DSWA, NSWF, PHASE III

Area: WILMINGTON, DE

Boring No: GF-106

Date: 1/24/90

Tested By: KLM



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S10,11	33.5'-40'	MH	90.8	72.3	48.2	24.1	--

Description and Comments: DK. GRAYISH BROWN-ELASTIC SILT.

GANNETT FLEMING GEOTECHNICAL LABORATORY

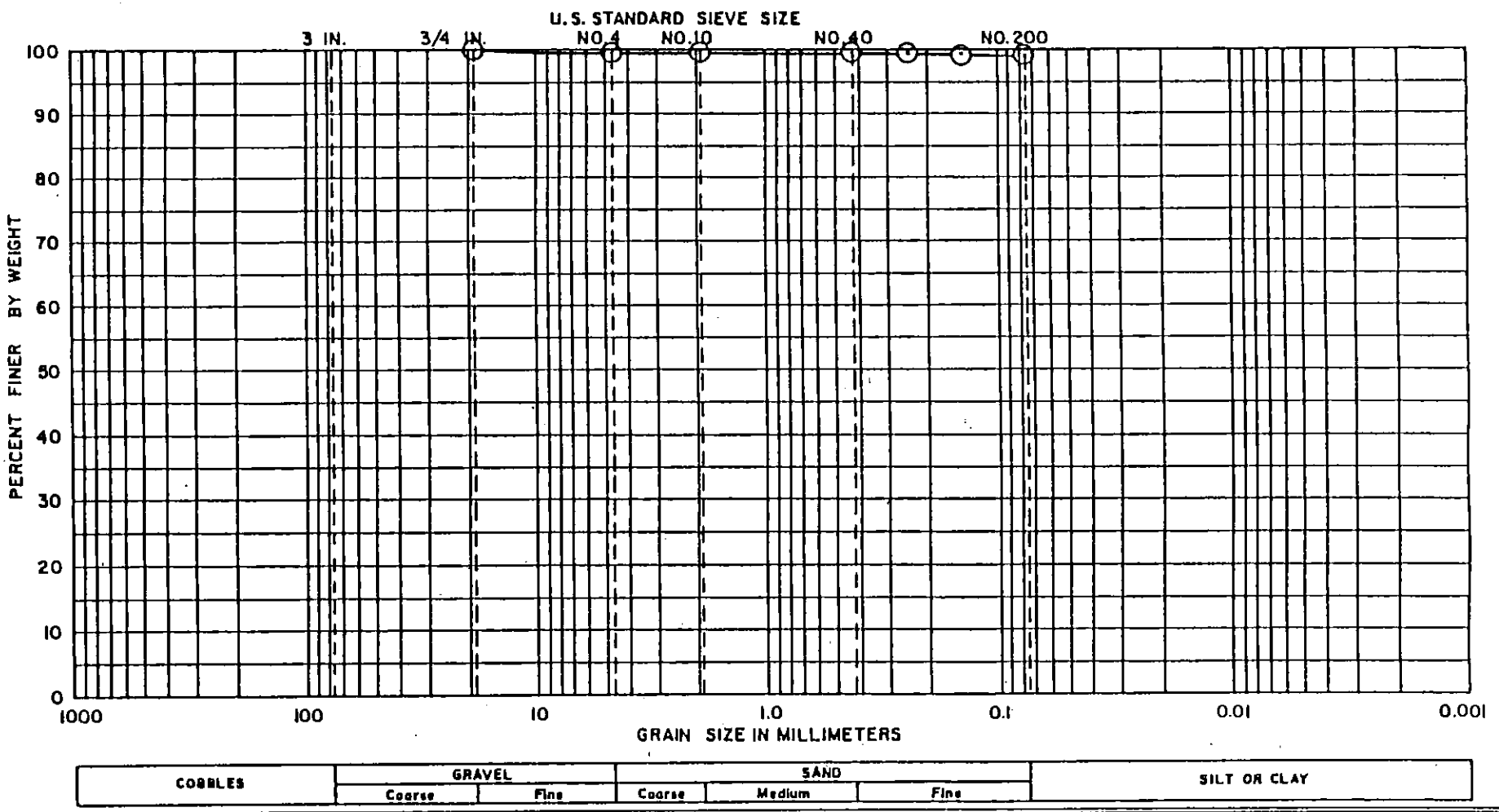
Project: DSWA, NSWF, PHASE III

Area: WILMINGTON, DE

Boring No: GF-106

Date: 12/19/89 Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S13,14	48.5'-55'	MH	70.1	61.8	41.8	20.0	--

Description and Comments: DK. GRAYISH BROWN-ELASTIC SILT.

CLASSIFICATION TEST—GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

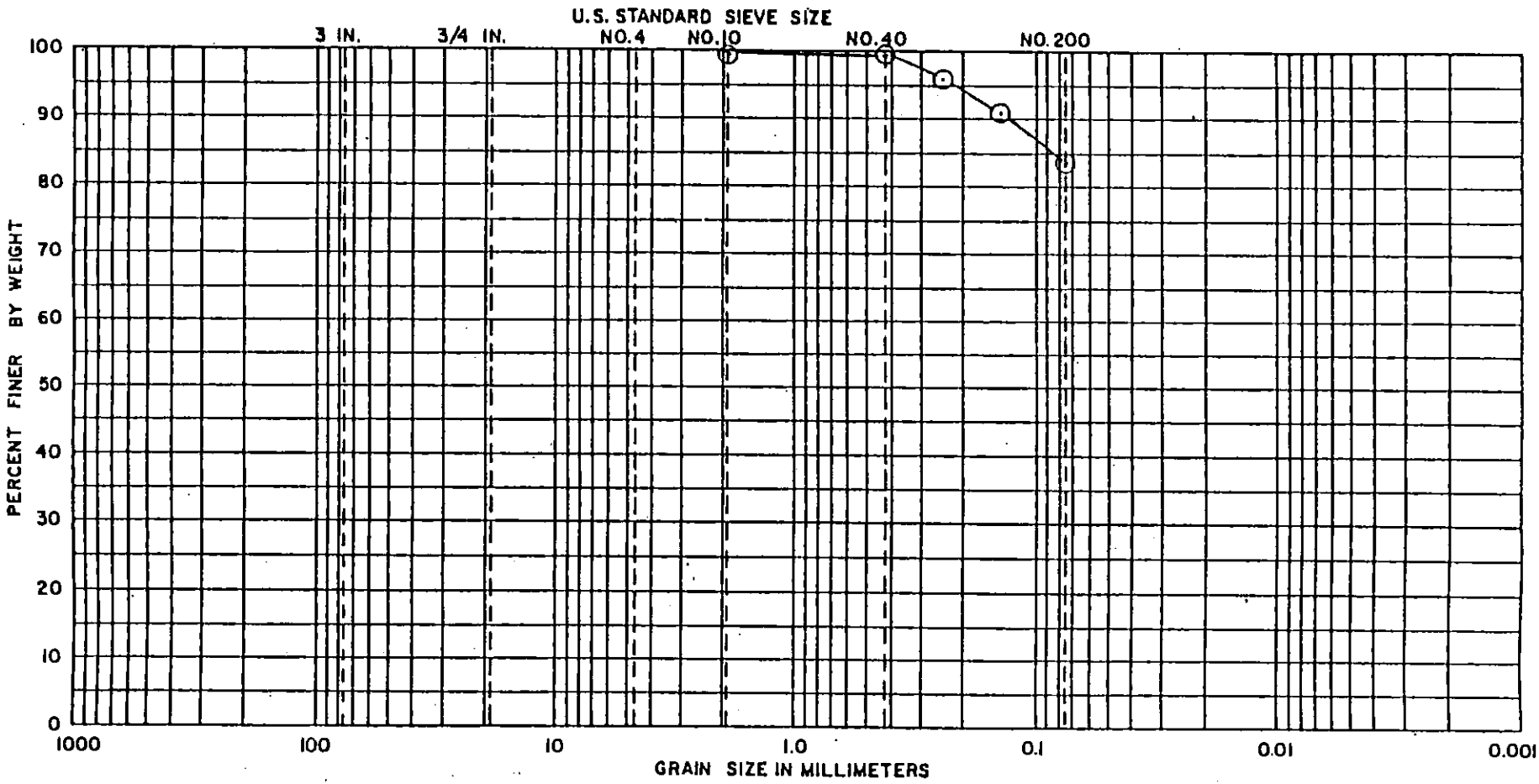
Project: DSWA, NSWF, PHASE III

Area: WILMINGTON, DE

Boring No: GF-106

Date: 12/19/89

Tested By: KLM



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-107/S-5, S-6	8.0'-15.0'	ML	47.1	--	N/P	--	--

Description and Comments: Gray Silt with Sand

CLASSIFICATION TEST - GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

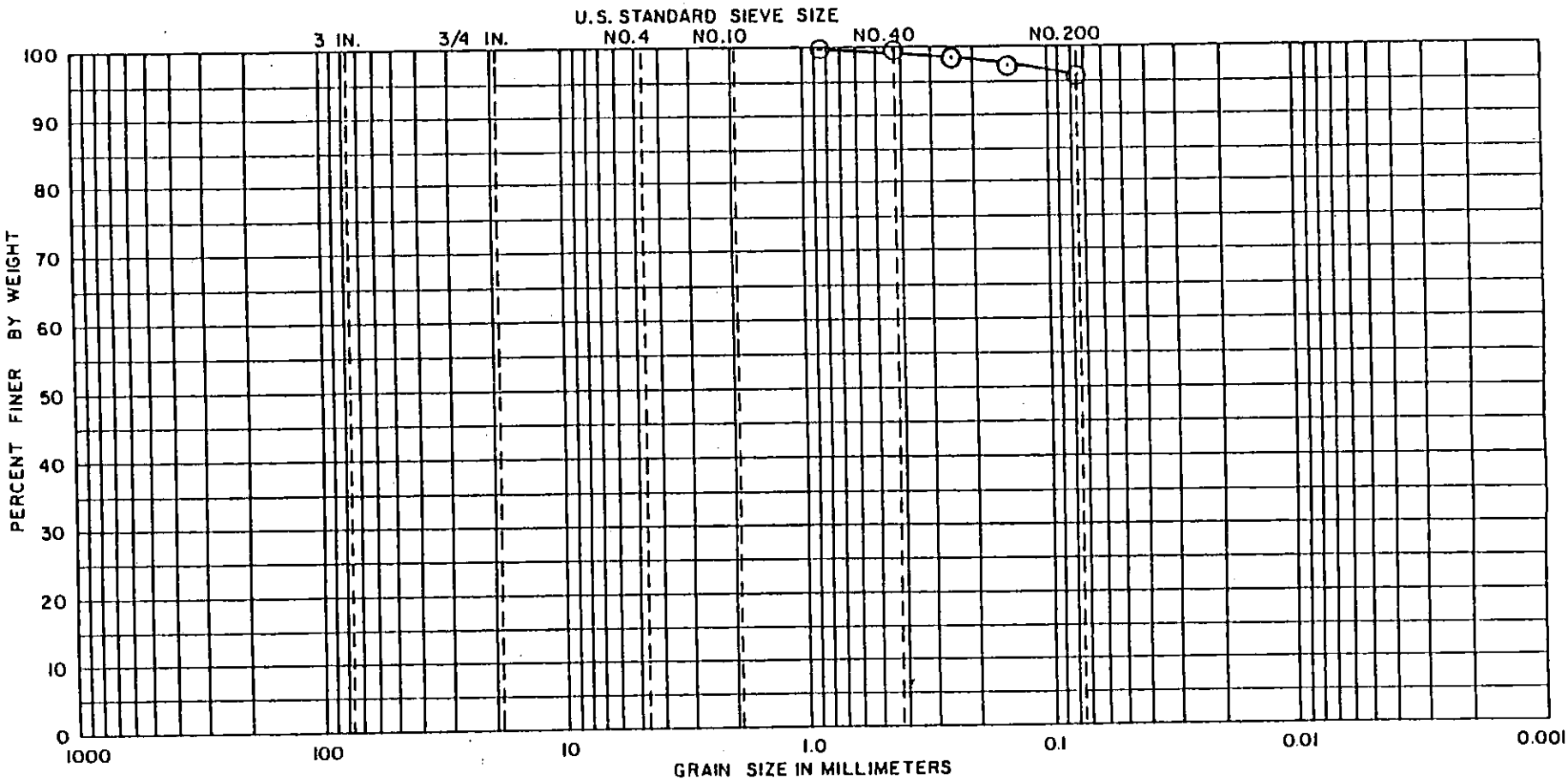
Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON, DE.

Boring No: GF-107 / S-5 & S-6

Date: Oct. 27, 1989

Tested By: K.A. Abdolos



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-107/U-1	20.0'-22.5'	MH	83.0	66.3	43.3	23.0	—
		LL ovendried =		56.3			

Description and Comments: 1) Grey elastic silt
2) LL ovendried/LL not dried = 0.85

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA , NSWF , PHASE III

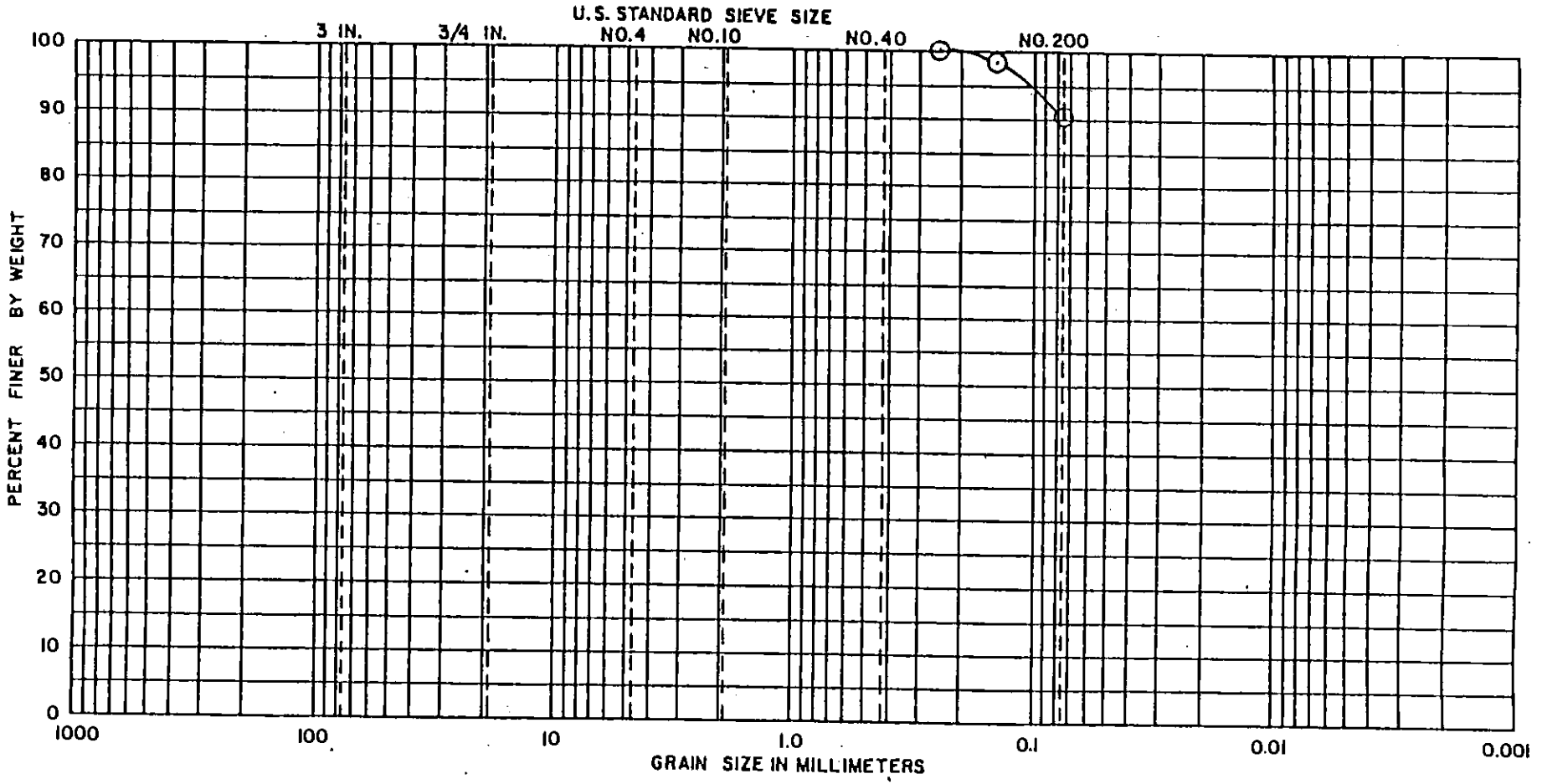
Area: WILMINGTON, DE.

Boring No: GF-107 / U-1

Date: Jan. 29, 1990

Tested By: K.A. Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-107/S-9	23.5'-30.0'	ML	48.5	--	N/P	--	--
S-10							

Description and Comments: Gray Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

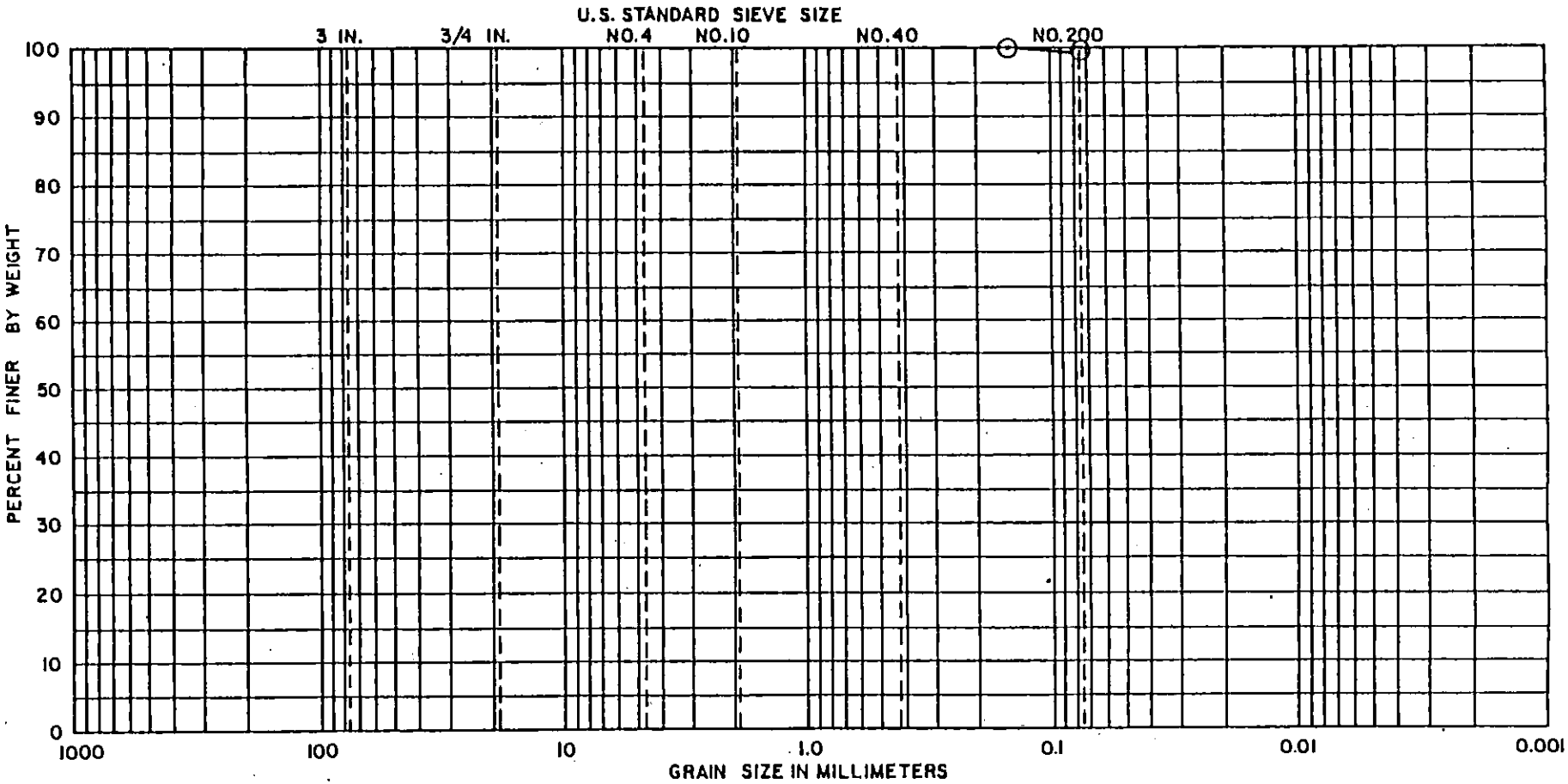
Area: WILMINGTON, DE.

Boring No: GF-107 / S-9 & S-10

Date: Oct. 27, 1989

Tested By: K.A. Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-107/S-11	33.5'-40.0'	MH	75.8	68.7	47.4	21.3	--
S-12							

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

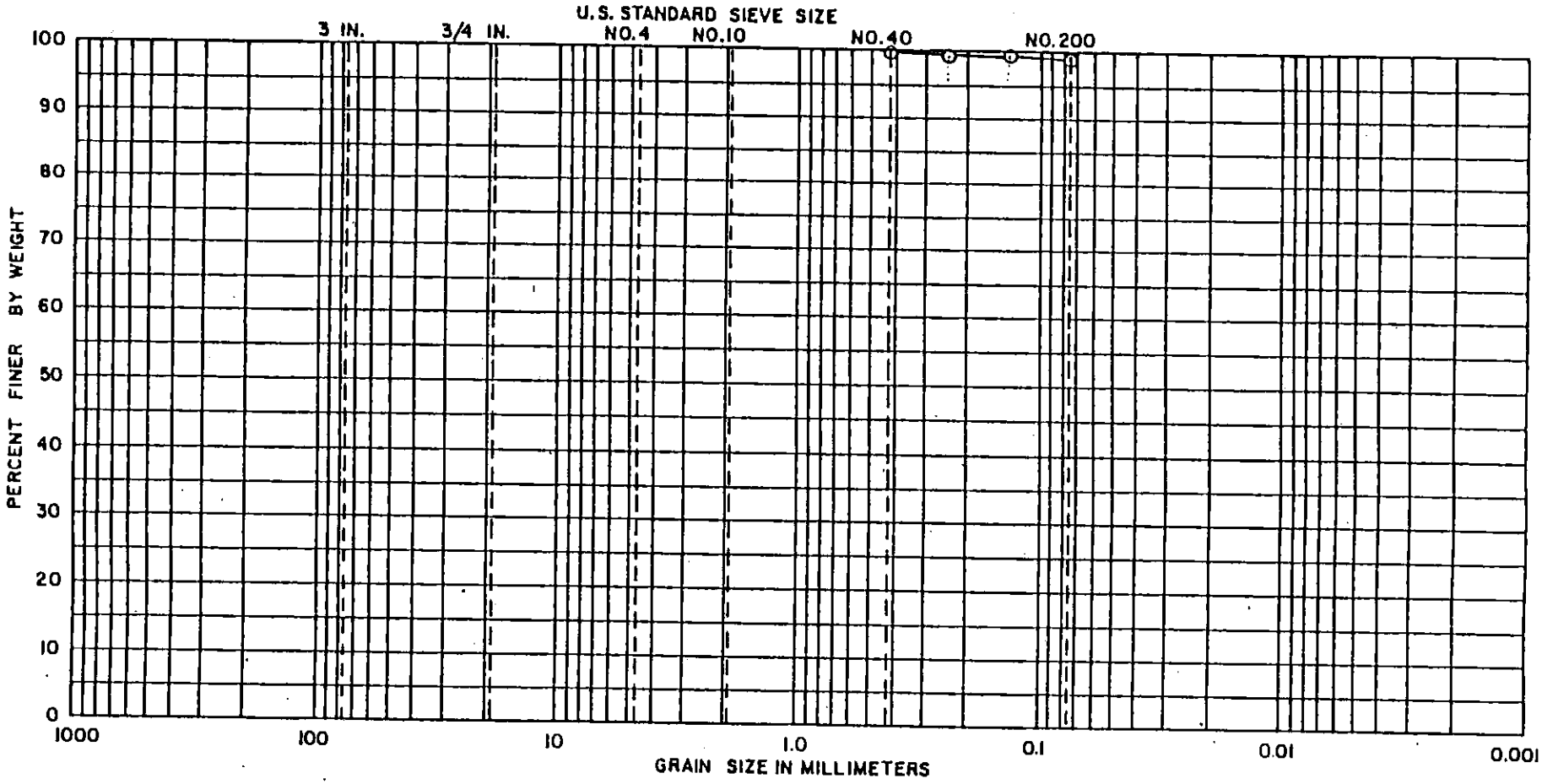
Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON, DE.

Boring No: GF-107 / S-11 & S-12

Date: Oct. 27, 1989 Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S14	48.0'-50.0'	MH	64.0	61.4	41.9	19.5	-
S16	53.5'-55.0'						

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

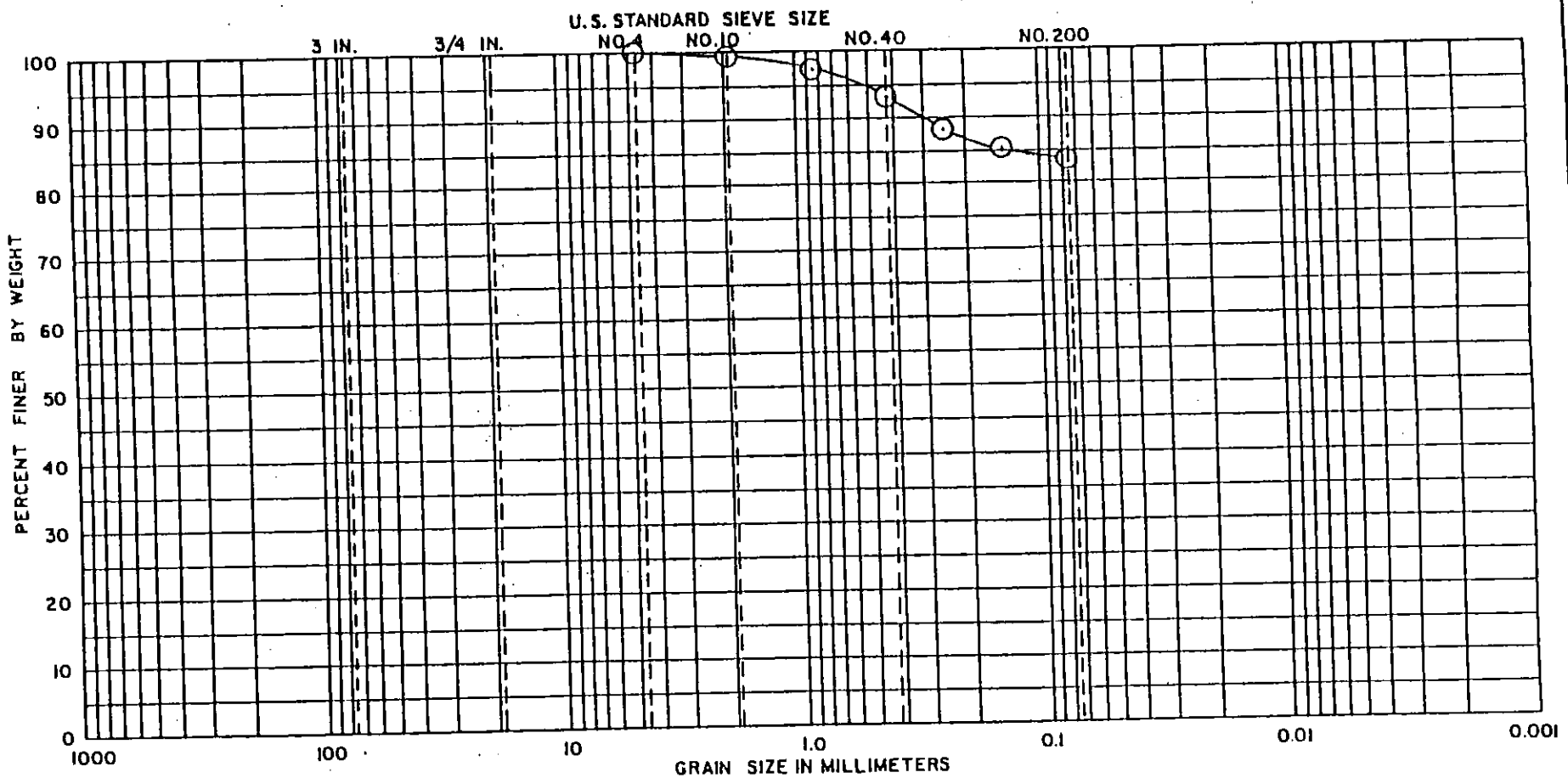
Area: WILMINGTON , DE

Boring No: GF-107

Date: 10/27/89

Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	55'-57'	ML	55.1	49.1	32.9	16.2	-
		(LL OVEN DRYED)	=	41.6			

Description and Comments:
1) BROWN-SILT WITH SAND.
2) LL OD / LL AD = .85

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF, PHASE III

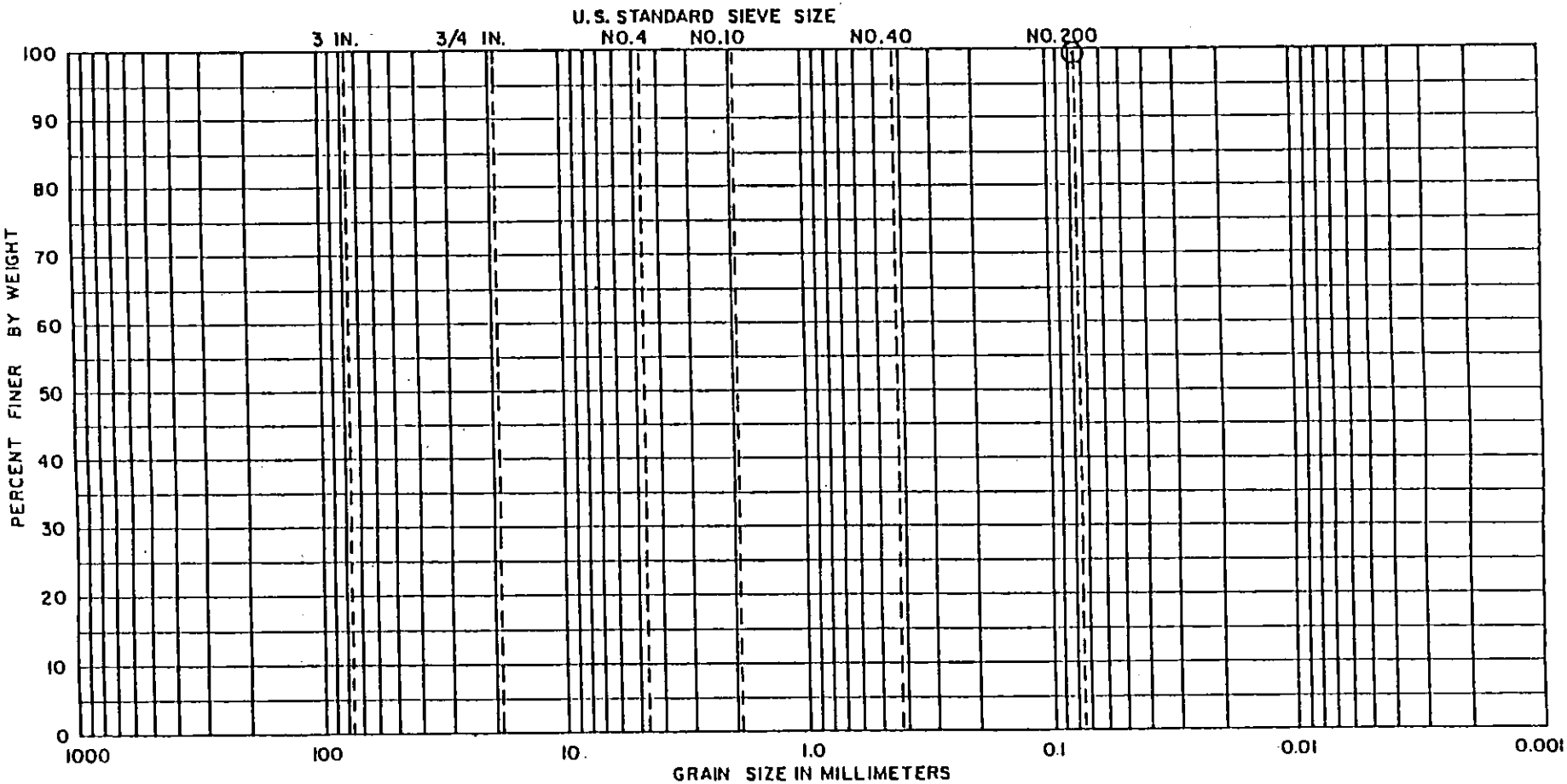
Area: WILMINGTON, DE

Boring No: GF-107

Date: 2/1/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
BAG	0 - 1'	MH		55.6	38.3	17.3	--
		(LL OVEN DRYED)	=	45.8			

Description and Comments:
1) BROWN-ELASTIC SILT.
2) LL OD / LL AD = .82

GANNETT FLEMING GEOTECHNICAL LABORATORY

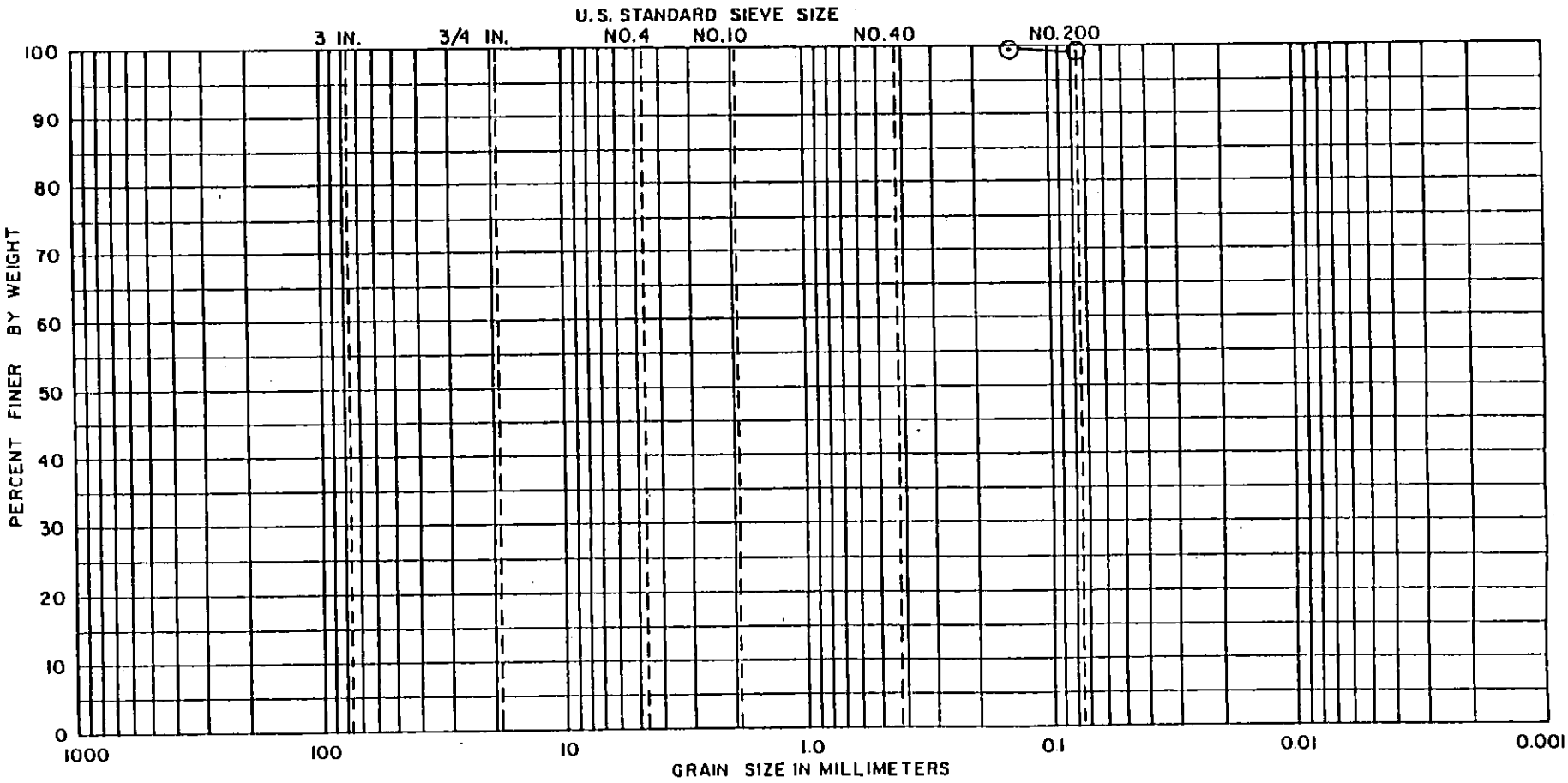
Project: DSWA, NSWF, PHASE III

Area: WILMINGTON, DE

Boring No: GF-108

Date: 2/9/90 Tested By: KLM

CL[illegible]ICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-108/U-1	8.0'-10.0'	MH	93.4	67.8	42.1	25.7	--
		LL ovendried =		55.9			

Description and Comments:
1) Grey elastic silt
2) LL ovendried / LL not dried = 0.82

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA , NSWF, PHASE III

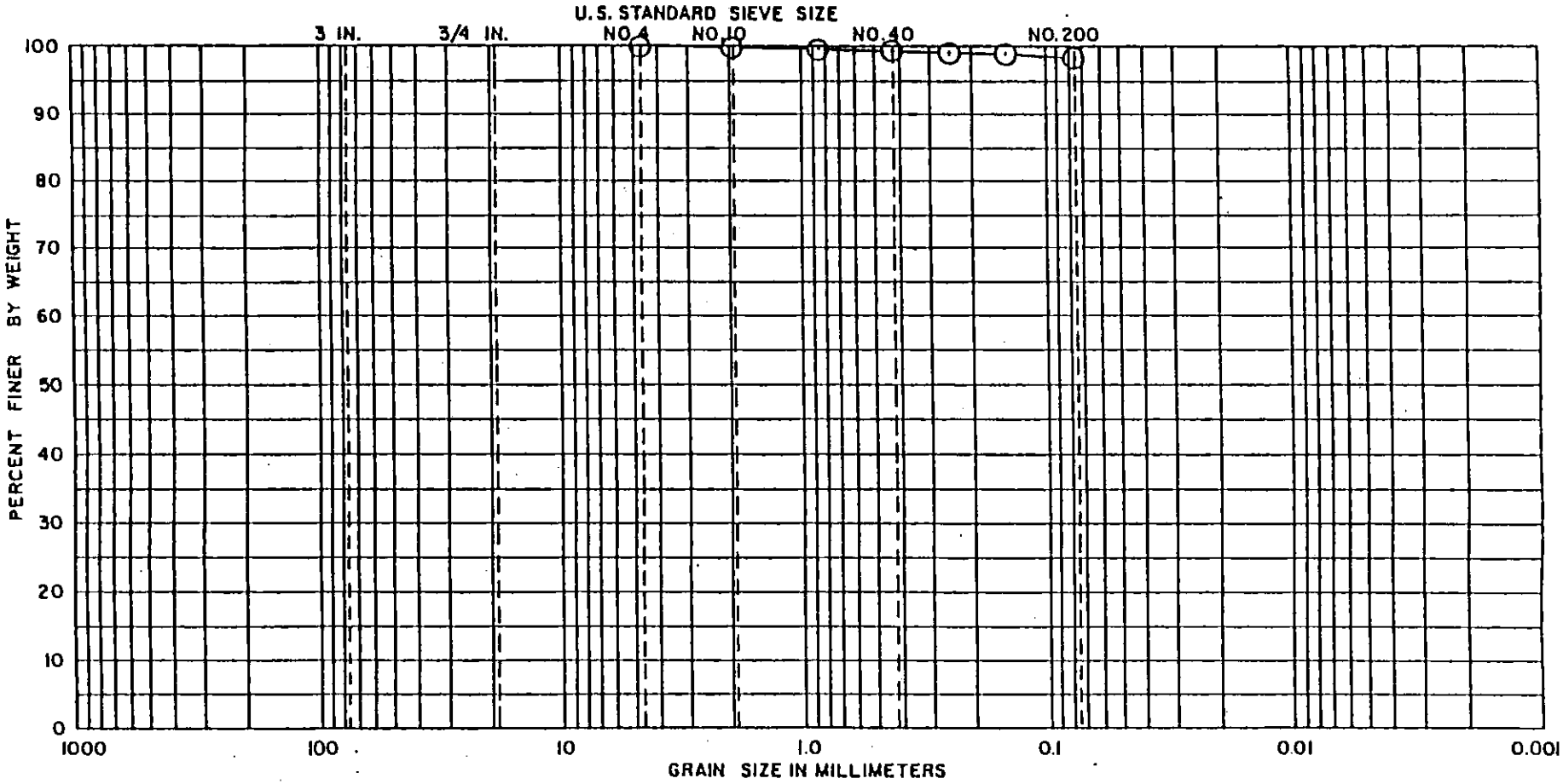
Area: WILMINGTON,DE.

Boring No: GF-108 / U-1

Date: Jan. 29, 1990

Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	15'-17'	MH	75.0	59.4	40.3	19.1	---
		(LL OVEN DRYED)	=	49.5			

Description and Comments:
1) BROWN-ELASTIC SILT.
2) LL OD / LL AD = .83

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF, PHASE III

Area: WILMINGTON, DE

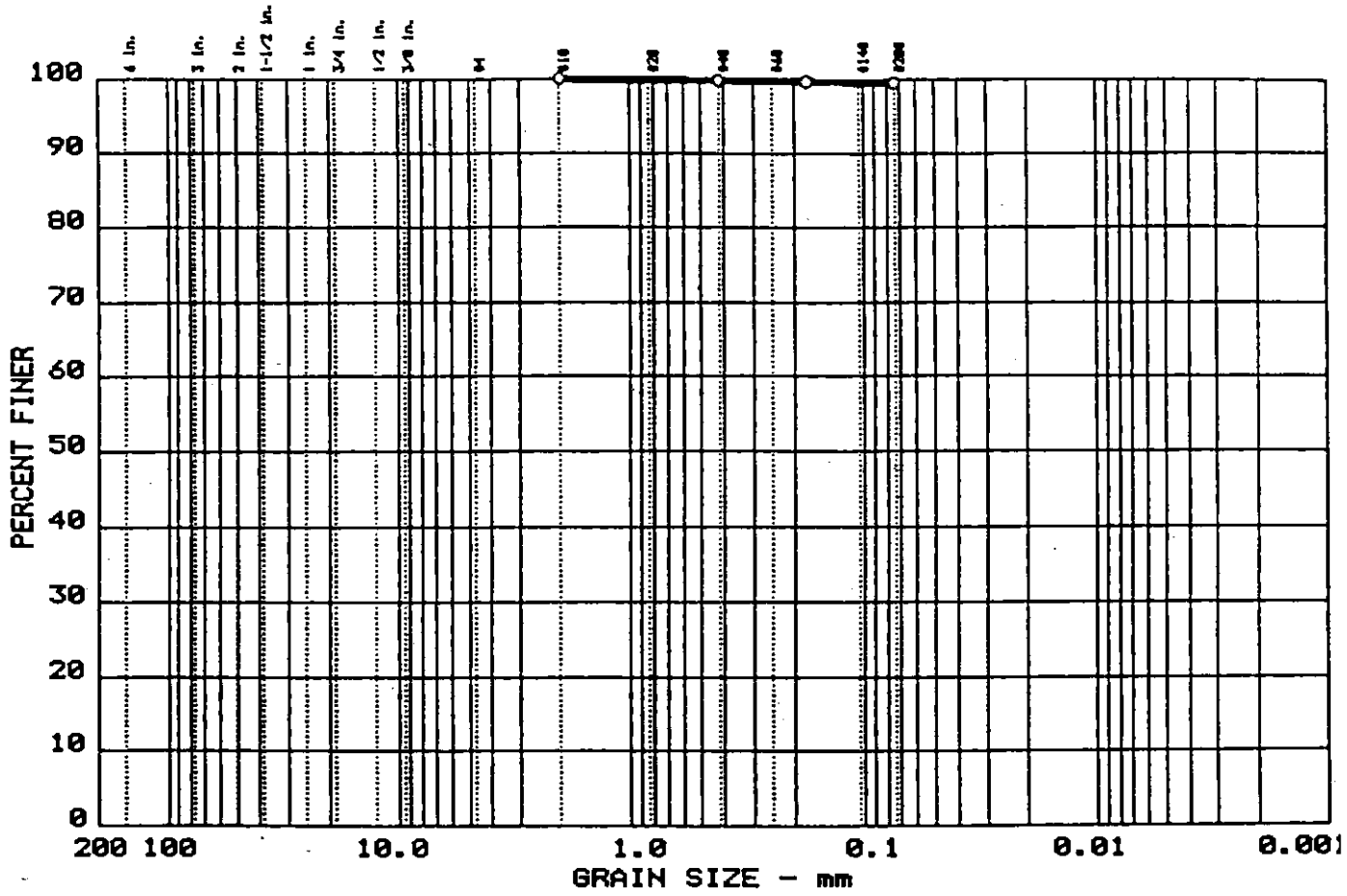
Boring No: GF-108

Date: 2/1/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES

GRAIN SIZE DISTRIBUTION TEST REPORT



	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
o	0.0	0.0	0.5	99.5	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
o	63	9								

MATERIAL DESCRIPTION	USCS	AASHTO
o Dark Grey Clayey Silt	MH	

Project No.: 5411
Project: DSWA - Phase III
o Location: Boring: GF-108; S: U-3; 28.5'-30.5'

Date: 1-29-90

Remarks:

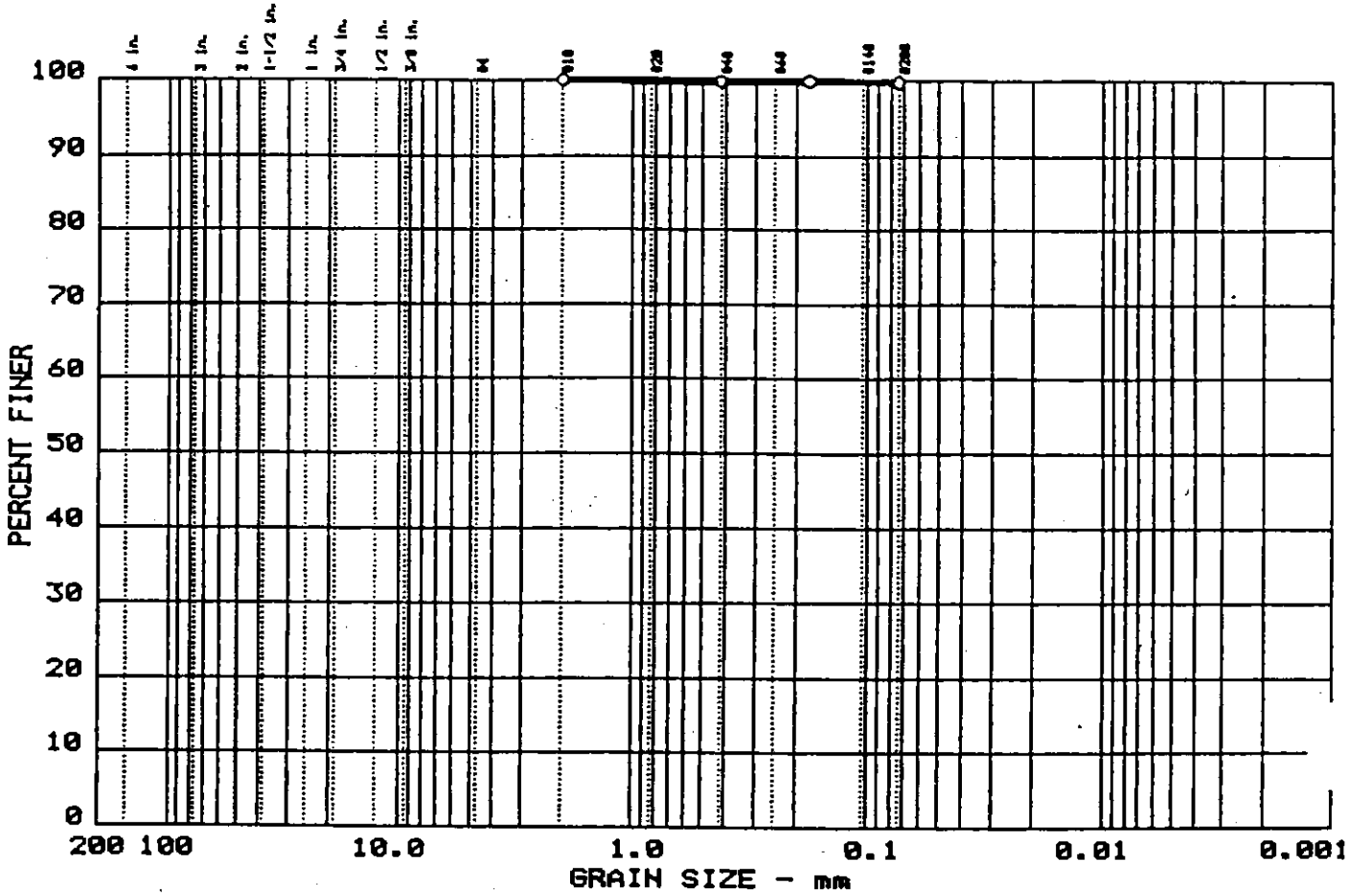
Project Location:
Wilmington, Delaware

Client:
Gannett-Fleming

GRAIN SIZE DISTRIBUTION TEST REPORT
F. T. KITLINSKI & ASSOCIATES, INC.

Figure No.1

GRAIN SIZE DISTRIBUTION TEST REPORT



	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
O	0.0	0.0	0.2	99.8	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
O	55	11								

MATERIAL DESCRIPTION	USCS	AASHTO
O Dark Grey Clayey Silt	MH	

Project No.: 5411
Project: DSWA - Phase III
O Location: Boring: GF-108; S: U-4; 49.0'- 51.0'

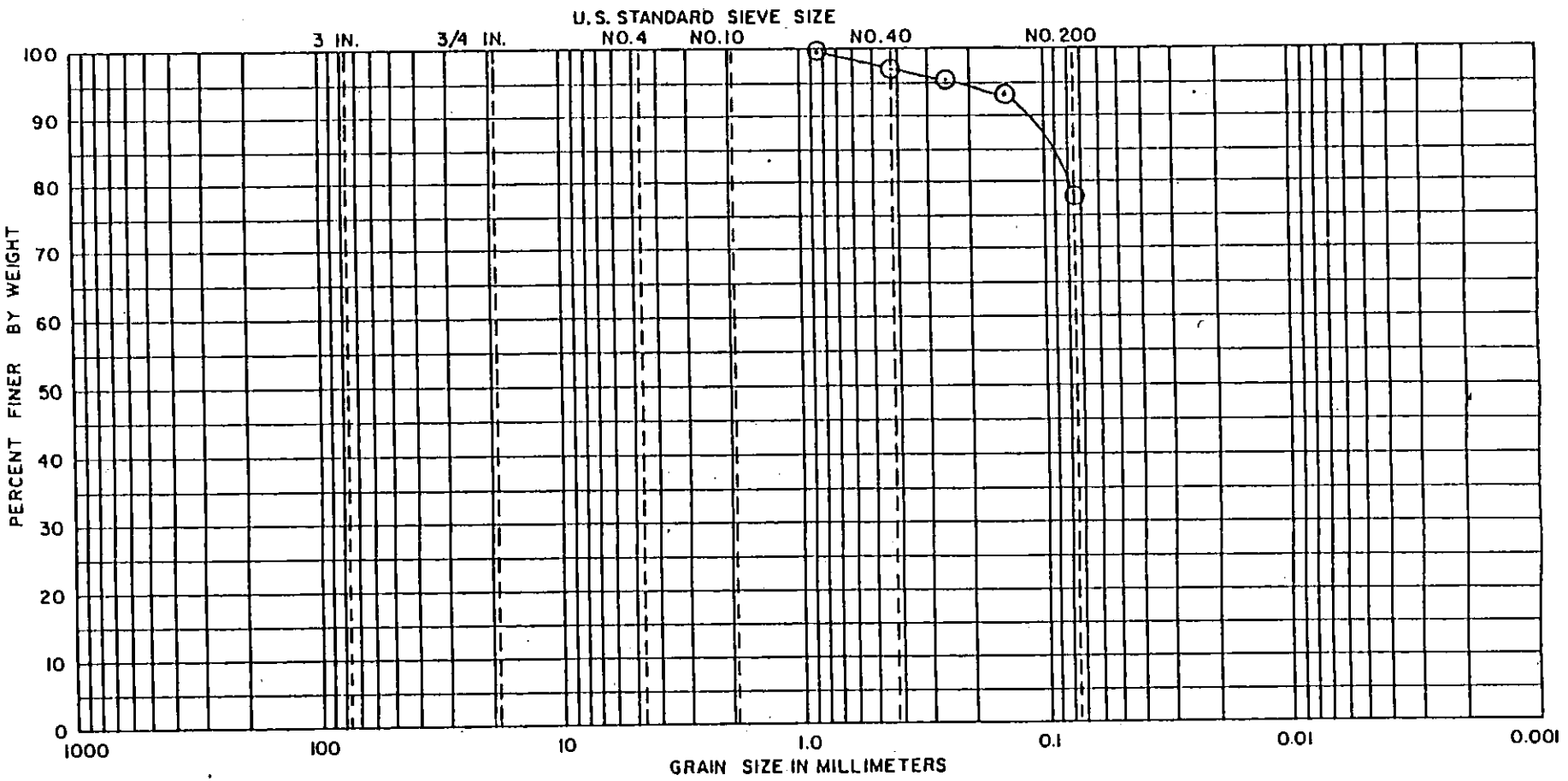
Date: 1-29-90

Remarks:

Project Location:
Wilmington, Delaware

Client:
Gannett-Fleming

GRAIN SIZE DISTRIBUTION TEST REPORT



Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-109/U-1	14.0'-16.0'	ML	35.2	37.7	26.3	11.4	--
		LL ovendried =		31.0			

Description and Comments: 1) Grey silt with sand
2) LL ovendried / LL not dried = 0.82

GANNETT FLEMING GEOTECHNICAL LABORATORY

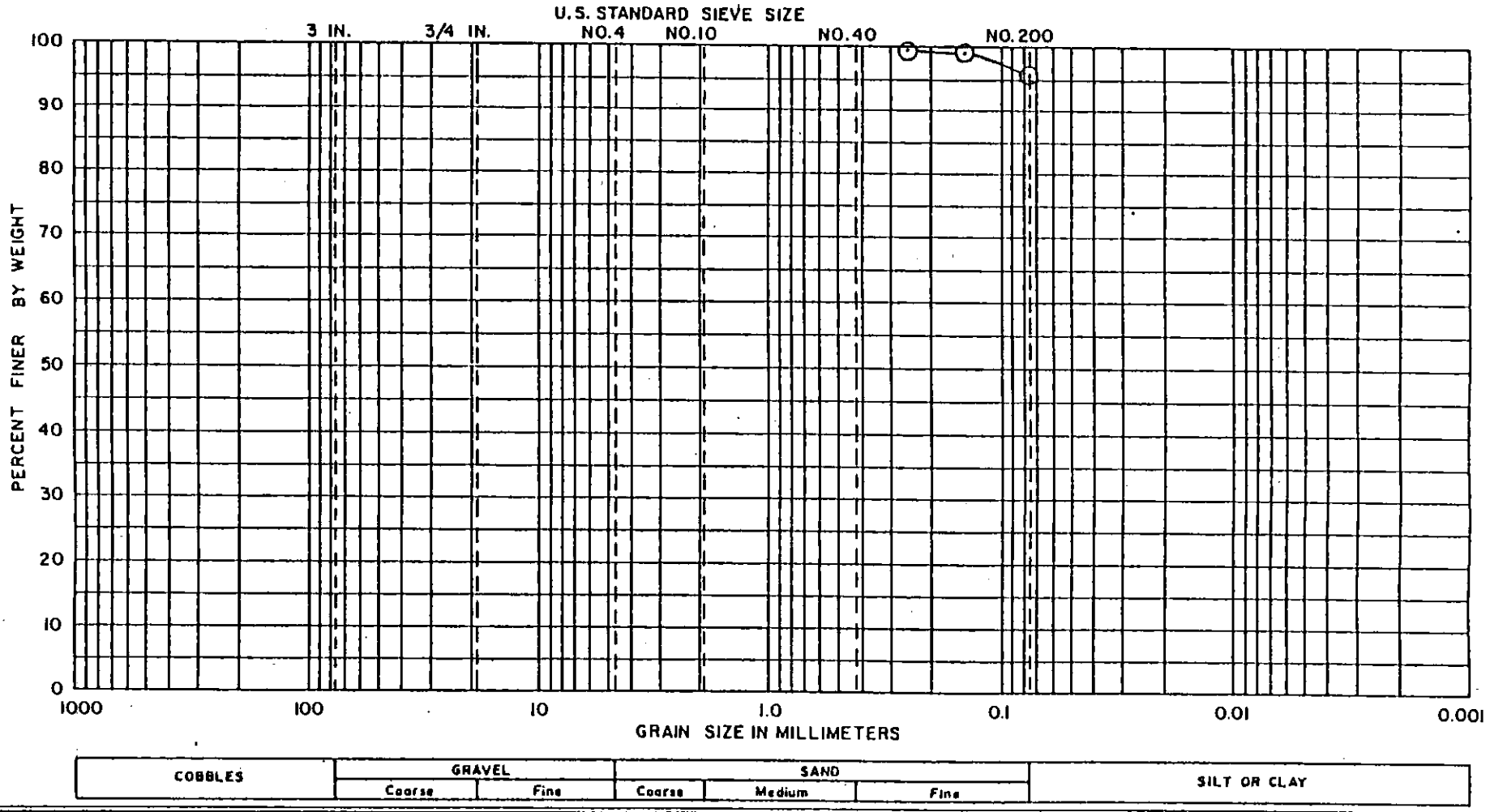
Project: DSWA / NSWF , PHASE III

Area: WILMINGTON, DE.

Boring No: GF-109 / U-1 (Bottom)

Date: Jan. 29, 1990 Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES



Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-109/U-2	17.0'-19.0'	MH		56.8	35.8	21.0	--
		LL ovendried =		49.5			

Description and Comments:
1) Grey elastic silt
2) LL ovendried/LL not dried = 0.87

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF , PHASE III

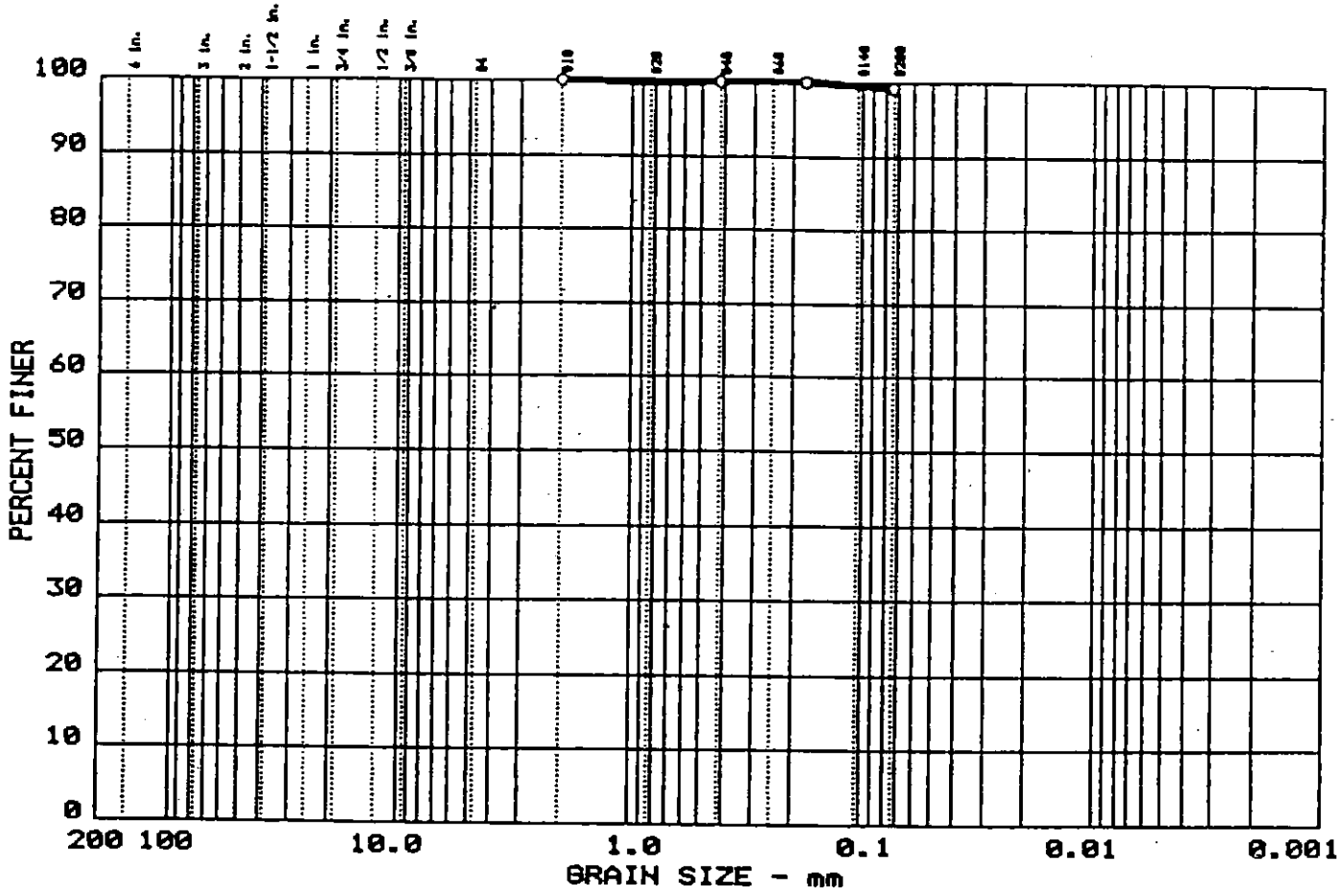
Area: WILMINGTON, DE.

Boring No: GF-109 / U-2

Date: Jan. 29, 1990 | Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES

GRAIN SIZE DISTRIBUTION TEST REPORT



	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
O	0.0	0.0	0.7	99.3	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
O	84	35								

MATERIAL DESCRIPTION	USCS	AASHTO
O Dark Grey Clayey Silt	MH	

Project No.: 5411
Project: DSWA - Phase III
O Location: Boring: GF-109; S: U-3; 37.0'- 39.0'

Date: 1-29-90

Remarks:

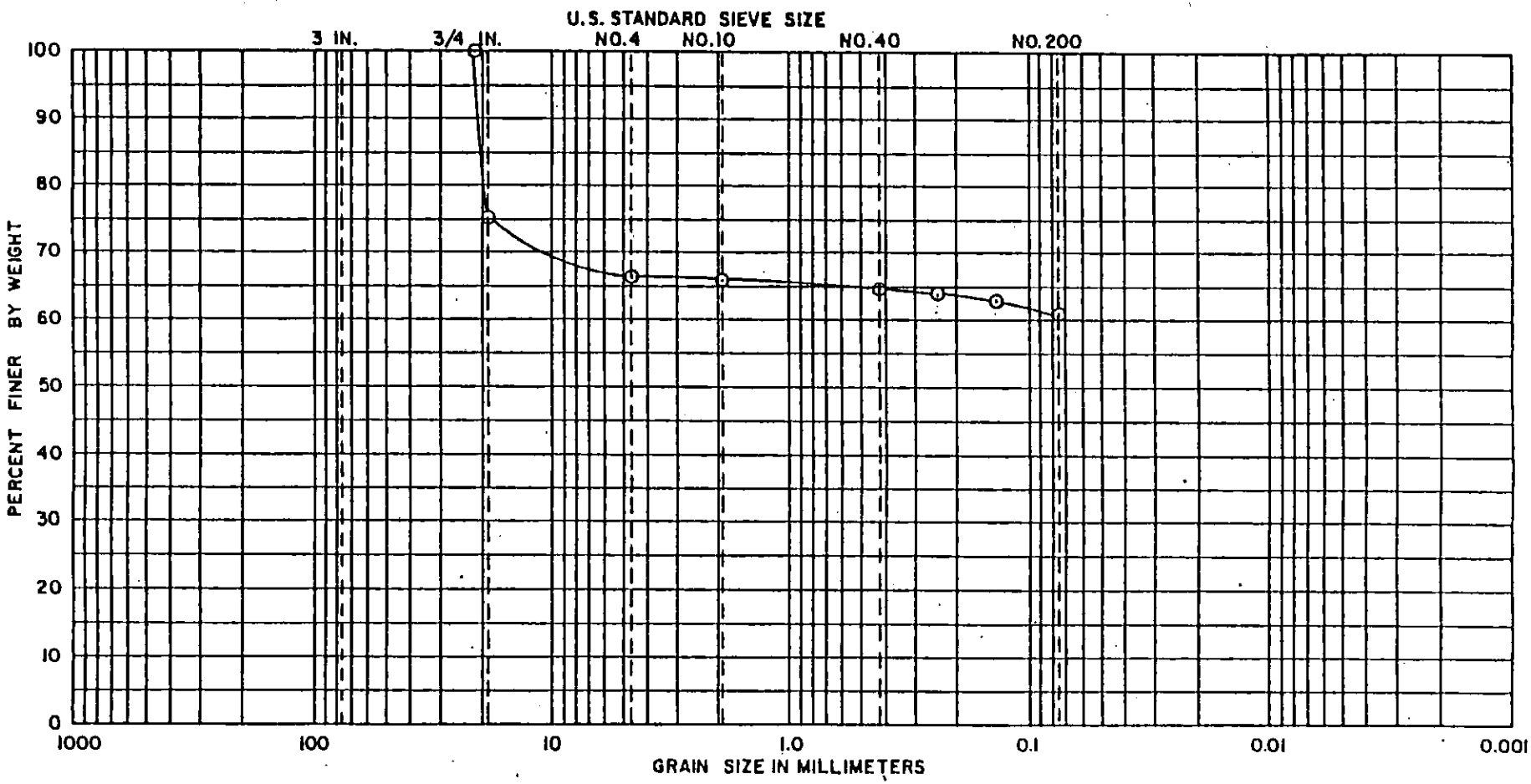
Project Location:
Wilmington, Delaware

Client:
Gannett-Fleming

GRAIN SIZE DISTRIBUTION TEST REPORT

F. T. KITLINSKI & ASSOCIATES, INC.

Figure No.3



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S3	4.0'-6.0'	MH	49.9	56.1	37.4	18.7	-
S5	8.0'-10.0'						

Description and Comments: Gray Gravelly Elastic Silt
Max. Grain Size 0.85"

GANNETT FLEMING GEOTECHNICAL LABORATORY

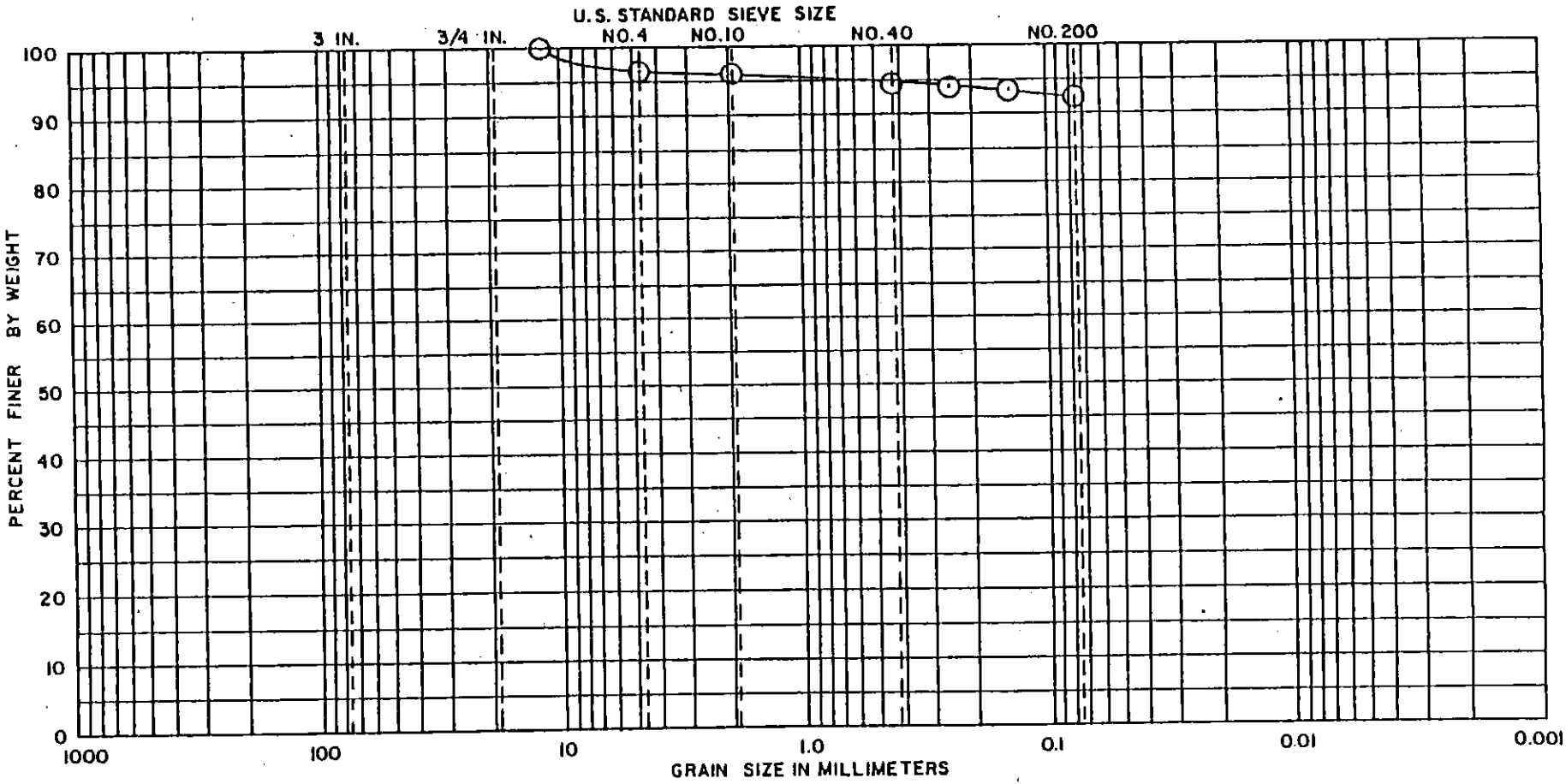
Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON , DE.

Boring No: GF-110

Date: 10/27/89 Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	10 - 12'	MH		67.1	45.4	21.7	--
		(LL OVEN DRYED)	=	55.9			

Description and Comments:
1) BROWN-ELASTIC SILT.
2) LL OD/LL AD = .83

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, NSWF, PHASE III

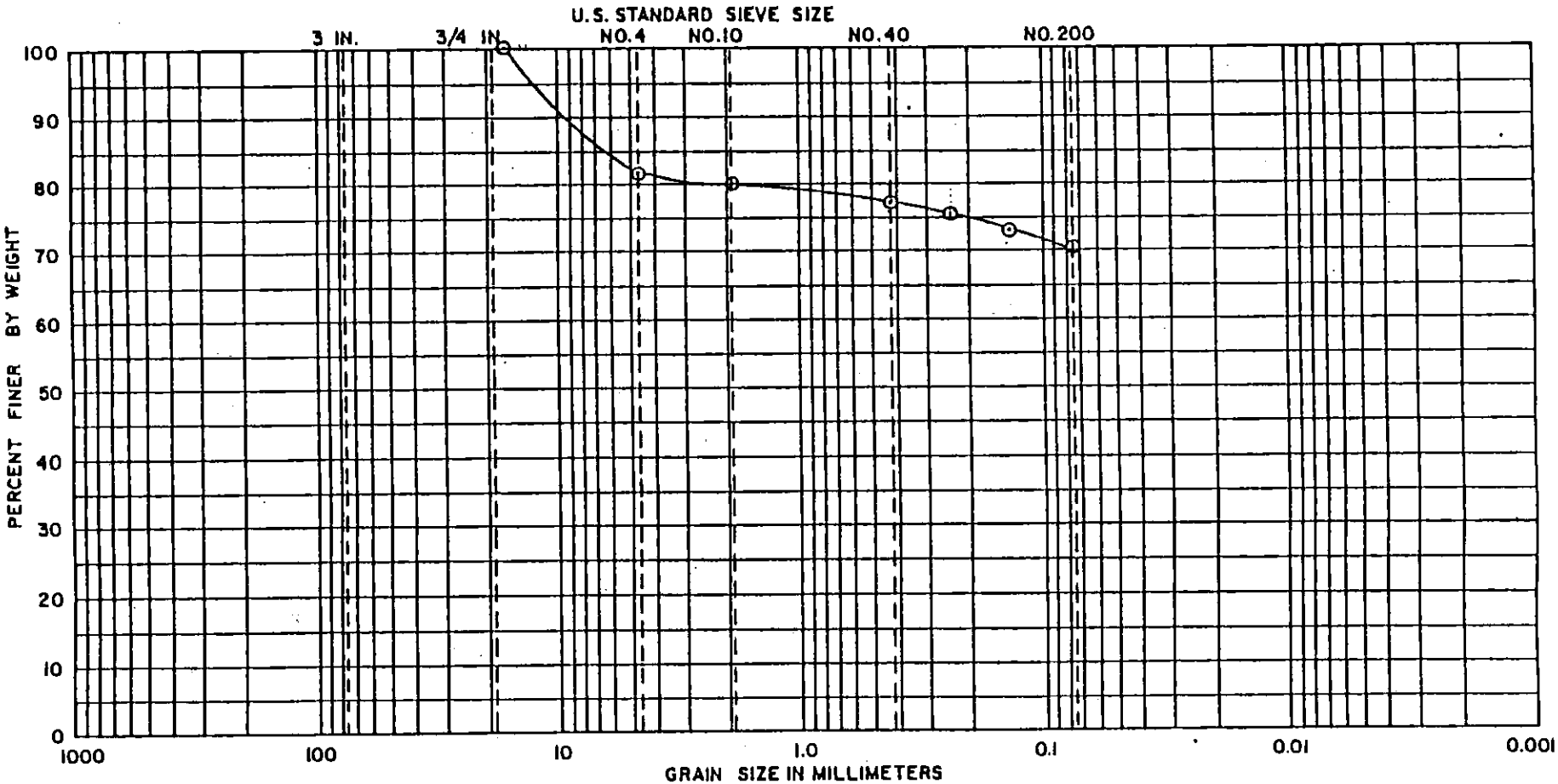
Area: WILMINGTON, DE

Boring No: GF-110

Date: 1/24/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	25.0'-27.0'	MH	70.1	53.3	35.8	17.5	-

Description and Comments: Gray Gravelly Elastic Silt
Max. Grain Size 0.70"

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

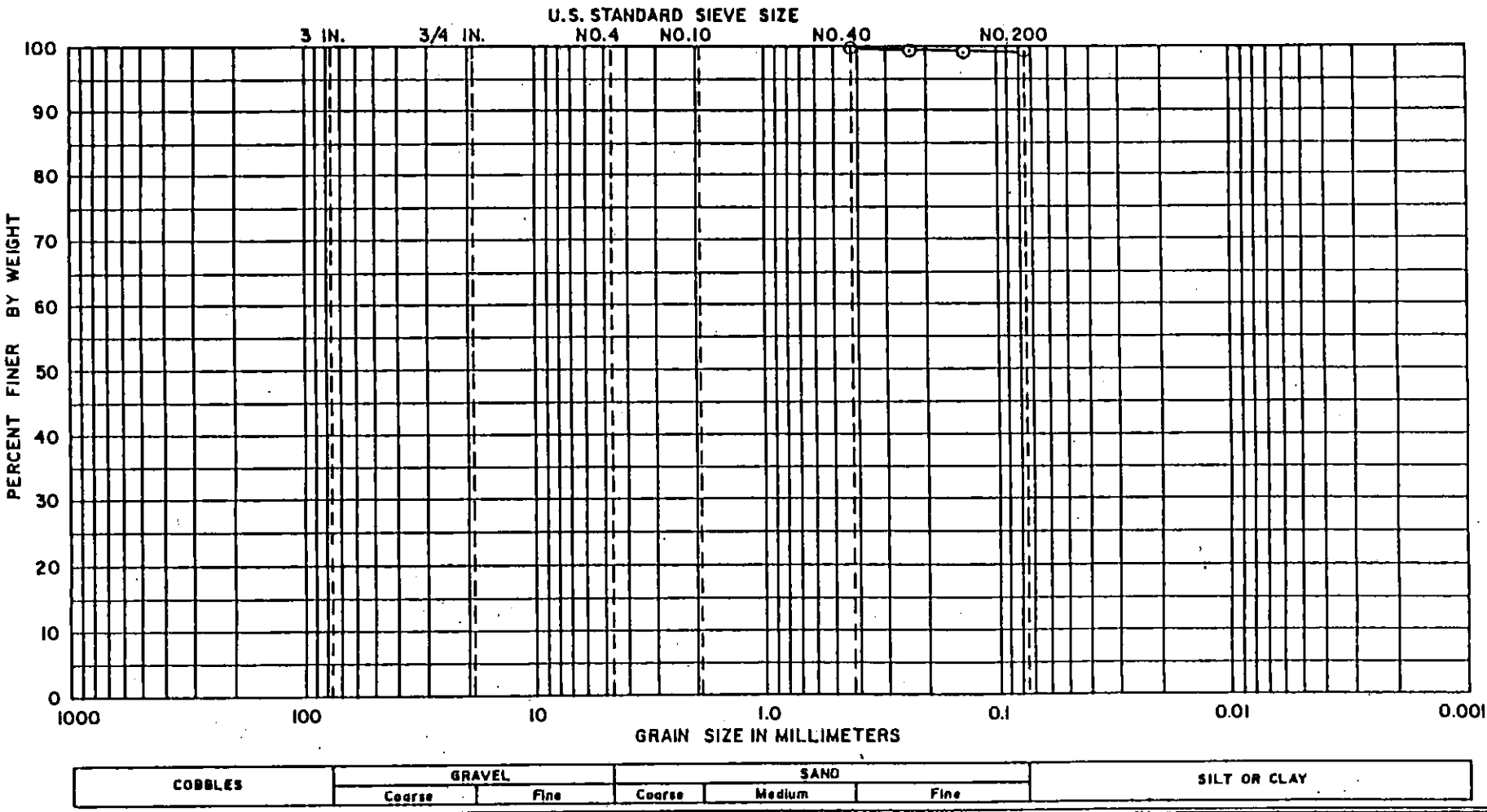
Area: WILMINGTON , DE

Boring No: GF-110

Date: 11/3/89

Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S12,S13	33.5'-40.0'	MH	78.5	68.8	45.2	23.6	-

Description and Comments: Gray Elastic Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF - 2 PHASE III

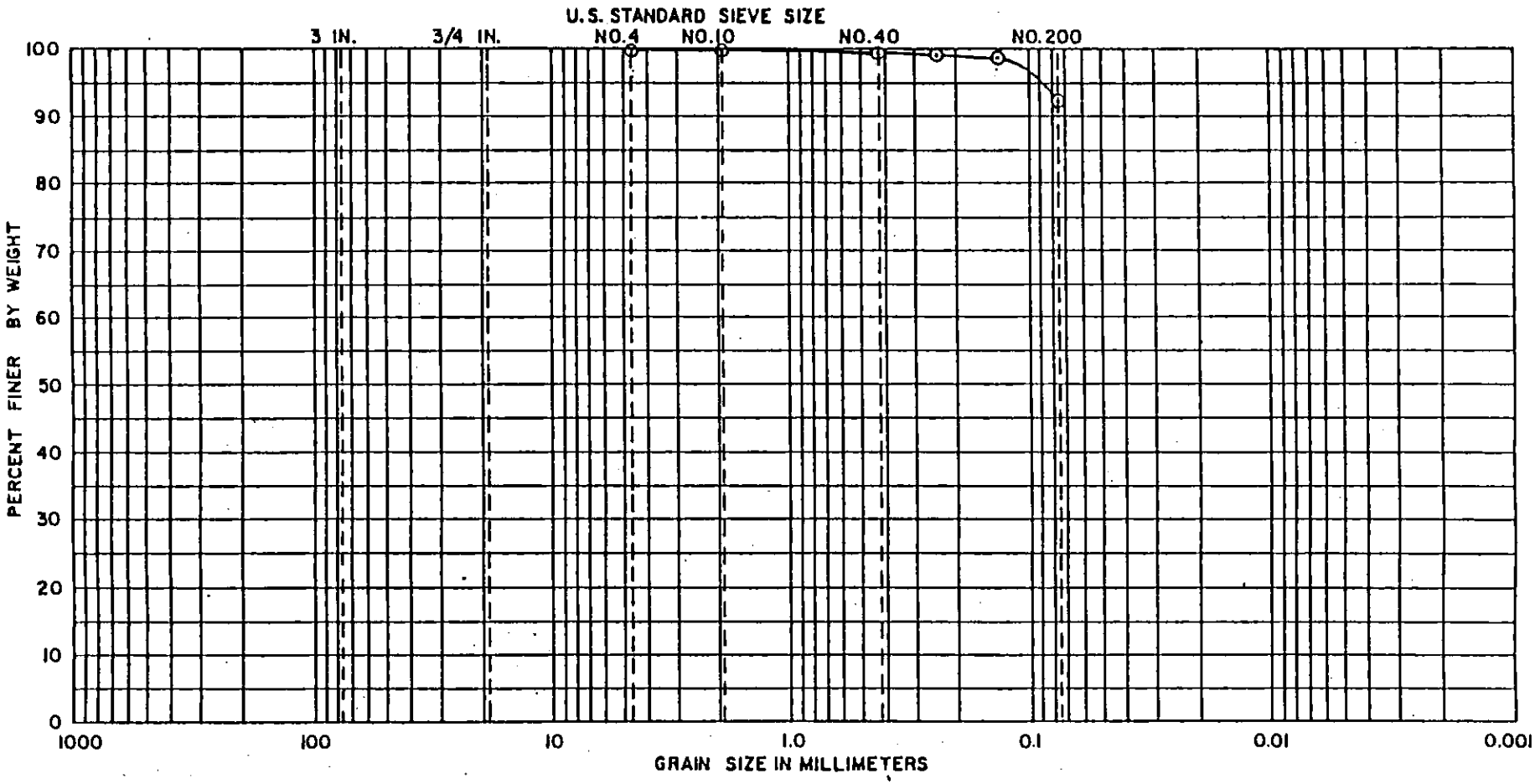
Area: WILMINGTON , DE

Boring No: GF-110

Date: 10/27/89

Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
S16,S17	53.5'-60.0'	ML	53.2	47.4	31.6	15.8	-

Description and Comments: Gray Silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

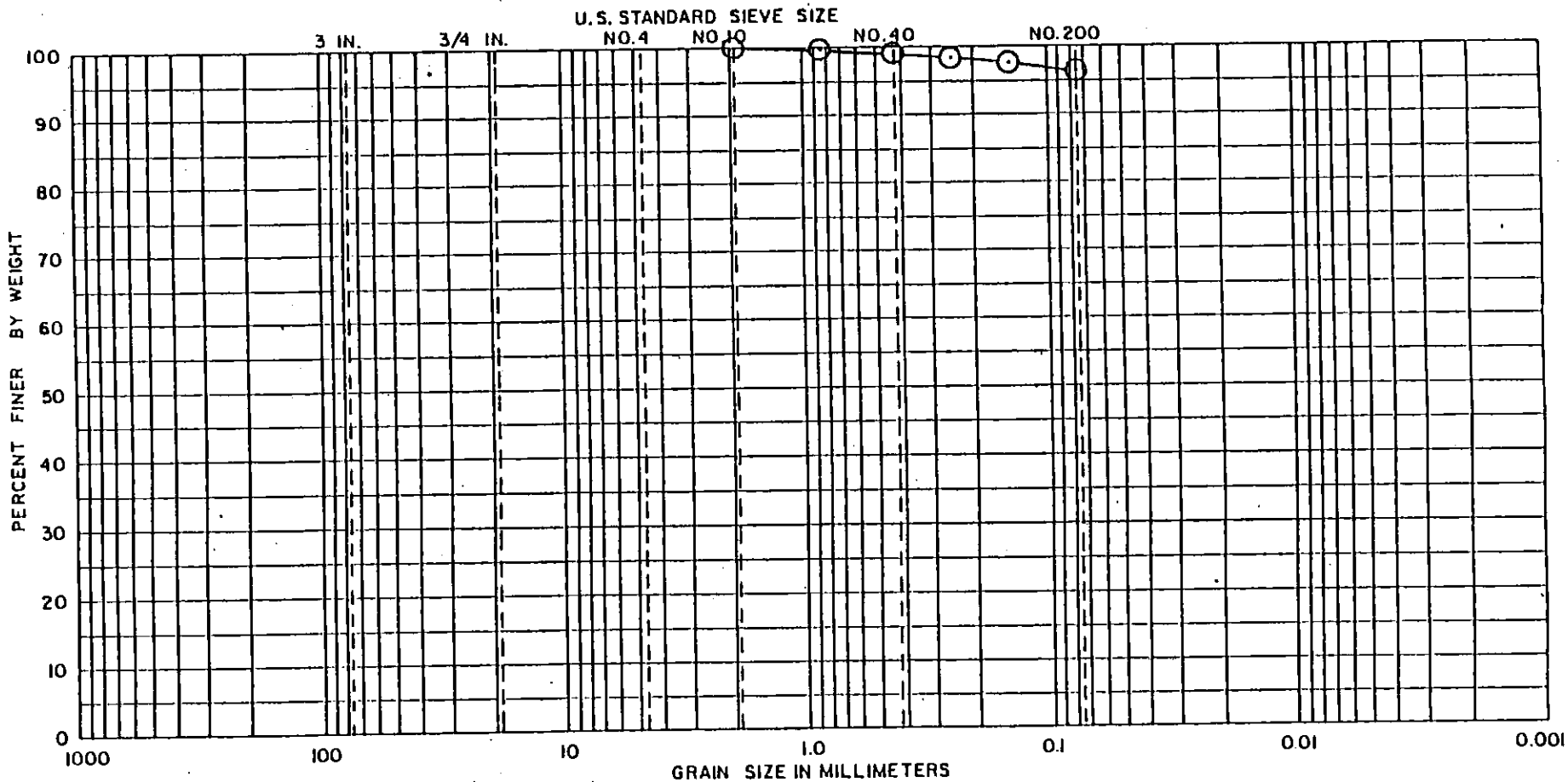
Project: DSWA NSWF - 2 PHASE III

Area: WILMINGTON , DE

Boring No: GF-110

Date: 10/27/89 Tested By: DKN

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	10' - 12'	MH		59.0	38.6	20.4	-
		(L.L.-OVEN DRYED)	=	51.1			

Description and Comments:
1) BLACK-ELASTIC SILT
2) L.L.-O.D. / L.L.-A.D. = .87

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF-2 PHASE - IA

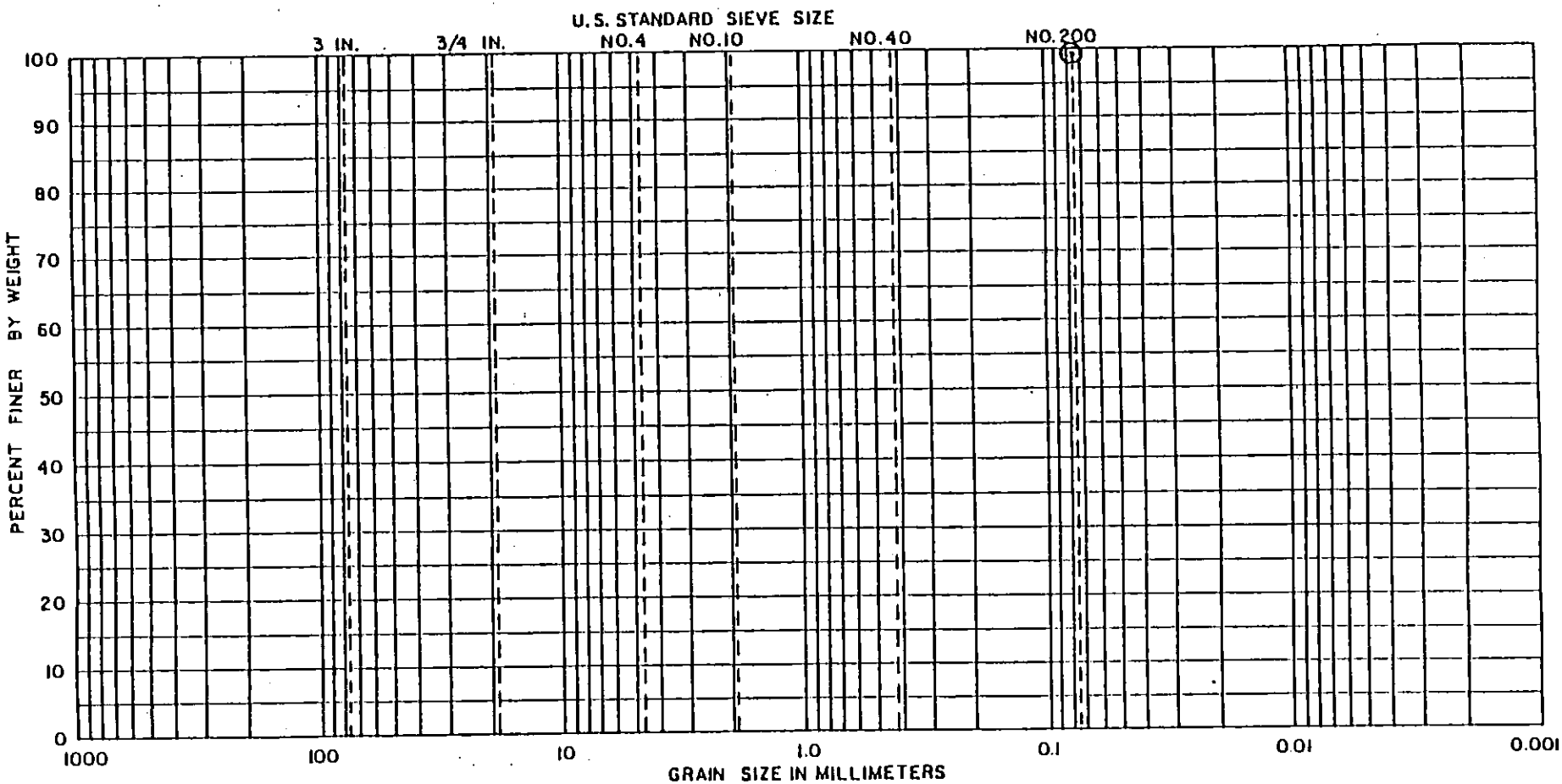
Area: WILMINGTON, DE

Boring No: GF-200

Date: 6/27/90

Tested By: KLM

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	20' - 22'	MH		59.9	34.8	25.1	-
		(L.L.-OVEN DRYED)	=	50.1			

Description and Comments:
1) BLACK-ELASTIC SILT
2) L.L.-O.D. / L.L.-A.D. = .84

CLASSIFICATION TEST - GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

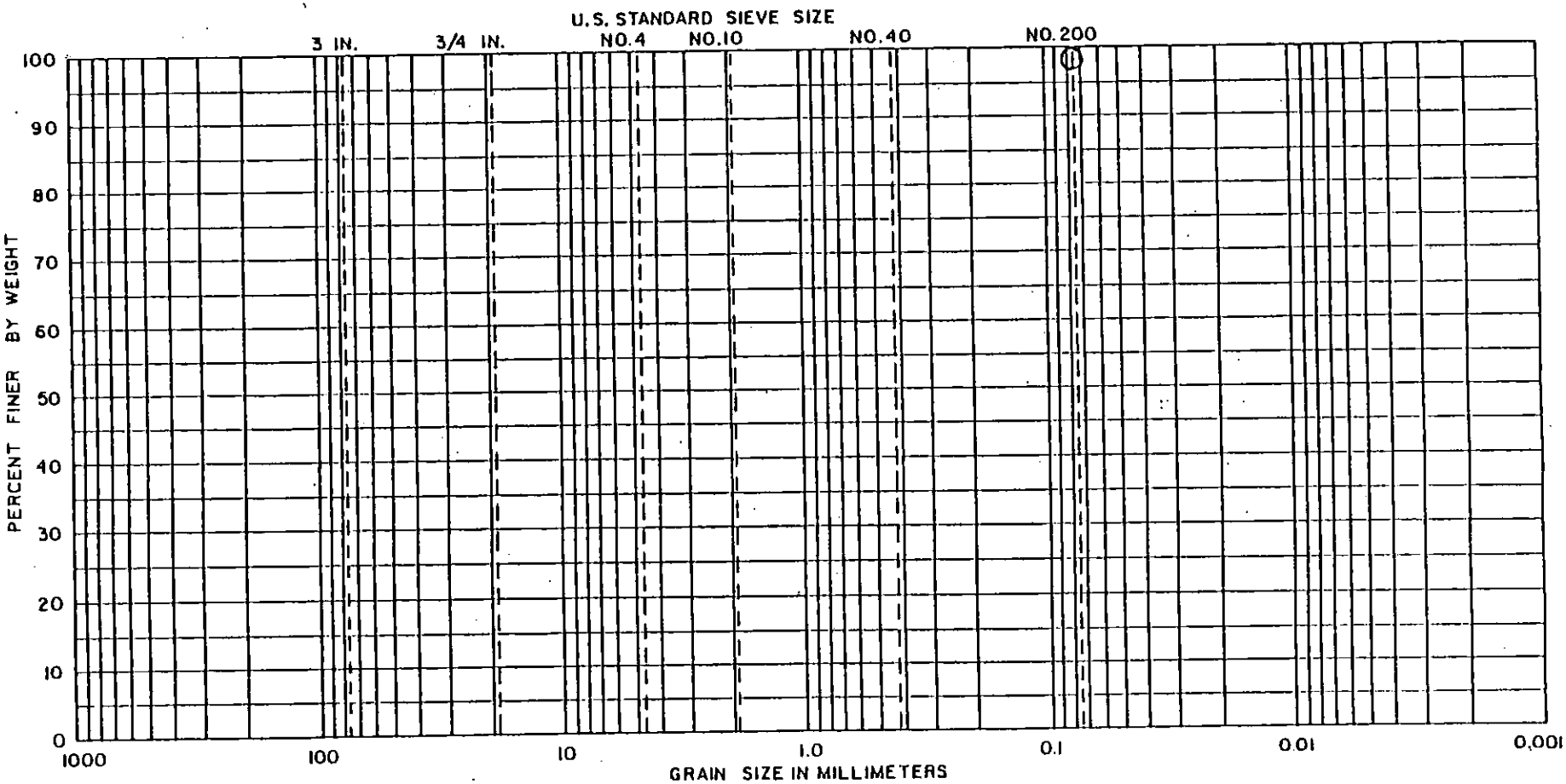
Project: DSWA NSWF-2 PHASE - IA

Area: WILMINGTON, DE

Boring No: GF-200

Date: 6/27/90

Tested By: KLM



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	10' - 12'	MH		53.4	36.5	16.9	--
		(L.L.-OVEN DRYED)	=	50.2			

Description and Comments:
1) BLACK-ELASTIC SILT
2) L.L.-O.D. / L.L.- A.D. = .94

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF-2 PHASE - IA

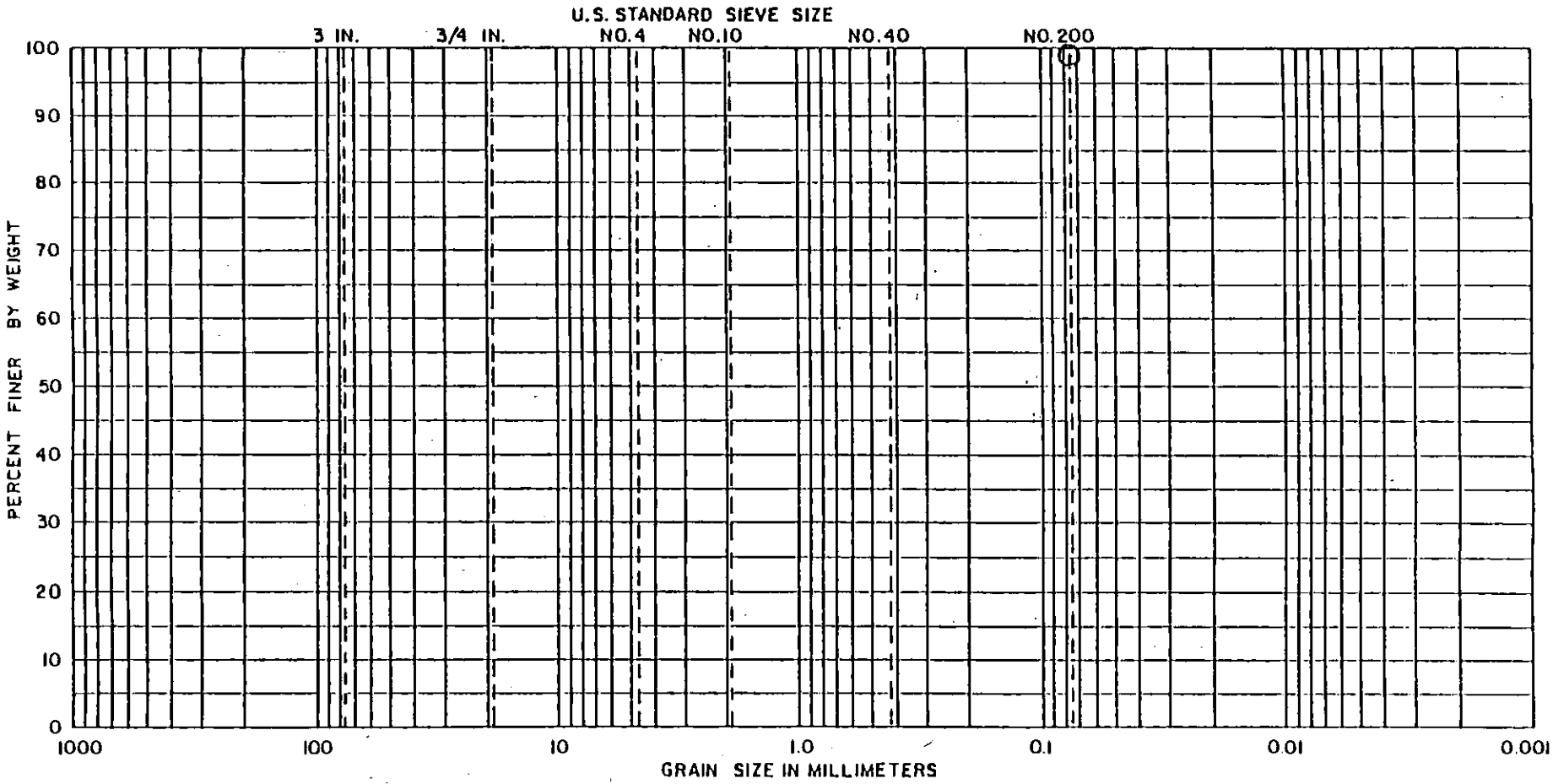
Area: WILMINGTON, DE

Boring No: GF-201

Date: 6/27/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	20' - 22'	ML		45.8	31.6	14.2	-
		(L.L.-OVEN DRYED)	-	41.3			

Description and Comments:
1) BLACK-SILT
2) L.L.-O.D. / L.L.-A.D. = .90

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF-2 PHASE - IA

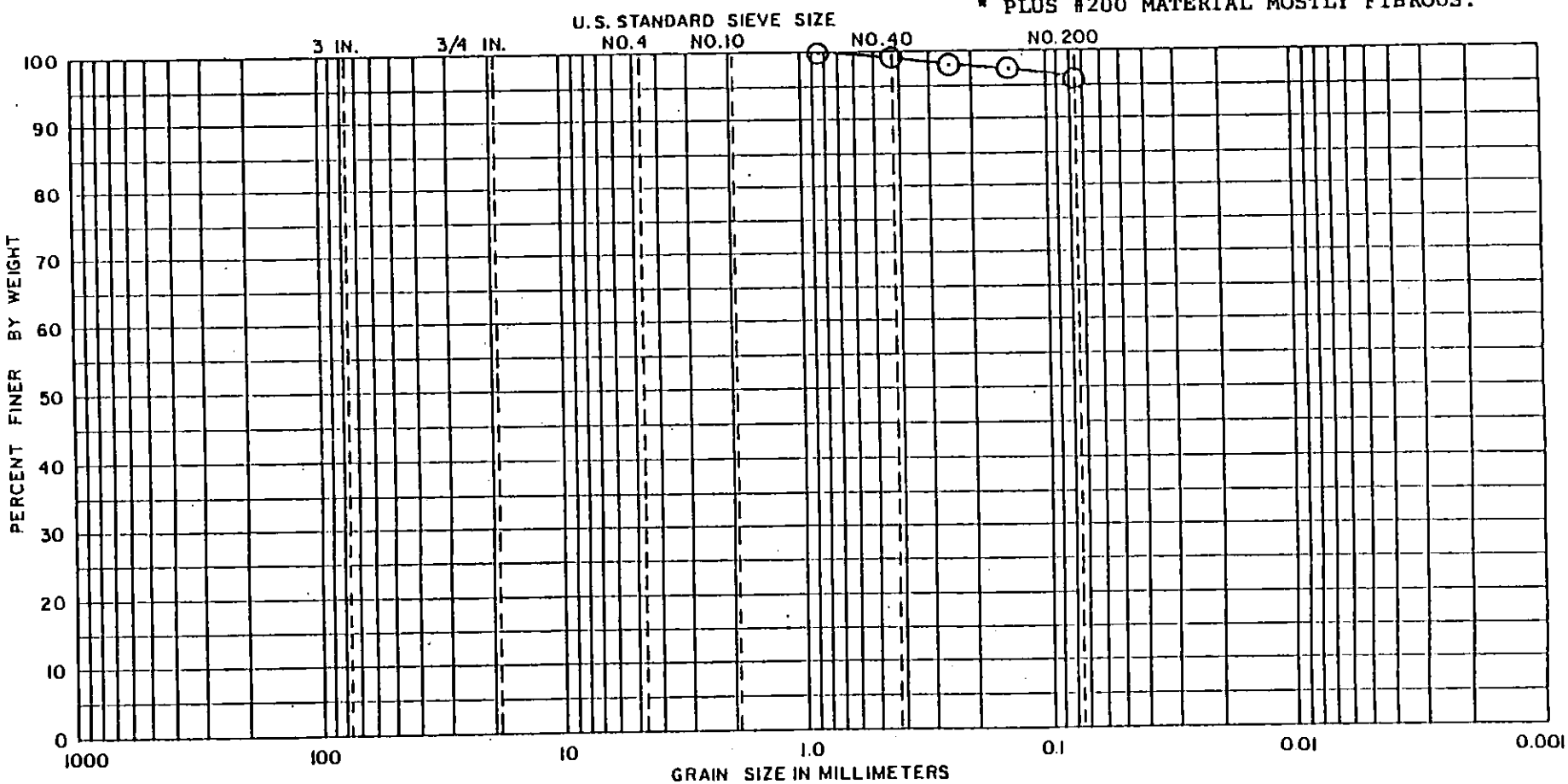
Area: WILMINGTON, DE

Boring No: GF-201

Date: 6/27/90

Tested By: KLM

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-3	30' - 32'	MH		74.7	47.6	27.1	-
		(L.L.-OVEN DRYED)	=	63.1			

Description and Comments:
1) BLACK-ELASTIC SILT
2) L.L.-O.D. / L.L.-A.D. = .84

CLASSIFICATION TEST-GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

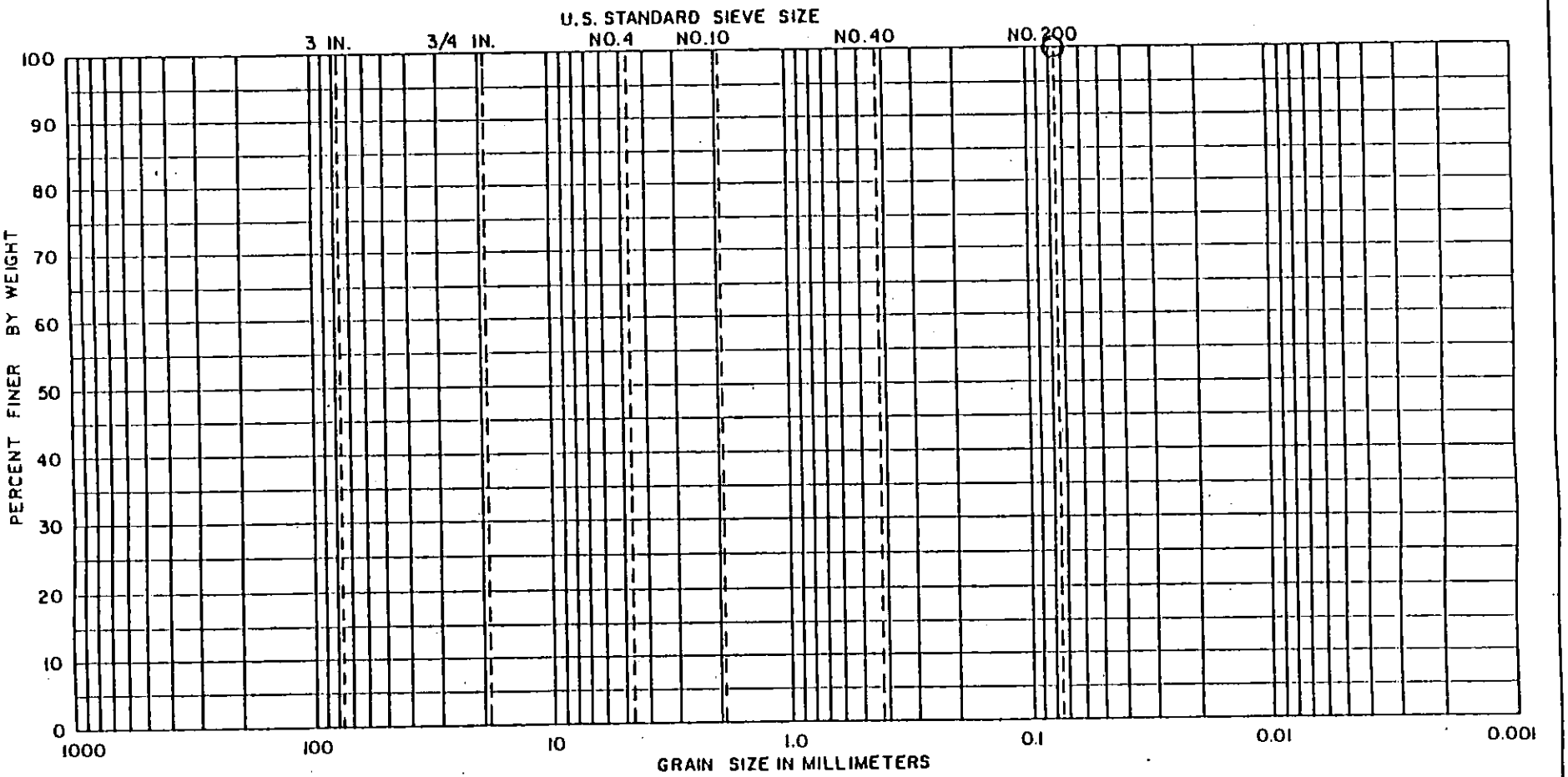
Project: DSWA NSWF-2 PHASE - IA

Area: WILMINGTON, DE

Boring No: GF-201

Date: 6/27/90

Tested By: KLM



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	10' - 12'	MH		60.9	41.1	19.8	-
		(L.L.-OVEN DRYED)	=	51.9			

Description and Comments:
1) BLACK-ELASTIC SILT
2) L.L.-O.D. / L.L.-A.D. = .85

CLASSIFICATION TEST-GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

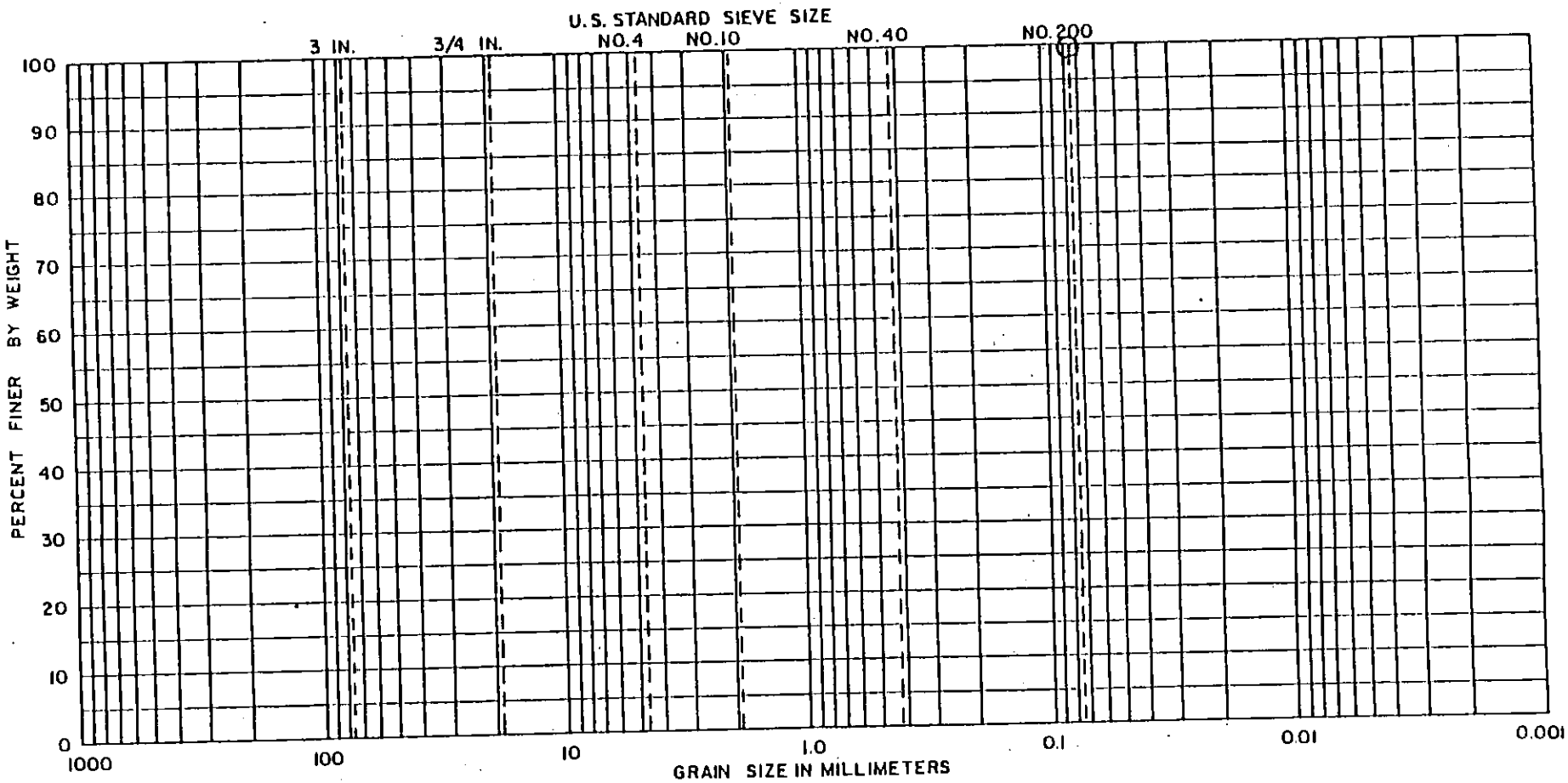
Project: DSWA NSWF-2 PHASE - IA

Area: WILMINGTON, DE

Boring No: GF-202

Date: 6/27/90

Tested By: KLM



Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-3	20' - 22'	MH		65.5	41.6	23.9	--
		(L.L.-OVEN DRYED)	=	58.4			

Description and Comments:
1) BLACK-ELASTIC SILT
2) L.L.-O.D. / L.L.-A.D. = .89

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF-2 PHASE - IA

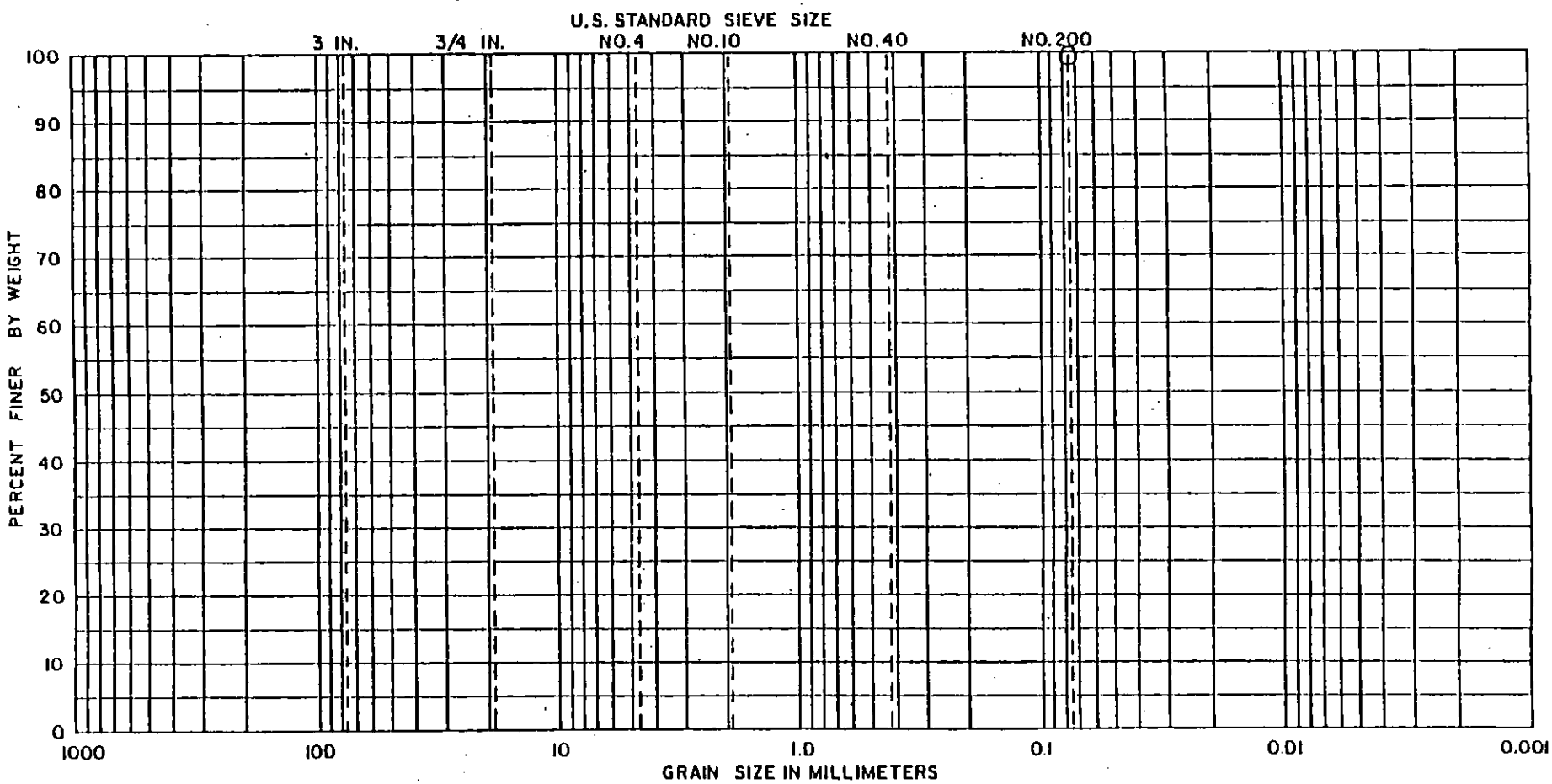
Area: WILMINGTON, DE

Boring No: GF-202

Date: 6/27/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-203/U-1	10.0'-12.0'	MH	72.8	58.9	39.0	19.9	--

Description and Comments: Dark grey elastic silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

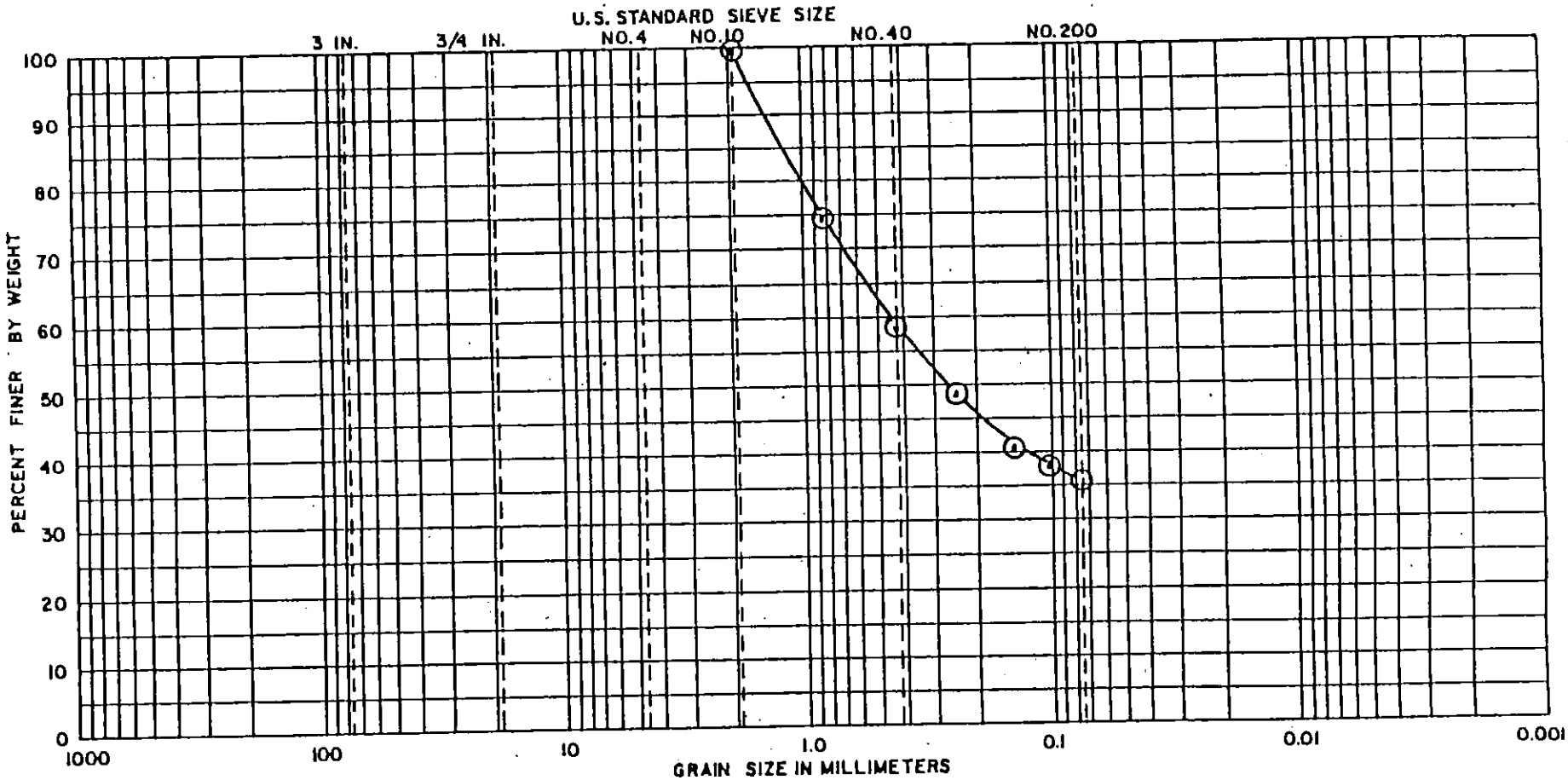
Project: DSWA-NSWF-2 PHASE IA

Area: WILMINGTON, DE.

Boring No: GF-203 / U-1

Date: July 6, 1990 Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
U-3	30.0-32.0	PT	--	--	NP	--	--

Description and Comments: Dark gray peat; Plus No. 200 material was fibrous

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, PHASE IA

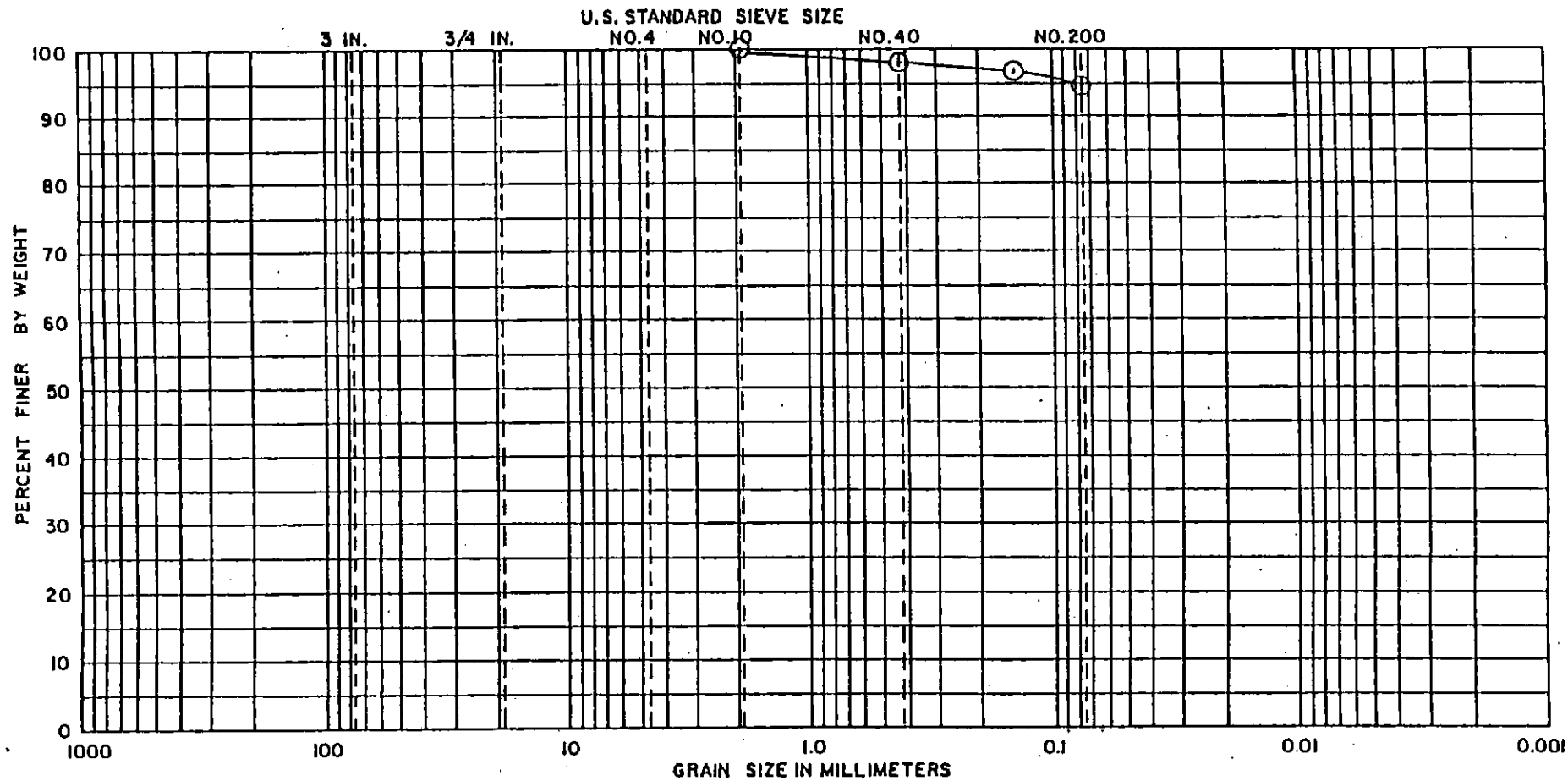
Area: WIMINGTON, DELAWARE

Boring No: GF-203

Date: 7/90

Tested By: D.F.P.

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
-204/U-1	38.0'-40.0'	MH	50.6	53.6	33.8	19.8	--

Description and Comments: Grey Elastic silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

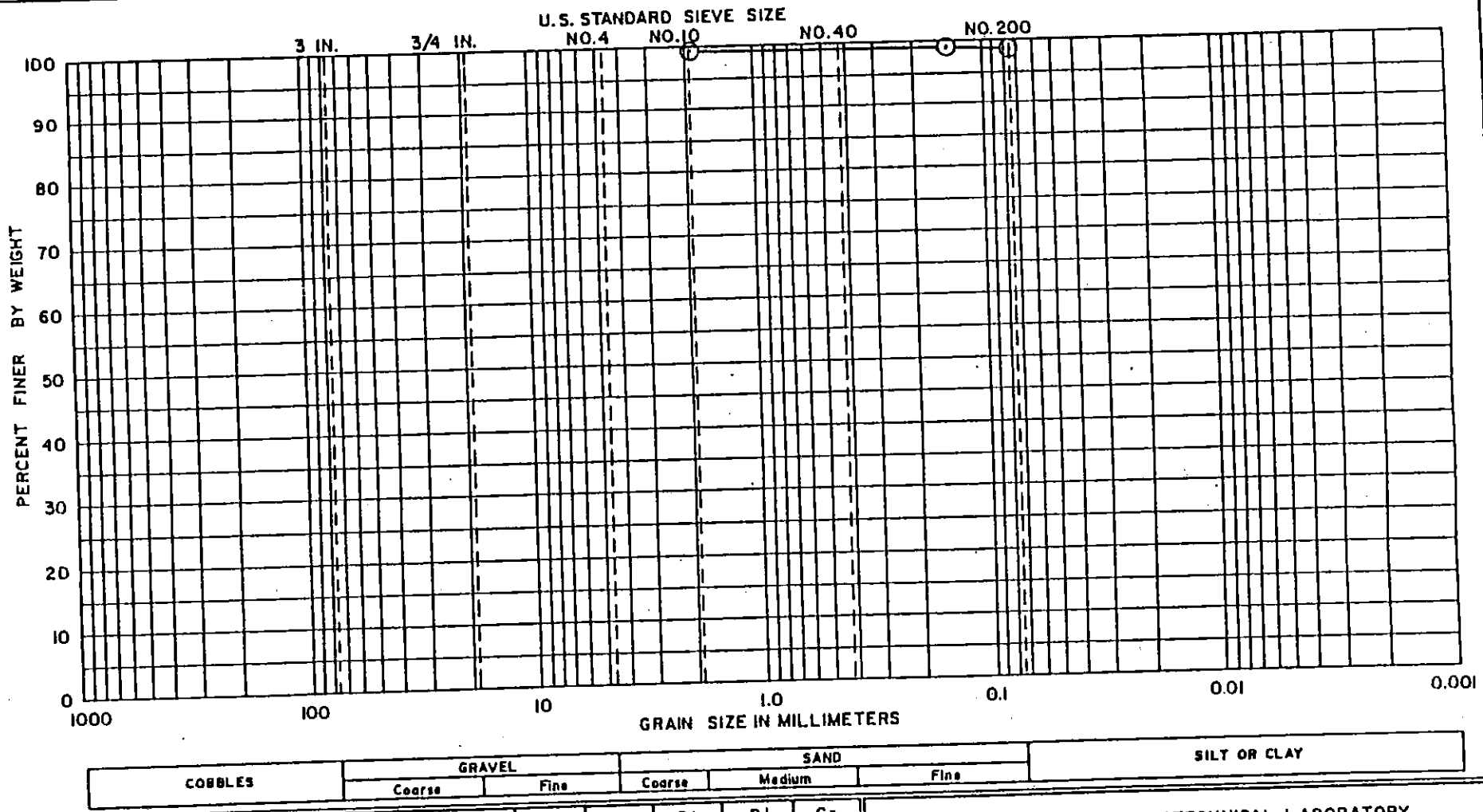
Project: DELAWARE SOLID WASTE AUTH. PHASE IA

Area: WILMINGTON, DE.

Boring No: GF-204 / U-1

Date: Aug. 2nd. 90 | Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES



Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-204/U-3	44.5'-46.5'	MH	83.5	69.9	43.1	26.8	--

Description and Comments: Grey Elastic silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE AUTH. PHASE IA

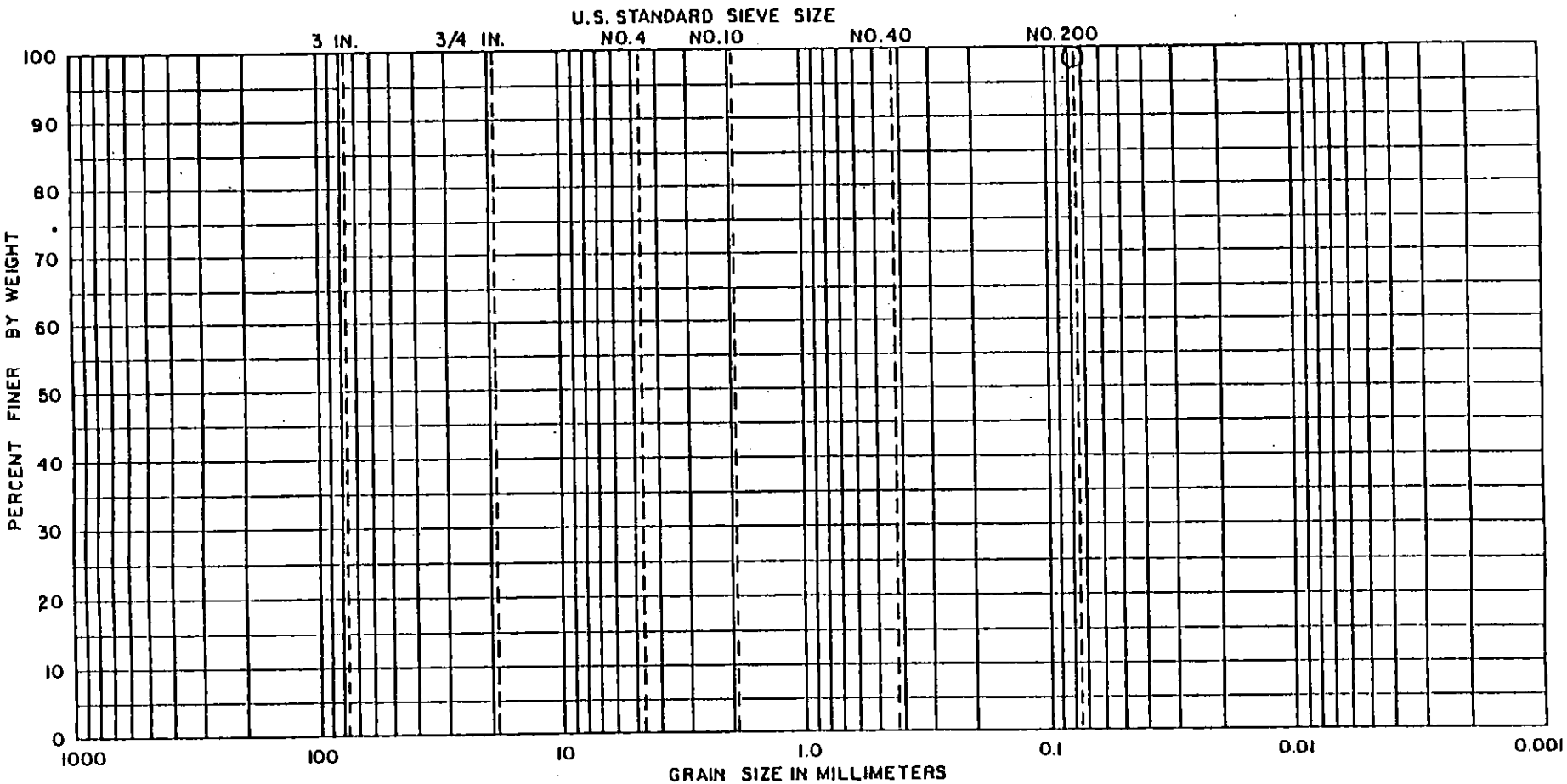
Area: WILMINGTON, DE.

Boring No: GF-204 / U-3

Date: Aug. 2nd. 1990

Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	10' - 12'	ML		41.1	28.8	12.3	---
		(L.L.-OVEN DRYED)	=	37.0			

Description and Comments:
1) BLACK-SILT
2) L.L.-O.D. / L.L.-A.D. = .90

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF-2 PHASE - IA

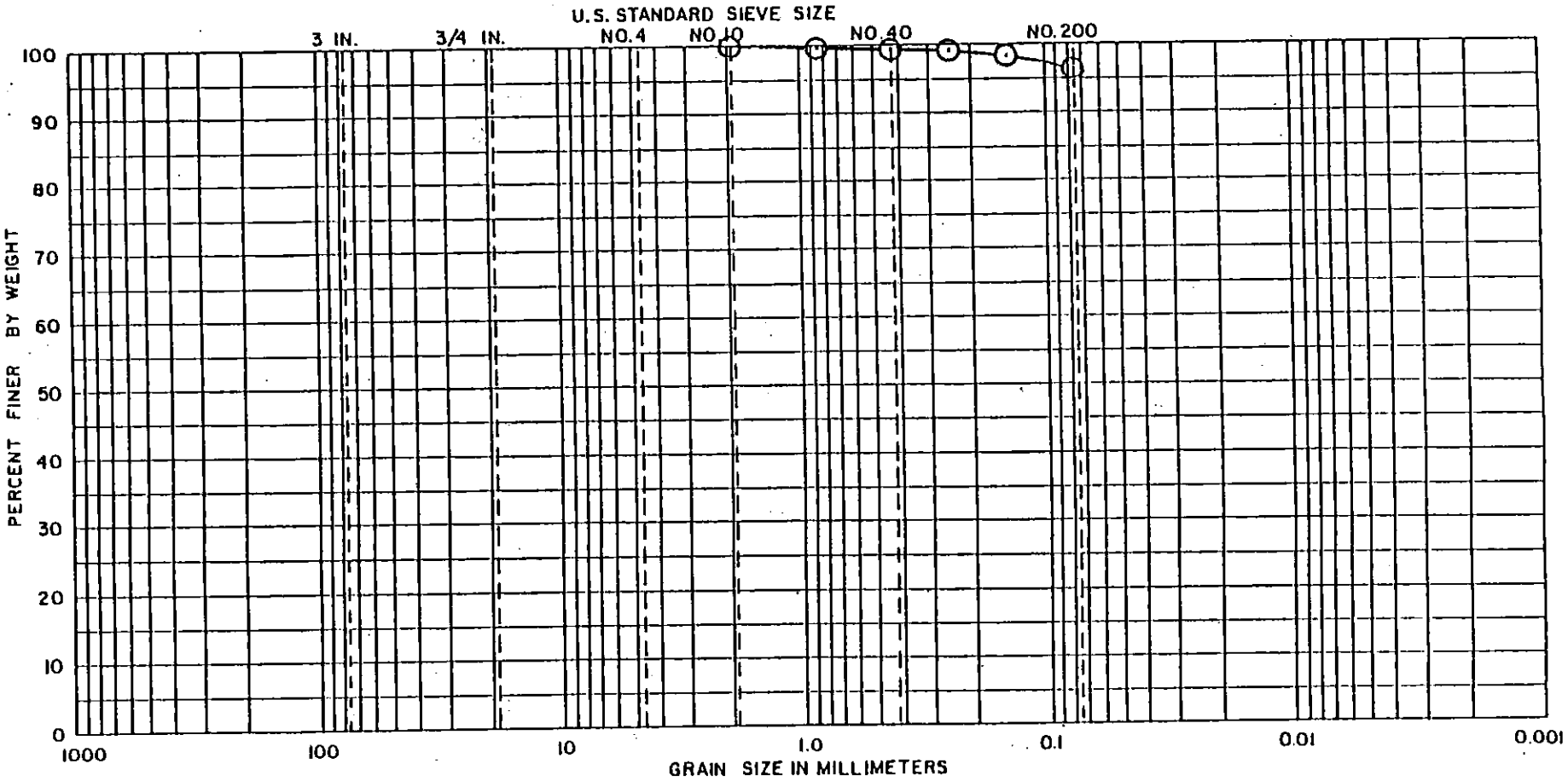
Area: WILMINGTON, DE

Boring No: GF-206

Date: 6/27/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	20' - 22'	MH		53.0	34.8	18.2	--
		(L.L.-OVEN DRYED)	=	46.0			

Description and Comments:
1) BLACK-ELASTIC SILT
2) L.L.-O.D. / L.L.-A.D. = .87

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF-2 PHASE - IA

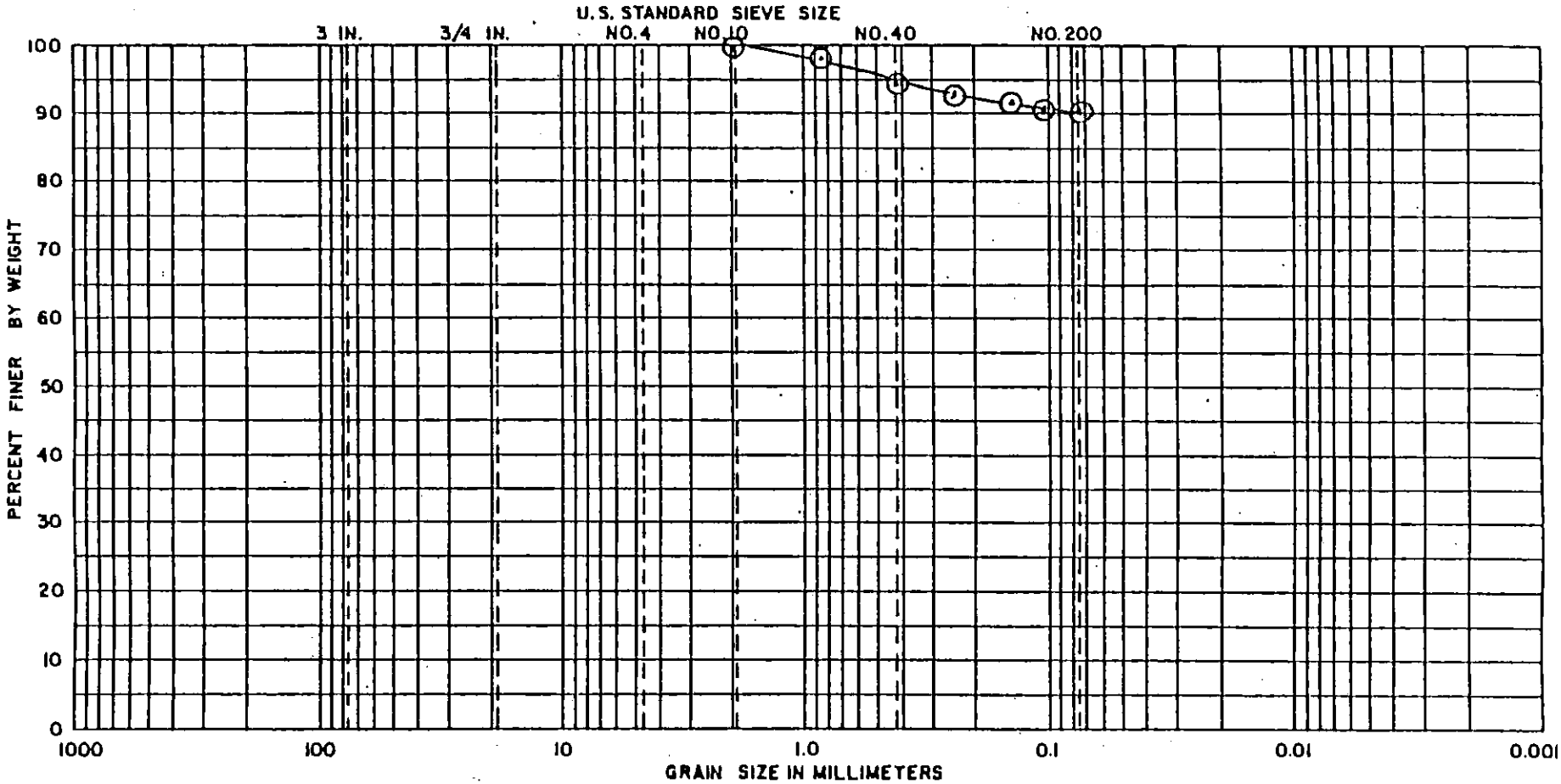
Area: WILMINGTON, DE

Boring No: GF-206

Date: 6/27/90

Tested By: KLM

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
SHELBY U-3	30.0-32.0'	ML		--	NP	--	--

Description and Comments: GRAY SILT

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, PHASE IA

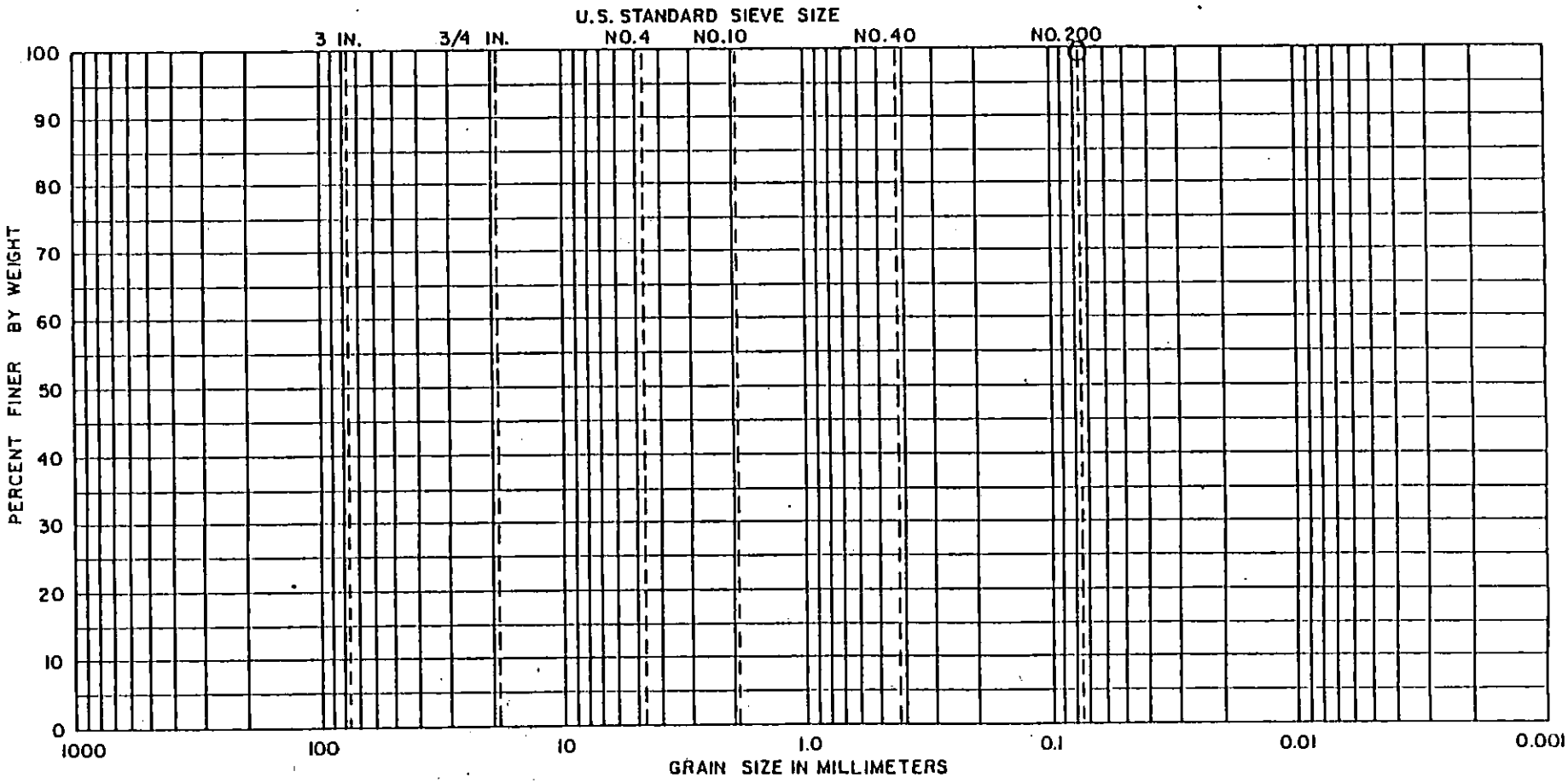
Area: WILMINGTON, DELAWARE

Boring No: GF-206

Date: 7/90

Tested By: D.F.P.

CLASSIFICATION TEST – GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-207/U-1	10.0'-12.0'	MH	82.9	57.6	39.2	18.4	--

Description and Comments: Dark grey elastic silt
Sample contains decomposed roots & Leaves

GANNETT FLEMING GEOTECHNICAL LABORATORY

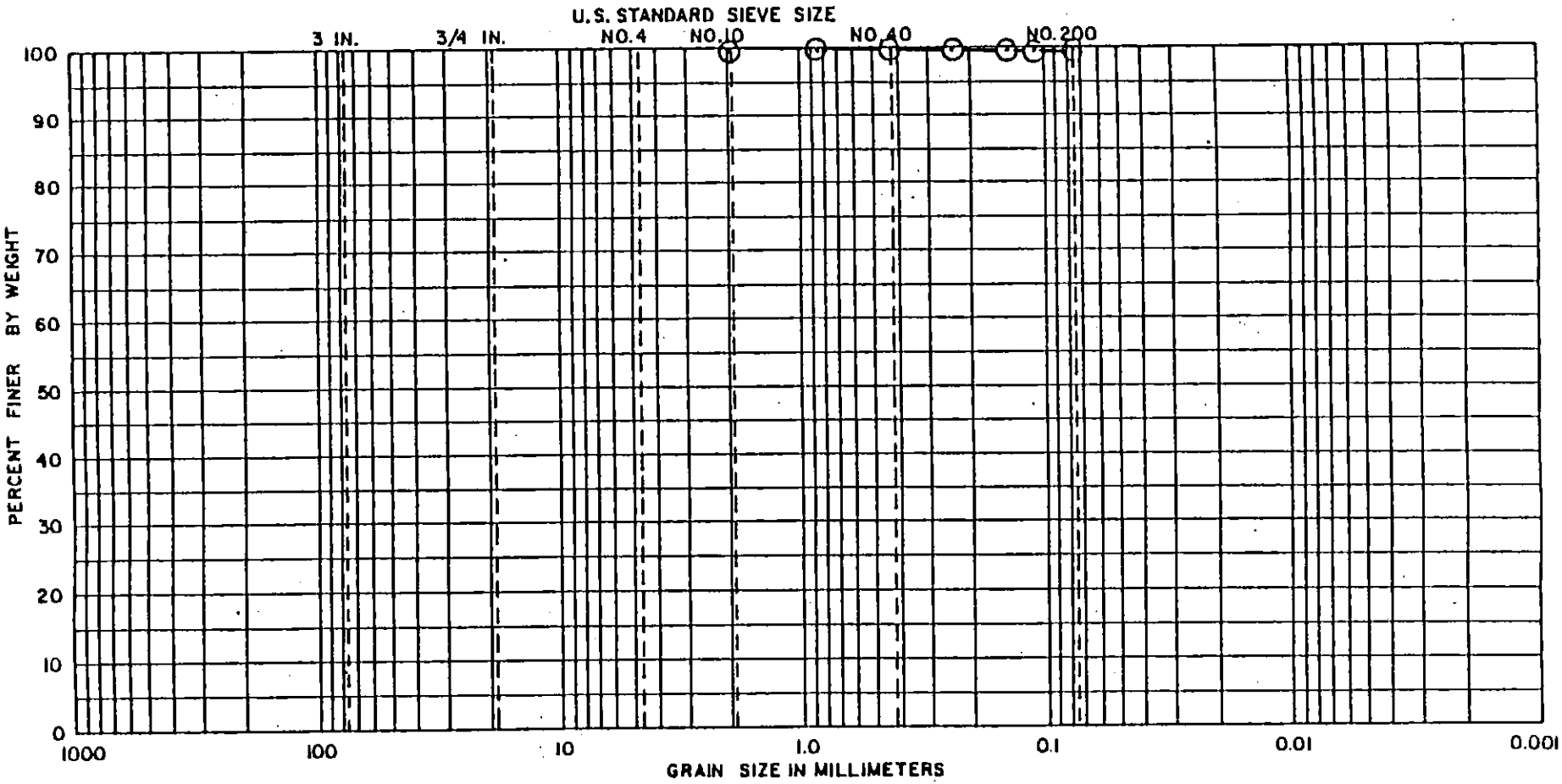
Project: DSWA - NSWF-2 PHASE IA

Area: WILMINGTON, DE.

Boring No: GF-207 / U-1

Date: July 6, 1990 | Tested By: K.A. Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	20.0'-22.0'	MH	87.2	76.4	51.7	24.7	--
		OVENDRIED	=	69.6			

Description and Comments: GRAY ELASTIC SILT

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA PHASE IA

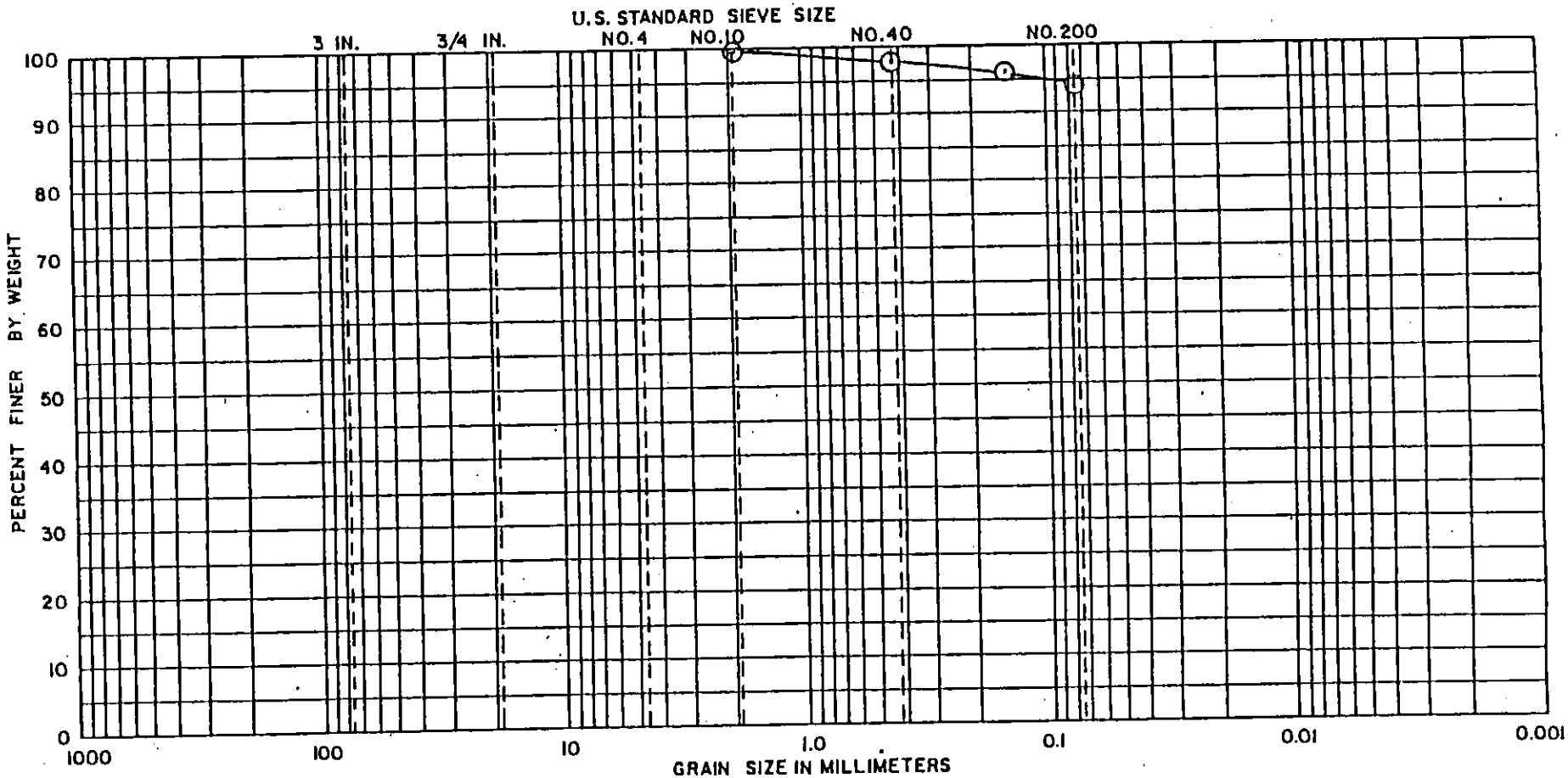
Area: WILMINGTON, DELAWARE

Boring No: GF-207

Date: 8/90

Tested By: D.F.P.

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-208/U-1	42.5'-44.5'	MH	81.6	59.2	37.0	22.2	--

Description and Comments: Grey Elastic silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

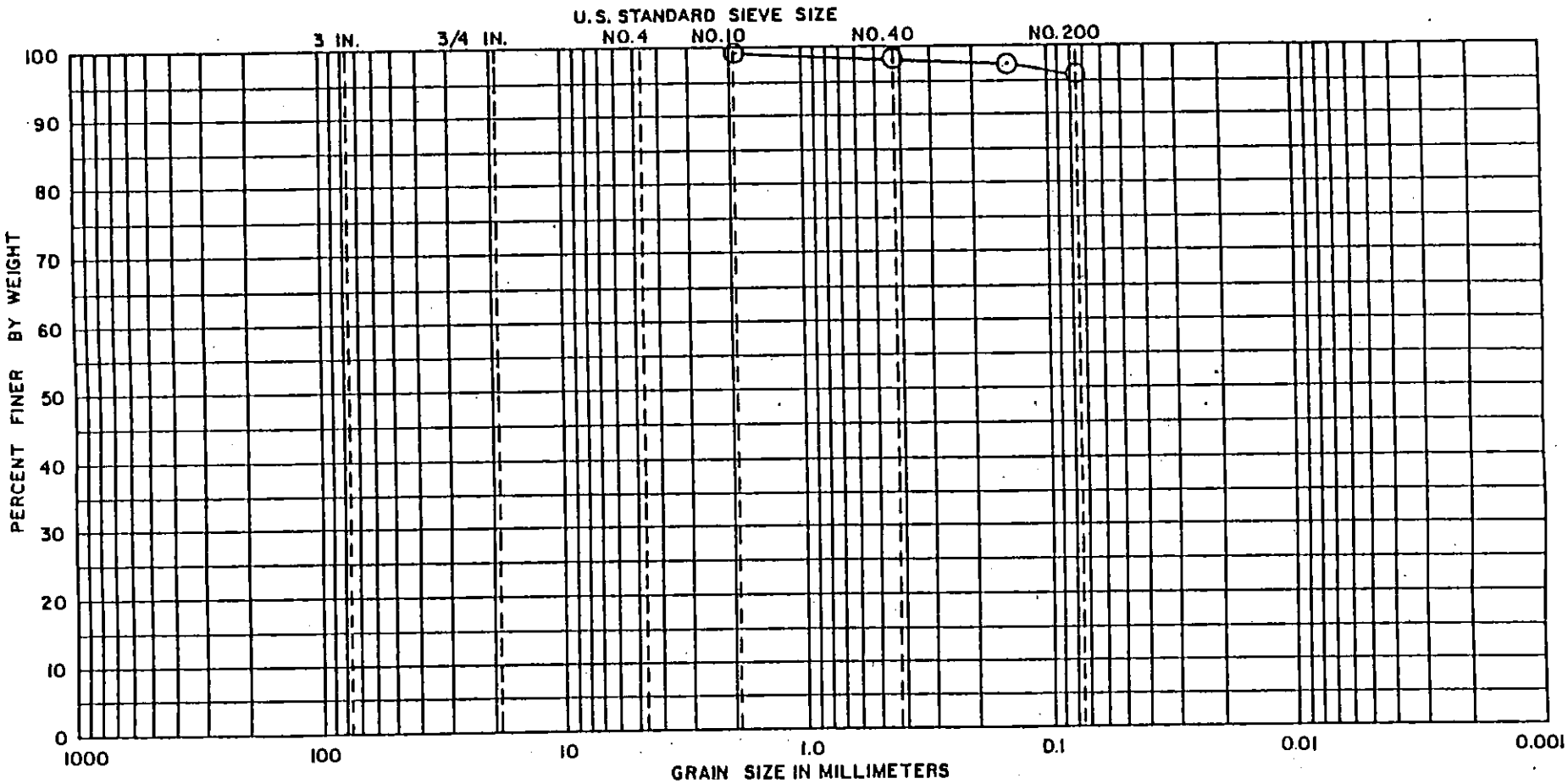
Project: DELAWARE SOLID WASTE AUTH. PHASE IA

Area: WILMINGTON, DE.

Boring No: GF-208 / U-1

Date: Aug. 2nd. 1990 | Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-208/U-2	44.5'-46.5'	MH	71.3	58.9	36.6	22.3	--

Description and Comments: Grey Elastic silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE AUTH. PHASE IA

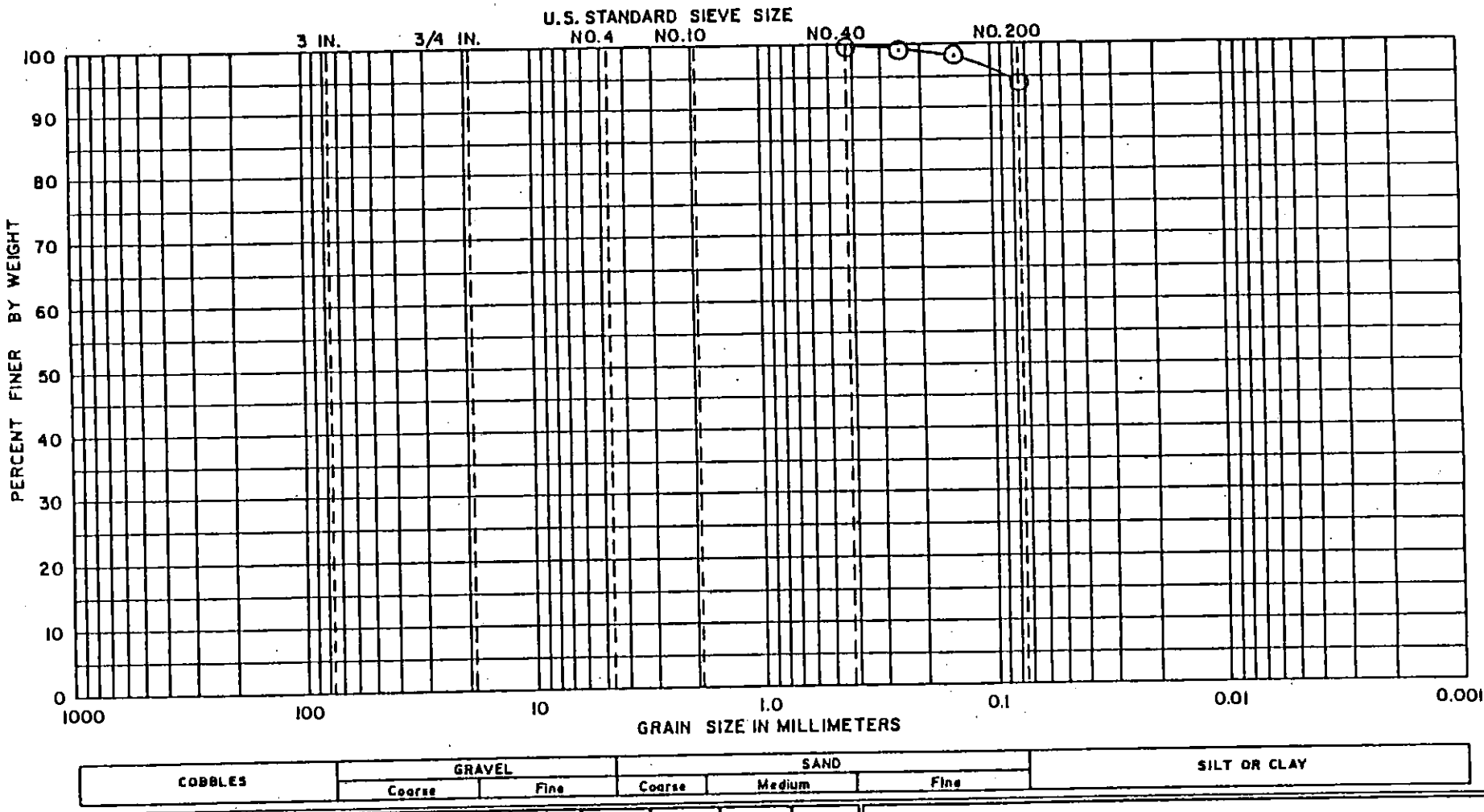
Area: WILMINGTON, DE.

Boring No: GF-208 / U-2

Date: Aug. 2nd. 1990

Tested By: K.A.Abdolos

CLASSIFICATION TEST—GRADATION CURVES



Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-208/U-3	49.0'-51.0'	ML_1	54.0	42.0	27.2	14.8	

Description and Comments: Grey silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE AUTH. PHASE IA

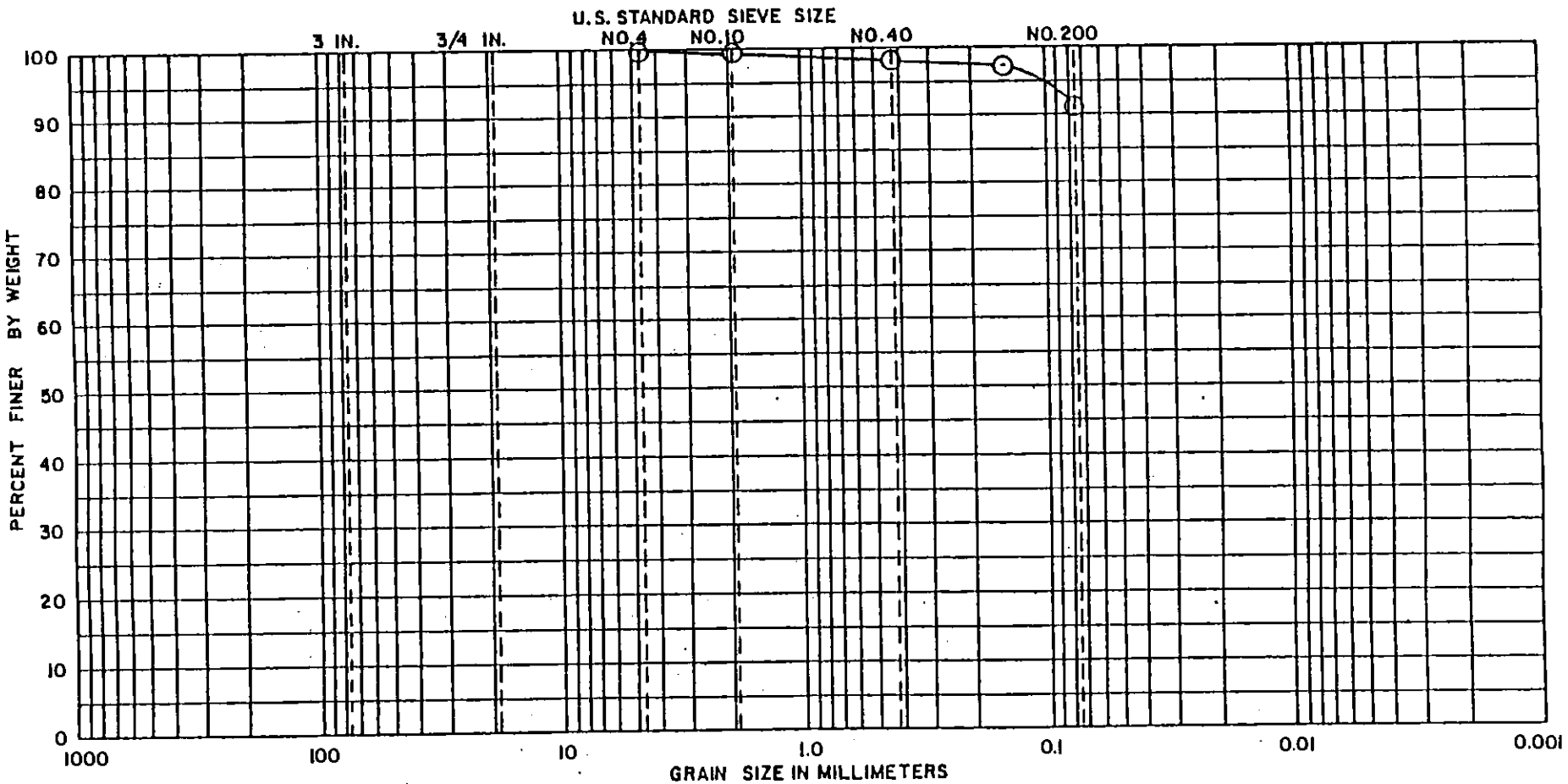
Area: WILMINGTON, DE.

Boring No: GF-208 / U-3

Date: Aug. 2nd. 1990

Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-209/U-1	42.0'-44.0'	ML		44.5	29.4	15.1	--

Description and Comments: Grey silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE AUTH. PHASE IA

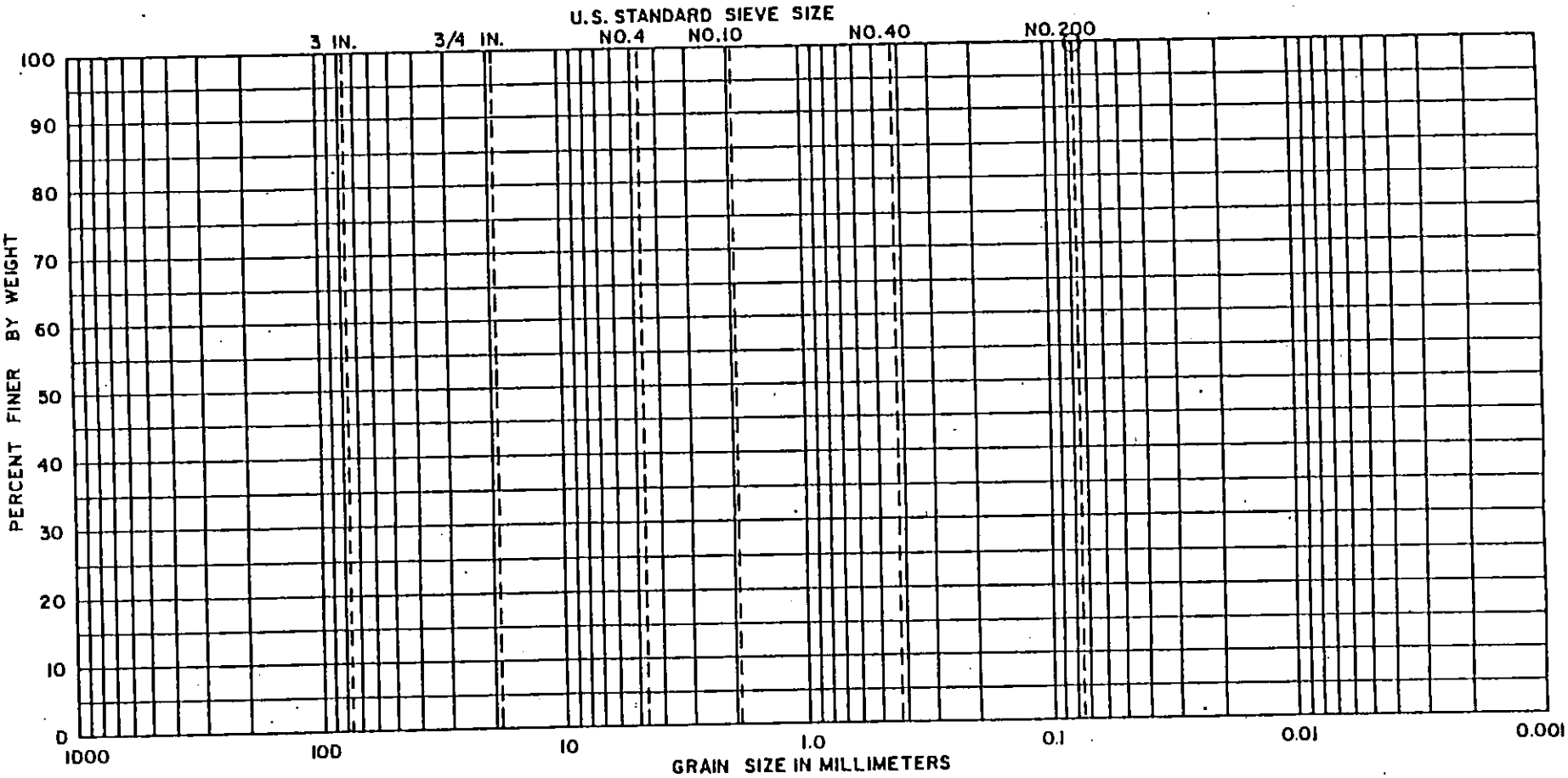
Area: WILMOINGTON, DE.

Boring No: GF-209 / U-1

Date: Aug. 2nd. 1990

Tested By: K.A.Abdolos

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-209/U-3	49.0'-51.0'	MH	81.0	59.8	35.5	24.3	--

Description and Comments: Grey Elastic silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DELAWARE SOLID WASTE AUTH. PHASE IA

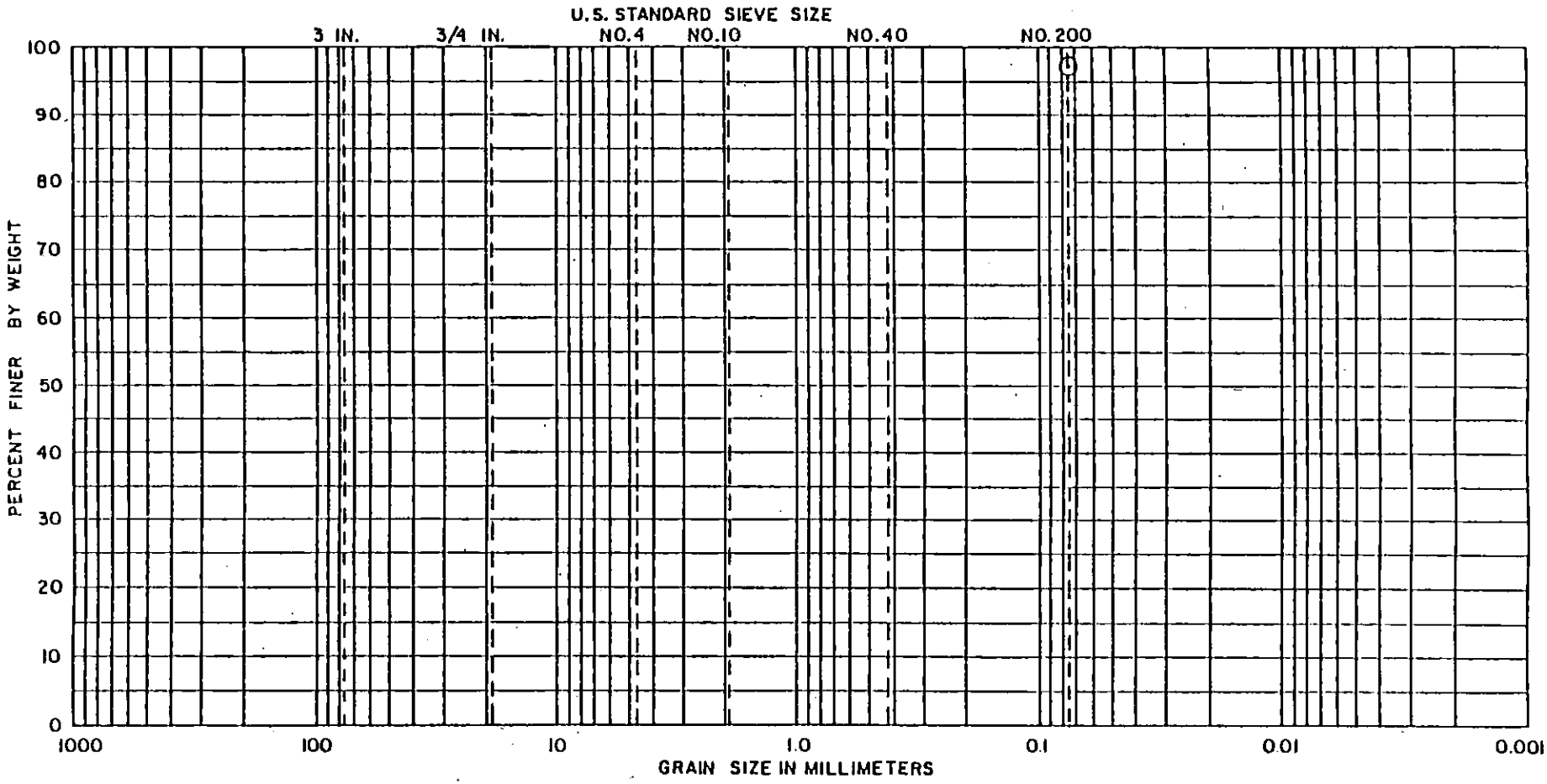
Area: WILMINGTON , DE.

Boring No: GF-209 / U-3

Date: Aug. 2nd. 1990

Tested By: K.A.Abdolos

CLASSIFICATION TEST—GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
GF-210/U-1	10.0'-12.0'	MH	76.9	64.0	41.6	22.4	--

Description and Comments: Dark grey elastic silt

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA NSWF-2 PHASE IA

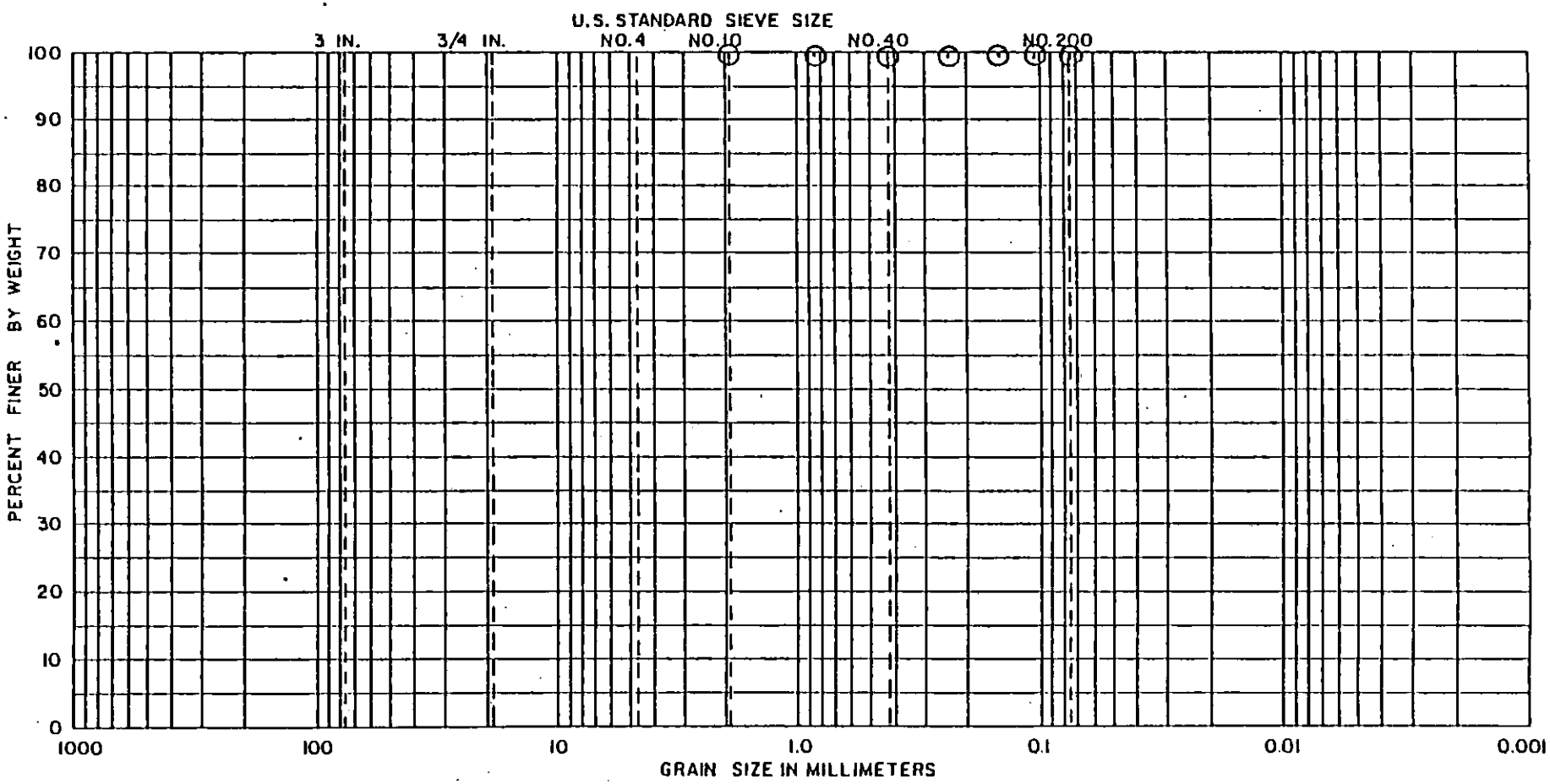
Area: WILMINGTON, DE.

Boring No: GF-210/U-1

Date: July 6, 1990

Tested By: K.A.Abdolos

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-2	20.0'-22.0'	MH	76.6	62.0	42.3	19.7	--
		OVENDRIED =		54.7			

Description and Comments: GRAY ELASTIC SILT

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA PHASE IA

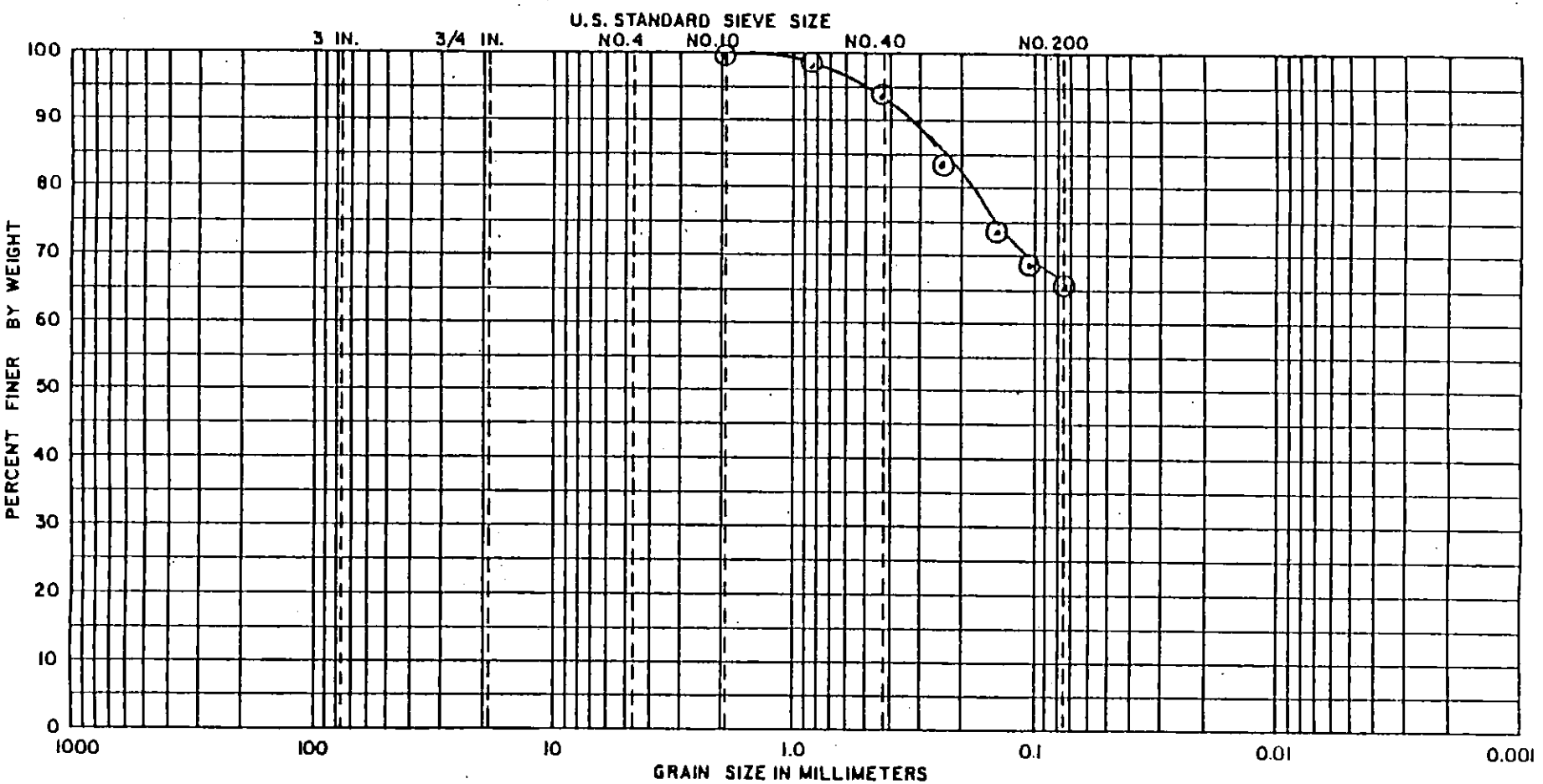
Area: WILMINGTON, DELAWARE

Boring No: GF-210

Date: 8/90

Tested By: D.F.P.

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
U-3	37.5-39.5'	PT	119.5	97.0	NP	--	--
		OVENDRIED	=	84.0			

Description and Comments: Black peat ; minus No. 200 material was fibrous

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA PHASE IA

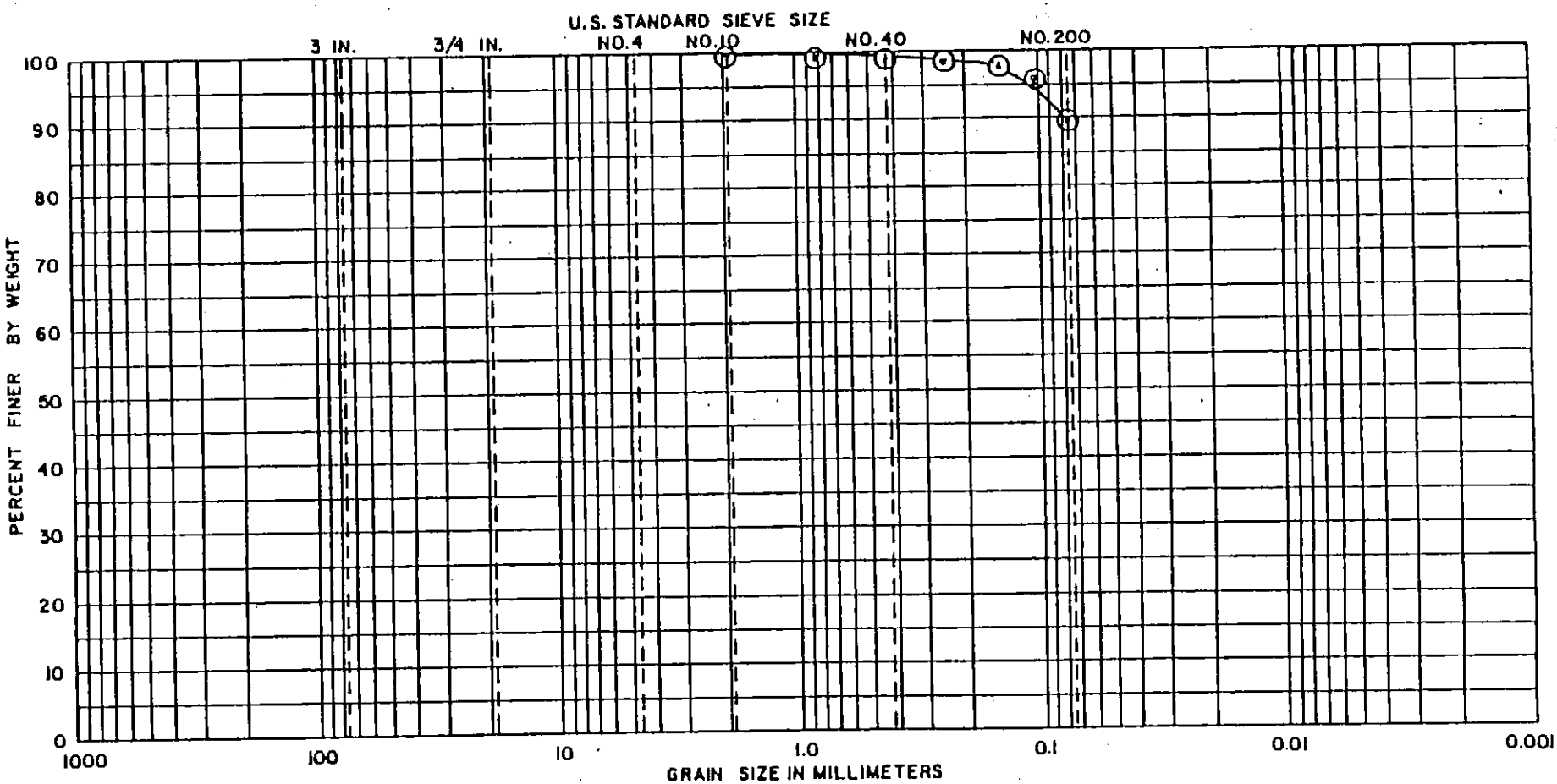
Area: WILMINGTON, DELAWARE

Boring No: GF-210

Date: 8/90

Tested By: D.F.P.

CLASSIFICATION TEST - GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Depth	Classification	Nat.WC	LL	PL	PI	Gs
U-1	10.0-12.0'	ML	--	--	NP	--	--

Description and Comments: GRAY SILT

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, PHASE IA

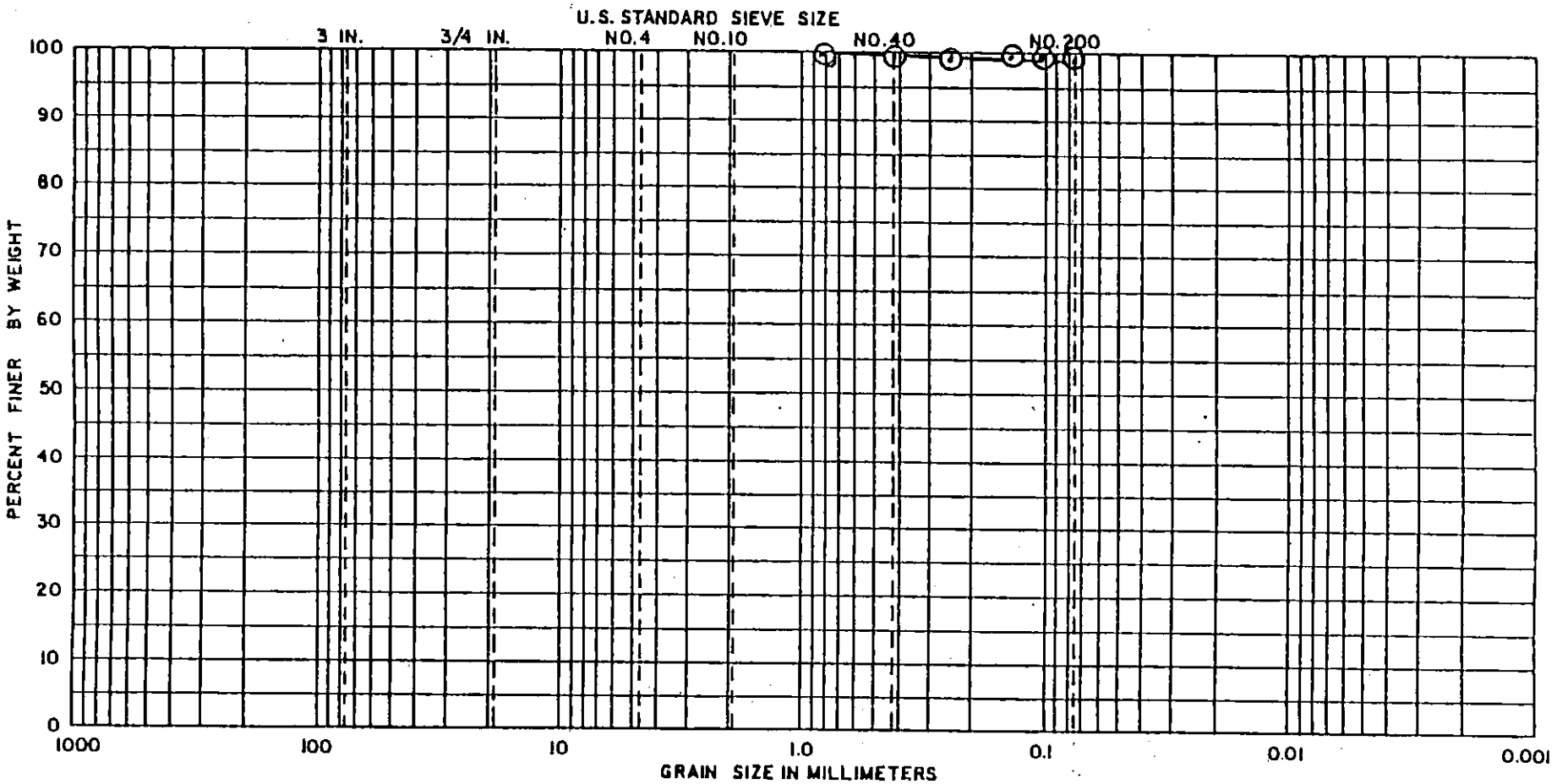
Area: WIMINGTON, DELAWARE

Boring No: GF-211

Date: 7/90

Tested By: D.F.P.

CLASSIFICATION TEST-GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

ample No.	Depth	Classification	Nat. WC	LL	PL	PI	Gs
-3	30.0-32.0	MH	--	56.3	40.1	16.2	--

escription and
omments: GRAY ELASTIC SILT

CLASSIFICATION TEST - GRADATION CURVES

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: DSWA, PHASE IA

Area: WIMINGTON, DELAWARE

Boring No: GF-211

Date: 7/90

Tested By: D.F.P.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB1/S4	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	003	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.9
#20	0.850	99.7
#50	0.300	99.2
#100	0.150	98.8
#200	0.075	97.8
HYDROMETER	0.0376	77.4
	0.0272	74.1
	0.0200	67.6
	0.0144	64.3
	0.0110	56.1
	0.0080	49.5
	0.0058	43.0
	0.0042	36.4
	0.0031	29.8
	0.0022	26.6
	0.0013	16.7
	0.0009	15.1

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

94.7

SAMPLE DESCRIPTION

gray-black sandy SILT or CLAY with 2% sand

Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB3/S10,S11	PROJECT ANALYST	SPM
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	008	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	96.8
#4	4.750	87.4
#10	2.000	69.7
#20	0.850	49.9
#50	0.300	21.2
#100	0.150	13.3
#200	0.075	9.0

EFFECTIVE SIZES

% Finer	Diameter mm
60	1.437
30	0.468
10	0.092
Uniformity Coefficient	Gradation Coefficient
15.6	1.7

SPECIFIC GRAVITY

2.74

SAMPLE DESCRIPTION

dark brown well graded SAND with 13% gravel and 9% silt or clay

Unified Soil Classification System (USCS) Group Symbol

SW/SM or SW/SC

NOTES

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB3/S7	PROJECT ANALYST	[illegible]
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	009	QA/QC ANALYST	[illegible]
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.9
#20	0.850	99.0
#50	0.300	98.1
#100	0.150	97.6
#200	0.075	96.5
HYDROMETER	0.0356	70.7
	0.0260	66.6
	0.0190	62.5
	0.0140	57.1
	0.0106	51.7
	0.0079	42.2
	0.0057	38.2
	0.0042	32.8
	0.0031	26.0
	0.0022	23.3
	0.0013	17.9
	0.0009	13.8

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

81.8

SAMPLE DESCRIPTION

gray-black sandy SILT or CLAY with 3% sand

Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB5/S14,S15	PROJECT ANALYST	SPM
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	015	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/16/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	94.8
#4	4.750	84.6
#10	2.000	71.1
#20	0.850	55.4
#50	0.300	29.1
#100	0.150	18.3
#200	0.075	11.8

EFFECTIVE SIZES

% Finer	Diameter mm
60	1.189
30	0.319
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown gravelly silty or clayey SAND with 15% gravel and 12% silt or clay

Unified Soil Classification System (USCS) Group Symbol

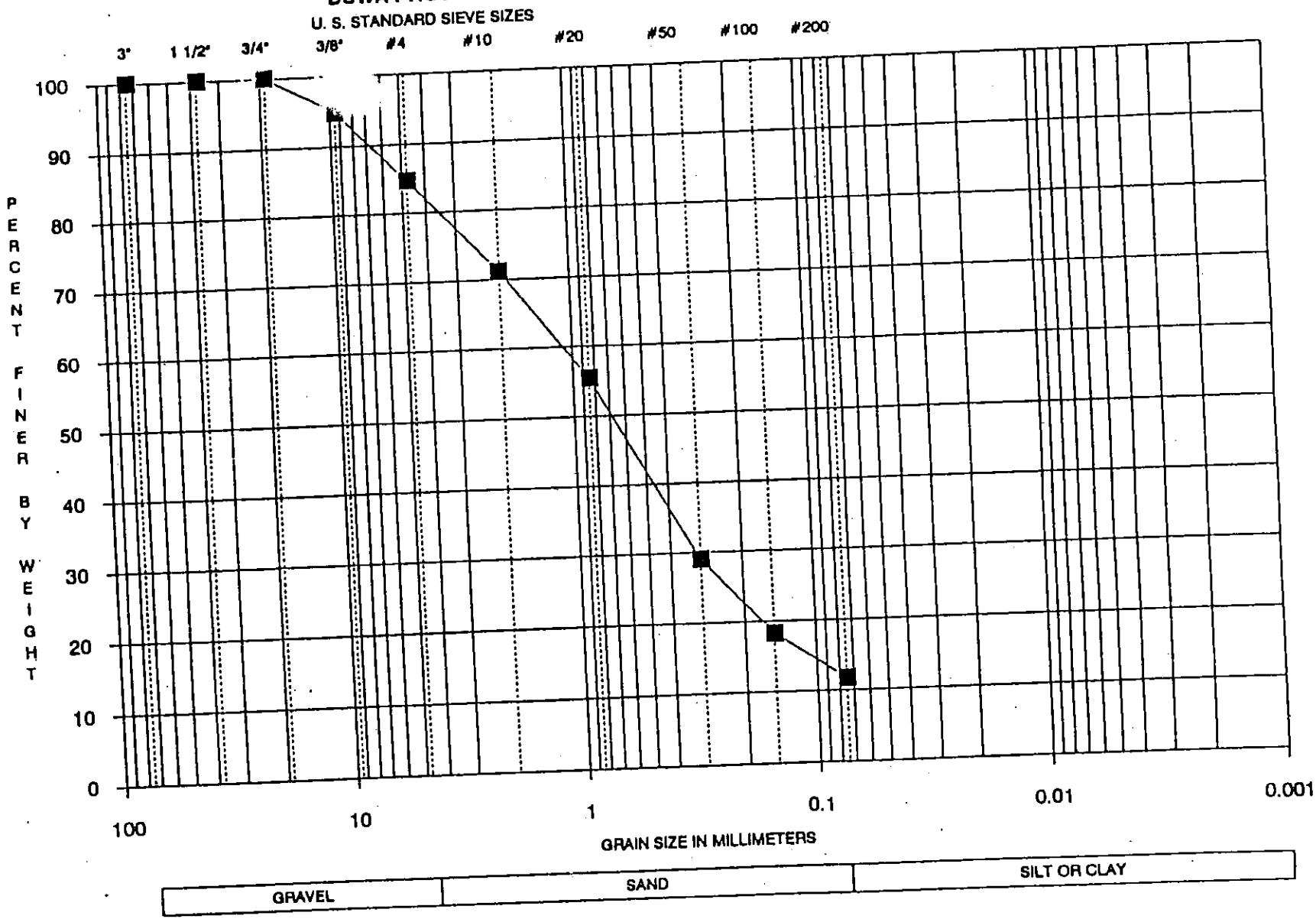
SP/SM or SP/SC

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB5/S14,S15, ETL SAMPLE # 9205X005-015



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB1/S4	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	003	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.9
#20	0.850	99.7
#50	0.300	99.2
#100	0.150	98.8
#200	0.075	97.8
HYDROMETER	0.0376	77.4
	0.0272	74.1
	0.0200	67.6
	0.0144	64.3
	0.0110	56.1
	0.0080	49.5
	0.0058	43.0
	0.0042	36.4
	0.0031	29.8
	0.0022	26.6
	0.0013	16.7
	0.0009	15.1

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

94.7

SAMPLE DESCRIPTION

gray-black sandy SILT or CLAY with 2% sand

Unified Soil Classification System (USCS) Group Symbol

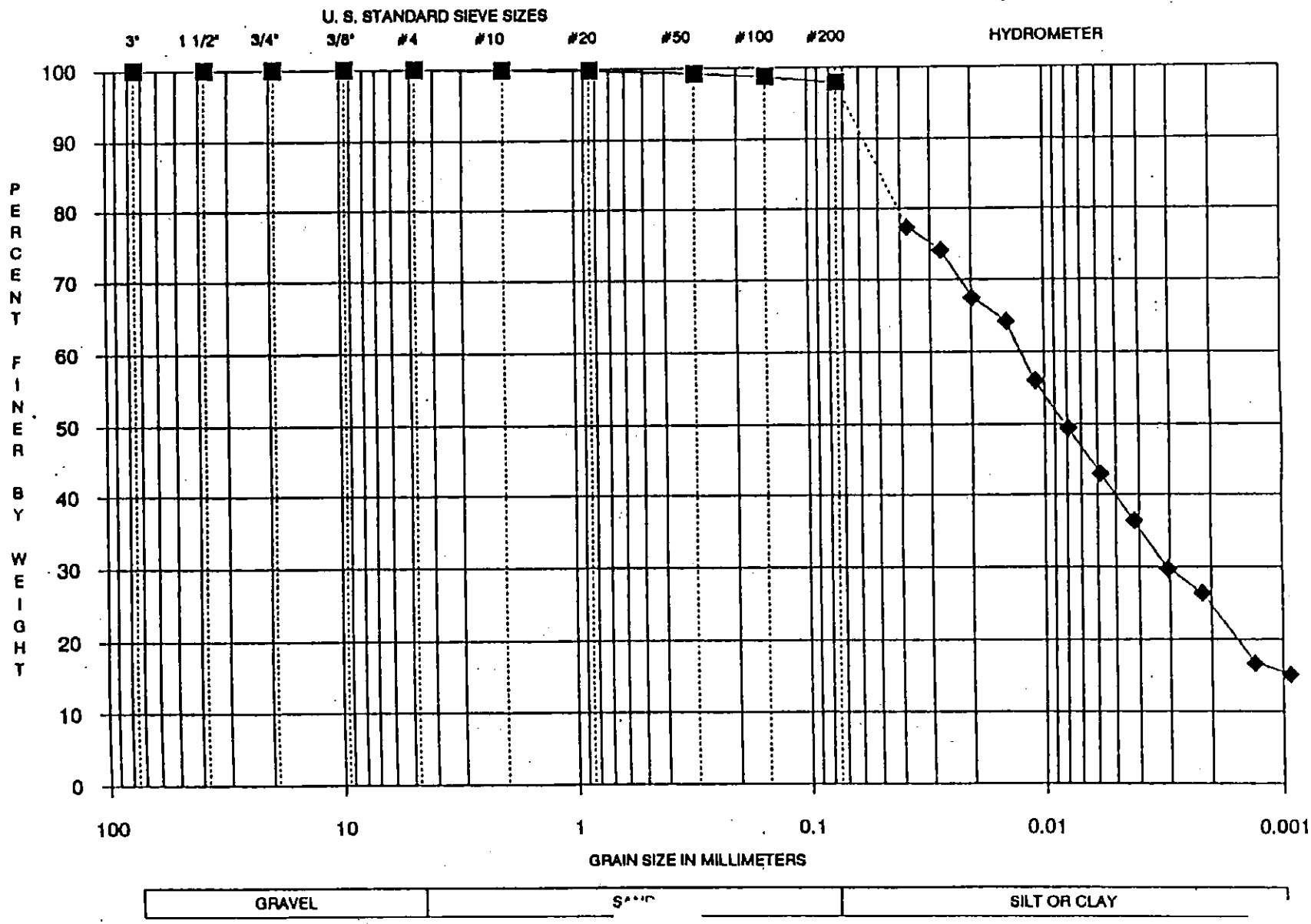
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB1/S4, ETL SAMPLE # 9205X005-003



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB3/S10,S11	PROJECT ANALYST	SPM
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	008	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	96.8
#4	4.750	87.4
#10	2.000	69.7
#20	0.850	49.9
#50	0.300	21.2
#100	0.150	13.3
#200	0.075	9.0

EFFECTIVE SIZES

% Finer	Diameter mm
60	1.437
30	0.468
10	0.092
Uniformity Coefficient	Gradation Coefficient
15.6	1.7

SPECIFIC GRAVITY

2.74

SAMPLE DESCRIPTION

dark brown well graded SAND with 13% gravel and 9% silt or clay

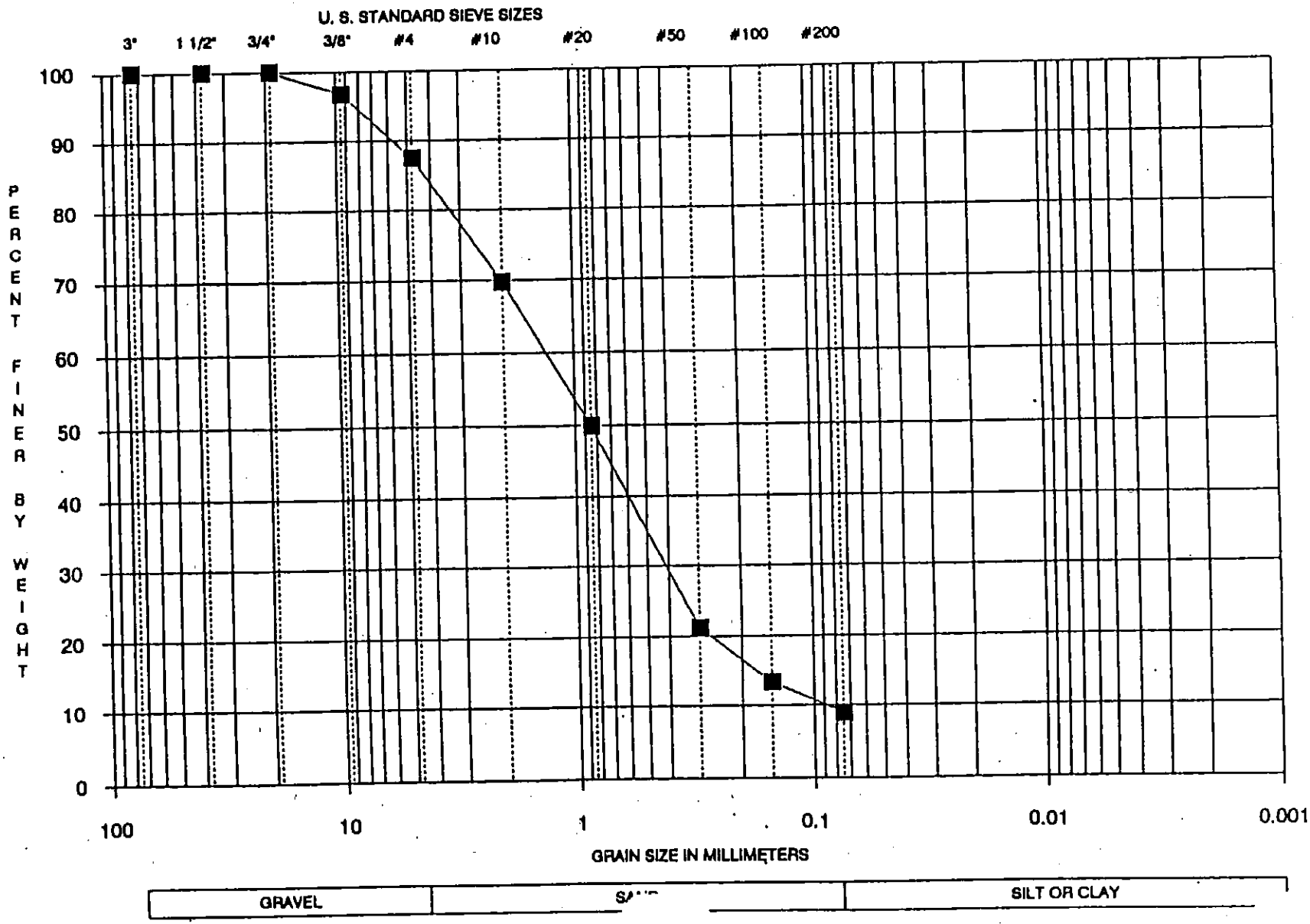
Unified Soil Classification System (USCS) Group Symbol

SW/SM or SW/SC

NOTES

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB3/S10,S11, ETL SAMPLE # 9205X005-008



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB3/S7	PROJECT ANALYST	[illegible]
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	009	QA/QC ANALYST	[illegible]
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.9
#20	0.850	99.0
#50	0.300	98.1
#100	0.150	97.6
#200	0.075	96.5
HYDROMETER	0.0356	70.7
	0.0260	66.6
	0.0190	62.5
	0.0140	57.1
	0.0106	51.7
	0.0079	42.2
	0.0057	38.2
	0.0042	32.8
	0.0031	26.0
	0.0022	23.3
	0.0013	17.9
	0.0009	13.8

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

81.8

SAMPLE DESCRIPTION

gray-black sandy SILT or CLAY with 3% sand

Unified Soil Classification System (USCS) Group Symbol

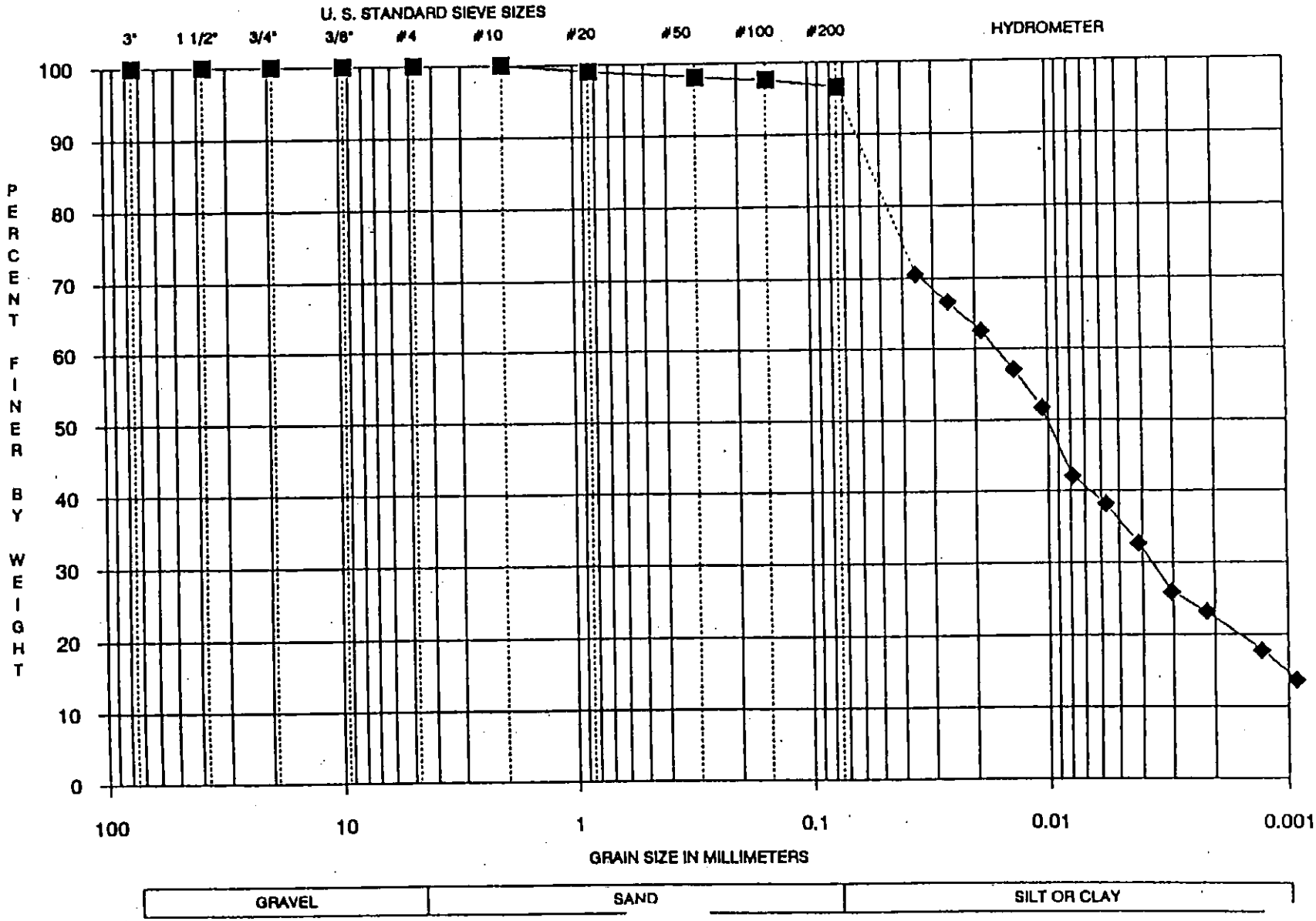
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR DSWA PROJECT SAMPLE TB3/S7, ETL SAMPLE # 9205X005-009



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB5/S14,S15	PROJECT ANALYST	SPM
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	015	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/16/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	94.8
#4	4.750	84.6
#10	2.000	71.1
#20	0.850	55.4
#50	0.300	29.1
#100	0.150	18.3
#200	0.075	11.8

EFFECTIVE SIZES

% Finer	Diameter mm
60	1.189
30	0.319
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown gravelly silty or clayey SAND with 15% gravel and 12% silt or clay

Unified Soil Classification System (USCS) Group Symbol

SP/SM or SP/SC

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB5/S14,S15	PROJECT ANALYST	SPM
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	015	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/16/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	94.8
#4	4.750	84.6
#10	2.000	71.1
#20	0.850	55.4
#50	0.300	29.1
#100	0.150	18.3
#200	0.075	11.8

EFFECTIVE SIZES

% Finer	Diameter mm
60	1.189
30	0.319
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown gravelly silty or clayey SAND with 15% gravel and 12% silt or clay

Unified Soil Classification System (USCS) Group Symbol

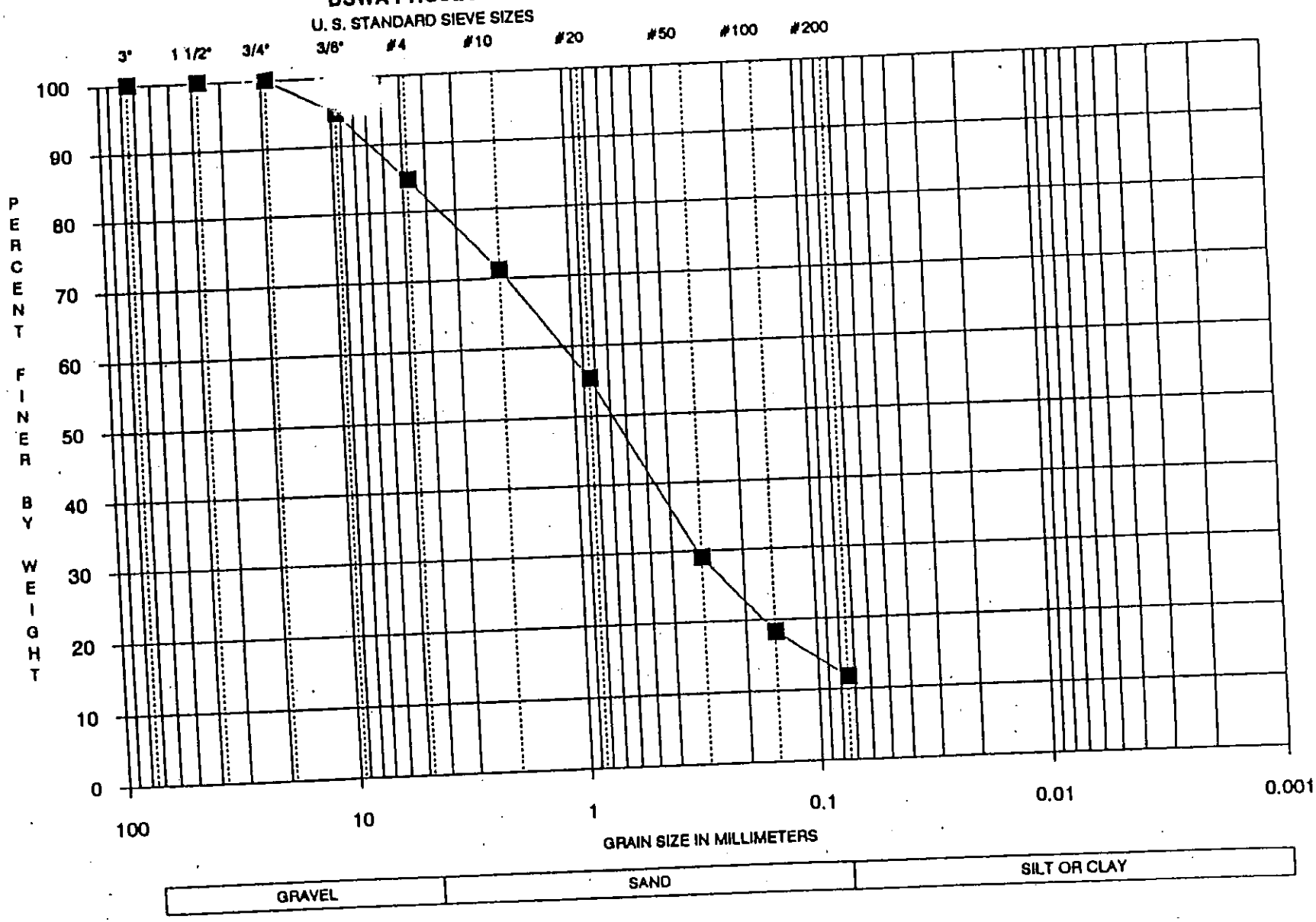
SM or SC

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB5/S14,S15, ETL SAMPLE # 9205X005-015



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB5/S3	PROJECT ANALYST	SPM
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	016	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/29/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	98.8
#10	2.000	98.1
#20	0.850	96.7
#50	0.300	94.0
#100	0.150	92.4
#200	0.075	89.4
HYDROMETER	0.0316	62.9
	0.0243	56.8
	0.0184	50.6
	0.0140	43.4
	0.0105	40.3
	0.0079	33.1
	0.0058	28.0
	0.0042	22.8
	0.0031	18.7
	0.0022	16.7
	0.0013	11.5
	0.0009	8.4

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

63.5

SAMPLE DESCRIPTION

dark brown gravelly sandy SILT or CLAY with 1% gravel and 10% sand

Unified Soil Classification System (USCS) Group Symbol

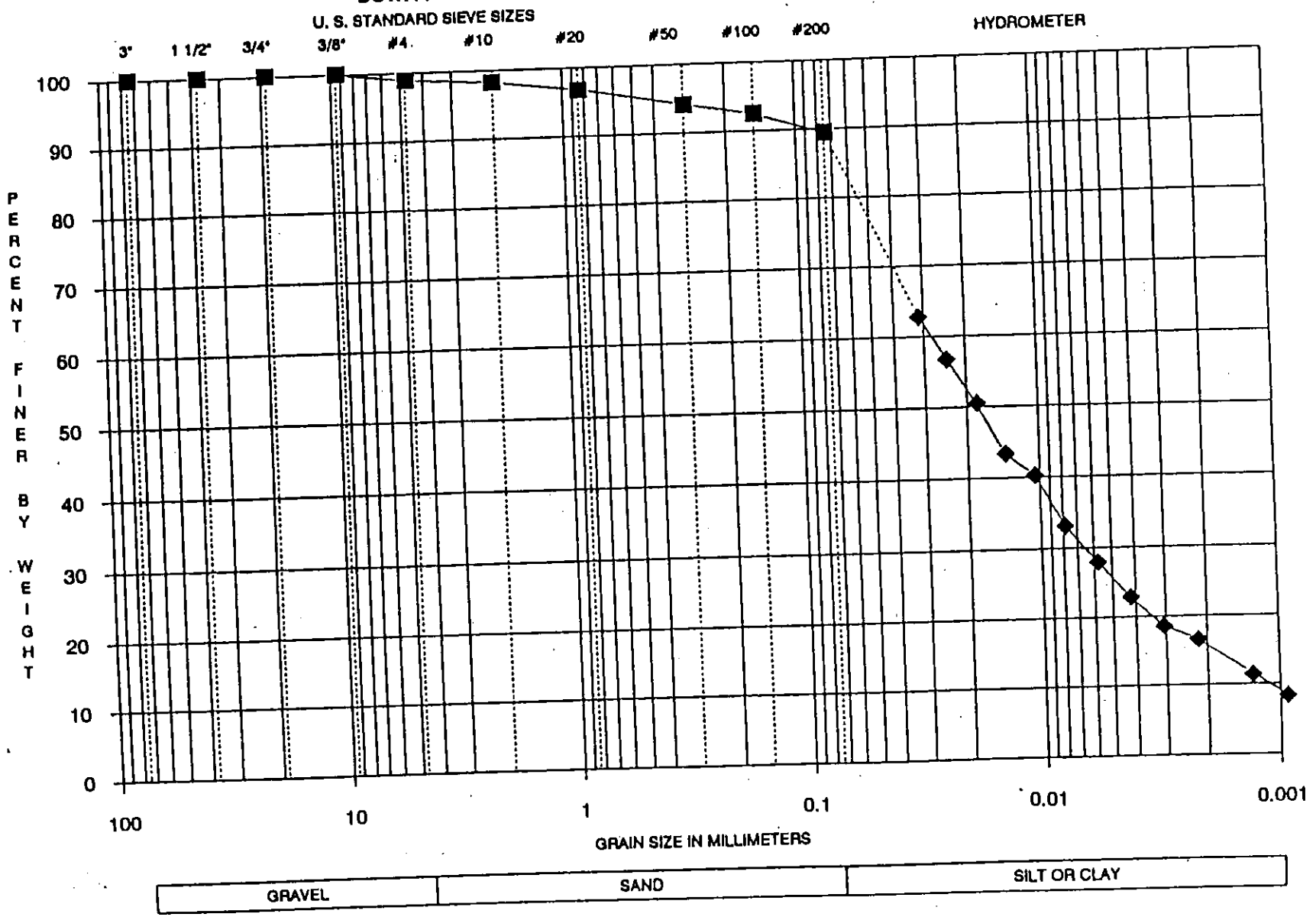
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB5/S3, ETL SAMPLE # 9205X005-016



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB7/S6,S7	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	018	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	97.8
3/8"	9.500	61.9
#4	4.750	32.9
#10	2.000	14.7
#20	0.850	8.9
#50	0.300	5.2
#100	0.150	3.5
#200	0.075	2.5

EFFECTIVE SIZES

% Finer	Diameter mm
60	9.184
30	4.306
10	1.070
Uniformity Coefficient	Gradation Coefficient
8.6	1.9

SAMPLE DESCRIPTION

multi-colored well graded GRAVEL
with 30% sand and 3% silt or clay

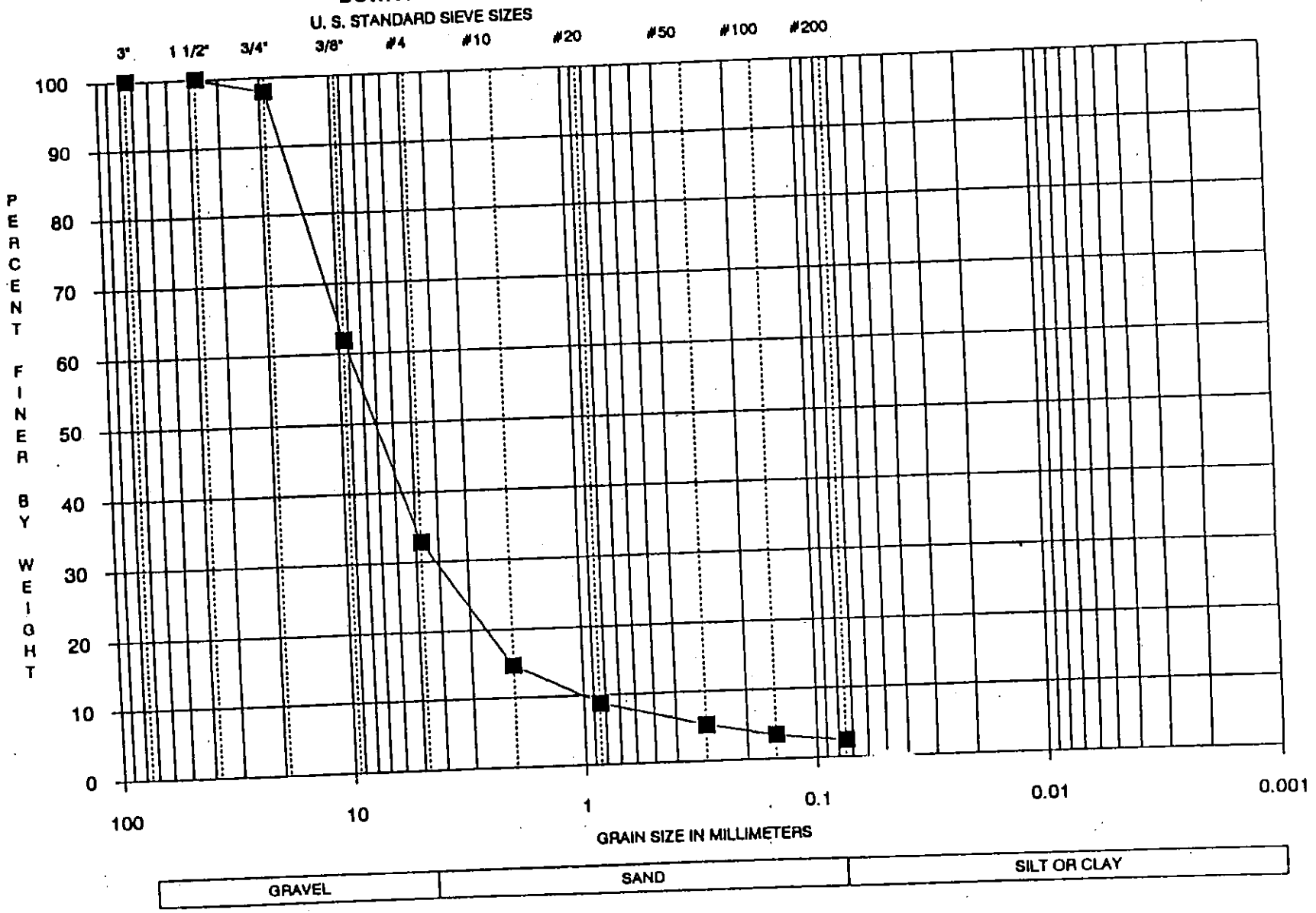
Unified Soil Classification System (USCS) Group Symbol

GW

NOTES

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB7/S6,S7, ETL SAMPLE # 9205X005-018



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB7/S3	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	019	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.9
#20	0.850	99.5
#50	0.300	98.9
#100	0.150	98.1
#200	0.075	96.4
HYDROMETER	0.0343	62.2
	0.0255	57.7
	0.0190	52.1
	0.0140	47.6
	0.0106	43.0
	0.0079	36.3
	0.0058	30.7
	0.0042	25.0
	0.0031	20.5
	0.0022	14.9
	0.0013	10.4
	0.0010	8.1

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

66.2

SAMPLE DESCRIPTION

gray-black sandy SILT or CLAY with 4% sand

Unified Soil Classification System (USCS) Group Symbol

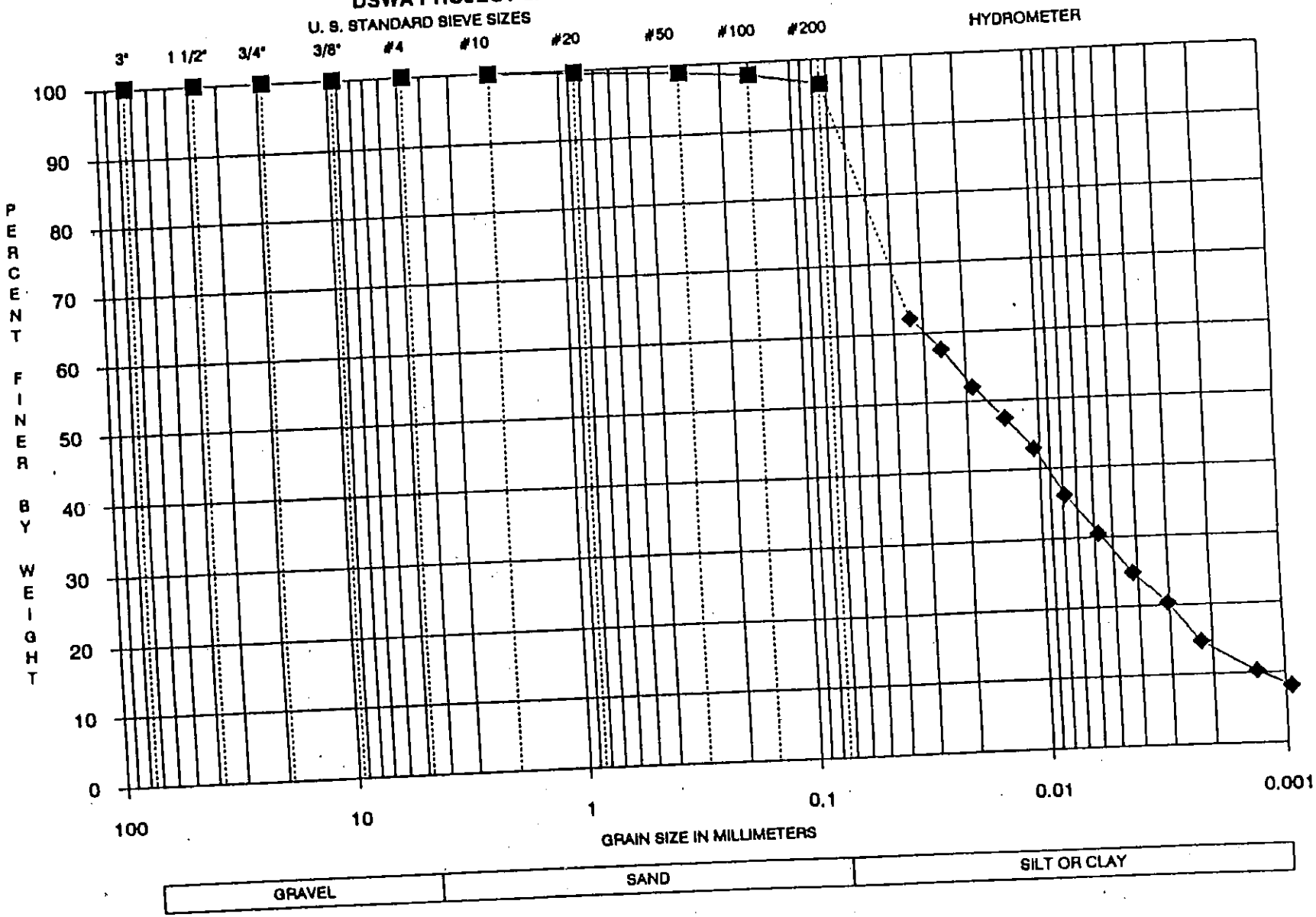
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB7/S3, ETL SAMPLE # 9205X005-019



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB7/S16,S17	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	020	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	91.9
3/8"	9.500	81.4
#4	4.750	74.6
#10	2.000	56.0
#20	0.850	39.5
#50	0.300	14.9
#100	0.150	10.2
#200	0.075	7.9

EFFECTIVE SIZES

% Finer	Diameter mm
60	2.595
30	0.638
10	0.145
Uniformity Coefficient	Gradation Coefficient
18.0	1.1

SAMPLE DESCRIPTION

multi-colored well graded SAND with 25% gravel and 8% silt or clay

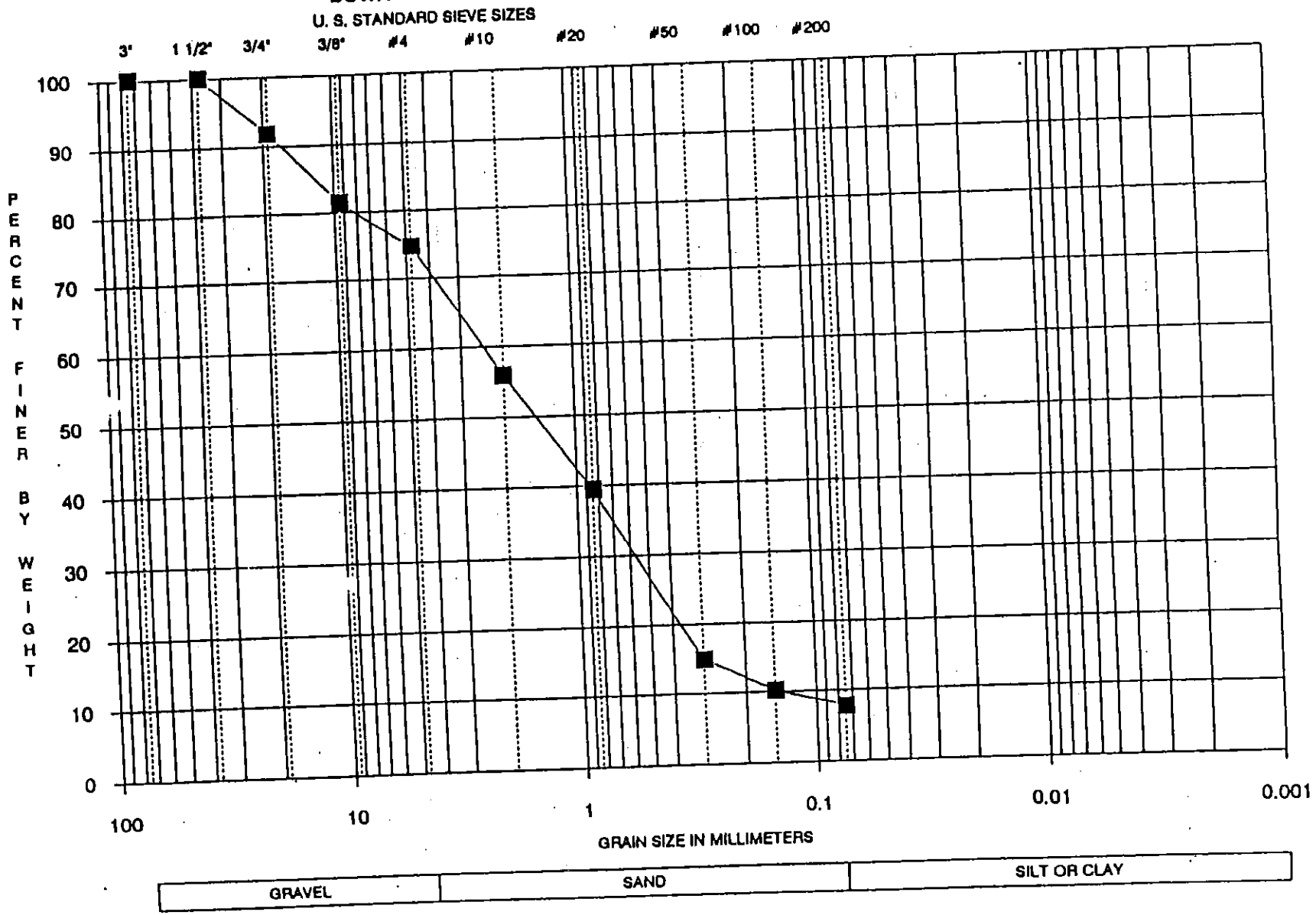
Unified Soil Classification System (USCS) Group Symbol

SW/SM or SW/SC

NOTES

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB7/S16,S17, ETL SAMPLE # 9205X005-020



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB7A/S1	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	024	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	99.6
#10	2.000	99.4
#20	0.850	97.4
#50	0.300	93.7
#100	0.150	91.9
#200	0.075	90.2
HYDROMETER	0.0376	67.1
	0.0277	61.5
	0.0203	55.8
	0.0150	48.6
	0.0113	43.0
	0.0082	37.3
	0.0060	30.2
	0.0044	25.9
	0.0032	20.2
	0.0023	17.4
	0.0013	13.1
	0.0010	10.2

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

62.4

SAMPLE DESCRIPTION

brown sandy SILT or CLAY with 10% sand

Unified Soil Classification System (USCS) Group Symbol

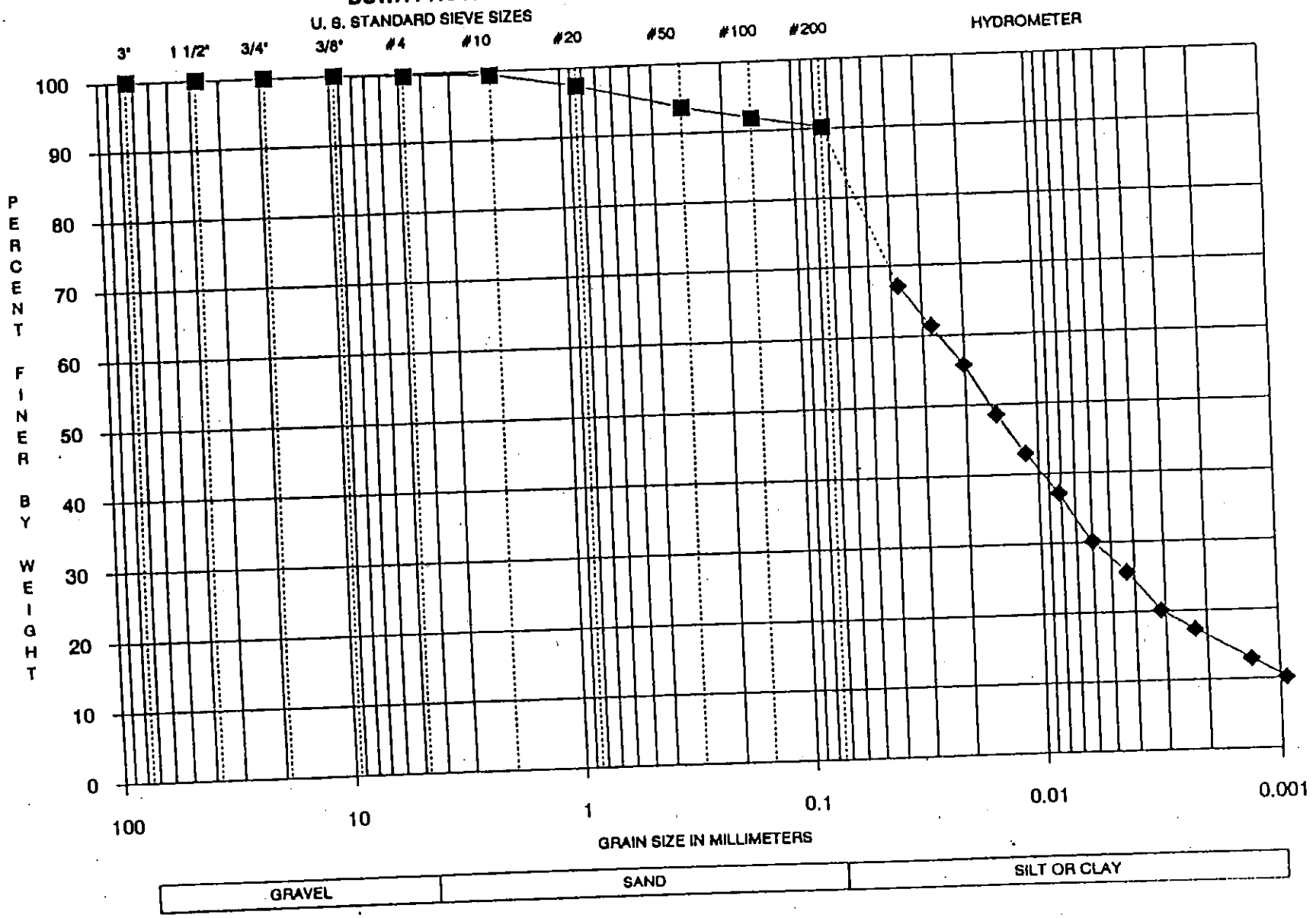
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB7A/S1, ETL SAMPLE # 9205X005-024



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB8/S12	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	025	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.8
#20	0.850	98.7
#50	0.300	98.0
#100	0.150	97.8
#200	0.075	97.2
HYDROMETER	0.0356	82.5
	0.0261	77.9
	0.0190	73.2
	0.0142	65.5
	0.0107	59.3
	0.0078	53.0
	0.0058	43.7
	0.0042	39.1
	0.0031	32.9
	0.0022	29.8
	0.0013	22.0
	0.0009	17.4

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SPECIFIC GRAVITY

2.61

SAMPLE DESCRIPTION

gray-black sandy SILT or CLAY with 3% sand

Unified Soil Classification System (USCS) Group Symbol

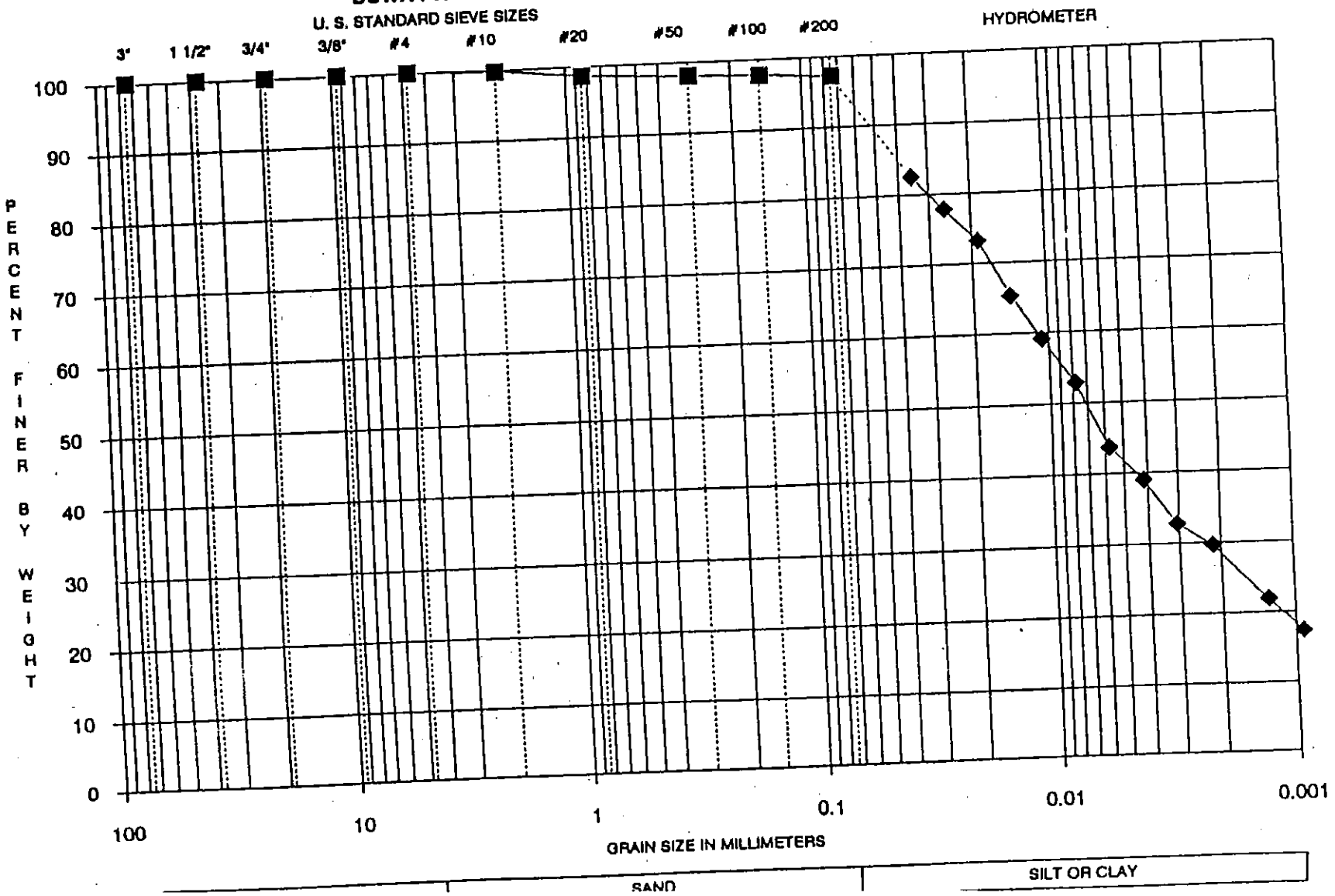
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB8/S12, ETL SAMPLE # 9205X005-025



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB9/S2,S3	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	029	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	96.3
#4	4.750	95.5
#10	2.000	94.1
#20	0.850	91.3
#50	0.300	83.7
#100	0.150	77.9
#200	0.075	72.3
HYDROMETER	0.0330	56.8
	0.0249	51.9
	0.0190	45.1
	0.0141	40.2
	0.0107	36.3
	0.0078	32.4
	0.0058	26.5
	0.0042	24.6
	0.0030	20.7
	0.0022	15.8
	0.0013	12.9
	0.0009	10.9

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown gravelly sandy SILT or CLAY with 4% gravel and 24% sand

Unified Soil Classification System (USCS) Group Symbol

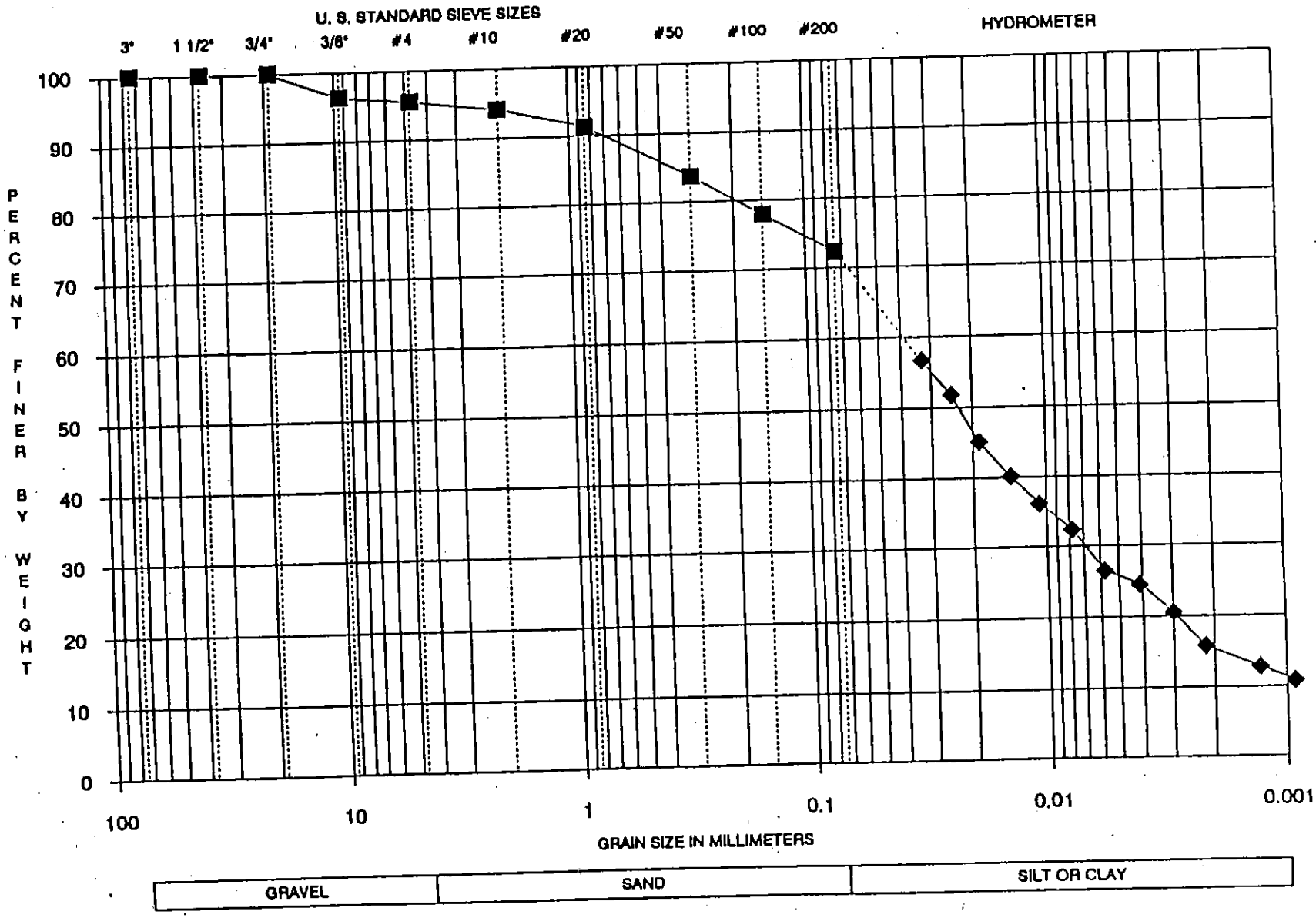
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB9/S2,S3, ETL SAMPLE # 9205X005-029



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB9/S8,S9,S10	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	030	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	05/30/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	91.0
#4	4.750	74.5
#10	2.000	44.0
#20	0.850	31.4
#50	0.300	15.9
#100	0.150	9.9
#200	0.075	7.3

EFFECTIVE SIZES

% Finer	Diameter mm
60	3.440
30	0.800
10	0.151
Uniformity Coefficient	Gradation Coefficient
22.7	1.2

SAMPLE DESCRIPTION

multi-colored well graded SAND with 25% gravel and 7% silt or clay

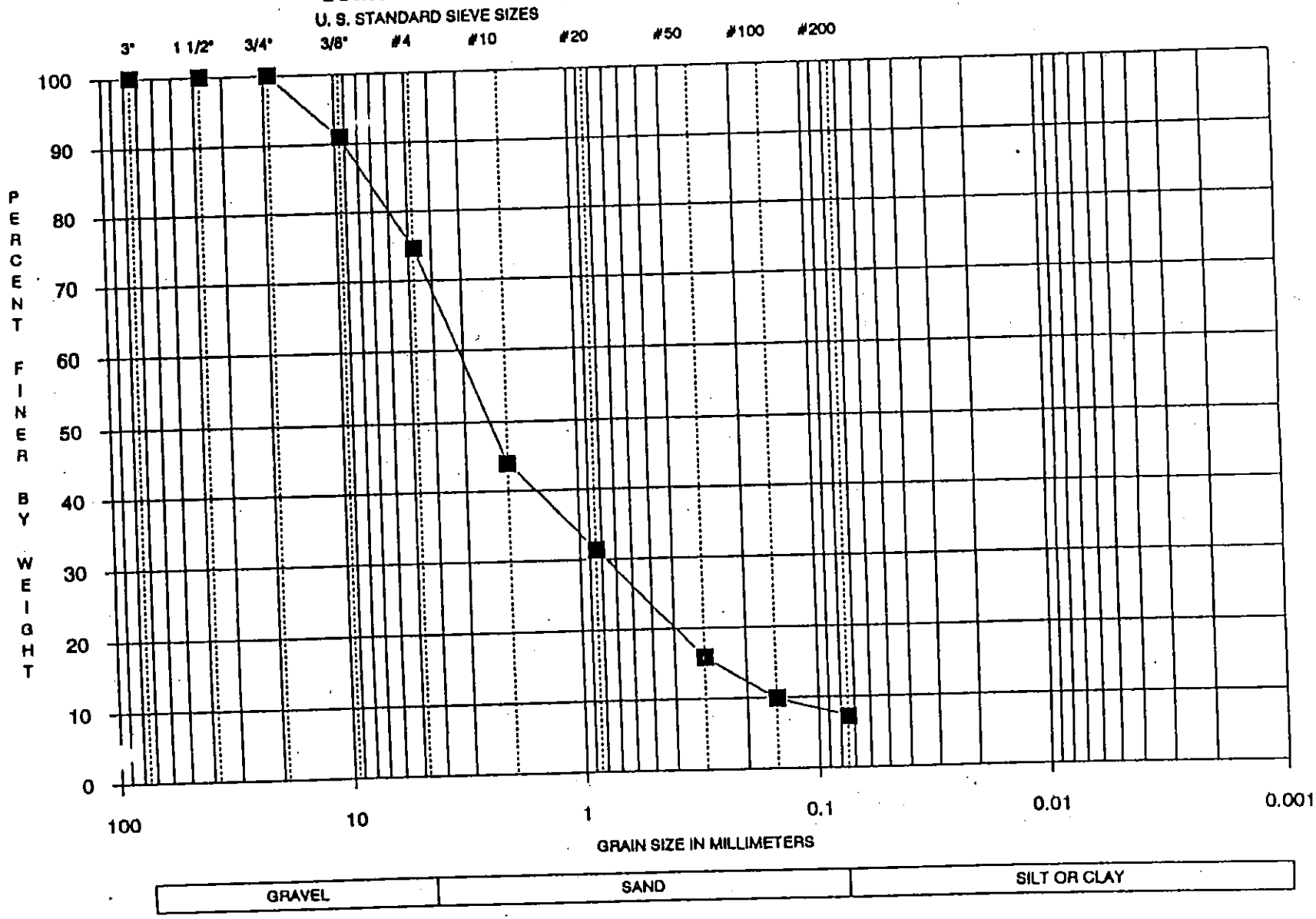
Unified Soil Classification System (USCS) Group Symbol

SW/SM or SW/SC

NOTES

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB9/S8,S9,S10, ETL SAMPLE # 9205X005-030



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB9/S14	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	031	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	06/10/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.5
#20	0.850	97.6
#50	0.300	91.0
#100	0.150	89.2
#200	0.075	87.9
HYDROMETER	0.0301	61.4
	0.0217	60.4
	0.0156	59.5
	0.0121	52.8
	0.0095	47.1
	0.0074	38.4
	0.0053	35.6
	0.0039	32.7
	0.0028	29.8
	0.0021	24.1
	0.0012	20.3
	0.0009	17.4

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

51.7

SAMPLE DESCRIPTION

dark gray sandy SILT or CLAY with 12% sand

Unified Soil Classification System (USCS) Group Symbol

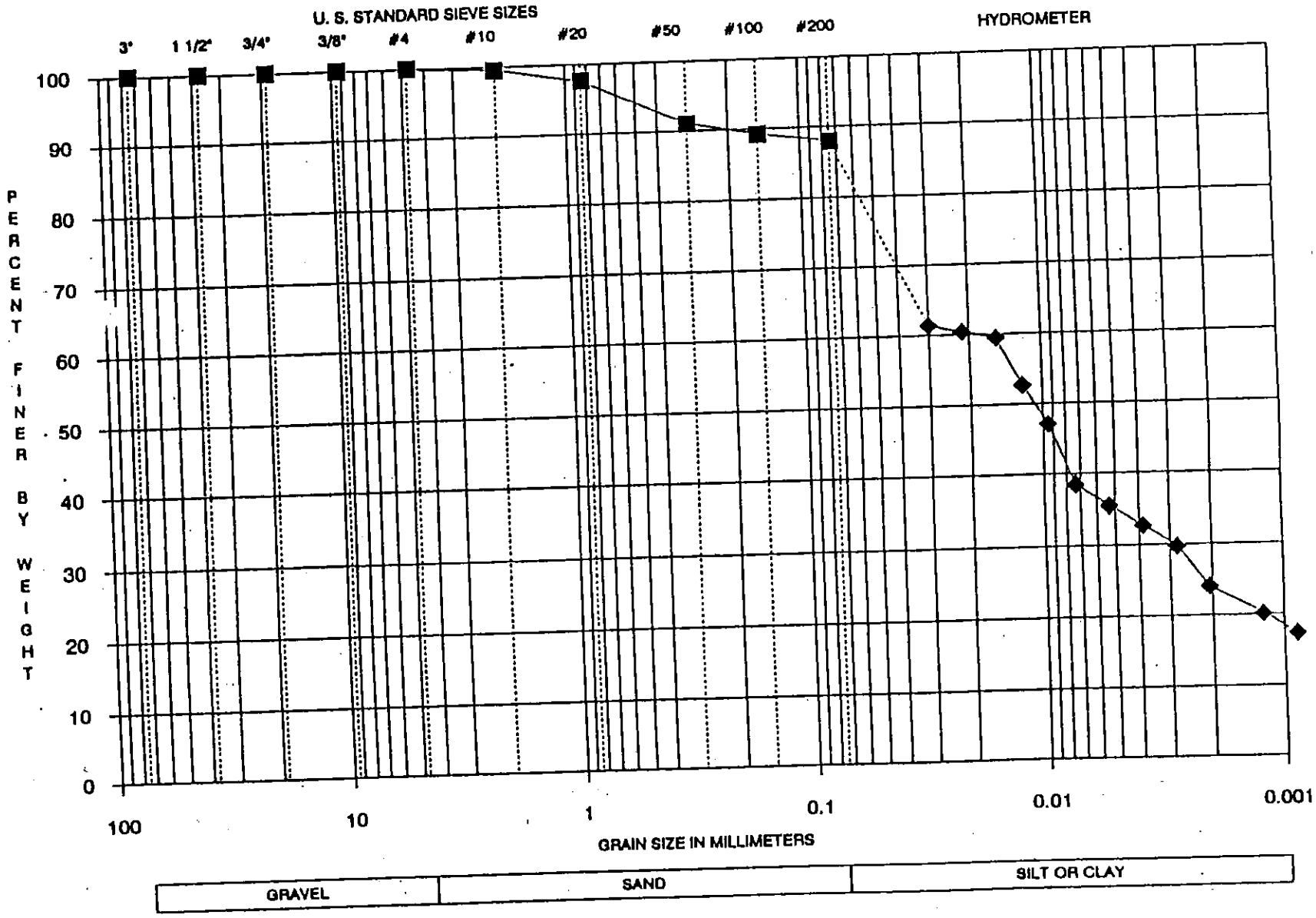
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB9/S14, ETL SAMPLE # 9205X005-031



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB10/S5	PROJECT ANALYST	SPM, ES
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	035	QA/QC ANALYST	RWF
W. O. NUMBER	2477-03-01-0004	DATE RECEIVED	5/14/92	DATE COMPLETED	06/10/92

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.9
#20	0.850	96.6
#50	0.300	90.9
#100	0.150	88.7
#200	0.075	87.2
HYDROMETER	0.0368	66.3
	0.0266	63.6
	0.0196	58.2
	0.0141	55.5
	0.0108	48.8
	0.0079	42.0
	0.0058	35.3
	0.0043	28.6
	0.0031	25.9
	0.0022	20.5
	0.0013	15.1
	0.0009	12.4

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

76.8

SAMPLE DESCRIPTION

brown sandy SILT or CLAY with 13% sand

Unified Soil Classification System (USCS) Group Symbol

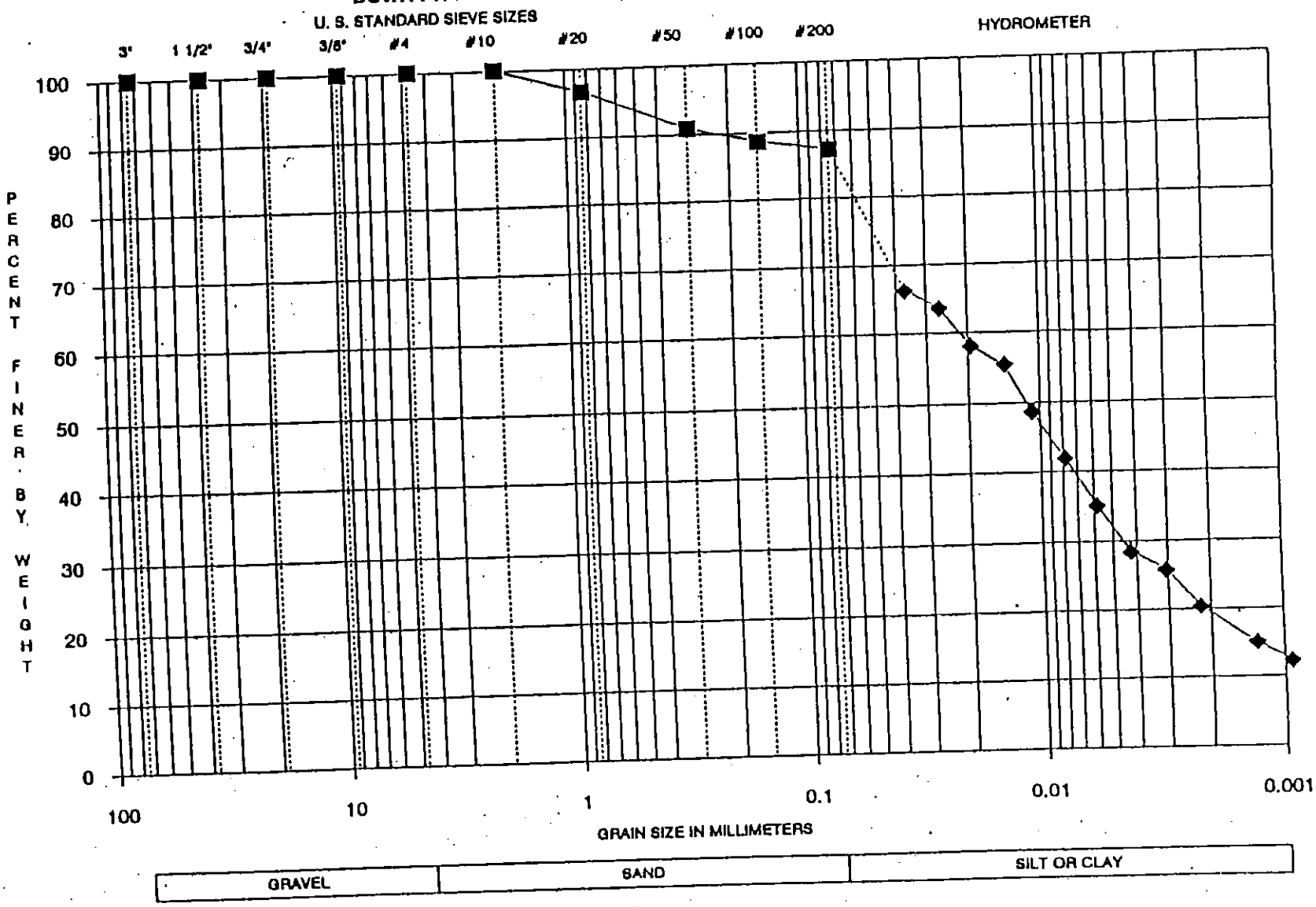
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR
DSWA PROJECT SAMPLE TB10/S5, ETL SAMPLE # 9205X005-035



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 4318 - LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS			
PROJECT	DSWA	PROJECT ANALYST	JDT
JOB NUMBER	9110X003	QA/QC ANALYST	RWF
W. O. NUMBER	6715-01-01-0010	DATE COMPLETED	08/03/93

Project Sample I. D.	ETL Sample Number	INDEX PROPERTIES % moisture dry basis			USCS Classification of Fine Fraction
		Plastic Limit	Liquid Limit	Plasticity Index	
TB-13-S7	009	34.1	51.1	17.0	MH
TB-22-S5	037	47.1	65.1	18.0	MH
TB-12-S2	059	52.2	69.0	16.8	MH
TB-12-S5	060	49.4	68.4	19.0	MH
TB-14-S11	062	50.6	71.2	20.6	MH
TB-15-S16	063	32.8	47.4	14.6	ML
TB-17-S7	064	29.7	38.6	8.9	ML
TB-18-S2	065	39.8	59.5	19.7	MH
TB-19-S4	066	NO COHESIVE PROPERTIES			---
TB-20-S14	067	44.9	63.7	18.8	MH
TB-21-S9	068	NO COHESIVE PROPERTIES			---

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 4972 - pH OF SOILS

PROJECT	JOB NUMBER	W. O. NUMBER	ANALYST	DATE
DSWA	9307X009	02477-004-001	JDT	7/26/93

SAMPLE DATA				
ETL Sample Number	070	071	072	073
Project I. D.	TB-11-S8	TB-13-S11	TB-14-S15	TB-15-S3

pH (standard units)	In H2O	In CaCl2	In H2O	In CaCl2	In H2O	In CaCl2	In H2O	In CaCl2
	6.29	6.21	6.37	6.38	6.76	6.59	6.93	6.9

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-11-S1	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	001	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	100.0
#20	0.850	99.9
#50	0.300	99.8
#100	0.150	99.7
#200	0.075	99.7
HYDROMETER	0.0324	96.2
	0.0239	91.5
	0.0178	85.1
	0.0132	78.8
	0.0101	72.4
	0.0075	62.9
	0.0056	55.0
	0.0041	47.1
	0.0030	37.6
	0.0022	31.2
	0.0013	23.3
	0.0009	21.7

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

light brown grey SILT or CLAY

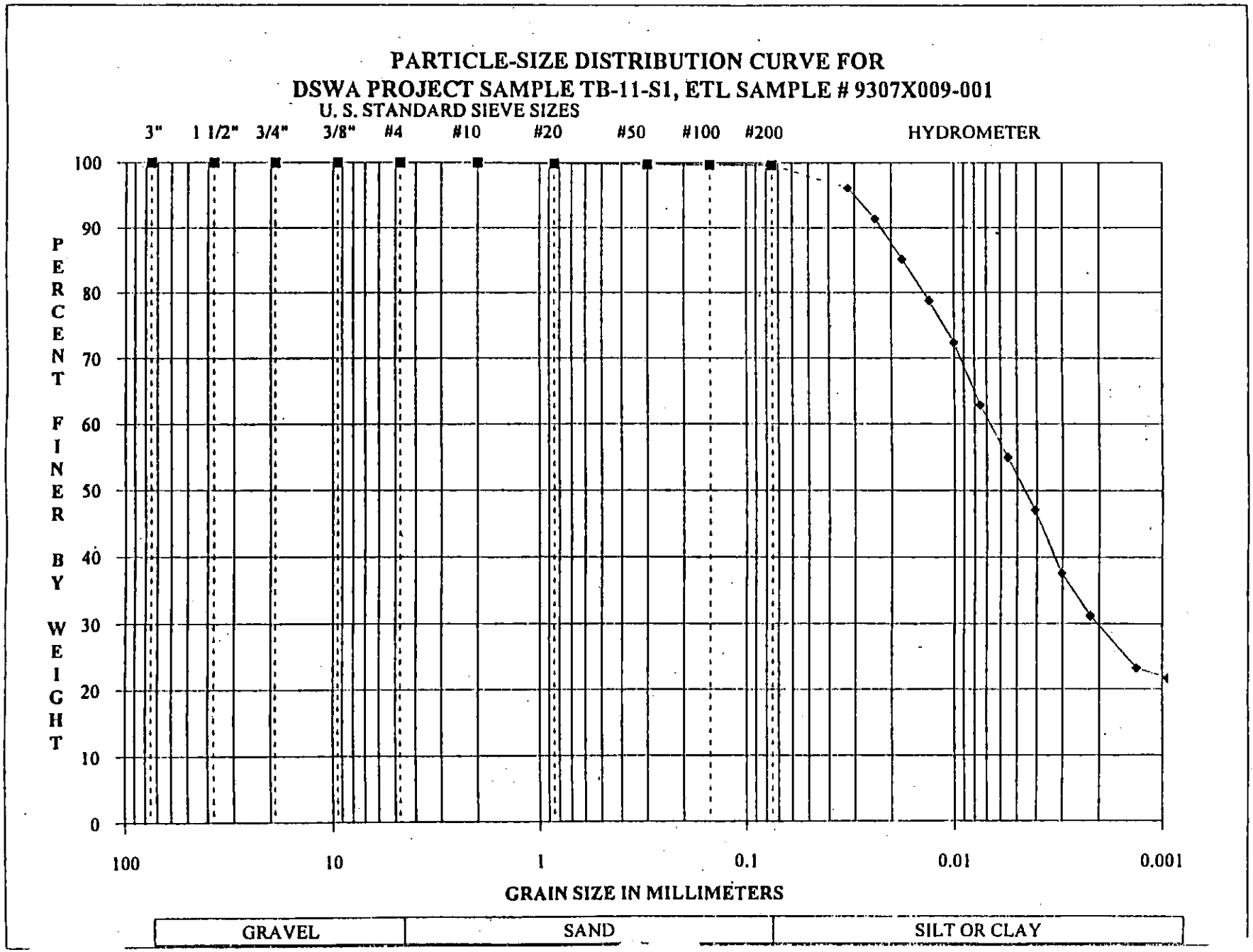
Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC1.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-22-S22	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	041	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	60.1
3/4"	19.00	60.1
3/8"	9.500	56.7
#4	4.750	53.2
#10	2.000	45.8
#20	0.850	37.9
#50	0.300	16.8
#100	0.150	11.4
#200	0.075	10.2

EFFECTIVE SIZES

% Finer	Diameter mm
60	36.968
30	0.644
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

grey silty or clayey sandy GRAVEL with 10% silt or clay and 43% sand (1)

Unified Soil Classification System (USCS) Group Symbol

GP/GM or GP/GC

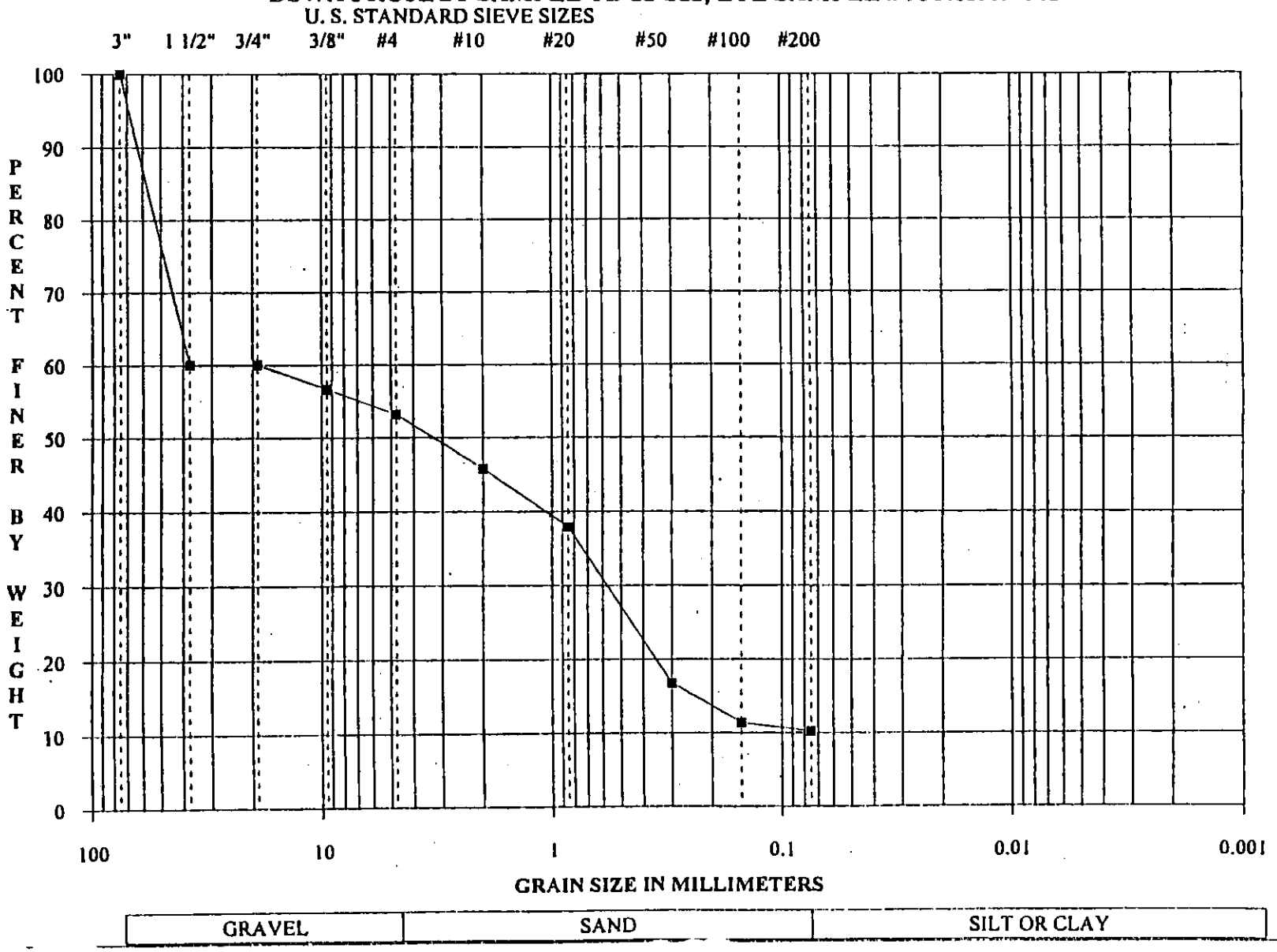
NOTES

NA=NOT APPLICABLE

(1) - 1 1/2" fraction consisted of one piece of gravel. (Included in distribution curve data.)

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR DSWA PROJECT SAMPLE TB-22-S22, ETL SAMPLE # 9307X009-041



GSC12.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-22-S22	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	041A	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	96.6
#4	4.750	93.1
#10	2.000	85.7
#20	0.850	77.9
#50	0.300	56.7
#100	0.150	51.3
#200	0.075	50.2

EFFECTIVE SIZES

% Finer	Diameter mm
60	0.386
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

grey gravelly sandy SILT or CLAY with 4% gravel and 43% sand (1)

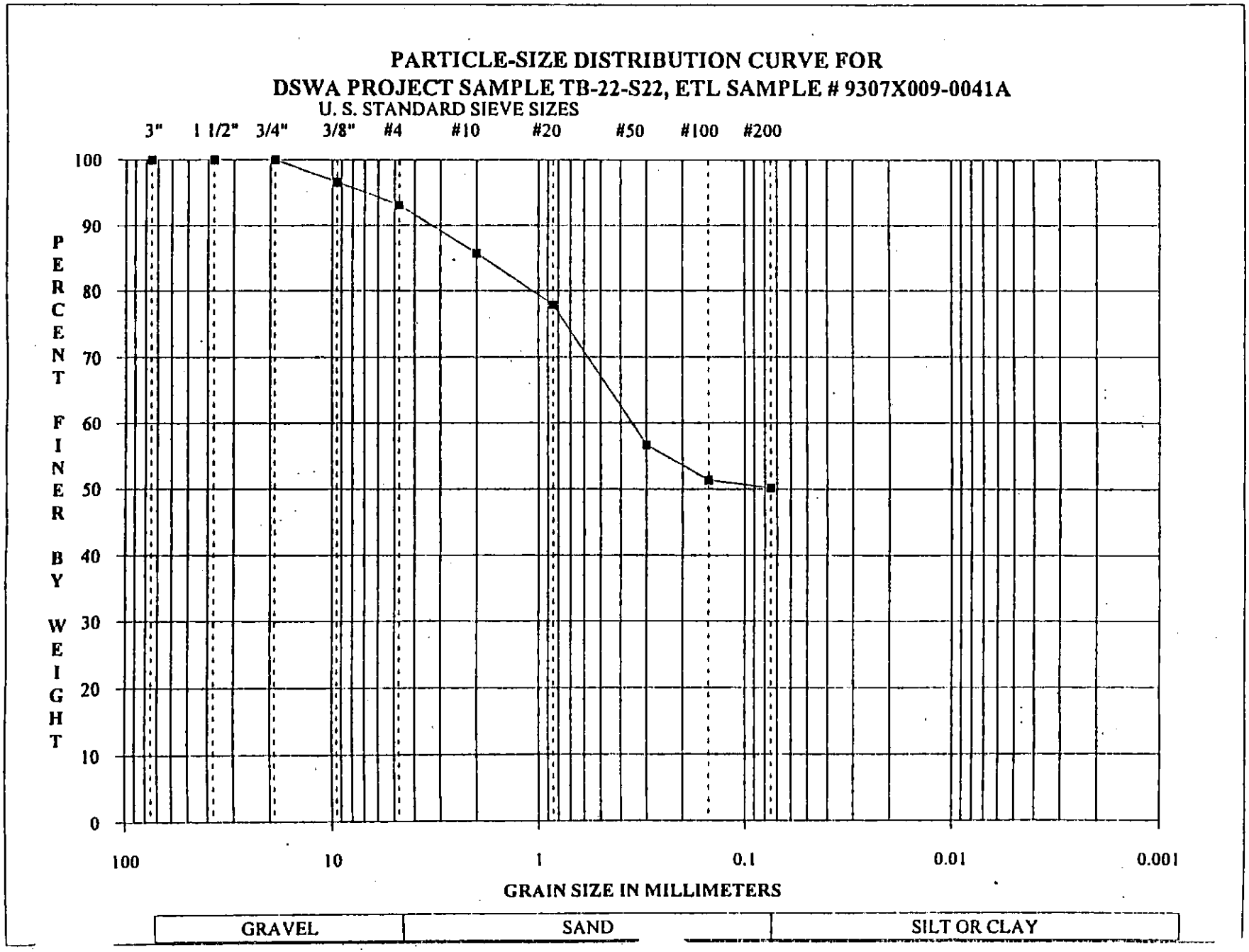
Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE
(1) - 1 1/2" fraction consisted of one piece of gravel. (Not included in distribution curve data.)

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC12A.X

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-18-S19	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	043	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	96.0
3/8"	9.500	82.9
#4	4.750	69.9
#10	2.000	54.4
#20	0.850	38.4
#50	0.300	19.4
#100	0.150	13.7
#200	0.075	9.3

EFFECTIVE SIZES

% Finer	Diameter mm
60	2.988
30	0.607
10	0.087
Uniformity Coefficient	Gradation Coefficient
34.5	1.4

SAMPLE DESCRIPTION

grey well graded SAND with 30% gravel and 9% silt or clay

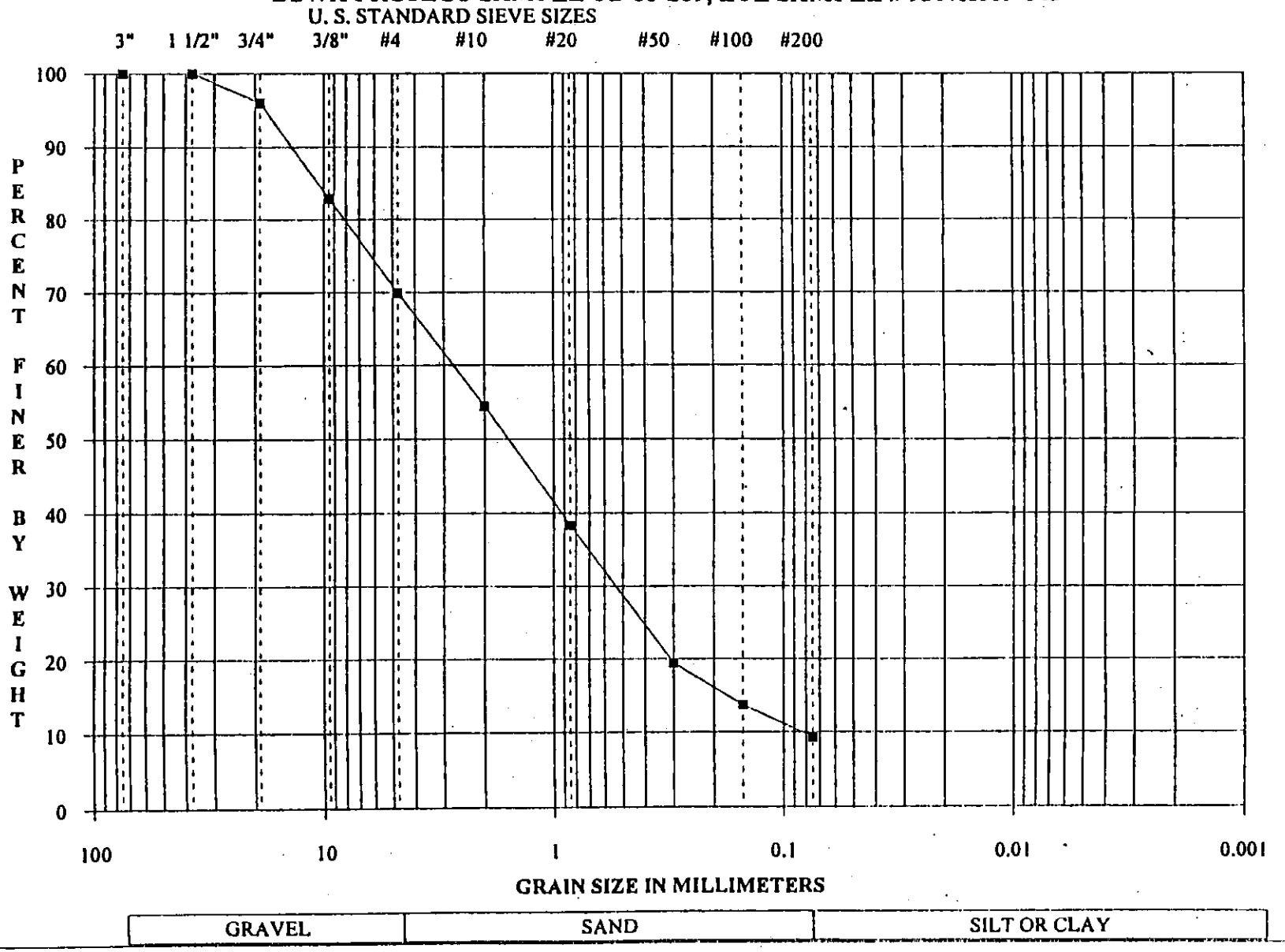
Unified Soil Classification System (USCS) Group Symbol

SW/SM or SW/SC

NOTES

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR DSWA PROJECT SAMPLE TB-18-S19, ETL SAMPLE # 9307X009-043



GSC13.XI

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-12-S6	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	045	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	100.0
#20	0.850	99.8
#50	0.300	99.7
#100	0.150	99.4
#200	0.075	98.0
HYDROMETER	0.0361	84.0
	0.0270	76.0
	0.0203	66.4
	0.0150	58.5
	0.0113	52.1
	0.0085	40.9
	0.0061	36.2
	0.0044	31.4
	0.0032	25.0
	0.0023	21.8
	0.0014	18.6
	0.0010	17.0

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown grey sandy SILT or CLAY with 2% sand

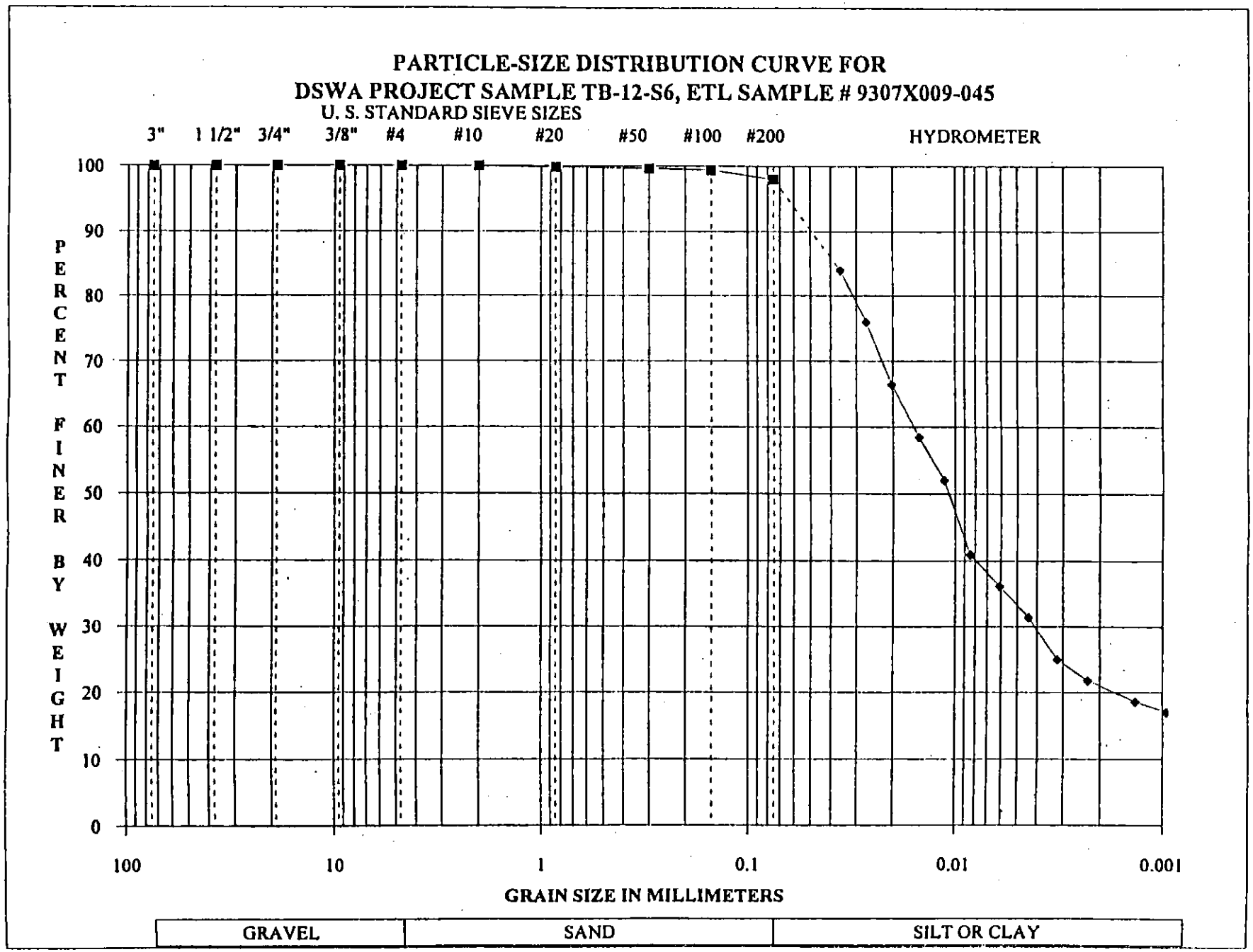
Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC2.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-13-S9	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	046	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	100.0
#20	0.850	99.7
#50	0.300	99.6
#100	0.150	99.2
#200	0.075	98.0
HYDROMETER	0.0365	91.8
	0.0267	86.5
	0.0195	81.2
	0.0147	68.7
	0.0111	63.4
	0.0081	56.3
	0.0059	51.0
	0.0043	43.9
	0.0031	38.5
	0.0023	29.7
	0.0013	24.3
	0.0010	20.8

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown grey sandy SILT or CLAY with 2% sand

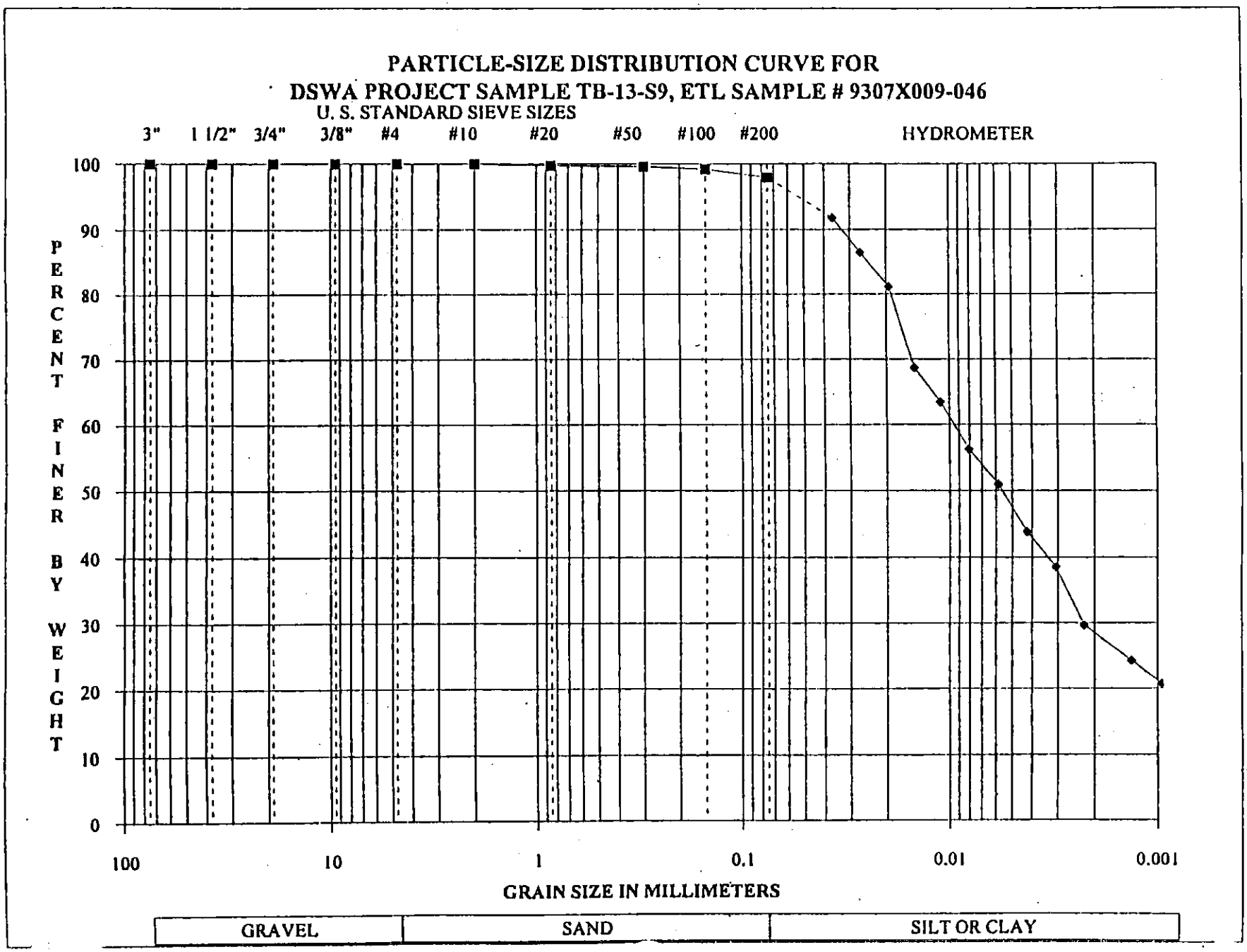
Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC3.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-14-S12	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	047	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	100.0
#20	0.850	100.0
#50	0.300	100.0
#100	0.150	100.0
#200	0.075	99.8
HYDROMETER	0.0382	79.3
	0.0279	74.3
	0.0205	67.7
	0.0150	61.0
	0.0113	54.4
	0.0084	44.4
	0.0061	37.7
	0.0044	31.1
	0.0032	26.1
	0.0023	21.1
	0.0014	17.8
	0.0010	14.5

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown grey SILT or CLAY

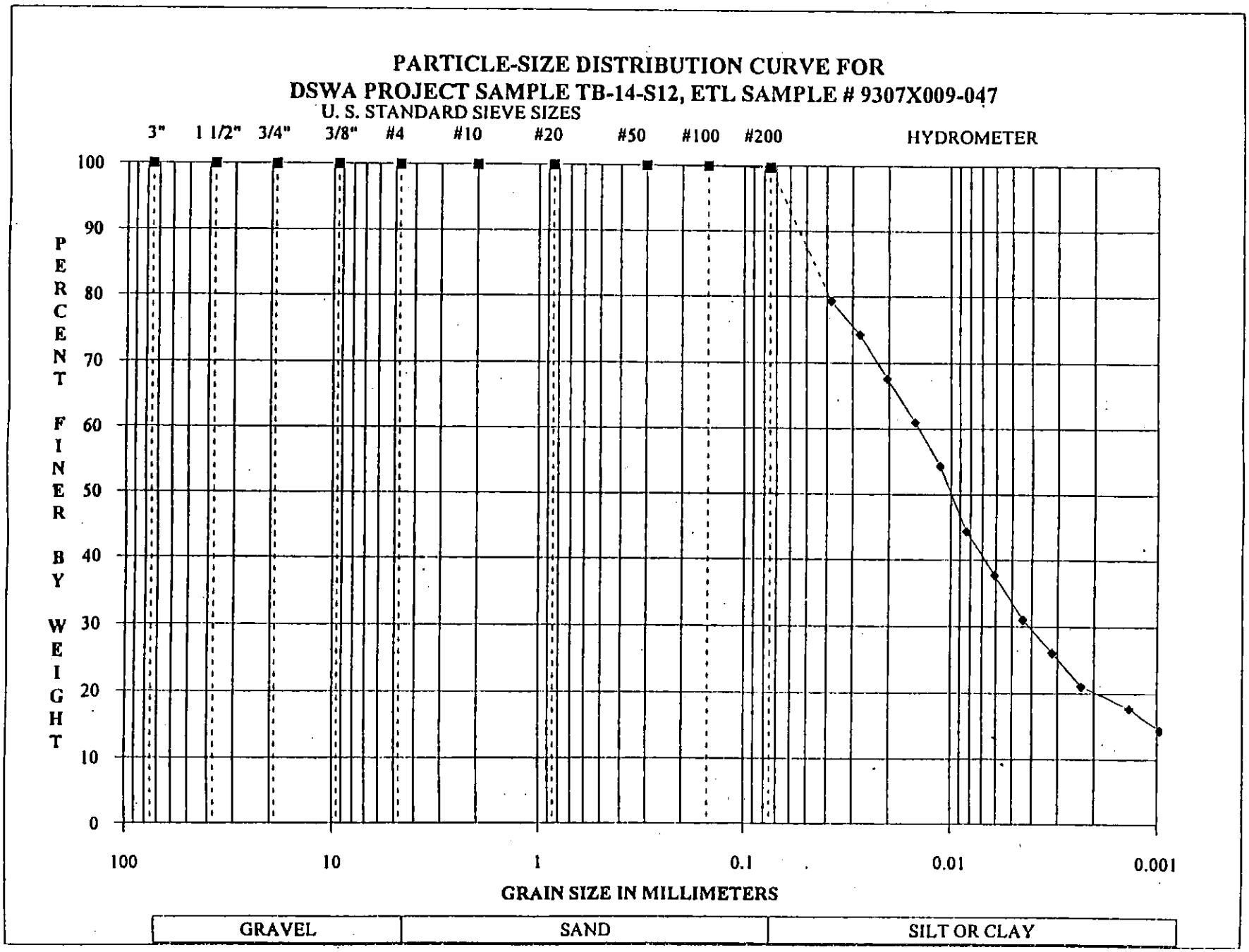
Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



SC4.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-15-S17	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	048	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.9
#20	0.850	99.7
#50	0.300	98.8
#100	0.150	97.4
#200	0.075	91.2
HYDROMETER	0.0382	72.0
	0.0276	69.0
	0.0199	66.0
	0.0147	58.4
	0.0112	52.4
	0.0081	47.9
	0.0059	41.8
	0.0043	37.3
	0.0031	31.3
	0.0022	26.7
	0.0013	23.7
	0.0009	19.2

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown sandy SILT or CLAY with 9% sand

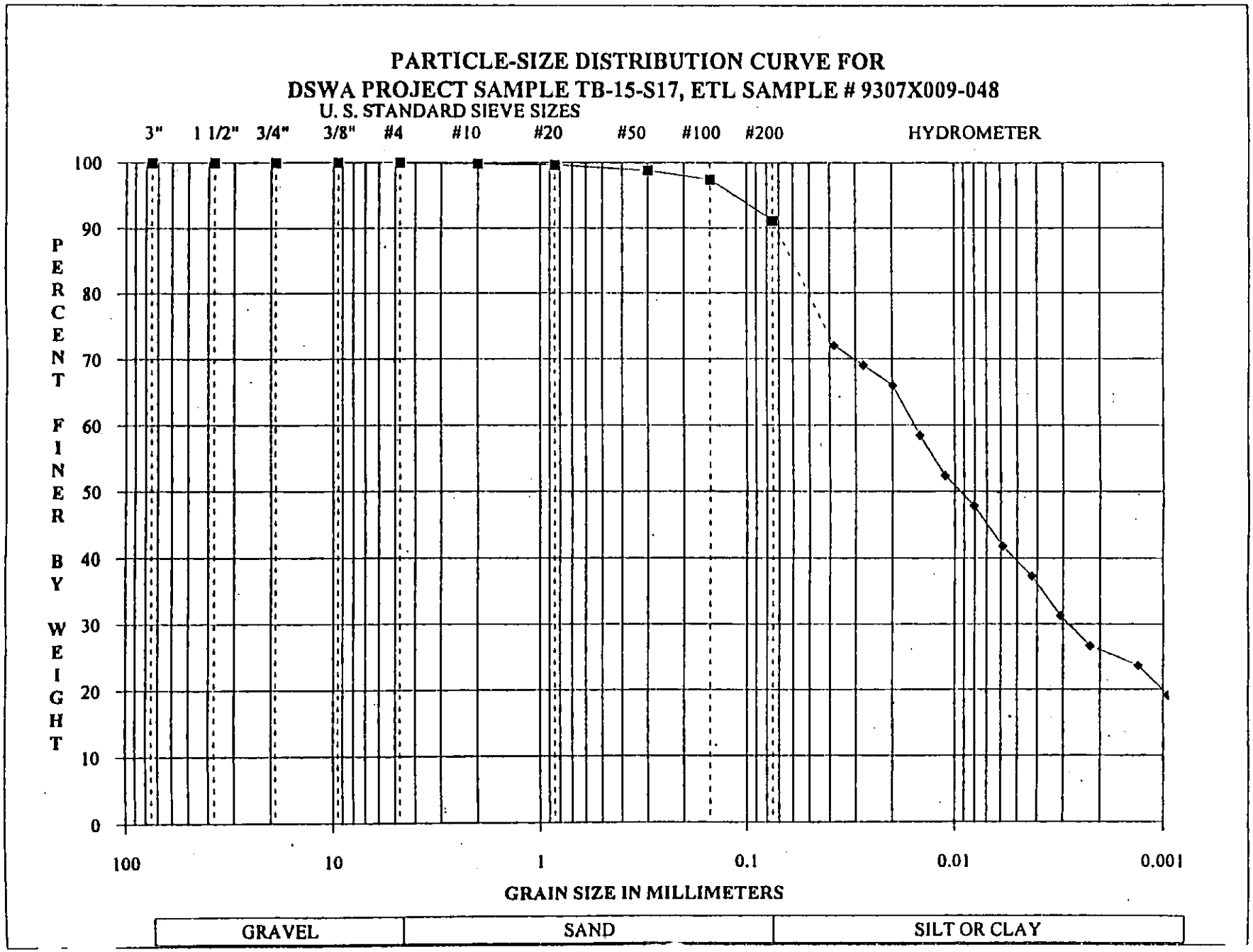
Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC5.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-16-S8	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	049	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	100.0
#20	0.850	99.6
#50	0.300	98.8
#100	0.150	98.1
#200	0.075	91.0
HYDROMETER	0.0382	71.4
	0.0292	59.4
	0.0218	50.4
	0.0163	40.0
	0.0122	34.0
	0.0088	31.0
	0.0063	26.5
	0.0046	22.0
	0.0033	19.0
	0.0023	16.0
	0.0014	13.0
	0.0010	10.0

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown sandy SILT or CLAY with 9% sand

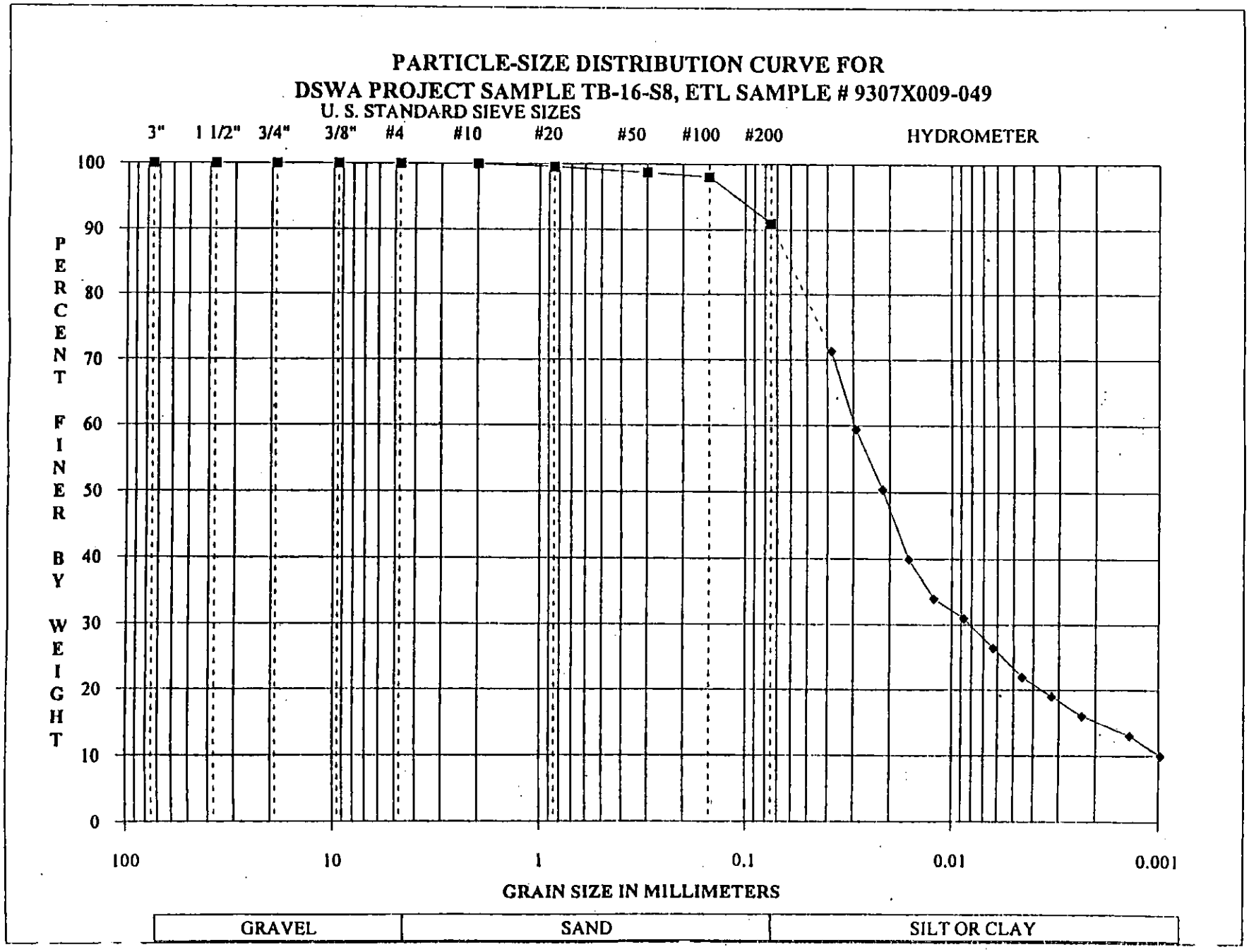
Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



:6.XL:

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-18-S3	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	050	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.9
#20	0.850	99.3
#50	0.300	98.8
#100	0.150	98.5
#200	0.075	97.3
HYDROMETER	0.0334	90.0
	0.0249	83.9
	0.0189	74.7
	0.0142	65.5
	0.0107	60.9
	0.0078	56.3
	0.0056	51.7
	0.0042	42.5
	0.0030	39.4
	0.0022	31.7
	0.0013	25.6
	0.0009	21.0

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

grey brown sandy SILT or CLAY with 3% sand

Unified Soil Classification System (USCS) Group Symbol

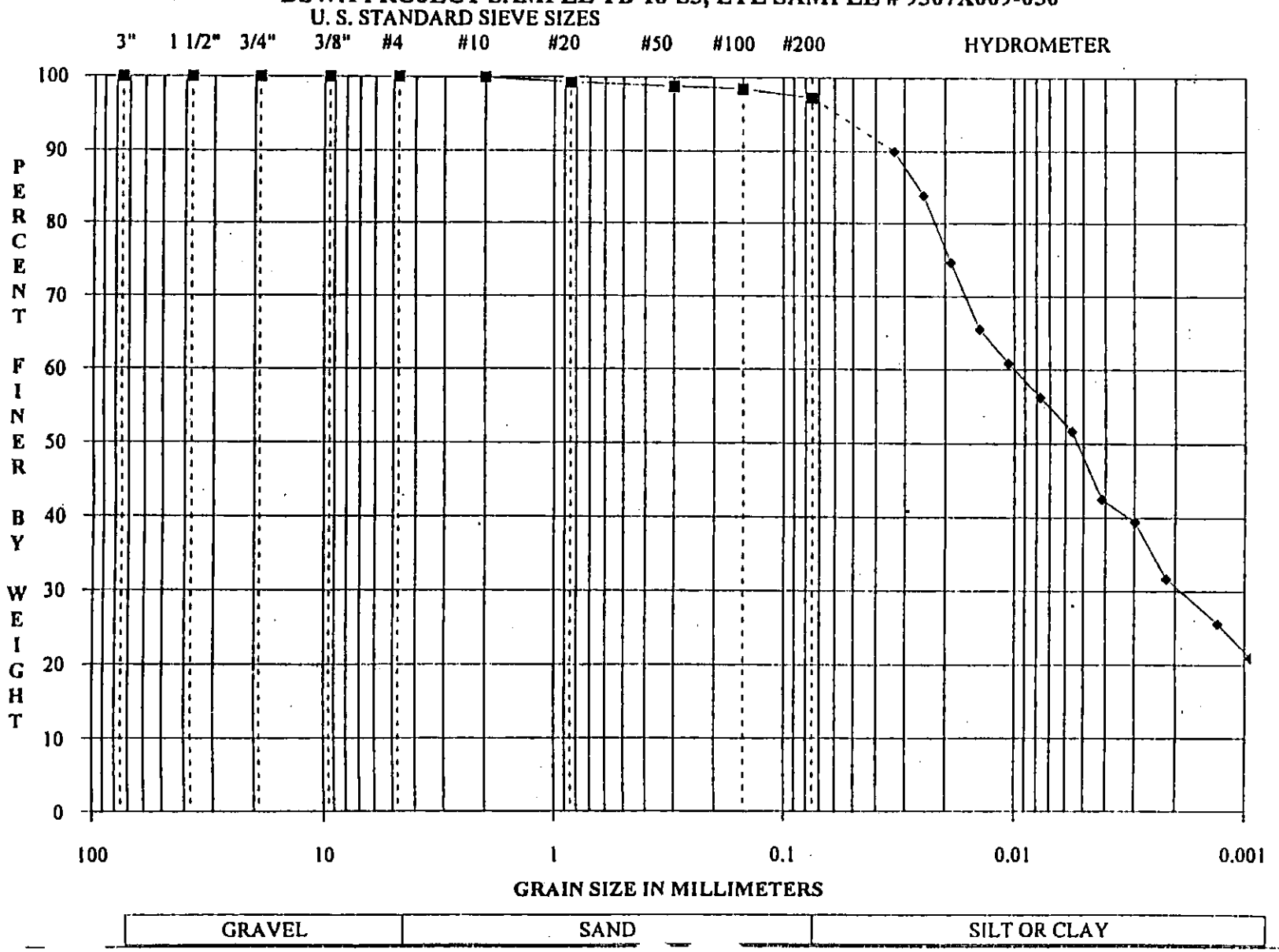
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR DSWA PROJECT SAMPLE TB-18-S3, ETL SAMPLE # 9307X009-050



SC7.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-19-S6	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	051	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	97.0
#10	2.000	91.4
#20	0.850	89.4
#50	0.300	87.6
#100	0.150	86.4
#200	0.075	84.9
HYDROMETER	0.0365	77.6
	0.0267	73.1
	0.0193	70.1
	0.0141	65.6
	0.0106	61.1
	0.0078	55.1
	0.0057	49.1
	0.0042	41.6
	0.0030	37.1
	0.0022	29.6
	0.0013	25.1
	0.0009	20.6

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

grey brown gravelly sandy SILT or CLAY with 3% gravel and 12% sand

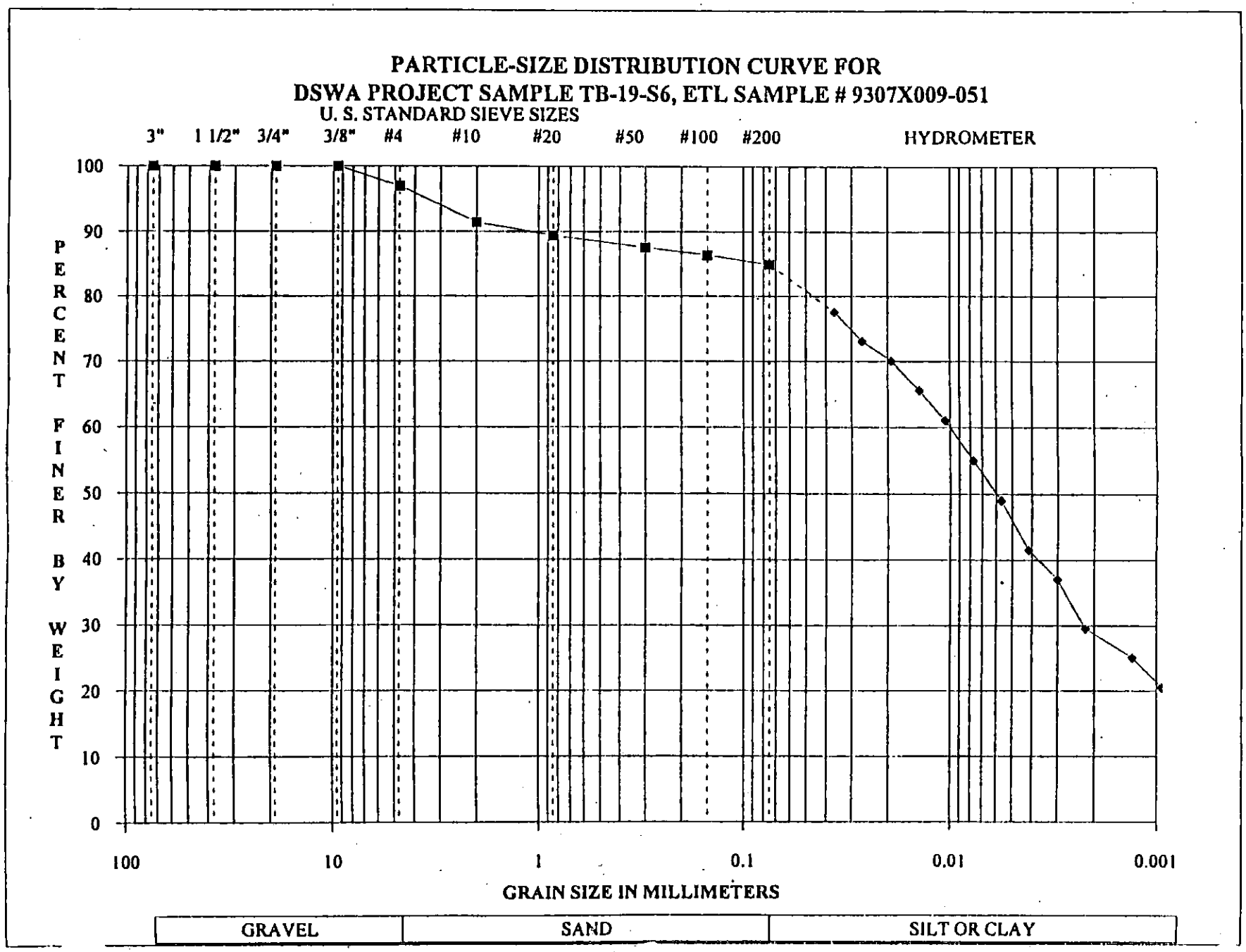
Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC8.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-20-S16	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	052	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	100.0
#20	0.850	100.0
#50	0.300	99.9
#100	0.150	94.4
#200	0.075	86.7
HYDROMETER	0.0382	70.9
	0.0284	63.5
	0.0205	60.5
	0.0149	56.1
	0.0111	53.1
	0.0081	45.7
	0.0059	39.7
	0.0043	35.2
	0.0031	30.8
	0.0022	26.3
	0.0013	23.3
	0.0009	18.9

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

grey brown sandy SILT or CLAY with 13% sand

Unified Soil Classification System (USCS) Group Symbol

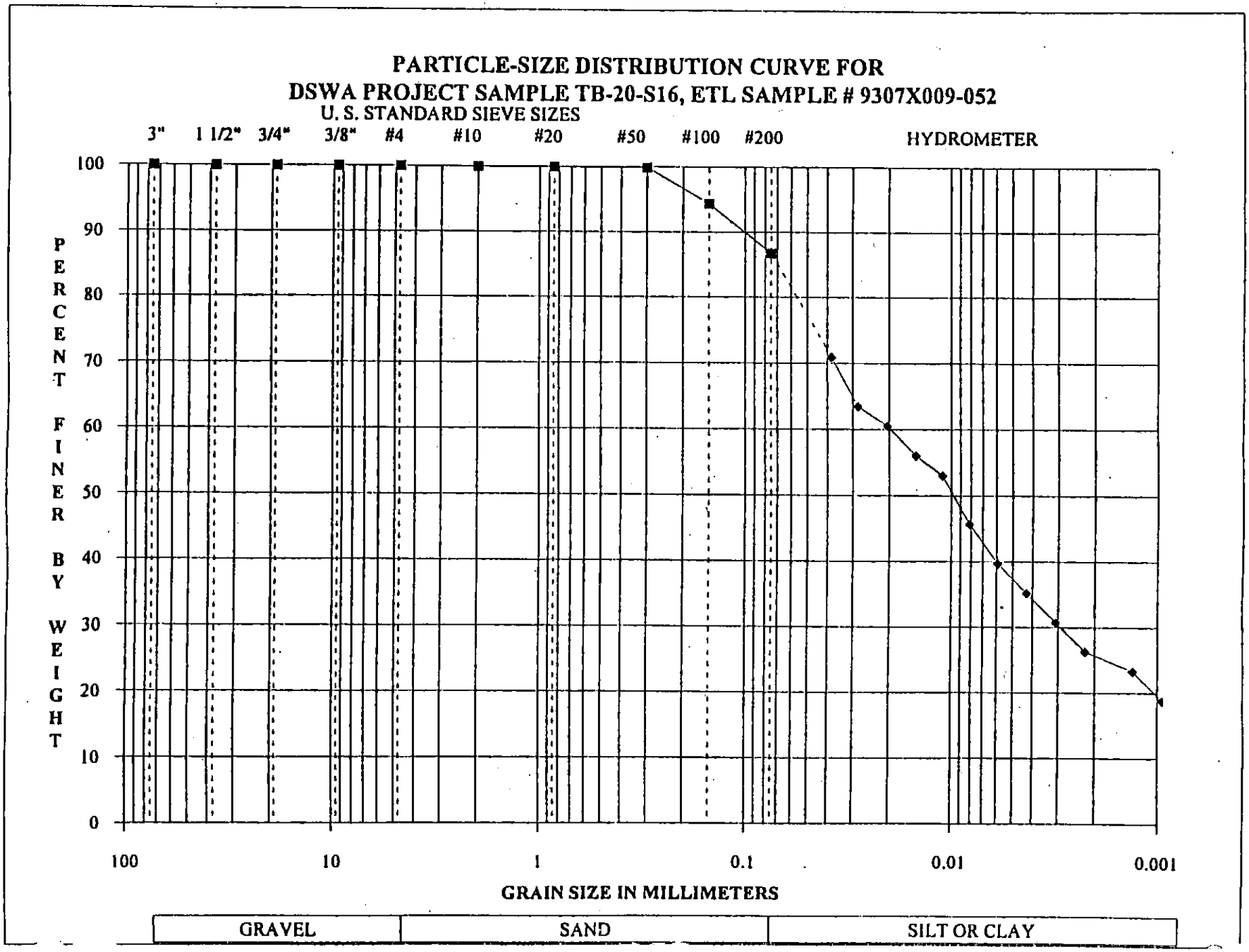
ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

GSC9.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC9 XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-21-S11	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	053	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.9
#20	0.850	99.7
#50	0.300	99.3
#100	0.150	98.8
#200	0.075	98.0
HYDROMETER	0.0347	84.9
	0.0252	81.9
	0.0189	74.2
	0.0138	69.7
	0.0107	60.5
	0.0078	55.9
	0.0057	48.3
	0.0042	40.7
	0.0031	33.1
	0.0022	27.0
	0.0013	20.9
	0.0010	16.3

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

grey brown sandy SILT or CLAY with 2% sand

Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

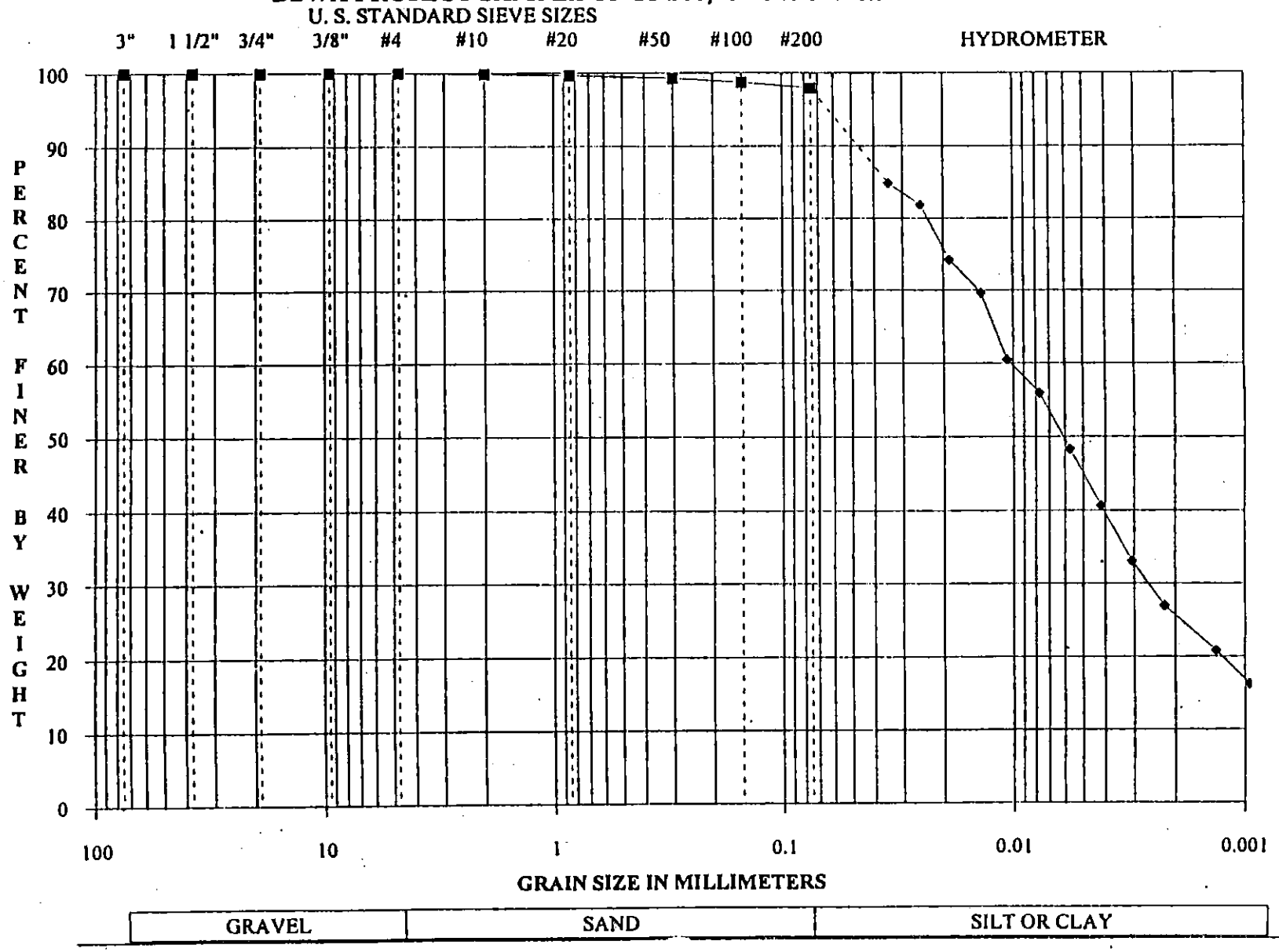
NOTES

NA=NOT APPLICABLE

GSC10.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR DSWA PROJECT SAMPLE TB-21-S11, ETL SAMPLE # 9307X009-053



GSC10.XLS

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-22-S3	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	054	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	100.0
#20	0.850	99.9
#50	0.300	99.7
#100	0.150	99.5
#200	0.075	98.7
HYDROMETER	0.0352	84.5
	0.0264	76.8
	0.0197	69.0
	0.0150	56.7
	0.0112	53.6
	0.0081	49.0
	0.0059	42.8
	0.0043	36.6
	0.0031	30.4
	0.0023	24.2
	0.0013	19.6
	0.0010	16.5

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

SAMPLE DESCRIPTION

brown sandy SILT or CLAY with 1% sand

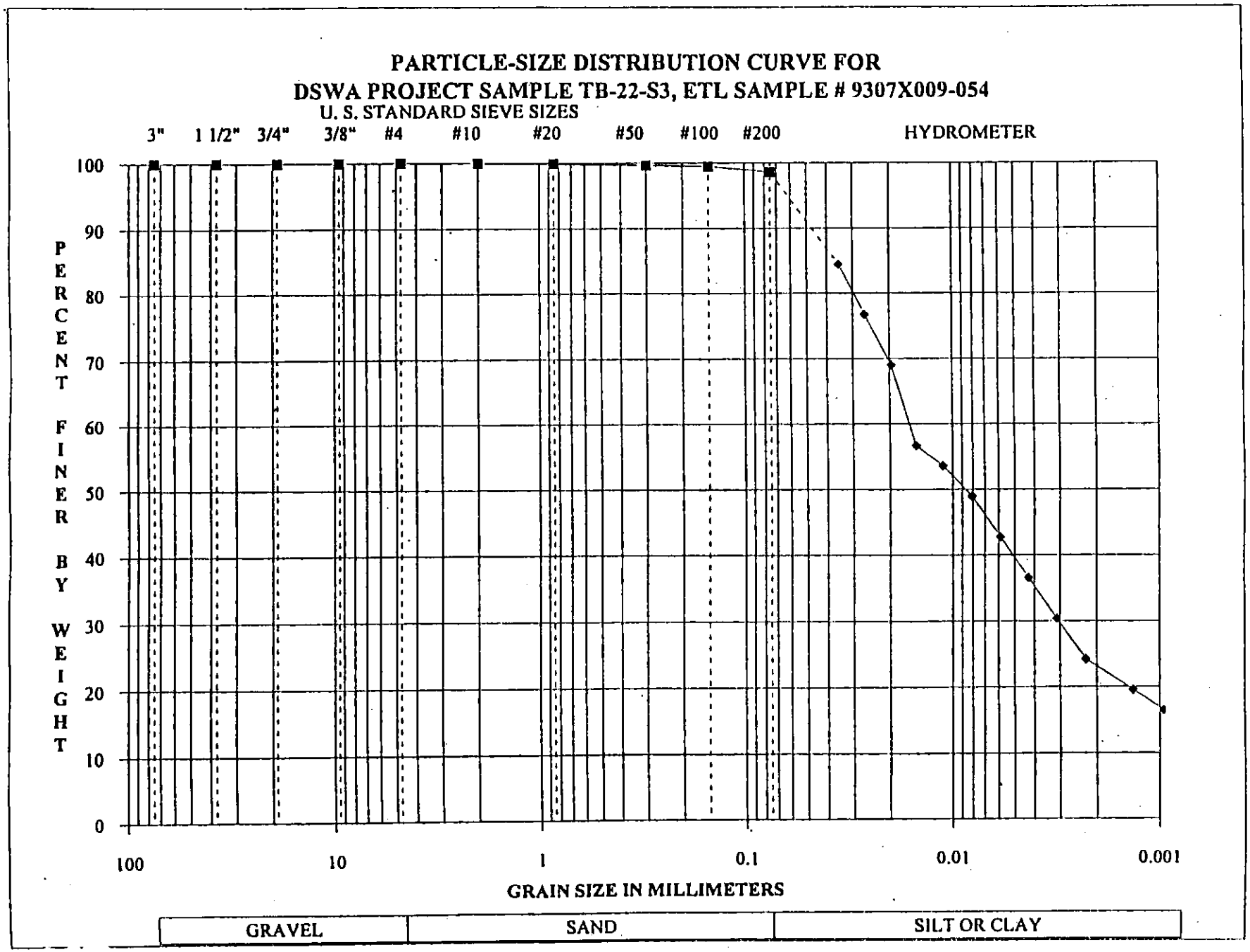
Unified Soil Classification System (USCS) Group Symbol

ML, CL, MH, or CH

NOTES

NA=NOT APPLICABLE

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC11.XL

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE I.D.	TB-11-S17	PROJECT ANALYST	JDT
JOB NUMBER	9307X009	ETL SAMPLE NUMBER	080	QA/QC ANALYST	RWF
W. O. NUMBER	02477-004-001	DATE RECEIVED	07/17/93	DATE COMPLETED	08/04/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	88.2
#4	4.750	53.3
#10	2.000	40.3
#20	0.850	28.7
#50	0.300	14.4
#100	0.150	9.5
#200	0.075	6.6

EFFECTIVE SIZES

% Finer	Diameter mm
60	5.665
30	0.978
10	0.165
Uniformity Coefficient	Gradation Coefficient
34.4	1.0

SAMPLE DESCRIPTION

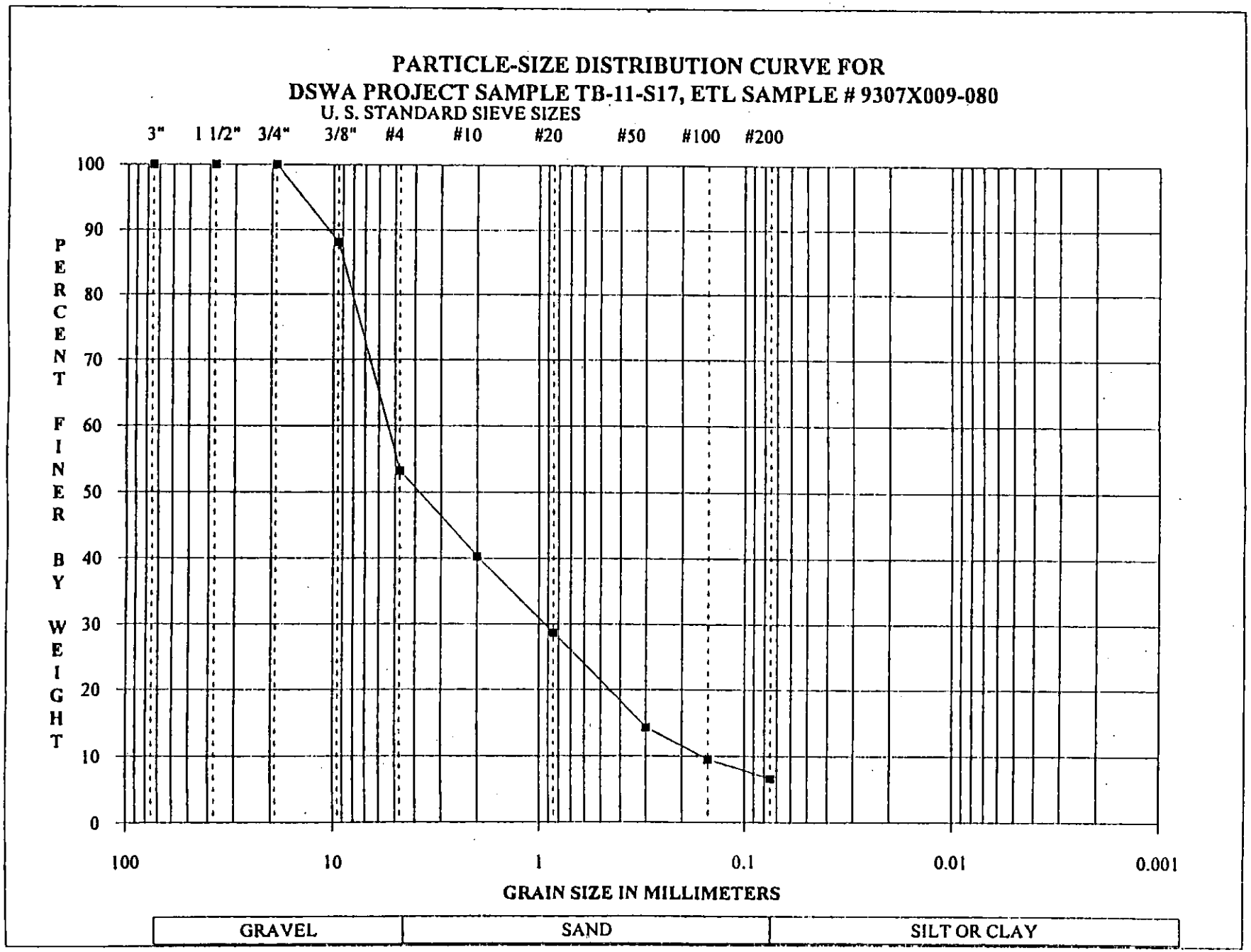
grey well graded GRAVEL
with 7% silt or clay and 46% sand

Unified Soil Classification System (USCS) Group Symbol

GW/GM or GW/GC

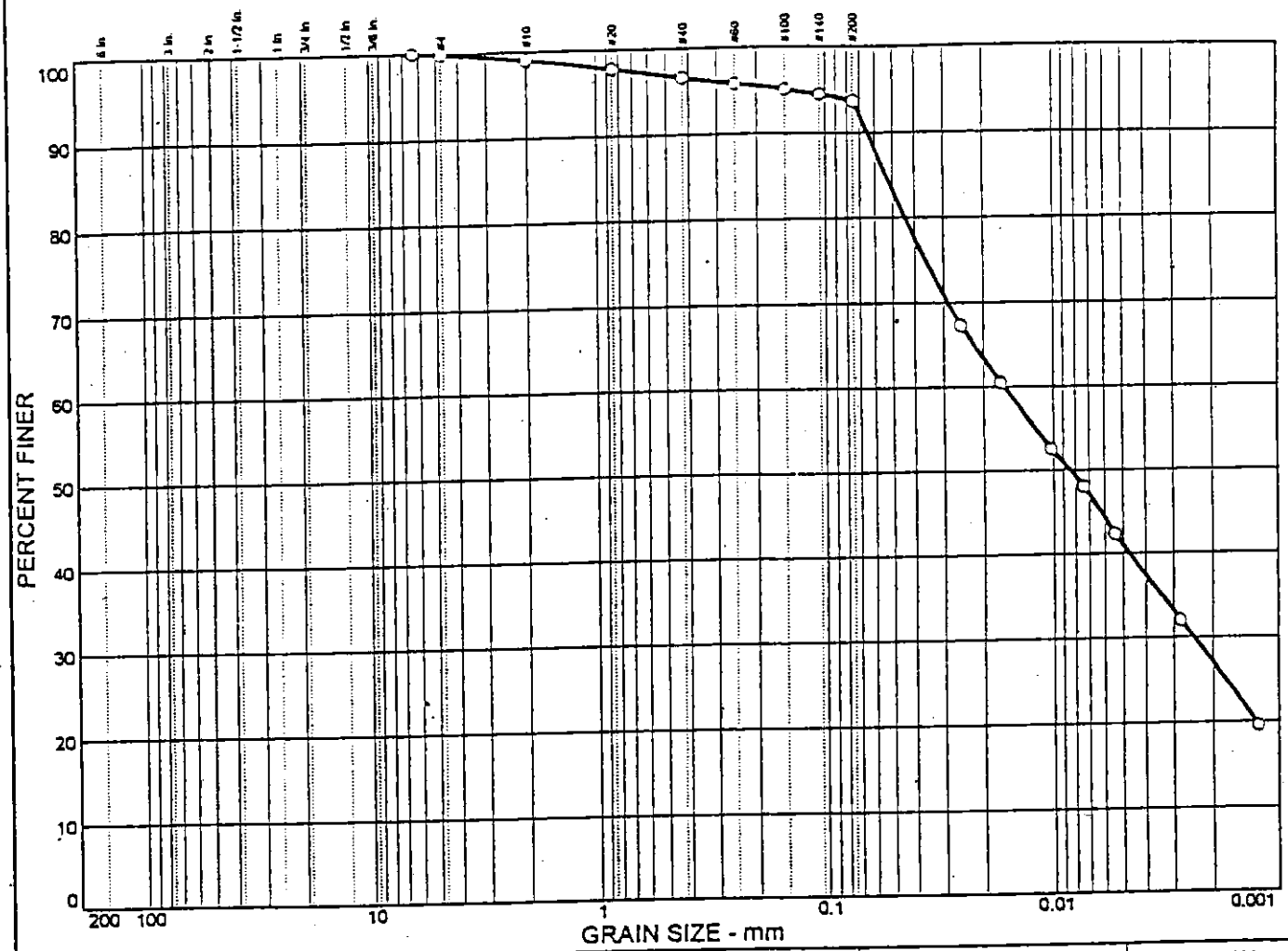
NOTES

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY



GSC14.X

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
O	0.0	0.2	6.1	52.8	40.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
O	58	40	0.0540	0.0162	0.0085	0.0024				

MATERIAL DESCRIPTION	USCS	AASHTO
O Gray elastic SILT	MH	

Project No. 31697.004 **Client:** Delaware Solid Waste Authority

Project: DSWA Phase IV

O **Source:** Boring No.: GF4-1 **Sample No.:** ST-1 **Elev./Depth:** 13.5'-15.5'

Remarks:

O Date: July 13, 1998

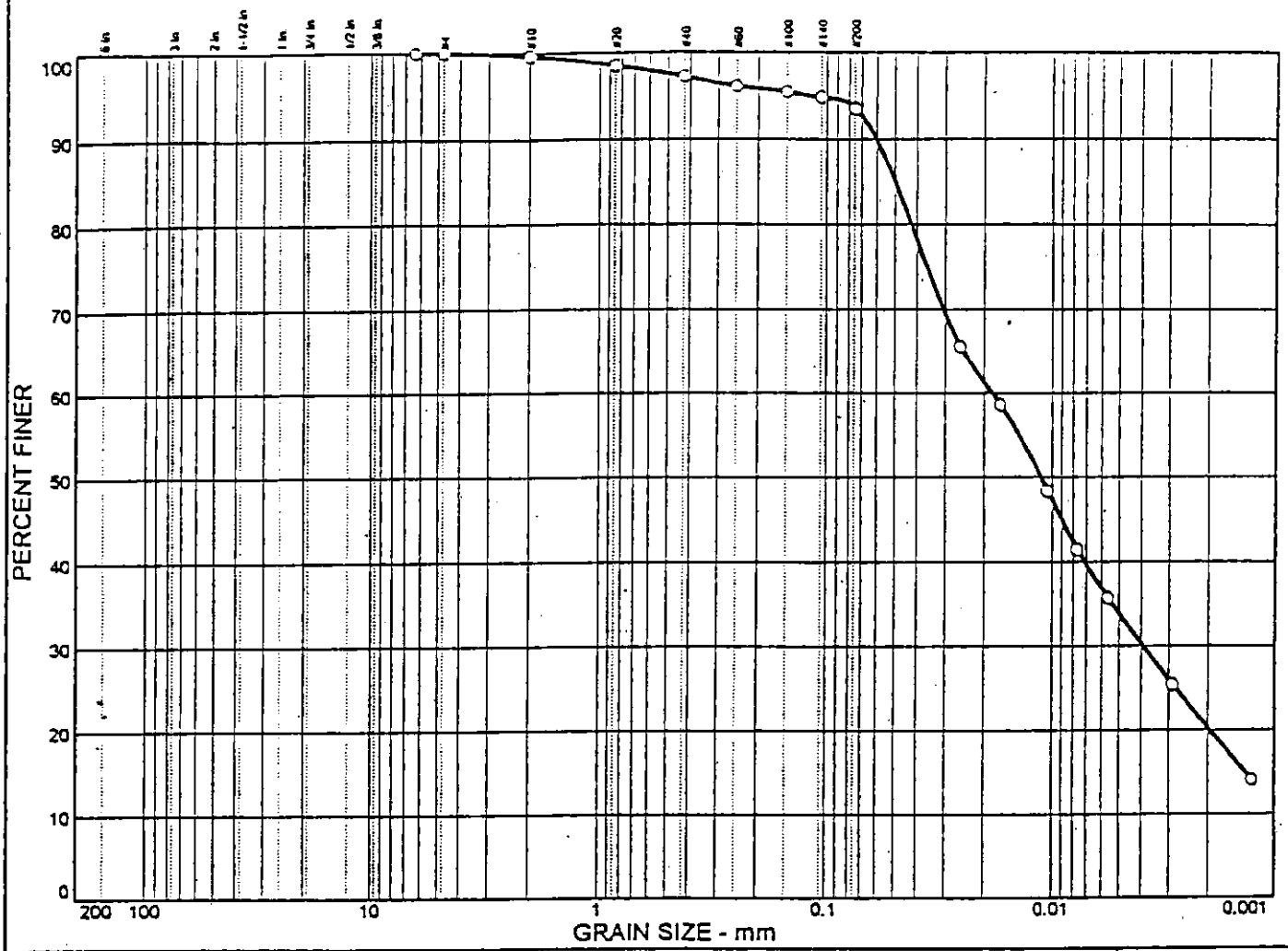
Nat. Water Content: 53.3%

Tested By: DFP

Gannett Fleming
ENGINEERS AND PLANNERS

Scale: USCS

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.0	6.5	59.7	33.8

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	57	39	0.0502	0.0185	0.0113	0.0039	0.0014			

MATERIAL DESCRIPTION	USCS	AASHTO
○ Gray elastic SILT	MH	

Project No. 31697.004 **Client:** Delaware Solid Waste Authority

Project: DSWA Phase IV

○ **Source:** Boring No.: GF4-1 **Sample No.:** ST-3 **Elev./Depth:** 44.5'-46.5'

Remarks:

○ Date: July 13, 1998

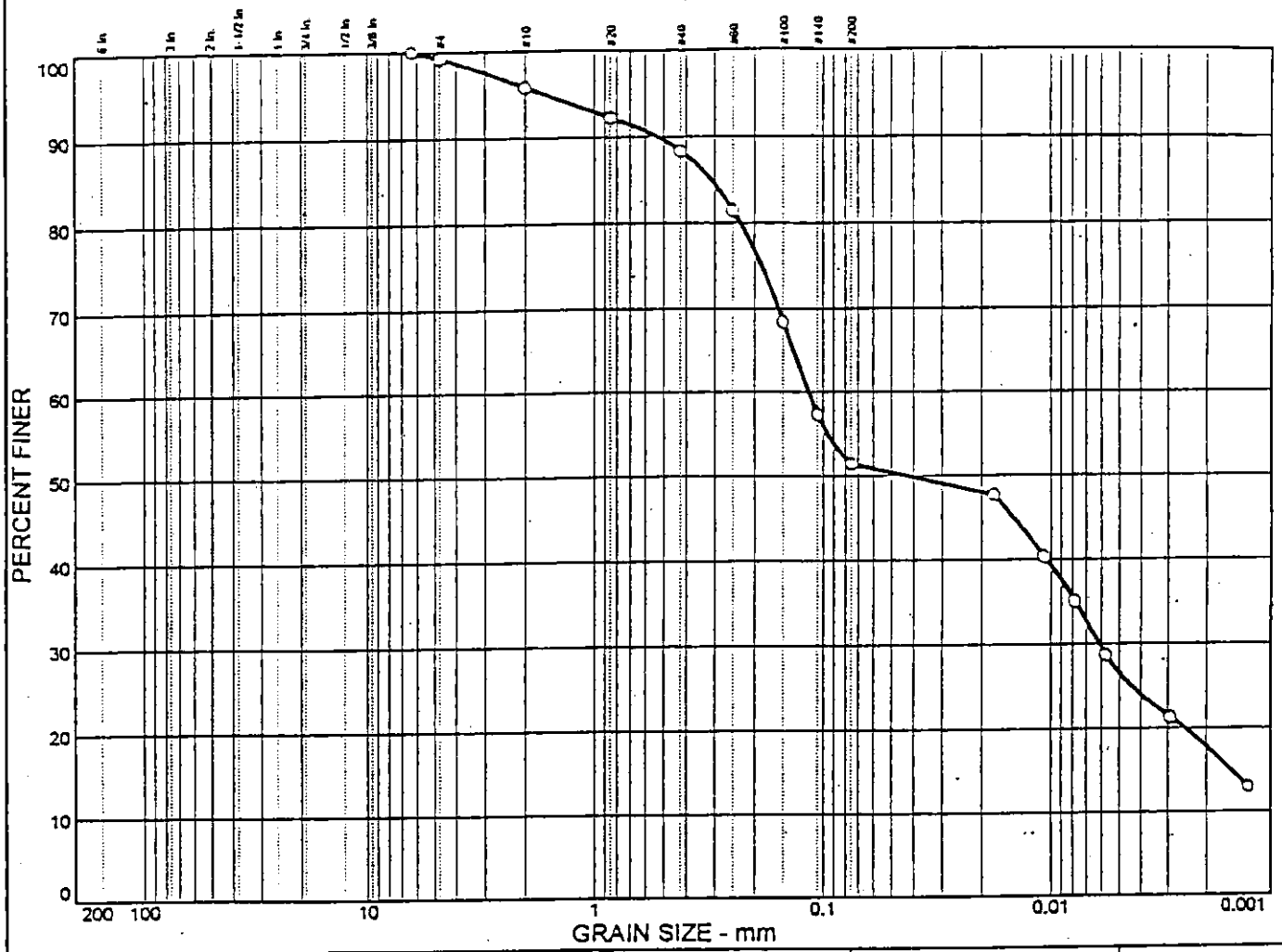
Nat. Water Content: 58.5%

Tested By: DFP

Gannett Fleming
ENGINEERS AND PLANNERS

Scale: USCS

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
O	0.0	0.8	47.8	24.9	26.5

X	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
O	29	NP	0.313	0.116	0.0435	0.0062	0.0015			

MATERIAL DESCRIPTION	USCS	AASHTO
O Gray sandy SILT	ML	

Project No. 31697.004 **Client:** Delaware Solid Waste Authority

Project: DSWA Phase IV

O **Source:** Boring No.: GF4-1 **Sample No.:** ST-6 **Elev./Depth:** 91'-93'

Remarks:

O Date: July 13, 1998

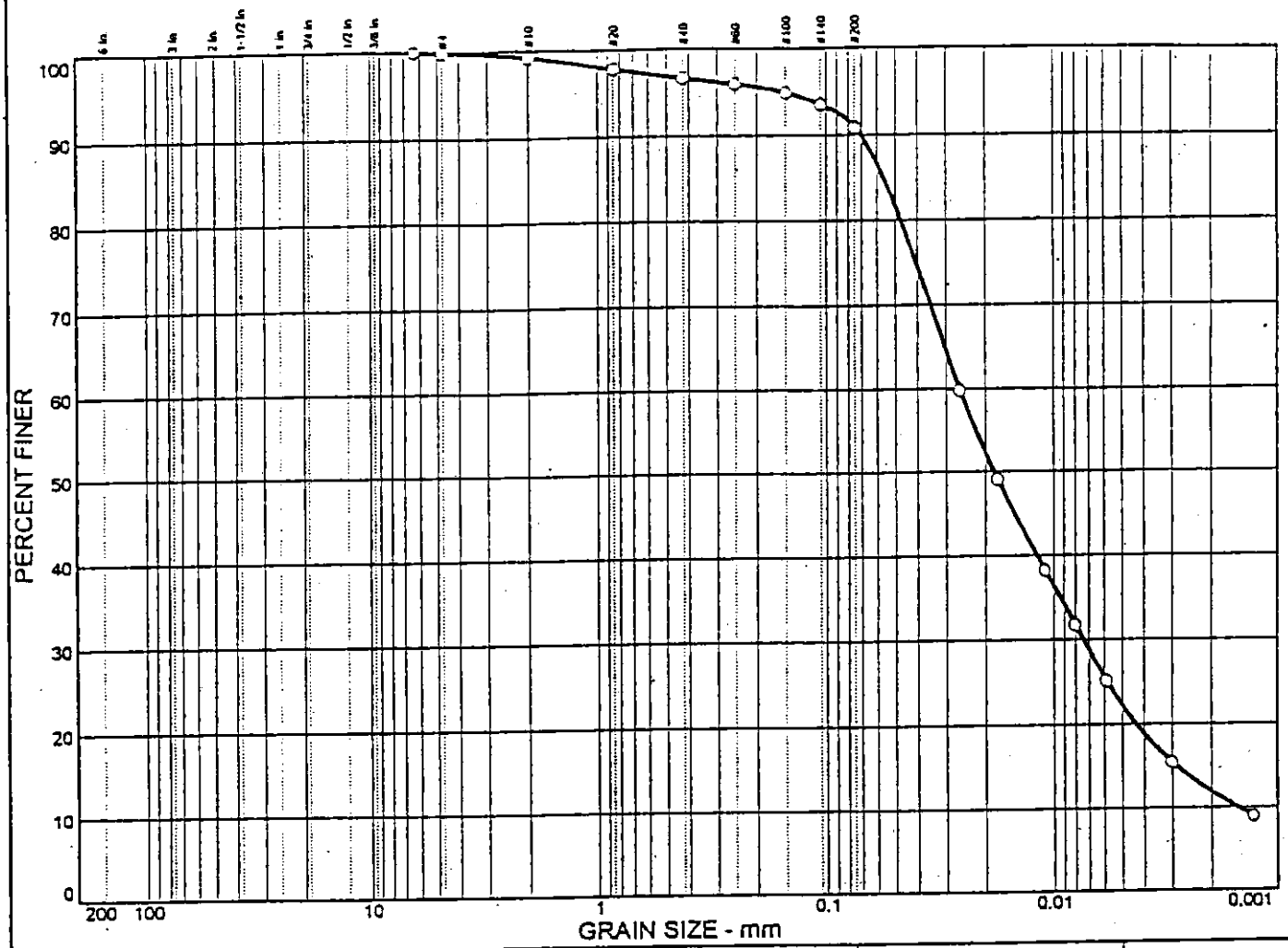
Nat. Water Content: 40.7%

Tested By: DFP

Gannett Fleming
ENGINEERS AND PLANNERS

Scale: USCS

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
O	0.0	0.2	9.0	68.6	22.2

X	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
O	48	35	0.0566	0.0262	0.0185	0.0074	0.0029	0.0015	1.37	17.02

MATERIAL DESCRIPTION	USCS	AASHTO
O Gray SILT	ML	

Project No. 31697.004 **Client:** Delaware Solid Waste Authority

Project: DSWA Phase IV

O **Source:** Boring No.: GF4-2 **Sample No.:** ST-1 **Elev./Depth:** 16.5'-18.5'

Remarks:

O Date: July 13, 1998

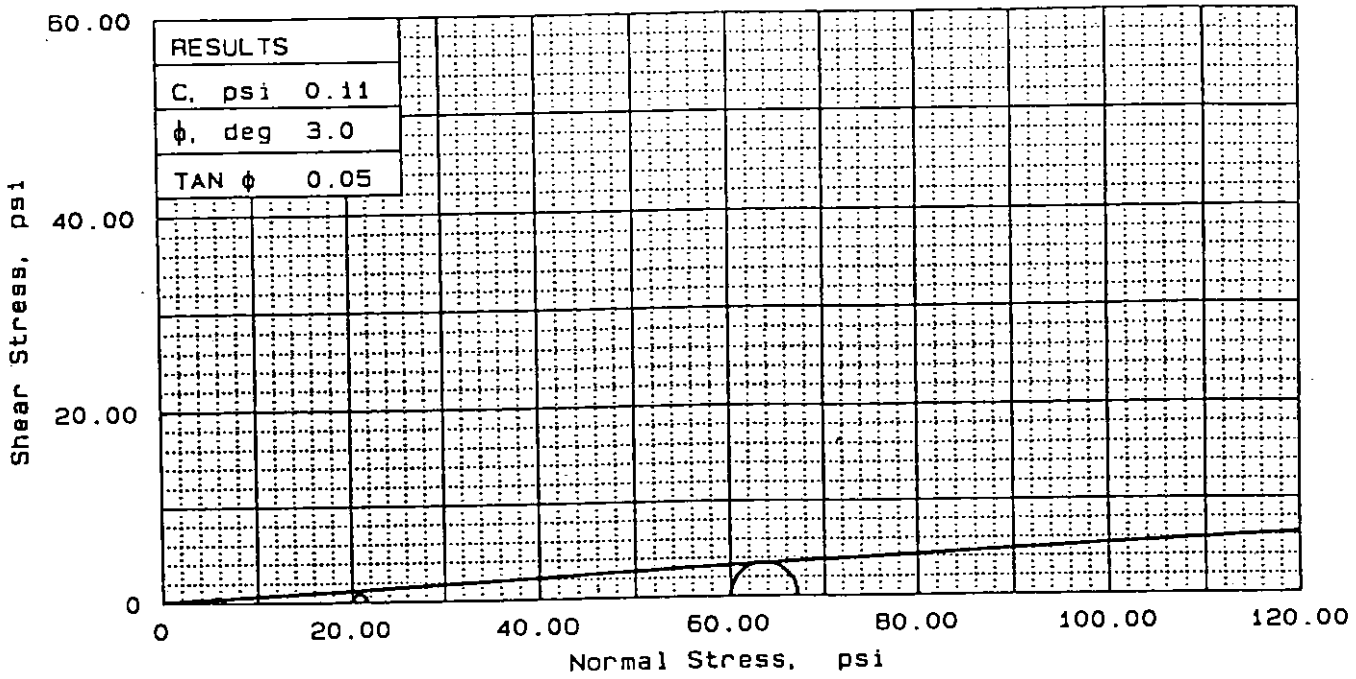
Nat. Water Content: 56.8%

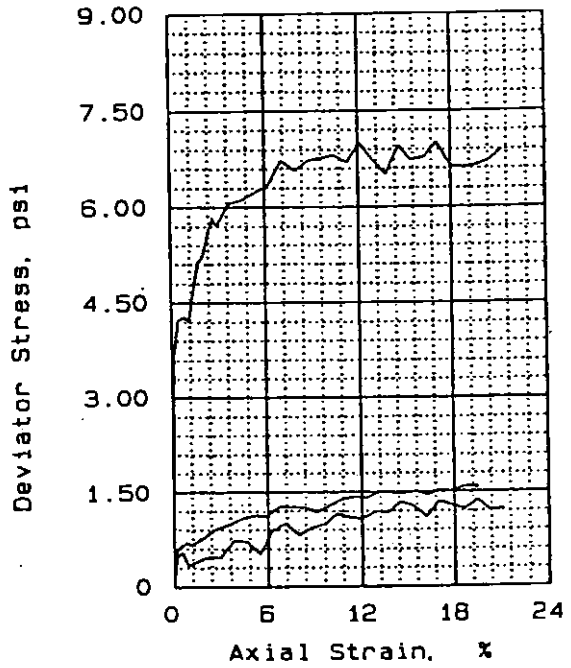
Tested By: DFP

Gannett Fleming
ENGINEERS AND PLANNERS

Scale: USCS

UNCONFINED COMPRESSION TESTS





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	85.2	94.3	86.5
	DRY DENSITY, pcf	49.7	42.8	48.8
	SATURATION, %	97.0	87.1	95.8
	VOID RATIO	2.329	2.869	2.392
	DIAMETER, in	2.77	2.97	2.83
	HEIGHT, in	5.80	6.00	5.85
AT TEST	WATER CONTENT, %	85.2	94.3	86.5
	DRY DENSITY, pcf	49.7	42.8	48.8
	SATURATION, %	97.0	87.1	95.8
	VOID RATIO	2.329	2.869	2.392
	DIAMETER, in	2.77	2.97	2.83
	HEIGHT, in	5.80	6.00	5.85
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		5.00	20.00	60.00
FAILURE STRESS, psi		1.38	1.60	7.01
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				
PORE PRESSURE, psi				
σ_1 FAILURE, psi		6.38	21.60	67.01
σ_3 FAILURE, psi		5	20	60

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DREDGE SPOIL

LL= PL= PI=
SPECIFIC GRAVITY= 2.55
REMARKS:
POINT #1: 50.1'-50.6'
POINT #2: 50.8'-51.3'
POINT #3: 51.3'-51.8'
FIG. NO.

CLIENT: WESTON

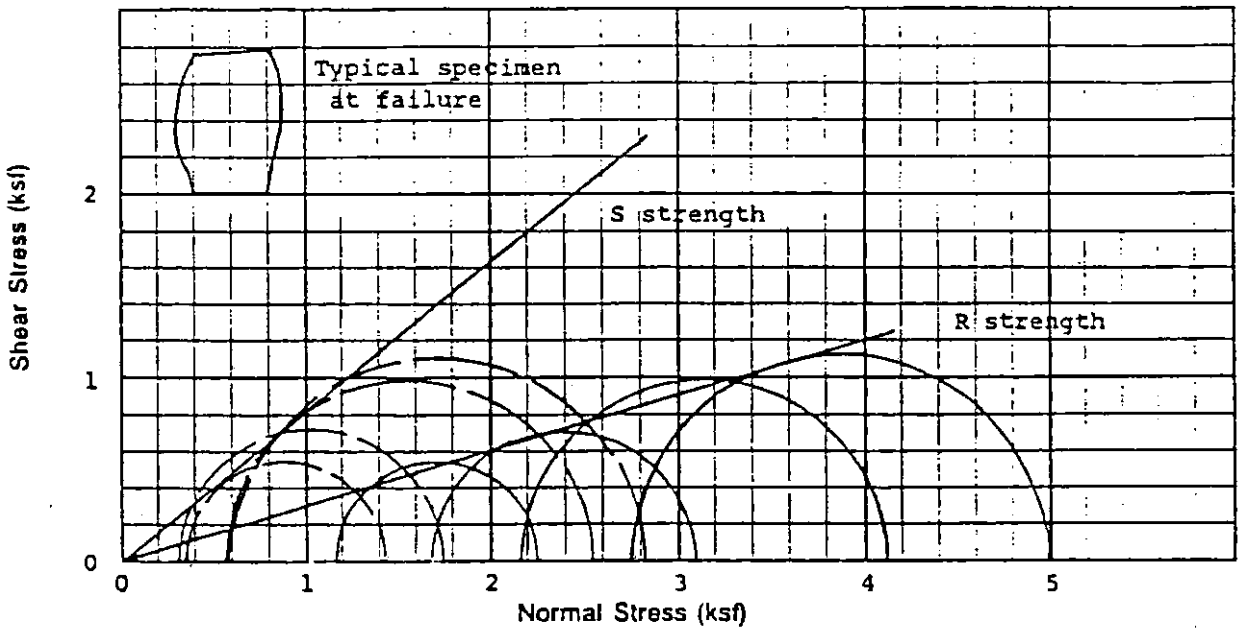
PROJECT: OSWA - PHASE IV

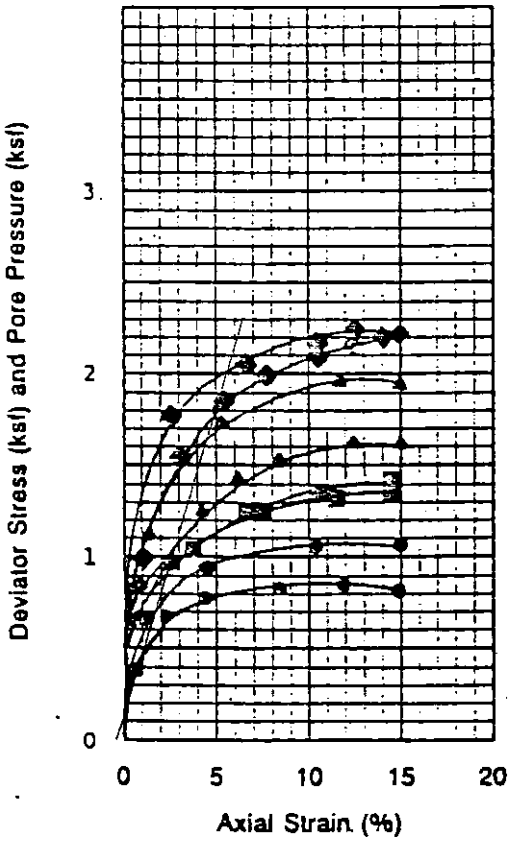
SAMPLE LOCATION: T83-ST6, 50.0'-52.0'

PROJ. NO.: 47533 DATE: 05-18-92

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





Specimen No			1	2	3	4
Diameter (in)		D_o	2.85	2.83	2.82	2.83
Height (in)		H_o	5.49	5.54	5.49	5.60
Initial	Water Content (%)	w_o	91.3	91.3	91.3	85.4
	Dry Density (pcf)	γ_{do}	47.4	47.3	47.3	[illegible]
	Void Ratio	e_o	2.357	2.368	2.347	2.302
	Saturation (%)	S_o	98.8	98.3	99.2	94.5
Before Test	Water Content (%)	w_c	74.4	70.8	69.3	65.0
	Dry Density (pcf)	γ_{dc}	55.0	56.8	57.5	59.8
	Void Ratio	e_c	1.890	1.806	1.766	1.644
	Saturation (%)	S_c	100	100	100	100
	Back Pressure (ksf)	μ_B	6.29	4.20	9.63	6.02
Total Minor Princ Stress (ksf)		σ_3	1.17	1.68	2.15	2.74 ←
Maximum Deviator Stress (ksf)		P/A	1.07	1.41	1.97	2.24 ←
Time Max Deviator Stress(min)		t_f	120	120	120	120
Total Major Princ Stress (ksf)		σ_1	2.24	3.09	4.12	4.98
Pore Pressure at Max Deviator Stress (ksf)		μ	0.83	1.35	1.60	2.17
Eff Minor Princ Stress (ksf)		σ_3'	0.34	0.32	0.55	0.57 ←
Eff Major Princ Stress (ksf)		σ_1'	1.41	1.73	2.52	2.81 ←

Remarks: Specimens produced a bulging failure.

Project DSWA NORTHERN FACILITY-2	Boring No GF-6/ -7	Sample No ST-2/ -1
Type of Test: CU with pore pressure measurements		Sample Type: Shelby
c = 0.0 ksf	ϕ = 17.0 °	c' = 0.0 ksf	ϕ' = 39.5 °

GANNETT FLEMING GEOTECHNICAL LABORATORY
TRIAXIAL COMPRESSION TEST REPORT

Figure D-1-2
Triaxial Test Data (CU Test)
Plot of Effective Stress vs. Shear Stress
GP-8, 25.0 - 27.0 ft.
NSWF- 2, Cherry Island

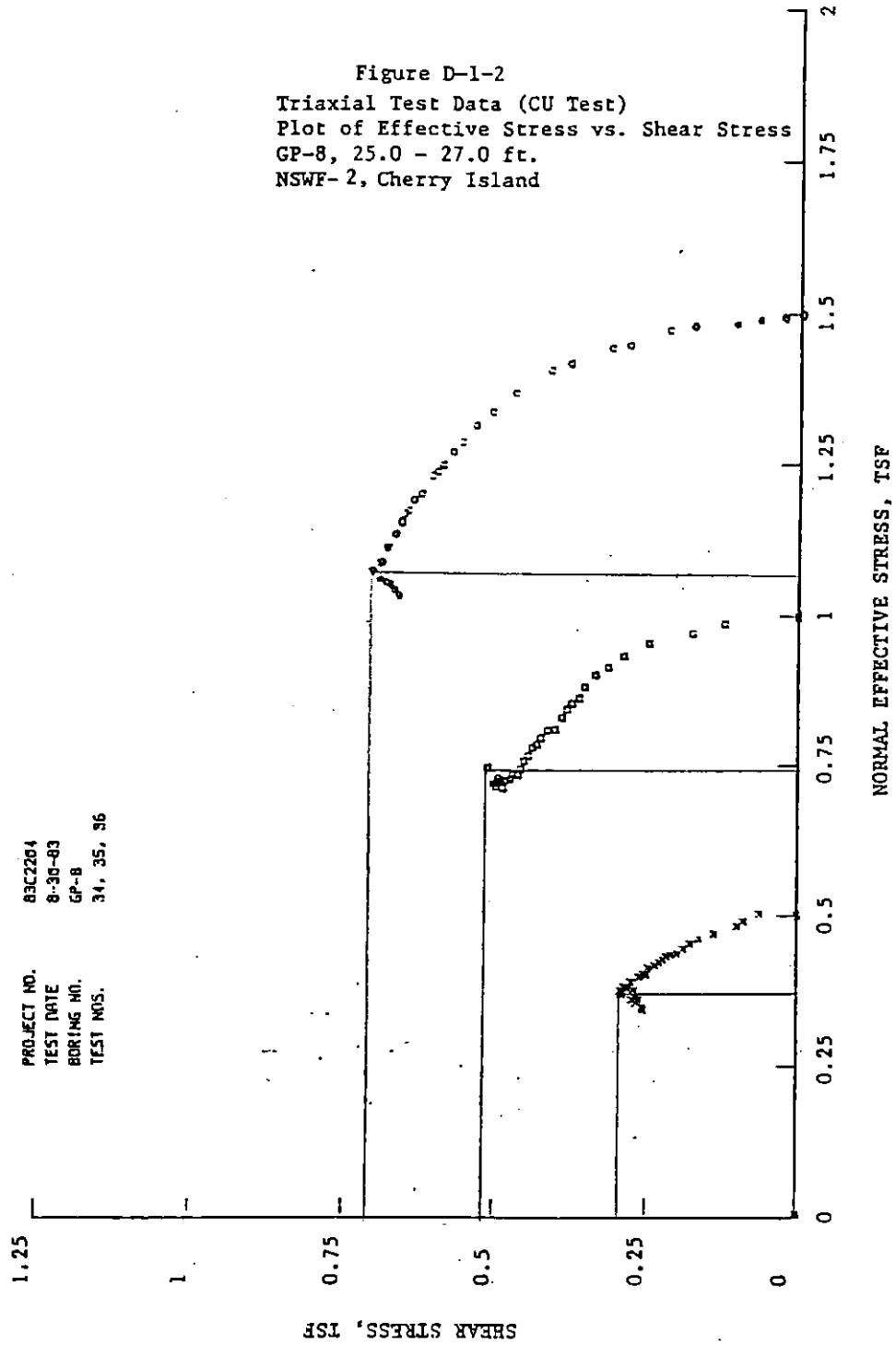
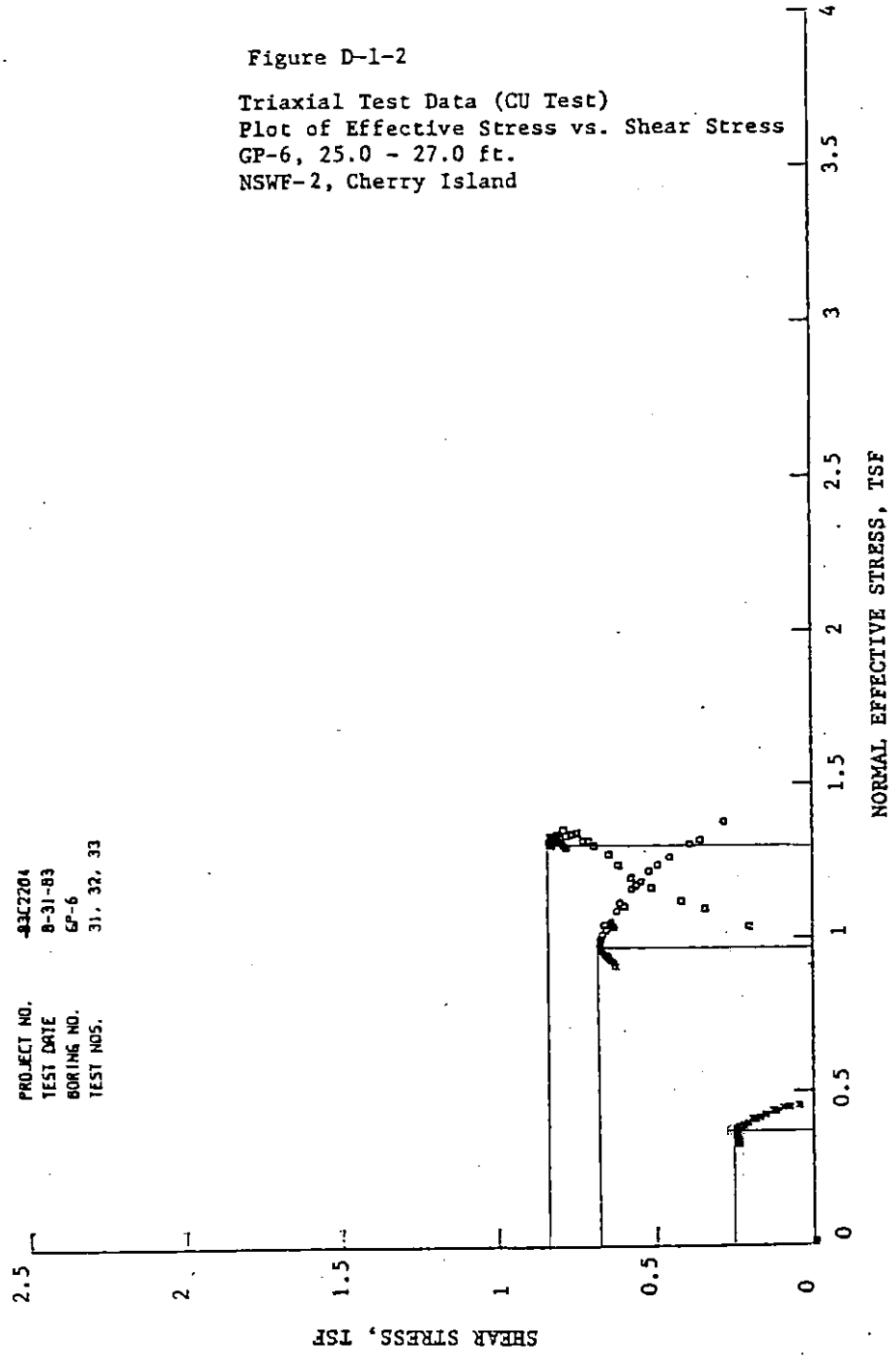
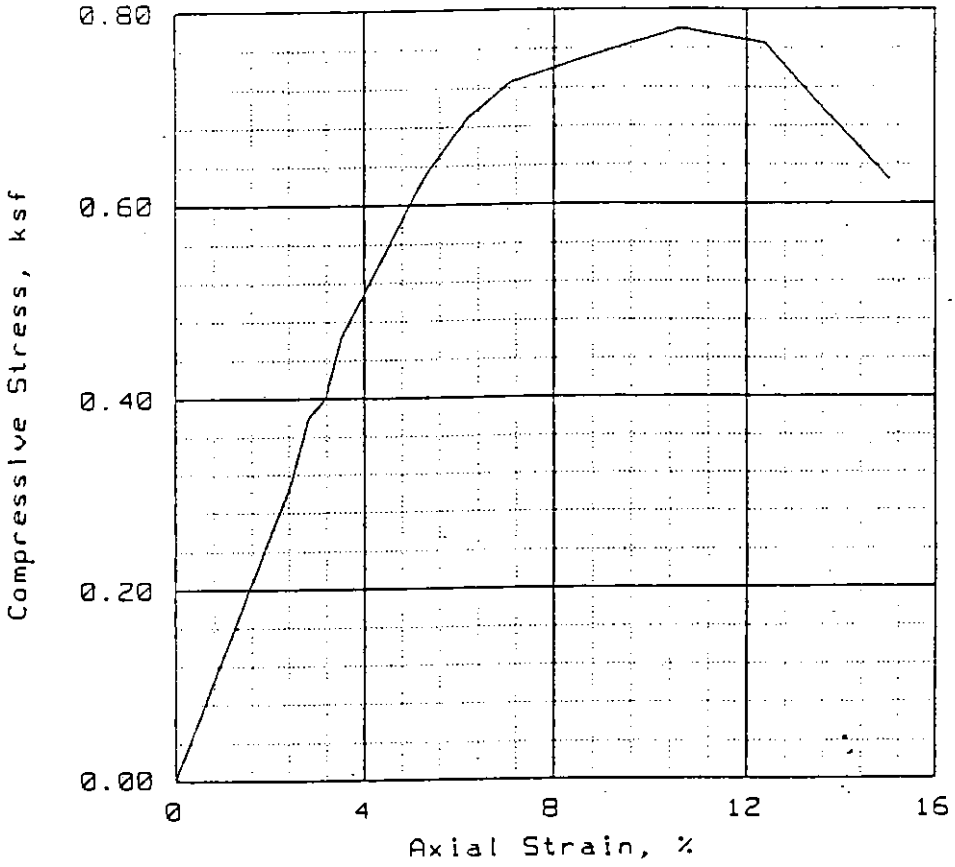


Figure D-1-2

Triaxial Test Data (CU Test)
Plot of Effective Stress vs. Shear Stress
GP-6, 25.0 - 27.0 ft.
NSWF-2, Cherry Island



UNCONFINED COMPRESSION TEST



SAMPLE NO.:	1			
Unconfined strength, ksf	0.78			
Undrained shear strength, ksf	0.39			
Failure strain, %	10.6			
Strain rate, in/min	0.0710			
Water content, %	56.8			
Wet density, pcf	101.0			
Dry density, pcf	64.4			
Saturation, %	94.9			
Void ratio	1.6162			
Specimen diameter, in	2.83			
Specimen height, in	5.65			
Height/diameter ratio	2.00			

Description: Gray SILT

LL = 48	PL = 35	PI = 13	GS= 2.7	Type: Undisturbed

Project No.: 31697.004
Date: July 13, 1998
Remarks:
Depth: 16.5'-18.5'
Nat. Water Content: 56.8%

Tested By: DFP
Fig. No.: ——

Client: Delaware Solid Waste Authority

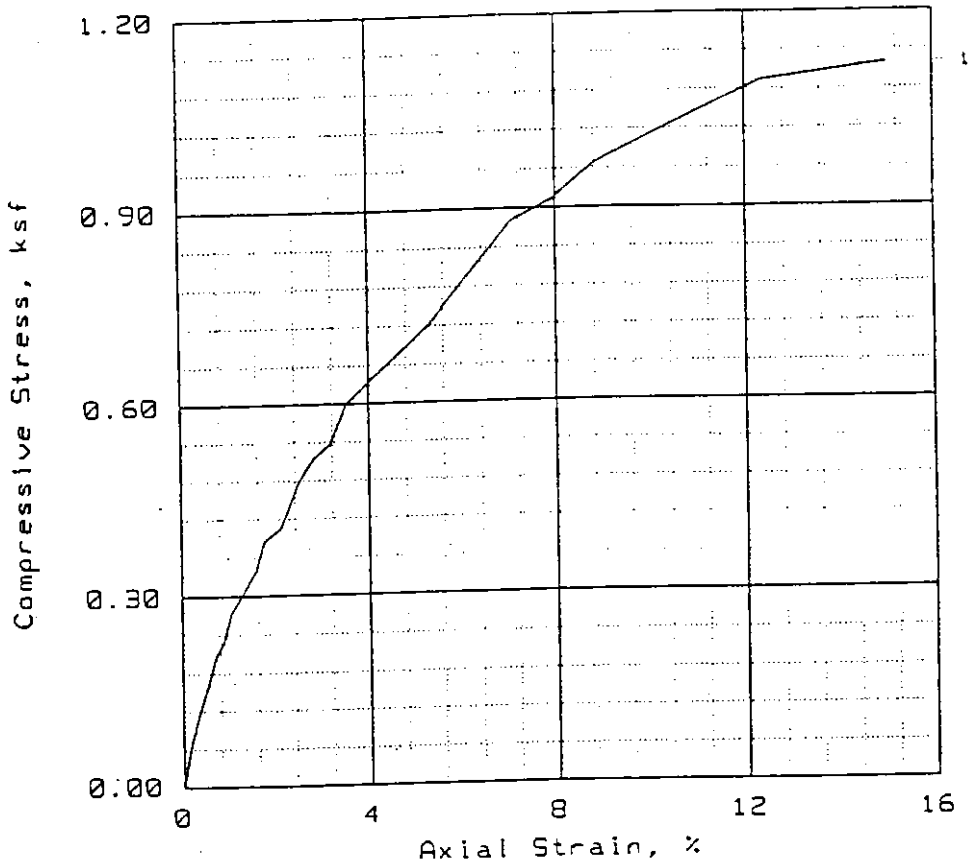
Project: DSWA Phase IV

Location: Boring No.: GF4-2
Sample: ST-1

UNCONFINED COMPRESSION TEST

GANNETT FLEMING, INC.

UNCONFINED COMPRESSION TEST



SAMPLE NO.:	1			
Unconfined strength, ksf	1.12			
Undrained shear strength, ksf	0.56			
Failure strain, %	15.0			
Strain rate, in/min	0.0710			
Water content, %	53.3			
Wet density, pcf	101.6			
Dry density, pcf	66.3			
Saturation, %	93.3			
Void ratio	1.5418			
Specimen diameter, in	2.82			
Specimen height, in	5.67			
Height/diameter ratio	2.01			

Description: Gray elastic SILT

LL = 58	PL = 40	PI = 18	GS= 2.7	Type: Undisturbed

Project No.: 31697.004
Date: July 13, 1998
Remarks:
Depth: 13.5'-15.5'
Nat. Water Content: 53.3%

Tested By: DFP
Fig. No.: ——

Client: Delaware Solid Waste Authority

Project: DSWA Phase IV

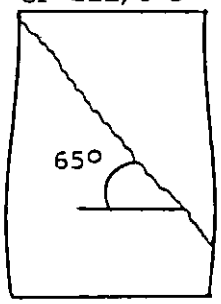
Location: Boring No.: GF4-1
Sample: ST-1

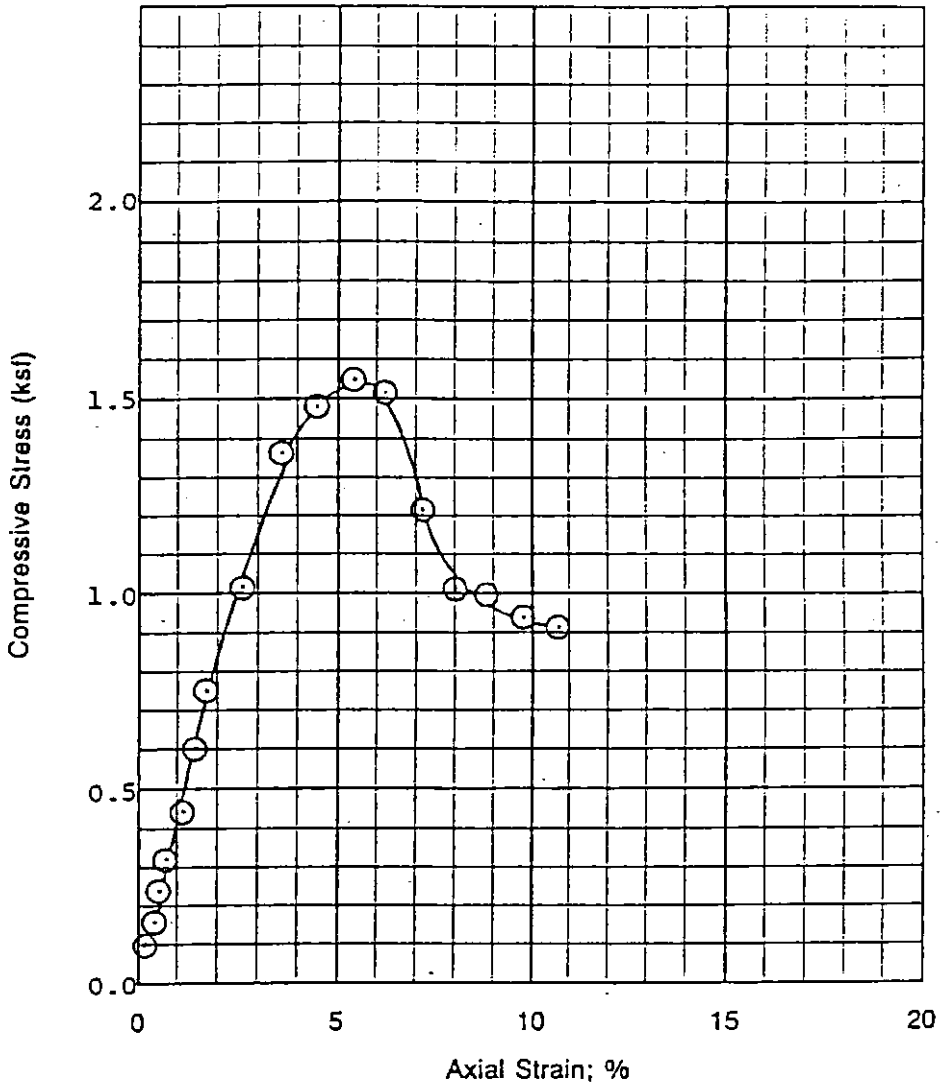
UNCONFINED COMPRESSION TEST

GANNETT FLEMING, INC.

Failure Sketches

GF-211/U-3





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	66.4 %	%	%	%
	Void ratio	e_o	1.939			
	Saturation	S_o	94.2 %	%	%	%
	Dry density, lb/cu ft	γ_d	58.4			
Time to failure, min		t_f	8			
Unconfined compressive strength, ksf		q_u	1.54			
Initial specimen diameter, in		D_o	2.85			
Initial specimen height, in		H_o	5.61			

UNCONFINED COMPRESSION TEST REPORT

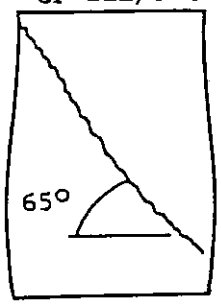
Project DELAWARE SOLID WASTE AUTH. PHASE IA Boring No GF-211

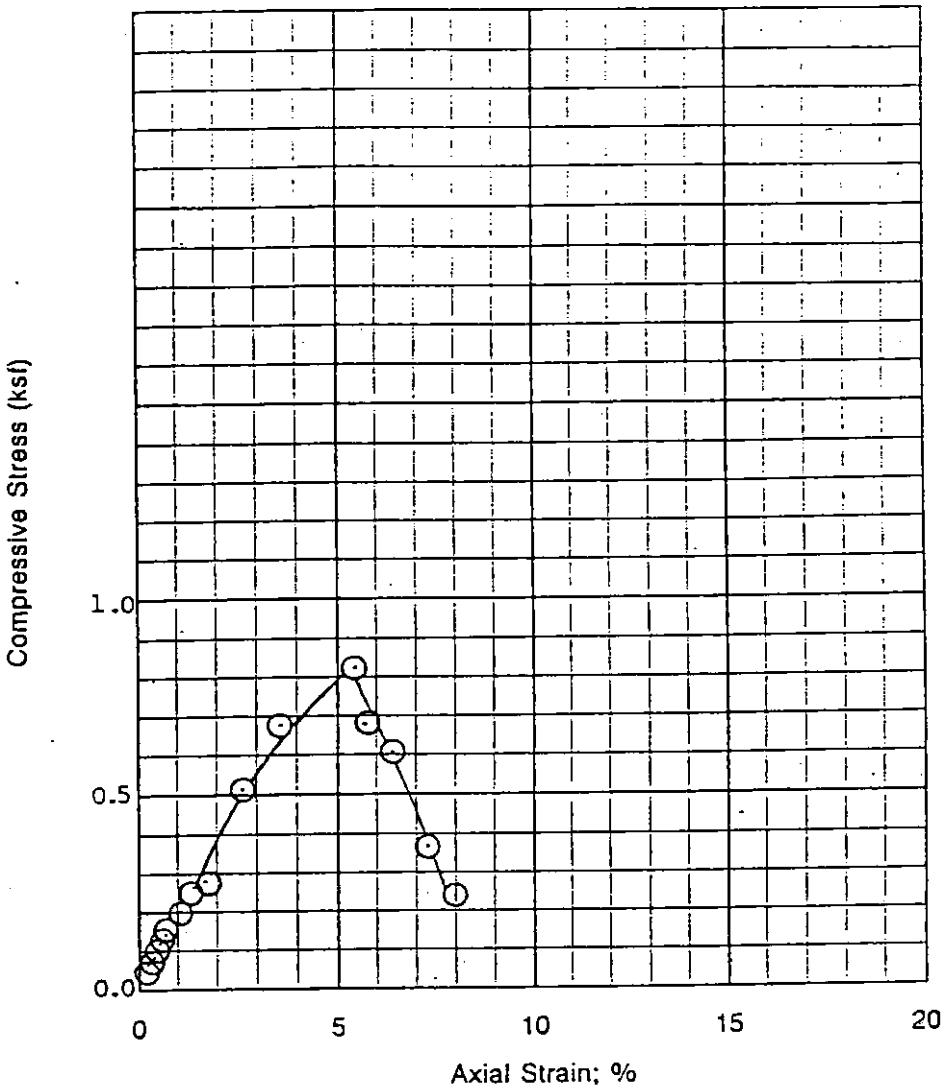
Sample No U-3 Depth 30.0' - 32.0' Date July 1990

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches

GF-211/U-1





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	36.4 %	%	%	%
	Void ratio	e_o	1.254			
	Saturation	S_o	79.8 %	%	%	%
	Dry density, lb/cu ft	γ_d	76.1			
Time to failure, min		t_f	8			
Unconfined compressive strength, ksf		q_u	0.82			
Initial specimen diameter, in		D_o	2.86			
Initial specimen height, in		H_o	5.59			

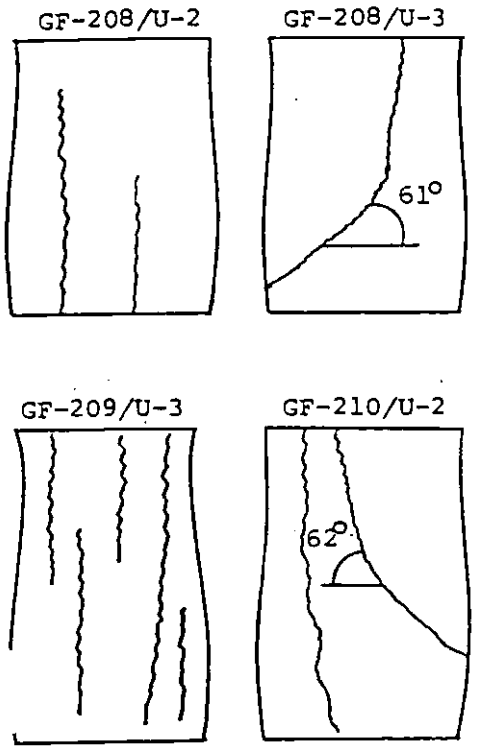
UNCONFINED COMPRESSION TEST REPORT

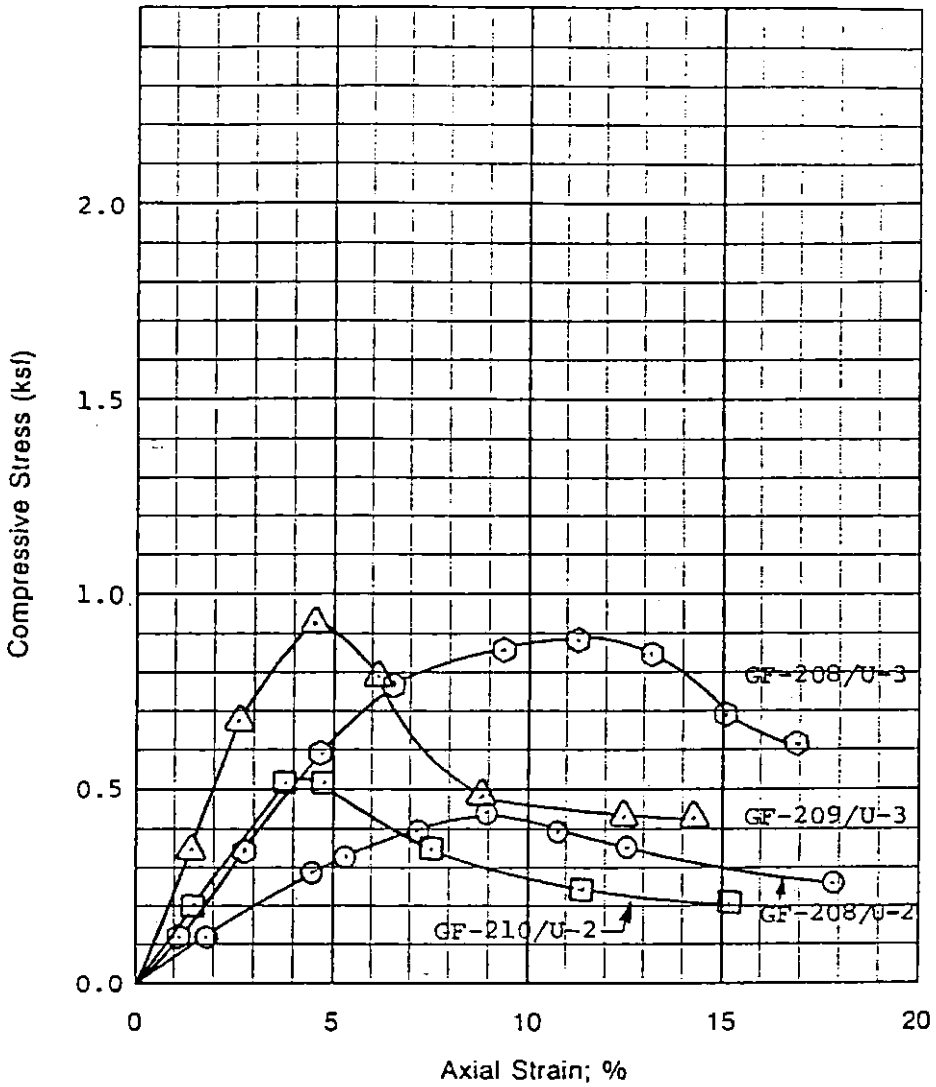
Project DELAWARE SOLID WASTE AUTH. PHASE IA Boring No GF-211

Sample No U-1 Depth 10.0' - 12.0' Date July 1990

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches





Boring No.			208/U2	208/U3	209/U3	210/U2
Depth			44.5'-46.5'	49.0'-51.0'	49.0'-51.0'	20.0'-22.0'
Initial	Water content	w_o	71.3 %	54.0 %	81.0 %	69.9 %
	Void ratio	e_o	2.148	1.526	2.354	2.097
	Saturation	S_o	91.3 %	97.3 %	94.6 %	91.7 %
	Dry density, lb/cu ft	γ_d	55.0	68.2	51.4	55.9
Time to failure, min		t_f	6.7	8.0	3.3	3.3
Unconfined compressive strength, ksf		q_u	0.44	0.88	0.93	0.53
Initial specimen diameter, in		D_o	2.85	2.83	2.83	2.84
Initial specimen height, in		H_o	5.57	5.32	5.60	5.28

UNCONFINED COMPRESSION TEST REPORT

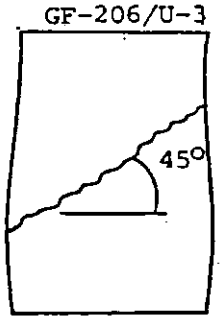
Project DELAWARE SOLID WASTE AUTH. PHASE IA Boring No //

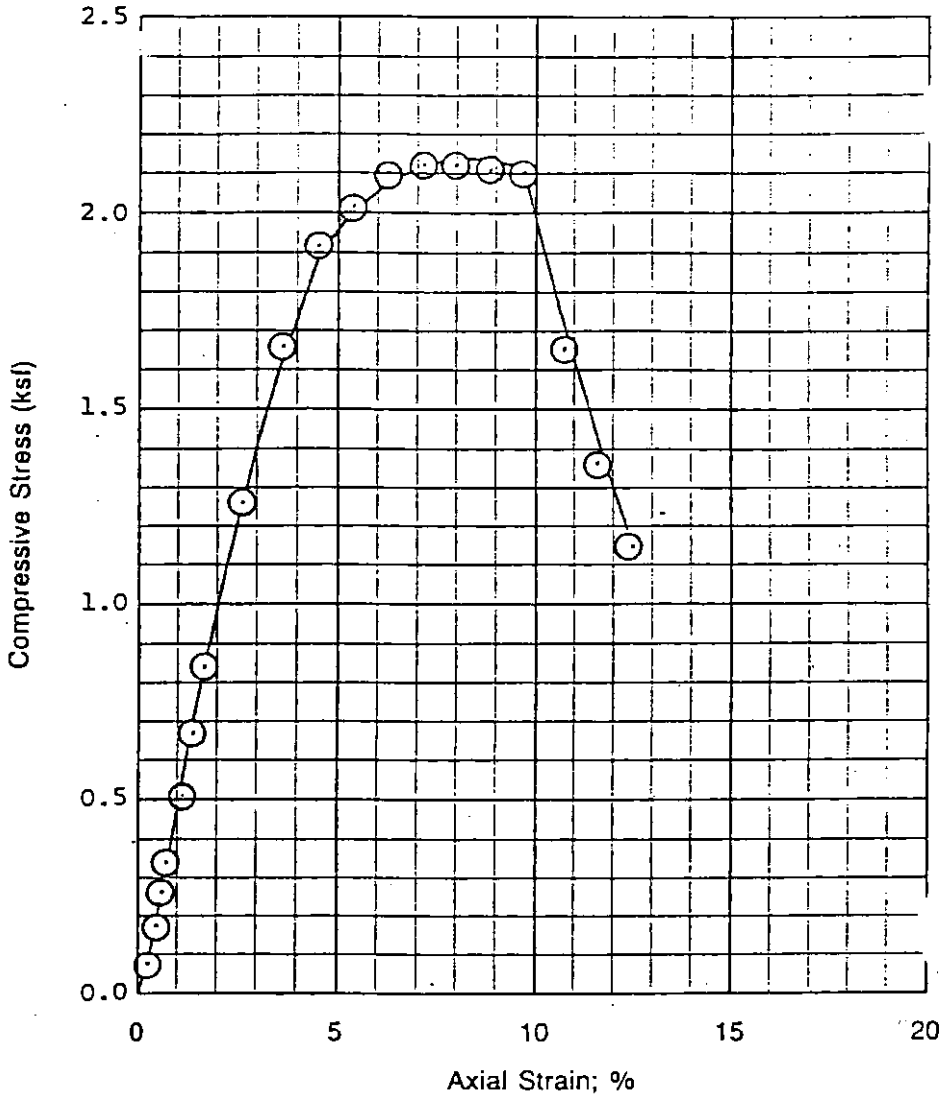
Sample No // Depth // Date July 1990

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches

GF-206/U-3





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	140.0 %	%	%	%
	Void ratio	e_o	4.080			
	Saturation	S_o	94.4 %	%	%	%
	Dry density, lb/cu ft	γ_d	33.8			
Time to failure, min		t_f	11			
Unconfined compressive strength, ksf		q_u	2.13			
Initial specimen diameter, in		D_o	2.85			
Initial specimen height, in		H_o	5.59			

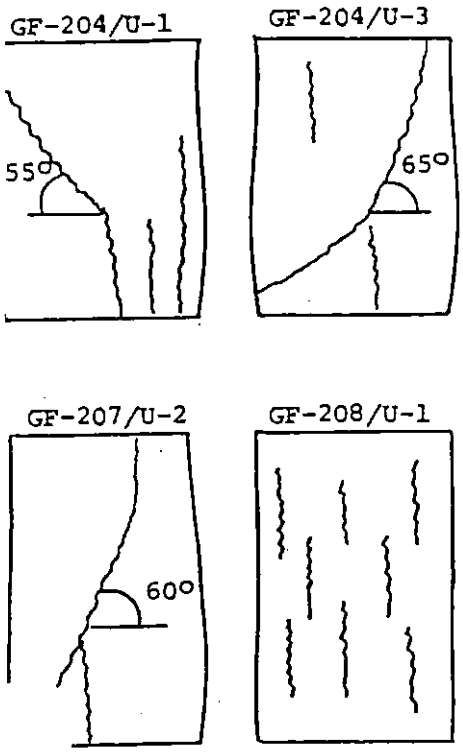
UNCONFINED COMPRESSION TEST REPORT

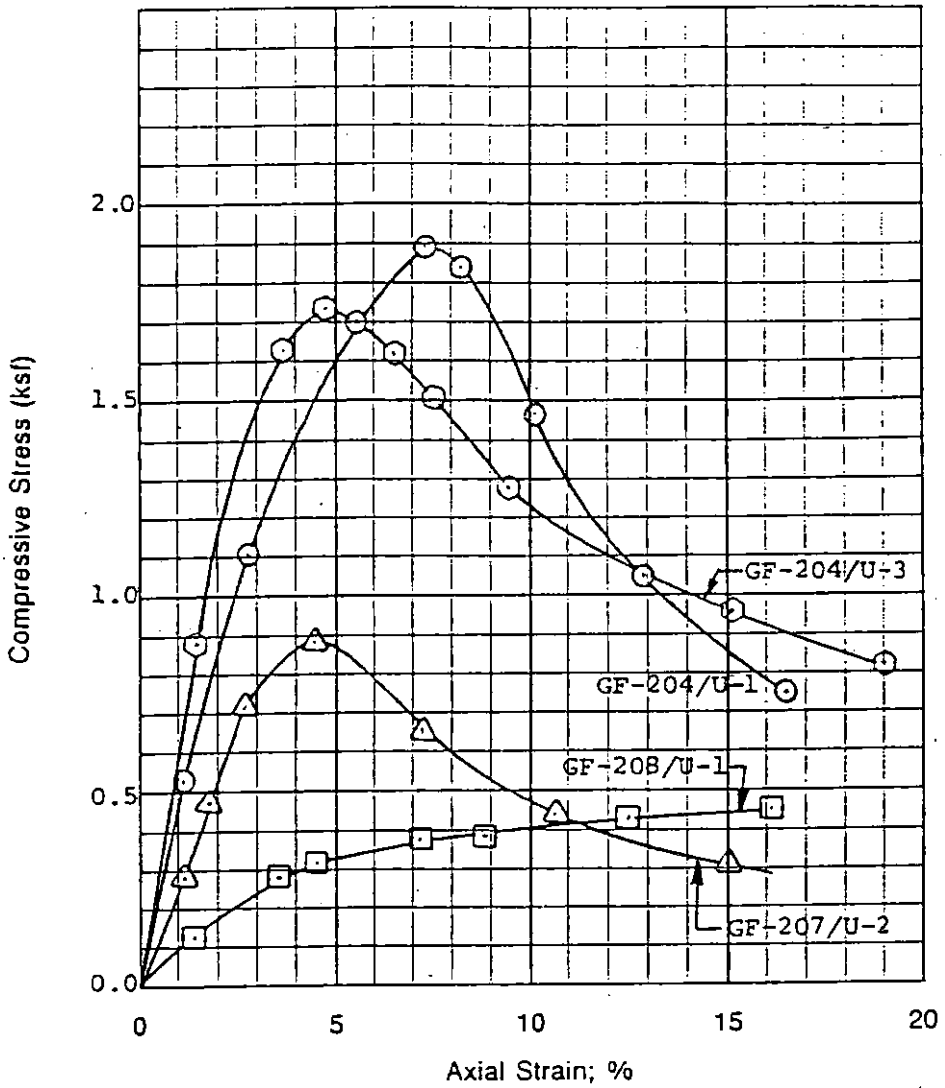
Project DELAWARE SOLID WASTE AUTH. PHASE IA Boring No GF-206

Sample No U-3 Depth 30.0' - 32.0' Date July 1990

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches





	Boring No.		204/U1	204/U3	207/U2	208/U1
	Depth		38.0'-40.0'	44.5'-46.5'	20.0'-22.0'	42.5'-44.5'
Initial	Water content	w_o	50.6 %	83.5 %	84.3 %	81.6 %
Initial	Void ratio	e_o	1.490	2.428	2.474	2.461
Initial	Saturation	S_o	93.4 %	94.6 %	93.7 %	91.2 %
Initial	Dry density, lb/cu ft	γ_d	69.3	50.2	49.6	49.9
Time to failure, min		t_f	5.3	3.3	3.3	
Unconfined compressive strength, ksf		q_u	1.89	1.73	0.88	0.44*
Initial specimen diameter, in		D_o	2.84	2.86	2.84	2.83
Initial specimen height, in		H_o	5.44	5.26	5.59	5.59

* @ 15% strain

UNCONFINED COMPRESSION TEST REPORT

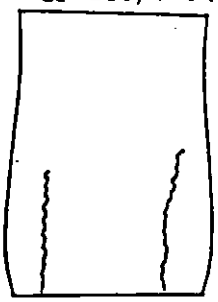
Project DELAWARE SOLID WASTE AUTH. PHASE IA Boring No //

Sample No // Depth // Date July 1990

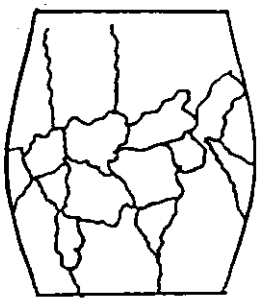
GANNETT FLEMING GEOTECHNICAL LABORATORY

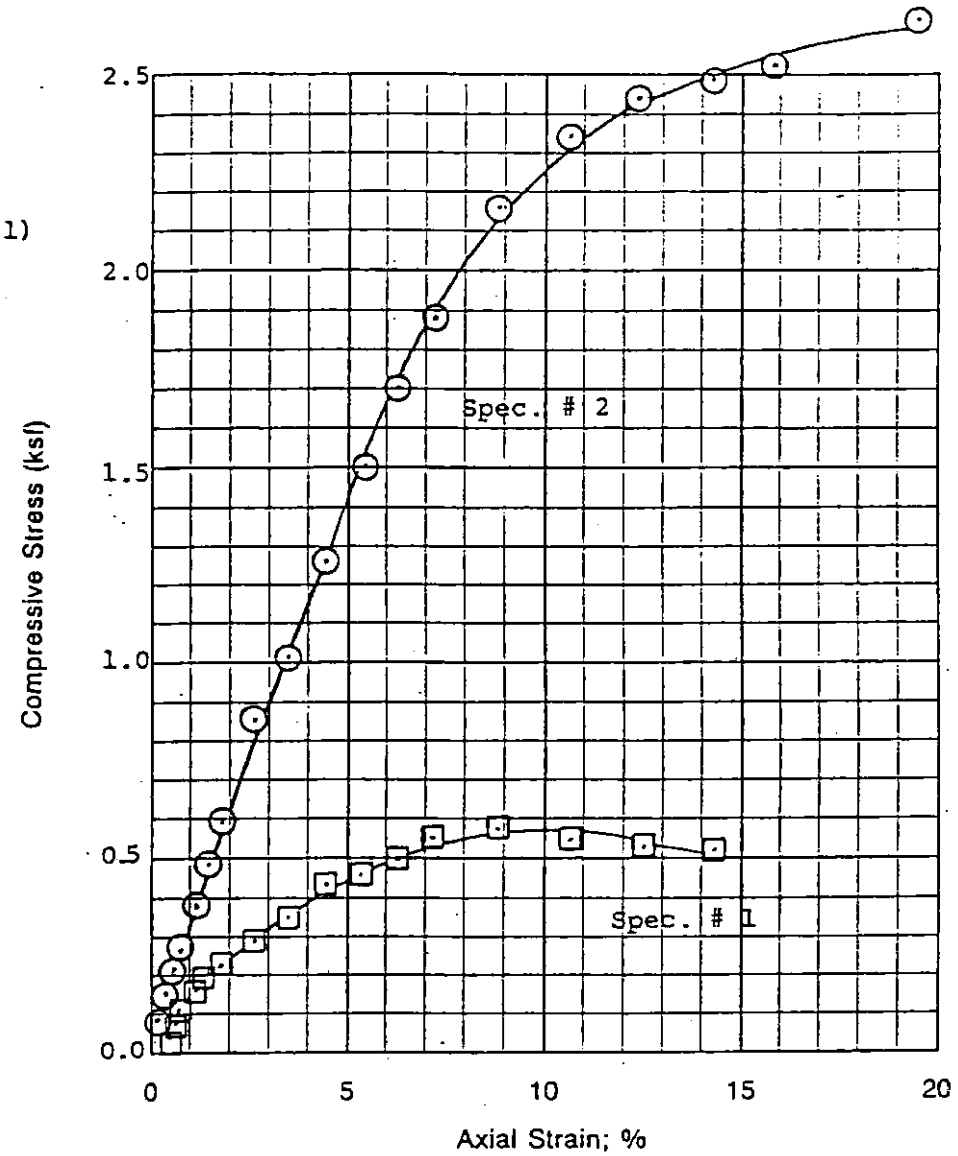
Failure Sketches

GF-203/U-3(Spec. # 1)



GF-203/U-3(Spec.# 2)





Test no			1	2		
Type of specimen			Shelby	Shelby		
Initial	Water content	w_o	98.8 %	193.8 %	%	%
	Void ratio	e_o	2.936	6.071		
	Saturation	S_o	92.5 %	87.8 %	%	%
	Dry density, lb/cu ft	γ_d	44.0	24.3		
Time to failure, min		t_f	13			
Unconfined compressive strength, ksf		q_u	0.58	2.53 *		
Initial specimen diameter, in		D_o	2.81	2.82		
Initial specimen height, in		H_o	5.61	5.65		

UNCONFINED COMPRESSION TEST REPORT

Project DELAWARE SOLID WASTE AUTH. PHASE IA Boring No GF-203

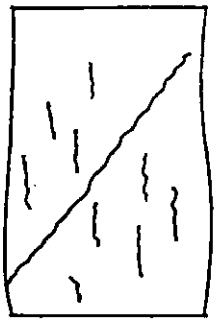
Sample No U-3 Depth 30.0' - 32.0' Date July 1990

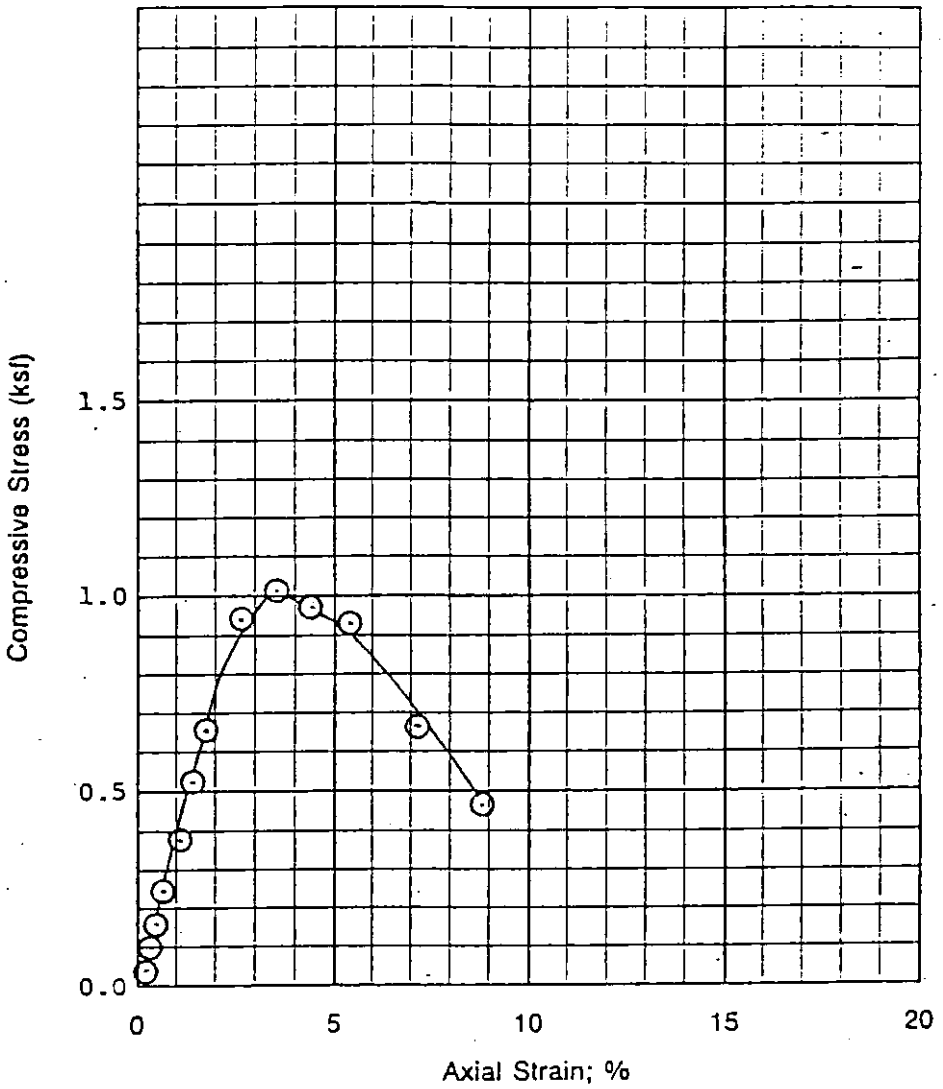
GANNETT FLEMING GEOTECHNICAL LABORATORY

* @ 15% strain

Failure Sketches

GF-203/U-2





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	67.0 %	%	%	%
	Void ratio	e_o	2.088			
	Saturation	S_o	88.2 %	%	%	%
	Dry density, lb/cu ft	γ_d	55.9			
Time to failure, min		t_f	2.5			
Unconfined compressive strength, ksf		q_u	1.03			
Initial specimen diameter, in		D_o	2.88			
Initial specimen height, in		H_o	5.59			

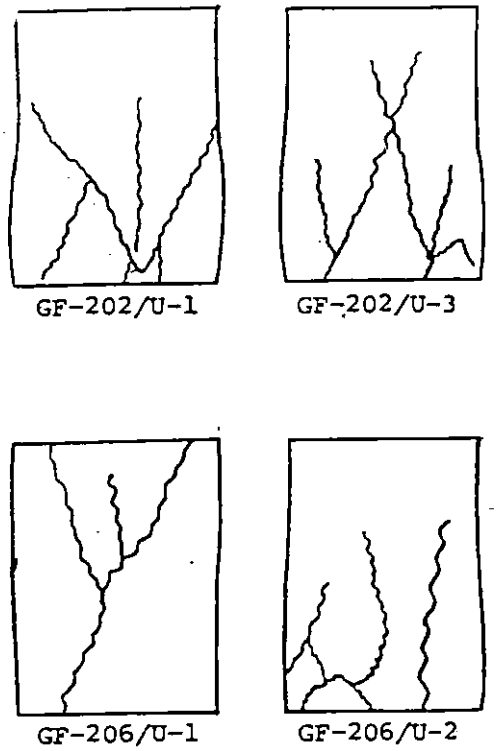
UNCONFINED COMPRESSION TEST REPORT

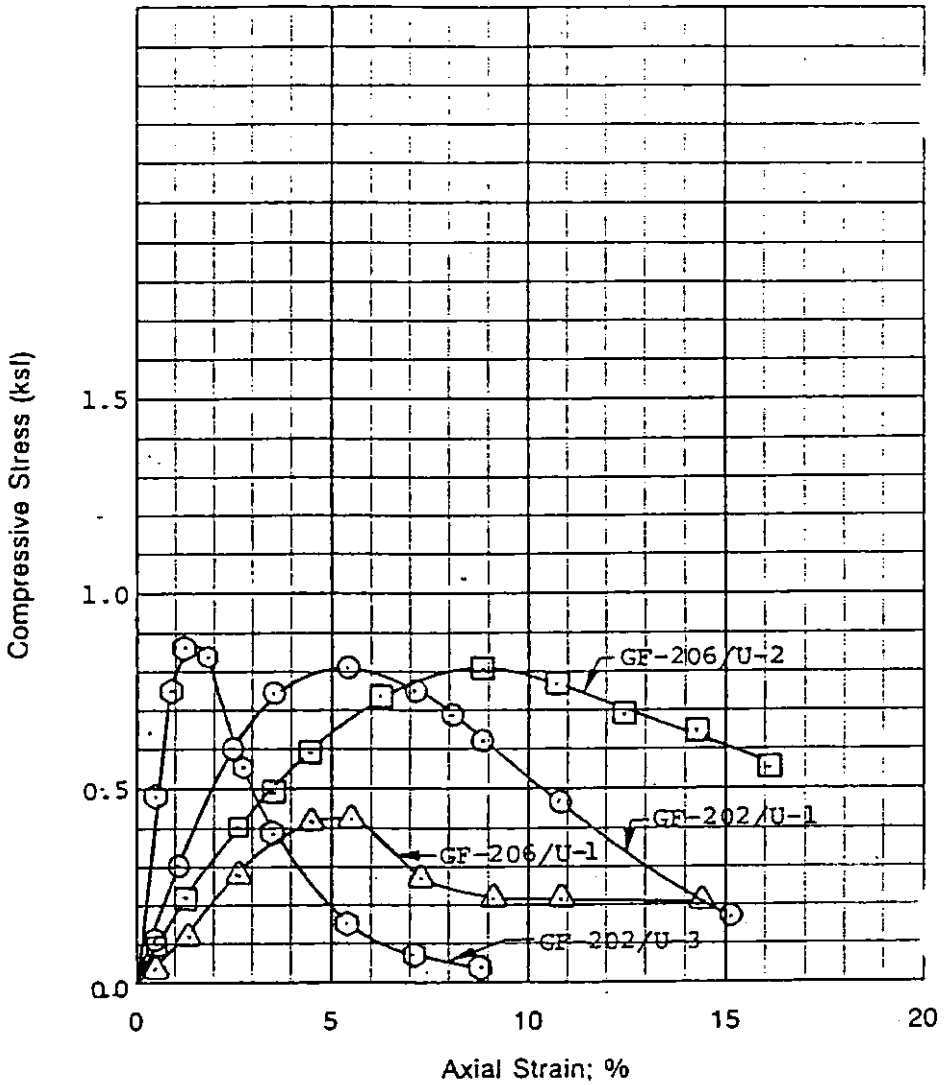
Project DELAWARE SOLID WASTE AUTH. PHASE IA Boring No GF-203

Sample No U-2 Depth 20.0' - 22.0' Date July 1990

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches





Boring No./Sample No.			GF-202/U 1	GF-202/U 3	GF-206/U 1	GF-206/U 2
Depth			10.0'-12.0'	20.0'-22.0'	10.0'-12.0'	20.0'-22.0'
Initial	Water content	w_o	92.0 %	85.0 %	50.8 %	58.7 %
	Void ratio	e_o	2.612	2.403	1.442	1.660
	Saturation	S_o	96.9 %	97.3 %	96.9 %	97.2 %
	Dry density, lb/cu ft	γ_d	47.5	50.4	70.3	64.5
Time to failure, min		t_f	2.7	0.67	2.7	4.5
Unconfined compressive strength, ksf		q_u	0.81	0.87	0.43	0.81
Initial specimen diameter, in		D_o	2.84	2.84	2.82	2.83
Initial specimen height, in		H_o	5.61	5.61	5.49	5.59

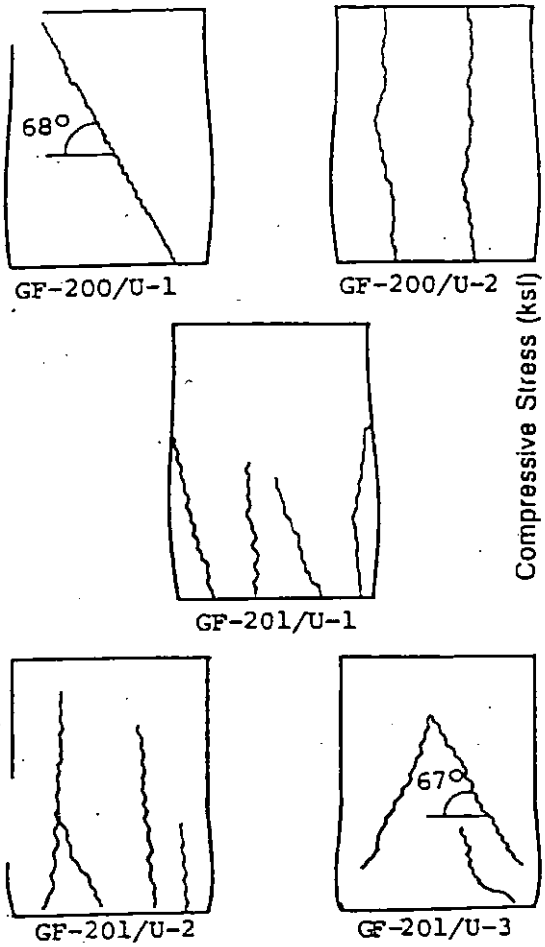
UNCONFINED COMPRESSION TEST REPORT

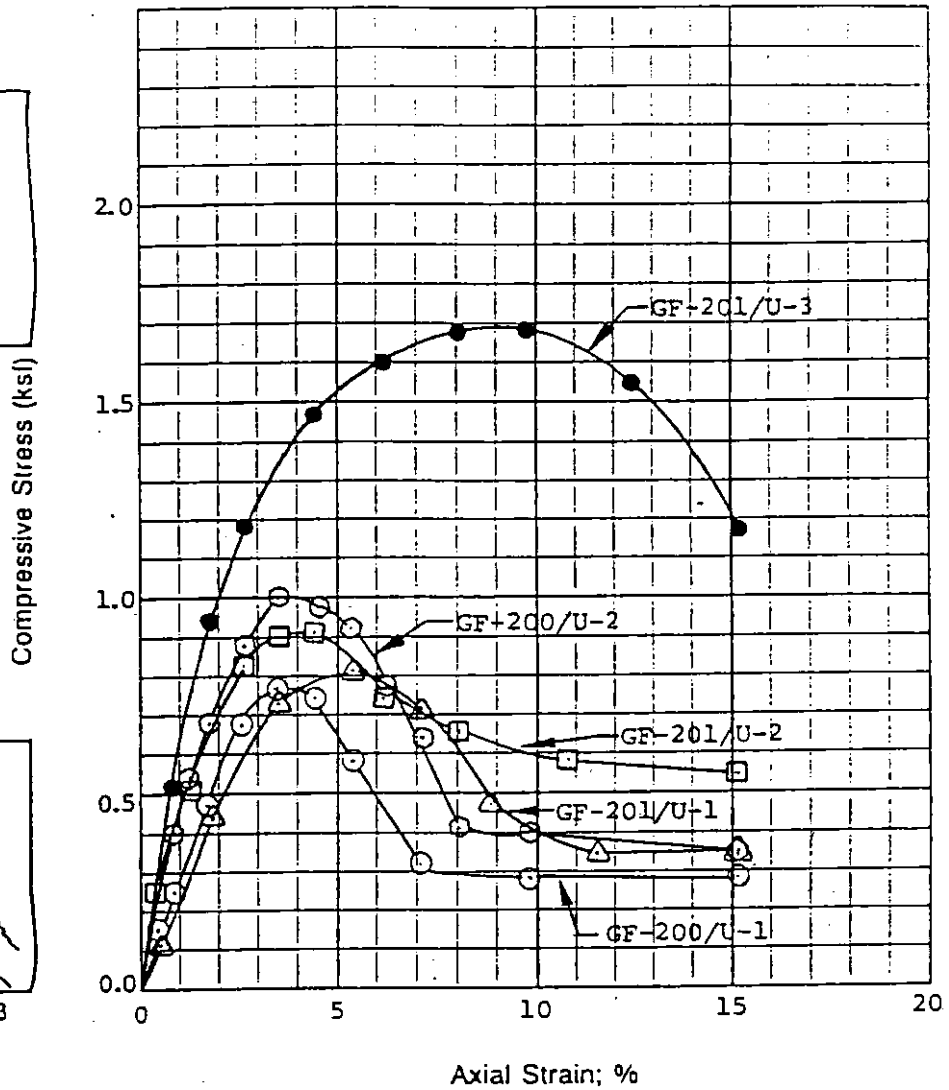
Project DELAWARE SOLID WASTE AUTH.NSWF-2/PHASE IA Boring No GF-202 & 206

Sample No // Depth 10.0' - 22.0' Date June 1990

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches





Boring No/Sample No.			200/U-1	200/U-2	201/U-1	201/U-2	201/U-3
Depth			10'-12'	20'-22'	10'-12'	20'-22'	30'-32'
Initial	Water content	w_o	79.8	84.4	94.3	94.8	90.1
	Void ratio	e_o	2.377	2.398	2.751	2.673	2.722
	Saturation	S_o	92.3	96.8	94.3	97.5	91.0
	Dry density, lb/cu ft	γ_d	51.1	50.5	45.8	46.7	46.1
Time to failure, min		t_f	1.8	1.8	2.7	2.2	4.9
Unconfined compressive strength, ksf		q_u	0.77	1.00	0.82	0.91	1.68
Initial specimen diameter, in		D_o	2.84	2.85	2.84	2.85	2.85
Initial specimen height, in		H_o	5.61	5.60	5.60	5.60	5.60

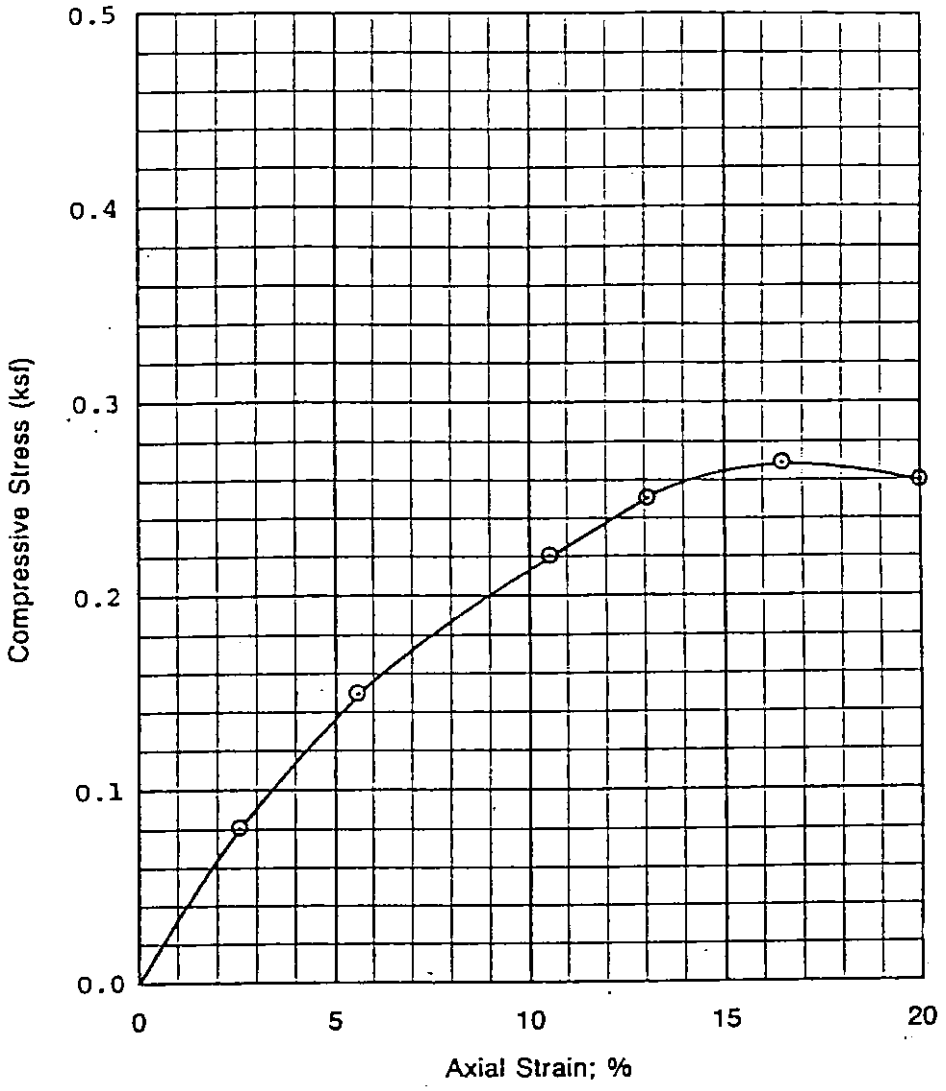
UNCONFINED COMPRESSION TEST REPORT

Project DELAWARE SOLID WASTE AUTH./NSWF-2/PHASE IA Boring No GF-200 & 201

Sample No /// Depth 10.0' - 32.0' Date June 1990

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches



Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	78.7 %	%	%	%
	Void ratio	e_o	2.249			
	Saturation	S_o	96.0 %	%	%	%
	Dry density, lb/cu ft	γ_d	52.8			
Time to failure, min		t_f	17			
Unconfined compressive strength, ksf		q_u	0.26			
Initial specimen diameter, in		D_o	2.838"			
Initial specimen height, in		H_o	5.742"			

UNCONFINED COMPRESSION TEST REPORT

Project DSWA NSWF - 2 PHASE III Boring No GF-110

Sample No U-2 Depth 25.0'-27.0' Date 11/3/89

GANNETT FLEMING GEOTECHNICAL LABORATORY

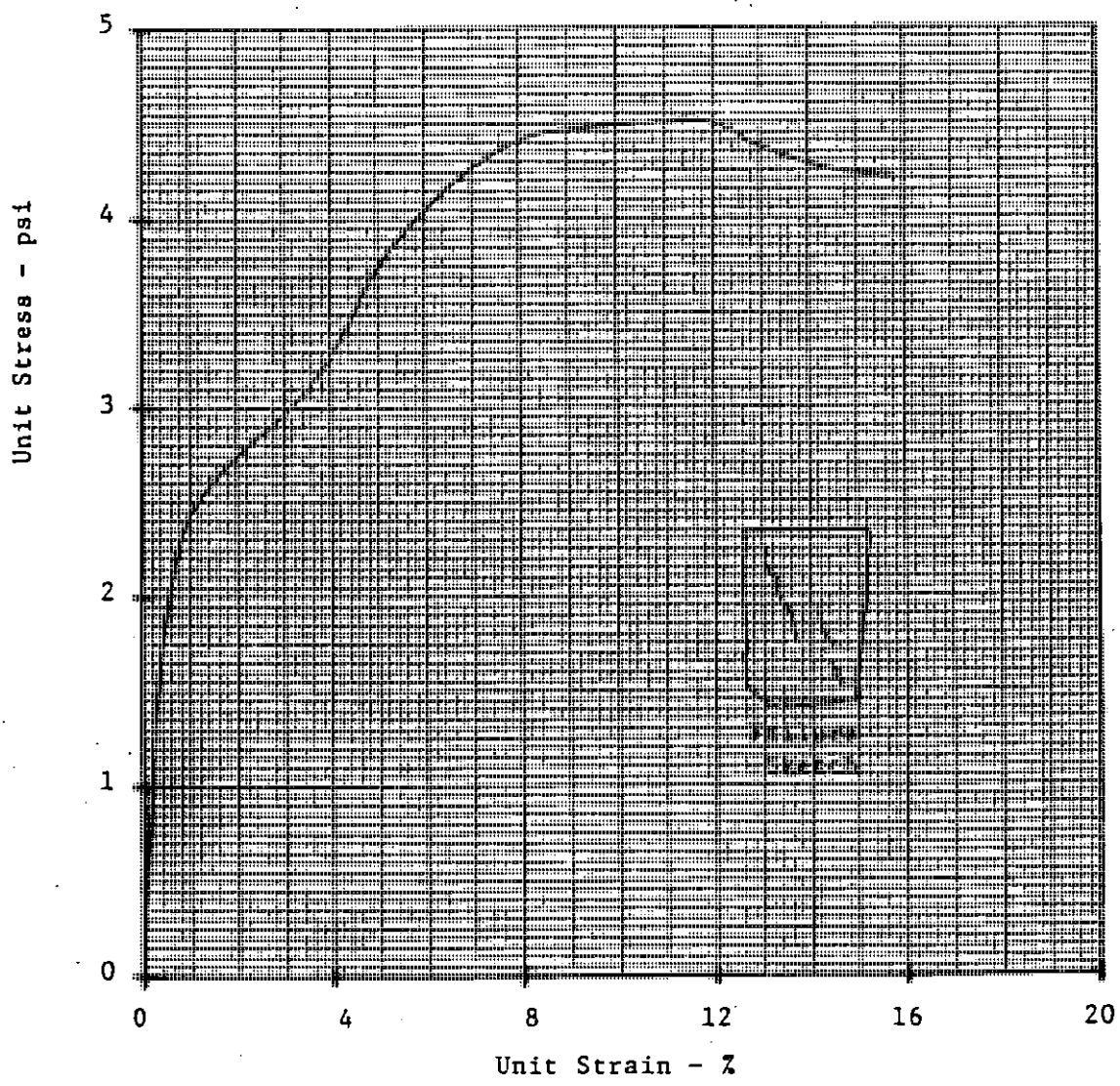
UNCONFINED COMPRESSION TEST
ASTM DESIGNATION: D 2166

DSWA, NSWF-2, Phase III
WILMINGTON, DELAWARE

Boring No.: GF-109
Sample Depth: 37.0'-39.0'

Sample Type: Undisturbed
Specimen Size: 1.75" dia.
3.50" hgt.

Maximum Compressive Stress:	4.55 p.s.i.
Failure Strain:	11.7%
Wet Density:	105.3 p.c.f.
Moisture Content:	79.5%
Dry Density:	58.7 p.c.f.



January 1990

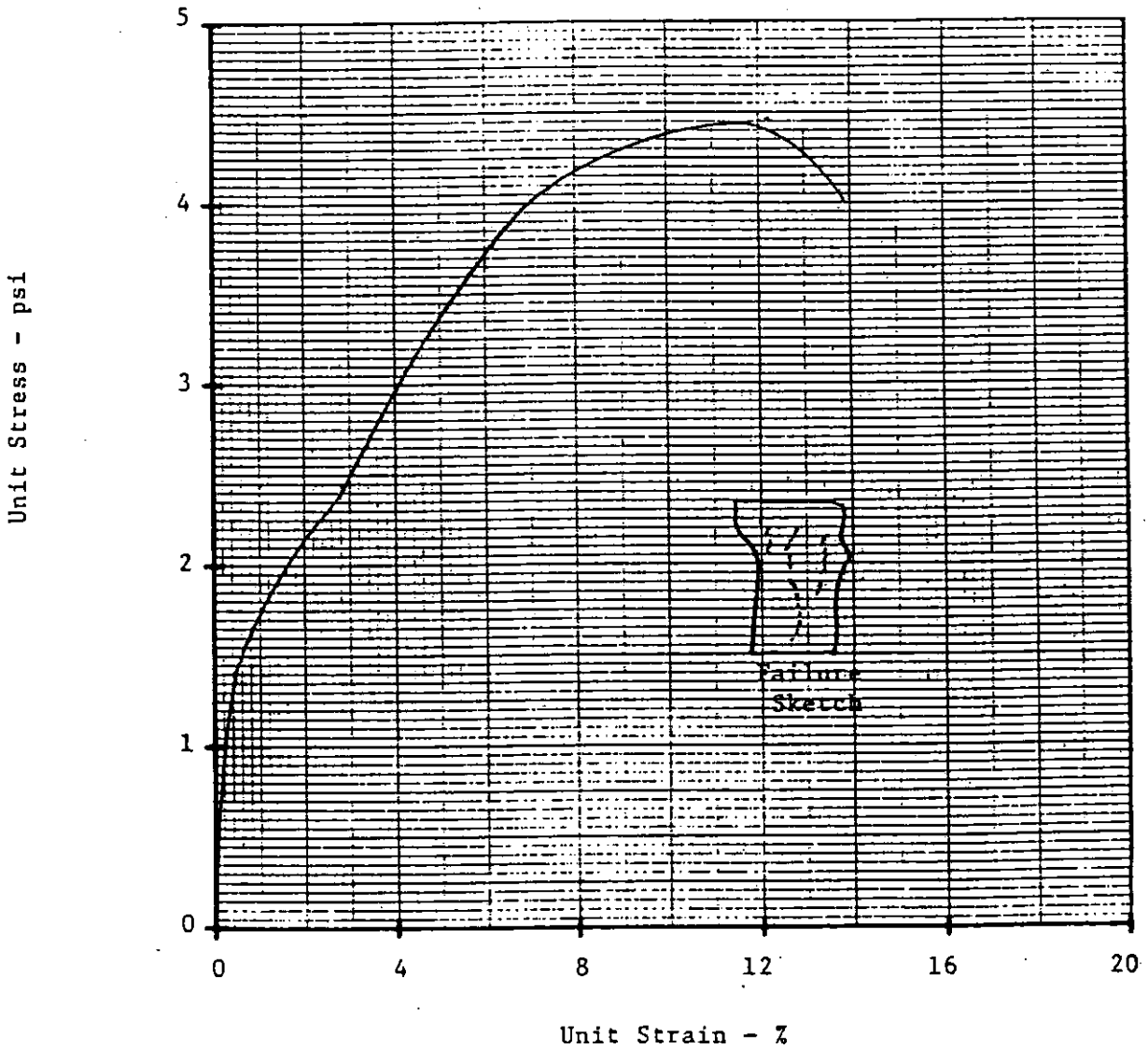
F. T. Kitlinski & Associates, Inc.
Harrisburg, Pennsylvania

UNCONFINED COMPRESSION TEST
ASTM DESIGNATION: D 2166

DSWA, NSWF-2, Phase III
WILMINGTON, DELAWARE

Boring No.: GF-108 Sample Type: Undisturbed
Sample Depth: 49.0'-51.0' Specimen Size: 1.75" dia.
3.50" hgt.

Maximum Compressive Strength: 4.44 p.s.i.
Failure Strain: 11.4%
Wet Density: 105.7 p.c.f.
Moisture Content: 67.9%
Dry Density: 63.0 p.c.f.



January 1990

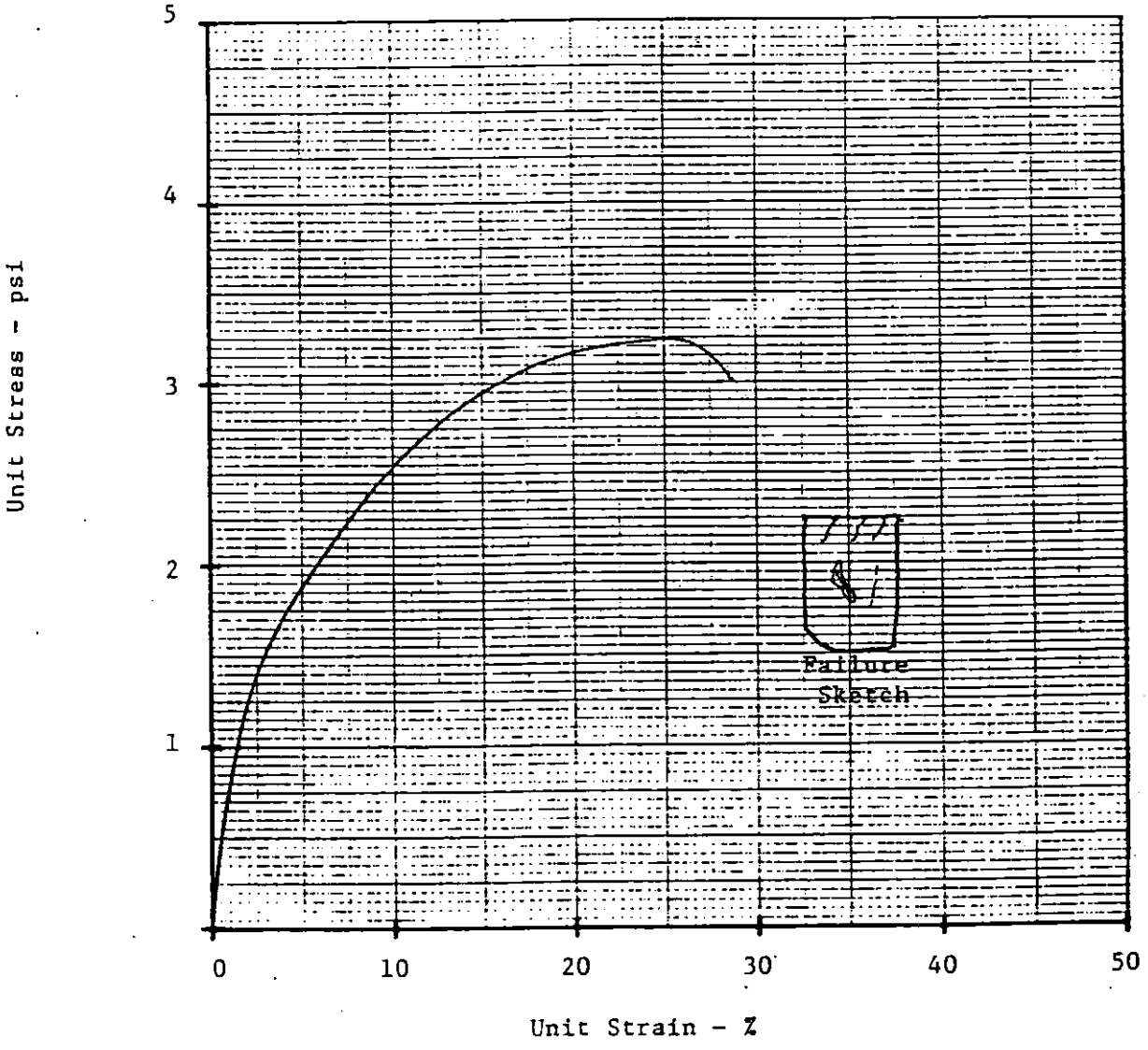
F. T. Kitlinski & Associates, Inc.
Harrisburg, Pennsylvania

UNCONFINED COMPRESSION TEST
ASTM DESIGNATION: D 2166

DSWA, NSWF-2, Phase III
WILMINGTON, DELAWARE

Boring No.: GF-108 Sample Type: Undisturbed
Depth: 28.5' - 30.5' Specimen Size: 1.75" dia.
3.50" hgt.

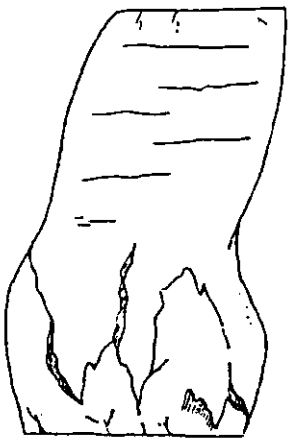
Maximum Compressive Stress: 3.23 p.s.i.
Failure Strain: 25.7%
Wet Density: 99.8 p.c.f
Moisture Content: 86.7%
Dry Density: 53.5 p.c.f.

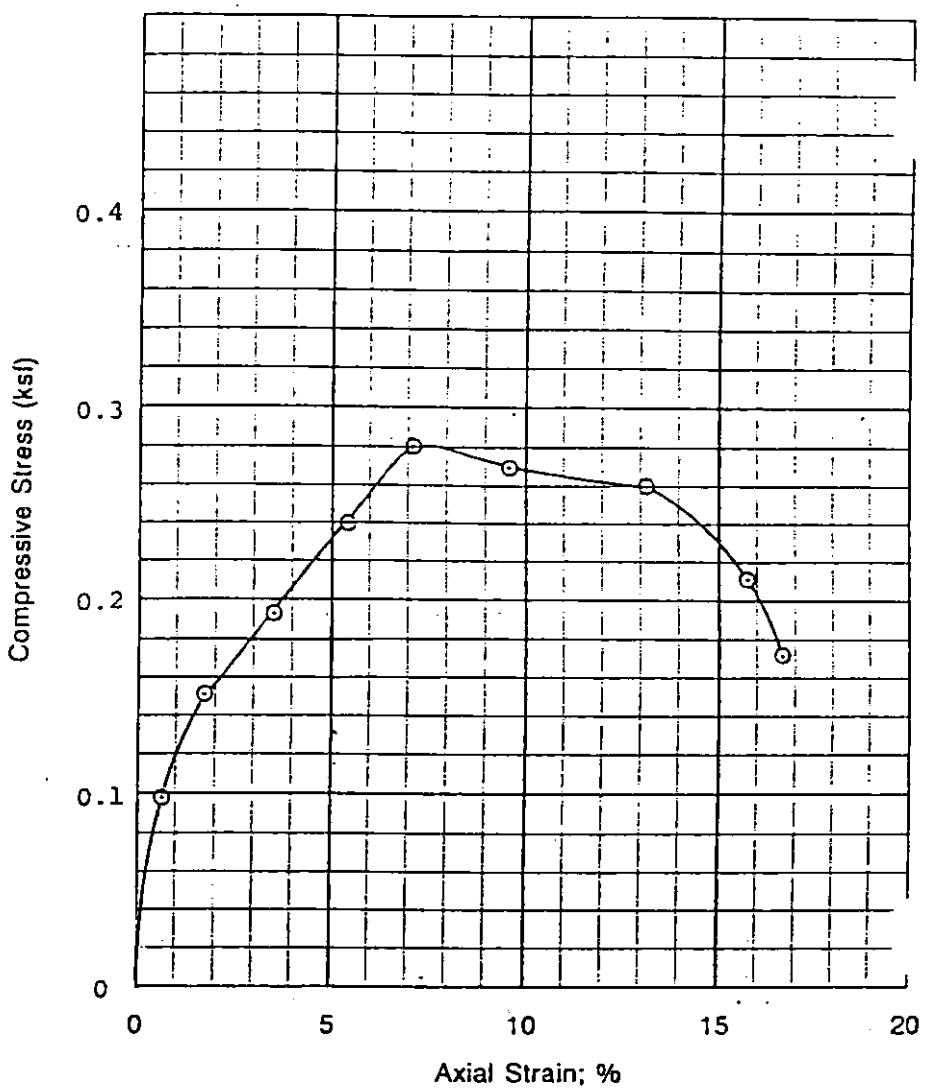


January 1990

F. T. Kitlinski & Associates, Inc.
Harrisburg, Pennsylvania

Failure Sketches





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	98.3 %	%	%	%
	Void ratio	e_o	2.705			
	Saturation	S_o	100 %	%	%	%
	Dry density, lb/cu ft	γ_d	46.3			
Time to failure, min		t_f	3.5			
Unconfined compressive strength, ksf		q_u	0.28			
Initial specimen diameter, in		D_o	1.820"			
Initial specimen height, in		H_o	5.770"			

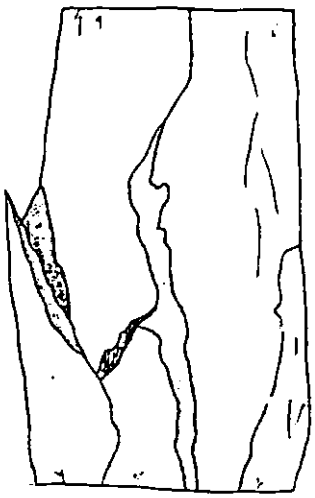
UNCONFINED COMPRESSION TEST REPORT

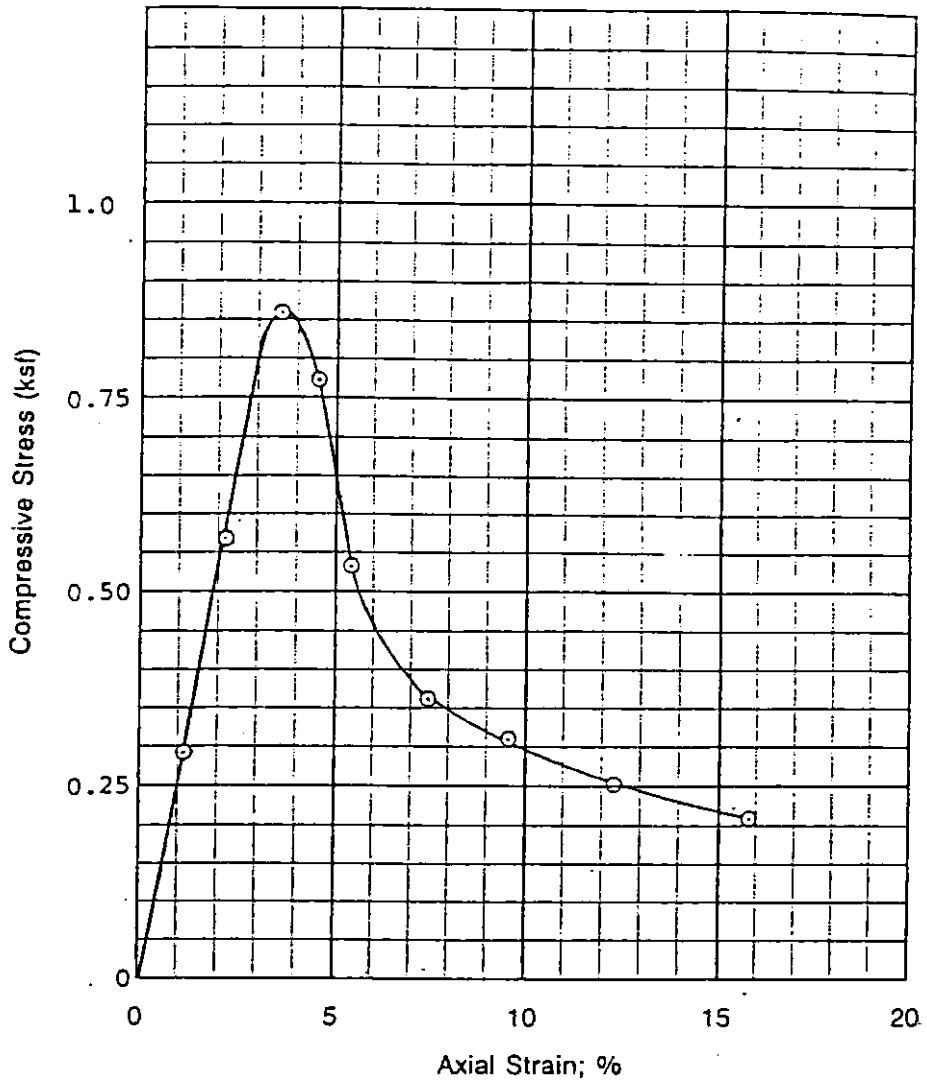
Project DSWA NSWF - 2 PHASE III Boring No GF - 104A

Sample No U - 4 Depth 35.0'-37.0' Date 11/27/89

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	53.8 %	%	%	%
	Void ratio	e_o	1.872			
	Saturation	S_o	79.0 %	%	%	%
	Dry density, lb/cu ft	γ_d	59.8			
Time to failure, min		t_f	2.0			
Unconfined compressive strength, ksf		q_u	0.86			
Initial specimen diameter, in		D_o	2.827"			
Initial specimen height, in		H_o	5.669"			

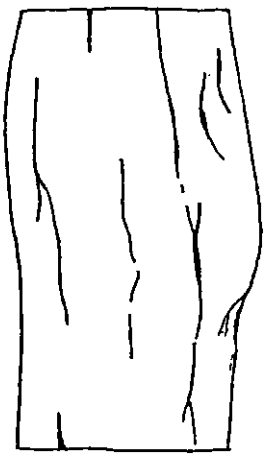
UNCONFINED COMPRESSION TEST REPORT

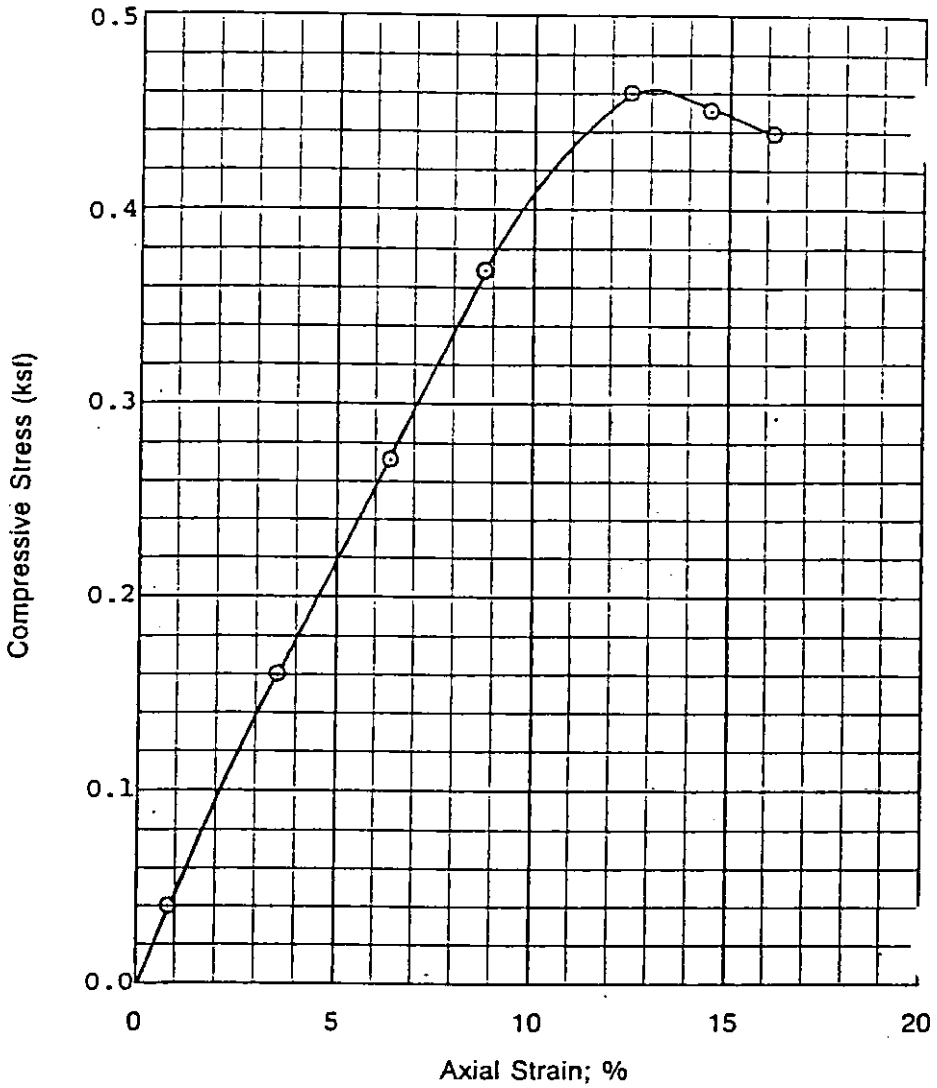
Project DSWA NSWF - 2 PHASE III Boring No GF - 104A

Sample No U - 2 Depth 16.5'-18.5' Date 11/22/89

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	56.5 %	%	%	%
	Void ratio	e_o	1.698			
	Saturation	S_o	91.5 %	%	%	%
	Dry density, lb/cu ft	γ_d	63.6			
Time to failure, min		t_f	11			
Unconfined compressive strength, ksf		q_u	0.46			
Initial specimen diameter, in		D_o	2.848"			
Initial specimen height, in		H_o	5.582"			

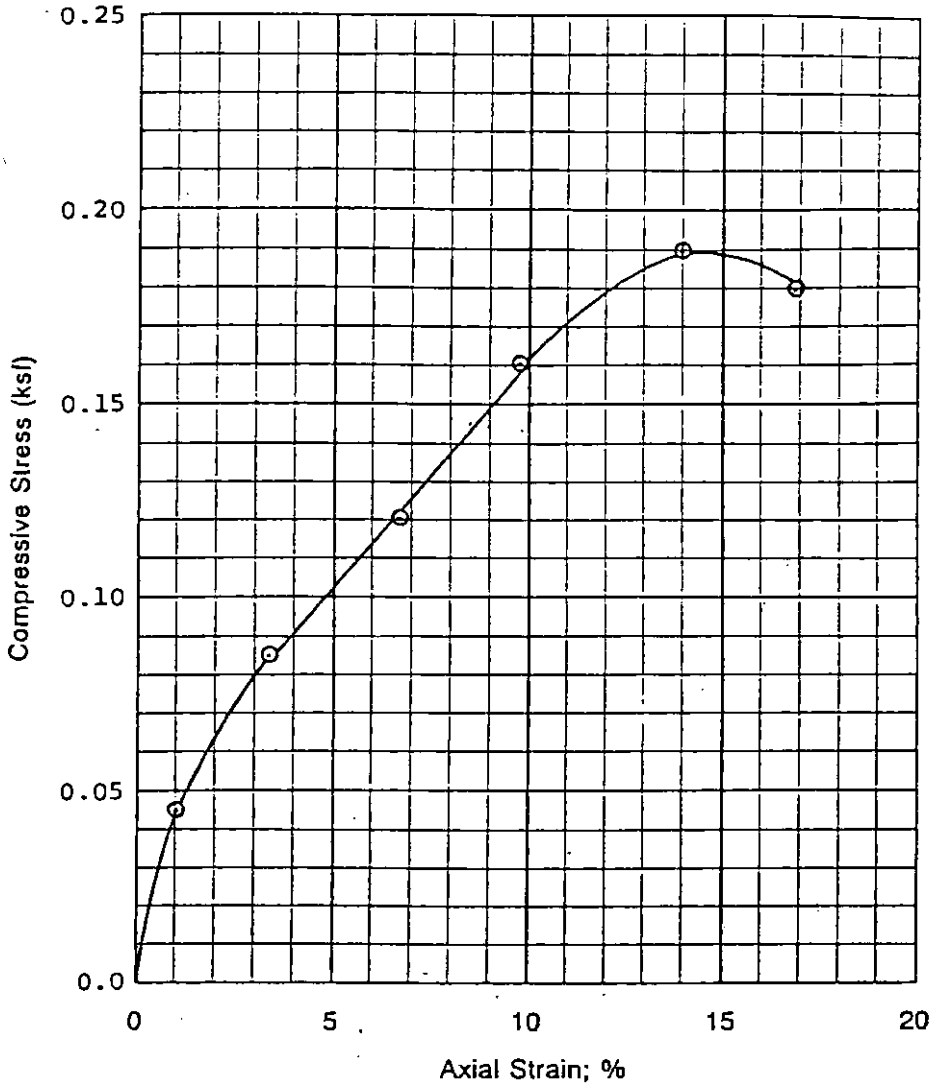
UNCONFINED COMPRESSION TEST REPORT

Project DSWA NSWF - 2 PHASE III Boring No GF-103

Sample No U-2 Depth 45.0'-47.0' Date 11/3/89

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches



Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	97.8 %	%	%	%
	Void ratio	e_o	2.552			
	Saturation	S_o	100.0 %	%	%	%
	Dry density, lb/cu ft	γ_d	48.5			
Time to failure, min		t_f	7			
Unconfined compressive strength, ksf		q_u	0.19			
Initial specimen diameter, in		D_o	2.762"			
Initial specimen height, in		H_o	5.664"			

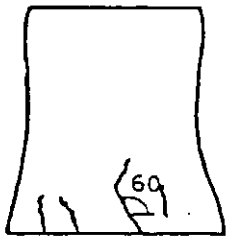
UNCONFINED COMPRESSION TEST REPORT

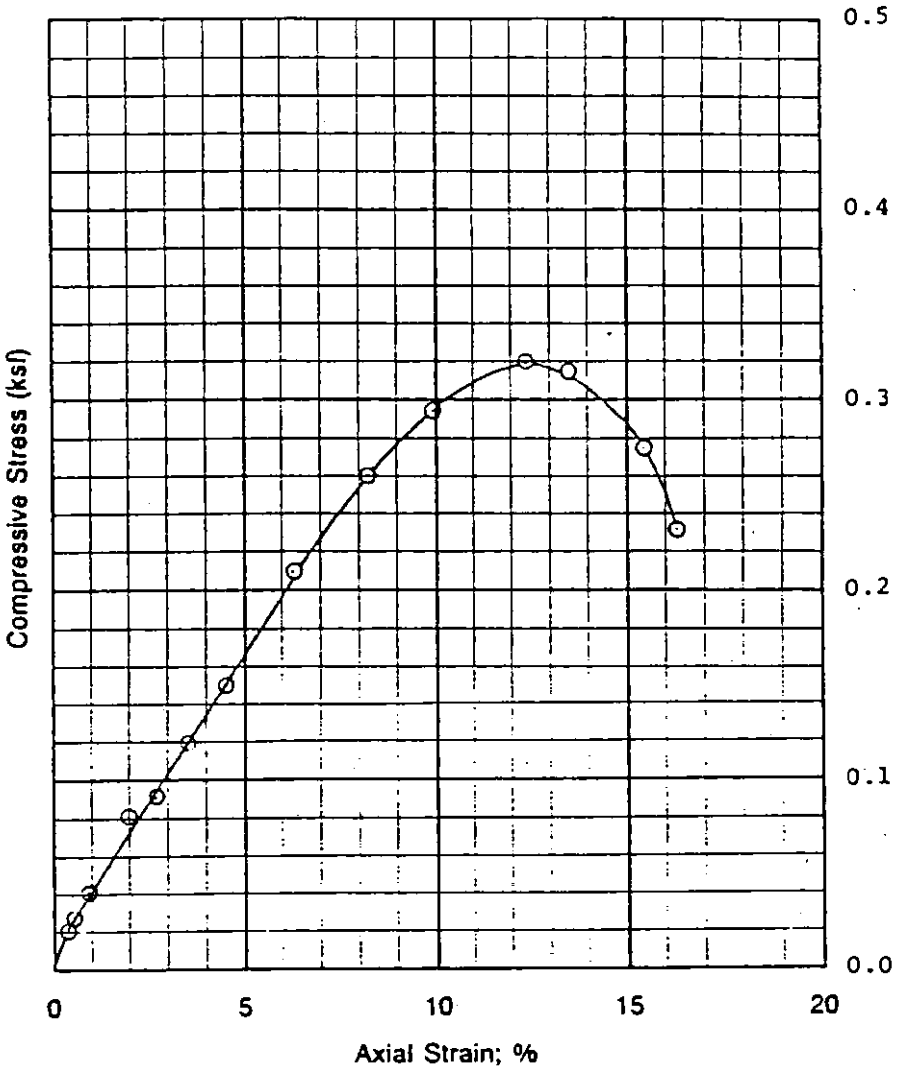
Project DSWA NSWF - 2 PHASE III Boring No GF-103

Sample No U-1 Depth 15.0'-17.0' Date 11/3/89

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	78.5 %	%	%	%
	Void ratio	e_o	2.100			
	Saturation	S_o	96.1 %	%	%	%
	Dry density, lb/cu ft	γ_d	51.7			
Time to failure, min		t_f	10.2			
Unconfined compressive strength, ksf		q_u	0.32			
Initial specimen diameter, in		D_o	2.843			
Initial specimen height, in		H_o	5.512			

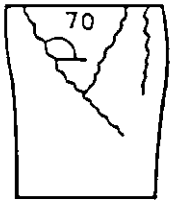
UNCONFINED COMPRESSION TEST REPORT

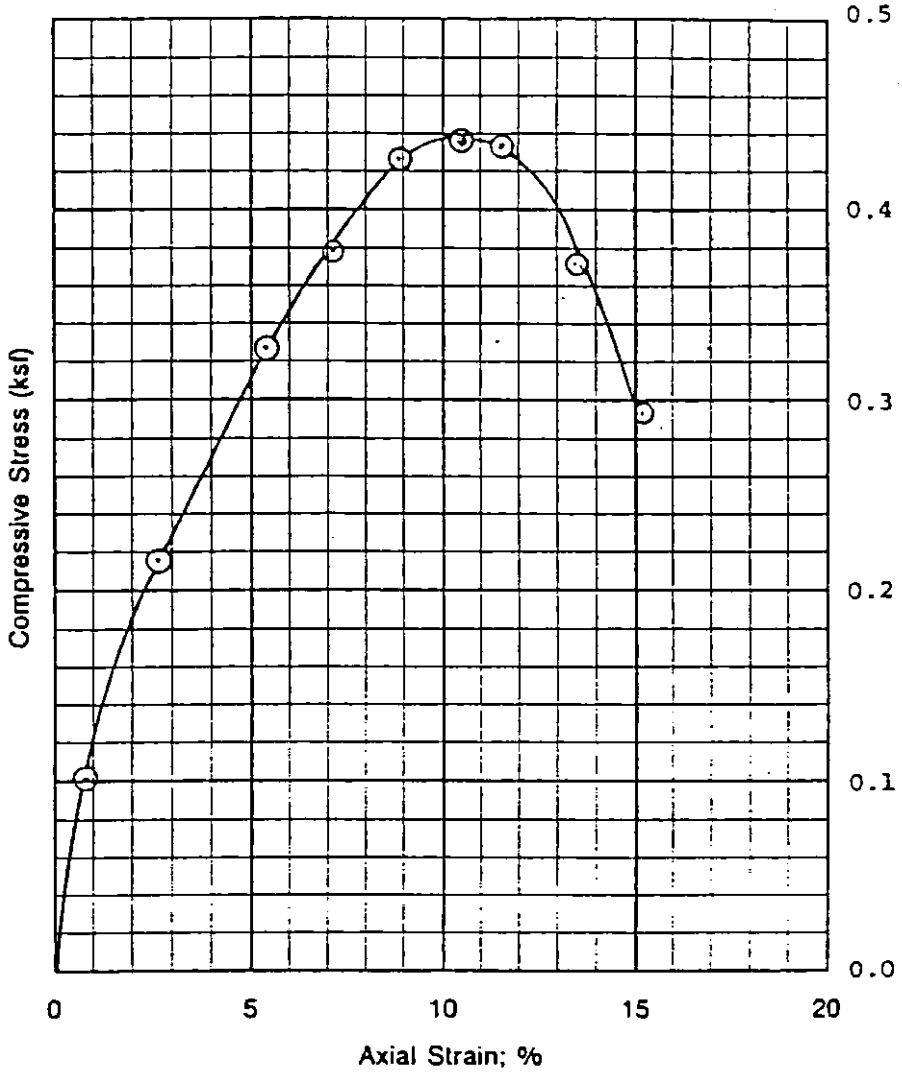
Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-8

Sample No S-13 Depth 25.0' - 27.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	82.1 %	%	%	%
	Void ratio	e_o	2.317			
	Saturation	S_o	95.5 %	%	%	%
	Dry density, lb/cu ft	γ_d	50.8			
Time to failure, min		t_f	6.1			
Unconfined compressive strength, ksf		q_u	0.44			
Initial specimen diameter, in		D_o	2.85			
Initial specimen height, in		H_o	6.36			

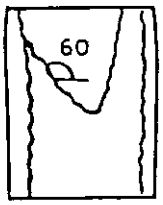
UNCONFINED COMPRESSION TEST REPORT

Project DSWA NORTHERN FACILITY- 2 Boring No GF-8

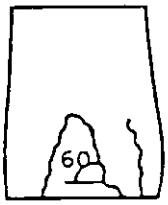
Sample No S-4 Depth 5- 7' Date 8/ 86

GANNETT FLEMING GEOTECHNICAL LABORATORY

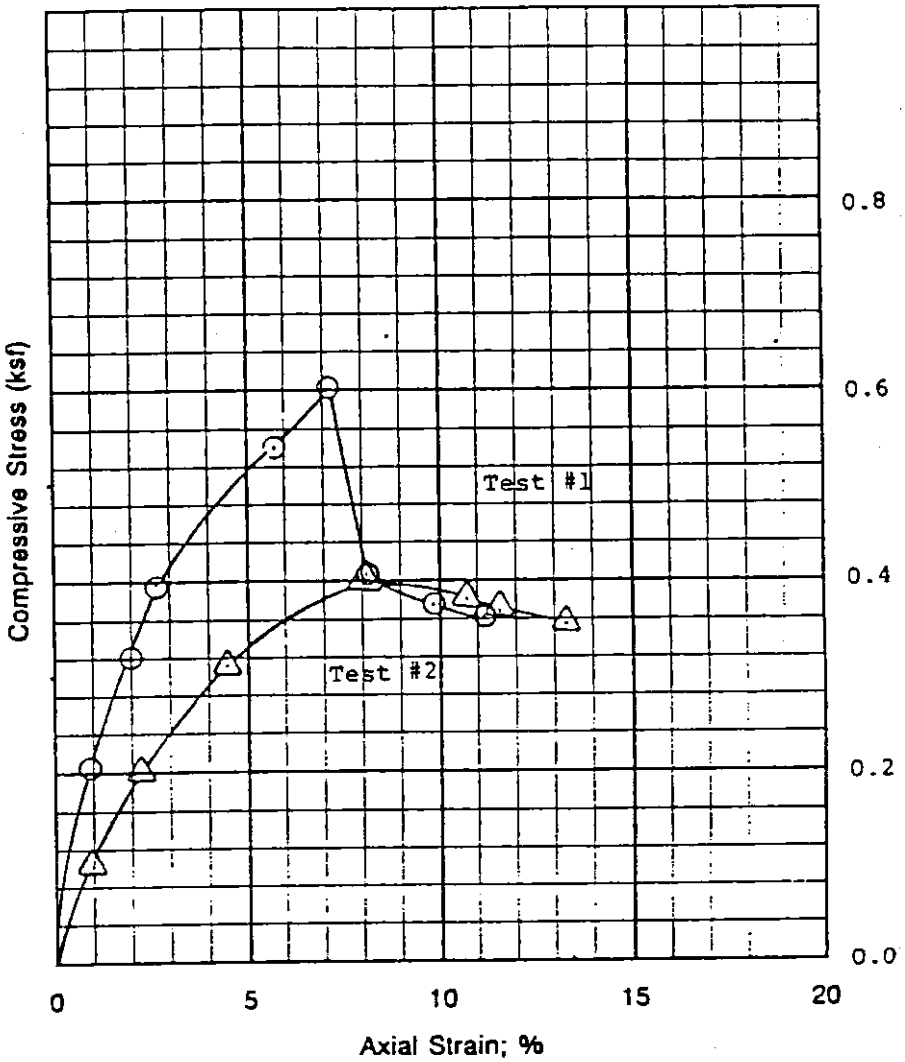
Failure Sketches



Test #1



Test #2



Test no			1	2		
Type of specimen			Shelby	Shelby		
Initial	Water content	w_o	85.3%	83.1%	%	%
	Void ratio	e_o	2.508	2.337		
	Saturation	S_o	90.4%	94.5%	%	%
	Dry density, lb/cu ft	γ_d	47.3	49.8		
Time to failure, min		t_f	3.6	4.6		
Unconfined compressive strength, ksf		q_u	0.61	0.38		
Initial specimen diameter, in		D_o	2.84	2.83		
Initial specimen height, in		H_o	6.35	5.58		

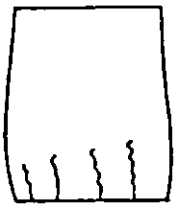
UNCONFINED COMPRESSION TEST REPORT

Project DSWA NORTHERN FACILITY -2 Boring No GF-6

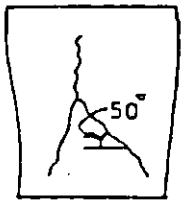
Sample No S-3 Depth 5- 7' Date 8/ 86

GANNETT FLEMING GEOTECHNICAL LABORATORY

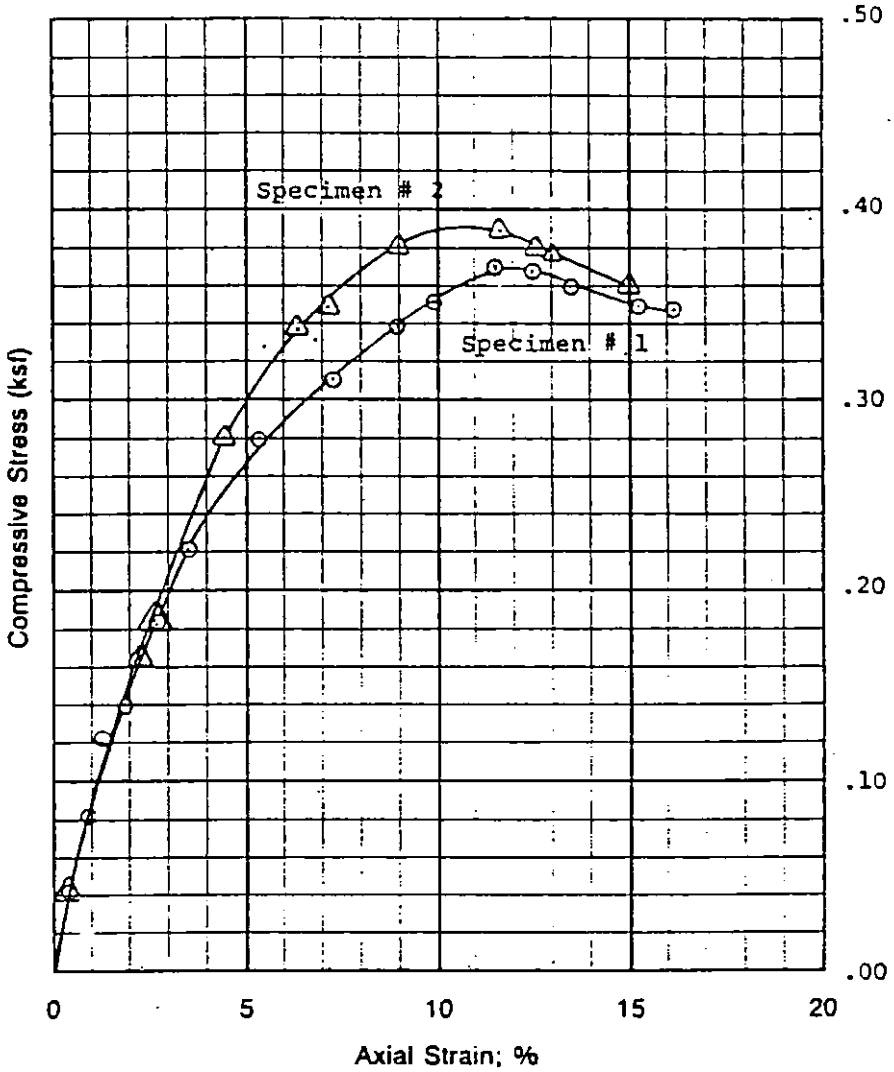
Failure Sketches



Specimen # 1



Specimen # 2



Test no			1	2		
Type of specimen			Shelby	Shelby		
Initial	Water content	w_o	67.9 %	80.8 %	%	%
	Void ratio	e_o	1.69	1.94		
	Saturation	S_o	96.4 %	100 %	%	%
	Dry density, lb/cu ft	γ_d	51.8	51.2		
Time to failure, min		t_f	8.5	6.6		
Unconfined compressive strength, ksf		q_u	.37	.39		
Initial specimen diameter, in		D_o	2.818	2.799		
Initial specimen height, in		H_o	5.557	5.553		

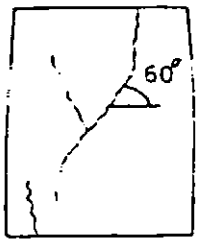
UNCONFINED COMPRESSION TEST REPORT

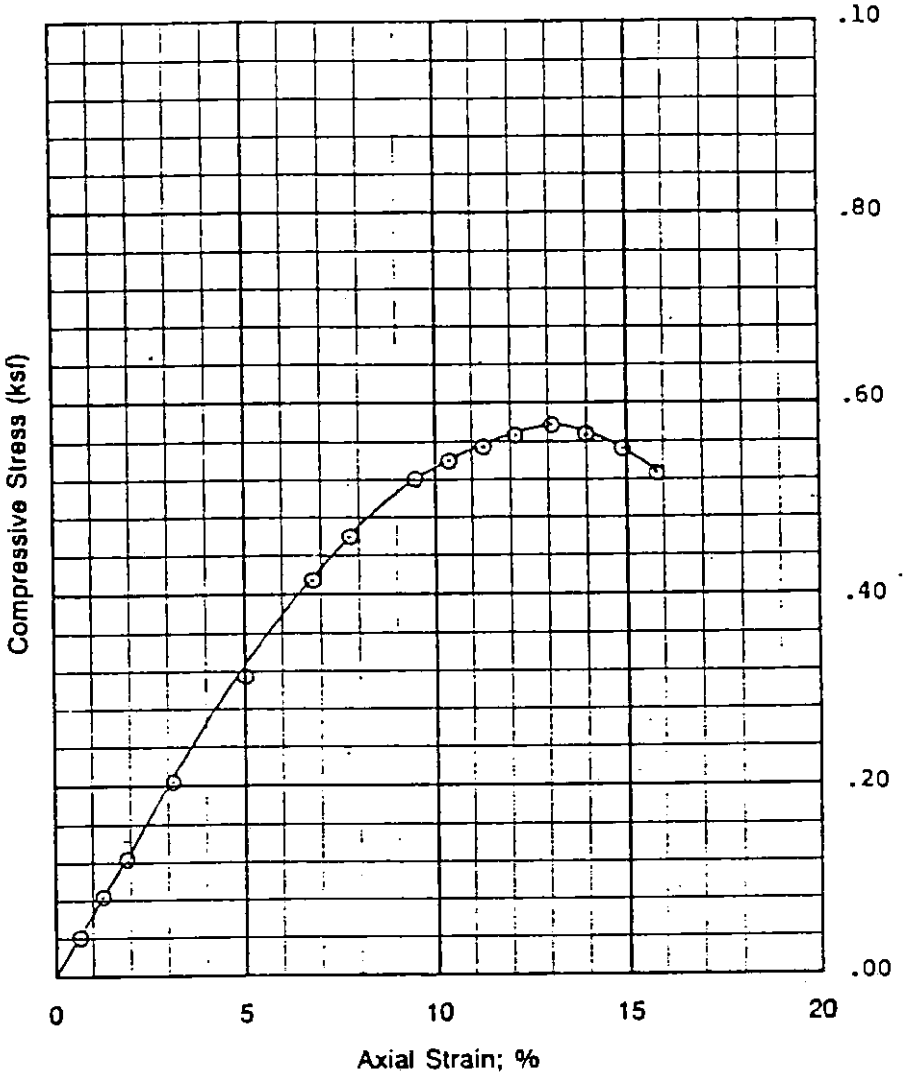
Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-10 Depth 20.0' - 22.0' Date 8/7/86

GANNETT FLEMING GEOTECHNICAL LABORATORY

Failure Sketches





Test no			1			
Type of specimen			Shelby			
Initial	Water content	w_o	62.0%	%	%	%
	Void ratio	e_o	1.55			
	Saturation	S_o	100 %	%	%	%
	Dry density, lb/cu ft	γ_d	58.8			
Time to failure, min		t_f	11.5			
Unconfined compressive strength, ksf		q_u	.58			
Initial specimen diameter, in		D_o	2.815			
Initial specimen height, in		H_o	5.569			

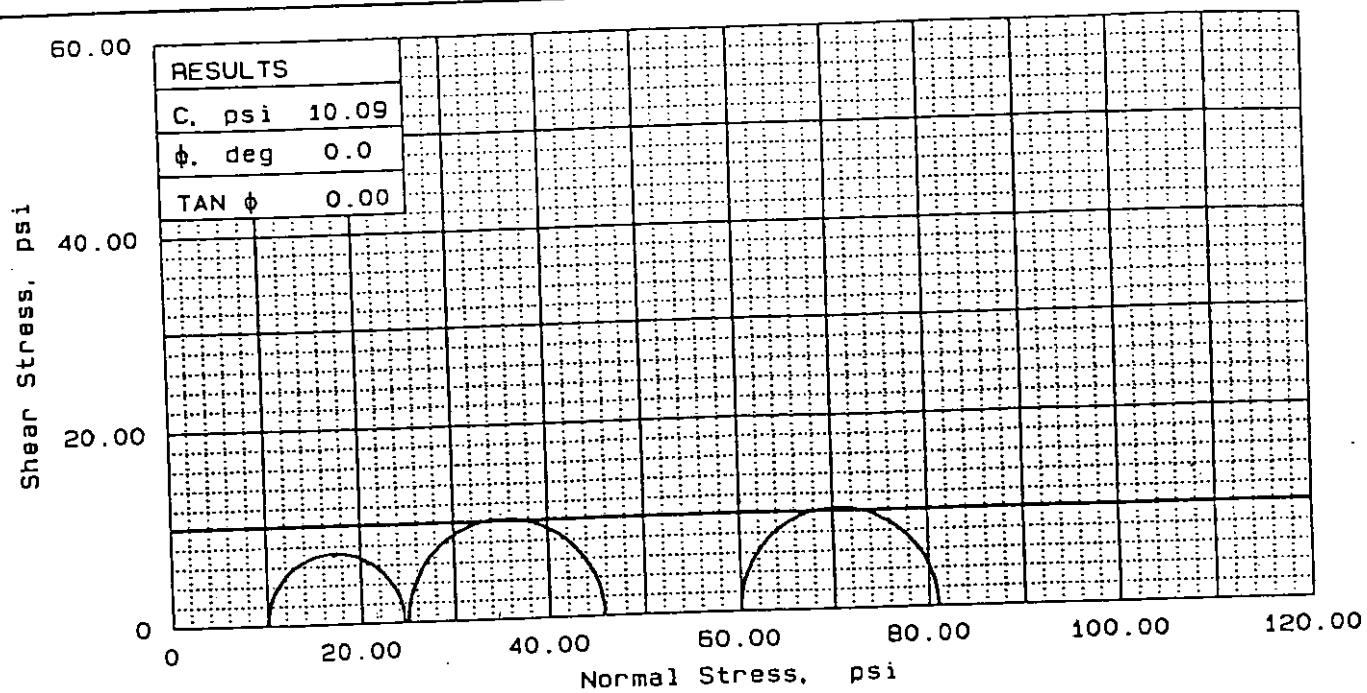
UNCONFINED COMPRESSION TEST REPORT

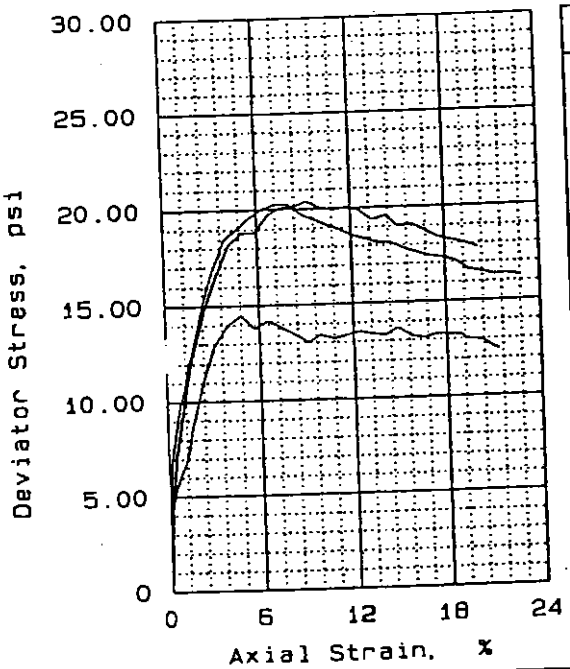
Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-7 Depth 10.0' - 12.0' Date 8/6/86

GANNETT FLEMING GEOTECHNICAL LABORATORY

TRIAXIAL TESTS





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	51.8	33.2	43.4
	DRY DENSITY, pcf	68.7	77.0	73.2
	SATURATION, %	97.3	76.6	91.2
	VOID RATIO	1.410	1.147	1.261
	DIAMETER, in	2.84	2.84	2.81
	HEIGHT, in	5.86	5.84	5.84
AT TEST	WATER CONTENT, %	51.8	33.2	43.4
	DRY DENSITY, pcf	68.7	77.0	73.2
	SATURATION, %	97.3	76.6	91.2
	VOID RATIO	1.410	1.147	1.261
	DIAMETER, in	2.84	2.84	2.81
	HEIGHT, in	5.86	5.84	5.84
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		10.00	25.00	60.00
FAILURE STRESS, psi		14.53	20.70	20.92
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				
PORE PRESSURE, psi				
σ_1 FAILURE, psi		24.53	45.70	80.92
σ_3 FAILURE, psi		10	25	60

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DREDGE SPOIL

LL- PL- PI-
SPECIFIC GRAVITY= 2.62
REMARKS:
POINT #1: 68.0'-68.5'
POINT #2: 68.5'-69.0'
POINT #3: 69.0'-69.5'
FIG. NO.

CLIENT: WESTON

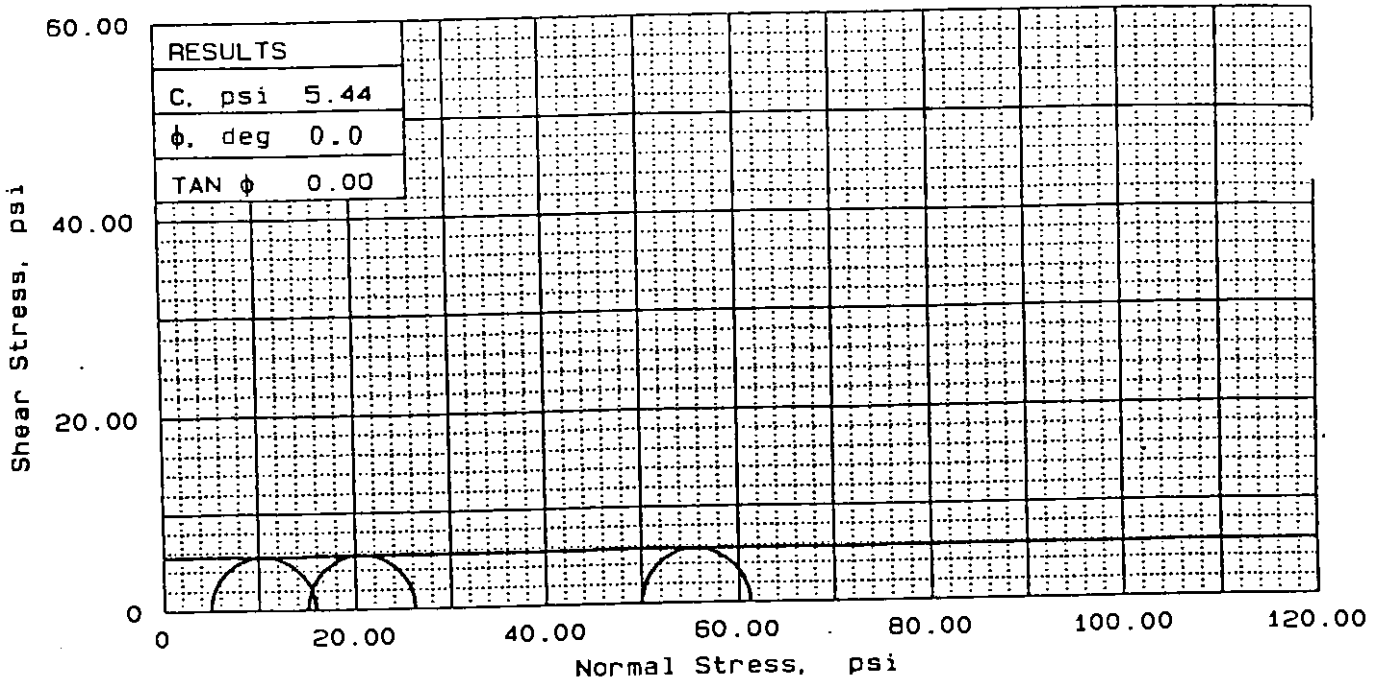
PROJECT: DSWA - PHASE IV

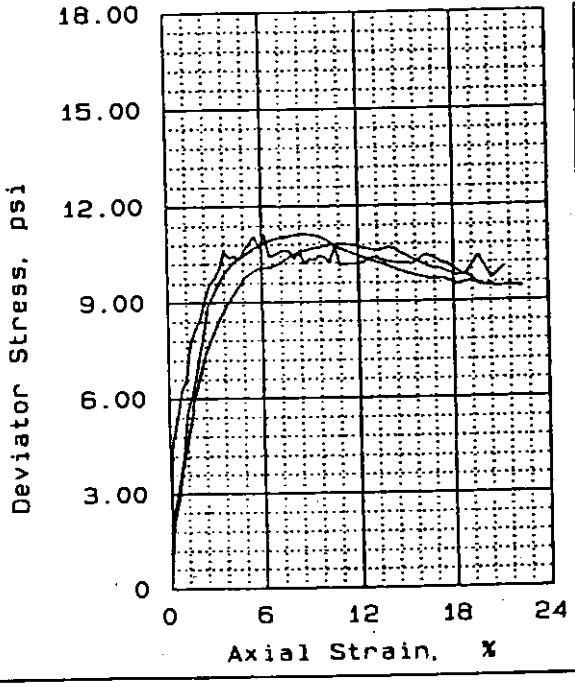
SAMPLE LOCATION: TB3-ST9, 67.5'-69.5'

PROJ. NO.: 47533 DATE: 05-15-92

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	63.7	76.9	65.7
	DRY DENSITY, pcf	61.2	54.2	56.3
	SATURATION, %	99.2	99.3	89.7
	VOID RATIO	1.702	2.053	1.940
	DIAMETER, in	2.82	2.83	2.83
	HEIGHT, in	5.82	5.83	5.87
AT TEST	WATER CONTENT, %	63.7	76.9	65.7
	DRY DENSITY, pcf	61.2	54.2	56.3
	SATURATION, %	99.2	99.3	89.7
	VOID RATIO	1.702	2.053	1.940
	DIAMETER, in	2.82	2.83	2.83
	HEIGHT, in	5.82	5.83	5.87
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		5.00	15.00	50.00
FAILURE STRESS, psi		10.82	11.14	11.11
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				
PORE PRESSURE, psi				
σ_1 FAILURE, psi		15.82	26.14	61.11
σ_3 FAILURE, psi		5	15	50

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DREDGE SPOIL

LL- PL- PI-
SPECIFIC GRAVITY= 2.54
REMARKS:
POINT #1: 18.4'-18.9'
POINT #2: 18.9'-19.4'
POINT #3: 19.4'-19.9'
FIG. NO.

CLIENT: WESTON

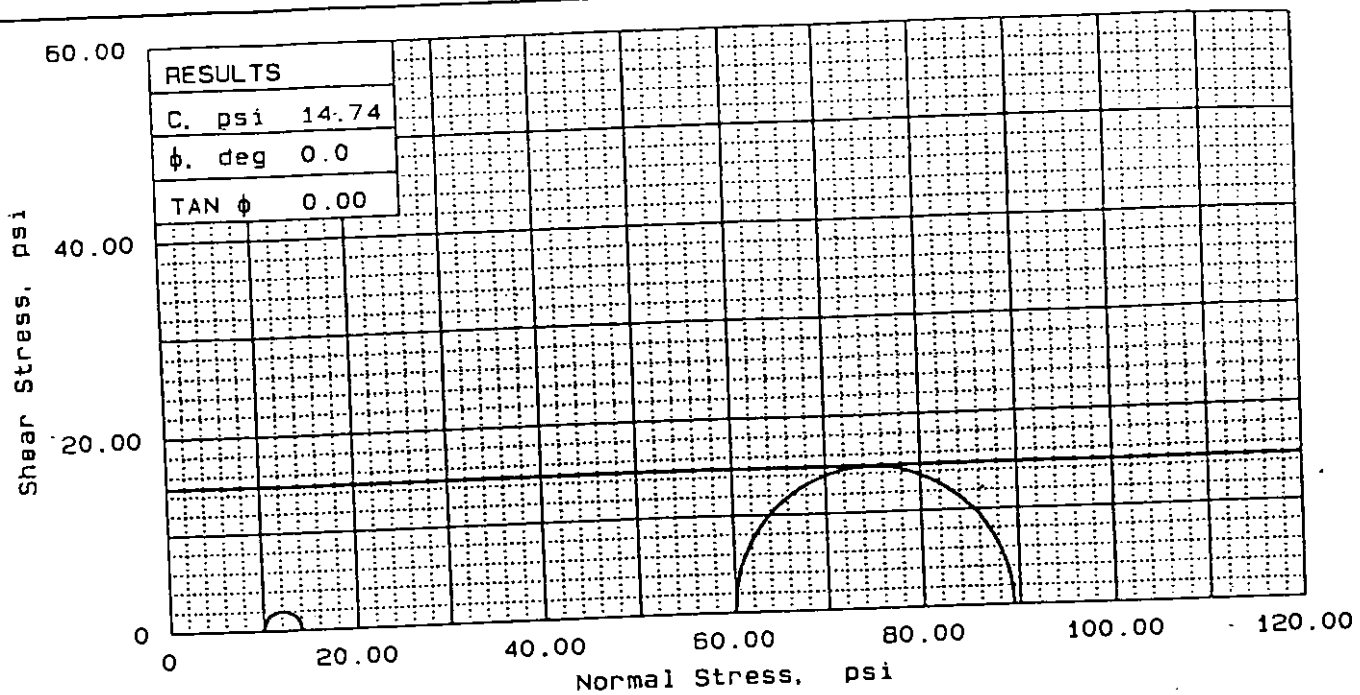
PROJECT: DSWA - PHASE IV

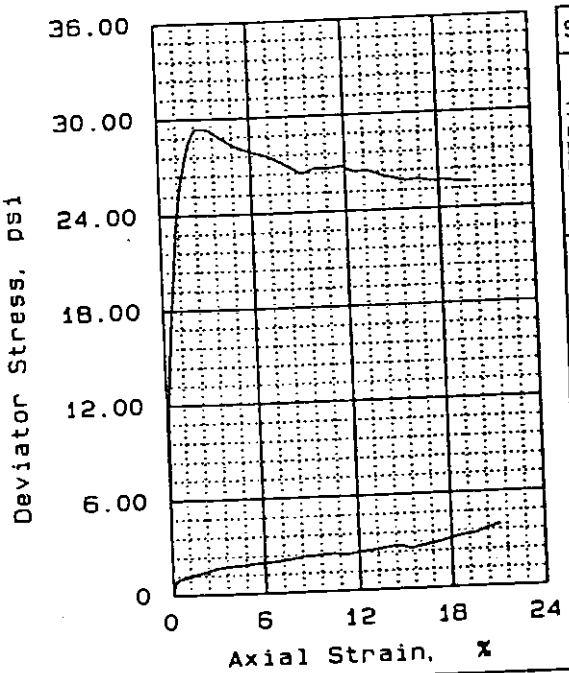
SAMPLE LOCATION: TB7-ST3, 18.0'-20.0'

PROJ. NO.: 47533 DATE: 05-18-92

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





SAMPLE NO.		1	2
INITIAL	WATER CONTENT, %	102.6	49.4
	DRY DENSITY, pcf	49.9	68.1
	SATURATION, %	117.4	91.4
	VOID RATIO	2.316	1.431
	DIAMETER, in	2.81	2.86
	HEIGHT, in	5.80	5.85
AT TEST	WATER CONTENT, %	102.6	49.4
	DRY DENSITY, pcf	49.9	68.1
	SATURATION, %	117.4	91.4
	VOID RATIO	2.316	1.431
	DIAMETER, in	2.81	2.86
	HEIGHT, in	5.80	5.85
BACK PRESSURE, psi		0.00	0.00
CELL PRESSURE, psi		10.00	60.00
FAILURE STRESS, psi		3.92	29.35
PORE PRESSURE, psi			
STRAIN RATE, %/min.		1.000	1.000
ULTIMATE STRESS, psi			
PORE PRESSURE, psi			
σ_1 FAILURE, psi		13.92	89.35
σ_3 FAILURE, psi		10	60

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DREDGE SPOIL

LL- PL- PI-
SPECIFIC GRAVITY= 2.64
REMARKS:
POINT #1: 65.5'-66.0'
POINT #2: 66.0'-66.5'

FIG. NO.

CLIENT: WESTON

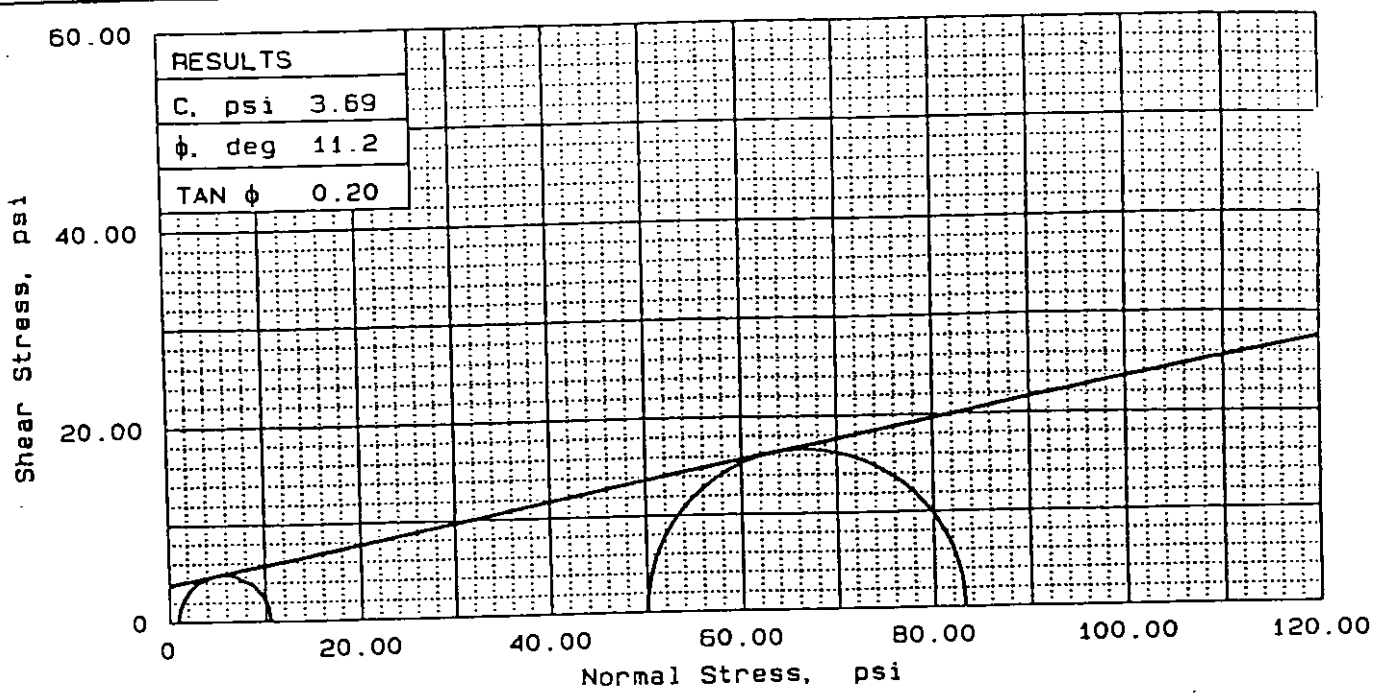
PROJECT: DSWA - PHASE IV

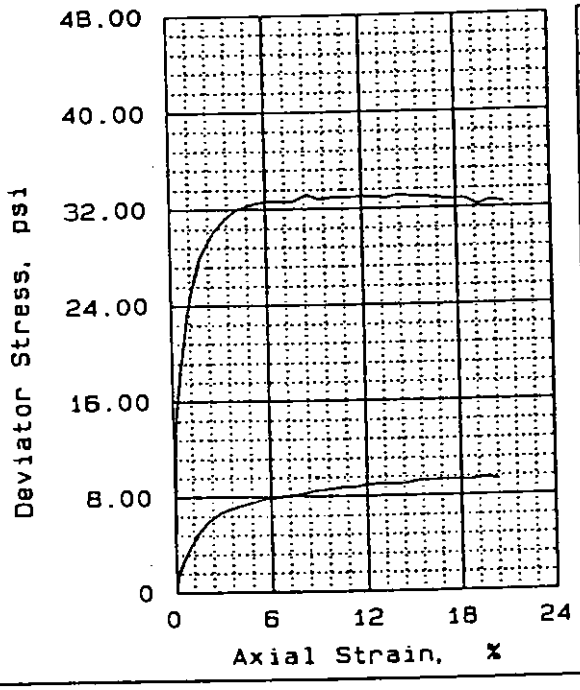
SAMPLE LOCATION: T87-ST4, 65.5'-67.5'

PROJ. NO.: 47533 DATE: 05-18-92

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





SAMPLE NO.		1	2
INITIAL	WATER CONTENT, %	51.9	44.7
	DRY DENSITY, pcf	59.2	68.3
	SATURATION, %	77.7	84.5
	VOID RATIO	1.730	1.369
	DIAMETER, in	2.86	2.82
	HEIGHT, in	5.84	5.87
AT TEST	WATER CONTENT, %	51.9	44.7
	DRY DENSITY, pcf	59.6	68.6
	SATURATION, %	78.4	85.3
	VOID RATIO	1.713	1.355
	DIAMETER, in	2.85	2.81
	HEIGHT, in	5.83	5.86
BACK PRESSURE, psi		0.00	0.00
CELL PRESSURE, psi		1.00	50.00
FAILURE STRESS, psi		9.47	33.15
PORE PRESSURE, psi			
STRAIN RATE, %/min.		1.000	1.000
ULTIMATE STRESS, psi			
PORE PRESSURE, psi			
σ_1 FAILURE, psi		10.47	83.15
σ_3 FAILURE, psi		1	50

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DREDGE SPOIL

LL- PL- PI-
SPECIFIC GRAVITY= 2.59
REMARKS: POINT #1: 1.6'-2.1'
POINT #2: 2.3'-2.8'

FIG. NO.

CLIENT: WESTON

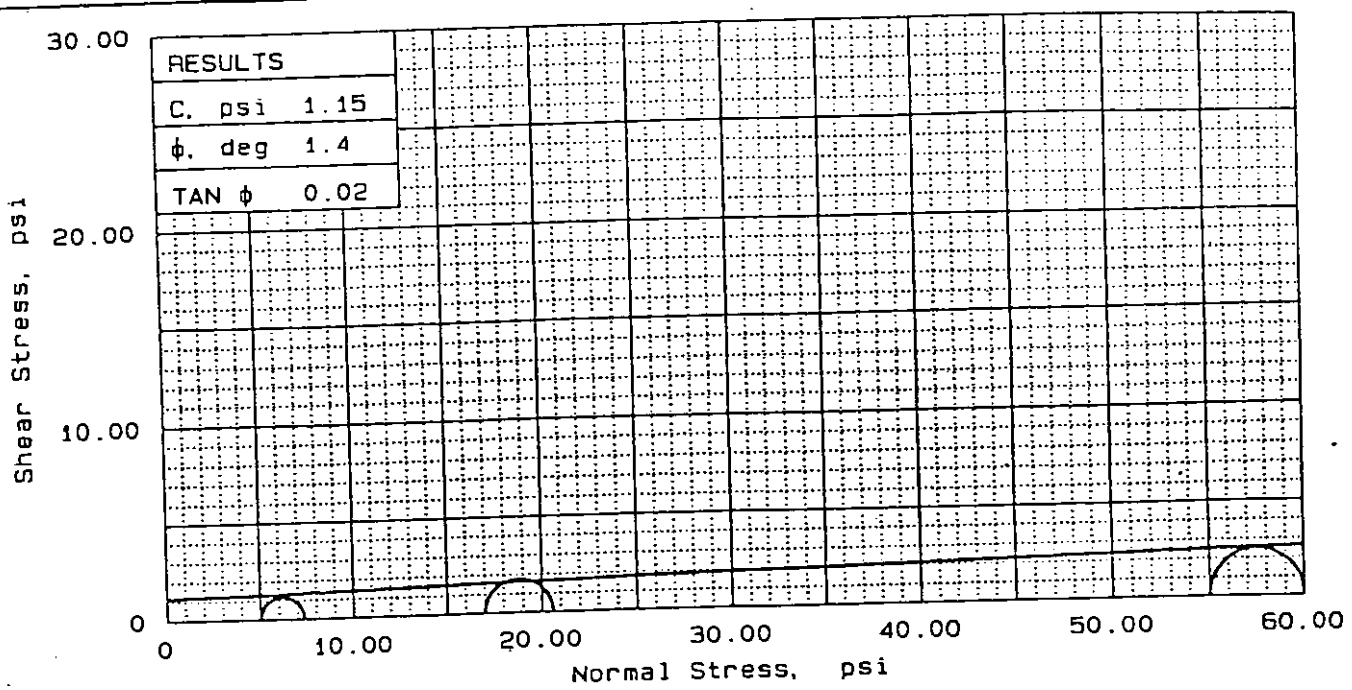
PROJECT: OSWA - PHASE IV

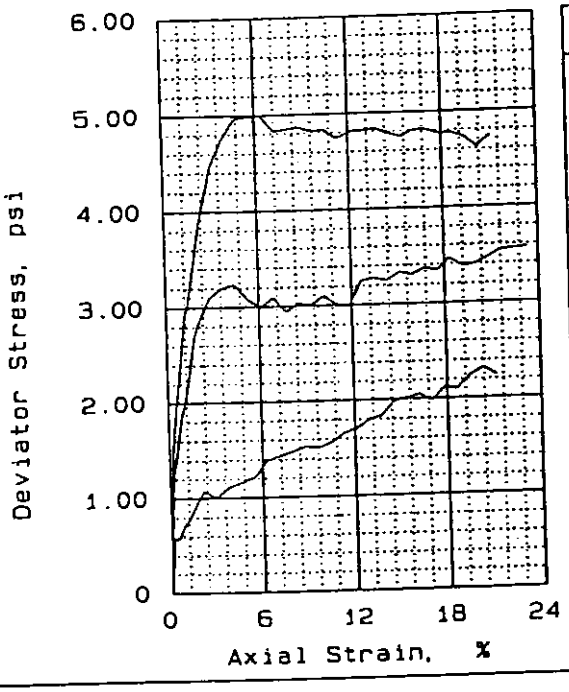
SAMPLE LOCATION: TB7A-ST1, 1.5'-3.5'

PROJ. NO.: 47533 DATE: 05-29-92

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	76.2	89.2	104.1
	DRY DENSITY, pcf	49.6	48.3	43.2
	SATURATION, %	86.6	97.4	97.3
	VOID RATIO	2.333	2.427	2.834
	DIAMETER, in	2.85	2.81	2.81
	HEIGHT, in	5.82	5.85	5.85
AT TEST	WATER CONTENT, %	76.2	89.2	104.1
	DRY DENSITY, pcf	49.6	48.3	43.2
	SATURATION, %	86.6	97.4	97.3
	VOID RATIO	2.333	2.427	2.834
	DIAMETER, in	2.85	2.81	2.81
	HEIGHT, in	5.82	5.85	5.85
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		5.00	17.00	55.00
FAILURE STRESS, psi		2.32	3.57	5.00
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				-
PORE PRESSURE, psi				
σ_1 FAILURE, psi		7.32	20.57	60.00
σ_3 FAILURE, psi		5	17	55

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DREDGE SPOIL

LL= PL= PI=
SPECIFIC GRAVITY= 2.57
REMARKS:
POINT #1: 20.1'-20.6'
POINT #2: 20.9'-21.4'
POINT #3: 21.5'-22.0'
FIG. NO.

CLIENT: WESTON

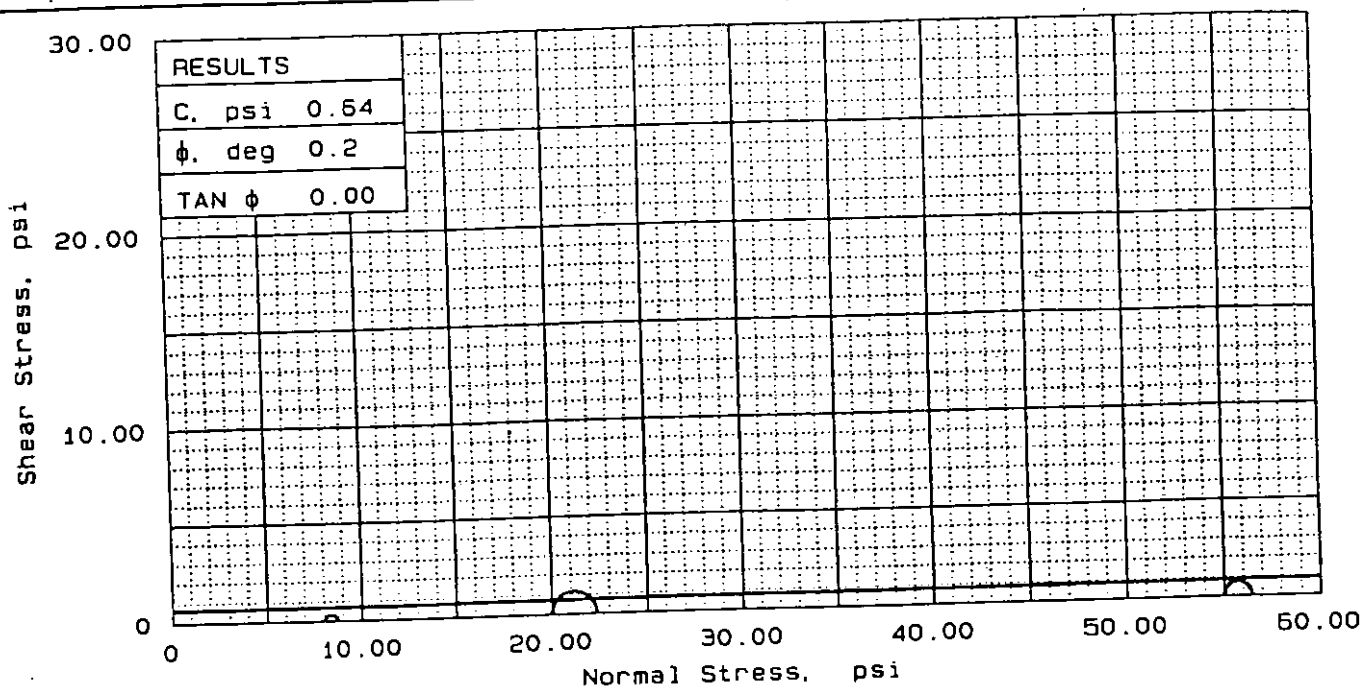
PROJECT: OSWA - PHASE IV

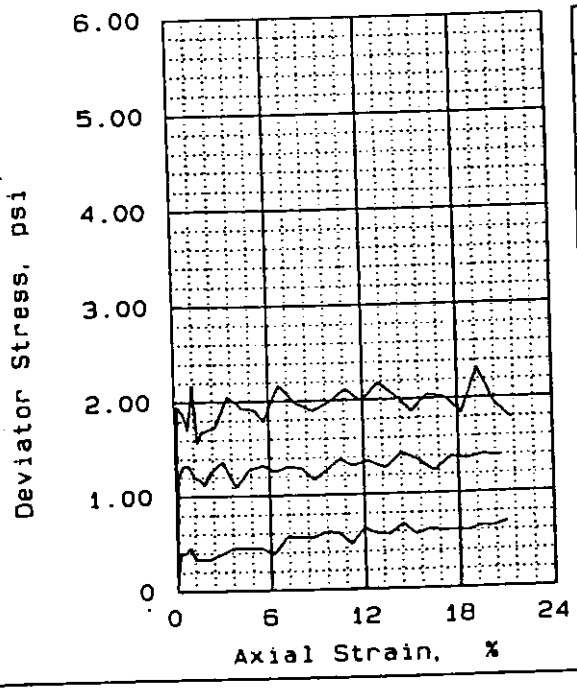
SAMPLE LOCATION: T88-ST1, 20.0'-22.0'

PROJ. NO.: 47533 DATE: 05-18-92

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	99.7	91.8	98.9
	DRY DENSITY, pcf	40.9	66.0	45.6
	SATURATION, %	87.7	165.2	101.0
	VOID RATIO	2.910	1.422	2.506
	DIAMETER, in	2.80	2.80	2.80
	HEIGHT, in	5.80	5.80	5.80
AT TEST	WATER CONTENT, %	99.7	91.8	98.9
	DRY DENSITY, pcf	40.9	66.0	45.6
	SATURATION, %	87.7	165.2	101.0
	VOID RATIO	2.910	1.422	2.506
	DIAMETER, in	2.80	2.80	2.80
	HEIGHT, in	5.80	5.80	5.80
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		8.00	20.00	55.00
FAILURE STRESS, psi		0.69	2.32	1.43
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				
PORE PRESSURE, psi				
σ_1 FAILURE, psi		8.69	22.32	56.43
σ_3 FAILURE, psi		8	20	55

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DREDGE SPOIL

LL= PL= PI=
SPECIFIC GRAVITY= 2.56
REMARKS: POINT #1: 40.0'-40.5'
POINT #2: 40.5'-41.0'
POINT #3: 41.0'-41.5'

FIG. NO.

CLIENT: WESTON

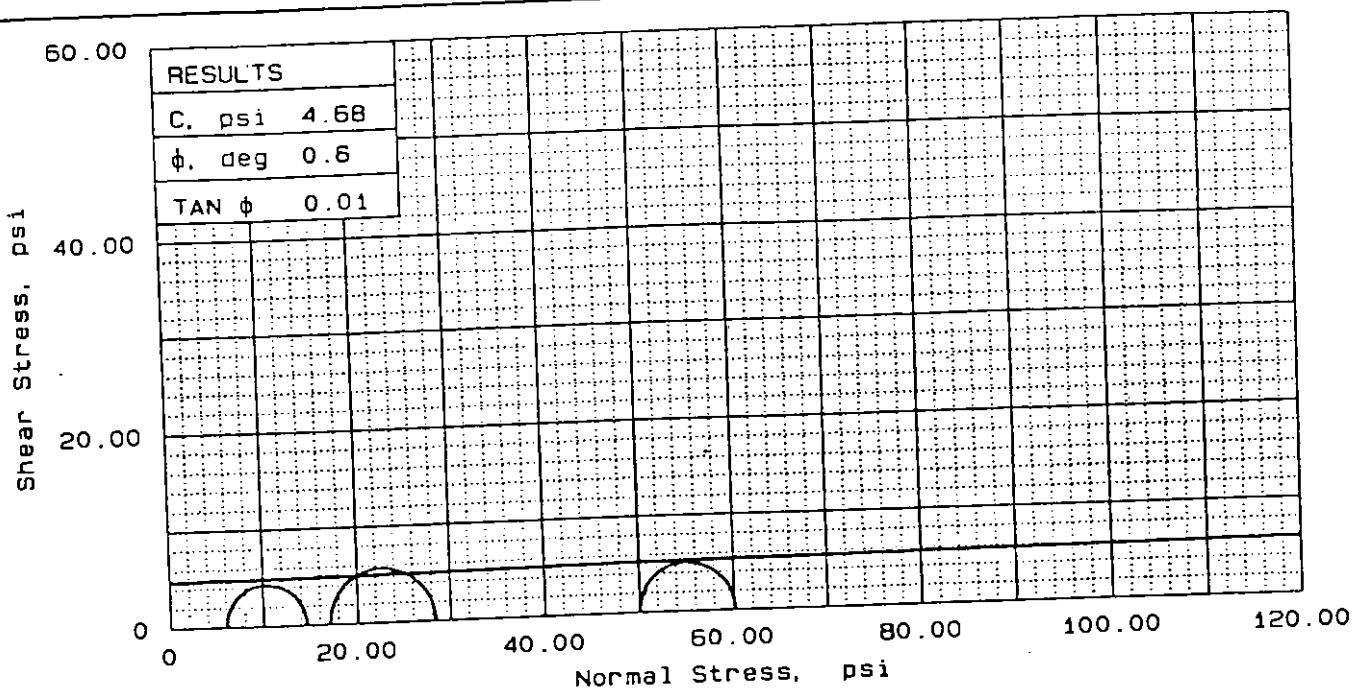
PROJECT: OSWA - PHASE IV

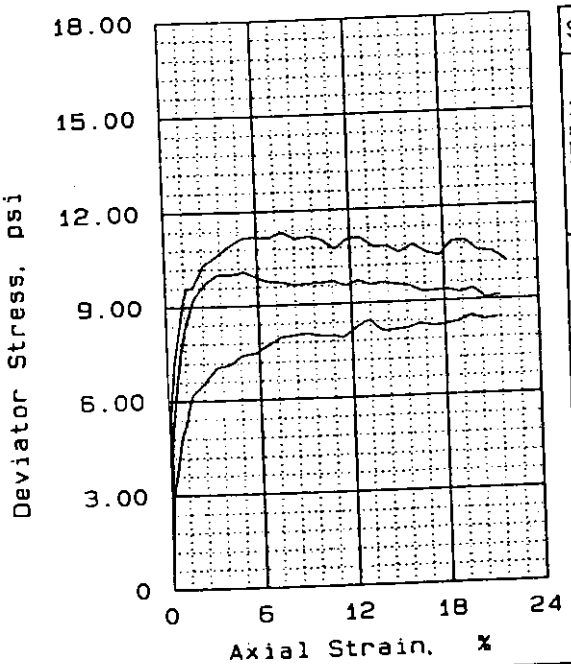
SAMPLE LOCATION: TB8-ST2, 40.0'-42.0'

PROJ. NO.: 47533 DATE: 07-23-92

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	47.0	51.4	40.0
	DRY DENSITY, pcf	67.7	65.8	70.5
	SATURATION, %	88.1	91.5	80.4
	VOID RATIO	1.378	1.449	1.284
	DIAMETER, in	2.82	2.84	2.83
	HEIGHT, in	5.82	5.80	5.82
AT TEST	WATER CONTENT, %	47.0	51.4	40.0
	DRY DENSITY, pcf	67.7	65.8	70.5
	SATURATION, %	88.1	91.5	80.4
	VOID RATIO	1.378	1.449	1.284
	DIAMETER, in	2.82	2.84	2.83
	HEIGHT, in	5.82	5.80	5.82
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		6.00	17.00	50.00
FAILURE STRESS, psi		8.50	11.32	10.11
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				-
PORE PRESSURE, psi				
σ_1 FAILURE, psi		14.50	28.32	60.11
σ_3 FAILURE, psi		6	17	50

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DREDGE SPOIL

LL= PL= PI=
SPECIFIC GRAVITY= 2.58
REMARKS: POINT #1: 3" FROM TOP
POINT #2: 8 1/2" FROM TOP
POINT #3: 15 1/2" FROM TOP

FIG. NO.

CLIENT: WESTON

PROJECT: DSWA - PHASE IV

SAMPLE LOCATION: TB9-ST1

PROJ. NO.: 47533 DATE: 07-23-92

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.

TEST NO.: 1

06-03-1992

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

Project No.: 47533
Project: WESTON/DSWA - PHASE IV

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:		Undisturbed	
Material:		DREDGE SPOIL	
Location:	TB3	ST2, 17.5'-19.5'	
Depth (ft):	18.5-19.0	19.0-19.5	
Effective Consolidation Pressure (psi):	5.0	50.0	
Saturation Pressures			
Initial Conditions,			
Lateral (psi):	10.0	10.0	
Back (psi):	5.0	5.0	
Consolidation Pressures,			
Initial Shearing Conditions,			
Lateral (psi):	62.0	97.0	
Back (psi):	57.0	47.0	
Initial Conditions,			
Height (inches):	5.829	5.846	
Diameter (inches):	2.827	2.902	
Weight (lbs.):	1.872	1.850	
Moisture Content (%):	90.2	98.5	
Volume (cf):	0.02117	0.02237	
Dry Unit Weight (pcf):	46.4	41.6	
Wet Unit Weight (pcf):	88.4	82.6	
Consolidated Conditions,			
Moisture Content (%):	79.7	56.6	
Volume (cf):	0.01961	0.01510	
Dry Unit Weight (pcf):	50.1	61.6	
Wet Unit Weight (pcf):	90.2	96.6	
At Maximum Principal Effective Stress Ratio,			
p' = (s'1 + s'3)/2, (psi):	4.8	29.5	
q' = (s'1 - s'3)/2, (psi):	3.8	18.6	

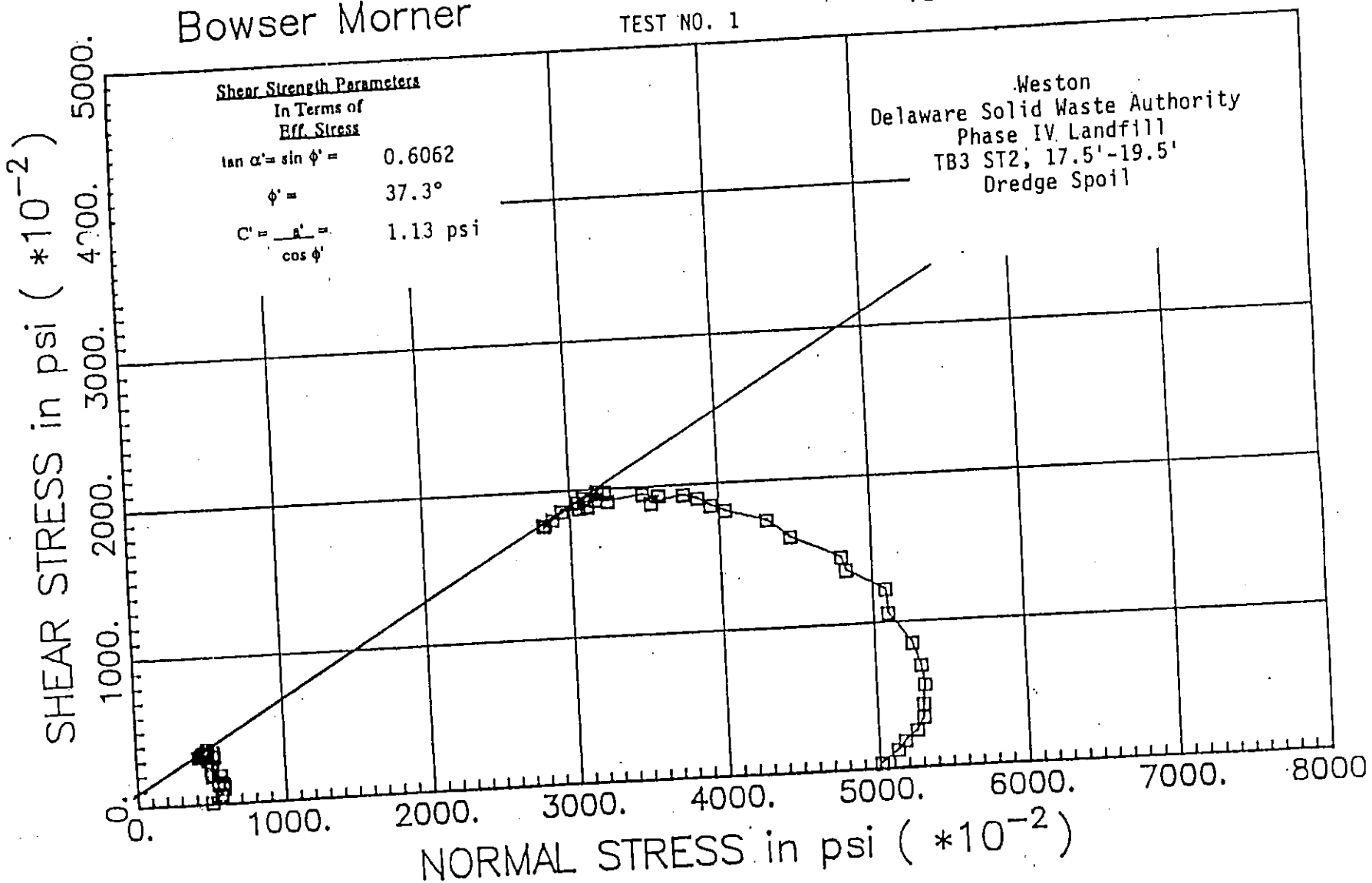
Measured Strength Parameters:
Effective Phi' (deg) = 37.3
C' (psi) = 1.13

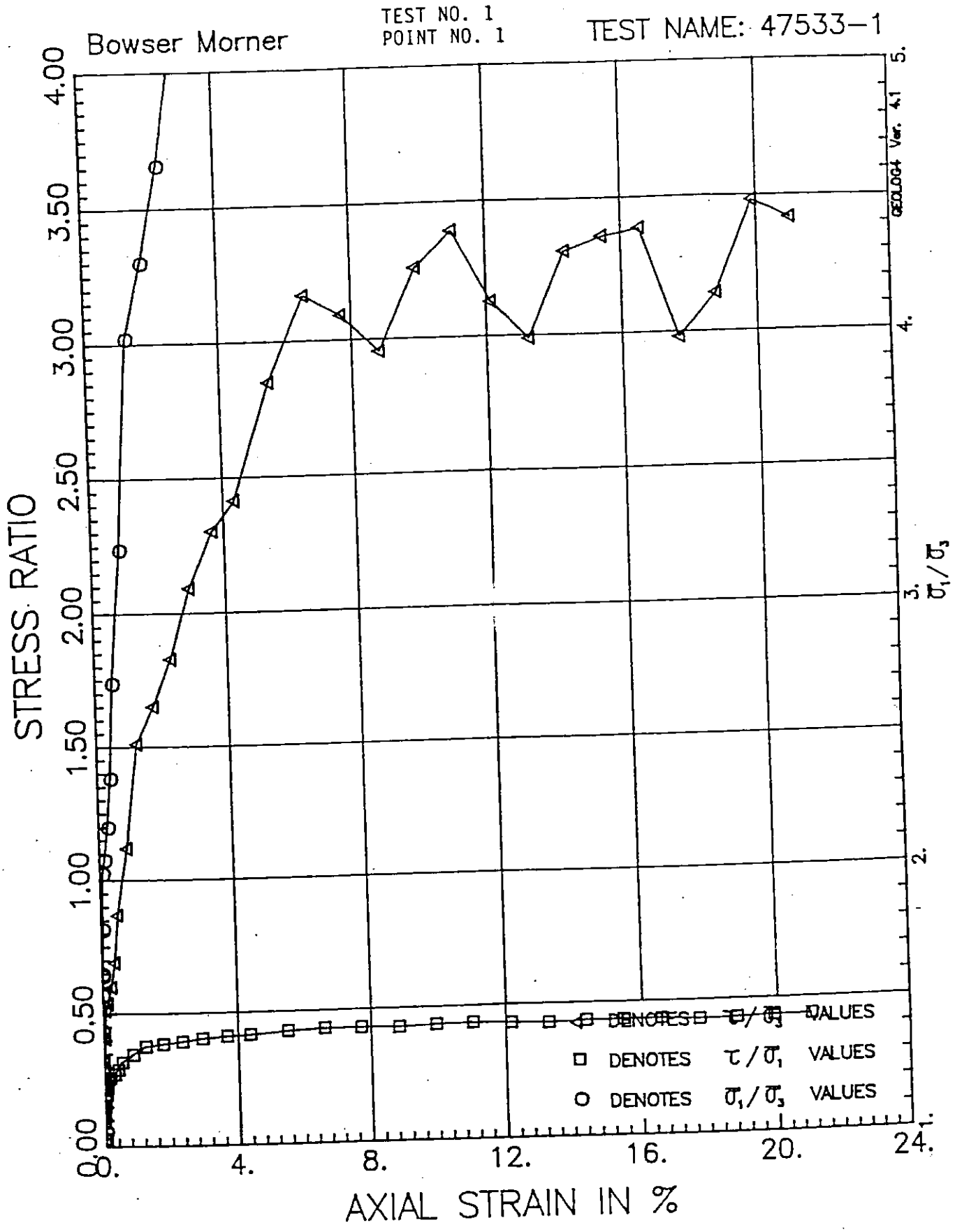
STRESS PATHS

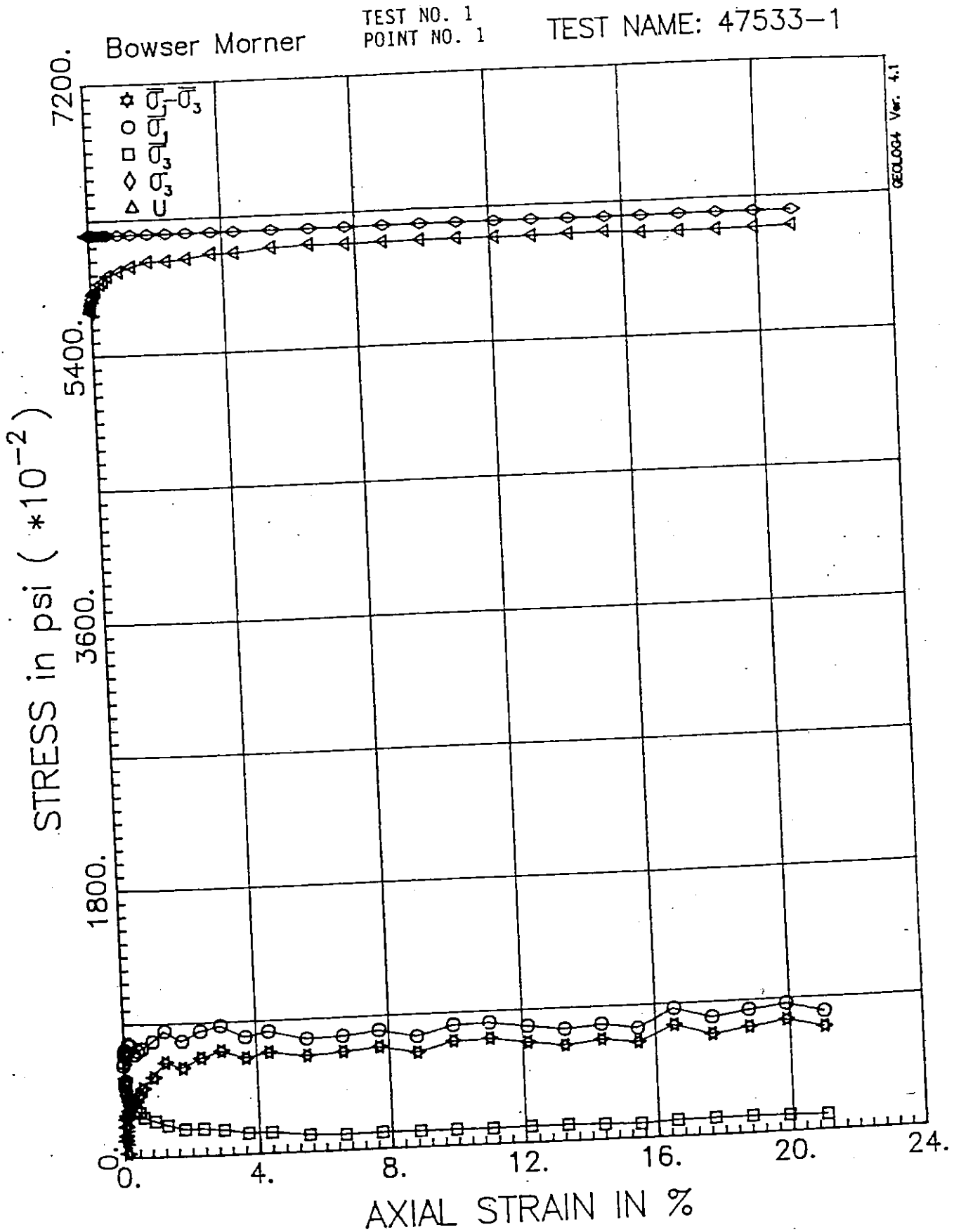
TEST NAME: 47533

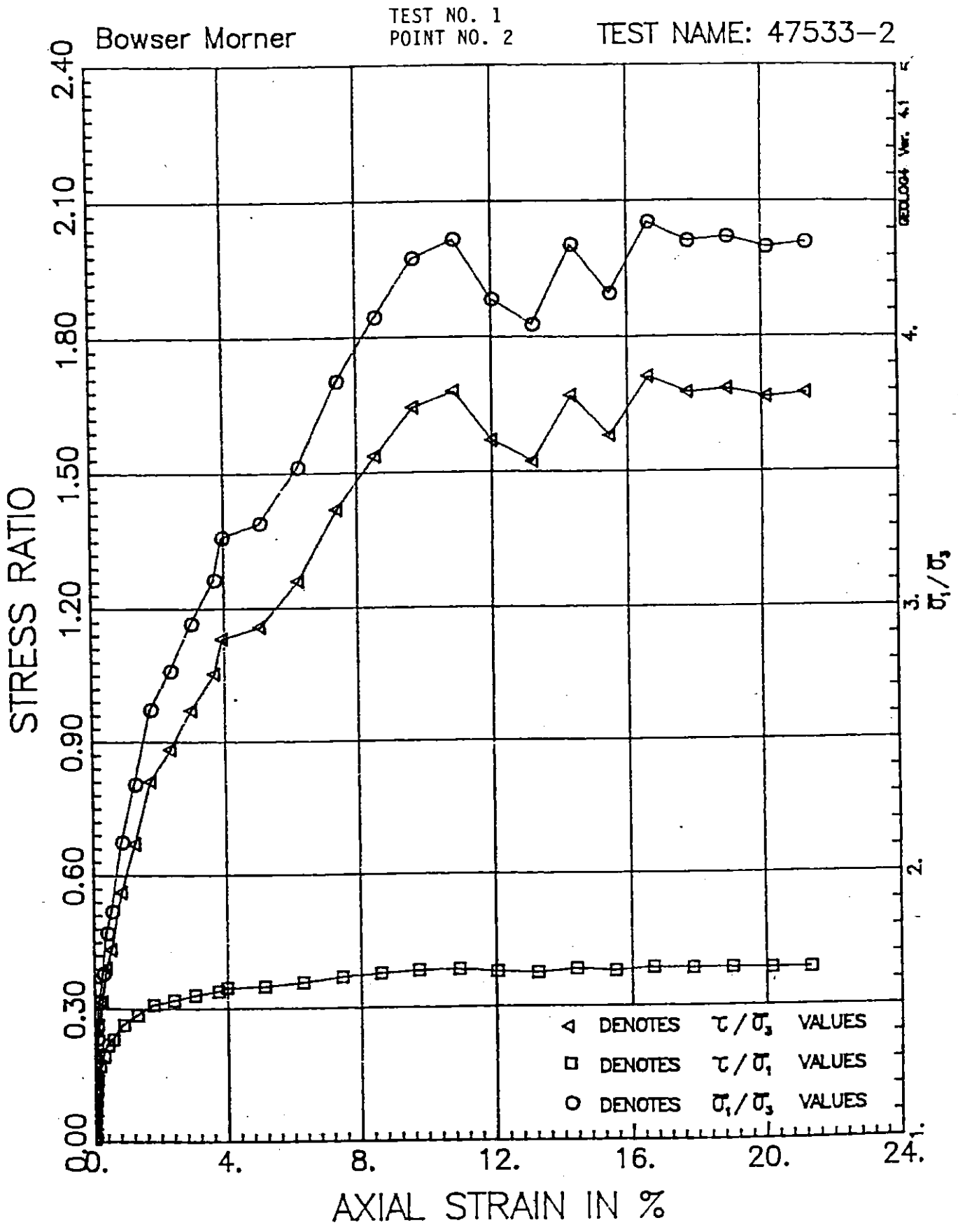
Bowser Morner

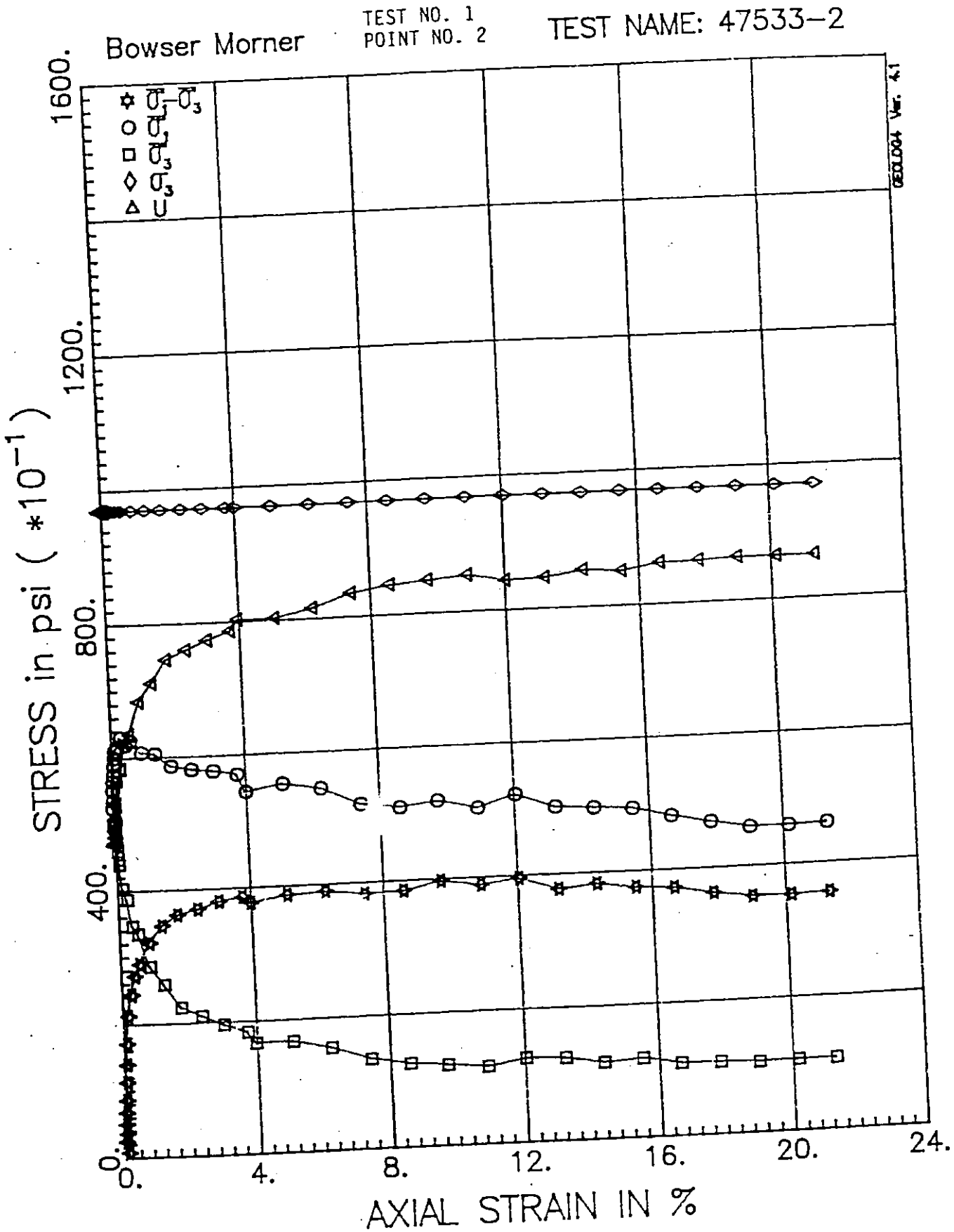
TEST NO. 1




Bowser Morner
TEST NO. 1
POINT NO. 1
TEST NAME: 47533-1
STRESS RATIO
AXIAL STRAIN IN %
σ_1/σ_3
GEOLOG4 Ver. 4.1
DENOTES σ_1/σ_3 VALUES
DENOTES τ/σ_1 VALUES
DENOTES σ_1/σ_3 VALUES
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
0.
4.
8.
12.
16.
20.
24.
1.
2.
3.
4.
5.


Bowser Morner
TEST NO. 1
POINT NO. 1
TEST NAME: 47533-1
GEOLOG4 Ver. 4.1
$\sigma_1-\sigma_3$
σ_1
σ_3
U
STRESS in psi (*10^-2)
7200.
5400.
3600.
1800.
0.
0.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %


Bowser Morner
TEST NO. 1
POINT NO. 2
TEST NAME: 47533-2
STRESS RATIO
AXIAL STRAIN IN %
σ_1/σ_3
GEOLOG4 Ver. 4.1
0.00
0.30
0.60
0.90
1.20
1.50
1.80
2.10
2.40
0.
4.
8.
12.
16.
20.
24.
1.
2.
3.
4.
5.
DENOTES τ/σ_3 VALUES
DENOTES τ/σ_1 VALUES
DENOTES σ_1/σ_3 VALUES


Bowser Morner
TEST NO. 1
POINT NO. 2
TEST NAME: 47533-2
$\bar{\sigma}_1-\bar{\sigma}_3$
$\bar{\sigma}_1$
$\bar{\sigma}_3$
$\bar{\sigma}_3$
U
STRESS in psi (*10^{-1})
1600.
1200.
800.
400.
0.
0.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %
GEOLOGY Ver. 4.1

06-03-1992

TEST NO.: 2

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

Project No.: 47533
Project: WESTON/DSWA - PHASE IV

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:		Undisturbed	
Material:		DREDGE SPOIL	
Location:	TB7	ST1, 6.5'-8.5'	
Depth (ft):	7.1-7.6	7.6-8.1	
Effective Consolidation Pressure (psi):	3.0	20.0	
Saturation Pressures			
Initial Conditions,			
Lateral (psi):	10.0	10.0	
Back (psi):	5.0	5.0	
Consolidation Pressures,			
Initial Shearing Conditions,			
Lateral (psi):	60.0	77.0	
Back (psi):	57.0	57.0	
Initial Conditions,			
Height (inches):	5.851	5.867	
Diameter (inches):	2.857	2.847	
Weight (lbs.):	2.086	2.104	
Moisture Content (%):	52.4	50.8	
Volume (cf):	0.02170	0.02161	
Dry Unit Weight (pcf):	63.0	64.5	
Wet Unit Weight (pcf):	96.1	97.3	
Consolidated Conditions,			
Moisture Content (%):	57.9	52.3	
Volume (cf):	0.02137	0.02018	
Dry Unit Weight (pcf):	64.0	69.1	
Wet Unit Weight (pcf):	101.1	105.3	
At Maximum Principal Effective Stress Ratio,			
p' = (s'1 + s'3)/2, (psi):	9.8	16.7	
q' = (s'1 - s'3)/2, (psi):	7.6	10.6	

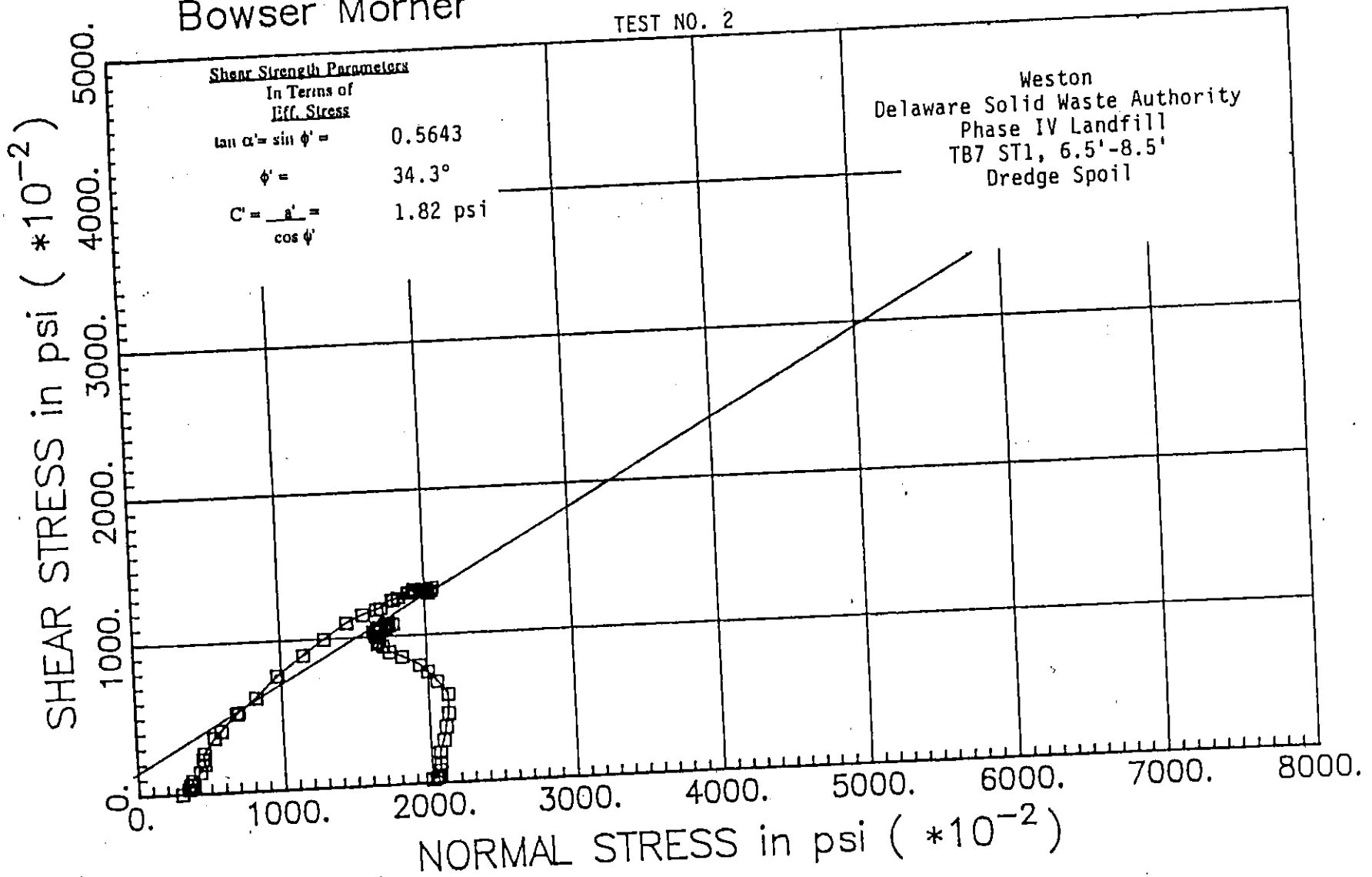
Measured Strength Parameters:
Effective Phi' (deg) = 34.3
C' (psi) = 1.82

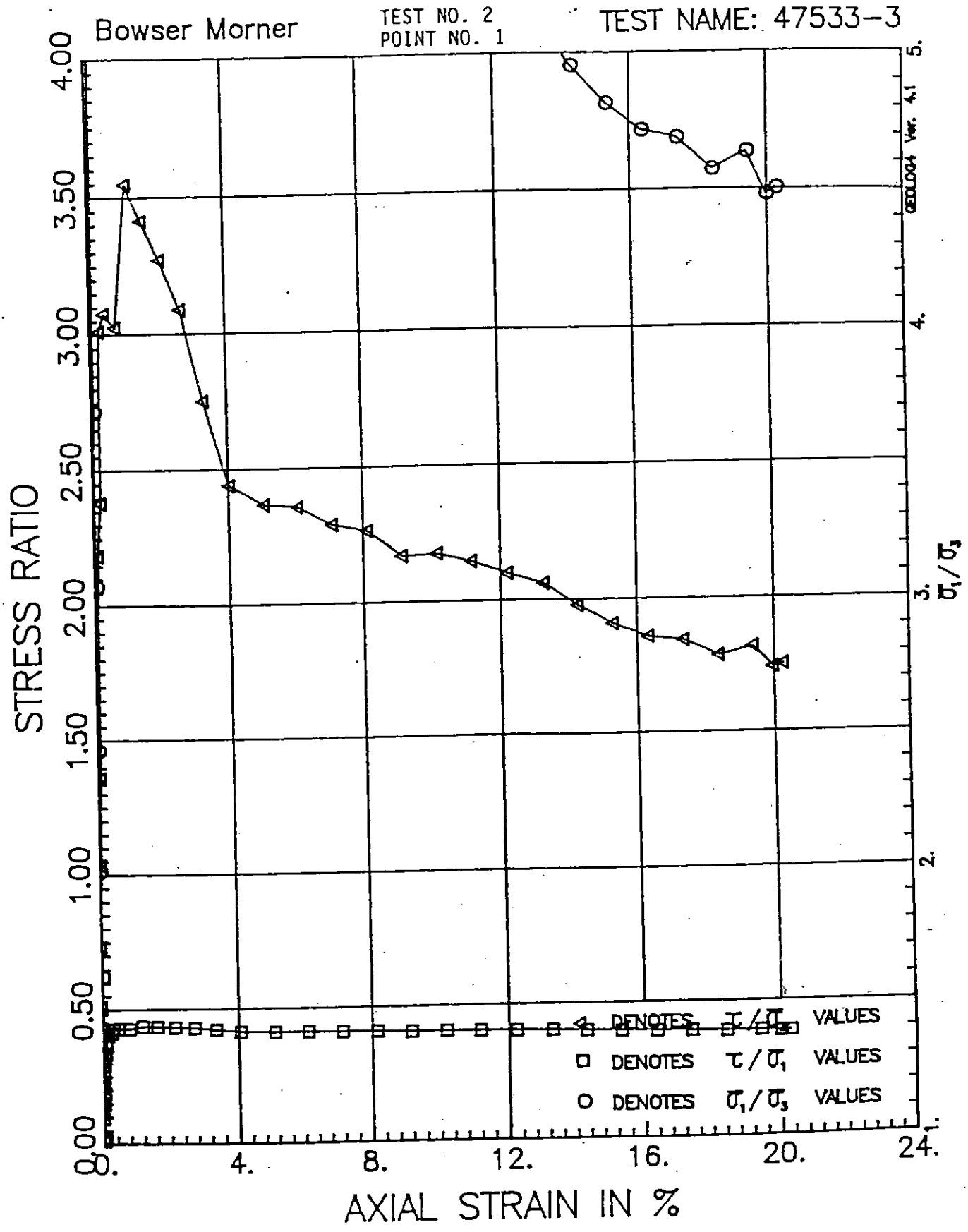
STRESS PATHS

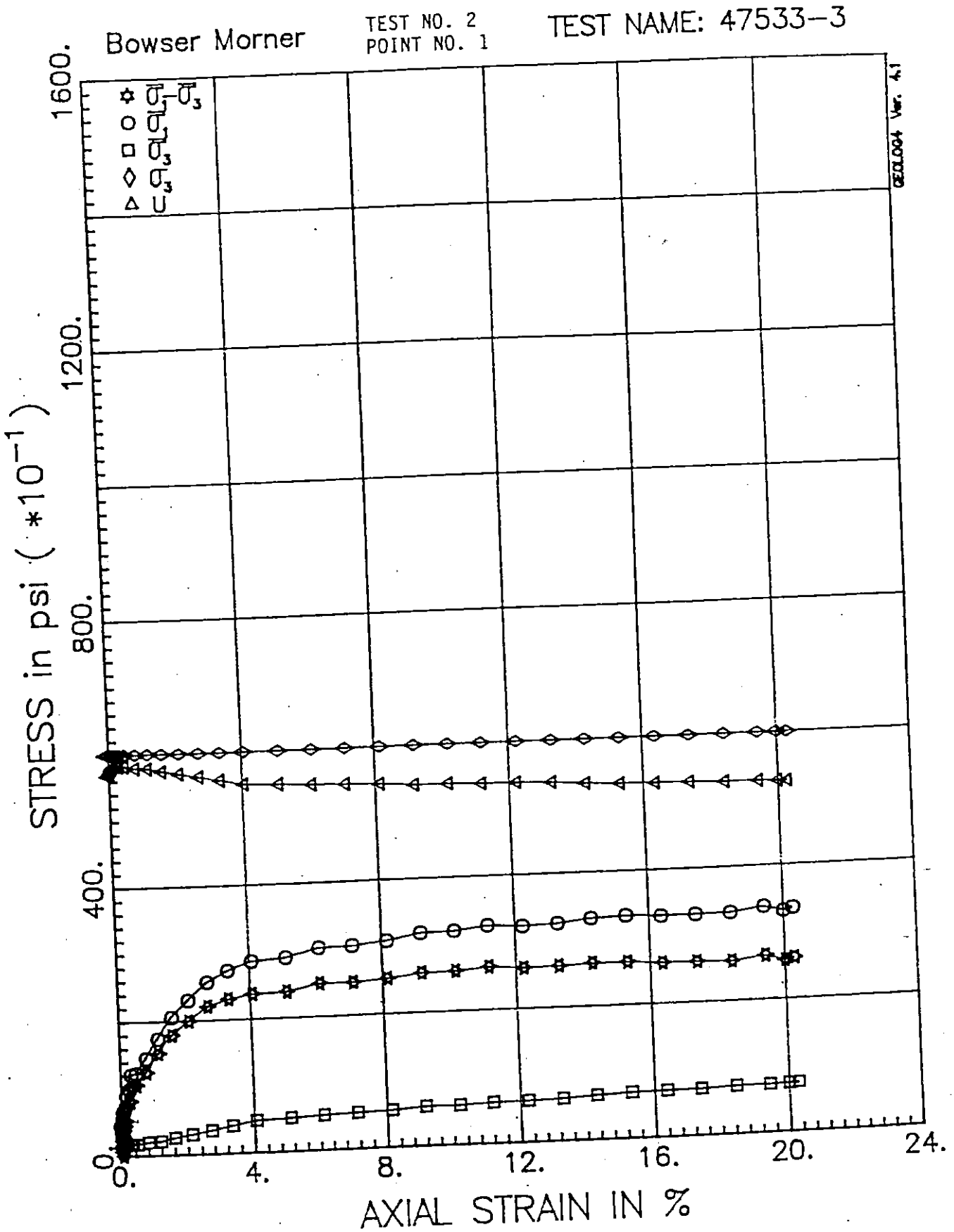
TEST NAME: 47533

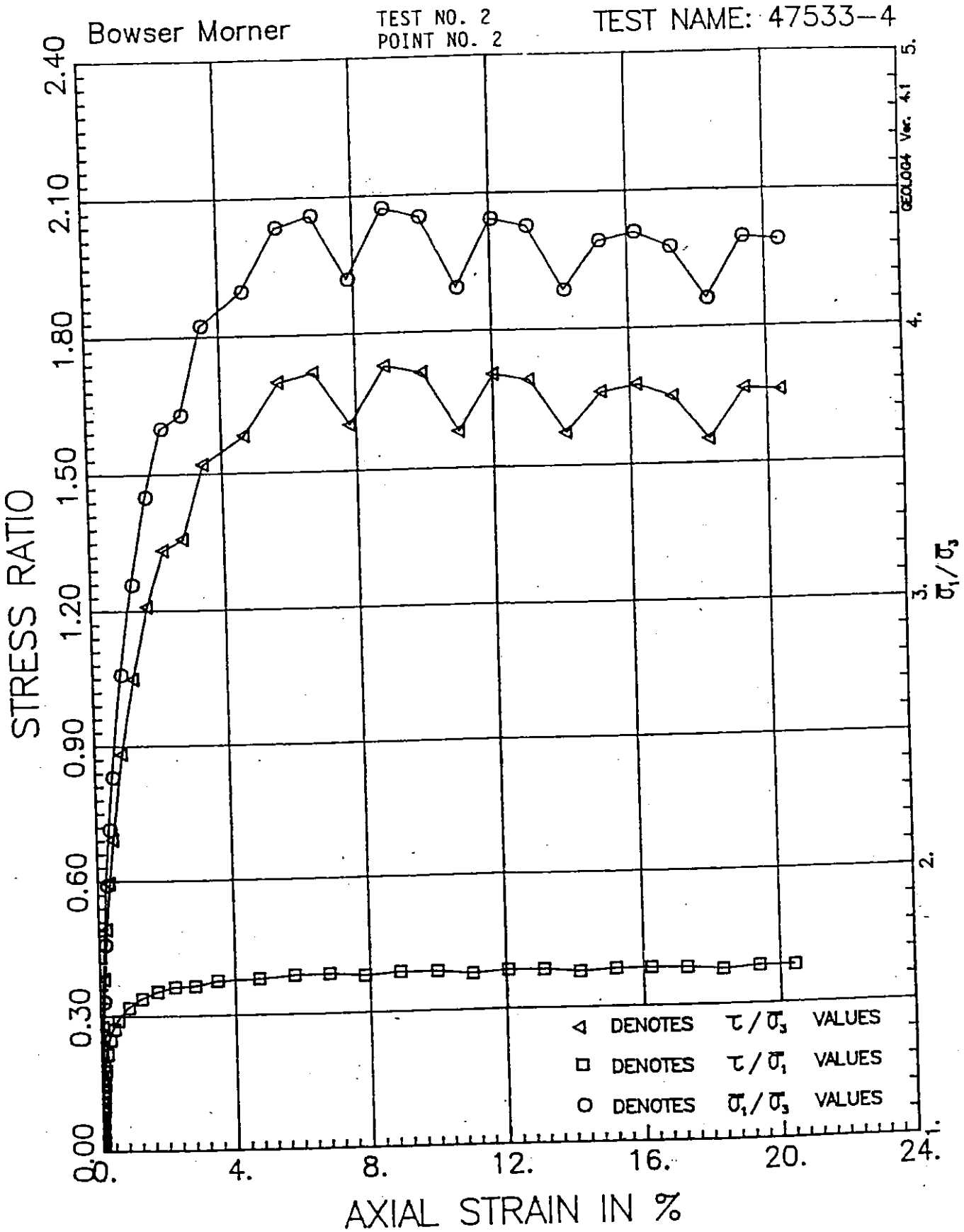
Bowser Morner

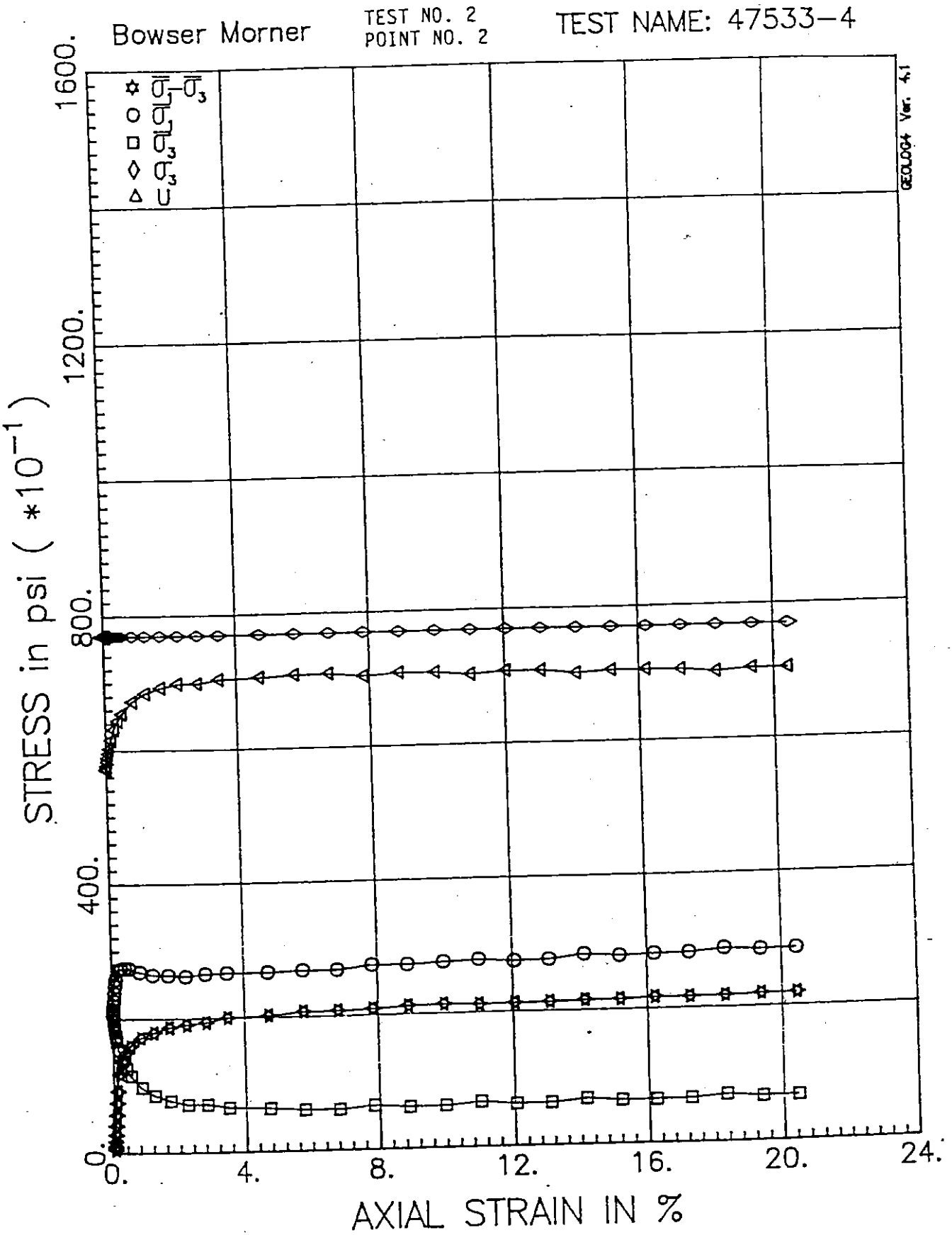
TEST NO. 2




Bowser Morner
TEST NO. 2
POINT NO. 1
TEST NAME: 47533-3
STRESS RATIO
AXIAL STRAIN IN %
σ_1/σ_3
GEDLOG4 Ver. 4.1
DENOTES τ/σ_3 VALUES
DENOTES τ/σ_1 VALUES
DENOTES σ_1/σ_3 VALUES
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
0.
4.
8.
12.
16.
20.
24.
1.
2.
3.
4.
5.


Bowser Morner
TEST NO. 2
POINT NO. 1
TEST NAME: 47533-3
$\bar{\sigma}_1-\bar{\sigma}_3$
$\bar{\sigma}_1$
$\bar{\sigma}_3$
$\bar{\sigma}_3$
U
STRESS in psi (*10^{-1})
1600.
1200.
800.
400.
0.
0.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %
GEOLOGY Ver. 4.1


Bowser Morner
TEST NO. 2
POINT NO. 2
TEST NAME: 47533-4
STRESS RATIO
AXIAL STRAIN IN %
σ_1/σ_3
GEOLOG4 Ver. 4.1
DENOTES τ/σ_3 VALUES
DENOTES τ/σ_1 VALUES
DENOTES σ_1/σ_3 VALUES
0.00
0.30
0.60
0.90
1.20
1.50
1.80
2.10
2.40
0.
4.
8.
12.
16.
20.
24.
1.
2.
3.
4.
5.



Bowser Morner
TEST NO. 2
POINT NO. 2
TEST NAME: 47533-4
$\bar{\sigma}_1-\bar{\sigma}_3$
$\bar{\sigma}_1$
$\bar{\sigma}_3$
σ_3
U
GEOLOG4 Ver. 4.1
STRESS in psi (*10^{-1})
1600.
1200.
800.
400.
0.
0.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %

06-03-1992

TEST NO.: 3

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

Project No.: 47533
Project: WESTON/DSWA - PHASE IV

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:		Undisturbed	
Material:		DREDGE SPOIL	
Location:	TB7A	ST3, 14.5'-16.5'	
Effective Consolidation Pressure (psi):	7.0	50.0	
Saturation Pressures			
Initial Conditions,			
Lateral (psi):	10.0	10.0	
Back (psi):	5.0	5.0	
Consolidation Pressures,			
Initial Shearing Conditions,			
Lateral (psi):	64.0	97.0	
Back (psi):	57.0	47.0	
Initial Conditions,			
Height (inches):	5.798	5.820	
Diameter (inches):	2.832	2.845	
Weight (lbs.):	2.239	2.085	
Moisture Content (%):	46.8	58.8	
Volume (cf):	.02113	0.02141	
Dry Unit Weight (pcf):	72.1	61.3	
Wet Unit Weight (pcf):	105.9	97.4	
Consolidated Conditions,			
Moisture Content (%):	43.9	43.4	
Volume (cf):	0.02012	0.01780	
Dry Unit Weight (pcf):	75.7	73.7	
Wet Unit Weight (pcf):	109.0	105.8	
At Maximum Principal Effective Stress Ratio,			
p' = (s'1 + s'3)/2, (psi):	9.8	34.0	
q' = (s'1 - s'3)/2, (psi):	6.1	21.7	

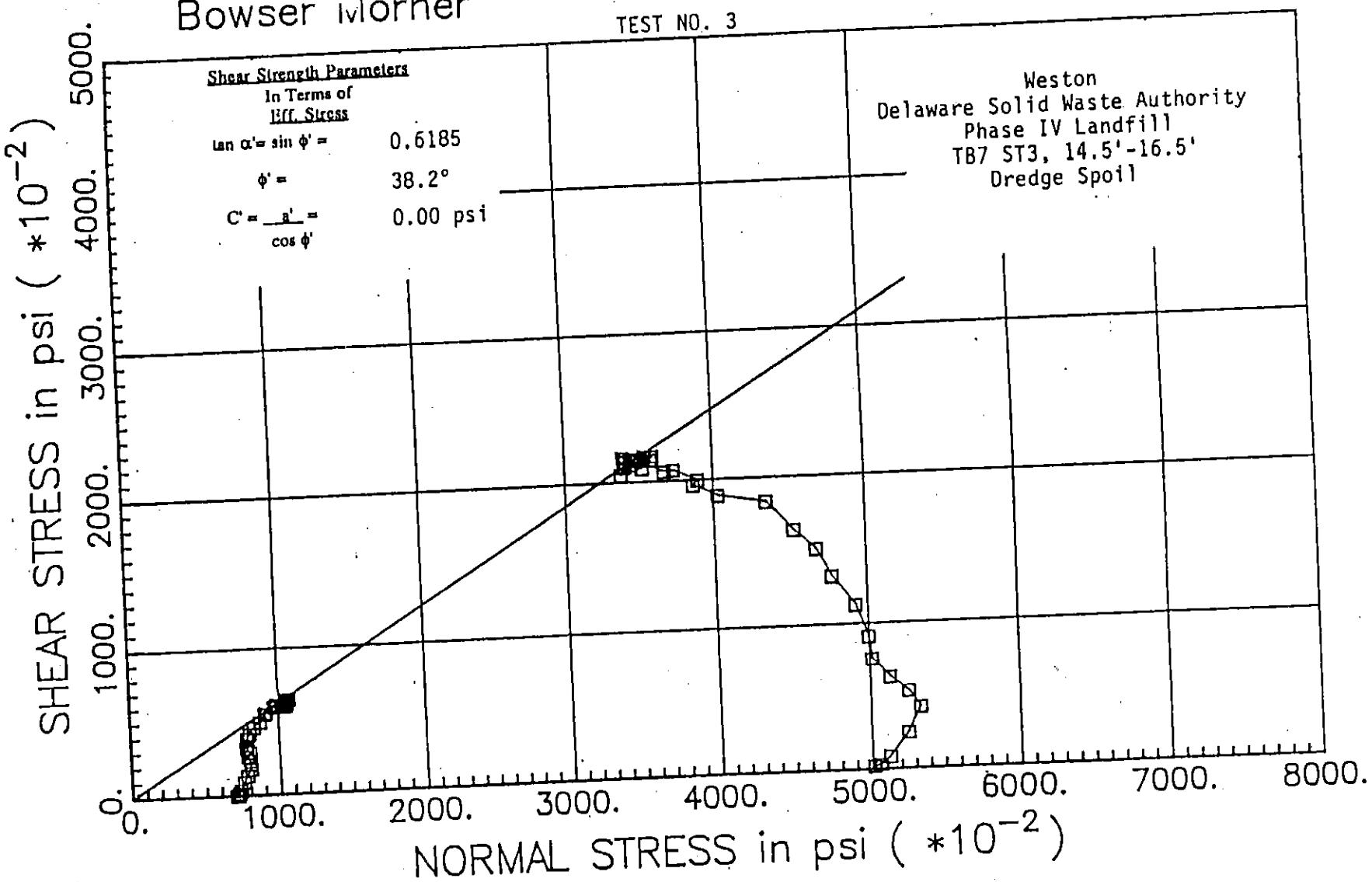
Measured Strength Parameters:
Effective Phi' (deg) = 38.2
C' (psi) = 0.00

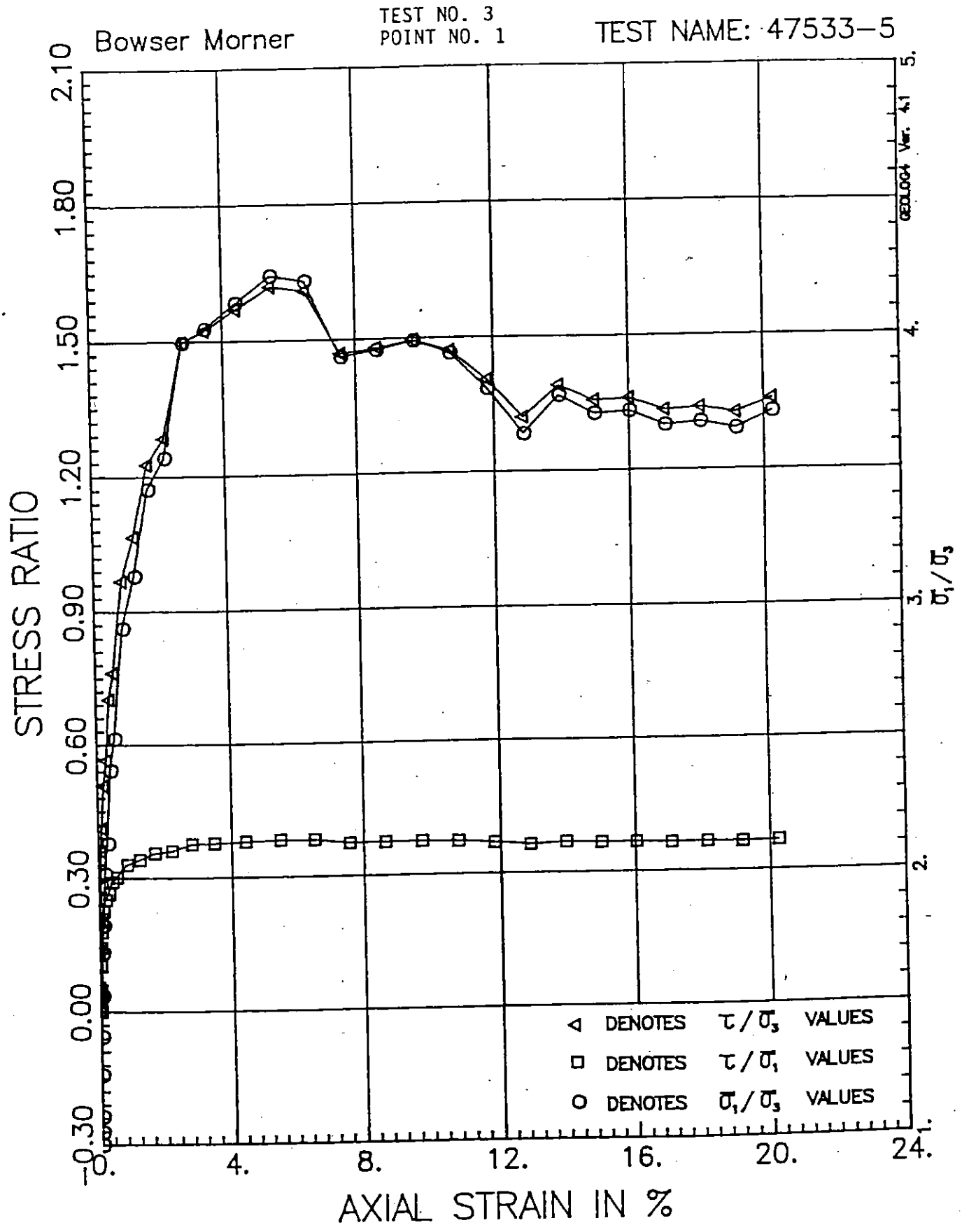
STRESS PATHS

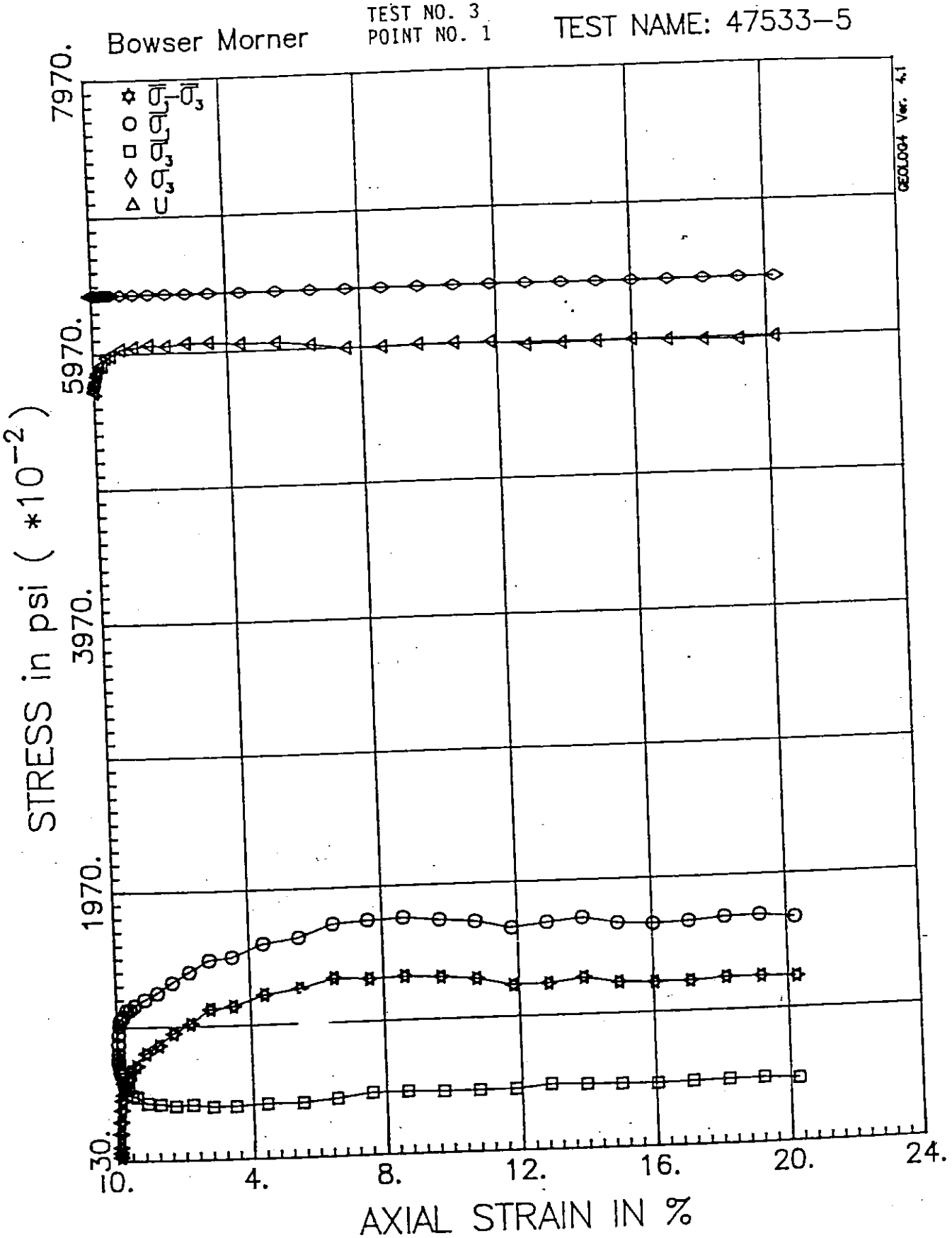
TEST NAME: 47533

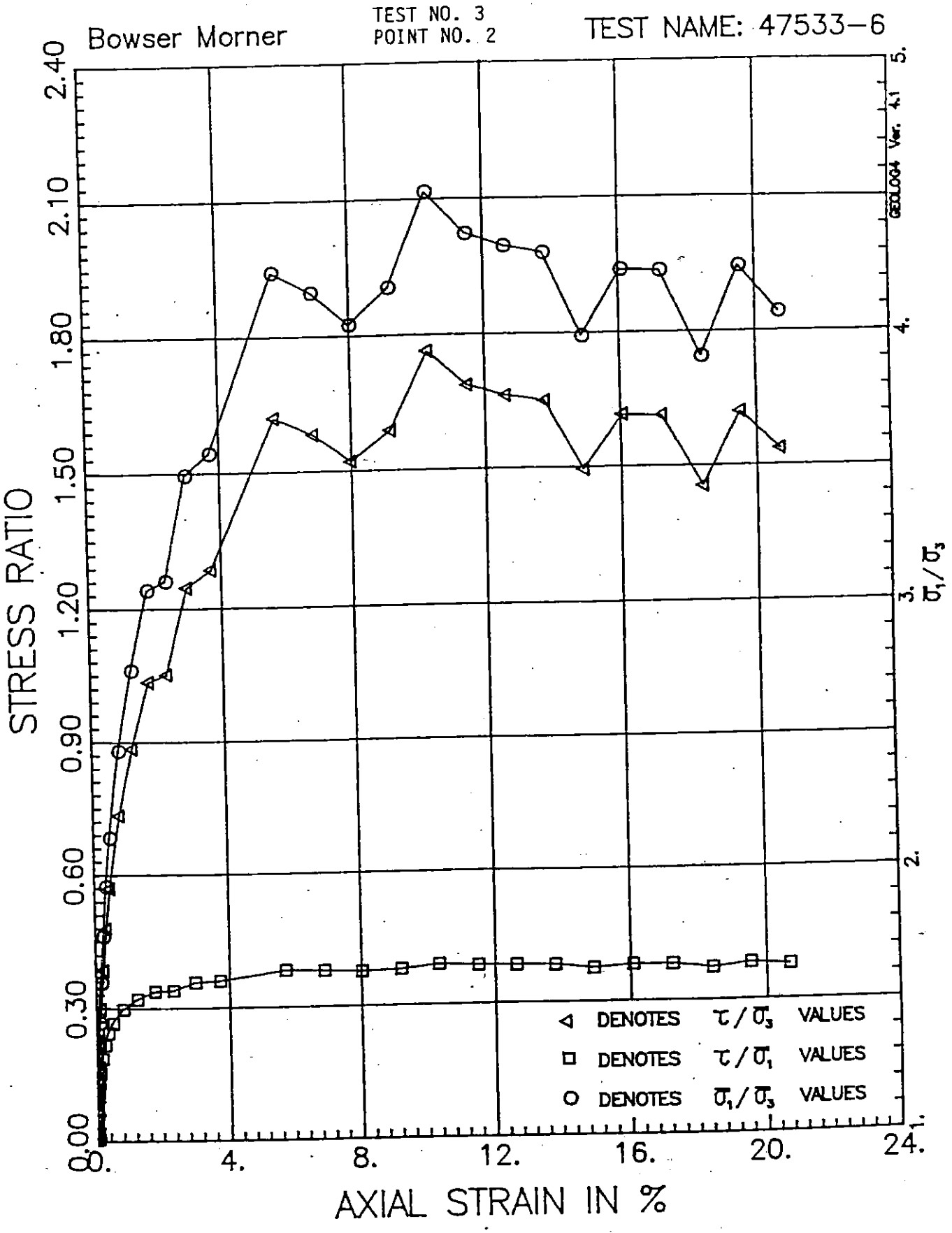
Bowser Morner

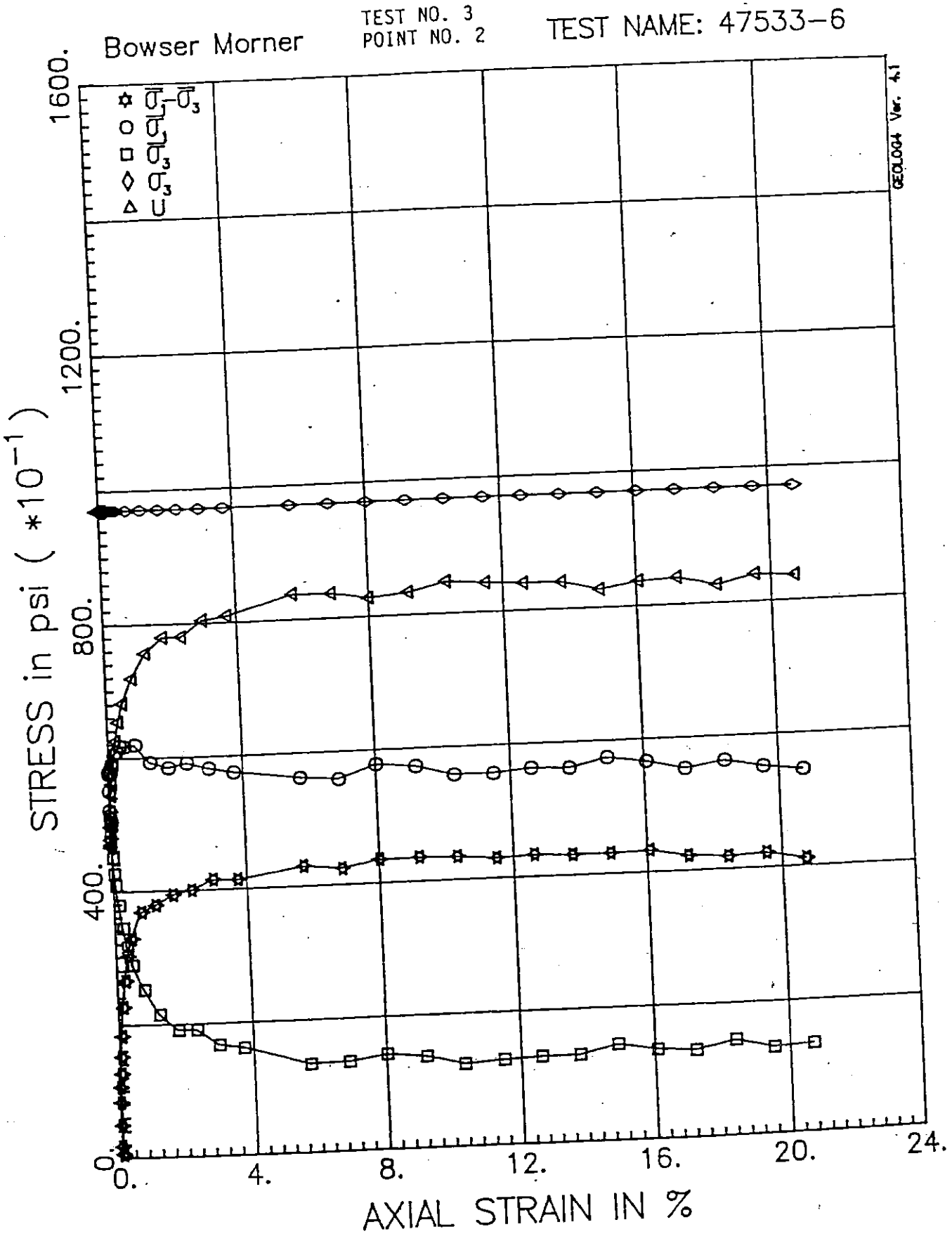
TEST NO. 3




Bowser Morner
TEST NO. 3
POINT NO. 1
TEST NAME: 47533-5
STRESS RATIO
AXIAL STRAIN IN %
σ_1/σ_3
2.10
1.80
1.50
1.20
0.90
0.60
0.30
0.00
-0.30
0.
4.
8.
12.
16.
20.
24.
5.
4.
3.
2.
1.
GEDLOG4 Ver. 4.1
DENOTES τ/σ_3 VALUES
DENOTES τ/σ_1 VALUES
DENOTES σ_1/σ_3 VALUES


Bowser Morner
TEST NO. 3
POINT NO. 1
TEST NAME: 47533-5
GEOLOGY Ver. 4.1
STRESS in psi (*10^-2)
7970.
5970.
3970.
1970.
30.
10.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %


Bowser Morner
TEST NO. 3
POINT NO. 2
TEST NAME: 47533-6
STRESS RATIO
AXIAL STRAIN IN %
σ_1/σ_3
GEOLOG4 Ver. 4.1
0.00
0.30
0.60
0.90
1.20
1.50
1.80
2.10
2.40
0.
4.
8.
12.
16.
20.
24.
1.
2.
3.
4.
5.
DENOTES τ/σ_3 VALUES
DENOTES τ/σ_1 VALUES
DENOTES σ_1/σ_3 VALUES


Bowser Morner
TEST NO. 3
POINT NO. 2
TEST NAME: 47533-6
GEOLOG4 Ver. 4.1
$\bar{\sigma}_1-\bar{\sigma}_3$
$\bar{\sigma}_1$
$\bar{\sigma}_3$
$\bar{\sigma}_3$
U
STRESS in psi (*10^{-1})
1600.
1200.
800.
400.
0.
0.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %

06-03-1992

TEST NO.: 4

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

Project No.: 47533
Project: WESTON/DSWA - PHASE IV

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:		Undisturbed	
Material:		DREDGE SPOIL	
Location:	TB8	ST3, 60.0'-61.5'	
Depth (ft):	60.8-61.3	61.4-61.9	
Effective Consolidation Pressure (psi):	12.0	60.0	
Saturation Pressures			
Initial Conditions,			
Lateral (psi):	10.0	10.0	
Back (psi):	5.0	5.0	
Consolidation Pressures,			
Initial Shearing Conditions,			
Lateral (psi):	69.0	97.0	
Back (psi):	57.0	37.0	
Initial Conditions,			
Height (inches):	5.785	5.839	
Diameter (inches):	2.860	2.831	
Weight (lbs.):	2.026	2.134	
Moisture Content (%):	69.8	60.4	
Volume (cf):	0.02150	0.02126	
Dry Unit Weight (pcf):	55.4	62.5	
Wet Unit Weight (pcf):	94.2	100.3	
Consolidated Conditions,			
Moisture Content (%):	58.5	43.1	
Volume (cf):	0.01810	0.01731	
Dry Unit Weight (pcf):	65.9	76.7	
Wet Unit Weight (pcf):	104.4	109.9	
At Maximum Principal Effective Stress Ratio,			
p' = (s'1 + s'3)/2, (psi):	12.7	44.1	
q' = (s'1 - s'3)/2, (psi):	7.9	25.7	

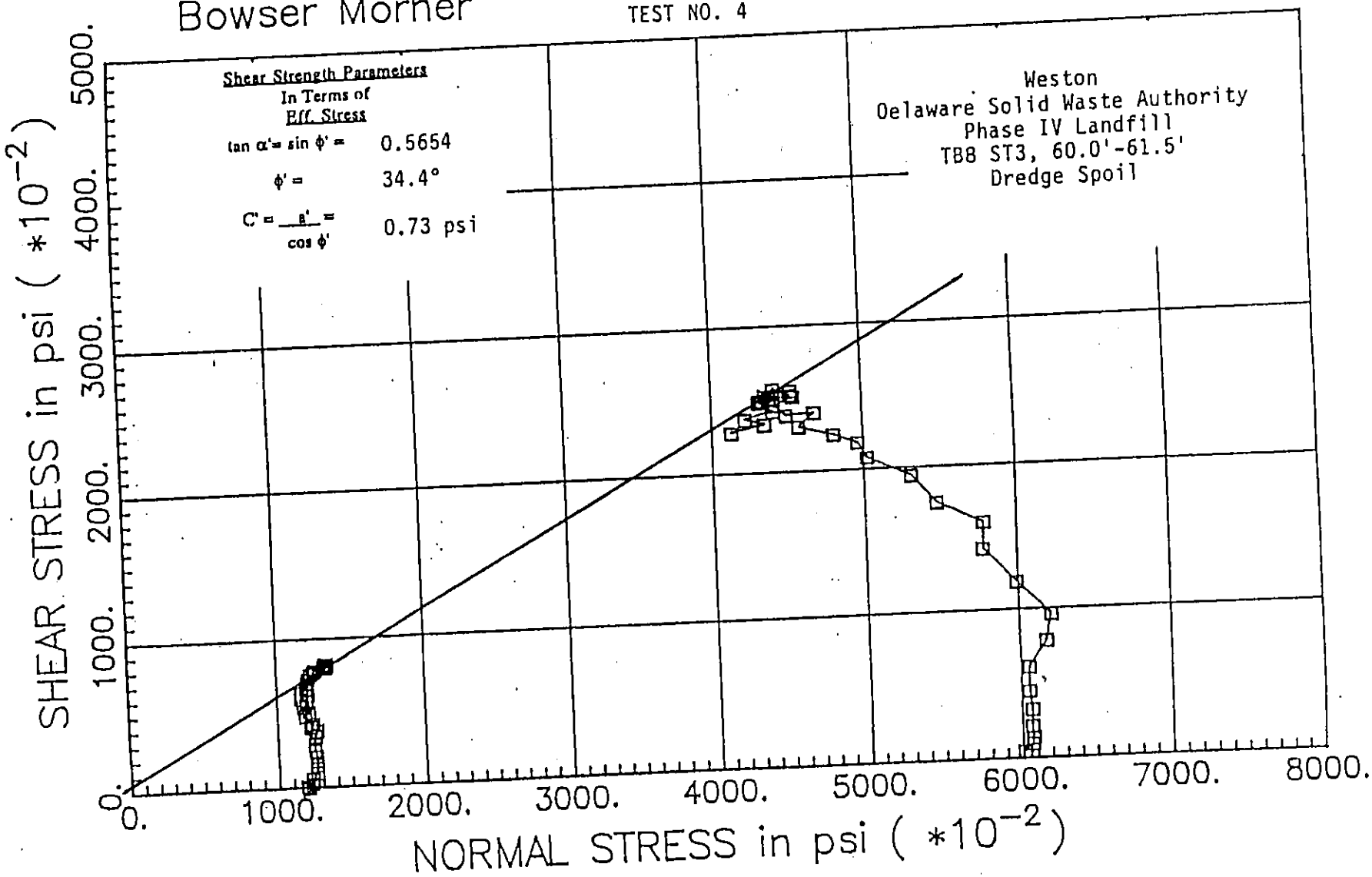
Measured Strength Parameters:
Effective Phi' (deg) = 34.4
C' (psi) = .73

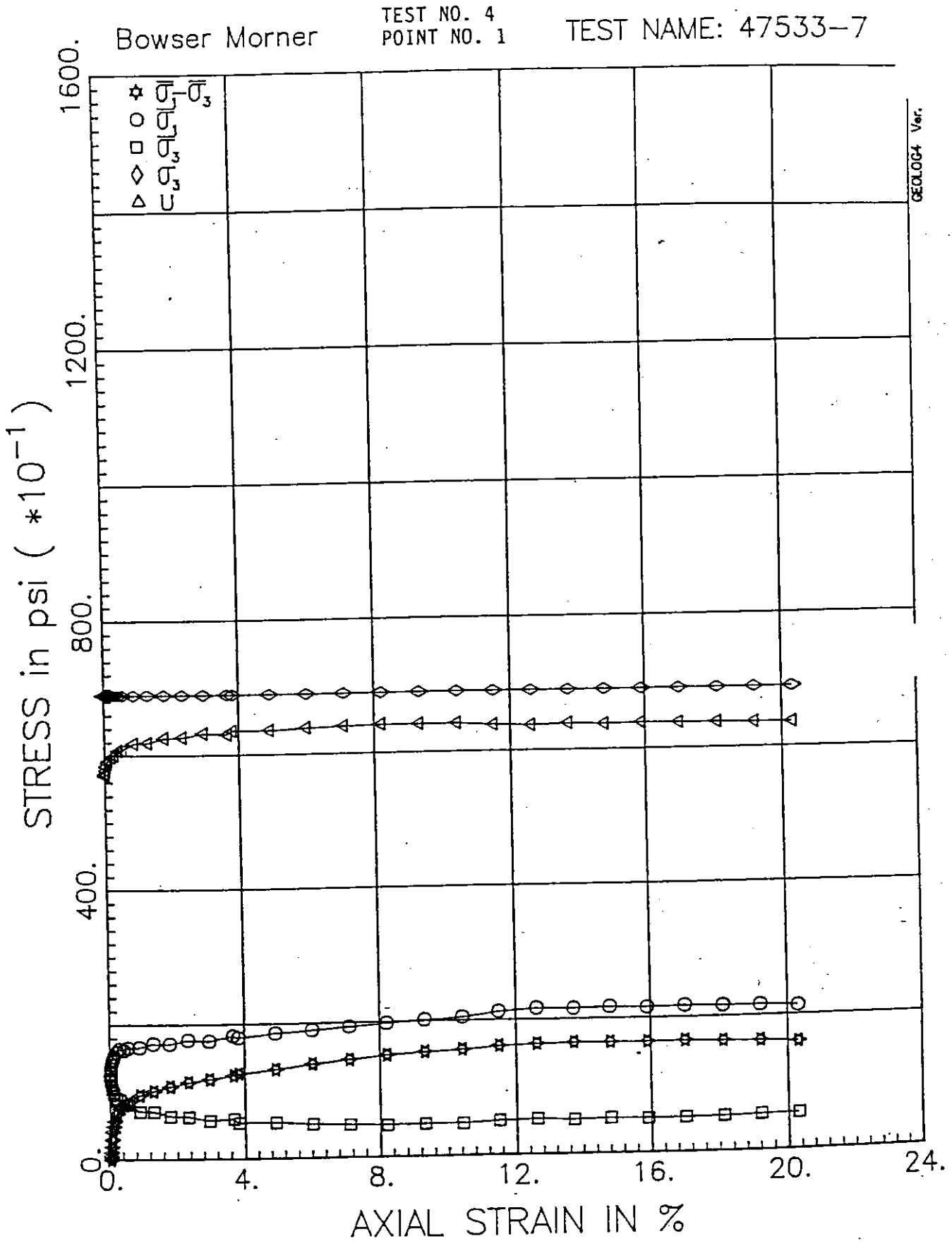
STRESS PATHS

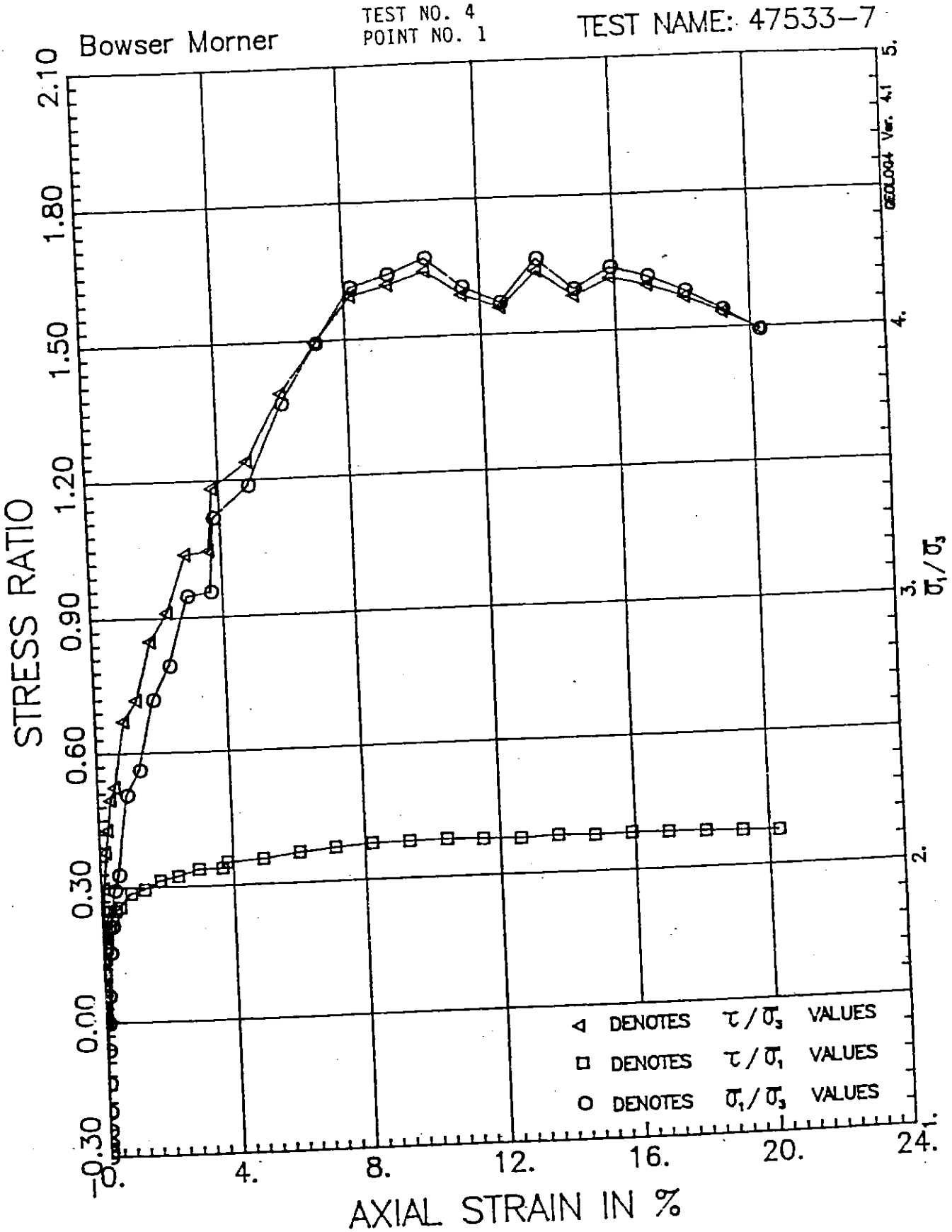
TEST NAME: 47533

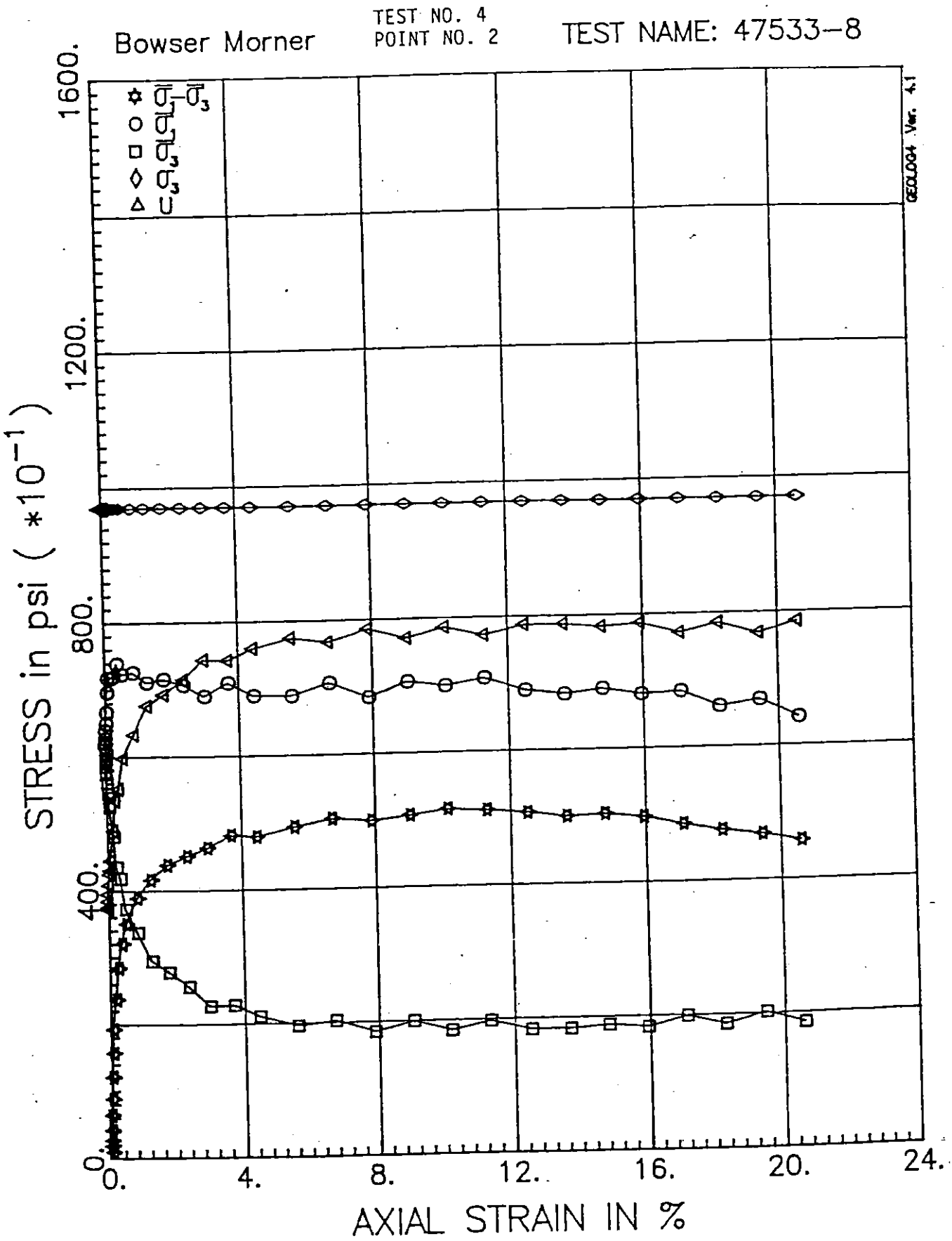
Bowser Morner

TEST NO. 4

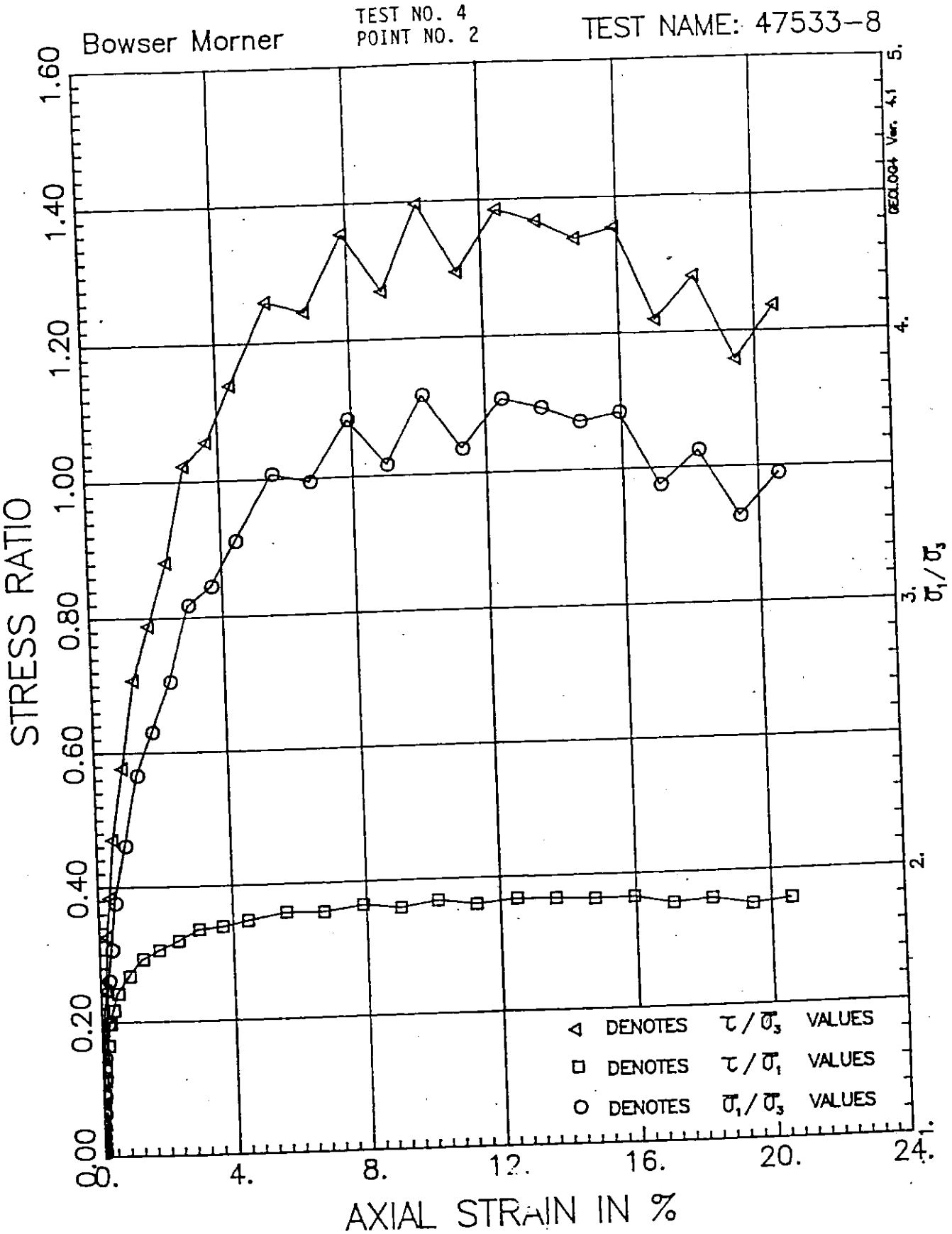



Bowser Morner
TEST NO. 4
POINT NO. 1
TEST NAME: 47533-7
$\bar{\sigma}_1-\bar{\sigma}_3$
$\bar{\sigma}_1$
$\bar{\sigma}_3$
u
STRESS in psi (*10^{-1})
1600.
1200.
800.
400.
0.
0.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %
GEOLOG4 Ver.


Bowser Morner
TEST NO. 4
POINT NO. 1
TEST NAME: 47533-7
STRESS RATIO
2.10
1.80
1.50
1.20
0.90
0.60
0.30
0.00
-0.30
0.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %
1.
2.
3.
4.
5.
σ1/σ3
GEOLOG4 Ver. 4.1
DENOTES τ/σ3 VALUES
DENOTES τ/σ1 VALUES
DENOTES σ1/σ3 VALUES



Bowser Morner
TEST NO. 4
POINT NO. 2
TEST NAME: 47533-8
$\bar{\sigma}_1-\bar{\sigma}_3$
$\bar{\sigma}_1$
$\bar{\sigma}_3$
σ_3
U
GEOLOG4 Ver. 4.1
STRESS in psi (*10^{-1})
1600.
1200.
800.
400.
0.
0.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %


Bowser Morner
TEST NO. 4
POINT NO. 2
TEST NAME: 47533-8
STRESS RATIO
AXIAL STRAIN IN %
σ_1/σ_3
DENOTES τ/σ_3 VALUES
DENOTES τ/σ_1 VALUES
DENOTES σ_1/σ_3 VALUES
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
0.
4.
8.
12.
16.
20.
24.
1.
2.
3.
4.
5.
GEOLOGY Ver. 4.1

06-03-1992

TEST NO.: 5

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

Project No.: 47533
Project: WESTON/DSWA - PHASE IV

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:		Undisturbed	
Material:		DREDGE SPOIL	
Location:	TB9	ST2, 40.0'-42.0'	
Depth (ft):	40.5-41.0	41.2-41.7	
Effective Consolidation Pressure (psi):	10.0	55.0	
Saturation Pressures			
Initial Conditions,			
Lateral (psi):	10.0	10.0	
Back (psi):	5.0	5.0	
Consolidation Pressures,			
Initial Shearing Conditions,			
Lateral (psi):	67.0	102.0	
Back (psi):	57.0	47.0	
Initial Conditions,			
Height (inches):	5.861	5.833	
Diameter (inches):	2.869	2.834	
Weight (lbs.):	1.945	1.936	
Moisture Content (%):	83.6	82.0	
Volume (cf):	0.02192	0.02129	
Dry Unit Weight (pcf):	48.2	49.9	
Wet Unit Weight (pcf):	88.7	90.9	
Consolidated Conditions,			
Moisture Content (%):	71.9	52.2	
Volume (cf):	0.01868	0.01475	
Dry Unit Weight (pcf):	56.6	72.0	
Wet Unit Weight (pcf):	97.4	109.7	
At Maximum Principal Effective Stress Ratio,			
p' = (s'1 + s'3)/2, (psi):	9.2	39.1	
q' = (s'1 - s'3)/2, (psi):	7.3	23.9	

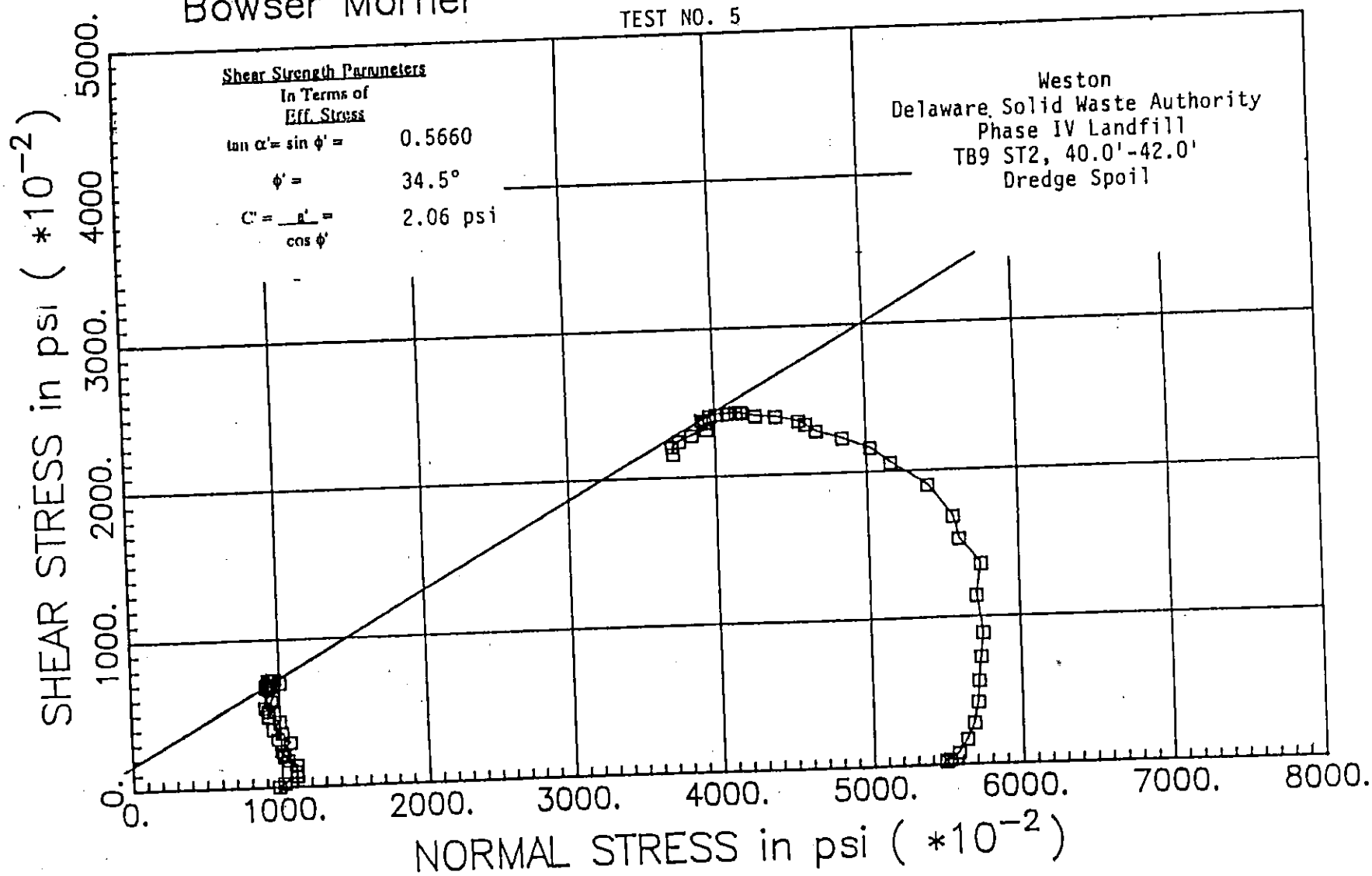
Measured Strength Parameters:
Effective Phi' (deg) = 34.5
C' (psi) = 2.06

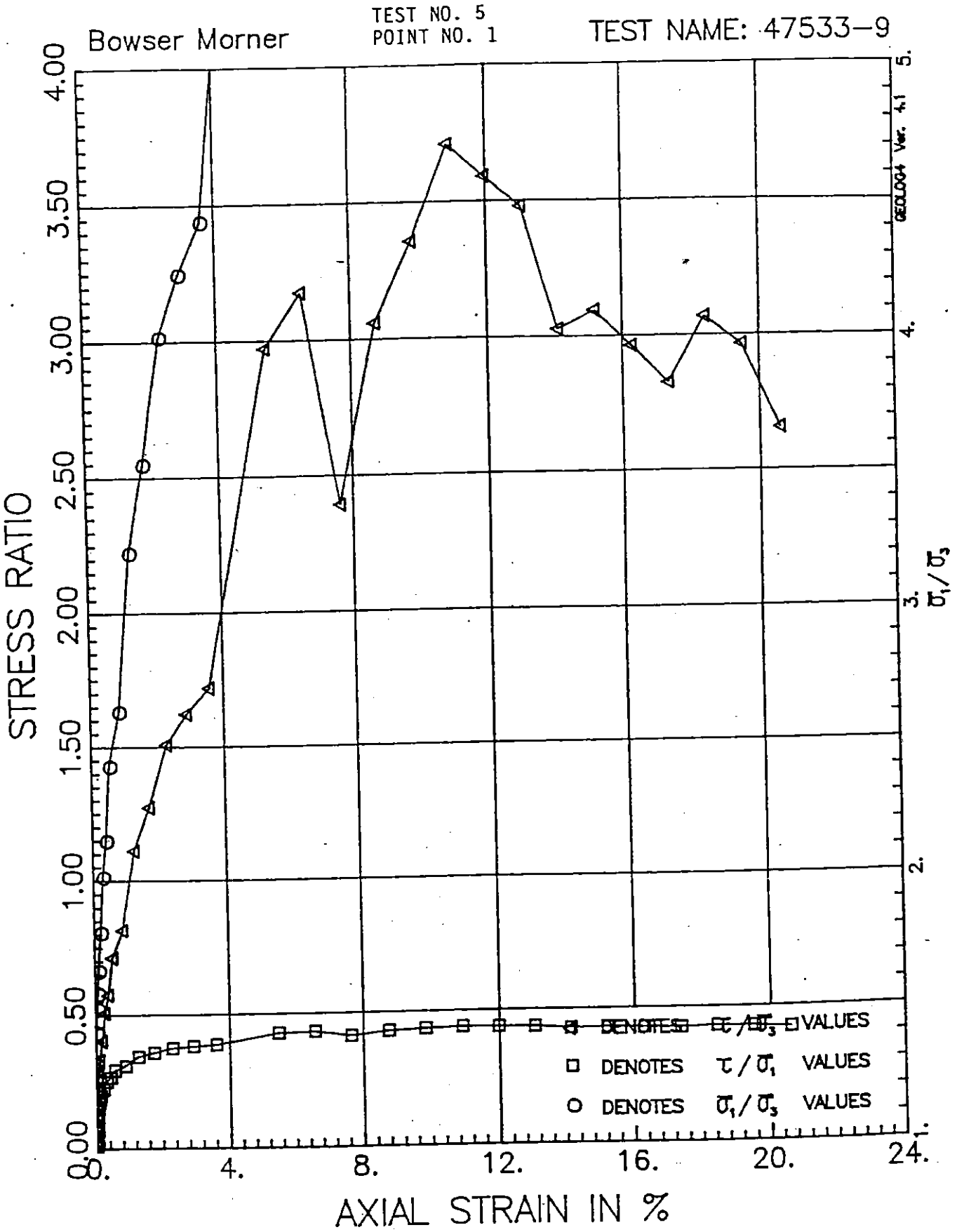
STRESS PATHS

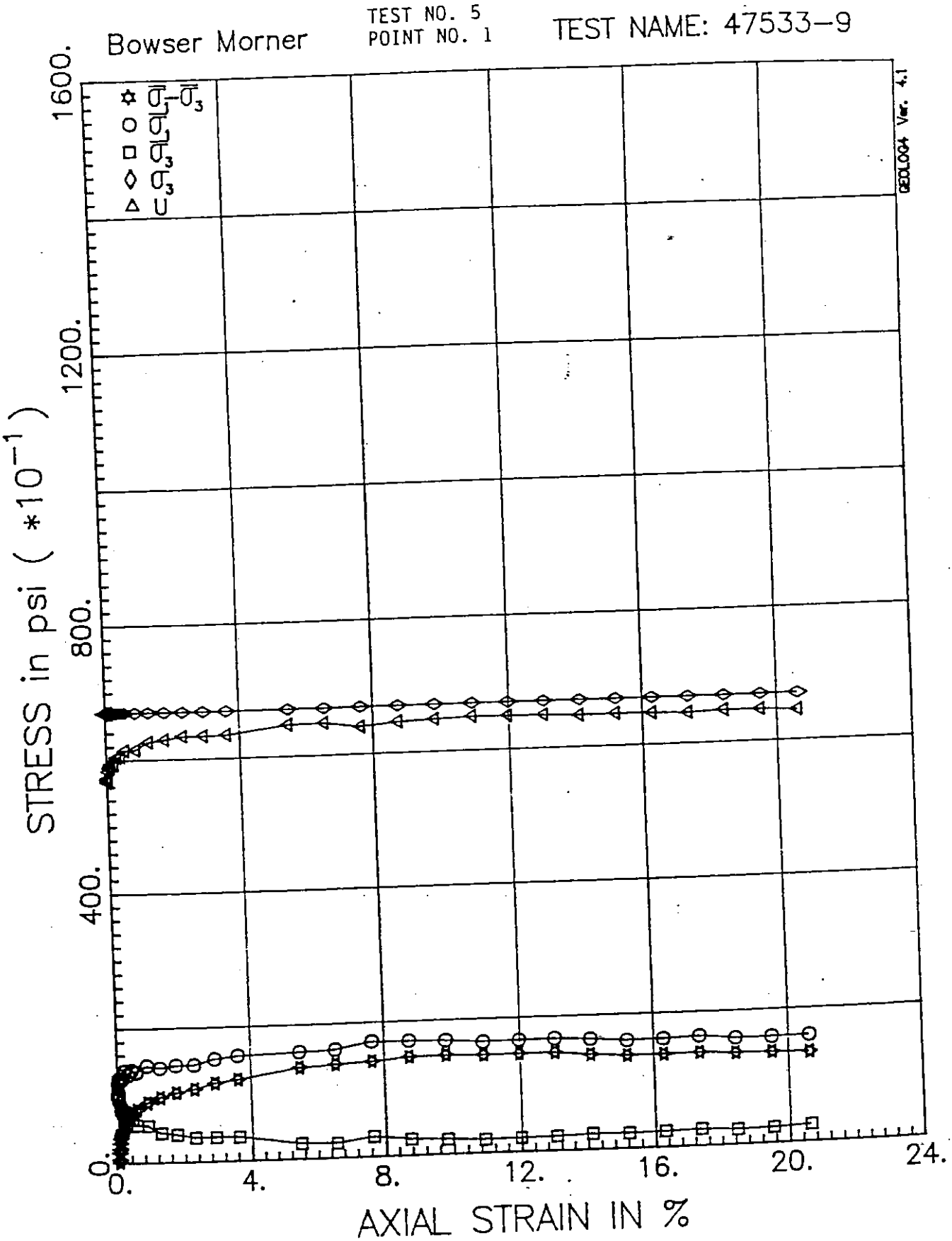
Bowser Morner

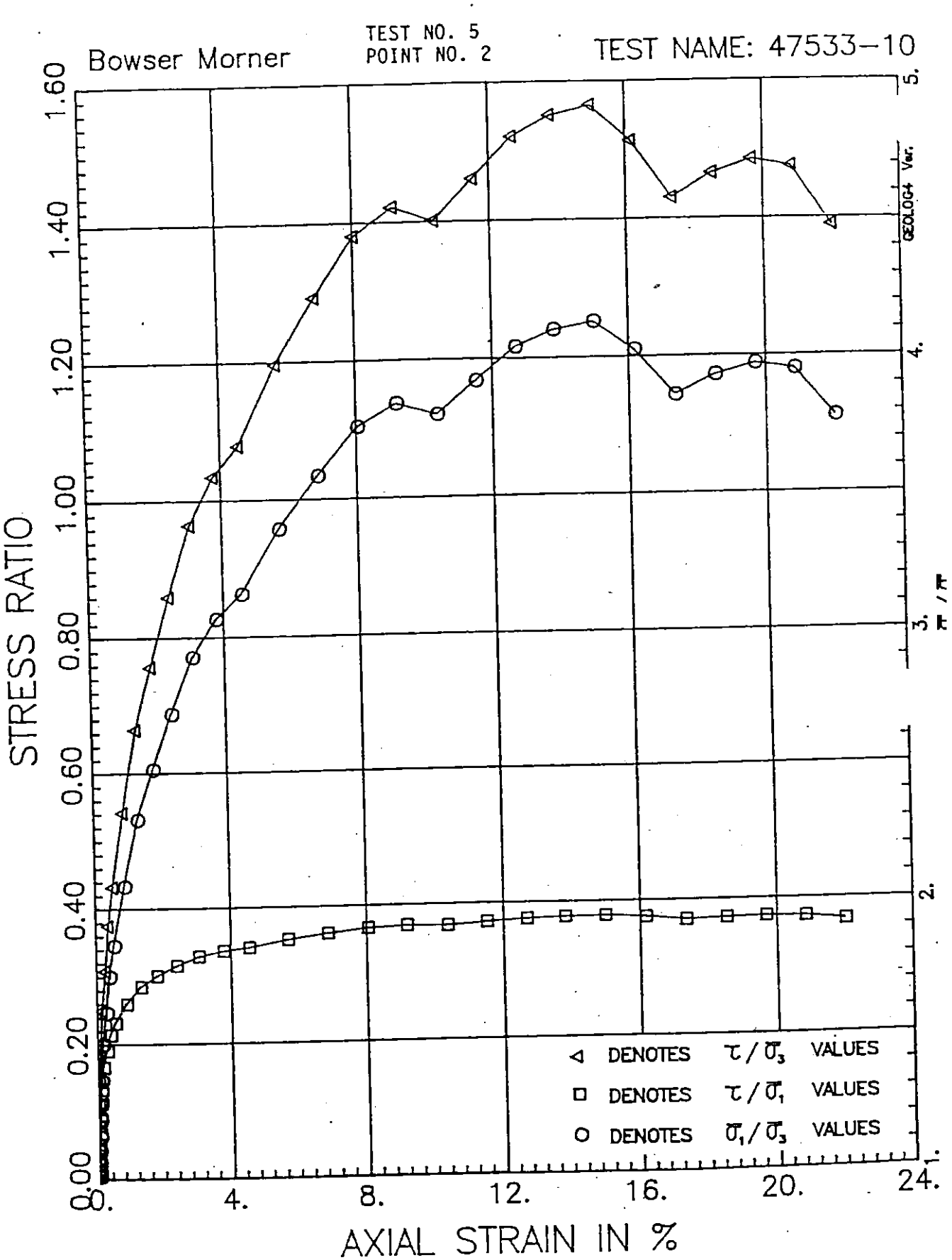
TEST NAME: 47533

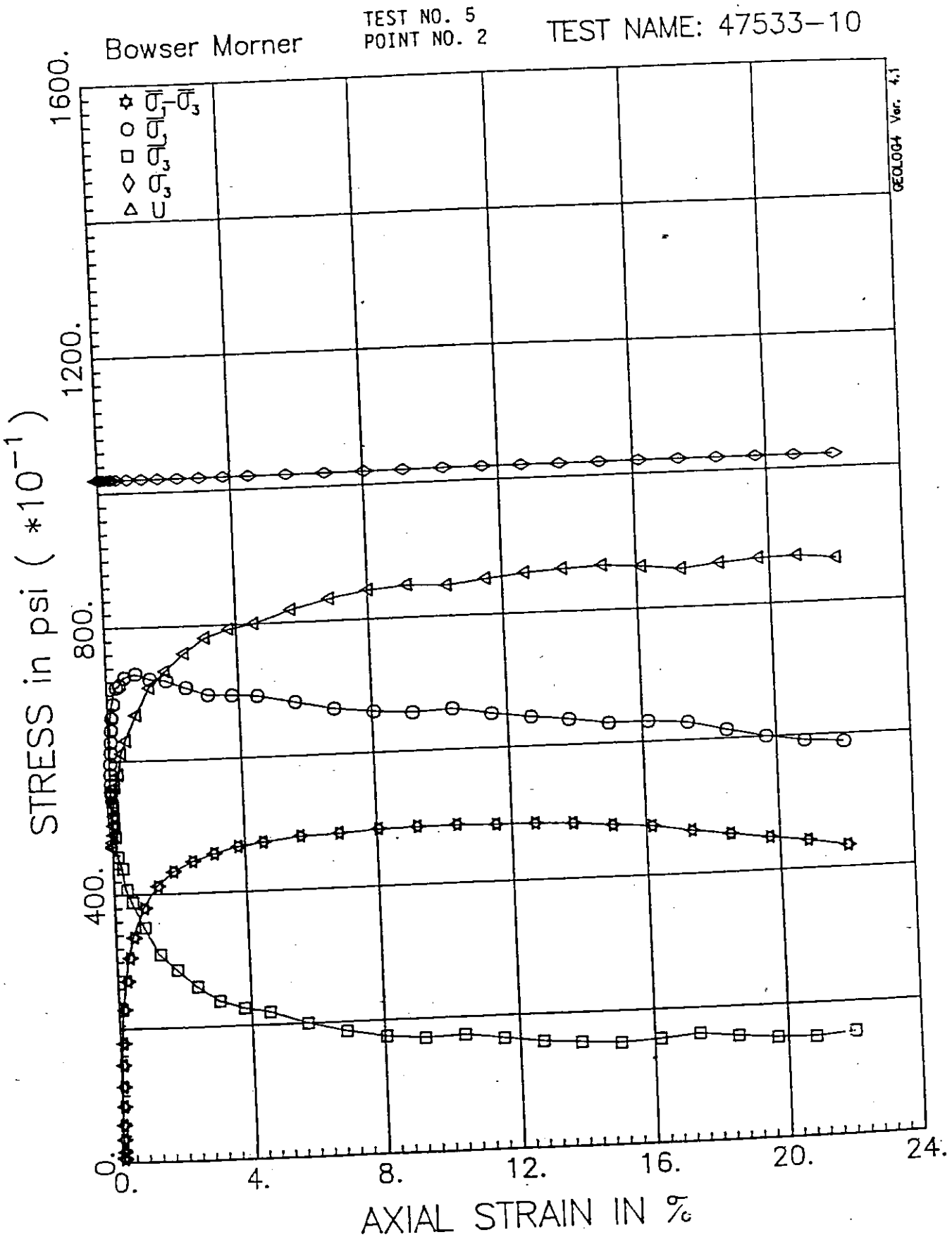
TEST NO. 5



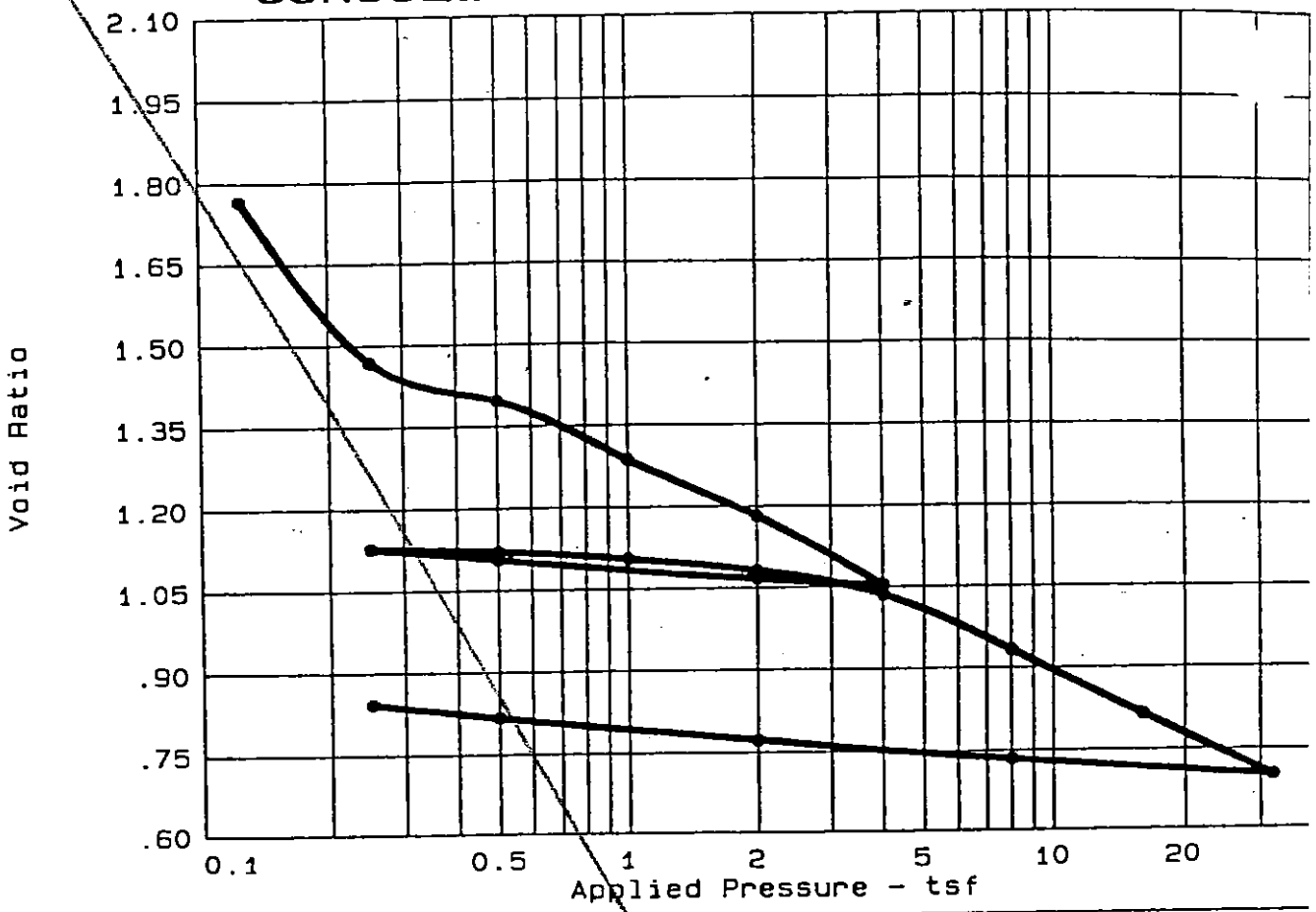

Bowser Morner
TEST NO. 5
POINT NO. 1
TEST NAME: 47533-9
STRESS RATIO
AXIAL STRAIN IN %
$\bar{\sigma}_1/\bar{\sigma}_3$
GEOLOGY Ver. 4.1
DENOTES $\tau/\bar{\sigma}_3$ VALUES
DENOTES $\tau/\bar{\sigma}_1$ VALUES
DENOTES $\bar{\sigma}_1/\bar{\sigma}_3$ VALUES
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
0.
4.
8.
12.
16.
20.
24.
1.
2.
3.
4.
5.


Bowser Morner
TEST NO. 5
POINT NO. 1
TEST NAME: 47533-9
$\bar{\sigma}_1-\bar{\sigma}_3$
$\bar{\sigma}_1$
$\bar{\sigma}_3$
σ_3
U
STRESS in psi (*10^{-1})
AXIAL STRAIN IN %
0.
400.
800.
1200.
1600.
4.
8.
12.
16.
20.
24.
GEOLOG4 Ver. 4.1


Bowser Morner
TEST NO. 5
POINT NO. 2
TEST NAME: 47533-10
STRESS RATIO
AXIAL STRAIN IN %
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
0.
4.
8.
12.
16.
20.
24.
1.
2.
3.
4.
5.
GEOLOG4 Ver.
DENOTES τ / σ̄3 VALUES
DENOTES τ / σ̄1 VALUES
DENOTES σ̄1 / σ̄3 VALUES


Bowser Morner
TEST NO. 5
POINT NO. 2
TEST NAME: 47533-10
$\bar{\sigma}_1-\bar{\sigma}_3$
$\bar{\sigma}_1$
$\bar{\sigma}_3$
σ_3
U
GEOLOGY Ver. 4.1
STRESS in psi ($*10^{-1}$)
1600.
1200.
800.
400.
0.
0.
4.
8.
12.
16.
20.
24.
AXIAL STRAIN IN %

CONSOLIDATION TEST REPORT



Coefficients of Consolidation (sq.in./min.)

No.	Load	Cv	No.	Load	Cv	No.	Load	Cv
1	0.13	0.002	12	2.00	0.125			
2	0.25	0.115	13	4.00	0.016			
3	0.50	0.165	14	8.00	0.112			
4	1.00	0.069	15	16.00	0.100			
5	2.00	0.051	16	32.00	0.073			
6	4.00	0.050						
10	0.50	0.213						
11	1.00	0.310						

Swell press.	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp Gr.	Initial void rat
	81.9 %	55.7	58.6			2.60	1.7705

TEST RESULTS

MATERIAL DESCRIPTI

DREDGE SPOIL

Project No.: 47533 WESTON
Project: OSWA - PHASE IV
Location: T83 ST9, 67.5'-69.5'

Date: 06-02-92

Remarks:
TEST SPECIMEN TAKEN
FROM: 67.8'-67

CONSOLIDATION TEST REPORT

BOWSER-MORNER, INC.

Fig. No.

TABLE I

Test Specimen Data For Unconsolidated Undrained Triaxial Compression Tests

Sample ID:	TB13 ST1 10.0'-12.0'		TB13 ST2 30.0'-32.0'			TB14 ST3 60.0'-62.0'			TB15 ST1 15.0'-17.0'			TB20 ST1 10.0'-12.0'			TB22 ST2 40.0'-42.0'		
Test Specimen:	pt. 1	pt. 2	pt. 1	pt. 2	pt. 3	pt. 1	pt. 2	pt. 3	pt. 1	pt. 2	pt. 3	pt. 1	pt. 2	pt. 3	pt. 1	pt. 2	pt. 3
Depth, ft.	10.4-10.9	10.9-11.4	30.5-31.0	31.0-31.5	31.5-32.0	60.4-60.9	60.9-61.4	61.4-61.9	15.4-15.9	15.9-16.4	16.4-16.9	10.2-10.7	10.7-11.2	11.2-11.7	40.5-41.0	41.0-41.5	41.5-42.0
Moisture Content, %:	74.3	90.8	66.4	71.6	67.2	56.0	60.6	58.1	77.6	80.0	46.7	74.4	77.1	71.1	74.1	76.4	84.0
Dry Unit Weight, pcf:	54.7	47.8	54.2	53.9	57.3	65.1	62.8	64.0	53.1	52.3	73.2	54.4	53.7	56.7	54.9	53.8	49.2
Saturation, %:	99.7	99.8	86.9	93.0	95.8	98.1	100.0	98.9	98.3	99.1	100.0	98.0	99.6	99.7	100.0	99.9	96.2
Void Ratio, (e):	1.888	2.303	1.971	1.988	1.813	1.474	1.567	1.516	2.046	2.090	1.208	1.960	1.996	1.841	1.876	1.936	2.209

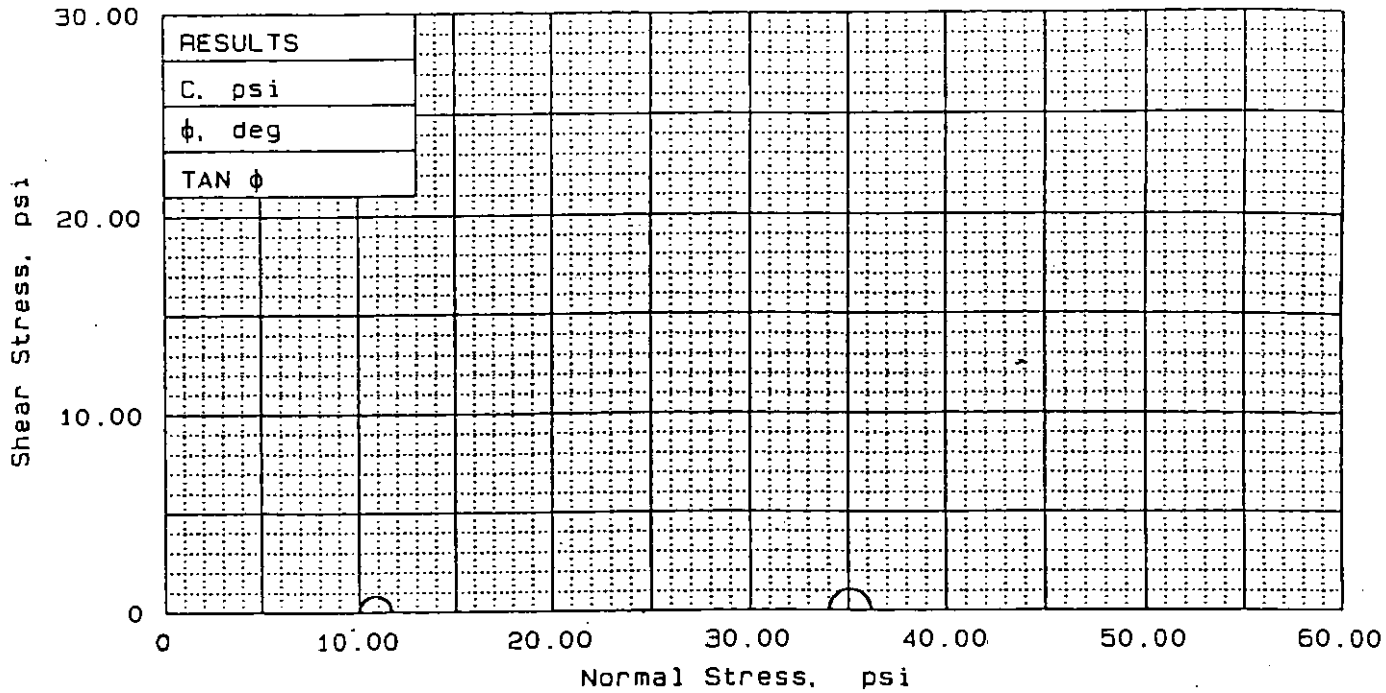
TABLE II

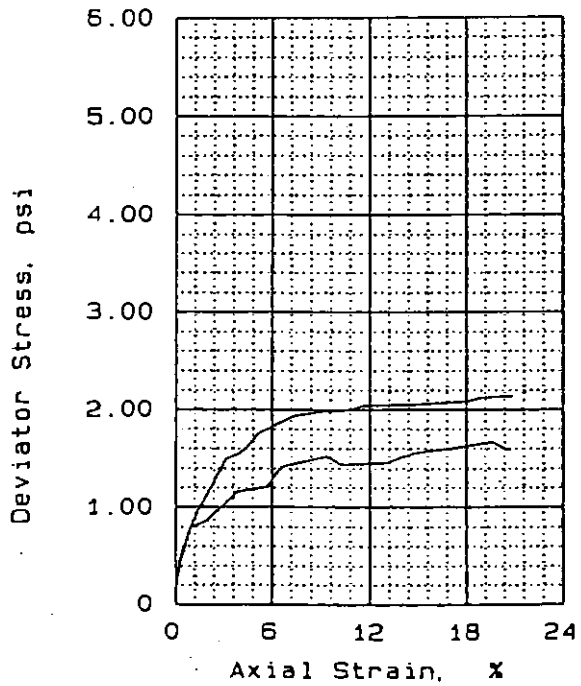
Test Specimen Data For Consolidated Undrained Triaxial Compression Tests with Pore Pressure Measurements

Sample ID:	TB17 ST2 30.0-32.0			TB18 ST1 19.0-21.0			TB19 ST2 45.0-47.0			TB21 ST1 48.0-17.0			TB22 ST1 20.0'-22.0'	
Test Specimen:	pt. 1	pt. 2	pt. 3	pt. 1	pt. 2	pt. 3	pt. 1	pt. 2	pt. 3	pt. 1	pt. 2	pt. 3	pt. 1	pt. 2
Depth, ft.	30.5-31.0	31.0-31.5	31.5-32.0	19.0-19.5	19.5-20.0	20.0-20.5	45.0-45.5	45.5-46.0	46.0-46.5	15.5-16.0	16.0-16.5	16.5-17.0	20.2-20.7	20.7-21.2
Moisture Content, %:	62.5	50.7	50.4	52.9	58.6	56.0	57.6	54.3	39.3	63.2	65.0	67.4	54.1	53.4
Dry Unit Weight, pcf:	62.2	70.4	71.1	66.7	63.5	64.9	62.7	66.5	78.5	56.8	58.6	57.4	65.6	65.2
Saturation, %:	100.0	100.0	100.0	97.1	98.9	98.3	93.8	97.5	95.0	89.8	97.0	97.5	96.6	94.5
Void Ratio, (e):	1.586	1.285	1.264	1.401	1.525	1.469	1.617	1.466	1.091	1.790	1.703	1.758	1.436	1.450

TABLE III
Specimen Data For Consolidation Testing

Sample ID:	TB13 ST1 10.0'-12.0'	TB14 ST3 60.0'-62.0'
Test Specimen Depth, ft.:	10.3-10.4	60.3-60.4
Moisture Content, %:	80.3	53.6
Dry Unit Weight, pcf:	47.0	61.8
Saturation, %:	86.0	86.2
Void Ratio, (e):	2.361	1.606





SAMPLE NO.		1	2
INITIAL	WATER CONTENT, %	74.3	90.8
	DRY DENSITY, pcf	54.7	47.8
	SATURATION, %	99.7	99.8
	VOID RATIO	1.888	2.303
	DIAMETER, in	2.74	2.78
	HEIGHT, in	5.79	5.79
AT TEST	WATER CONTENT, %		
	DRY DENSITY, pcf		
	SATURATION, %		
	VOID RATIO		
	DIAMETER, in	2.74	2.78
	HEIGHT, in	5.79	5.79
BACK PRESSURE, psi		0.00	0.00
CELL PRESSURE, psi		10.00	34.00
FAILURE STRESS, psi		1.67	2.14
PORE PRESSURE, psi			
STRAIN RATE, %/min.		1.000	1.000
ULTIMATE STRESS, psi			
PORE PRESSURE, psi			
σ_1 FAILURE, psi		11.67	36.14
σ_3 FAILURE, psi		10	34

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DARK GRAY SILT, SOME CLAY, SOME SAND
LL= PL= PI=
SPECIFIC GRAVITY= 2.53
REMARKS:
POINT NO. 1: 10.4'-10.9'
POINT NO. 2: 10.9'-11.4'

CLIENT: ROY F. WESTON, INC.

PROJECT: DSWA PHASE V LANDFILL

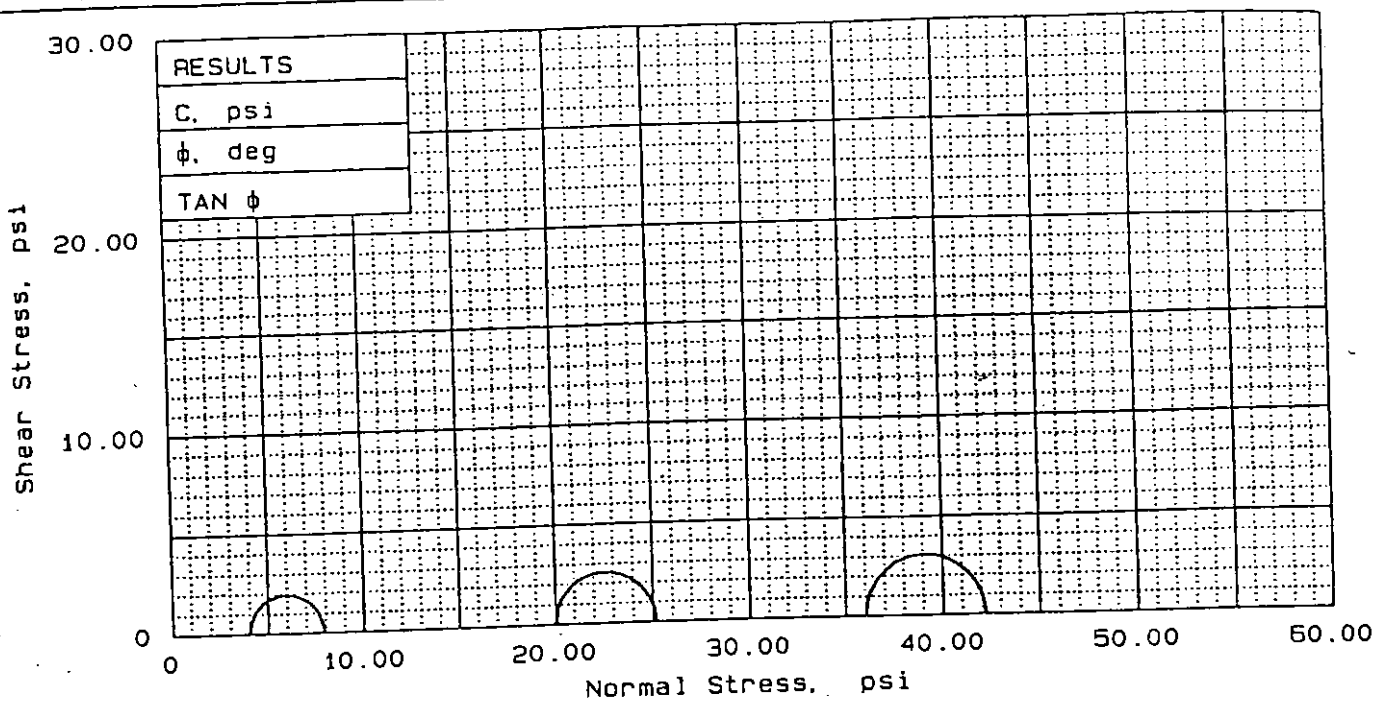
SAMPLE LOCATION: TB-13 ST1, 10.0'-12.0'

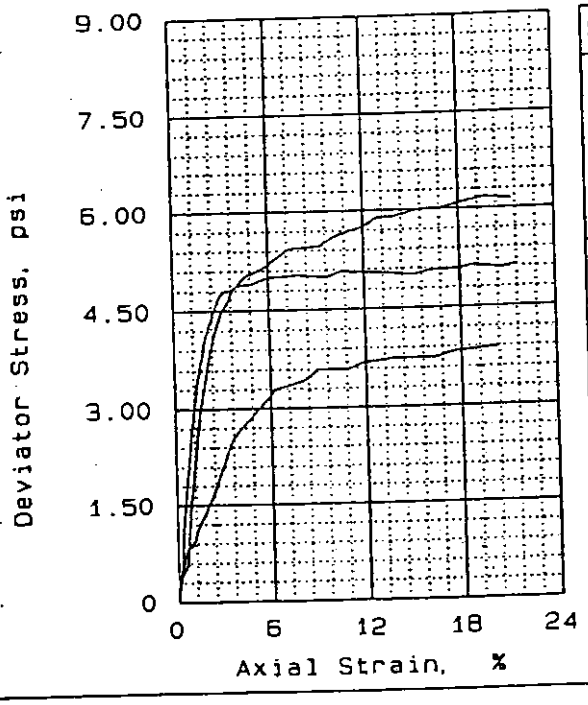
PROJ. NO.: 101210 DATE: 08-11-93

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.

FIG. NO.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	66.4	71.6	67.2
	DRY DENSITY, pcf	54.2	53.9	57.3
	SATURATION, %	86.9	93.0	95.8
	VOID RATIO	1.971	1.988	1.813
	DIAMETER, in	2.83	2.85	2.84
	HEIGHT, in	5.82	5.80	5.78
AT TEST	WATER CONTENT, %			
	DRY DENSITY, pcf			
	SATURATION, %			
	VOID RATIO			
	DIAMETER, in	2.83	2.85	2.84
	HEIGHT, in	5.82	5.80	5.78
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		4.00	20.00	36.00
FAILURE STRESS, psi		3.88	5.14	6.17
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				
PORE PRESSURE, psi				
σ_1 FAILURE, psi		7.88	25.14	42.17
σ_3 FAILURE, psi		4	20	36

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DARK GRAY ORGANIC SILT, SOME SAND, SOME CLAY
LL= PL= PI=
SPECIFIC GRAVITY= 2.58
REMARKS:
POINT NO. 1: 30.5'-31.0'
POINT NO. 2: 31.0'-31.5'
POINT NO. 3: 31.5'-32.0'
FIG. NO.

CLIENT: ROY F. WESTON, INC.

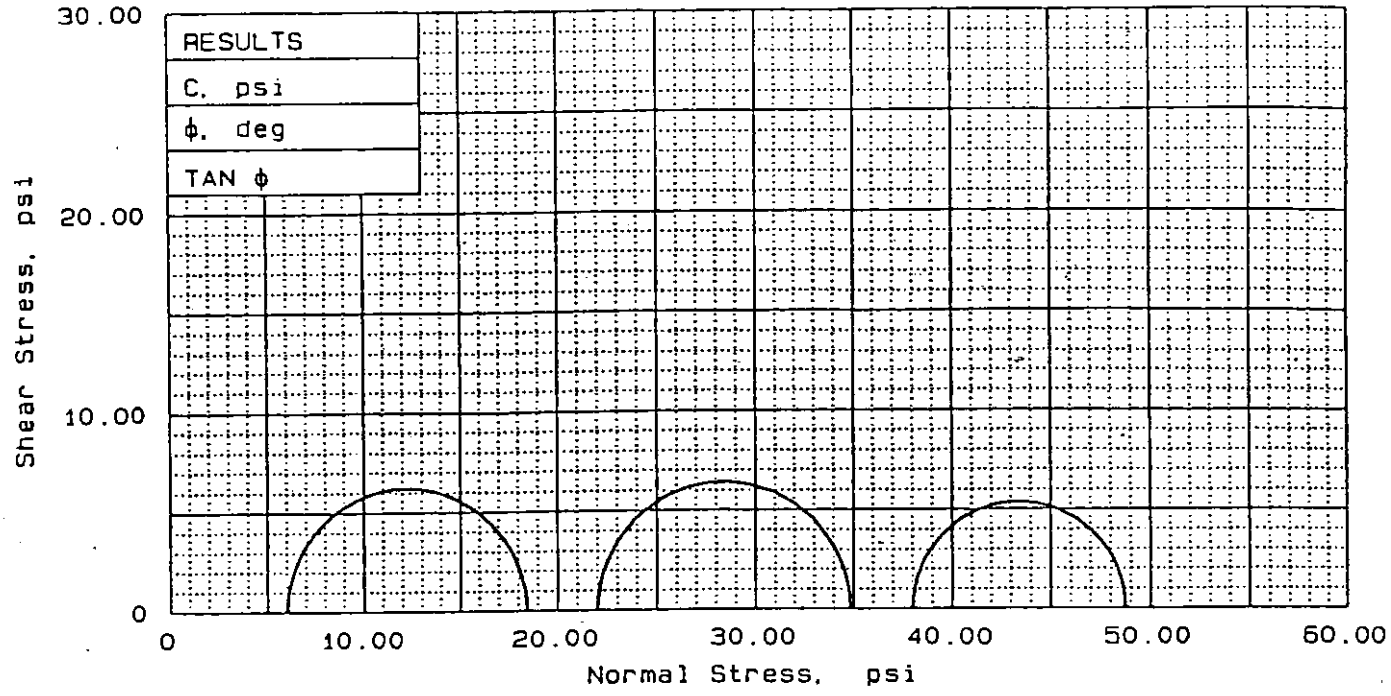
PROJECT: OSWA PHASE V LANDFILL

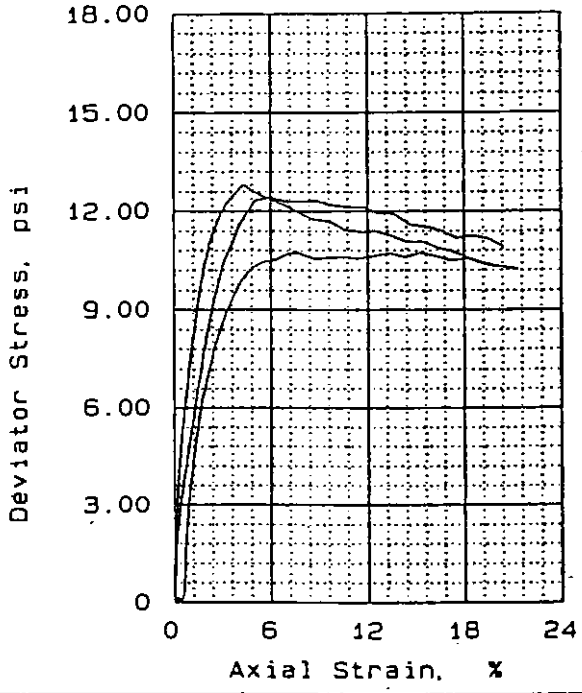
SAMPLE LOCATION: T8-13 ST2, 30.0'-32.0'

PROJ. NO.: 101210 DATE: 07-26-93

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	56.0	60.6	58.1
	DRY DENSITY, pcf	65.1	62.8	64.0
	SATURATION, %	98.1	100.0	98.9
	VOID RATIO	1.474	1.567	1.516
	DIAMETER, in	2.83	2.82	2.82
	HEIGHT, in	5.85	5.84	5.85
AT TEST	WATER CONTENT, %			
	DRY DENSITY, pcf			
	SATURATION, %			
	VOID RATIO			
	DIAMETER, in	2.83	2.82	2.82
	HEIGHT, in	5.85	5.84	5.85
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		6.00	22.00	38.00
FAILURE STRESS, psi		12.41	12.81	10.74
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				
PORE PRESSURE, psi				
σ_1 FAILURE, psi		18.41	34.81	48.74
σ_3 FAILURE, psi		6	22	38

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DARK GRAY ORGANIC SILT, SOME SAND, SOME CLAY
LL= PL= PI=
SPECIFIC GRAVITY= 2.58
REMARKS:
POINT NO. 1: 60.4'-60.9'
POINT NO. 2: 60.9'-61.4'
POINT NO. 3: 61.4'-61.9'
FIG. NO.

CLIENT: ROY F. WESTON, INC.

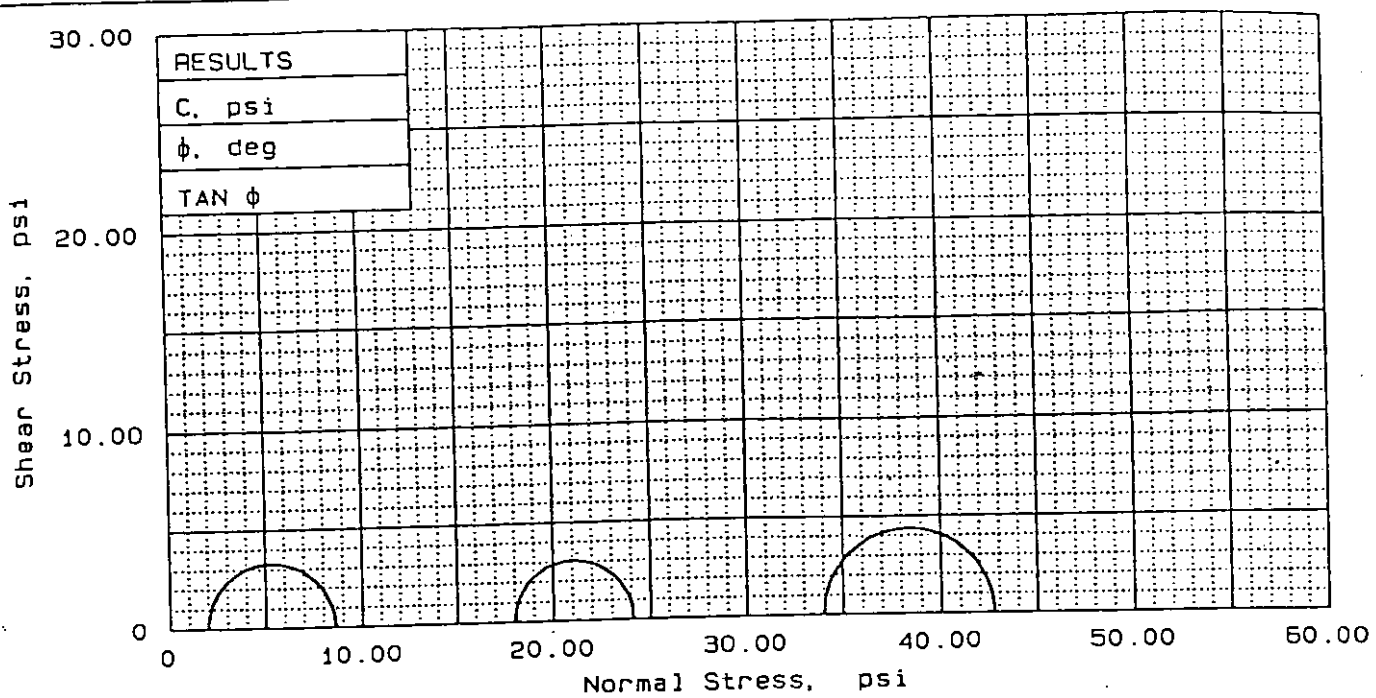
PROJECT: DSWA PHASE V LANDFILL

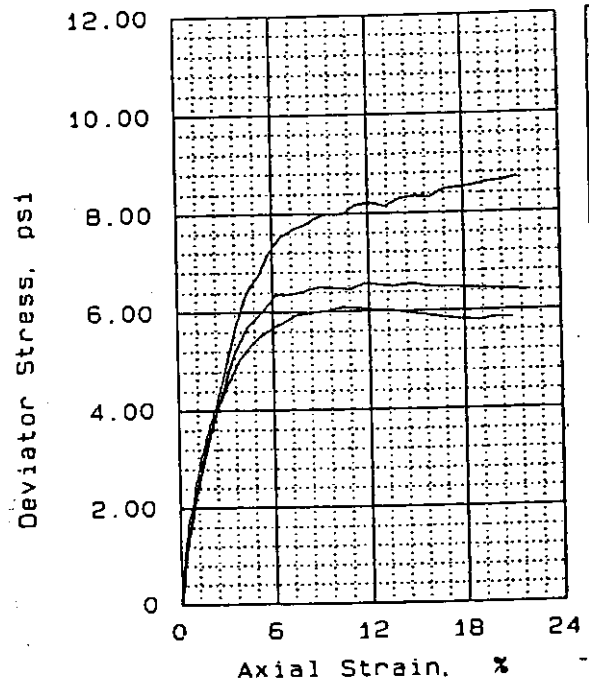
SAMPLE LOCATION: TB-14 ST3, 60.0'-62.0'

PROJ. NO.: 101210 DATE: 08-09-93

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER INC.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	77.6	80.0	46.7
	DRY DENSITY, pcf	53.1	52.3	73.2
	SATURATION, %	98.3	99.1	100.0
	VOID RATIO	2.046	2.090	1.208
	DIAMETER, in	2.84	2.82	2.82
	HEIGHT, in	5.84	5.84	5.82
AT TEST	WATER CONTENT, %			
	DRY DENSITY, pcf			
	SATURATION, %			
	VOID RATIO			
	DIAMETER, in	2.84	2.82	2.82
	HEIGHT, in	5.84	5.84	5.82
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		2.00	18.00	34.00
FAILURE STRESS, psi		6.57	6.09	8.72
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				
PORE PRESSURE, psi				
σ_1 FAILURE, psi		8.57	24.09	42.72
σ_3 FAILURE, psi		2	18	34

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DARK GRAY ORGANIC SILT, SOME SAND, SOME CLAY
LL= PL= PI=
SPECIFIC GRAVITY= 2.59
REMARKS:
POINT NO. 1: 15.4'-15.9'
POINT NO. 2: 15.9'-16.4'
POINT NO. 3: 16.4'-16.9'
FIG. NO.

CLIENT: ROY F. WESTON, INC.

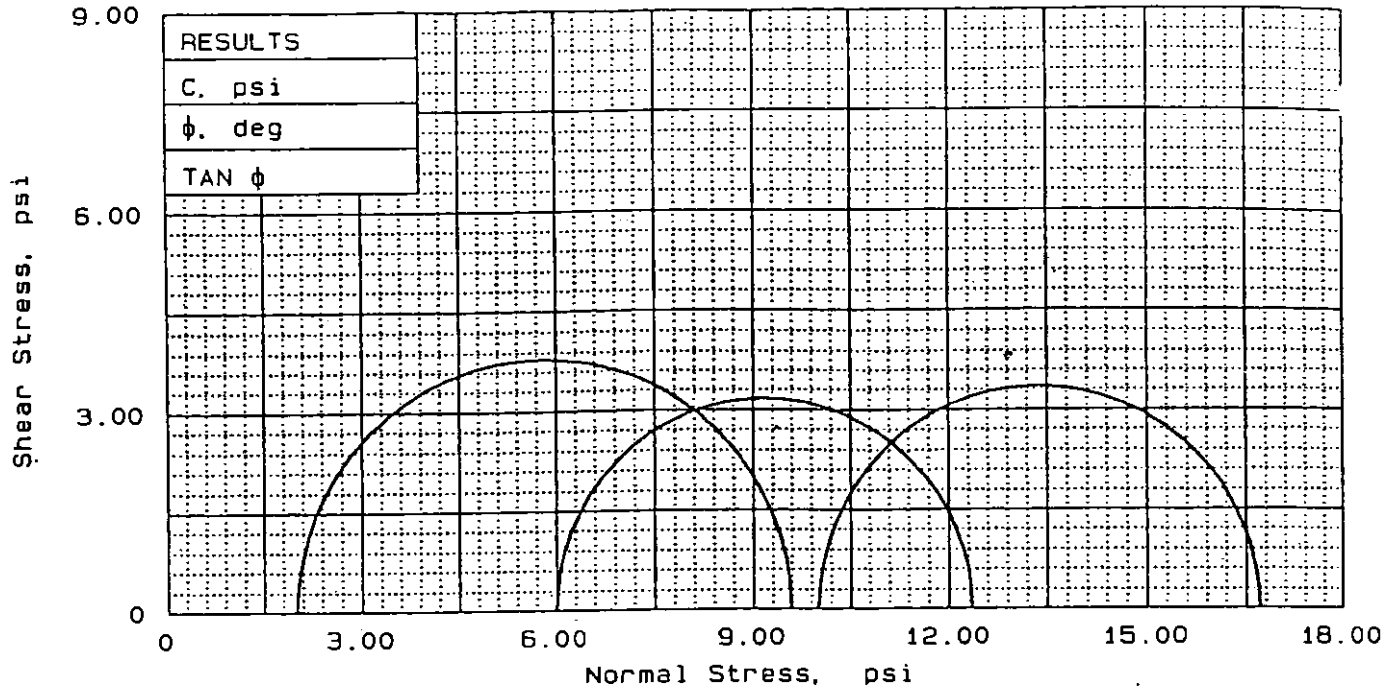
PROJECT: DSWA PHASE V LANDFILL

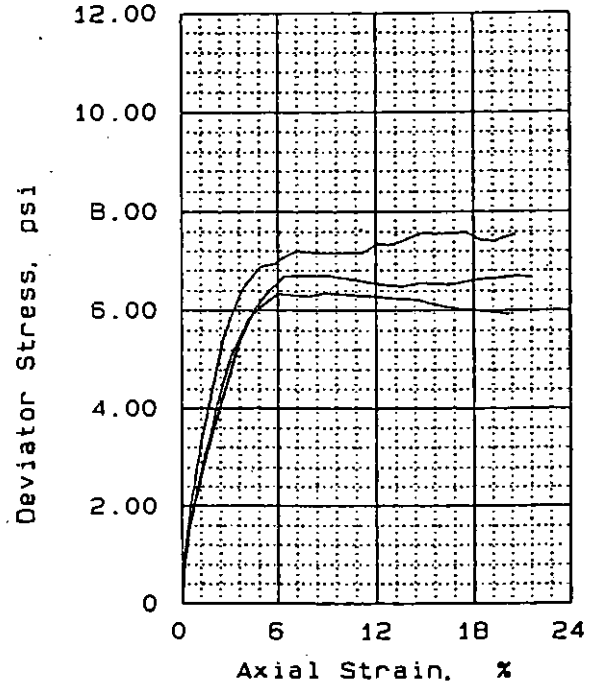
SAMPLE LOCATION: T8-15 ST1, 15.0'-17.0'

PROJ. NO.: 101210 DATE: 07-26-93

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	74.4	77.1	71.1
	DRY DENSITY, pcf	54.4	53.7	56.7
	SATURATION, %	98.0	99.6	99.7
	VOID RATIO	1.960	1.996	1.841
	DIAMETER, in	2.81	2.81	2.81
	HEIGHT, in	5.84	5.82	5.84
AT TEST	WATER CONTENT, %			
	DRY DENSITY, pcf			
	SATURATION, %			
	VOID RATIO			
	DIAMETER, in	2.81	2.81	2.81
	HEIGHT, in	5.84	5.82	5.84
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		2.00	6.00	10.00
FAILURE STRESS, psi		7.57	6.35	6.70
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				
PORE PRESSURE, psi				
σ_1 FAILURE, psi		9.57	12.35	16.70
σ_3 FAILURE, psi		2	6	10

TYPE OF TEST:
Unconsolidated undrained
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: DARK GRAY ORGANIC SILT, SOME CLAY, TRACE SAND
LL= PL= PI=
SPECIFIC GRAVITY= 2.58
REMARKS:
POINT NO. 1: 10.2'-10.7'
POINT NO. 2: 10.7'-11.2'
POINT NO. 3: 11.2'-11.7'
FIG. NO.

CLIENT: ROY F. WESTON, INC.

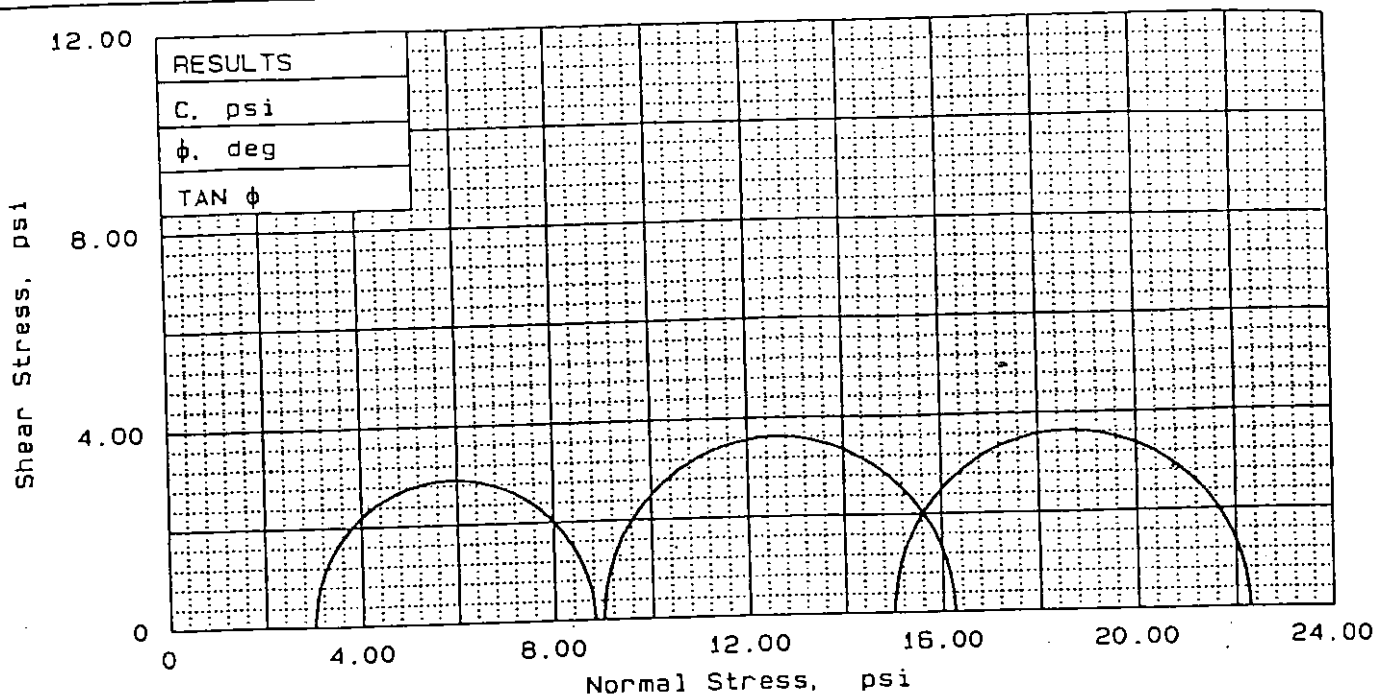
PROJECT: DSWA PHASE V LANDFILL

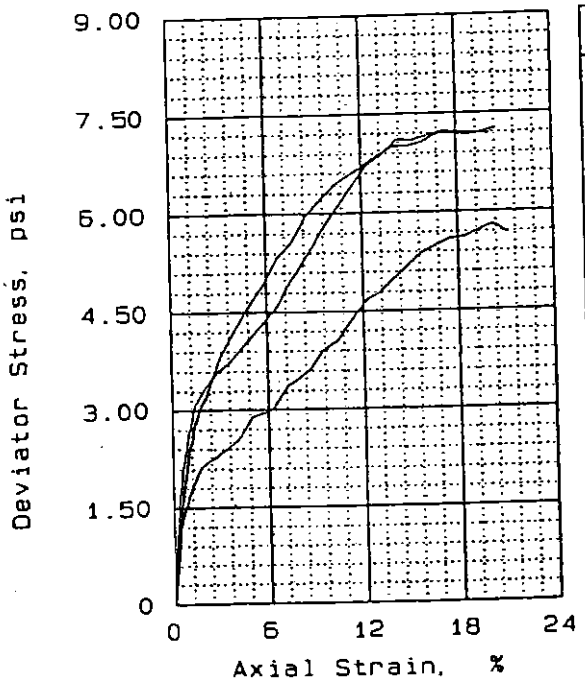
SAMPLE LOCATION: TB-20 ST1, 10.0'-12.0'

PROJ. NO.: 101210 DATE: 07-26-93

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	74.1	76.4	84.0
	DRY DENSITY, pcf	54.9	53.8	49.2
	SATURATION, %	100.0	99.9	96.2
	VOID RATIO	1.876	1.936	2.209
	DIAMETER, in	2.47	2.61	2.71
	HEIGHT, in	6.00	5.86	5.83
AT TEST	WATER CONTENT, %			
	DRY DENSITY, pcf			
	SATURATION, %			
	VOID RATIO			
	DIAMETER, in	2.47	2.61	2.71
	HEIGHT, in	6.00	5.86	5.83
BACK PRESSURE, psi		0.00	0.00	0.00
CELL PRESSURE, psi		3.00	9.00	15.00
FAILURE STRESS, psi		5.81	7.23	7.26
PORE PRESSURE, psi				
STRAIN RATE, %/min.		1.000	1.000	1.000
ULTIMATE STRESS, psi				
PORE PRESSURE, psi				
σ_1 FAILURE, psi		8.81	16.23	22.26
σ_3 FAILURE, psi		3	9	15

TYPE OF TEST:
Unconsolidated undrained

SAMPLE TYPE: UNDISTURBED

DESCRIPTION: DARK GRAY ORGANIC SILT, SOME SAND, SOME CLAY

LL= PL= PI=

SPECIFIC GRAVITY= 2.53

REMARKS:

POINT NO. 1: 40.5'-41.0'

POINT NO. 2: 41.0'-41.5'

POINT NO. 3: 41.5'-42.0'

FIG. NO.

CLIENT: ROY F. WESTON, INC.

PROJECT: DSWA PHASE V LANDFILL

SAMPLE LOCATION: TB-22 ST2, 40.0'-42.0'

PROJ. NO.: 101210 DATE: 08-06-93

TRIAXIAL COMPRESSION TEST

BOWSER-MORNER, INC.

08-16-1993 TEST NO.: 1

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

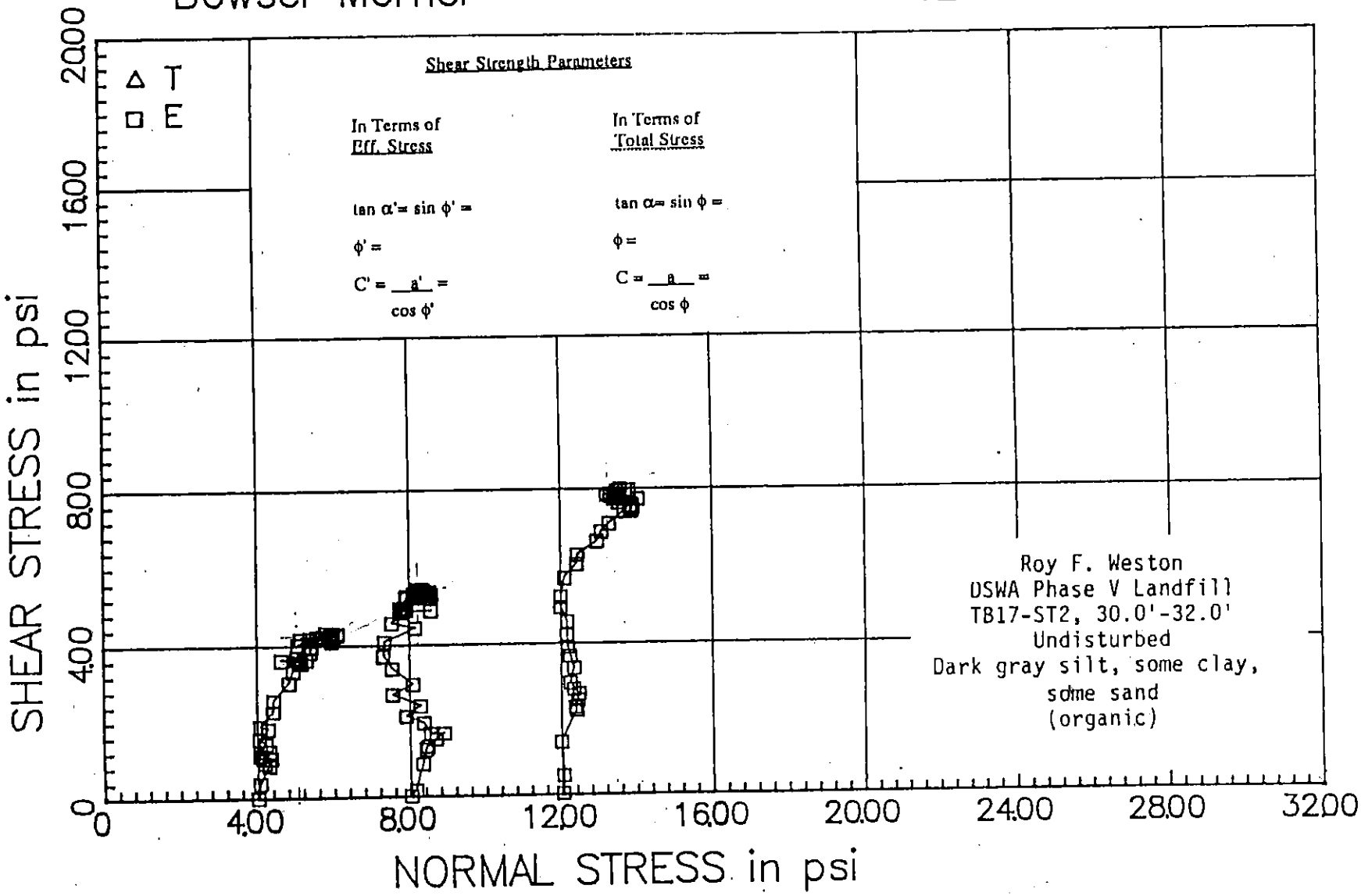
Project No.: 101210-ROY F. WESTON
Project: DSWA PHASE V LANDFILL

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:		Undisturbed	
Material:		DARK GRAY SILT, SOME CLAY,	
:		SOME SAND (ORGANIC)	
Location:		TB17-ST2, 30.0'-32.0'	
Boring No.:	TB17	TB17	TB17
Sample No.:	ST2	ST2	ST2
Depth (ft):	30.5-31.0	31.0-31.5	31.5-32.
Effective Consolidation Pressure (psi):	4.0	8.0	12.0
Saturation Pressures Initial Conditions,			
Lateral (psi):	10.0	10.0	10.0
Back (psi):	5.0	5.0	5.0
Consolidation Pressures, Initial Shearing Conditions,			
Lateral (psi):	61.0	75.0	69.0
Back (psi):	57.0	67.0	57.0
Initial Conditions,			
Height (inches):	5.834	5.855	5.852
Diameter (inches):	2.835	2.821	2.790
Weight (lbs.):	2.157	2.250	2.214
Moisture Content (%):	62.5	50.7	50.4
Volume (cf):	0.02131	0.02117	.02070
Dry Unit Weight (pcf):	62.2	70.4	71.1
Wet Unit Weight (pcf):	101.2	106.2	106.9
Consolidated Conditions,			
Moisture Content (%):	59.5	47.1	44.2
Volume (cf):	0.01987	0.02044	0.01942
Dry Unit Weight (pcf):	66.8	73.0	75.7
Wet Unit Weight (pcf):	106.5	107.4	109.2
At Maximum Principal Effective Stress Ratio,			
p' = (s'1 + s'3)/2, (psi):	5.1	8.2	13.2
q' = (s'1 - s'3)/2, (psi):	4.2	5.5	7.9

Measured Strength Parameters:
Effective Phi' (deg) =
C' (psi) =

STRESS PATHS

Bowser Morner TEST NO. 1 TEST NAME: 1210



08-10-1993 TEST NO.: 2

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

Project No.: 101210-ROY F. WESTON
Project: DSWA PHASE V LANDFILL

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:	Undisturbed		
Material:	DARK GRAY SILT, SOME SAND, SOME CLAY, TR GRAVEL (ORGANIC)		
Location:	TB18-ST1, 19.0'- 21.0'		
Boring No.:	TB18	TB18	TB18
Sample No.:	ST1	ST1	ST1
Depth (ft):	19.3-19.8	19.8-20.3	20.3-20.8
Effective Consolidation Pressure (psi):	3.0	7.0	11.0
Saturation Pressures Initial Conditions,			
Lateral (psi):	10.0	10.0	10.0
Back (psi):	5.0	5.0	5.0
Consolidation Pressures, Initial Shearing Conditions,			
Lateral (psi):	61.0	64.0	68.0
Back (psi):	58.0	57.0	57.0
Initial Conditions,			
Height (inches):	5.848	5.862	5.866
Diameter (inches):	2.842	2.841	2.832
Weight (lbs.):	2.193	2.167	2.168
Moisture Content (%):	52.9	58.6	56.0
Volume (cf):	0.02146	0.02150	0.02138
Dry Unit Weight (pcf):	66.7	63.5	64.9
Wet Unit Weight (pcf):	102.1	100.8	101.4
Consolidated Conditions,			
Moisture Content (%):	53.2	57.8	52.0
Volume (cf):	0.02076	0.02077	0.02019
Dry Unit Weight (pcf):	69.0	65.7	68.7
Wet Unit Weight (pcf):	105.8	103.8	104.6
At Maximum Principal Effective Stress Ratio,			
p' = (s'1 + s'3)/2, (psi):	6.1	12.2	12.9
q' = (s'1 - s'3)/2, (psi):	4.7	9.2	8.8

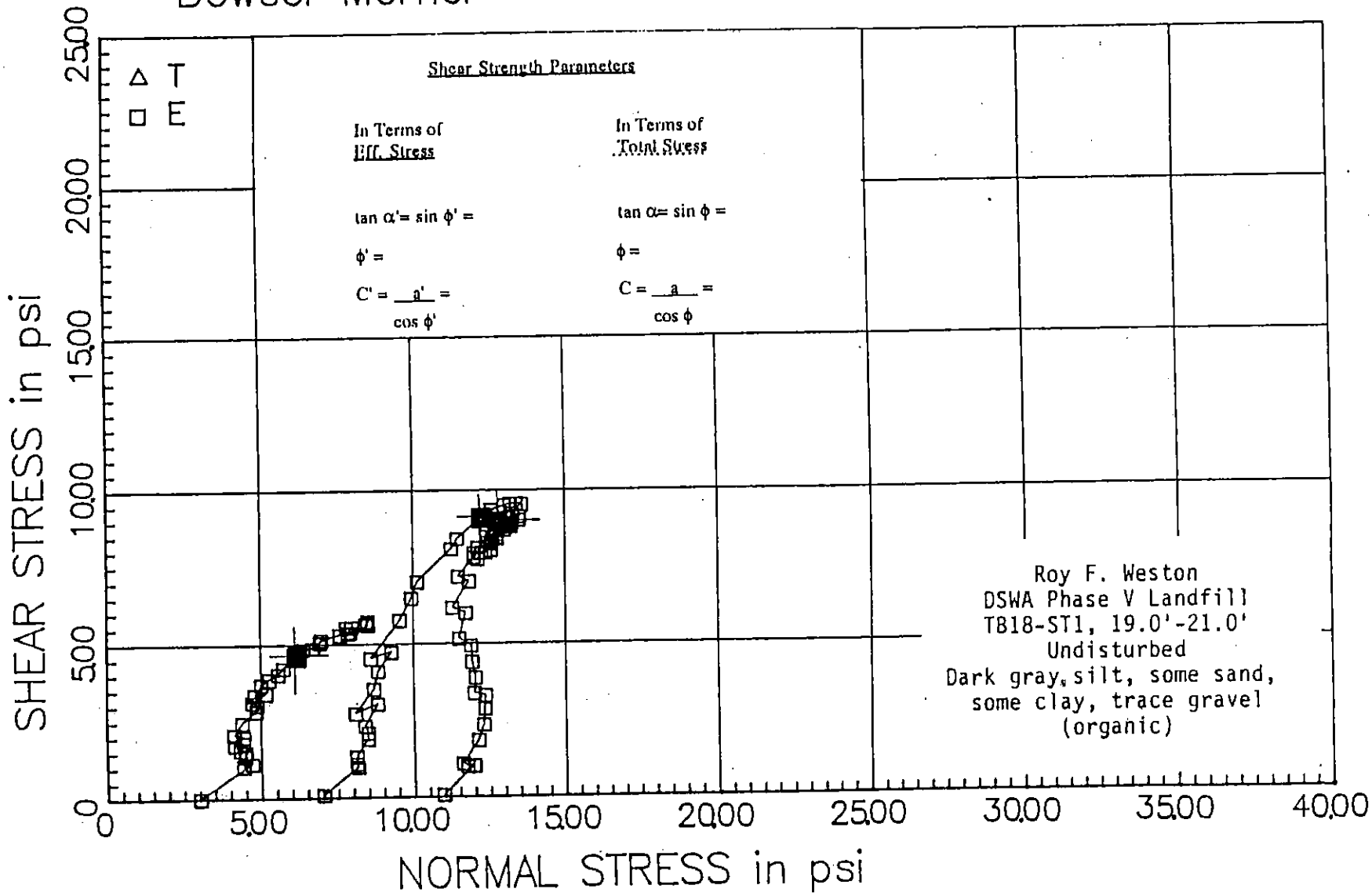
Measured Strength Parameters:
Effective Phi' (deg) =
C' (psi) =

STRESS PATHS

Bowser Morner

Test no. 2

TEST NAME: 1210



08-16-1993 TEST NO.: 3

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

Project No.: 101210-ROY F. WESTON
Project: DSWA PHASE V LANDFILL

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:	Undisturbed		
Material:	DARK GRAY SILT AND SAND		
:	SOME CLAY (ORGANIC)		
Location:	TB19-ST2, 45.0'-47.0'		
Boring No.:	TB19	TB19	TB19
Sample No.:	ST2	ST2	ST2
Depth (ft):	45.0-45.5	45.5-46.0	46.0-46.5
Effective Consolidation Pressure (psi):	5.0	9.0	13.0
Saturation Pressures			
Initial Conditions,			
Lateral (psi):	10.0	10.0	10.0
Back (psi):	5.0	5.0	5.0
Consolidation Pressures,			
Initial Shearing Conditions,			
Lateral (psi):	62.0	66.0	70.0
Back (psi):	57.0	57.0	57.0
Initial Conditions,			
Height (inches):	5.846	5.819	5.867
Diameter (inches):	2.842	2.870	2.856
Weight (lbs.):	2.123	2.238	2.380
Moisture Content (%):	57.6	54.3	39.3
Volume (cf):	0.02146	0.02178	0.02175
Dry Unit Weight (pcf):	62.7	66.5	78.5
Wet Unit Weight (pcf):	98.9	102.7	109.4
Consolidated Conditions,			
Moisture Content (%):	55.7	52.4	37.8
Volume (cf):	0.02002	0.02074	0.02061
Dry Unit Weight (pcf):	67.2	69.9	82.8
Wet Unit Weight (pcf):	104.7	106.5	114.1
At Maximum Principal Effective Stress Ratio,			
p' = (s'1 + s'3)/2, (psi):	7.1	12.0	16.3
q' = (s'1 - s'3)/2, (psi):	5.3	8.1	9.8

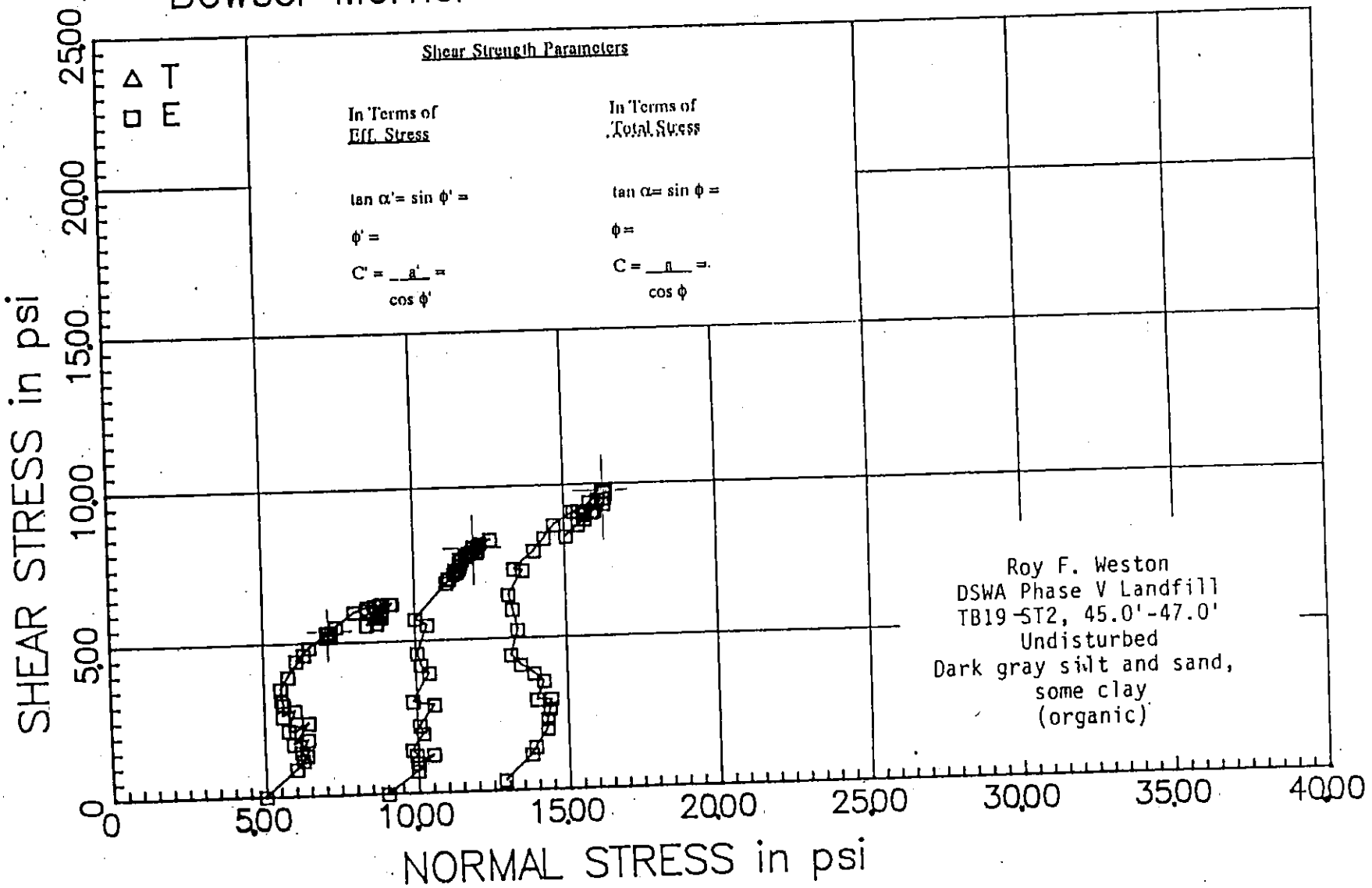
Measured Strength Parameters:
Effective Phi' (deg) =
C' (psi) =

STRESS PATHS

Bowser Morner

TEST NO. 3

TEST NAME: 1210



08-16-1993

TEST NO.: 4

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

Project No.: 101210-ROY F. WESTON
Project: DSWA PHASE V LANDFILL

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:	Undisturbed		
Material:	DARK GRAY SILT, SOME SAND, SOME CLAY (ORGANIC)		
:	TB21-ST1, 15.0'-17.0'		
Location:			
Boring No.:	TB21	TB21	TB21
Sample No.:	ST1	ST1	ST1
Depth (ft):	15.5-16.0	16.0-16.5	16.5-17.0
Effective Consolidation Pressure (psi):	3.0	7.0	11.0
Saturation Pressures			
Initial Conditions,			
Lateral (psi):	10.0	10.0	10.0
Back (psi):	5.0	5.0	5.0
Consolidation Pressures,			
Initial Shearing Conditions,			
Lateral (psi):	61.0	64.0	68.0
Back (psi):	58.0	58.0	57.0
Initial Conditions,			
Height (inches):	5.838	5.838	5.839
Diameter (inches):	2.832	2.831	2.820
Weight (lbs.):	1.975	2.059	2.031
Moisture Content (%):	63.2	65.0	67.4
Volume (cf):	0.02128	0.02126	0.02110
Dry Unit Weight (pcf):	56.8	58.6	57.4
Wet Unit Weight (pcf):	92.8	96.8	96.2
Consolidated Conditions,			
Moisture Content (%):	67.0	61.3	62.3
Volume (cf):	0.02059	0.02055	0.01986
Dry Unit Weight (pcf):	58.7	60.7	61.0
Wet Unit Weight (pcf):	98.1	97.9	99.1
At Maximum Principal Effective Stress Ratio,			
p' = (s'1 + s'3)/2, (psi):	5.5	7.6	13.8
q' = (s'1 - s'3)/2, (psi):	4.1	4.8	4.3

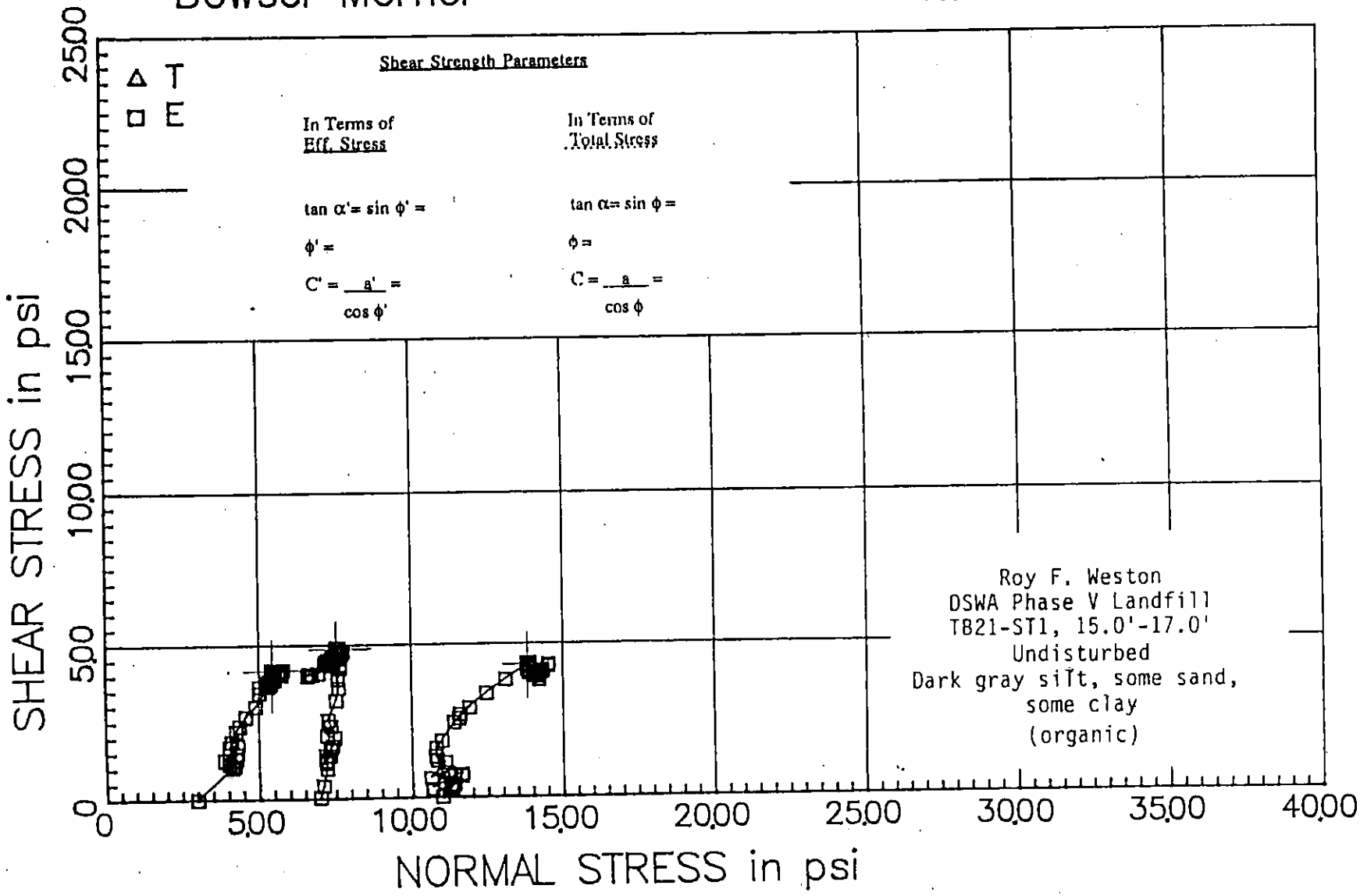
Measured Strength Parameters:
Effective Phi' (deg) =
C' (psi) =

STRESS PATHS

Bowser Morner

Test No. 4

TEST NAME: 1210



08-13-1993

TEST NO.: 5

CONSOLIDATED-UNDRAINED TRIAXIAL TEST SUMMARY

Project No.: 101210-ROY F. WESTON
Project: DSWA PHASE V LANDFILL

SAMPLE CONDITIONS	Test Sample 1	Test Sample 2	Test Sample 3
Sample Preparation:	Undisturbed		
Material:	DARK BROWN SILT, SOME CLAY, SOME SAND (TRACE ORGANICS)		
Location:	TB22-ST1, 20.0-22.0		
Boring No.:	TB22	TB22	
Sample No.:	ST1	ST1	
Depth (ft):	20.2-20.7	20.7-21.2	
Effective Consolidation Pressure (psi):	7.0	11.0	
Saturation Pressures			
Initial Conditions, Lateral (psi):	10.0	10.0	
Back (psi):	5.0	5.0	
Consolidation Pressures,			
Initial Shearing Conditions, Lateral (psi):	65.0	70.0	
Back (psi):	58.0	59.0	
Initial Conditions, Height (inches):	5.859	5.860	
Diameter (inches):	2.843	2.816	
Weight (lbs.):	2.176	2.114	
Moisture Content (%):	54.1	53.4	
Volume (cf):	.02152	0.02112	
Dry Unit Weight (pcf):	65.6	65.2	
Wet Unit Weight (pcf):	101.1	100.1	
Consolidated Conditions, Moisture Content (%):	51.8	47.9	
Volume (cf):	0.02071	0.01954	
Dry Unit Weight (pcf):	68.1	70.4	
Wet Unit Weight (pcf):	103.5	104.3	
At Maximum Principal Effective Stress Ratio, p' = (s'1 + s'3)/2, (psi):	8.3	10.2	
q' = (s'1 - s'3)/2, (psi):	5.6	7.3	

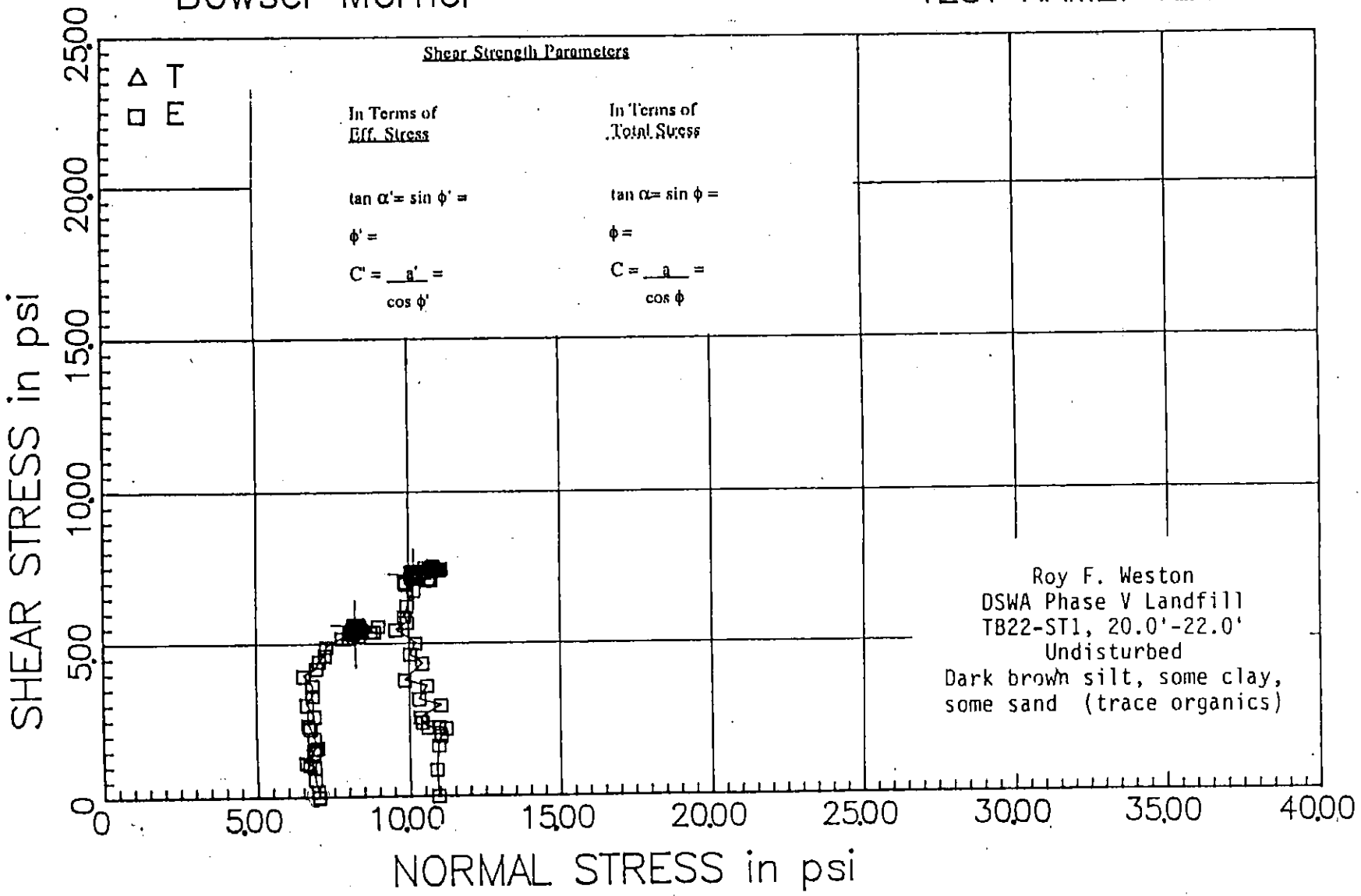
Measured Strength Parameters:
Effective Phi' (deg) =
C' (psi) =

STRESS PATHS

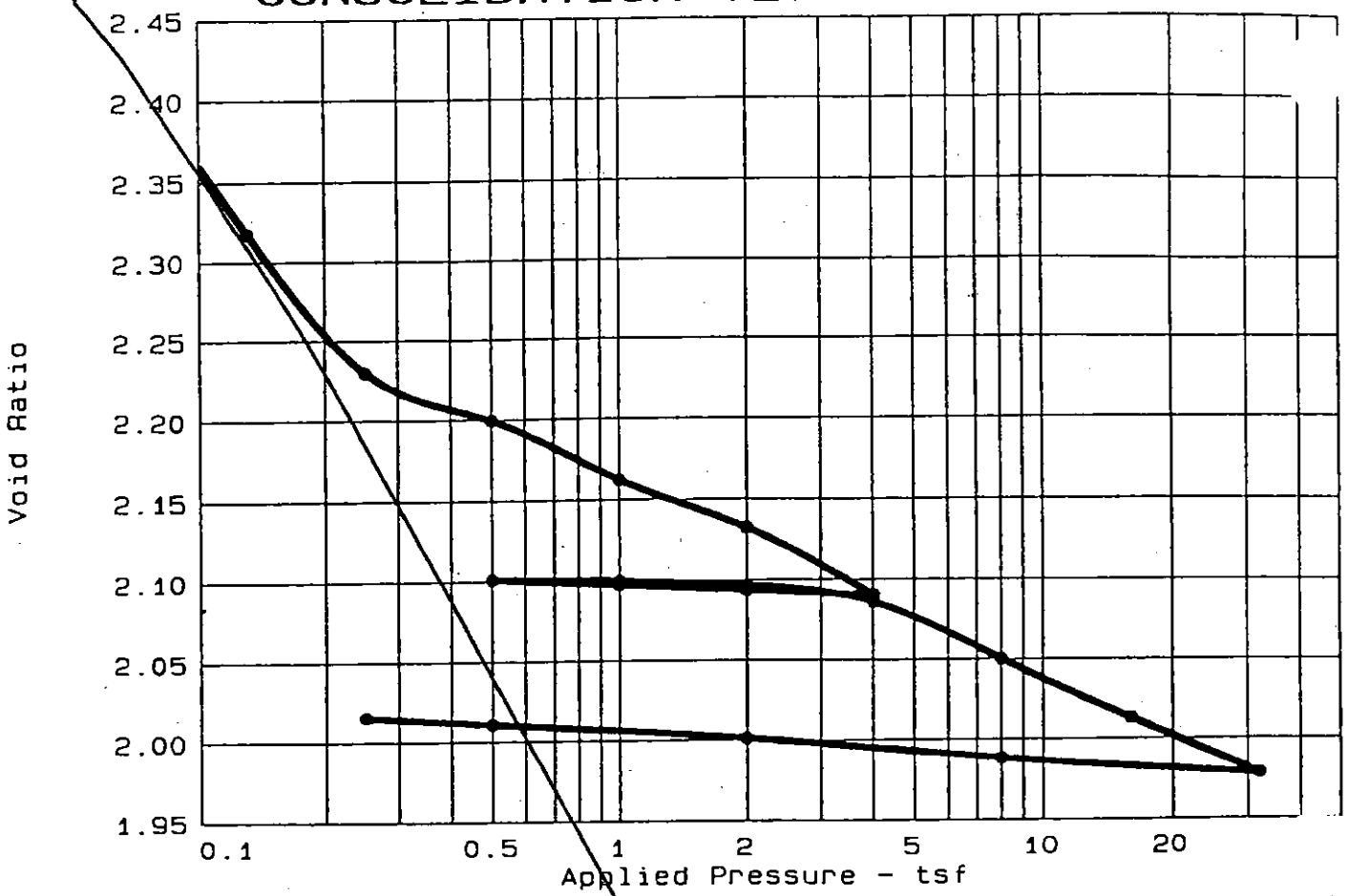
Bowser Morner

Test no. 5

TEST NAME: 1210



CONSOLIDATION TEST REPORT



Coefficients of Consolidation (sq.in./min.)								
No.	Load	Cv	No.	Load	Cv	No.	Load	Cv
1	0.13	0.004	12	4.00	0.185			
2	0.25	0.006	13	8.00	0.006			
3	0.50	0.019	14	16.00	0.007			
4	1.00	0.001	15	32.00	0.011			
5	2.00	0.003						
6	4.00	0.003						
10	1.00	0.082						
11	2.00	0.010						

Swell press.	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp. Gr.	Initial void ratio
	86.0 %	80.3	47.0			2.53	2.3605

TEST RESULTS

C_v at 32.00 tsf applied = 0.011 sq. in./min.

MATERIAL DESCRIPTION

DARK GRAY ORGANIC SILT, SOME CLAY, SOME SAND

Class: visual

Remarks:

FILE NO. 65

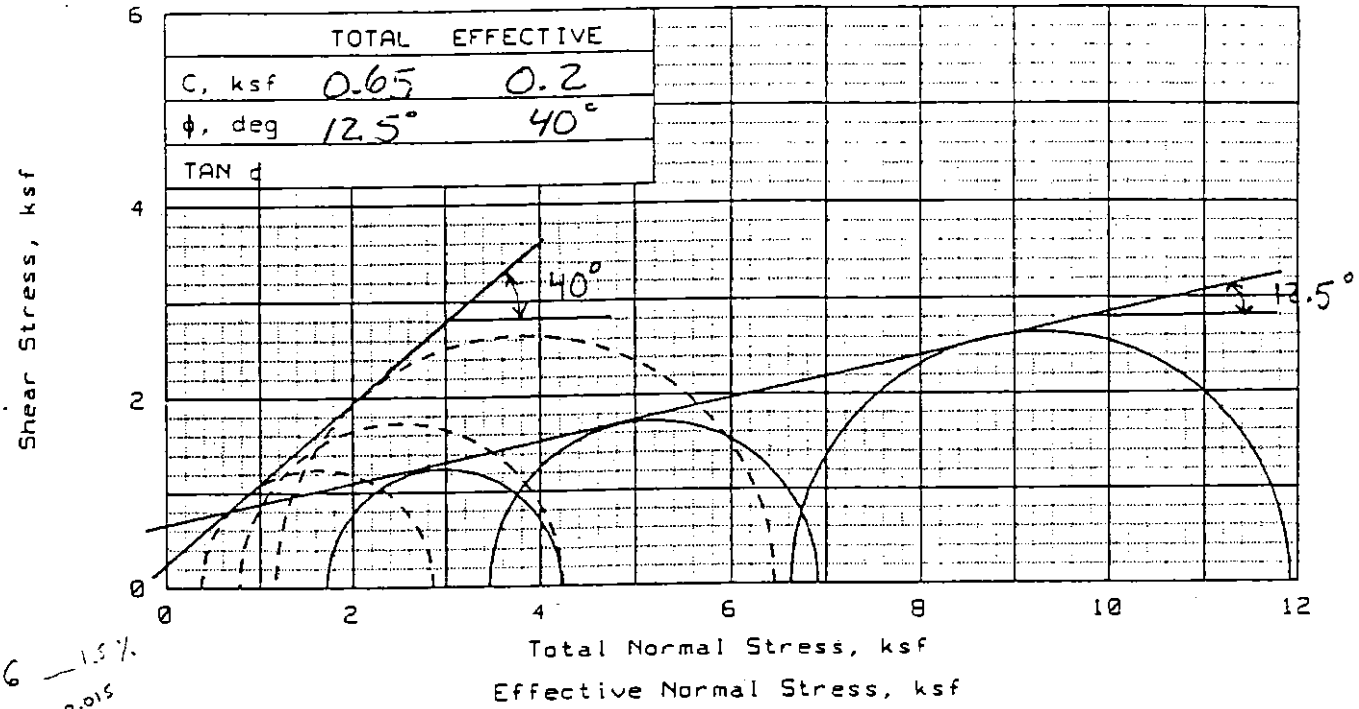
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB13-ST1, 10.0'-12.0'

Date: 08-20-93

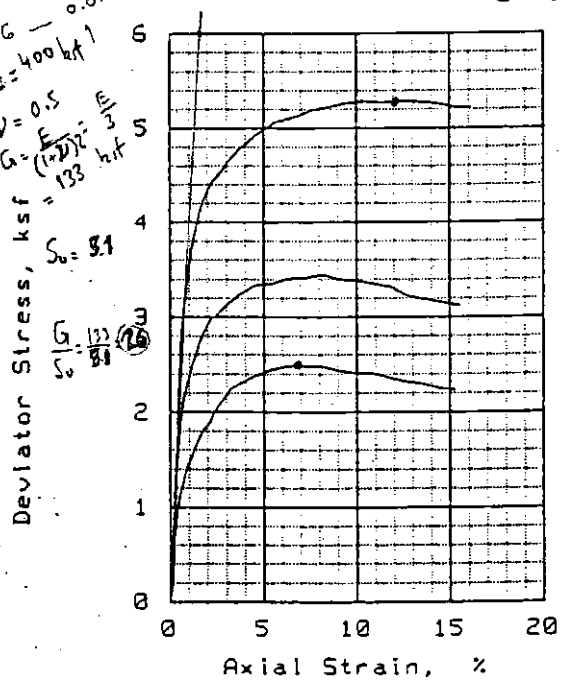
CONSOLIDATION TEST REPORT

BOWSER-MORNER, INC.

Fig. No.



ε — 1.5%
ε — 0.015
E = 400 ksf
ν = 0.5
$G = \frac{E}{(1+\nu)2} = \frac{E}{3}$ = 133 ksf
S_u = 8.1
$\frac{G}{S_u} = \frac{133}{8.1}$ (16)



SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	69.3	69.3	69.3
	DRY DENSITY, pcf	56.0	57.7	58.2
	SATURATION, %	92.9	97.5	98.7
	VOID RATIO	2.012	1.919	1.896
	DIAMETER, in	2.84	2.84	2.83
	HEIGHT, in	5.68	5.65	5.65
AT TEST	WATER CONTENT, %	68.3	61.9	50.3
	DRY DENSITY, pcf	59.3	63.1	71.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.844	1.673	1.359
	DIAMETER, in	2.78	2.76	2.64
	HEIGHT, in	5.57	5.49	5.29
Strain rate, in/min		0.0070	0.0070	0.0070
BACK PRESSURE, ksf		7.92	7.92	7.92
CELL PRESSURE, ksf		9.65	11.38	14.54
FAIL STRESS, ksf		2.49	3.45	5.29
EXCESS PORE PR., ksf		1.35	2.68	5.46
ULTIMATE STRESS, ksf				
EXCESS PORE PR., ksf				
$\bar{\sigma}_1$ FAILURE, ksf		2.86	4.23	6.45
$\bar{\sigma}_3$ FAILURE, ksf		0.37	0.78	1.17

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: Gray elastic SILT

LL= 57 PL= 39 PI= 18
SPECIFIC GRAVITY= 2.7
REMARKS: Depth: 44.5'-46.5'
Nat. Water Content: 58.5%

Tested By: DFP
Fig. No.: _____

CLIENT: Delaware Solid Waste Authority

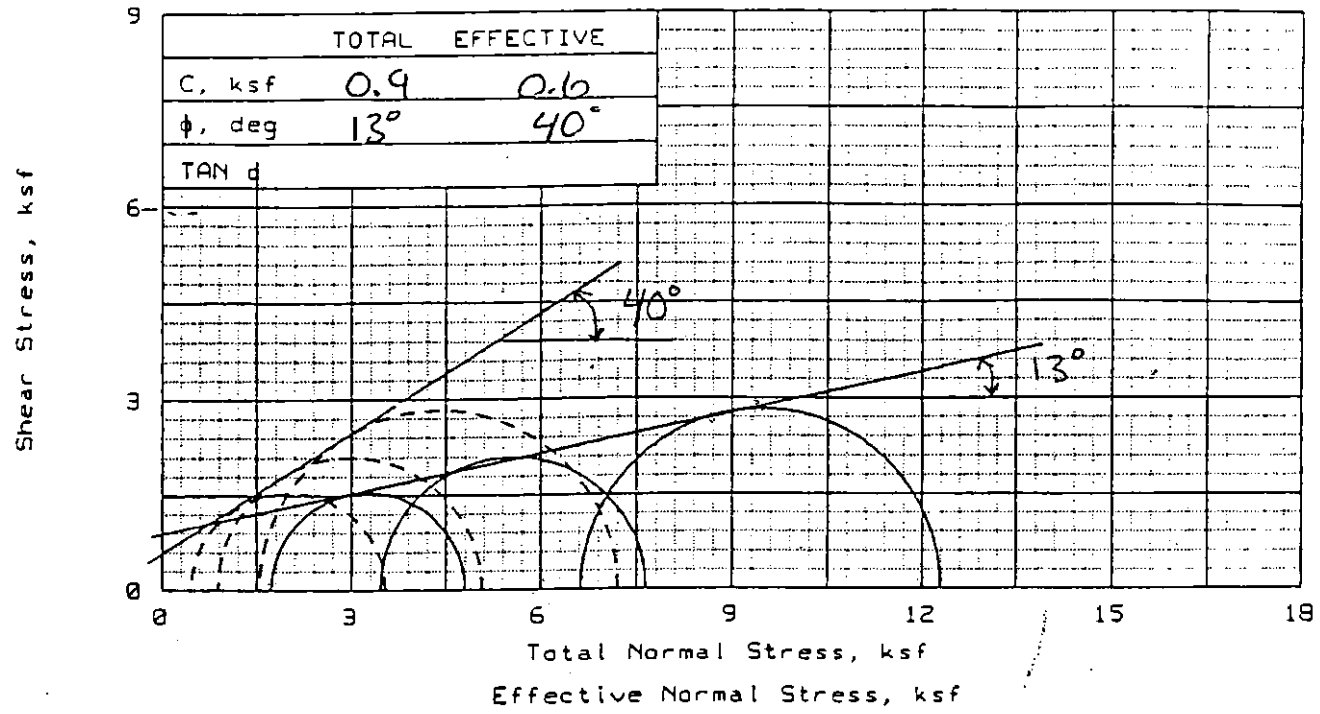
PROJECT: DSWA Phase IV

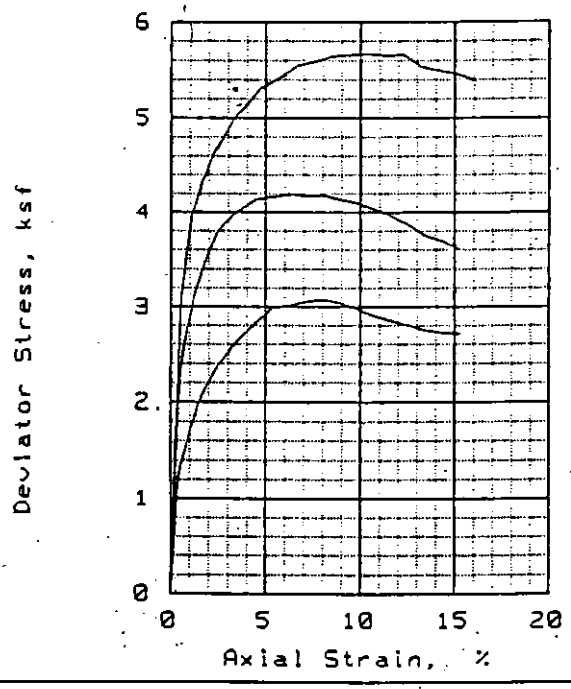
SAMPLE LOCATION: Boring No.: GF4-1
Sample: ST-3

PROJ. NO.: 31697.004 DATE: July 13, 1998

TRIAXIAL SHEAR TEST REPORT

GANNETT FLEMING, INC.





SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	40.7	40.7	40.7
	DRY DENSITY, pcf	73.1	73.6	72.2
	SATURATION, %	84.2	85.1	82.3
	VOID RATIO	1.305	1.291	1.335
	DIAMETER, in	2.85	2.85	2.87
	HEIGHT, in.	5.68	5.70	5.66
AT TEST	WATER CONTENT, %	43.6	42.4	33.0
	DRY DENSITY, pcf	77.5	78.6	89.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.176	1.145	0.892
	DIAMETER, in	2.79	2.79	2.67
	HEIGHT, in	5.57	5.58	5.29
Strain rate, in/min		0.0070	0.0070	0.0070
BACK PRESSURE, ksf		7.92	7.92	7.92
CELL PRESSURE, ksf		9.65	11.38	14.54
FAIL STRESS, ksf		3.07	4.19	5.67
EXCESS PORE PR., ksf		1.27	2.58	5.08
ULTIMATE STRESS, ksf				
EXCESS PORE PR., ksf				
$\bar{\sigma}_1$ FAILURE, ksf		3.53	5.07	7.21
$\bar{\sigma}_3$ FAILURE, ksf		0.46	0.88	1.54

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: Gray sandy SILT

LL= 29 PL= NP PI= 29
SPECIFIC GRAVITY= 2.7
REMARKS: Depth: 91'-93'
Nat. Water Content: 40.7%

Tested By: DFP
Fig. No.: _____

CLIENT: Delaware Solid Waste Authority

PROJECT: DSWA Phase IV

SAMPLE LOCATION: Boring No.: GF4-1
Sample: ST-6

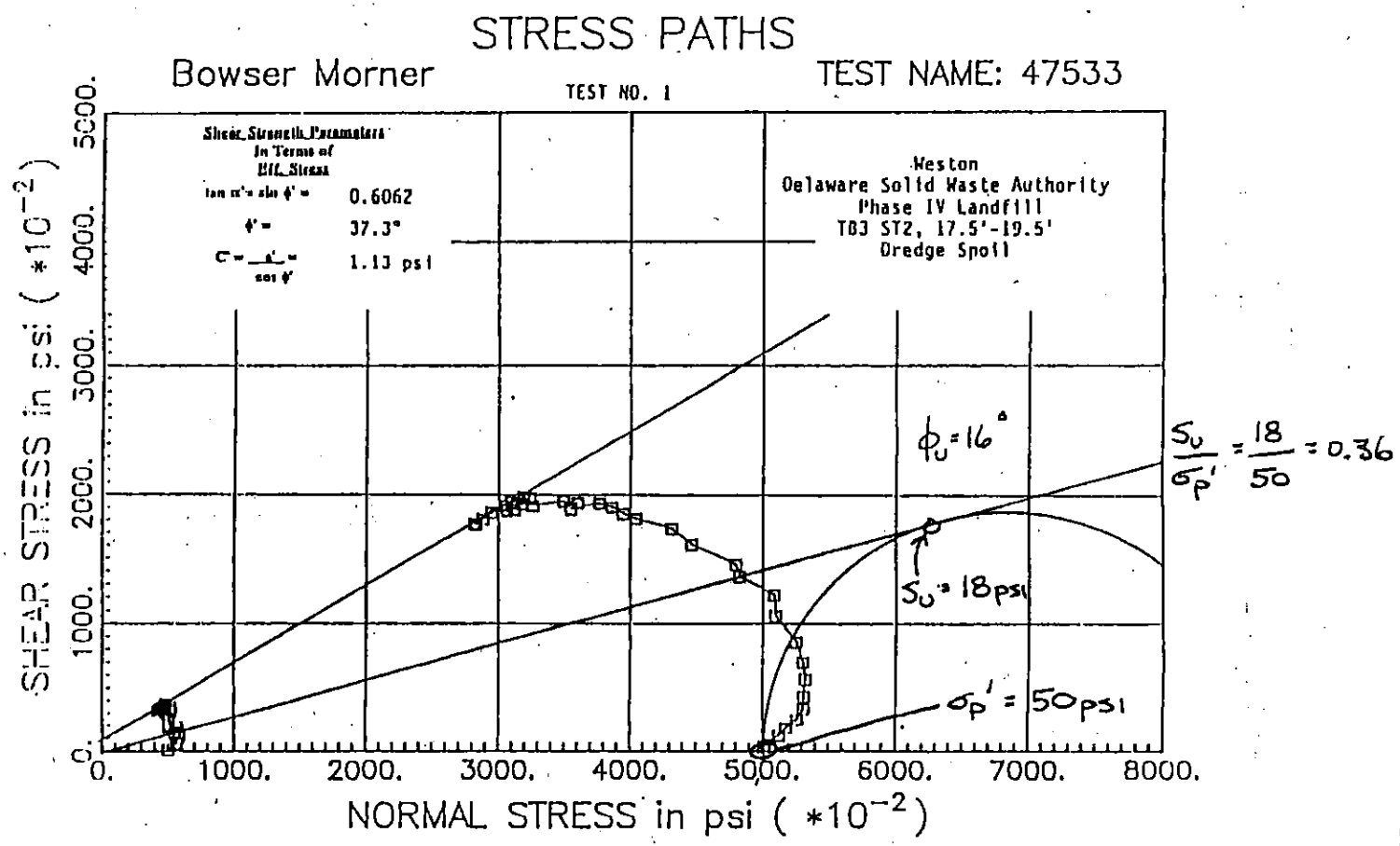
PROJ. NO.: 31697.004 DATE: July 13, 1998

TRIAXIAL SHEAR TEST REPORT

GANNETT FLEMING, INC.

FIGURE 4.3
Cherry Island Landfill
Wilmington, DE
985176

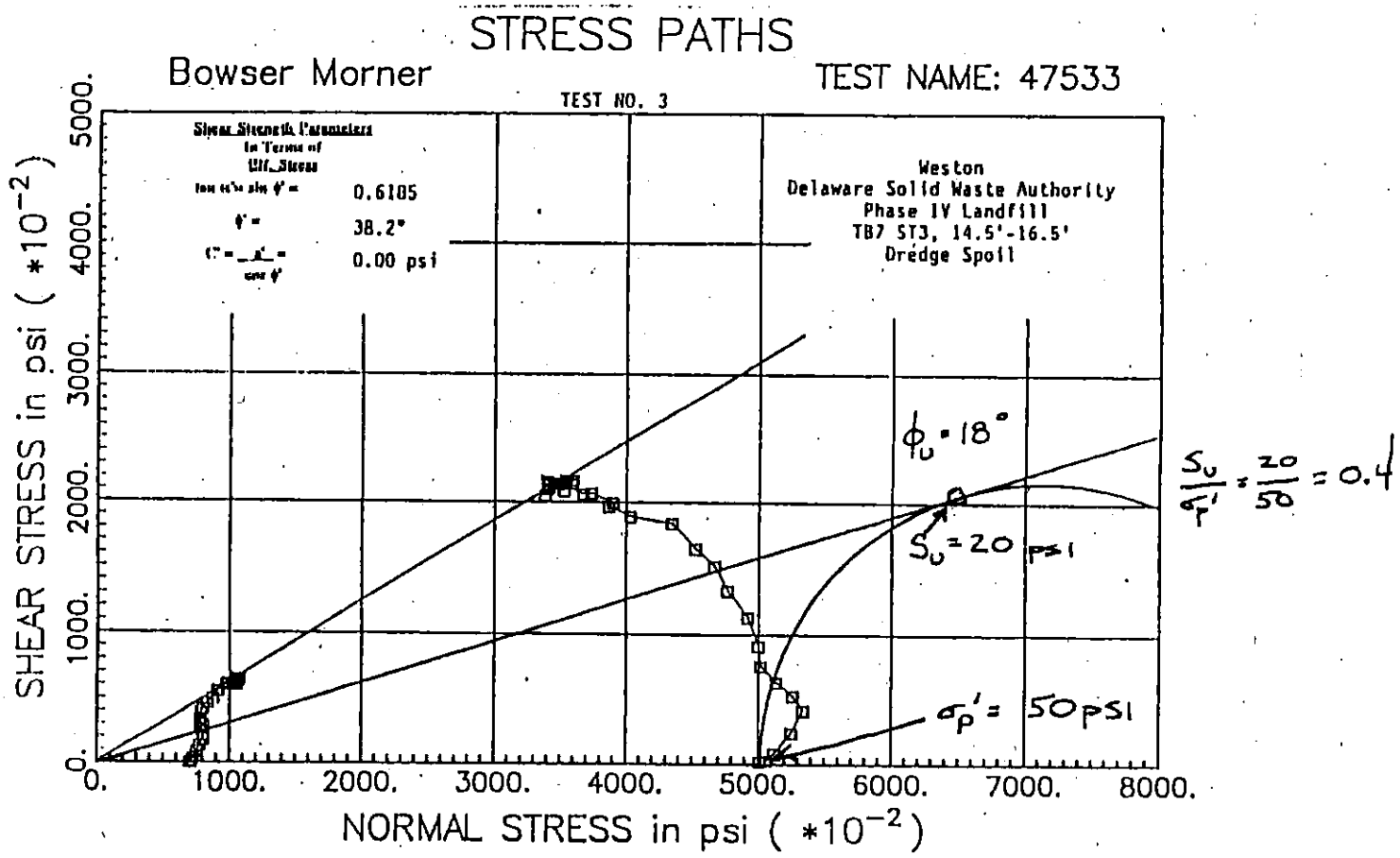
Back Calculated Undrained Friction Angle from Isotropically Consolidated Undrained Triaxial Compression Tests by Weston for Phase IV (Weston, 1992)



SCHNABEL ENGINEERING

FIGURE 4.4
Cherry Island Landfill
Wilmington, DE
985176

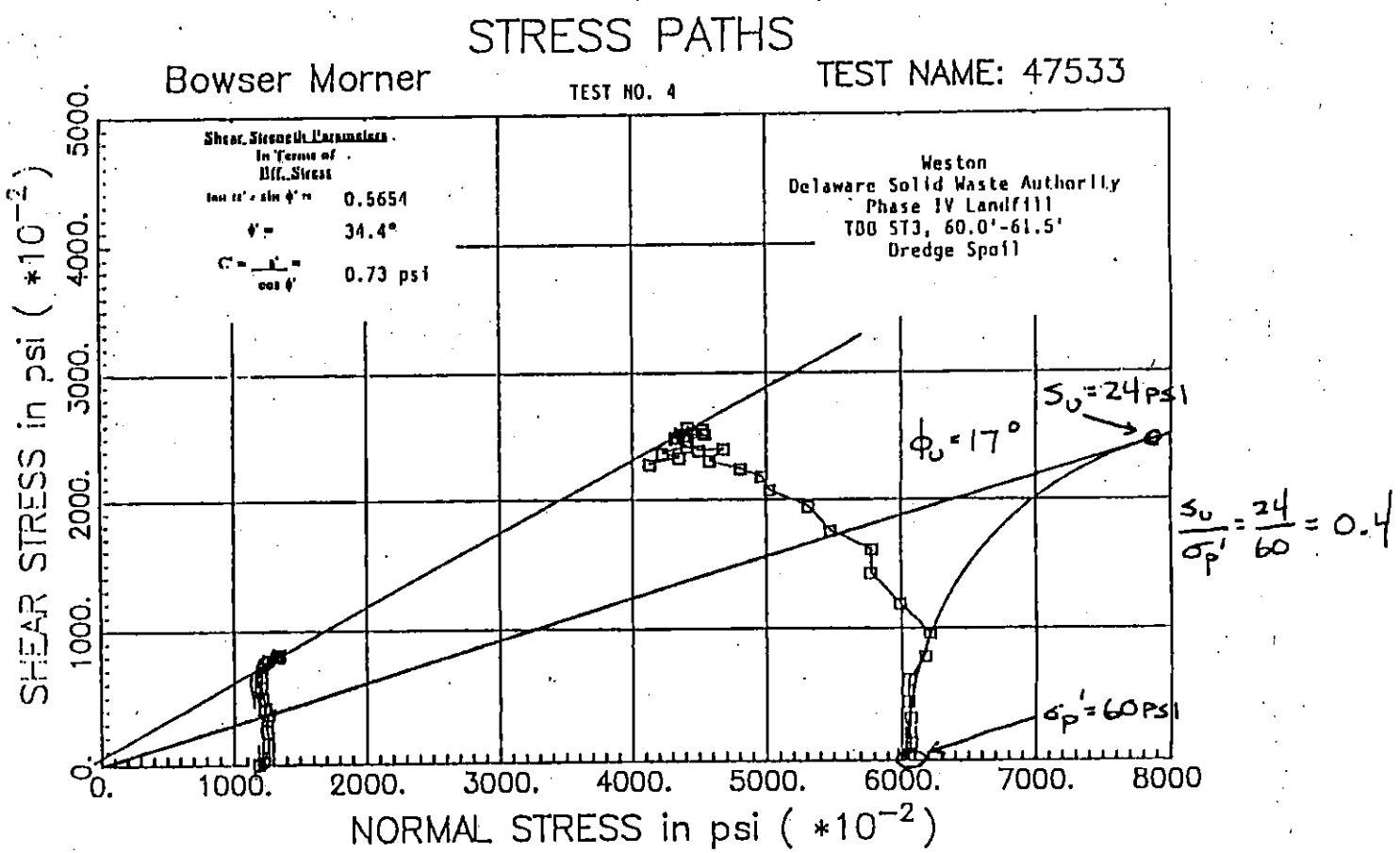
Back Calculated Undrained Friction Angle from Isotropically Consolidated Undrained Triaxial Compression Tests by Weston for Phase IV (Weston, 1992)



SCHNABEL ENGINEERING

FIGURE 4.5
Cherry Island Landfill
Wilmington, DE
985176

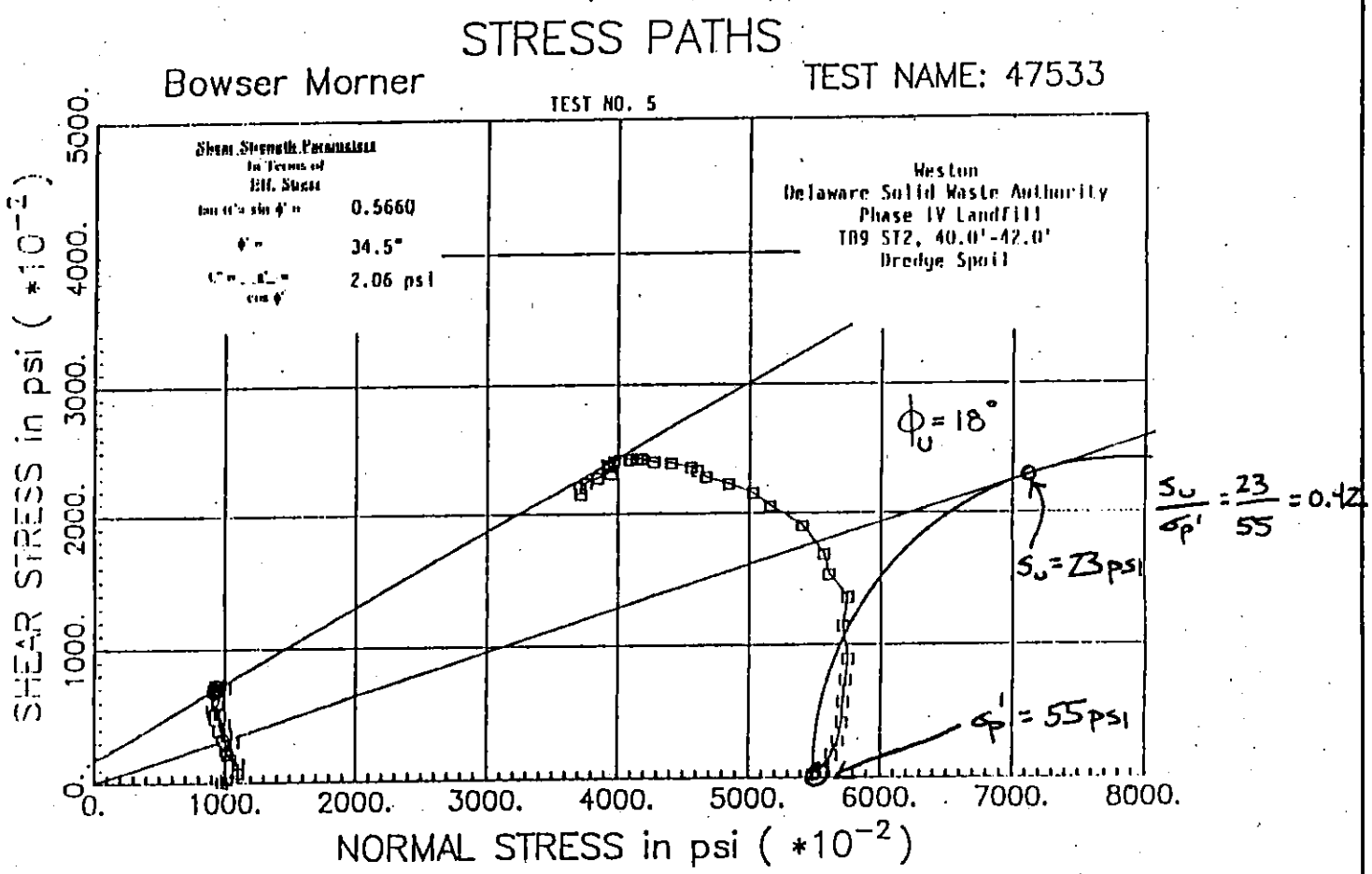
Back Calculated Undrained Friction Angle from Isotropically Consolidated Undrained Triaxial Compression Tests by Weston for Phase IV (Weston, 1992)



SCHNABEL ENGINEERING

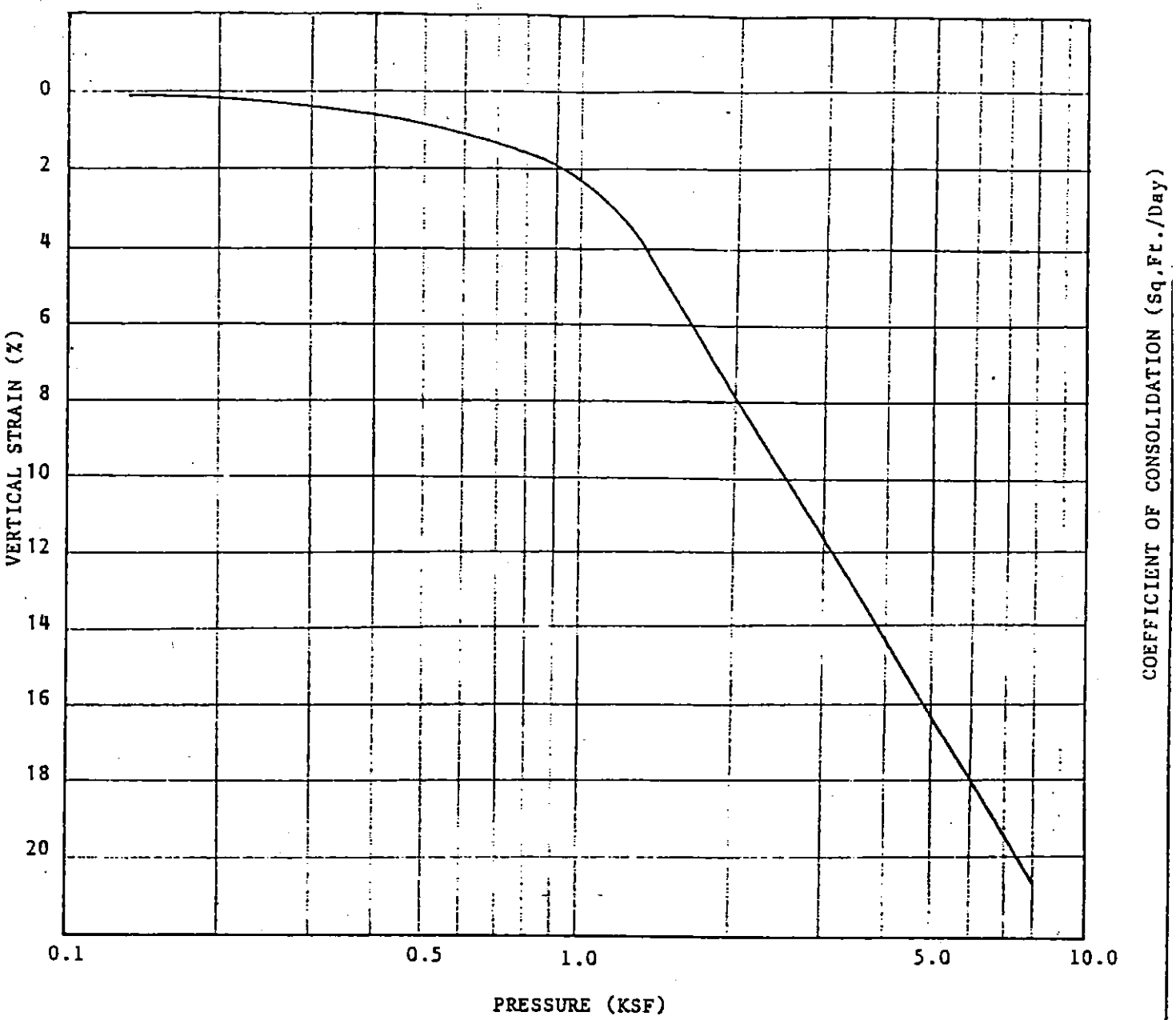
FIGURE 4.6
Cherry Island Landfill
Wilmington, DE
985176

Back Calculated Undrained Friction Angle from Isotropically Consolidated Undrained Triaxial Compression Tests by Weston for Phase IV (Weston, 1992)



SCHNABEL ENGINEERING

CONSOLIDATION TESTS



Test Boring Number G-1 Depth 10.6

Atterberg Limits: LL 86, PI 25, U.S.C.S. Class. MH

Initial Moisture Content 84.1 % Initial Dry Density 41.7 PCF

Est. Existing Overburden Pressure, Po = 0.33 KSF

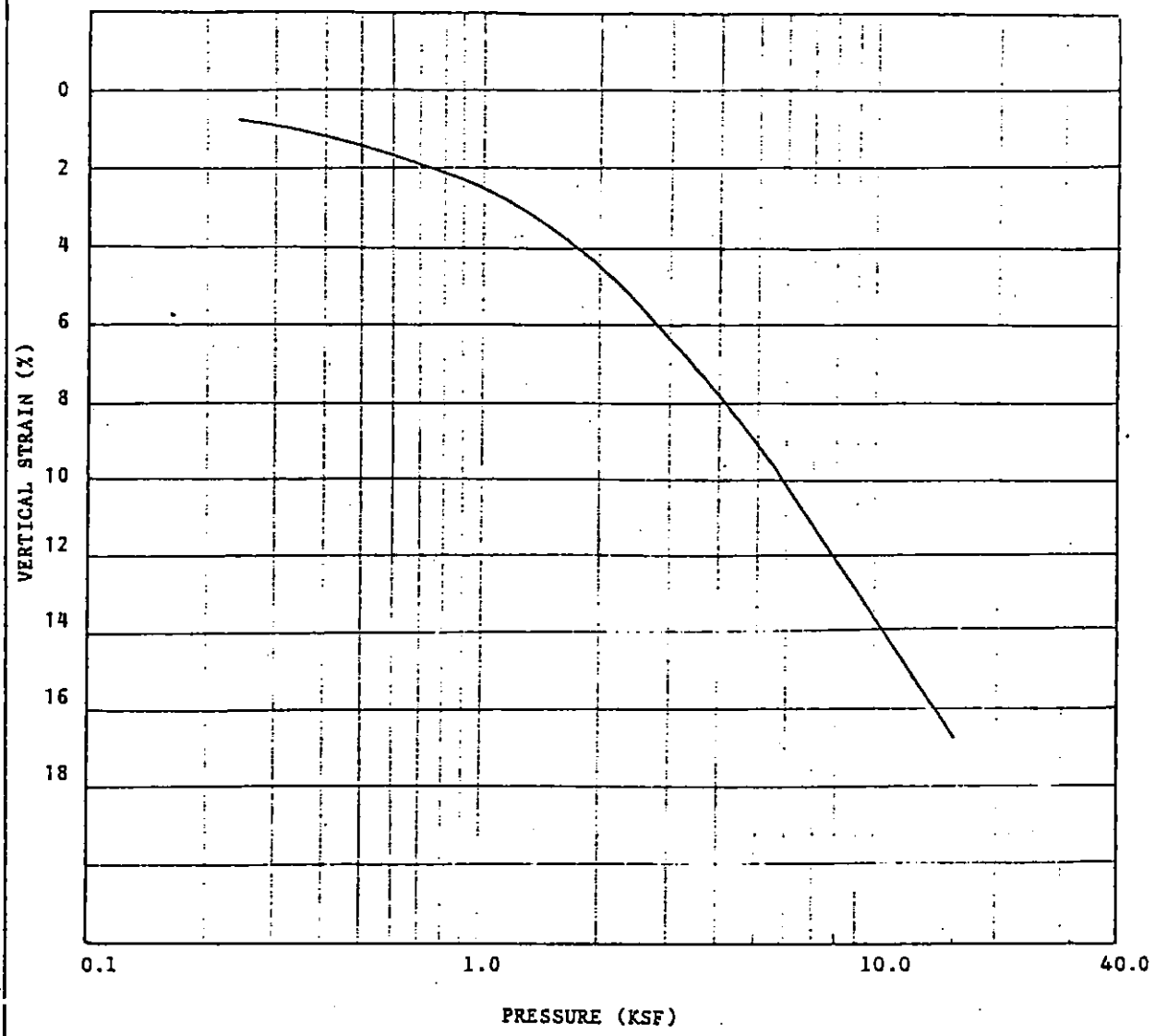
Est. Preconsolidation Pressure, Pc = 1.1 1.01 KSF

Sample Description Dark gray silt, trace fine sand, trace organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410 | F | e: October 21, 1983 | Sheet 1 of 19



Test Boring Number G-2 Depth 15.7

Atterberg Limits: LL 63, PI 21, U.S.C.S. Class. MH

Initial Moisture Content 71.5 % Initial Dry Density 54.9 PCF

Est. Existing Overburden Pressure, Po = 0.5 KSF

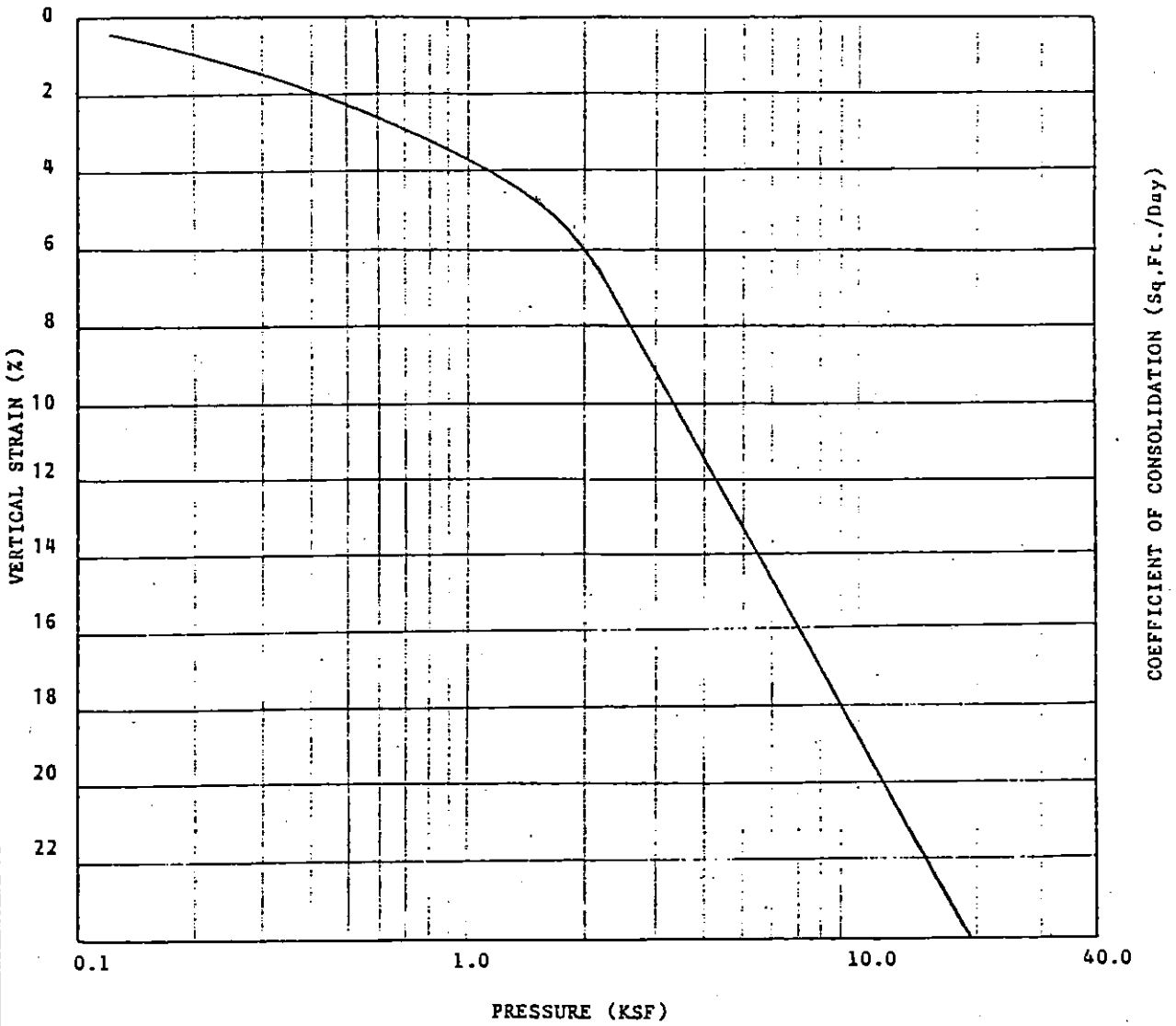
Est. Preconsolidation Pressure, Pc = 2.1 KSF

Sample Description Dark gray silt, trace fine sand, trace organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: October 21, 1983	Sheet 2 of 19



Test Boring Number GP-3 Depth 16.5

Atterberg Limits: LL 74, PI 24, U.S.C.S. Class. MH

Initial Moisture Content 78.5 % Initial Dry Density 51.6 PCF

Est. Existing Overburden Pressure, Po = 0.5 KSF

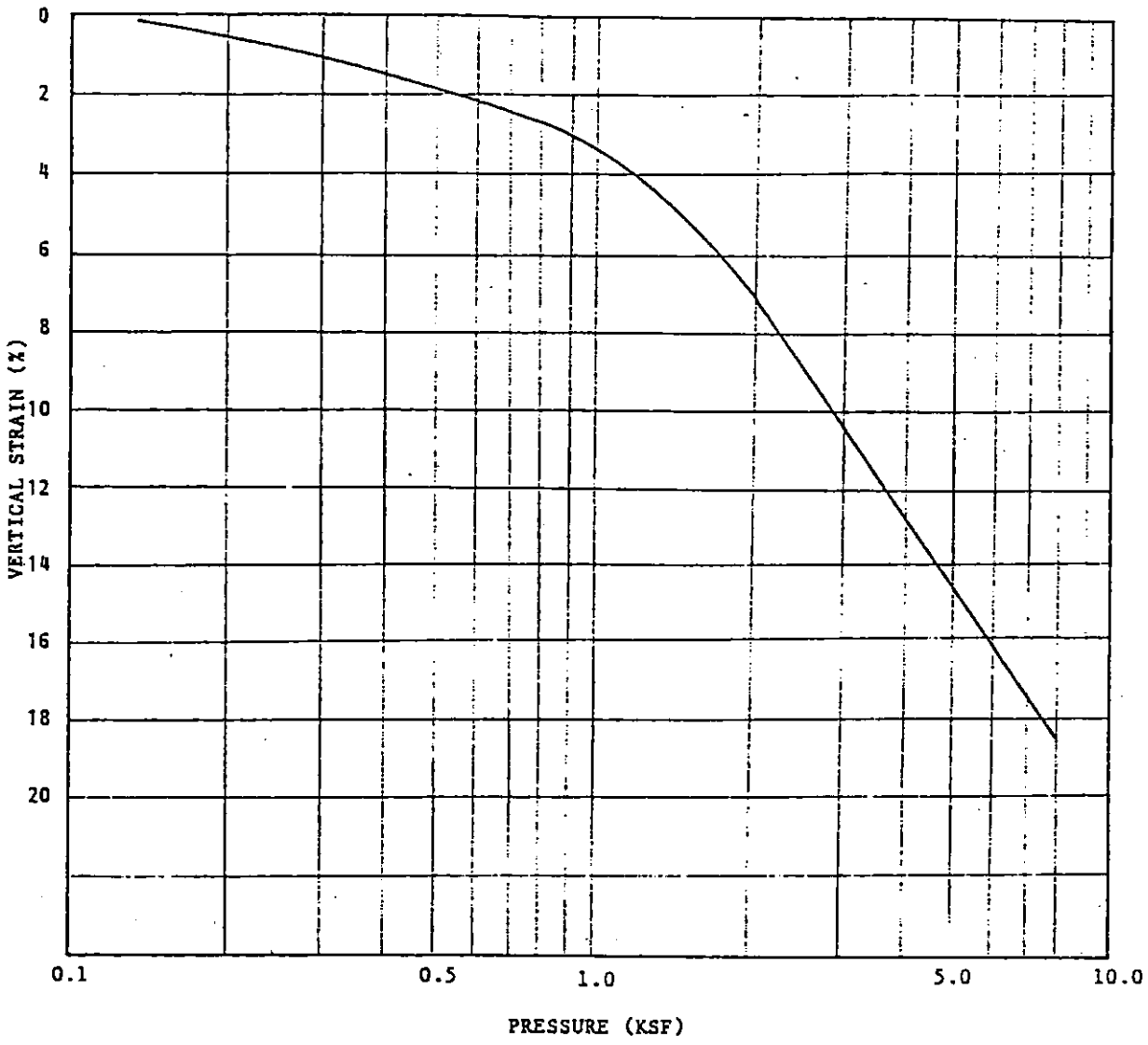
Est. Preconsolidation Pressure, Pc = 1.9 KSF

Sample Description Dark gray silt, trace fine sand, trace mica, trace organics

CONSOLIDATION TEST -
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: October 21, 1983	Sheet 3 of 19



Test Boring Number GP-4 Depth 16.1

Atterberg Limits: LL 80, PI 27, U.S.C.S. Class. MH

Initial Moisture Content 86.9 % Initial Dry Density 47.5 PCF

Est. Existing Overburden Pressure, Po = 0.5 KSF

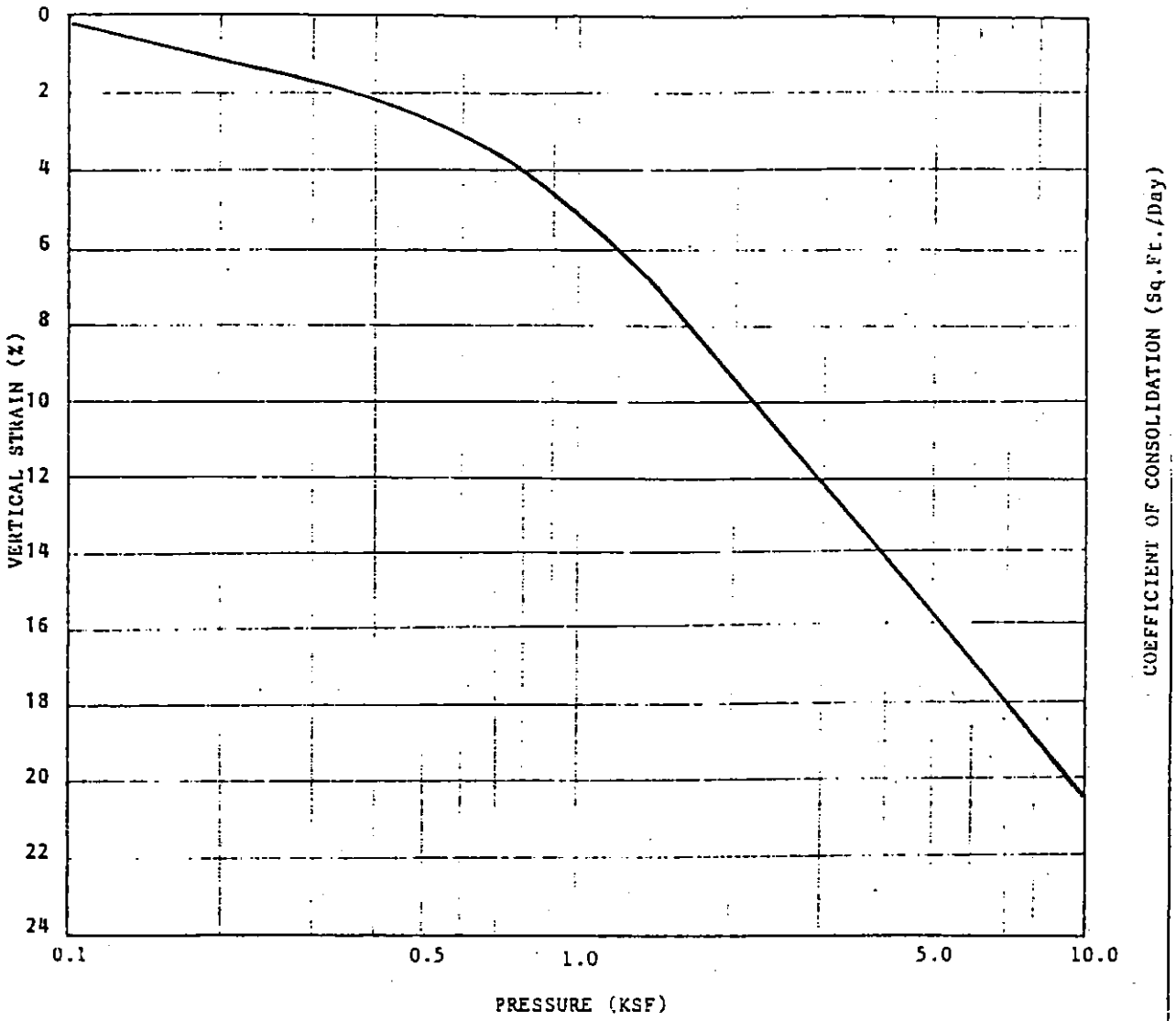
Est. Preconsolidation Pressure, Pc = 1.3 KSF

Sample Description Dark gray silt, trace fine sand, trace organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

BUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: October 21, 1983	Sheet 4 of 19



Test Boring Number GP-6 Depth 16.1

Atterberg Limits: LL 85, PI 21, U.S.C.S. Class. MH

Initial Moisture Content 106.0 % Initial Dry Density 42.1 PCF

Est. Existing Overburden Pressure, Po = 0.5 KSF

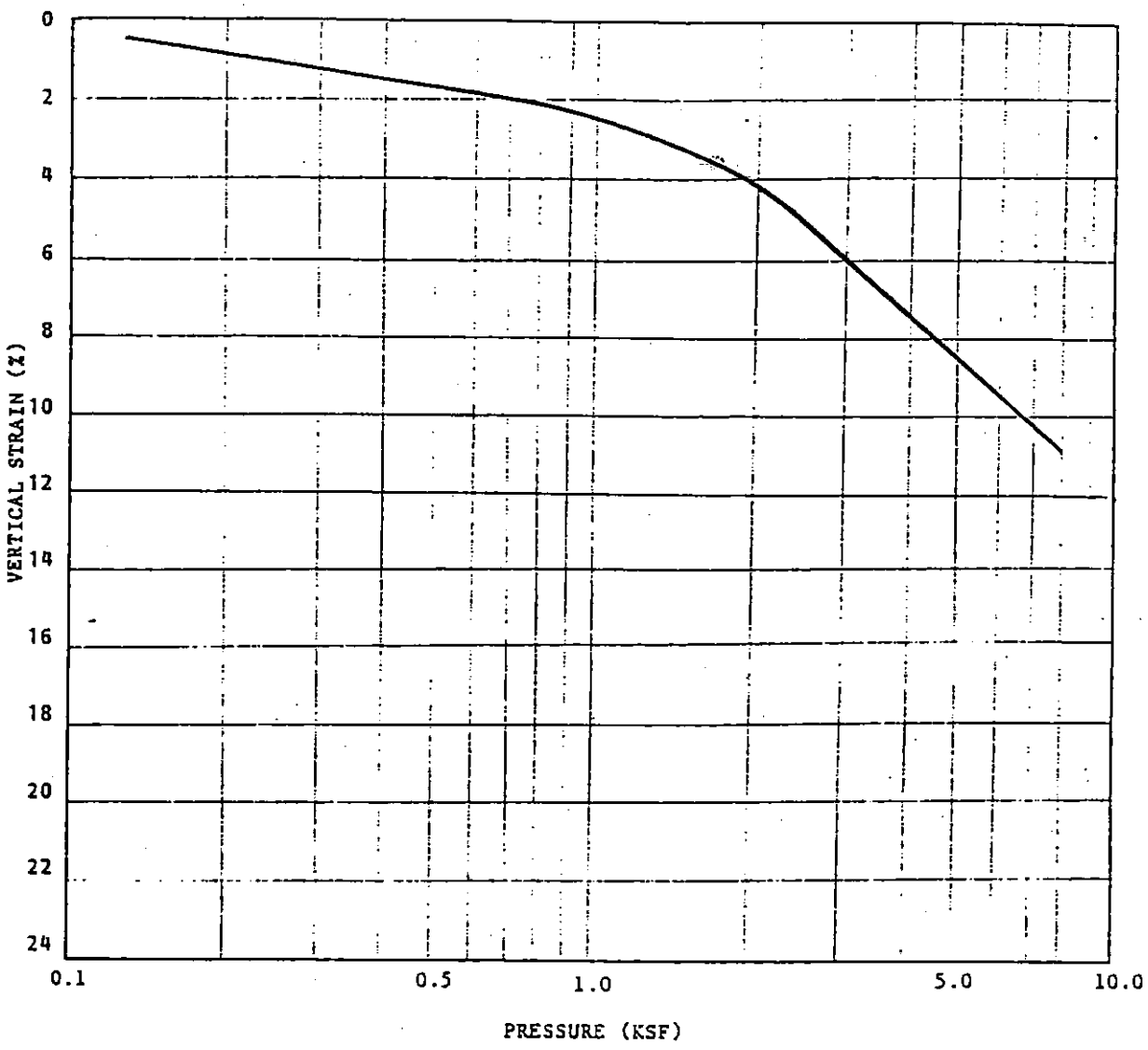
Est. Preconsolidation Pressure, Pc = 1.2 KSF

Sample Description Dark gray silt, trace fine little sand, some organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410 | Figure D-1-1 | Date: October 21, 1983 | Sheet 5 of 19



Test Boring Number GP-6 Depth 40.1

Atterberg Limits: LL 56, PI 23, U.S.C.S. Class. MH

Initial Moisture Content 48.8 % Initial Dry Density 69.4 PCF

Est. Existing Overburden Pressure, Po = 1.1 KSF

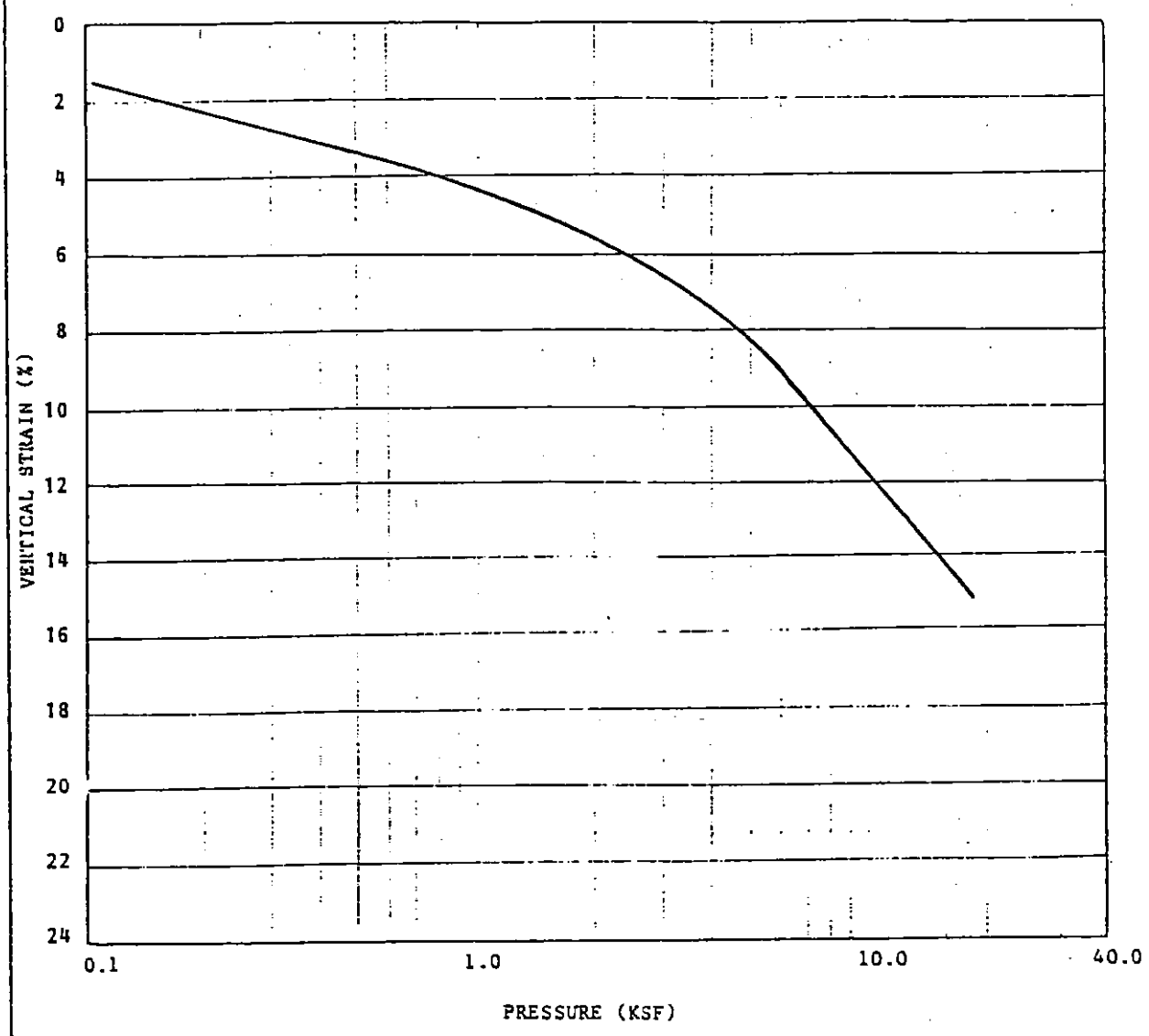
Est. Preconsolidation Pressure, Pc = ~~2.1~~ 1.8 KSF

Sample Description Dark gray silt, trace fine sand

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410 | Figure D-1-1 | Date: October 24, 1983 | Sheet 6 of 19



Test Boring Number GP-6 Depth 41.2

Atterberg Limits: LL 56, PI 23, U.S.C.S. Class. MH

Initial Moisture Content 50.5 % Initial Dry Density 69.4 PCF

Est. Existing Overburden Pressure, Po = 1.1 KSF

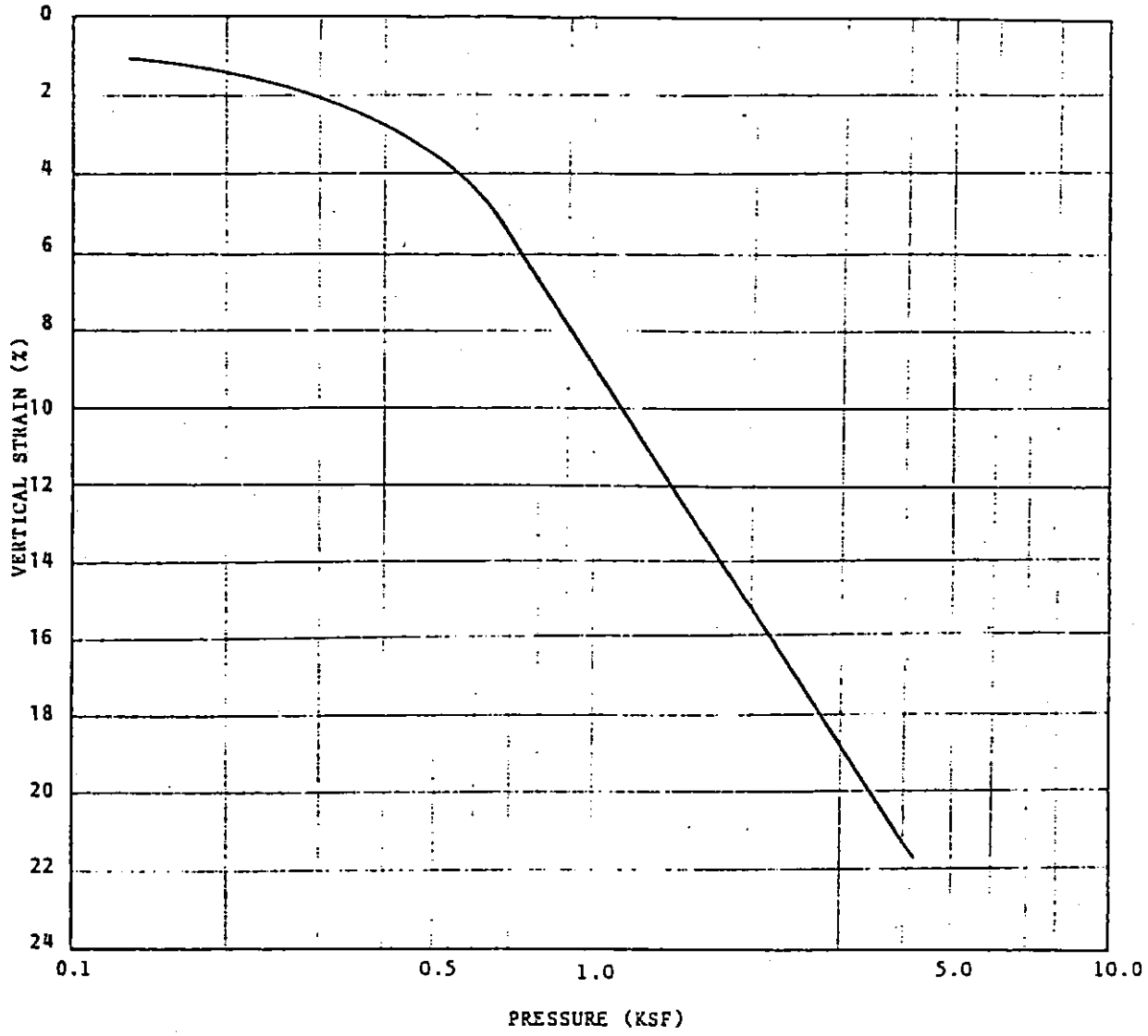
Est. Preconsolidation Pressure, Pc = 4.3 KSF

Sample Description Dark gray silt, trace fine sand

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: October 21, 1983 Sheet 7 of 19



Test Boring Number GP-7 Depth 20.5

Atterberg Limits: LL 84, PI 40, U.S.C.S. Class. MH

Initial Moisture Content 100.3 % Initial Dry Density 41.4 PCF

Est. Existing Overburden Pressure, Po = 0.58 KSF

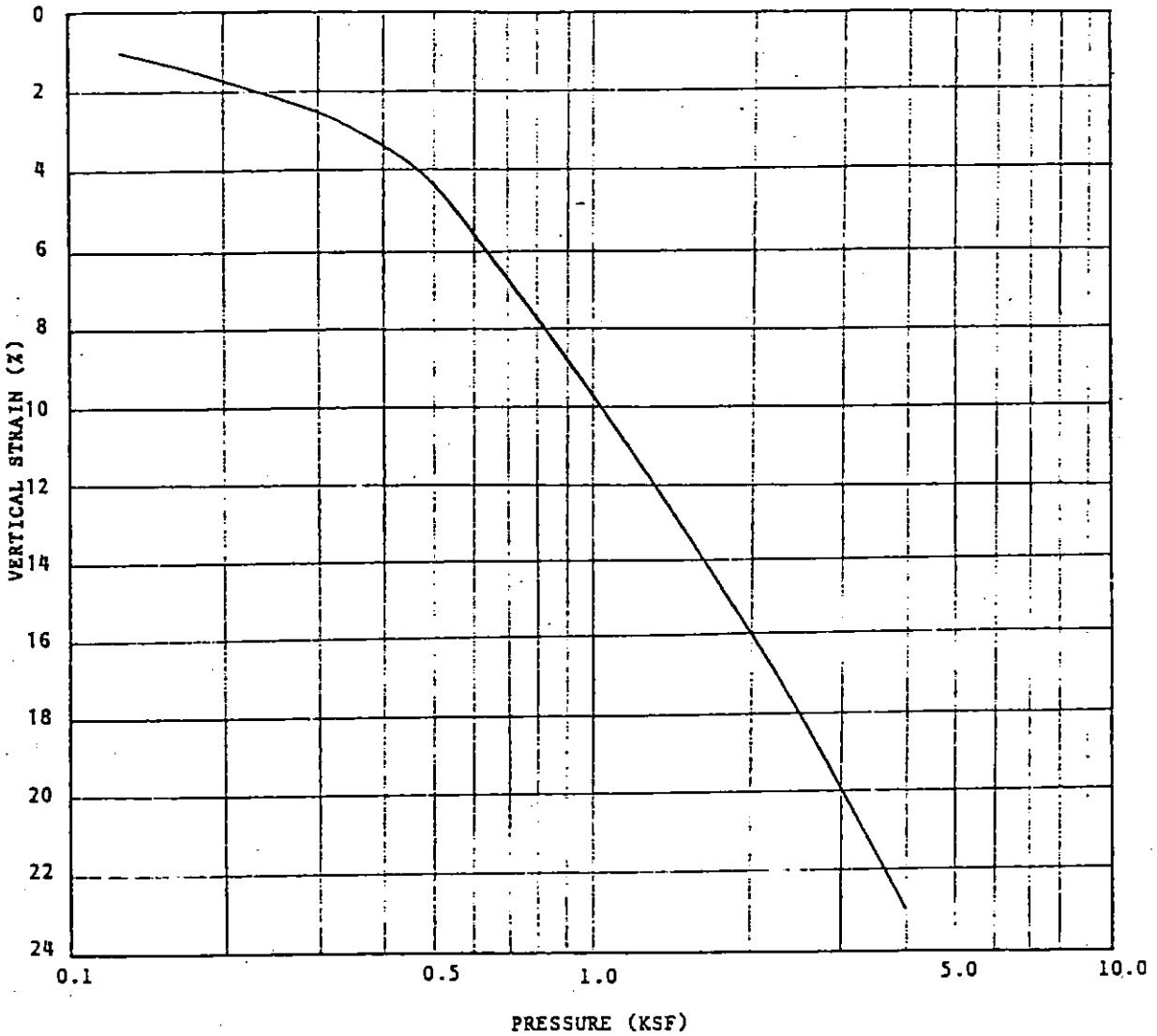
Est. Preconsolidation Pressure, Pc = 0.64 KSF

Sample Description Dark gray silt, trace to little organics, trace fine sand

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410 | Figure D-1-1 | Date: October 21, 1983 | Sheet 8 of 19



Test Boring Number GP-7 Depth 20.8

Atterberg Limits: LL 84, PI 40, U.S.C.S. Class. MH

Initial Moisture Content 100.3 % Initial Dry Density 41.4 PCF

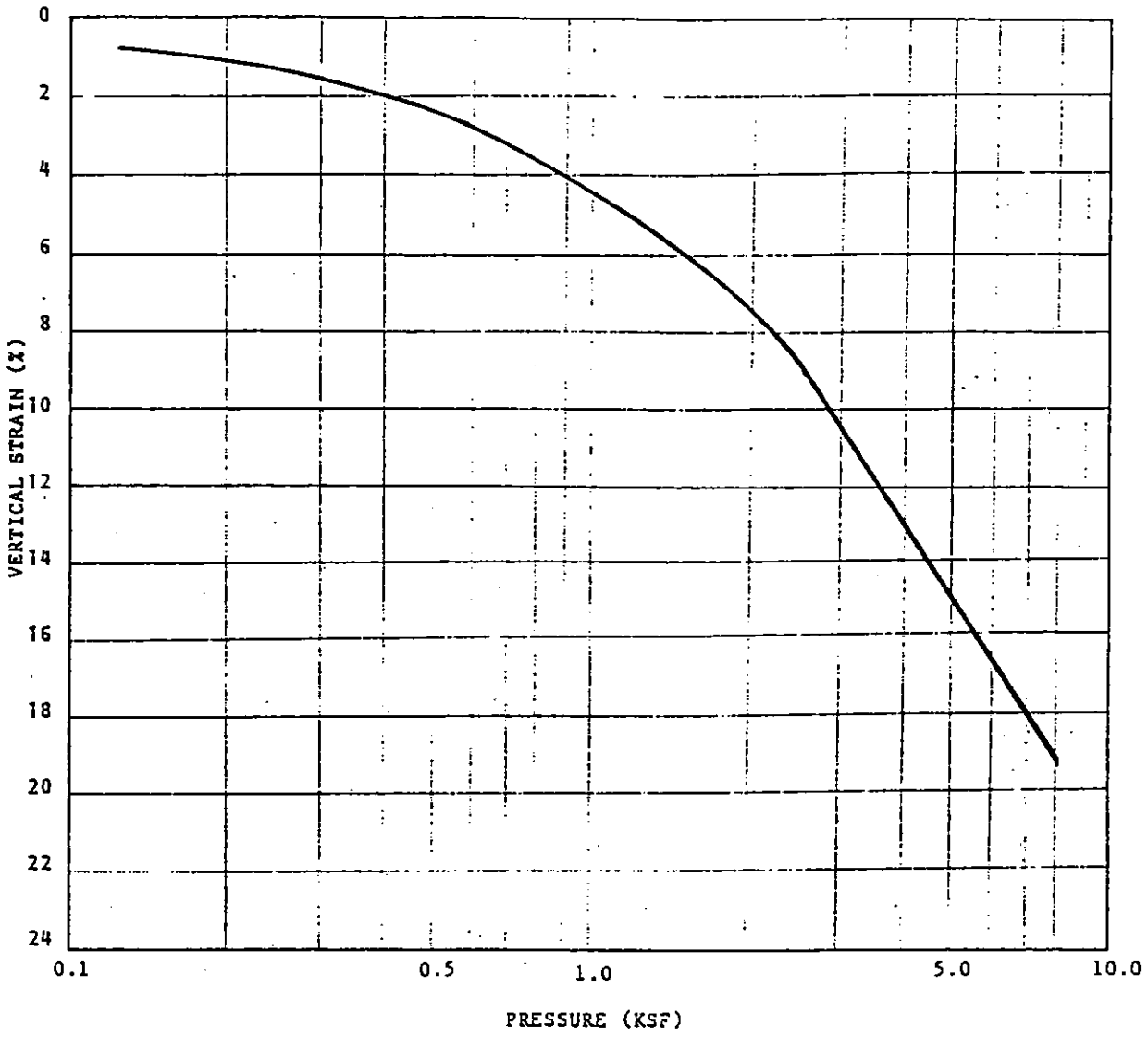
Est. Existing Overburden Pressure, Po = 0.58 KSF

Est. Preconsolidation Pressure, Pc = 0.52 KSF

Sample Description Dark gray silt, trace fine sand, trace organics

CONSOLIDATION TEST (A.S.T.M.: D-2435) For NSWF-2 Cherry Island Wilmington, Delaware	DUFFIELD ASSOCIATES, INC. Consulting Geotechnical Engineers 5400 Limestone Road Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: October 21, 1983	Sheet 9 of 19



Test Boring Number GP-7 Depth 30.5

Atterberg Limits: LL 76, PI 36, U.S.C.S. Class. MH

Initial Moisture Content 89.7 % Initial Dry Density 46.2 PCF

Est. Existing Overburden Pressure, Po = 0.84 KSF

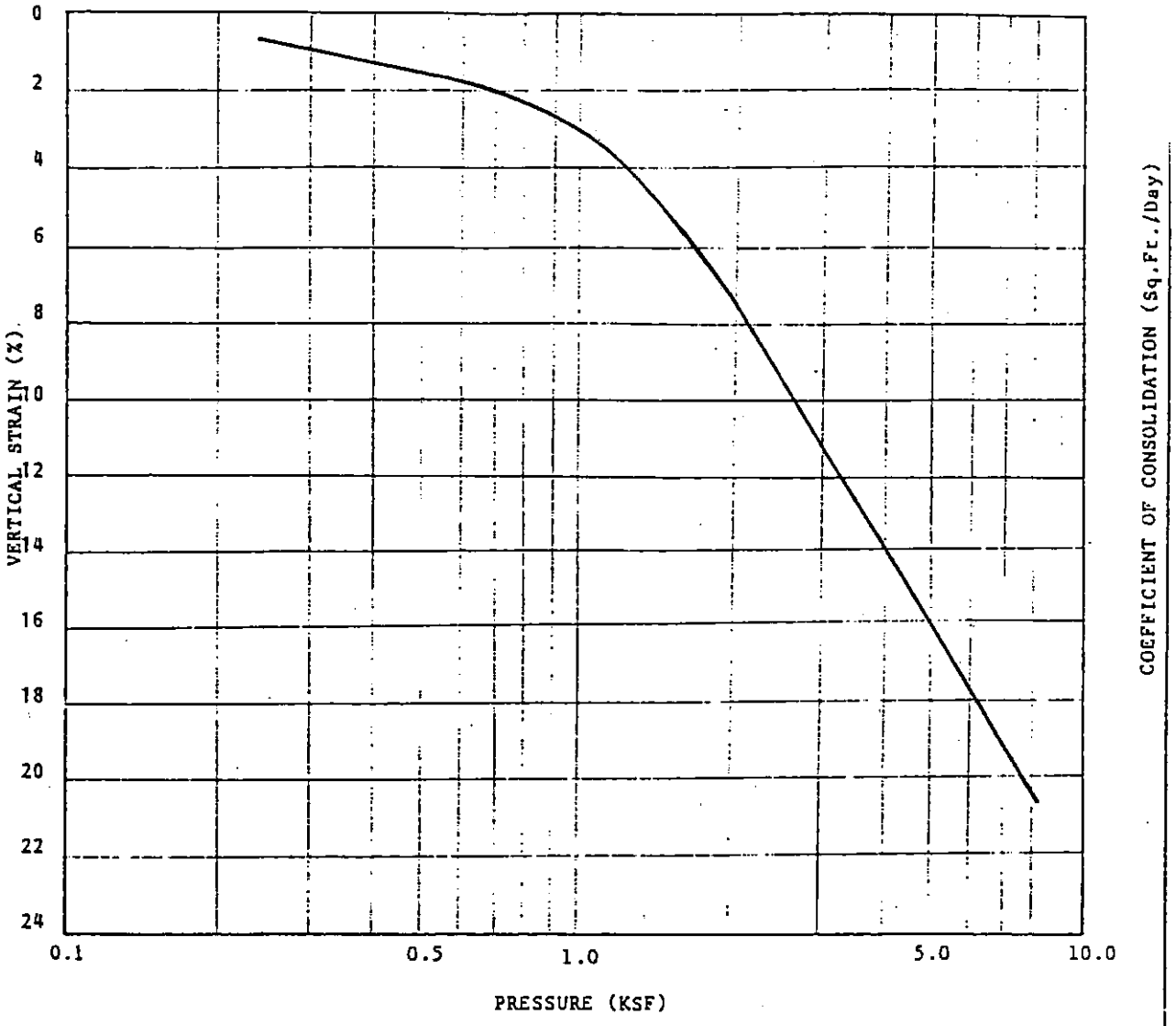
Est. Preconsolidation Pressure, Pc = 1.7 KSF

Sample Description Dark gray silt, trace fine sand, trace organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: October 24, 1983	Sheet 10 of 19



Test Boring Number GP-7 Depth 30.8

Atterberg Limits: LL 76, PI 36, U.S.C.S. Class. MH

Initial Moisture Content 89.7 % Initial Dry Density 46.2 PCF

Est. Existing Overburden Pressure, Po = 0.84 KSF

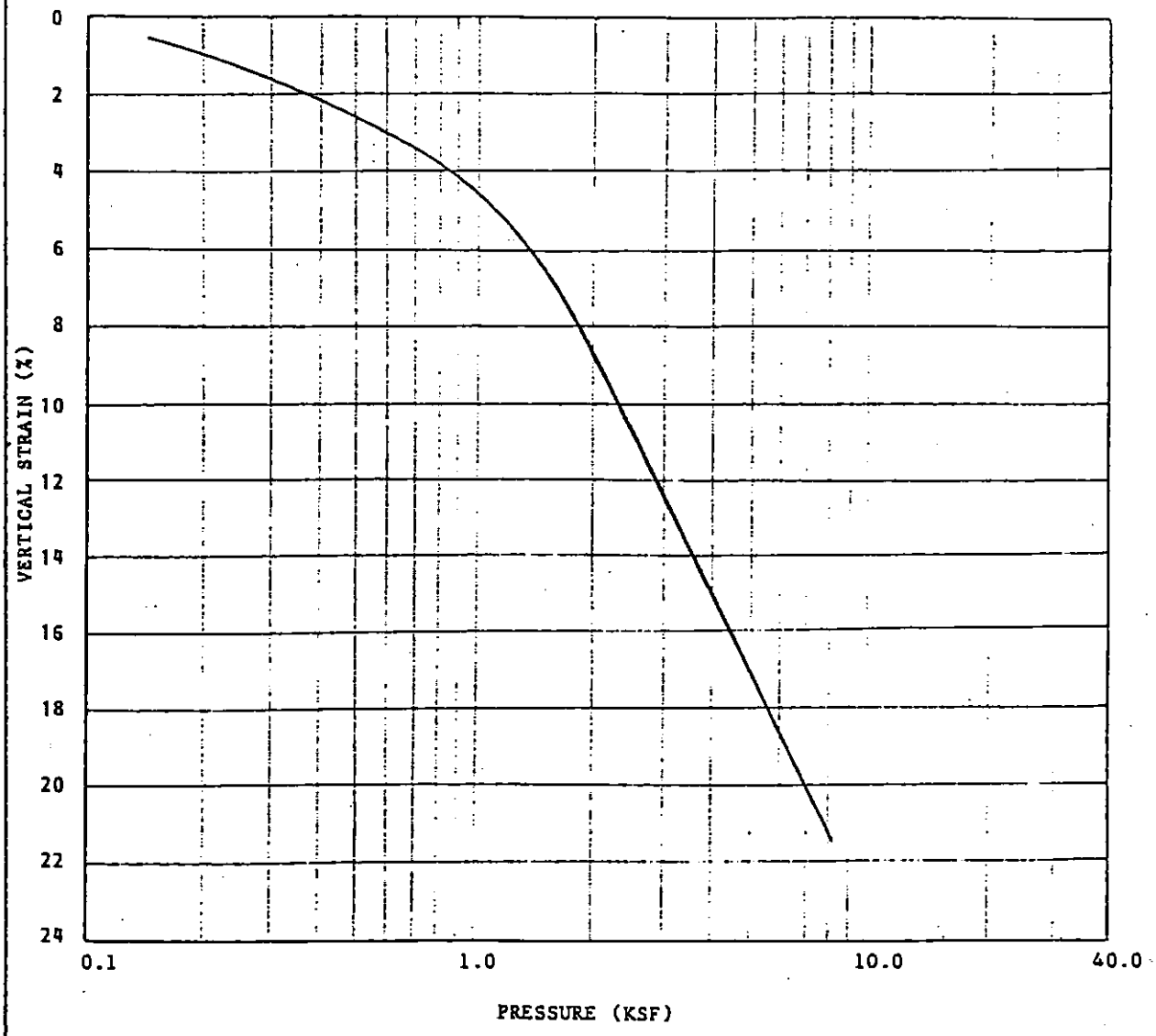
Est. Preconsolidation Pressure, Pc = 1.5 1.15 KSF

Sample Description Dark gray high plasticity silt with trace organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410 | Figure D-1-1 | Date: October 21, 1983 | Sheet 11 of 19



Test Boring Number GP-8 Depth 35.9

Atterberg Limits: LL 74, PI 23, U.S.C.S. Class. MH

Initial Moisture Content 94 % Initial Dry Density 44.9 PCF

Est. Existing Overburden Pressure, Po = 0.98 KSF

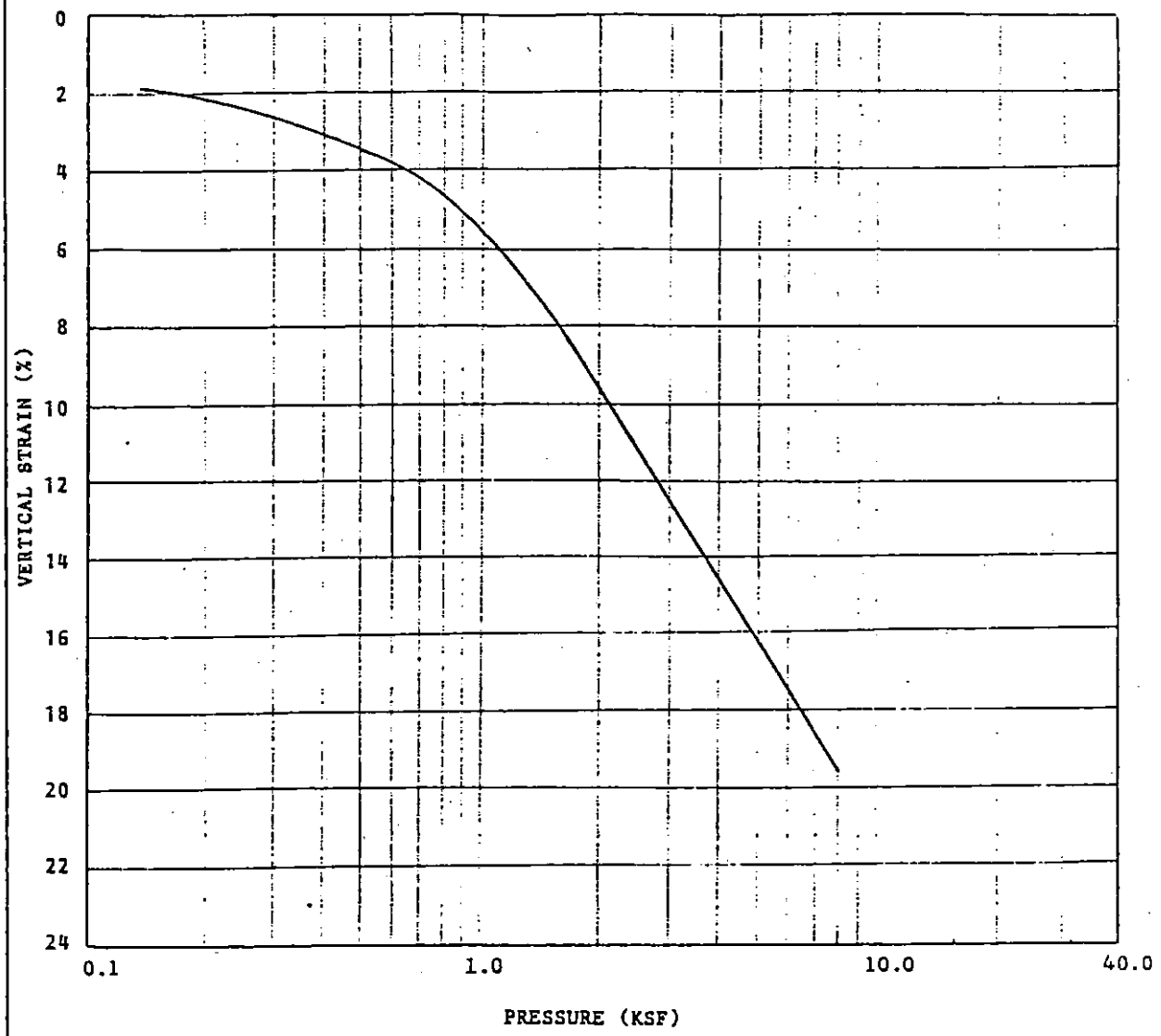
Est. Preconsolidation Pressure, Pc = 1.2 KSF

Sample Description Dark gray silt, trace fine sand, trace organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19806

W. O. 410	Figure D-1-1	Date: October 21, 1983	Sheet 12 of 19



Test Boring Number GP-9 Depth 36.1

Atterberg Limits: LL 56, PI 16, U.S.C.S. Class. MH

Initial Moisture Content 70 % Initial Dry Density 56.1 PCF

Est. Existing Overburden Pressure, Po = 1.0 KSF

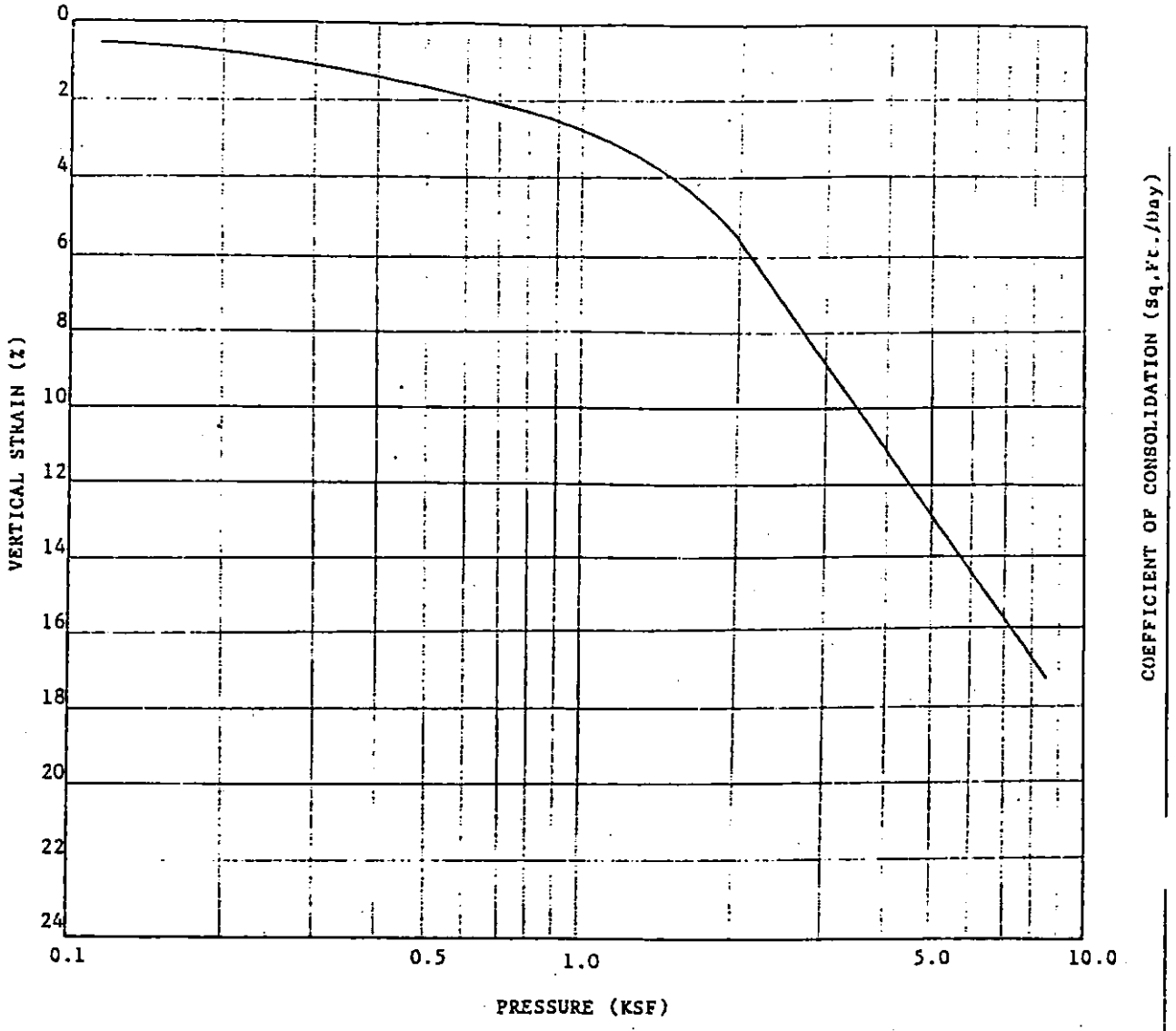
Est. Preconsolidation Pressure, Pc = 1.1 KSF

Sample Description Dark gray and black silt, trace fine sand, trace mica, trace organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
Cherry Island
Wilmington, Delaware

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: October 21, 1983	Sheet 13 of 19



Test Boring Number A-1 Depth 13.6'

Atterberg Limits: LL 21, PI 0, U.S.C.S. Class. ML-OL

Initial Moisture Content 47.1 % Initial Dry Density 69.7 PCF

Est. Existing Overburden Pressure, Po = 0.6 KSF

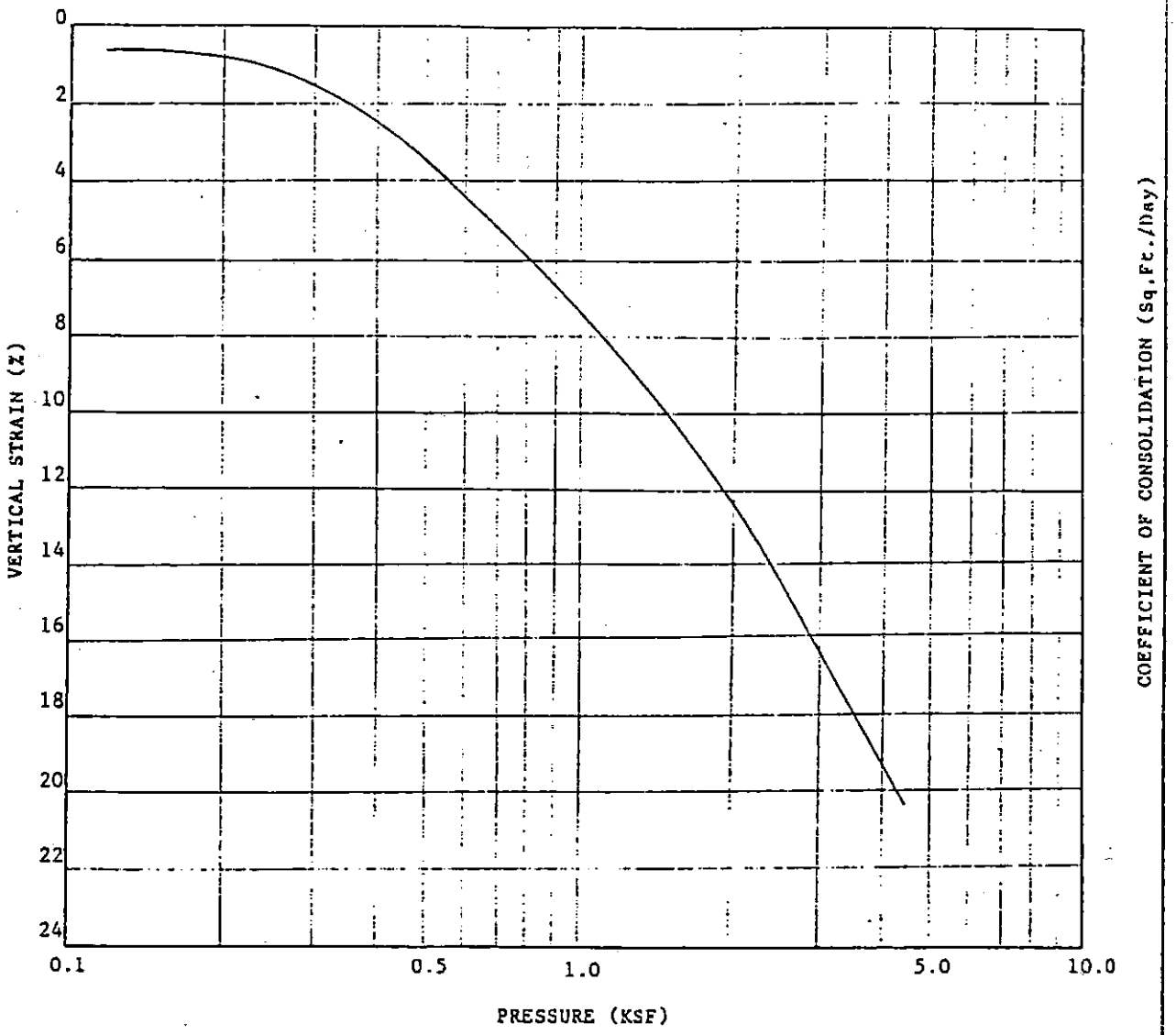
Est. Preconsolidation Pressure, Pc = 1.4 1.4 KSF

Sample Description Dark gray silt, little fine sand, trace organics, trace mica.

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
CHERRY ISLAND
WILMINGTON, DE

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: 11/23/83	Sheet 14 of 19



Test Boring Number A-1 Depth 27.0

Atterberg Limits: LL 65, PI 24, U.S.C.S. Class. MH

Initial Moisture Content 73.4 % Initial Dry Density 53.2 PCF

Est. Existing Overburden Pressure, Po = 1.0 KSF

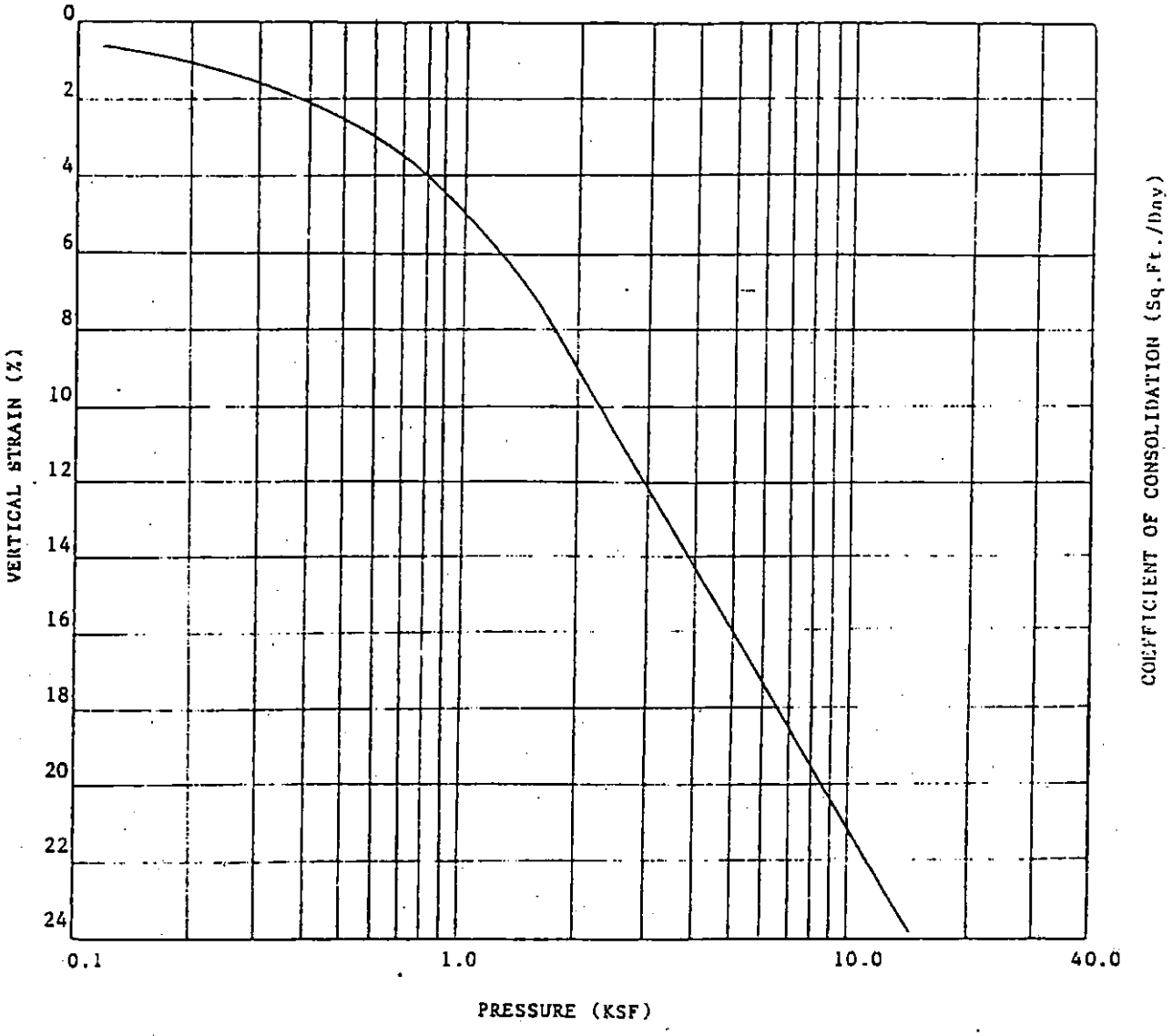
Est. Preconsolidation Pressure, Pc = 0.9 KSF

Sample Description Dark gray and medium gray silt, little organics, trace very fine sand.

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
CHERRY ISLAND
WILMINGTON, DE

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: 11/23/83	Sheet 15 of 19



Test Boring Number A2 Depth 12.6

Atterberg Limits: LL 60, PI 25, U.S.C.S. Class. MH-OH

Initial Moisture Content 76.8 % Initial Dry Density 53.0 PCF

Est. Existing Overburden Pressure, Po = 0.5 KSF

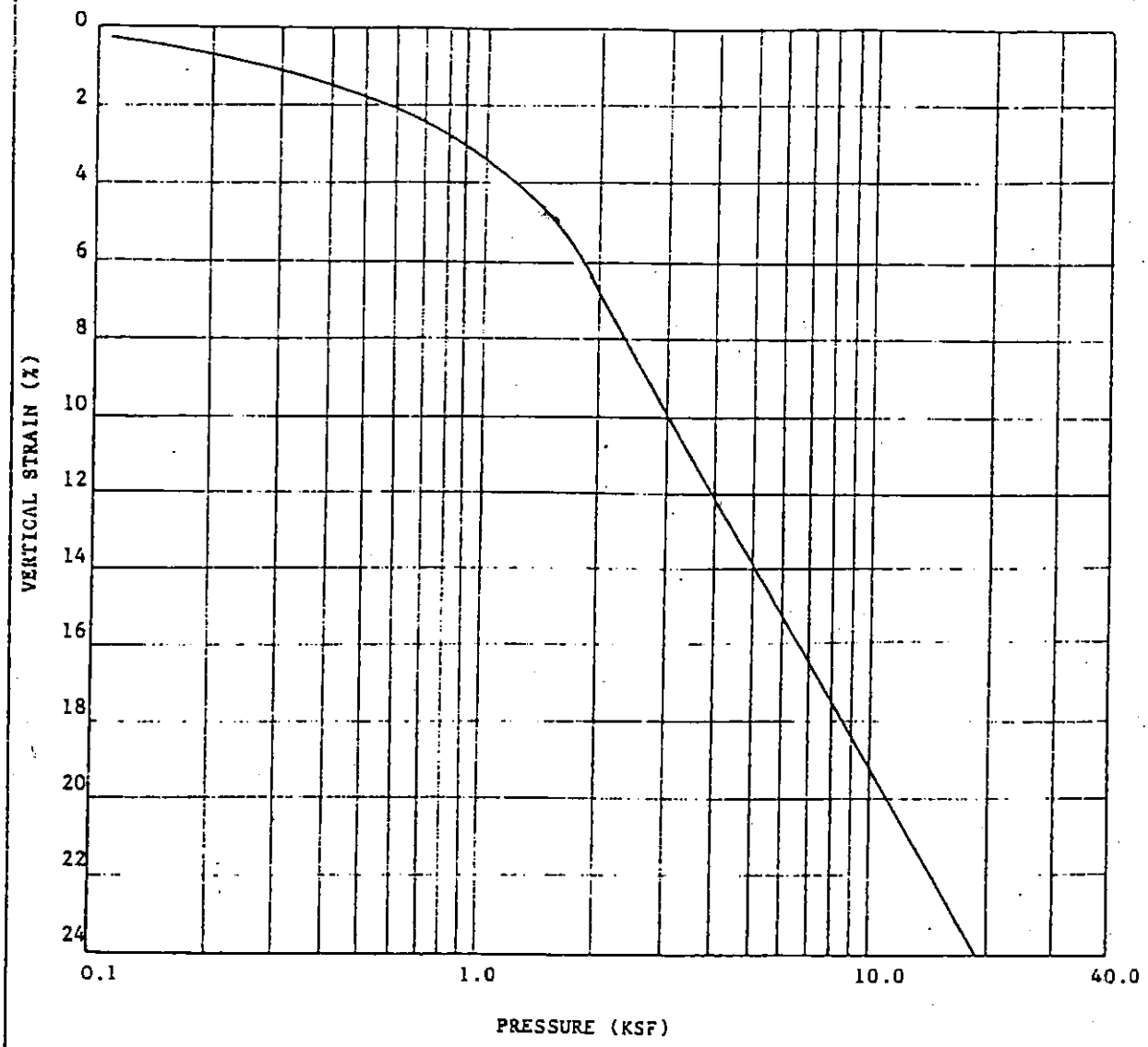
Est. Preconsolidation Pressure, Pc = 1.2 KSF

Sample Description Dark gray silt, trace very fine sand, trace organics, trace mica.

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
CHERRY ISLAND
WILMINGTON, DE

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

Job No. 410	Figure D-1-1	Date: 12/21/83	Sheet 16 of 19



Test Boring Number A-3 Depth 25.1

Atterberg Limits: LL 72, PI 25, U.S.C.S. Class. MH

Initial Moisture Content 91.6 % Initial Dry Density 46.6 PCF

Est. Existing Overburden Pressure, Po = 0.9 KSF

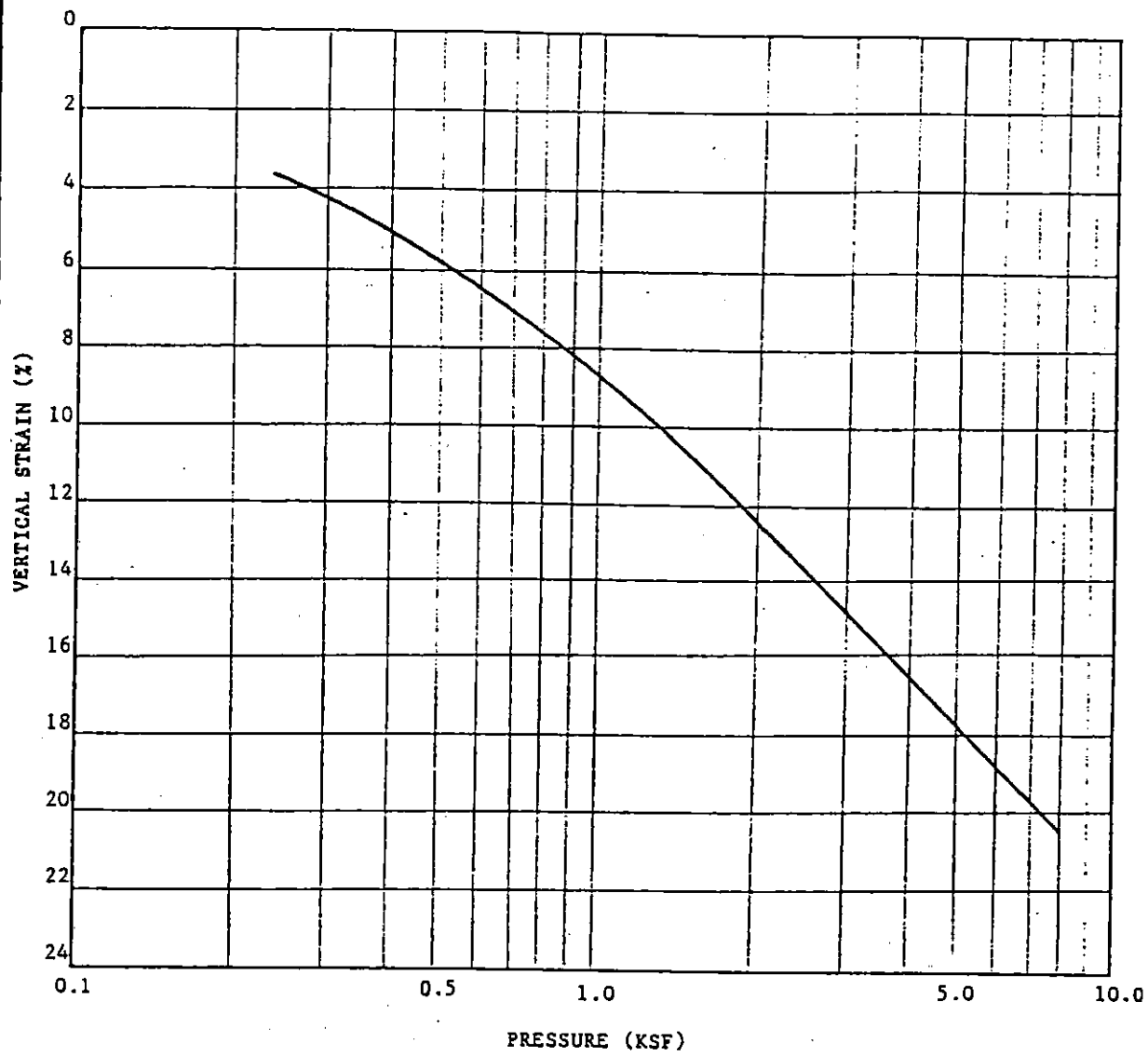
Est. Preconsolidation Pressure, Pc = 1.6 1.5 KSF

Sample Description Dark gray silt, trace fine sand, trace peat

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
CHERRY ISLAND
WILMINGTON, DE

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: 12/20/83	Sheet 17 of 19



Test Boring Number A-5 Depth 15.5'

Atterberg Limits: LL 26, PI 0, U.S.C.S. Class. ML-OL

Initial Moisture Content 39.3 % Initial Dry Density -- PCF

Est. Existing Overburden Pressure, Po = 0.6 KSF

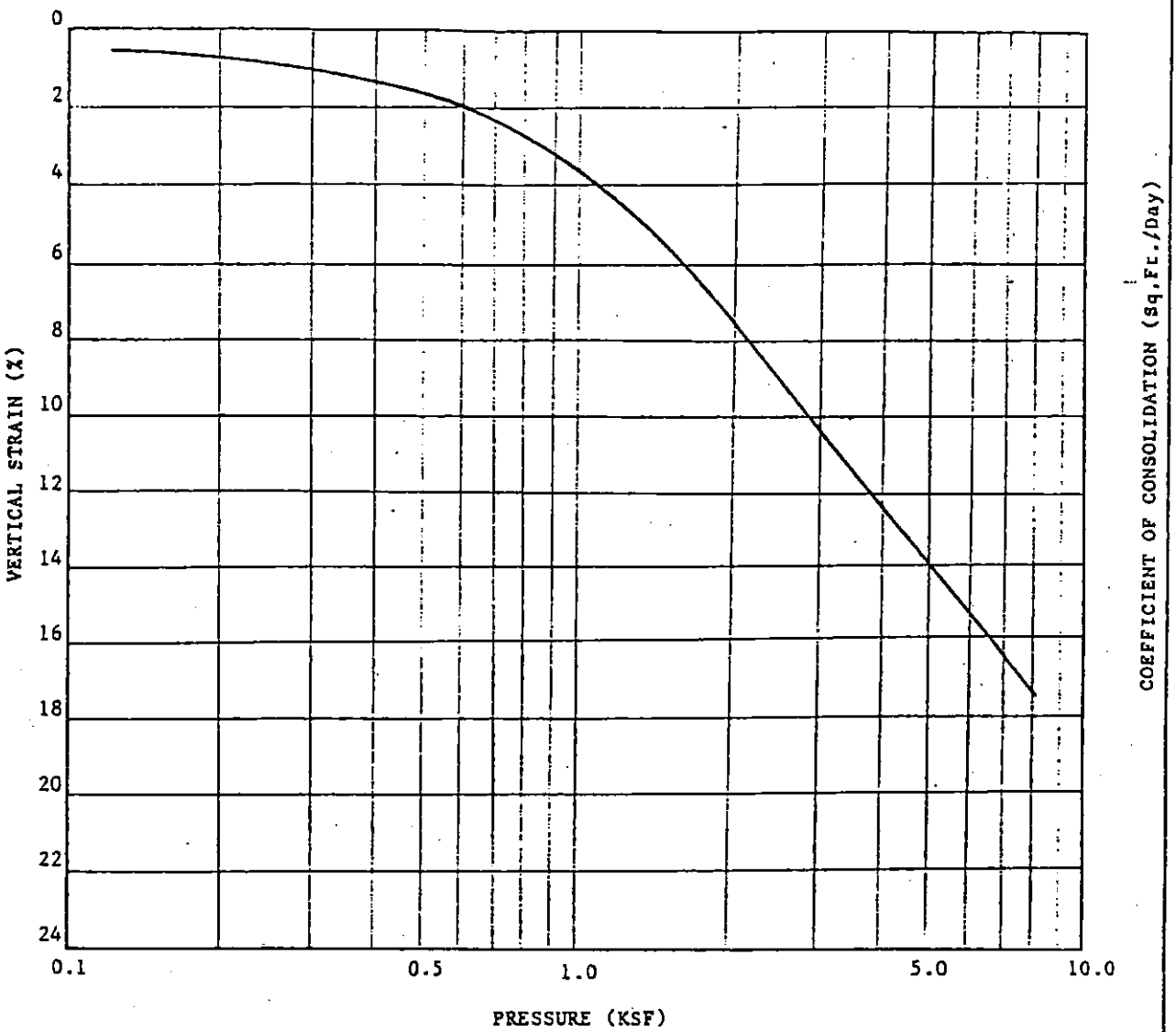
Est. Preconsolidation Pressure, Pc = 1.0 KSF

Sample Description Medium gray silt, trace very fine sand, trace organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: 12/27/83	Sheet 18 of 19



Test Boring Number #A-7 Depth 20.1

Atterberg Limits: LL 43, PI 10, U.S.C.S. Class. ML-OL

Initial Moisture Content 73.2 % Initial Dry Density 60.9 PCF

Est. Existing Overburden Pressure, Po = 0.7 KSF

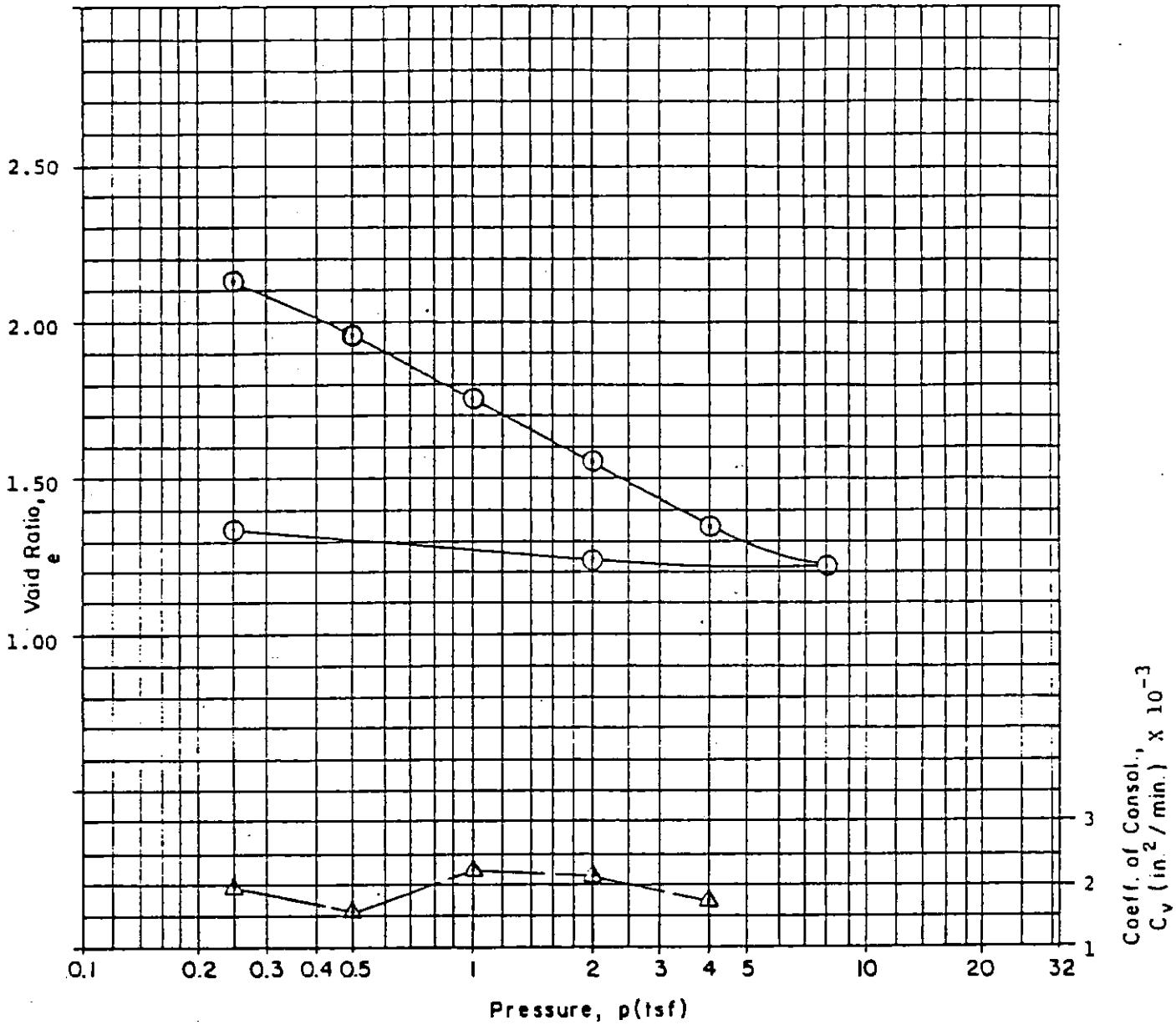
Est. Preconsolidation Pressure, Pc = 1.0 KSF

Sample Description Dark gray silt, trace very fine sand, trace organics

CONSOLIDATION TEST
(A.S.T.M.: D-2435)
For
NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

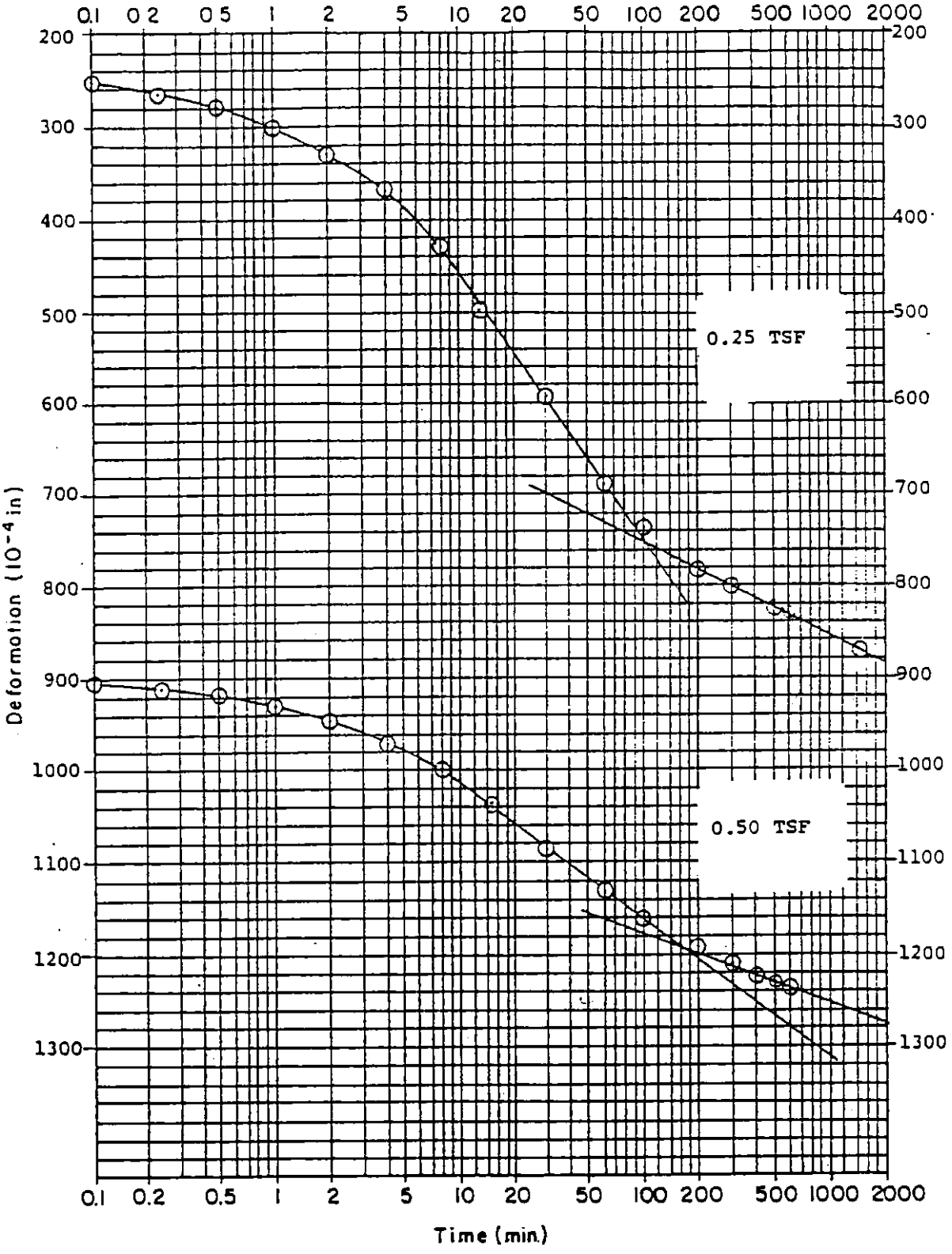
DUFFIELD ASSOCIATES, INC.
Consulting Geotechnical Engineers
5400 Limestone Road
Newark, Delaware 19808

W. O. 410	Figure D-1-1	Date: 12/28/83	Sheet 19 of 19



Type of Specimen	Shelby			Before Test			After Test	
Dia	2.50 in	H_T	0.75 in	Water Content	w_o	82.3	w_f	52.4
Compression Index		C_c	0.67	Void Ratio	e_o	2.429	e_f	1.341
Classification			MH	Saturation	S_o	96	S_f	99
w_l	62.4	I_p	16.1	Project DSWF NORTHERN FACILITY-2				
w_p	46.3	LI	2.2	Boring No	GF-1		Sample No	S-7
Remarks	Exceeded ma			Depth	10- 12'		Date	8/ 86
travel limits at 8 '								

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

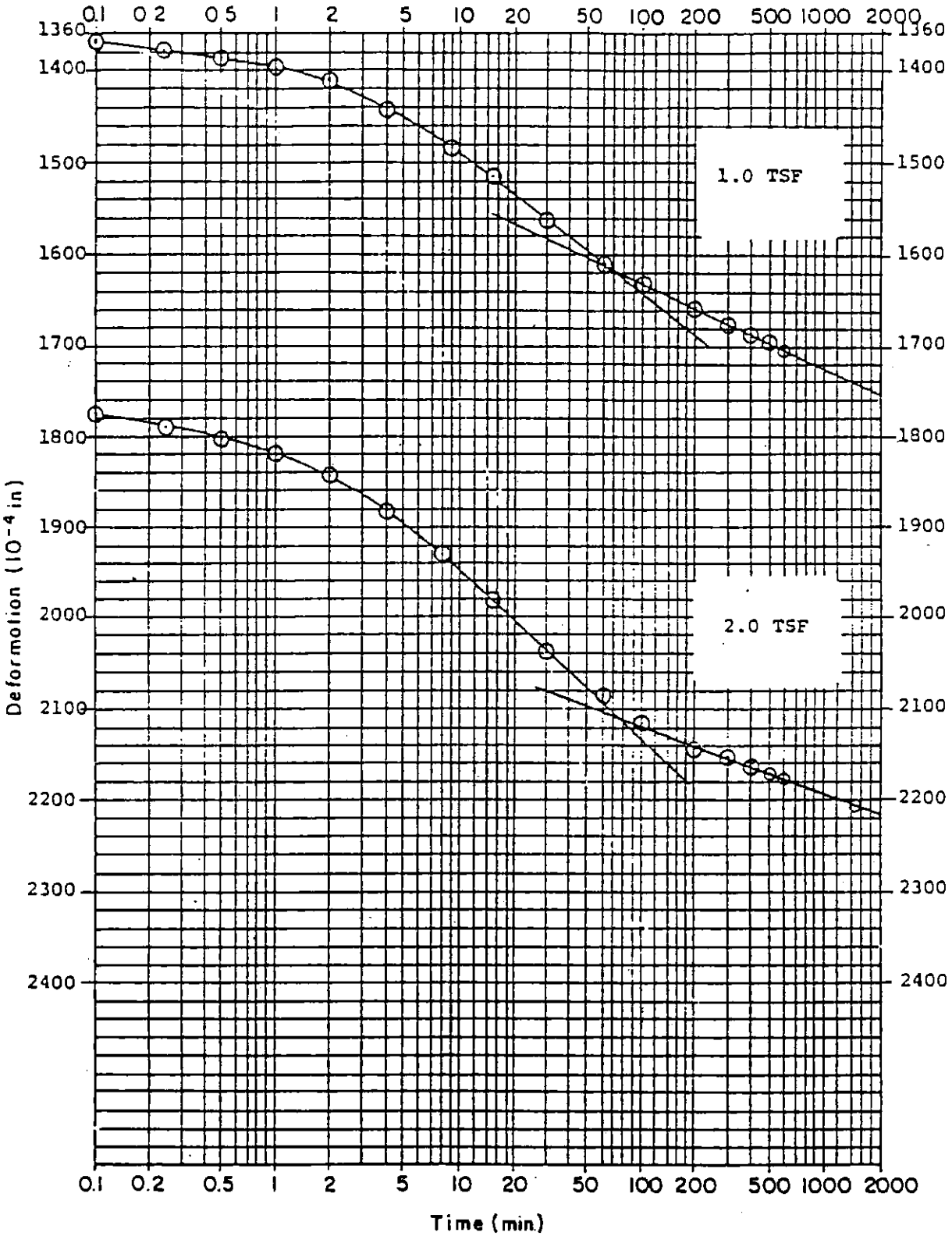


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-7 Depth 10.0' - 12.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

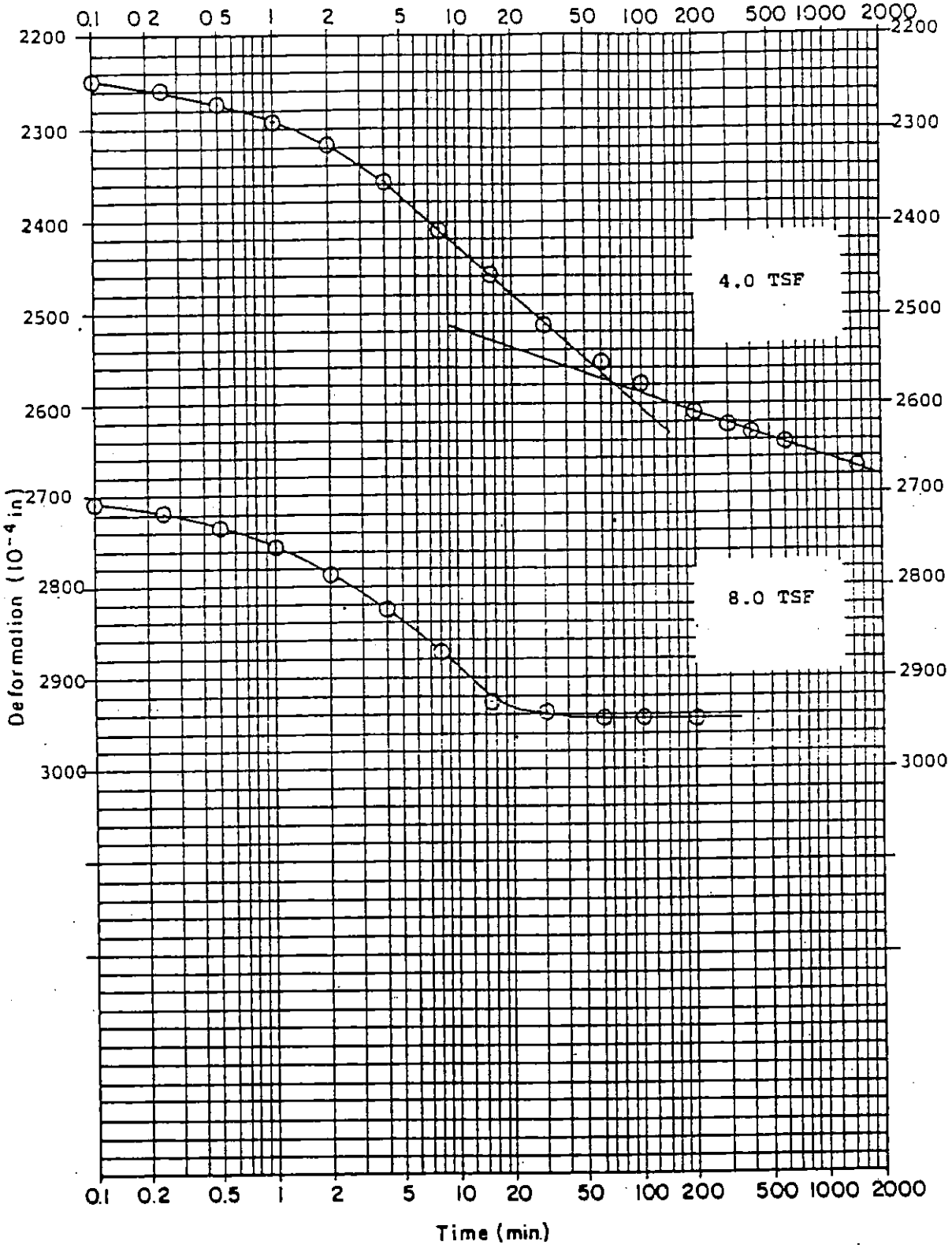


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-7 Depth 10.0' - 12.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

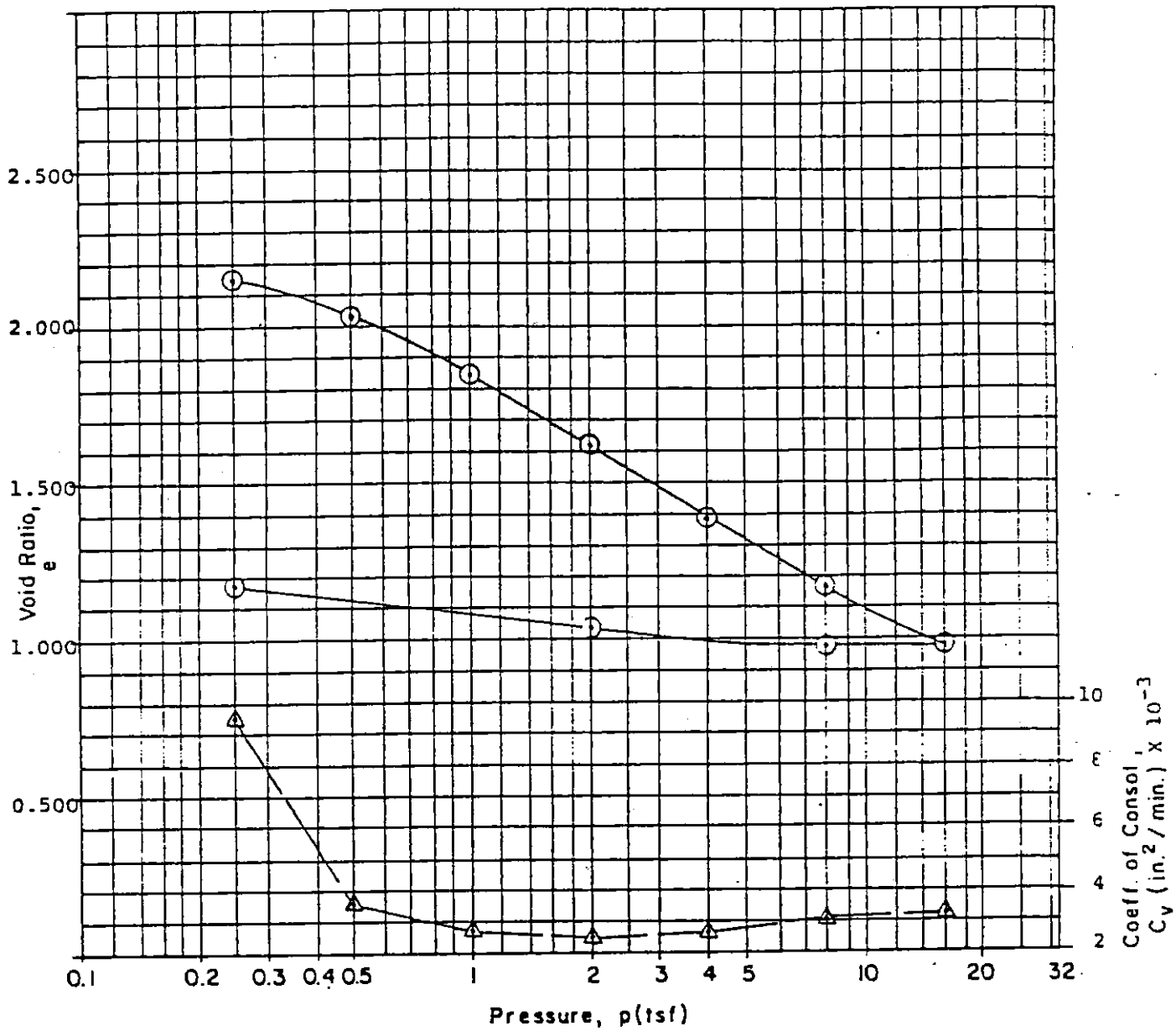


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-7 Depth 10.0' - 12.0' Date Aug. 1986

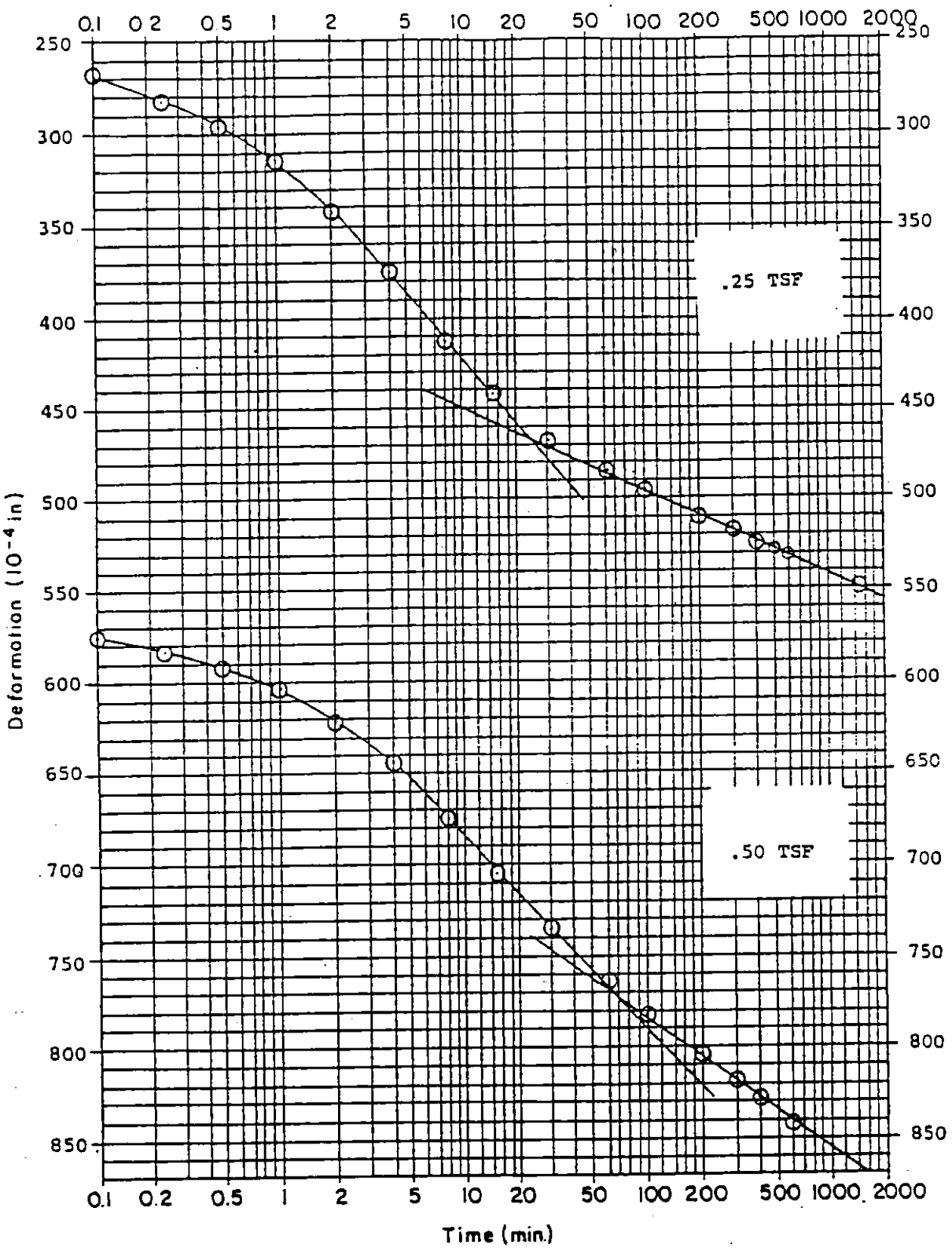
GANNETT FLEMING GEOTECHNICAL LABORATORY



Type of Specimen	Shelby			Before Test			After Test	
Dia	2.50 in	H_T	0.75 in	Water Content	w_o	79.0	w_f	46.5
Compression Index		C_c	0.73	Void Ratio	e_o	2.271	e_f	1.178
Classification			MH	Saturation	S_o	97.6	S_f	100
w_l	62.8	I_p	18.1	Project DSWA NORTHERN FACILITY-2				
w_p	44.7	LI	1.9	Boring No	GF-1		Sample No	S-10
Remarks Results questionable				Depth	20- 22'		Date	8/ 86

beyond 8 TSF due to specimens extreme compressibility. Exceeded machine travel limits at 32 TSF.

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

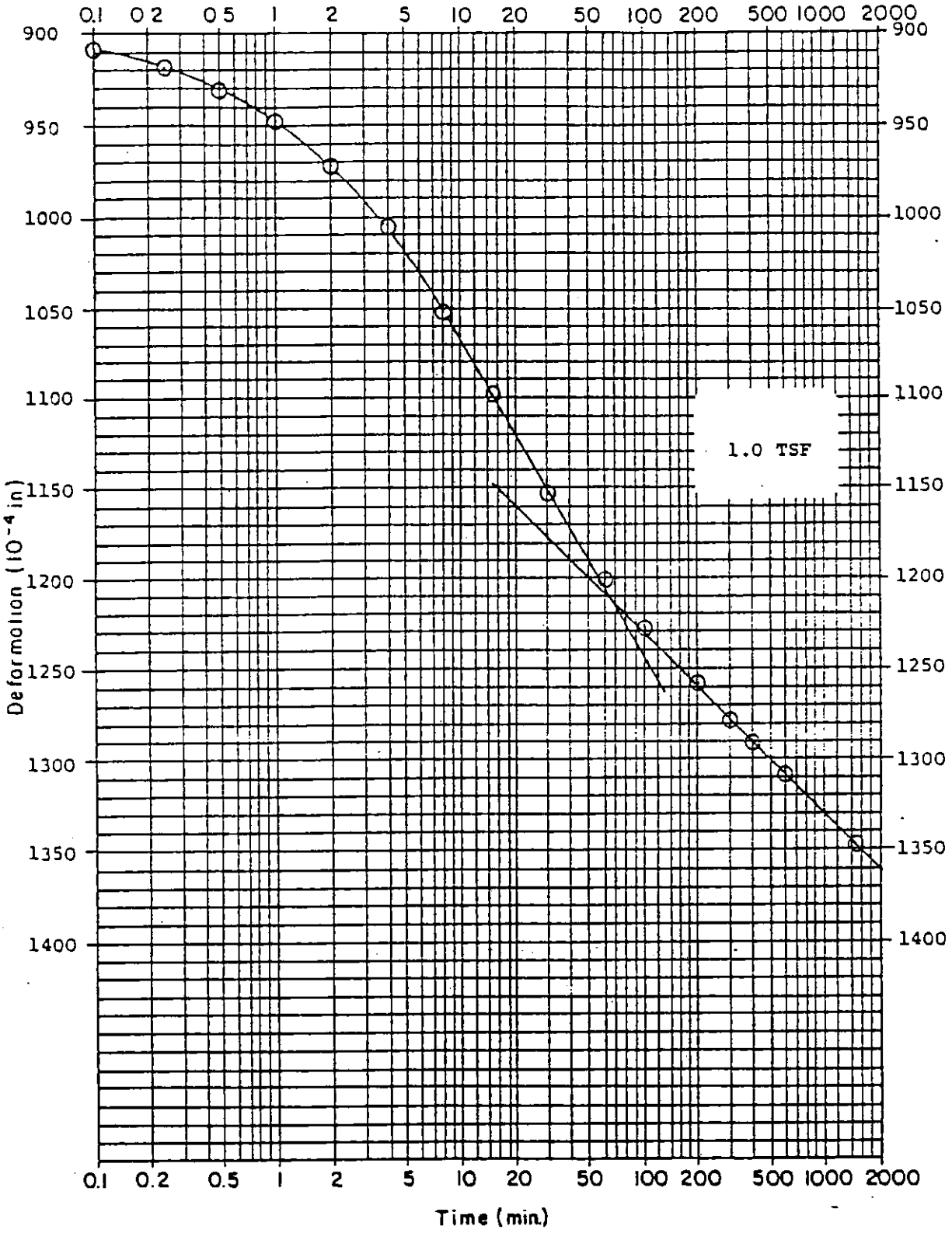


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF - 1

Sample No S-10 Depth 20.0' - 22.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

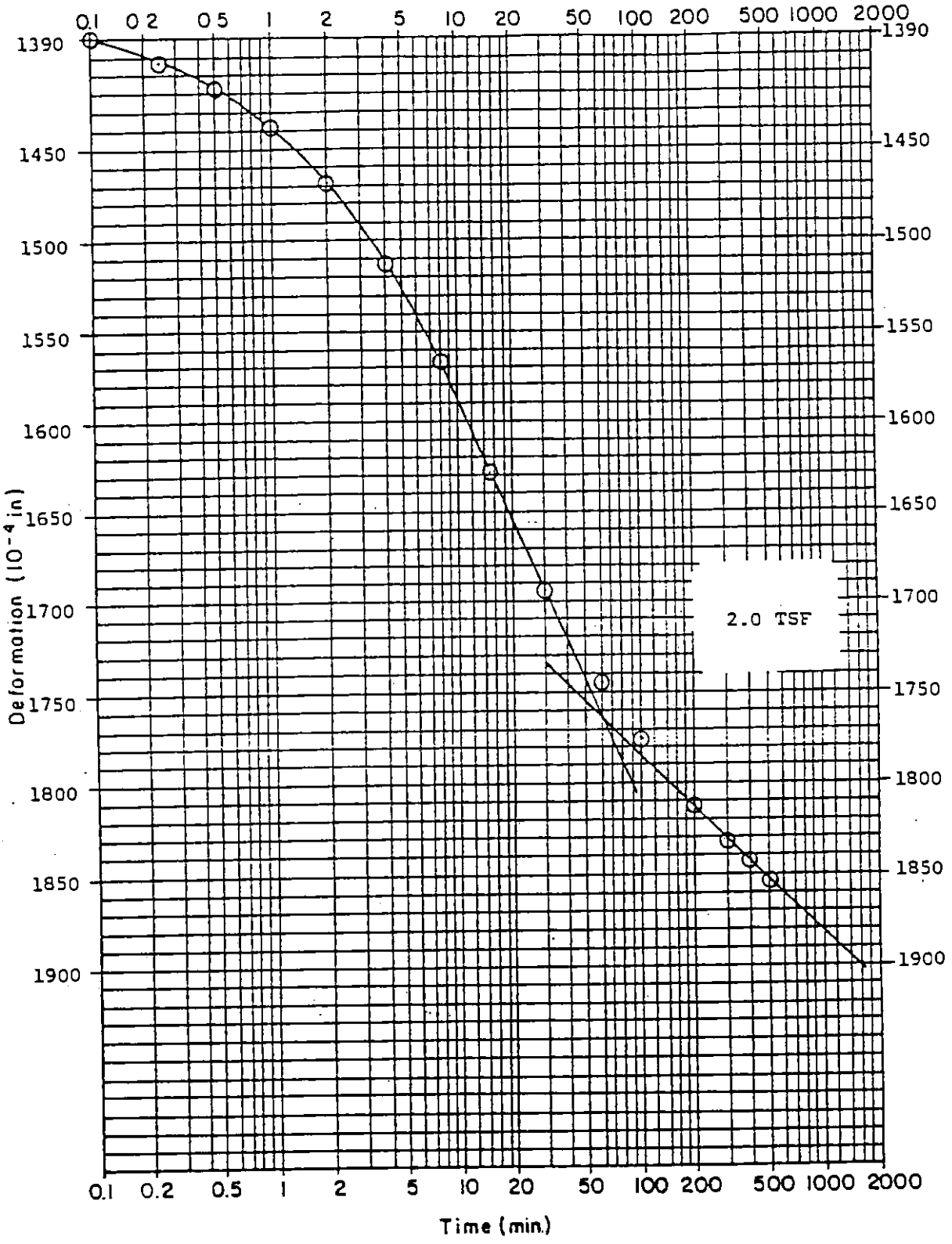


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-10 Depth 20.0' - 22.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

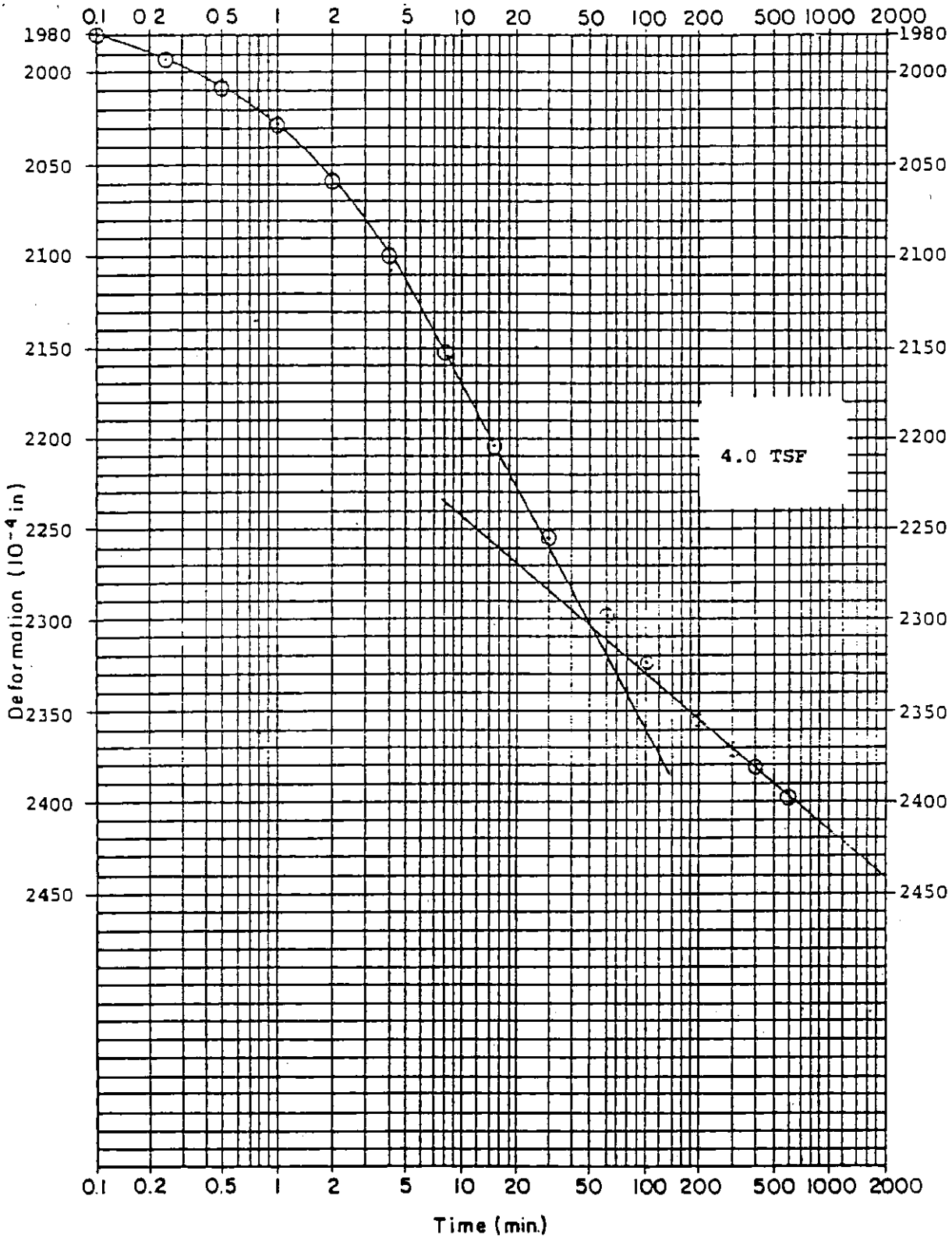


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-10 Depth 20.0' - 22.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

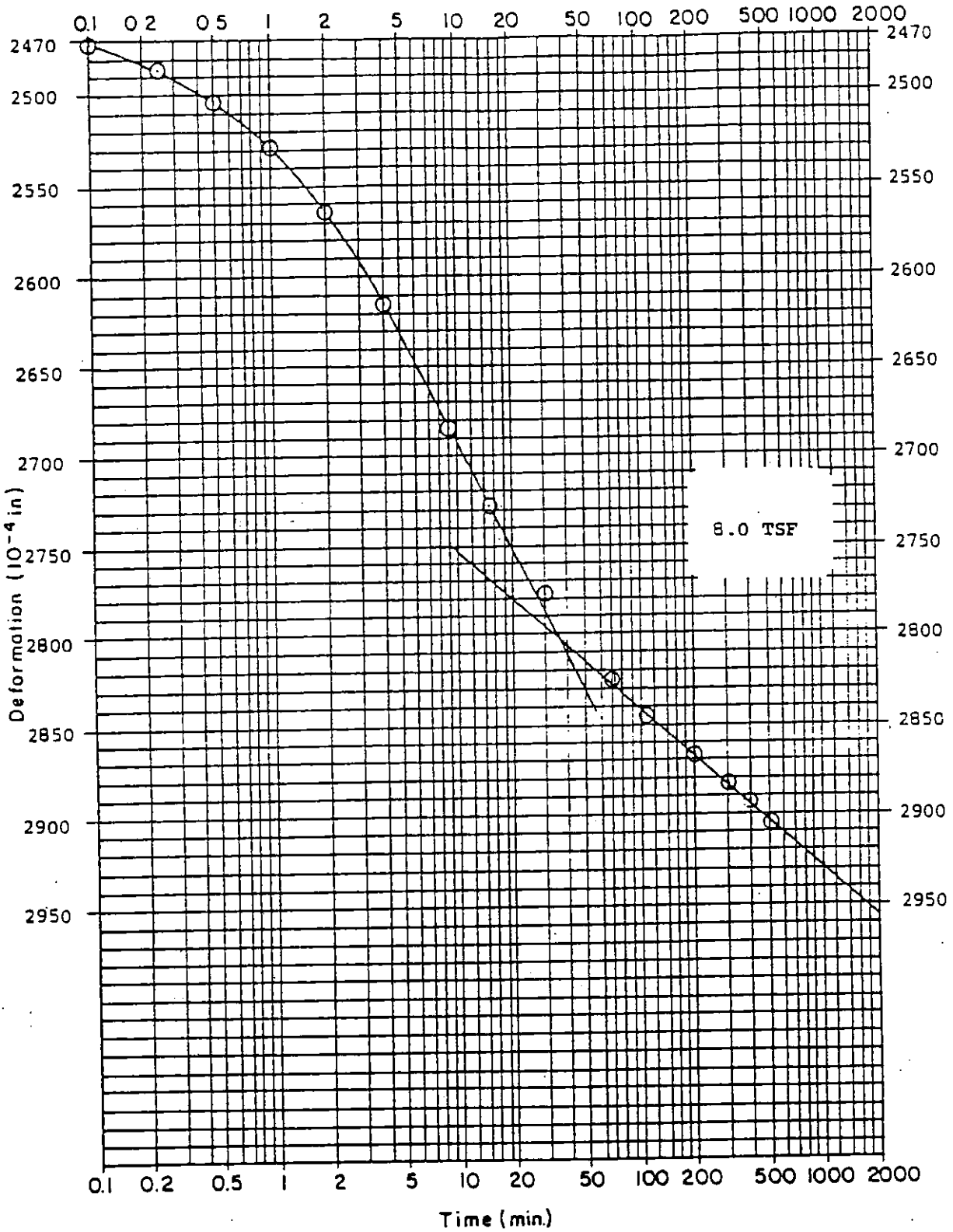


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-10 Depth 20.0' - 22.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

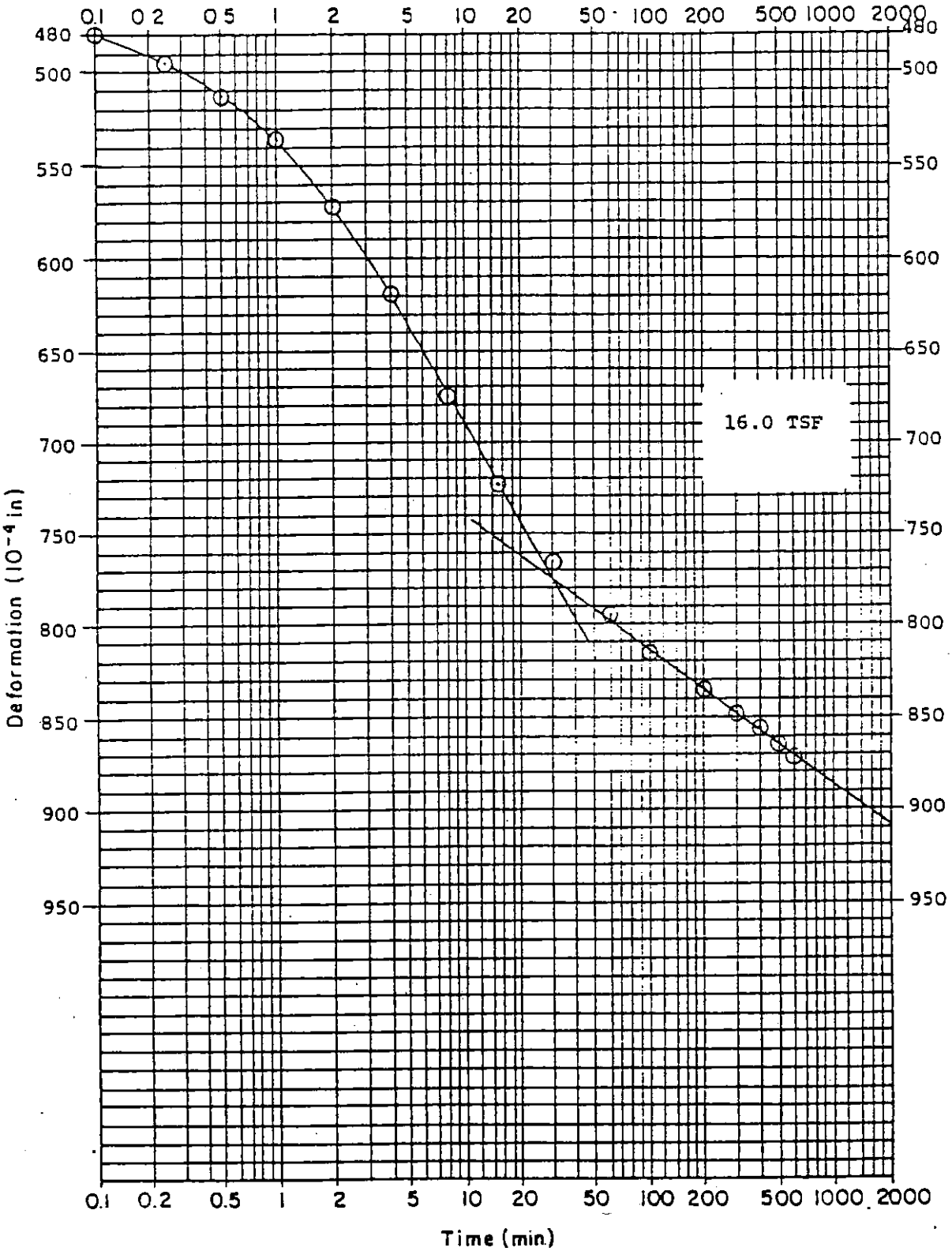


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-10 Depth 20.0' - 22.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

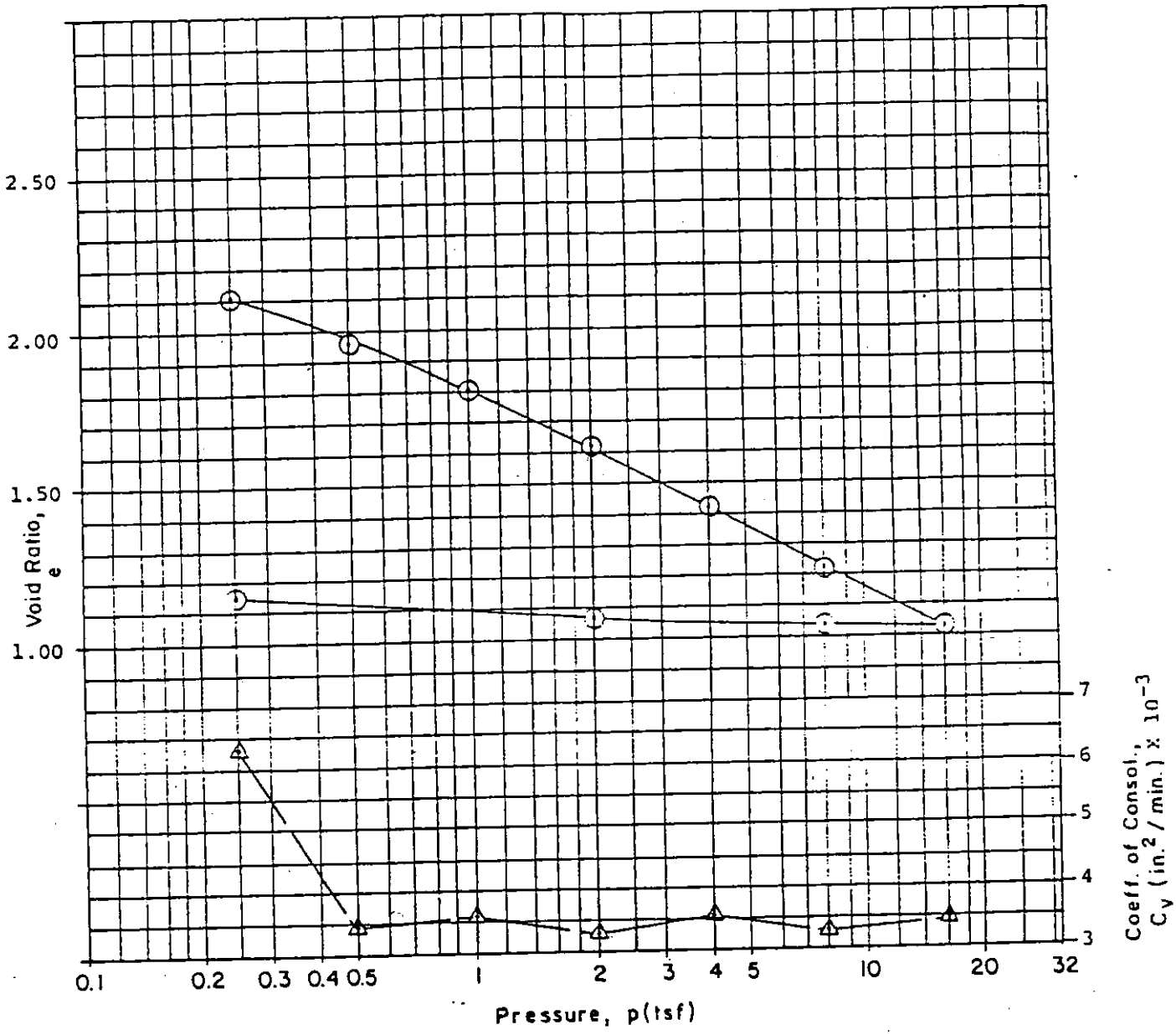


CONSOLIDATION TEST-TIME CURVES

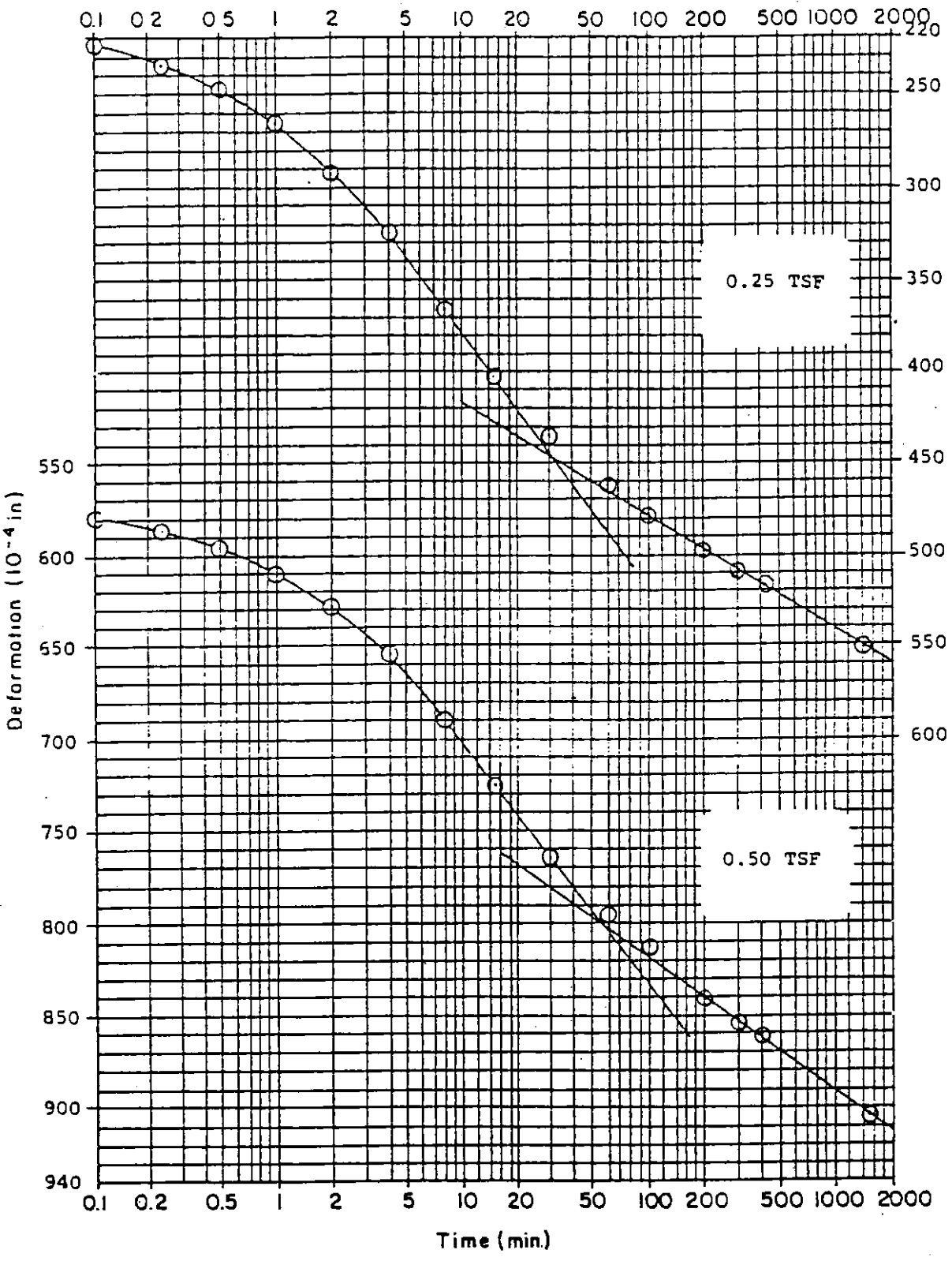
Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-1

Sample No S-10 Depth 20.0' - 22.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY



Type of Specimen	Shelby			Before Test			After Test	
Dia	2.50 in	H_T	0.75 in	Water Content	w_o	84.9	w_f	45.3
Compression Index		C_c	0.64	Void Ratio	e_o	2.261	e_f	1.150
Classification	OH			Saturation	S_o	99	S_f	100
w_l	72.4	I_p	26.0	Project DSWA NORTHERN FACILITY-2				
w_p	46.4	LI	1.5	Boring No	GF-7		Sample No	Tube #1
Remarks Exceeded machine				Depth	10- 12'		Date	8/ 86
travel limits at 32 TSF.				GANNETT FLEMING GEOTECHNICAL LABORATORY CONSOLIDATION TEST REPORT				

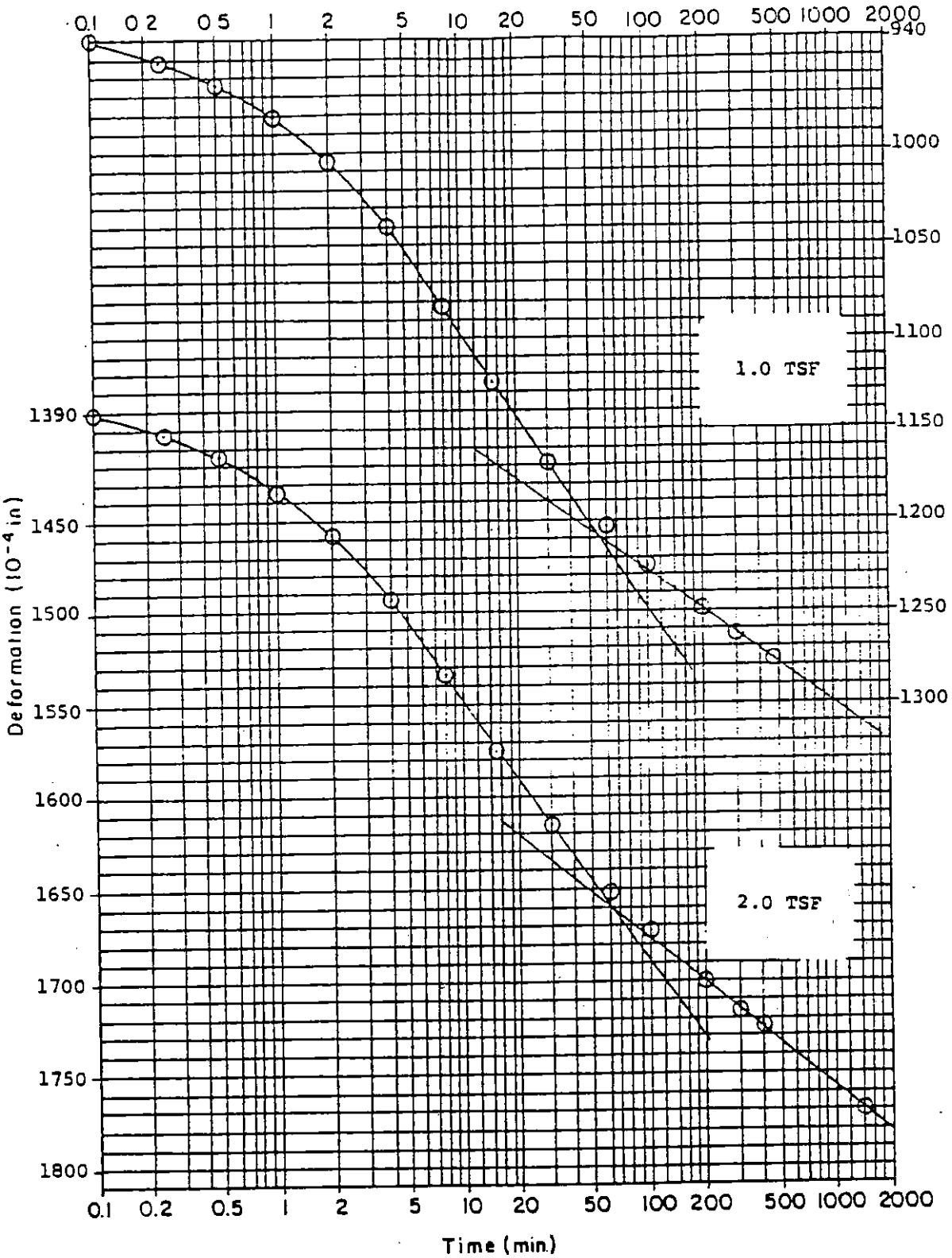


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF - 7

Sample No Tube - 1 Depth 10.0' - 12.0 ' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

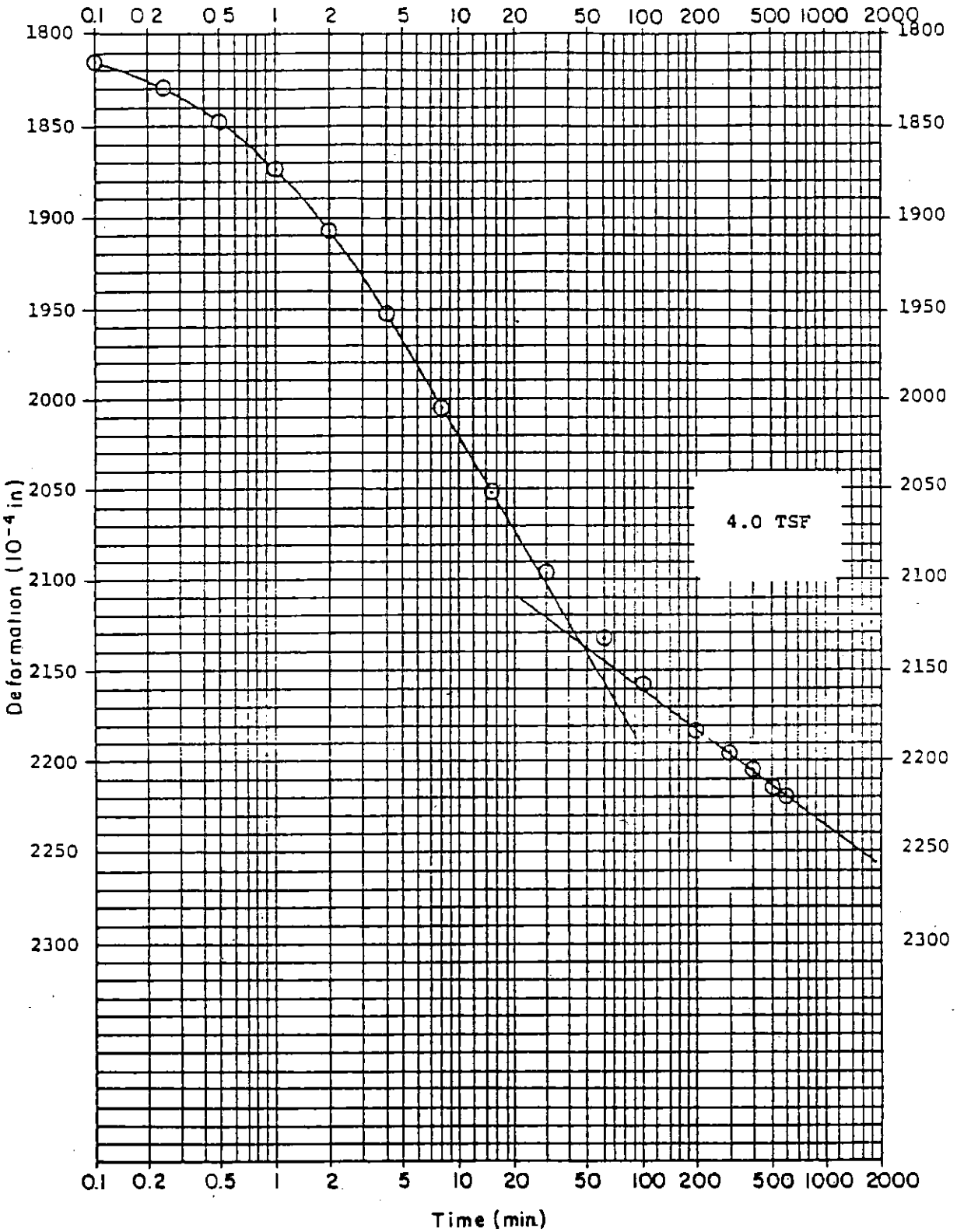


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF - 7

Sample No Tube - 1 Depth 10.0' - 12.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

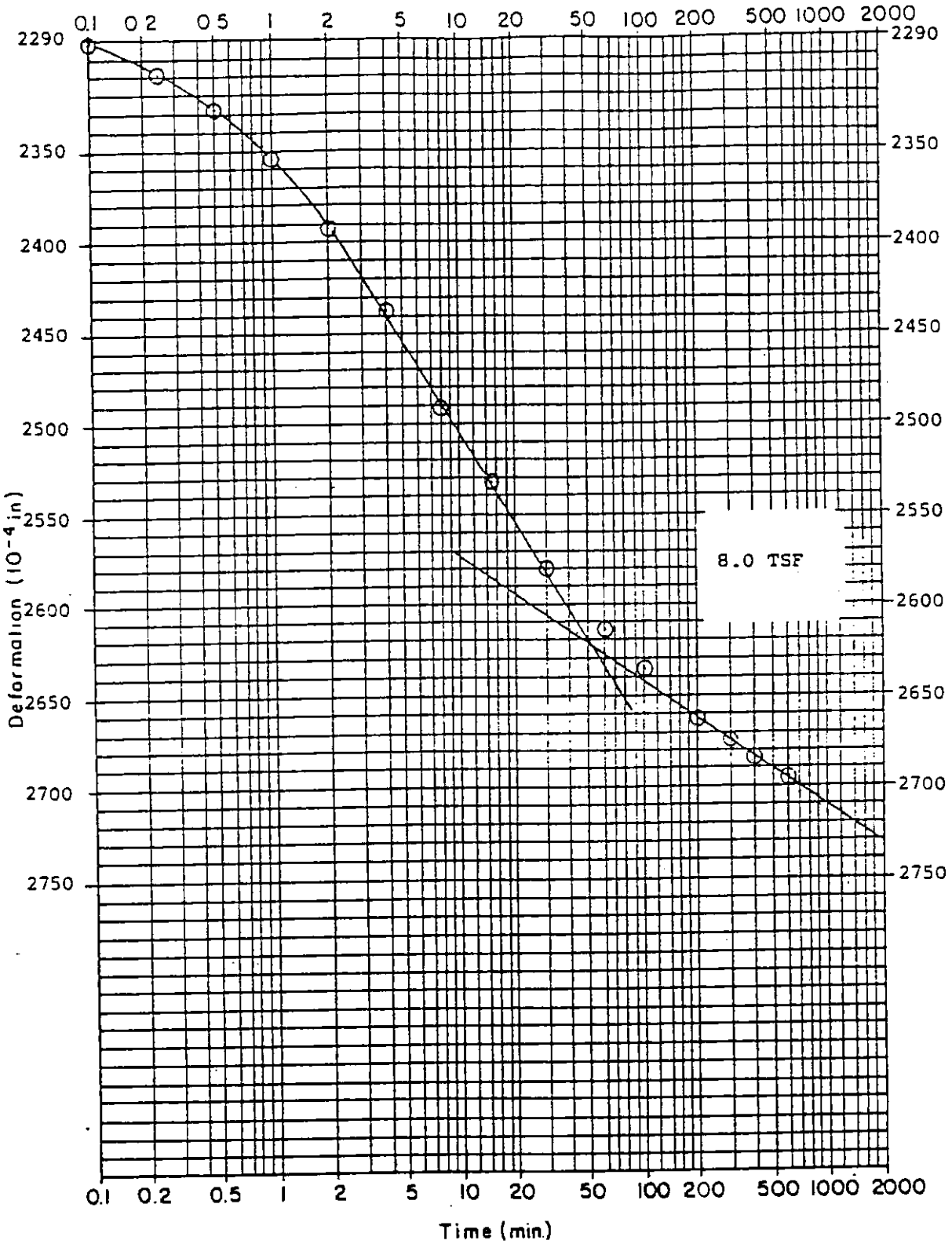


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-7

Sample No Tube - 1 Depth 10.0' - 12.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

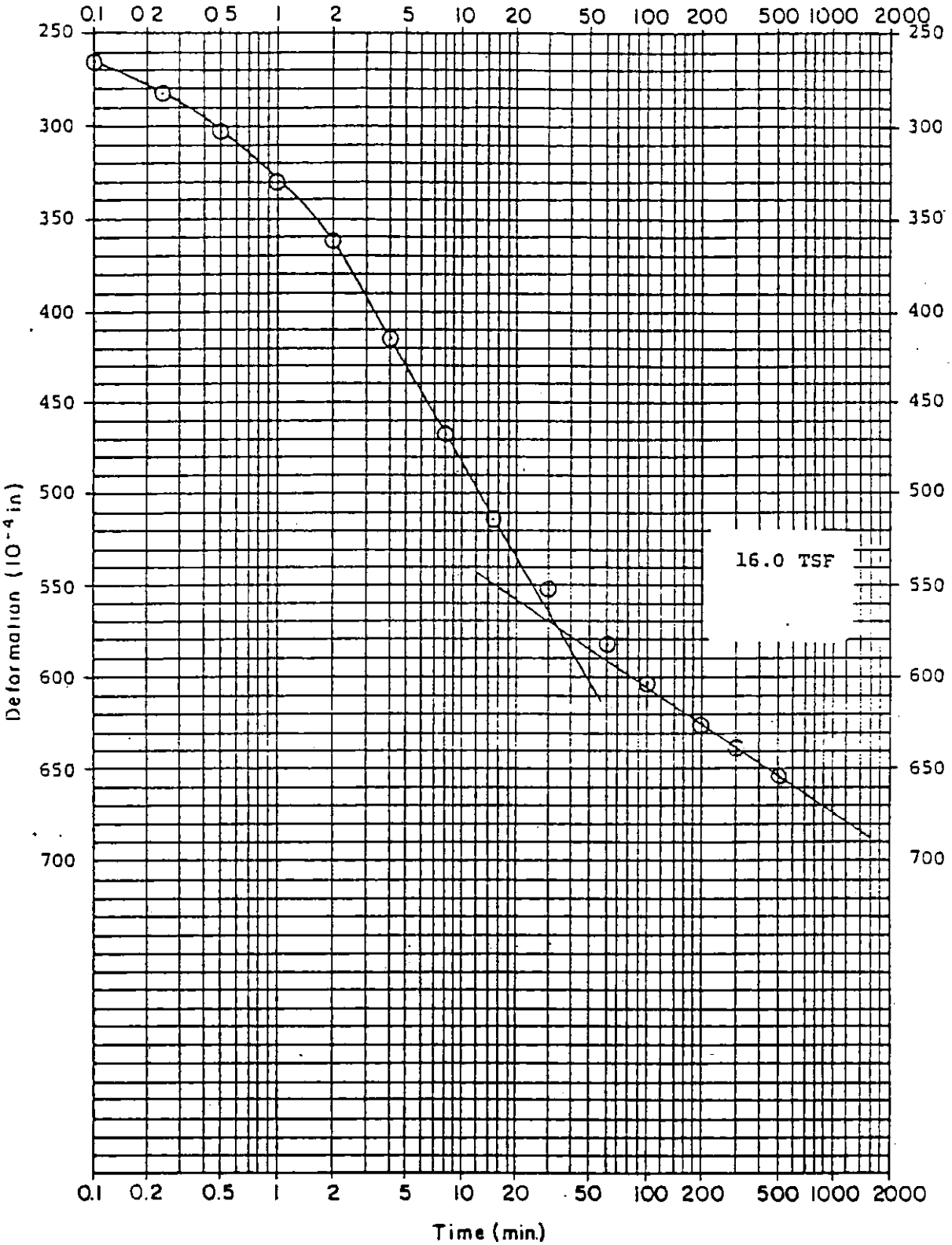


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-7

Sample No Tube - 1 Depth 10.0' - 12.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

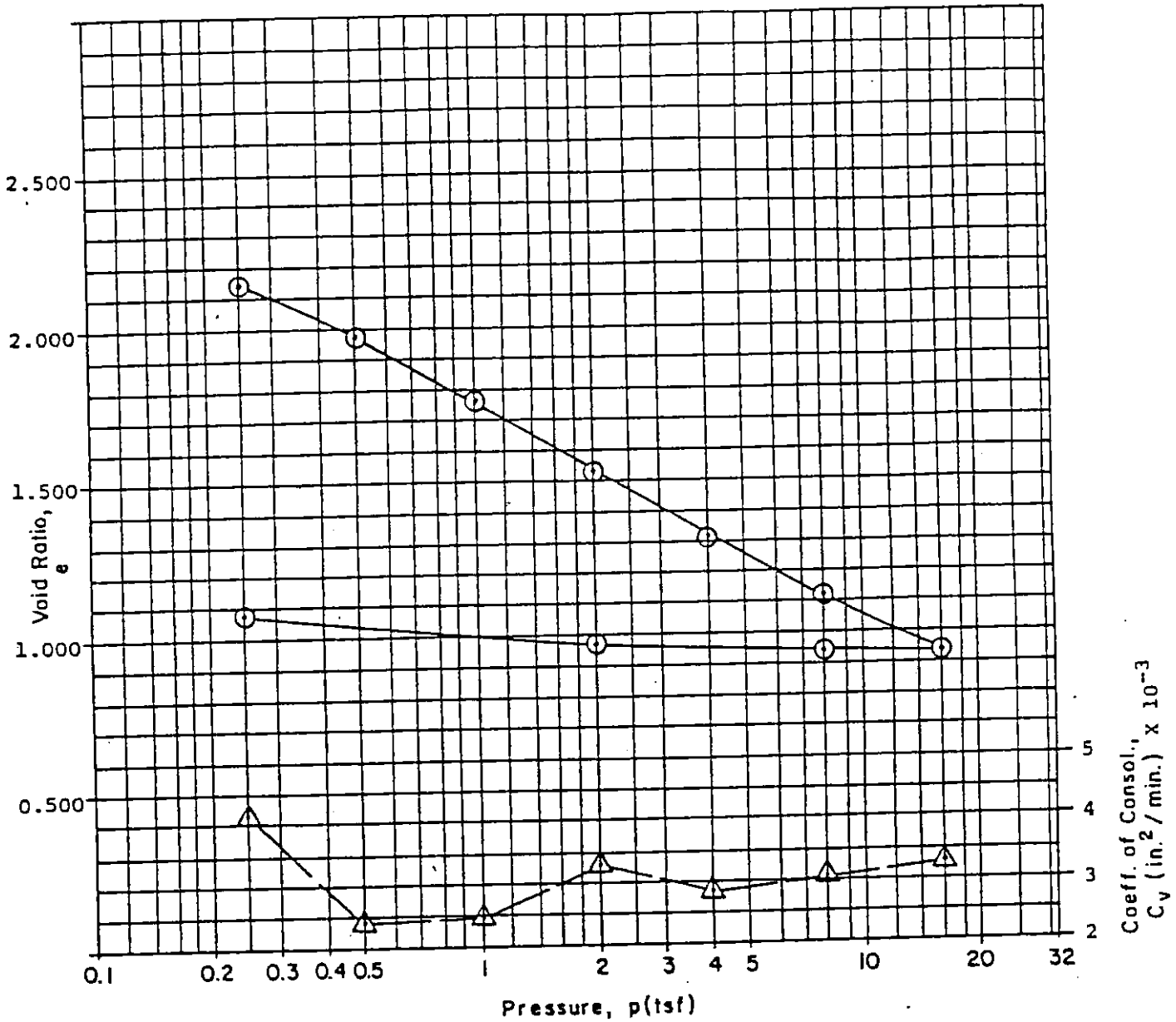


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-7

Sample No Tube - 1 Depth 10.0' - 12.0' Date Aug. 1986

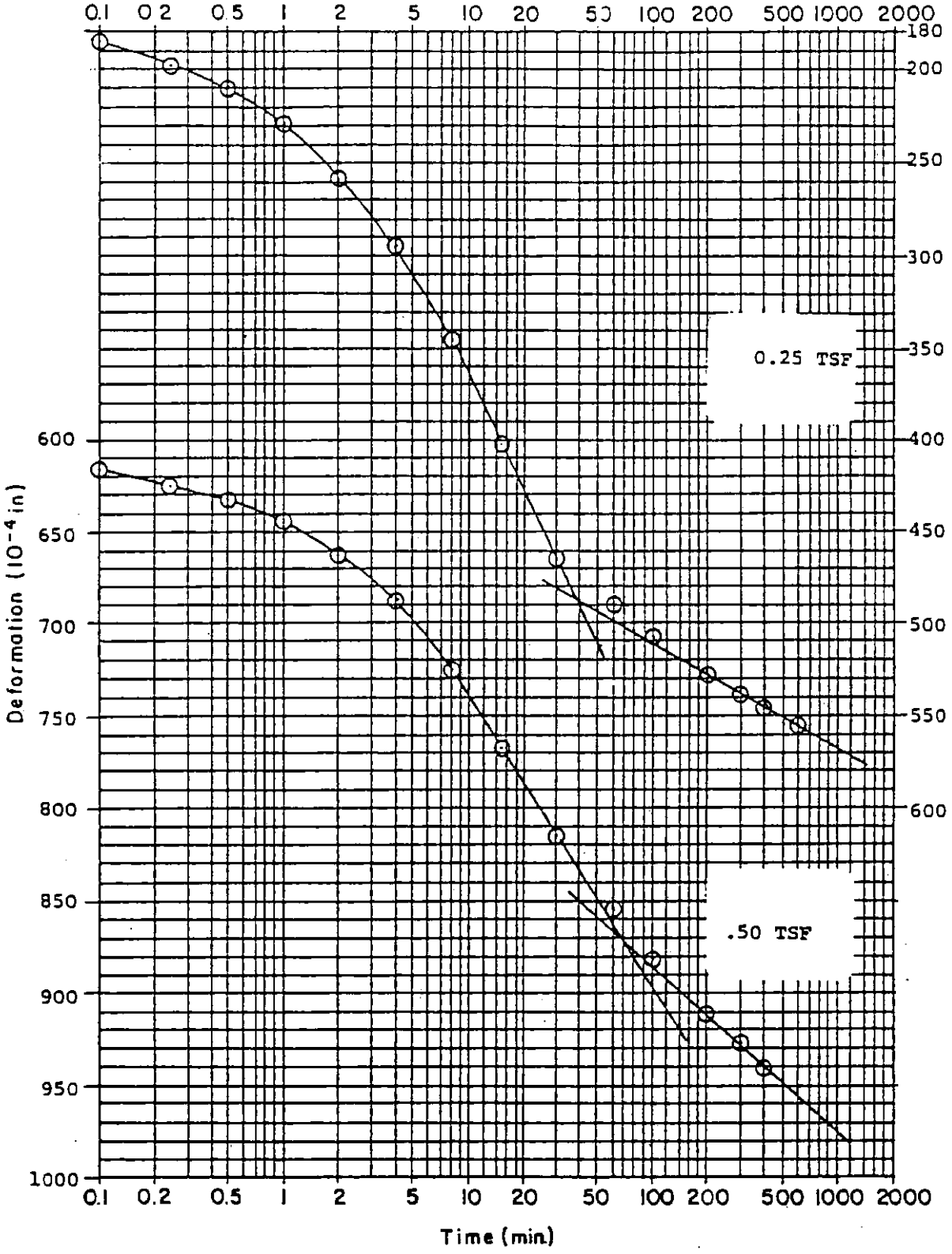
GANNETT FLEMING GEOTECHNICAL LABORATORY



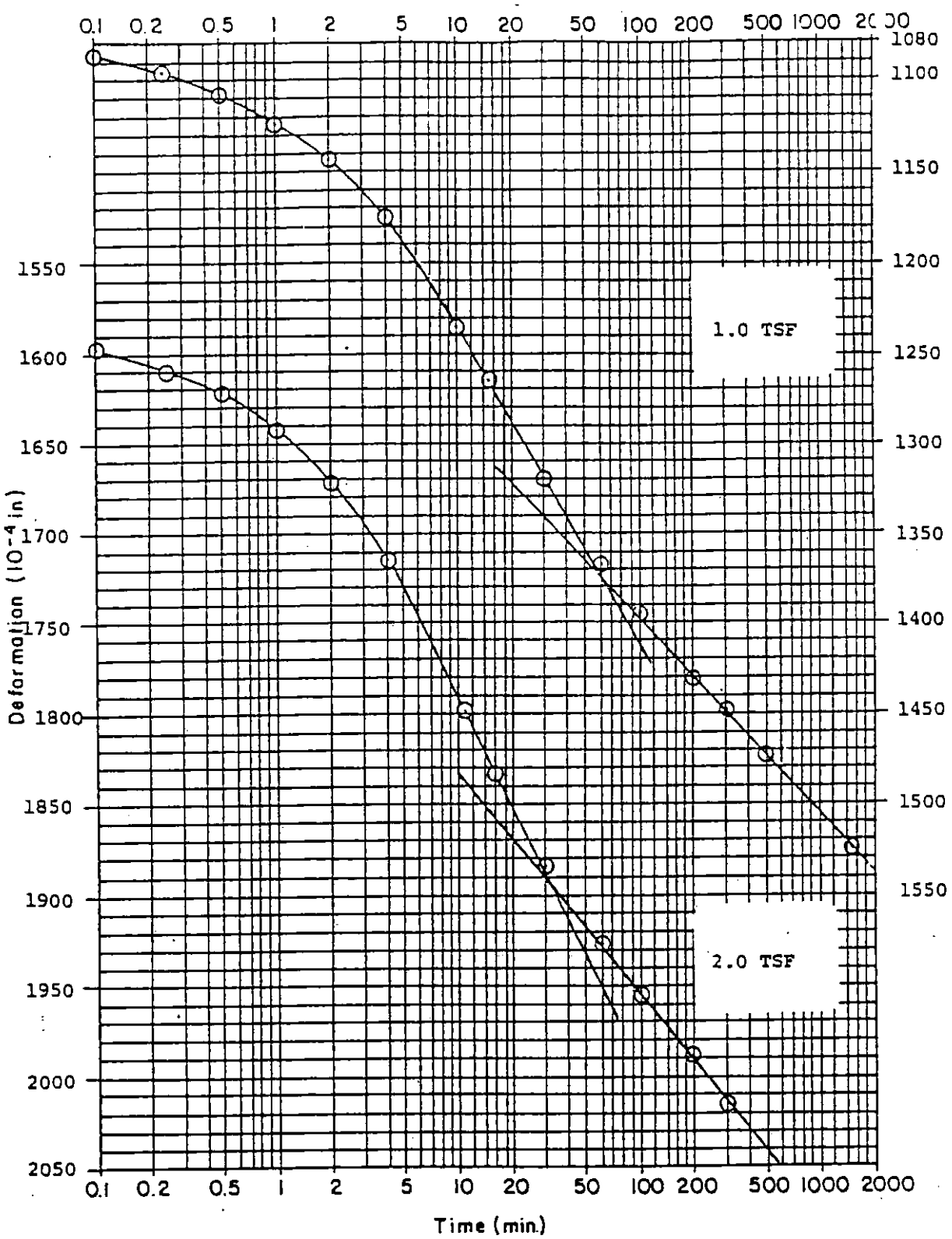
Type of Specimen			Shelby	Before Test			After Test	
Dia	2.50 in	H_T	0.75 in	Water Content	w_o	88.4	w_f	43.4
Compression Index		C_c	0.72	Void Ratio	e_o	2.322	e_f	1.085
Classification			OH	Saturation	S_o	97.1	S_f	100
w_l	76.5	I_p	28.6	Project	DSWA NORTHERN FACILITY-2			
w_p	47.9	LI	1.4	Boring No	GF-7		Sample No	ST-1
Remarks	Results questionable			Depth	20-22'		Date	9/ 86

beyond 8 TSF due to specimen's extreme compressibility. Exceeded machine travel limits at 32 TSF.

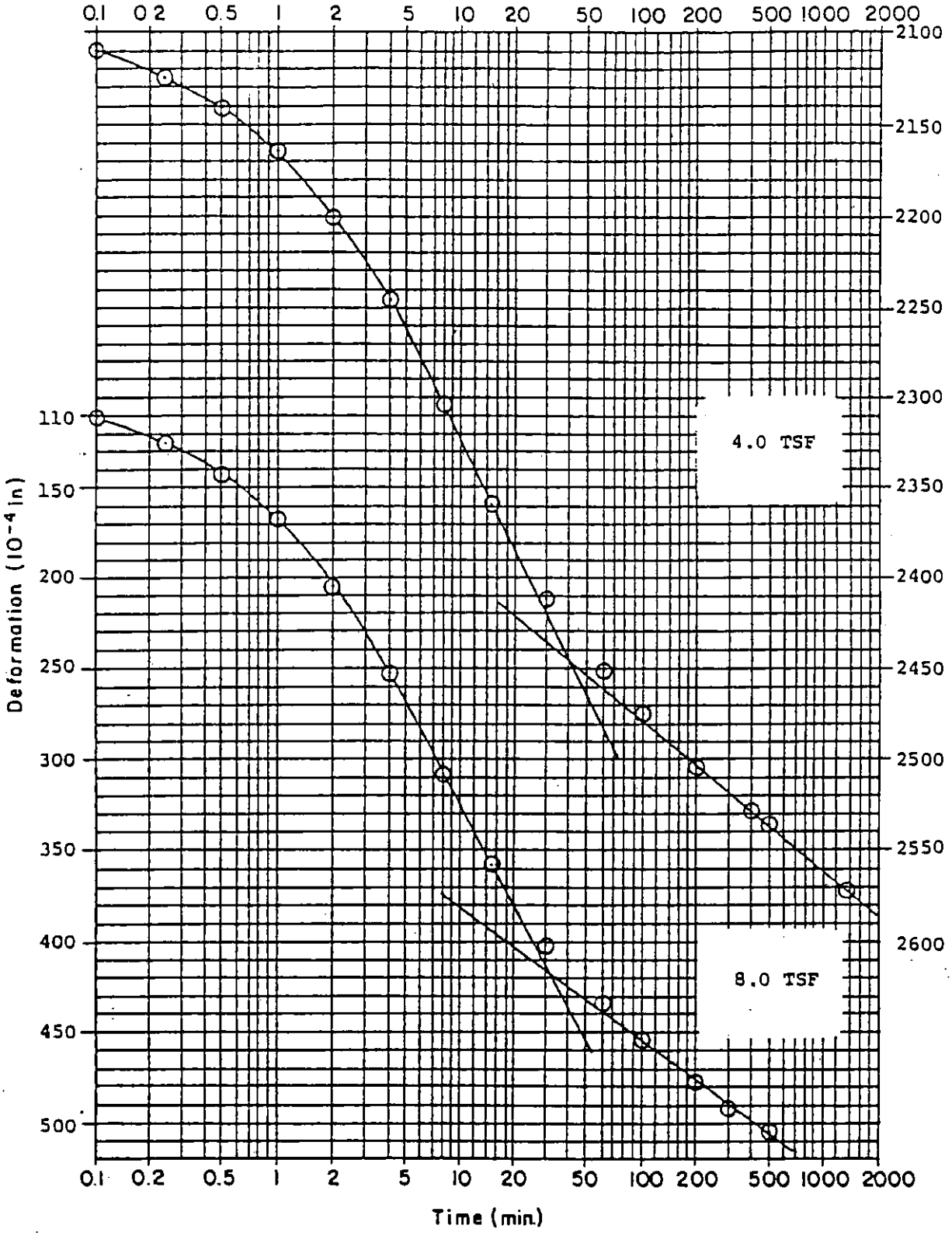
GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT



CONSOLIDATION TEST-TIME CURVES			
Project	DELAWARE SOLID WASTE FACILITY - 2	Boring No	GF-7
Sample No	ST-1	Depth 20.0' - 22.0'	Date Aug. 1986
GANNETT FLEMING GEOTECHNICAL LABORATORY			



CONSOLIDATION TEST-TIME CURVES			
Project	DELAWARE SOLID WASTE FACILITY - 2	Boring No	GF-7
Sample No	ST-1	Depth 20.0' - 22.0'	Date Aug. 1986
GANNETT FLEMING GEOTECHNICAL LABORATORY			

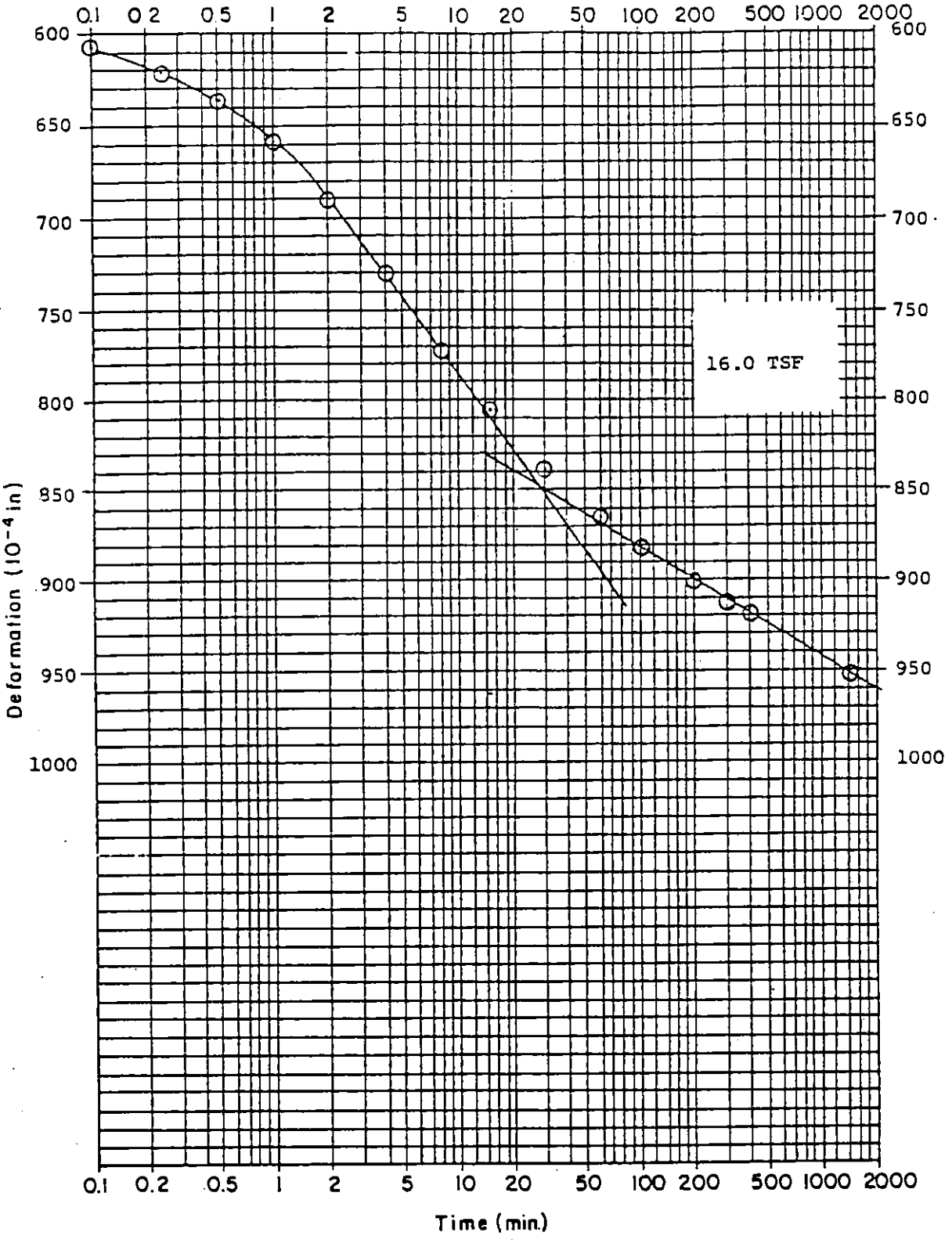


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-7

Sample No ST-1 Depth 20.0' - 22.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

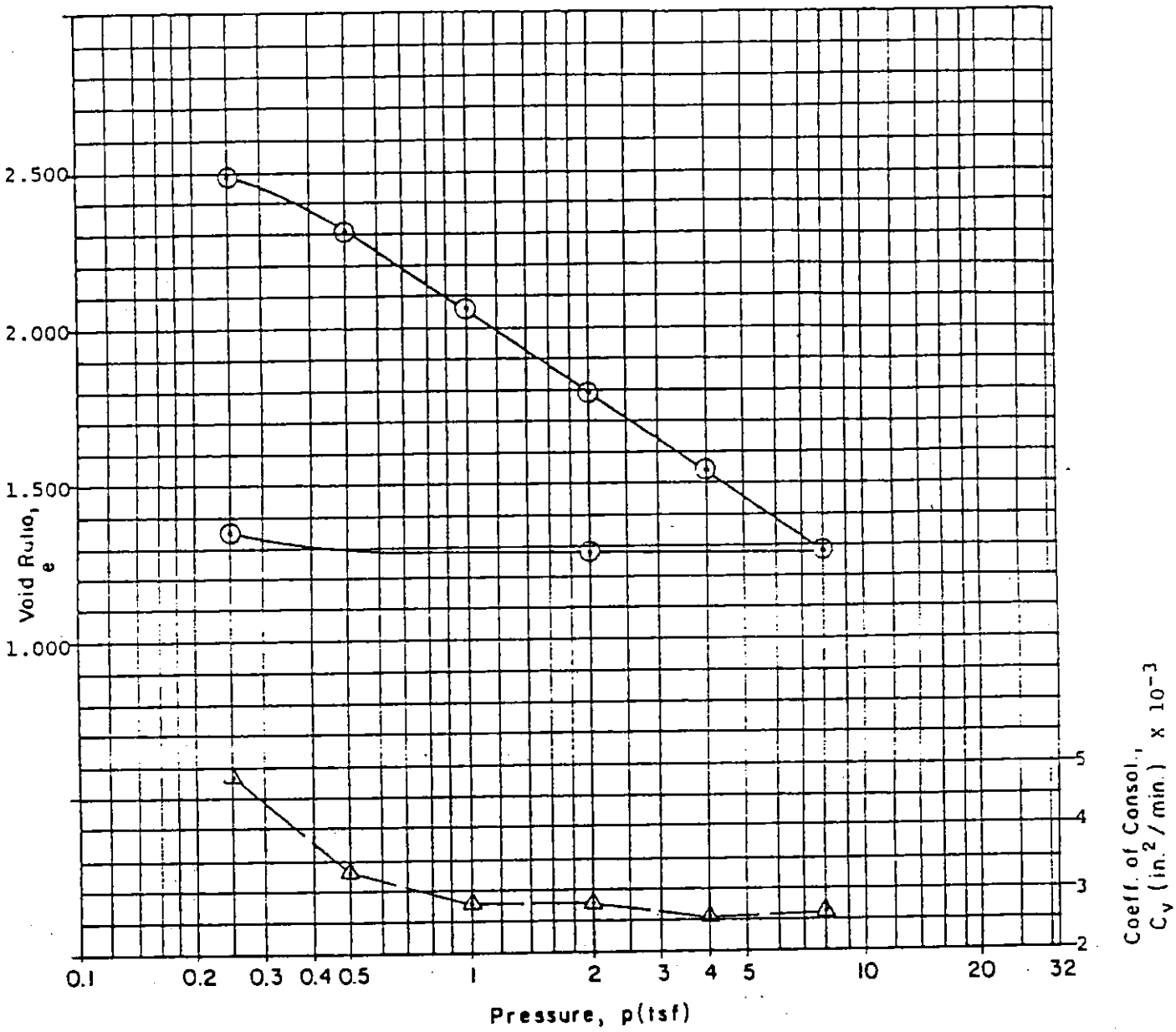


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-7

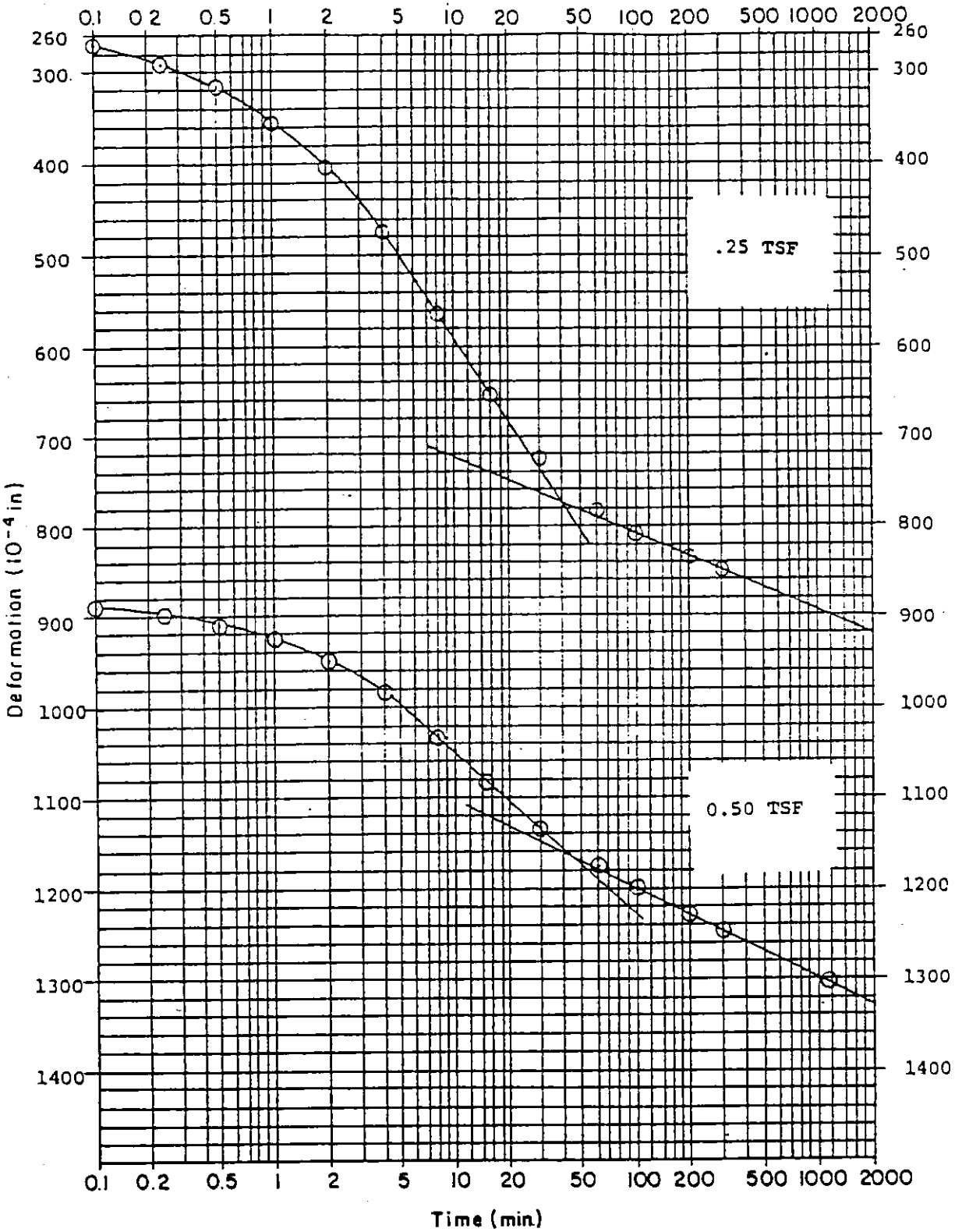
Sample No ST-1 Depth 20.0' - 22.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY



Type of Specimen	Shelby			Before Test		After Test	
Dia 2.50 in	H_T	0.75 in		Water Content	w_o 95.2	w_f	52.8
Compression Index	C_c	0.84		Void Ratio	e_o 2.828	e_f	1.365
Classification		OH		Saturation	S_o 95.4	S_f	98.6
w_l 74.6	I_p	26.0		Project DSWA NORTHERN FACILITY-2			
w_p 48.6	LI	1.8		Boring No GF-8		Sample No	S-4
Remarks Exceeded machine travel limits at 16 TSF.				Depth 5- 7'		Date	8/ 86

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

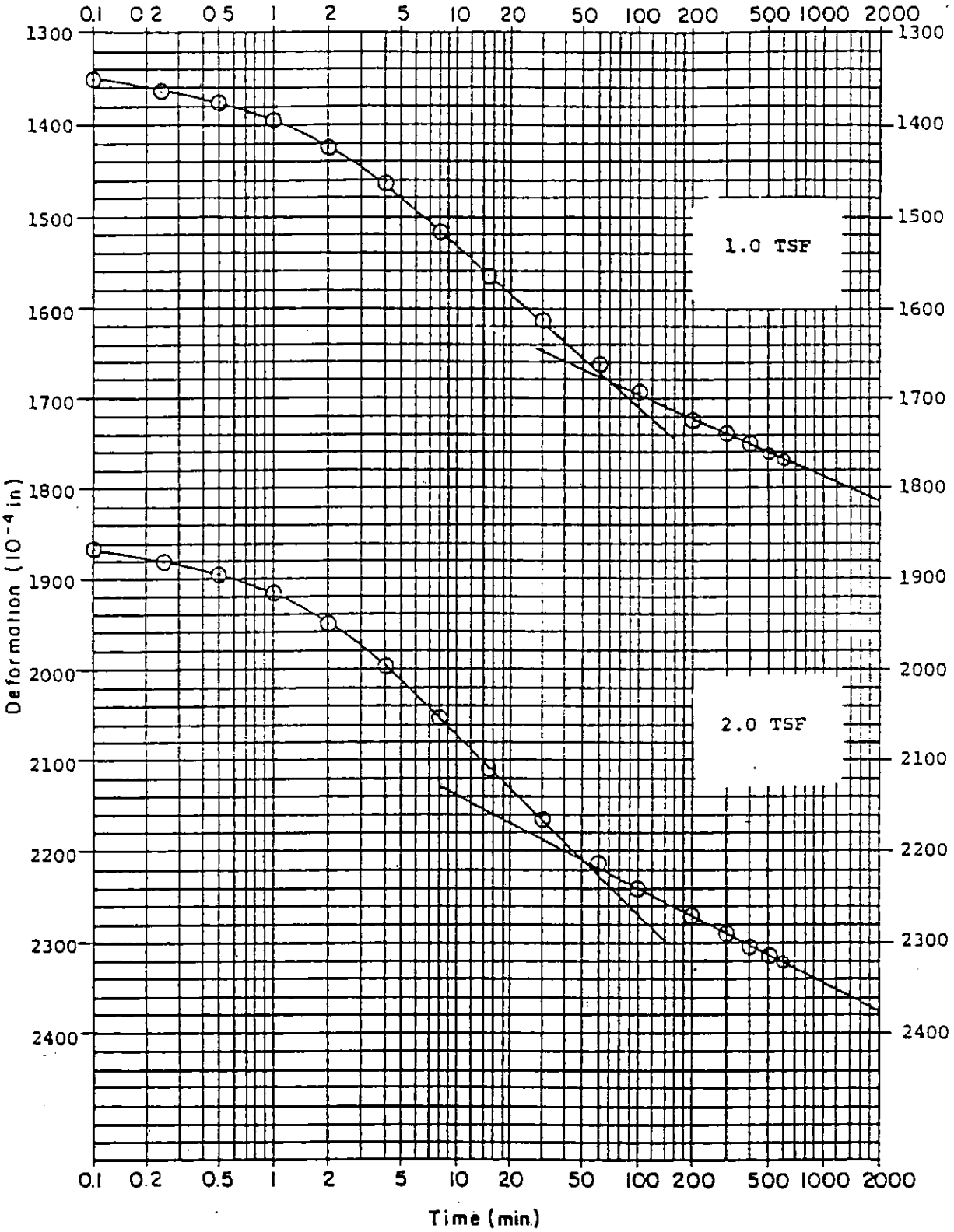


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-8

Sample No S-4 Depth 5.0' - 7.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

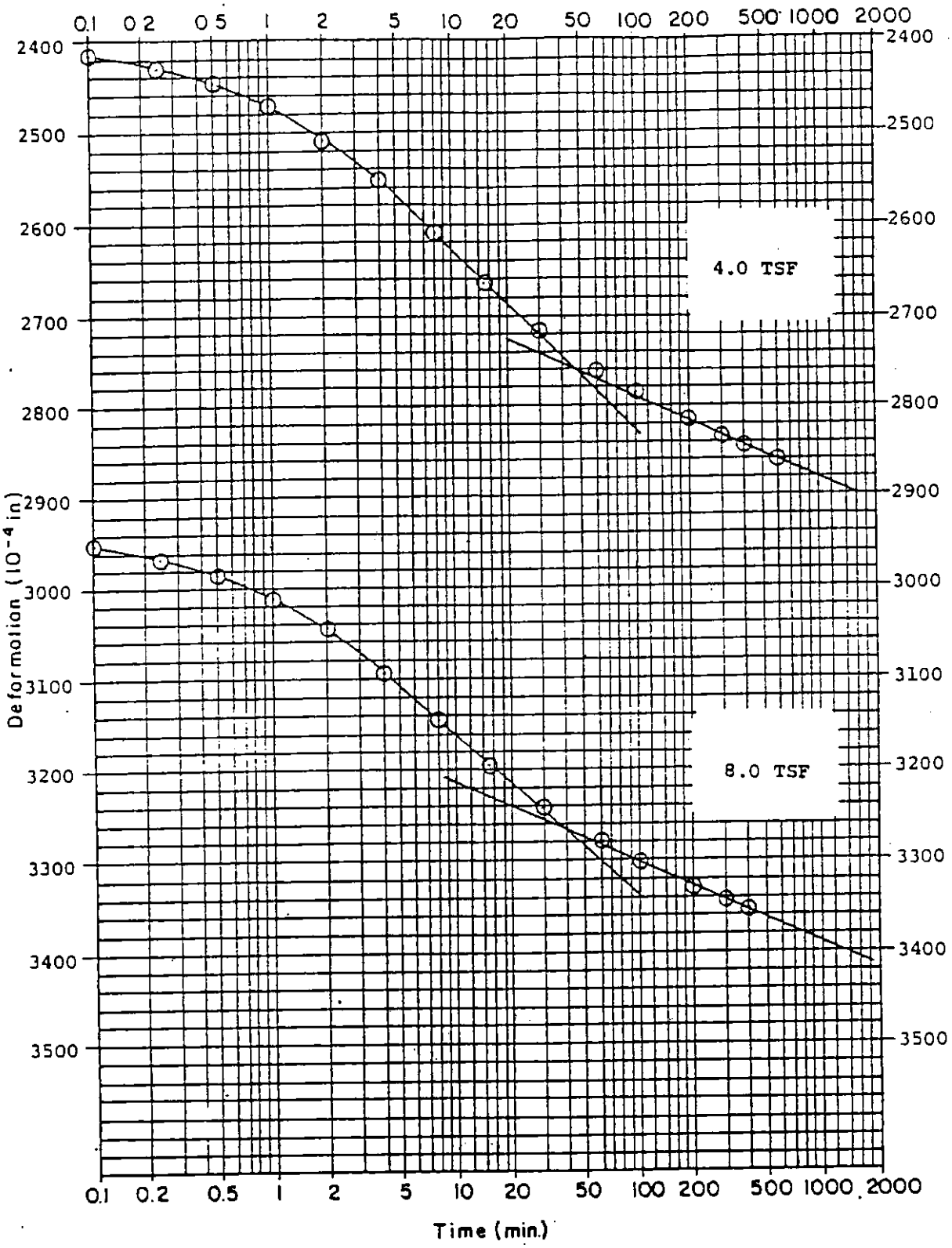


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-8

Sample No S-4 Depth 5.0' - 7.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

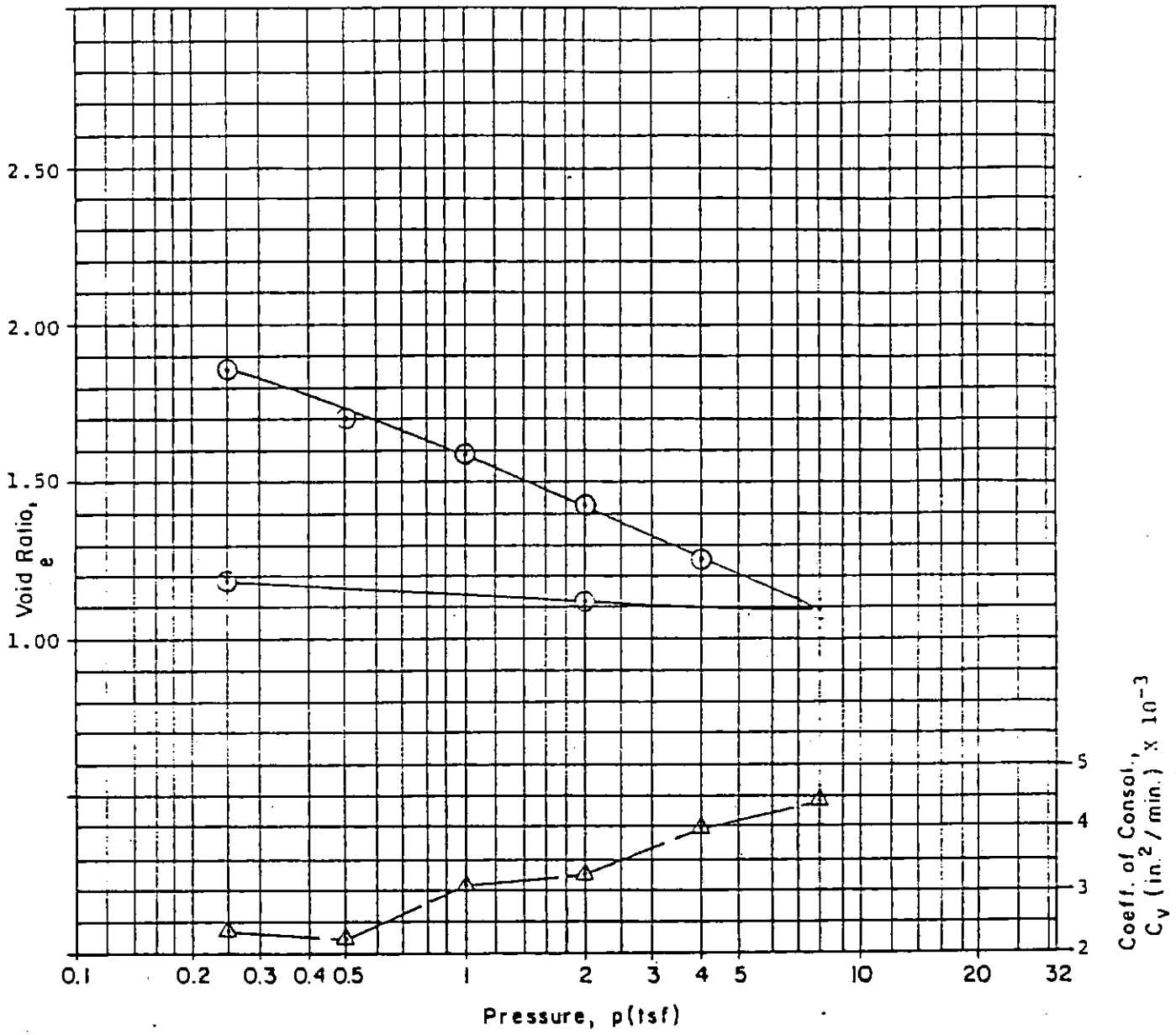


CONSOLIDATION TEST-TIME CURVES

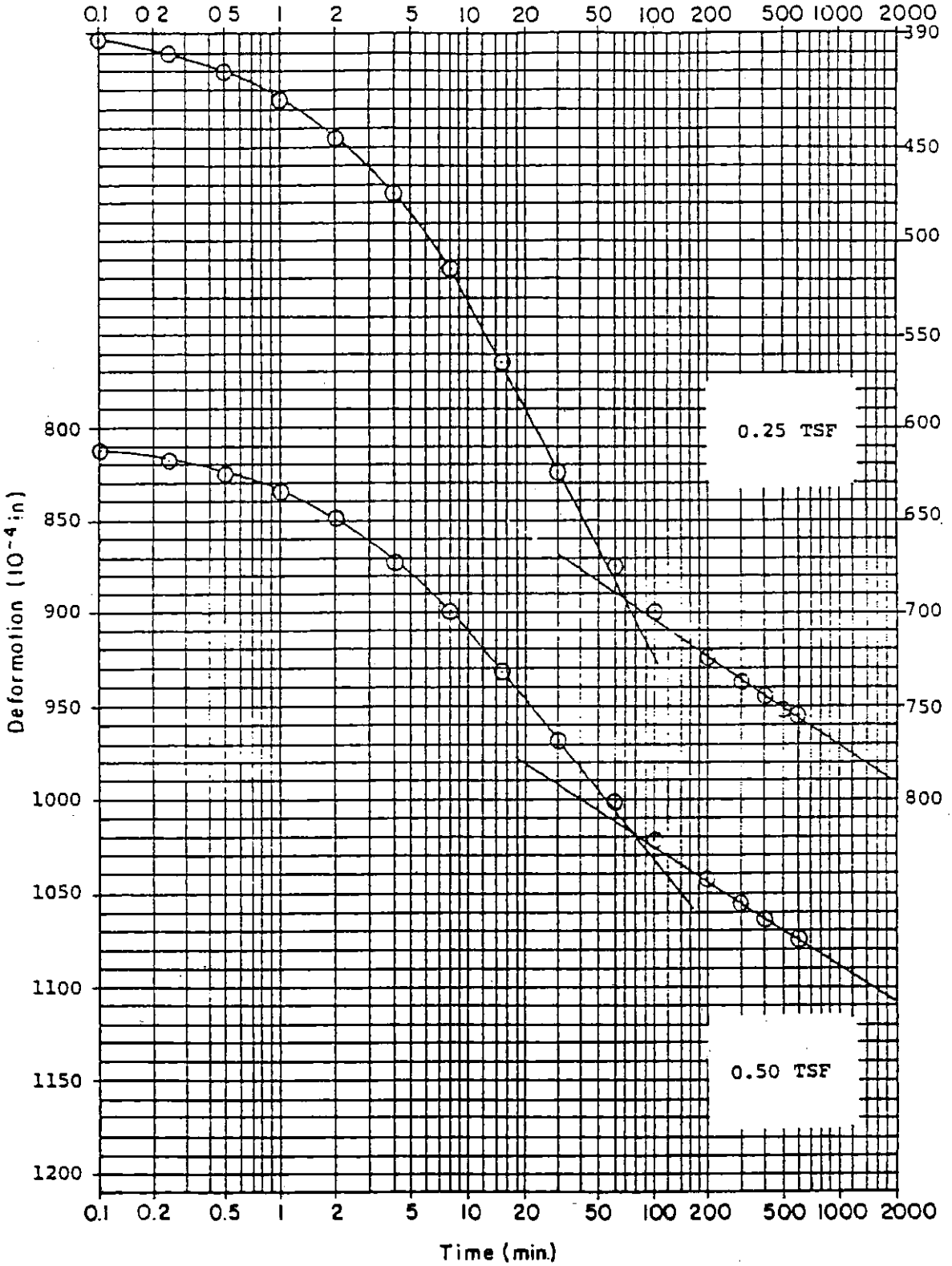
Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-8

Sample No S-4 Depth 5.0' - 7.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY



Type of Specimen	Shelby			Before Test			After Test
Dia 2.50 in	H_T 0.75 in			Water Content	w_o	82.7	w_f 46.5
Compression Index	C_c 0.54			Void Ratio	e_o	2.101	e_f 1.196
Classification	MH			Saturation	S_o	97	S_f 100
w_l 65.9	I_p 23.5			Project DSWA NORTHERN FACILITY-2			
w_p 42.4	LI 1.7			Boring No	GF-8	Sample No	S-13
Remarks Exceeded machine				Depth	25- 27'	Date	8/ 86
limits at 16 TSF.				GANNETT FLEMING GEOTECHNICAL LABORATORY CONSOLIDATION TEST REPORT			

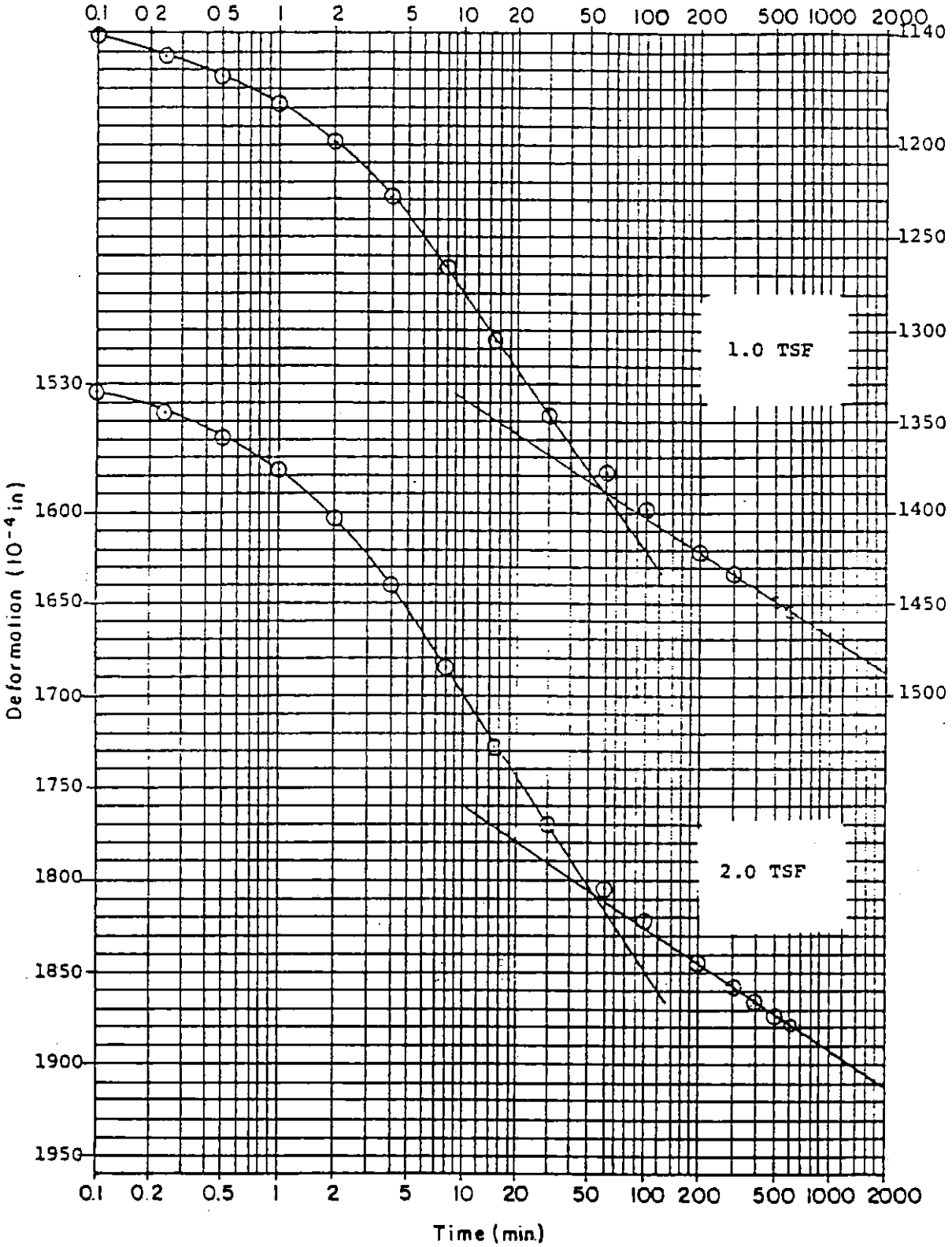


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-8

Sample No S-13 Depth 25.0' - 27.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

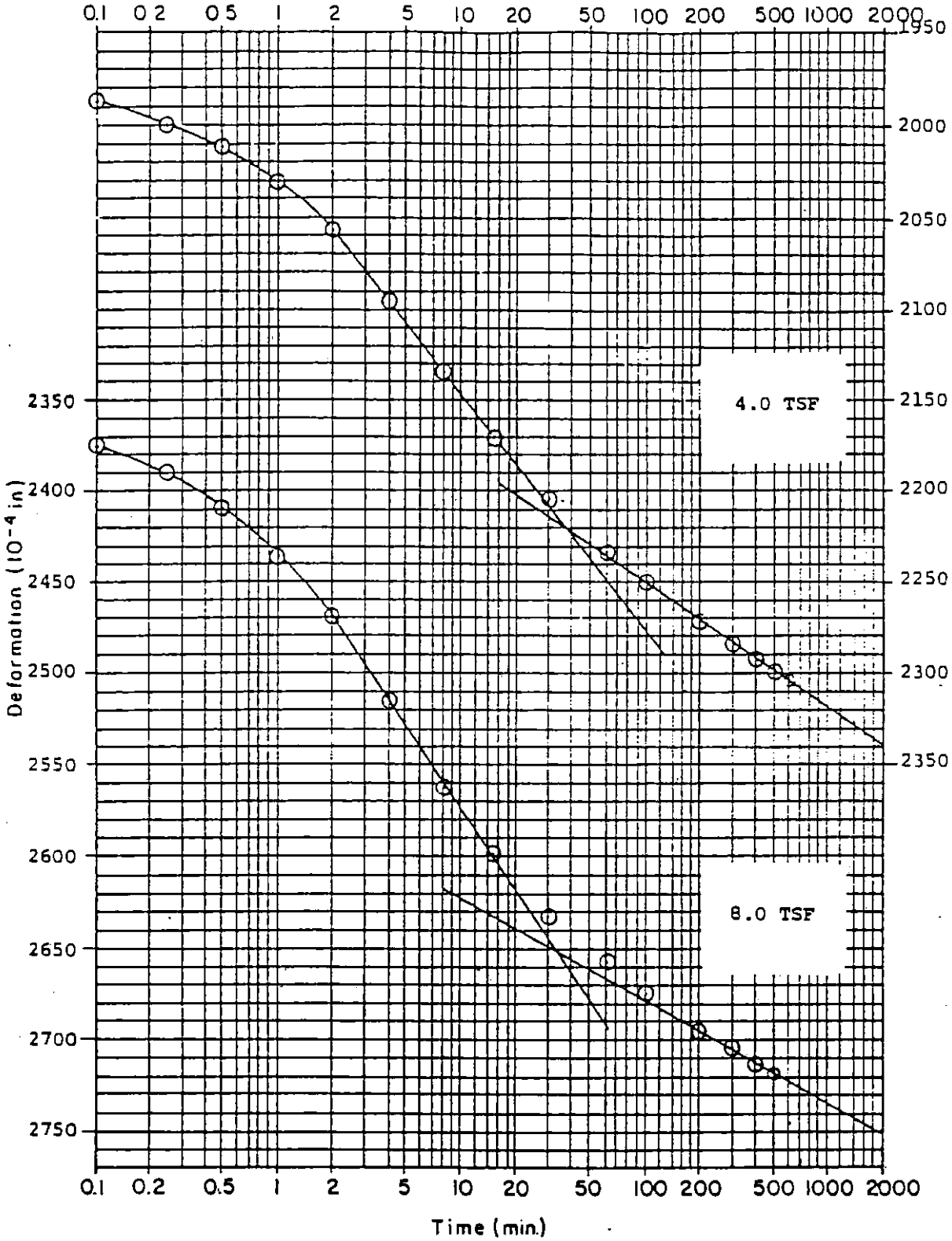


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-8

Sample No S-13 Depth 25.0' - 27.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY

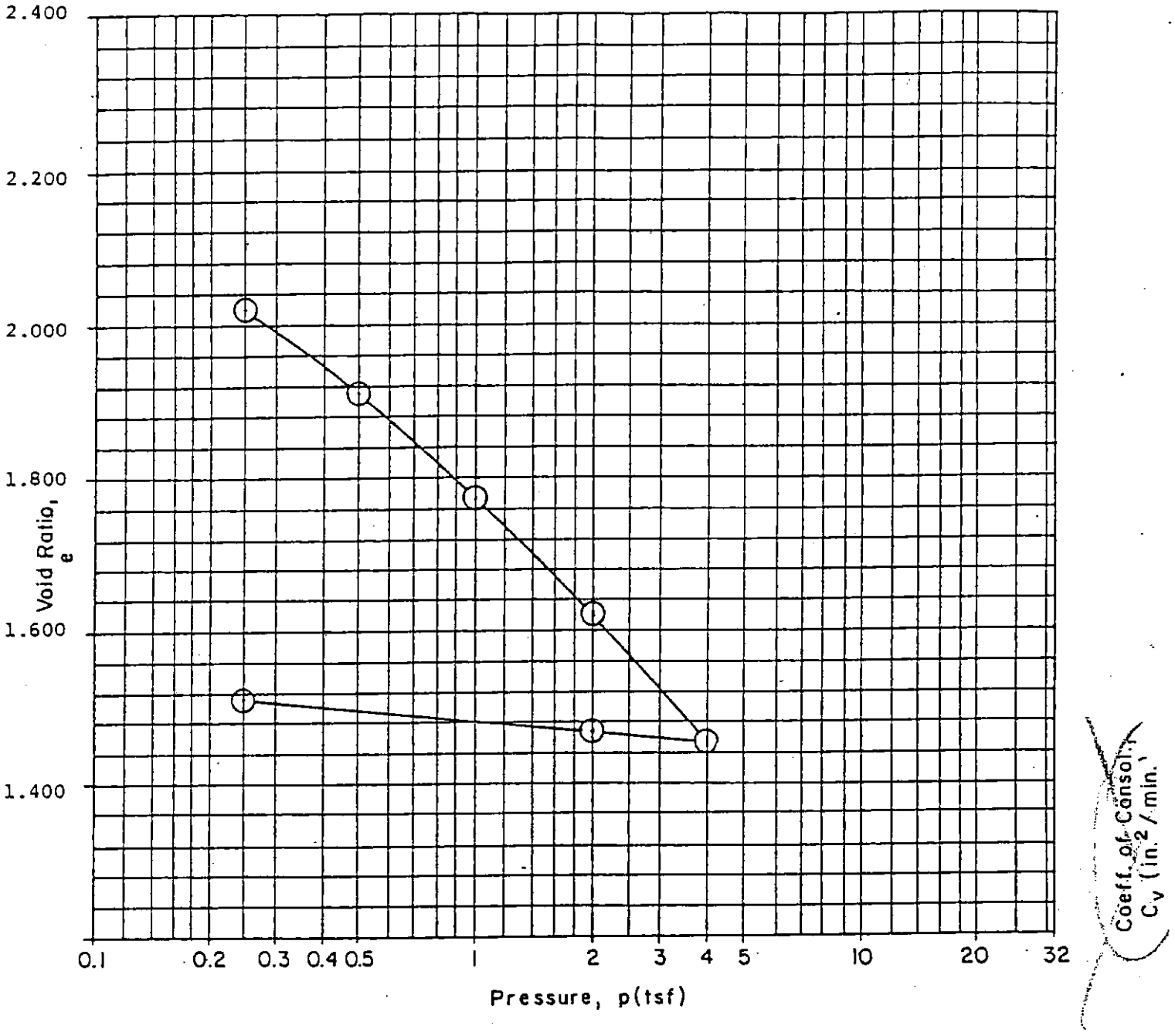


CONSOLIDATION TEST-TIME CURVES

Project DELAWARE SOLID WASTE FACILITY - 2 Boring No GF-8

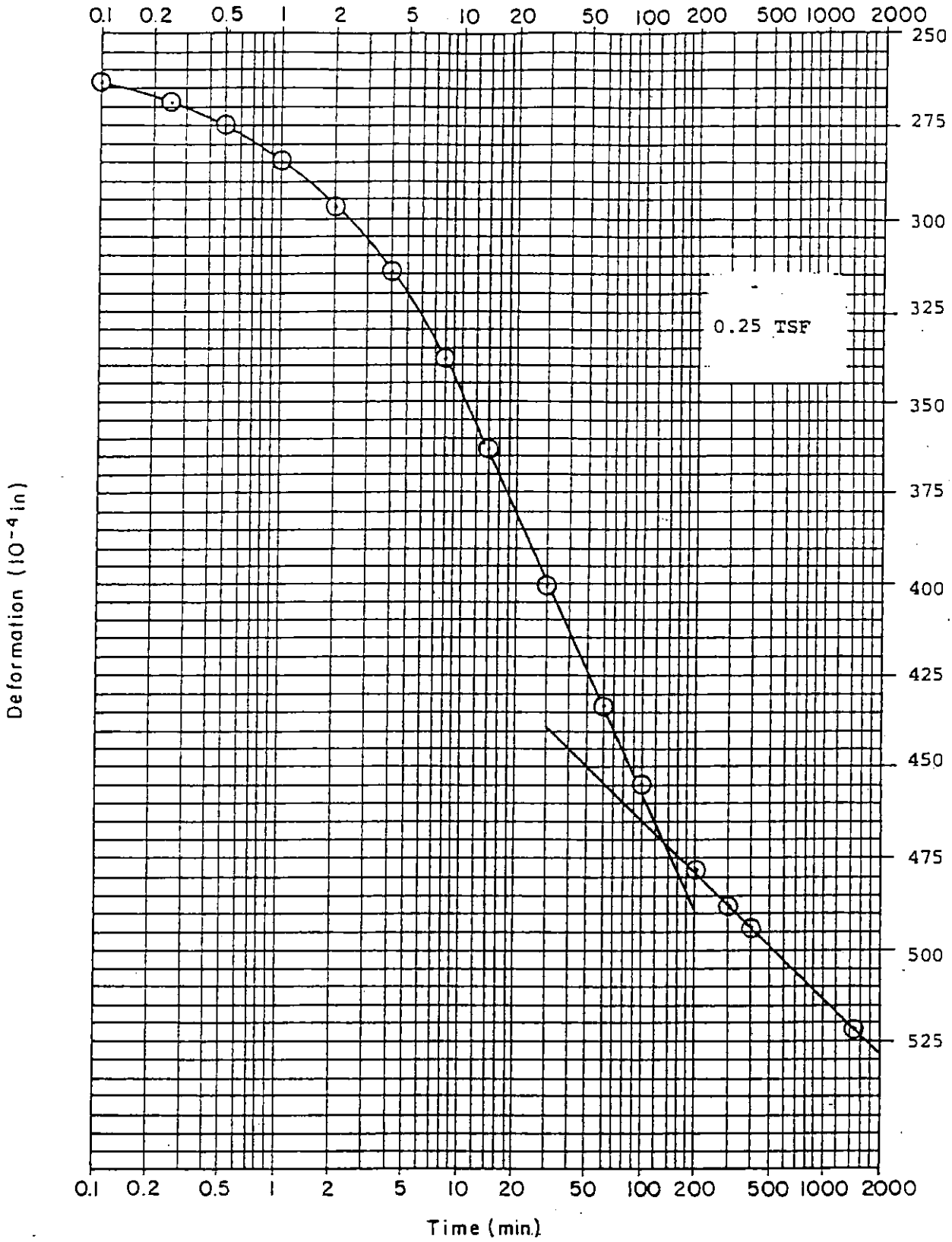
Sample No S-13 Depth 25.0' - 27.0' Date Aug. 1986

GANNETT FLEMING GEOTECHNICAL LABORATORY



Type of Specimen SHELBY TUBE				Before Test			After Test	
Dia	2.50 in	H_T	1.00 in	Water Content	w_o	73.7	w_f	55.8
Compression Index		C_c	0.55	Void Ratio	e_o	2.105	e_f	1.508
Classification BRN.-ELASTIC SILT.				Saturation	S_o	94.5	S_f	100.0
w_l	69.3	I_p	21.5	Project DSWA, NSWF, PHASE III				
w_p	47.8	LI	1.2	Boring No GF-102			Sample No U-2	
Remarks WET DENSITY = 94.3 pcf				Depth 35'- 37'			Date 2/5/90	

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

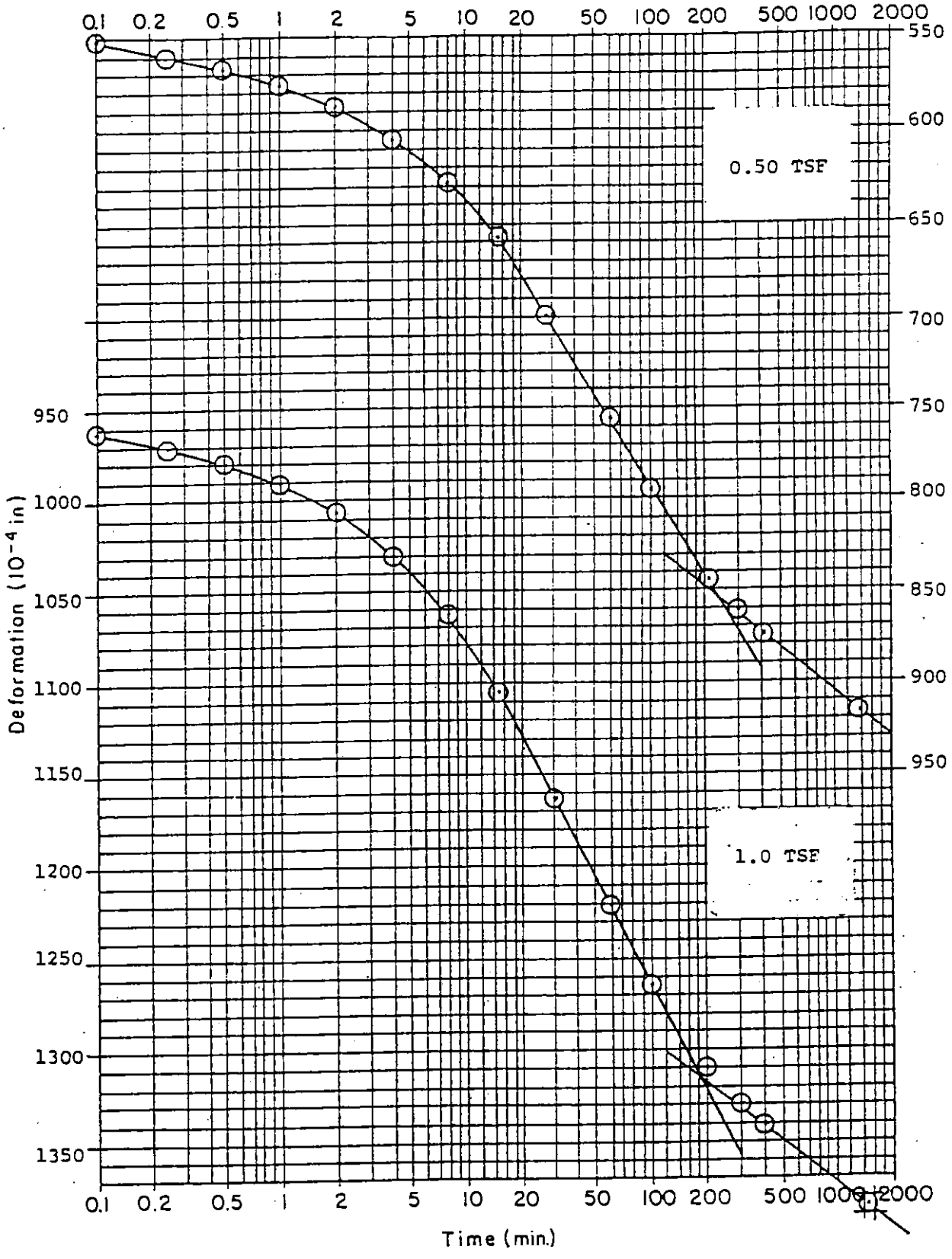


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-102

Sample No U-2 Depth 35 - 37' Date 1/29/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

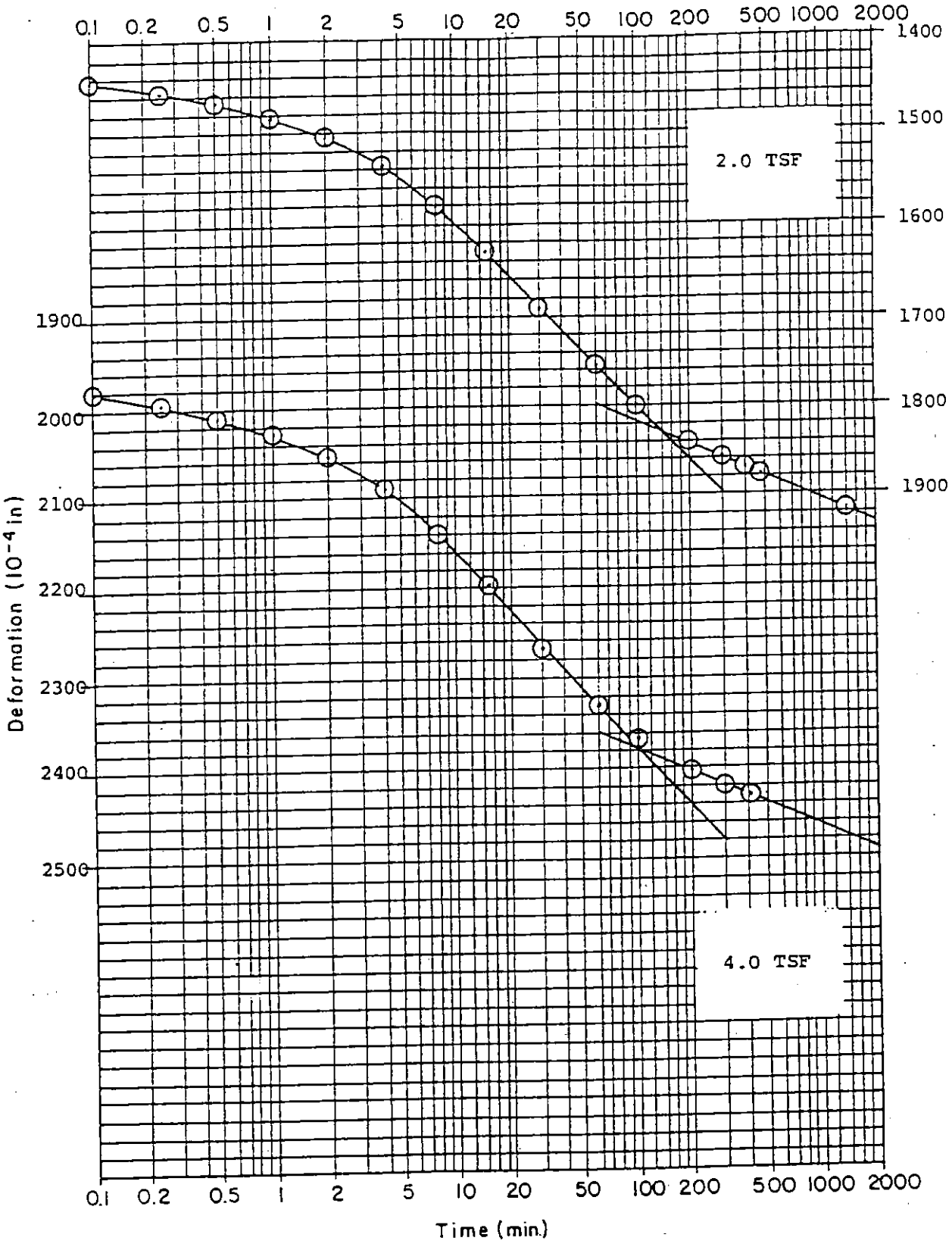


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-102

Sample No U-2 Depth 35 - 37' Date 1/29/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

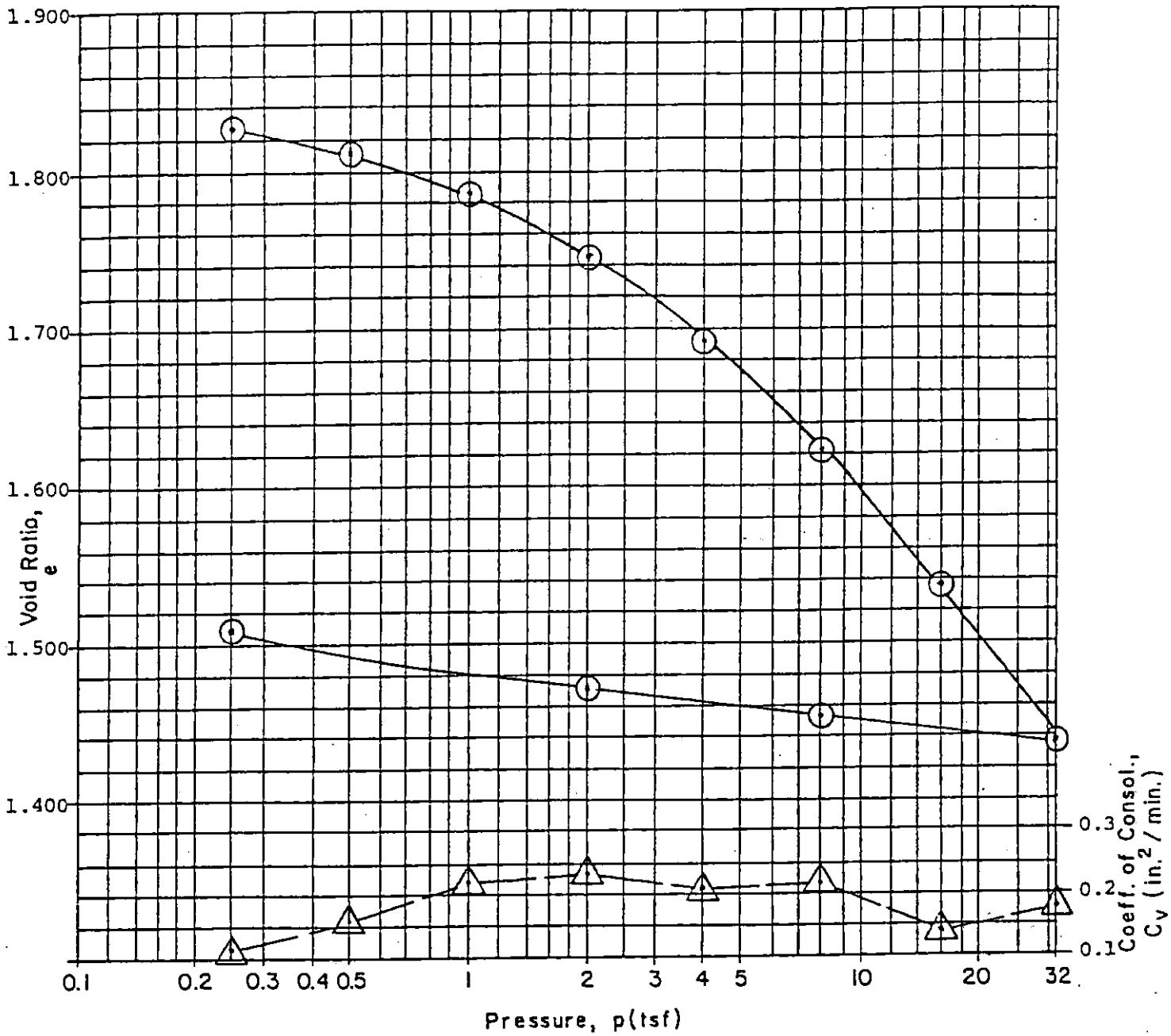


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-102

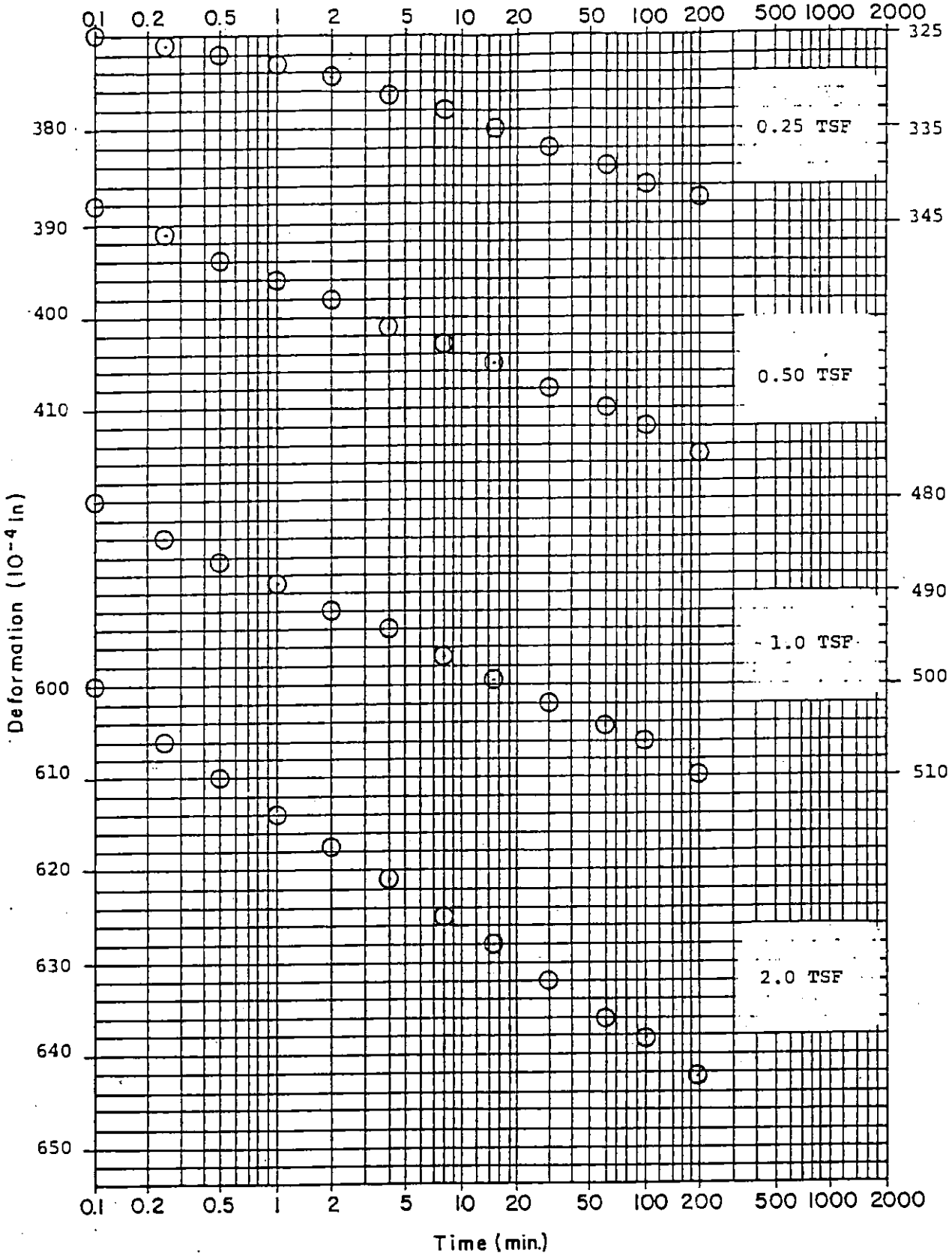
Sample No U-2 Depth 35 - 37' Date 1/29/90

GANNETT FLEMING GEOTECHNICAL LABORATORY



Type of Specimen	Shelby			Before Test				After Test	
Dia	2.50 in	H_T	0.75 in	Water Content	w_o	53.6		w_f	46.9
Compression Index		C_c	0.30	Void Ratio	e_o	1.855		e_f	1.509
Classification	ML			Saturation	S_o	78.0		S_f	85.5
w_l		I_p	NP	Project	DSWA NSWF-2 PHASE III				
w_p		LI		Boring No	GF-104A		Sample No	U-2	
Remarks	Wet Density= 90.6pcf			Depth	16.5-18.5'		Date	12/89	

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

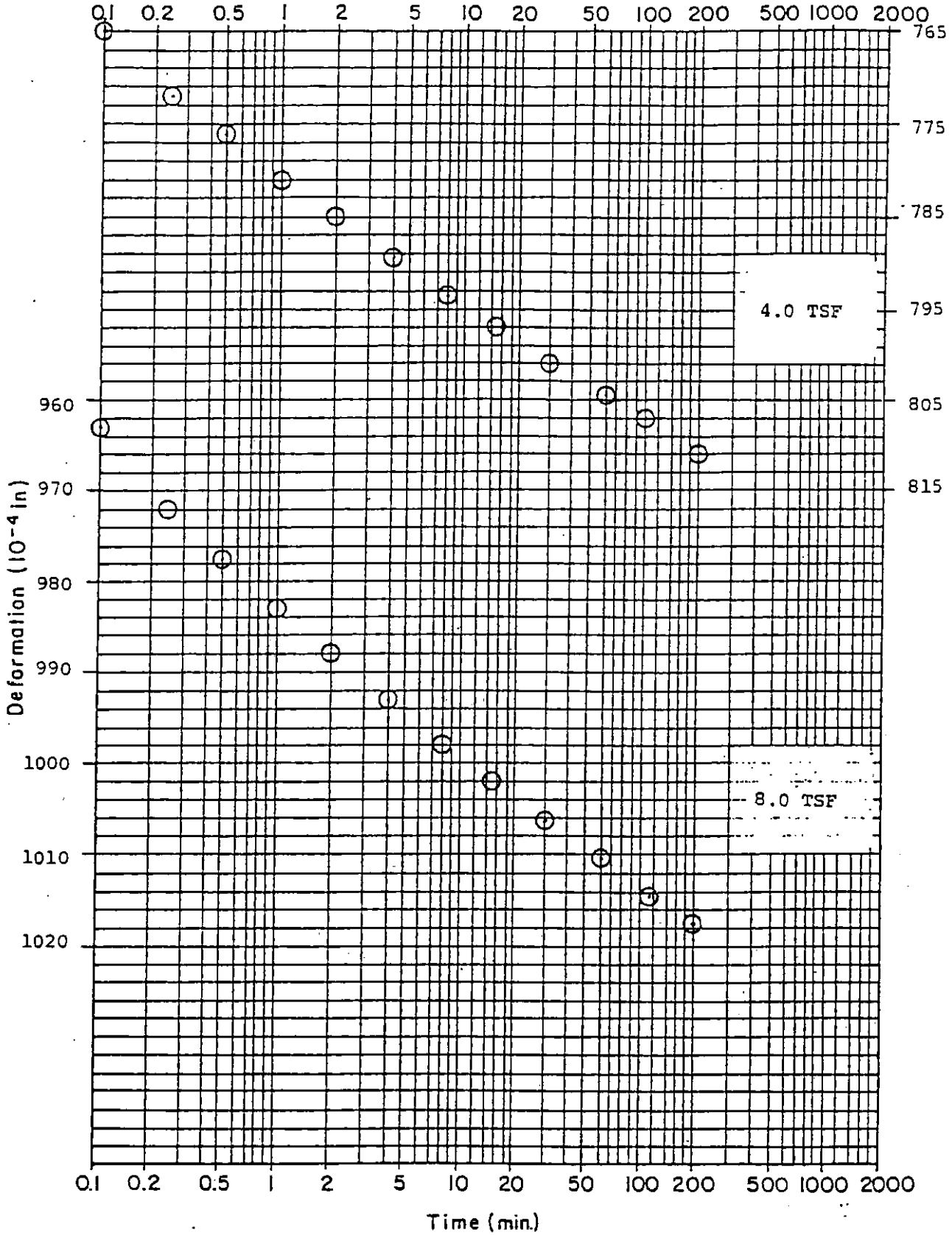


CONSOLIDATION TEST-TIME CURVES

Project DSWA NSWF-2 PHASE III Boring No GF-104A

Sample No U-2 Depth 16.5'-18.5' Date 12/13/89

GANNETT FLEMING GEOTECHNICAL LABORATORY

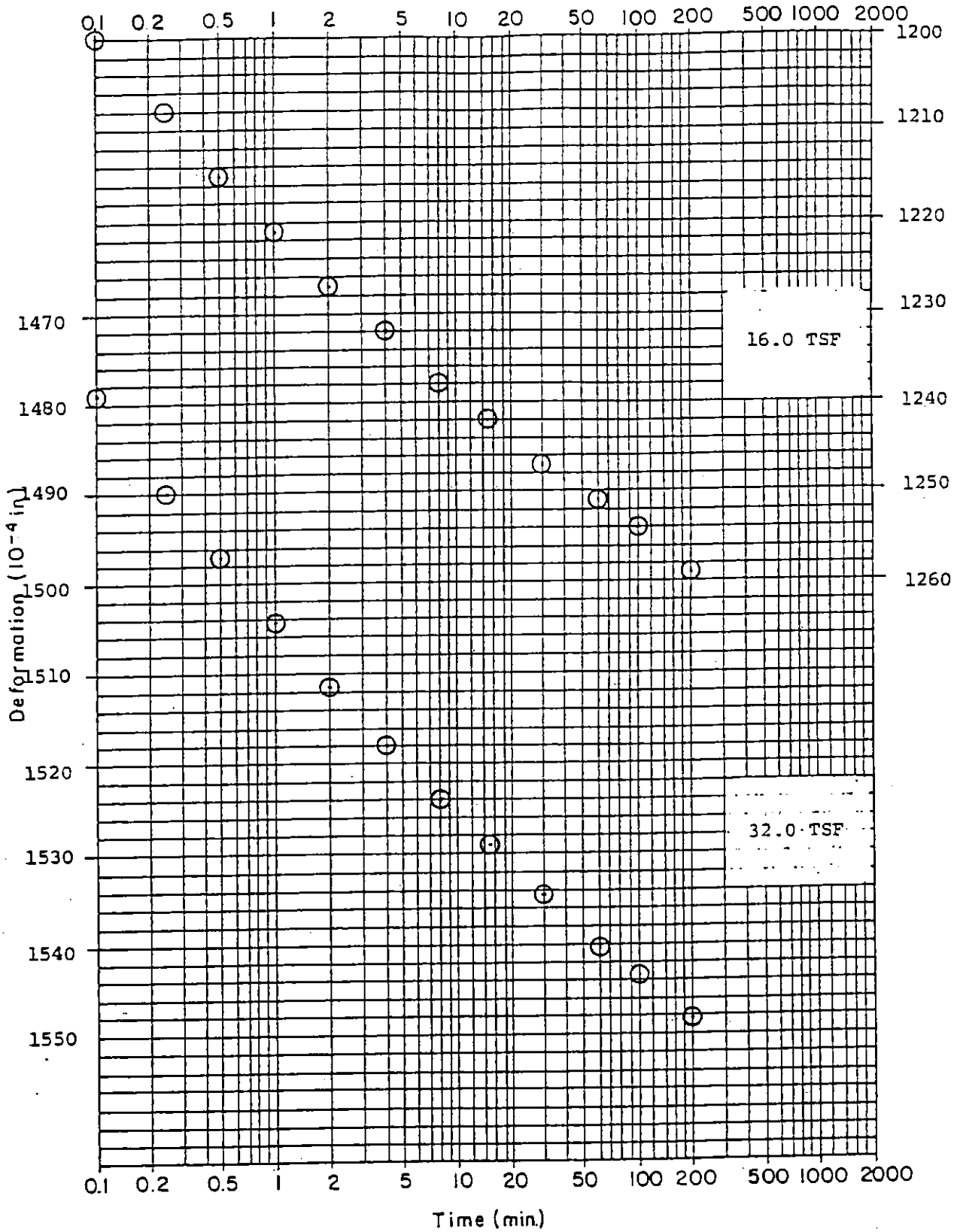


CONSOLIDATION TEST-TIME CURVES

Project DSWA NSWF-2 PHASE III Boring No GF-104A

Sample No U-2 Depth 16.5'-18.5' Date 12/13/89

GANNETT FLEMING GEOTECHNICAL LABORATORY

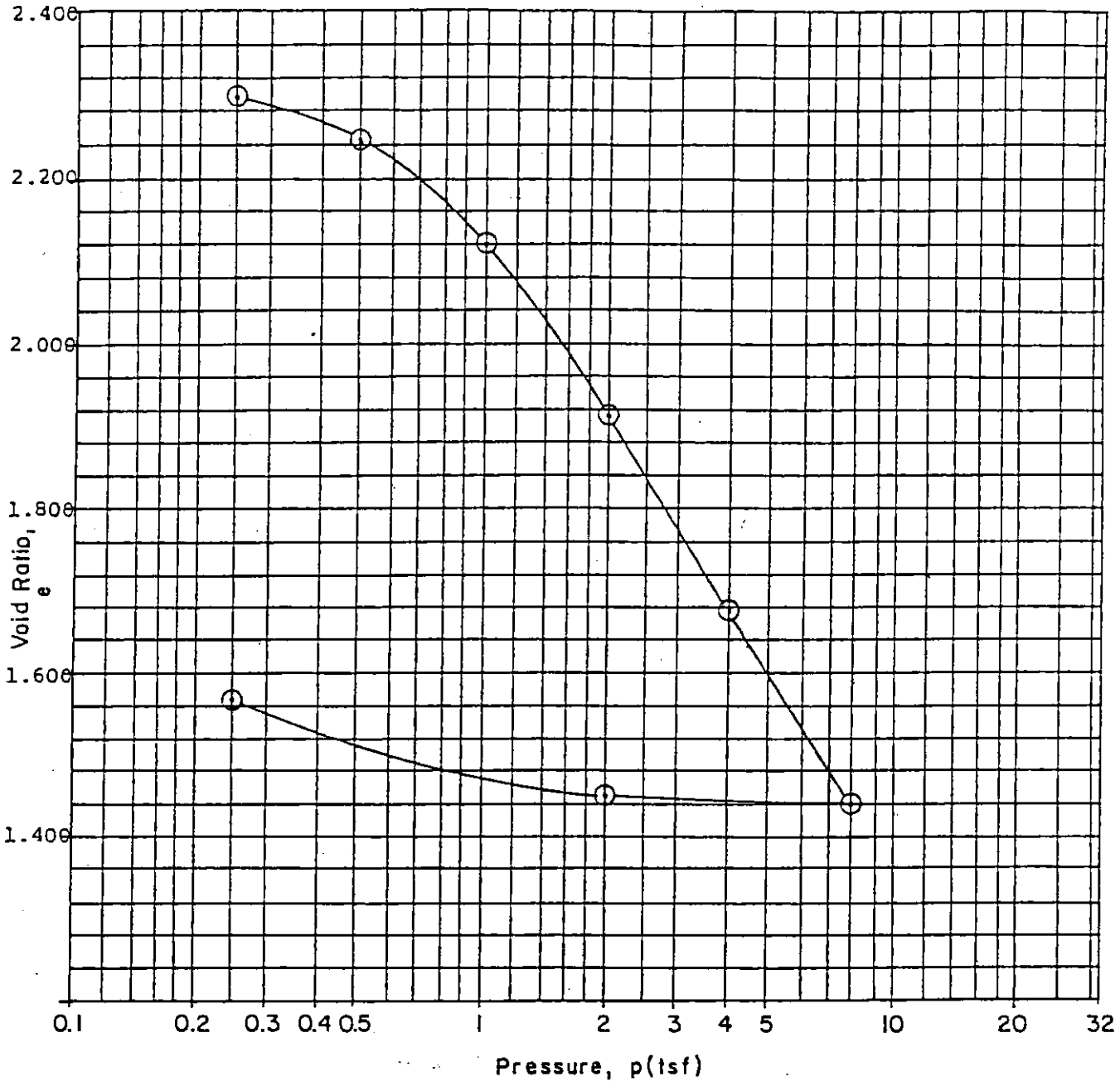


CONSOLIDATION TEST-TIME CURVES

Project DSWA NSWF-2 PHASE III Boring No GF-104A

Sample No U-2 Depth 16.5'-18.5' Date 12/13/89

GANNETT FLEMING GEOTECHNICAL LABORATORY

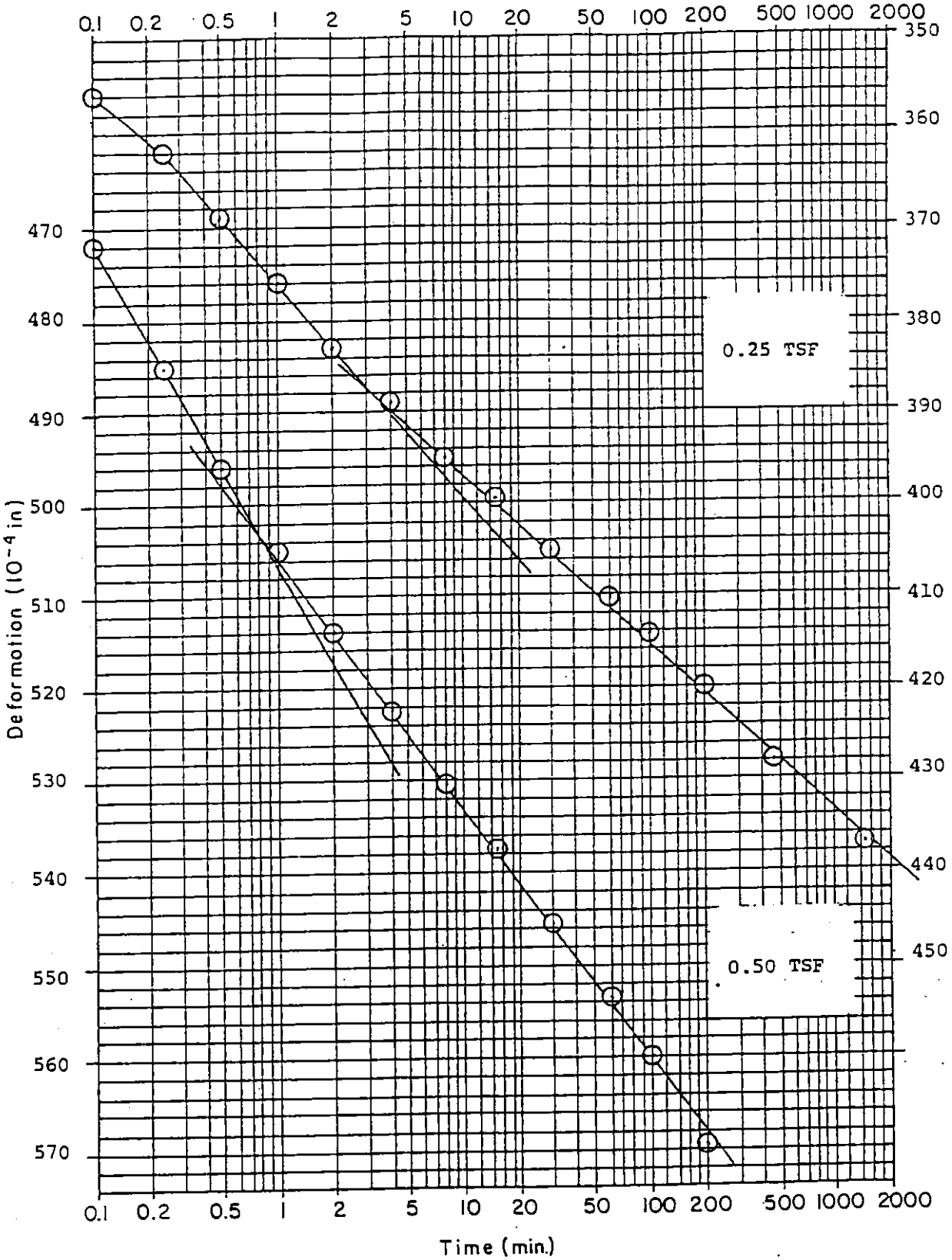


SEE ADDITIONAL SHEET

Coeff. of Consol., C_v (in.^{2}/min.)

Type of Specimen	Shelby			Before Test				After Test	
Dia	2.50 in	H_T	0.75 in	Water Content	w_o	77.2		w_f	58.0
Compression Index		C_c	0.79	Void Ratio	e_o	2.350		e_f	1.567
Classification	MH			Saturation	S_o	88.7		S_f	100
w_l	75.5	I_p	30.4	Project	DSWA,NSWF,PHASE III				
w_p	45.1	LI	1.1	Boring No	GF-105		Sample No	U-2	
Remarks	Wet density=89.2pcf			Depth	18.5-20.5'		Date	1/90	

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

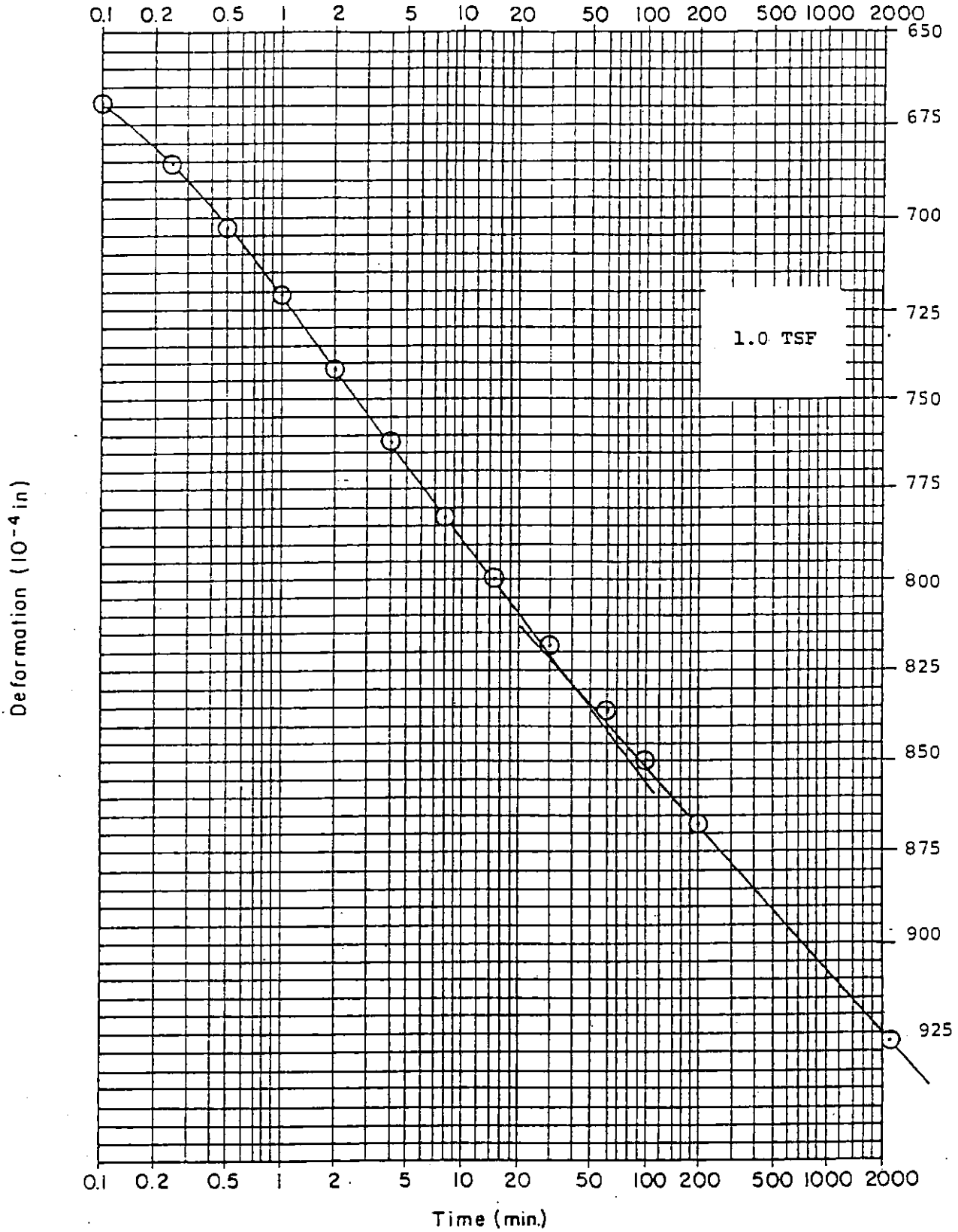


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-105

Sample No U-2 Depth 18.5'-20.5' Date 1/24/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

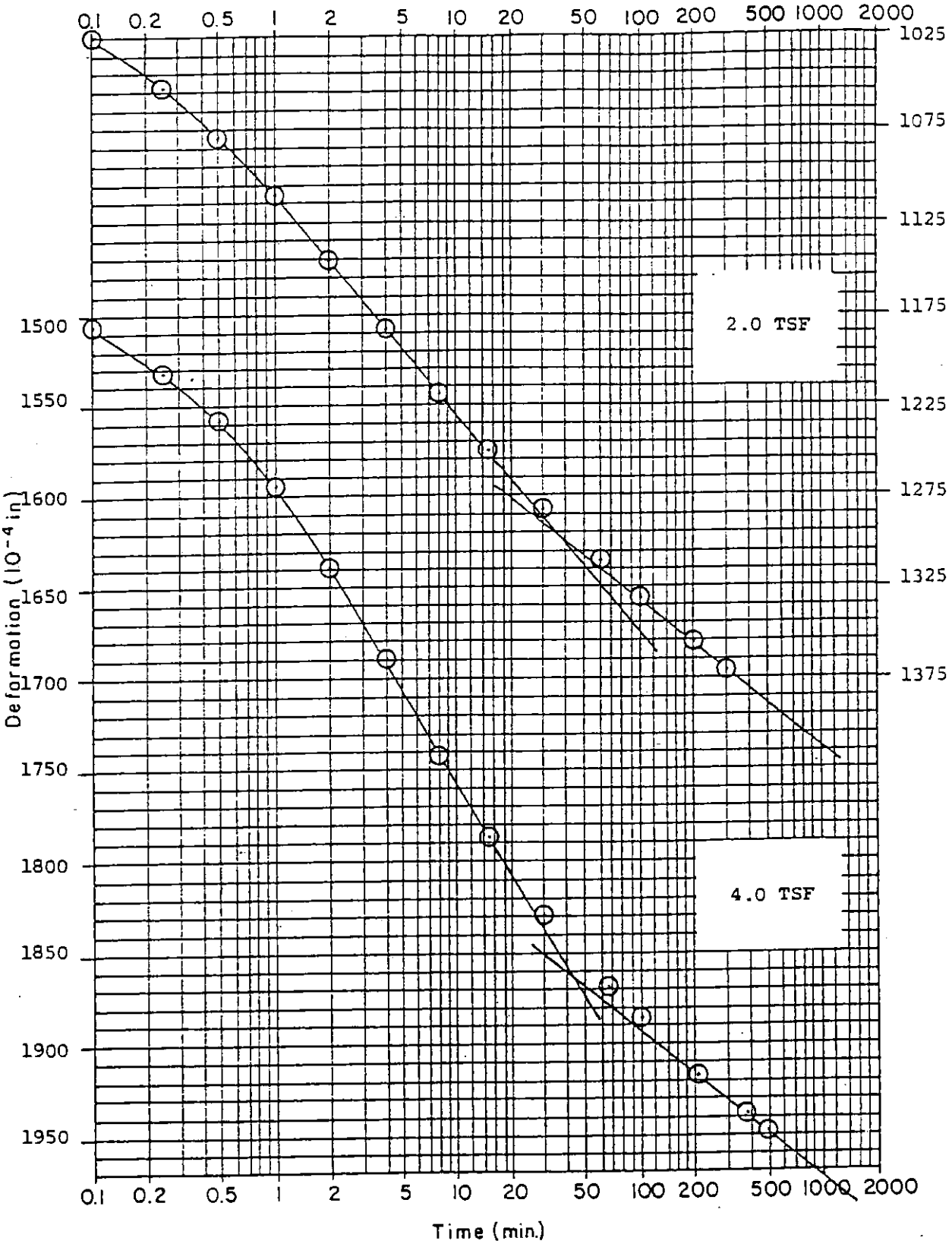


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-105

Sample No U-2 Depth 18.5'-20.5' Date 1/24/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

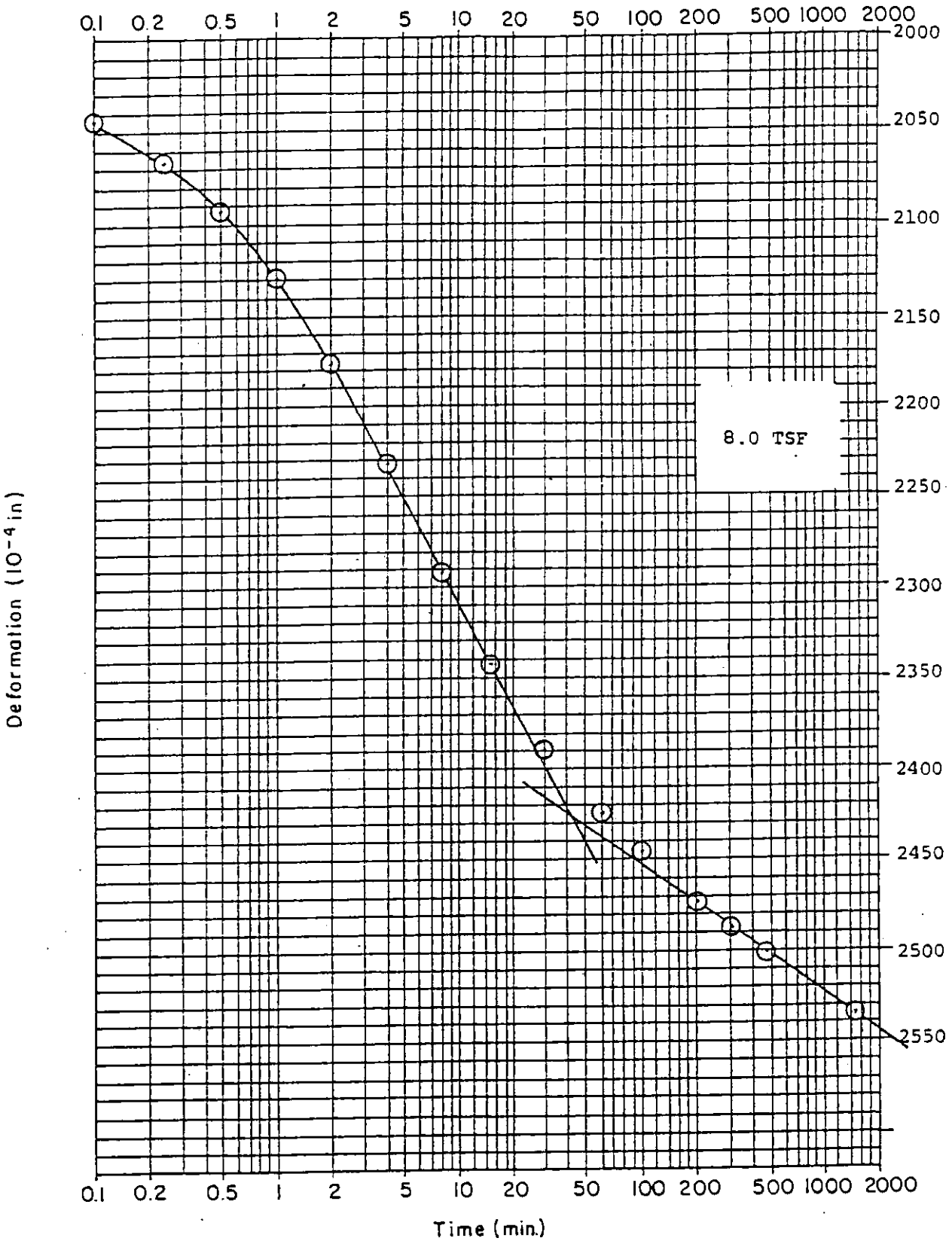


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-105

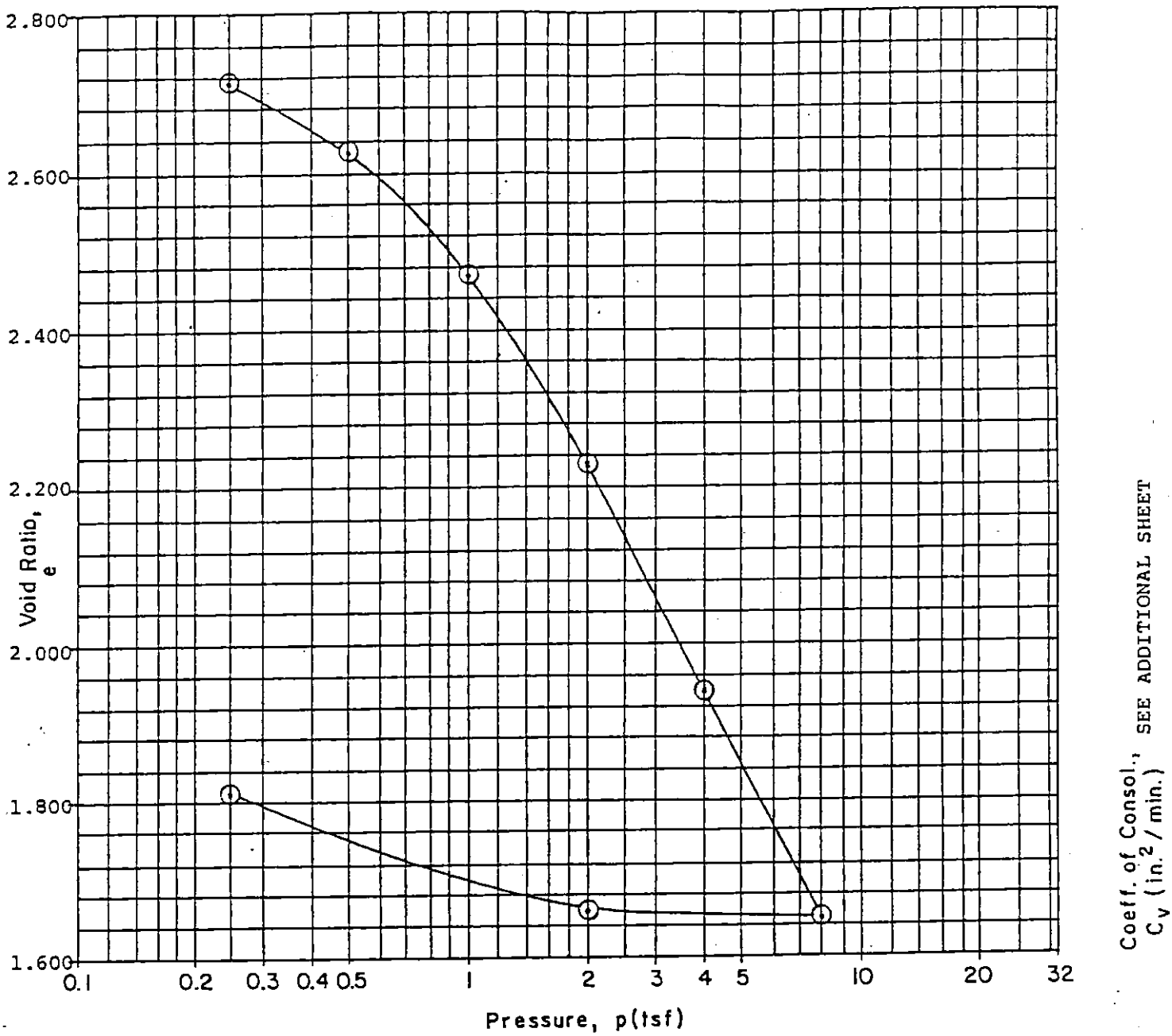
Sample No U-2 Depth 18.5'-20.5' Date 1/24/90

GANNETT FLEMING GEOTECHNICAL LABORATORY



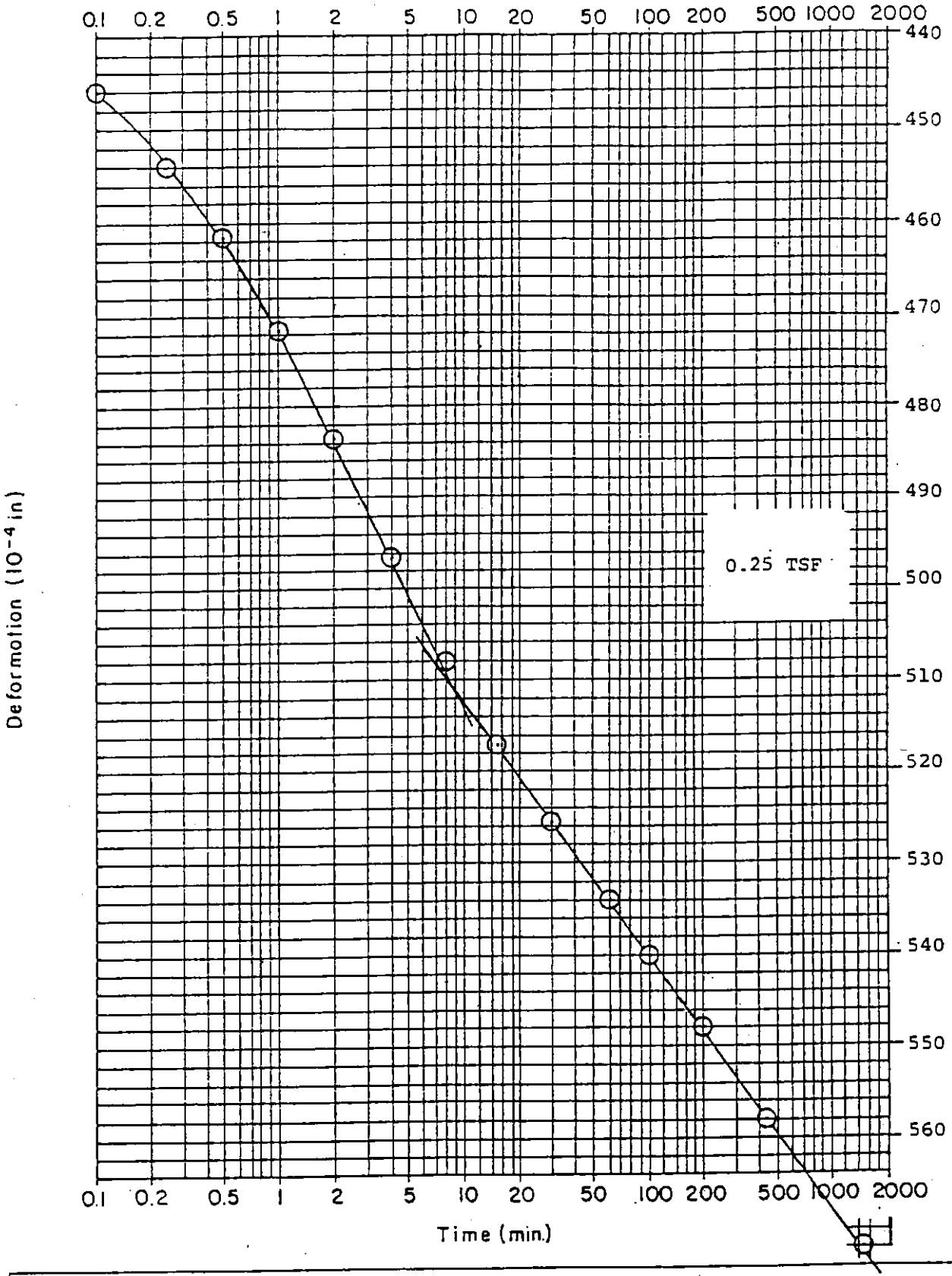
CONSOLIDATION TEST-TIME CURVES	
Project _____	Boring No _____
Sample No _____ Depth _____	Date _____
GANNETT FLEMING GEOTECHNICAL LABORATORY	

ASSUME: GF-105, U-2



Type of Specimen	Shelby			Before Test				After Test	
Dia	2.50 in	H_T	0.75 in	Water Content	w_o	95.7		w_f	67.0
Compression Index		C_c	0.97	Void Ratio	e_o	2.781		e_f	1.809
Classification	MH			Saturation	S_o	92.9		S_f	100
w_l	72.0	I_p	31.6	Project	DSWA,NSWF,PHASE III				
w_p	40.4	LI	1.8	Boring No	GF-106		Sample No	U-1	
Remarks	Wet density=87.3pcf			Depth	8-10'		Date	1/90	

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

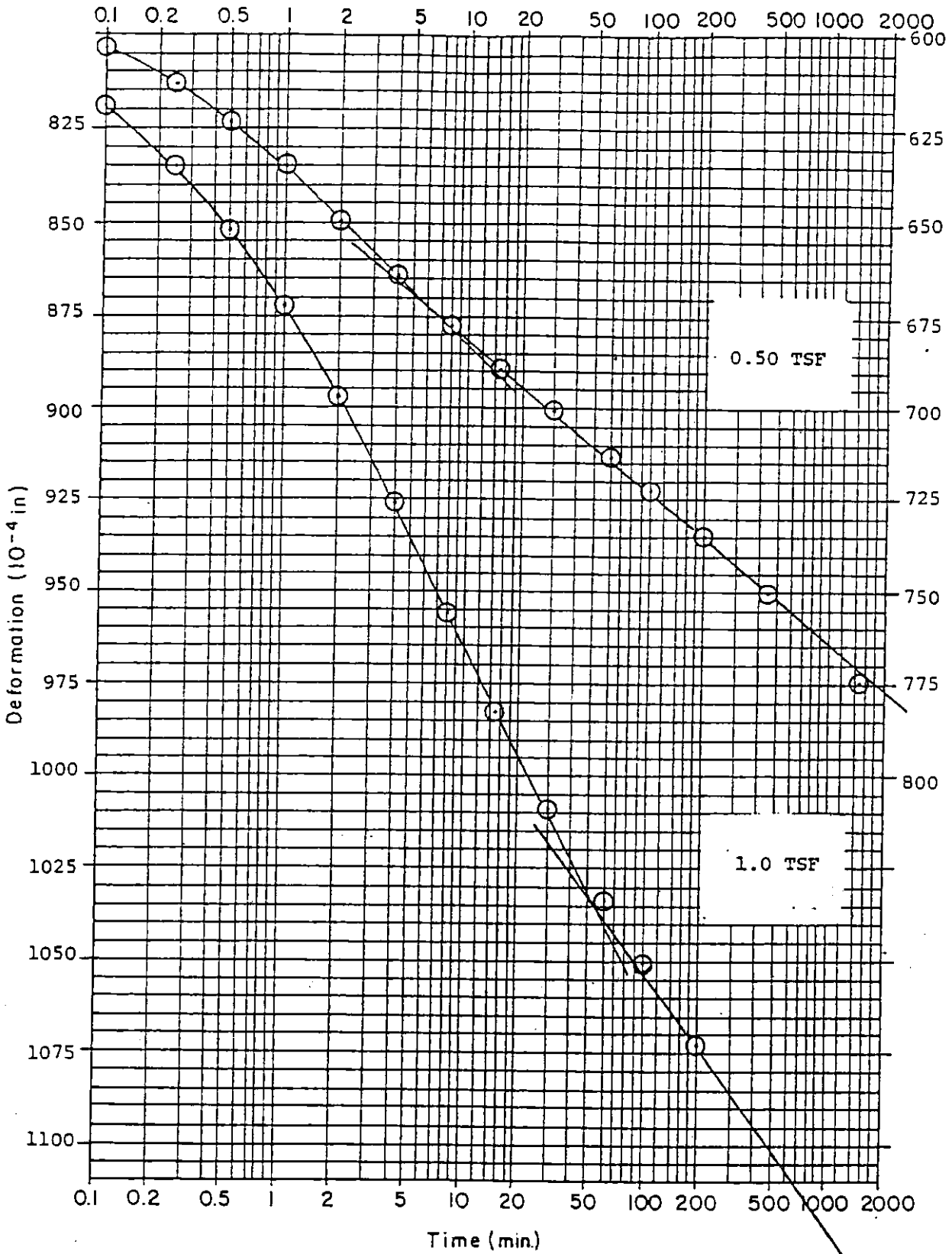


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-106

Sample No U-1 Depth 8' - 10' Date 1/24/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

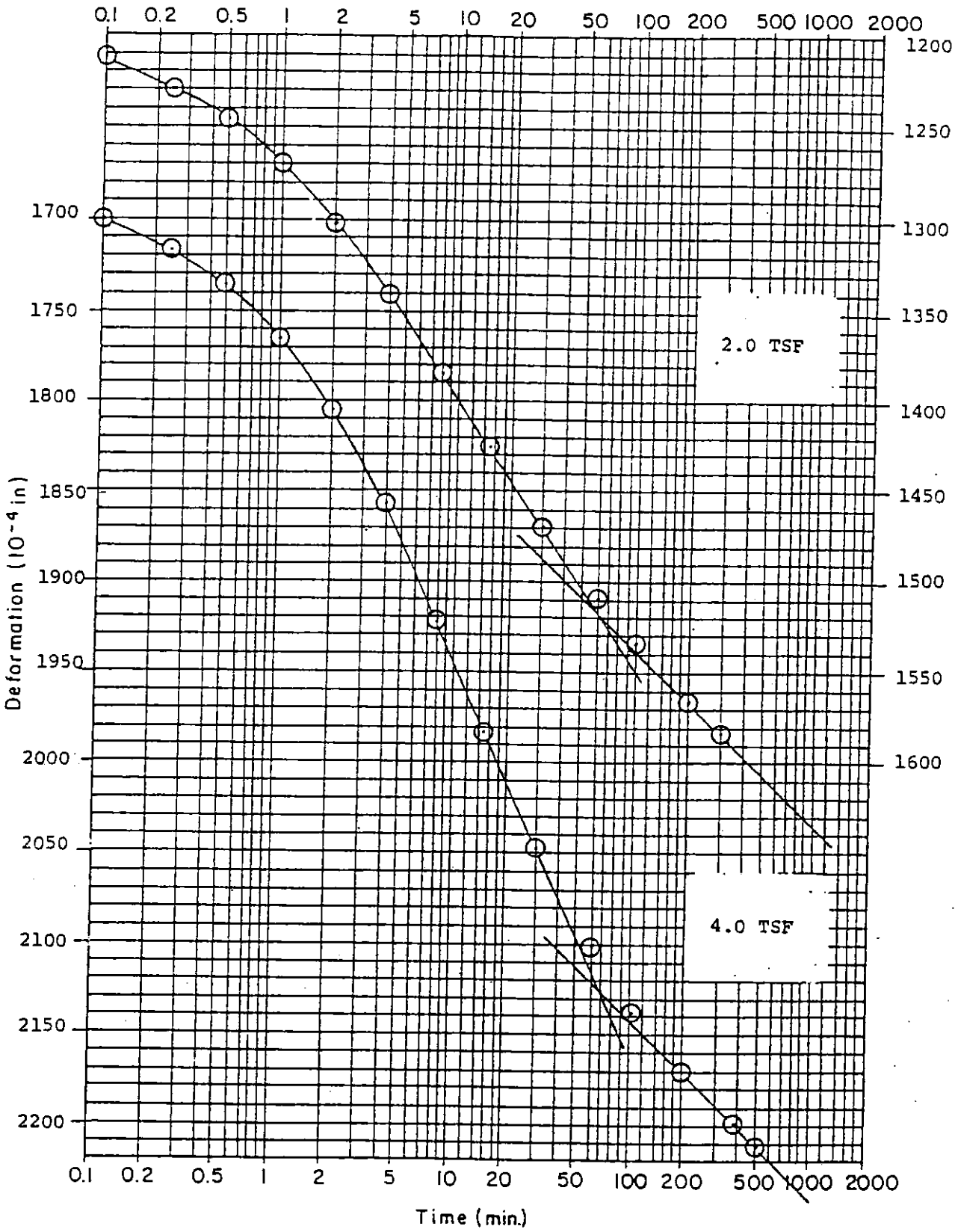


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-106

Sample No U-1 Depth 8' - 10' Date 1/24/90

GANNETT FLEMING GEOTECHNICAL LABORATORY



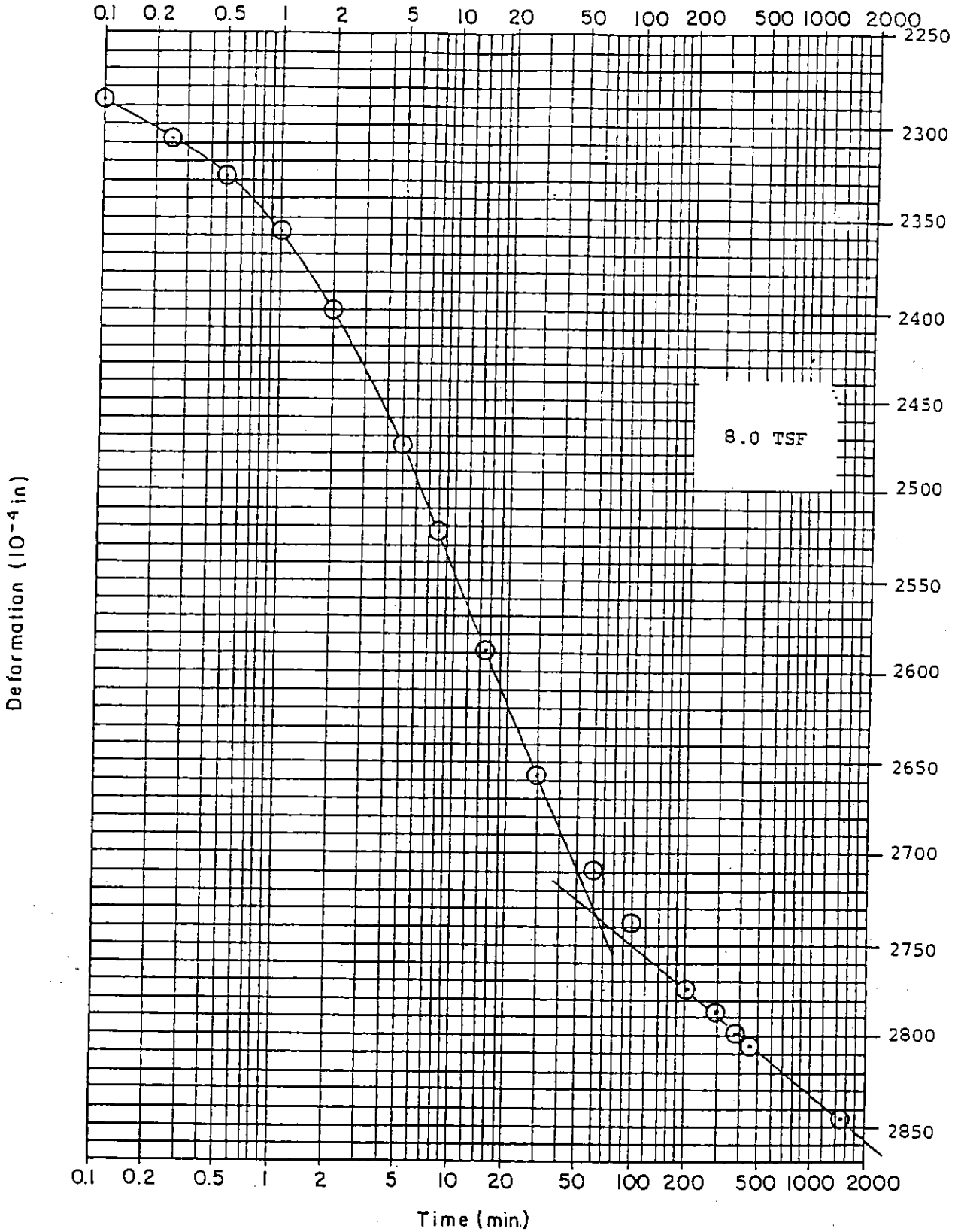
CONSOLIDATION TEST-TIME CURVES

Project _____ Boring No _____

Sample No _____ Depth _____ Date _____

GANNETT FLEMING GEOTECHNICAL LABORATORY

ASSUME : GE106 U-1

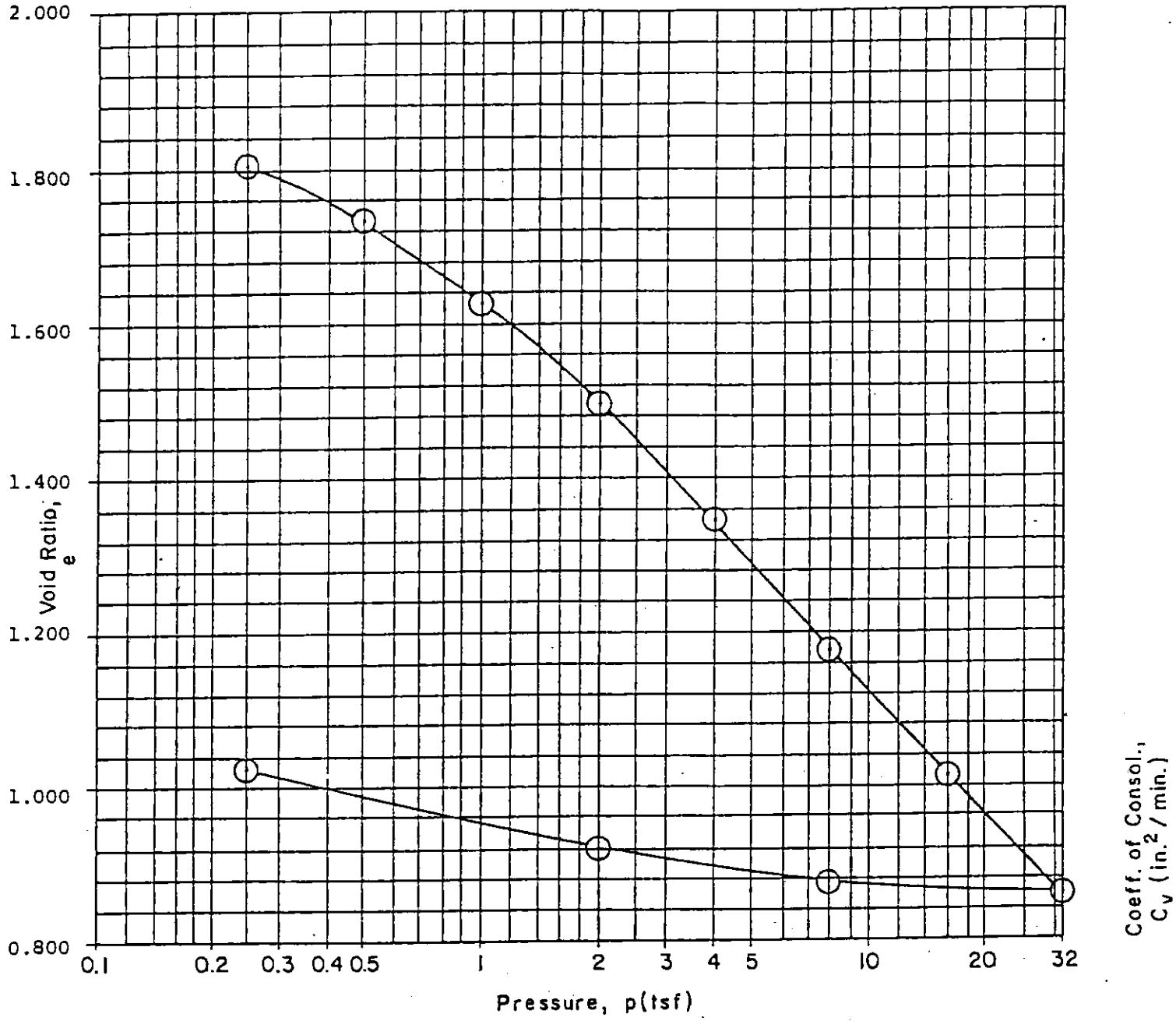


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-106

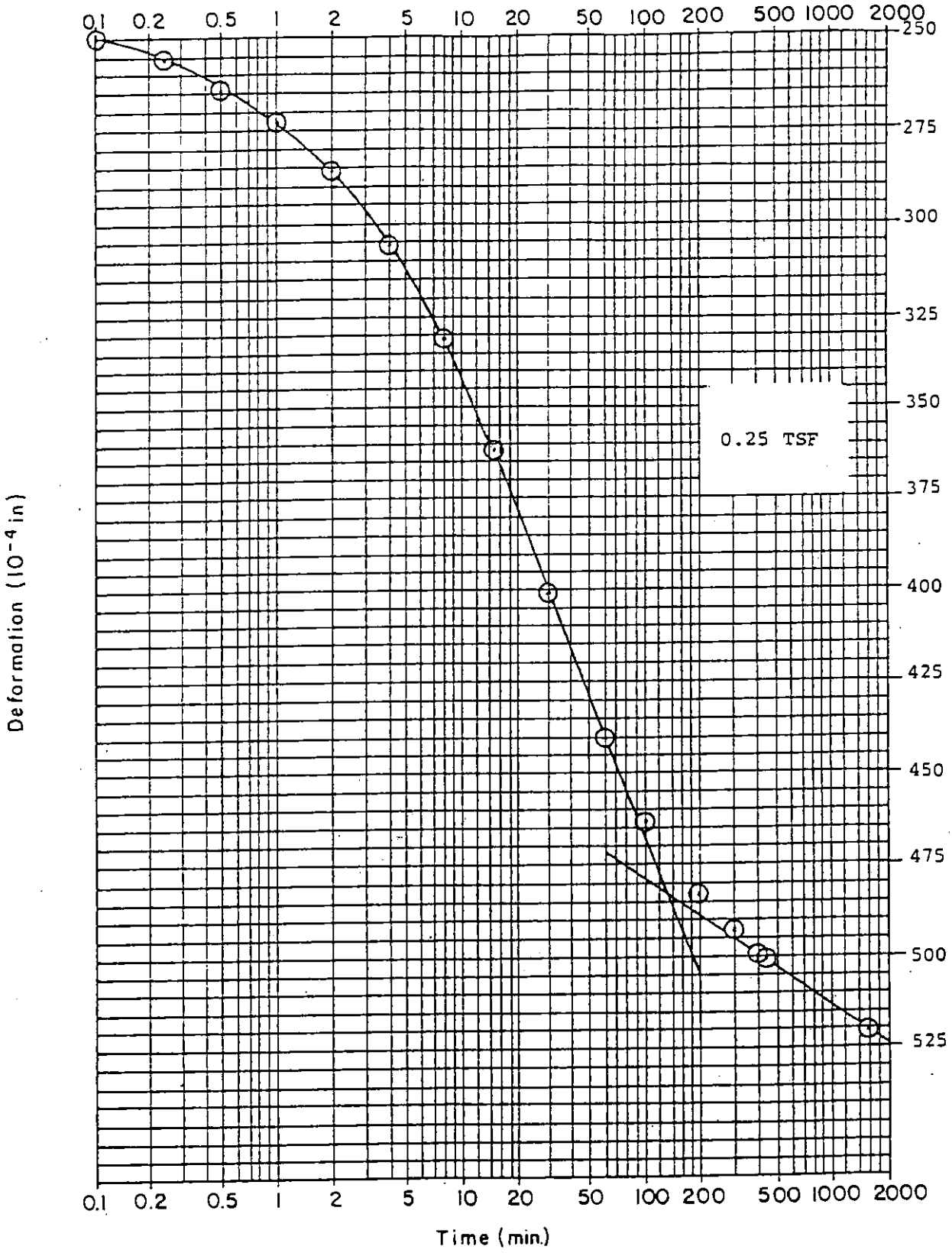
Sample No U-1 Depth 8' - 10' Date 1/24/90

GANNETT FLEMING GEOTECHNICAL LABORATORY



Type of Specimen SHELBY TUBE				Before Test			After Test	
Dia	2.50 in	H_T	1.00 in	Water Content	w_o	66.5	w_f	38.0
Compression Index		C_c	0.53	Void Ratio	e_o	1.883	e_f	1.026
Classification BRN.-SILT WITH SAND				Saturation	S_o	95.4	S_f	100.0
w_l	49.1	I_p	16.2	Project DSWA, NSWF, PHASE III				
w_p	32.9	LI	2.1	Boring No GF-107			Sample No U-2	
Remarks WET DENSITY = 97.4 pcf				Depth 55' - 57'			Date 2/5/90	

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

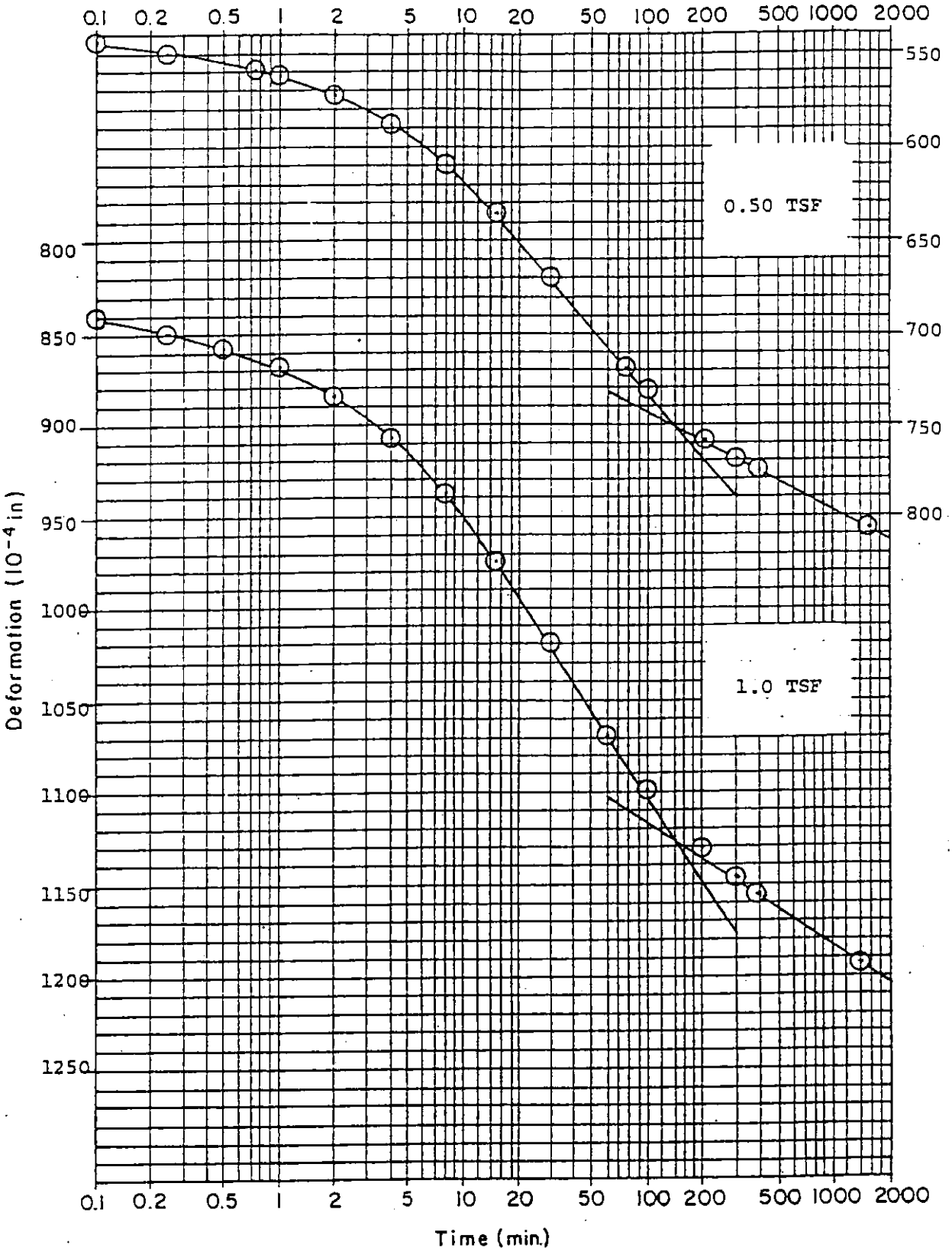


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-107

Sample No U-2 Depth 55 - 57' Date 1/29/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

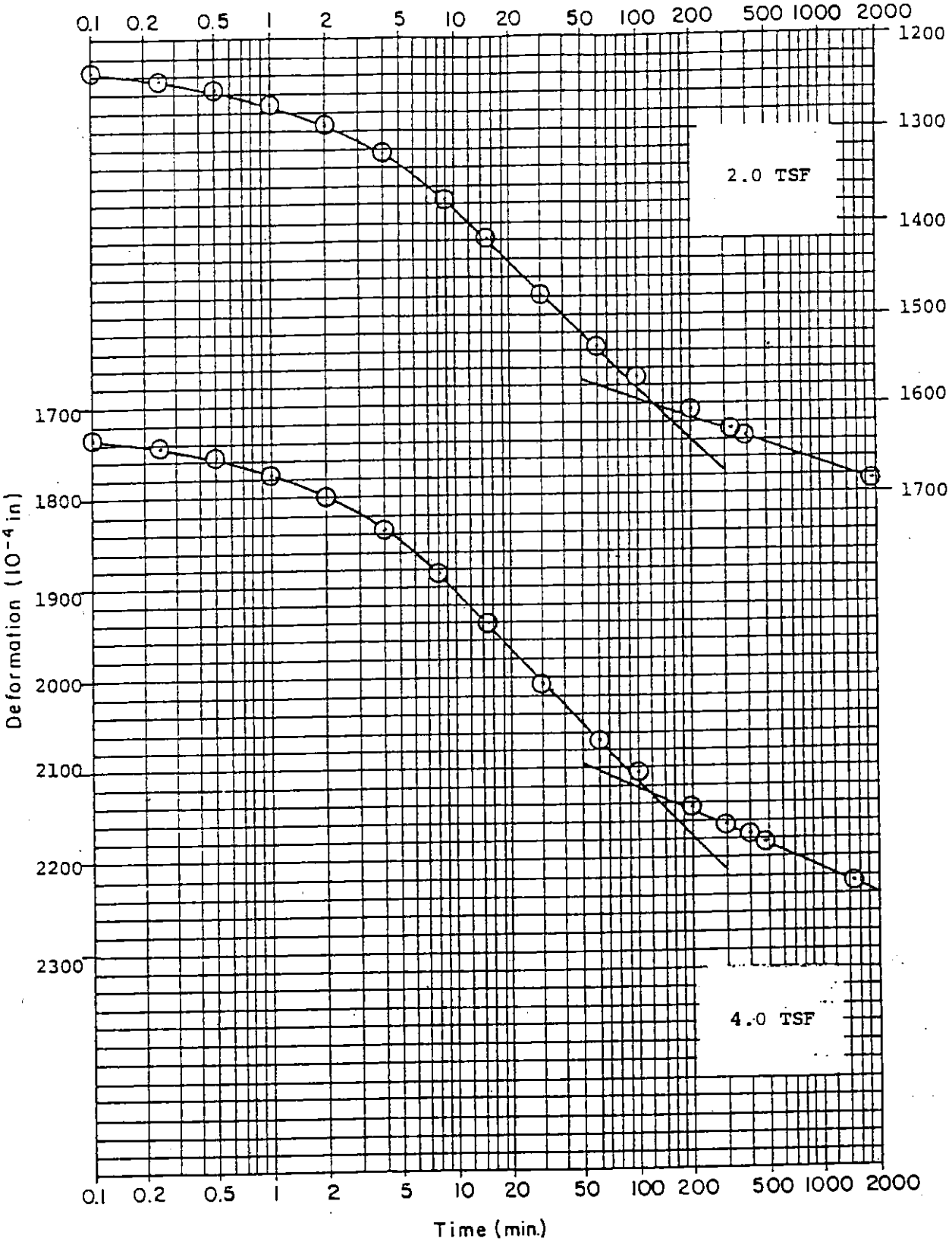


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-107

Sample No U-2 Depth 55 - 57' Date 1/29/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

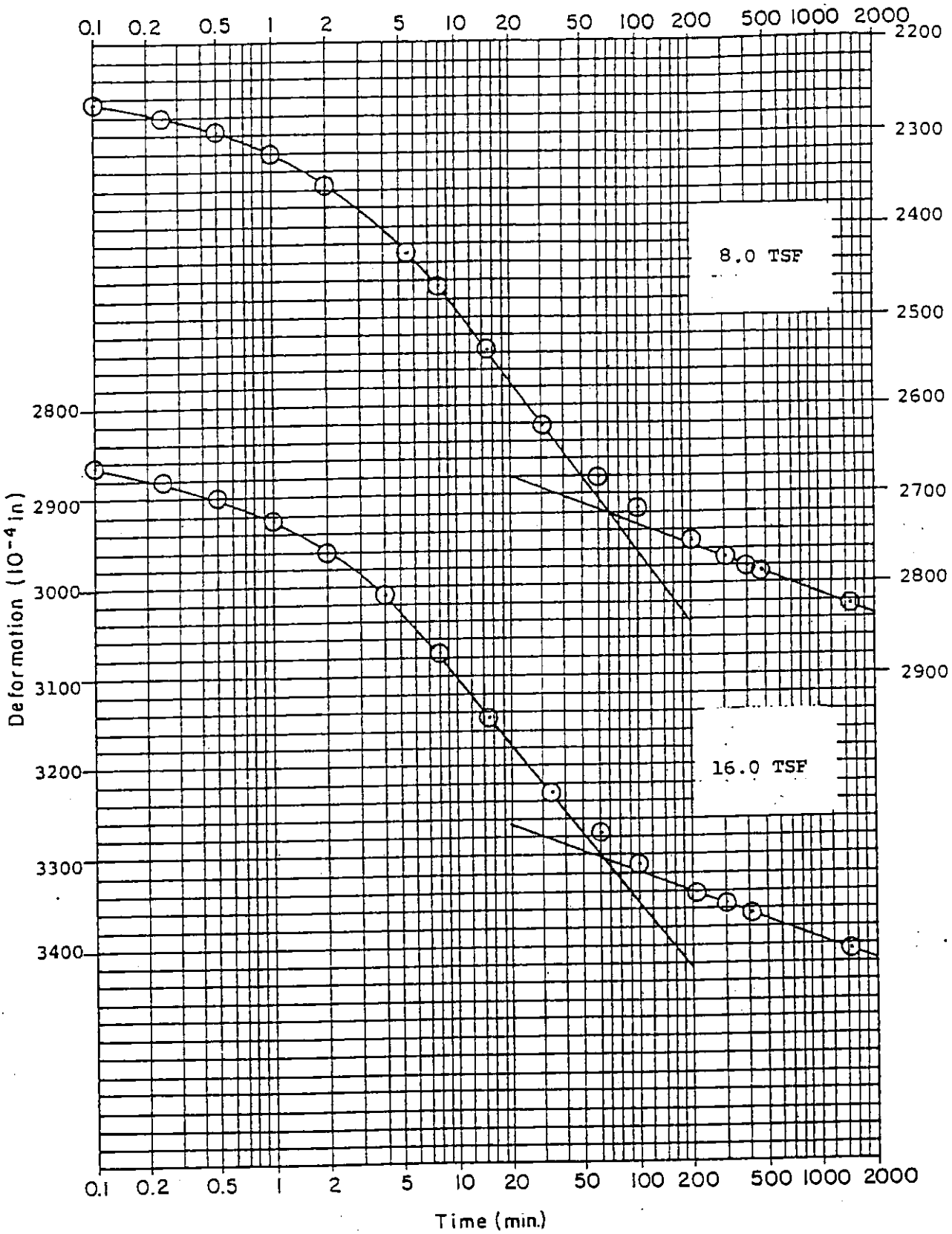


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-107

Sample No U-2 Depth 55 - 57' Date 1/29/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

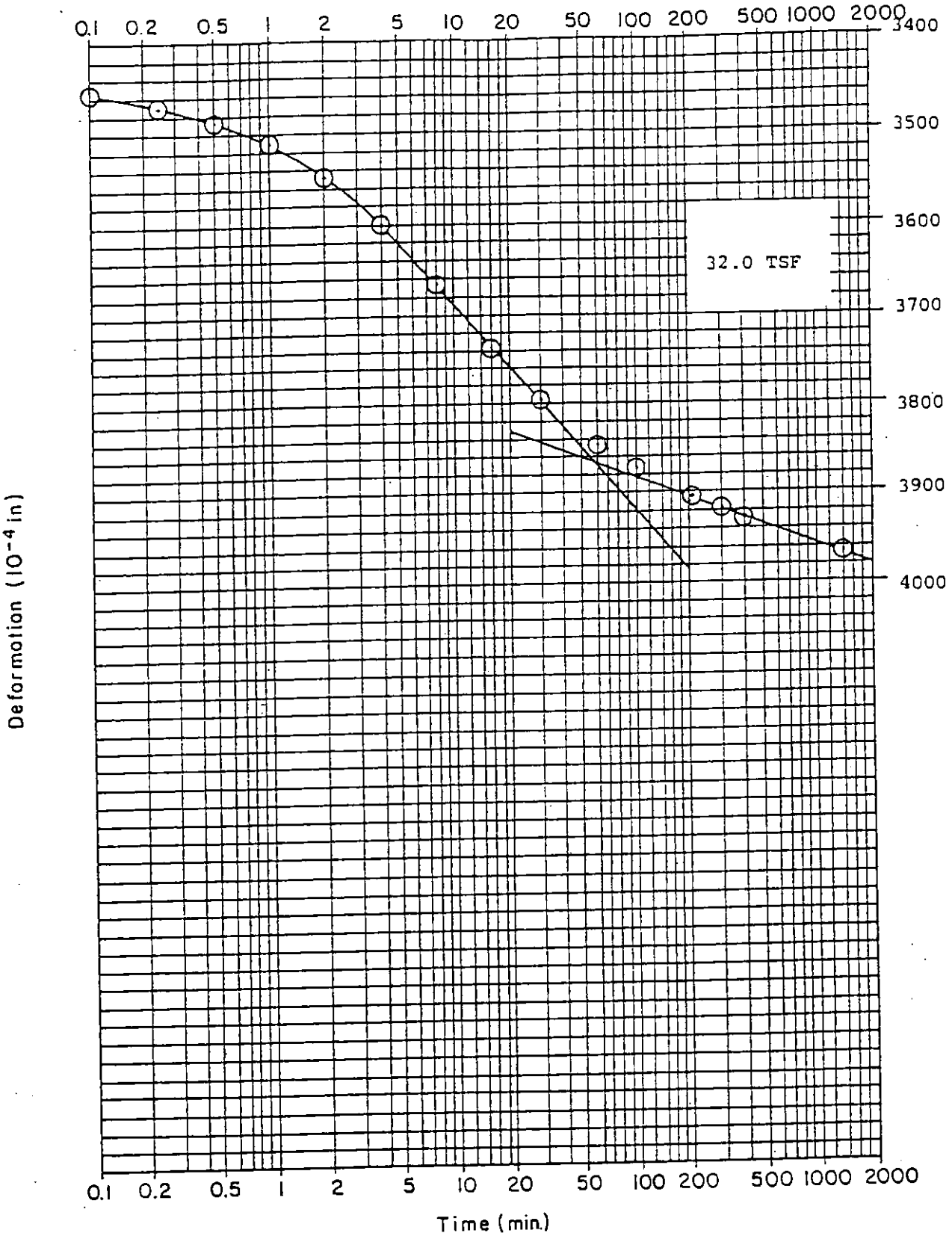


CONSOLIDATION TEST-TIME CURVES

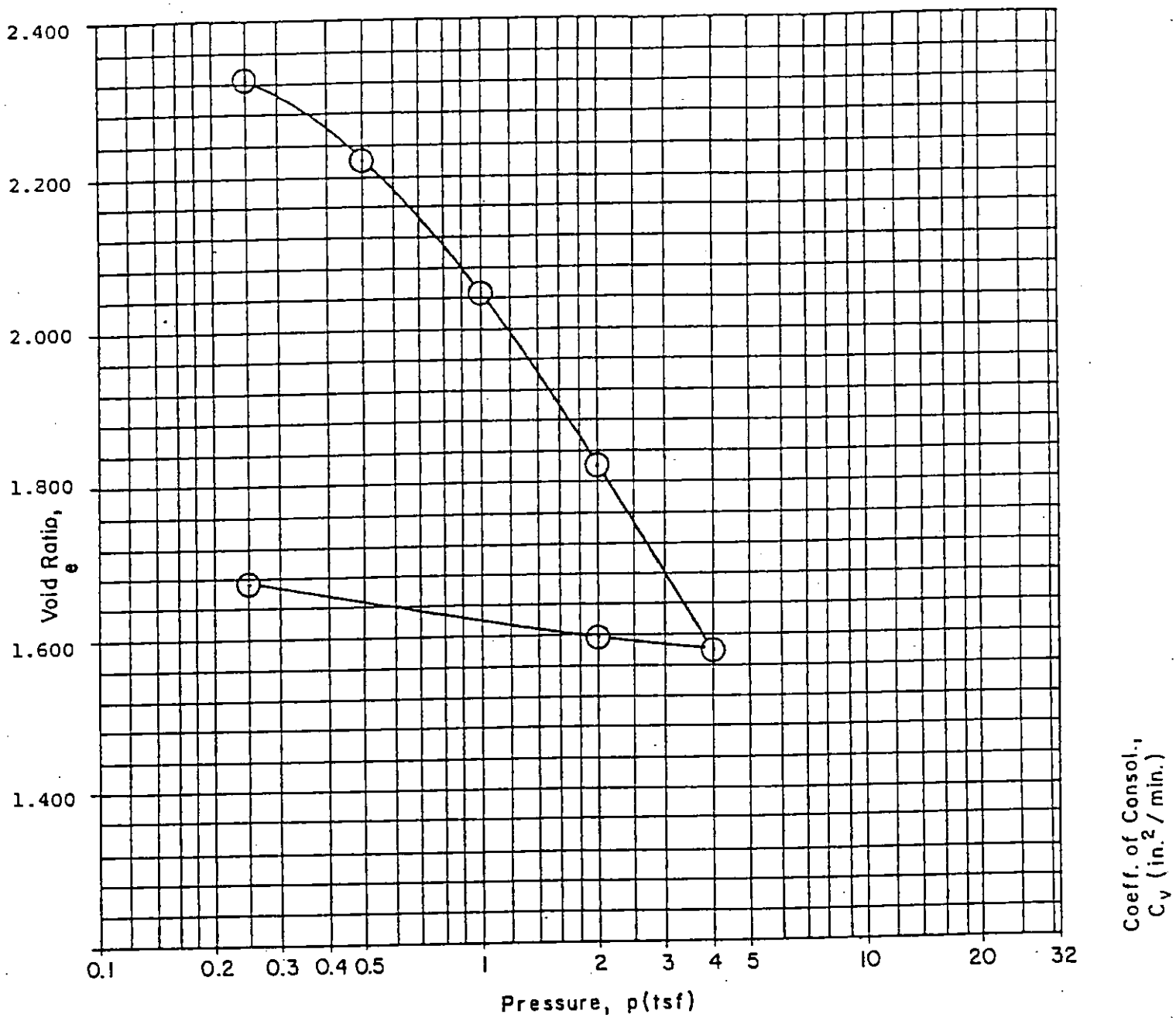
Project DSWA, NSWF, PHASE III Boring No GF-107

Sample No U-2 Depth 55 - 57' Date 1/29/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

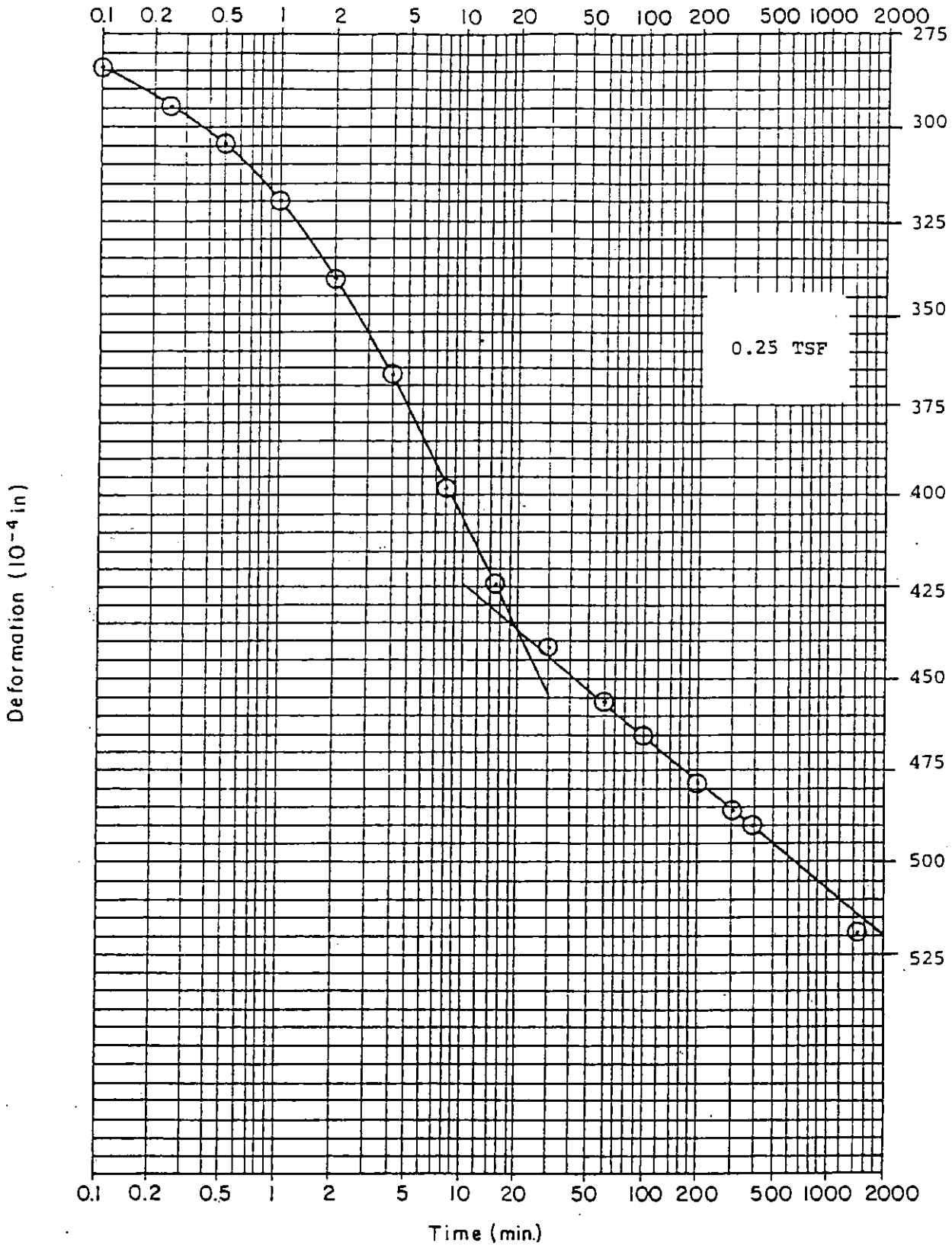


CONSOLIDATION TEST-TIME CURVES			
Project	DSWA, NSWF, PHASE III	Boring No	GF-107
Sample No	U-2	Depth 55 - 57'	Date 1/29/90
GANNETT FLEMING GEOTECHNICAL LABORATORY			



Type of Specimen - SHELBY TUBE				Before Test			After Test
Dia	2.50 in	H_T	1.00 in	Water Content	w_o	86.3	w_f 61.8
Compression Index		C_c	0.80	Void Ratio	e_o	2.409	e_f 1.670
Classification BRN.-ELASTIC SILT				Saturation	S_o	96.6	S_f 100.0
w_l 59.4		I_p 19.1		Project DSWA, NSWF, PHASE III			
w_p 40.3		LI 2.4		Boring No GF-108		Sample No U-2	
Remarks WET DENSITY = 92.1 pcf				Depth 15' - 17'		Date 2/5/90	

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

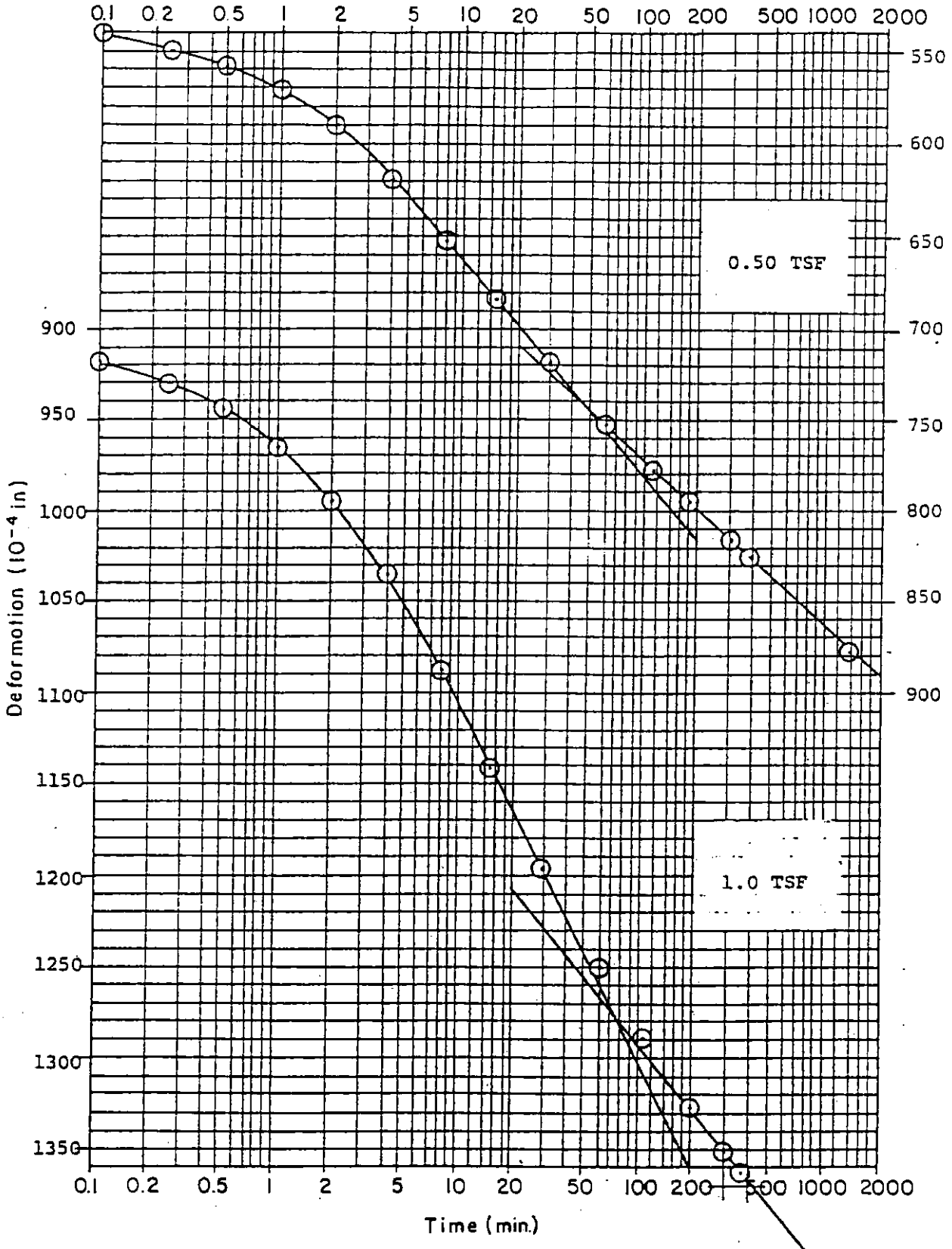


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-108

Sample No U-2 Depth 15 - 17' Date 1/29/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

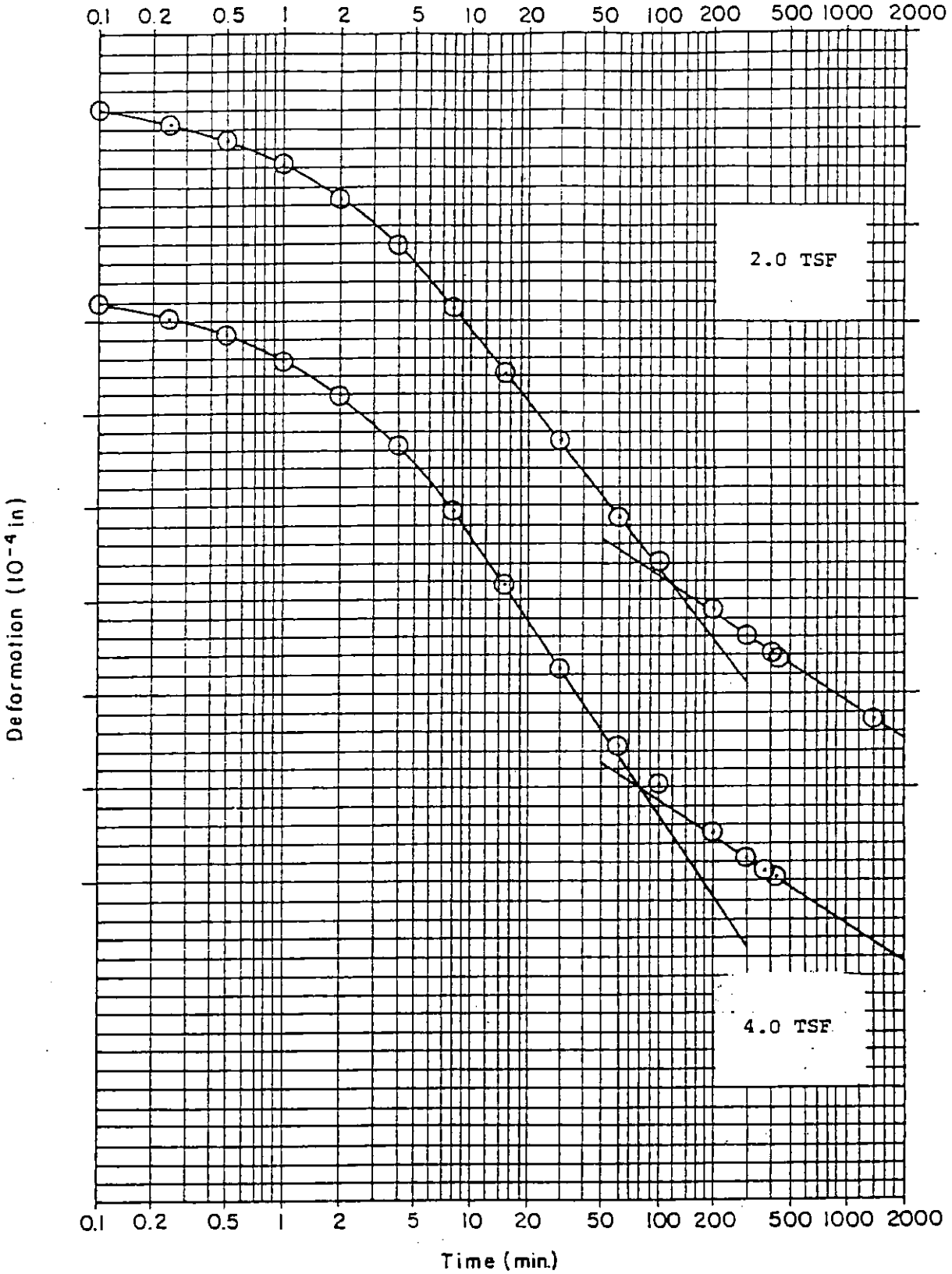


CONSOLIDATION TEST-TIME CURVES

Project DSWA, NSWF, PHASE III Boring No GF-108

Sample No U-2 Depth 15 - 17' Date 1/29/90

GANNETT FLEMING GEOTECHNICAL LABORATORY



CONSOLIDATION TEST-TIME CURVES	
Project _____	Boring No _____
Sample No _____ Depth _____	Date _____
GANNETT FLEMING GEOTECHNICAL LABORATORY	

ASSUME: GF108, u-2

GANNETT FLEMING GEOTECHNICAL LABORATORY

CONSOLIDATION TEST REPORT

Coefficient of Consolidation, c_v

Project DSWA,NSWF,PHASE III Date 1/90

Boring	GF-105	GF-106	
Sample	U-2	U-1	
Depth	18.5-20.5'	8-10'	
Load (tsf)			
¼	0.057 in^2/min	0.025 in^2/min	
½	0.12 "	0.030 "	
1	0.013 "	0.0077 "	
2	0.011 "	0.0043 "	
4	0.069 "	0.0030 "	
8	0.0051 "	0.0025 "	
16			
32			

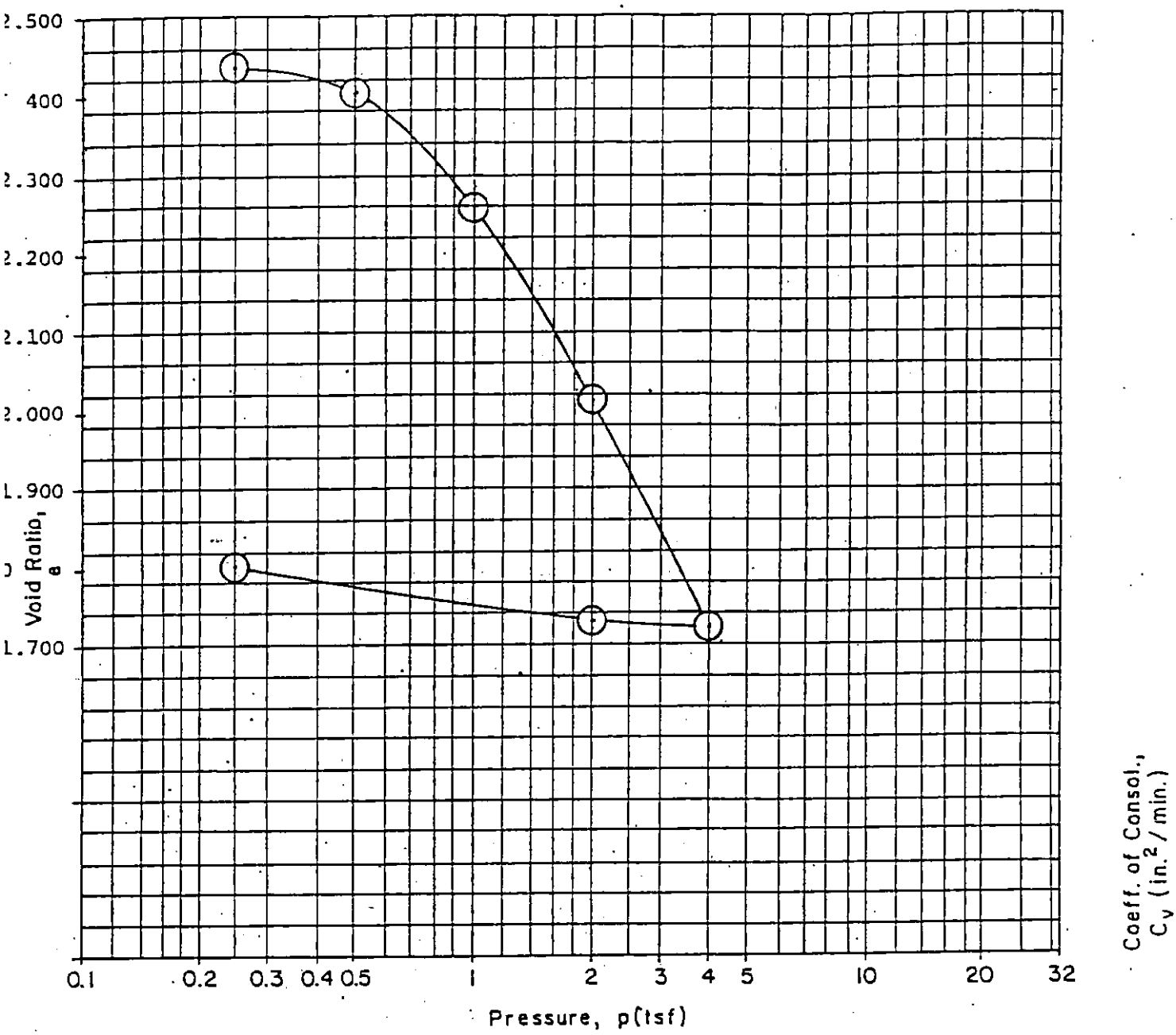
GANNETT FLEMING GEOTECHNICAL LABORATORY

CONSOLIDATION TEST REPORT

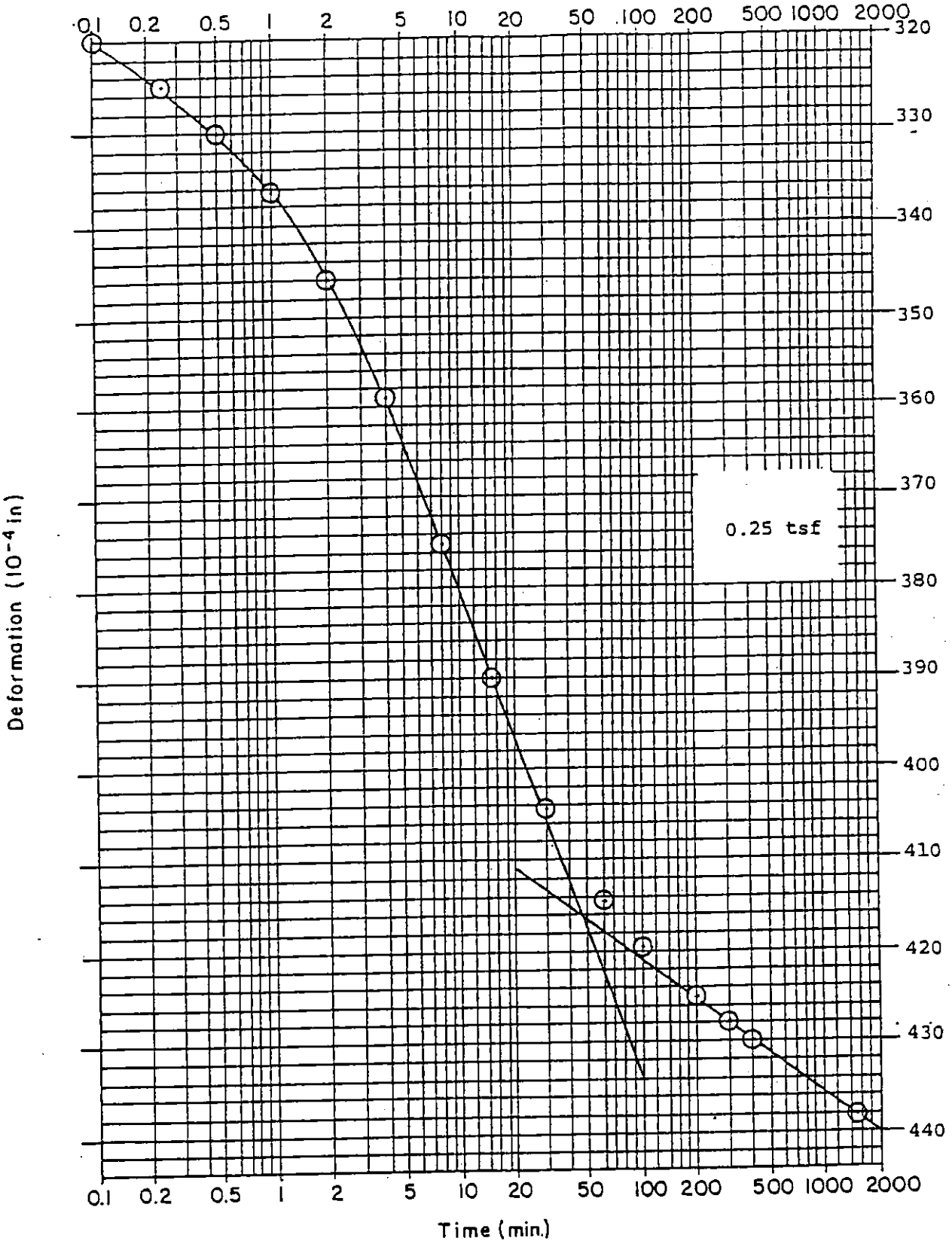
Coefficient of Consolidation, c_v

Project DSWA, NSWF, PHASE III Date 2/5/90

Boring	GF-102	GF-108	GF-107
Sample	U-2	U-2	U-2
Depth	35' - 37'	15' - 17'	55' - 57'
Load(tsf)			
¼	0.0037 in^2/min	0.017 in^2/min	0.0033 in^2/min
½	0.0016 "	0.0081 "	0.0026 "
1	0.0019 "	0.0052 "	0.0027 "
2	0.0025 "	0.0034 "	0.0029 "
4	0.0030 "	0.0033 "	0.0030 "
8			0.0033 "
16			0.0035 "
32			0.0034 "



Type of Specimen	SHELBY TUBE			Before Test			After Test	
Dia	2.50 in	H_T	[redacted] 1"	Water Content	w_o	84.5	w_f	65.6
Compression Index		C_c	0.96	Void Ratio	e_o	2.489	e_f	1.804
Classification	MH			Saturation	S_o	93.4	S_f	100
w_l	58.9	I_p	19.9	Project	DSWA, PHASE IA			
w_p	39.0	LI	2.3	Boring No	GF-203		Sample No	U-1
Remarks				D	- 12.0'		Date	7/23/90
WET DENSITY = 90.8 pcf				EMING GEOTECHNICAL LABORATORY NSOLIDATION TEST REPORT				

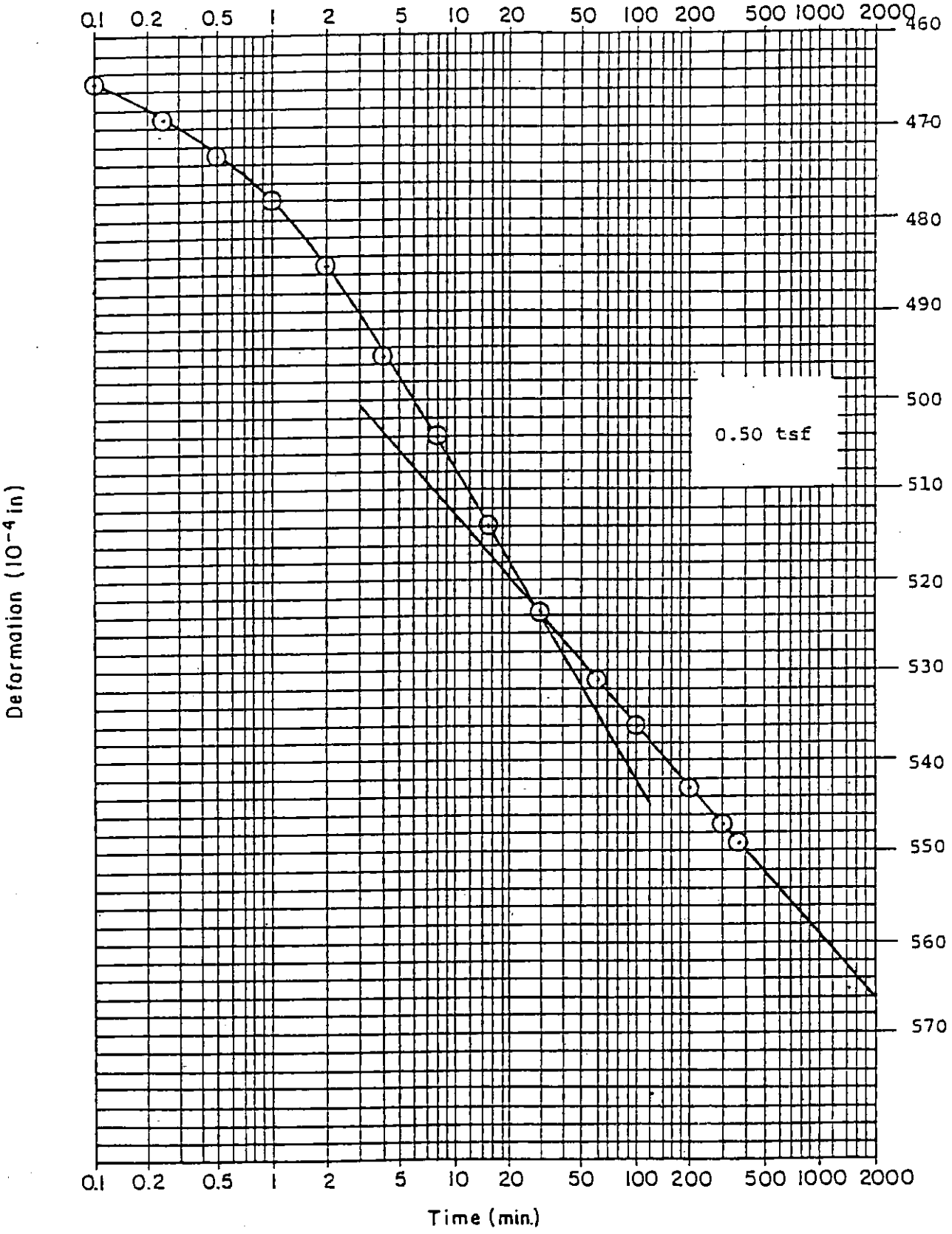


CONSOLIDATION TEST-TIME CURVES

Project DSWA, PHASE IA Boring No GF-203

Sample No U-1 Depth 10.0' - 12.0' Date 7/19/90

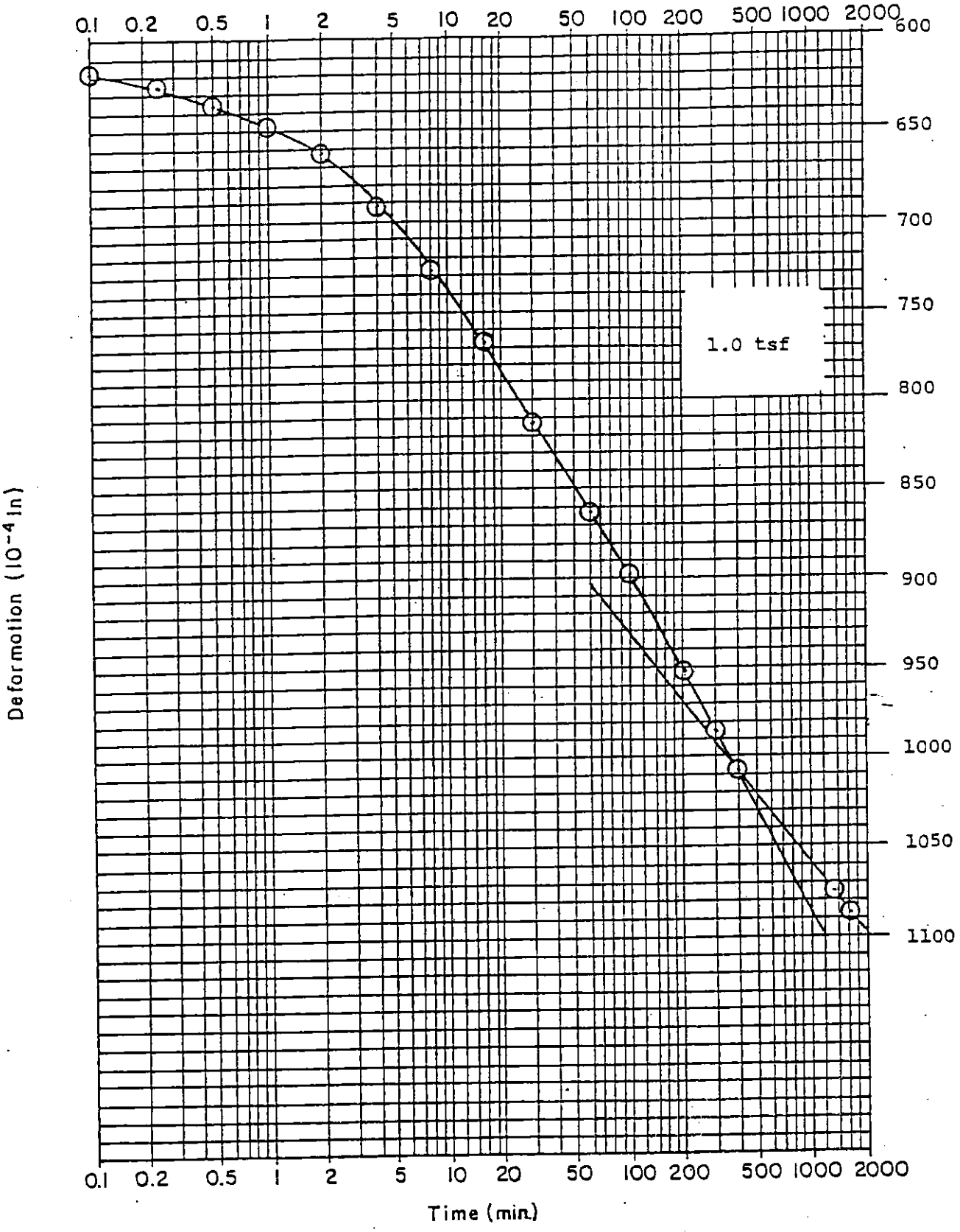
GANNETT FLEMING GEOTECHNICAL LABORATORY



CONSOLIDATION TEST-TIME CURVES

Project DSWA, PHASE IA Boring No GF-203

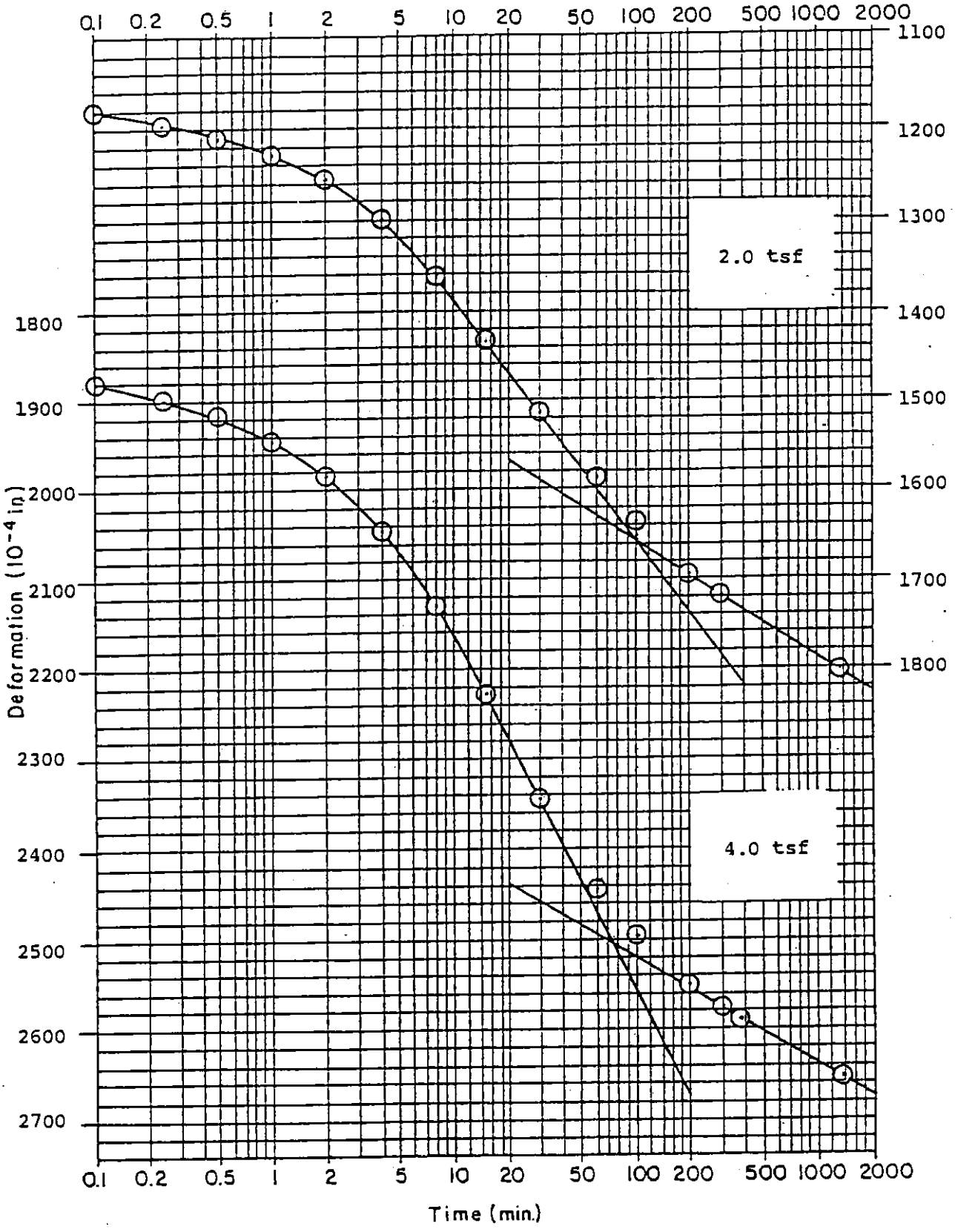
Sample No U-1 Depth 10.0' - 12.0' Date 7/19/90



CONSOLIDATION TEST-TIME CURVES

Project DSWA, PHASE IA Boring No GF-203

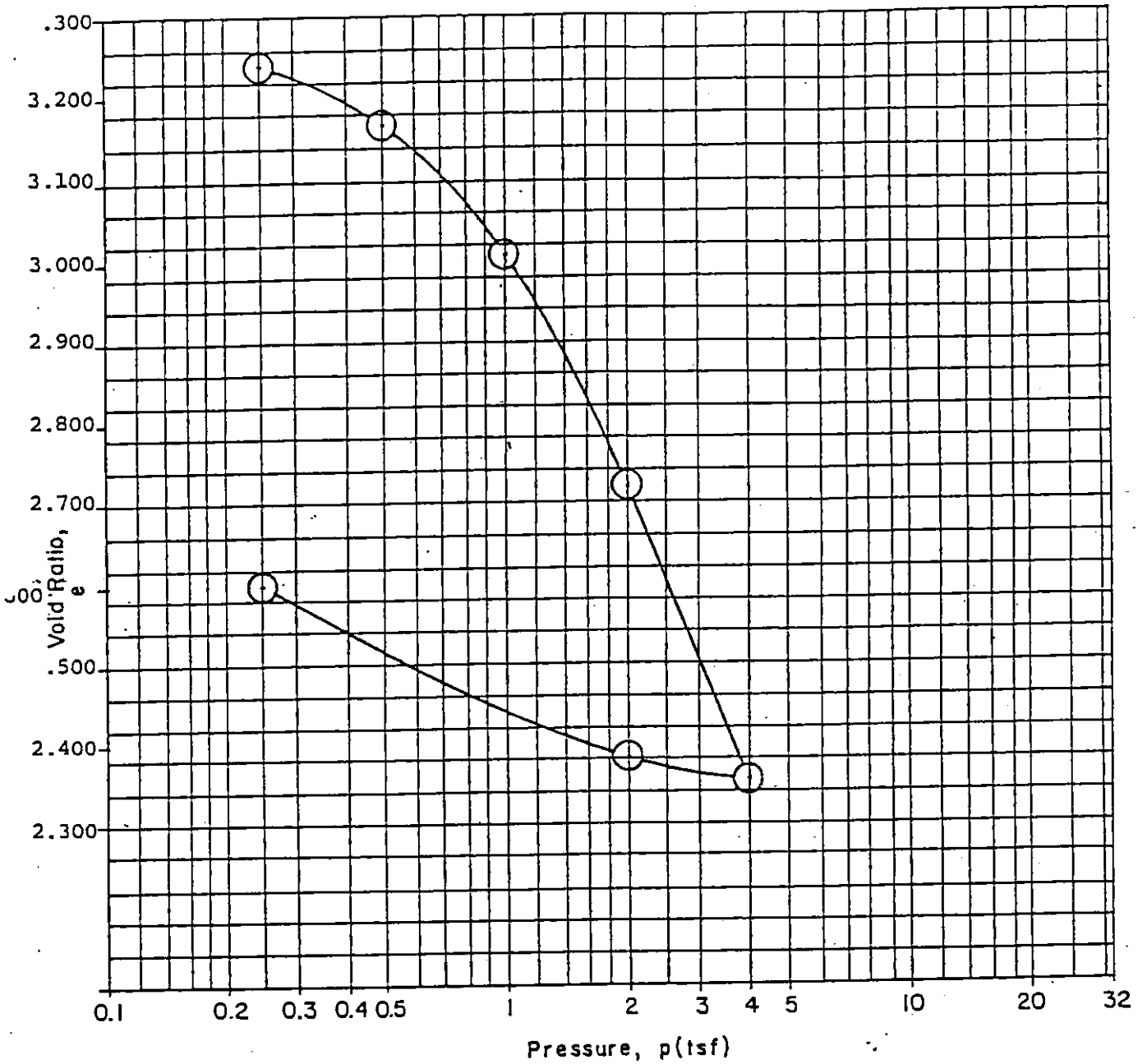
Sample No U-1 Depth 10.0' - 12.0' Date 7/19/90



CONSOLIDATION TEST-TIME CURVES

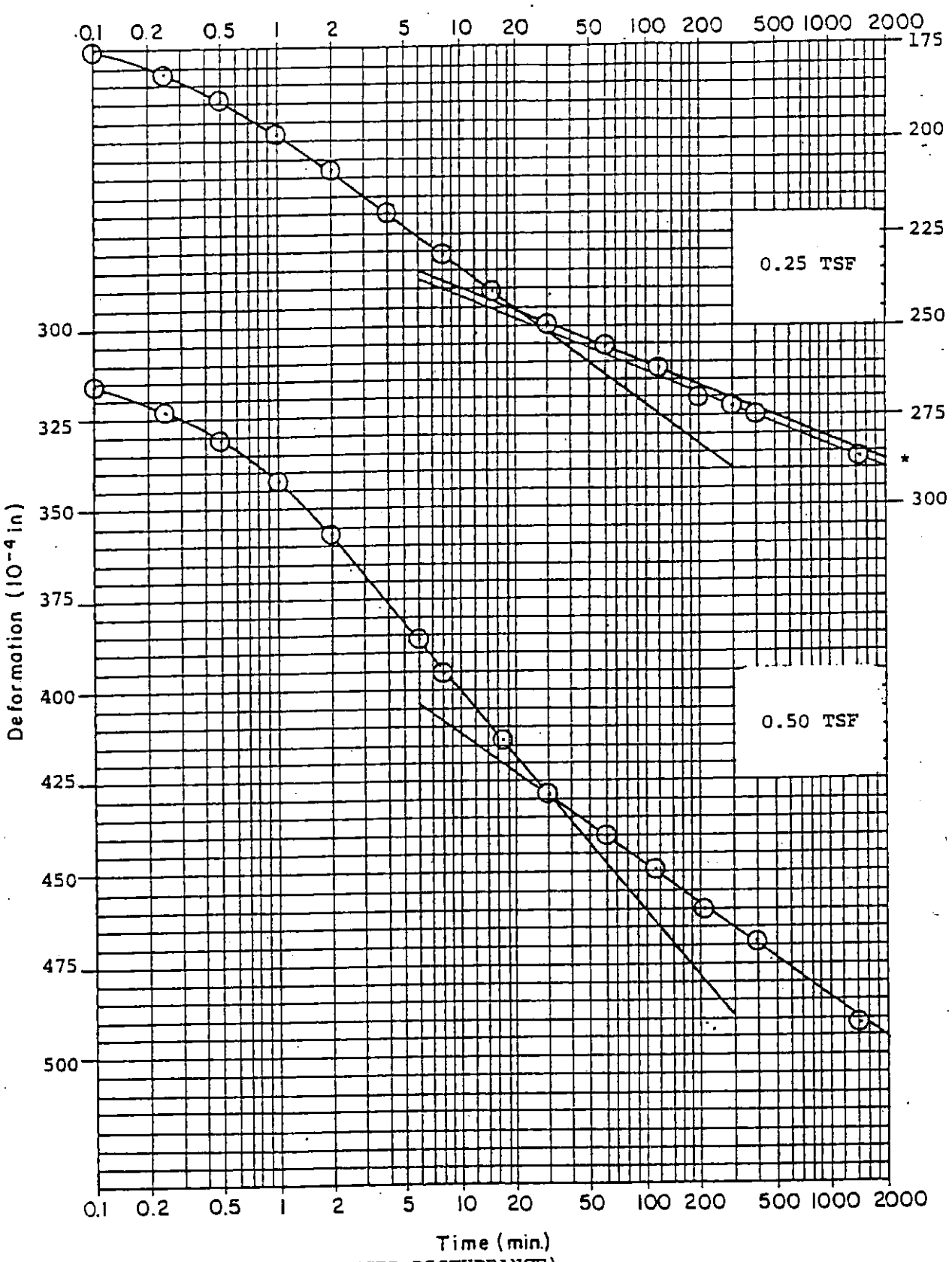
Project DSWA, PHASE IA Boring No GF-203

Sample No U-1 Depth 10.0' - 12.0' Date 7/19/90



Type of Specimen				Before Test			After Test	
Dia	2.50 in	H_T	1.0 in.	Water Content	w_o	116.62	w_f	94.5
Compression Index		C_c	1.2	Void Ratio	e_o	3.298	e_f	2.599
Classification	PT			Saturation	S_o	97.3	S_f	100
w_l	--	I_p	NP	Project	DSWA PHASE IA			
w_p	--	LI	--	Boring No	GF-203		Sample No	U-3
Remarks	WET DENSITY 86.5			Depth	30.0-32.0'		Date	8/90

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT



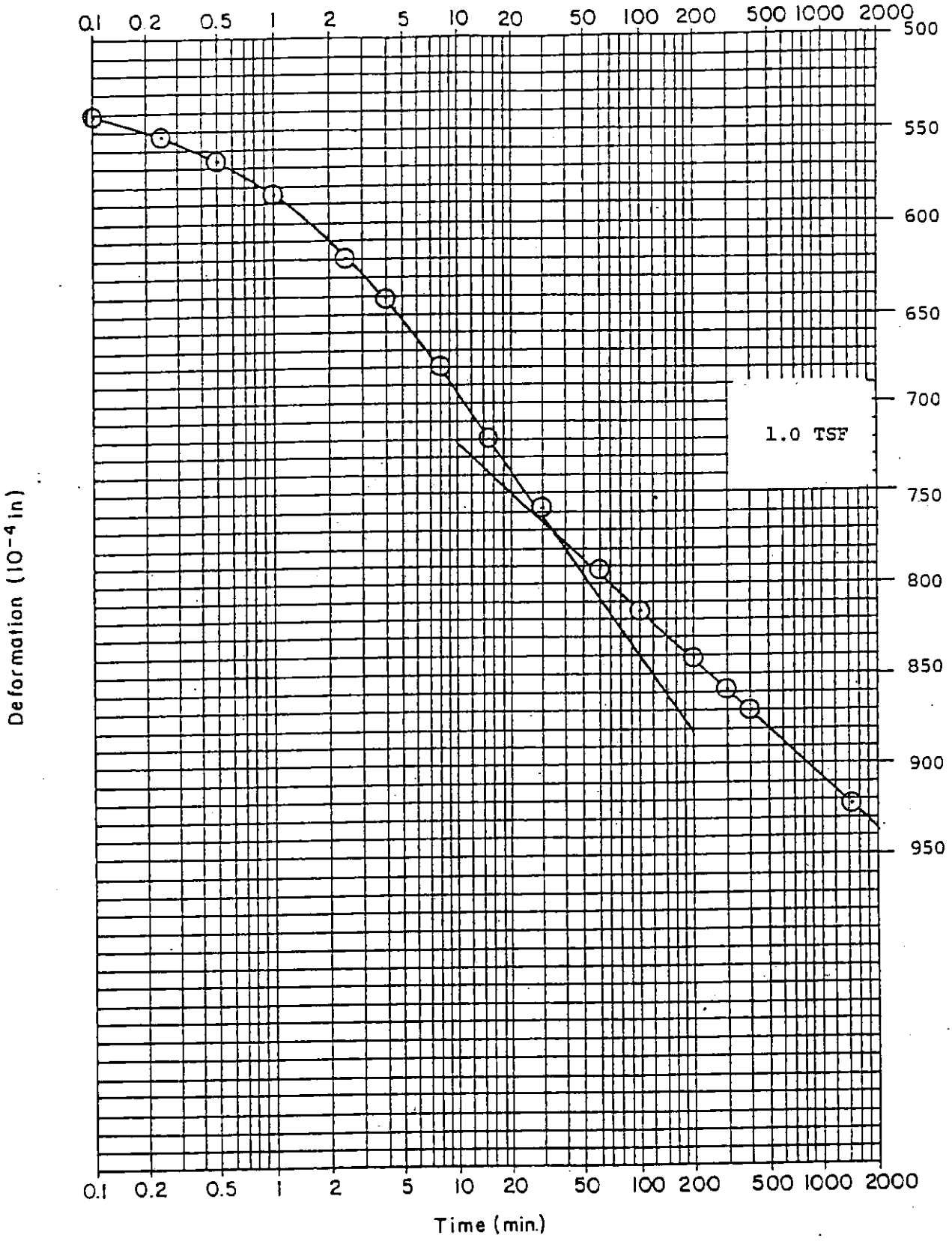
*(CORRECTION FOR CONSOLIDOMETER DISTURBANCE)

CONSOLIDATION TEST-TIME CURVES

Project DSWA, PHASE IA Boring No GF-203

Sample No U-3 Depth 30.0'- 32.0' Date 7/27/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

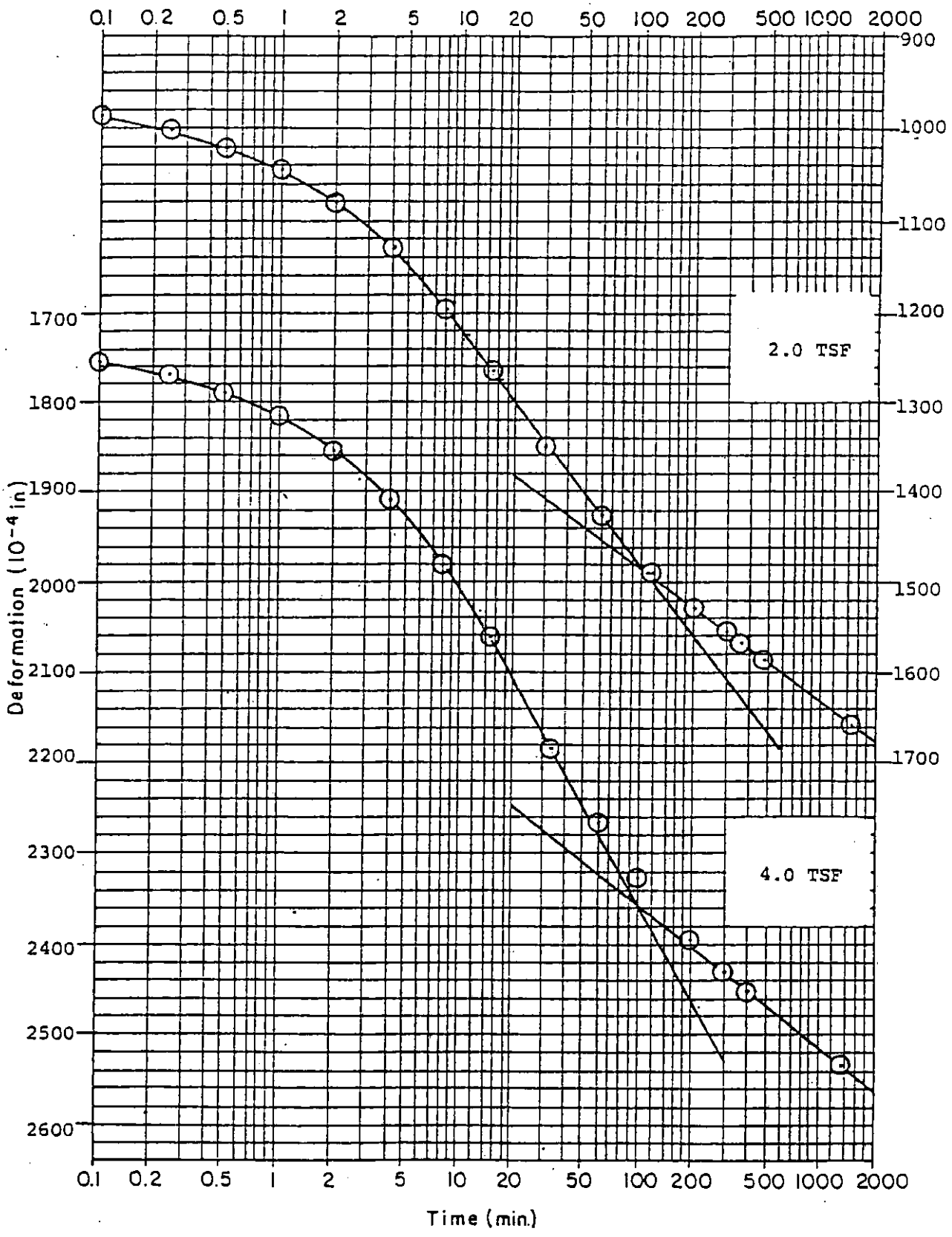


CONSOLIDATION TEST-TIME CURVES

Project DSWA, PHASE IA Boring No GF-203

Sample No U-3 Depth 30.0' - 32.0' Date 7/27/90

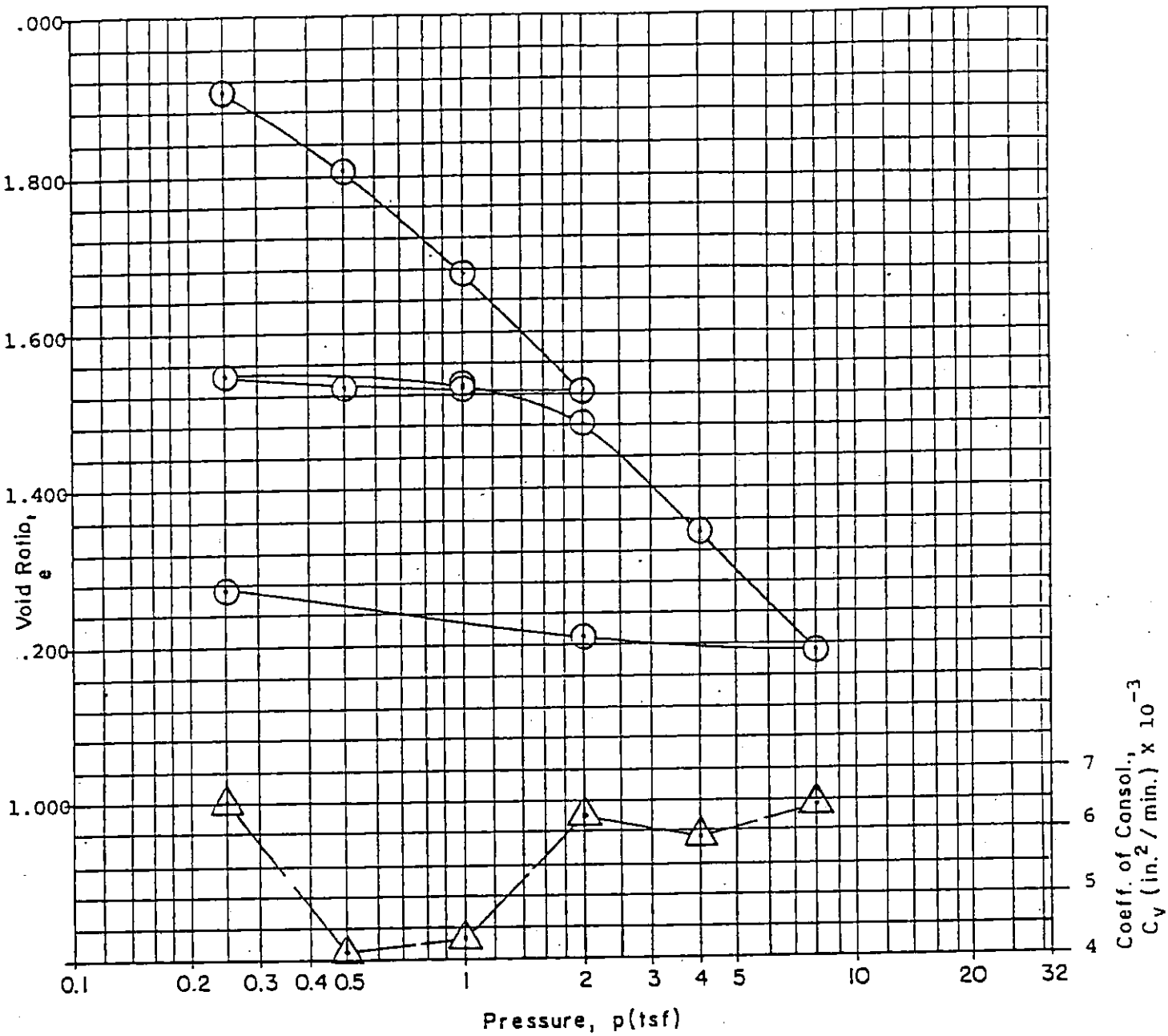
GANNETT FLEMING GEOTECHNICAL LABORATORY



CONSOLIDATION TEST-TIME CURVES

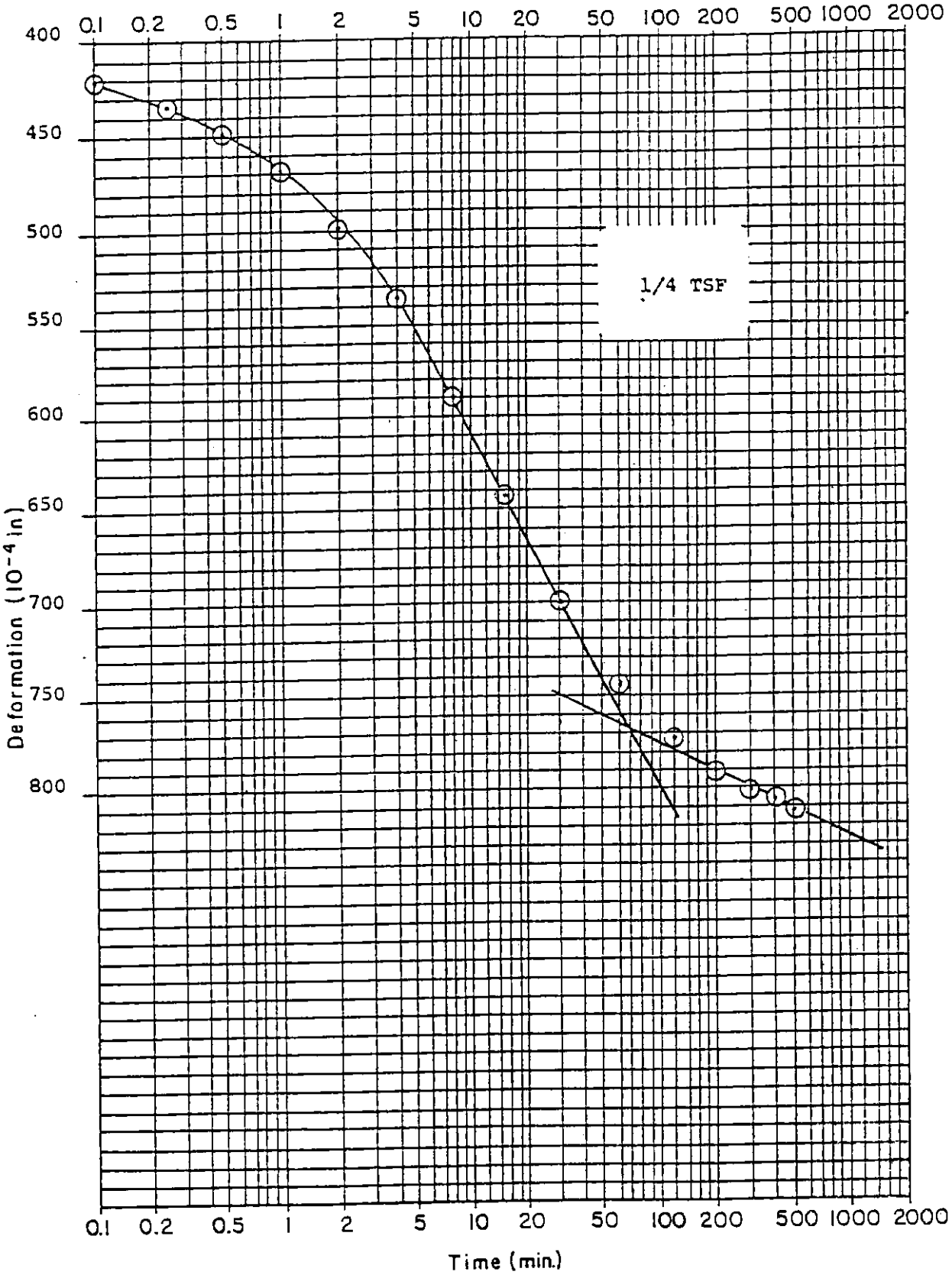
Project DSWA, PHASE IA Boring No GF-203

Sample No U-3 Depth 30.0' - 32.0' Date 7/27/90



Type of Specimen	Shelby			Before Test			After Test
Dia	2.50 in	H_T	0.75 in	Water Content	w_o	68.1	w_f 46.3
Compression Index		C_c	0.51	Void Ratio	e_o	2.058	e_f 1.274
Classification				Saturation	S_o	91.0	S_f 100
w_l		I_p		Project DSWA, PHASE IA			
w_p		LI		Boring No GF-209		Sample No U-1	
Remarks Wet density= 94.9pcf				Depth 42-44'		Date 7/90	

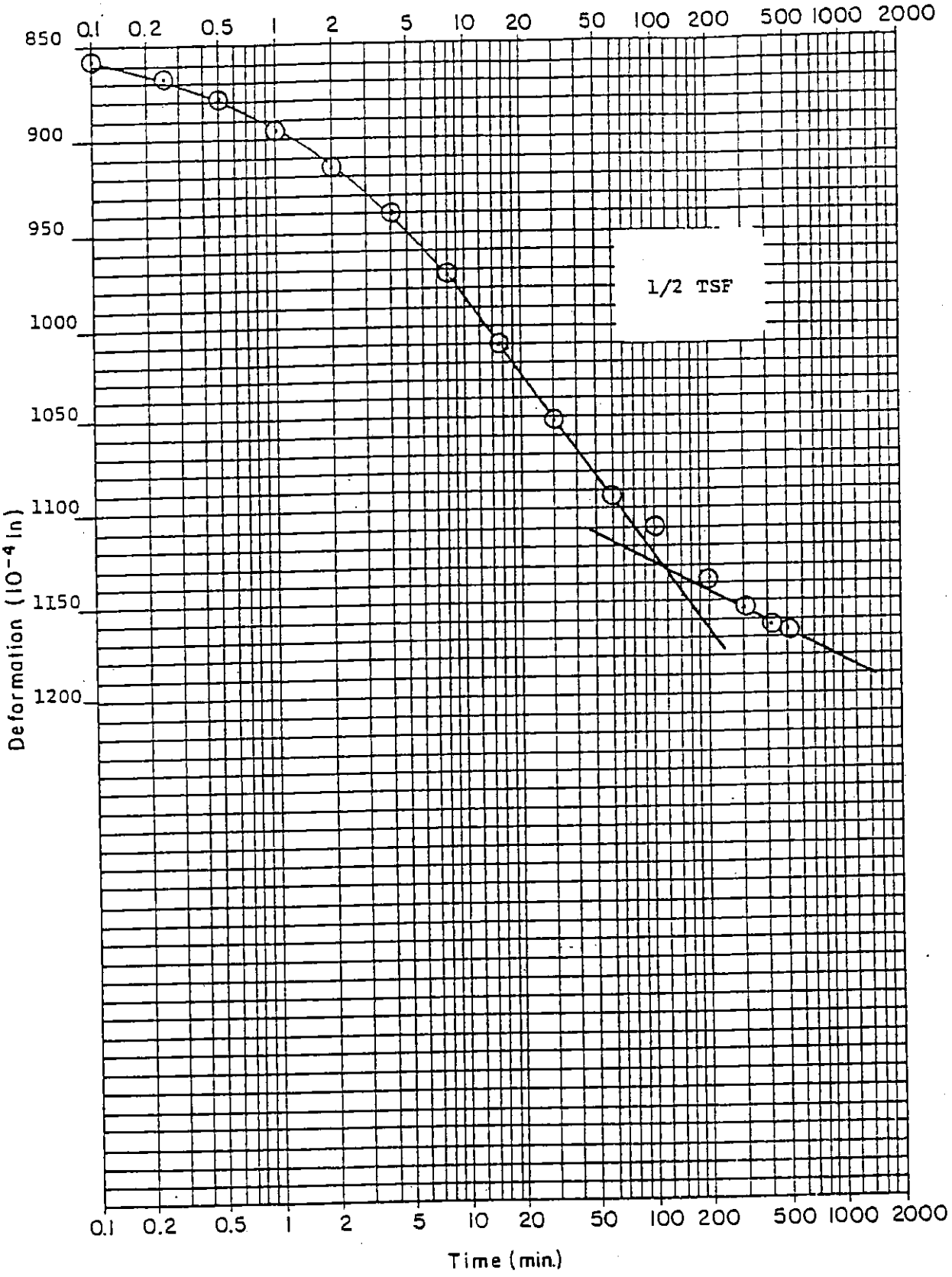
GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT



CONSOLIDATION TEST-TIME CURVES

Project DSWA Boring No GF-209

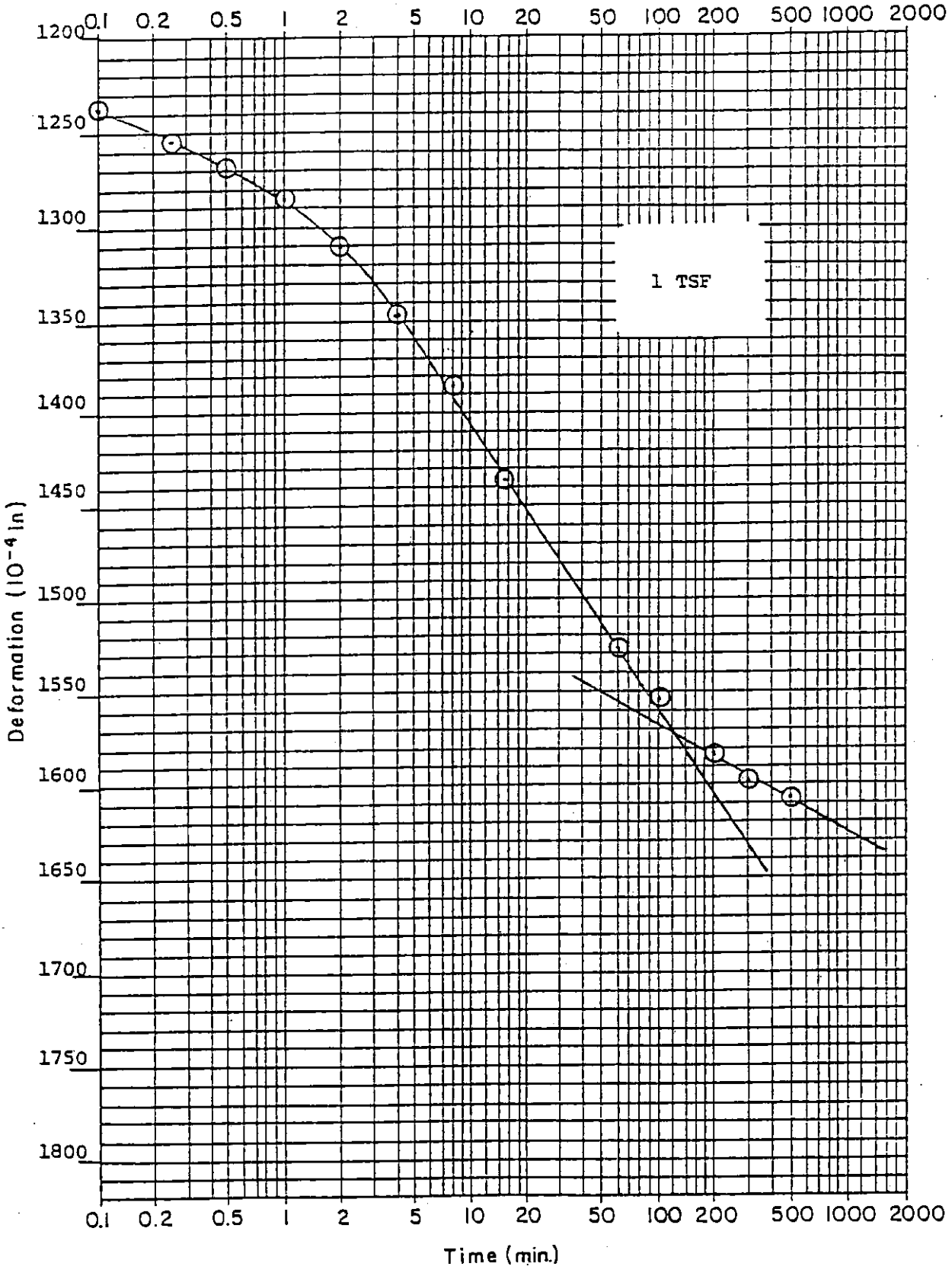
Sample No. U-1 Depth 42.0-44.0' Date 6/90



CONSOLIDATION TEST-TIME CURVES

Project DSWA Boring No GF-209

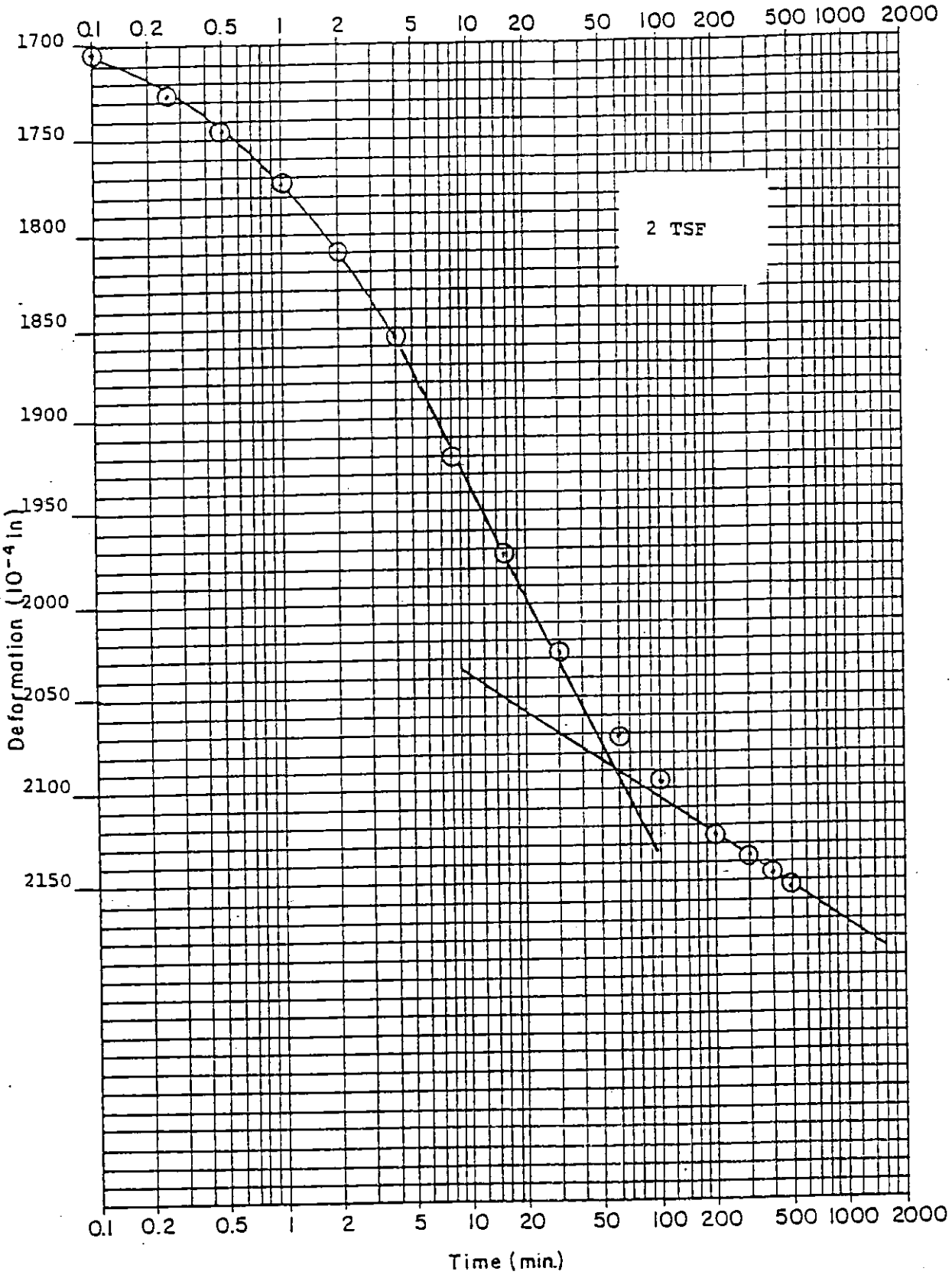
Sample No U-1 Depth 42.0-44.0' Date 6/90



CONSOLIDATION TEST-TIME CURVES

Project OSWA Boring No GF-209

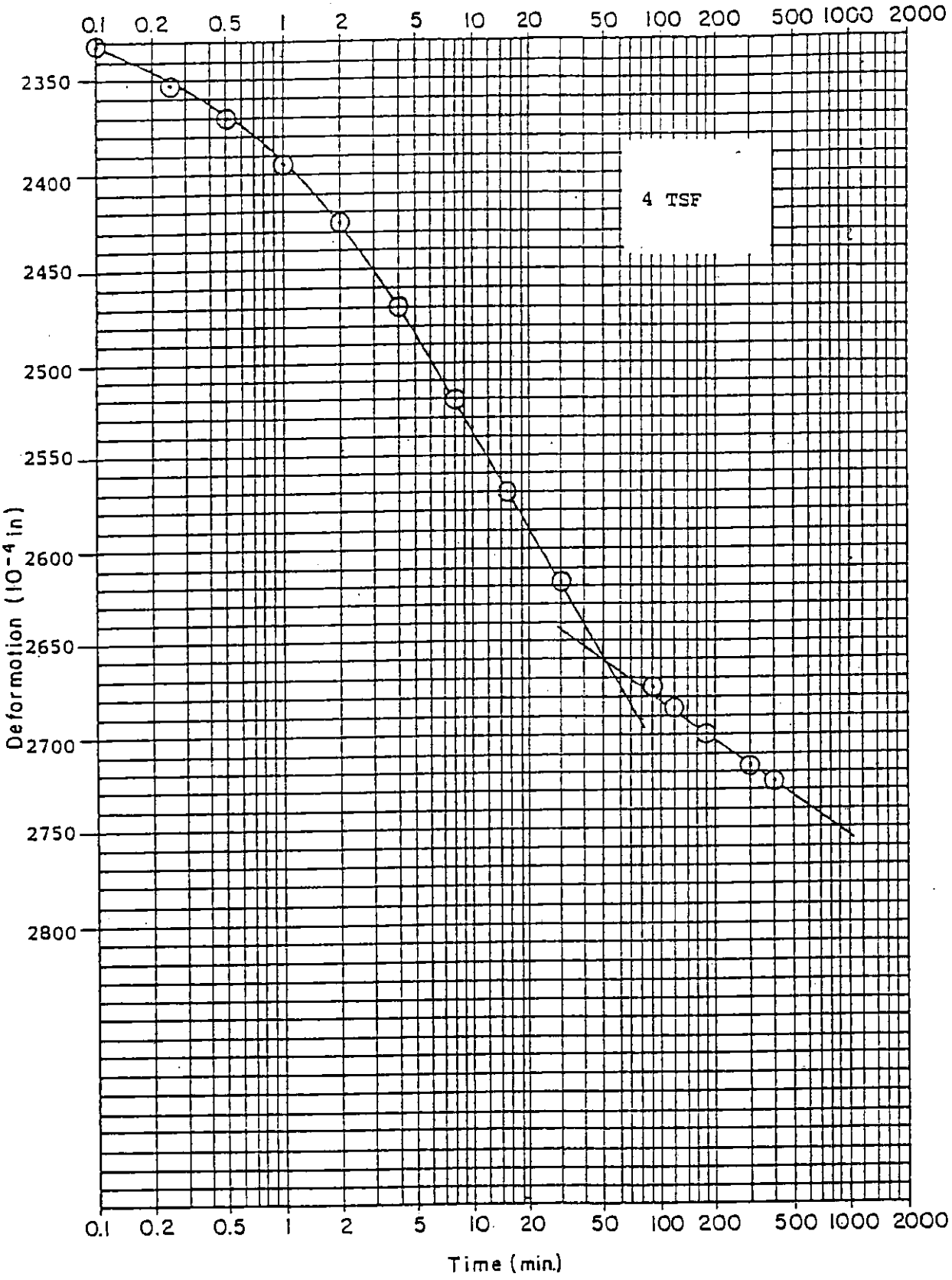
Sample No U-1 Depth 42.0-44.0' Date 6/90



CONSOLIDATION TEST-TIME CURVES

Project DSWA Boring No GF-209

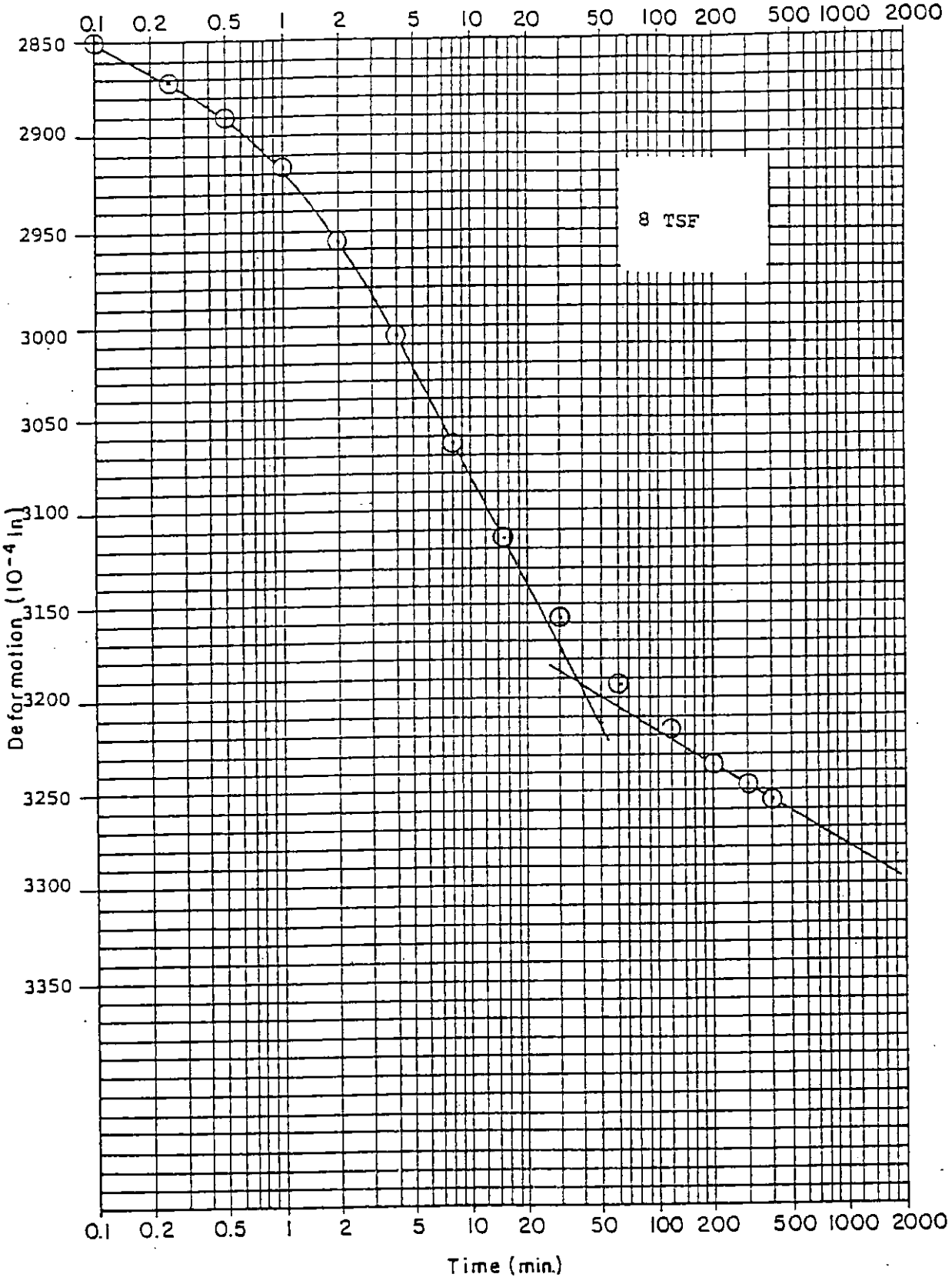
Sample No U-1 Depth 42.0+44.0' Date 6/90



CONSOLIDATION TEST-TIME CURVES

Project DSWA Boring No GF-209

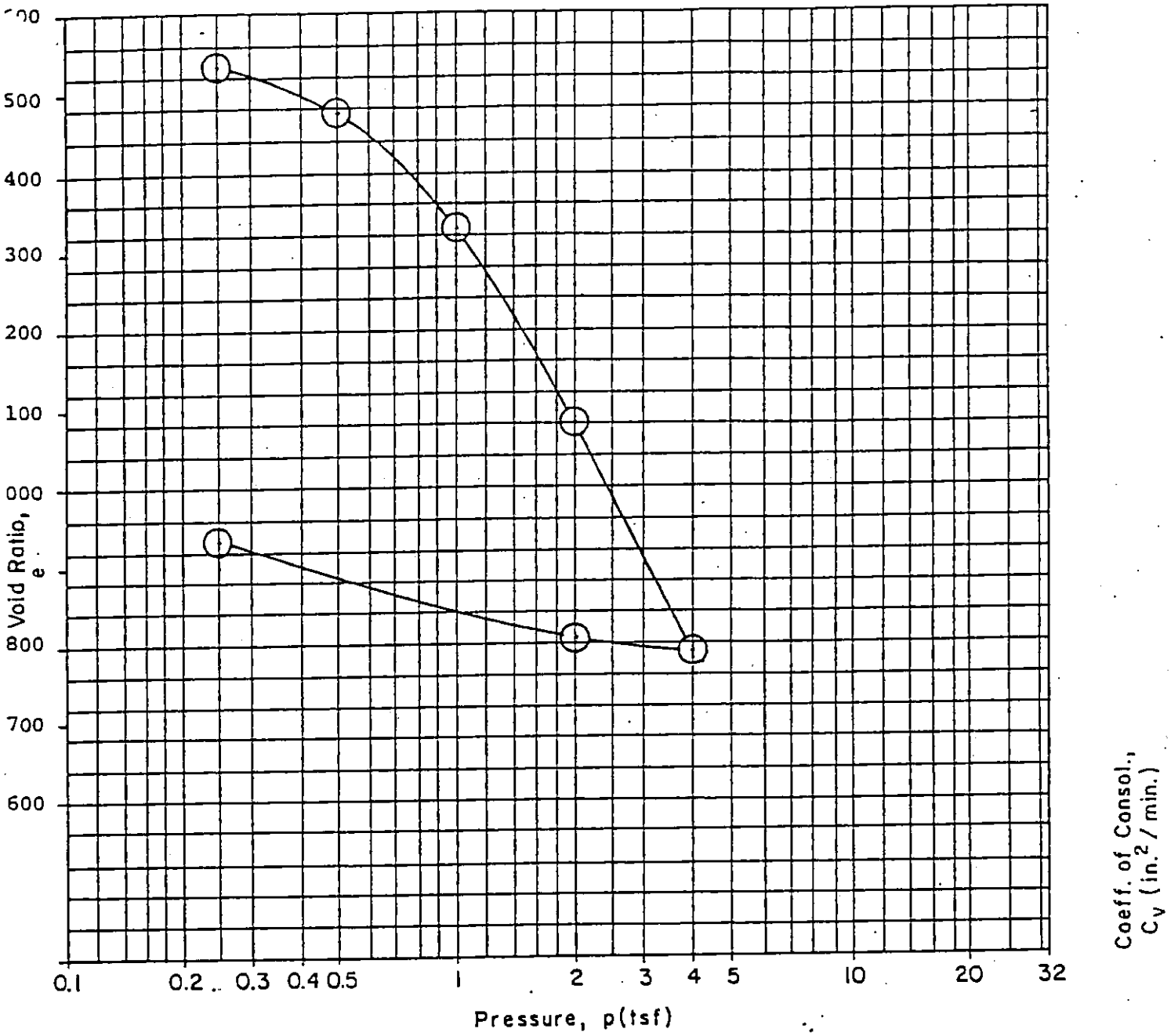
Sample No U-1 Depth 42-44' Date 7/90



CONSOLIDATION TEST-TIME CURVES

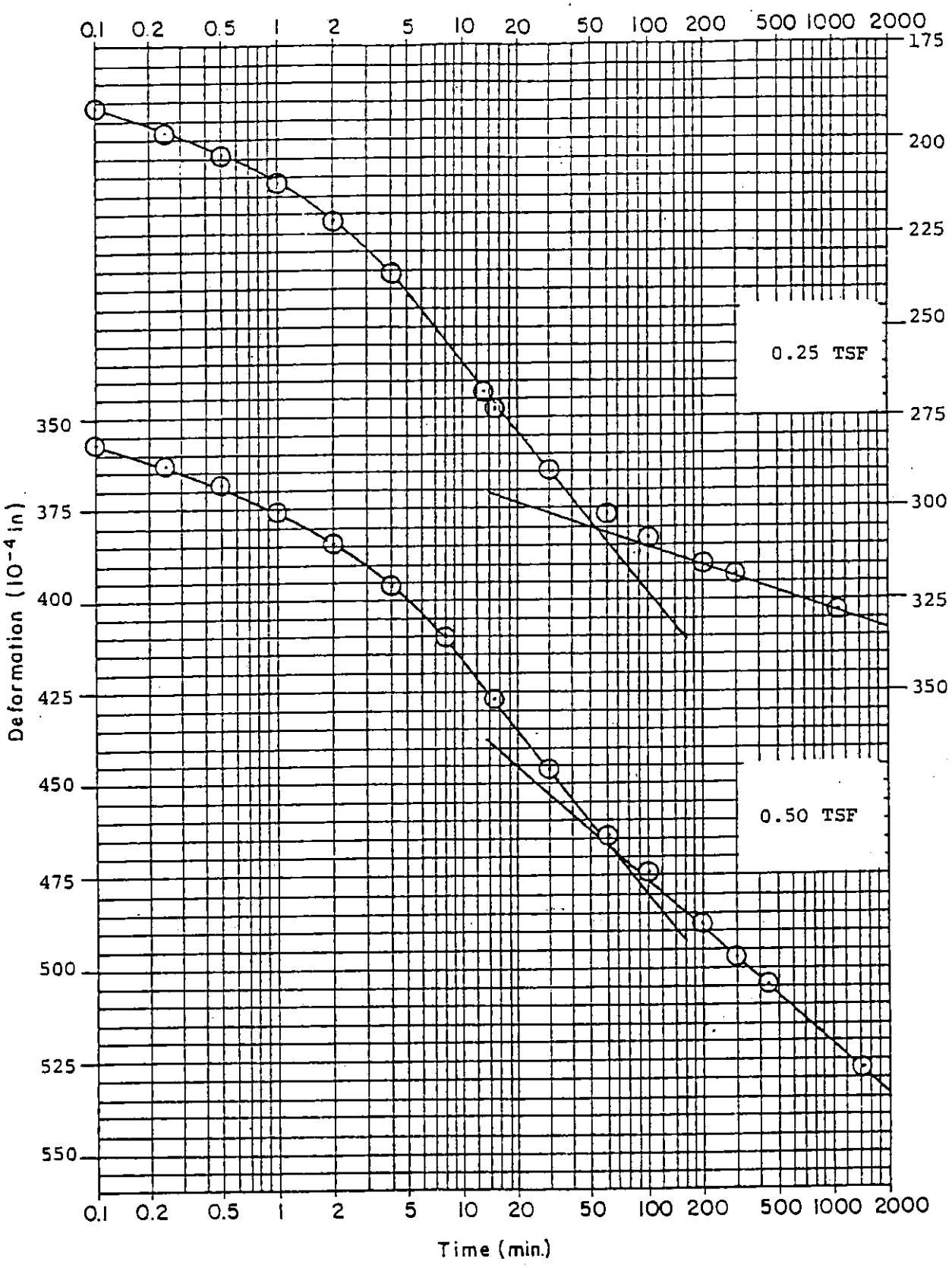
Project DSWA Boring No GF-209

Sample No U-1 Depth 42-44' Date 7/90



Type of Specimen				Before Test			After Test	
Dia	2.50 in	H_T	1.0in.	Water Content	w_o	86.19	w_f	70.4
Compression Index		C_c	0.97	Void Ratio	e_o	2.603	e_f	1.938
Classification	MH			Saturation	S_o	91.1	S_f	100
w_l 59.8		I_p	24.3	Project DSWA PHASE IA				
w_p 35.5		LI	2.1	Boring No GF-209			Sample No U-3	
Remarks WET DENSITY 88.8				Depth 49.0'-51.0'			Date 8/90	

GANNETT FLEMING GEOTECHNICAL LABORATORY
CONSOLIDATION TEST REPORT

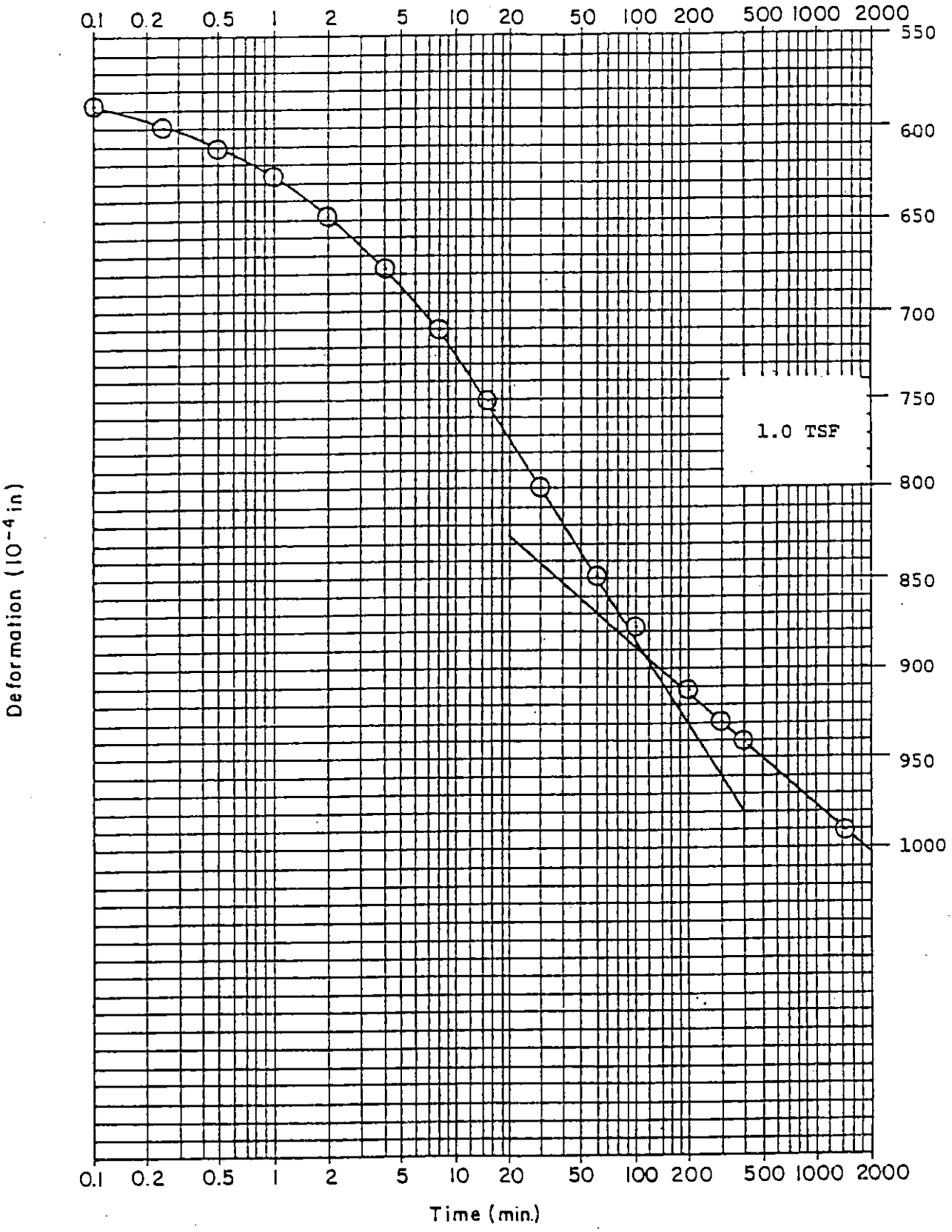


CONSOLIDATION TEST-TIME CURVES

Project DSWA, PHASE IA Boring No GF-209

Sample No U-3 Depth 49.0' - 51.0' Date 7/30/90

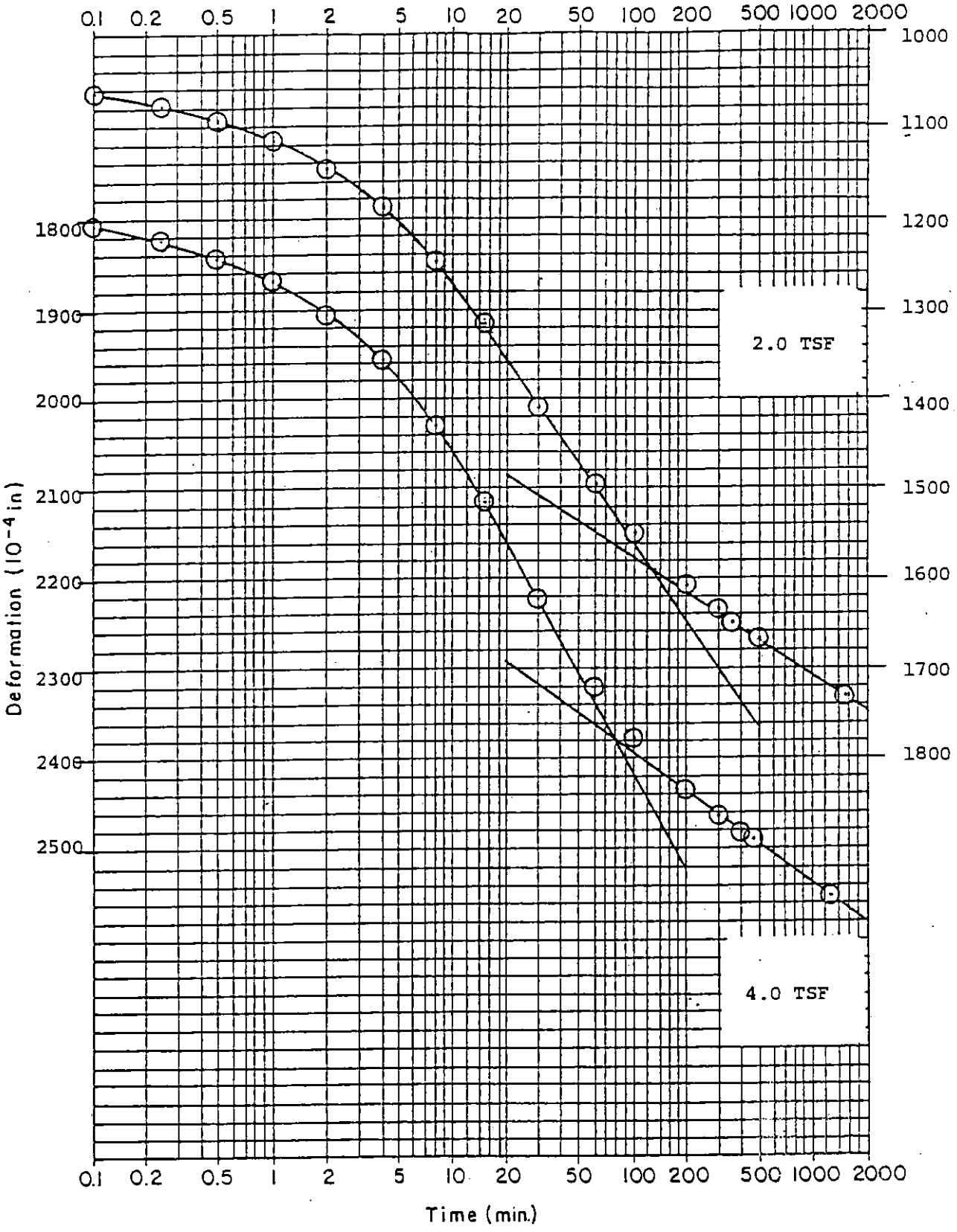
GANNETT FLEMING GEOTECHNICAL LABORATORY



CONSOLIDATION TEST-TIME CURVES

Project DSWA, PHASE IA Boring No GF-209

Sample No U-3 Depth 49.0' - 51.0' Date 7/30/90



CONSOLIDATION TEST-TIME CURVES

Project DSWA, PHASE IA Boring No GF-209

Sample No U-3 Depth 49.0' - 51.0' Date 7/30/90

GANNETT FLEMING GEOTECHNICAL LABORATORY

GANNETT FLEMING GEOTECHNICAL LABORATORY

CONSOLIDATION TEST REPORT

Coefficient of Consolidation, c_v

Project DSWA, PHASE IA Date 7/23/90

Boring	GF-203		
Sample	U-1		
Depth	10.0'-12.0'		
Load (tsf)			
¼	0.0092 (in^2/min)		
½	0.014 "		
1	0.0016 "		
2	0.0033 "		
4	0.003 "		
8			
16			
32			

GANNETT FLEMING GEOTECHNICAL LABORATORY

CONSOLIDATION TEST REPORT

Coefficient of Consolidation, c_v

Project DSWA PHASE IA Date 8/90

Boring	GF-203	GF-209	
Sample	U-3	U-3	
Depth	30.3'-32.0'	49.0'-51.0'	
Load (tsf)			
¼	.0278 (in^2/min)	.0082 (in^2/min)	
½	.0168	.0062	
1	.0106	.0040	
2	.0039	.0027	
4	.0026	.0028	
8			
16			
32			

ASTM D 2435 - ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS

PROJECT	DSWA	PROJECT SAMPLE I. D.	B2 ST3	
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	039	
JOB NUMBER	9205X005	CONSOLIDOM./RING #	1	3
ANALYST	RWF/WB	TEST PERIOD	05/27/92 to 06/27/92	

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen was cut from the 3" to 10" interval of a total 15" recovery as measured from the tube bottom; soil is a semi-cohesive dark brown sandy silt or clay

RING DIMENSIONS	
Ring Diameter, cm	6.340
Ring Height, cm	2.551
Ring Area, sq cm	31.57

SPECIMEN SET-UP DATA	
Specimen Height fromTop of Ring, cm	Initial
1	1.042
2	1.042
3	1.042
Average	1.042

Weights, g	Initial	Final
Specimen, Ring & Stone	209.00	192.30
Ring & Stone	145.75	145.75
Specimen	63.25	46.55

Moisture Content	Initial	Final
Pan Number	1	2
Wet Sample & Pan Wt, g	622.52	184.85
Dry Sample & Pan Wt, g	383.45	170.43
Pan Tare Wt, g	136.51	138.30
Moisture Content, % dry	96.8	44.9

Specific Gravity	
Flask #	1
Temperature, degrees F	23
Flask, Sample & Water Weight, g	404.96
Flask & Water Weight, g	370.28
Dish #	C
Dry Sample & Dish Weight,g	285.82
Dish Weight, g	229.55
Specific Gravity	2.60

NOTES

SPECIMEN DATA	Initial	Final
Wet Weight, grams	63.3	46.6
Dry Weight, grams	32.1	32.1
Diameter, cm	6.340	6.340
Total Height, cm	1.500	0.921
Solids Height, cm	0.991	0.991
Moisture Content, % Dry	96.8	44.9
Wet Unit Weight, pcf	82.8	127.5
Dry Unit Weight, pcf	42.1	87.8
Void Ratio	2.50	0.85
Degree of Saturation, %	96.3	116.6

CONSOLIDOMETER SET-UP DATA	
Overburden Soil Type	ML
Average Height Above Sample, feet	80
Average Wet Unit Weight, pcf	108
Overburden Stress, tsf	4.32
Rebound Stress, tsf	2.00

Load Increment Schedule		
Applied Stress	tsf	psi
Increment # 1	0.125	0.9
2	0.25	1.3
3	0.5	2.1
4	1	3.7
5	2	6.9
6	0.5	2.1
7	0.125	0.9
8	0.5	2.1
9	2	6.9
10	4	13.3
11	8	26.2
12	16	51.8
13	32	103.1
14		
15		
16		

ASTM D 2435 - ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS

PROJECT	DSWA	PROJECT SAMPLE I. D.	B2 ST3
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	039
JOB NUMBER	9205X005	CONSOLIDOMETER #	1
ANALYST	RWF/WB		

LOAD INCREMENT		1	TSF	PSI
Applied Load			0.062	0.7
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
06/01/92	9:10:00	0	3845	0
	9:10:06	0.1	3843	2
	9:10:15	0.25	3842	3
	9:10:30	0.5	3840	5
	9:11	1	3833	12
	9:12	2	3828	17
	9:14	4	3820	25
	9:18	8	3814	31
	9:25	15	3810	35
	9:40	30	3803	42
	10:10	60	3799	46
	11:10	120	3795	50
	13:10	240	3790	55
	17:10	480	3786	59
06/02/92	8:46	1416	3775	70
		4.9E+07		3845

LOAD INCREMENT		2	TSF	PSI
Applied Load			0.250	1.3
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
06/02/92	9:00:00	0	3775	70
	9:00:06	0.1	3735	110
	9:00:15	0.25	3730	115
	9:00:30	0.5	3714	131
	9:01	1	3709	136
	9:02	2	3695	150
	9:04	4	3657	188
	9:08	8	3630	215
	9:15	15	3612	233
	9:30	30	3598	247
	10:00	60	3582	263
	11:00	120	3569	276
	13:00	240	3558	287
	17:00	480	3546	299
06/03/92	8:22	1402	3524	321
		4.9E+07		3845

LOAD INCREMENT		3	TSF	PSI
Applied Load			0.499	2.1
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation inches
06/03/92	8:30:00	0	3524	321
	8:30:06	0.1	3472	373
	8:30:15	0.25	3465	380
	8:30:30	0.5	3459	386
	8:31	1	3455	390
	8:32	2	3435	410
	8:34	4	3425	420
	8:38	8	3418	427
	8:45	15	3384	461
	9:00	30	3336	509
	9:30	60	3313	532
	10:30	120	3285	560
	12:30	240	3267	578
	16:30	480	3247	598
06/04/92	8:08	1418	3215	630
		4.9E+07		3845

LOAD INCREMENT		4	TSF	PSI
Applied Load			0.998	3.7
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation inches
06/04/92	8:15:00	0	3215	630
	8:15:06	0.1	3165	680
	8:15:15	0.25	3158	687
	8:15:30	0.5	3150	695
	8:16	1	3140	705
	8:17	2	3130	715
	8:19	4	3086	759
	8:23	8	3040	805
	8:30	15	2973	872
	8:45	30	2940	905
	9:15	60	2915	930
	10:15	120	2885	960
	12:15	240	2840	1005
	16:15	480	2821	1024
06/05/92	8:38	1463	2784	1061
		4.9E+07		3845

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 2435 - ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS

PROJECT	DSWA	PROJECT SAMPLE I.D.	B2 ST3
W.O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	039
JOB NUMBER	9205X005	CONSOLIDOMETER #	1
ANALYST	RWF/WB		

LOAD INCREMENT	5	TSF	PSI
Applied Load		1.000	6.9

Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
06/05/92	8:45:00	0	2704	1061
	8:45:06	0.1	2748	1067
	8:45:15	0.25	2725	1120
	8:45:30	0.5	2709	1136
	8:46	1	2680	1157
	8:47	2	2650	1186
	8:49	4	2614	1201
	8:53	8	2563	1362
	9:00	15	2516	1329
	9:15	30	2471	1374
	9:45	60	2434	1421
	10:45	120	2392	1453
	12:45	240	2362	1483
	16:45	480	2333	1512
06/06/92	11:13	1530	2291	1554
06/08/92	7:57	4272	2250	1595

LOAD INCREMENT	6	TSF	PSI
Applied Load		0.400	2.1

Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
06/08/92	9:30:00	0	2259	1580
	9:30:06	0.1	2272	1573
	9:30:15	0.25	2281	1564
	9:30:30	0.5	2297	1548
	9:31	1	2304	1541
	9:32	2	2314	1531
	9:34	4	2325	1520
	9:38	8	2336	1509
	9:45	15	2347	1498
	10:00	30	2349	1497
	10:30	60	2352	1493
	11:30	120	2357	1488
	13:30	240	2361	1484
	17:30	480		3845
		4.9E+07		3845
		4.9E+07		3845

LOAD INCREMENT	7	TSF	PSI
Applied Load		0.062	0.7

Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation inches
06/08/92	13:30:00	0	2361	1484
	13:30:06	0.1	2380	1465
	13:30:15	0.25	2388	1457
	13:30:30	0.5	2396	1449
	13:31	1	2404	1441
	13:32	2	2419	1426
	13:34	4	2441	1404
	13:38	8	2471	1374
	13:45	15	2508	1337
	14:00	30	2551	1294
	14:30	60	2590	1255
	15:30	120	2620	1225
	17:30	240	2660	1185
	21:30	480	2660	1185
06/09/92	8:42	1152	2704	1141
		4.0E+07		3845

LOAD INCREMENT	8	TSF	PSI
Applied Load		0.400	2.1

Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
06/09/92	8:45:00	0	2704	1141
	8:45:06	0.1	2672	1173
	8:45:15	0.25	2664	1181
	8:45:30	0.5	2656	1189
	8:46	1	2649	1196
	8:47	2	2622	1223
	8:49	4	2593	1252
	8:53	8	2558	1287
	9:00	15	2547	1298
	9:15	30	2537	1314
	9:45	60	2496	1349
	10:45	120	2450	1355
	12:45	240		3845
	16:45	480		3845
		4.9E+07		3845
		4.9E+07		3845

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 2435 - ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS

PROJECT	DSWA	PROJECT SAMPLE I. D.	B2 ST3
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	039
JOB NUMBER	9205X005	CONSOLIDOMETER #	1
ANALYST	RWF/WB		

LOAD INCREMENT		9	TSF	PSI
Applied Load			1.996	6.9
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
06/09/92	11:00:00	0	2490	1355
	11:00:06	0.1	2442	1403
	11:00:15	0.25	2427	1418
	11:00:30	0.5	2408	1437
	11:01	1	2382	1463
	11:02	2	2347	1498
	11:04	4	2322	1523
	11:08	8	2271	1574
	11:15	15	2245	1600
	11:30	30	2229	1616
	12:00	60	2217	1628
	13:00	120	2205	1640
	15:00	240	2197	1648
	19:00	480		3845
		4.9E+07		3845
		4.9E+07		3845

LOAD INCREMENT		10	TSF	PSI
Applied Load			4.024	13.4
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
06/09/92	8:45:00	0	2197	1648
	8:45:06	0.1	2146	1699
	8:45:15	0.25	2139	1710
	8:45:30	0.5	2122	1726
	8:46	1	2108	1737
	8:47	2	2077	1768
	8:49	4	2049	1802
	8:53	8	2004	1841
	9:00	15	1970	1875
	9:15	30	1944	1901
	9:45	60	1915	1930
	10:45	120	1895	1950
	12:45	240	1880	1965
	16:45	480	1865	1980
06/10/92	8:07	1402	1844	2001
		4.9E+07		3845

LOAD INCREMENT		11	TSF	PSI
Applied Load			8.018	26.2
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation inches
06/11/92	8:35:00	0	1844	2001
	8:35:06	0.1	1809	2036
	8:35:15	0.25	1796	2049
	8:35:30	0.5	1781	2064
	8:36	1	1758	2087
	8:37	2	1727	2118
	8:39	4	1687	2158
	8:43	8	1645	2200
	8:50	15	1601	2244
	9:05	30	1565	2280
	9:35	60	1545	2300
	10:35	120	1514	2331
	12:35	240	1502	2343
	16:35	480	1457	2388
06/12/92	8:42	1447	1457	2388
		4.9E+07		3845

LOAD INCREMENT		12	TSF	PSI
Applied Load			16.063	52.0
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation inches
06/12/92	9:20:00	0	1457	2388
	9:20:06	0.1	1400	2445
	9:20:15	0.25	1387	2458
	9:20:30	0.5	1370	2475
	9:21	1	1349	2496
	9:22	2	1318	2529
	9:24	4	1278	2567
	9:28	8	1235	2610
	9:35	15	1201	2644
	9:50	30	1170	2675
	10:20	60	1143	2702
	11:20	120	1137	2708
	13:20	240	1125	2720
	17:20	480	1100	2745
06/13/92	9:45	1485	1075	2770
06/15/92	9:25	4325	1053	2792

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 2435 - ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS

PROJECT	DSWA	PROJECT SAMPLE I. D.	B2 ST3
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	039
JOB NUMBER	9205X005	CONSOLIDOMETER #	1
ANALYST	RWF/WB		

LOAD INCREMENT	13	TSF	PSI
Applied Load		32.000	103.4
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
06/15/92	9:25:00	0	1053	2752
	9:25:06	0.1	1013	2852
	9:25:15	0.25	999	2886
	9:25:30	0.5	988	2858
	9:26	1	968	2879
	9:27	2	940	2905
	9:29	4	910	2935
	9:33	8	879	2966
	9:40	15	852	2993
	9:55	30	831	3014
	10:25	60	810	3035
	11:25	120	795	3050
	13:25	240	782	3063
	17:25	480	770	3075
06/16/92	8:25	1080	752	3093
		4.5E+07		3845

LOAD INCREMENT	14	TSF	PSI
Applied Load		0.156	
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
		0		3845
	0:00:06	0.1		3845
	0:00:15	0.25		3845
	0:00:30	0.5		3845
	0:01	1		3845
	0:02	2		3845
	0:04	4		3845
	0:08	8		3845
	0:15	15		3845
	0:30	30		3845
	1:00	60		3845
	2:00	120		3845
	4:00	240		3845
	8:00	480		3845
		0		3845
		0		3845

LOAD INCREMENT	15	TSF	PSI
Applied Load		0.156	
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation inches
		0		3845
	0:00:06	0.1		3845
	0:00:15	0.25		3845
	0:00:30	0.5		3845
	0:01	1		3845
	0:02	2		3845
	0:04	4		3845
	0:08	8		3845
	0:15	15		3845
	0:30	30		3845
	1:00	60		3845
	2:00	120		3845
	4:00	240		3845
	8:00	480		3845
		0		3845
		0		3845

LOAD INCREMENT	16	TSF	PSI
Applied Load		0.156	
Date	Time 24 HR	Elapsed Time min.	Dial Reading 10E-4 in.	Deformation 10E-4 in.
		0		3845
	0:00:06	0.1		3845
	0:00:15	0.25		3845
	0:00:30	0.5		3845
	0:01	1		3845
	0:02	2		3845
	0:04	4		3845
	0:08	8		3845
	0:15	15		3845
	0:30	30		3845
	1:00	60		3845
	2:00	120		3845
	4:00	240		3845
	8:00	480		3845
		0		3845
		0		3845

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 2435 - ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS

PROJECT	DSWA	PROJECT SAMPLE I. D.	B2 ST3
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	39
JOB NUMBER	9205X005	TEST PERIOD	05/27/92 to 06/27/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen was cut from the 3" to 10" interval of a total 15" recovery as measured from the tube bottom; soil is a semi-cohesive dark brown sandy silt or clay

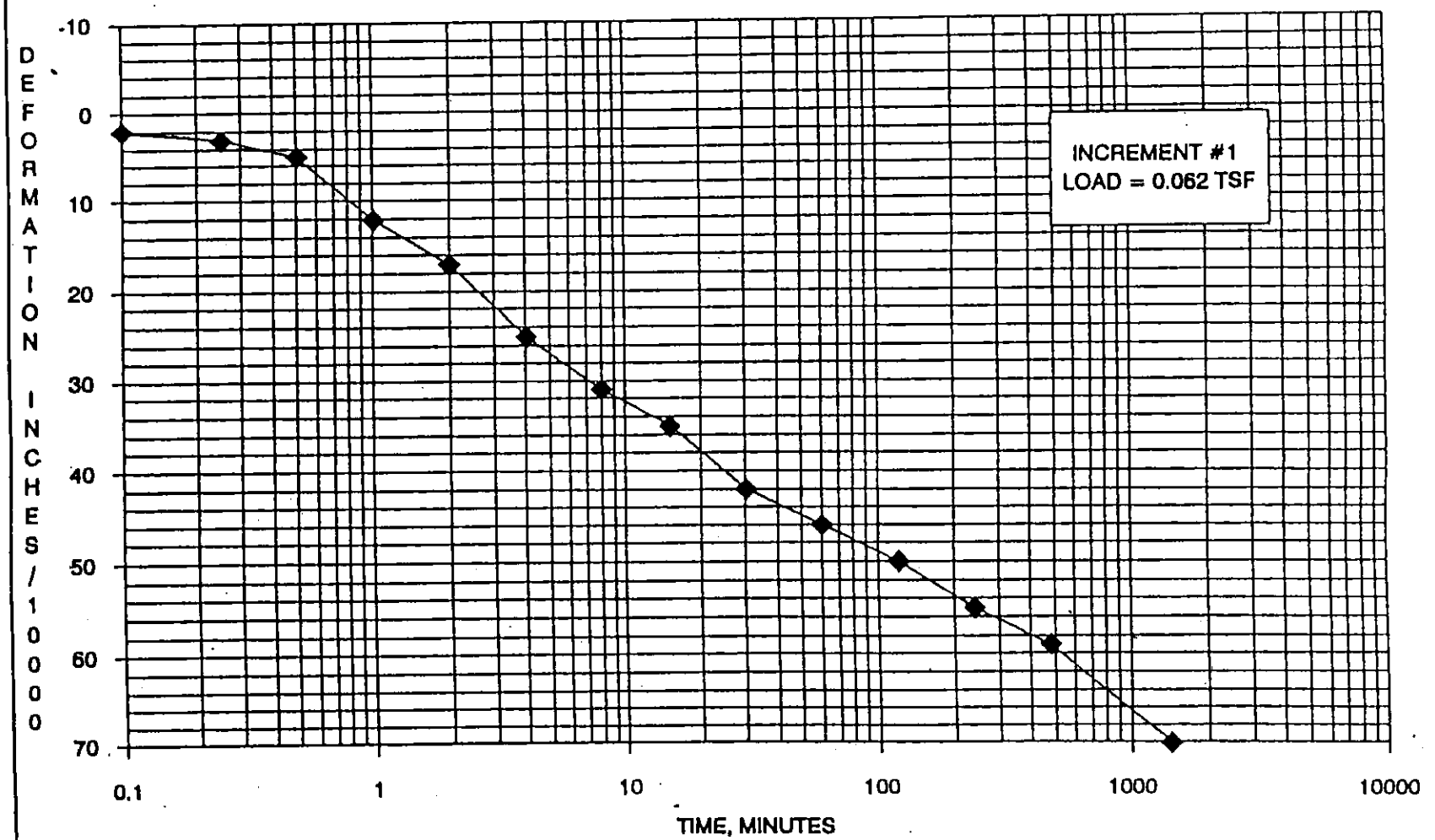
SPECIMEN DATA	Initial	Final
Wet Weight, grams	63.3	46.6
Dry Weight, grams	32.1	32.1
Diameter, cm	6.340	6.340
Total Height, cm	1.509	0.723
Solids Height, cm	0.391	0.391
Moisture Content, % dry	96.8	44.9
Wet Unit Weight, pcf	82.8	127.2
Dry Unit Weight, pcf	42.1	87.8
Void Ratio	2.861	0.851
Degree of Saturation, %	88.3	116.5

Load Increment	Effective Stress tsf	Height Change 10E-4 in.	Height Inches (Hf)	% Strain (Ef)	Void Ratio (ef)
Initial	0	0	0.594	0.0	2.861
1	0.062	70	0.587	1.2	2.815
2	0.250	321	0.562	5.4	2.652
3	0.499	630	0.531	10.6	2.451
4	0.998	1061	0.488	17.9	2.171
5	1.996	1586	0.435	26.7	1.830
6	0.499	1586	0.435	26.7	1.830
7	0.062	1484	0.446	25.0	1.896
8	0.499	1355	0.459	22.8	1.980
9	1.996	1648	0.429	27.7	1.790
10	4.024	2001	0.394	33.7	1.560
11	8.016	2388	0.355	40.2	1.309
12	16.063	2792	0.315	47.0	1.046
13	32.095	3093	0.285	52.1	0.851

Load Increment	Effective Stress tsf	Time minutes		Specimen Height inches		Strain %		Void Ratio		Cv cm2/min
		t50	t100	H50	H100	E50	E100	e50	e100	
1	0.062	4.5	90.0	1.503	1.497	0.4	0.8	2.845	2.829	0.0989
2	0.250	3.6	60.0	1.465	1.442	2.9	4.4	2.748	2.691	0.1175
3	0.499	10.6	91.0	1.393	1.368	7.7	9.3	2.564	2.501	0.0361
4	0.998	9.2	100.0	1.302	1.261	13.7	16.4	2.333	2.227	0.0363
5	1.996	7.4	93.0	1.186	1.137	21.4	24.6	2.033	1.909	0.0374
10	4.024	4.0	43.0	1.051	1.018	30.3	32.5	1.690	1.605	0.0544
11	8.016	5.5	95.0	0.957	0.918	36.6	39.2	1.450	1.349	0.0328
12	16.063	4.0	90.0	0.858	0.822	43.2	45.5	1.195	1.104	0.0362
13	32.095	3.7	85.0	0.764	0.736	49.4	51.2	0.955	0.883	0.0311

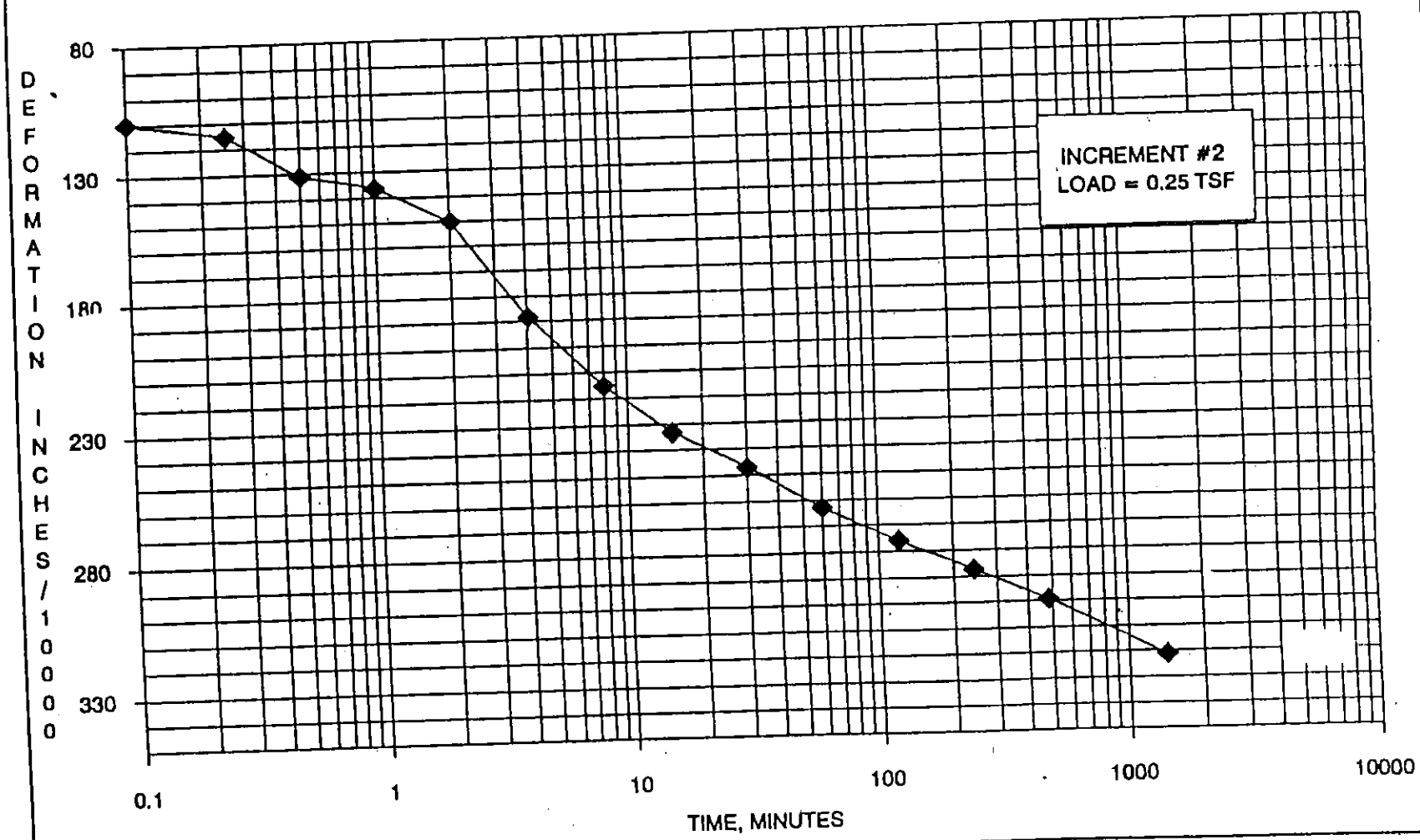
DEFORMATION VERSUS TIME

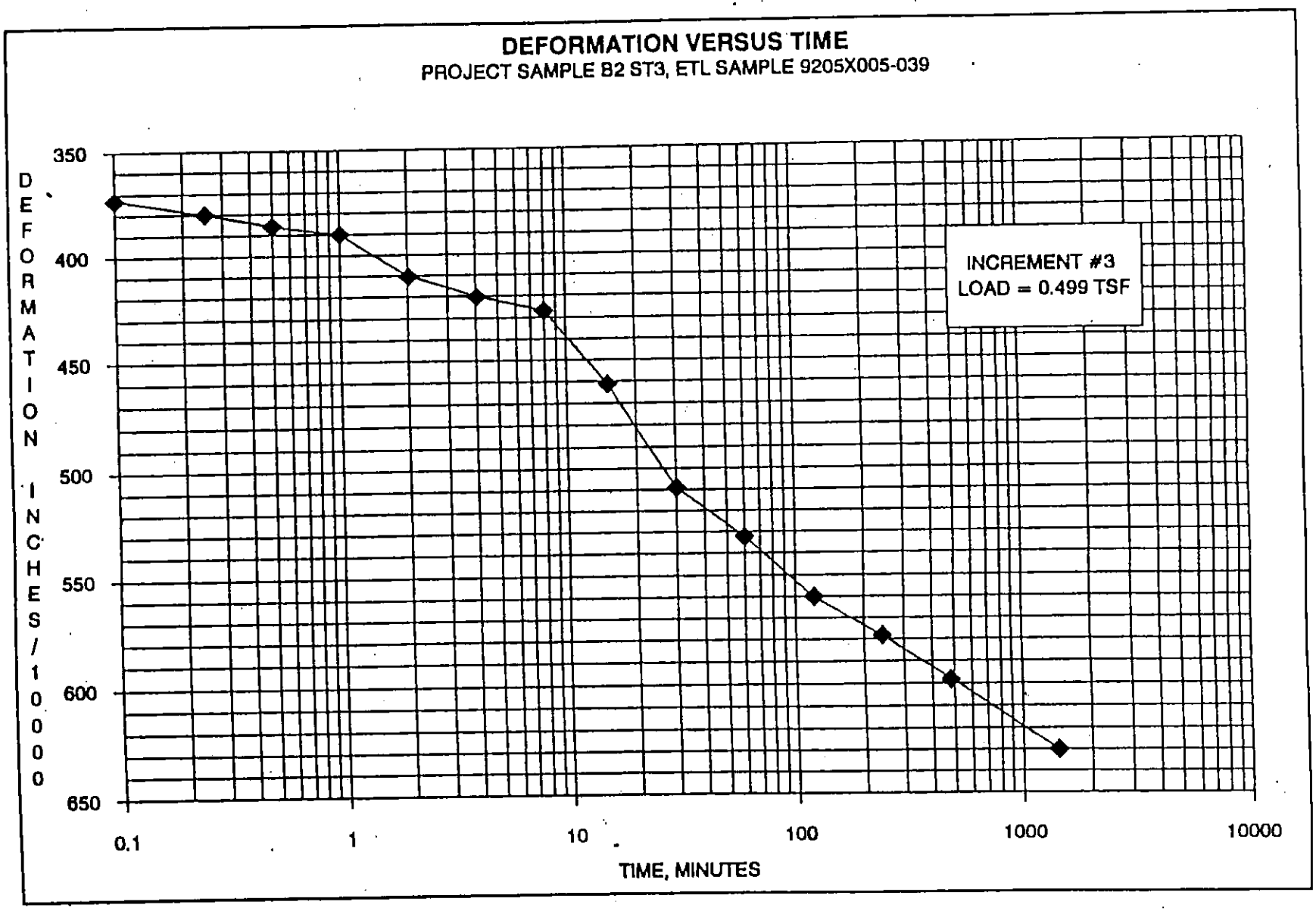
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039

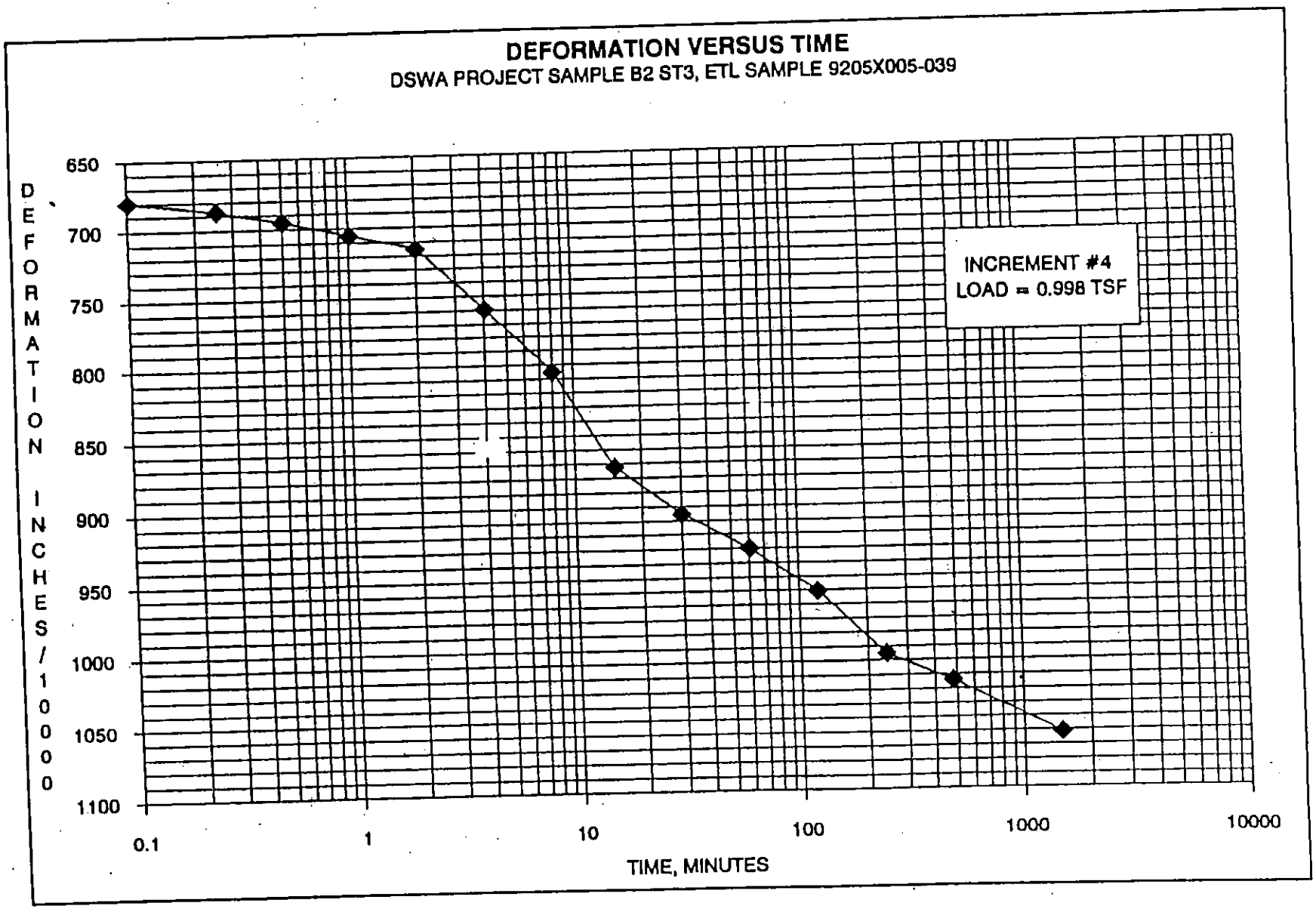


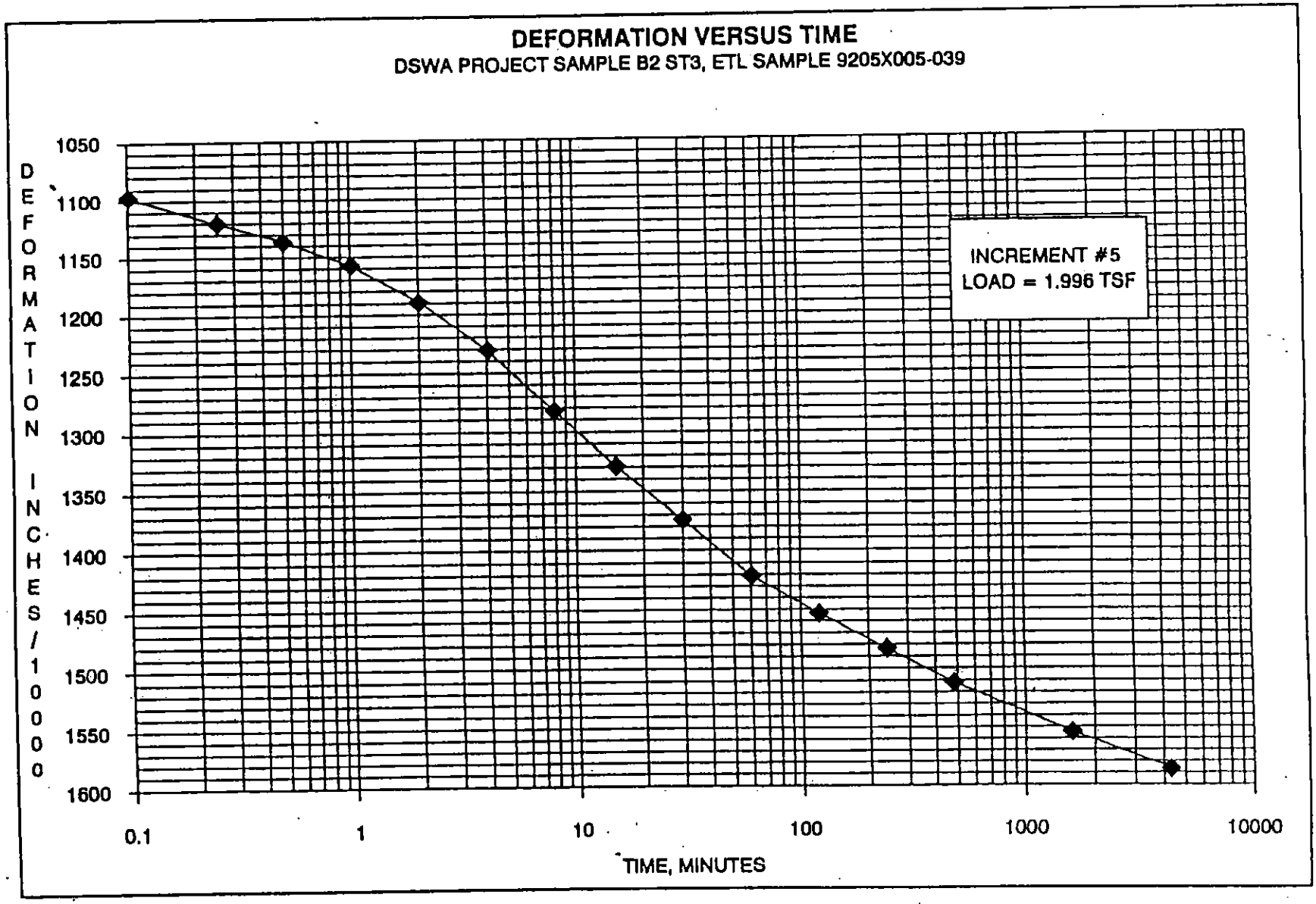
DEFORMATION VERSUS TIME

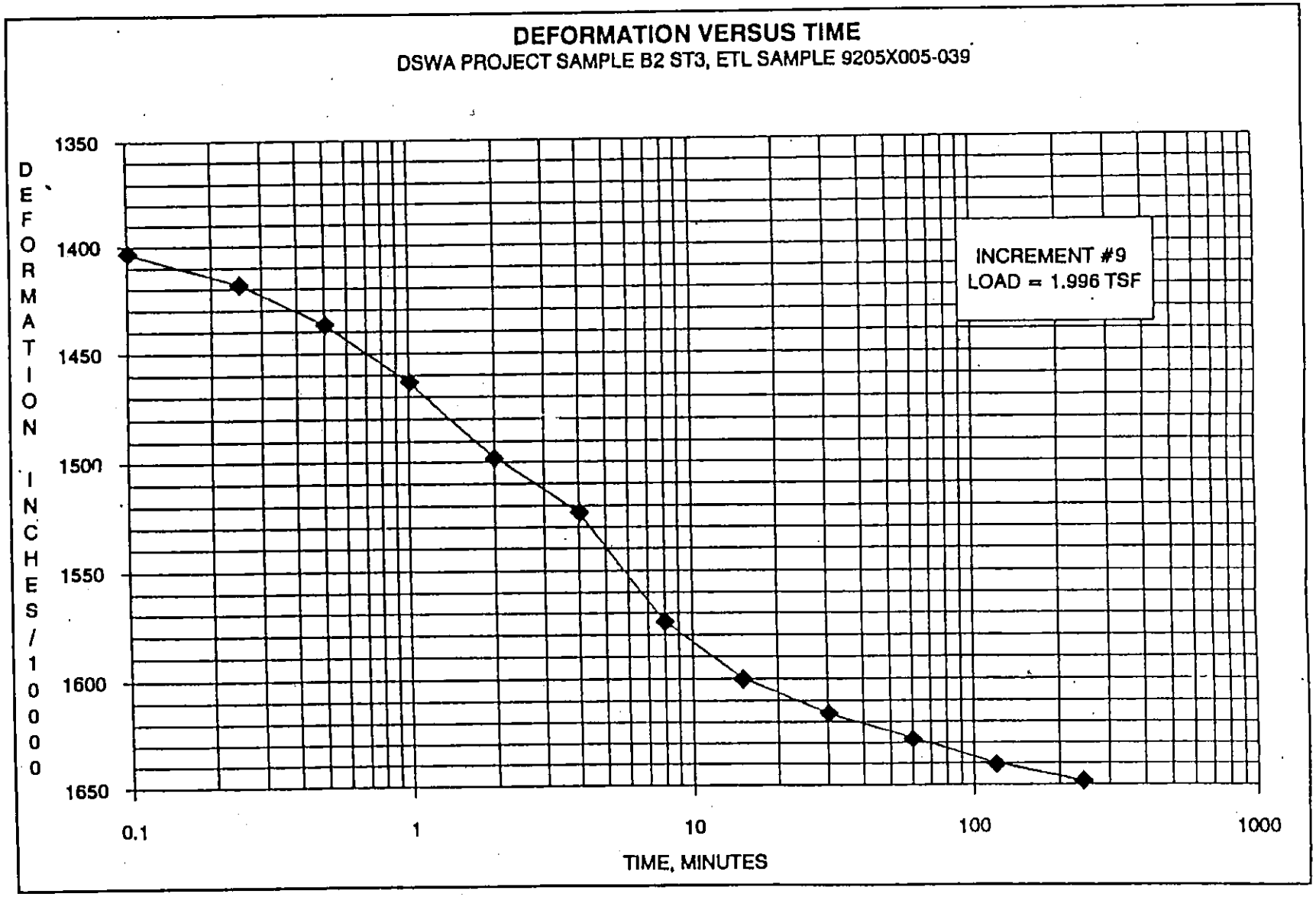
PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005 039

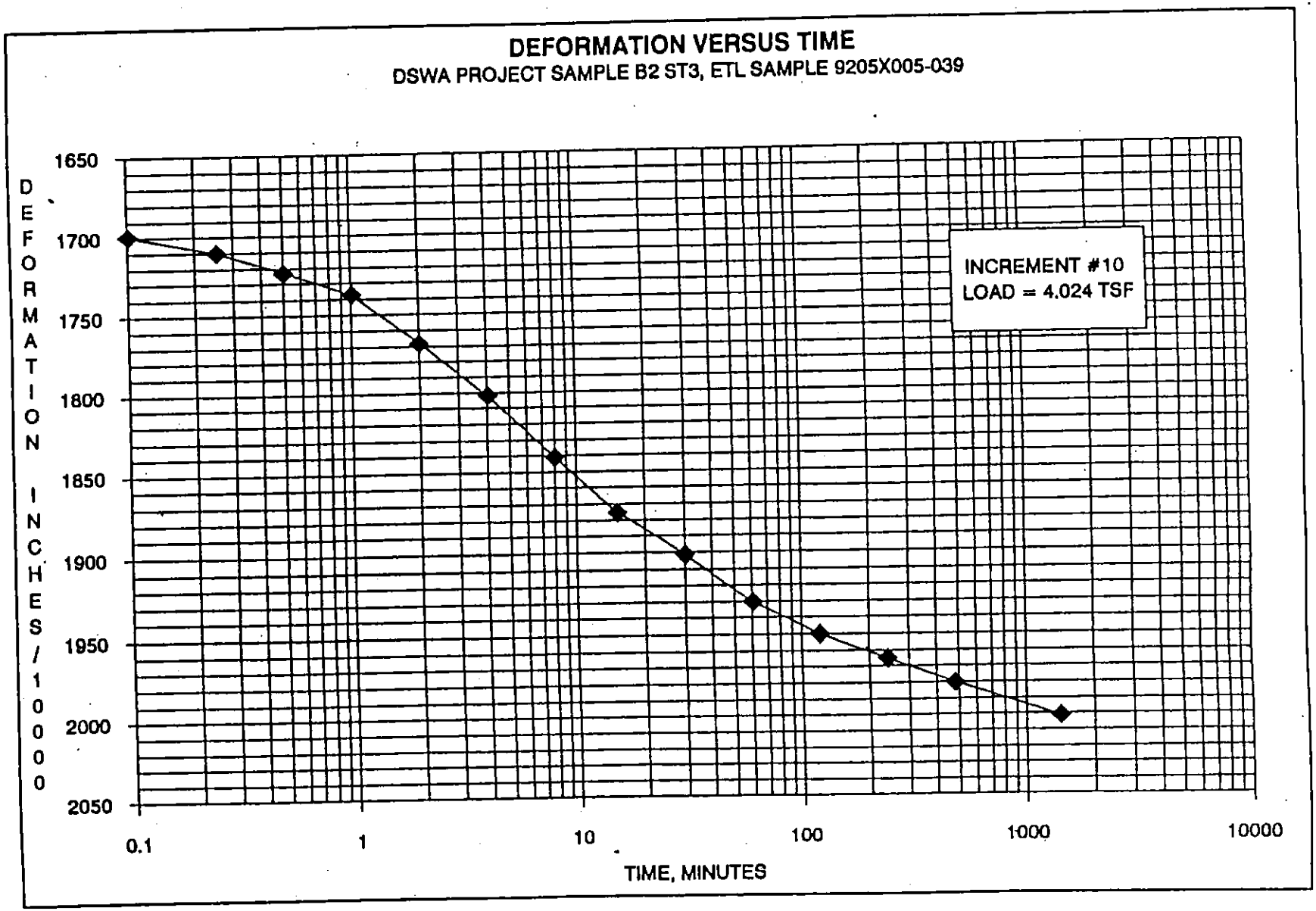


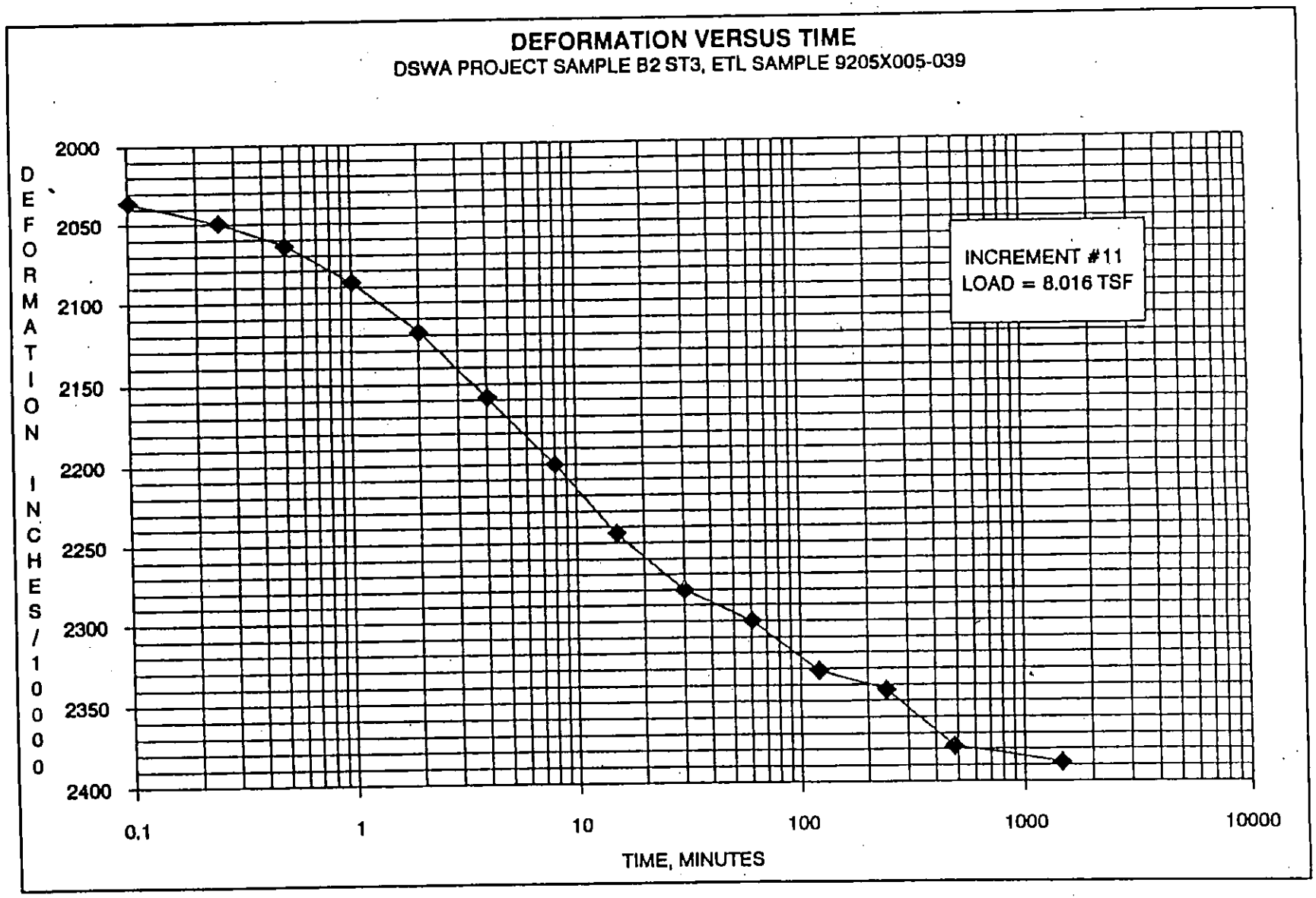

DEFORMATION VERSUS TIME
PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
DEFORMATION INCHES/100000
350
400
450
500
550
600
650
0.1
1
10
100
1000
10000
TIME, MINUTES
INCREMENT #3
LOAD = 0.499 TSF

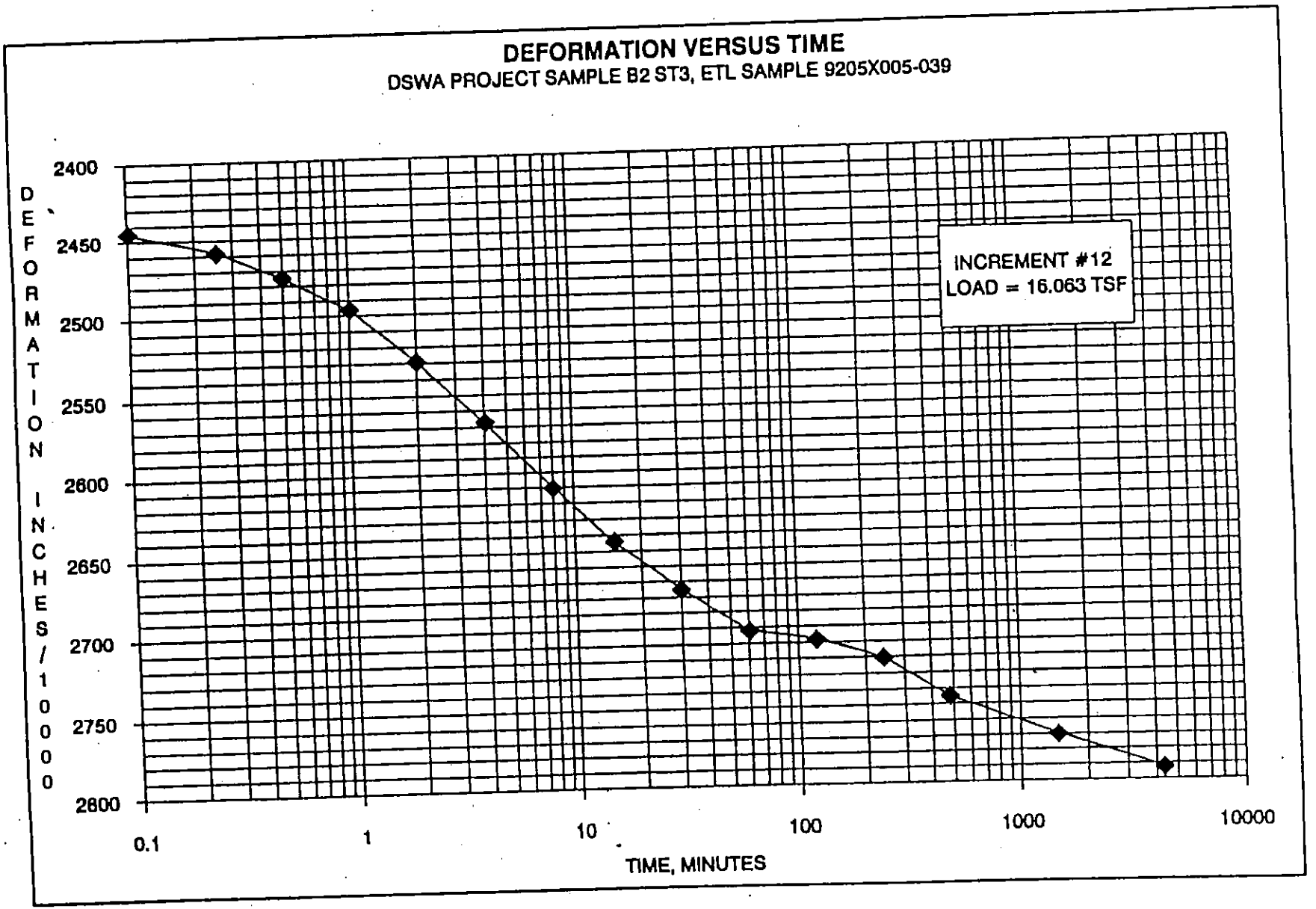

DEFORMATION VERSUS TIME
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
DEFORMATION INCHES/10000
650
700
750
800
850
900
950
1000
1050
1100
0.1
1
10
100
1000
10000
TIME, MINUTES
INCREMENT #4
LOAD = 0.998 TSF

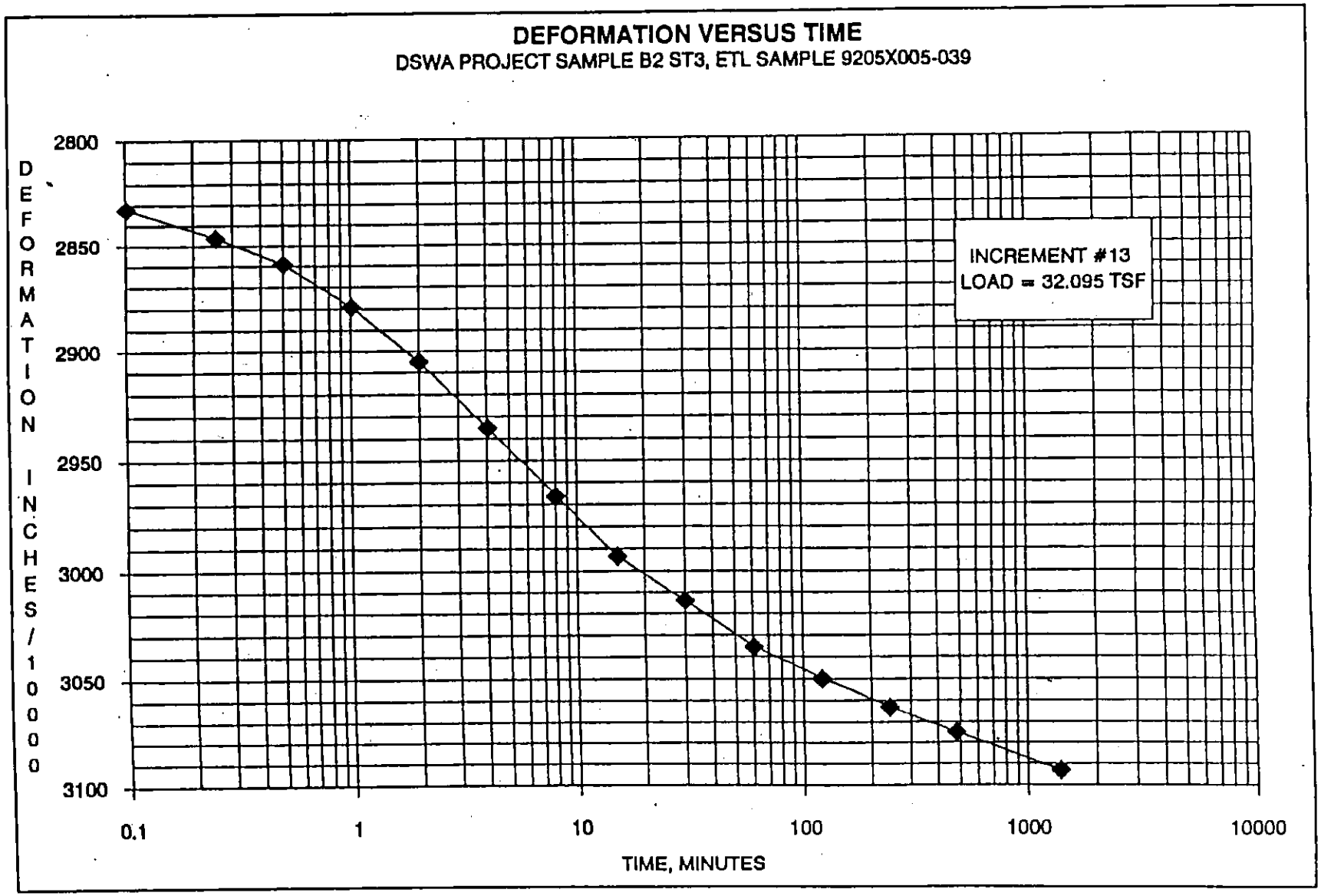

DEFORMATION VERSUS TIME
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
DEFORMATION INCHES/10000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
0.1
1
10
100
1000
10000
TIME, MINUTES
INCREMENT #5
LOAD = 1.996 TSF

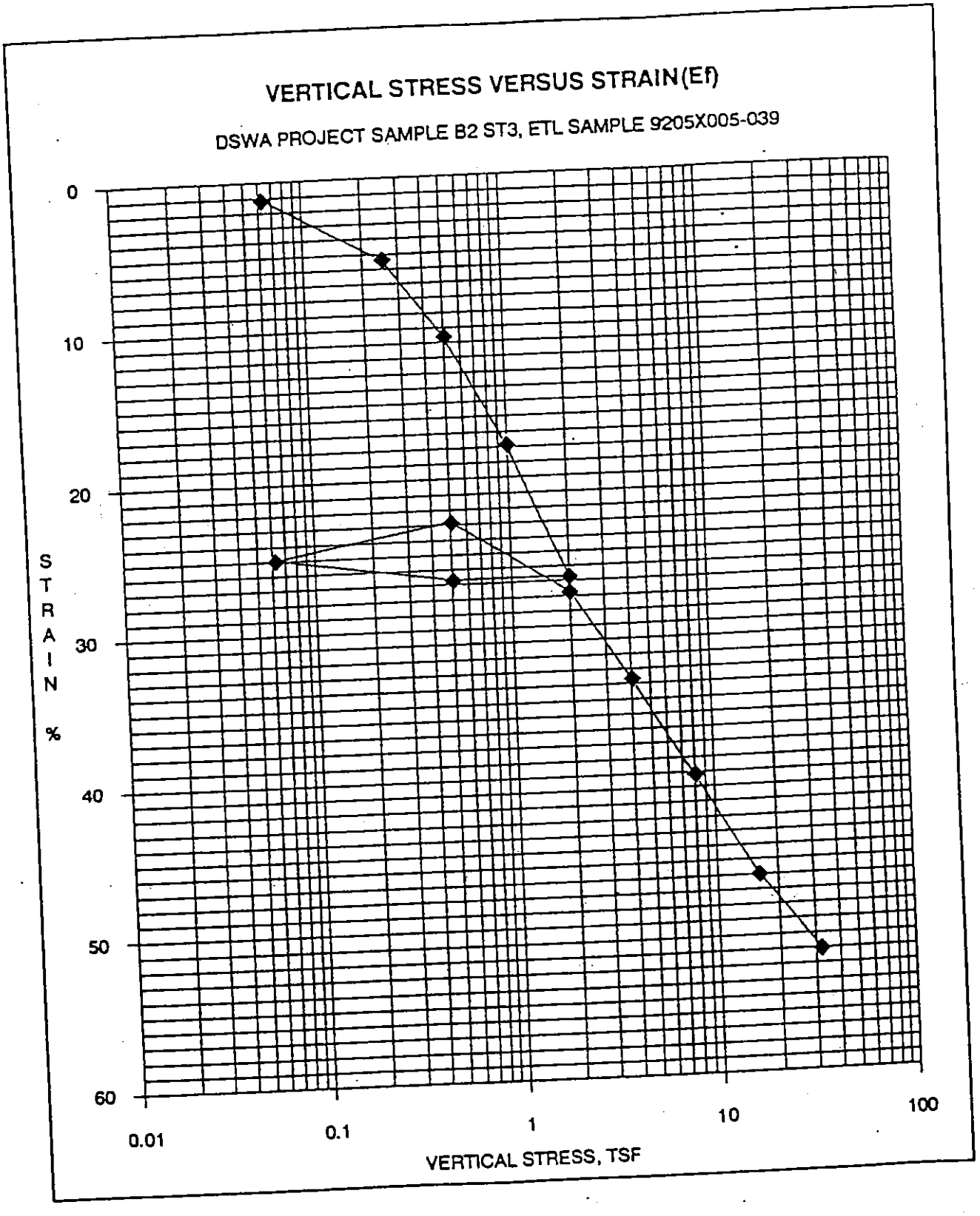

DEFORMATION VERSUS TIME
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
DEFORMATION INCHES/10000
1350
1400
1450
1500
1550
1600
1650
0.1
1
10
100
1000
TIME, MINUTES
INCREMENT #9
LOAD = 1.996 TSF

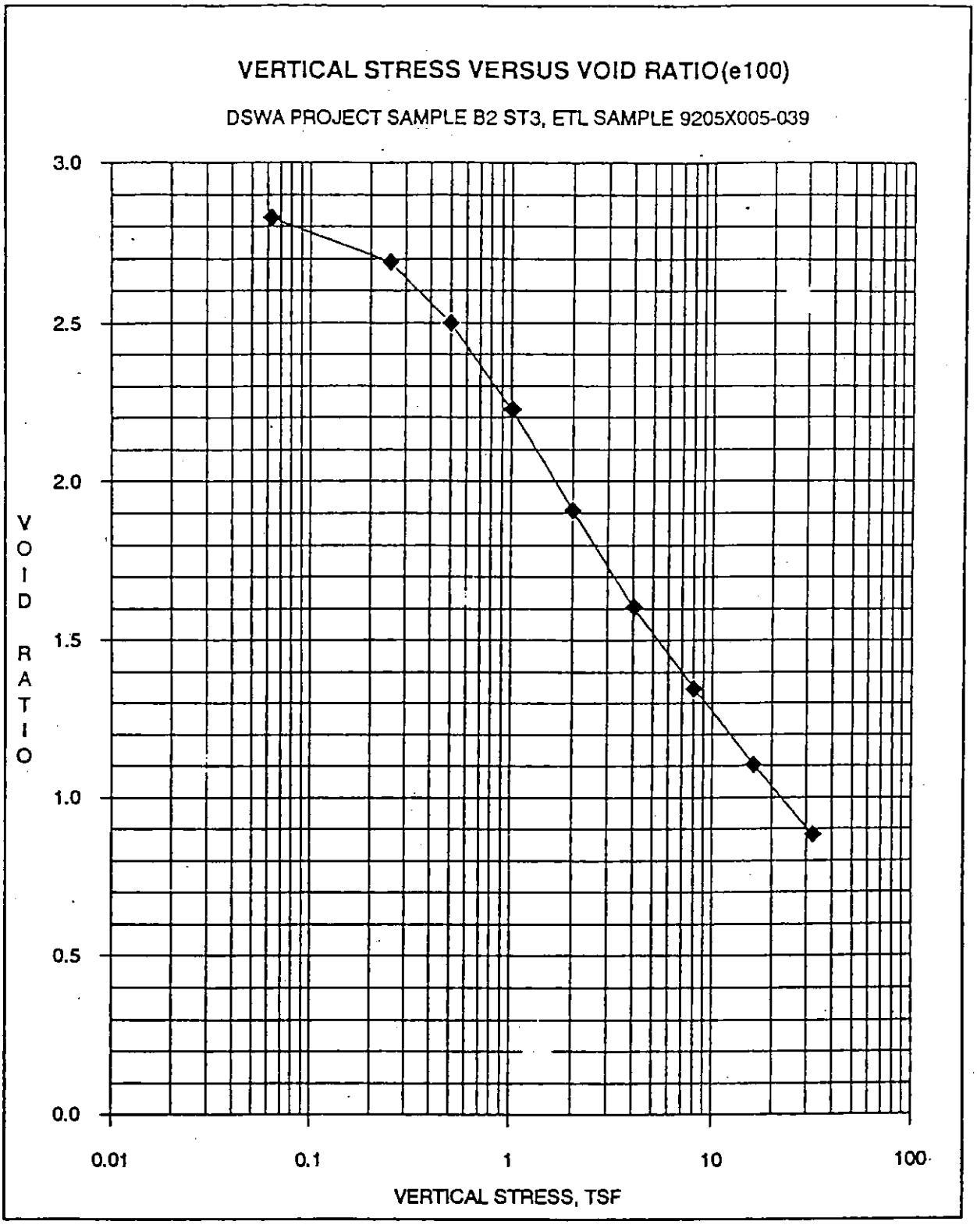

DEFORMATION VERSUS TIME
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
DEFORMATION INCHES/10000
1650
1700
1750
1800
1850
1900
1950
2000
2050
0.1
1
10
100
1000
10000
TIME, MINUTES
INCREMENT #10
LOAD = 4.024 TSF

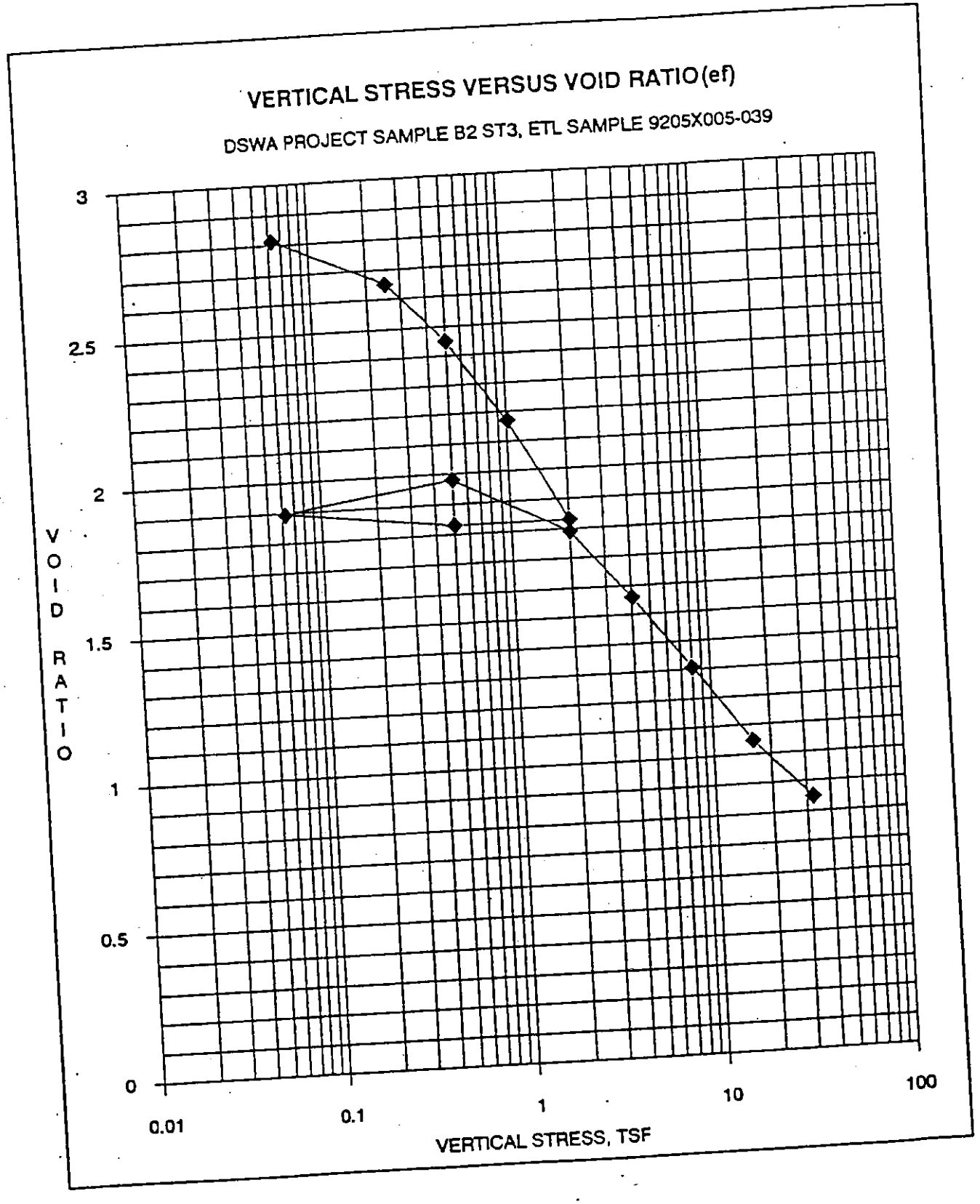

DEFORMATION VERSUS TIME
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
DEFORMATION INCHES/10000
2000
2050
2100
2150
2200
2250
2300
2350
2400
0.1
1
10
100
1000
10000
TIME, MINUTES
INCREMENT #11
LOAD = 8.016 TSF

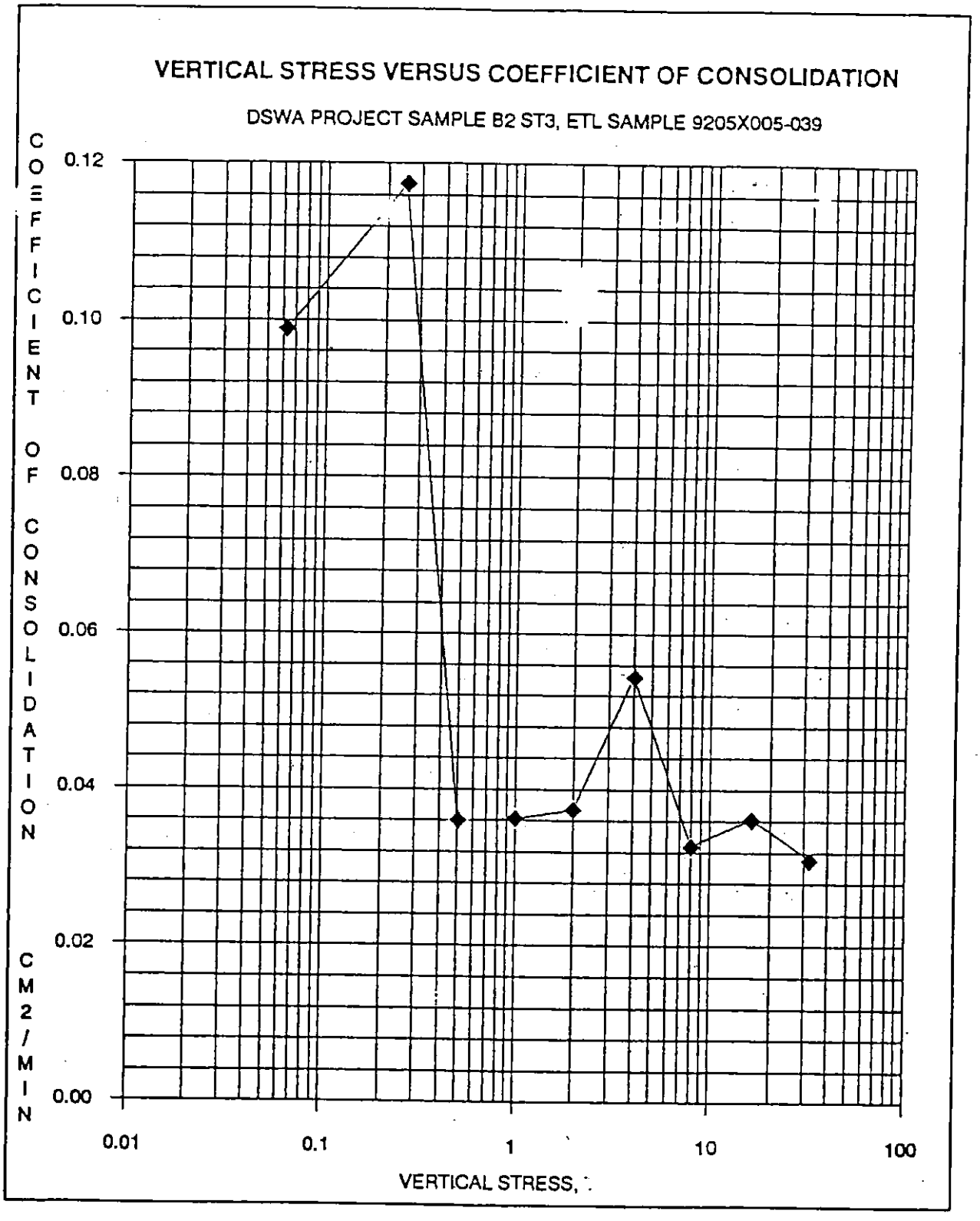

DEFORMATION VERSUS TIME
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
DEFORMATION INCHES/10000
2400
2450
2500
2550
2600
2650
2700
2750
2800
0.1
1
10
100
1000
10000
TIME, MINUTES
INCREMENT #12
LOAD = 16.063 TSF


DEFORMATION VERSUS TIME
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
DEFORMATION INCHES/10000
2800
2850
2900
2950
3000
3050
3100
0.1
1
10
100
1000
10000
TIME, MINUTES
INCREMENT #13
LOAD = 32.095 TSF

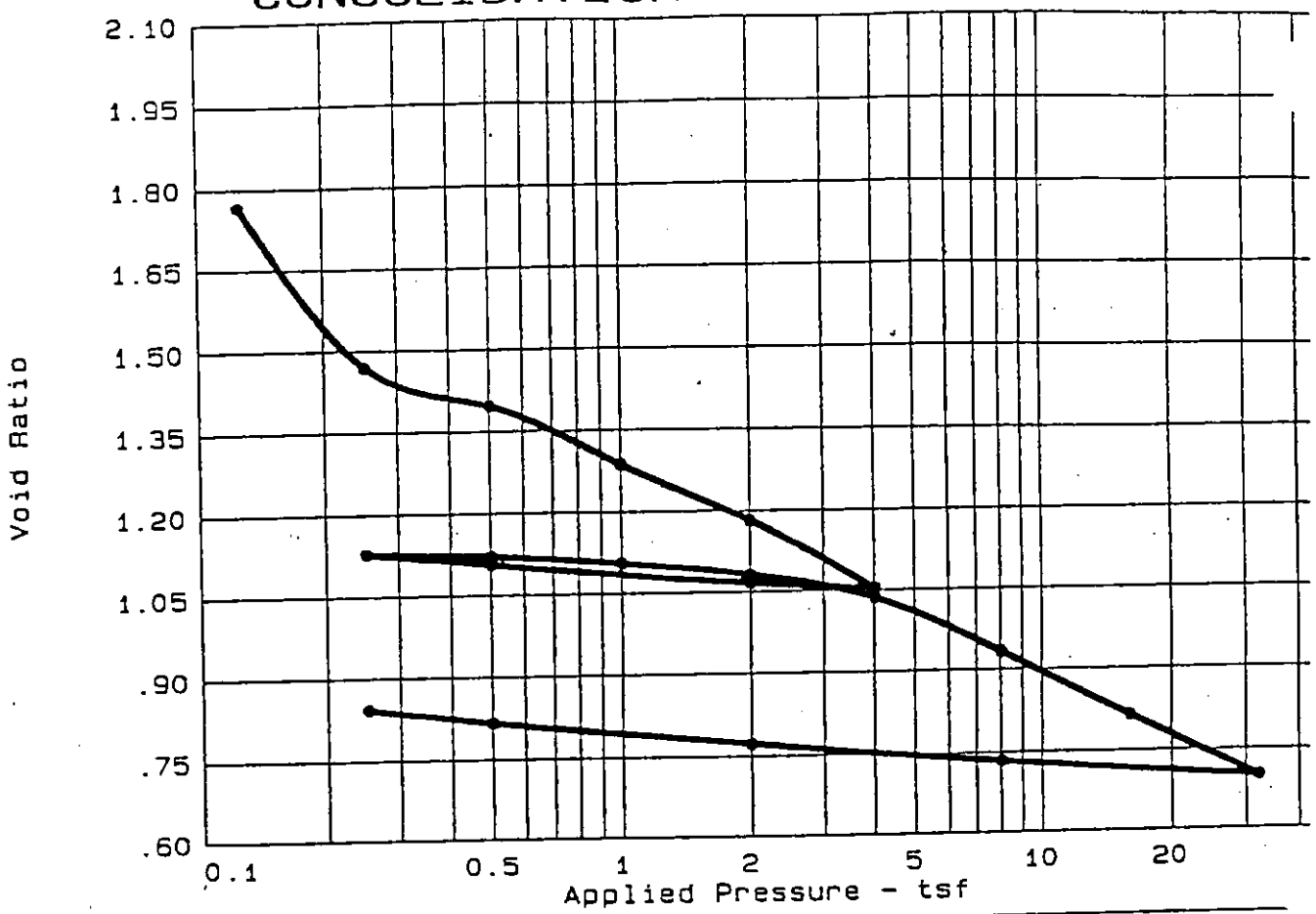

VERTICAL STRESS VERSUS STRAIN(Ef)
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
STRAIN %
0
10
20
30
40
50
60
0.01
0.1
1
10
100
VERTICAL STRESS, TSF


VERTICAL STRESS VERSUS VOID RATIO(e100)
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
3.0
2.5
2.0
1.5
1.0
0.5
0.0
VOID RATIO
0.01
0.1
1
10
100
VERTICAL STRESS, TSF


VERTICAL STRESS VERSUS VOID RATIO(ef)
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
VOID RATIO
3
2.5
2
1.5
1
0.5
0
0.01
0.1
1
10
100
VERTICAL STRESS, TSF


VERTICAL STRESS VERSUS COEFFICIENT OF CONSOLIDATION
DSWA PROJECT SAMPLE B2 ST3, ETL SAMPLE 9205X005-039
COEFFICIENT OF CONSOLIDATION
CM2/MIN
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.01
0.1
1
10
100
VERTICAL STRESS,

CONSOLIDATION TEST REPORT



Coefficients of Consolidation (sq.in./min.)

No.	Load	Cv	No.	Load	Cv	No.	Load	Cv
1	0.13	0.002	12	2.00	0.125			
2	0.25	0.115	13	4.00	0.016			
3	0.50	0.165	14	8.00	0.112			
4	1.00	0.069	15	16.00	0.100			
5	2.00	0.051	16	32.00	0.073			
6	4.00	0.050						
10	0.50	0.213						
11	1.00	0.310						

Swell press.	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void rati
	81.9 %	55.7	58.6			2.60	1.7705

TEST RESULTS

MATERIAL DESCRIPTIO

DREDGE SPOIL

Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: T83 ST9, 67.5'-69.5'

Date: 06-02-92

Remarks:
TEST SPECIMEN TAKEN FROM: 67.8'-67.9'

CONSOLIDATION TEST REPORT

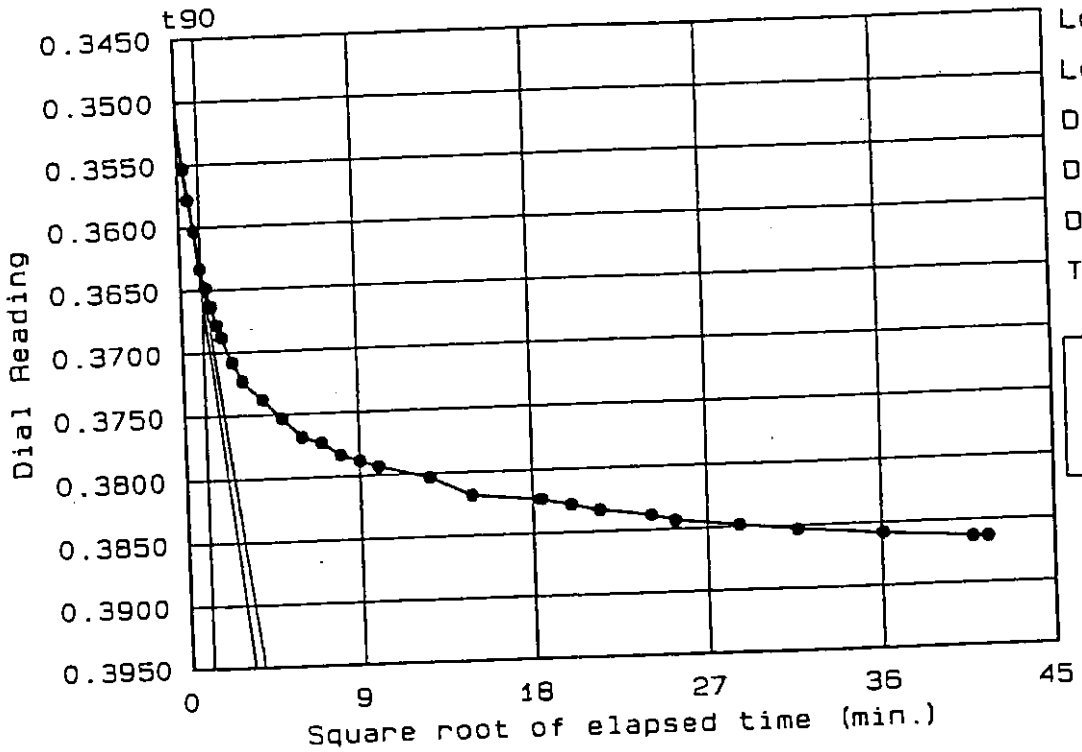
BOWSER-MORNER, INC.

Fig. No. _____

Dial Reading vs. Time

Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB3 ST9, 67.5'-69.5'

Date: 06-02-92



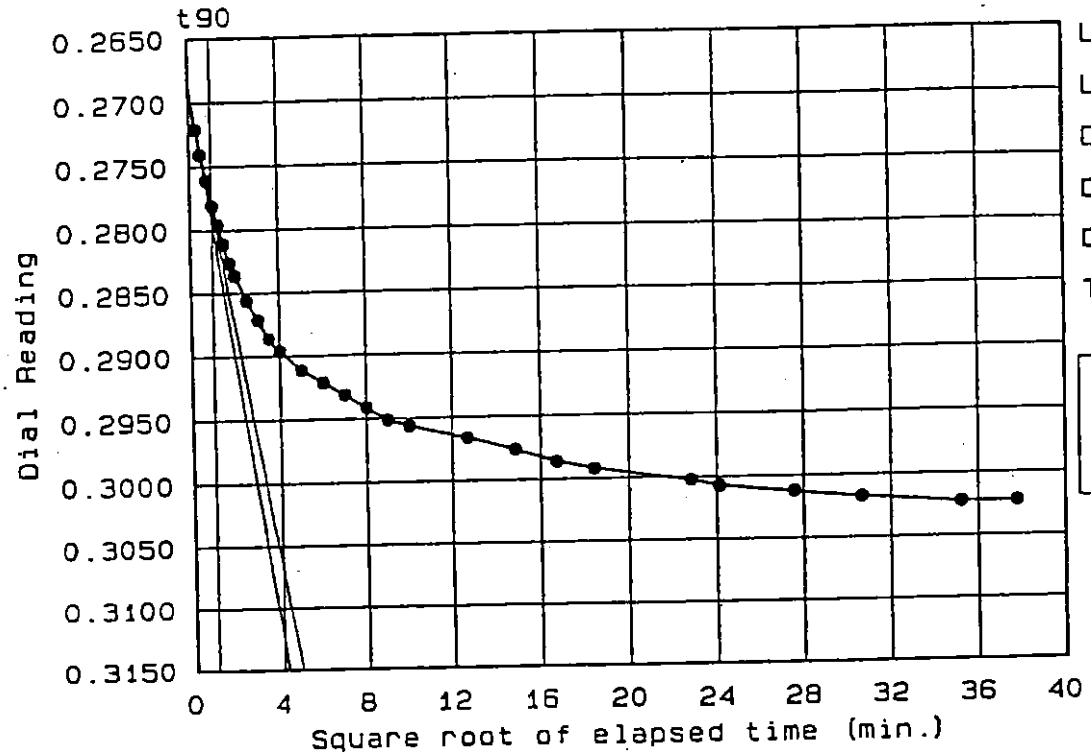
Load No.= 16
Load= 32.00 tsf
D_0 = 0.3510
D_{90} = 0.3638
D_{100}= 0.3652
T_{90}= 1.17 min.

C_v @ T_{90} =
0.07 in.^{2}/min.

Dial Reading vs. Time

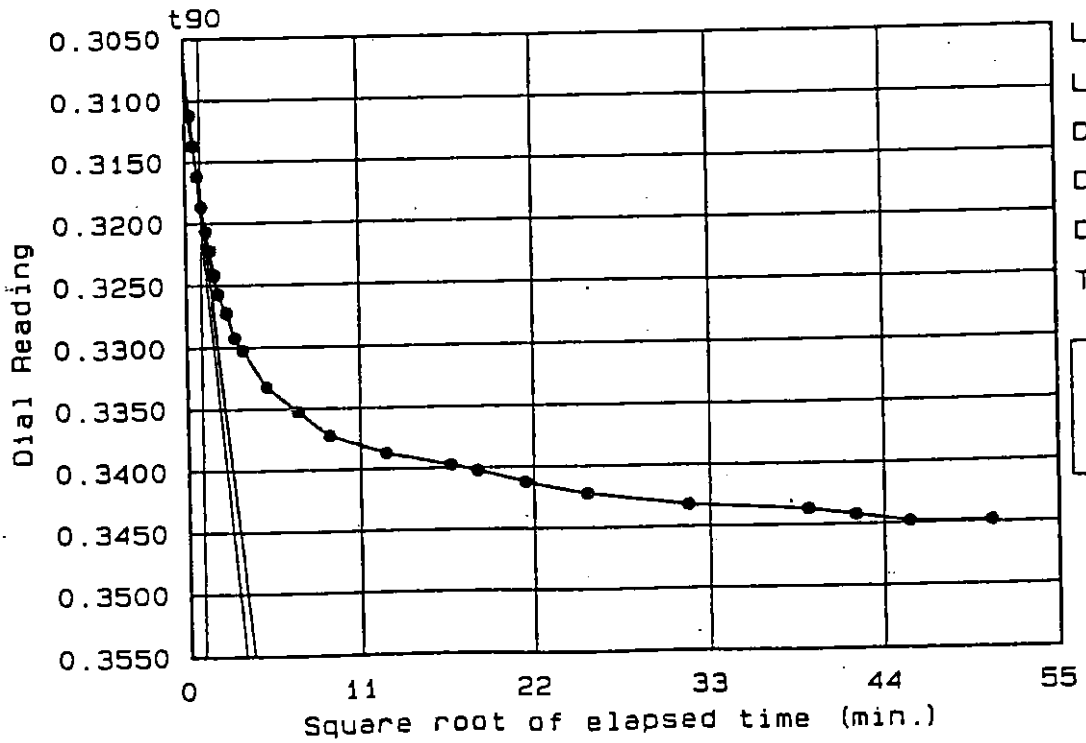
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB3 ST9. 67.5'-69.5'

Date: 06-02-92



Load No.= 14
Load= 8.00 tsf
D_0 = 0.2687
D_{90} = 0.2780
D_{100}= 0.2790
T_{90}= 0.97 min.

C_v @ T_{90} =
0.11 in.^{2}/min.



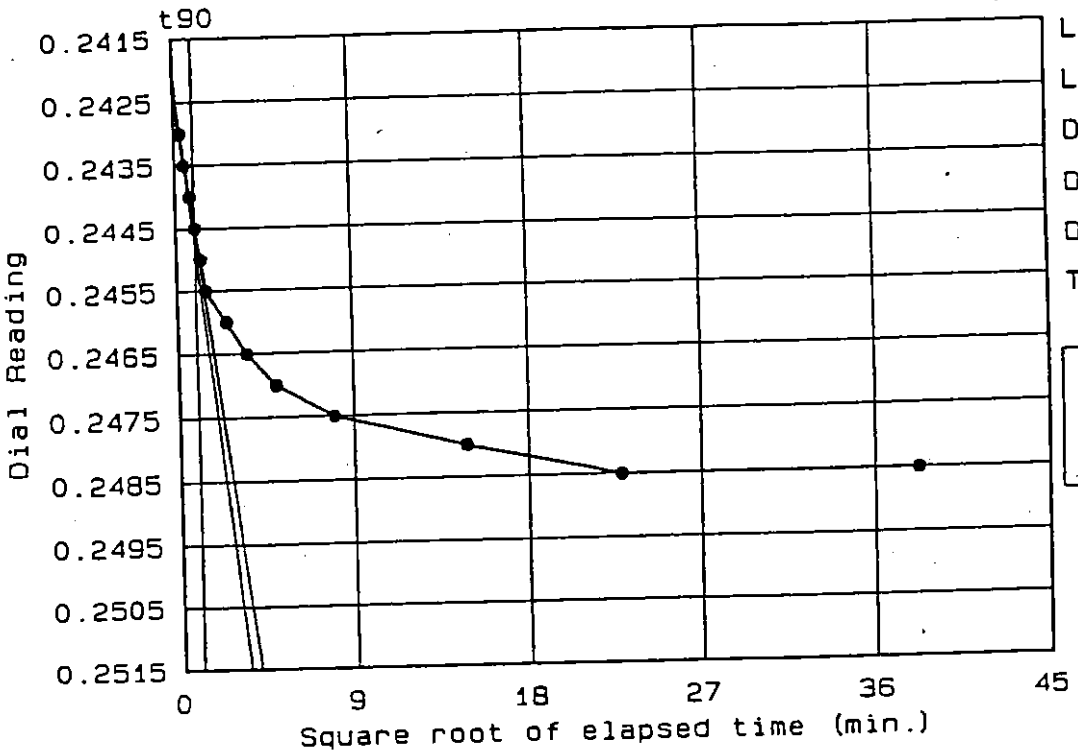
Load No.= 15
Load= 16.00 ts
D_0 = 0.3069
D_{90} = 0.3185
D_{100}= 0.3198
T_{90}= 0.97 min

C_v @ T_{90} =
0.10 in.^{2}/min.

Dial Reading vs. Time

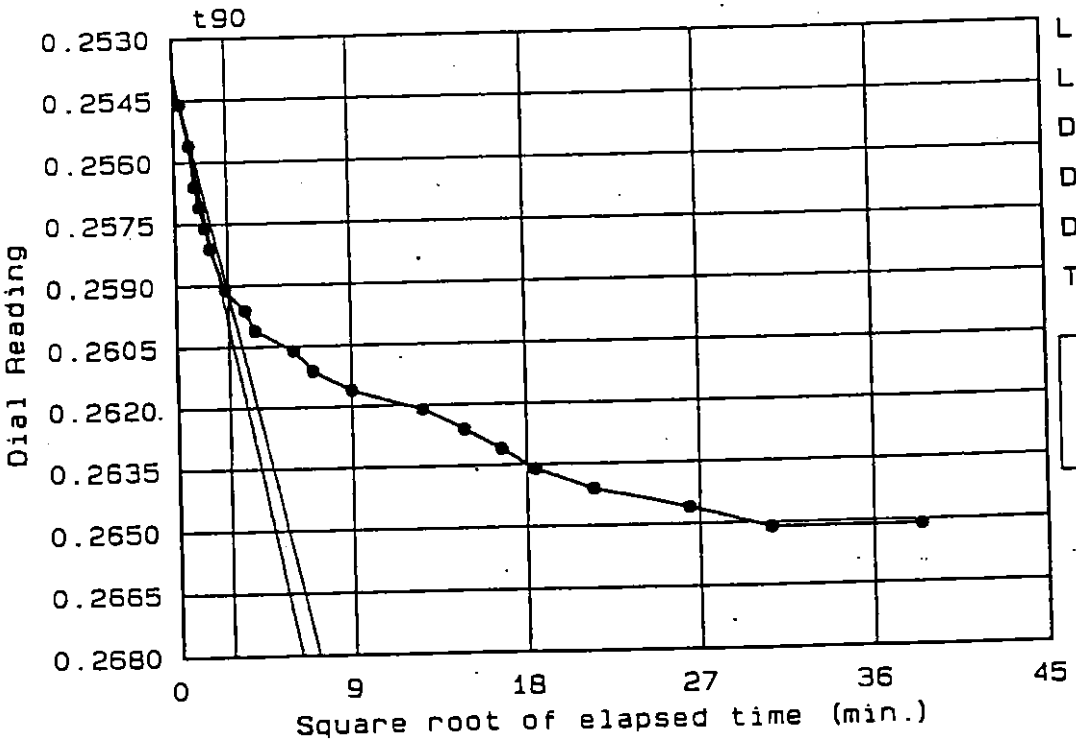
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB3 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 12
Load= 2.00 tsf
D_0 = 0.2421
D_{90} = 0.2445
D_{100}= 0.2447
T_{90}= 0.97 min.

C_v @ T_{90} =
0.13 in.^{2}/min.



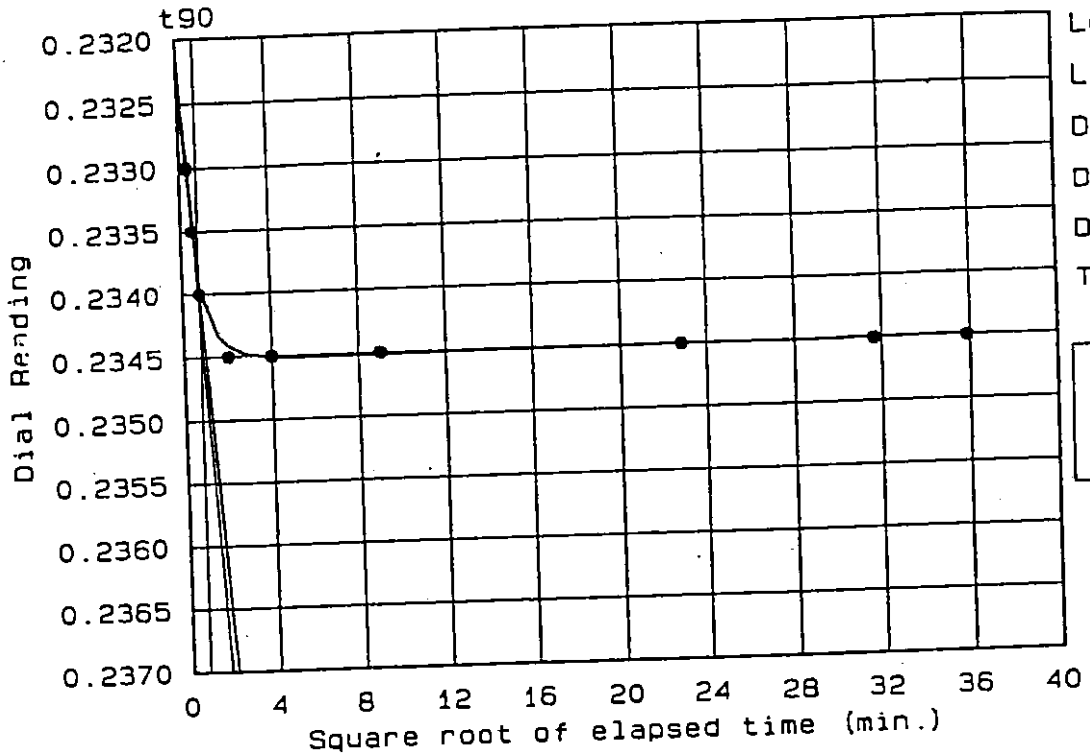
Load No.= 13
Load= 4.00 tsf
D_0 = 0.2539
D_{90} = 0.2592
D_{100}= 0.2598
T_{90}= 7.19 min.

C_v @ T_{90} =
0.02 in.^{2}/min.

Dial Reading vs. Time

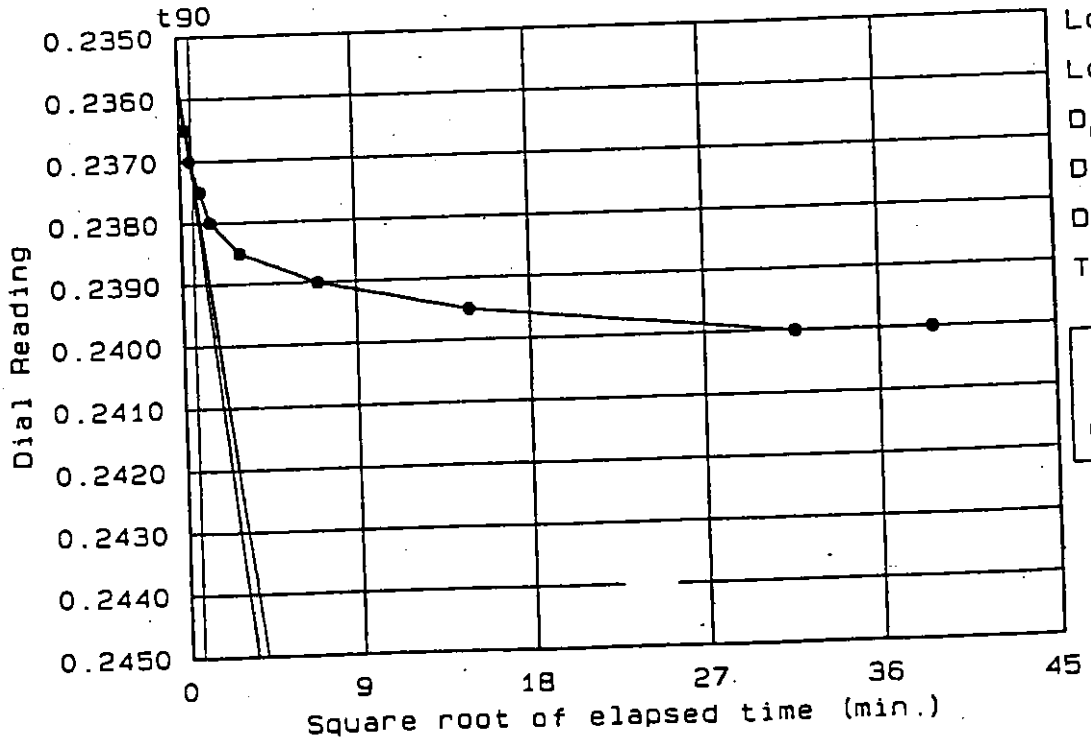
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB3 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 10
Load= 0.50 tsf
D_0 = 0.2321
D_{90} = 0.2339
D_{100}= 0.2342
T_{90}= 0.59 min.

C_v @ T_{90} =
0.21 in.^{2}/min.



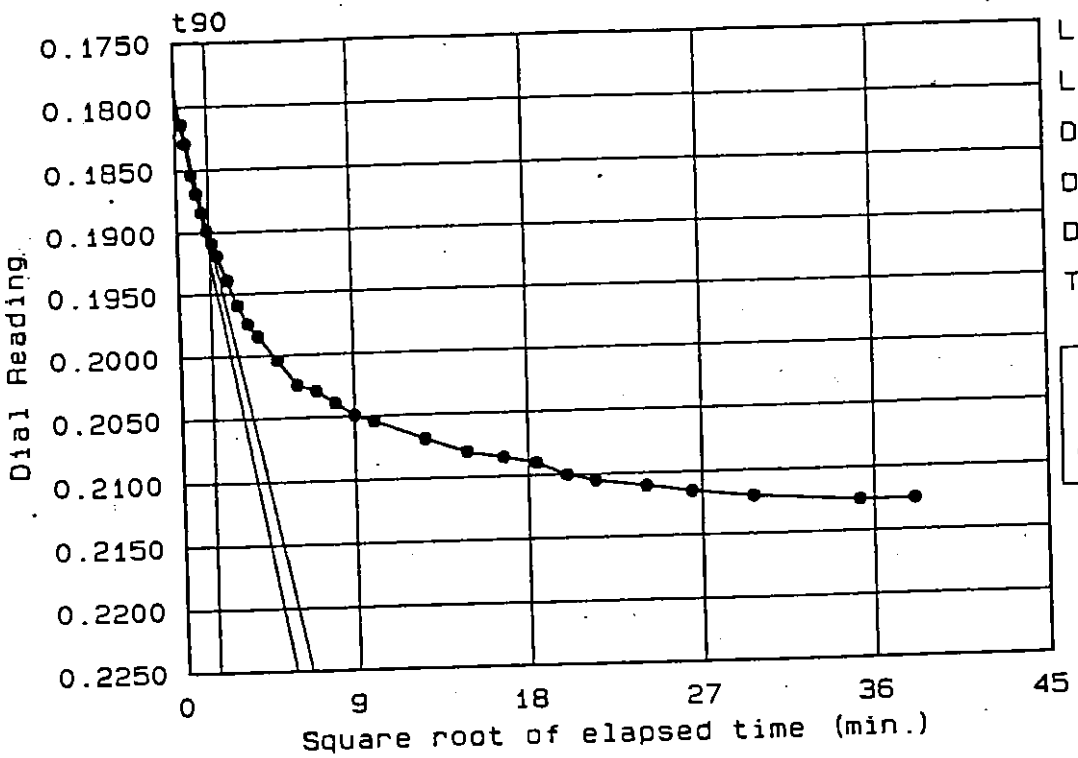
Load No.= 11
Load= 1.00 tsf
D_0 = 0.2356
D_{90} = 0.2371
D_{100}= 0.2373
T_{90}= 0.40 min.

C_v @ T_{90} =
0.31 in.^{2}/min.

Dial Reading vs. Time

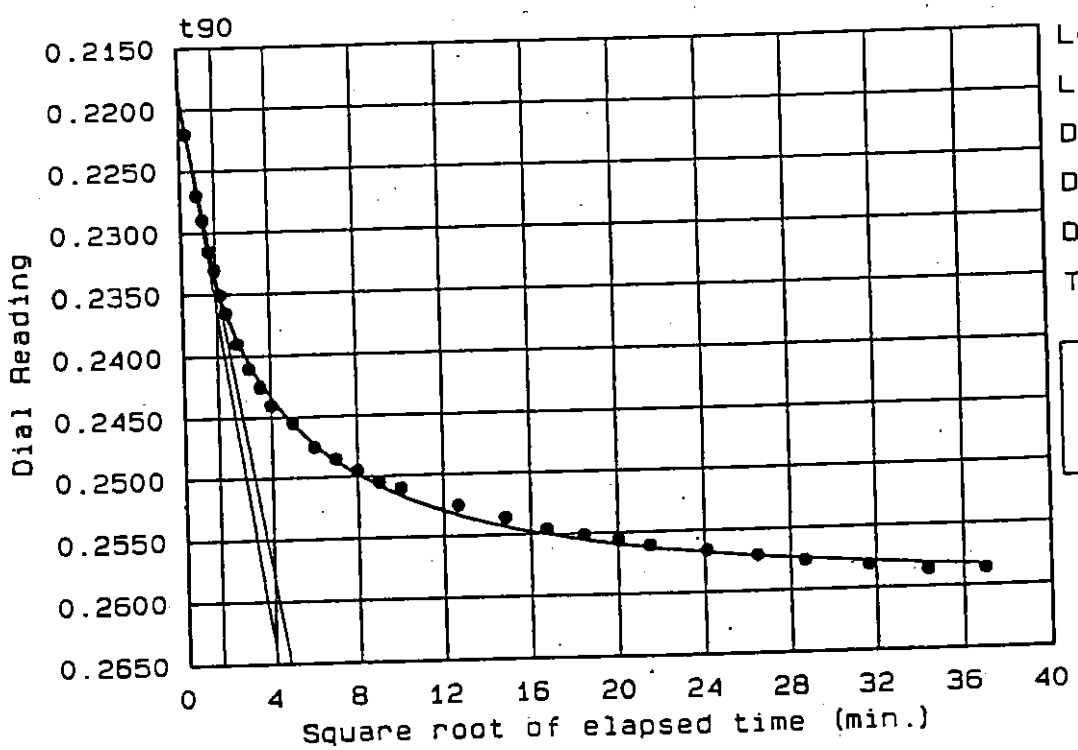
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB3 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 5
Load= 2.00 tsf
D_0 = 0.1788
D_{90} = 0.1905
D_{100}= 0.1917
T_{90}= 2.69 min.

C_v @ T_{90} =
0.05 in.^{2}/min.



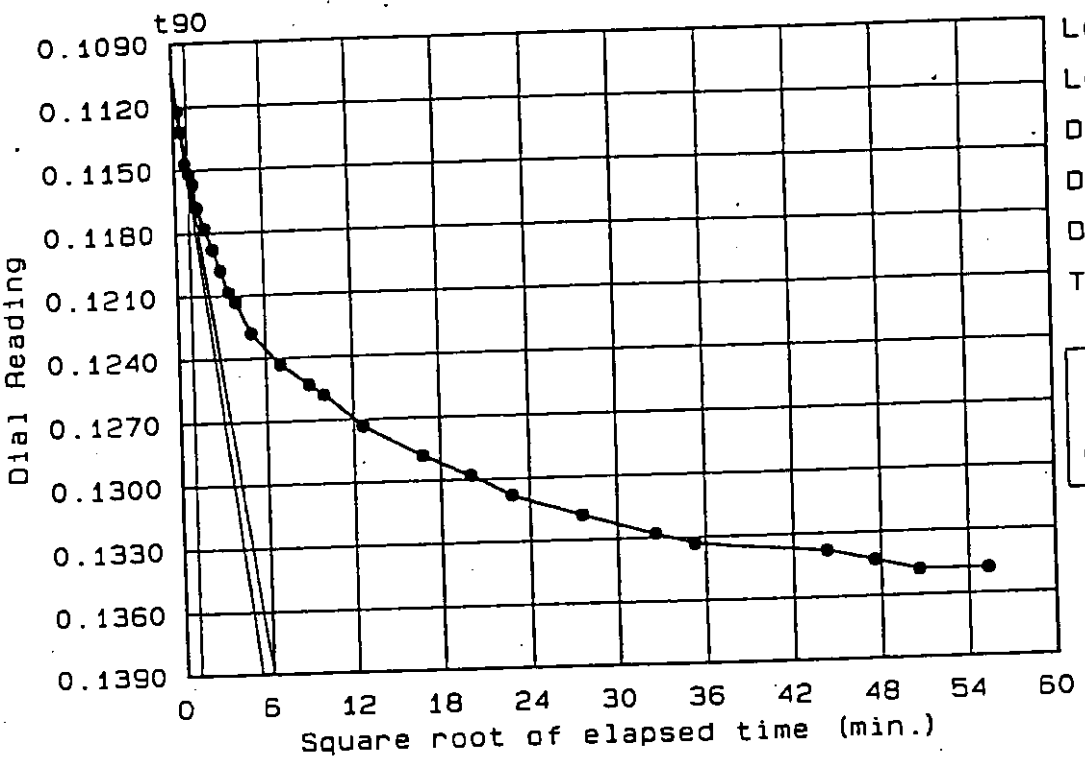
Load No.= 6
Load= 4.00 tsf
D_0 = 0.2184
D_{90} = 0.2340
D_{100}= 0.2358
T_{90}= 2.49 min.

C_v @ T_{90} =
0.05 in.^{2}/min.

Dial Reading vs. Time

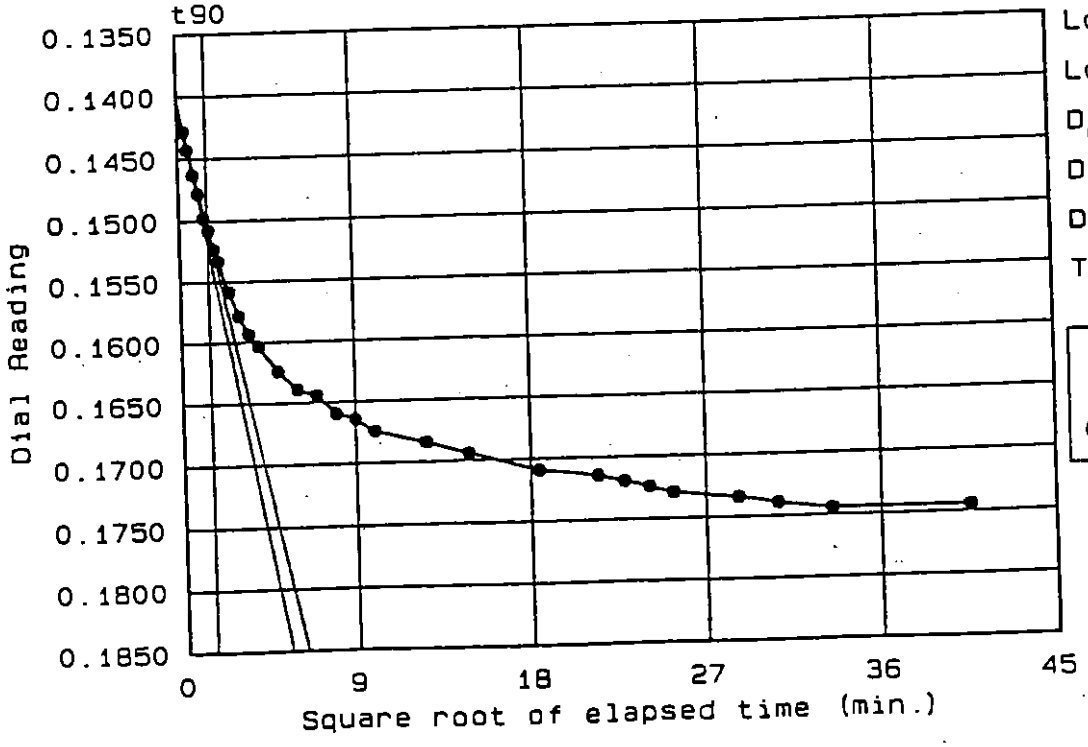
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB3 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 3
Load= 0.50 tsf
D_0 = 0.1105
D_{90} = 0.1152
D_{100}= 0.1157
T_{90}= 0.99 min.

C_v @ T_{90} =
0.16 in.^{2}/min.



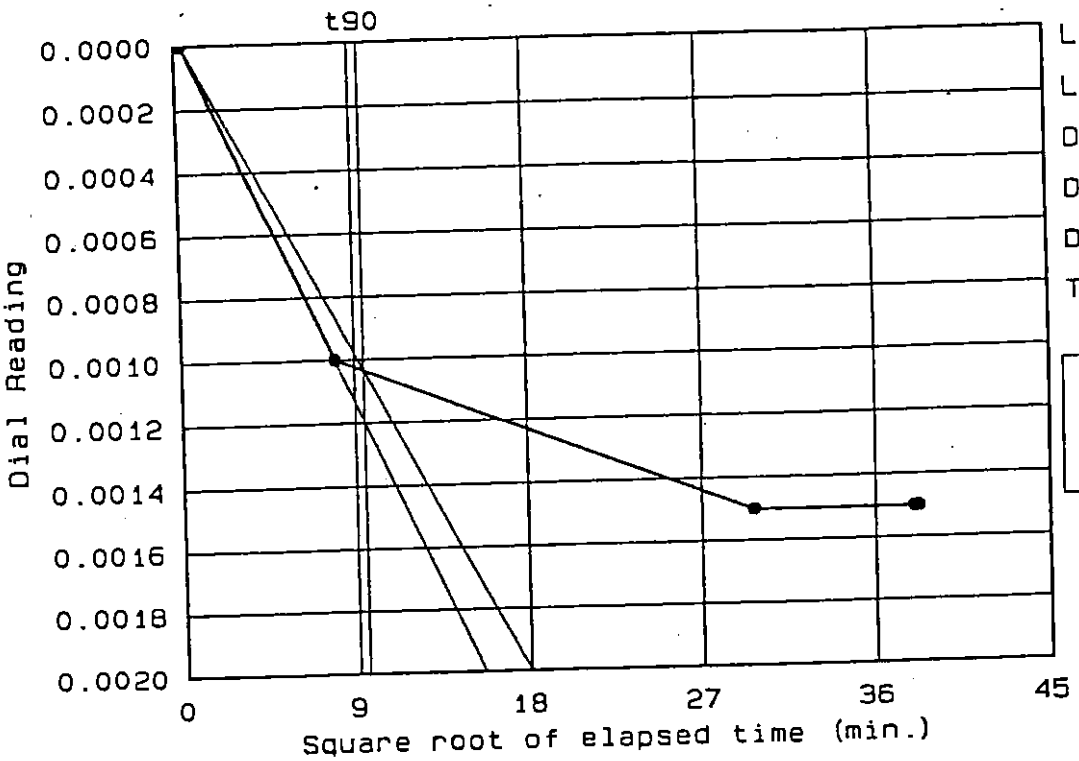
Load No.= 4
Load= 1.00 tsf
D_0 = 0.1402
D_{90} = 0.1507
D_{100}= 0.1519
T_{90}= 2.19 min.

C_v @ T_{90} =
0.07 in.^{2}/min.

Dial Reading vs. Time

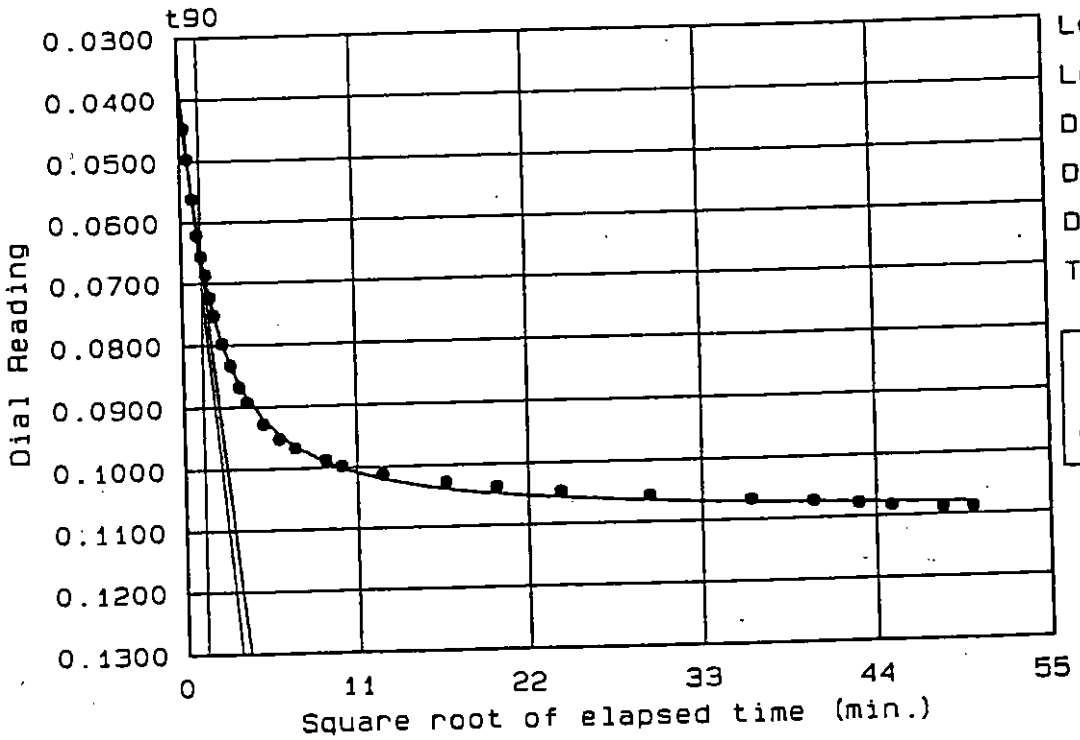
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB3 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 1
Load= 0.13 tsf
D_0 = 0.0000
D_{90} = 0.0010
D_{100}= 0.0011
T_{90}= 90.00 min.

C_v @ T_{90} =
0.00 in.^{2}/min.



Load No.= 2
Load= 0.25 tsf
D_0 = 0.0360
D_{90} = 0.0659
D_{100}= 0.0692
T_{90}= 1.60 min.

C_v @ T_{90} =
0.11 in.^{2}/min.

Load 0.25 tsf CONSOLIDATION TEST READINGS Load No. 20

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.02	0.34370	11	29.07	0.33470
2	0.10	0.34270			
3	0.25	0.34220			
4	0.57	0.34170			
5	1.57	0.34120			
6	2.25	0.34070			
7	5.67	0.33920			
8	11.67	0.33770			
9	17.67	0.33670			
10	23.67	0.33520			

Void Ratio: 0.8432 Consolidation: 33.5 %

Load 8.00 tsf — CONSOLIDATION TEST READINGS — Load No. 17

No.	Elapsed Time	Dial Reading
1	0.00	0.38380
2	0.10	0.37780
3	0.25	0.37680
4	0.57	0.37630
5	1.00	0.37580
6	2.25	0.37530
7	6.25	0.37480
8	16.00	0.37430
9	22.52	0.37430

Void Ratio: 0.7335 Consolidation: 37.4 %

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No. 18

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.37330	11	11.92	0.36180
2	0.10	0.36930	12	14.92	0.36130
3	0.25	0.36780	13	26.92	0.36080
4	0.57	0.36680	14	29.92	0.36030
5	1.00	0.36580	15	30.75	0.36030
6	1.57	0.36530			
7	2.25	0.36430			
8	2.92	0.36430			
9	5.92	0.36330			
10	8.92	0.36230			

Void Ratio: 0.7723 Consolidation: 36.0 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 19

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.35830	11	12.63	0.34680
2	0.10	0.35630	12	15.63	0.34630
3	0.25	0.35480	13	18.63	0.34530
4	0.57	0.35380	14	21.63	0.34480
5	1.00	0.35280	15	24.63	0.34420
6	2.25	0.35130	16	25.90	0.34420
7	3.07	0.35080			
8	4.00	0.35030			
9	6.25	0.34880			
10	9.63	0.34780			

Void Ratio: 0.8169 Consolidation: 34.4 %

Load 16.00 tsf — CONSOLIDATION TEST READINGS — Load No. 15

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.30520	11	9.00	0.32920	21	1000.00	0.3432
2	0.10	0.31120	12	12.25	0.33020	22	1540.00	0.34370
3	0.25	0.31370	13	25.00	0.33320	23	1780.00	0.34420
4	0.57	0.31620	14	49.00	0.33520	24	2080.00	0.34480
5	1.00	0.31870	15	81.00	0.33720	25	2578.88	0.34480
6	1.57	0.32070	16	160.00	0.33870			
7	2.25	0.32220	17	280.00	0.33970			
8	3.07	0.32420	18	340.00	0.34020			
9	4.00	0.32570	19	460.00	0.34120			
10	6.25	0.32720	20	640.00	0.34220			

Void Ratio: 0.8152 Consolidation: 34.5 %
D0 = 0.3069 D90 = 0.3185 D100 = 0.3198 T90 = 0.97 min.
Cv @ 1 min.= 0.100 sq. in./min.

Load 32.00 tsf — CONSOLIDATION TEST READINGS — Load No. 16

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.34530	11	9.00	0.37230	21	340.00	0.38230
2	0.10	0.35530	12	16.00	0.37380	22	400.00	0.38280
3	0.25	0.35780	13	25.00	0.37530	23	460.00	0.38330
4	0.57	0.36030	14	36.00	0.37680	24	580.00	0.38380
5	1.00	0.36330	15	49.00	0.37730	25	640.00	0.384[illegible]
6	1.57	0.36480	16	64.00	0.37830	26	820.00	0.38[illegible]
7	2.25	0.36630	17	81.00	0.37880	27	1000.00	0.385[illegible]
8	3.07	0.36780	18	100.00	0.37930	28	1300.00	0.385[illegible]
9	4.00	0.36880	19	160.00	0.38030	29	1660.00	0.3863[illegible]
10	6.25	0.37080	20	220.00	0.38180	30	1724.22	0.38630

Void Ratio: 0.7002 Consolidation: 38.6 %
D0 = 0.3510 D90 = 0.3638 D100 = 0.3652 T90 = 1.17 min.
Cv @ 1.2 min.= 0.073 sq. in./min.

Load 4.00 tsf CONSOLIDATION TEST READINGS Load No. 13

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.24850	11	36.00	0.26060	21	1478.27	0.26510
2	0.10	0.25460	12	49.00	0.26110			
3	0.57	0.25560	13	81.00	0.26160			
4	1.00	0.25660	14	160.00	0.26210			
5	1.57	0.25710	15	220.00	0.26260			
6	2.25	0.25760	16	280.00	0.26310			
7	3.07	0.25810	17	340.00	0.26360			
8	6.25	0.25910	18	460.00	0.26410			
9	12.25	0.25960	19	700.00	0.26460			
10	16.00	0.26010	20	940.00	0.26510			

Void Ratio: 1.0360 Consolidation: 26.5 %
D0 = 0.2539 D90 = 0.2592 D100 = 0.2598 T90 = 7.19 min.
Cv @ 7.2 min.= 0.016 sq. in./min.

Load 8.00 tsf CONSOLIDATION TEST READINGS Load No. 14

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.26560	11	9.00	0.28710	21	220.00	0.29760
2	0.10	0.27210	12	12.25	0.28860	22	280.00	0.29860
3	0.25	0.27410	13	16.00	0.28960	23	340.00	0.29920
4	0.57	0.27610	14	25.00	0.29110	24	520.00	0.30020
5	1.00	0.27810	15	36.00	0.29210	25	580.00	0.30070
6	1.57	0.27960	16	49.00	0.29310	26	760.00	0.30120
7	2.25	0.28110	17	64.00	0.29410	27	940.00	0.30170
8	3.07	0.28260	18	81.00	0.29510	28	1240.00	0.30220
9	4.00	0.28360	19	100.00	0.29560	29	1426.65	0.30220
10	6.25	0.28560	20	160.00	0.29660			

Void Ratio: 0.9332 Consolidation: 30.2 %
D0 = 0.2687 D90 = 0.2780 D100 = 0.2790 T90 = 0.97 min.
Cv @ 1 min.= 0.112 sq. in./min.

Load 1.00 tsf — CONSOLIDATION TEST READINGS — Load No. 11

No.	Elapsed Time	Dial Reading
1	0.00	0.23500
2	0.10	0.23650
3	0.25	0.23700
4	1.00	0.23750
5	2.25	0.23800
6	9.00	0.23850
7	49.00	0.23900
8	220.00	0.23950
9	1000.00	0.24000
10	1496.93	0.24000

Void Ratio: 1.1056 Consolidation: 24.0 %
D0 = 0.2356 D90 = 0.2371 D100 = 0.2373 T90 = 0.40 min.
Cv @ 0.4 min.= 0.310 sq. in./min.

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No. 12

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.24000	11	64.00	0.24750
2	0.10	0.24300	12	220.00	0.24800
3	0.25	0.24350	13	520.00	0.24850
4	0.57	0.24400	14	1460.52	0.24850
5	1.00	0.24450			
6	1.57	0.24500			
7	2.25	0.24550			
8	6.25	0.24600			
9	12.25	0.24650			
10	25.00	0.24700			

Void Ratio: 1.0820 Consolidation: 24.9 %
D0 = 0.2421 D90 = 0.2445 D100 = 0.2447 T90 = 0.97 min.
Cv @ 1 min.= 0.125 sq. in./min.

Load 0.25 tsf CONSOLIDATION TEST READINGS Load No. 9

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.24050	11	13.65	0.23350
2	0.10	0.23900	12	16.65	0.23300
3	0.25	0.23800	13	19.65	0.23250
4	0.57	0.23750	14	22.65	0.23200
5	1.00	0.23700	15	25.65	0.23200
6	2.25	0.23650			
7	3.07	0.23600			
8	4.00	0.23550			
9	7.65	0.23450			
10	10.65	0.23400			

Void Ratio: 1.1277 Consolidation: 23.2 %

Load 0.50 tsf CONSOLIDATION TEST READINGS Load No. 10

No.	Elapsed Time	Dial Reading
1	0.00	0.23250
2	0.10	0.23300
3	0.25	0.23350
4	0.57	0.23400
5	4.00	0.23450
6	16.00	0.23450
7	81.00	0.23450
8	520.00	0.23450
9	1000.00	0.23450
10	1285.00	0.23450

Void Ratio: 1.1208 Consolidation: 23.5 %
D0 = 0.2321 D90 = 0.2339 D100 = 0.2342 T90 = 0.59 min.
Cv @ 0.6 min.= 0.213 sq. in./min.

Load No. 6

CONSOLIDATION TEST READINGS

Load 4.00 tsf

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.21250	11	12.25	0.24250	21	280.00	0.25460
2	0.10	0.22200	12	16.00	0.24400	22	340.00	0.25510
3	0.57	0.22700	13	25.00	0.24550	23	400.00	0.25560
4	1.00	0.22900	14	36.00	0.24750	24	460.00	0.25610
5	1.57	0.23150	15	49.00	0.24850	25	580.00	0.25660
6	2.25	0.23300	16	64.00	0.24950	26	700.00	0.25710
7	3.07	0.23500	17	81.00	0.25050	27	820.00	0.25760
8	4.00	0.23650	18	100.00	0.25100	28	1000.00	0.25810
9	6.25	0.23900	19	160.00	0.25250	29	1180.00	0.25860
10	9.00	0.24100	20	220.00	0.25360	30	1366.02	0.25860

Void Ratio: 1.0540 Consolidation: 25.9 %

D0 = 0.2184 D90 = 0.2340 D100 = 0.2358 T90 = 2.49 min.

Cv @ 2.5 min.= 0.050 sq. in./min.

Load No. 7

CONSOLIDATION TEST READINGS

Load 2.00 tsf

No.	Elapsed Time	Dial Reading
1	0.00	0.25760
2	0.10	0.25610
3	0.25	0.25510
4	0.57	0.25460
5	6.25	0.25410
6	25.18	0.25410

Void Ratio: 1.0665 Consolidation: 25.4 %

Load No. 8

CONSOLIDATION TEST READINGS

Load 0.50 tsf

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.25310	11	9.00	0.24200
2	0.10	0.24850	12	12.25	0.24150
3	0.25	0.24700	13	16.00	0.24100
4	0.57	0.24650	14	22.60	0.24050
5	1.00	0.24550	15	28.58	0.24000
6	1.57	0.24500	16	31.58	0.24000
7	2.25	0.24450			
8	3.07	0.24400			
9	4.00	0.24350			
10	6.25	0.24250			

Void Ratio: 1.1056 Consolidation: 24.0 %

Load 1.00 tsf CONSOLIDATION TEST READINGS Load No. 4

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.13830	11	9.00	0.15780	21	220.00	0.16940
2	0.10	0.14280	12	12.25	0.15930	22	340.00	0.17090
3	0.25	0.14430	13	16.00	0.16030	23	460.00	0.17140
4	0.57	0.14630	14	25.00	0.16240	24	520.00	0.17190
5	1.00	0.14780	15	36.00	0.16390	25	580.00	0.17240
6	1.57	0.14980	16	49.00	0.16440	26	640.00	0.17290
7	2.25	0.15080	17	64.00	0.16590	27	820.00	0.17340
8	3.07	0.15230	18	81.00	0.16640	28	940.00	0.17390
9	4.00	0.15330	19	100.00	0.16740	29	1120.00	0.17440
10	6.25	0.15580	20	160.00	0.16840	30	1645.47	0.17440

Void Ratio: 1.2873 Consolidation: 17.4 %
D0 = 0.1402 D90 = 0.1507 D100 = 0.1519 T90 = 2.19 min.
Cv @ 2.2 min.= 0.069 sq. in./min.

Load 2.00 tsf CONSOLIDATION TEST READINGS Load No. 5

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.17740	11	9.00	0.19590	21	220.00	0.20800
2	0.10	0.18140	12	12.25	0.19740	22	280.00	0.20850
3	0.25	0.18290	13	16.00	0.19840	23	340.00	0.20900
4	0.57	0.18540	14	25.00	0.20040	24	400.00	0.21000
5	1.00	0.18690	15	36.00	0.20240	25	460.00	0.21050
6	1.57	0.18840	16	49.00	0.20290	26	580.00	0.21100
7	2.25	0.18990	17	64.00	0.20390	27	700.00	0.21150
8	3.07	0.19090	18	81.00	0.20490	28	880.00	0.21200
9	4.00	0.19190	19	100.00	0.20540	29	1240.00	0.21250
10	6.25	0.19390	20	160.00	0.20690	30	1451.98	0.21250

Void Ratio: 1.1818 Consolidation: 21.3 %
D0 = 0.1788 D90 = 0.1905 D100 = 0.1917 T90 = 2.69 min.
Cv @ 2.7 min.= 0.051 sq. in./min.

Load No. 2

CONSOLIDATION TEST READINGS

Load 0.25 tsf

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.03060	11	9.00	0.08320	21	400.00	0.10370
2	0.10	0.04460	12	12.25	0.08670	22	580.00	0.10470
3	0.25	0.04960	13	16.00	0.08920	23	880.00	0.10570
4	0.57	0.05610	14	25.00	0.09270	24	1300.00	0.10670
5	1.00	0.06210	15	36.00	0.09520	25	1600.00	0.10720
6	1.57	0.06560	16	49.00	0.09670	26	1840.00	0.10770
7	2.25	0.06860	17	81.00	0.09870	27	2020.00	0.10820
8	3.07	0.07220	18	100.00	0.09970	28	2320.00	0.10870
9	4.00	0.07520	19	160.00	0.10120	29	2506.82	0.10870
10	6.25	0.07970	20	280.00	0.10270			

Void Ratio: 1.4693 Consolidation: 10.9 % T90 = 1.60 min.
D0 = 0.0360 D90 = 0.0659 D100 = 0.0692
Cv @ 1.6 min.= 0.115 sq. in./min.

Load No. 3

CONSOLIDATION TEST READINGS

Load 0.50 tsf

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.10970	11	12.25	0.12080	21	760.00	0.13180
2	0.10	0.11220	12	16.00	0.12130	22	1060.00	0.13280
3	0.25	0.11320	13	25.00	0.12280	23	1240.00	0.13330
4	0.57	0.11470	14	49.00	0.12430	24	1960.00	0.13380
5	1.00	0.11520	15	81.00	0.12530	25	2260.00	0.134
6	1.57	0.11570	16	100.00	0.12580	26	2560.00	0.13
7	2.25	0.11680	17	160.00	0.12730	27	3061.58	0.13
8	4.00	0.11780	18	280.00	0.12880			
9	6.25	0.11880	19	400.00	0.12980			
10	9.00	0.11980	20	520.00	0.13080			

Void Ratio: 1.3970 Consolidation: 13.5 % T90 = 0.99 min.
D0 = 0.1105 D90 = 0.1152 D100 = 0.1157
Cv @ 1 min.= 0.165 sq. in./min.

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
0.50	0.23450	0.0000	0.23450	1.1208	23.5 Consol.
1.00	0.24000	0.0000	0.24000	1.1056	24.0 Consol.
2.00	0.24850	0.0000	0.24850	1.0820	24.9 Consol.
4.00	0.26510	0.0000	0.26510	1.0360	26.5 Consol.
8.00	0.30220	0.0000	0.30220	0.9332	30.2 Consol.
16.00	0.34480	0.0000	0.34480	0.8152	34.5 Consol.
32.00	0.38630	0.0000	0.38630	0.7002	38.6 Consol.
8.00	0.37430	0.0000	0.37430	0.7335	37.4 Consol.
2.00	0.36030	0.0000	0.36030	0.7723	36.0 Consol.
0.50	0.34420	0.0000	0.34420	0.8169	34.4 Consol.
0.25	0.33470	0.0000	0.33470	0.8432	33.5 Consol.

CONSOLIDATION TEST RESULTS

Compression index = NOT SELECTED
Preconsolidation pressure = NOT SELECTED

Load 0.13 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading
1	0.10	0.00000
2	64.00	0.00100
3	880.00	0.00150
4	1441.93	0.00150
5	1457.93	0.00150

Void Ratio: 1.7663 Consolidation: 0.2 %
D0 = 0.0000 D90 = 0.0010 D100 = 0.0011 T90 = 90.00 min.
Cv @ 90 min.= 0.002 sq. in./min.

Test No. 35

CONSOLIDATION TEST PROJECT DATA

Project Number:	47533 WESTON
Project:	DSWA - PHASE IV
Date:	06-02-92
Location 1:	TB3 ST9, 67.5'-69.5'
2:	
Remarks 1:	TEST SPECIMEN TAKEN
2:	FROM: 67.8'-67.9'
3:	
4:	
5:	
Material 1:	DREDGE SPOIL
description 2:	
Classification:	
Liquid limit:	
Plasticity index:	
Figure Number:	

CONSOLIDATION TEST SPECIMEN DATA

TOTAL SAMPLE		BEFORE TEST		AFTER TEST	
Wet w+t	= 117.57 g.	Oedometer No.	= 19	Wet w+t	= 99.64 g.
ry w+t	= 75.49 g	Machine No.	= N/A	Dry w+t	= 75.49 g.
are wt.	= 0.00 g.	Spec. Gravity	= 2.60	Tare wt.	= 0.00 g.
Height	= 1.00 in.	Height	= 1.00 in.		
iameter	= 2.50 in.	Diameter	= 2.50 in.		
eight	= 117.57 g.				
				Moisture	= 32.0 %
Moisture	= 55.7 %	Ht. Solids	= 0.36 in.	Dry wt.	= 75.49 g. *
Wet Den.	= 91.2 pcf	Dry wt.	= 75.49 g.	Void ratio	= 0.8432
Dry Den.	= 58.6 pcf	Void ratio	= 1.7705	Saturation	= 98.6 %
		Saturation	= 81.9 %		

* Final dry weight used in calculations

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
Initial	0.00000			1.7705	
0.13	0.00150	0.0000	0.00150	1.7663	0.2 Consol.
0.25	0.10870	0.0000	0.10870	1.4693	10.9 Consol.
0.50	0.13480	0.0000	0.13480	1.3970	13.5 Consol.
1.00	0.17440	0.0000	0.17440	1.2873	17.4 Consol.
2.00	0.21250	0.0000	0.21250	1.1818	21.3 Consol.
4.00	0.25860	0.0000	0.25860	1.0540	25.9 Consol.
2.00	0.25410	0.0000	0.25410	1.0665	25.4 Consol.
0.50	0.24000	0.0000	0.24000	1.1056	24.0 Consol.
0.25	0.23200	0.0000	0.23200	1.1277	23.2 Consol.

Test No. 35

CONSOLIDATION TEST PROJECT DATA

Project Number:	47533 WESTON
Project:	DSWA - PHASE IV
Date:	06-02-92
Location 1:	TB3 ST9, 67.5'-69.5'
2:	
Remarks 1:	TEST SPECIMEN TAKEN
2:	FROM: 67.8'-67.9'
3:	
4:	
5:	
Material 1:	DREDGE SPOIL
description 2:	
Classification:	
Liquid limit:	
Plasticity index:	
Figure Number:	

CONSOLIDATION TEST SPECIMEN DATA

TOTAL SAMPLE		BEFORE TEST		AFTER TEST	
Wet w+t	= 117.57 g.	Oedometer No.	= 19	Wet w+t	= 99.64 g.
Dry w+t	= 75.49 g	Machine No.	= N/A	Dry w+t	= 75.49 g.
Tare wt.	= 0.00 g.	Spec. Gravity	= 2.60	Tare wt.	= 0.00 g.
Height	= 1.00 in.	Height	= 1.00 in.		
Diameter	= 2.50 in.	Diameter	= 2.50 in.		
Weight	= 117.57 g.				
Moisture	= 55.7 %	Ht. Solids	= 0.36 in.	Moisture	= 32.0 %
Wet Den.	= 91.2 pcf	Dry wt.	= 75.49 g.	Dry wt.	= 75.49 g. *
Dry Den.	= 58.6 pcf	Void ratio	= 1.7705	Void ratio	= 0.8432
		Saturation	= 81.9 %	Saturation	= 98.6 %

* Final dry weight used in calculations

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	D ( )	DEFLECTI (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
Initial	0.00000			1.7705	
0.13	0.00150	0.0000	0.00150	1.7663	0.2 Consol.
0.25	0.10870	0.0000	0.10870	1.4693	10.9 Consol.
0.50	0.13480	0.0000	0.13480	1.3970	13.5 Consol.
1.00	0.17440	0.0000	0.17440	1.2873	17.4 Consol.
2.00	0.21250	0.0000	0.21250	1.1818	21.3 Consol.
4.00	0.25860	0.0000	0.25860	1.0540	25.9 Consol.
2.00	0.25410	0.0000	0.25410	1.0665	25.4 Consol.
0.50	0.24000	0.0000	0.24000	1.1056	24.0 Consol.
0.25	0.23200	0.0000	0.23200	1.1277	23.2 Consol.

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
0.50	0.23450	0.0000	0.23450	1.1208	23.5 Consol.
1.00	0.24000	0.0000	0.24000	1.1056	24.0 Consol.
2.00	0.24850	0.0000	0.24850	1.0820	24.9 Consol.
4.00	0.26510	0.0000	0.26510	1.0360	26.5 Consol.
8.00	0.30220	0.0000	0.30220	0.9332	30.2 Consol.
16.00	0.34480	0.0000	0.34480	0.8152	34.5 Consol.
32.00	0.38630	0.0000	0.38630	0.7002	38.6 Consol.
8.00	0.37430	0.0000	0.37430	0.7335	37.4 Consol.
2.00	0.36030	0.0000	0.36030	0.7723	36.0 Consol.
0.50	0.34420	0.0000	0.34420	0.8169	34.4 Consol.
0.25	0.33470	0.0000	0.33470	0.8432	33.5 Consol.

CONSOLIDATION TEST RESULTS

Compression index = NOT SELECTED
Preconsolidation pressure = NOT SELECTED

Load 0.13 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading
1	0.10	0.00000
2	64.00	0.00100
3	880.00	0.00150
4	1441.93	0.00150
5	1457.93	0.00150

Void Ratio: 1.7663 Consolidation: 0.2 %
D0 = 0.0000 D50 = 0.0003 D100 = 0.0006 T50 = 0.65 min.
Cv @ 0.6 min.= 0.076 sq. in./min.

Load No. 2

Load 0.25 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.03060	11	9.00	0.08320	21	400.00	0.10370
2	0.10	0.04460	12	12.25	0.08670	22	580.00	0.10470
3	0.25	0.04960	13	16.00	0.08920	23	880.00	0.10570
4	0.57	0.05610	14	25.00	0.09270	24	1300.00	0.10670
5	1.00	0.06210	15	36.00	0.09520	25	1600.00	0.10720
6	1.57	0.06560	16	49.00	0.09670	26	1840.00	0.10770
7	2.25	0.06860	17	81.00	0.09870	27	2020.00	0.10820
8	3.07	0.07220	18	100.00	0.09970	28	2320.00	0.10870
9	4.00	0.07520	19	160.00	0.10120	29	2506.82	0.10870
10	6.25	0.07970	20	280.00	0.10270			

Void Ratio: 1.4693 Consolidation: 10.9 %
D0 = 0.0380 D50 = 0.0666 D100 = 0.0952 T50 = 1.66 min.
Cv @ 1.7 min.= 0.026 sq. in./min.

Load No. 3

Load 0.50 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.10970	11	12.25	0.12080	21	760.00	0.13180
2	0.10	0.11220	12	16.00	0.12130	22	1060.00	0.13280
3	0.25	0.11320	13	25.00	0.12280	23	1240.00	0.13330
4	0.57	0.11470	14	49.00	0.12430	24	1960.00	0.13380
5	1.00	[illegible]	15	81.00	0.12530	25	2260.00	0.13430
6	1.57	[illegible]	16	100.00	0.12580	26	2560.00	0.13480
7	2.25	0.11680	17	160.00	0.12730	27	3061.58	0.13480
8	4.00	0.11780	18	280.00	0.12880			
9	6.25	0.11880	19	400.00	0.12980			
10	9.00	0.11980	20	520.00	0.13080			

Void Ratio: 1.3970 Consolidation: 13.5 %

Load 1.00 tsf CONSOLIDATION TEST READINGS Load No. 4

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.13830	11	9.00	0.15780	21	220.00	0.16940
2	0.10	0.14280	12	12.25	0.15930	22	340.00	0.17090
3	0.25	0.14430	13	16.00	0.16030	23	460.00	0.17140
4	0.57	0.14630	14	25.00	0.16240	24	520.00	0.17190
5	1.00	0.14780	15	36.00	0.16390	25	580.00	0.17240
6	1.57	0.14980	16	49.00	0.16440	26	640.00	0.17290
7	2.25	0.15080	17	64.00	0.16590	27	820.00	0.17340
8	3.07	0.15230	18	81.00	0.16640	28	940.00	0.17390
9	4.00	0.15330	19	100.00	0.16740	29	1120.00	0.17440
10	6.25	0.15580	20	160.00	0.16840	30	1645.47	0.17440

Void Ratio: 1.2873 Consolidation: 17.4 %
D0 = 0.1413 D50 = 0.1543 D100 = 0.1672 T50 = 4.39 min.
Cv @ 4.4 min.= 0.008 sq. in./min.

Load 2.00 tsf CONSOLIDATION TEST READINGS Load No. 5

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.17740	11	9.00	0.19590	21	220.00	0.20800
2	0.10	0.18140	12	12.25	0.19740	22	280.00	0.20850
3	0.25	0.18290	13	16.00	0.19840	23	340.00	0.20900
4	0.57	0.18540	14	25.00	0.20040	24	400.00	0.21000
5	1.00	0.18690	15	36.00	0.20240	25	460.00	0.2105
6	1.57	0.18840	16	49.00	0.20290	26	580.00	0.2110
7	2.25	0.18990	17	64.00	0.20390	27	700.00	0.2115
8	3.07	0.19090	18	81.00	0.20490	28	880.00	0.2120
9	4.00	0.19190	19	100.00	0.20540	29	1240.00	0.21250
10	6.25	0.19390	20	160.00	0.20690	30	1451.98	0.21250

Void Ratio: 1.1818 Consolidation: 21.3 %
D0 = 0.1792 D50 = 0.1943 D100 = 0.2094 T50 = 6.30 min.
Cv @ 6.3 min.= 0.005 sq. in./min.

Load No. 6

Load 4.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.21250	11	12.25	0.24250	21	280.00	0.[illegible]460
2	0.10	0.22200	12	16.00	0.24400	22	340.00	0.[illegible]10
3	0.57	0.22700	13	25.00	0.24550	23	400.00	0.[illegible]50
4	1.00	0.22900	14	36.00	0.24750	24	460.00	0.[illegible]10
5	1.57	0.23150	15	49.00	0.24850	25	580.00	0.25660
6	2.25	0.23300	16	64.00	0.24950	26	700.00	0.25710
7	3.07	0.23500	17	81.00	0.25050	27	820.00	0.25760
8	4.00	0.23650	18	100.00	0.25100	28	1000.00	0.25810
9	6.25	0.23900	19	160.00	0.25250	29	1180.00	0.25860
10	9.00	0.24100	20	220.00	0.25360	30	1366.02	0.25860

Void Ratio: 1.0540 Consolidation: 25.9 %
D0 = 0.2193 D50 = 0.2342 D100 = 0.2490 T50 = 2.51 min.
Cv @ 2.5 min.= 0.011 sq. in./min.

Load No. 7

Load 2.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading
1	0.00	0.25760
2	0.10	0.25610
3	0.25	0.25510
4	0.57	0.25460
5	6.25	0.25410
6	25.18	0.25410

Void Ratio: 1.0665 Consolidation: 25.4 %

Load No. 8

Load 0.50 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.25310	11	9.00	0.24200
2	0.10	0.24850	12	12.25	0.24150
3	0.25	0.24700	13	16.00	0.24100
4	0.57	0.24650	14	22.60	0.24050
5	1.00	0.24550	15	28.58	0.24000
6	1.57	0.24500	16	31.58	0.24000
7	2.25	0.24450			
8	3.07	0.24400			
9	4.00	0.24350			
10	6.25	0.24250			

Void Ratio: 1.1056 Consolidation: 24.0 %

Load 0.25 tsf CONSOLIDATION TEST READINGS Load No. 9

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.24050	11	13.65	0.23350
2	0.10	0.23900	12	16.65	0.23300
3	0.25	0.23800	13	19.65	0.23250
4	0.57	0.23750	14	22.65	0.23200
5	1.00	0.23700	15	25.65	0.23200
6	2.25	0.23650			
7	3.07	0.23600			
8	4.00	0.23550			
9	7.65	0.23450			
10	10.65	0.23400			

Void Ratio: 1.1277 Consolidation: 23.2 %

Load 0.50 tsf CONSOLIDATION TEST READINGS Load No. 10

No.	Elapsed Time	Dial Reading
1	0.00	0.23250
2	0.10	0.23300
3	0.25	0.23350
4	0.57	0.23400
5	4.00	0.23450
6	16.00	0.23450
7	81.00	0.23450
8	520.00	0.23450
9	1000.00	0.23450
10	1285.00	0.23450

Void Ratio: 1.1208 Consolidation: 23.5 %
D0 = 0.2322 D50 = 0.2333 D100 = 0.2344 T50 = 0.17 min.
Cv @ 0.2 min.= 0.175 sq. in./min.

Load No. 11

ɔad 1.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading
1	0.00	0.23500
2	0.10	0.23650
3	0.25	0.23700
4	1.00	0.23750
5	2.25	0.23800
6	9.00	0.23850
7	49.00	0.23900
8	220.00	0.23950
9	1000.00	0.24000
10	1496.93	0.24000

Void Ratio: 1.1056 Consolidation: 24.0 %

Load No. 12

oad 2.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.24000	11	64.00	0.24750
2	0.10	0.24300	12	220.00	0.24800
3	0.25	0.24350	13	520.00	0.24850
4	0.57	0.24400	14	1460.52	0.24850
5	1.00	0.24450			
6	1.57	0.24500			
7	2.25	0.24550			
8	6.25	0.24600			
9	12.25	0.24650			
10	25.00	0.24700			

Void Ratio: 1.0820 Consolidation: 24.9 %
D0 = 0.2421 D50 = 0.2453 D100 = 0.2485 T50 = 2.53 min.
Cv @ 2.5 min.= 0.011 sq. in./min.

Load 4.00 tsf — CONSOLIDATION TEST READINGS — Load No. 13

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.24850	11	36.00	0.26060	21	1478.27	0.26510
2	0.10	0.25460	12	49.00	0.26110			
3	0.57	0.25560	13	81.00	0.26160			
4	1.00	0.25660	14	160.00	0.26210			
5	1.57	0.25710	15	220.00	0.26260			
6	2.25	0.25760	16	280.00	0.26310			
7	3.07	0.25810	17	340.00	0.26360			
8	6.25	0.25910	18	460.00	0.26410			
9	12.25	0.25960	19	700.00	0.26460			
10	16.00	0.26010	20	940.00	0.26510			

Void Ratio: 1.0360 Consolidation: 26.5 %
D0 = 0.2538 D50 = 0.2553 D100 = 0.2568 T50 = 0.31 min.
Cv @ 0.3 min.= 0.087 sq. in./min.

Load 8.00 tsf — CONSOLIDATION TEST READINGS — Load No. 14

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.26560	11	9.00	0.28710	21	220.00	0.29760
2	0.10	0.27210	12	12.25	0.28860	22	280.00	0.29860
3	0.25	0.27410	13	16.00	0.28960	23	340.00	0.29920
4	0.57	0.27610	14	25.00	0.29110	24	520.00	0.30020
5	1.00	0.27810	15	36.00	0.29210	25	580.00	0.3007
6	1.57	0.27960	16	49.00	0.29310	26	760.00	0.3012
7	2.25	0.28110	17	64.00	0.29410	27	940.00	0.3017
8	3.07	0.28260	18	81.00	0.29510	28	1240.00	0.3022
9	4.00	0.28360	19	100.00	0.29560	29	1426.65	0.30220
10	6.25	0.28560	20	160.00	0.29660			

Void Ratio: 0.9332 Consolidation: 30.2 %
D0 = 0.2695 D50 = 0.2819 D100 = 0.2943 T50 = 2.59 min.
Cv @ 2.6 min.= 0.010 sq. in./min.

Load No. 15

Load 16.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.30520	11	9.00	0.32920	21	1000.00	0.34320
2	0.10	0.31120	12	12.25	0.33020	22	1540.00	0.34370
3	0.25	0.31370	13	25.00	0.33320	23	1780.00	0.34420
4	0.57	0.31620	14	49.00	0.33520	24	2080.00	0.34480
5	1.00	0.31870	15	81.00	0.33720	25	2578.88	0.34480
6	1.57	0.32070	16	160.00	0.33870			
7	2.25	0.32220	17	280.00	0.33970			
8	3.07	0.32420	18	340.00	0.34020			
9	4.00	0.32570	19	460.00	0.34120			
10	6.25	0.32720	20	640.00	0.34220			

Void Ratio: 0.8152 Consolidation: 34.5 %
D0 = 0.3079 D50 = 0.3211 D100 = 0.3344 T50 = 1.62 min.
Cv @ 1.6 min.= 0.014 sq. in./min.

Load No. 16

Load 32.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.34530	11	9.00	0.37230	21	340.00	0.38230
2	0.10	0.35530	12	16.00	0.37380	22	400.00	0.38280
3	0.25	0.35780	13	25.00	0.37530	23	460.00	0.38330
4	0.57	0.36030	14	36.00	0.37680	24	580.00	0.38380
5	1.00	0.36330	15	49.00	0.37730	25	640.00	0.38430
6	1.57	0.36480	16	64.00	0.37830	26	820.00	0.38480
7	2.25	0.36630	17	81.00	0.37880	27	1000.00	0.38530
8	3.07	0.36780	18	100.00	0.37930	28	1300.00	0.38580
9	4.00	0.36880	19	160.00	0.38030	29	1660.00	0.38630
10	6.25	0.37080	20	220.00	0.38180	30	1724.22	0.38630

Void Ratio: 0.7002 Consolidation: 38.6 %
D0 = 0.3512 D50 = 0.3632 D100 = 0.3752 T50 = 1.04 min.
Cv @ 1 min.= 0.019 sq. in./min.

Load 8.00 tsf — CONSOLIDATION TEST READINGS — Load No. 17

No.	Elapsed Time	Dial Reading
1	0.00	0.38380
2	0.10	0.37780
3	0.25	0.37680
4	0.57	0.37630
5	1.00	0.37580
6	2.25	0.37530
7	6.25	0.37480
8	16.00	0.37430
9	22.52	0.37430

Void Ratio: 0.7335 Consolidation: 37.4 %

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.37330	11	11.92	0.36180
2	0.10	0.36930	12	14.92	0.36130
3	0.25	0.36780	13	26.92	0.36080
4	0.57	0.36680	14	29.92	0.36030
5	1.00	0.36580	15	30.75	0.36030
6	1.57	0.36530			
7	2.25	0.36430			
8	2.92	0.36430			
9	5.92	0.36330			
10	8.92	0.36230			

Void Ratio: 0.7723 Consolidation: 36.0 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.35830	11	12.63	0.34680
2	0.10	0.35630	12	15.63	0.34630
3	0.25	0.35480	13	18.63	0.34530
4	0.57	0.35380	14	21.63	0.34480
5	1.00	0.35280	15	24.63	0.34420
6	2.25	0.35130	16	25.90	0.34420
7	3.07	0.35080			
8	4.00	0.35030			
9	6.25	0.34880			
10	9.63	0.34780			

Void Ratio: 0.8169 Consolidation: 34.4 %

Load No. 20

Load 0.25 tsf

CONSOLIDATION TEST READINGS

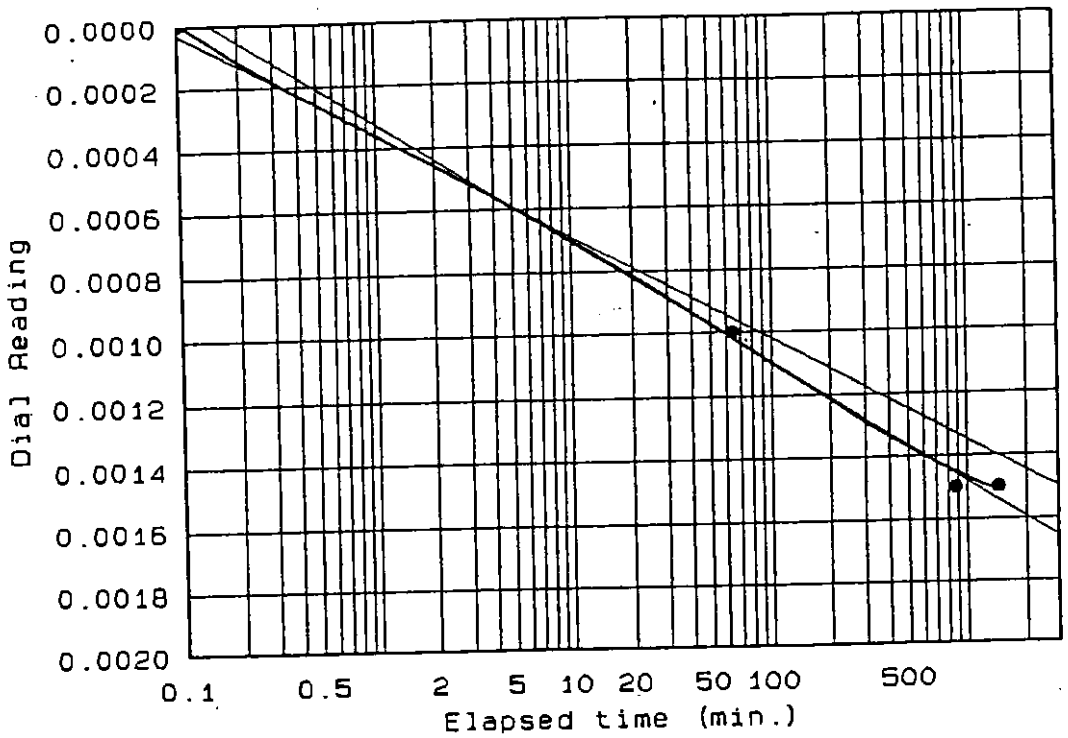
No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.02	0.34370	11	29.07	0.33470
2	0.10	0.34270			
3	0.25	0.34220			
4	0.57	0.34170			
5	1.57	0.34120			
6	2.25	0.34070			
7	5.67	0.33920			
8	11.67	0.33770			
9	17.67	0.33670			
10	23.67	0.33520			

Void Ratio: 0.8432 Consolidation: 33.5 %

Dial Reading vs. Time

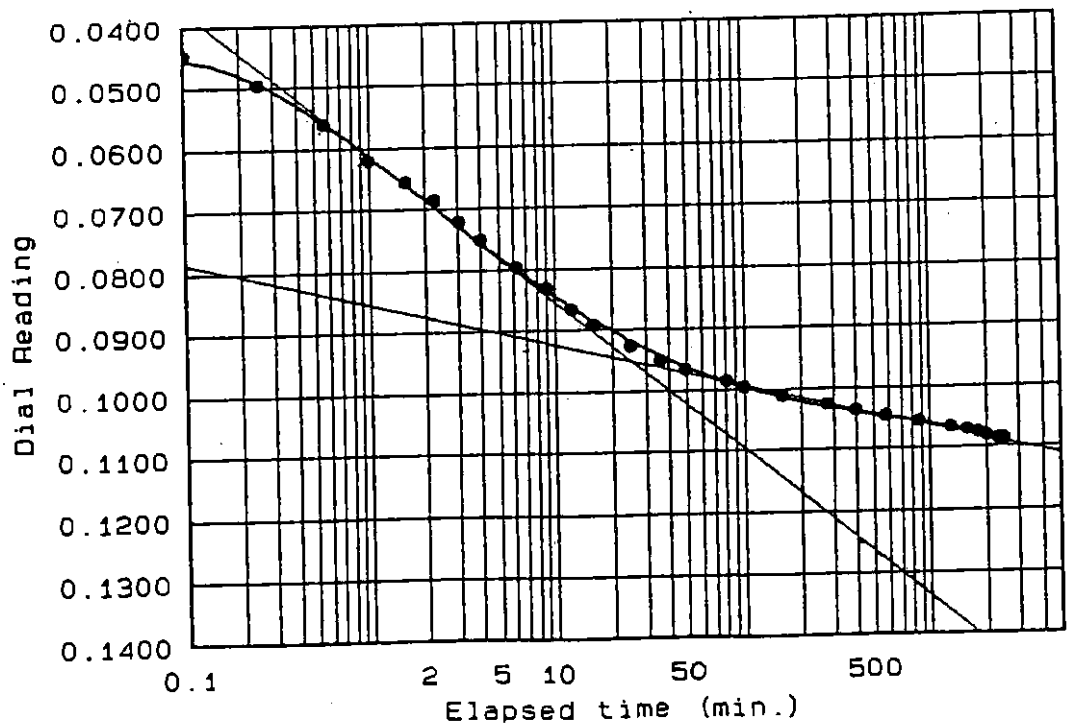
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: T83 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 1
Load= 0.13 tsf
D_0 = 0.0000
D_{50} = 0.0003
D_{100}= 0.0006
T_{50}= 0.65 min.

C_v @ T_{50} =
0.08 in.^{2}/min.



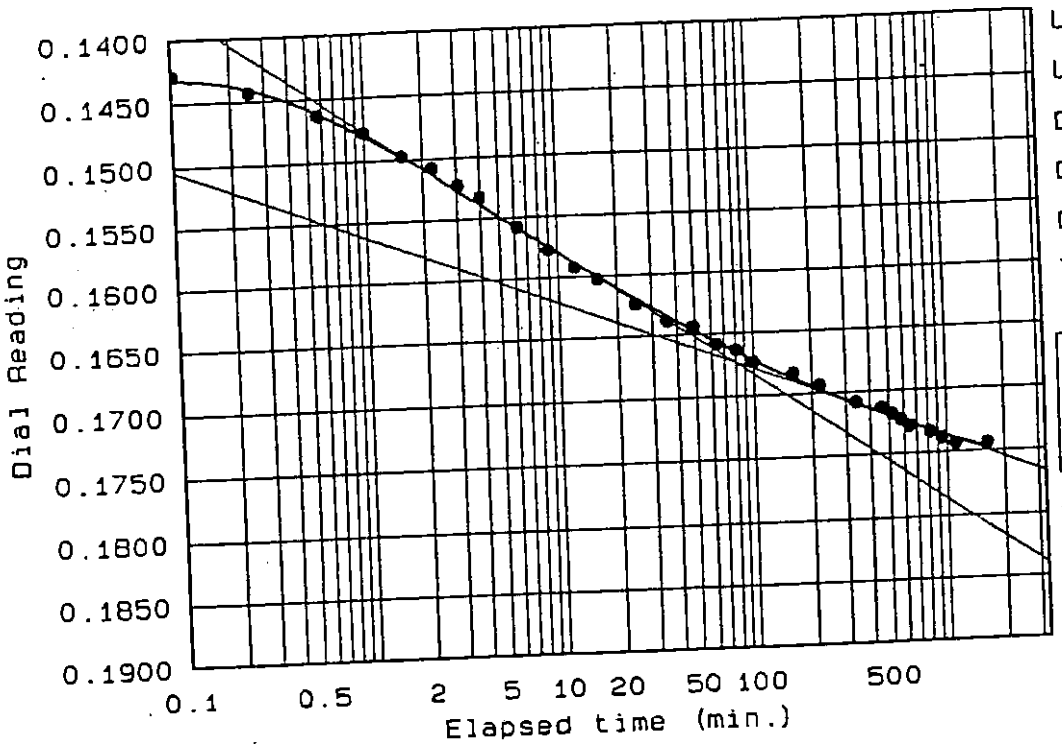
Load No.= 2
Load= 0.25 tsf
D_0 = 0.0380
D_{50} = 0.0666
D_{100}= 0.0952
T_{50}= 1.66 min.

C_v @ T_{50} =
0.03 in.^{2}/min.

Dial Reading vs. Time

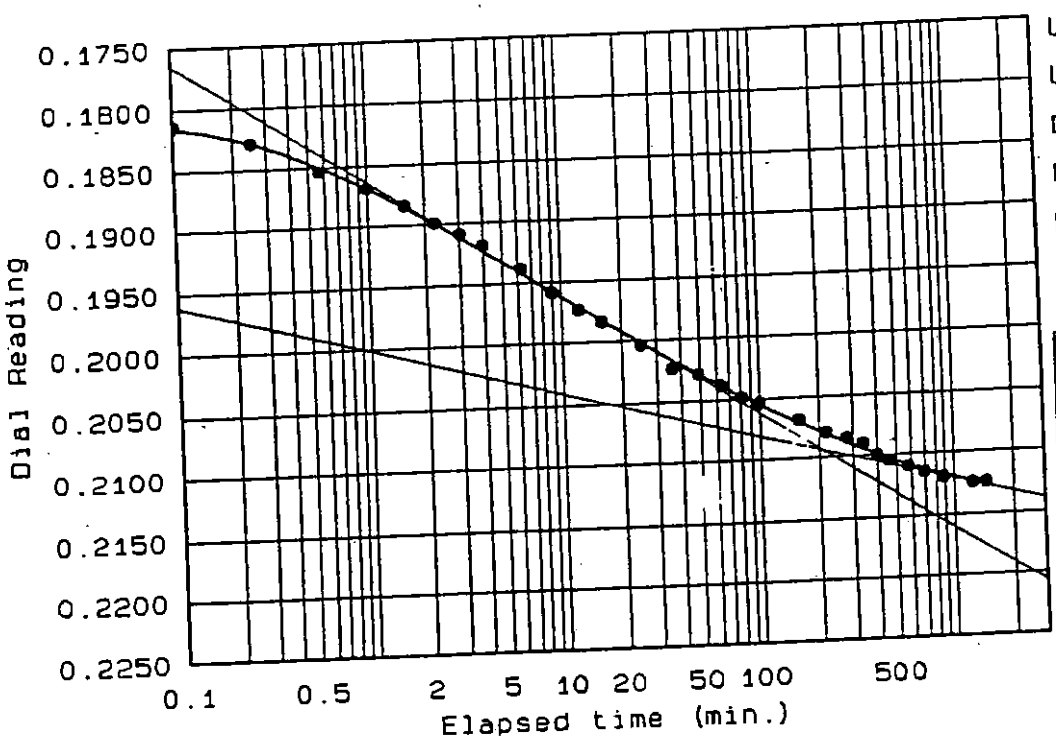
Project No : 4-533 WESTON
Project: DSWA PHASE IV
Location: TB3 .T9. 67.5'-69.5'

Date: 06-02-92



Load No.= 4
Load= 1.00 tsf
D_0 = 0.1413
D_{50} = 0.1543
D_{100}= 0.1672
T_{50}= 4.39 min.

C_v @ T_{50} =
0.01 in.^{2}/min.



Load No.= 5
Load= 2.00 tsf
D_0 = 0.1792
D_{50} = 0.1943
D_{100}= 0.2094
T_{50}= 6.30 min.

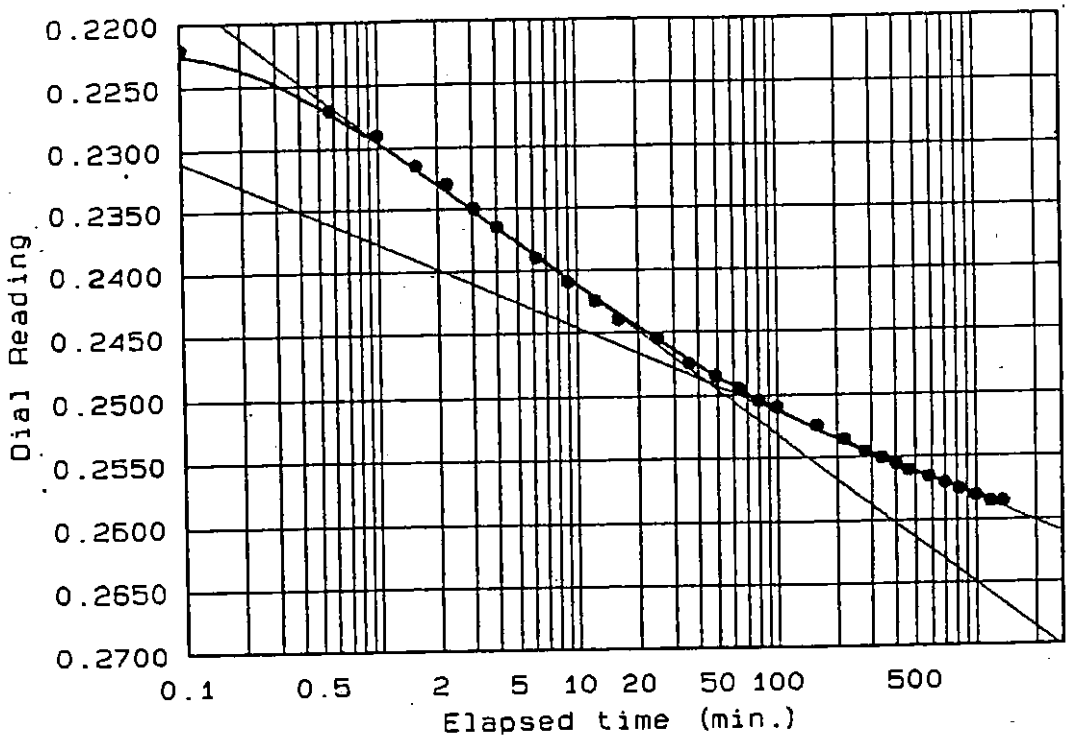
C_v @ T_{50} =
0.01 in.^{2}/min.

BOWSER-MORNER, INC.

Dial Reading vs. Time

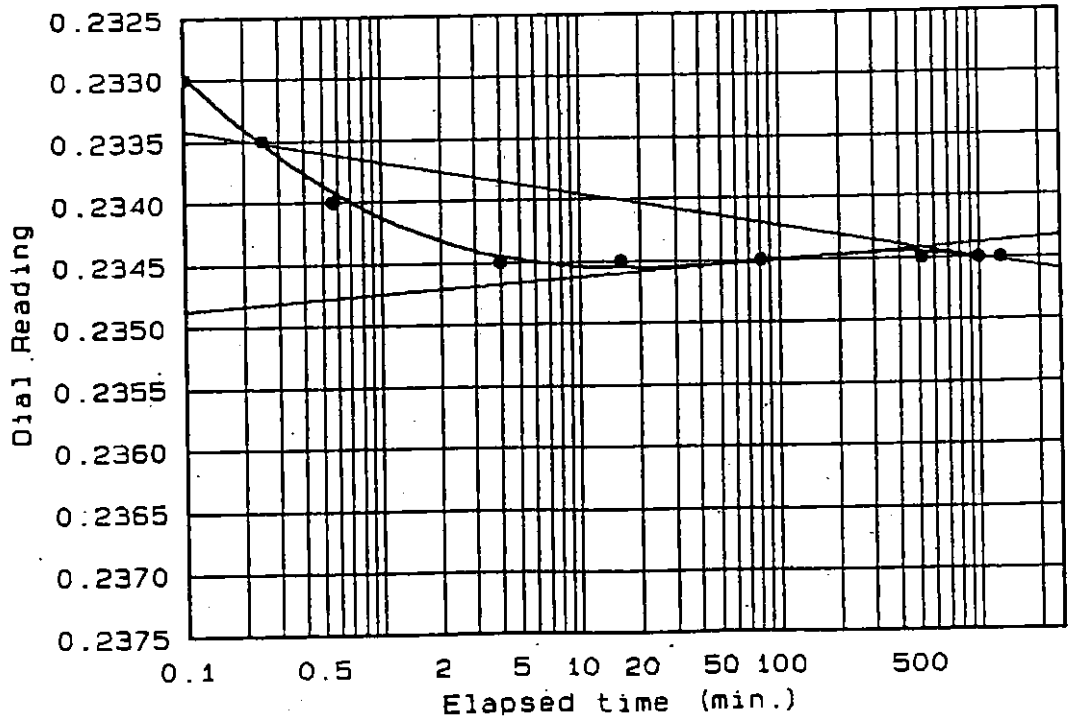
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB3 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 6
Load= 4.00 tsf
D_0 = 0.2193
D_{50} = 0.2342
D_{100}= 0.2490
T_{50}= 2.51 min.

C_v @ T_{50} =
0.01 in.^{2}/min.



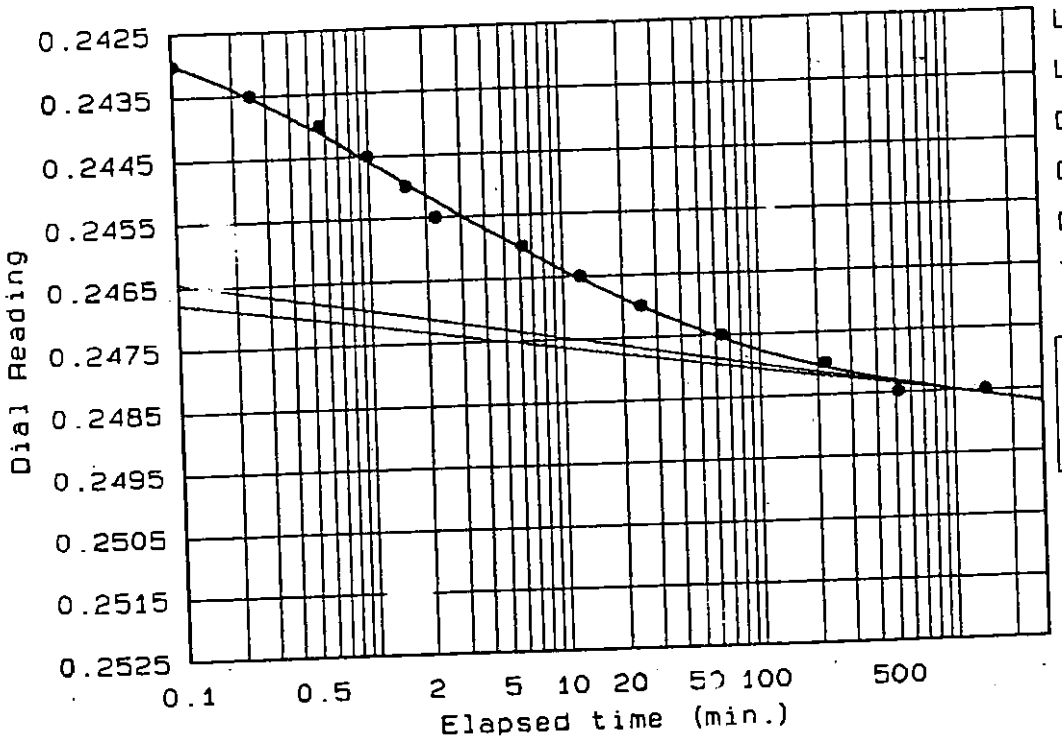
Load No.= 10
Load= 0.50 tsf
D_0 = 0.2322
D_{50} = 0.2333
D_{100}= 0.2344
T_{50}= 0.17 min.

C_v @ T_{50} =
0.18 in.^{2}/min.

Dial Reading vs. Time

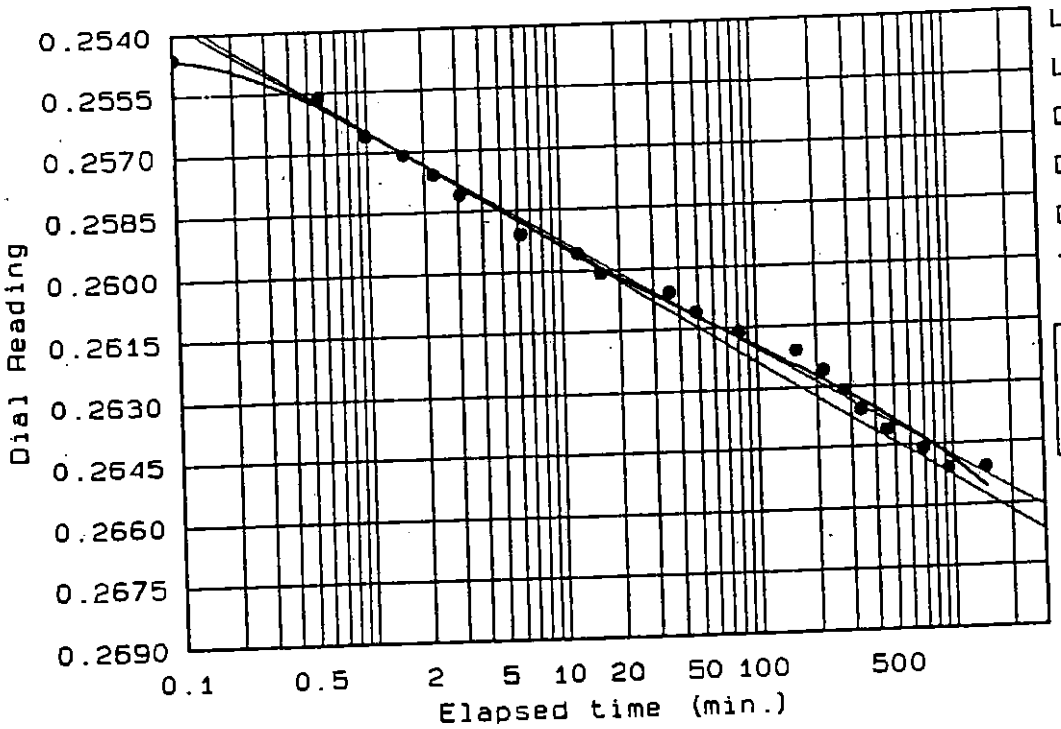
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: T63 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 12
Load= 2.00 tsf
D_0 = 0.2421
D_{50} = 0.2453
D_{100}= 0.2485
T_{50}= 2.53 min.

C_v @ T_{50} =
0.01 in.^{2}/min.



Load No.= 13
Load= 4.00 tsf
D_0 = 0.2538
D_{50} = 0.2553
D_{100}= 0.2568
T_{50}= 0.31 min.

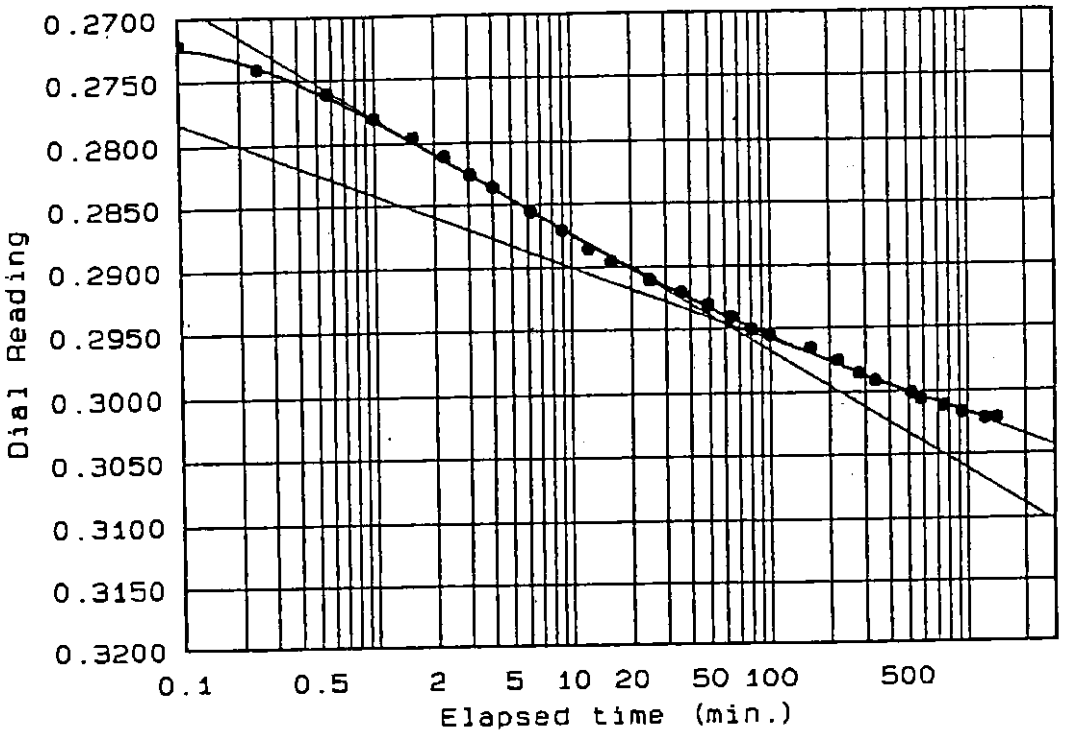
C_v @ T_{50} =
0.09 in.^{2}/min.

BOWSER-MORNER, INC.

Dial Reading vs. Time

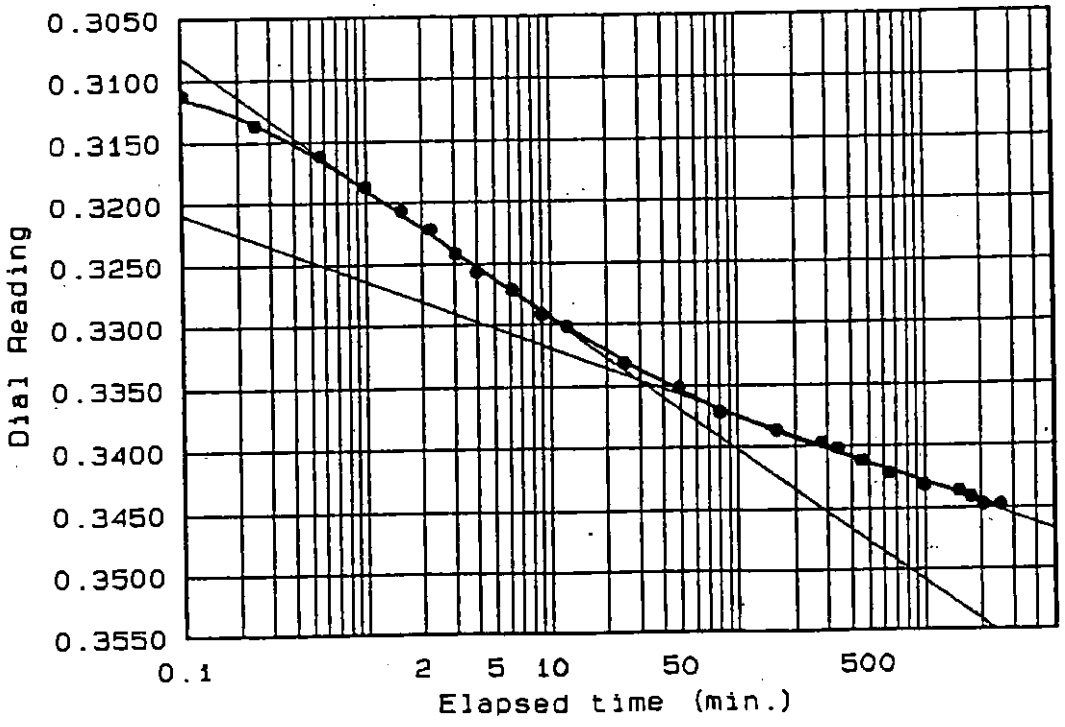
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: T83 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 14
Load= 8.00 tsf
D_0 = 0.2695
D_{50} = 0.2819
D_{100}= 0.2943
T_{50}= 2.59 min.

C_v @ T_{50} =
0.01 in.^{2}/min.



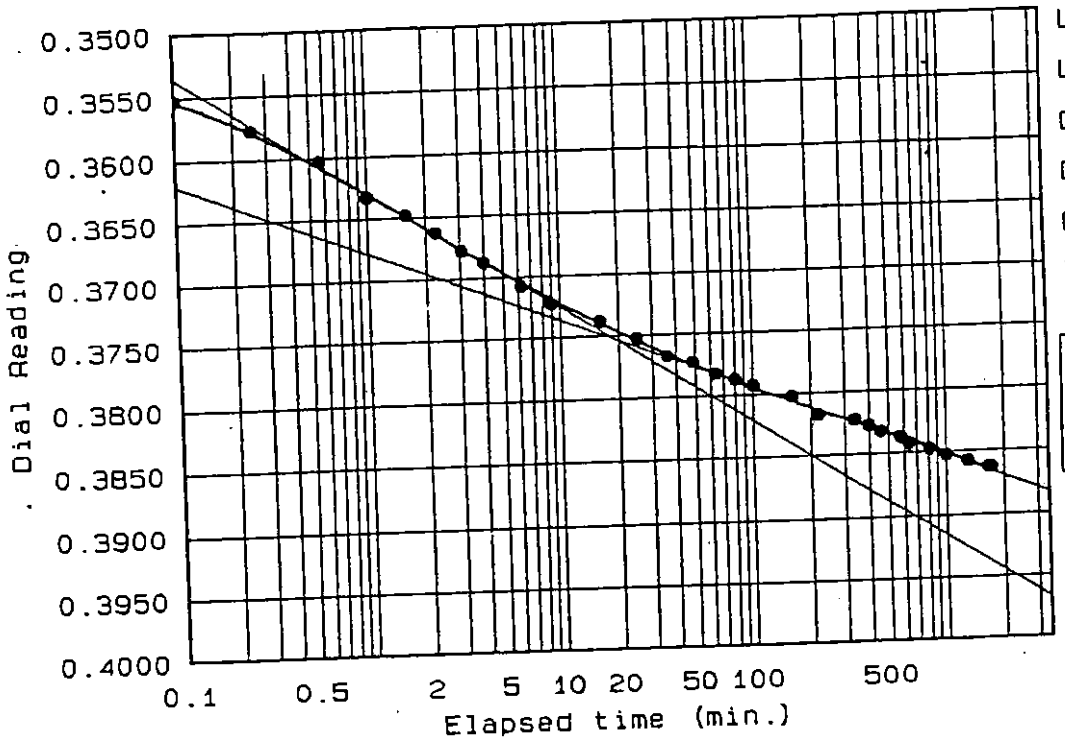
Load No.= 15
Load= 16.00 tsf
D_0 = 0.3079
D_{50} = 0.3211
D_{100}= 0.3344
T_{50}= 1.62 min.

C_v @ T_{50} =
0.01 in.^{2}/min.

Dial Reading vs. Time

Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB3 ST9, 67.5'-69.5'

Date: 06-02-92



Load No.= 16

Load= 32.00 tsf

D_0 = 0.3512

D_{50} = 0.3632

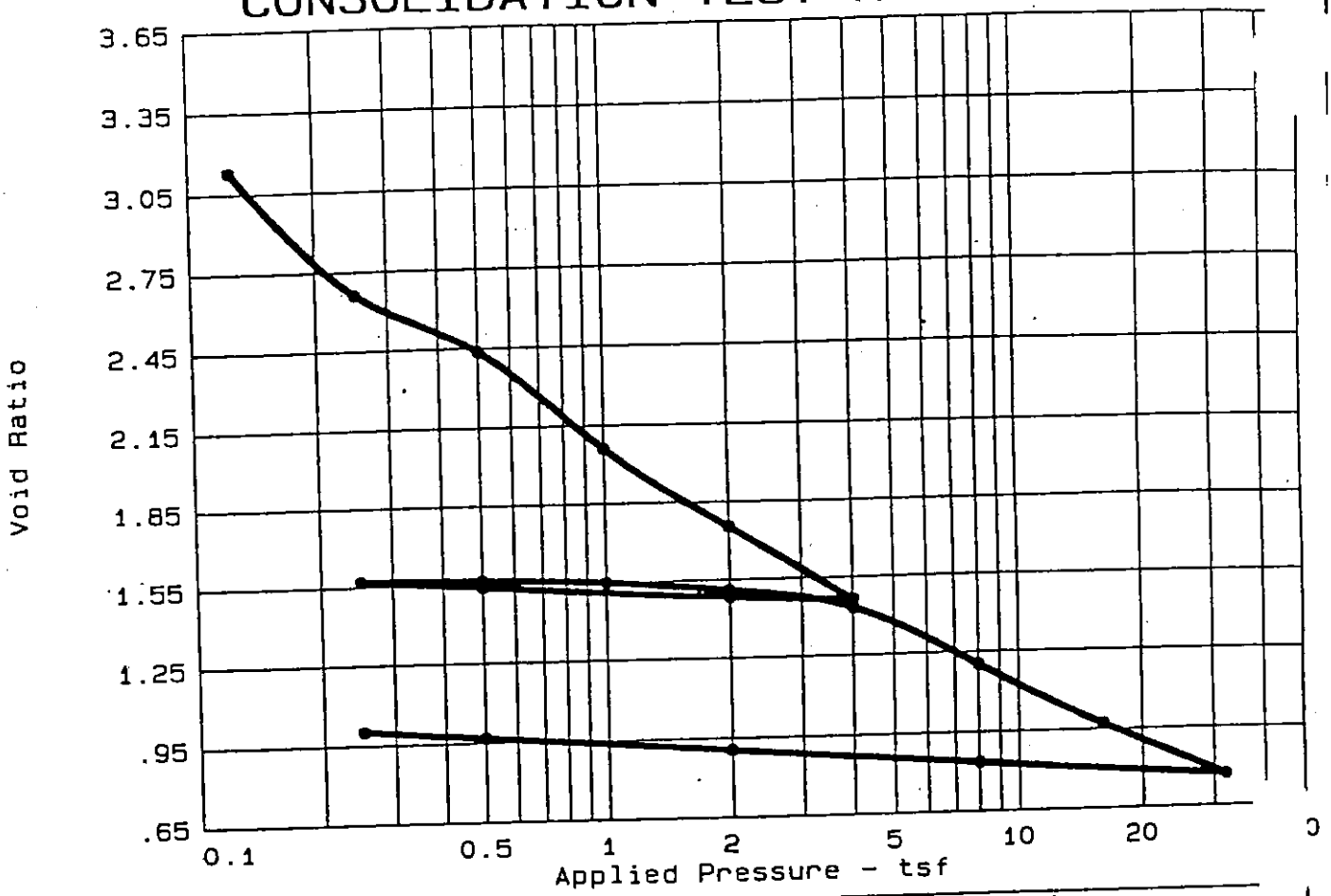
D_{100}= 0.3752

T_{50}= 1.04 min.

C_v @ T_{50} =

0.02 in.^{2}/min.

CONSOLIDATION TEST REPORT



Coefficients of Consolidation (sq.in./min.)

No.	Load	Cv	No.	Load	Cv	No.	Load	Cv
1	0.13	0.004	12	2.00	0.028			
2	0.25	0.321	13	4.00	0.083			
3	0.50	0.012	14	8.00	0.004			
4	1.00	0.073	15	16.00	0.037			
5	2.00	0.030	16	32.00	0.011			
6	4.00	0.017						
10	0.50	0.000						
11	1.00	0.036						

Swell press.	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
	81.8 %	100.1	38.6			2.56	3.1351

TEST RESULTS

C_v at 32.00 tsf applied = 0.011 sq. in./min.

MATERIAL DESCRIPTION

DREDGE SPOIL

Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1. 23.0'-25.0'

Date: 06-02-92

Remarks:
TEST SPECIMEN TAKE
FROM: 24.5'-24.6'

CONSOLIDATION TEST REPORT

BOWSER-MORNER, INC.

Fig. No.

Test No. 36

CONSOLIDATION TEST PROJECT DATA

Project Number:	47533 WESTON
Project:	DSWA - PHASE IV
Date:	06-02-92
Location 1:	TB4 ST1, 23.0'-25.0'
2:	
Remarks 1:	TEST SPECIMEN TAKEN
2:	FROM: 24.5'-24.6'
3:	
4:	
5:	
Material 1:	DREDGE SPOIL
description 2:	
Classification:	
Liquid limit:	
Plasticity index:	
Figure Number:	

CONSOLIDATION TEST SPECIMEN DATA

TOTAL SAMPLE		BEFORE TEST		AFTER TEST	
Wet w+t =	99.67 g.	Oedometer No. =	19	Wet w+t =	70.00 g.
Dry w+t =	49.80 g	Machine No. =	N/A	Dry w+t =	49.80 g.
Tare wt. =	0.00 g.	Spec. Gravity =	2.56	Tare wt. =	0.00 g.
Height =	1.00 in.	Height =	1.00 in.		
Diameter =	2.50 in.	Diameter =	2.50 in.		
Weight =	99.67 g.				
Moisture =	% 100.1 %	Ht. Solids =	0.24 in.	Moisture =	40.6 %
Wet Den. =	77.4 pcf	Dry wt. =	49.80 g.	Dry wt. =	49.80 g. *
Dry Den. =	38.6 pcf	Void ratio =	3.1351	Void ratio =	1.0034
		Saturation =	81.8 %	Saturation =	103. %

* Final dry weight used in calculations

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
Initial	0.00000			3.1351	
0.13	0.00140	0.0000	0.00140	3.1293	0.1 Consol.
0.25	0.11440	0.0000	0.11440	2.6620	11.4 Consol.
0.50	0.16840	0.0000	0.16840	2.4387	16.8 Consol.
1.00	0.25960	0.0000	0.25960	2.0616	26.0 Consol.
2.00	0.33390	0.0000	0.33390	1.7544	33.4 Consol.
4.00	0.40430	0.0000	0.40430	1.4633	40.4 Consol.
2.00	0.39960	0.0000	0.39960	1.4827	40.0 Consol.
0.50	0.38590	0.0000	0.38590	1.5393	38.6 Consol.
0.25	0.37830	0.0000	0.37830	1.5708	37.8 Consol.

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL
0.50	0.37970	0.0000	0.37970	1.5650	38.0 Consol.
1.00	0.38400	0.0000	0.38400	1.5472	38.4 Consol.
2.00	0.39300	0.0000	0.39300	1.5100	39.3 Consol.
4.00	0.41190	0.0000	0.41190	1.4318	41.2 Consol.
8.00	0.46720	0.0000	0.46720	1.2032	46.7 Consol.
16.00	0.52300	0.0000	0.52300	0.9724	52.3 Consol.
32.00	0.57170	0.0000	0.57170	0.7710	57.2 Consol.
8.00	0.55610	0.0000	0.55610	0.8356	55.6 Consol.
2.00	0.53910	0.0000	0.53910	0.9058	53.9 Consol.
0.50	0.52350	0.0000	0.52350	0.9704	52.4 Consol.
0.25	0.51550	0.0000	0.51550	1.0034	51.6 Consol.

CONSOLIDATION TEST RESULTS

Compression index = NOT SELECTED
Preconsolidation pressure = NOT SELECTED

Load 0.13 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading
1	0.10	0.00000
2	12.25	0.00050
3	28.87	0.00090
4	408.30	0.00140
5	1444.63	0.00140

Void Ratio: 3.1293 Consolidation: 0.1 %
D0 = 0.0000 D90 = 0.0010 D100 = 0.0011 T90 = 55.61 min.
Cv @ 55.6 min.= 0.004 sq. in./min.

Load No. 2

Load 0.25 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.01890	11	12.25	0.08990	21	700.00	0.10830
2	0.10	0.06100	12	16.00	0.09080	22	880.00	0.10920
3	0.25	0.06760	13	25.00	0.09320	23	1060.00	0.11020
4	0.57	0.07330	14	36.00	0.09510	24	1360.00	0.11110
5	1.57	0.07900	15	64.00	0.09740	25	1720.00	0.11260
6	2.25	0.08040	16	100.00	0.09980	26	1840.00	0.11300
7	3.07	0.08230	17	160.00	0.10210	27	1960.00	0.11350
8	4.00	0.08370	18	280.00	0.10450	28	2140.00	0.11400
9	6.25	0.08650	19	460.00	0.10640	29	2320.00	0.11440
10	9.00	0.08840	20	520.00	0.10740	30	2508.27	0.11440

Void Ratio: 2.6620 Consolidation: 11.4 %
D0 = 0.0496 D90 = 0.0733 D100 = 0.0760 T90 = 0.58 min.
Cv @ 0.6 min.= 0.321 sq. in./min.

Load No. 3

Load 0.50 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.11590	11	220.00	0.15090	21	1300.00	0.16320
2	0.25	0.12060	12	280.00	0.15230	22	1360.00	0.16360
3	1.00	0.12300	13	340.00	0.15370	23	1780.00	0.16410
4	2.25	0.12530	14	400.00	0.15510	24	1900.00	0.16460
5	4.00	0.12770	15	580.00	0.15700	25	2020.00	0.16550
6	9.00	0.13150	16	700.00	0.15890	26	2260.00	0.16650
7	16.00	0.13430	17	880.00	0.16030	27	2560.00	0.16740
8	36.00	0.13950	18	940.00	0.16130	28	2680.00	0.16790
9	64.00	0.14330	19	1120.00	0.16220	29	3059.72	0.16840
10	100.00	0.14610	20	1180.00	0.16270	30	3062.72	0.16840

Void Ratio: 2.4387 Consolidation: 16.8 %
D0 = 0.1182 D90 = 0.1331 D100 = 0.1347 T90 = 12.72 min.
Cv @ 12.7 min.= 0.012 sq. in./min.

Load 1.00 tsf — CONSOLIDATION TEST READINGS — Load No. 4

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.16840	11	9.00	0.21610	21	400.00	0.25250
2	0.10	0.18070	12	12.25	0.21940	22	520.00	0.25440
3	0.25	0.18440	13	16.00	0.22320	23	640.00	0.25540
4	0.57	0.18920	14	25.00	0.22840	24	760.00	0.25680
5	1.00	0.19290	15	36.00	0.23220	25	880.00	0.25730
6	1.57	0.19670	16	49.00	0.23550	26	1000.00	0.25820
7	2.25	0.20050	17	64.00	0.23830	27	1120.00	0.25870
8	3.07	0.20380	18	81.00	0.24020	28	1180.00	0.25920
9	4.00	0.20620	19	160.00	0.24590	29	1480.00	0.25960
10	6.25	0.21140	20	280.00	0.24970	30	1646.93	0.25960

Void Ratio: 2.0616 Consolidation: 26.0 %
D0 = 0.1741 D90 = 0.1981 D100 = 0.2007 T90 = 1.80 min.
Cv @ 1.8 min.= 0.073 sq. in./min.

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No. 5

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.26060	11	49.00	0.31260	21	520.00	0.32960
2	0.10	0.26720	12	64.00	0.31540	22	580.00	0.33060
3	0.25	0.26960	13	81.00	0.31680	23	640.00	0.33100
4	0.57	0.27290	14	100.00	0.31870	24	700.00	0.33150
5	1.00	0.27570	15	160.00	0.32200	25	820.00	0.332
6	1.57	0.27810	16	220.00	0.32440	26	880.00	0.332
7	3.07	0.28330	17	280.00	0.32580	27	940.00	0.332
8	6.25	0.28990	18	340.00	0.32730	28	1240.00	0.333
9	12.25	0.29750	19	400.00	0.32820	29	1420.00	0.33390
10	25.00	0.30600	20	460.00	0.32910	30	1445.83	0.33390

Void Ratio: 1.7544 Consolidation: 33.4 %
D0 = 0.2631 D90 = 0.2845 D100 = 0.2868 T90 = 3.55 min.
Cv @ 3.5 min.= 0.030 sq. in./min.

Load No. 6

Load 4.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.33580	11	25.00	0.38120	21	520.00	0.40100
2	0.10	0.34140	12	36.00	0.38450	22	580.00	0.40150
3	0.25	0.34380	13	49.00	0.38730	23	640.00	0.40200
4	0.57	0.34660	14	64.00	0.38920	24	700.00	0.40240
5	1.57	0.35230	15	81.00	0.39060	25	760.00	0.40290
6	3.07	0.35800	16	100.00	0.39250	26	880.00	0.40340
7	6.25	0.36510	17	160.00	0.39530	27	1000.00	0.40390
8	9.00	0.36930	18	220.00	0.39720	28	1300.00	0.40390
9	12.25	0.37260	19	340.00	0.39910	29	1360.00	0.40430
10	16.00	0.37640	20	460.00	0.40060	30	1364.05	0.40430

Void Ratio: 1.4633 Consolidation: 40.4 %
D0 = 0.3373 D90 = 0.3622 D100 = 0.3650 T90 = 4.84 min.
Cv @ 4.8 min.= 0.017 sq. in./min.

Load No. 7

Load 2.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.40340	11	16.02	0.40010
2	0.10	0.40200	12	19.02	0.39960
3	0.25	0.40200	13	22.02	0.39960
4	0.57	0.40150			
5	1.57	0.40100			
6	2.25	0.40060			
7	3.07	0.40060			
8	6.25	0.40010			
9	9.00	0.40010			
10	12.25	0.40060			

Void Ratio: 1.4827 Consolidation: 40.0 %

Load 0.50 tsf CONSOLIDATION TEST READINGS Load No. 8

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.39960	11	9.00	0.38870
2	0.10	0.39630	12	12.25	0.38780
3	0.25	0.39580	13	16.00	0.38730
4	0.57	0.39490	14	24.27	0.38590
5	1.00	0.39440	15	27.27	0.38590
6	1.57	0.39300	16	30.27	0.38590
7	2.25	0.39250			
8	3.07	0.39200			
9	4.00	0.39110			
10	6.25	0.38970			

Void Ratio: 1.5393 Consolidation: 38.6 %

Load 0.25 tsf CONSOLIDATION TEST READINGS Load No. 9

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.38540	11	8.78	0.38120
2	0.10	0.38450	12	11.78	0.38020
3	0.25	0.38450	13	14.78	0.38020
4	0.57	0.38400	14	17.78	0.37970
5	1.00	0.38400	15	20.78	0.37930
6	1.57	0.38350	16	23.78	0.37830
7	2.25	0.38350	17	26.78	0.37830
8	3.07	0.38310			
9	4.00	0.38260			
10	5.78	0.38210			

Void Ratio: 1.5708 Consolidation: 37.8 %

Load 0.50 tsf CONSOLIDATION TEST READINGS Load No. 10

No.	Elapsed Time	Dial Reading
1	0.00	0.37880
2	0.25	0.37930
3	1.57	0.37970
4	820.00	0.37970
5	1120.00	0.37970
6	1286.77	0.37970

Void Ratio: 1.5650 Consolidation: 38.0 %
D0 = 0.3790 D90 = 0.3797 D100 = 0.3798 T90 = 330.72 min.
Cv @ 330.7 min.= 0.000 sq. in./min.

Load No. 11

Load 1.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading
1	0.00	0.37970
2	0.10	0.38120
3	0.57	0.38160
4	2.25	0.38210
5	9.00	0.38260
6	49.00	0.38310
7	220.00	0.38350
8	700.00	0.38400
9	1499.15	0.38400

Void Ratio: 1.5472 Consolidation: 38.4 %
D0 = 0.3809 D90 = 0.3821 D100 = 0.3822 T90 = 2.24 min.
Cv @ 2.2 min.= 0.036 sq. in./min.

Load No. 12

Load 2.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.38540	11	12.25	0.39060
2	0.10	0.38640	12	64.00	0.39160
3	0.25	0.38680	13	160.00	0.39200
4	0.57	0.38730	14	280.00	0.39250
5	1.00	0.38780	15	580.00	0.39300
6	1.57	0.38830	16	1462.13	0.39300
7	2.25	0.38870			
8	4.00	0.38920			
9	6.25	0.38970			
10	9.00	0.39010			

Void Ratio: 1.5100 Consolidation: 39.3 %
D0 = 0.3857 D90 = 0.3889 D100 = 0.3892 T90 = 2.78 min.
Cv @ 2.8 min.= 0.028 sq. in./min.

Load 4.00 tsf CONSOLIDATION TEST READINGS Load No. 13

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.39390	11	100.00	0.40760	21	1476.62	0.41190
2	0.10	0.39680	12	160.00	0.40810			
3	0.25	0.39770	13	220.00	0.40860			
4	0.57	0.39870	14	280.00	0.40910			
5	2.25	0.40100	15	340.00	0.40950			
6	4.00	0.40240	16	400.00	0.41000			
7	9.00	0.40390	17	460.00	0.41050			
8	16.00	0.40580	18	580.00	0.41100			
9	49.00	0.40670	19	700.00	0.41140			
10	81.00	0.40720	20	1120.00	0.41190			

Void Ratio: 1.4318 Consolidation: 41.2 %
D0 = 0.3953 D90 = 0.3993 D100 = 0.3998 T90 = 0.91 min.
Cv @ 0.9 min.= 0.083 sq. in./min.

Load 8.00 tsf CONSOLIDATION TEST READINGS Load No. 14

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.41470	11	64.00	0.45490	21	1240.00	0.46680
2	0.10	0.41800	12	81.00	0.45590	22	1360.00	0.46720
3	0.25	0.41950	13	160.00	0.45970	23	1425.32	0.46720
4	0.57	0.42230	14	280.00	0.46200			
5	1.57	0.42700	15	400.00	0.46340			
6	3.07	0.43130	16	520.00	0.46440			
7	6.25	0.43650	17	580.00	0.46490			
8	12.25	0.44260	18	640.00	0.46530			
9	25.00	0.44880	19	760.00	0.46580			
10	49.00	0.45300	20	1000.00	0.46630			

Void Ratio: 1.2032 Consolidation: 46.7 %
D0 = 0.4154 D90 = 0.4453 D100 = 0.4486 T90 = 17.72 min.
Cv @ 17.7 min.= 0.004 sq. in./min.

Load No. 15

CONSOLIDATION TEST READINGS

Load 16.00 tsf

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.47120	11	16.00	0.50270	21	580.00	0.51920
2	0.10	0.47390	12	36.00	0.50840	22	640.00	0.51970
3	0.25	0.47620	13	64.00	0.51120	23	760.00	0.52020
4	0.57	0.47860	14	100.00	0.51310	24	880.00	0.52070
5	1.00	0.48190	15	160.00	0.51500	25	1180.00	0.52110
6	1.57	0.48330	16	220.00	0.51590	26	1540.00	0.52160
7	2.25	0.48570	17	280.00	0.51640	27	1660.00	0.52210
8	3.07	0.48800	18	340.00	0.51690	28	1900.00	0.52260
9	4.00	0.49040	19	400.00	0.51830	29	2200.00	0.52300
10	9.00	0.49750	20	460.00	0.51880	30	2580.85	0.52300

Void Ratio: 0.9724 Consolidation: 52.3 %
D0 = 0.4699 D90 = 0.4830 D100 = 0.4845 T90 = 1.44 min.
Cv @ 1.4 min.= 0.037 sq. in./min.

Load No. 16

CONSOLIDATION TEST READINGS

Load 32.00 tsf

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.02	0.52490	11	9.00	0.55050	21	460.00	0.56800
2	0.10	0.53010	12	12.25	0.55280	22	520.00	0.56840
3	0.25	0.53200	13	16.00	0.55470	23	580.00	0.56890
4	0.57	0.53440	14	25.00	0.55710	24	700.00	0.56940
5	1.00	0.53670	15	36.00	0.55900	25	760.00	0.56990
6	1.57	0.53860	16	49.00	0.56040	26	940.00	0.57030
7	2.25	0.54100	17	81.00	0.56230	27	1120.00	0.57080
8	3.07	0.54290	18	160.00	0.56510	28	1360.00	0.57130
9	4.00	0.54480	19	280.00	0.56610	29	1600.00	0.57170
10	6.25	0.54810	20	400.00	0.56750	30	1726.58	0.57170

Void Ratio: 0.7710 Consolidation: 57.2 %
D0 = 0.5268 D90 = 0.5447 D100 = 0.5467 T90 = 3.96 min.
Cv @ 4 min.= 0.011 sq. in./min.

Load 8.00 tsf — CONSOLIDATION TEST READINGS — Load No. 17

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.56890	11	9.00	0.55760
2	0.10	0.56280	12	12.25	0.55710
3	0.25	0.56180	13	16.00	0.55710
4	0.57	0.56090	14	24.28	0.55660
5	1.00	0.56040	15	27.28	0.55610
6	1.57	0.55990	16	30.28	0.55610
7	2.25	0.55940	17	31.12	0.55610
8	3.07	0.55900			
9	4.00	0.55850			
10	6.25	0.55800			

Void Ratio: 0.8356 Consolidation: 55.6 %

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No. 18

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.55470	11	9.00	0.54240
2	0.10	0.55050	12	12.25	0.54150
3	0.25	0.54950	13	16.00	0.54050
4	0.57	0.54860	14	16.62	0.54010
5	1.00	0.54810	15	22.62	0.53960
6	1.57	0.54760	16	25.62	0.53910
7	2.25	0.54670	17	28.45	0.53910
8	3.07	0.54570			
9	4.00	0.54530			
10	6.25	0.54380			

Void Ratio: 0.9058 Consolidation: 53.9 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 19

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.53770	11	9.93	0.52870
2	0.10	0.53630	12	12.93	0.52730
3	0.25	0.53530	13	15.93	0.52680
4	0.57	0.53490	14	18.93	0.52590
5	1.00	0.53440	15	21.93	0.52490
6	1.57	0.53390	16	23.23	0.52450
7	2.25	0.53340	17	27.23	0.52350
8	3.07	0.53200			
9	3.93	0.53150			
10	6.93	0.53060			

Void Ratio: 0.9704 Consolidation: 52.4 %

Load No. 20

ad 0.25 tsf

CONSOLIDATION TEST READINGS

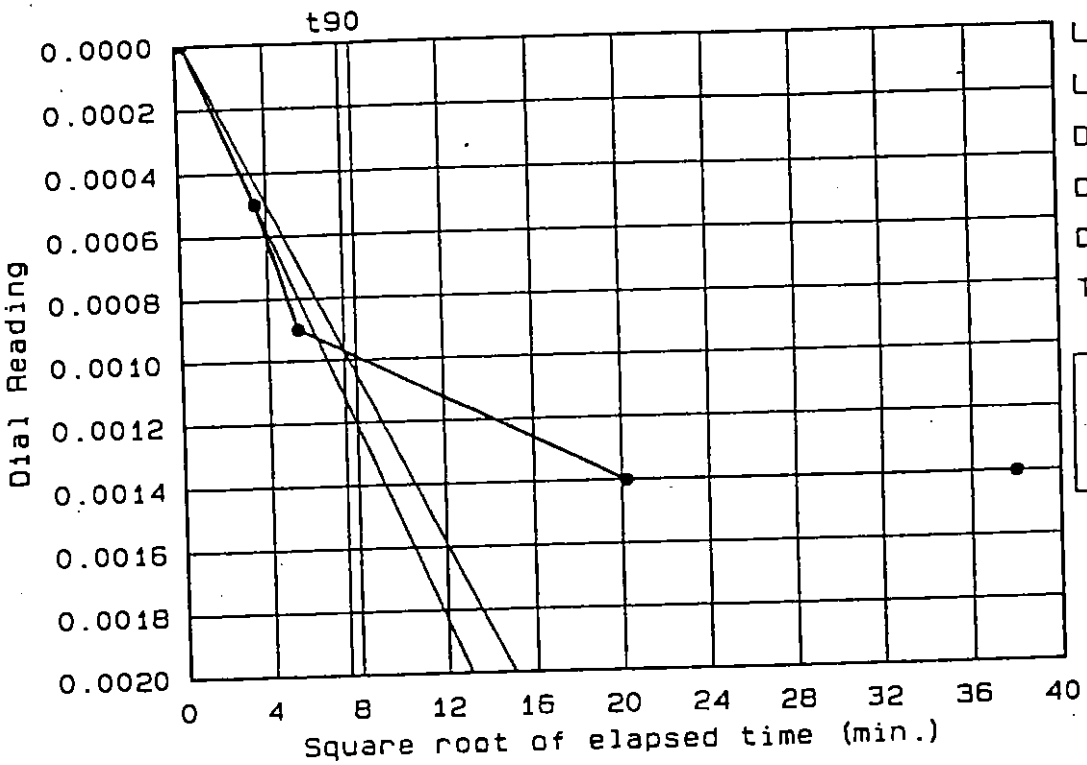
No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.52350	1	[illegible].82	0.51690
2	0.10	0.52300	2	[illegible]3.82	0.51640
3	0.25	0.52260	13	26.82	0.51590
4	1.57	0.52210	14	27.60	0.51550
5	2.82	0.52160			
6	5.82	0.52070			
7	8.82	0.51970			
8	11.82	0.51880			
9	14.82	0.51830			
10	17.82	0.51780			

Void Ratio: 1.0034 Consolidation: 51.6 %

Dial Reading vs. Time

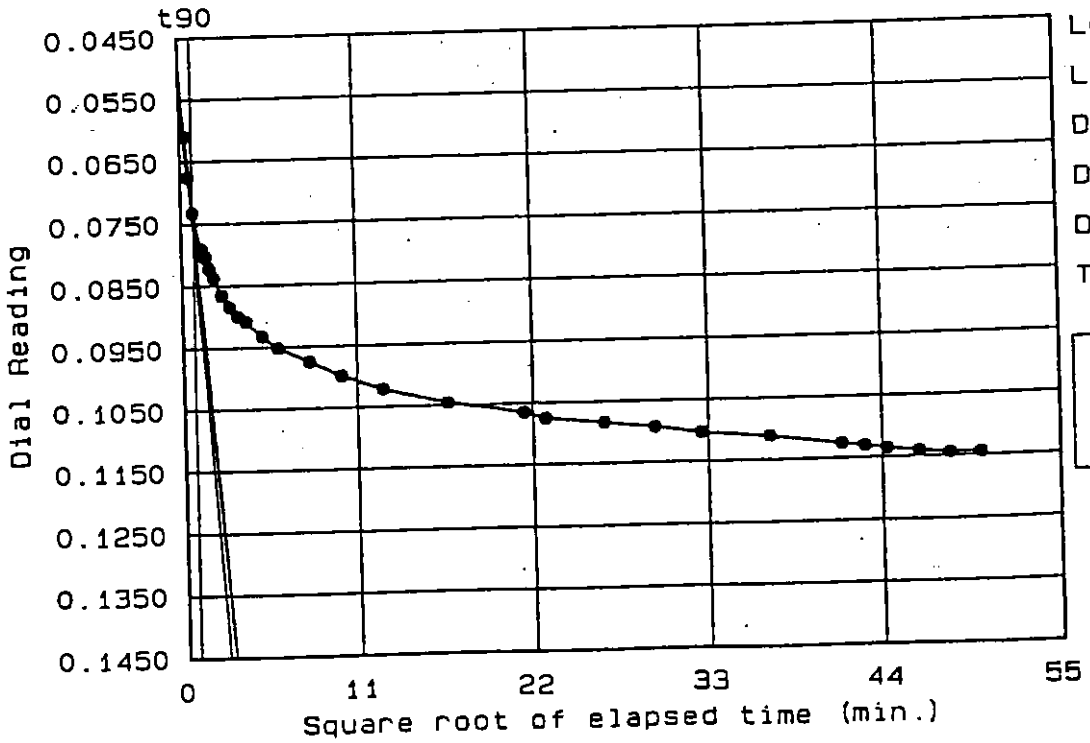
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1, 23.0'-25.0'

Date: 06-02-92



Load No.= 1
Load= 0.13 tsf
D_0 = 0.0000
D_{90} = 0.0010
D_{100}= 0.0011
T_{90}= 55.61 min.

C_v @ T_{90} =
0.00 in.^{2}/min.



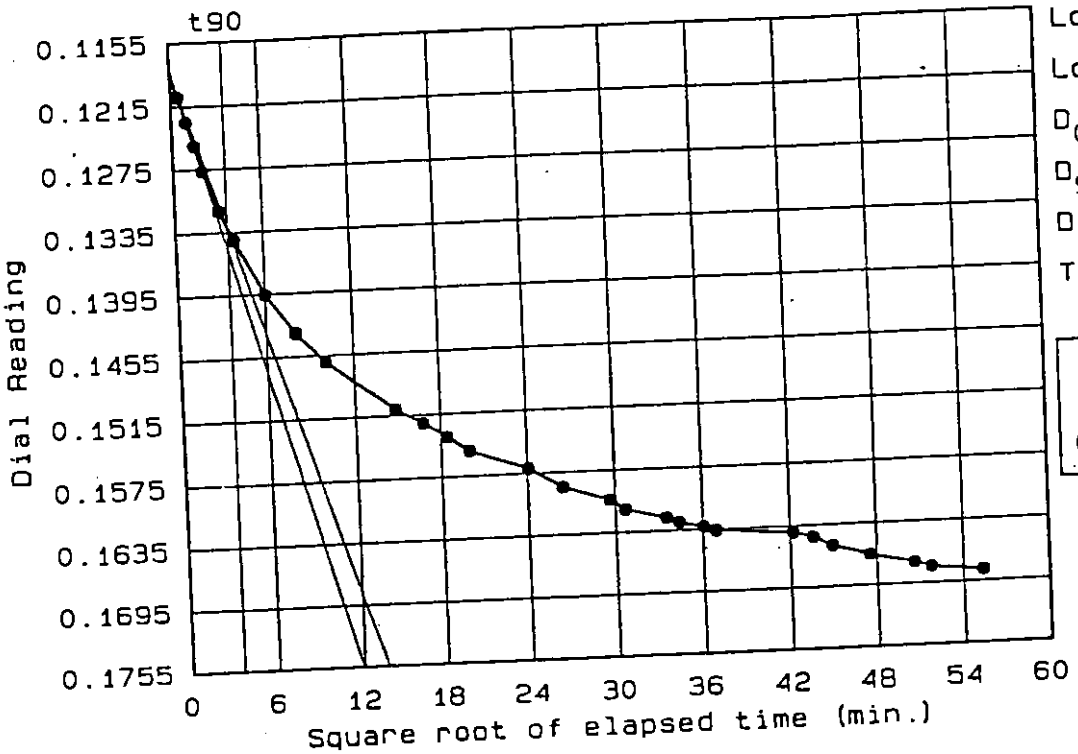
Load No.= 2
Load= 0.25 tsf
D_0 = 0.0496
D_{90} = 0.0733
D_{100}= 0.0760
T_{90}= 0.58 min.

C_v @ T_{90} =
0.32 in.^{2}/min.

Dial Reading vs. Time

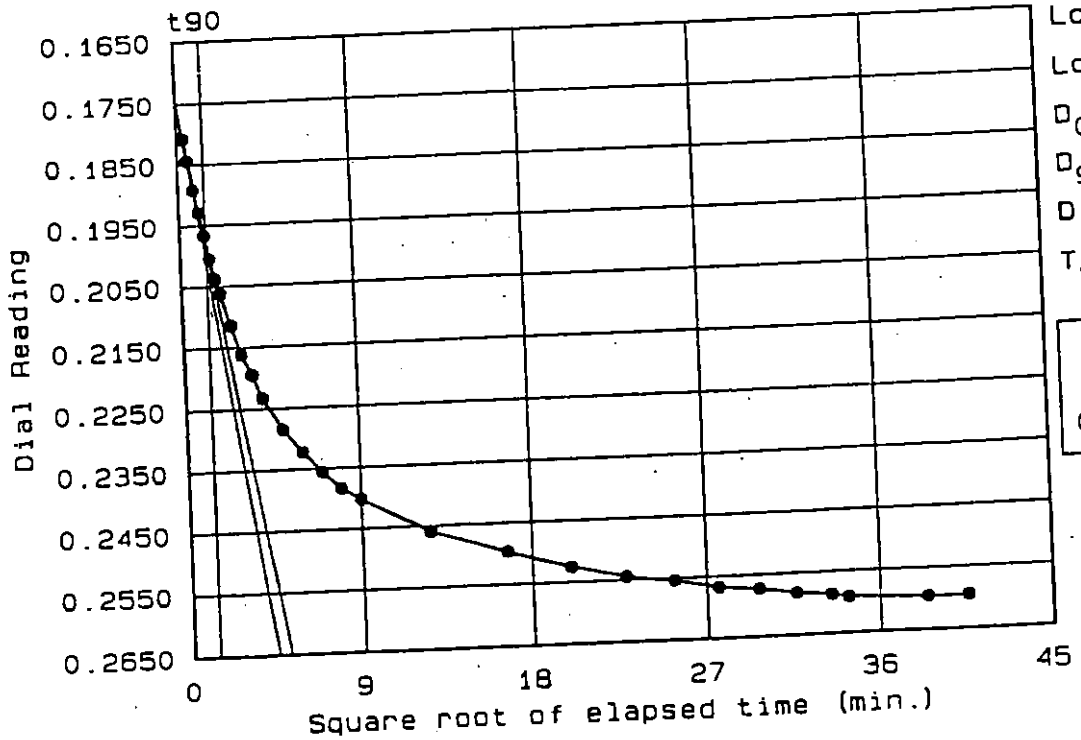
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1. 23.0'-25.0'

Date: 06-02-92



Load No.= 3
Load= 0.50 tsf
D_0 = 0.1182
D_{90} = 0.1331
D_{100}= 0.1347
T_{90}= 12.72 min.

C_v @ T_{90} =
0.01 in.^{2}/min.



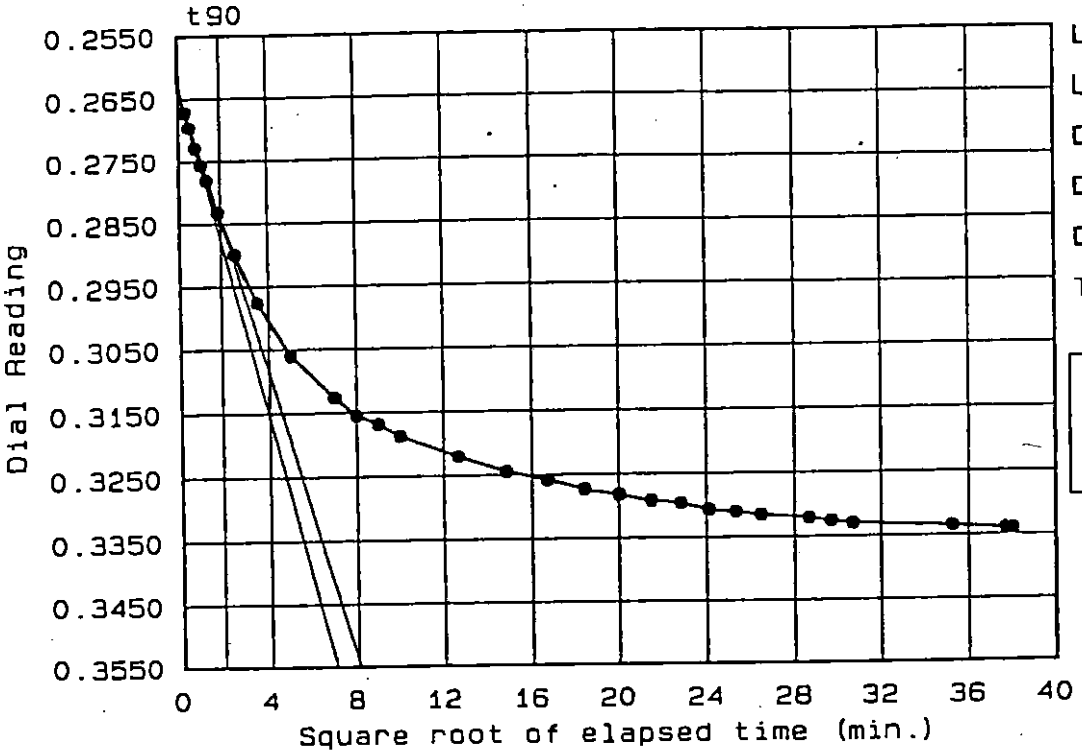
Load No.= 4
Load= 1.00 tsf
D_0 = 0.1741
D_{90} = 0.1981
D_{100}= 0.2007
T_{90}= 1.80 min.

C_v @ T_{90} =
0.07 in.^{2}/min.

Dial Reading vs. Time

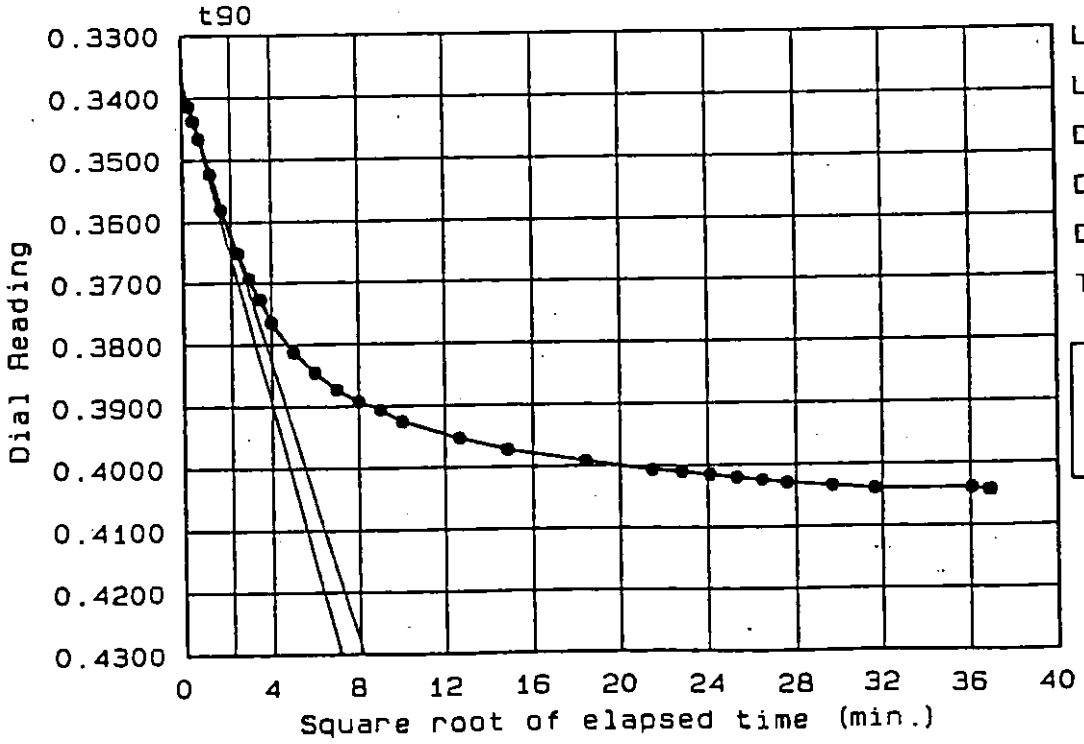
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1, 23.0'-25.0'

Date: 06-02-92



Load No.= 5
Load= 2.00 tsf
D_0 = 0.2631
D_{90} = 0.2845
D_{100}= 0.2868
T_{90}= 3.55 min.

C_v @ T_{90} =
0.03 in.^{2}/min.



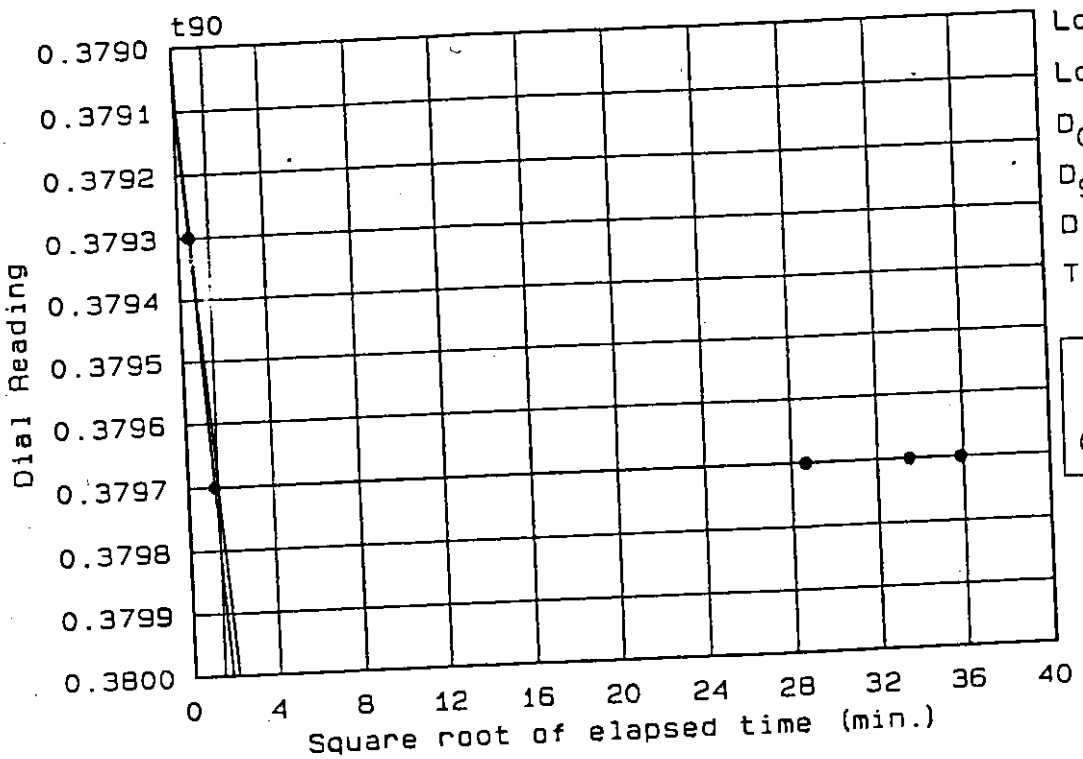
Load No.= 6
Load= 4.00 tsf
D_0 = 0.3373
D_{90} = 0.3622
D_{100}= 0.3650
T_{90}= 4.84 min.

C_v @ T_{90} =
0.02 in.^{2}/min.

Dial Reading vs. Time

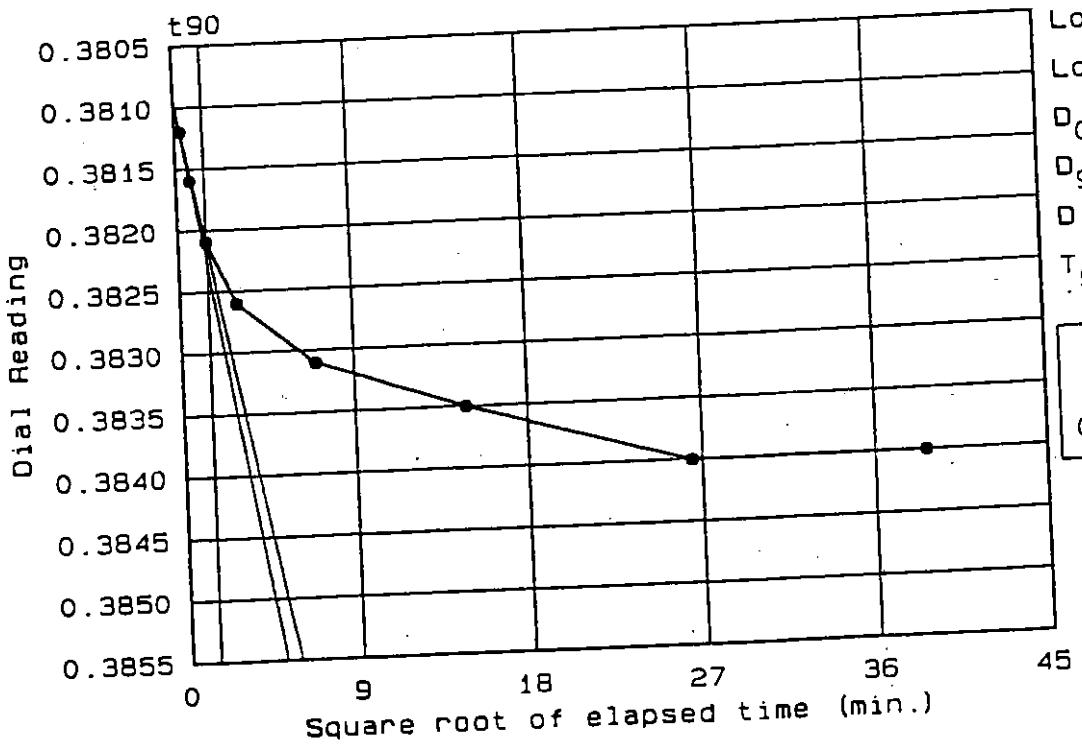
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1, 23.0'-25.0'

Date: 06-02-92



Load No.= 10
Load= 0.50 tsf
D_0 = 0.3790
D_{90} = 0.3797
D_{100}= 0.3798
T_{90}= 330.72 min

C_v @ T_{90} =
0.00 in.^{2}/min.



Load No.= 11
Load= 1.00 tsf
D_0 = 0.3809
D_{90} = 0.3821
D_{100}= 0.3822
T_{90}= 2.24 min

C_v @ T_{90} =
0.04 in.^{2}/min.

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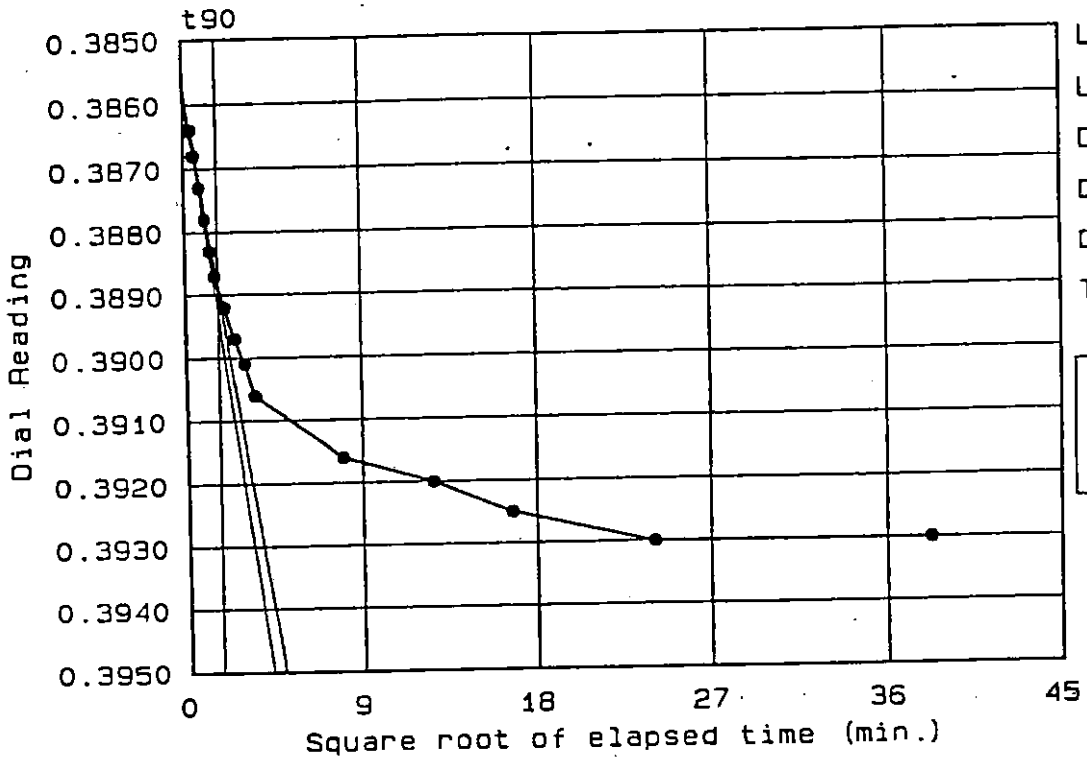
Dial Reading vs. Time

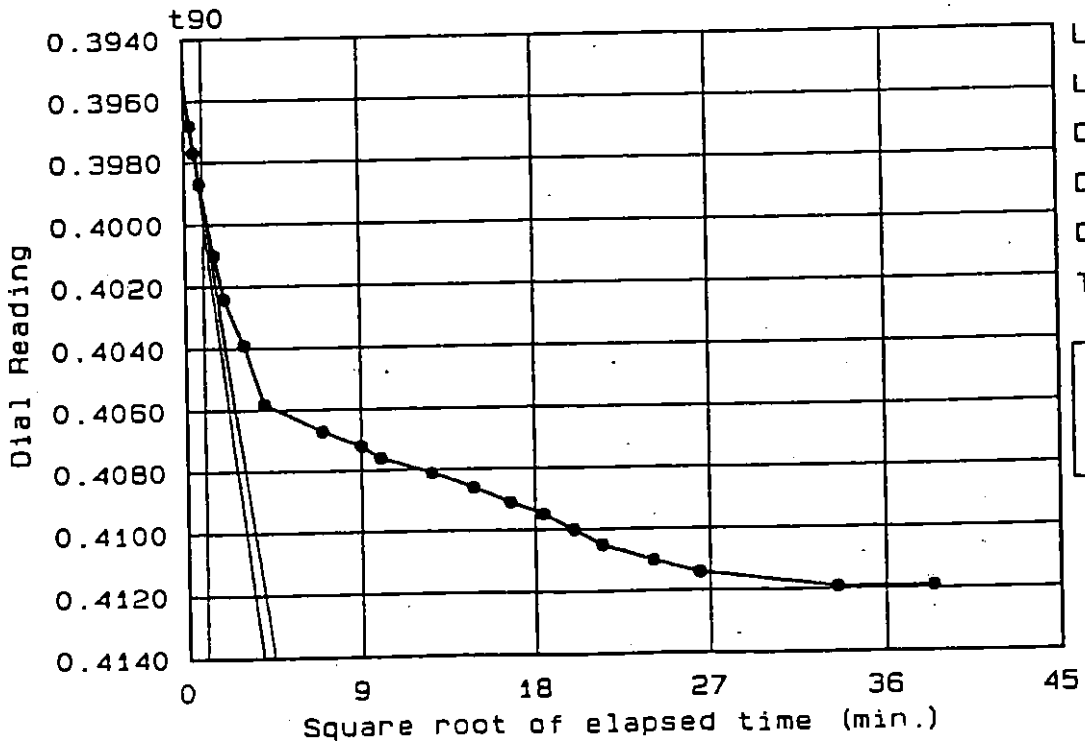
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1, 23.0'-25.0'

Date: 06-02-92



Load No.= 12
Load= 2.00 tsf
D_0 = 0.3857
D_{90} = 0.3889
D_{100}= 0.3892
T_{90}= 2.78 min.

C_v @ T_{90} =
0.03 in.^{2}/min.



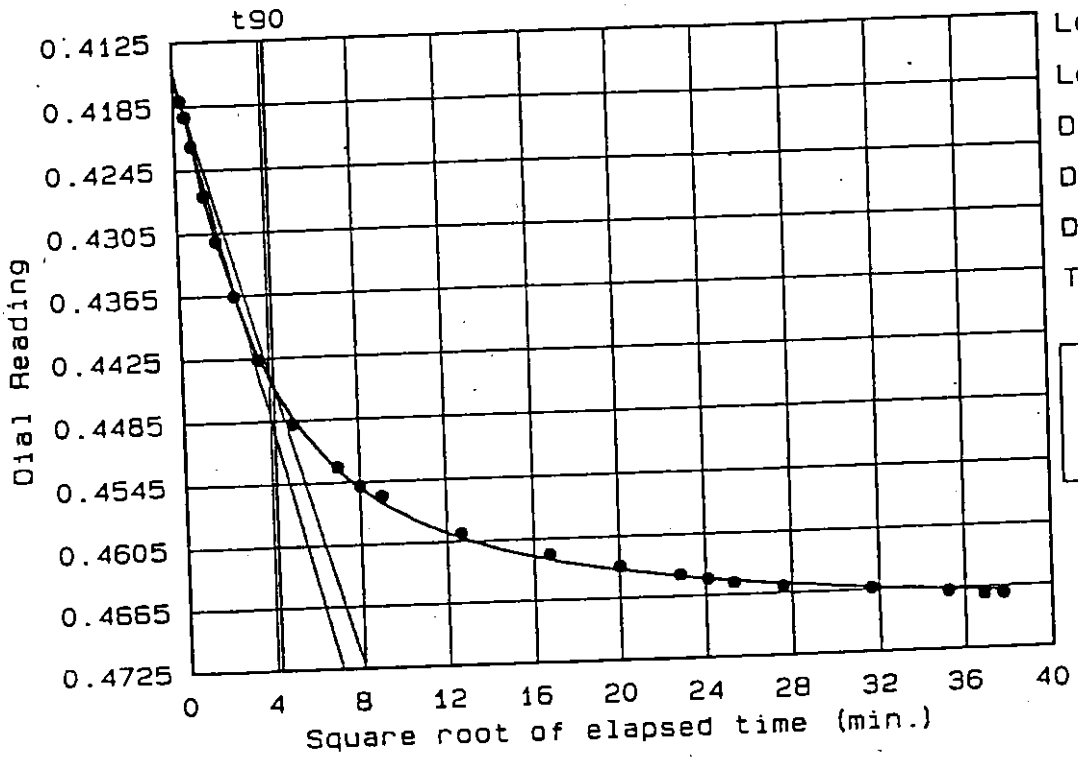
Load No.= 13
Load= 4.00 tsf
D_0 = 0.3953
D_{90} = 0.3993
D_{100}= 0.3998
T_{90}= 0.91 min.

C_v @ T_{90} =
0.08 in.^{2}/min.

Dial Reading vs. Time

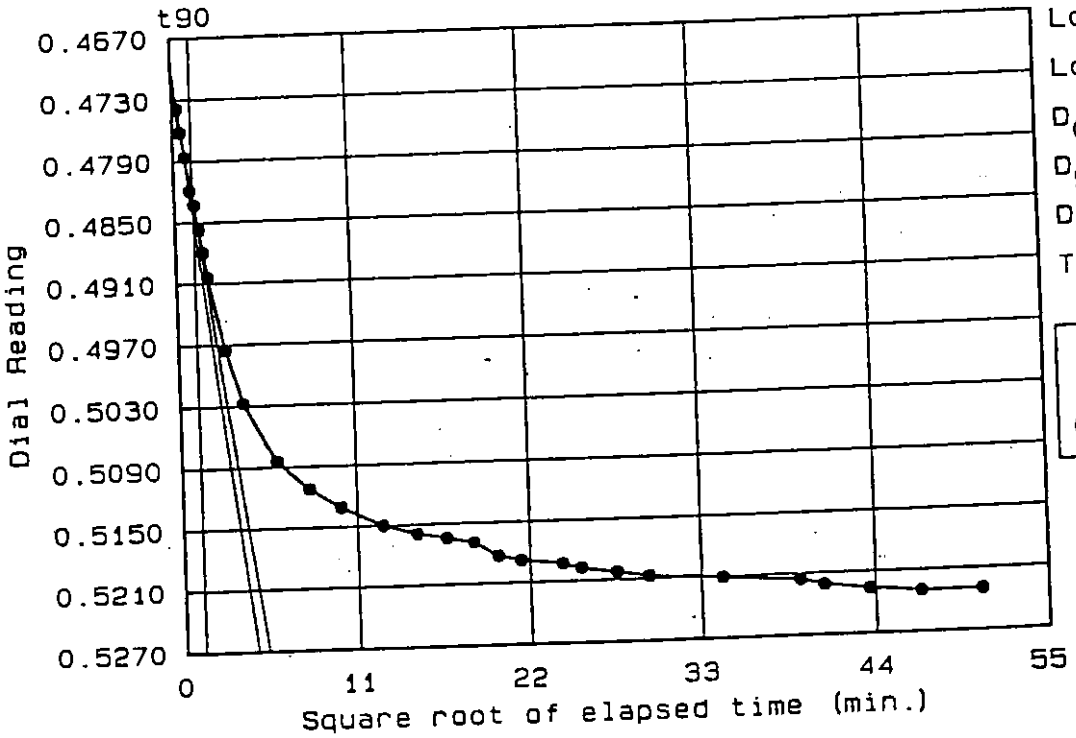
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1. 23.0'-25.0'

Date: 06-02-92



Load No.= 14
Load= 8.00 tsf
D_0 = 0.4154
D_{90} = 0.4453
D_{100}= 0.4486
T_{90}= 17.72 min

C_v @ T_{90} =
0.00 in.^{2}/min.



Load No.= 15
Load= 16.00 ts
D_0 = 0.4699
D_{90} = 0.4830
D_{100}= 0.4845
T_{90}= 1.44 min.

C_v @ T_{90} =
0.04 in.^{2}/min.

BOWSER-MORNER, INC.

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
0.50	0.37970	0.0000	0.37970	1.5650	38.0 Consol.
1.00	0.38400	0.0000	0.38400	1.5472	38.4 Consol.
2.00	0.39300	0.0000	0.39300	1.5100	39.3 Consol.
4.00	0.41190	0.0000	0.41190	1.4318	41.2 Consol.
8.00	0.46720	0.0000	0.46720	1.2032	46.7 Consol.
16.00	0.52300	0.0000	0.52300	0.9724	52.3 Consol.
32.00	0.57170	0.0000	0.57170	0.7710	57.2 Consol.
8.00	0.55610	0.0000	0.55610	0.8356	55.6 Consol.
2.00	0.53910	0.0000	0.53910	0.9058	53.9 Consol.
0.50	0.52350	0.0000	0.52350	0.9704	52.4 Consol.
0.25	0.51550	0.0000	0.51550	1.0034	51.6 Consol.

CONSOLIDATION TEST RESULTS

Compression index = NOT SELECTED
Preconsolidation pressure = NOT SELECTED

Load 0.13 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading
1	0.10	0.00000
2	12.25	0.00050
3	28.87	0.00090
4	408.30	0.00140
5	1444.63	0.00140

Void Ratio: 3.1293 Consolidation: 0.1 %
D0 = 0.0000 D50 = 0.0007 D100 = 0.0015 T50 = 24.12 min.
Cv @ 24.1 min.= 0.002 sq. in./min.

Load No. 2

Load 0.25 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.01890	11	12.25	0.08990	21	700.00	0.10830
2	0.10	0.06100	12	16.00	0.09080	22	880.00	0.10920
3	0.25	0.06760	13	25.00	0.09320	23	1060.00	0.11020
4	0.57	0.07330	14	36.00	0.09510	24	1360.00	0.11110
5	1.57	0.07900	15	64.00	0.09740	25	1720.00	0.11260
6	2.25	0.08040	16	100.00	0.09980	26	1840.00	0.11300
7	3.07	0.08230	17	160.00	0.10210	27	1960.00	0.11350
8	4.00	0.08370	18	280.00	0.10450	28	2140.00	0.11400
9	6.25	0.08650	19	460.00	0.10640	29	2320.00	0.11440
10	9.00	0.08840	20	520.00	0.10740	30	2508.27	0.11440

Void Ratio: 2.6620 Consolidation: 11.4 %
D0 = 0.0515 D50 = 0.0810 D100 = 0.1104 T50 = 2.28 min.
Cv @ 2.3 min.= 0.019 sq. in./min.

Load No. 3

Load 0.50 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.11590	11	220.00	0.15090	21	1300.00	0.16320
2	0.25	0.12060	12	280.00	0.15230	22	1360.00	0.16360
3	1.00	0.12300	13	340.00	0.15370	23	1780.00	0.16410
4	2.25	0.12530	14	400.00	0.15510	24	1900.00	0.16460
5	4.00	0.12770	15	580.00	0.15700	25	2020.00	0.16550
6	9.00	0.13150	16	700.00	0.15890	26	2260.00	0.16650
7	16.00	0.13430	17	880.00	0.16030	27	2560.00	0.16740
8	36.00	0.13950	18	940.00	0.16130	28	2680.00	0.16790
9	64.00	0.14330	19	1120.00	0.16220	29	3059.72	0.16840
10	100.00	0.14610	20	1180.00	0.16270	30	3062.72	0.16840

Void Ratio: 2.4387 Consolidation: 16.8 %
D0 = 0.1187 D50 = 0.1413 D100 = 0.1640 T50 = 50.17 min.
Cv @ 50.2 min.= 0.001 sq. in./min.

Load 1.00 tsf CONSOLIDATION TEST READINGS Load No. 4

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.16840	11	9.00	0.21610	21	400.00	0.25250
2	0.10	0.18070	12	12.25	0.21940	22	520.00	0.25440
3	0.25	0.18440	13	16.00	0.22320	23	640.00	0.25540
4	0.57	0.18920	14	25.00	0.22840	24	760.00	0.25680
5	1.00	0.19290	15	36.00	0.23220	25	880.00	0.25730
6	1.57	0.19670	16	49.00	0.23550	26	1000.00	0.25820
7	2.25	0.20050	17	64.00	0.23830	27	1120.00	0.25870
8	3.07	0.20380	18	81.00	0.24020	28	1180.00	0.25920
9	4.00	0.20620	19	160.00	0.24590	29	1480.00	0.25960
10	6.25	0.21140	20	280.00	0.24970	30	1646.93	0.25960

Void Ratio: 2.0616 Consolidation: 26.0 %
D0 = 0.1767 D50 = 0.2157 D100 = 0.2548 T50 = 8.70 min.
Cv @ 8.7 min.= 0.003 sq. in./min.

Load 2.00 tsf CONSOLIDATION TEST READINGS Load No. 5

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.26060	11	49.00	0.31260	21	520.00	0.32960
2	0.10	0.26720	12	64.00	0.31540	22	580.00	0.33060
3	0.25	0.26960	13	81.00	0.31680	23	640.00	0.33100
4	0.57	0.27290	14	100.00	0.31870	24	700.00	0.33150
5	1.00	0.27570	15	160.00	0.32200	25	820.00	0.332[illegible]
6	1.57	0.27810	16	220.00	0.32440	26	880.00	0.332[illegible]
7	3.07	0.28330	17	280.00	0.32580	27	940.00	0.332[illegible]
8	6.25	0.28990	18	340.00	0.32730	28	1240.00	0.3334[illegible]
9	12.25	0.29750	19	400.00	0.32820	29	1420.00	0.33390
10	25.00	0.30600	20	460.00	0.32910	30	1445.83	0.33390

Void Ratio: 1.7544 Consolidation: 33.4 %
D0 = 0.2653 D50 = 0.2984 D100 = 0.3315 T50 = 13.17 min.
Cv @ 13.2 min.= 0.002 sq. in./min.

Load No. 6

Load 4.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.33580	11	25.00	0.38120	21	520.00	0.40100
2	0.10	0.34140	2	36.00	0.38450	22	580.00	0.40150
3	0.25	0.34380	13	49.00	0.38730	23	640.00	0.40200
4	0.57	0.34660	14	64.00	0.38920	24	700.00	0.40240
5	1.57	0.35230	15	81.00	0.39060	25	760.00	0.40290
6	3.07	0.35800	16	100.00	0.39250	26	880.00	0.40340
7	6.25	0.36510	17	160.00	0.39530	27	1000.00	0.40390
8	9.00	0.36930	18	220.00	0.39720	28	1300.00	0.40390
9	12.25	0.37260	19	340.00	0.39910	29	1360.00	0.40430
10	16.00	0.37640	20	460.00	0.40060	30	1364.05	0.40430

Void Ratio: 1.4633 Consolidation: 40.4 %
D0 = 0.3405 D50 = 0.3717 D100 = 0.4028 T50 = 10.72 min.
Cv @ 10.7 min 0.002 sq. in./min.

Load No. 7

Load 2.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.40340	11	16.02	0.40010
2	0.10	0.40200	12	19.02	0.39960
3	0.25	0.40200	13	22.02	0.39960
4	0.57	0.40150			
5	1.57	0.40100			
6	2.25	0.40060			
7	3.07	0.40060			
8	6.25	0.40010			
9	9.00	0.40010			
10	12.25	0.40060			

Void Ratio: 1.4827 Consolidation: 40.0 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 8

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.39960	11	9.00	0.38870
2	0.10	0.39630	12	12.25	0.38780
3	0.25	0.39580	13	16.00	0.38730
4	0.57	0.39490	14	24.27	0.38590
5	1.00	0.39440	15	27.27	0.38590
6	1.57	0.39300	16	30.27	0.38590
7	2.25	0.39250			
8	3.07	0.39200			
9	4.00	0.39110			
10	6.25	0.38970			

Void Ratio: 1.5393 Consolidation: 38.6 %

Load 0.25 tsf — CONSOLIDATION TEST READINGS — Load No. 9

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.38540	11	8.78	0.38120
2	0.10	0.38450	12	11.78	0.38020
3	0.25	0.38450	13	14.78	0.38020
4	0.57	0.38400	14	17.78	0.37970
5	1.00	0.38400	15	20.78	0.37930
6	1.57	0.38350	16	23.78	0.37830
7	2.25	0.38350	17	26.78	0.37830
8	3.07	0.38310			
9	4.00	0.38260			
10	5.78	0.38210			

Void Ratio: 1.5708 Consolidation: 37.8 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 10

No.	Elapsed Time	Dial Reading
1	0.00	0.37880
2	0.25	0.37930
3	1.57	0.37970
4	820.00	0.37970
5	1120.00	0.37970
6	1286.77	0.37970

Void Ratio: 1.5650 Consolidation: 38.0 %

Load No. 11

Load 1.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading
1	0.00	0.37970
2	0.10	0.38120
3	0.57	0.38160
4	2.25	0.38210
5	9.00	0.38260
6	49.00	0.38310
7	220.00	0.38350
8	700.00	0.38400
9	1499.15	0.38400

Void Ratio: 1.5472 Consolidation: 38.4 %
D0 = 0.3809 D50 = 0.3821 D100 = 0.3833 T50 = 2.59 min.
Cv @ 2.6 min.= 0.007 sq. in./min.

Load No. 12

Load 2.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.38540	11	12.25	0.39060
2	0.10	0.38640	12	64.00	0.39160
3	0.25	0.38680	13	160.00	0.39200
4	0.57	0.38730	14	280.00	0.39250
5	1.00	0.38780	15	580.00	0.39300
6	1.57	0.38830	16	1462.13	0.39300
7	2.25	0.38870			
8	4.00	0.38920			
9	6.25	0.38970			
10	9.00	0.39010			

Void Ratio: 1.5100 Consolidation: 39.3 %
D0 = 0.3858 D50 = 0.3887 D100 = 0.3915 T50 = 2.21 min.
Cv @ 2.2 min.= 0.008 sq. in./min.

Load 4.00 tsf CONSOLIDATION TEST READINGS Load No. 13

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Readi
1	0.00	0.39390	11	100.00	0.40760	21	1476.62	0.411[illegible]
2	0.10	0.39680	12	160.00	0.40810			
3	0.25	0.39770	13	220.00	0.40860			
4	0.57	0.39870	14	280.00	0.40910			
5	2.25	0.40100	15	340.00	0.40950			
6	4.00	0.40240	16	400.00	0.41000			
7	9.00	0.40390	17	460.00	0.41050			
8	16.00	0.40580	18	580.00	0.41100			
9	49.00	0.40670	19	700.00	0.41140			
10	81.00	0.40720	20	1120.00	0.41190			

Void Ratio: 1.4318 Consolidation: 41.2 %
D0 = 0.3955 D50 = 0.3996 D100 = 0.4037 T50 = 0.88 min.
Cv @ 0.9 min.= 0.020 sq. in./min.

Load 8.00 tsf CONSOLIDATION TEST READINGS Load No. 14

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.41470	11	64.00	0.45490	21	1240.00	0.46680
2	0.10	0.41800	12	81.00	0.45590	22	1360.00	0.46720
3	0.25	0.41950	13	160.00	0.45970	23	1425.32	0.46720
4	0.57	0.42230	14	280.00	0.46200			
5	1.57	0.42700	15	400.00	0.46340			
6	3.07	0.43130	16	520.00	0.46440			
7	6.25	0.43650	17	580.00	0.46490			
8	12.25	0.44260	18	640.00	0.46530			
9	25.00	0.44880	19	760.00	0.46580			
10	49.00	0.45300	20	1000.00	0.46630			

Void Ratio: 1.2032 Consolidation: 46.7 %
D0 = 0.4166 D50 = 0.4408 D100 = 0.4650 T50 = 9.87 min.
Cv @ 9.9 min.= 0.002 sq. in./min.

Load 16.00 tsf — CONSOLIDATION TEST READINGS — Load No. 15

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.47120	11	16.00	0.50270	21	580.00	0.51920
2	0.10	0.47390	12	36.00	0.50840	22	640.00	0.51970
3	0.25	0.47620	13	64.00	0.51120	23	760.00	0.52020
4	0.57	0.47860	14	100.00	0.51310	24	880.00	0.52070
5	1.00	0.48190	15	160.00	0.51500	25	1180.00	0.52110
6	1.57	0.48330	16	220.00	0.51590	26	1540.00	0.52160
7	2.25	0.48570	17	280.00	0.51640	27	1660.00	0.52210
8	3.07	0.48800	18	340.00	0.51690	28	1900.00	0.52260
9	4.00	0.49040	19	400.00	0.51830	29	2200.00	0.52300
10	9.00	0.49750	20	460.00	0.51880	30	2580.85	0.52300

Void Ratio: 0.9724 Consolidation: 52.3 %
D0 = 0.4733 D50 = 0.4930 D100 = 0.5127 T50 = 5.06 min.
Cv @ 5.1 min.= 0.002 sq. in./min.

Load 32.00 tsf — CONSOLIDATION TEST READINGS — Load No. 16

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.02	0.52490	11	9.00	0.55050	21	460.00	0.56800
2	0.10	0.53010	12	12.25	0.55280	22	520.00	0.56840
3	0.25	0.53200	13	16.00	0.55470	23	580.00	0.56890
4	0.57	0.53440	14	25.00	0.55710	24	700.00	0.56940
5	1.00	0.53670	15	36.00	0.55900	25	760.00	0.56990
6	1.57	0.53860	16	49.00	0.56040	26	940.00	0.57030
7	2.25	0.54100	17	81.00	0.56230	27	1120.00	0.57080
8	3.07	0.54290	18	160.00	0.56510	28	1360.00	0.57130
9	4.00	0.54480	19	280.00	0.56610	29	1600.00	0.57170
10	6.25	0.54810	20	400.00	0.56750	30	1726.58	0.57170

Void Ratio: 0.7710 Consolidation: 57.2 %
D0 = 0.5292 D50 = 0.5454 D100 = 0.5615 T50 = 4.00 min.
Cv @ 4 min.= 0.003 sq. in./min.

Load 8.00 tsf — CONSOLIDATION TEST READINGS — Load No. 17

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.56890	11	9.00	0.55760
2	0.10	0.56280	12	12.25	0.55710
3	0.25	0.56180	13	16.00	0.55710
4	0.57	0.56090	14	24.28	0.55660
5	1.00	0.56040	15	27.28	0.55610
6	1.57	0.55990	16	30.28	0.55610
7	2.25	0.55940	17	31.12	0.55610
8	3.07	0.55900			
9	4.00	0.55850			
10	6.25	0.55800			

Void Ratio: 0.8356 Consolidation: 55.6 %

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No. 18

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.55470	11	9.00	0.54240
2	0.10	0.55050	12	12.25	0.54150
3	0.25	0.54950	13	16.00	0.54050
4	0.57	0.54860	14	16.62	0.54010
5	1.00	0.54810	15	22.62	0.53960
6	1.57	0.54760	16	25.62	0.53910
7	2.25	0.54670	17	28.45	0.53910
8	3.07	0.54570			
9	4.00	0.54530			
10	6.25	0.54380			

Void Ratio: 0.9058 Consolidation: 53.9 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 19

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.53770	11	9.93	0.52870
2	0.10	0.53630	12	12.93	0.52730
3	0.25	0.53530	13	15.93	0.52680
4	0.57	0.53490	14	18.93	0.52590
5	1.00	0.53440	15	21.93	0.52490
6	1.57	0.53390	16	23.23	0.52450
7	2.25	0.53340	17	27.23	0.52350
8	3.07	0.53200			
9	3.93	0.53150			
10	6.93	0.53060			

Void Ratio: 0.9704 Consolidation: 52.4 %

Load 0.25 tsf CONSOLIDATION TEST READINGS Load No. 20

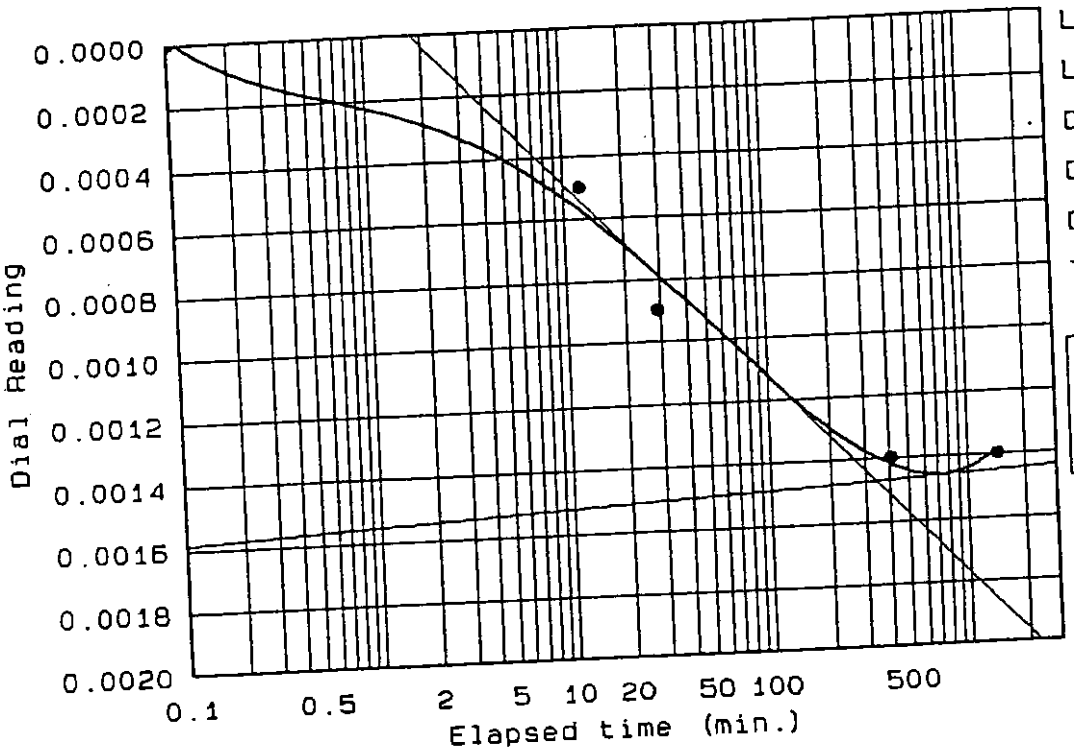
No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.52350	11	20.82	0.51690
2	0.10	0.52300	12	23.82	0.51640
3	0.25	0.52260	13	26.82	0.51590
4	1.57	0.52210	14	27.60	0.51550
5	2.82	0.52160			
6	5.82	0.52070			
7	8.82	0.51970			
8	11.82	0.51880			
9	14.82	0.51830			
10	17.82	0.51780			

Void Ratio: 1.0034 Consolidation: 51.6 %

Dial Reading vs. Time

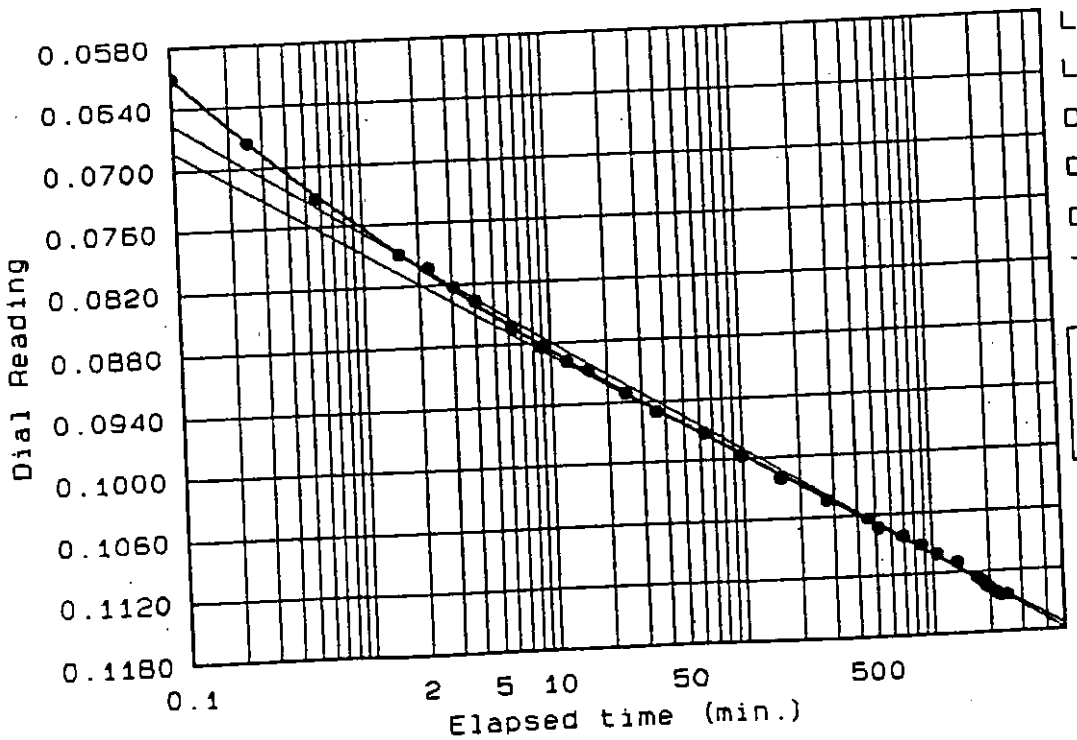
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1, 23.0'-25.0'

Date: 05-02-92



Load No.= 1
Load= 0.13 tsf
D_0 = 0.0000
D_{50} = 0.0007
D_{100}= 0.0015
T_{50}= 24.12 min

C_v @ T_{50} =
0.00 in.^{2}/min.



Load No.= 2
Load= 0.25 ts
D_0 = 0.0515
D_{50} = 0.0810
D_{100}= 0.1104
T_{50}= 2.28 mi

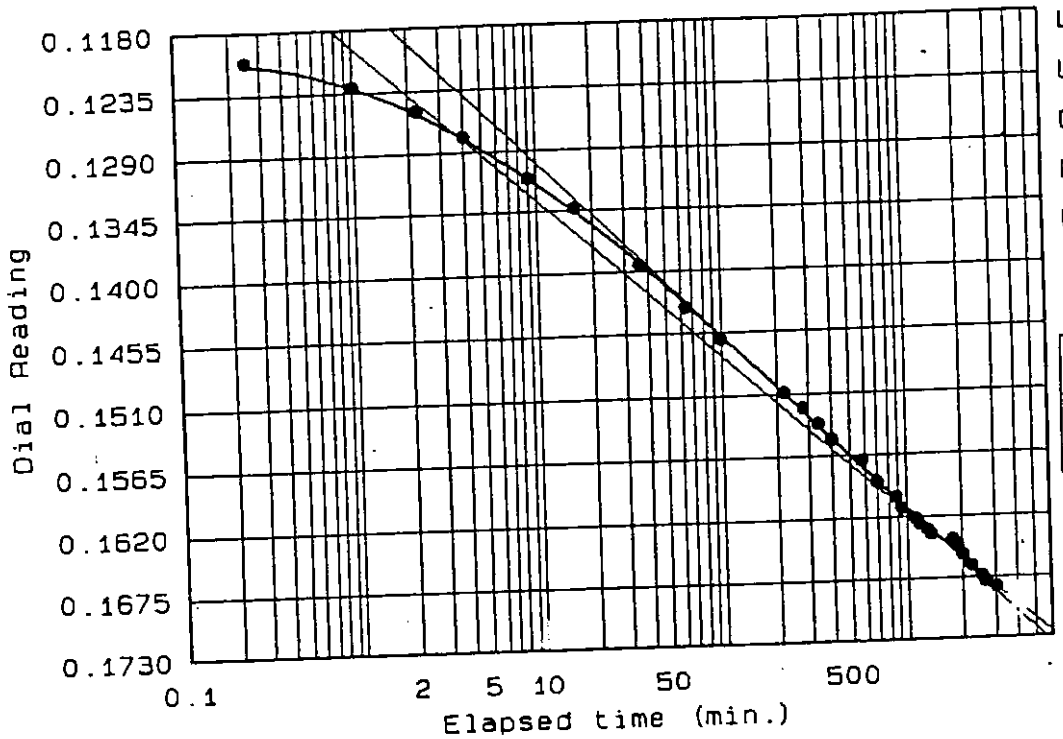
C_v @ T_{50} =
0.02 in.^{2}/mi

BOWSER-MORNER, INC.

Dial Reading vs. Time

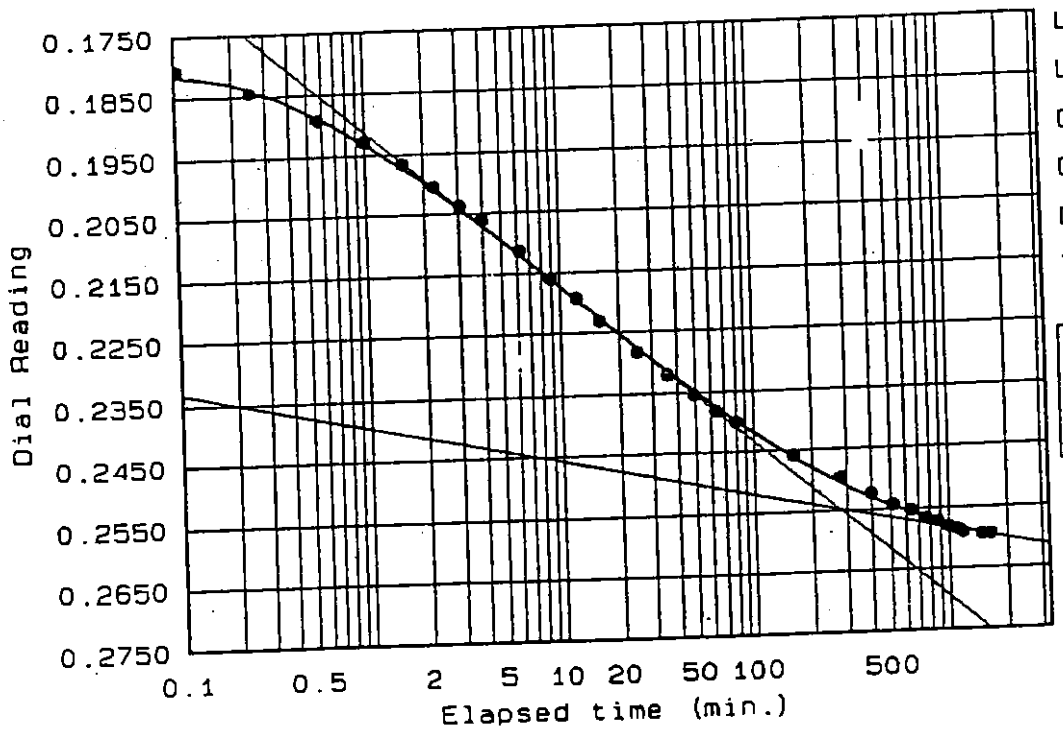
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1, 23.0'-25.0'

Date: 06-02-92



Load No.= 3
Load= 0.50 tsf
D_0 = 0.1187
D_{50} = 0.1413
D_{100}= 0.1640
T_{50}= 50.17 min.

C_v @ T_{50} =
0.00 in.^{2}/min.



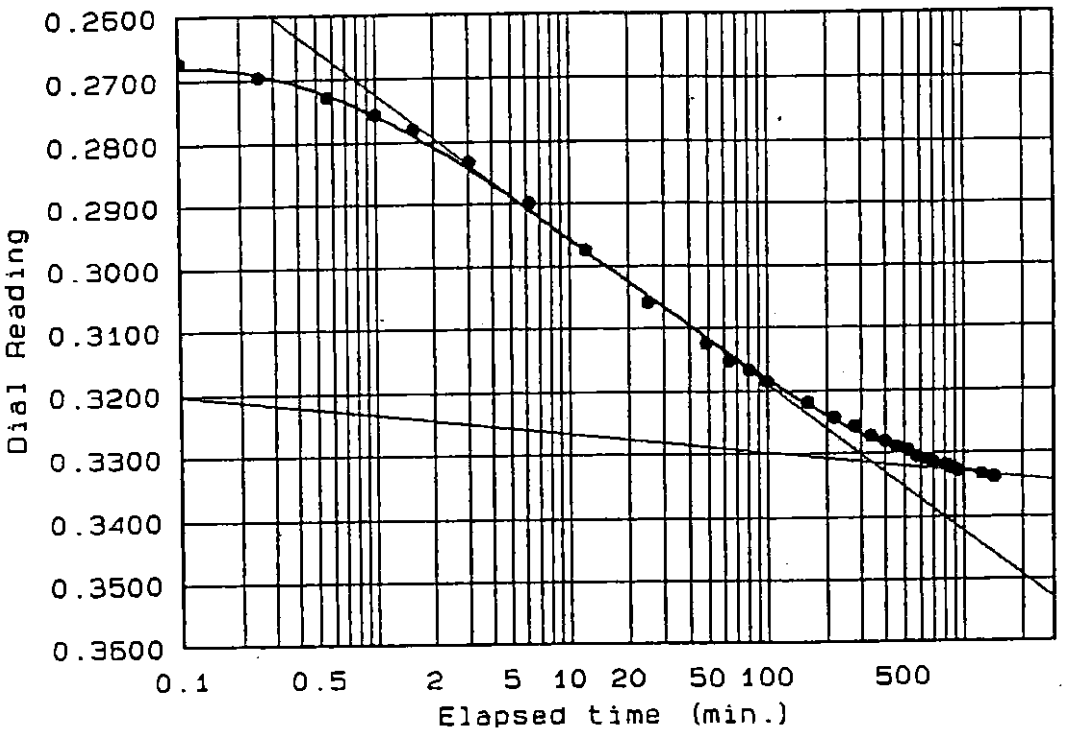
Load No.= 4
Load= 1.00 tsf
D_0 = 0.1767
D_{50} = 0.2157
D_{100}= 0.2548
T_{50}= 8.70 min.

C_v @ T_{50} =
0.00 in.^{2}/min.

Dial Reading vs. Time

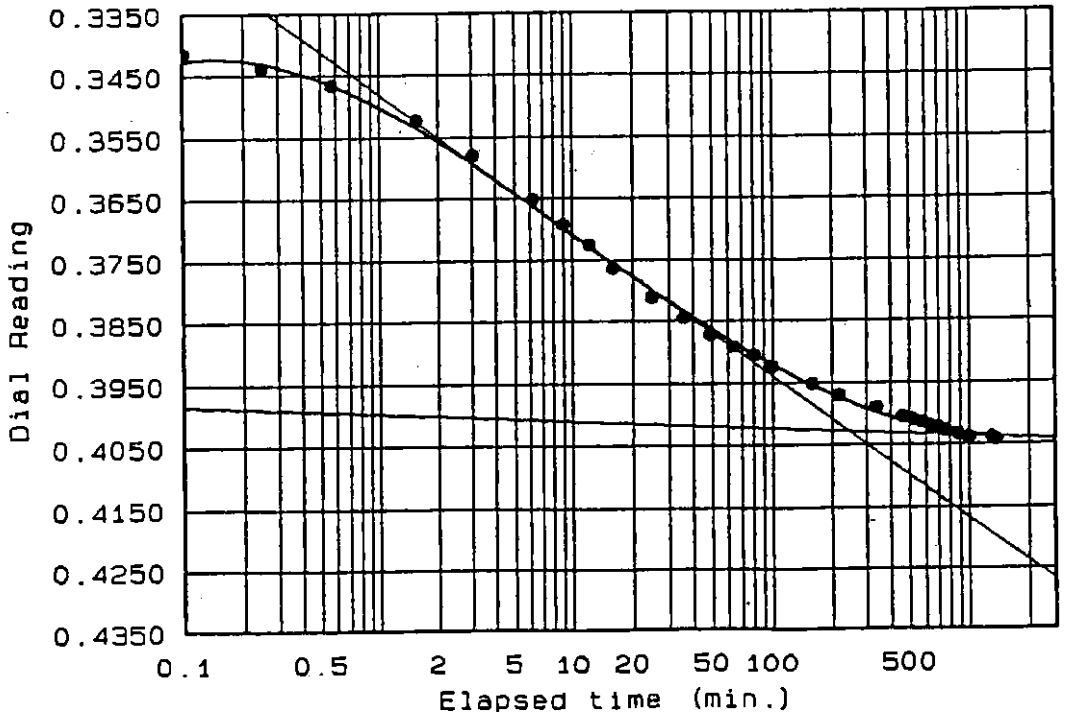
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: T84 ST1, 23.0'-25.0'

Date: 06-02-92



Load No.= 5
Load= 2.00 tsf
D_0 = 0.2653
D_{50} = 0.2984
D_{100}= 0.3315
T_{50}= 13.17 min.

C_v @ T_{50} =
0.00 in.^{2}/min.



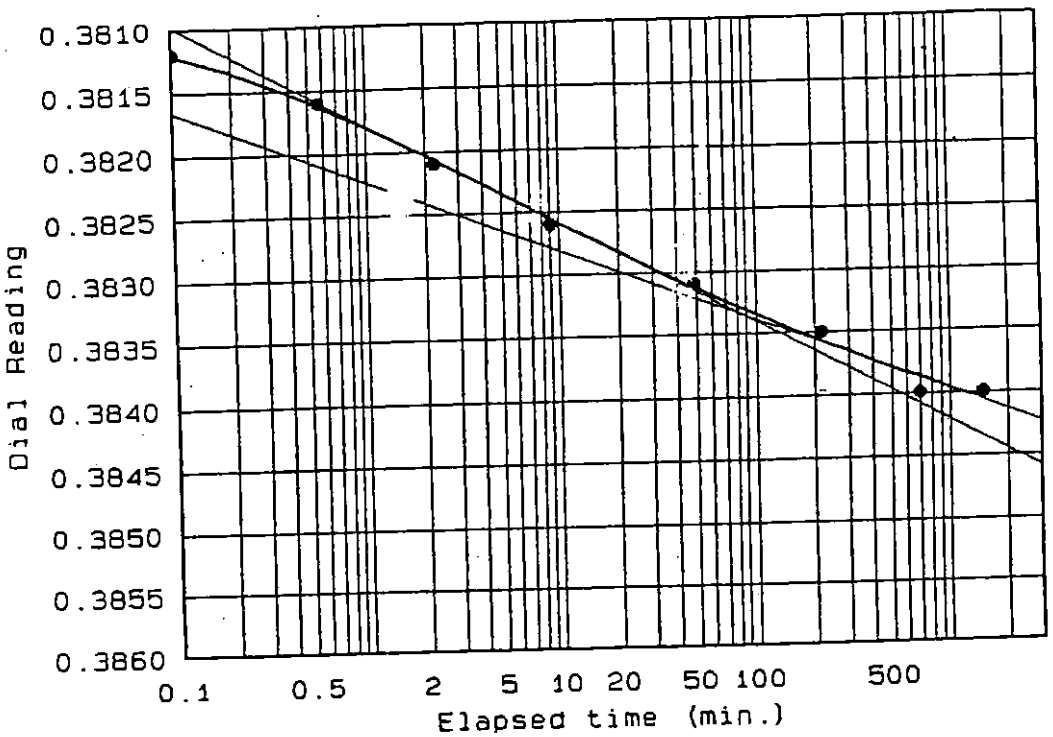
Load No.= 6
Load= 4.00 tsf
D_0 = 0.3405
D_{50} = 0.3717
D_{100}= 0.4028
T_{50}= 10.72 min.

C_v @ T_{50} =
0.00 in.^{2}/min.

Dial Reading vs. Time

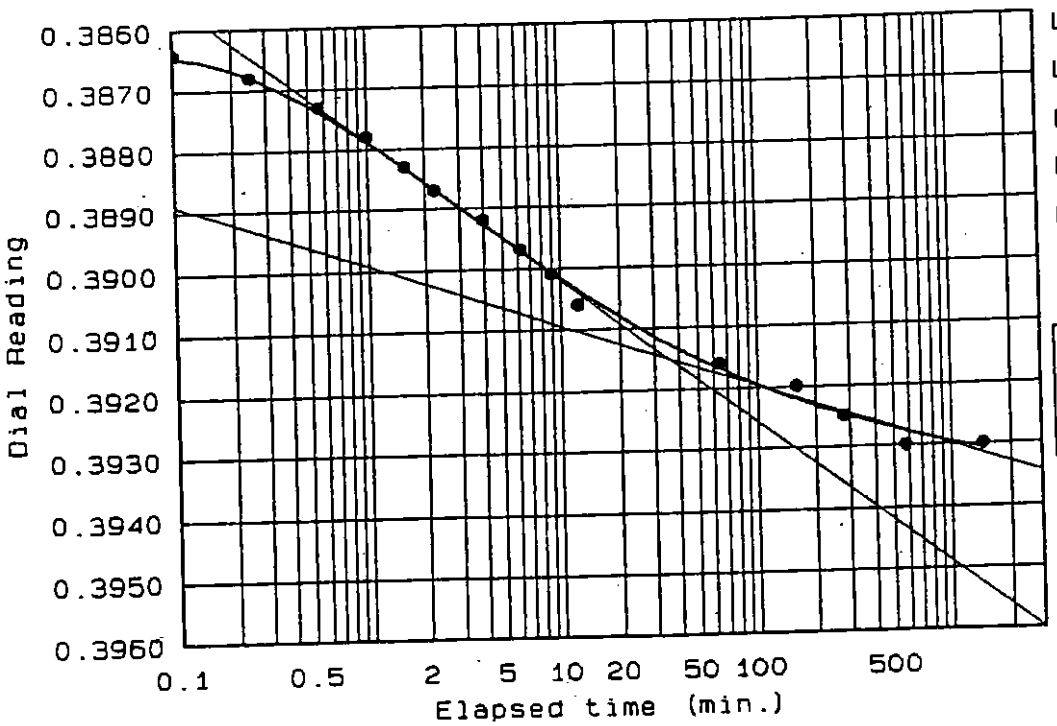
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1, 23.0'-25.0'

Date: 06-02-92



Load No.= 11
Load= 1.00 tsf
D_0 = 0.3809
D_{50} = 0.3821
D_{100}= 0.3833
T_{50}= 2.59 min.

C_v @ T_{50} =
0.01 in.^{2}/min.



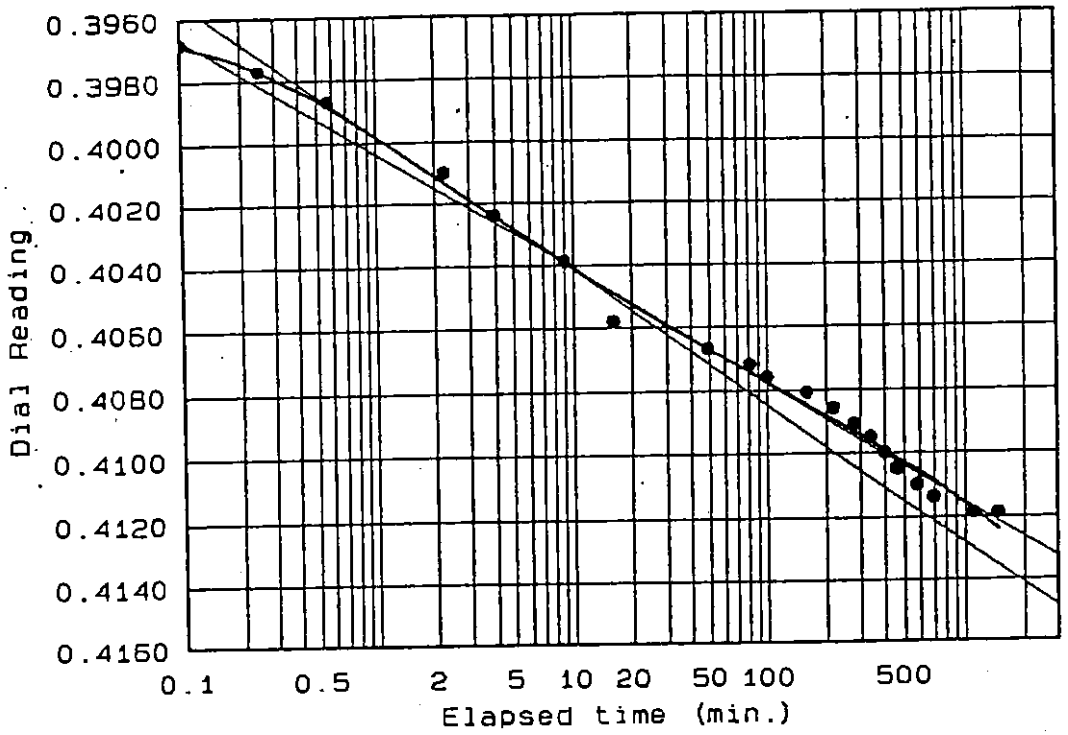
Load No.= 12
Load= 2.00 tsf
D_0 = 0.3858
D_{50} = 0.3887
D_{100}= 0.3915
T_{50}= 2.21 min.

C_v @ T_{50} =
0.01 in.^{2}/min.

Dial Reading vs. Time

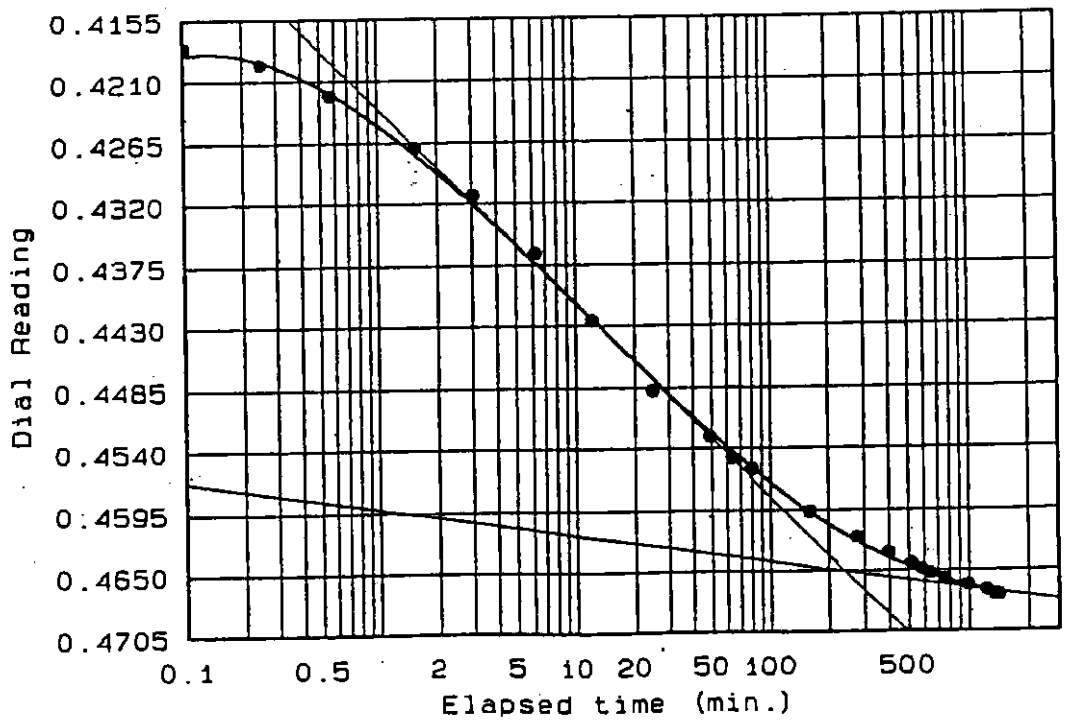
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1, 23.0'-25.0'

Date: 06-02-92



Load No.= 13
Load= 4.00 tsf
D_0 = 0.3955
D_{50} = 0.3996
D_{100}= 0.4037
T_{50}= 0.88 min.

C_v @ T_{50} =
0.02 in.^{2}/min.



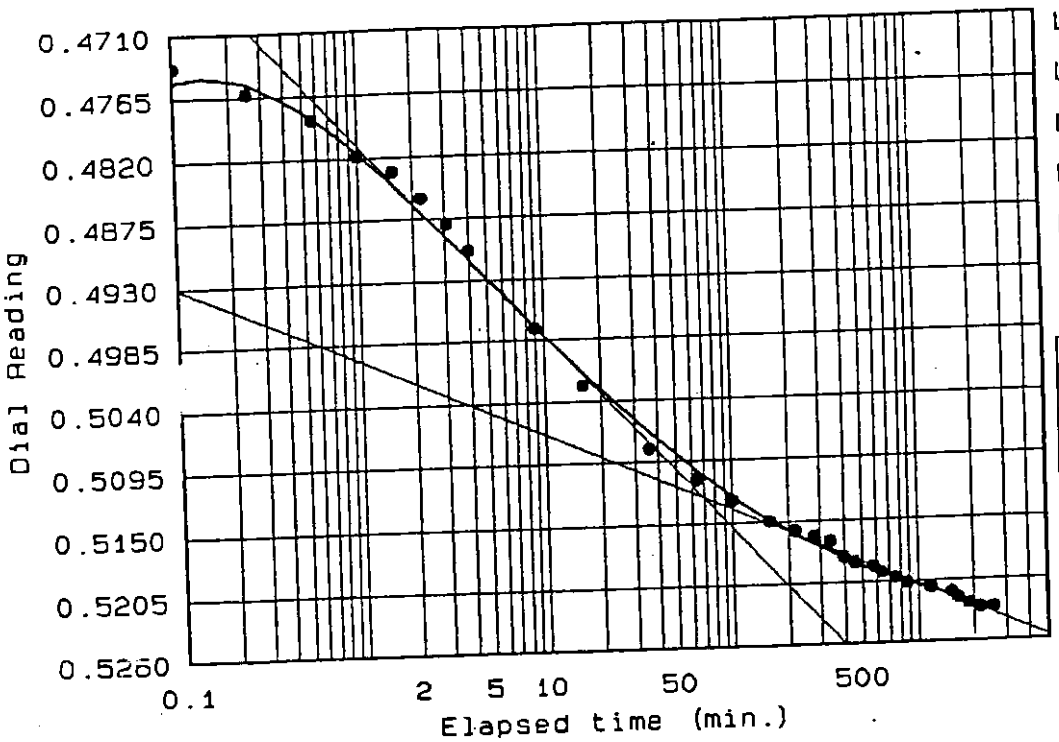
Load No.= 14
Load= 8.00 tsf
D_0 = 0.4166
D_{50} = 0.4408
D_{100}= 0.4650
T_{50}= 9.87 min.

C_v @ T_{50} =
0.00 in.^{2}/min.

Dial Reading vs. Time

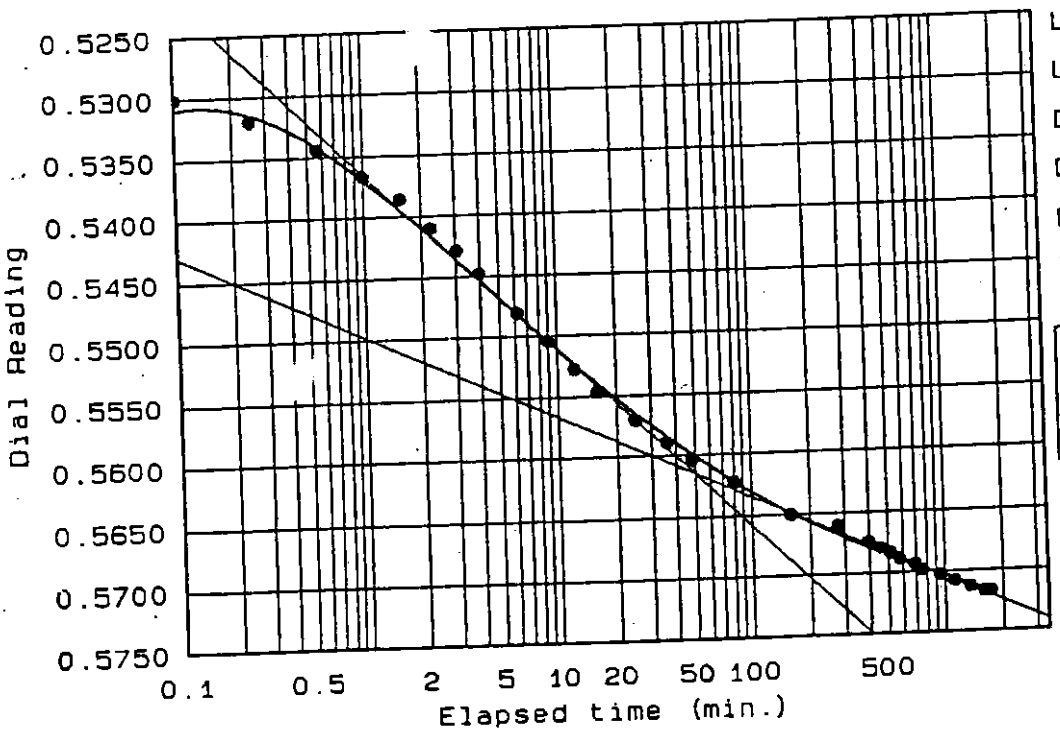
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB4 ST1. 23.0'-25.0'

Date: 06-02-92



Load No.= 15
Load= 16.00 tsf
D_0 = 0.4733
D_{50} = 0.4930
D_{100}= 0.5127
T_{50}= 5.06 min.

C_v @ T_{50} =
0.00 in.^{2}/min.

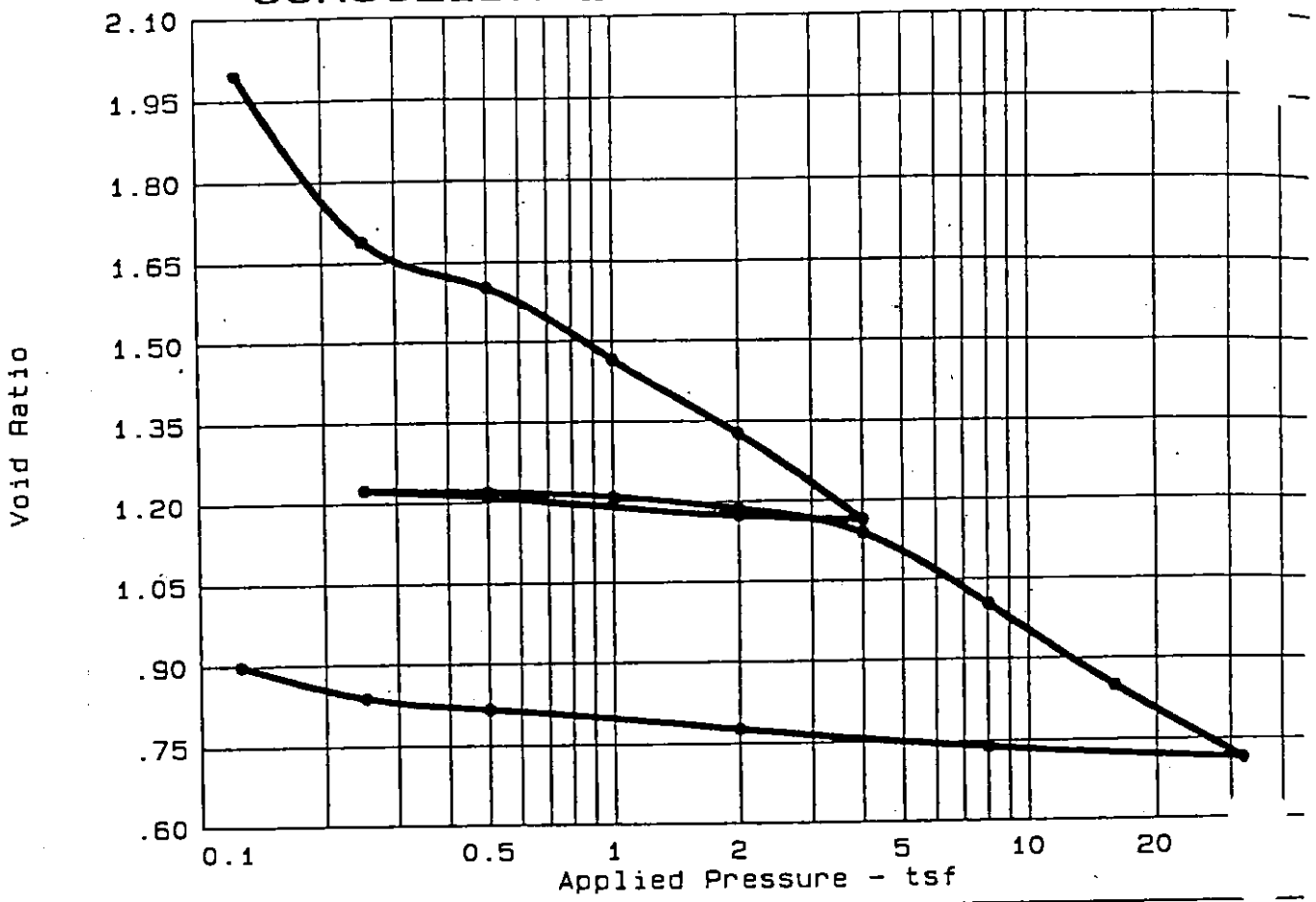


Load No.= 16
Load= 32.00 ts
D_0 = 0.5292
D_{50} = 0.5454
D_{100}= 0.5615
T_{50}= 4.00 min.

C_v @ T_{50} =
0.00 in.^{2}/min.

BOWSER-MORNER, INC.

CONSOLIDATION TEST REPORT



Coefficients of Consolidation (sq.in./min.)

No.	Load	Cv	No.	Load	Cv	No.	Load	Cv
1	0.13	0.009	12	2.00	0.042			
2	0.25	0.279	13	4.00	0.102			
3	0.50	0.052	14	8.00	0.104			
4	1.00	0.218	15	16.00	0.021			
5	2.00	0.179	16	32.00	0.016			
6	4.00	0.028						
10	0.50	0.046						
11	1.00	0.017						

Swell press.	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
	81.5 %	63.6	53.5			2.58	2.0130

TEST RESULTS

MATERIAL DESCRIPTION

DREDGE SPOIL

Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB1 ST6. 37.0'-39.0'

Date: 06-02-92

Remarks:
TEST SPECIMEN TA
FROM: 38.3'-38.

CONSOLIDATION TEST REPORT

BOWSER-MORNER, INC.

Fig. No. _____

Test No. 37

CONSOLIDATION TEST PROJECT DATA

Project Number:	47533 WESTON
Project:	DSWA - PHASE IV
Date:	06-02-92
Locati 1:	TB1 ST6, 37.0'-39.0'
2:	
Remarks 1:	TEST SPECIMEN TAKEN
2:	FROM: 38.3'-38.4'
3:	
4:	
5:	
Material 1:	DREDGE SPOIL
description 2:	
Classification:	
Liquid limit:	
Plasticity index:	
Figure Number:	

CONSOLIDATION TEST SPECIMEN DATA

TOTAL SAMPLE		BEFORE TEST		AFTER TEST	
Wet w+t	= 112.67 g.	Oedometer No.	= 19	Wet w+t	= 91.50 g.
Dry w+t	= 68.88 g	Machine No.	= N/A	Dry w+t	= 68.88 g.
Tare wt.	= 0.00 g.	Spec. Gravity	= 2.58	Tare wt.	= 0.00 g.
Height	= 1.00 in.	Height	= 1.00 in.		
Diameter	= 2.50 in.	Diameter	= 2.50 in.		
Weight	= 112.67 g.				
Moisture	= 63.6 %	Ht. Solids	= 0.33 in.	Moisture	= 32.8 %
Wet Den.	= 87.4 pcf	Dry wt.	= 68.88 g.	Dry wt.	= 68.88 g. *
Dry Den.	= 53.5 pcf	Void ratio	= 2.0130	Void ratio	= 0.8991
		Saturation	= 81.5 %	Saturation	= 94.2 %

* Final dry weight used in calculations

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
Initial	0.00000			2.0130	
0.13	0.00560	0.0000	0.00560	1.9961	0.6 Consol.
0.25	0.10790	0.0000	0.10790	1.6879	10.8 Consol.
0.50	0.13620	0.0000	0.13620	1.6026	13.6 Consol.
1.00	0.18160	0.0000	0.18160	1.4658	18.2 Consol.
2.00	0.22790	0.0000	0.22790	1.3263	22.8 Consol.
4.00	0.28170	0.0000	0.28170	1.1642	28.2 Consol.
2.00	0.27890	0.0000	0.27890	1.1727	27.9 Consol.
0.50	0.26640	0.0000	0.26640	1.2103	26.6 Consol.
0.25	0.26170	0.0000	0.26170	1.2245	26.2 Consol.

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL
0.50	0.26310	0.0000	0.26310	1.2203	26.3 Consol.
1.00	0.26640	0.0000	0.26640	1.2103	26.6 Consol.
2.00	0.27430	0.0000	0.27430	1.1865	27.4 Consol.
4.00	0.29000	0.0000	0.29000	1.1392	29.0 Consol.
8.00	0.33540	0.0000	0.33540	1.0024	33.5 Consol.
16.00	0.38590	0.0000	0.38590	0.8503	38.6 Consol.
32.00	0.43130	0.0000	0.43130	0.7135	43.1 Consol.
8.00	0.42300	0.0000	0.42300	0.7385	42.3 Consol.
2.00	0.41050	0.0000	0.41050	0.7762	41.1 Consol.
0.50	0.39700	0.0000	0.39700	0.8168	39.7 Consol.
0.25	0.38960	0.0000	0.38960	0.8391	39.0 Consol.
0.13	0.36970	0.0000	0.36970	0.8991	37.0 Consol.

CONSOLIDATION TEST RESULTS

Compression index = NOT SELECTED
Preconsolidation pressure = NOT SELECTED

Load 0.13 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading
1	0.00	0.00000
2	0.10	0.00190
3	1.00	0.00230
4	12.25	0.00370
5	16.00	0.00420
6	160.00	0.00460
7	640.00	0.00510
8	1462.78	0.00560
9	1478.78	0.00560

Void Ratio: 1.9961 Consolidation: 0.6 %
D0 = 0.0017 D90 = 0.0042 D100 = 0.0045 T90 = 24.72 min.
Cv @ 24.7 min.= 0.009 sq. in./min.

Load 0.25 tsf — CONSOLIDATION TEST READINGS — Load No. 2

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.00760	11	9.00	0.08990	21	700.00	0.10420
2	0.10	0.06020	12	16.00	0.09220	22	1180.00	0.10470
3	0.25	0.06580	13	36.00	0.09540	23	1240.00	0.10520
4	0.57	0.07130	14	64.00	0.09730	24	1300.00	0.10560
5	1.00	0.07510	15	100.00	0.09870	25	1540.00	0.10610
6	1.57	0.07880	16	220.00	0.10100	26	1660.00	0.10660
7	2.25	0.08150	17	340.00	0.10240	27	1900.00	0.10700
8	3.07	0.08340	18	460.00	0.10280	28	2140.00	0.10750
9	4.00	0.08520	19	520.00	0.10330	29	2380.00	0.10790
10	6.25	0.08760	20	580.00	0.10380	30	2509.35	0.10790

Void Ratio: 1.6879 Consolidation: 10.8 %
D0 = 0.0506 D90 = 0.0723 D100 = 0.0748 T90 = 0.67 min.
Cv @ 0.7 min.= 0.279 sq. in./min.

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 3

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.10750	11	160.00	0.12650	21	2440.00	0.13570
2	0.10	0.11170	12	280.00	0.12790	22	2620.00	0.13620
3	0.57	0.11350	13	400.00	0.12930	23	3060.15	0.13620
4	1.57	0.11540	14	460.00	0.12970			
5	3.07	0.11670	15	640.00	0.13110			
6	6.25	0.11810	16	760.00	0.13160			
7	12.25	0.12000	17	820.00	0.13200			
8	25.00	0.12230	18	940.00	0.13250			
9	49.00	0.12320	19	1060.00	0.13300			
10	81.00	0.12460	20	2260.00	0.13530			

Void Ratio: 1.6026 Consolidation: 13.6 %
D0 = 0.1104 D90 = 0.1168 D100 = 0.1175 T90 = 3.17 min.
Cv @ 3.2 min.= 0.052 sq. in./min.

oad 1.00 tsf CONSOLIDATION TEST READINGS Load No. 4

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.13670	11	12.25	0.16400	21	400.00	0.17740
2	0.10	0.14550	12	16.00	0.16540	22	460.00	0.17790
3	0.25	0.14780	13	36.00	0.16910	23	580.00	0.17880
4	1.00	0.15200	14	49.00	0.17000	24	640.00	0.17930
5	1.57	0.15380	15	64.00	0.17140	25	700.00	0.17980
6	2.25	0.15570	16	81.00	0.17190	26	820.00	0.18020
7	3.07	0.15750	17	100.00	0.17280	27	940.00	0.18070
8	4.00	0.15890	18	220.00	0.17510	28	1060.00	0.18110
9	6.25	0.16080	19	280.00	0.17600	29	1180.00	0.18160
10	9.00	0.16310	20	340.00	0.17700	30	1647.40	0.18160

Void Ratio: 1.4658 Consolidation: 18.2 %
D0 = 0.1415 D90 = 0.1506 D100 = 0.1516 T90 = 0.69 min.
Cv @ 0.7 min.= 0.218 sq. in./min.

Load 2.00 tsf CONSOLIDATION TEST READINGS Load No. 5

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.18440	11	16.00	0.21080	21	520.00	0.22520
2	0.10	0.18950	12	36.00	0.21450	22	580.00	0.22560
3	0.25	0.19180	13	49.00	0.21590	23	640.00	0.22610
4	0.57	0.19410	14	64.00	0.21680	24	760.00	0.22650
5	1.00	0.19600	15	100.00	0.21910	25	820.00	0.2270
6	2.25	0.19970	16	160.00	0.22050	26	1180.00	0.2275
7	3.07	0.20150	17	220.00	0.22190	27	1444.50	0.2279
8	4.00	0.20290	18	280.00	0.22280			
9	9.00	0.20750	19	340.00	0.22380			
10	12.25	0.20940	20	460.00	0.22470			

Void Ratio: 1.3263 Consolidation: 22.8 %
D0 = 0.1855 D90 = 0.1949 D100 = 0.1960 T90 = 0.75 min.
Cv @ 0.7 min.= 0.179 sq. in./min.

Load 4.00 tsf — CONSOLIDATION TEST READINGS — Load No. 6

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.22750	11	9.00	0.25990	21	220.00	0.27610
2	0.10	0.23630	12	12.25	0.26220	22	280.00	0.27700
3	0.25	0.23860	13	16.00	0.26360	23	340.00	0.27800
4	0.57	0.24180	14	25.00	0.26640	24	400.00	0.27840
5	1.00	0.24460	15	36.00	0.26820	25	520.00	0.27940
6	1.57	0.24690	16	49.00	0.26960	26	640.00	0.28030
7	2.25	0.249	17	64.00	0.27100	27	760.00	0.28070
8	3.07	0.25160	18	81.00	0.27190	28	880.00	0.28120
9	4.00	0.25430	19	100.00	0.27290	29	1360.00	0.28170
10	6.25	0.25710	20	160.00	0.27470	30	1364.25	0.28170

Void Ratio: 1.1642 Consolidation: 28.2 %
D0 = 0.2323 D90 = 0.2545 D100 = 0.2570 T90 = 4.15 min.
Cv @ 4.1 min.= 0.028 sq. in./min.

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No.

No.	Elapsed Time	Dial Reading
1	0.00	0.28170
2	0.10	0.28030
3	0.57	0.27980
4	1.00	0.27940
5	6.25	0.27890
6	22.88	0.27890

Void Ratio: 1.1727 Consolidation: 27.9 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No.

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.27840	11	12.25	0.26780
2	0.10	0.27520	12	25.00	0.26680
3	0.25	0.27430	13	31.33	0.26640
4	0.57	0.27330			
5	1.00	0.27240			
6	1.57	0.27150			
7	2.25	0.27060			
8	4.00	0.26960			
9	6.25	0.26920			
10	9.00	0.26820			

Void Ratio: 1.2103 Consolidation: 26.6 %

Load 0.25 tsf CONSOLIDATION TEST READINGS Load No. 9

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.26640	11	24.38	0.26170
2	0.10	0.26590			
3	0.57	0.26550			
4	1.57	0.26500			
5	2.25	0.26450			
6	4.00	0.26410			
7	6.25	0.26360			
8	9.38	0.26310			
9	12.38	0.26220			
10	21.38	0.26170			

Void Ratio: 1.2245 Consolidation: 26.2 %

Load 0.50 tsf CONSOLIDATION TEST READINGS Load No. 10

No.	Elapsed Time	Dial Reading
1	0.00	0.26170
2	0.25	0.26220
3	1.00	0.26270
4	2.25	0.26310
5	100.00	0.26310
6	400.00	0.26310
7	700.00	0.26310
8	940.00	0.26310
9	1287.00	0.26310

Void Ratio: 1.2203 Consolidation: 26.3 %
D0 = 0.2617 D90 = 0.2631 D100 = 0.2632 T90 = 2.51 min.
Cv @ 2.5 min.= 0.046 sq. in./min.

Load 1.00 tsf CONSOLIDATION TEST READINGS Load No. 11

No.	Elapsed Time	Dial Reading
1	0.00	0.26310
2	0.10	0.26450
3	1.57	0.26500
4	4.00	0.26550
5	64.00	0.26590
6	460.00	0.26640
7	1497.25	0.26640

Void Ratio: 1.2103 Consolidation: 26.6 %
D0 = 0.2643 D90 = 0.2655 D100 = 0.2657 T90 = 6.77 min.
Cv @ 6.8 min.= 0.017 sq. in./min.

Load No. 12

Load 2.00 tsf

CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.26820	11	400.00	0.27430
2	0.10	0.26920	12	940.00	0.27430
3	0.25	0.26960	13	1462.98	0.27430
4	0.57	0.27060			
5	1.57	0.27100			
6	2.25	0.27150			
7	4.00	0.27190			
8	9.00	0.27240			
9	64.00	0.27330			
10	160.00	0.27380			

Void Ratio: 1.1865 Consolidation: 27.4 %
D0 = 0.2685 D90 = 0.2716 D100 = 0.2720 T90 = 2.68 min.
Cv @ 2.7 min.= 0.042 sq. in./min.

Load No. 13

Load 4.00 tsf

CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.27430	11	16.00	0.28400	21	880.00	0.29000
2	0.10	0.27750	12	25.00	0.28440	22	1477.45	0.29000
3	0.25	0.27840	13	49.00	0.28490			
4	0.57	0.27940	14	64.00	0.28540			
5	1.00	0.28030	15	81.00	0.28580			
6	1.57	0.28070	16	160.00	0.28680			
7	2.25	0.28120	17	340.00	0.28820			
8	3.07	0.28170	18	520.00	0.28860			
9	4.00	0.28210	19	580.00	0.28910			
10	6.25	0.28260	20	700.00	0.28950			

Void Ratio: 1.1392 Consolidation: 29.0 %
D0 = 0.2760 D90 = 0.2804 D100 = 0.2808 T90 = 1.07 min.
Cv @ 1.1 min.= 0.102 sq. in./min.

Load 8.00 tsf CONSOLIDATION TEST READINGS Load No. 14

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.29000	11	9.00	0.31600	21	340.00	0.3317[illegible]
2	0.10	0.29560	12	12.25	0.31780	22	400.00	0.33220
3	0.25	0.29790	13	16.00	0.31870	23	460.00	0.33260
4	0.57	0.30020	14	25.00	0.32150	24	520.00	0.33310
5	1.00	0.30250	15	36.00	0.32290	25	580.00	0.33360
6	1.57	0.30480	16	49.00	0.32430	26	700.00	0.33400
7	2.25	0.30720	17	64.00	0.32570	27	760.00	0.33450
8	3.07	0.30900	18	81.00	0.32660	28	940.00	0.33490
9	4.00	0.31090	19	160.00	0.32850	29	1300.00	0.33540
10	6.25	0.31360	20	280.00	0.33120	30	1422.62	0.33540

Void Ratio: 1.0024 Consolidation: 33.5 %
D0 = 0.2916 D90 = 0.3023 D100 = 0.3035 T90 = 0.97 min.
Cv @ 1 min.= 0.104 sq. in./min.

Load 16.00 tsf CONSOLIDATION TEST READINGS Load No. 15

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.33540	11	9.00	0.36550	21	580.00	0.38220
2	0.10	0.34100	12	12.25	0.36740	22	640.00	0.38270
3	0.25	0.34330	13	16.00	0.36880	23	760.00	0.38310
4	0.57	0.34650	14	36.00	0.37250	24	1180.00	0.38360
5	1.00	0.34980	15	64.00	0.37480	25	1240.00	0.3841[illegible]
6	1.57	0.35210	16	100.00	0.37620	26	1540.00	0.384[illegible]
7	2.25	0.35490	17	220.00	0.37900	27	1780.00	0.385[illegible]
8	3.07	0.35720	18	340.00	0.38030	28	1960.00	0.3854
9	4.00	0.35900	19	400.00	0.38130	29	2260.00	0.38590
10	6.25	0.36230	20	460.00	0.38170	30	2582.58	0.38590

Void Ratio: 0.8503 Consolidation: 38.6 %
D0 = 0.3370 D90 = 0.3593 D100 = 0.3618 T90 = 4.18 min.
Cv @ 4.2 min.= 0.021 sq. in./min.

Load No. 16

Load 32.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.02	0.38590	11	25.00	0.41880	21	640.00	0.42900
2	0.25	0.39420	12	36.00	0.42020	22	760.00	0.42950
3	1.00	0.39980	13	49.00	0.42110	23	940.00	0.42990
4	2.25	0.40490	14	64.00	0.42200	24	1120.00	0.43040
5	3.07	0.40680	15	100.00	0.42340	25	1300.00	0.43080
6	4.00	0.40860	16	220.00	0.42570	26	1719.82	0.43130
7	6.25	0.41140	17	340.00	0.42670	27	1725.82	0.43130
8	9.00	0.41370	18	400.00	0.42710			
9	12.25	0.41560	19	460.00	0.42810			
10	16.00	0.41690	20	580.00	0.42850			

Void Ratio: 0.7135 Consolidation: 43.1 %
D0 = 0.3886 D90 = 0.4093 D100 = 0.4116 T90 = 4.52 min.
Cv @ 4.5 min.= 0.016 sq. in./min.

Load No. 17

Load 8.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading
1	0.00	0.43040
2	0.10	0.42620
3	0.25	0.42530
4	0.57	0.42480
5	1.57	0.42440
6	3.07	0.42390
7	6.25	0.42340
8	16.00	0.42300
9	25.90	0.42300

Void Ratio: 0.7385 Consolidation: 42.3 %

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.42250	11	9.80	0.41280
2	0.10	0.41930	12	12.80	0.41230
3	0.25	0.41830	13	18.80	0.41140
4	0.57	0.41740	14	27.80	0.41090
5	1.00	0.41650	15	31.63	0.41050
6	1.57	0.41600			
7	2.25	0.41560			
8	3.07	0.41510			
9	3.80	0.41460			
10	6.80	0.41370			

Void Ratio: 0.7762 Consolidation: 41.1 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.40950	11	7.78	0.40120
2	0.10	0.40720	12	10.78	0.40030
3	0.25	0.40630	13	13.78	0.39930
4	0.57	0.40580	14	16.78	0.39890
5	1.00	0.40490	15	19.78	0.39800
6	1.57	0.40440	16	22.78	0.39750
7	2.25	0.40400	17	27.08	0.39700
8	3.07	0.40350			
9	4.00	0.40300			
10	6.25	0.40170			

Void Ratio: 0.8168 Consolidation: 39.7 %

Load 0.25 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.39660	11	24.73	0.39010
2	0.10	0.39560	12	30.10	0.38960
3	1.00	0.39520			
4	1.57	0.39470			
5	3.73	0.39420			
6	6.73	0.39330			
7	9.73	0.39290			
8	12.73	0.39240			
9	15.73	0.39150			
10	18.73	0.39100			

Void Ratio: 0.8391 Consolidation: 39.0 %

Load No. 21

Load 0.13 tsf

CONSOLIDATION TEST READINGS

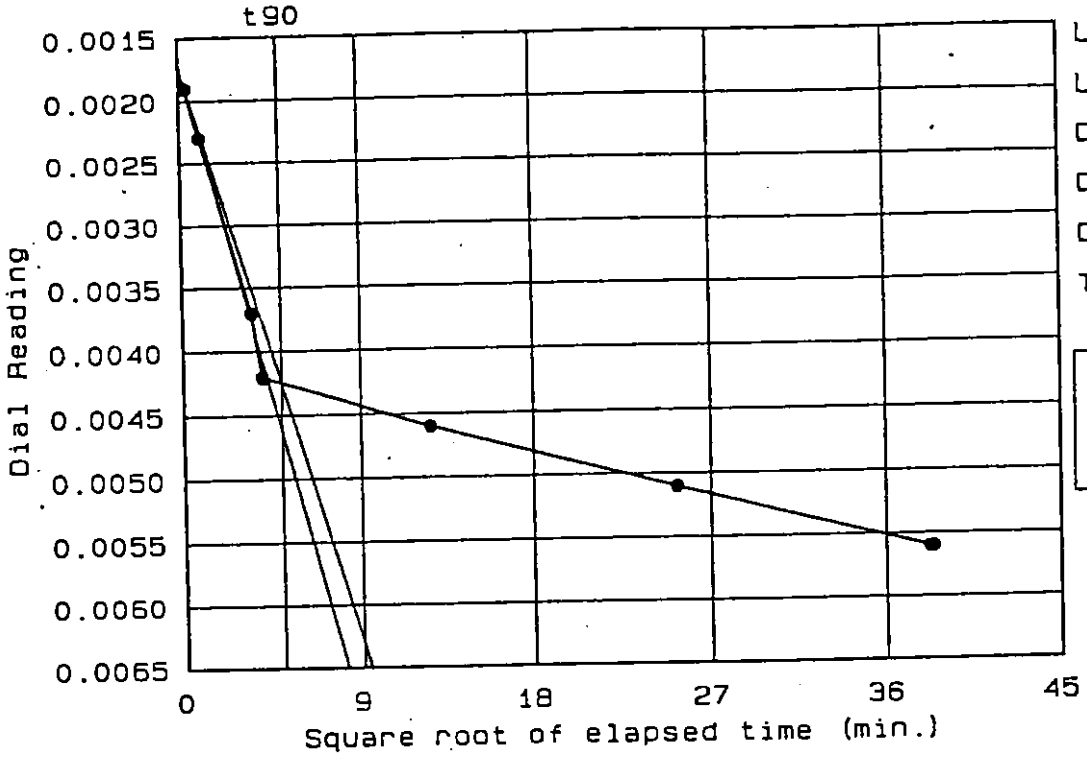
No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.38910	11	12.25	0.37900
2	0.10	0.38820	12	16.00	0.33630
3	0.25	0.38540	13	25.00	0.33910
4	0.57	0.37940	14	29.55	0.36970
5	1.00	0.37800			
6	1.57	0.37990			
7	2.25	0.38360			
8	4.00	0.38310			
9	6.25	0.38030			
10	9.00	0.34790			

Void Ratio: 0.8991 Consolidation: 37.0 %

Dial Reading vs. Time

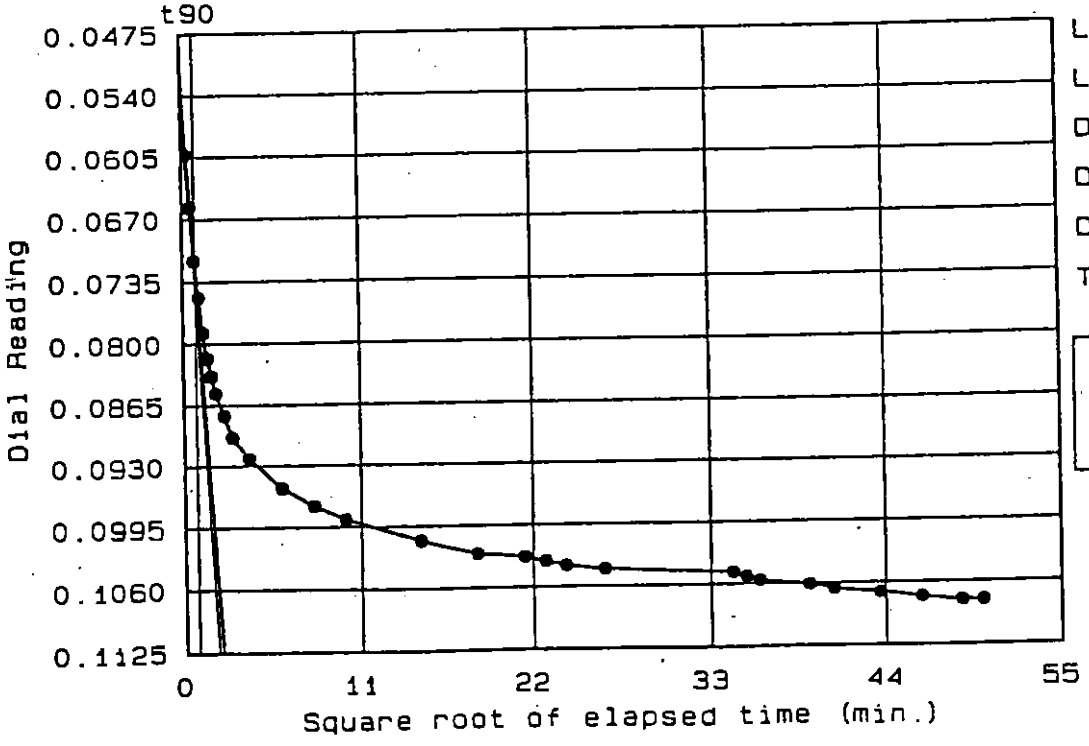
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB1 ST6, 37.0'-39.0'

Date: 06-02-92



Load No.= 1
Load= 0.13 tsf
D_0 = 0.0017
D_{90} = 0.0042
D_{100}= 0.0045
T_{90}= 24.72 min.

C_v @ T_{90} =
0.01 in.^{2}/min.



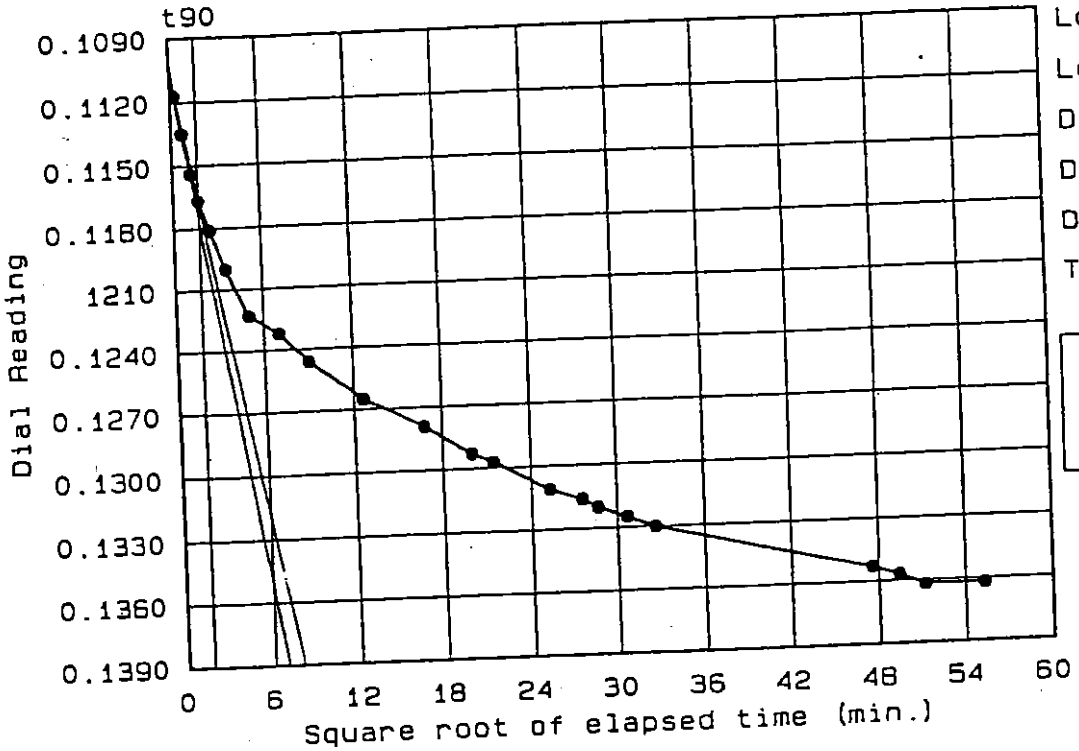
Load No.= 2
Load= 0.25 tsf
D_0 = 0.0506
D_{90} = 0.0723
D_{100}= 0.0748
T_{90}= 0.67 min.

C_v @ T_{90} =
0.28 in.^{2}/min.

Dial Reading vs. Time

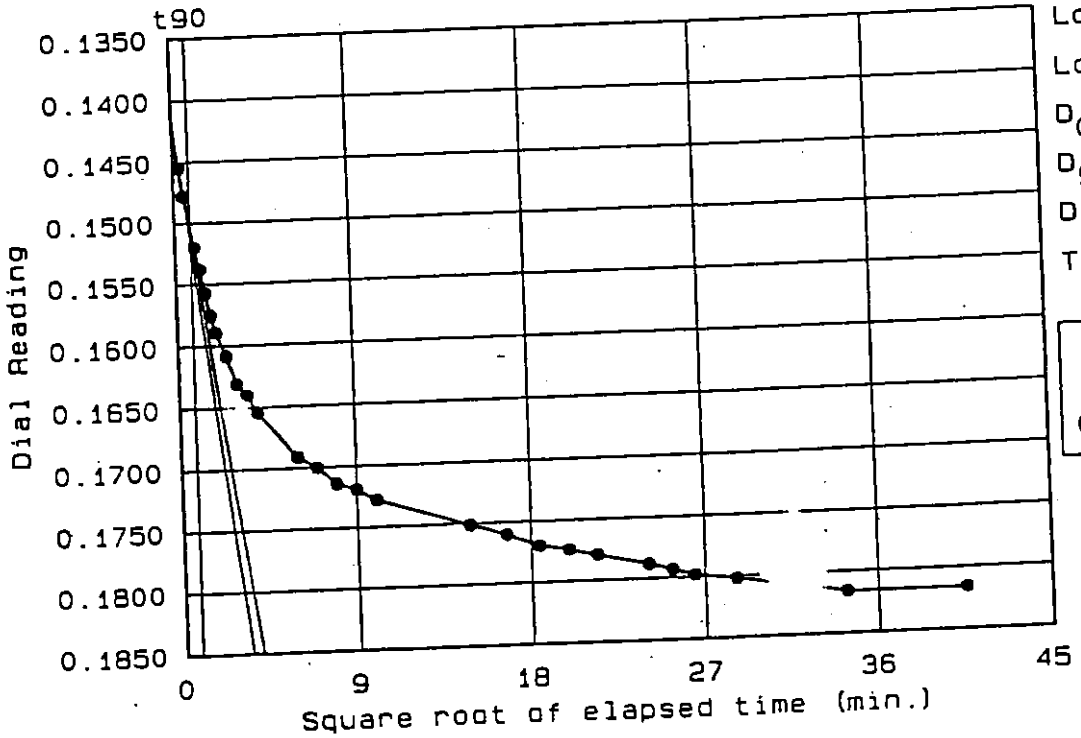
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB1 ST6, 37.0'-39.0'

Date: 06-02-92



Load No.= 3
Load= 0.50 tsf
D_0 = 0.1 4
D_{90} = 0.1168
D_{100}= 0.1175
T_{90}= 3.17 min.

C_v @ T_{90} =
0.05 in.^{2}/min.



Load No.= 4
Load= 1.00 tsf
D_0 = 0.1415
D_{90} = 0.1506
D_{100}= 0.1516
T_{90}= 0.69 min.

C_v @ T_{90} =
0.22 in.^{2}/min.

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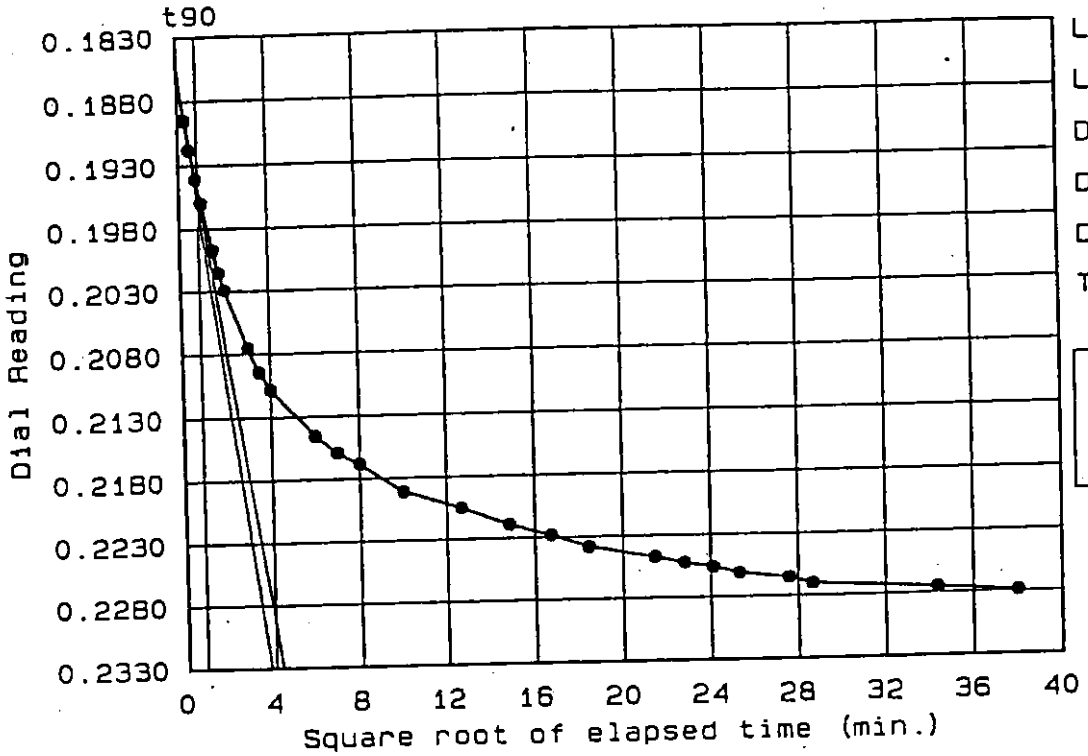
Dial Reading vs. Time

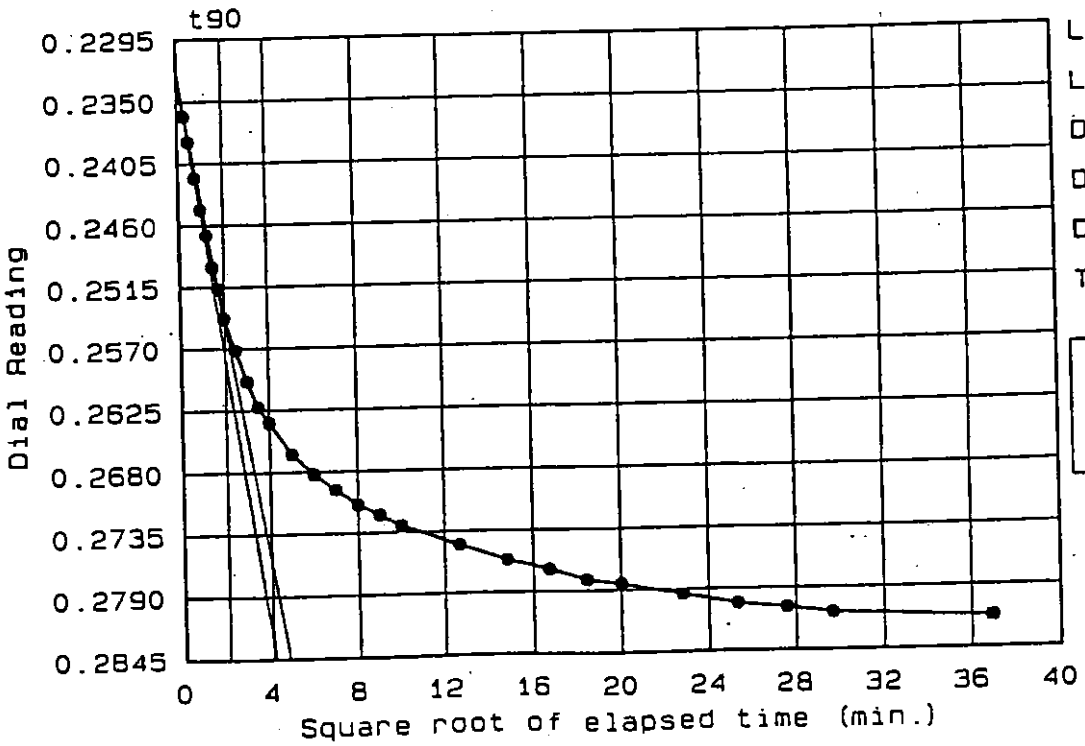
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB1 ST6. 37.0'-39.0'

Date: 06-02-92



Load No.= 5
Load= 2.00 tsf
D_0 = 0.1855
D_{90} = 0.1949
D_{100}= 0.1960
T_{90}= 0.75 min.

C_v @ T_{90} =
0.18 in.^{2}/min.



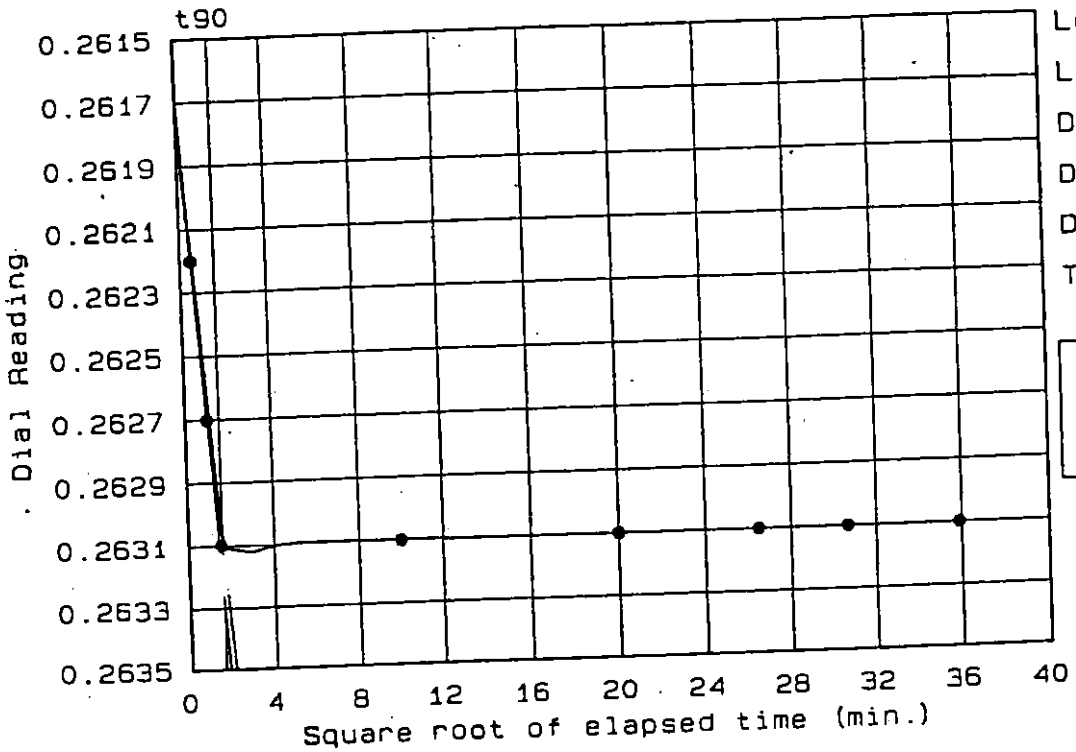
Load No.= 6
Load= 4.00 tsf
D_0 = 0.2323
D_{90} = 0.2545
D_{100}= 0.2570
T_{90}= 4.15 min.

C_v @ T_{90} =
0.03 in.^{2}/min.

Dial Reading vs. Time

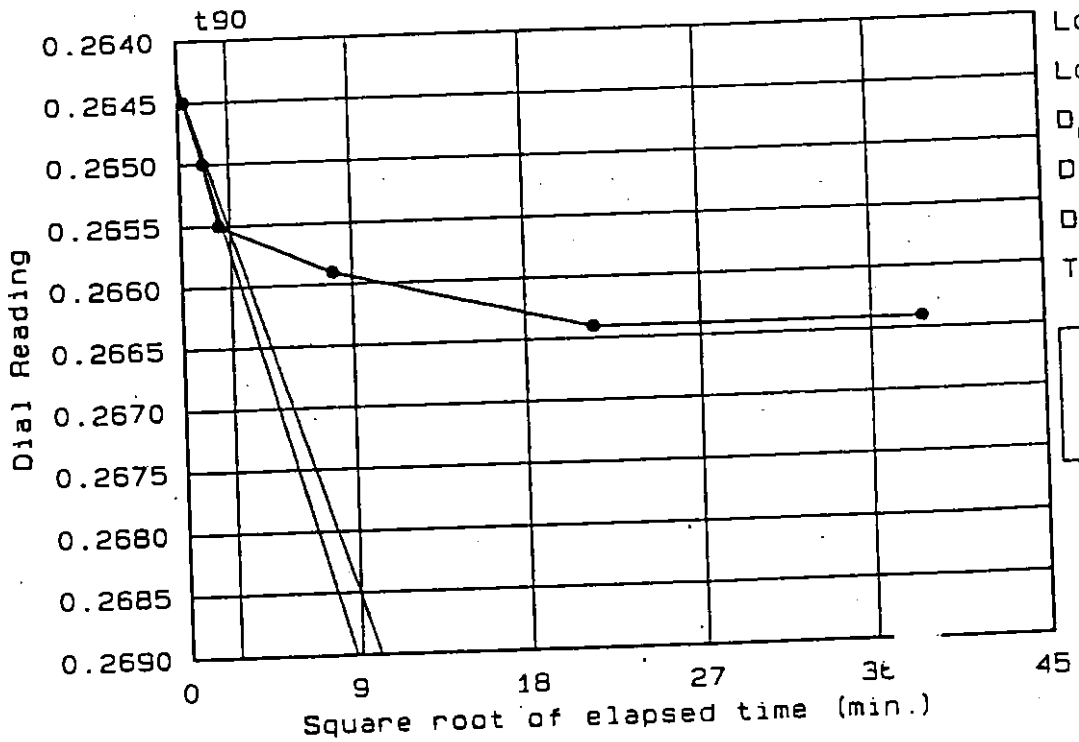
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB1 ST6, 37.0'-39.0'

Date: 06-02-92



Load No.= 10
Load= 0.50 tsf
D_0 = 0.2617
D_{90} = 0.2631
D_{100}= 0.2632
T_{90}= 2.51 min.

C_v @ T_{90} =
0.05 in.^{2}/min.



Load No.= 11
Load= 1.00 tsf
D_0 = 0.2643
D_{90} = 0.2655
D_{100}= 0.2657
T_{90}= 6.77 min.

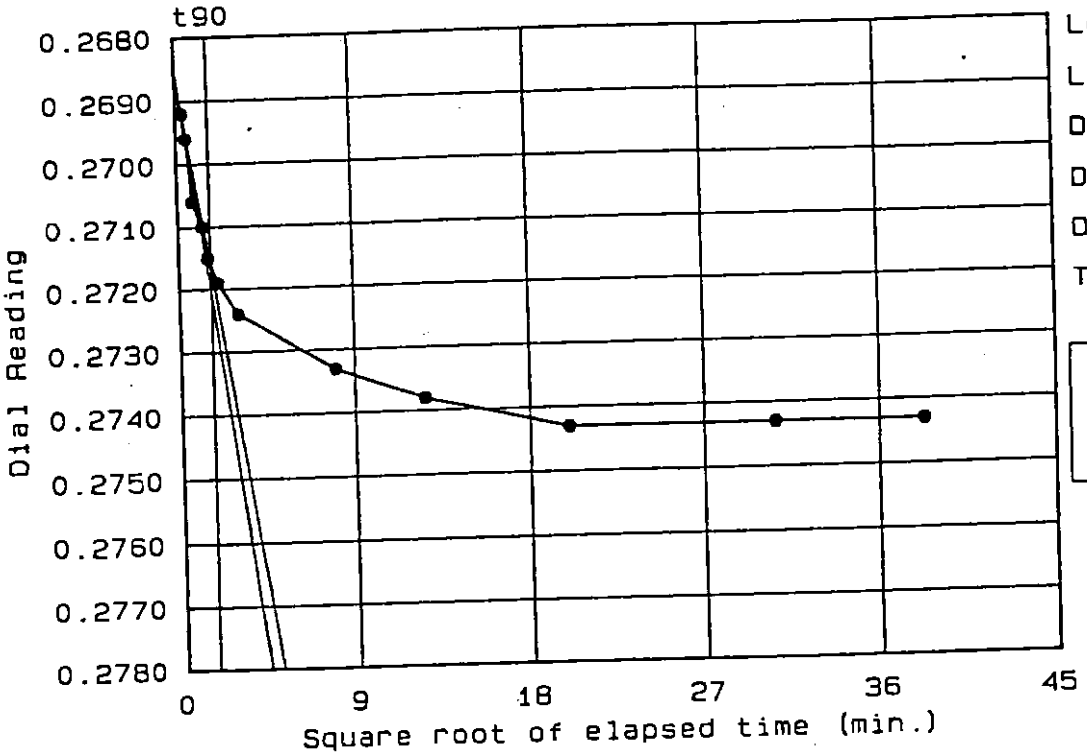
C_v @ T_{90} =
0.02 in.^{2}/min.

BOWSER-MORNER, INC.

Dial Reading vs. Time

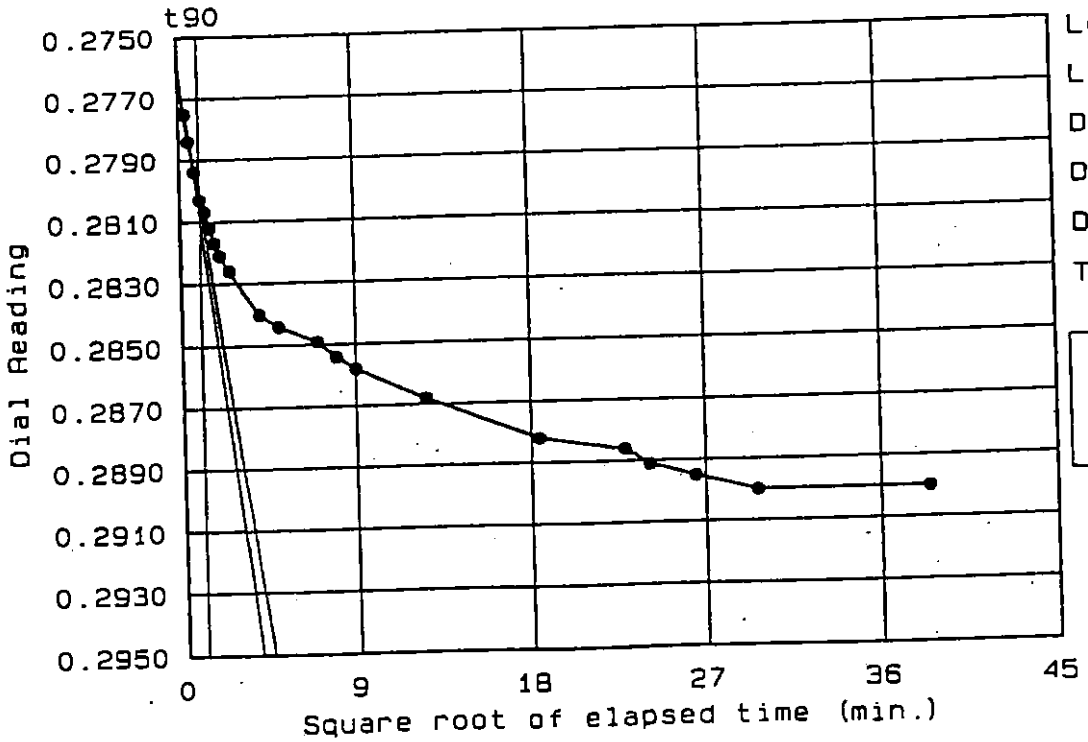
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB1 ST6, 37.0'-39.0'

Date: 06-02-92



Load No.= 12
Load= 2.00 tsf
D_0 = 0.2685
D_{90} = 0.2716
D_{100}= 0.2720
T_{90}= 2.68 min.

C_v @ T_{90} =
0.04 in.^{2}/min.



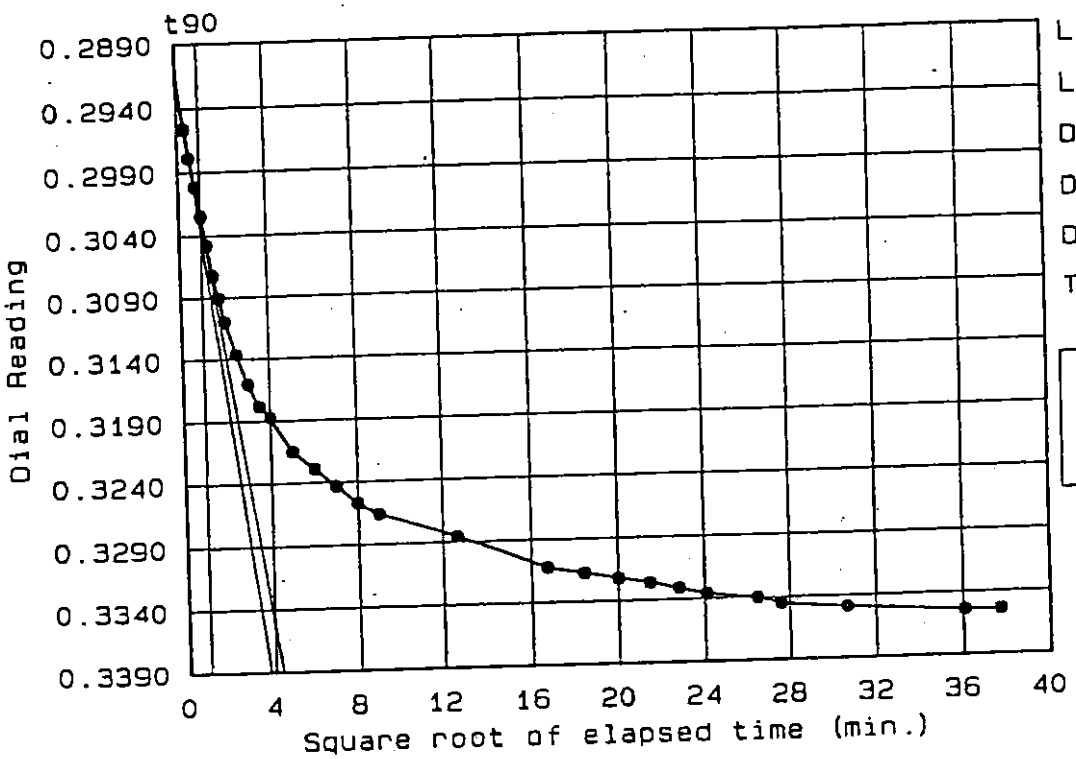
Load No.= 13
Load= 4.00 tsf
D_0 = 0.2760
D_{90} = 0.2804
D_{100}= 0.2808
T_{90}= 1.07 min.

C_v @ T_{90} =
0.10 in.^{2}/min.

Dial Reading vs. Time

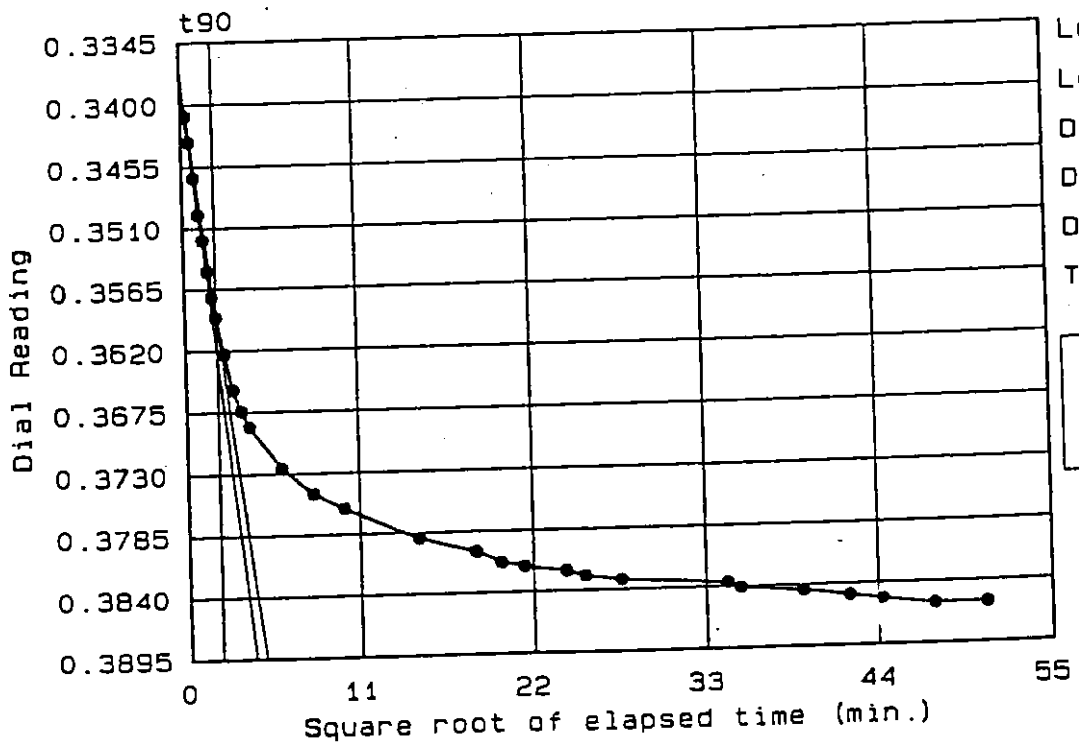
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: T81 ST6. 37.0'-39.0'

Date: 06-02-92



Load No.= 14
Load= 8.00 tsf
D_0 = 0.2916
D_{90} = 0.3023
D_{100}= 0.3035
T_{90}= 0.97 min.

C_v @ T_{90} =
0.10 in.^{2}/min.



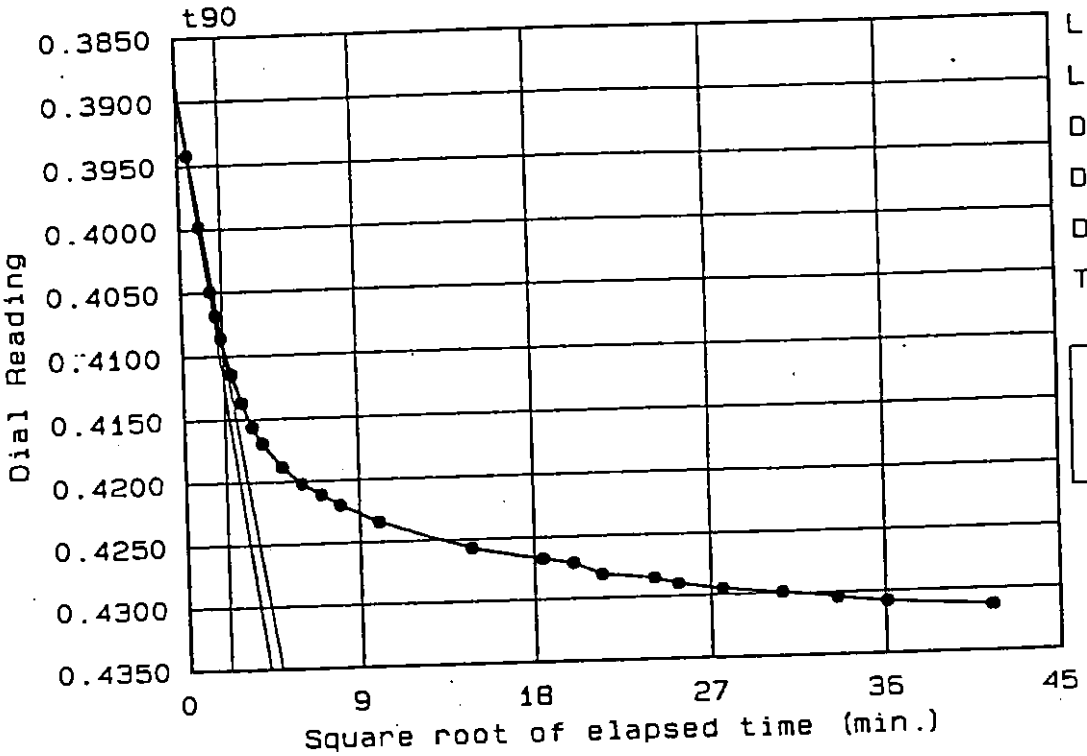
Load No.= 15
Load= 16.00 tsf
D_0 = 0.3370
D_{90} = 0.3593
D_{100}= 0.3618
T_{90}= 4.18 min.

C_v @ T_{90} =
0.02 in.^{2}/min.

Dial Reading vs. Time

Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB1 ST6, 37.0'-39.0'

Date: 06-02-92



Load No.= 16
Load= 32.00 tsf
D_0 = 0.3886
D_{90} = 0.4093
D_{100}= 0.4116
T_{90}= 4.52 min.

C_v @ T_{90} =
0.02 in.^{2}/min.

Test No. 37

CONSOLIDATION TEST PROJECT DATA

Project Number:	47533 WESTON
Project:	DSWA - PHASE IV
Date:	06-02-92
Location 1:	TB1 ST6, 37.0'-39.0'
2:	
Remarks 1:	TEST SPECIMEN TAKEN
2:	FROM: 38.3'-38.4'
3:	
4:	
5:	
Material 1:	DREDGE SPOIL
description 2:	
Classification:	
Liquid limit:	
Plasticity index:	
Figure Number:	

CONSOLIDATION TEST SPECIMEN DATA

TOTAL SAMPLE		BEFORE TEST		AFTER TEST	
et w+t =	112.67 g.	Oedometer No. =	19	Wet w+t =	91.50 g.
ry w+t =	68.88 g	Machine No. =	N/A	Dry w+t =	68.88 g.
are wt. =	0.00 g.	Spec. Gravity =	2.58	Tare wt. =	0.00 g.
eight =	1.00 in.	Height =	1.00 in.		
iameter =	2.50 in.	Diameter =	2.50 in.		
eight =	112.67 g.				
oisture =	63.6 %	Ht. Solids =	0.33 in.	Moisture =	32.8 %
et Den. =	87.4 pcf	Dry wt. =	68.88 g.	Dry wt. =	68.88 g. *
Dry Den. =	53.5 pcf	Void ratio =	2.0130	Void ratio =	0.8991
		Saturation =	81.5 %	Saturation =	94.2 %

Final dry weight used in calculations

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
Initial	0.00000			2.0130	
0.13	0.00560	0.0000	0.00560	1.9961	0.6 Consol.
0.25	0.10790	0.0000	0.10790	1.6879	10.8 Consol.
0.50	0.13620	0.0000	0.13620	1.6026	13.6 Consol.
1.00	0.18160	0.0000	0.18160	1.4658	18.2 Consol.
2.00	0.22790	0.0000	0.22790	1.3263	22.8 Consol.
4.00	0.28170	0.0000	0.28170	1.1642	28.2 Consol.
2.00	0.27890	0.0000	0.27890	1.1727	27.9 Consol.
0.50	0.26640	0.0000	0.26640	1.2103	26.6 Consol.
0.25	0.26170	0.0000	0.26170	1.2245	26.2 Consol.

CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
0.50	0.26310	0.0000	0.26310	1.2203	26.3 Consol.
1.00	0.26640	0.0000	0.26640	1.2103	26.6 Consol.
2.00	0.27430	0.0000	0.27430	1.1865	27.4 Consol.
4.00	0.29000	0.0000	0.29000	1.1392	29.0 Consol.
8.00	0.33540	0.0000	0.33540	1.0024	33.5 Consol.
16.00	0.38590	0.0000	0.38590	0.8503	38.6 Consol.
32.00	0.43130	0.0000	0.43130	0.7135	43.1 Consol.
8.00	0.42300	0.0000	0.42300	0.7385	42.3 Consol.
2.00	0.41050	0.0000	0.41050	0.7762	41.1 Consol.
0.50	0.39700	0.0000	0.39700	0.8168	39.7 Consol.
0.25	0.38960	0.0000	0.38960	0.8391	39.0 Consol.
0.13	0.36970	0.0000	0.36970	0.8991	37.0 Consol.

CONSOLIDATION TEST RESULTS

Compression index = NOT SELECTED
Preconsolidation pressure = NOT SELECTED

Load 0.13 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading
1	0.00	0.00000
2	0.10	0.00190
3	1.00	0.00230
4	12.25	0.00370
5	16.00	0.00420
6	160.00	0.00460
7	640.00	0.00510
8	1462.78	0.00560
9	1478.78	0.00560

Void Ratio: 1.9961 Consolidation: 0.6 %
D0 = 0.0020 D50 = 0.0029 D100 = 0.0038 T50 = 2.50 min.
Cv @ 2.5 min.= 0.020 sq. in./min.

Load No. 2

Load 0.25 tsf — CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.00760	11	9.00	0.08990	21	7[illegible].00	0.10420
2	0.10	0.06020	12	16.00	0.09220	22	11[illegible].00	0.10470
3	0.25	0.06580	13	36.00	0.09540	23	1240.00	0.10520
4	0.57	0.07130	14	64.00	0.09730	24	1300.00	0.10560
5	1.00	0.07510	15	100.00	0.09870	25	1540.00	0.10610
6	1.57	0.07[illegible]80	16	220.00	0.101[illegible]	26	1660.00	0.10660
7	2.25	0.0[illegible]0	17	340.00	0.102[illegible]	27	1900.00	0.10700
8	3.07	0.0[illegible]40	18	460.00	0.10280	28	2140.00	0.10750
9	4.00	0.08520	19	520.00	0.10330	29	2380.00	0.10790
10	6.25	0.08760	20	580.00	0.10380	30	2509.35	0.10790

Void Ratio: 1.6879 Consolidation: 10.8 %
D0 = 0.0514 D50 = 0.0783 D100 = 0.1052 T50 = 1.47 min.
Cv @ 1.5 min.= 0.030 sq. in./min.

Load No. 3

Load 0.50 tsf — CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.10750	11	160.00	0.12650	21	2440.00	0.13570
2	0.10	0.11170	12	280.00	0.12790	22	2620.00	0.13620
3	0.57	0.11350	13	400.00	0.12930	23	3060.15	0.13620
4	1.57	0.11540	14	460.00	0.12970			
5	3.07	0.11670	15	640.00	0.13110			
6	6.25	0.11810	16	760.00	0.13160			
7	12.25	0.12000	17	820.00	0.132[illegible]			
8	25.00	0.12230	18	940.00	0.132[illegible]			
9	49.00	0.12320	19	1060.00	0.13300			
10	81.00	0.12[illegible]	20	2260.00	0.13530			

Void Ratio: 1.6026 Consolidation: 13.6 %

Load 1.00 tsf — CONSOLIDATION TEST READINGS — Load No. 4

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.13670	11	12.25	0.16400	21	400.00	0.17740
2	0.10	0.14550	12	16.00	0.16540	22	460.00	0.17790
3	0.25	0.14780	13	36.00	0.16910	23	580.00	0.17880
4	1.00	0.15200	14	49.00	0.17000	24	640.00	0.17930
5	1.57	0.15380	15	64.00	0.17140	25	700.00	0.17980
6	2.25	0.15570	16	81.00	0.17190	26	820.00	0.18020
7	3.07	0.15750	17	100.00	0.17280	27	940.00	0.18070
8	4.00	0.15890	18	220.00	0.17510	28	1060.00	0.18110
9	6.25	0.16080	19	280.00	0.17600	29	1180.00	0.18160
10	9.00	0.16310	20	340.00	0.17700	30	1647.40	0.18160

Void Ratio: 1.4658 Consolidation: 18.2 %
D0 = 0.1428 D50 = 0.1563 D100 = 0.1698 T50 = 2.38 min.
Cv @ 2.4 min.= 0.015 sq. in./min.

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No. 5

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.18440	11	16.00	0.21080	21	520.00	0.22520
2	0.10	0.18950	12	36.00	0.21450	22	580.00	0.22560
3	0.25	0.19180	13	49.00	0.21590	23	640.00	0.22610
4	0.57	0.19410	14	64.00	0.21680	24	760.00	0.22650
5	1.00	0.19600	15	100.00	0.21910	25	820.00	0.2270
6	2.25	0.19970	16	160.00	0.22050	26	1180.00	0.2275
7	3.07	0.20150	17	220.00	0.22190	27	1444.50	0.2279
8	4.00	0.20290	18	280.00	0.22280			
9	9.00	0.20750	19	340.00	0.22380			
10	12.25	0.20940	20	460.00	0.22470			

Void Ratio: 1.3263 Consolidation: 22.8 %
D0 = 0.1869 D50 = 0.2045 D100 = 0.2222 T50 = 5.25 min.
Cv @ 5.3 min.= 0.006 sq. in./min.

Load No. 6

ad 4.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.	0.22750	11	9.00	0.25990	21	220.00	0.27610
	0.	0.23630	12	12.25	0.26220	22	280.00	0.27700
	0.25	0.23860	13	16.00	0.26360	23	340.00	0.27800
	0.57	0.24180	14	25.00	0.26640	24	400.00	0.27840
4	1.00	0.24460	15	36.00	0.26820	25	520.00	0.27940
5	1.57	0.24690	16	49.00	0.26960	26	640.00	0.28030
6	2.25	0.24970	17	64.00	0.27100	27	760.00	0.28070
7	3.07	0.25160	18	81.00	0.27190	28	880.00	0.28120
8	4.00	0.25430	19	100.00	0.27290	29	1360.00	0.28170
9	6.25	0.25710	20	160.00	0.27470	30	1364.25	0.28170
10								

Void Ratio: 1.1642 Consolidation: 28.2 %
D0 = 0.2336 D50 = 0.2525 D100 = 0.2714 T50 = 3.21 min.
Cv @ 3.2 min.= 0.009 sq. in./min.

Load No. 7

Load 2.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading
1	0.00	0.28170
2	0.10	0.28030
3	0.57	0.27980
4	1.00	0.27940
5	6.25	0.27890
6	22.88	0.27890

Void Ratio: 1.1727 Consolidation: 27.9 %

Load No. 8

Load 0.50 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.27840	11	12.25	0.26780
2	0.10	0.27520	12	25.00	0.26680
3	0.25	0.27430	13	31.33	0.26640
4	0.57	0.27330			
5	1.00	0.27240			
6	1.57	0.27150			
7	2.25	0.27060			
8	4.00	0.26960			
9	6.25	0.26920			
10	9.00	0.26820			

Void Ratio: 1.2103 Consolidation: 26.6 %

Load 0.25 tsf — CONSOLIDATION TEST READINGS — Load No.

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.26640	11	24.38	0.26170
2	0.10	0.26590			
3	0.57	0.26550			
4	1.57	0.26500			
5	2.25	0.26450			
6	4.00	0.26410			
7	6.25	0.26360			
8	9.38	0.26310			
9	12.38	0.26220			
10	21.38	0.26170			

Void Ratio: 1.2245 Consolidation: 26.2 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 1

No.	Elapsed Time	Dial Reading
1	0.00	0.26170
2	0.25	0.26220
3	1.00	0.26270
4	2.25	0.26310
5	100.00	0.26310
6	400.00	0.26310
7	700.00	0.26310
8	940.00	0.26310
9	1287.00	0.26310

Void Ratio: 1.2203 Consolidation: 26.3 %
D0 = 0.2616 D50 = 0.2623 D100 = 0.2630 T50 = 0.35 min.
Cv @ 0.3 min.= 0.078 sq. in./min.

Load 1.00 tsf — CONSOLIDATION TEST READINGS — Load No.

No.	Elapsed Time	Dial Reading
1	0.00	0.26310
2	0.10	0.26450
3	1.57	0.26500
4	4.00	0.26550
5	64.00	0.26590
6	460.00	0.26640
7	1497.25	0.26640

Void Ratio: 1.2103 Consolidation: 26.6 %
D0 = 0.2643 D50 = 0.2654 D100 = 0.2665 T50 = 5.92 min.
Cv @ 5.9 min.= 0.004 sq. in./min.

Load No. 12

ad 2.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.26820	11	400.00	0.27430
2	0.10	0.26920	12	940.00	0.27430
3	0.25	0.26960	13	1462.98	0.27430
4	0.57	0.27060			
5	1.57	0.27100			
6	2.25	0.27150			
7	4.00	0.27190			
8	9.00	0.27240			
9	64.00	0.27330			
10	160.00	0.27380			

Void Ratio: 1.1865 Consolidation: 27.4 %
D0 = 0.2682 D50 = 0.2713 D100 = 0.2744 T50 = 1.93 min.
Cv @ 1.9 min.= 0.014 sq. in./min.

Load No. 13

oad 4.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.27430	11	16.00	0.28400	21	880.00	0.29000
2	0.10	0.27750	12	25.00	0.28440	22	1477.45	0.29000
3	0.25	0.27840	13	49.00	0.28490			
4	0.57	0.27940	14	64.00	0.28540			
5	1.00	0.28030	15	81.00	0.28580			
6	1.57	0.28070	16	160.00	0.28680			
7	2.25	0.28120	17	340.00	0.28820			
8	3.07	0.28170	18	520.00	0.28860			
9	4.00	0.28210	19	580.00	0.28910			
10	6.25	0.28260	20	700.00	0.28950			

Void Ratio: 1.1392 Consolidation: 29.0 %

Load No. 14

Load 8.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.29000	11	9.00	0.31600	21	340.00	0.33170
2	0.10	0.29560	12	12.25	0.31780	22	400.00	0.33220
3	0.25	0.29790	13	16.00	0.31870	23	460.00	0.33260
4	0.57	0.30020	14	25.00	0.32150	24	520.00	0.33310
5	1.00	0.30250	15	36.00	0.32290	25	580.00	0.33360
6	1.57	0.30480	16	49.00	0.32430	26	700.00	0.33400
7	2.25	0.30720	17	64.00	0.32570	27	760.00	0.33450
8	3.07	0.30900	18	81.00	0.32660	28	940.00	0.33490
9	4.00	0.31090	19	160.00	0.32850	29	1300.00	0.33540
10	6.25	0.31360	20	280.00	0.33120	30	1422.62	0.33540

Void Ratio: 1.0024 Consolidation: 33.5 %
D0 = 0.2933 D50 = 0.3098 D100 = 0.3262 T50 = 3.33 min.
Cv @ 3.3 min.= 0.007 sq. in./min.

Load No. 15

Load 16.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.33540	11	9.00	0.36550	21	580.00	0.38220
2	0.10	0.34100	12	12.25	0.36740	22	640.00	0.38270
3	0.25	0.34330	13	16.00	0.36880	23	760.00	0.38310
4	0.57	0.34650	14	36.00	0.37250	24	1180.00	0.38360
5	1.00	0.34980	15	64.00	0.37480	25	1240.00	0.38410
6	1.57	0.35210	16	100.00	0.37620	26	1540.00	0.3845
7	2.25	0.35490	17	220.00	0.37900	27	1780.00	0.3850
8	3.07	0.35720	18	340.00	0.38030	28	1960.00	0.3854
9	4.00	0.35900	19	400.00	0.38130	29	2260.00	0.38590
10	6.25	0.36230	20	460.00	0.38170	30	2582.58	0.38590

Void Ratio: 0.8503 Consolidation: 38.6 %
D0 = 0.3382 D50 = 0.3557 D100 = 0.3732 T50 = 2.36 min.
Cv @ 2.4 min.= 0.009 sq. in./min.

Load No. 16

Load 32.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.02	0.38590	11	25.00	0.41880	21	640.00	0.42900
2	0.25	0.39420	12	36.00	0.42020	22	760.00	0.42950
3	1.00	0.39980	13	49.00	0.42110	23	940.00	0.42990
4	2.25	0.40490	14	64.00	0.42200	24	1120.00	0.43040
5	3.07	0.40680	15	100.00	0.42340	25	1300.00	0.43080
6	4.00	0.40860	16	220.00	0.42570	26	1719.82	0.43130
7	6.25	0.41140	17	340.00	0.42670	27	1725.82	0.43130
8	9.00	0.41370	18	400.00	0.42710			
9	12.25	0.41560	19	460.00	0.42810			
10	16.00	0.41690	20	580.00	0.42850			

Void Ratio: 0.7135 Consolidation: 43.1 %
D0 = 0.3886 D50 = 0.4041 D100 = 0.4195 T50 = 1.93 min.
Cv @ 1.9 min.= 0.009 sq. in./min.

Load No. 17

Load 8.00 tsf CONSOLIDATION TEST READINGS

No.	Elapsed Time	Dial Reading
1	0.00	0.43040
2	0.10	0.42620
3	0.25	0.42530
4	0.57	0.42480
5	1.57	0.42440
6	3.07	0.42390
7	6.25	0.42340
8	16.00	0.42300
9	25.90	0.42300

Void Ratio: 0.7385 Consolidation: 42.3 %

Load 2.00 tsf — CONSOLIDATION TEST READINGS — Load No. 18

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.42250	11	9.80	0.41280
2	0.10	0.41930	12	12.80	0.41230
3	0.25	0.41830	13	18.80	0.41140
4	0.57	0.41740	14	27.80	0.41090
5	1.00	0.41650	15	31.63	0.41050
6	1.57	0.41600			
7	2.25	0.41560			
8	3.07	0.41510			
9	3.80	0.41460			
10	6.80	0.41370			

Void Ratio: 0.7762 Consolidation: 41.1 %

Load 0.50 tsf — CONSOLIDATION TEST READINGS — Load No. 19

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.40950	11	7.78	0.40120
2	0.10	0.40720	12	10.78	0.40030
3	0.25	0.40630	13	13.78	0.39930
4	0.57	0.40580	14	16.78	0.39890
5	1.00	0.40490	15	19.78	0.39800
6	1.57	0.40440	16	22.78	0.39750
7	2.25	0.40400	17	27.08	0.39700
8	3.07	0.40350			
9	4.00	0.40300			
10	6.25	0.40170			

Void Ratio: 0.8168 Consolidation: 39.7 %

Load 0.25 tsf — CONSOLIDATION TEST READINGS — Load No. 20

No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.39660	11	24.73	0.39010
2	0.10	0.39560	12	30.10	0.38960
3	1.00	0.39520			
4	1.57	0.39470			
5	3.73	0.39420			
6	6.73	0.39330			
7	9.73	0.39290			
8	12.73	0.39240			
9	15.73	0.39150			
10	18.73	0.39100			

Void Ratio: 0.8391 Consolidation: 39.0 %

ad 0.13 tsf CONSOLIDATION TEST READINGS Load No. 21

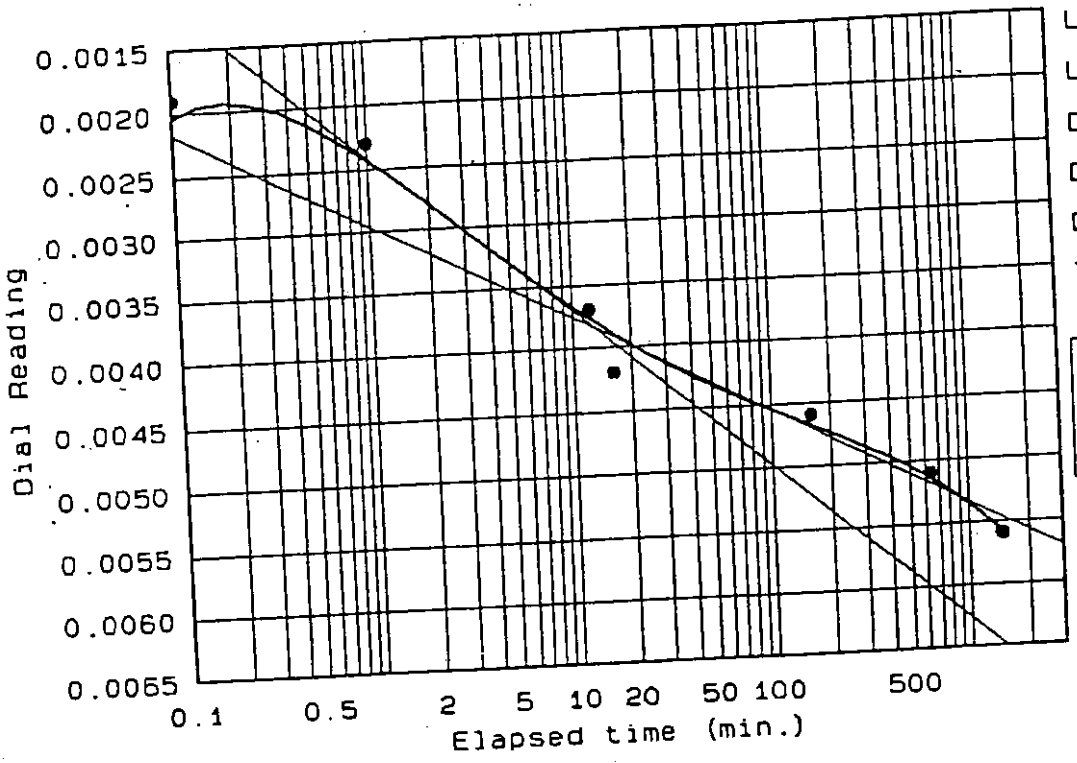
No.	Elapsed Time	Dial Reading	No.	Elapsed Time	Dial Reading
1	0.00	0.38910	11	12.25	0.37900
2	0.10	0.38820	12	16.00	0.33630
3	0.25	0.38540	13	25.00	0.33910
4	0.57	0.37940	14	29.55	0.36970
5	1.00	0.37800			
6	1.57	0.37990			
7	2.25	0.38360			
8	4.00	0.38310			
9	6.25	0.38030			
10	9.00	0.34790			

Void Ratio: 0.8991 Consolidation: 37.0 %

Dial Reading vs. Time

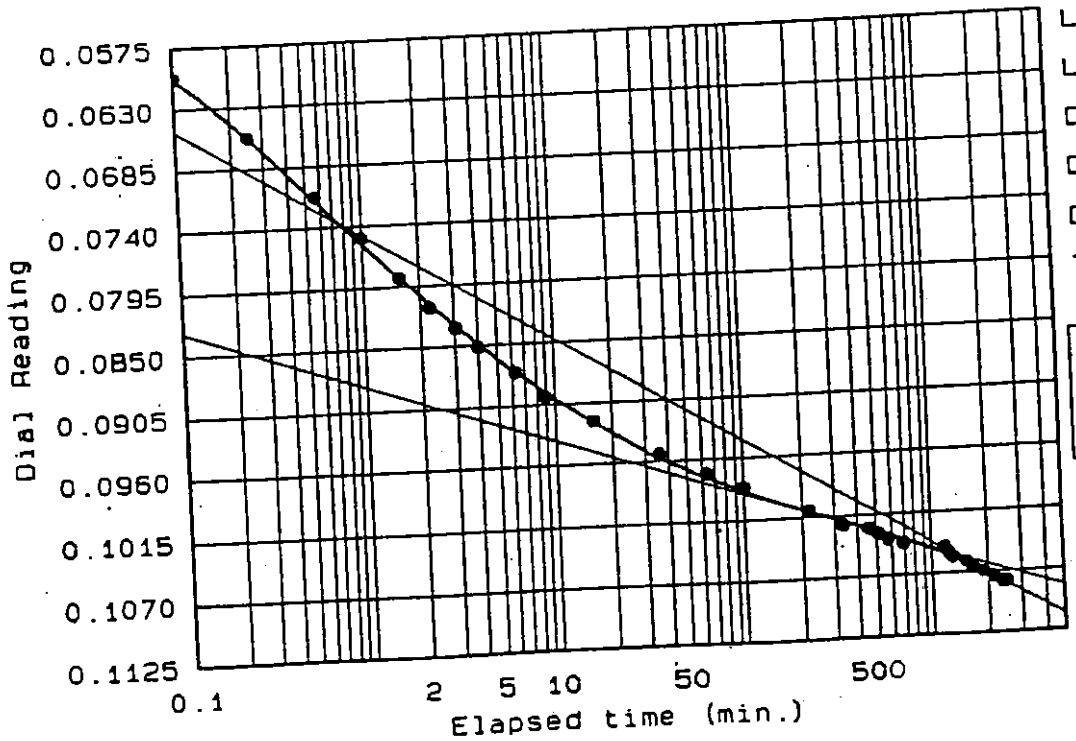
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB1 ST6. 37.0'-39.0'

Date: 06-02-92



Load No.= 1
Load= 0.13 tsf
D_0 = 0.0020
D_{50} = 0.0029
D_{100}= 0.0038
T_{50}= 2.50 min.

C_v @ T_{50} =
0.02 in.^{2}/min.



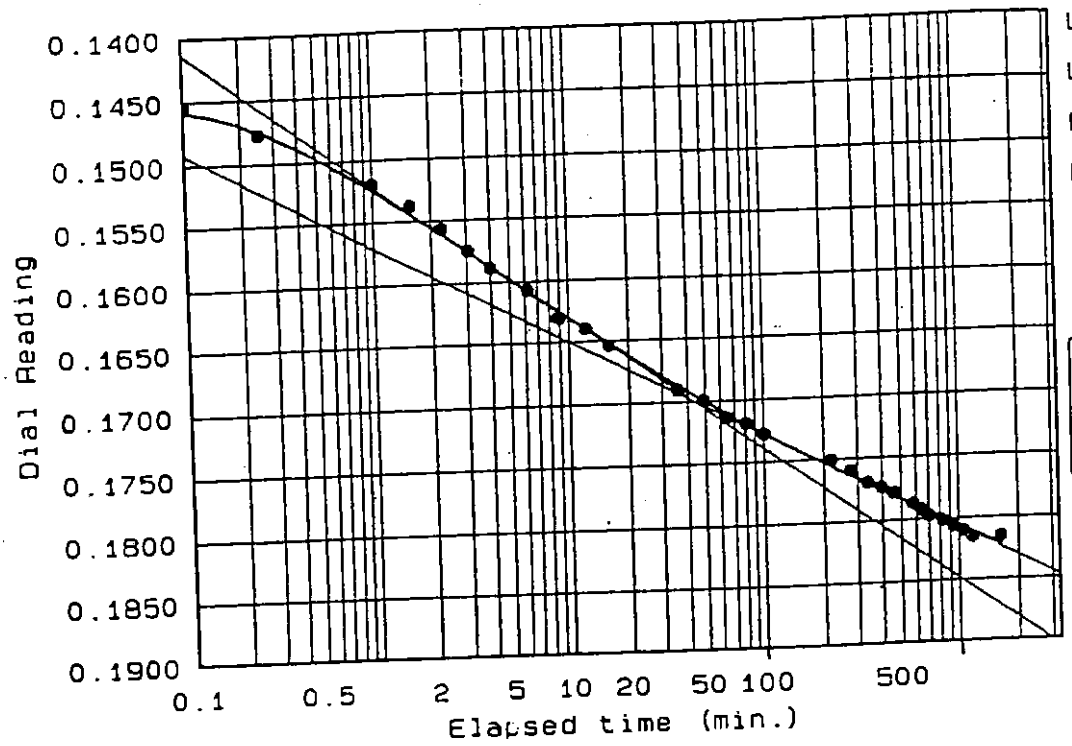
Load No.= 2
Load= 0.25 tsf
D_0 = 0.0514
D_{50} = 0.0783
D_{100}= 0.1052
T_{50}= 1.47 min.

C_v @ T_{50} =
0.03 in.^{2}/min.

Dial Reading vs. Time

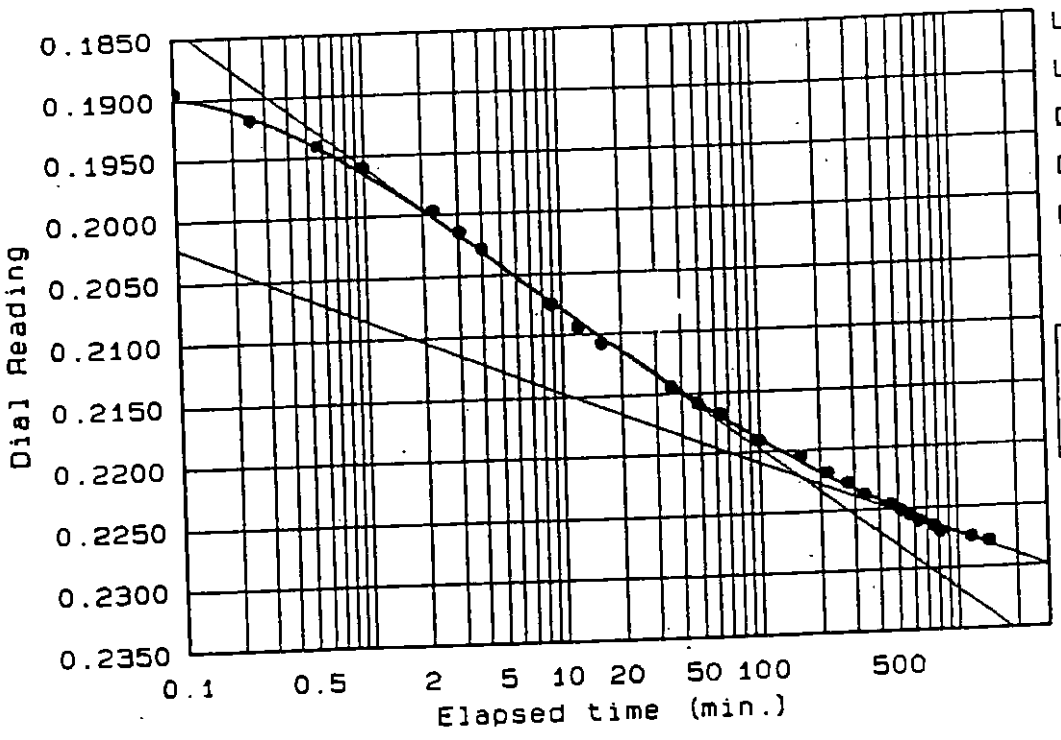
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: T81 ST6, 37.0'-39.0'

Date: 06-02-92



Load No.= 4
Load= 1.00 tsf
D_0 = 0.1428
D_{50} = 0.1563
D_{100}= 0.1698
T_{50}= 2.38 min.

C_v @ T_{50} =
0.01 in.^{2}/min.



Load No.= 5
Load= 2.00 tsf
D_0 = 0.1869
D_{50} = 0.2045
D_{100}= 0.2222
T_{50}= 5.25 min

C_v @ T_{50} =
0.01 in.^{2}/min.

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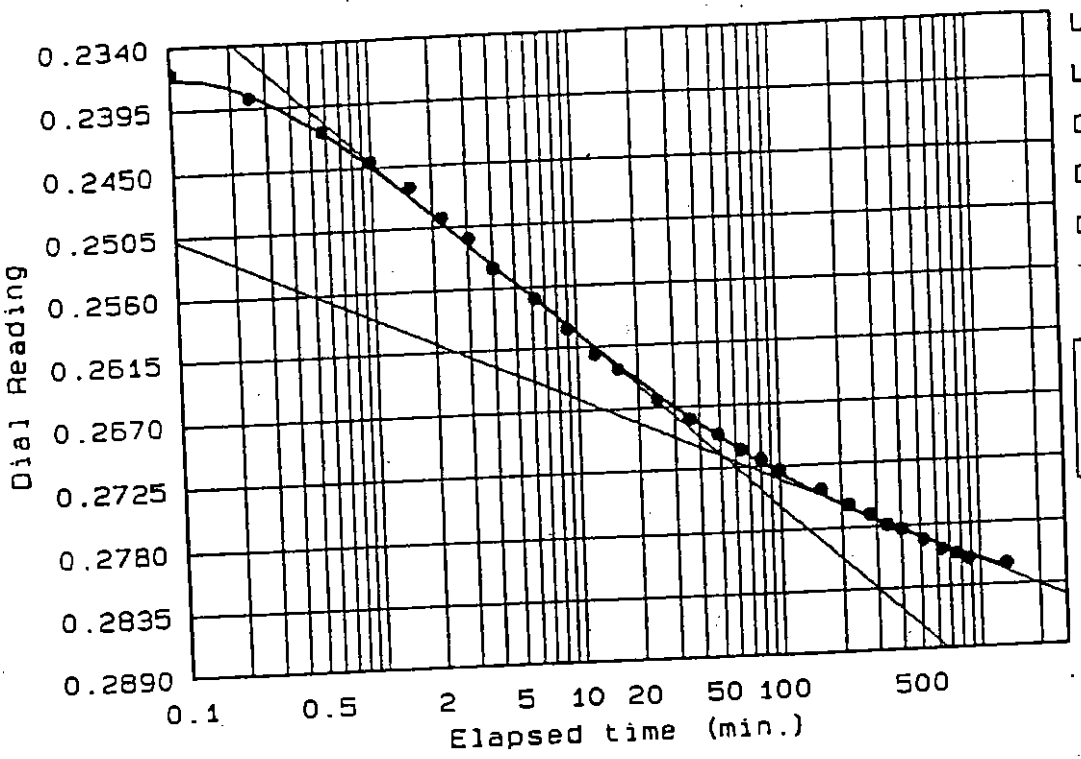
Dial Reading vs. Time

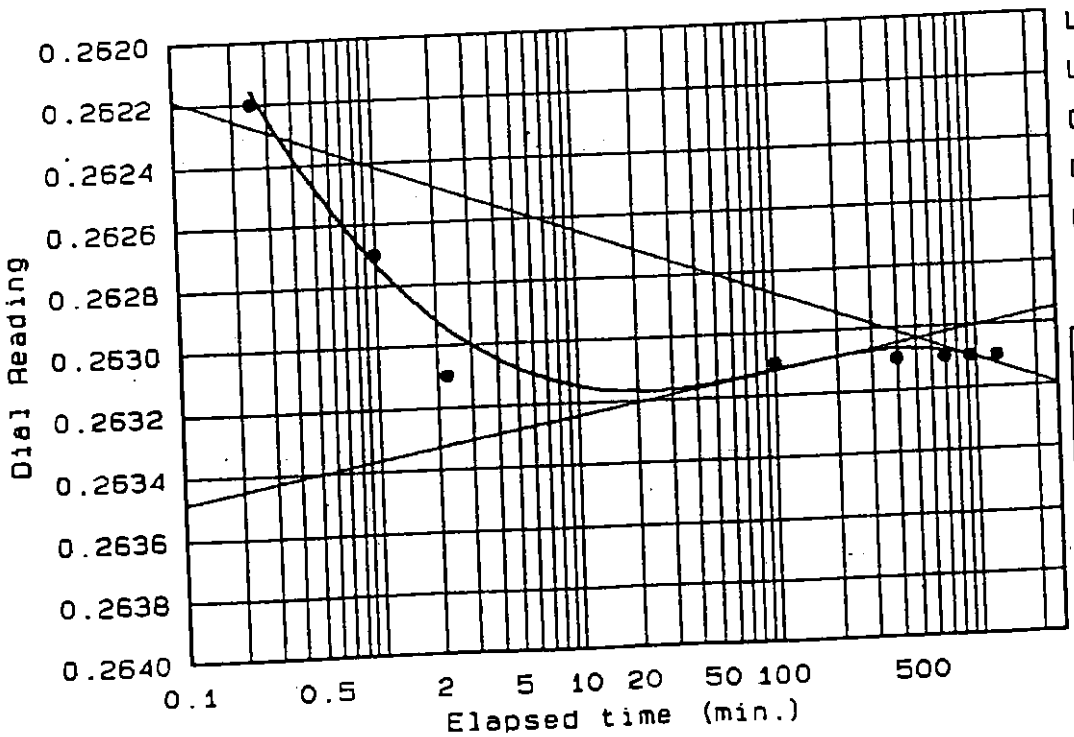
Project No.: 47533 WESTON
Project: OSWA - PHASE IV
Location: TB1 ST6. 37.0'-39.0'

Date: 06-02-92



Load No.= 6
Load= 4.00 tsf
D_0 = 0.2336
D_{50} = 0.2525
D_{100}= 0.2714
T_{50}= 3.21 min.

C_v @ T_{50} =
0.01 in.^{2}/min.



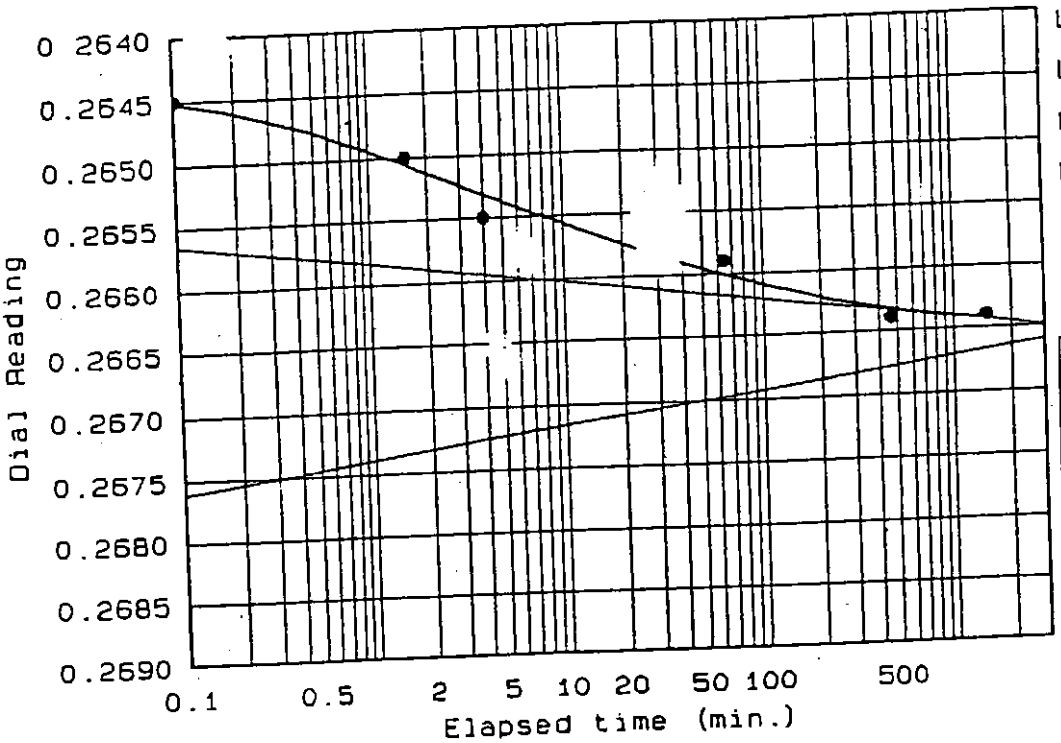
Load No.= 10
Load= 0.50 tsf
D_0 = 0.2616
D_{50} = 0.2623
D_{100}= 0.2630
T_{50}= 0.35 min.

C_v @ T_{50} =
0.08 in.^{2}/min.

Dial Reading vs. Time

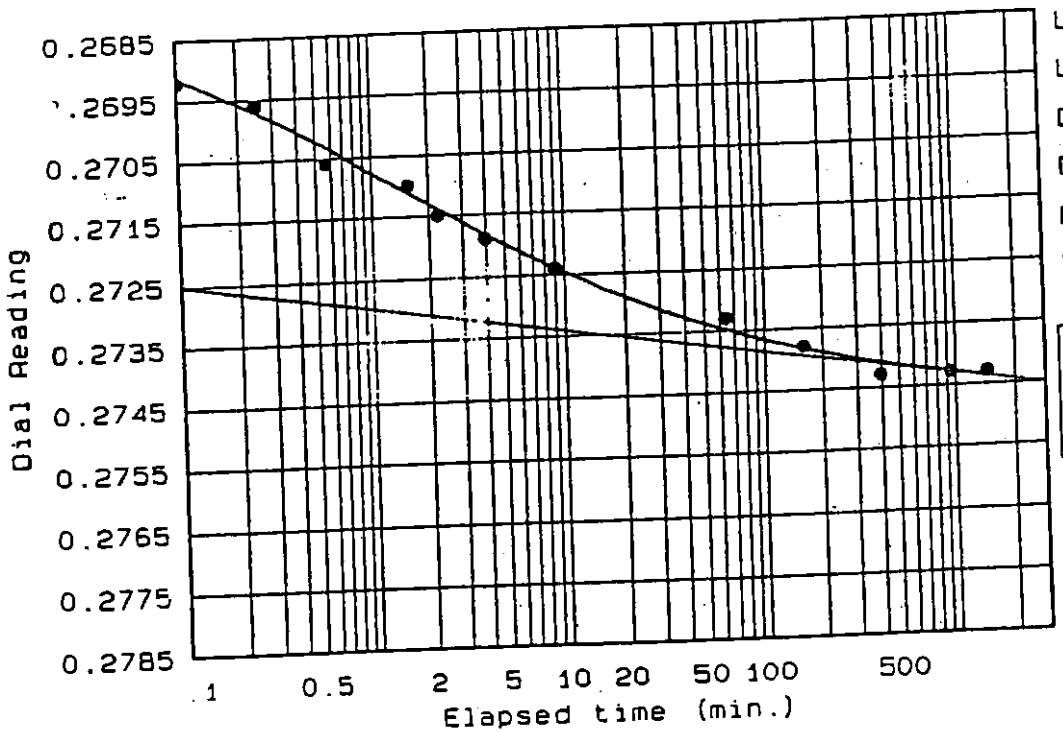
Project No.: 47533 WESTON
Project: DSWA - PHASE IV
Location: TB1 ST6, 37.0'-39.0'

Date: 06-02-92



Load No.= 11
Load= 1.00 tsf
D_0 = 0.2643
D_{50} = 0.2654
D_{100}= 0.2665
T_{50}= 5.92 min.

C_v @ T_{50} =
0.00 in.^{2}/min.



Load No.= 12
Load= 2.00 tsf
D_0 = 0.2682
D_{50} = 0.2713
D_{100}= 0.2744
T_{50}= 1.93 min.

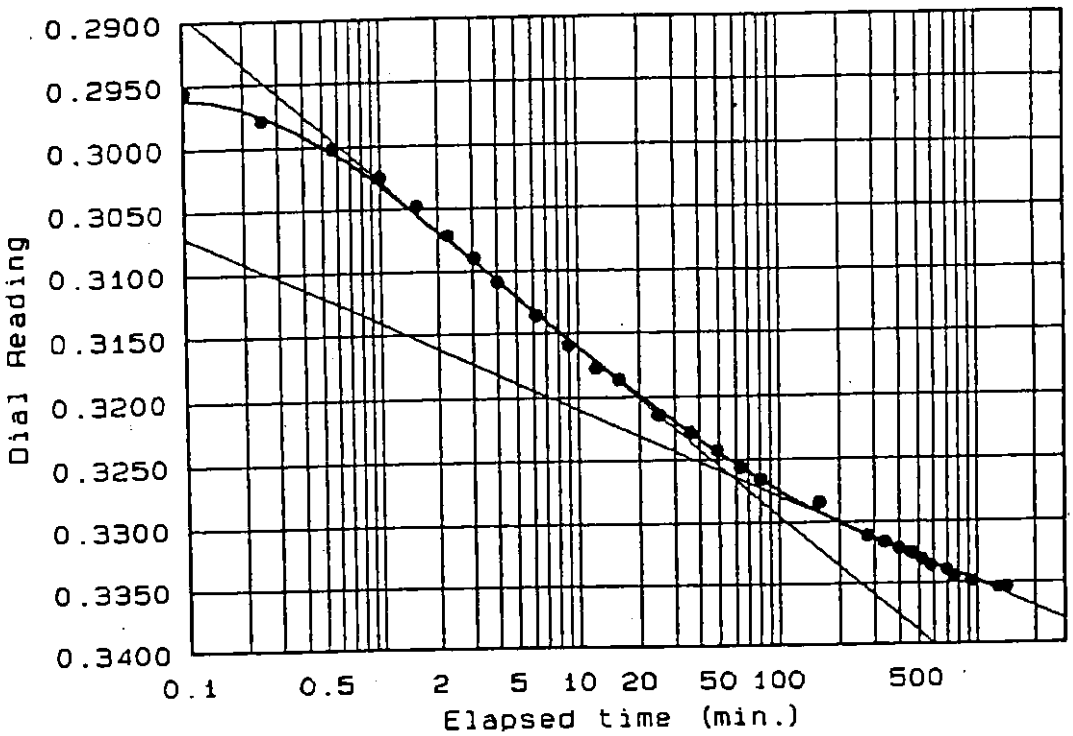
C_v @ T_{50} =
0.01 in.^{2}/min.

BOWSER-MORNER, INC.

Dial Reading vs. Time

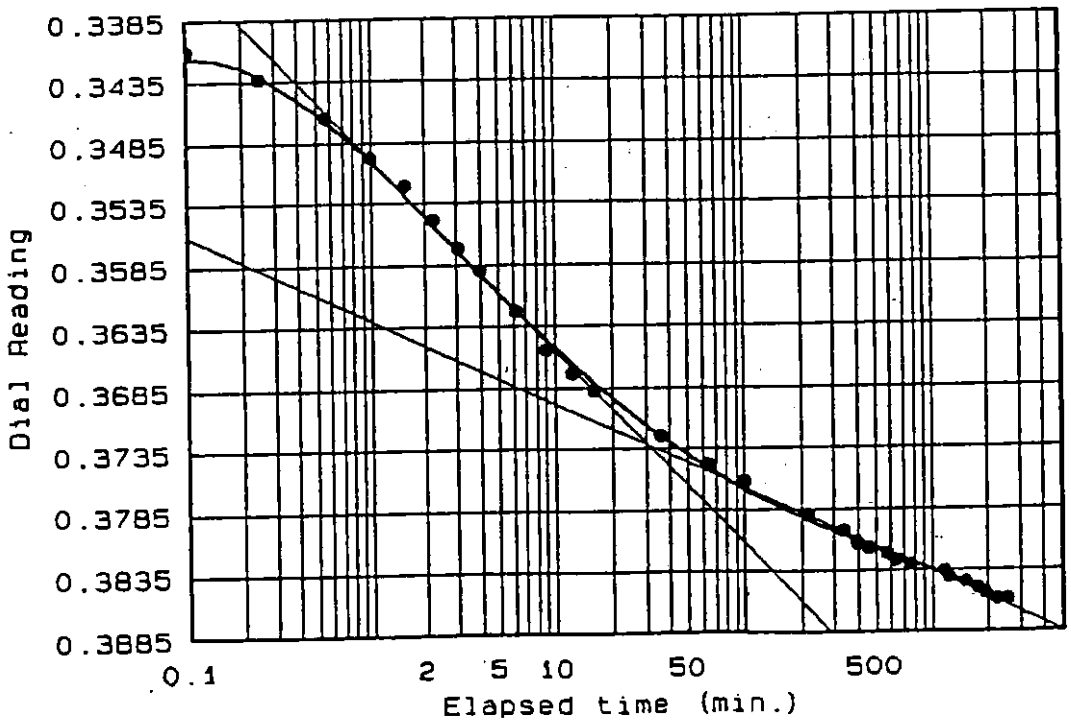
Project No.: 47533 WESTON
Project: OSWA - PHASE IV
Location: T81 ST6, 37.0'-39.0'

Date: 06-02-92



Load No.= 14
Load= 8.00 tsf
D_0 = 0.2933
D_{50} = 0.3098
D_{100}= 0.3262
T_{50}= 3.33 min.

C_v @ T_{50} = 0.01 in.^{2}/min.



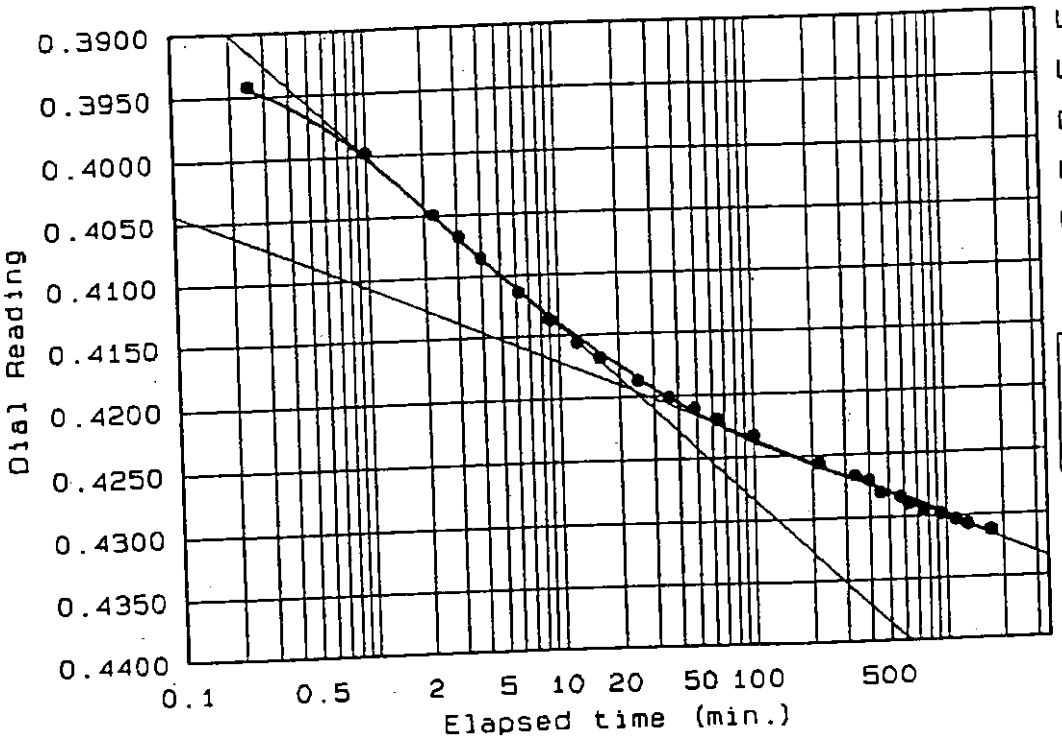
Load No.= 15
Load= 16.00 tsf
D_0 = 0.3382
D_{50} = 0.3557
D_{100}= 0.3732
T_{50}= 2.36 min.

C_v @ T_{50} = 0.01 in.^{2}/min.

Dial Reading vs. Time

Project No.: 47533 WESTON
Project: OSWA - PHASE IV
Location: TB1 ST6, 37.0'-39.0'

Date: 06-02-92



Load No.= 16

Load= 32.00 ts

D_0 = 0.3886

D_{50} = 0.4041

D_{100} = 0.4195

T_{50} = 1.93 min.

C_v @ T_{50} =

0.01 in.²/min.

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 2435 - ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-11, ST-2 (31'-33')
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	006
W. O. NUMBER	02477-004-001	TEST PERIOD	07/27/93 to 02/09/93

SPECIMEN PREPARATION/DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long Shelby tube; specimen was cut from the 8" to 12" interval of a total 27" recovery as measured from the tube bottom; sample was inundated with tap water after initial conditions were measured prior to loading; soil is a soft cohesive gray sandy SILT.

SPECIMEN DATA	Initial	Final
Total Height, inches	0.541	0.360
Solids Height, inches	0.168	0.169
Moisture Content, % dry	78.7	43.0
Specific Gravity	2.59	2.59
Wet Unit Weight, pcf	89.8	108.4
Dry Unit Weight, pcf	50.3	75.8
Void Ratio	2.218	1.134
Degree of Saturation, %	92.0	98.3

NOTES

(1) Initial conditions prior to inundation with water.

(2) Final conditions after Increment #19.

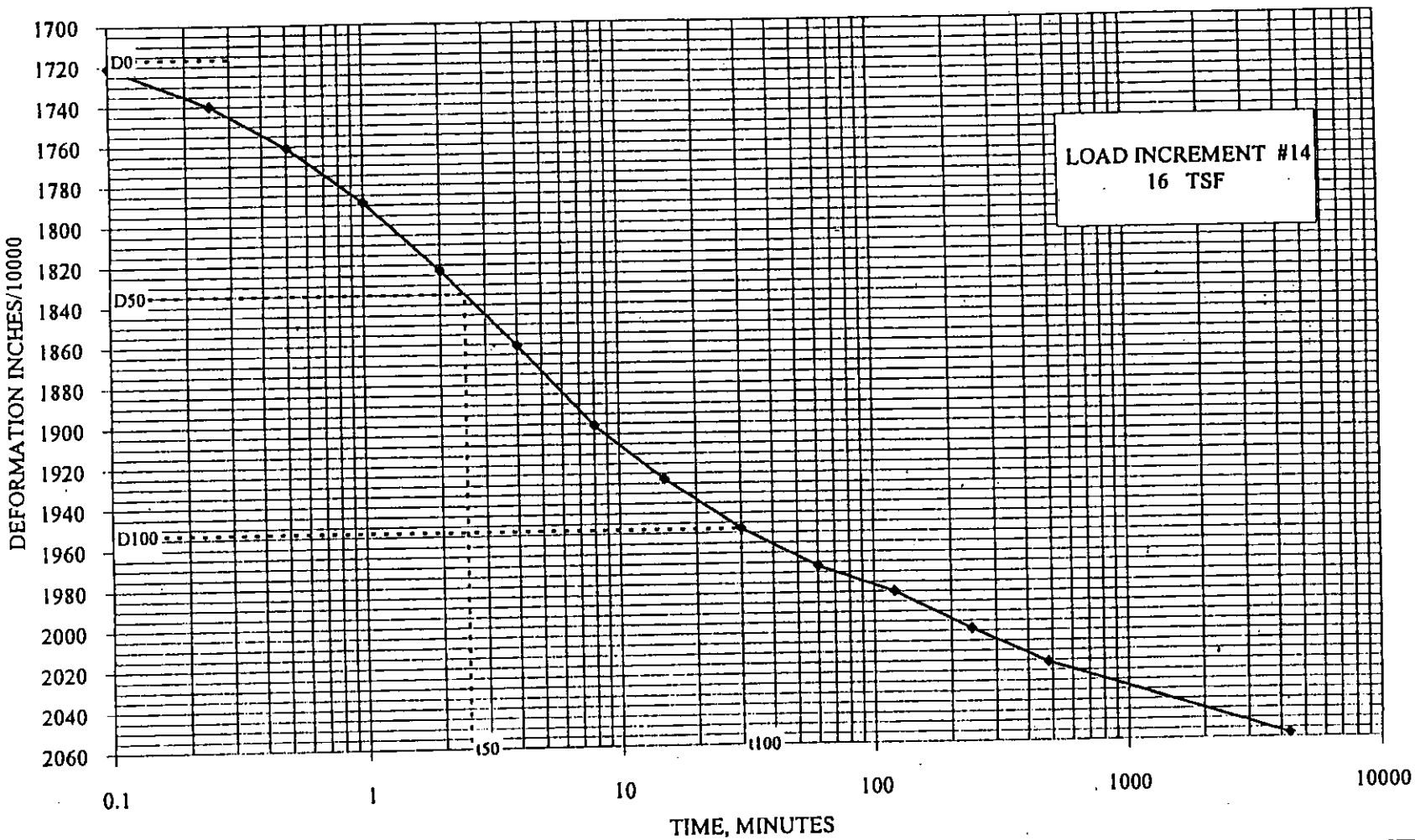
END OF INCREMENT/DECREMENT TEST RESULTS

Load Increment/ Decrement	Load Duration minutes	Effective Stress tsf	Height Change 10E-4 in.	Height inches (Hf)	% Strain (Ef)	Void Ratio (ef)
Initial	0	0	0	0.541	0.0	2.218
1	1405	0.125	144	0.527	2.7	2.132
2	1435	0.250	233	0.518	4.3	2.079
3	1435	0.500	365	0.505	6.7	2.001
4	2875	1.000	595	0.482	11.0	1.864
5	1435	2.000	928	0.448	17.1	1.666
6	1435	4.001	1333	0.408	24.6	1.425
7	1435	2.000	1301	0.411	24.0	1.444
8	1250	1.000	1261	0.415	23.3	1.468
9	4330	0.500	1200	0.421	22.2	1.504
10	1425	1.000	1231	0.418	22.7	1.486
11	1440	2.000	1274	0.414	23.5	1.460
12	1435	4.001	1378	0.403	25.5	1.398
13	1435	8.001	1681	0.373	31.1	1.218
14	4320	16.002	2058	0.335	38.0	0.994
15	1425	32.004	2356	0.306	43.5	0.817
16	480	8.001	2283	0.313	42.2	0.860
17	480	2.000	2155	0.326	39.8	0.936
18	480	0.500	2009	0.340	37.1	1.023
19	480	0.125	1816	0.360	33.6	1.138

CNLS1.XLS

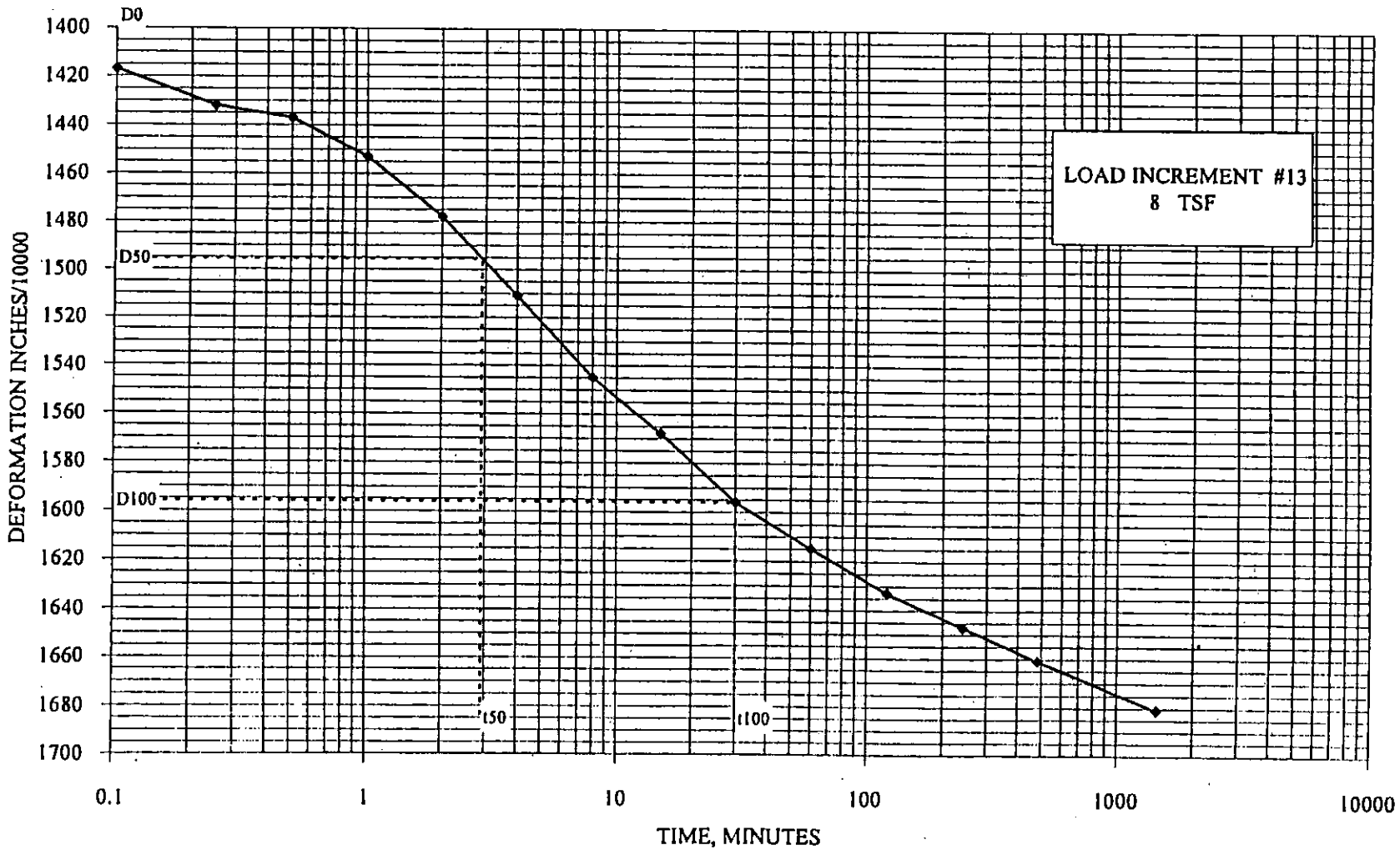
DEFORMATION VERSUS TIME

DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006



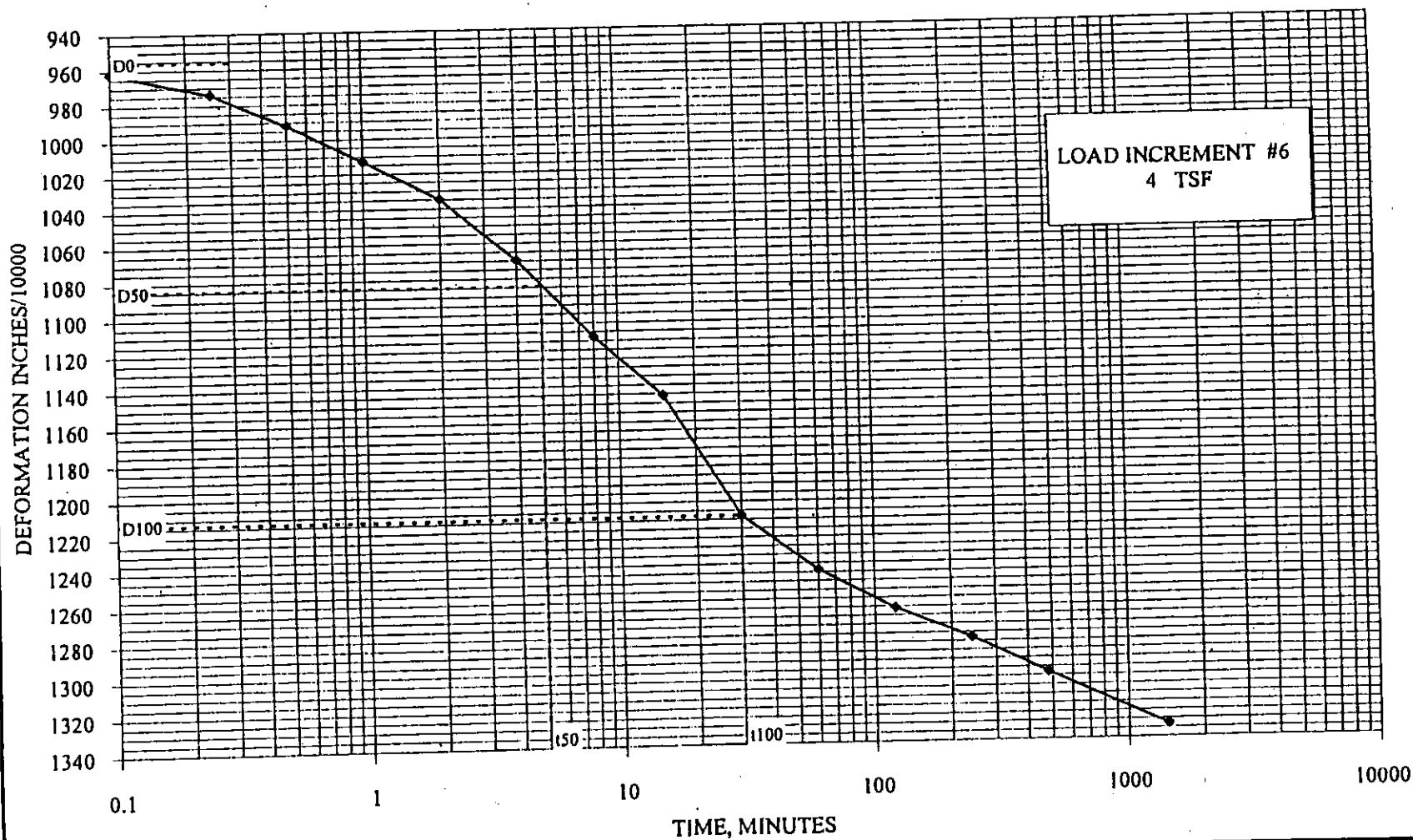
DEFORMATION VERSUS TIME

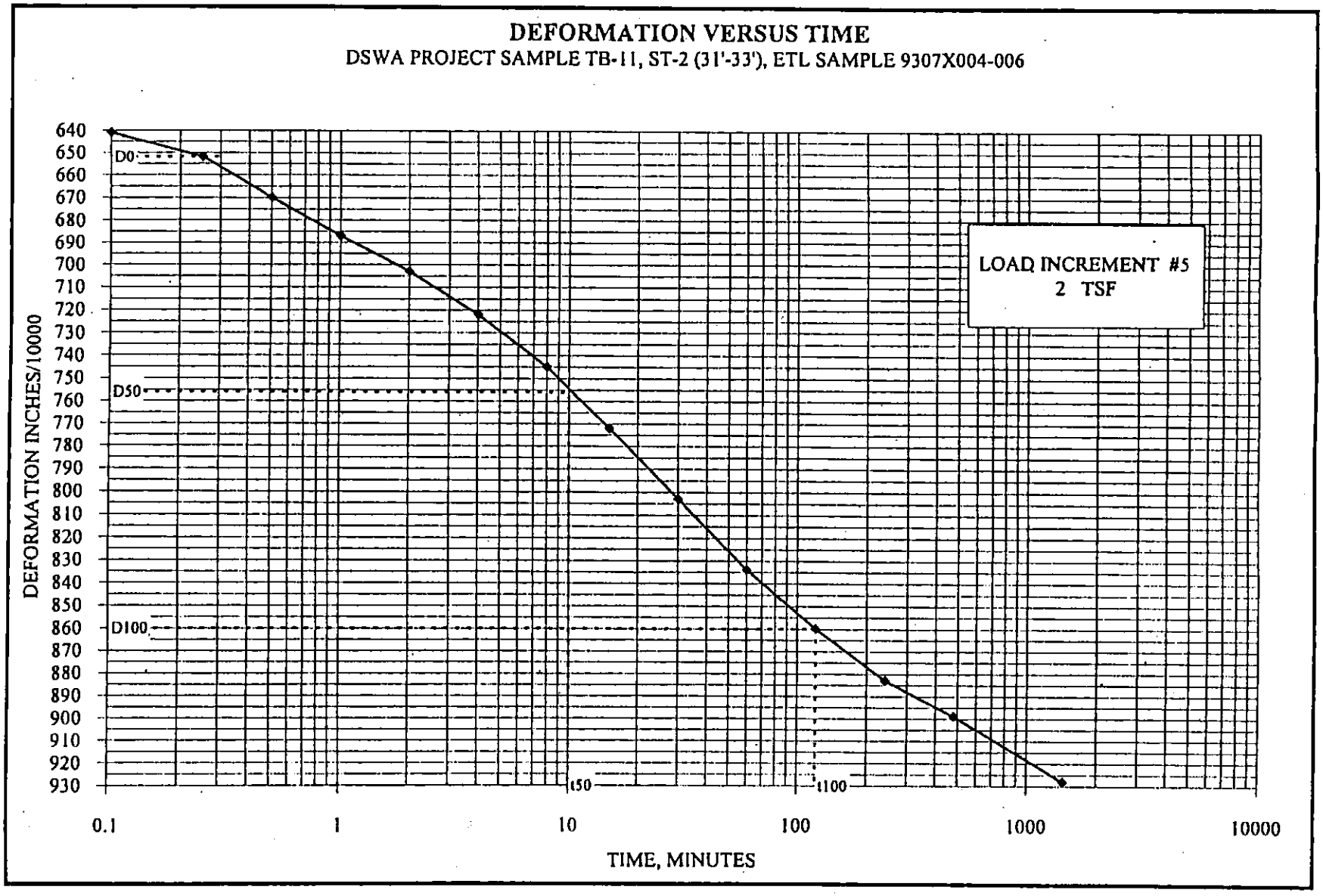
DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006



DEFORMATION VERSUS TIME

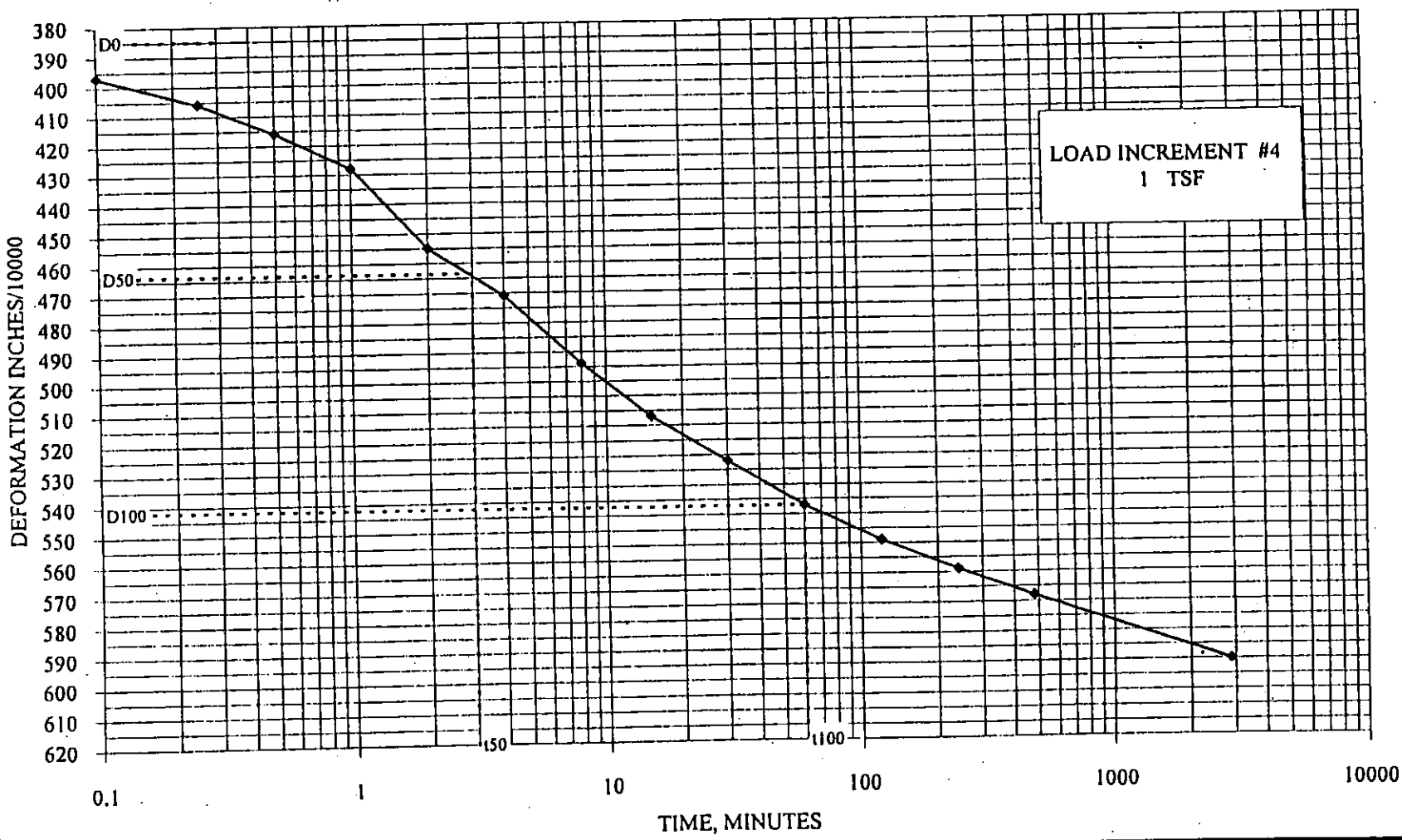
DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006




DEFORMATION VERSUS TIME
DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006
LOAD INCREMENT #5
2 TSF
D0
D50
D100
t50
t100
DEFORMATION INCHES/10000
640
650
660
670
680
690
700
710
720
730
740
750
760
770
780
790
800
810
820
830
840
850
860
870
880
890
900
910
920
930
0.1
1
10
100
1000
10000
TIME, MINUTES

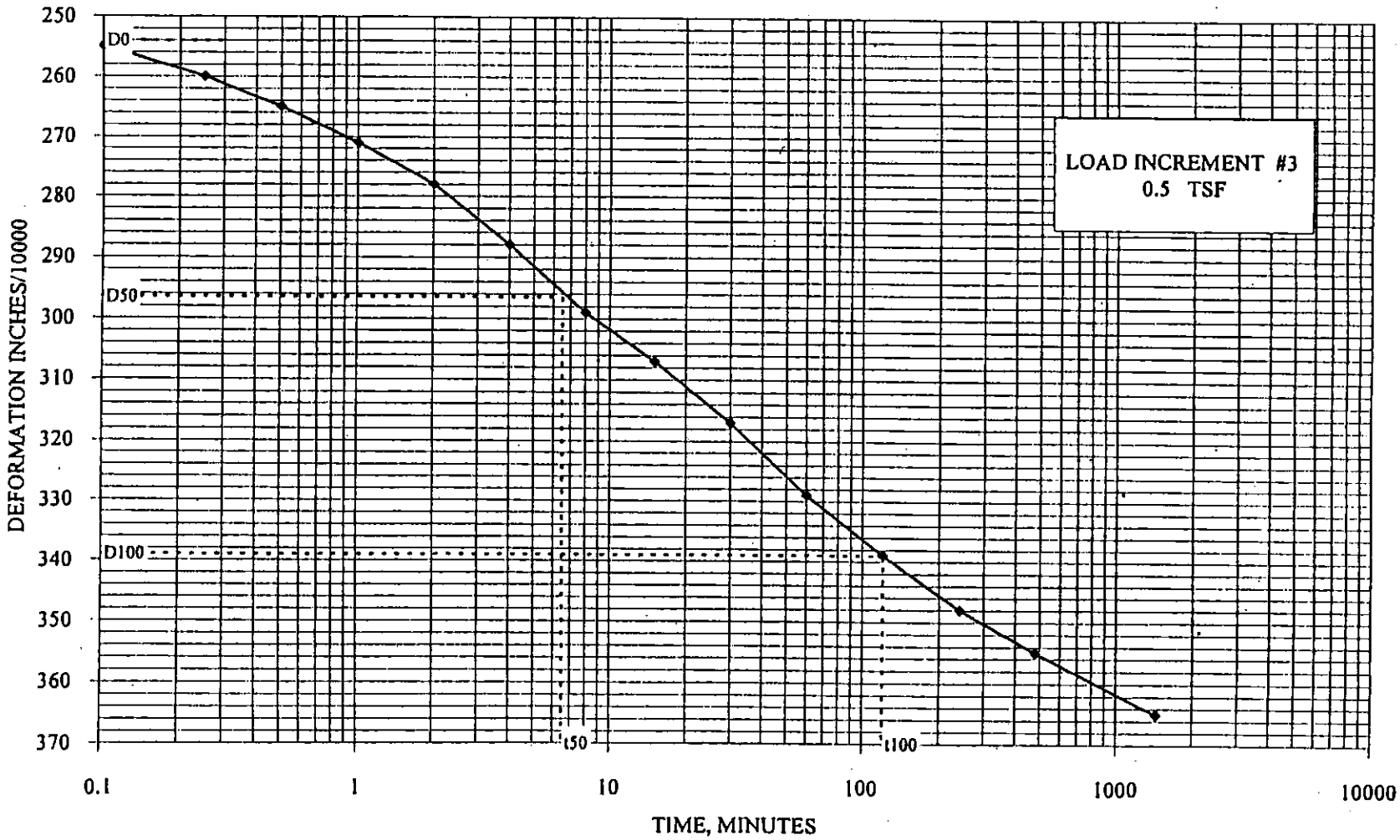
DEFORMATION VERSUS TIME

DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006



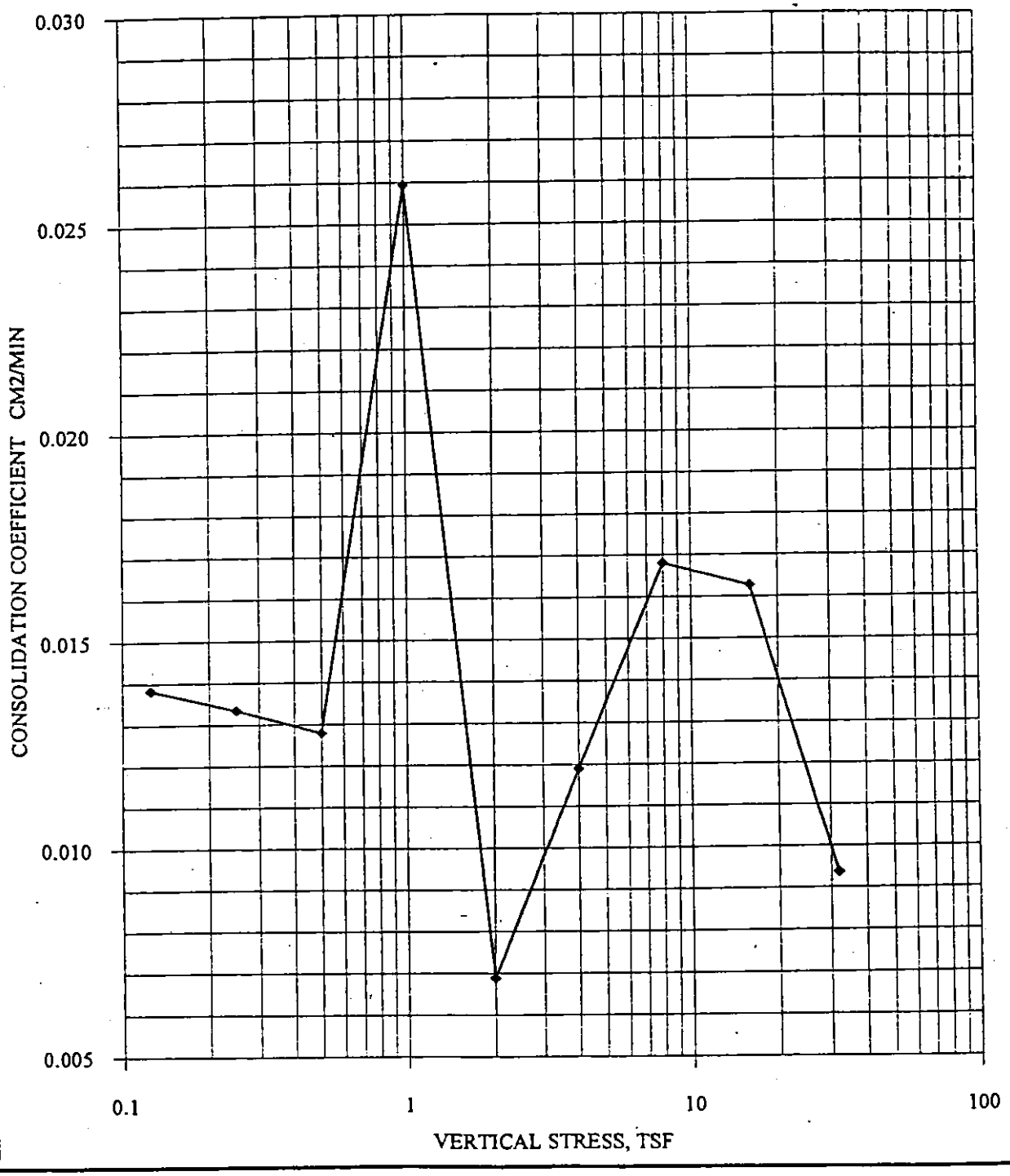
DEFORMATION VERSUS TIME

DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006



CONSOLIDATION COEFF. VS VERTICAL STRESS (LOG TIME)

DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006



ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 2435 - ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-11, ST-2 (31'-33')
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	006
W. O. NUMBER	02477-004-001	TEST PERIOD	07/27/93 to 02/09/93

SPECIMEN PREPARATION/DESCRIPTION

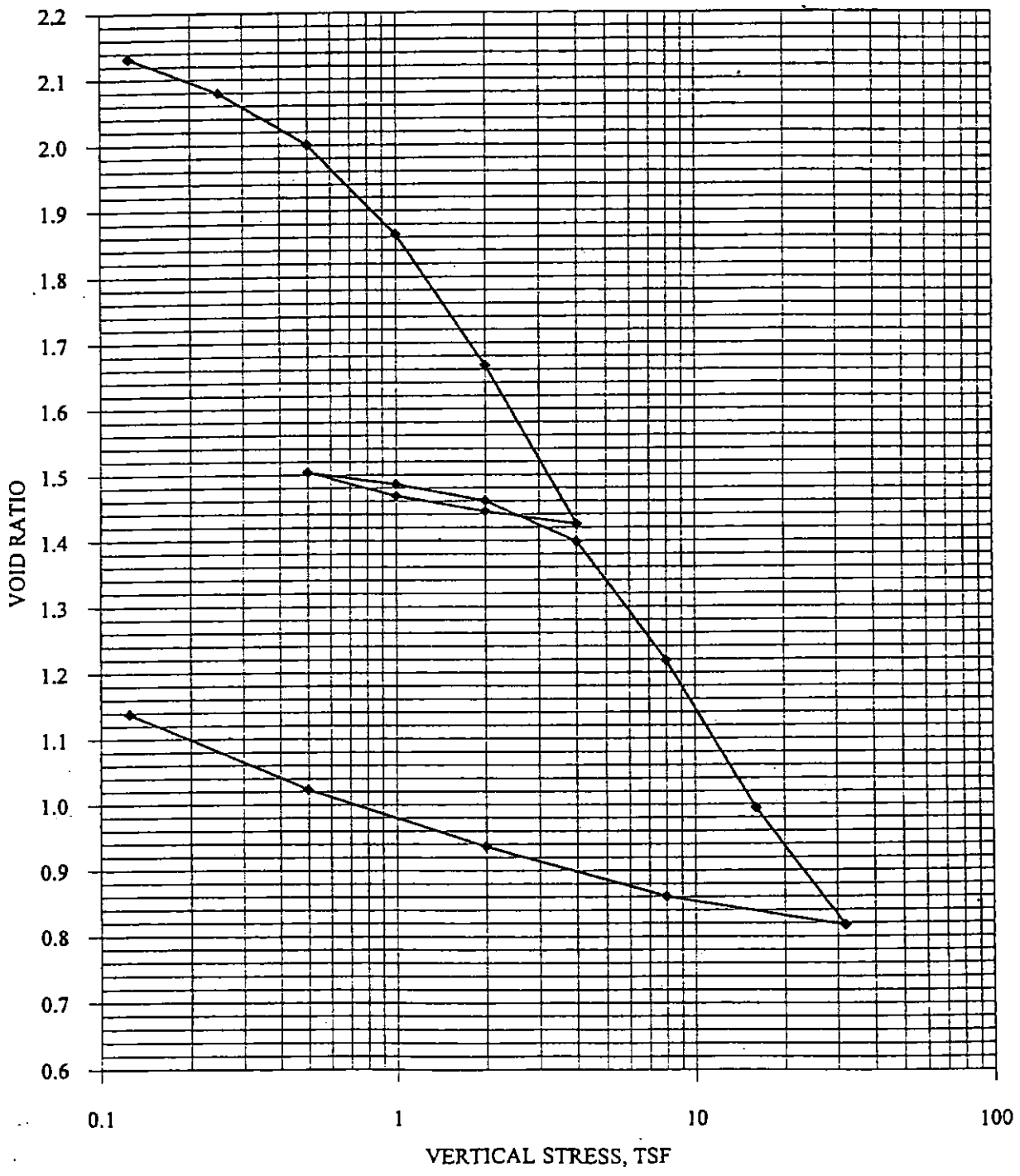
undisturbed soil specimen collected in a 3" diameter by 30" long Shelby tube; specimen was cut from the 8" to 12" interval of a total 27" recovery as measured from the tube bottom; sample was inundated with tap water after initial conditions were measured prior to loading; soil is a soft cohesive gray sandy SILT.

END OF PRIMARY CONSOLIDATION TEST RESULTS - LOG TIME METHOD

Load	Effective Stress	Time minutes		Specimen Height inches		Strain %		Void Ratio		Cv
Increment	tsf	t50	t100	H50	H100	E50	E100	e50	e100	cm2/min
1	0.125	6.5	120.0	0.532	0.529	1.7	2.3	2.162	2.143	0.01383
2	0.250	6.5	120.0	0.523	0.520	3.4	4.0	2.107	2.089	0.01335
3	0.500	6.5	120.0	0.512	0.507	5.5	6.3	2.041	2.016	0.01279
4	1.000	3.0	60.0	0.495	0.487	8.6	10.0	1.942	1.895	0.02594
5	2.000	10.0	120.0	0.466	0.455	14.0	15.9	1.768	1.706	0.00689
6	4.001	5.0	30.0	0.433	0.420	20.0	22.4	1.573	1.497	0.01190
13	8.001	2.9	30.0	0.392	0.382	27.6	29.5	1.329	1.269	0.01681
14	16.002	2.5	30.0	0.358	0.346	33.9	36.1	1.127	1.057	0.01626
15	32.004	3.5	30.0	0.321	0.312	40.7	42.3	0.909	0.855	0.00936

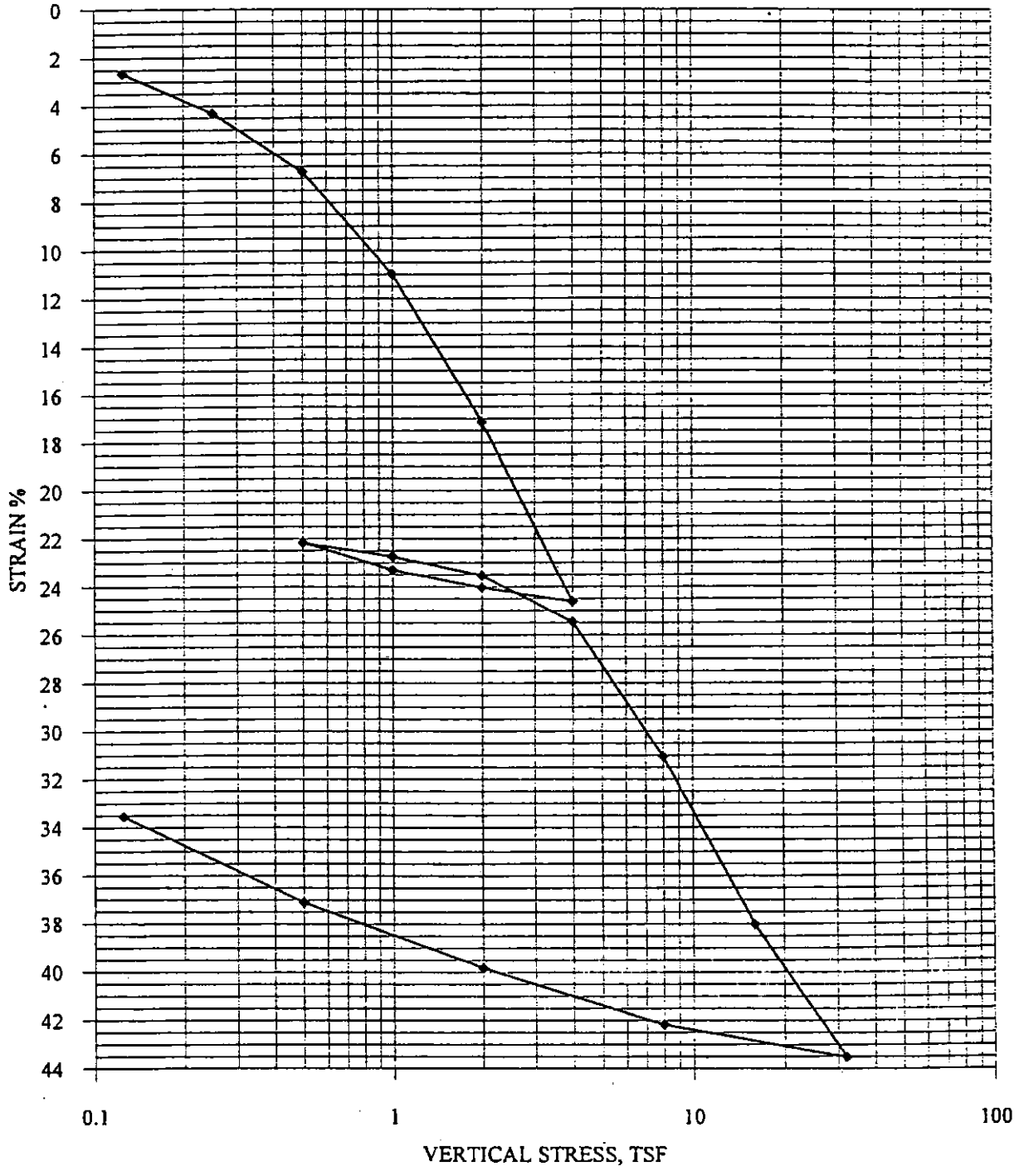
VOID RATIO VERSUS VERTICAL STRESS

DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006



STRAIN VERSUS VERTICAL STRESS

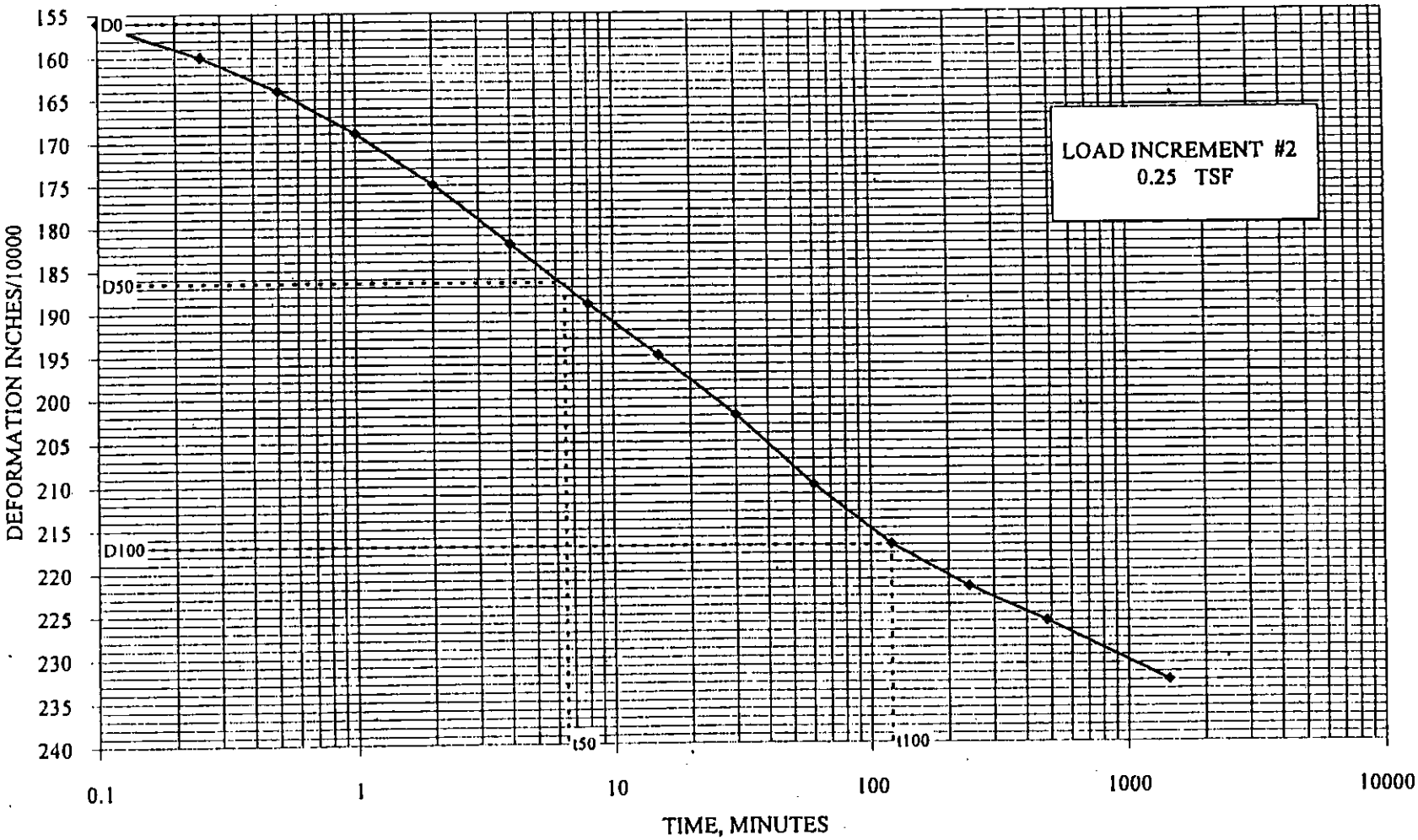
DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006



4

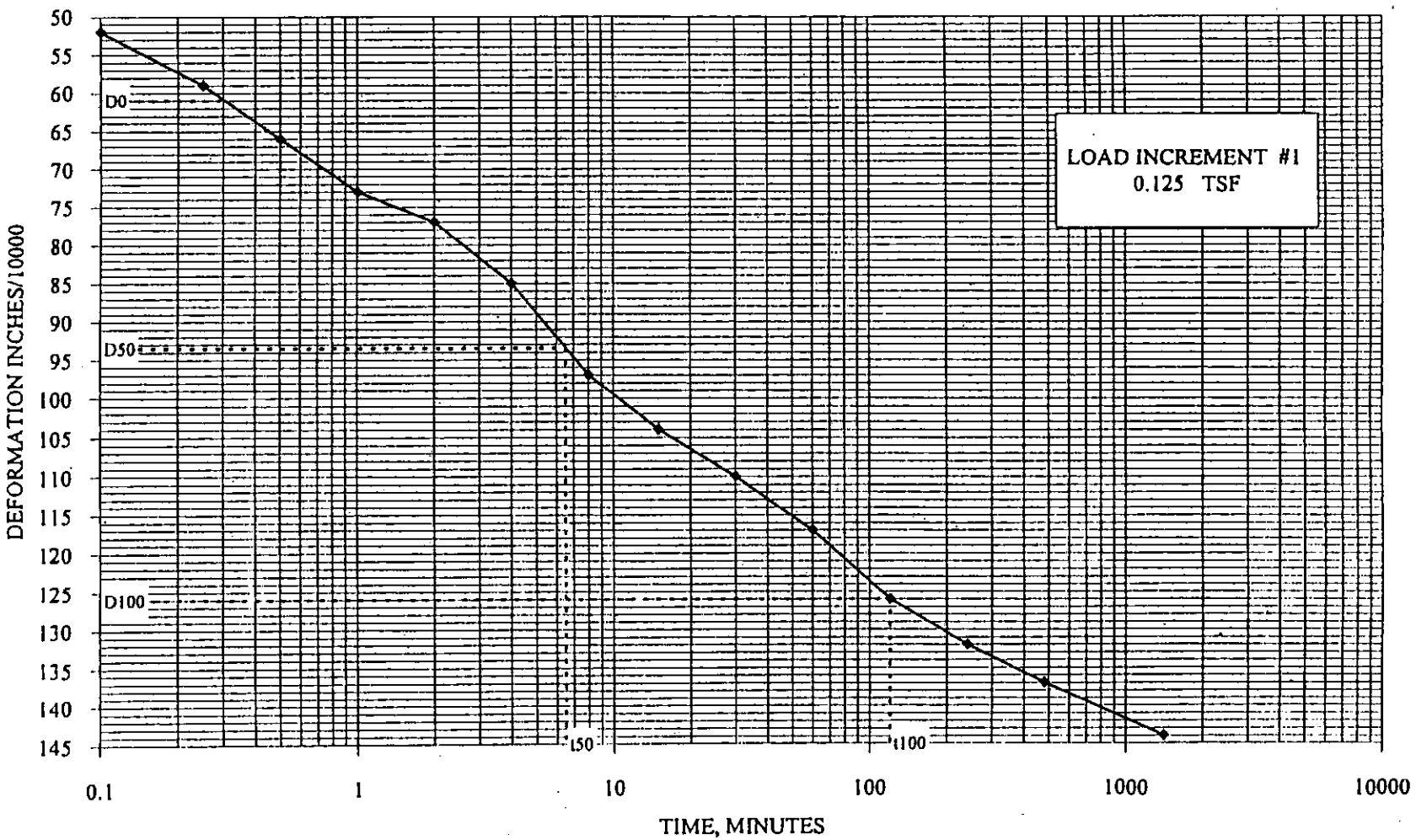
DEFORMATION VERSUS TIME

DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006

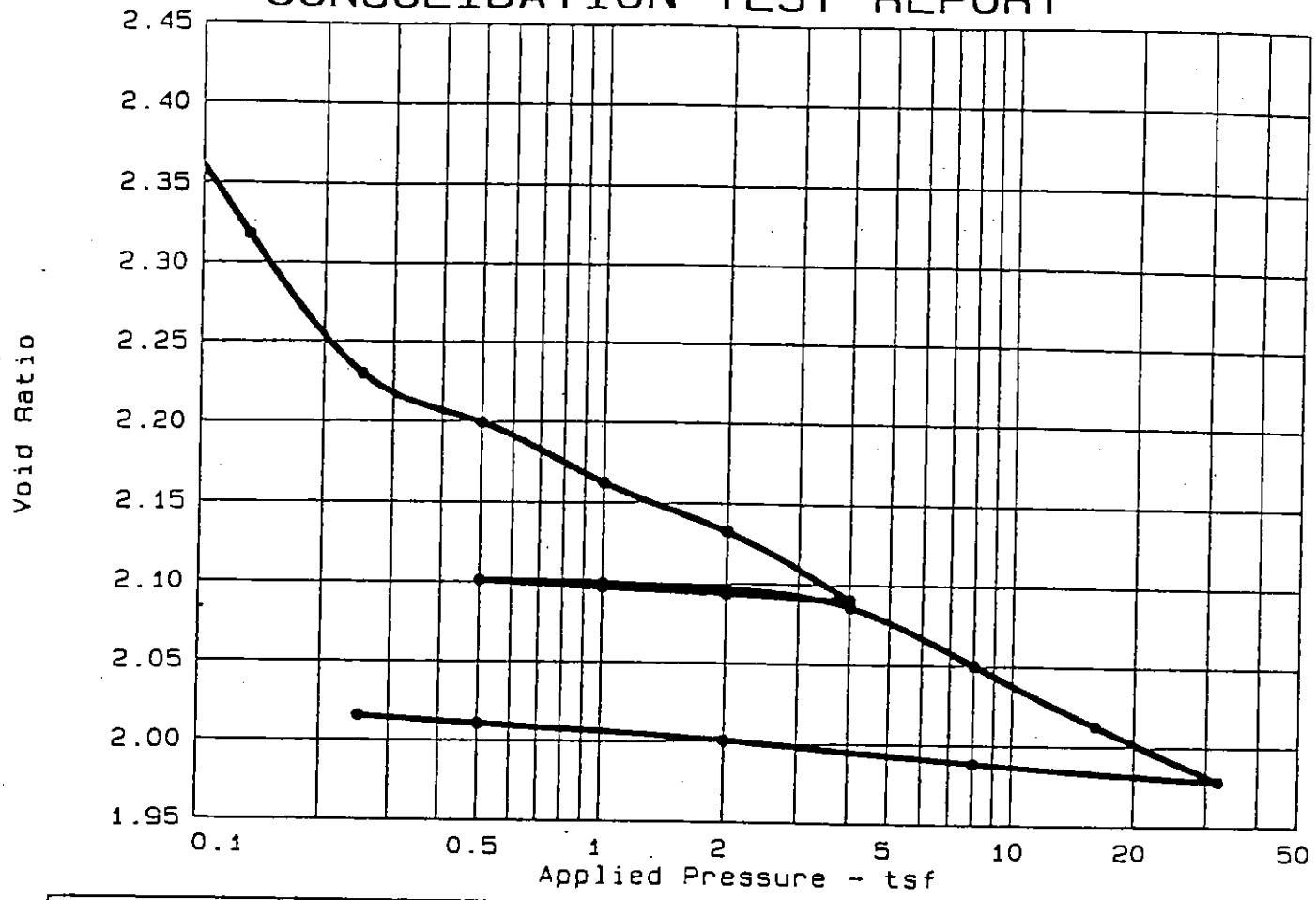


DEFORMATION VERSUS TIME

DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006



CONSOLIDATION TEST REPORT



Coefficients of Consolidation (sq.in./min.)								
No.	Load	Cv	No.	Load	Cv	No.	Load	Cv
1	0.13	0.004	12	4.00	0.185			
2	0.25	0.006	13	8.00	0.006			
3	0.50	0.019	14	16.00	0.007			
4	1.00	0.001	15	32.00	0.011			
5	2.00	0.003						
6	4.00	0.003						
10	1.00	0.082						
11	2.00	0.010						

Swell press.	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
	86.0 %	80.3	47.0			2.53	2.3605

TEST RESULTS

C_v at 32.00 tsf applied = 0.011 sq. in./min.

MATERIAL DESCRIPTION

DARK GRAY ORGANIC SILT, SOME CLAY, SOME SAND

Class: visual

Remarks:

FILE NO. 65

Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB13-ST1, 10.0'-12.0'

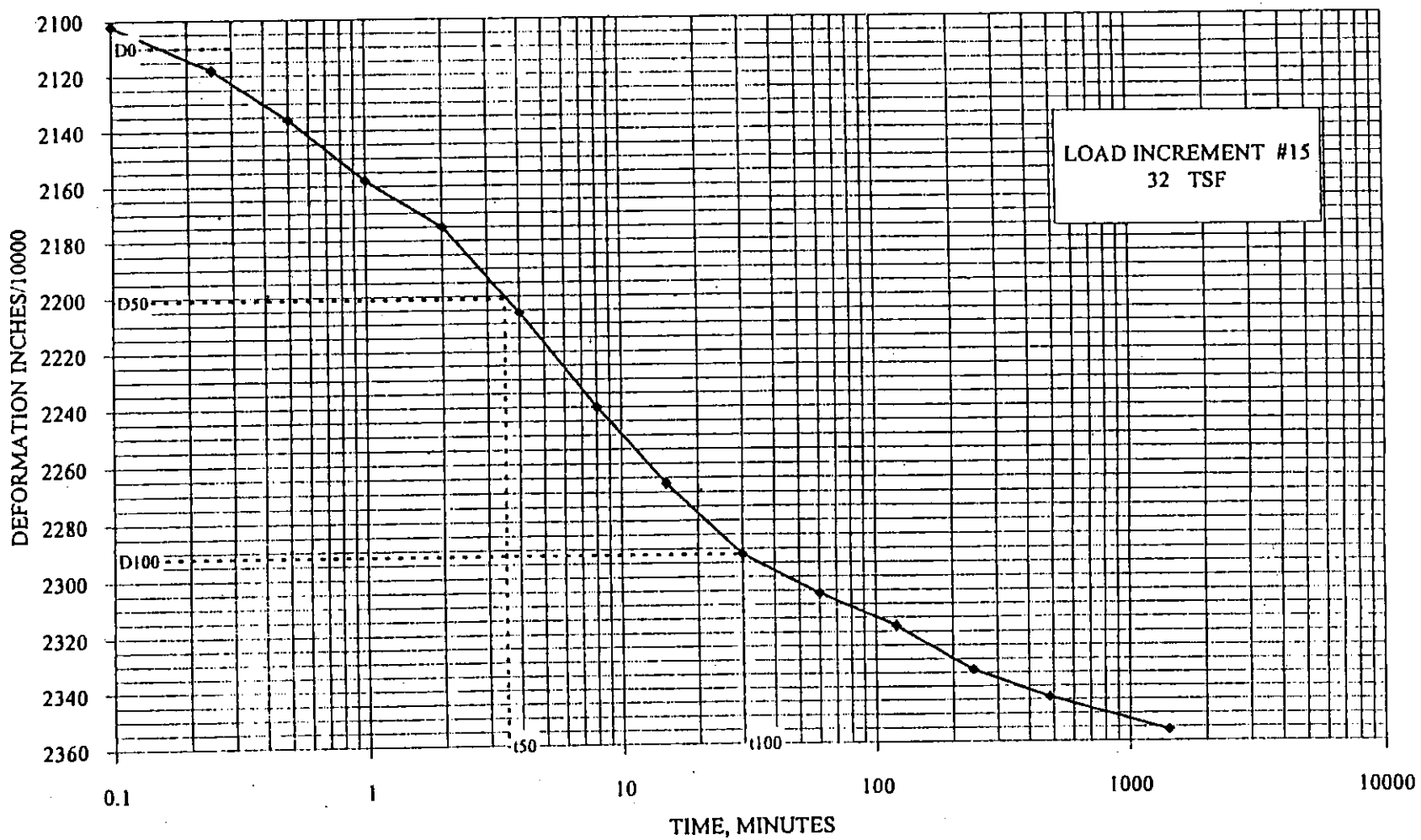
Date: 08-20-93

CONSOLIDATION TEST REPORT

BOWSER-MORNER, INC.

DEFORMATION VERSUS TIME

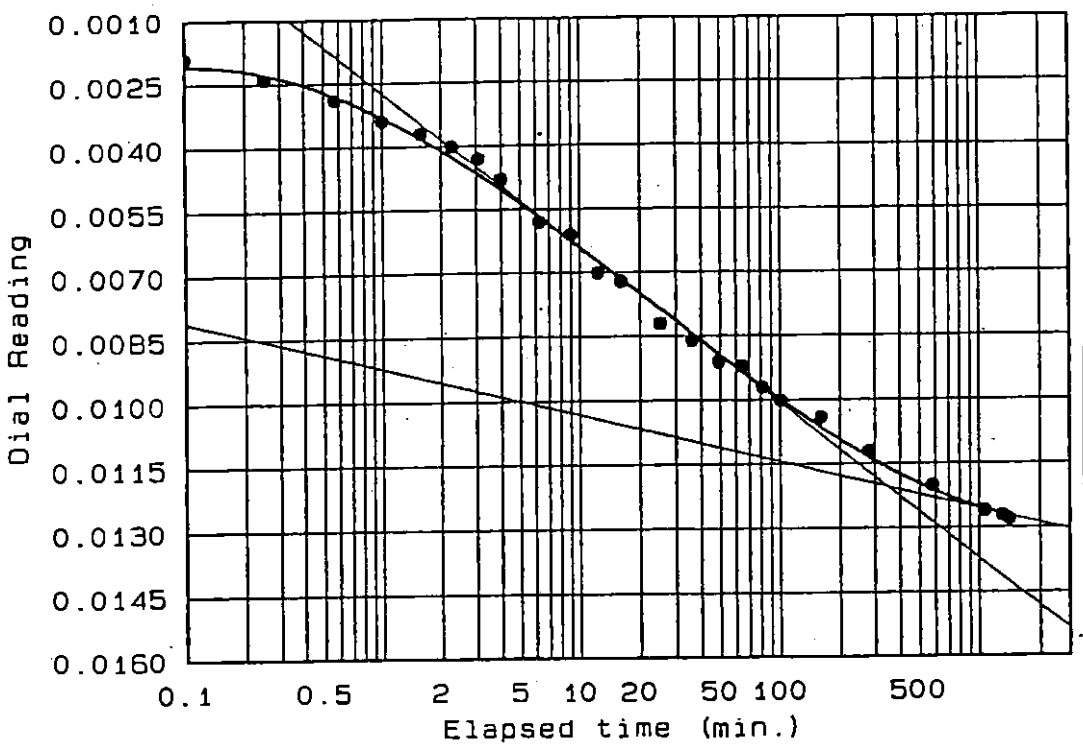
DSWA PROJECT SAMPLE TB-11, ST-2 (31'-33'), ETL SAMPLE 9307X004-006



Dial Reading vs. Time

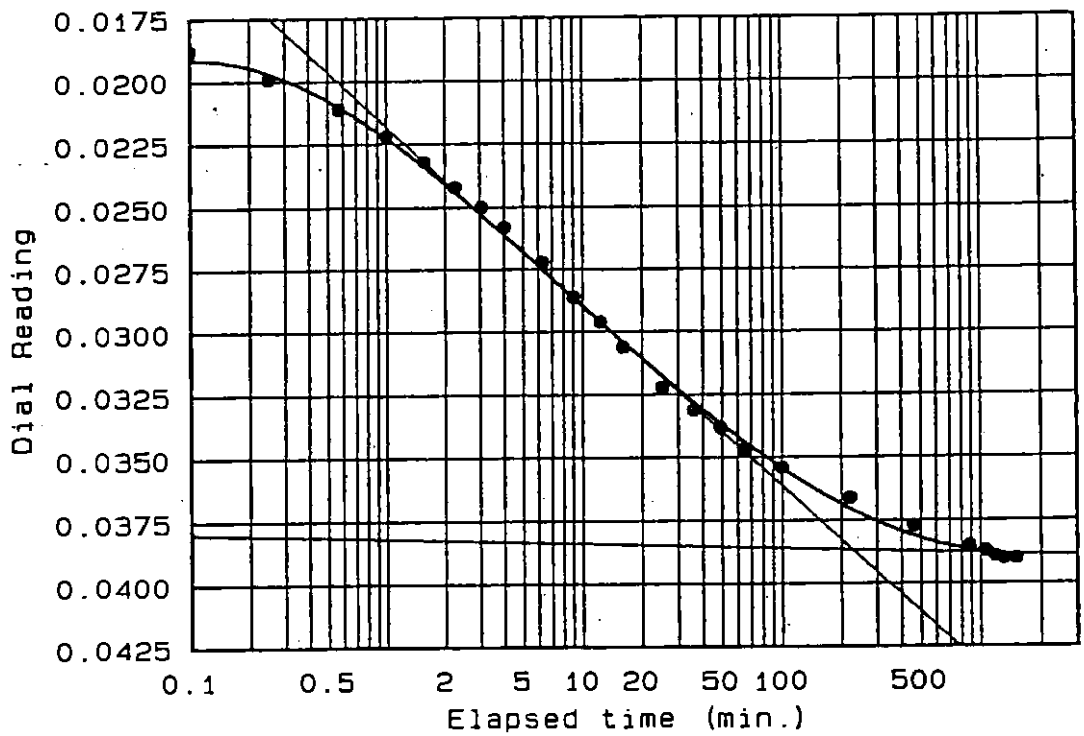
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB13-ST1, 10.0'-12.0'

Date: 08-20-93



Load No.= 1
Load= 0.13 tsf
D_0 = 0.0016
D_{50} = 0.0068
D_{100}= 0.0120
T_{50}= 13.09 min.

C_v @ T_{50} =
0.00 in.^{2}/min.



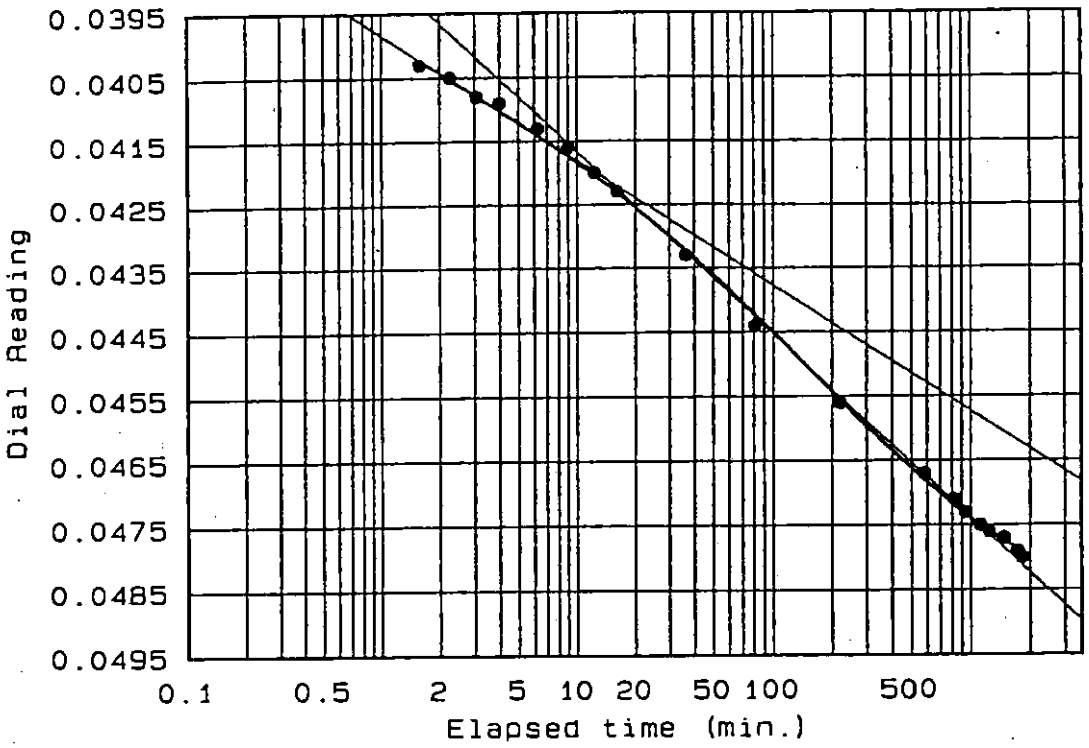
Load No.= 2
Load= 0.25 tsf
D_0 = 0.0180
D_{50} = 0.0283
D_{100}= 0.0387
T_{50}= 8.13 min.

C_v @ T_{50} =
0.01 in.^{2}/min.

Dial Reading vs. Time

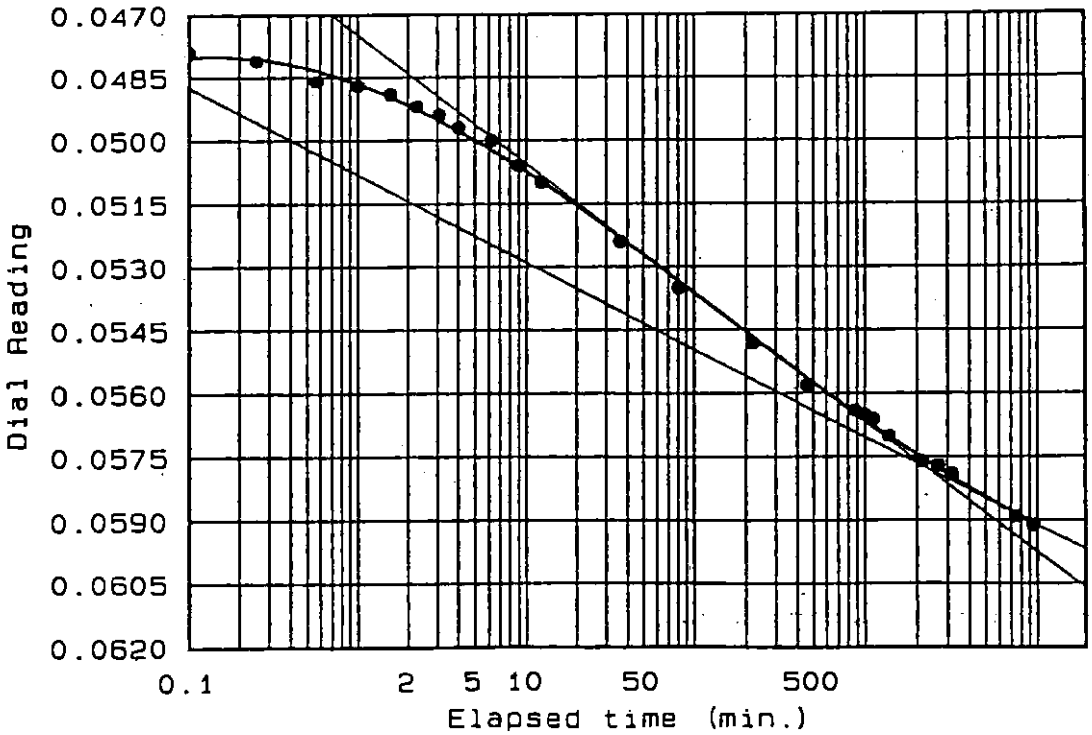
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB13-ST1, 10.0'-12.0'

Date: 08-20-93



Load No.= 3
Load= 0.50 tsf
D_0 = 0.0390
D_{50} = 0.0406
D_{100}= 0.0421
T_{50}= 2.33 min.

C_v @ T_{50} =
0.02 in.^{2}/min.



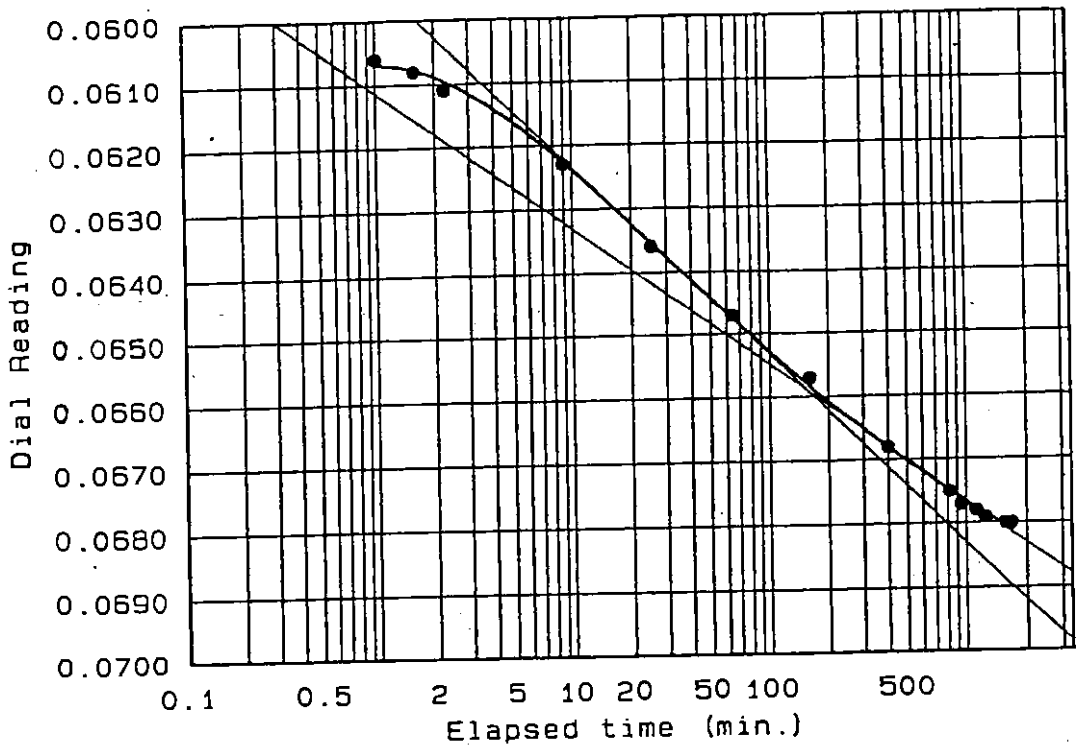
Load No.= 4
Load= 1.00 tsf
D_0 = 0.0478
D_{50} = 0.0528
D_{100}= 0.0578
T_{50}= 53.10 min.

C_v @ T_{50} =
0.00 in.^{2}/min.

Dial Reading vs. Time

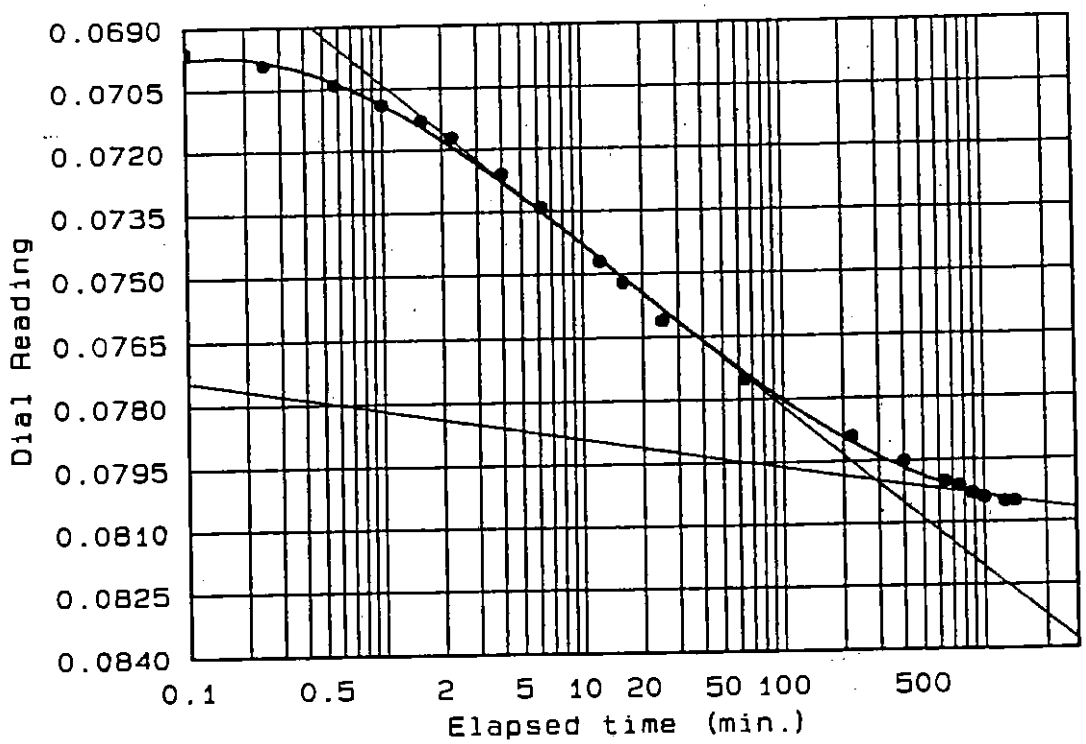
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB13-ST1, 10.0'-12.0'

Date: 08-20-93



Load No.= 5
Load= 2.00 tsf
D_0 = 0.0600
D_{50} = 0.0629
D_{100}= 0.0659
T_{50}= 15.58 min.

C_v @ T_{50} =
0.00 in^2/min.



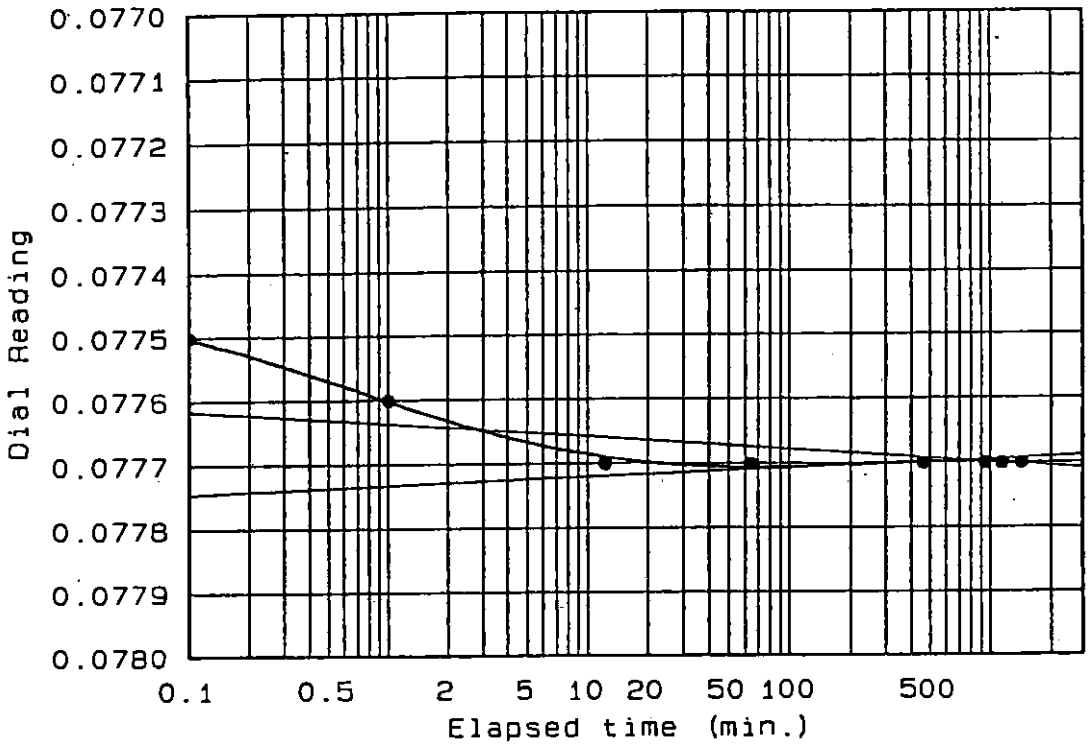
Load No.= 6
Load= 4.00 tsf
D_0 = 0.0695
D_{50} = 0.0747
D_{100}= 0.0800
T_{50}= 12.89 min.

C_v @ T_{50} =
0.00 in^2/min.

Dial Reading vs. Time

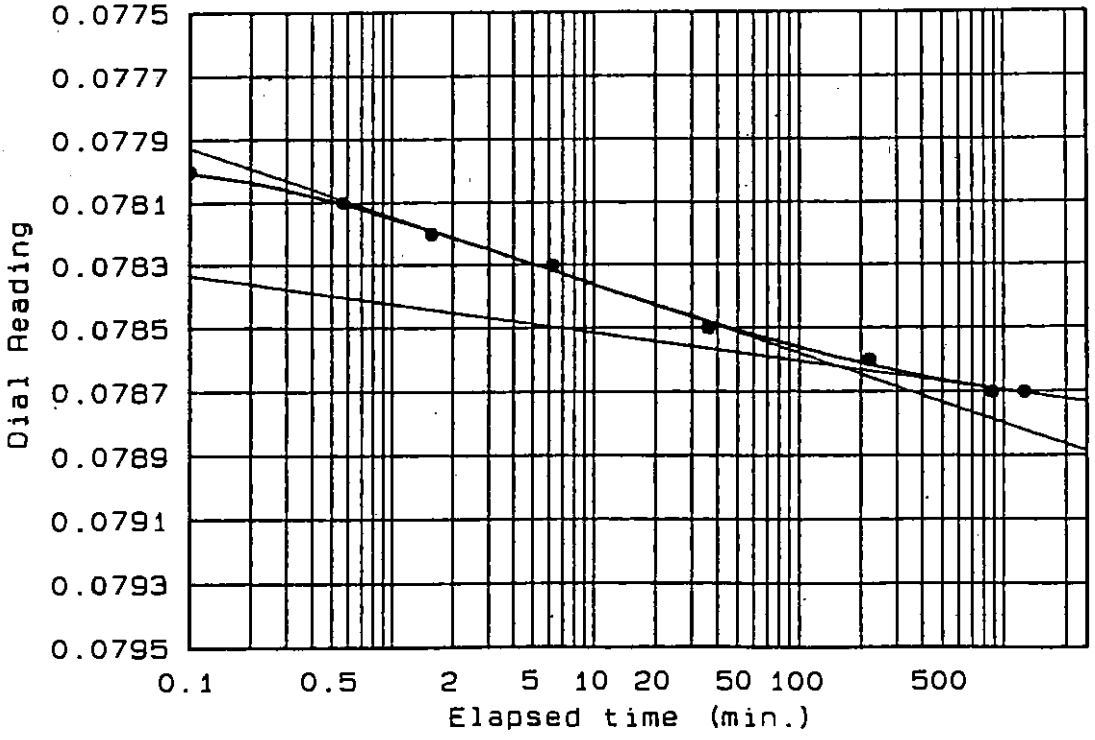
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB13-ST1, 10.0'-12.0'

Date: 08-20-93



Load No.= 10
Load= 1.00 tsf
D_0 = 0.0774
D_{50} = 0.0776
D_{100}= 0.0777
T_{50}= 0.51 min.

C_v @ T_{50} = 0.08 in.^{2}/min.



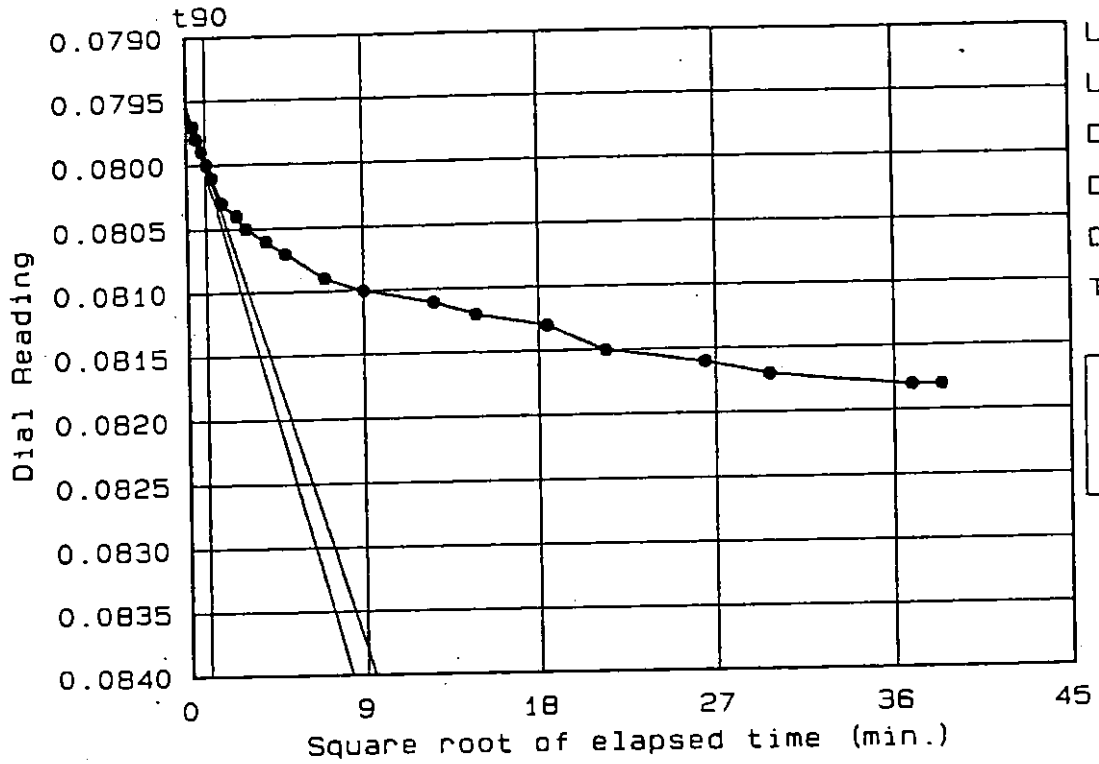
Load No.= 11
Load= 2.00 tsf
D_0 = 0.0779
D_{50} = 0.0783
D_{100}= 0.0786
T_{50}= 4.02 min.

C_v @ T_{50} = 0.01 in.^{2}/min.

Dial Reading vs. Time

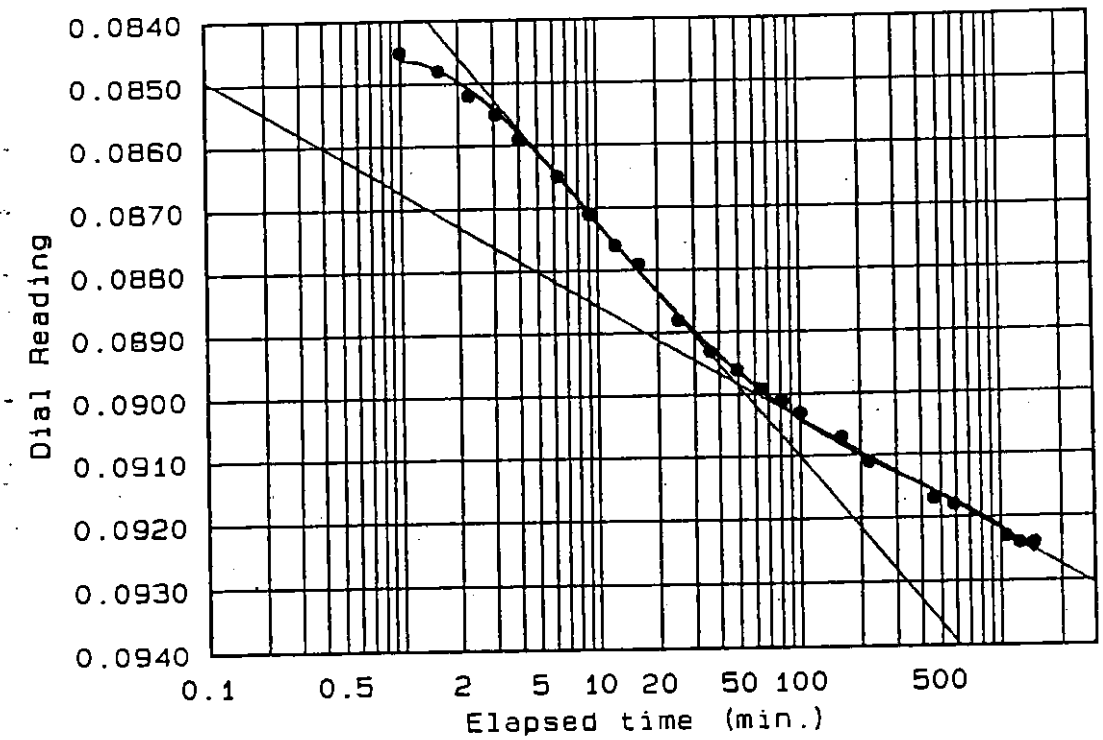
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB13-ST1, 10.0'-12.0'

Date: 08-20-93



Load No.= 12
Load= 4.00 tsf
D_0 = 0.0795
D_{90} = 0.0800
D_{100}= 0.0800
T_{90}= 0.97 min.

C_v @ T_{90} =
0.18 in.^{2}/min.



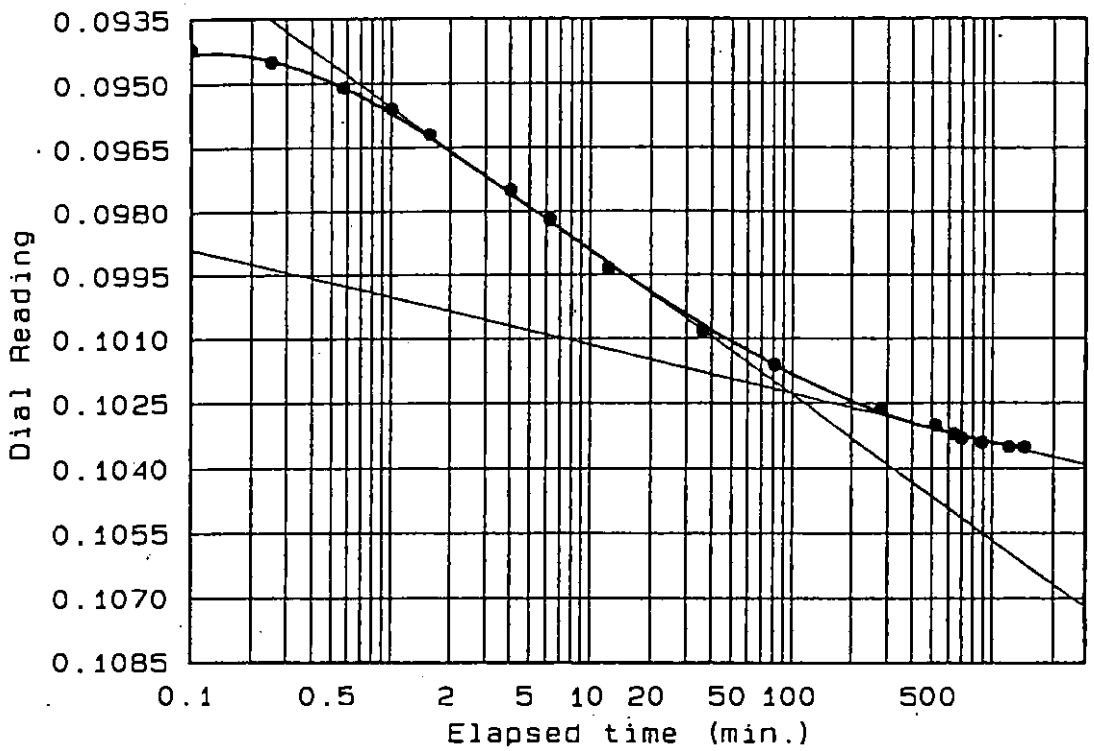
Load No.= 13
Load= 8.00 tsf
D_0 = 0.0835
D_{50} = 0.0866
D_{100}= 0.0898
T_{50}= 6.88 min.

C_v @ T_{50} =
0.01 in.^{2}/min.

Dial Reading vs. Time

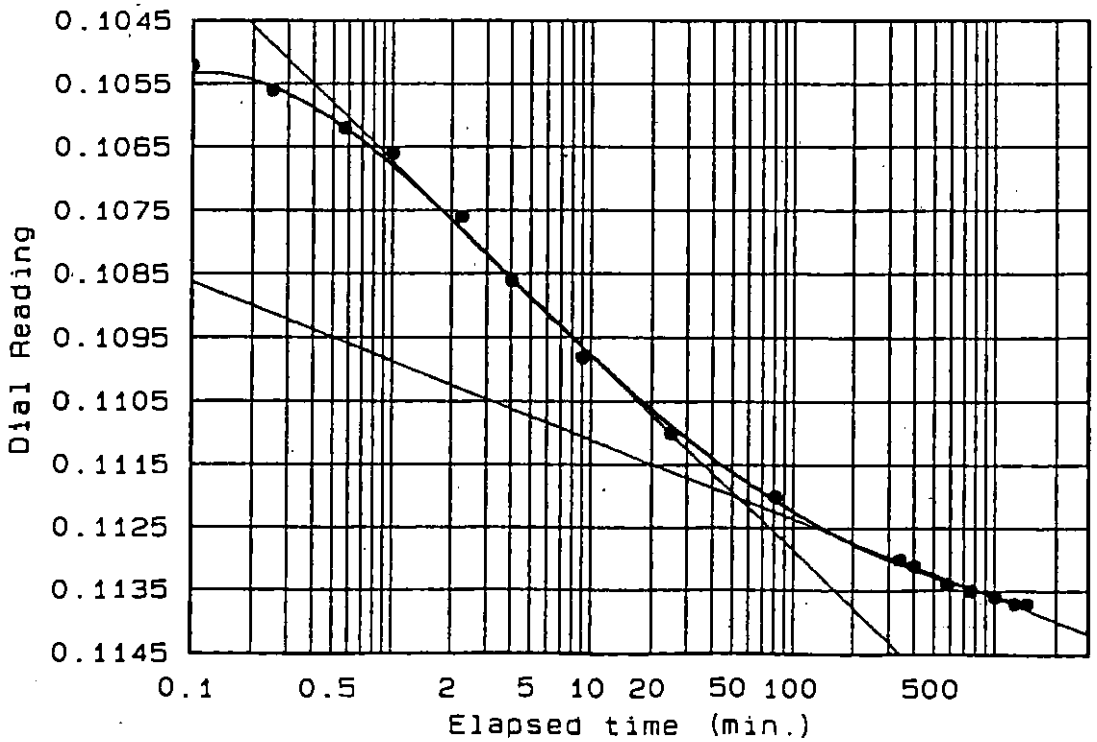
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB13-ST1, 10.0'-12.0'

Date: 08-20-93



Load No.= 14
Load= 16.00 tsf
D_0 = 0.0938
D_{50} = 0.0980
D_{100}= 0.1022
T_{50}= 5.47 min.

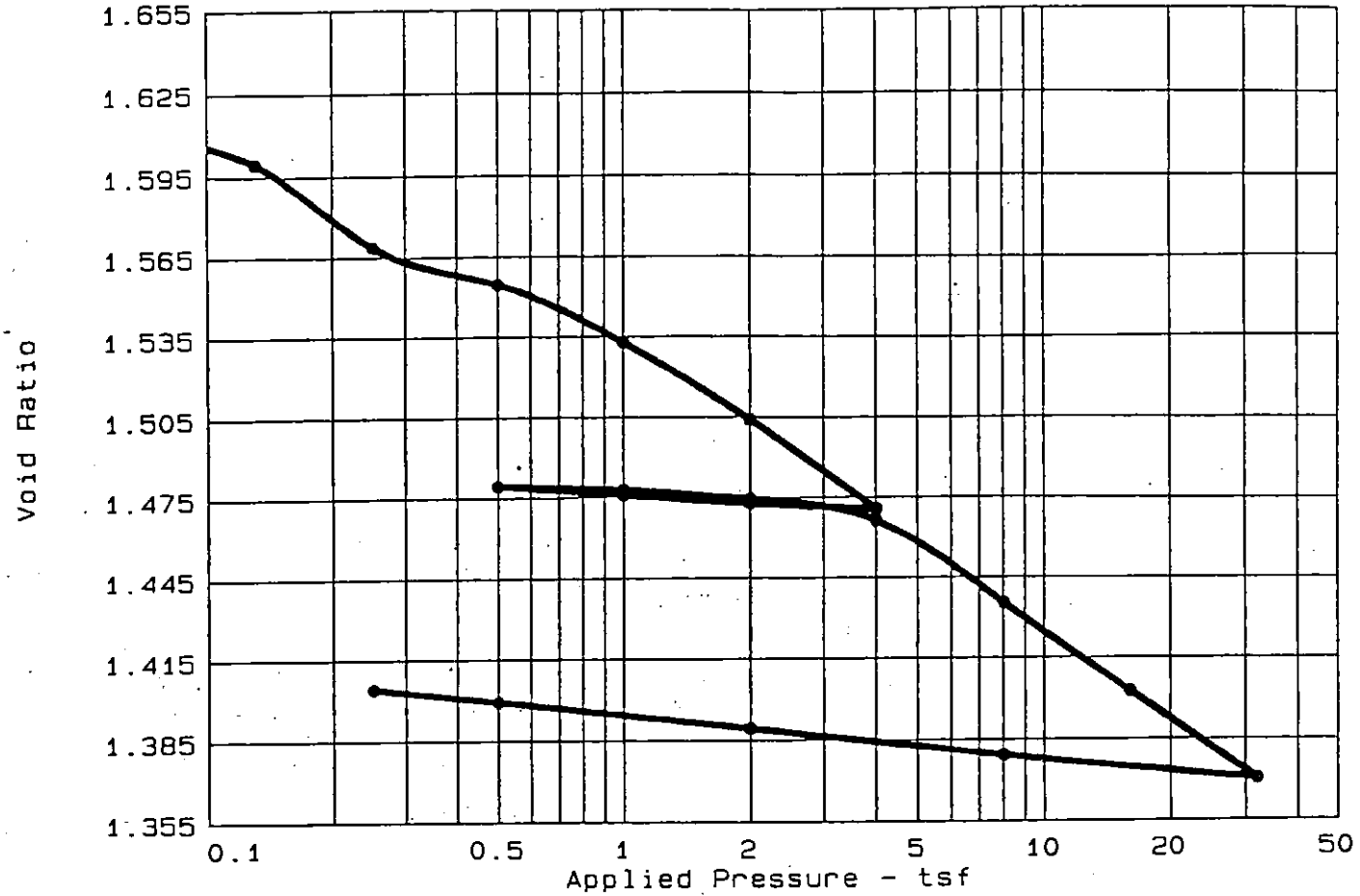
C_v @ T_{50} = 0.01 in.^{2}/min.



Load No.= 15
Load= 32.00 tsf
D_0 = 0.1048
D_{50} = 0.1084
D_{100}= 0.1120
T_{50}= 3.50 min.

C_v @ T_{50} = 0.01 in.^{2}/min.

CONSOLIDATION TEST REPORT



Coefficients of Consolidation (sq.in./min.)								
No.	Load	Cv	No.	Load	Cv	No.	Load	Cv
1	0.13	0.014	12	4.00	0.021			
2	0.25	0.468	13	8.00	0.018			
3	0.50	0.005	14	16.00	0.032			
4	1.00	0.004	15	32.00	0.037			
5	2.00	0.011						
6	4.00	0.015						
10	1.00	0.223						
11	2.00	0.349						

Swell press.	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
	86.1 %	53.6	61.8			2.58	1.6059

TEST RESULTS

C_v at 32.00 tsf applied = 0.037 sq. in./min.

MATERIAL DESCRIPTION

DARK GRAY ORGANIC SILT, SOME CLAY, SOME SAND

Class: visual

Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB14-ST3, 60.0'-62.0'

Date: 08-20-93

Remarks:

FILE NO. 64

CONSOLIDATION TEST REPORT

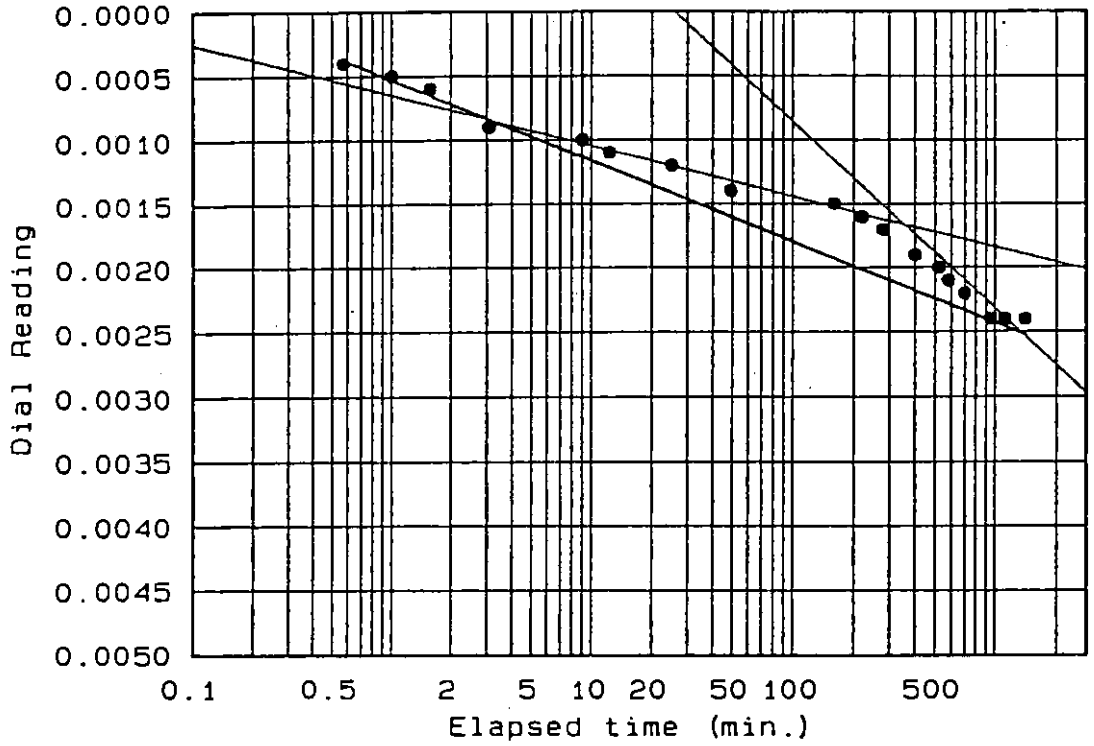
BOWSER-MORNER, INC.

Fig. No._____

Dial Reading vs. Time

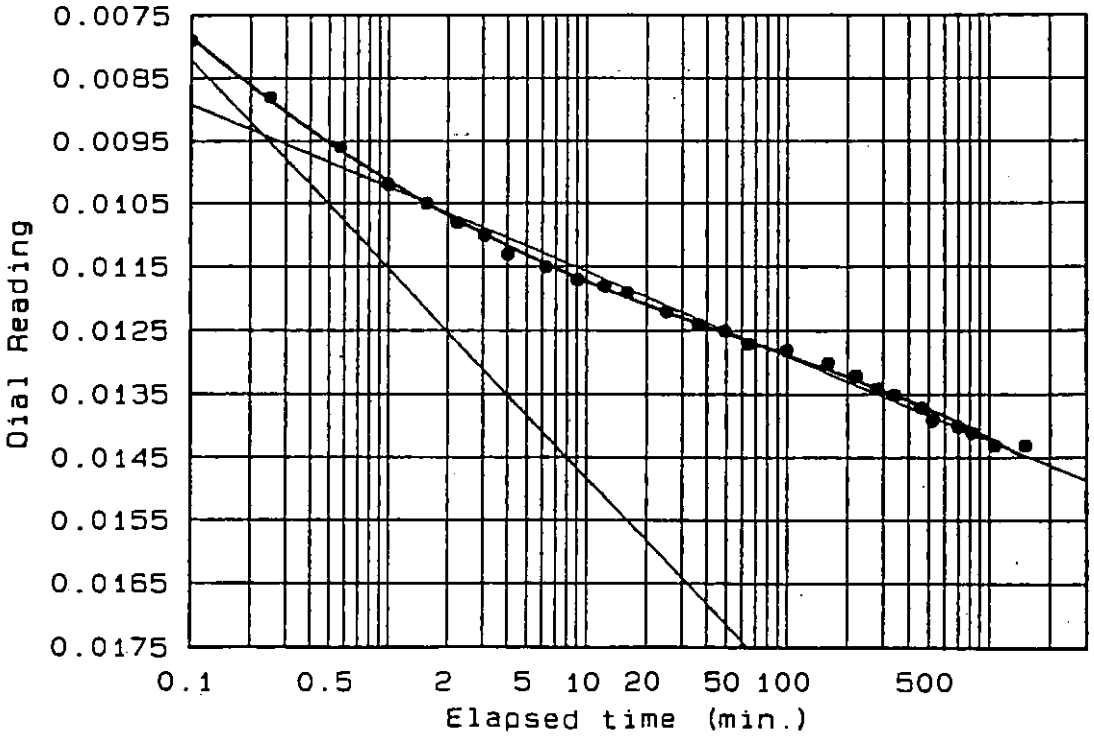
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB14-ST3, 60.0'-62.0'

Date: 08-20-93



Load No.= 1
Load= 0.13 tsf
D_0 = 0.0000
D_{50} = 0.0008
D_{100}= 0.0017
T_{50}= 3.40 min.

C_v @ T_{50} =
0.01 in.^{2}/min.



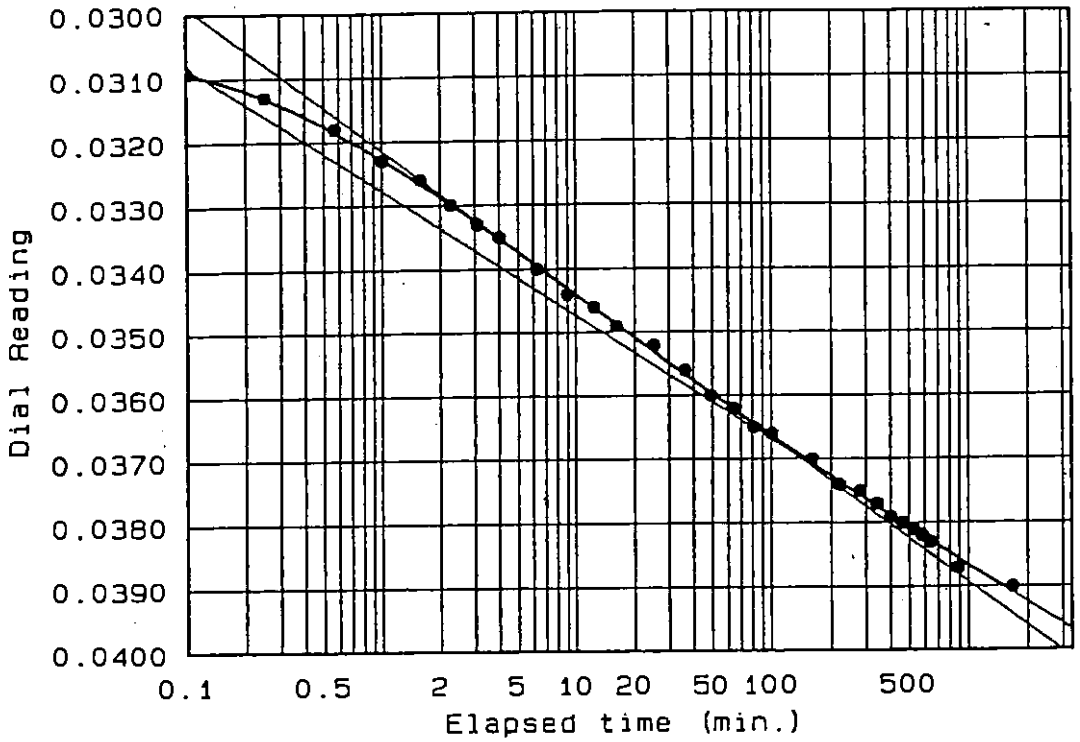
Load No.= 2
Load= 0.25 tsf
D_0 = 0.0064
D_{50} = 0.0079
D_{100}= 0.0094
T_{50}= 0.10 min.

C_v @ T_{50} =
0.47 in.^{2}/min.

Dial Reading vs. Time

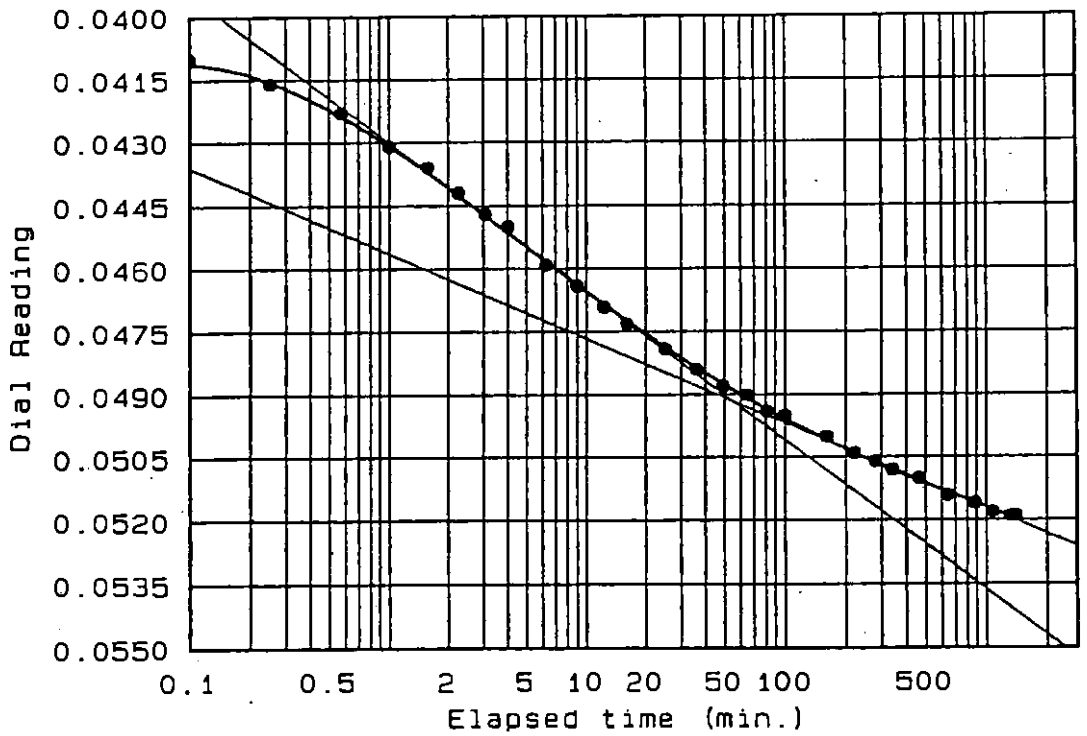
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB14-ST3, 60.0'-62.0'

Date: 08-20-93



Load No.= 5
Load= 2.00 tsf
D_0 = 0.0302
D_{50} = 0.0336
D_{100}= 0.0369
T_{50}= 4.17 min.

C_v @ T_{50} =
0.01 in.^{2}/min.



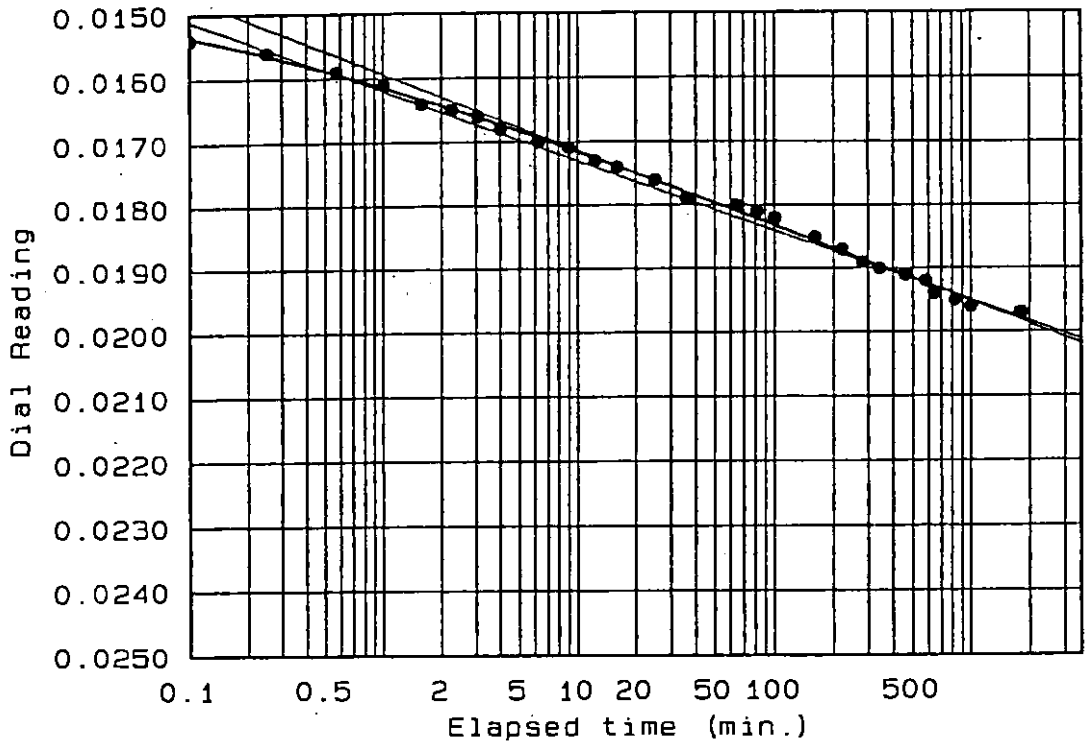
Load No.= 6
Load= 4.00 tsf
D_0 = 0.0402
D_{50} = 0.0447
D_{100}= 0.0491
T_{50}= 2.99 min.

C_v @ T_{50} =
0.01 in.^{2}/min.

Dial Reading vs. Time

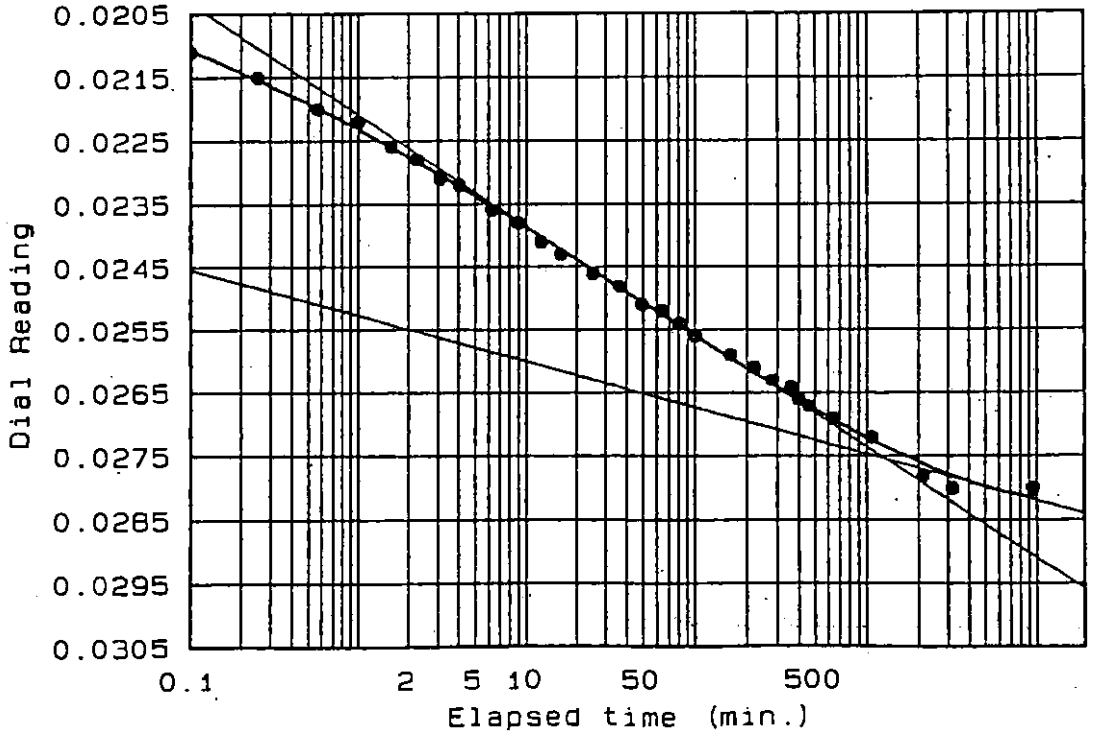
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB14-ST3, 60.0'-62.0'

Date: 08-20-93



Load No.= 3
Load= 0.50 tsf
D_0 = 0.0149
D_{50} = 0.0172
D_{100}= 0.0194
T_{50}= 9.89 min.

C_v @ T_{50} =
0.00 in.^{2}/min.



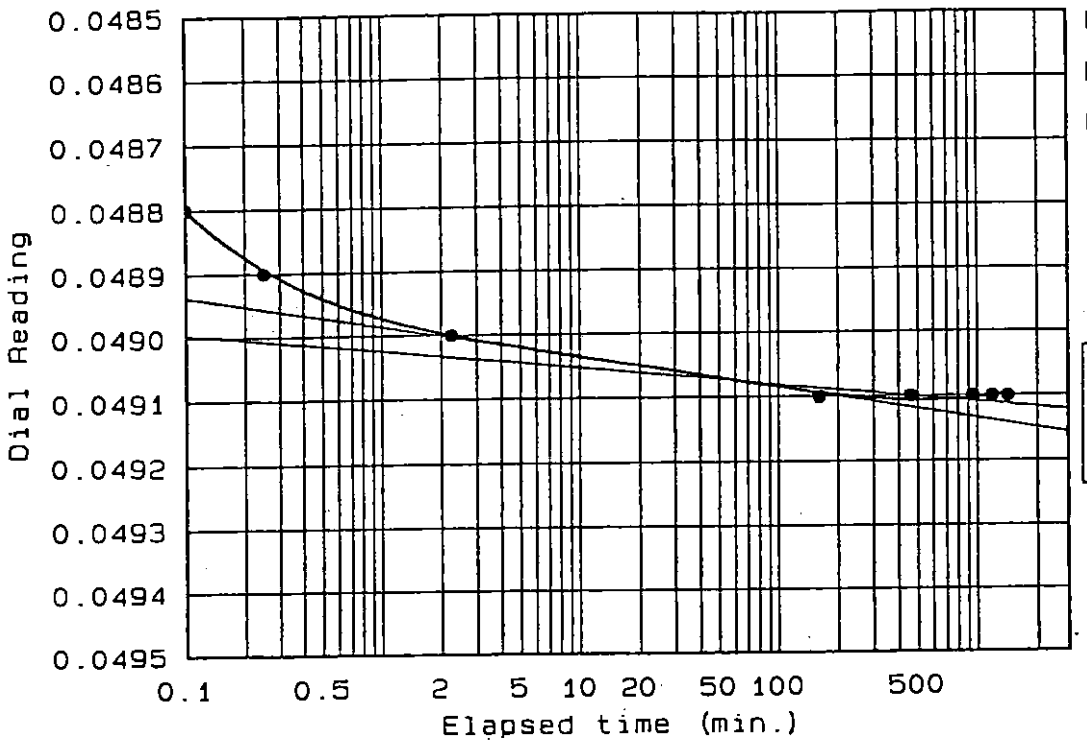
Load No.= 4
Load= 1.00 tsf
D_0 = 0.0203
D_{50} = 0.0239
D_{100}= 0.0275
T_{50}= 11.21 min.

C_v @ T_{50} =
0.00 in.^{2}/min.

Dial Reading vs. Time

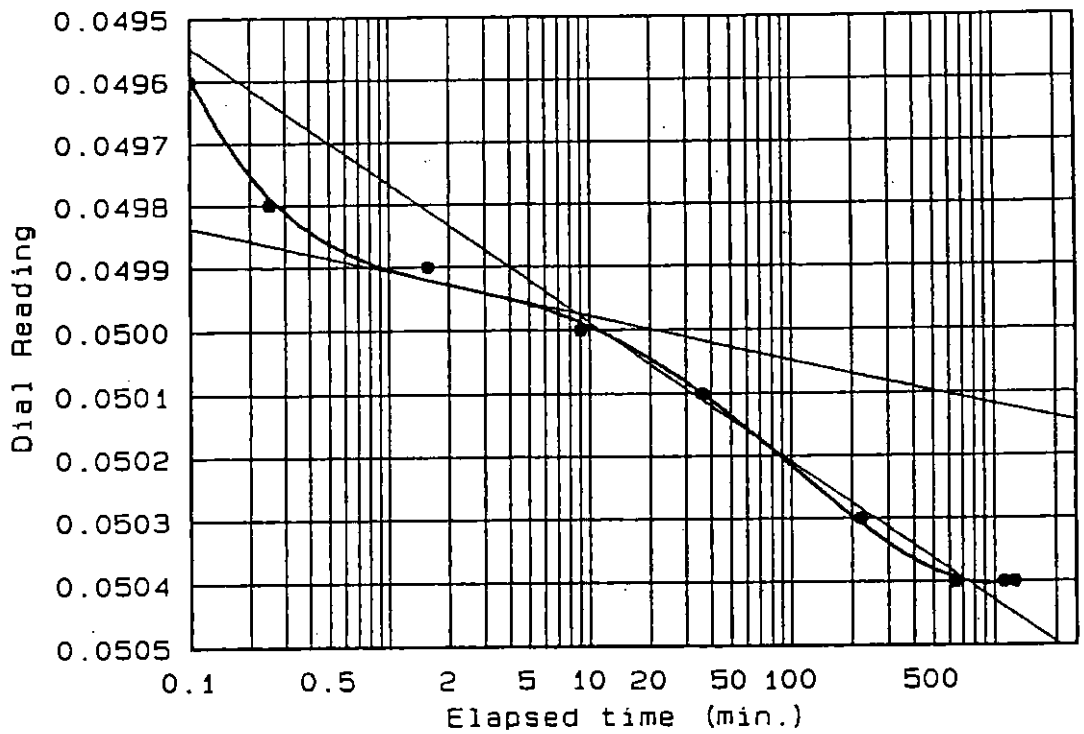
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB14-ST3, 60.0'-62.0'

Date: 08-20-93



Load No.= 10
Load= 1.00 tsf
D_0 = 0.0487
D_{50} = 0.0489
D_{100}= 0.0491
T_{50}= 0.20 min.

C_v @ T_{50} =
0.22 in.^{2}/min.



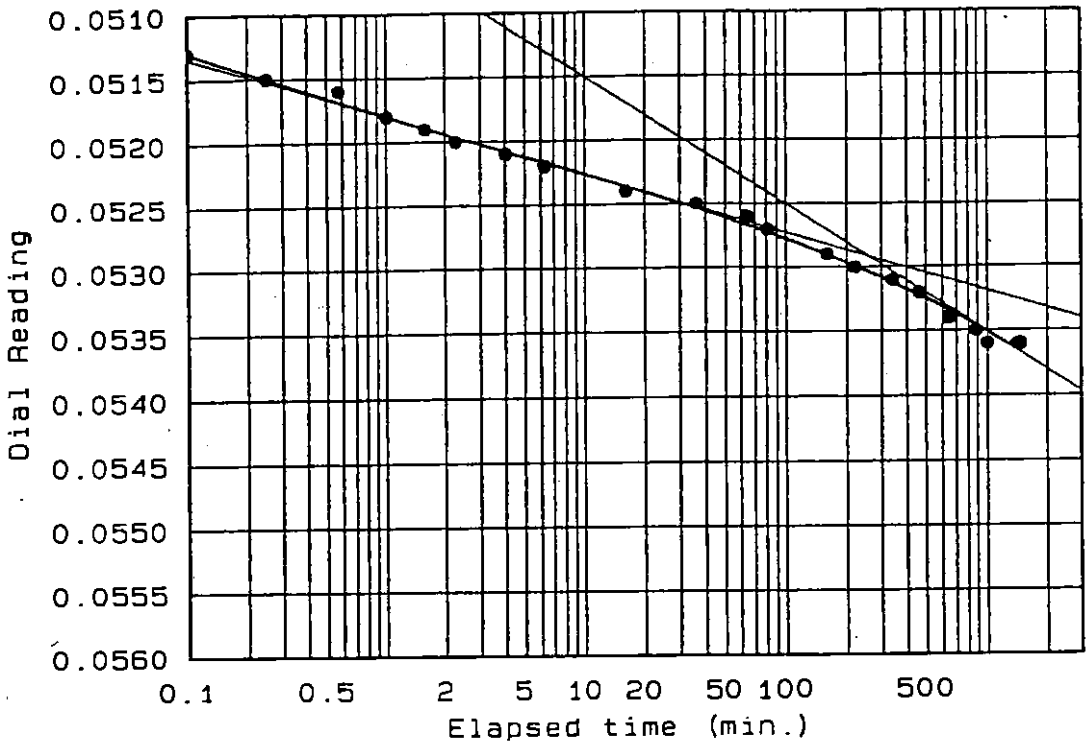
Load No.= 11
Load= 2.00 tsf
D_0 = 0.0493
D_{50} = 0.0497
D_{100}= 0.0500
T_{50}= 0.13 min.

C_v @ T_{50} =
0.35 in.^{2}/min.

Dial Reading vs. Time

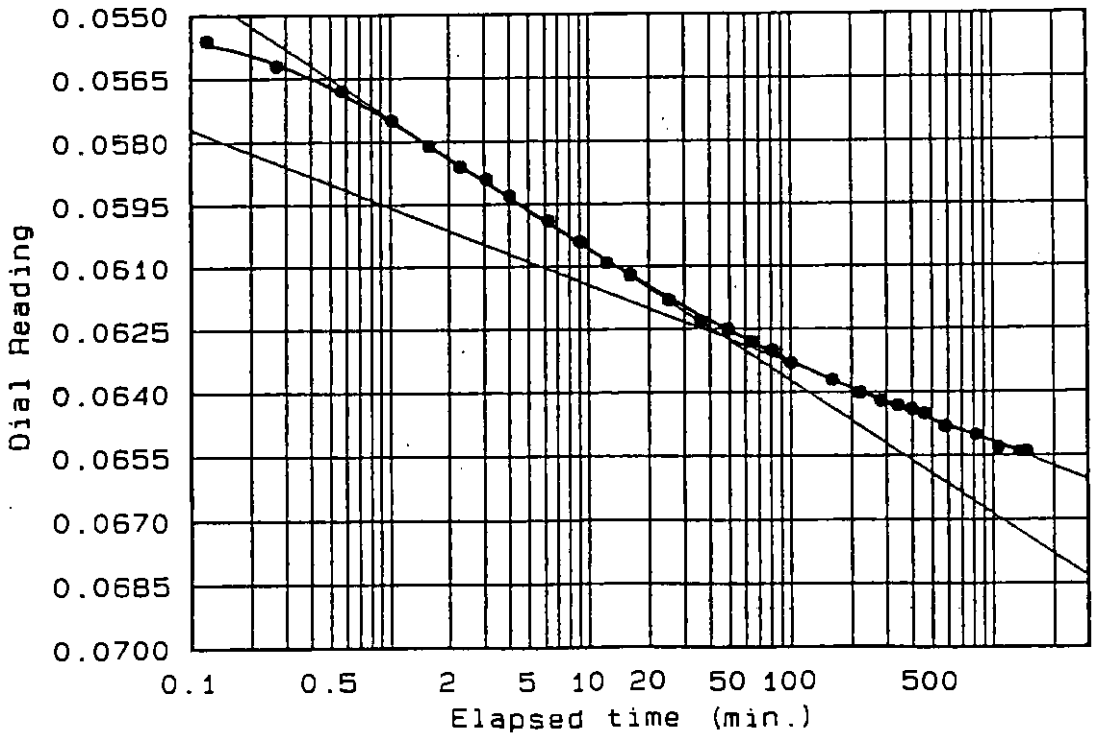
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB14-ST3, 60.0'-62.0'

Date: 08-20-93



Load No.= 12
Load= 4.00 tsf
D_0 = 0.0510
D_{50} = 0.0519
D_{100}= 0.0529
T_{50}= 2.06 min.

C_v @ T_{50} =
0.02 in.^{2}/min.



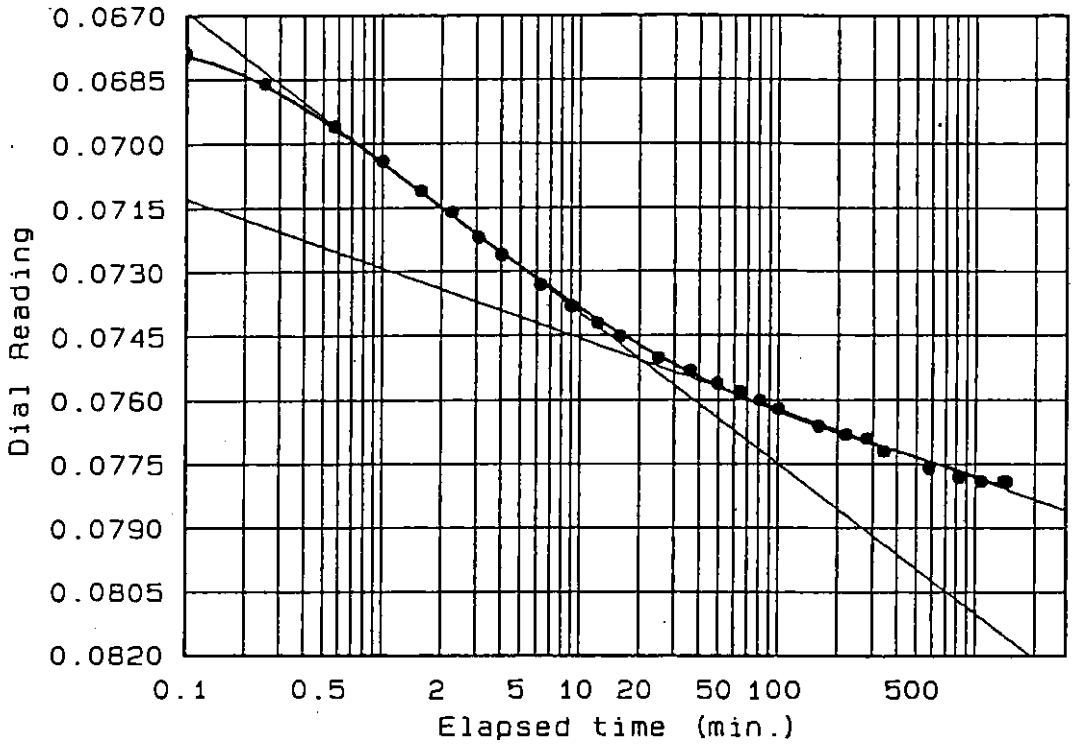
Load No.= 13
Load= 8.00 tsf
D_0 = 0.0547
D_{50} = 0.0587
D_{100}= 0.0627
T_{50}= 2.47 min.

C_v @ T_{50} =
0.02 in.^{2}/min.

Dial Reading vs. Time

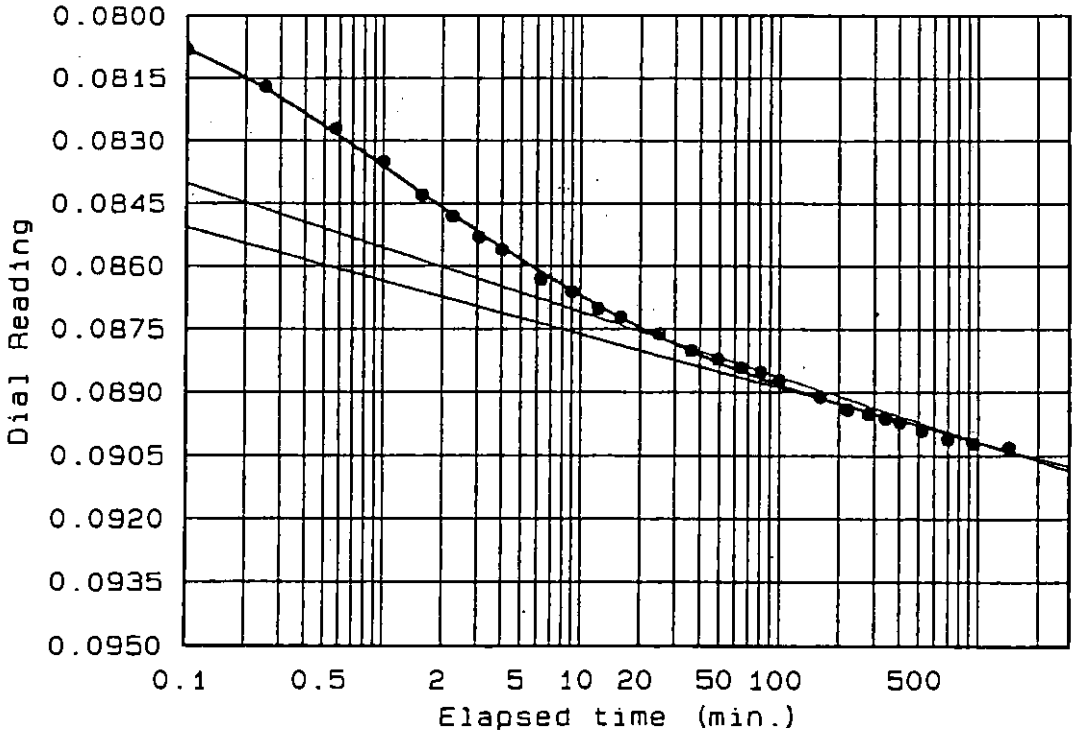
Project No.: 101210-ROY F. WESTON, INC.
Project: DSWA PHASE V LANDFILL
Location: TB14-ST3, 60.0'-62.0'

Date: 08-20-93



Load No.= 14
Load= 16.00 tsf
D_0 = 0.0667
D_{50} = 0.0709
D_{100}= 0.0751
T_{50}= 1.33 min.

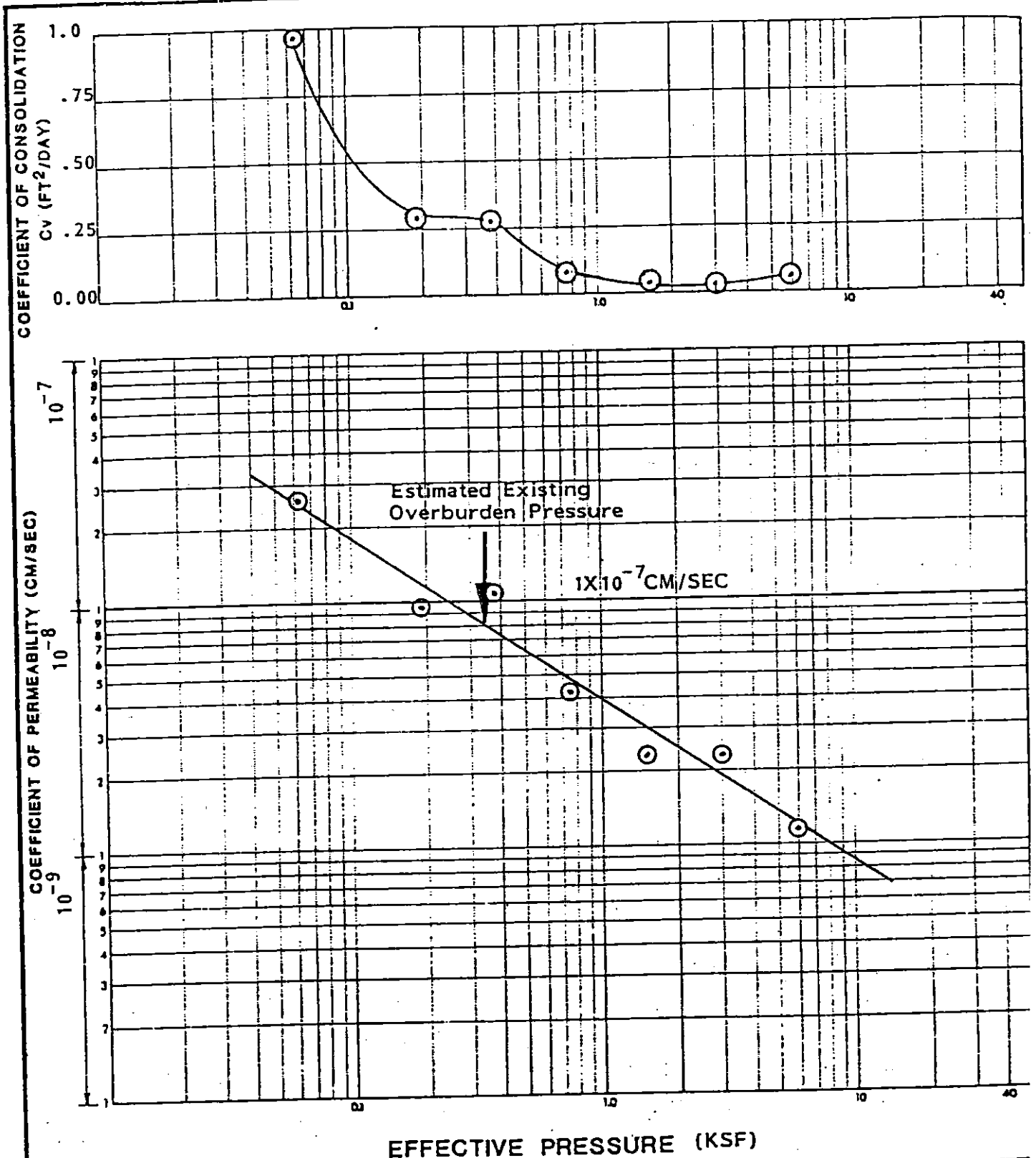
C_v @ T_{50} =
0.03 in.^{2}/min.



Load No.= 15
Load= 32.00 tsf
D_0 = 0.0792
D_{50} = 0.0847
D_{100}= 0.0902
T_{50}= 2.14 min.

C_v @ T_{50} =
0.04 in.^{2}/min.

PERMEABILITY TESTS

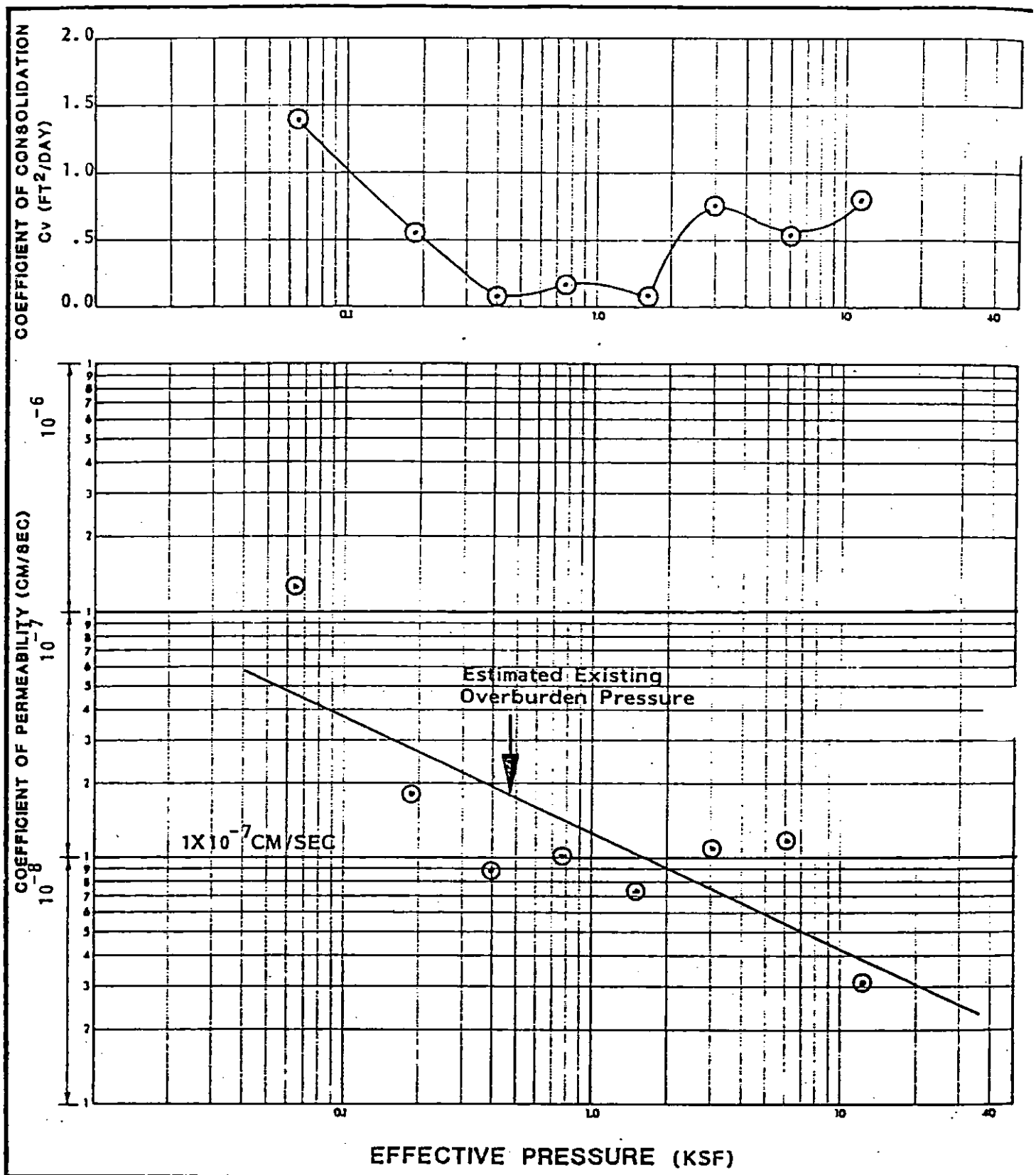


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: G-1 DEPTH: 10.6

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 198
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-1

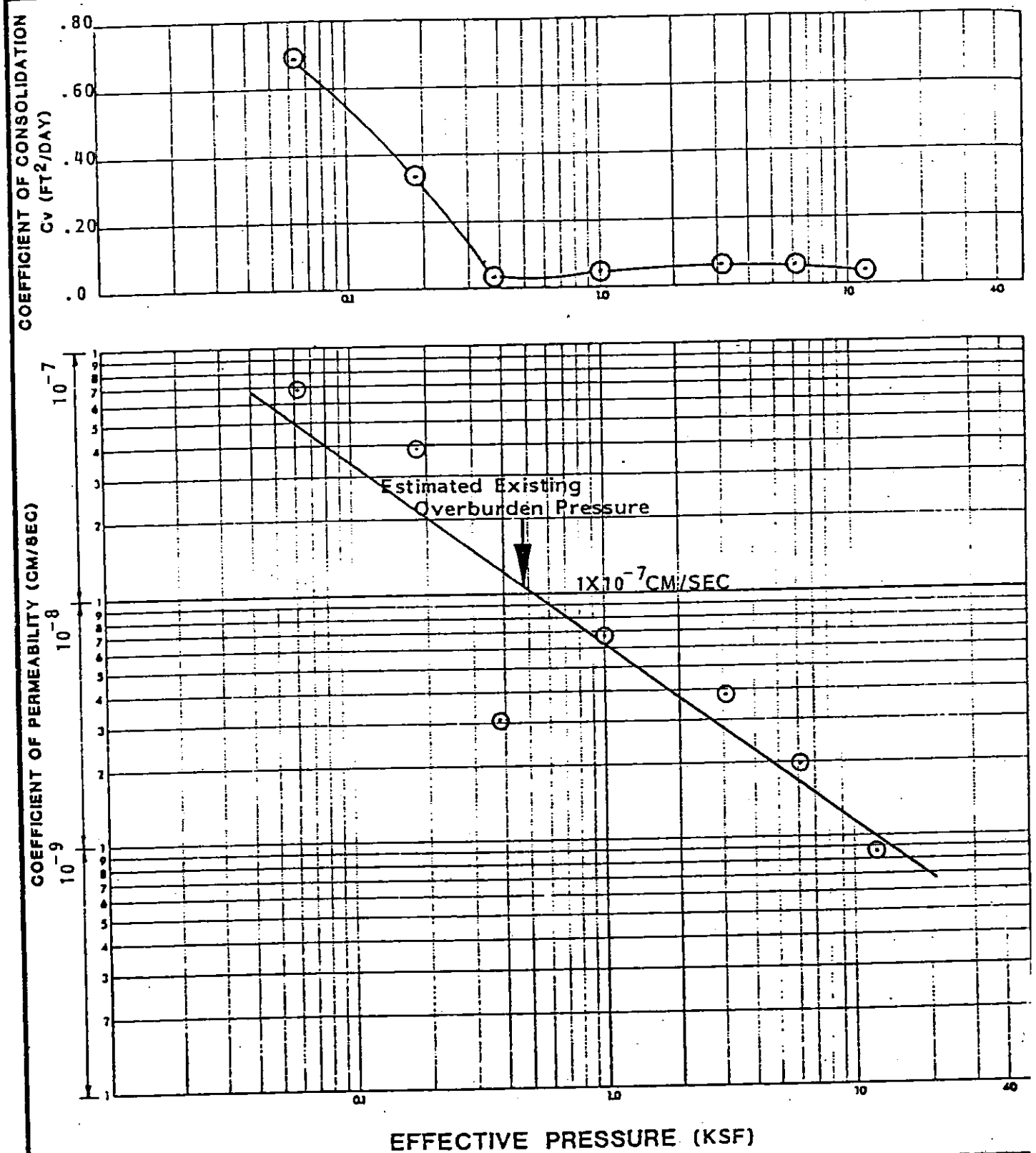


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: G-2 DEPTH: 15.7

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 1
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-2

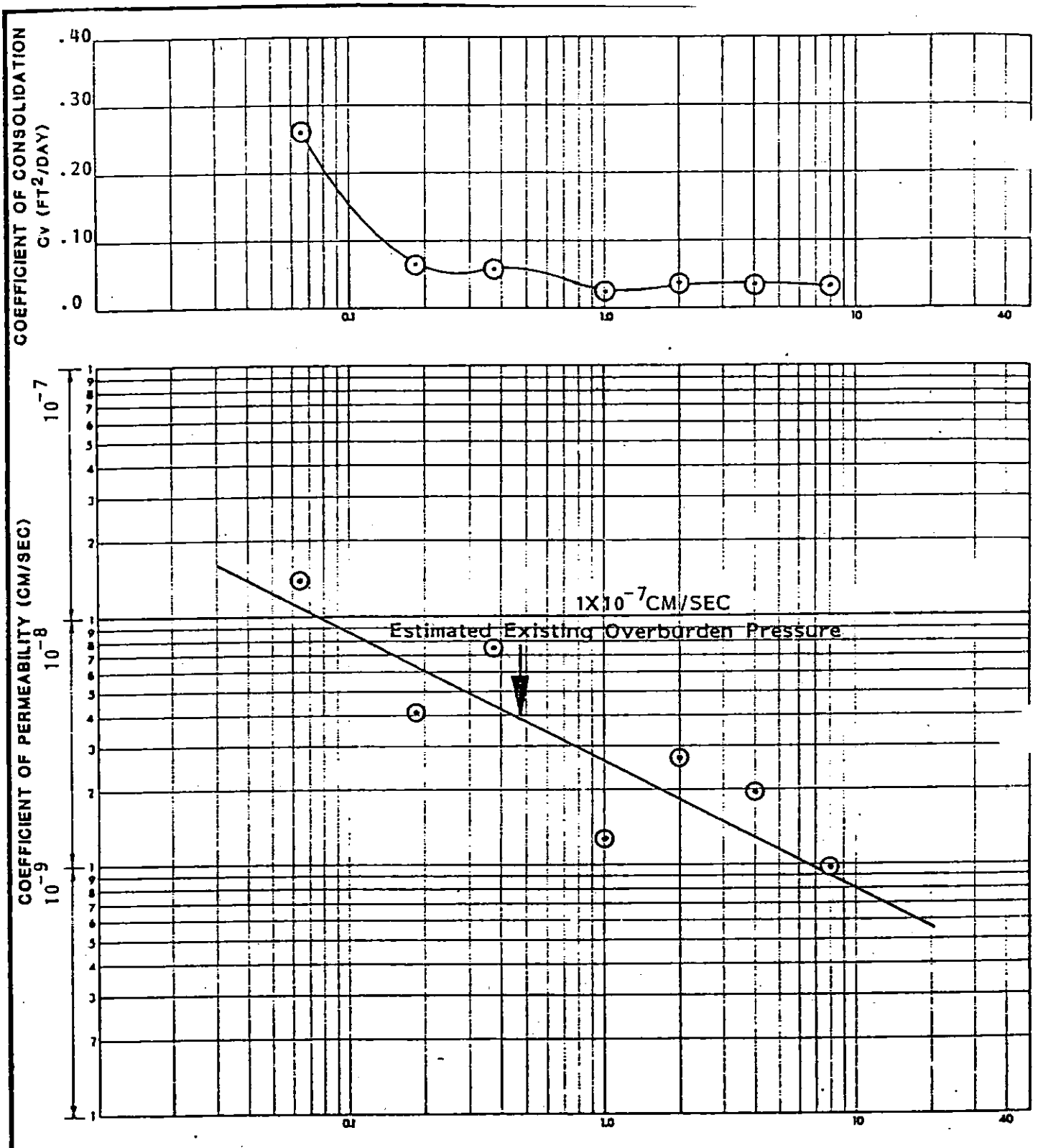


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: GP-3 DEPTH: 16.5

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 198
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-3

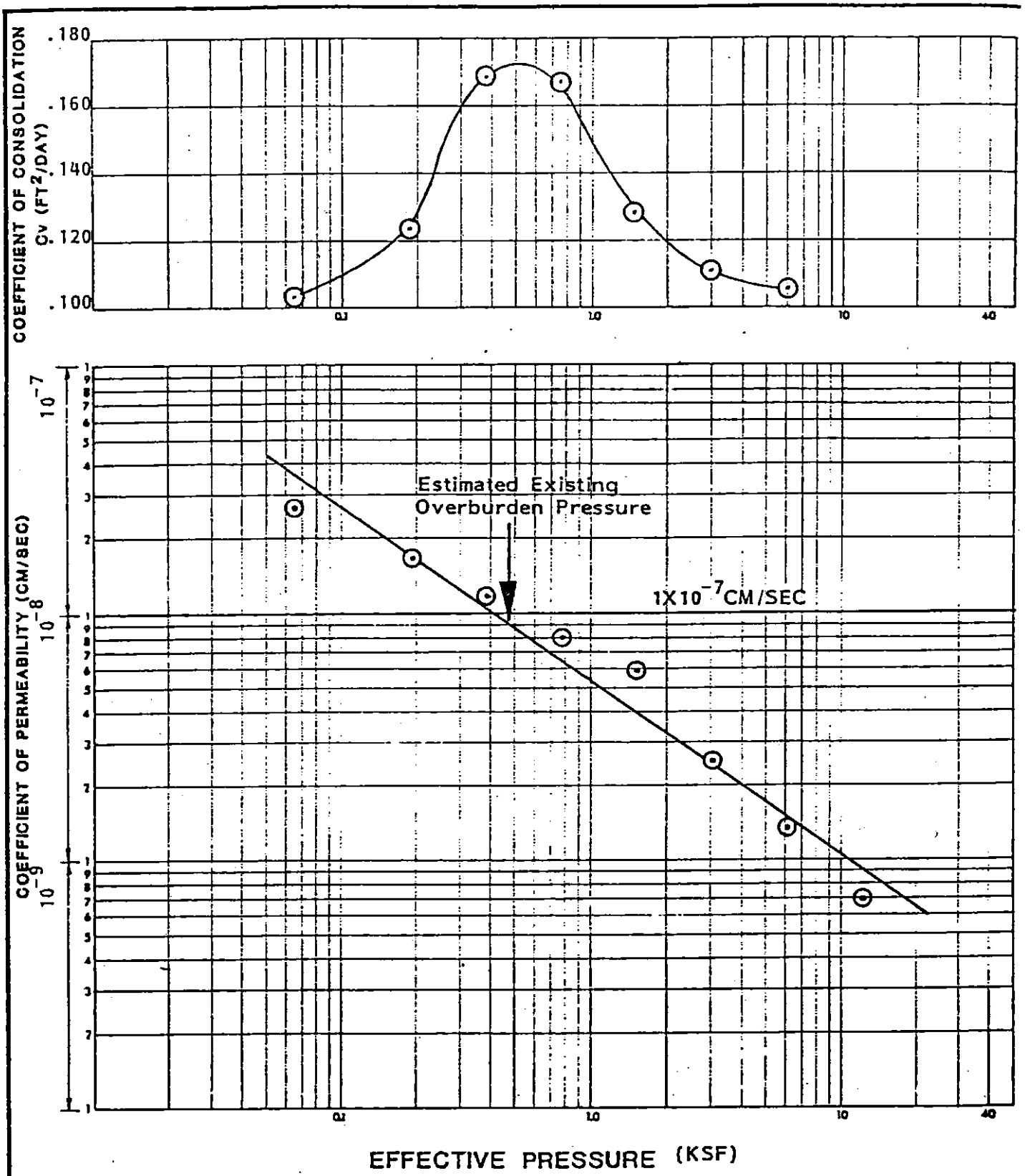


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: GP-4 DEPTH: 16.1

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 1
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-4

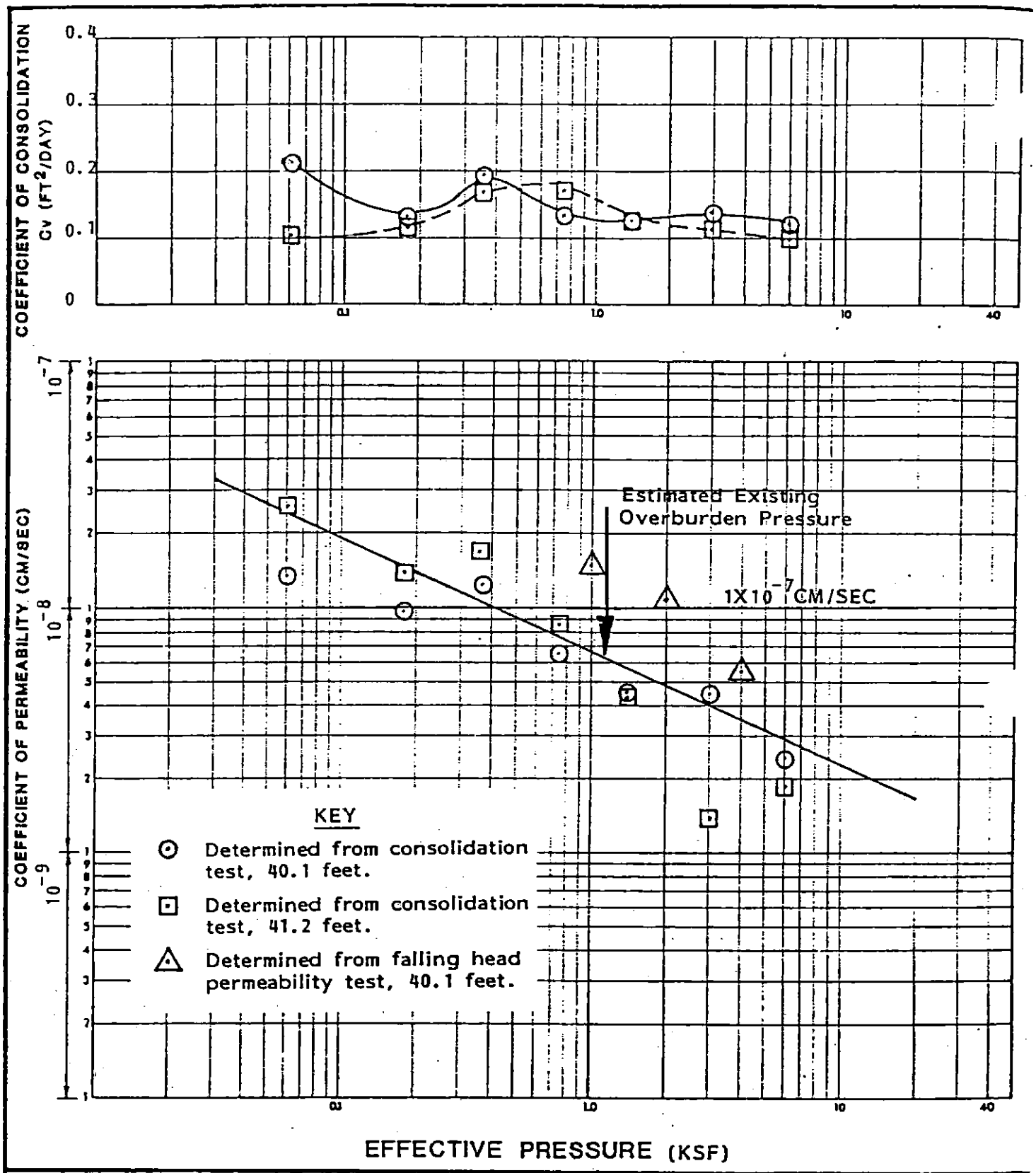


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: GP-6 DEPTH: 16.1

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 1983
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-5

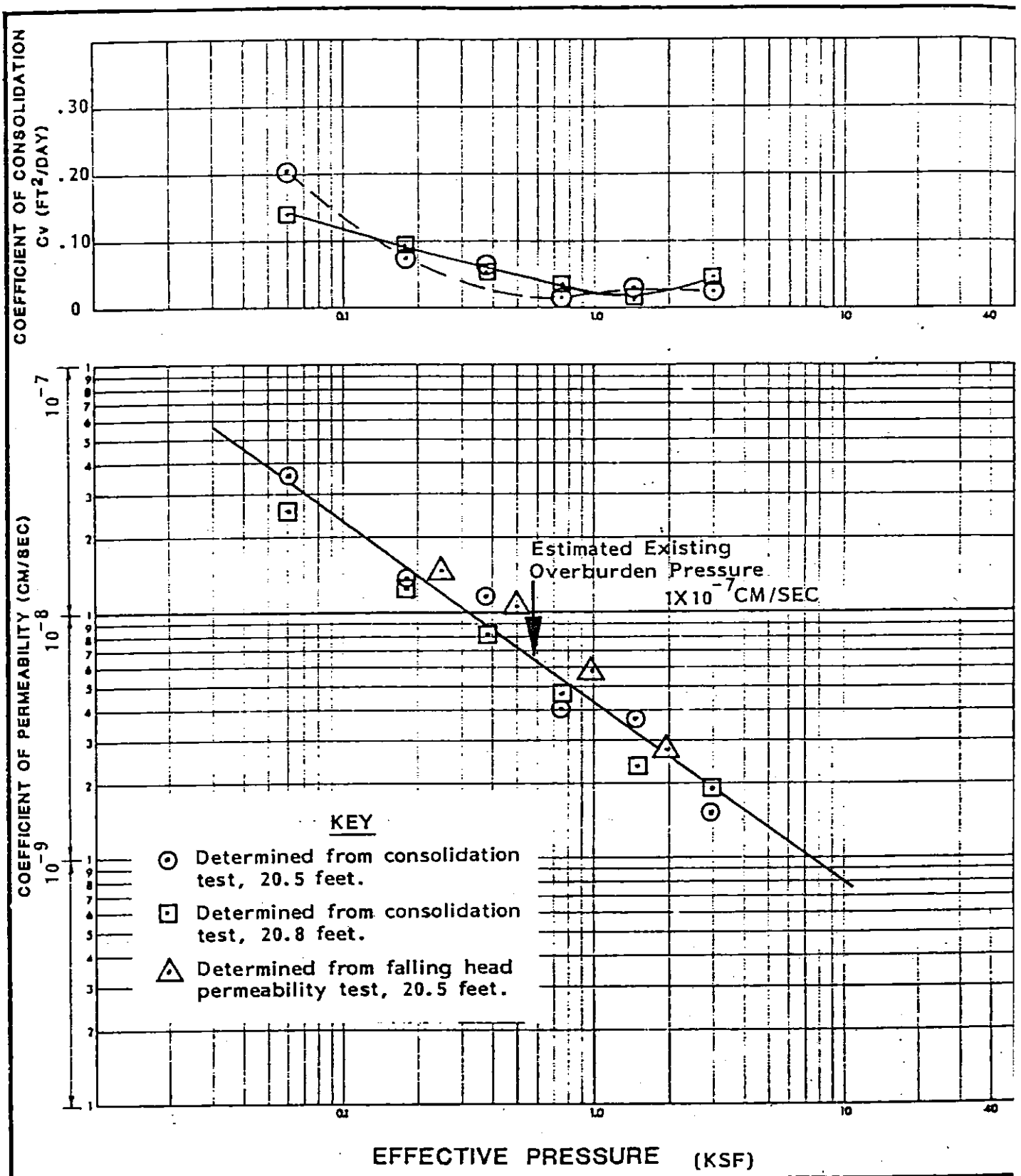


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: GP-6 DEPTH: 40.1, 41.2

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 1983
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-6

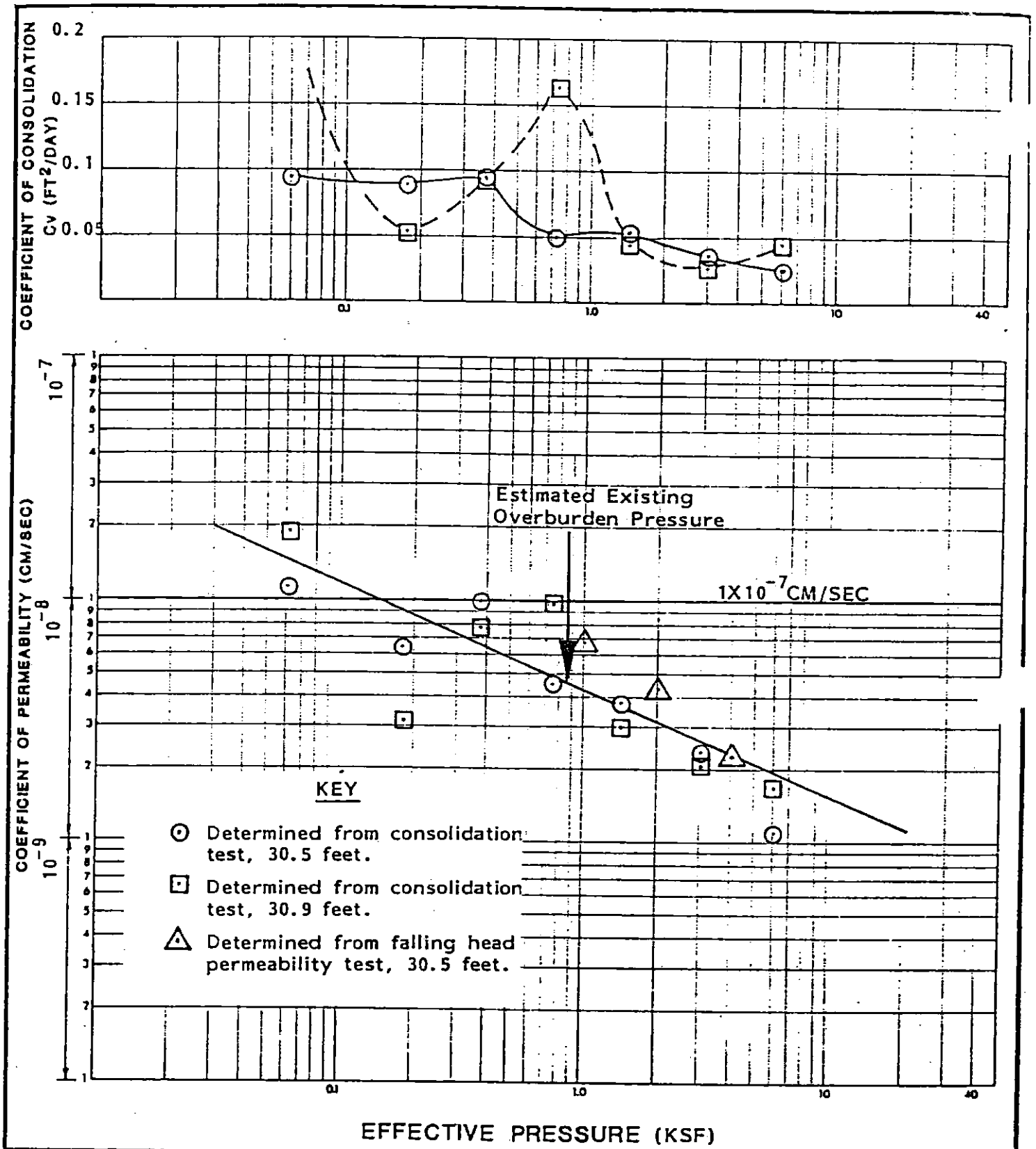


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: GP-7 DEPTH: 20.5, 20.8

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 198
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-7

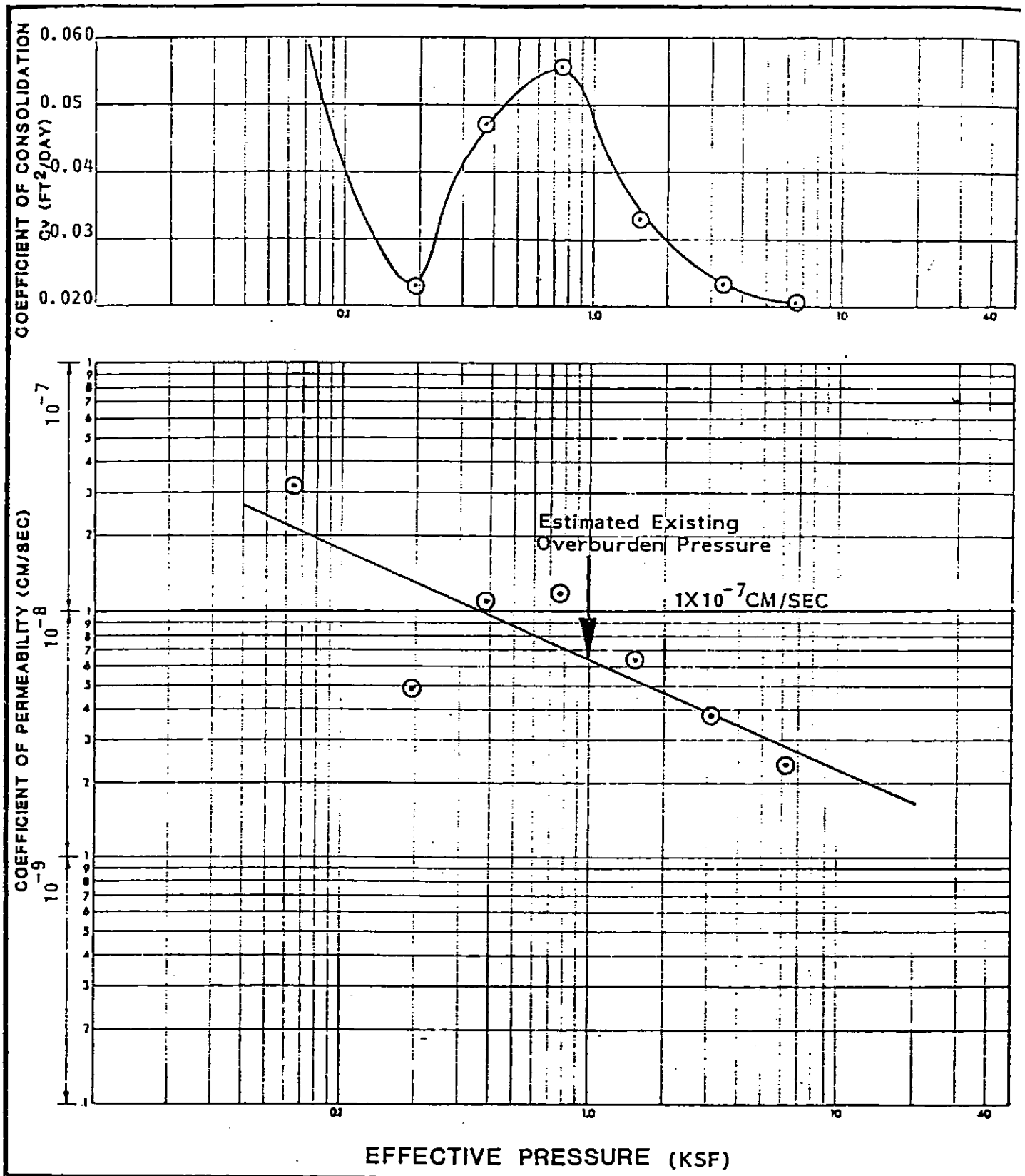


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: GP-7 DEPTH: 30.5, 30.9

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 1983
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-8

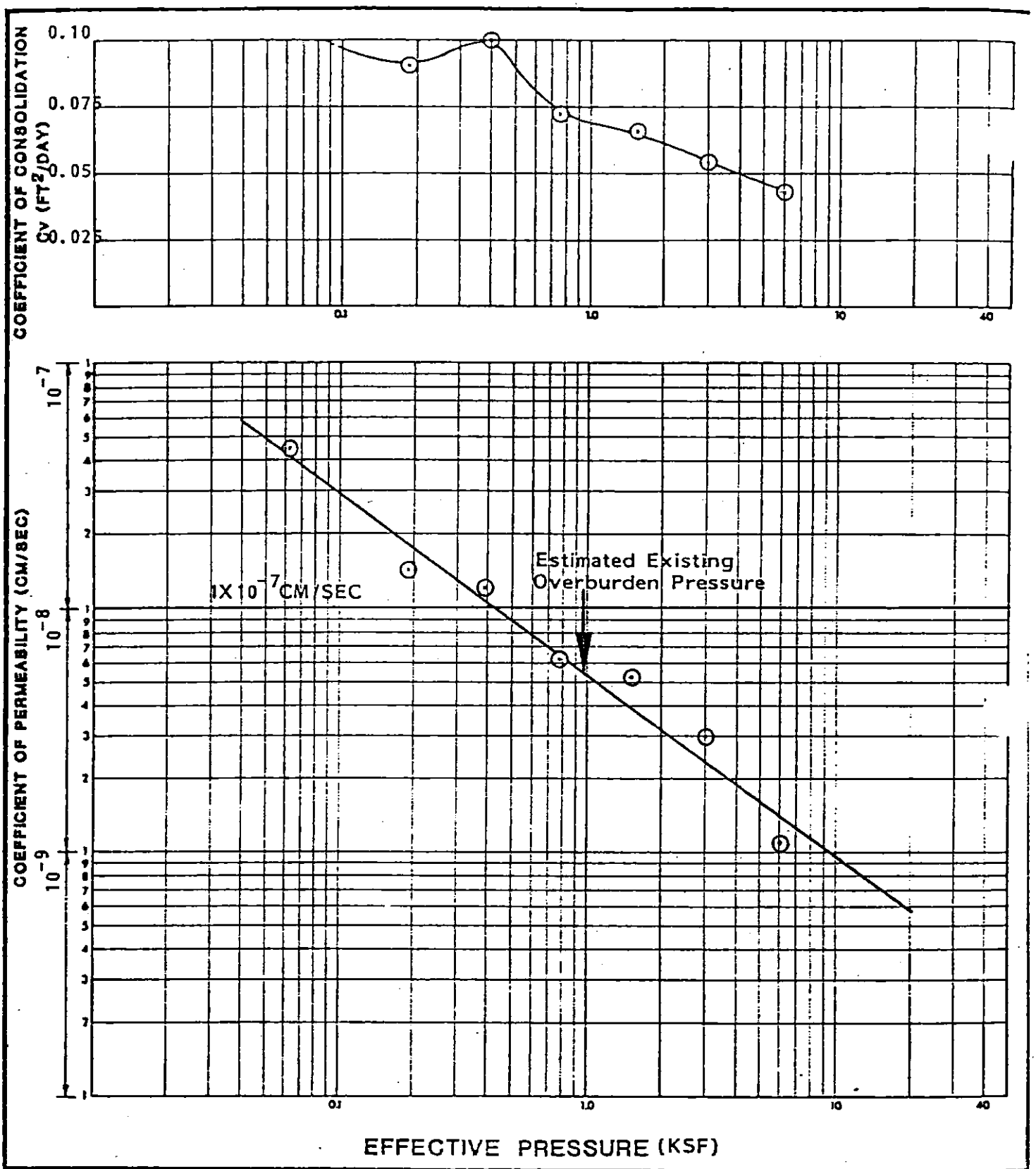


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: GP-8 DEPTH: 35.9

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 1983
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-9

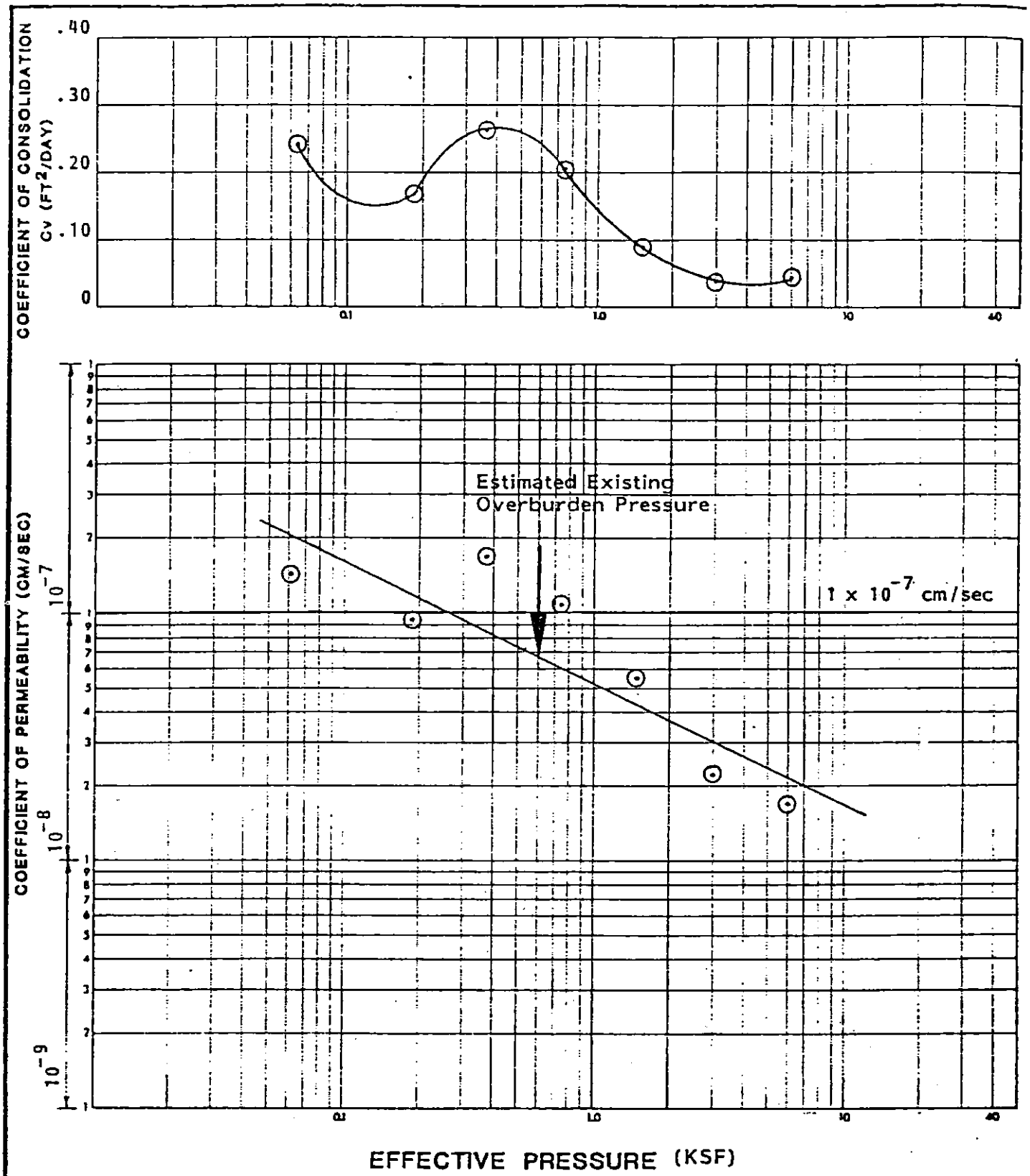


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: GP-9 DEPTH: 36.1

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: October 26, 15
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-10

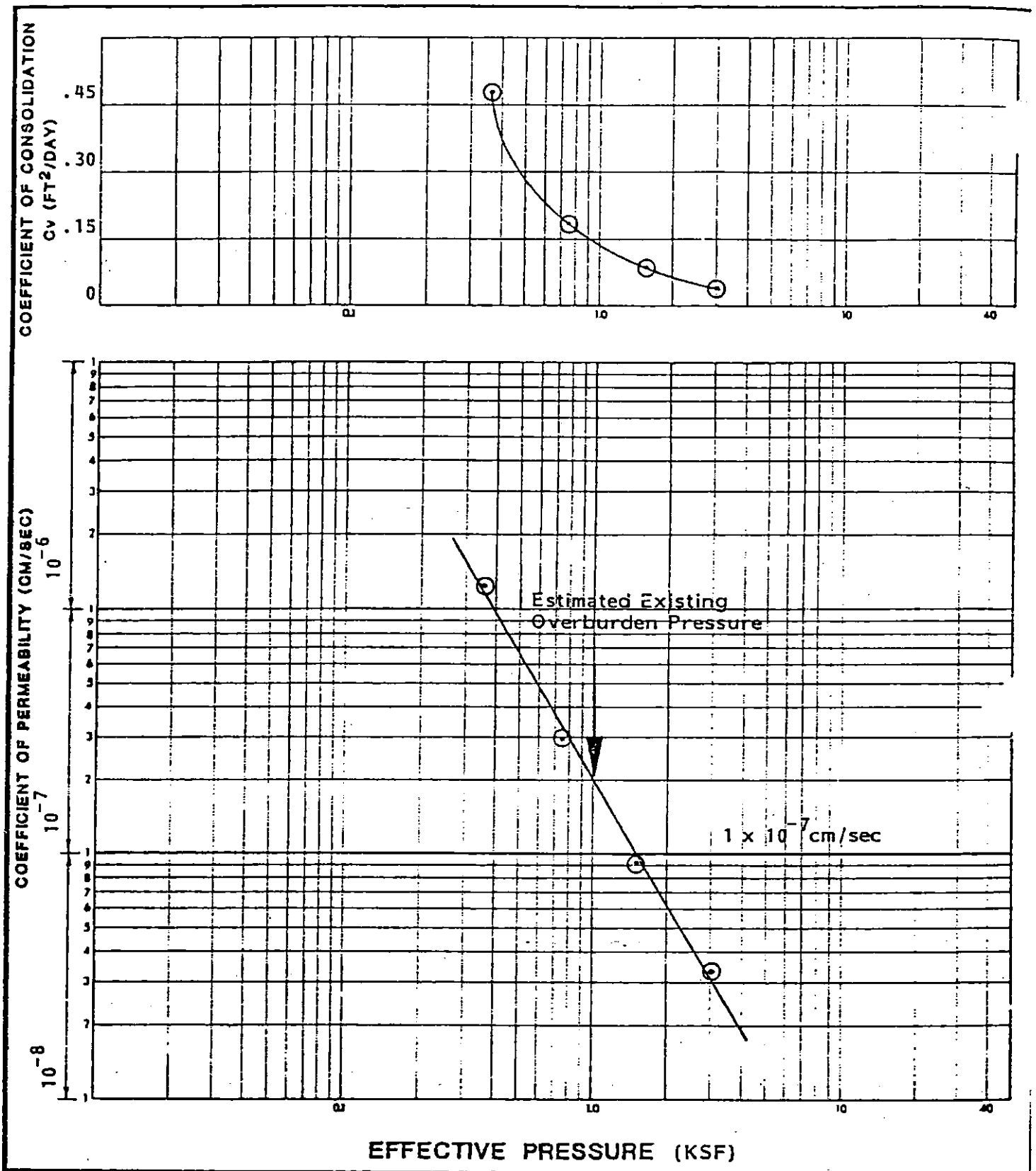


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: A-1 DEPTH: 13.6

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: 12/22/83
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-11



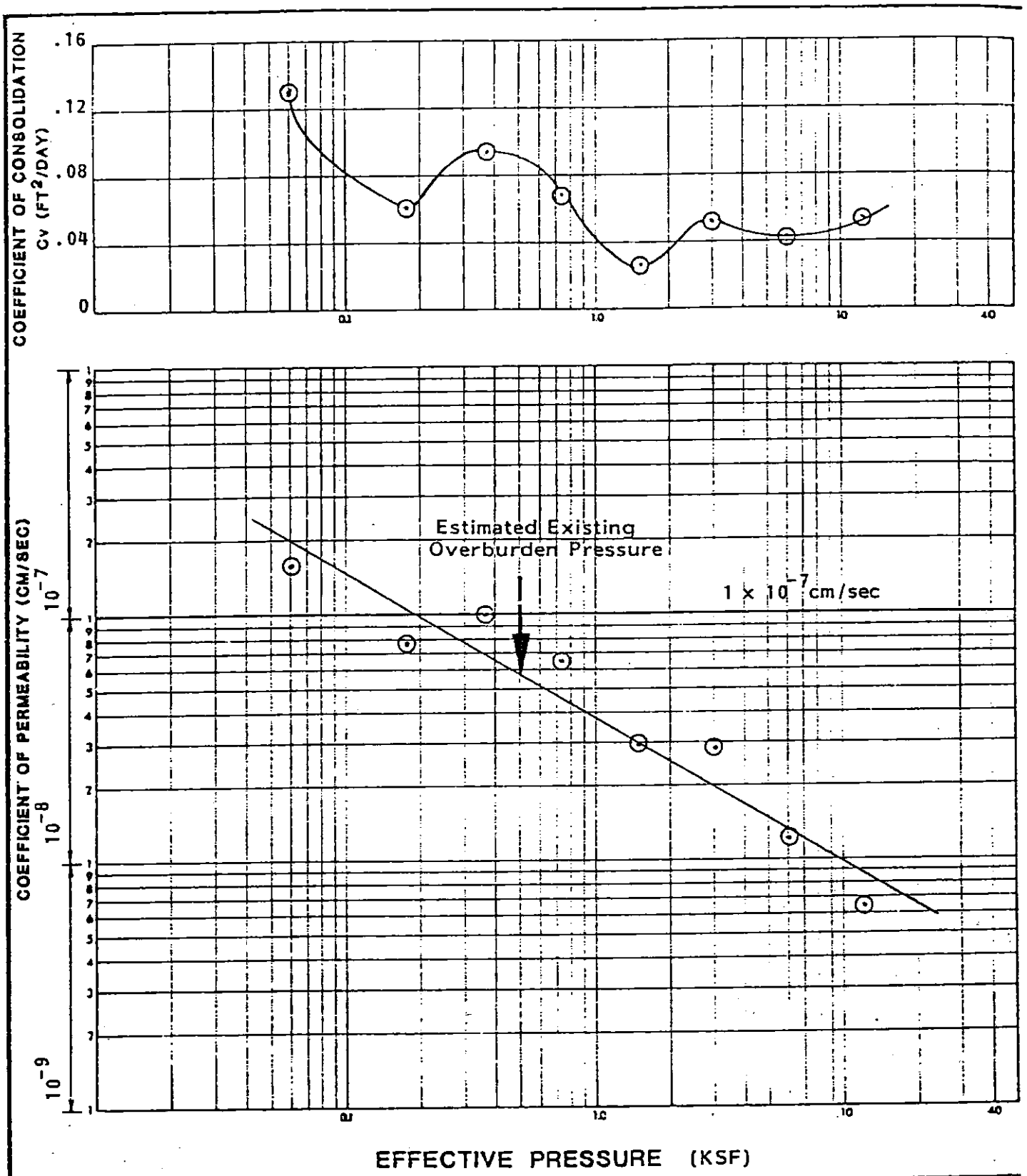
PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST

TEST BORING: A-1 DEPTH: 27.4

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: 12/22/83
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-12

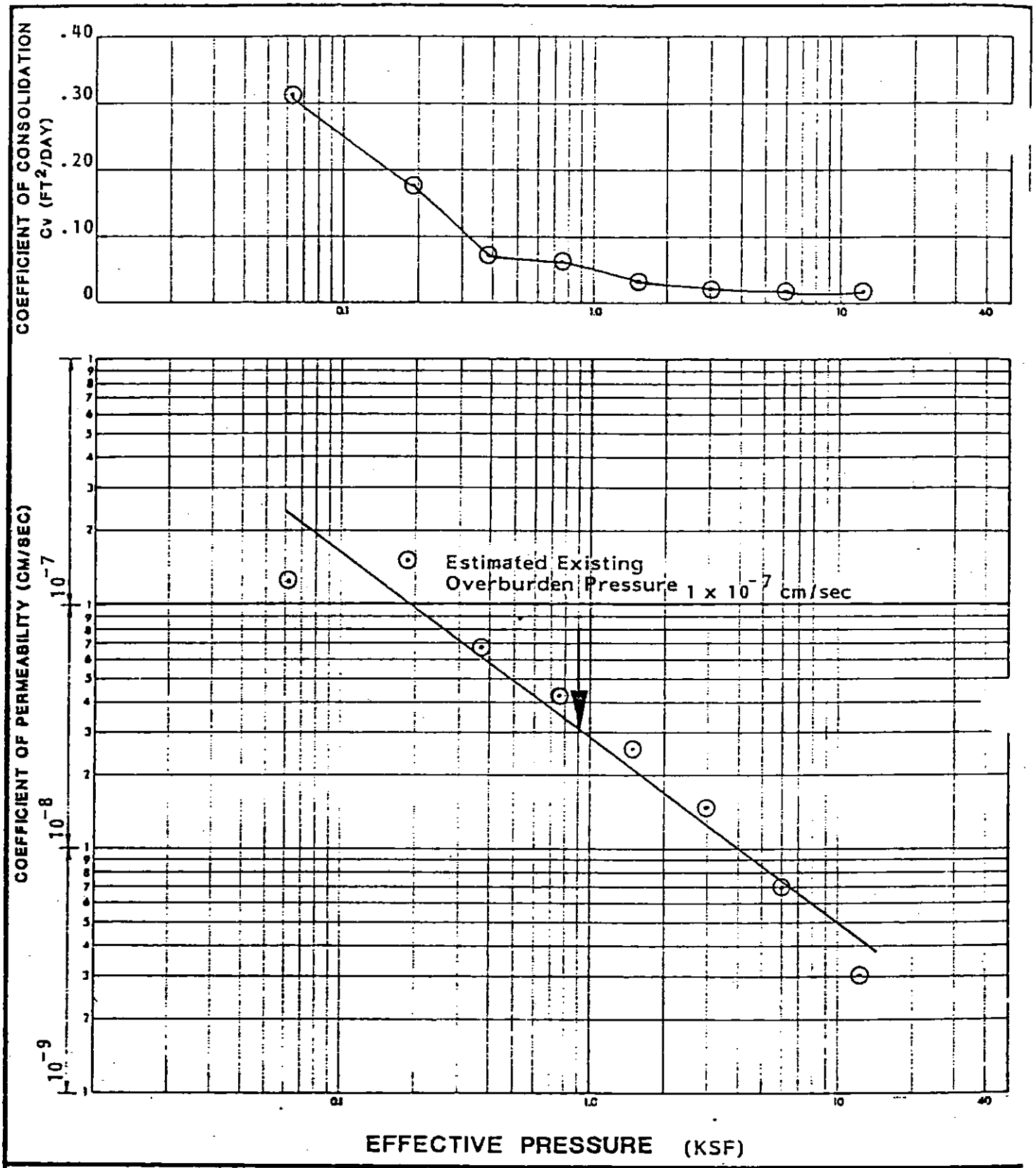


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: A-2 DEPTH: 12.6

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: 12/22/83
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-13



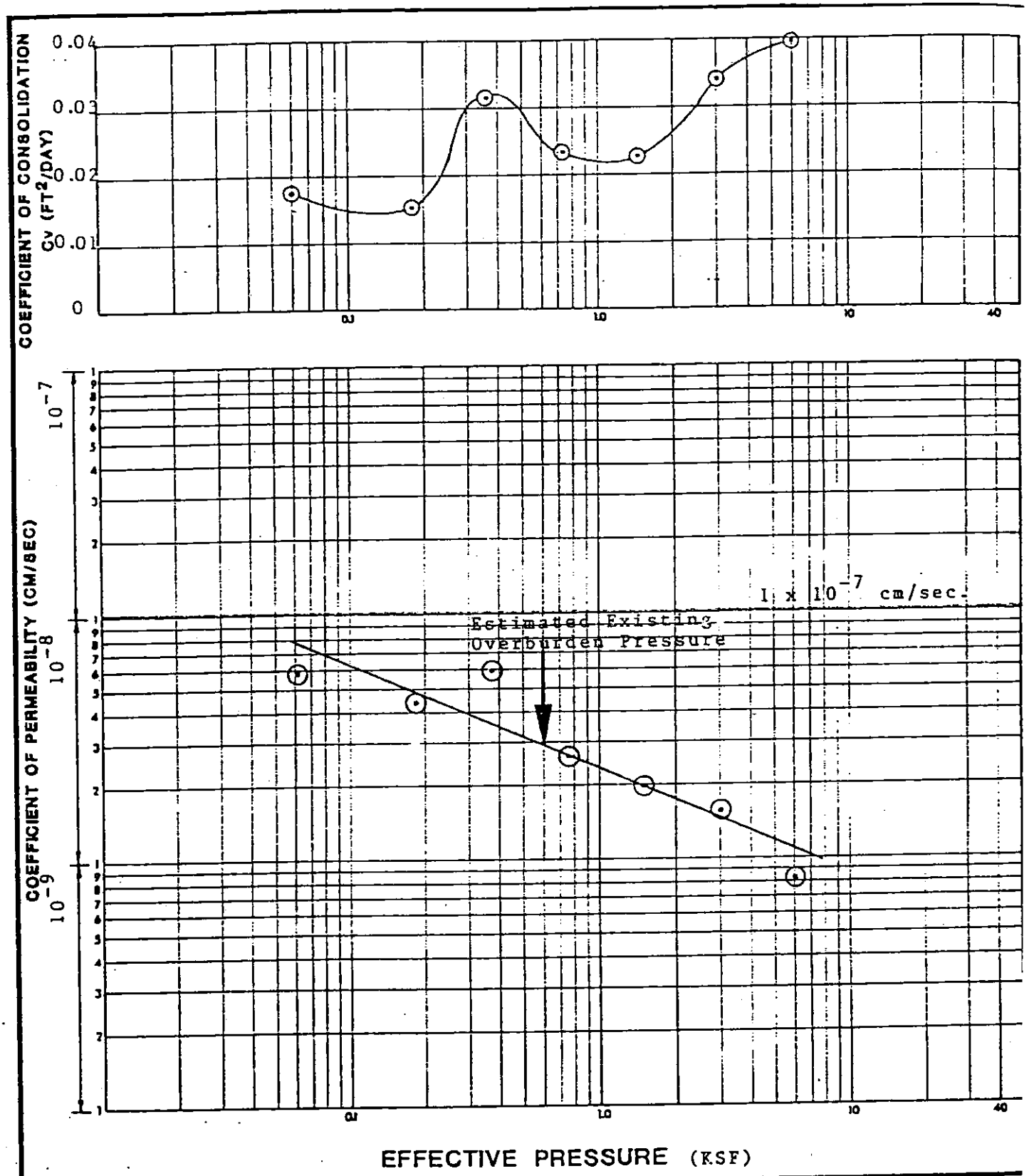
PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST

TEST BORING: A-3 DEPTH: 25.1

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date: 12/22/83
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-14

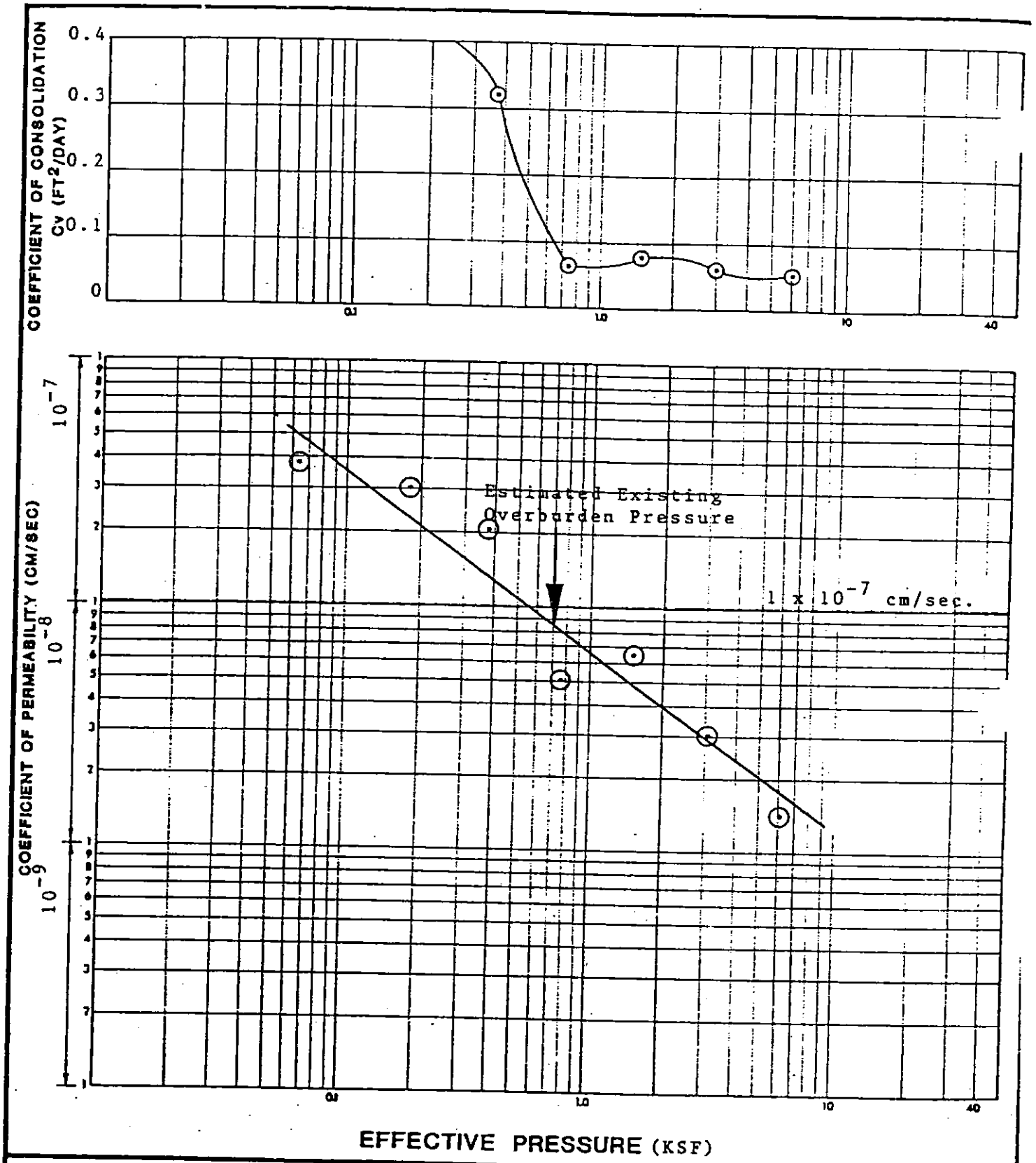


PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST
TEST BORING: A-5 DEPTH: 15.5

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date:
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-15



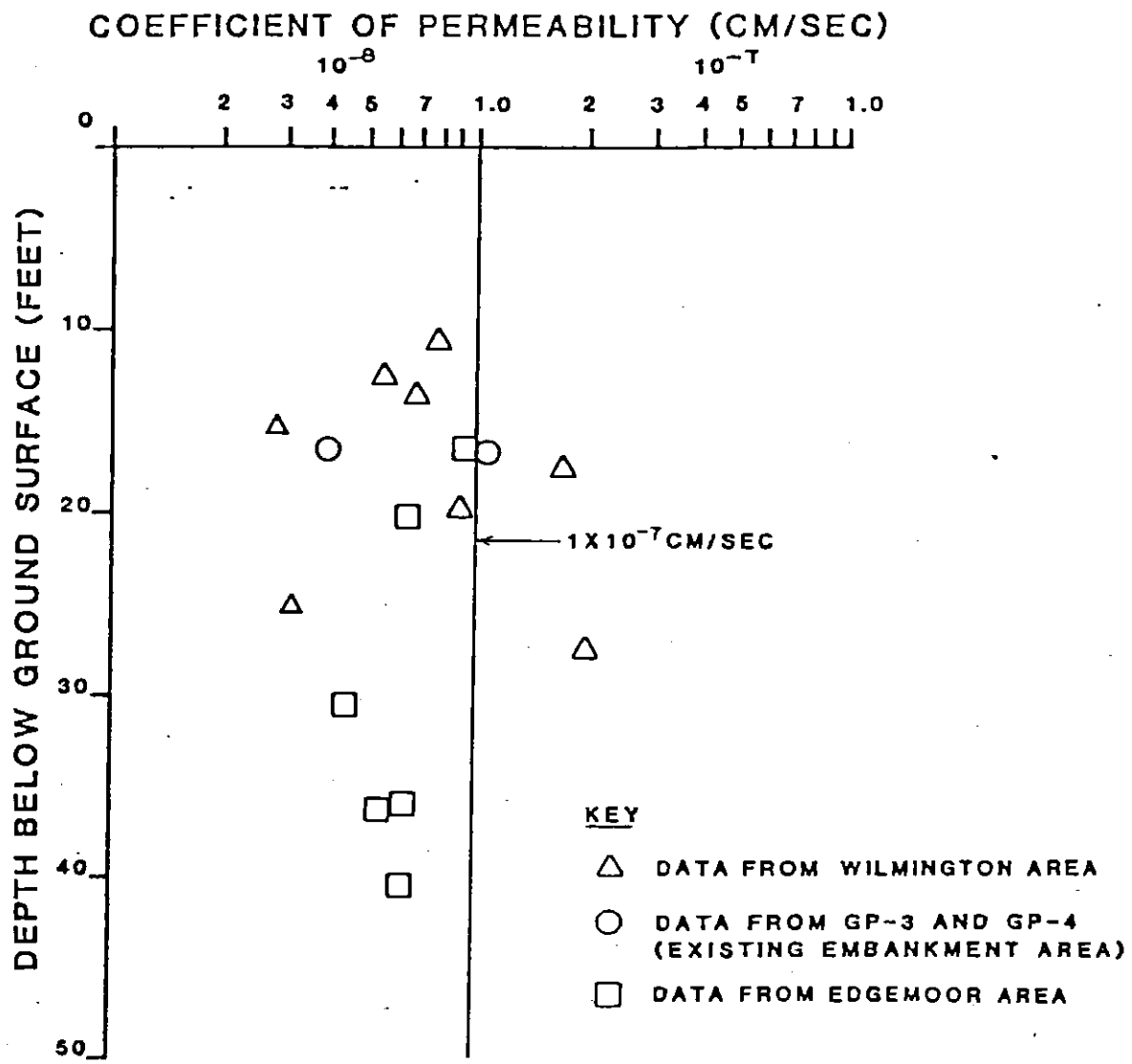
PERMEABILITY RELATED DATA
FROM CONSOLIDATION TEST

TEST BORING: A-7 DEPTH: 20.1

NSWF-2
CHERRY ISLAND
WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DSH Chk'd: RDC	Date:
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-16



NOTE

PERMEABILITIES AT ESTIMATED EXISTING OVERBURDEN PRESSURES DETERMINED FROM PLOTS OF PERMEABILITY VS. PRESSURE LINEAR REGRESSION LINES

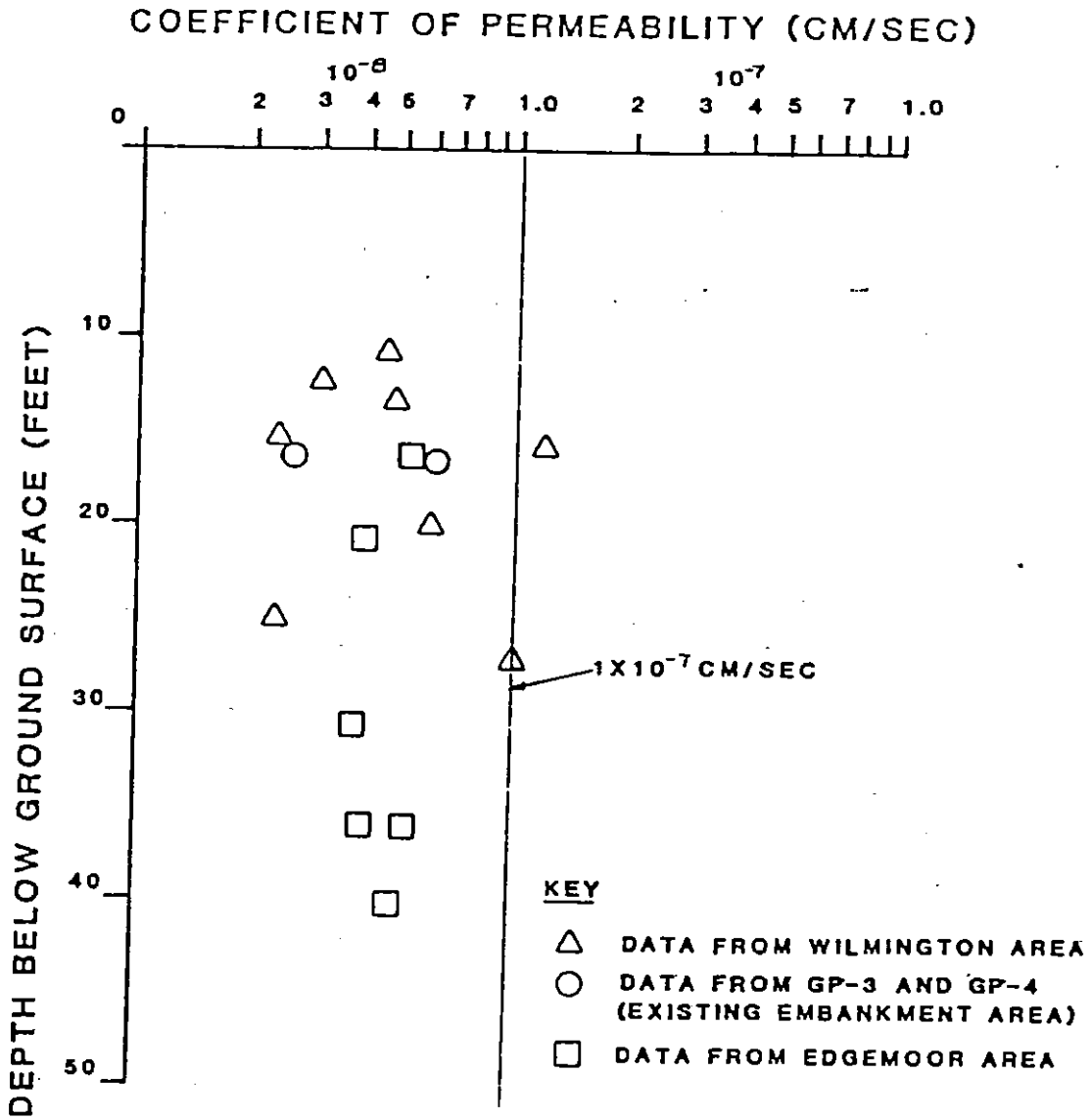
COEFFICIENT OF PERMEABILITY VS. DEPTH AT ESTIMATED EXISTING OVERBURDEN PRESSURE

NSWF-2
CHERRY ISLAND

WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DMA Chk'd: RDC	Date: 1/6/84
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-17



NOTE

PERMEABILITIES DETERMINED FROM PLOTS OF PERMEABILITY VS. PRESSURE LINEAR REGRESSION LINES FROM SUM OF ESTIMATED EXISTING OVERBURDEN PRESSURE AND 25% OF ULTIMATE DESIGN LOAD DUE TO 40 FEET OF REFUSE (500 PSF)

COEFFICIENT OF PERMEABILITY VS. DEPTH AT TIME 25% OF ULTIMATE DESIGN LOAD IS FELT

NSWF-2

CHERRY ISLAND

WILMINGTON, DELAWARE

DUFFIELD ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

Drawn: DMA Chk'd: RDC	Date: 1/6/84
Scale: AS SHOWN	W.O.: 410
File No.:	Fig. D-6-18

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, NSWF, PHASE III

BOREHOLE	GF-104
SAMPLE	Bag
DEPTH (FT)	0-1

UNIFIED CLASSIFICATION	MH
LIQUID LIMIT	79.9
PLASTIC LIMIT	54.6
PLASTICITY INDEX	25.3

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	4.00	3.89
HEIGHT (IN)	4.60	4.47
WATER CONTENT (%)	48.6	48.4
VOID RATIO	1.510	1.308
SATURATION (%)	86.7	100
DRY DENSITY (PCF)	67.2	73.0

EFFECTIVE CONSOLIDATION PRESSURE (PSI) (SEE BELOW)

PERMEABILITY DATA

CONSOL PRESSURE (KSF)	0.91	1.90	3.61
CELL PRESSURE (PSI)	47.0	59.0	76.0
BACK PRESSURE			
AT BOTTOM OF SPECIMEN (PSI)	42.2	51.3	60.3
AT TOP OF SPECIMEN (PSI)	40.4	45.4	50.4
HYDRAULIC (	11	36	61
PERMEABILI	3.2×10^{-7}	1.7×10^{-7}	6.3×10^{-8}

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, NSWF, PHASE III

BOREHOLE	GF-104
SAMPLE	U-1
DEPTH (FT)	6.5-8.5'

UNIFIED CLASSIFICATION	MH
LIQUID LIMIT	65.9
PLASTIC LIMIT	40.9
PLASTICITY INDEX	25.0

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	2.82	2.75
HEIGHT (IN)	4.14	4.04
WATER CONTENT (%)	50.6	45.1
VOID RATIO	1.403	1.218
SATURATION (%)	97.4	100
DRY DENSITY (PCF)	70.2	76.0

EFFECTIVE CONSOLIDATION PRESSURE (PSI) Consolidated the same specimen under the four pressures listed below.

PERMEABILITY DATA

CONSOL PRESSURE (KSF)	0.36	0.79	1.25	1.68
CELL PRESSURE (PSI)	53.0	56.0	59.0	62.0
BACK PRESSURE				
AT BOTTOM OF SPECIMEN (PSI)	51.3	51.3	51.3	55.3
AT TOP OF SPECIMEN (PSI)	50.5	50.5	50.3	50.3
HYDRAULIC GRADIENT	6.2	6.7	6.8	34
PERMEABILITY (CM/SEC)	3.5×10^{-6}	4.1×10^{-7}	1.7×10^{-7}	$9.8 \times 10^{-}$

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DELAWARE SOLID WASTE AUTHORITY, NSWF, PHASE III

BOREHOLE GF-105

SAMPLE BAG

DEPTH (FT) 0'-1'

UNIFIED CLASSIFICATION	MH
LIQUID LIMIT	71.2
PLASTIC LIMIT	49.5
PLASTICITY INDEX	21.7

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	4.00	3.91
HEIGHT (IN)	3.32	3.25
WATER CONTENT (%)	52.0	55.5
VOID RATIO	1.668	1.490
SATURATION (%)	84.2	100
DRY DENSITY (PCF)	63.2	67.2

EFFECTIVE CONSOLIDATION PRESSURE (PSI) (SEE BELOW)

PERMEABILITY DATA

CON. PRESSURE (KSF)	0.76	0.95
CELL PRESSURE (PSI)	76.0	83.0
BACK PRESSURE		
AT BOTTOM OF SPECIMEN (PSI)	72.2	78.1
AT TOP OF SPECIMEN (PSI)	70.7	76.4
HYDRAULIC GRADIENT	16	15
PERMEABILITY (CM/SEC)	2.5×10^{-6}	2.0×10^{-6}

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, NSWF, PHASE III

BOREHOLE	GF-105
SAMPLE	Bag
DEPTH (FT)	0-1

UNIFIED CLASSIFICATION	MH
LIQUID LIMIT	71.2
PLASTIC LIMIT	49.5
PLASTICITY INDEX	21.7

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	4.01	3.85
HEIGHT (IN)	4.60	4.42
WATER CONTENT (%)	46.7	41.4
VOID RATIO	1.380	1.119
SATURATION (%)	91.4	100
DRY DENSITY (PCF)	70.8	79.5

EFFECTIVE CONSOLIDATION PRESSURE (PSI) (SEE BELOW)

PERMEABILITY DATA

CONSOL PRESSURE (KSF)	0.91	1.90	3.61
CELL PRESSURE (PSI)	47.0	59.0	76.0
BACK PRESSURE			
AT BOTTOM OF SPECIMEN (PSI)	42.3	51.3	60.3
AT TOP OF SPECIMEN (PSI)	40.3	45.3	50.4
HYDRAULIC GRADIENT	12	37	62
PERMEABILITY (CM/SEC)	2.4×10^{-8}	2.4×10^{-8}	1.4×10^{-8}

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, NSWF, PHASE III

BOREHOLE GF-105

SAMPLE U-1

DEPTH (FT) 5-7'

UNIFIED CLASSIFICATION	MH
LIQUID LIMIT	69.5
PLASTIC LIMIT	42.2
PLASTICITY INDEX	27.3

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	2.84	2.76
HEIGHT (IN)	4.20	4.11
WATER CONTENT (%)	70.5	71.8
VOID RATIO	2.133	1.940
SATURATION (%)	89.2	100
DRY DENSITY (PCF)	53.8	57.3

EFFECTIVE CONSOLIDATION PRESSURE (PSI) Consolidated the same specimen under the three pressures listed below.

PERMEABILITY DATA

CONSOL PRESSURE (KSF)	0.36	0.79	1.25
CELL PRESSURE (PSI)	53.0	56.0	59.0
BACK PRESSURE			
AT BOTTOM OF SPECIMEN (PSI)	51.3	51.2	51.2
AT TOP OF SPECIMEN (PSI)	50.5	50.5	50.3
HYDRAULIC GRADIENT	5.3	4.8	5.5
PERMEABILITY (CM/SEC)	8.6×10^{-5}	6.7×10^{-5}	7.2×10^{-5}

Note: High permeability due to the fractured structure of the specimen. The fractures are most likely to be the result of numerous wet, dry cycles.

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DELAWARE SOLID WASTE AUTHORITY, NSWF, PHASE III

BOREHOLE	GF-106
SAMPLE	BAG
DEPTH (FT)	0'-1'

UNIFIED CLASSIFICATION	MH
LIQUID LIMIT	53.2
PLASTIC LIMIT	38.1
PLASTICITY INDEX	15.1

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	4.02	4.00
HEIGHT (IN)	3.89	3.87
WATER CONTENT (%)	52.0	55.1
VOID RATIO	1.518	1.488
SATURATION (%)	92.5	100
DRY DENSITY (PCF)	67.0	67.7

EFFECTIVE CONSOLIDATION PRESSURE (PSI) (SEE BELOW)

PERMEABILITY DATA

CON. PRESSURE (KSF)	0.76	0.95
CELL PRESSURE (PSI)	76.0	83.0
BACK PRESSURE		
AT BOTTOM OF SPECIMEN (PSI)	72.2	78.0
AT TOP OF SPECIMEN (PSI)	70.7	76.4
HYDRAULIC GRADIENT	14	13
PERMEABILITY (CM/SEC)	2.8×10^{-7}	2.7×10^{-7}

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA,NSWF,PHASE III

BOREHOLE GF-106

SAMPLE U-1

DEPTH (FT) 8-10'

UNIFIED CLASSIFICATION ML

LIQUID LIMIT

PLASTIC LIMIT N/P

PLASTICITY INDEX

SPECIMEN DATA /Specimen #1

	BEFORE CONSOLIDATION	FOURTH AFTER CONSOLIDATION
DIAMETER (IN)	2.77	2.76
HEIGHT (IN)	3.74	3.74
WATER CONTENT (%)	69.7	75.3
VOID RATIO	2.047	2.033
SATURATION (%)	91.9	100
DRY DENSITY (PCF)	55.3	55.6

EFFECTIVE CONSOLIDATION PRESSURE (PSI) Consolidated same specimen under the four pressures listed below.

PERMEABILITY DATA

CONSOL PRESSURE (KSF)	0.16	0.45	0.82	1.8
CELL PRESSURE (PSI)	61.8	68.8	76.8	88.
BACK PRESSURE				
AT BOTTOM OF SPECIMEN (PSI)	60.7	65.9	70.9	75.
AT TOP OF SPECIMEN (PSI)	61.2	66.6	73.5	78.
HYDRAULIC GRADIENT	3.7	5.2	19	19
PERMEABILITY (CM/SEC)	2.0×10^{-5}	1.8×10^{-5}	1.5×10^{-5}	1.3 X

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA,NSWF,PHASE III

BOREHOLE GF-107

SAMPLE U-1

DEPTH (FT) 20-22

UNIFIED CLASSIFICATION MH

LIQUID LIMIT 66.3

PLASTIC LIMIT 43.3

PLASTICITY INDEX 23.0

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	2.90	2.65
HEIGHT (IN)	4.36	4.00
WATER CONTENT (%)	83.0	60.7
VOID RATIO	2.449	1.639
SATURATION (%)	91.5	100
DRY DENSITY (PCF)	48.9	63.9

EFFECTIVE CONSOLIDATION PRESSURE (PSI) Consolidated the same specimen under the two pressures listed below.

PERMEABILITY DATA

CONSOL PRESSURE (KSF)	0.36	1.68
CELL PRESSURE (PSI)	53.0	62.0
BACK PRESSURE		
AT BOTTOM OF SPECIMEN (PSI)	51.3	56.3
AT TOP OF SPECIMEN (PSI)	50.3	50.3
HYDRAULIC GRADIENT	6.6	41
PERMEABILITY (CM/SEC)	1.3×10^{-7}	5.3×10^{-8}

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DELAWARE SOLID WASTE AUTHORITY, NSWF, PHASE III

BOREHOLE GF-108

SAMPLE BAG

DEPTH (FT) 0'-1'

UNIFIED CLASSIFICATION	MH
LIQUID LIMIT	55.6
PLASTIC LIMIT	38.3
PLASTICITY INDEX	17.3

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	4.00	3.79
HEIGHT (IN)	4.56	4.32
WATER CONTENT (%)	54.1	44.8
VOID RATIO	1.608	1.210
SATURATION (%)	90.8	100
DRY DENSITY (PCF)	64.6	76.3

EFFECTIVE CONSOLIDATION PRESSURE (PSI) (SEE BELOW)

PERMEABILITY DATA

CON. PRESSURE (KSF)	0.75	1.80
CELL PRESSURE (PSI)	76.0	89.0
BACK PRESSURE		
AT BOTTOM OF SPECIMEN (PSI)	72.3	78.4
AT TOP OF SPECIMEN (PSI)	70.8	76.4
HYDRAULIC GRADIENT	12	12
PERMEABILITY (CM/SEC)	2.7×10^{-7}	1.4×10^{-7}

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, NSWF, PHASE III

BOREHOLE	GF-108
SAMPLE	Bag
DEPTH (FT)	0-1

UNIFIED CLASSIFICATION	MH
LIQUID LIMIT	55.6
PLASTIC LIMIT	38.3
PLASTICITY INDEX	17.3

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	4.01	3.76
HEIGHT (IN)	4.57	4.29
WATER CONTENT (%)	42.2	31.8
VOID RATIO	1.247	0.857
SATURATION (%)	91.3	100
DRY DENSITY (PCF)	75.0	90.8

EFFECTIVE CONSOLIDATION PRESSURE (PSI) (SEE BELOW)

PERMEABILITY DATA

CONSOL PRESSURE (KSF)	0.91	1.90	3.61
CELL PRESSURE (PSI)	47.0	59.0	76.0
BACK PRESSURE			
AT BOTTOM OF SPECIMEN (PSI)	42.3	51.3	60.3
AT TOP OF SPECIMEN (PSI)	40.4	45.3	50.3
HYDRAULIC GRADIENT	12	38	64
PERMEABILITY (CM/SEC)	3.8×10^{-8}	2.9×10^{-8}	2.0×10^{-8}

GANNETT FLEMING GEOTECHNICAL LABORATORY

COMPATIBILITY SUMMARY SHEET

PROJECT DSWA,NSWF,PHASE III DATE 4/ 90

BORING GF-108 SAMPLE Bag DEPTH 0-1'

SPECIMEN DATA

Unified Classification MH

Liquid Limit 55.6

Plastic Limit 38.3

Water Content 40.3 %

Dry Density 80.7 pcf

Void Ratio 1.088

Saturation 100 %

Diameter 2.8 inch/ Height 2.2 inch

TEST CONDITIONS

Consolidation Pressure 1.50 ksf

Cell Pressure 78.8 psi

Back Pressure

At the bottom of specimen 78.3 psi

At the top of specimen 68.3 psi

Hydraulic Gradient 128

TEST RESULTS

Initial Permeability 1.5×10^{-8} cm/sec

Final Permeability 1.7×10^{-8} cm/sec

Notes: (1) The initial permeability is reported using distilled water as the permeant.

(2) The final permeability is reported after exchanging two pore volumes with leachate.

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA,NSWF,PHASE III

BOREHOLE GF-109

SAMPLE U-1

DEPTH (FT) 14-16

UNIFIED CLASSIFICATION MH

LIQUID LIMIT

PLASTIC LIMIT

PLASTICITY INDEX

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	2.88	2.65
HEIGHT (IN)	4.07	3.76
WATER CONTENT (%)	84.1	61.2
VOID RATIO	2.382	1.654
SATURATION (%)	95.3	100
DRY DENSITY (PCF)	49.8	63.6

EFFECTIVE CONSOLIDATION PRESSURE (PSI) Consolidated the same specimen under the two pressures listed below.

PERMEABILITY DATA

CONSOL PRESSURE(KSF)	0.36	1.68
CELL PRESSURE (PSI)	53.0	62.0
BACK PRESSURE		
AT BOTTOM OF SPECIMEN (PSI)	51.3	56.3
AT TOP OF SPECIMEN (PSI)	50.3	50.4
HYDRAULIC GRADIENT	7.0	44
PERMEABILITY (CM/SEC)	1.7×10^{-7}	5.2×10^{-8}

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, NSWF, PHASE III

BOREHOLE	GF-110
SAMPLE	U-1
DEPTH (FT)	10-12'

UNIFIED CLASSIFICATION	MH
LIQUID LIMIT	67.1
PLASTIC LIMIT	45.4
PLASTICITY INDEX	21.7

SPECIMEN DATA

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
DIAMETER (IN)	2.84	2.78
HEIGHT (IN)	4.00	3.90
WATER CONTENT (%)	62.5	57.5
VOID RATIO	1.727	1.552
SATURATION (%)	97.7	100
DRY DENSITY (PCF)	61.8	66.1

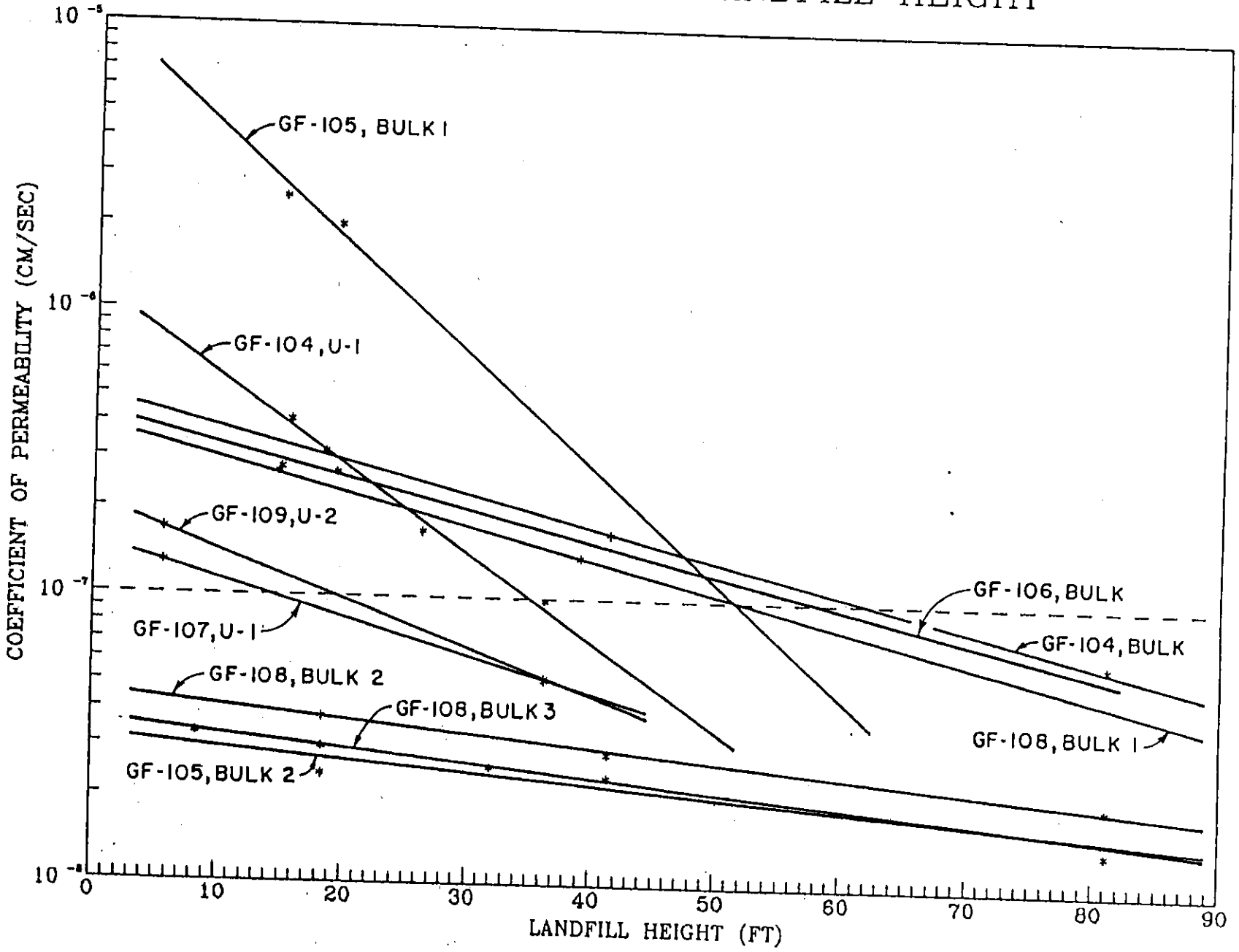
EFFECTIVE CONSOLIDATION PRESSURE (PSI) Consolidated the same specimen under the three pressures listed below.

PERMEABILITY DATA

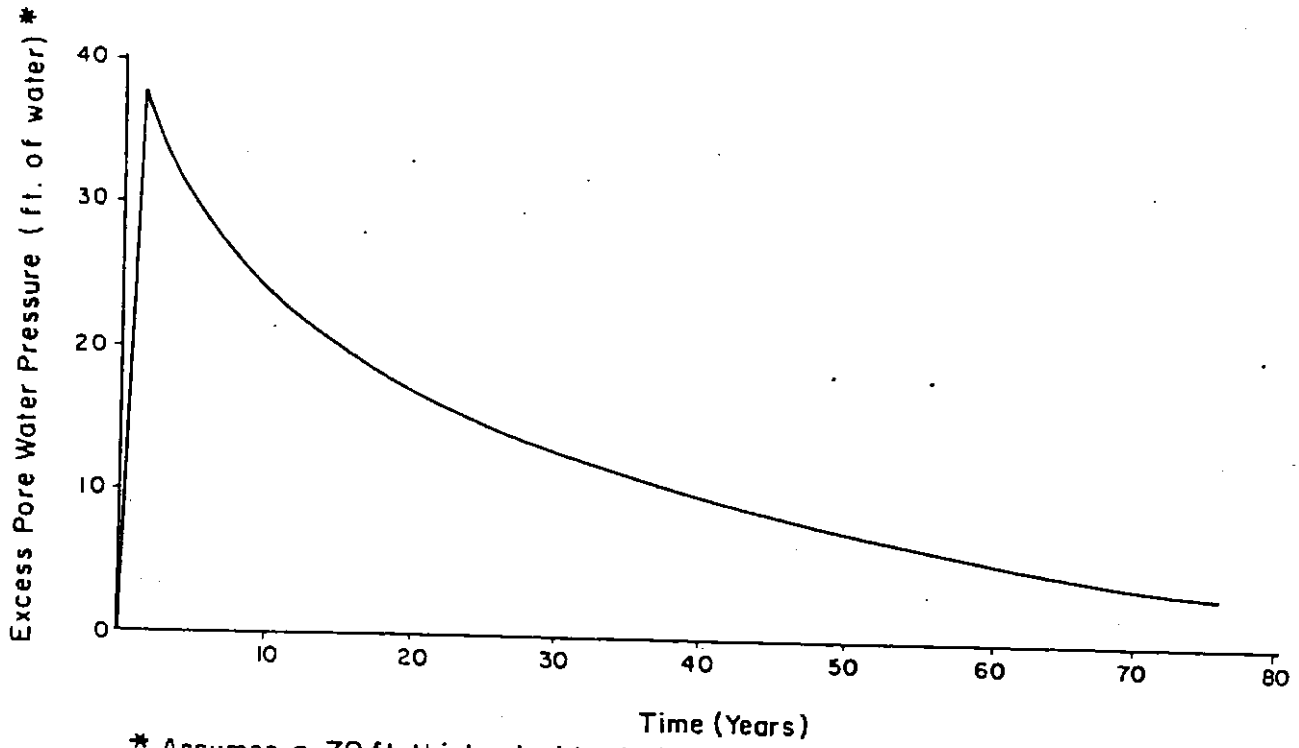
CONSOL PRESSURE(KSF)	0.36	0.79	1.25
CELL PRESSURE (PSI)	53.0	56.0	59.0
BACK PRESSURE			
AT BOTTOM OF SPECIMEN (PSI)	51.2	51.2	51.2
AT TOP OF SPECIMEN (PSI)	50.5	50.5	50.3
HYDRAULIC GRADIENT	4.8	5.5	5.9
PERMEABILITY (CM/SEC)	2.5×10^{-4}	1.5×10^{-4}	1.1×10^{-4}

Note: Specimen contained a cylindrically shaped stained region. This stained cylinder had a diameter of about ¼ to ½ inches, and was oriented vertically in the sample. The stained cylinder probably represents a piece of decayed phragmites. Its open structure very probably produced the high permeabilities.

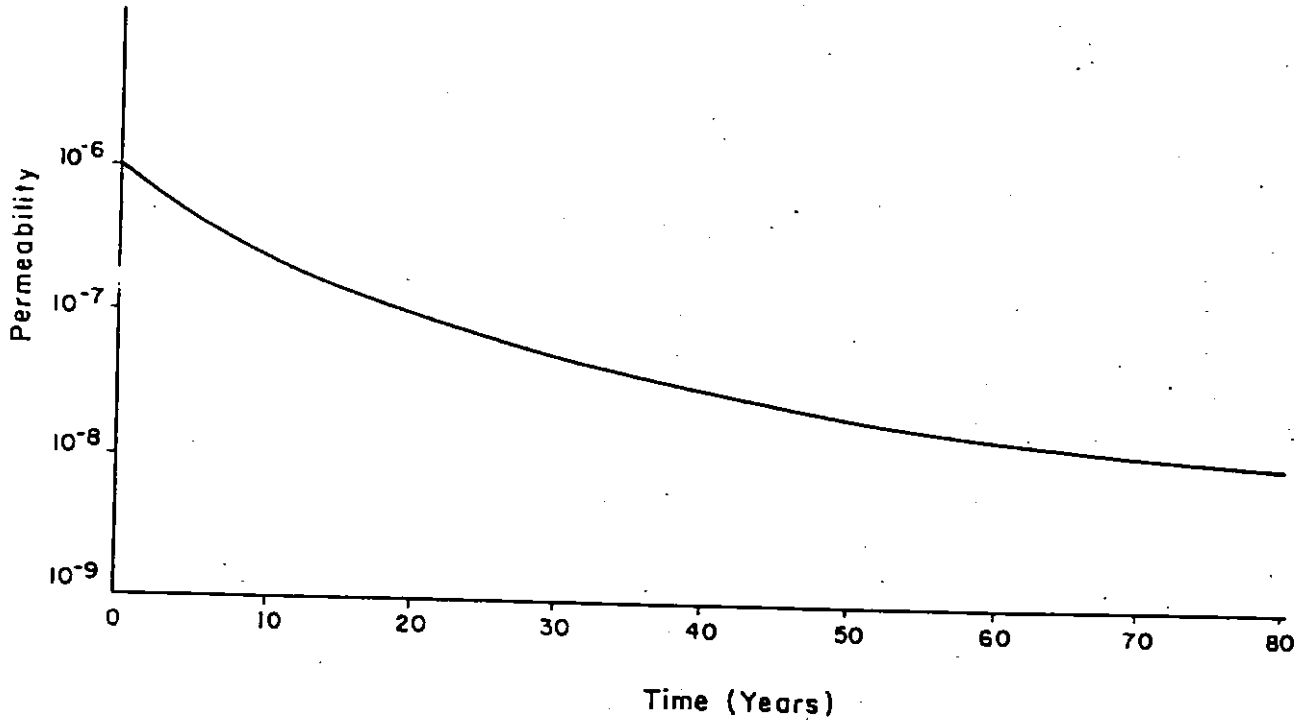
PERMEABILITY VS. LANDFILL HEIGHT



PERM VS CONSOLIDATION PRESSUI



* Assumes a 70 ft. thick, doubly drained layer



UPWARD GRADIENT AND PERMEABILITY VS. TIME

Figure 3.03

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, PHASE IA DATE 7/90

BORING GF-203 SAMPLE U-1 DEPTH 10-12'

SPECIMEN DATA

Unified Classification MH

Liquid Limit 58.9

Plastic Limit 39.0

Water Content 72.8 %

Dry Density 56.0 pcf

Void Ratio 2.068

Saturation 96.8 %

Diameter 2.84 inch/ Height 3.01 inch

Undisturbed X Remolded ___

TEST RESULTS	#1	#2
Consolidation Pressure	0.86 ksf	1.73 ksf
Height	2.96 inch	2.92 inch
Water Content	69.8 %	65.2%
Dry Density	58.8 pcf	61.5 pcf
Void Ratio	1.920	1.792
Saturation	100 %	100%
Cell Pressure	51.0 psi	57.0 psi
Back Pressure		
At the bottom of specimen	48.3 psi	50.2 psi
At the top of specimen	45.4 psi	45.3 psi
Hydraulic Gradient	27	47
Permeability	1.4×10^{-7} cm/sec	8.1×10^{-8} cm/sec

Remarks:

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, PHASE I DATE 8/90

BORING GF-204 SAMPLE U-1 DEPTH 38-40'

SPECIMEN DATA

Unified Classification MH

Liquid Limit 53.6

Plastic Limit 33.8

Water Content 50.6 %

Dry Density 69.2 pcf

Void Ratio 1.480

Saturation 94.0 %

Diameter 2.85 inch/ Height 3.52 inch

Undisturbed X Remolded ___

TEST RESULTS

Consolidation Pressure 1.44 ksf

Height 3.48 inch

Water Content 50.8 %

Dry Density 71.6 pcf

Void Ratio 1.398

Saturation 100 %

Cell Pressure 65.0 psi

Back Pressure

At the bottom of specimen 60.3 psi

At the top of specimen 55.4 psi

Hydraulic Gradient 39

Permeability 5.6×10^{-8} cm/sec

Remarks:

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA , PHASE IA DATE July 1990

BORING GF-207 SAMPLE U-1 DEPTH 10.0' - 12.0'

SPECIMEN DATA

Unified Classification MH

Liquid Limit 57.6

Plastic Limit 39.3

Water Content 82.9 %

Dry Density 50.3 pcf

Void Ratio 2.416

Saturation 94.4 %

Diameter 2.83 inch/ Height 2.90 inch

Undisturbed XX Remolded ___

TEST RESULTS	#1		#2	#3	#4
Consolidation Pressure	0.86	ksf	1.73 ksf	2.59 ksf	3.46 ksf
Height	2.83	inch	2.78 in.	2.73 in.	2.70 in.
Water Content	79.6	%	72.8%	66.9%	63.4%
Dry Density	53.8	pcf	57.2 pcf	60.4 pcf	62.6 pcf
Void Ratio	2.189		2.003	1.841	1.743
Saturation	100	%	100%	100%	100%
Cell Pressure	51.0	psi	57.0 psi	68.0 psi	79.0 psi
Back Pressure					
At the bottom of specimen	48.2	psi	50.2 psi	55.2 psi	60.3 psi
At the top of specimen	45.5	psi	45.4 psi	50.3 psi	55.4 psi
Hydraulic Gradient	26		48	50	50
Permeability	1.6×10^{-6}	cm/sec	2.9×10^{-7}	1.7×10^{-7}	1.0×10^{-7}

Remarks: Specimen contained a root fragment along its full length.

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, PHASE I DATE 8/90

BORING GF-208 SAMPLE U-1 DEPTH 42.5-44.5'

SPECIMEN DATA

Unified Classification MH

Liquid Limit 59.2

Plastic Limit 37.0

Water Content 86.3 %

Dry Density 48.8 pcf

Void Ratio 2.521

Saturation 94.1 %

Diameter 2.81 inch/ Height 3.16 inch

Undisturbed X Remolded ___

TEST RESULTS	#1	#2	#3
Consolidation Pressure	1.44 ksf	2.16 ksf	2.88 ksf
Height	3.00 inch	2.96 inch	2.92 inch
Water Content	73.1 %	68.1 %	64.5 %
Dry Density	57.0 pcf	59.7 pcf	61.9 pcf
Void Ratio	2.009	1.873	1.773
Saturation	100 %	100 %	100 %
Cell Pressure	65.0 psi	75.0 psi	80.0 psi
Back Pressure			
At the bottom of specimen	60.3 psi	65.4 psi	65.4 psi
At the top of specimen	55.4 psi	60.5 psi	60.4 psi
Hydraulic Gradient	43	46	47
Permeability	6.8×10^{-7} cm/sec	2.4×10^{-7} cm/sec	6.0×10^{-8}

Remarks:

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, PHASE I DATE 8/90

BORING GF-209 SAMPLE U-1 DEPTH 42-44'

SPECIMEN DATA

Unified Classification ML

Liquid Limit 44.5

Plastic Limit 29.4

Water Content 72.5 %

Dry Density 56.3 pcf

Void Ratio 2.049

Saturation 97.3 %

Diameter 2.78 inch/ Height 3.65 inch

Undisturbed x Remolded ___

TEST RESULTS

Consolidation Pressure 1.44 ksf

Height 3.49 inch

Water Content 60.2 %

Dry Density 64.7 pcf

Void Ratio 1.654

Saturation 100 %

Cell Pressure 65.0 psi

Back Pressure

At the bottom of specimen 60.3 psi

At the top of specimen 55.4 psi

Hydraulic Gradient 40

Permeability 3.7×10^{-8} cm/sec

Remarks:

GANNETT FLEMING GEOTECHNICAL LABORATORY

PERMEABILITY SUMMARY SHEET

PROJECT DSWA, PHASE IA DATE 7/90

BORING GF-210 SAMPLE U-1 DEPTH 10-12'

SPECIMEN DATA

Unified Classification MH

Liquid Limit 64.0

Plastic Limit 41.6

Water Content 76.9 %

Dry Density 51.4 pcf

Void Ratio 2.338

Saturation 90.5 %

Diameter 2.82 inch/ Height 5.01 inch

Undisturbed X Remolded ___

TEST RESULTS	#1	#2
Consolidation Pressure	0.86 ksf	1.73 ksf
Height	4.87 inch	4.76 inch
Water Content	75.0 %	67.0%
Dry Density	56.0 pcf	60.0 pcf
Void Ratio	2.063	1.844
Saturation	100 %	100%
Cell Pressure	51.0 psi	57.0 psi
Back Pressure		
At the bottom of specimen	48.3 psi	50.2 psi
At the top of specimen	45.4 psi	45.3 psi
Hydraulic Gradient	16	29
Permeability	1.7×10^{-7} cm/sec	5.1×10^{-8}

Remarks:

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-1,ST-2,13'-15'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	001.1
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 06/24/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	659	569
Dry Weight, grams	336	373
Diameter, cm	7.20	6.89
Length, cm	10.63	9.74
Volume, cc	432	363
Moisture Content, % dry	96.1	52.5
Wet Unit Weight, pcf	95	98
Dry Unit Weight, pcf	48.5	64.1
Specific Gravity	2.60	2.60
Void Ratio	2.35	1.53
Porosity, %	70.1	60.5
Pore Volume, cc	303	220
Degree of Saturation, %	106.5	89.1

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	14.0
Average Wet Unit Weight, pcf	95
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	4.2
Maximum Differential Pressure, psi	3.2
Maximum Possible Gradient	23.1
Selected Target Gradient	23.1
Target Cell Pressure, psi	74.2
Target Outlet Pressure, psi	70.0
Target Inlet Pressure, psi	73.2

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	74.3
Outlet Pressure, psi	70.0
Inlet Pressure, psi	73.4
Differential Pressure, psi	3.4
Confining Pressure, psi	4.3
Hydraulic Gradient	24.8
Inlet Volume/Outlet Volume Ratio	1.01
Permeation Volume, pore volumes	0.65
Hydraulic Conductivity, cm/sec	2.21 E-07

NOTES

(1) Initial conc ›ed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen ›andy silt or clay

(2) Final cond ɪ conditions after saturation and consolidation at reported maximum confining pressure

(3) Average o ɪrements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-1,ST-2,13'-15'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	001.2
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 06/24/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	659	569
Dry Weight, grams	336	373
Diameter, cm	7.20	6.89
Length, cm	10.63	9.74
Volume, cc	432	363
Moisture Content, % dry	96.1	52.5
Wet Unit Weight, pcf	95	98
Dry Unit Weight, pcf	48.5	64.1
Specific Gravity	2.60	2.60
Void Ratio	2.35	1.53
Porosity, %	70.1	60.5
Pore Volume, cc	303	220
Degree of Saturation, %	106.5	89.1

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	14.0
Average Wet Unit Weight, pcf	95
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	25.6
Maximum Differential Pressure, psi	24.6
Maximum Possible Gradient	177.6
Selected Target Gradient	21.2
Target Cell Pressure, psi	95.6
Target Outlet Pressure, psi	70
Target Inlet Pressure, psi	73

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	95.5
Outlet Pressure, psi	70.0
Inlet Pressure, psi	73.2
Differential Pressure, psi	3.2
Confining Pressure, psi	25.5
Hydraulic Gradient	23.3
Inlet Volume/Outlet Volume Ratio	0.87
Permeation Volume, pore volumes	0.08
Hydraulic Conductivity, cm/sec	3.36 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-2,ST-1,13.5'-15.5'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	005.1
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 07/20/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	495	367
Dry Weight, grams	223	224
Diameter, cm	7.03	6.34
Length, cm	10.08	7.41
Volume, cc	391	234
Moisture Content, % dry	122.5	63.9
Wet Unit Weight, pcf	79	98
Dry Unit Weight, pcf	35.5	59.8
Specific Gravity	2.61	2.61
Void Ratio	3.59	1.73
Porosity, %	78.2	63.4
Pore Volume, cc	306	148
Degree of Saturation, %	89.2	96.6

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	14.5
Average Wet Unit Weight, pcf	79
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	9.6
Maximum Differential Pressure, psi	8.6
Maximum Possible Gradient	81.6
Selected Target Gradient	19.1
Target Cell Pressure, psi	79.6
Target Outlet Pressure, psi	70.0
Target Inlet Pressure, psi	72.7

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	79.6
Outlet Pressure, psi	70.0
Inlet Pressure, psi	72.7
Differential Pressure, psi	2.7
Confining Pressure, psi	9.6
Hydraulic Gradient	25.5
Inlet Volume/Outlet Volume Ratio	1.03
Permeation Volume, pore volumes	0.16
Hydraulic Conductivity, cm/sec	3.25 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-2,ST-1,13.5'-15.5'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	005.2
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 07/20/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	495	367
Dry Weight, grams	223	224
Diameter, cm	7.03	6.34
Length, cm	10.08	7.41
Volume, cc	391	234
Moisture Content, % dry	122.5	63.9
Wet Unit Weight, pcf	79	98
Dry Unit Weight, pcf	35.5	59.8
Specific Gravity	2.61	2.61
Void Ratio	3.59	1.73
Porosity, %	78.2	63.4
Pore Volume, cc	306	148
Degree of Saturation, %	89.2	96.6

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	14.5
Average Wet Unit Weight, pcf	79
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	15.0
Maximum Differential Pressure, psi	14.0
Maximum Possible Gradient	132.9
Selected Target Gradient	19.1
Target Cell Pressure, psi	85.0
Target Outlet Pressure, psi	70
Target Inlet Pressure, psi	

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	85.1
Outlet Pressure, psi	70.0
Inlet Pressure, psi	72.8
Differential Pressure, psi	2.8
Confining Pressure, psi	15.1
Hydraulic Gradient	26.8
Inlet Volume/Outlet Volume Ratio	0.92
Permeation Volume, pore volumes	0.09
Hydraulic Conductivity, cm/sec	2.24 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-2,ST-1,13.5'-15.5'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	005.3
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 07/20/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	495	367
Dry Weight, grams	223	224
Diameter, cm	7.03	6.34
Length, cm	10.08	7.41
Volume, cc	391	234
Moisture Content, % dry	122.5	63.9
Wet Unit Weight, pcf	79	98
Dry Unit Weight, pcf	35.5	59.8
Specific Gravity	2.61	2.61
Void Ratio	3.59	1.73
Porosity, %	78.2	63.4
Pore Volume, cc	306	148
Degree of Saturation, %	89.2	96.6

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	14.5
Average Wet Unit Weight, pcf	79
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	15.0
Maximum Differential Pressure, psi	14.0
Maximum Possible Gradient	132.9
Selected Target Gradient	19.1
Target Cell Pressure, psi	90.4
Target Outlet Pressure, psi	70.0
Target Inlet Pressure, psi	72.7

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	90.3
Outlet Pressure, psi	70.0
Inlet Pressure, psi	72.7
Differential Pressure, psi	2.7
Confining Pressure, psi	20.3
Hydraulic Gradient	26.1
Inlet Volume/Outlet Volume Ratio	0.95
Permeation Volume, pore volumes	0.11
Hydraulic Conductivity, cm/sec	1.73 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-2,ST-1,13.5'-15.5'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	005.4
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 07/20/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	495	367
Dry Weight, grams	223	224
Diameter, cm	7.03	6.34
Length, cm	10.08	7.41
Volume, cc	391	234
Moisture Content, % dry	122.5	63.9
Wet Unit Weight, pcf	79	98
Dry Unit Weight, pcf	35.5	59.8
Specific Gravity	2.61	2.61
Void Ratio	3.59	1.73
Porosity, %	78.2	63.4
Pore Volume, cc	306	148
Degree of Saturation, %	89.2	96.6

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	14.5
Average Wet Unit Weight, pcf	79
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	15.0
Maximum Differential Pressure, psi	14.0
Maximum Possible Gradient	132.9
Selected Target Gradient	19.1
Target Cell Pressure, psi	95.7
Target Outlet Pressure, psi	70.0
Target Inlet Pressure, psi	7

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	95.6
Outlet Pressure, psi	70.0
Inlet Pressure, psi	72.8
Differential Pressure, psi	2.8
Confining Pressure, psi	25.6
Hydraulic Gradient	26.7
Inlet Volume/Outlet Volume Ratio	0.96
Permeation Volume, pore volumes	0.07
Hydraulic Conductivity, cm/sec	1.41 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-3,ST-3,27.5'-29.5'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	002.1
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 08/19/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	589	507
Dry Weight, grams	324	317
Diameter, cm	6.91	6.61
Length, cm	10.09	8.58
Volume, cc	379	294
Moisture Content, % dry	81.8	60.0
Wet Unit Weight, pcf	97	107
Dry Unit Weight, pcf	53.4	67.2
Specific Gravity	2.64	2.64
Void Ratio	2.09	1.45
Porosity, %	67.6	59.2
Pore Volume, cc	256	174
Degree of Saturation, %	103.5	109.0

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	28.5
Average Wet Unit Weight, pcf	97
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	6.5
Maximum Differential Pressure, psi	5.5
Maximum Possible Gradient	45.1
Selected Target Gradient	30.0
Target Cell Pressure, psi	76.5
Target Outlet Pressure, psi	70.0
Target Inlet Pressure, psi	73.7

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	76.6
Outlet Pressure, psi	70.0
Inlet Pressure, psi	74.6
Differential Pressure, psi	4.6
Confining Pressure, psi	6.6
Hydraulic Gradient	37.5
Inlet Volume/Outlet Volume Ratio	1.03
Permeation Volume, pore volumes	0.77
Hydraulic Conductivity, cm/sec	2.85 E-07

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

E

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-3,ST-3,27.5'-29.5'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	002.2
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 08/18/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	589	507
Dry Weight, grams	324	317
Diameter, cm	6.91	6.61
Length, cm	10.09	8.58
Volume, cc	379	294
Moisture Content, % dry	81.8	60.0
Wet Unit Weight, pcf	97	107
Dry Unit Weight, pcf	53.4	67.2
Specific Gravity	2.64	2.64
Void Ratio	2.09	1.45
Porosity, %	67.6	59.2
Pore Volume, cc	256	174
Degree of Saturation, %	103.5	109.0

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	28.5
Average Wet Unit Weight, pcf	97
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	27.9
Maximum Differential Pressure, psi	26.9
Maximum Possible Gradient	220.4
Selected Target Gradient	30.0
Target Cell Pressure, psi	97.9
Target Outlet Pressure, psi	7'
Target Inlet Pressure, psi	

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	98.0
Outlet Pressure, psi	70.0
Inlet Pressure, psi	74.7
Differential Pressure, psi	4.7
Confining Pressure, psi	28.0
Hydraulic Gradient	38.3
Inlet Volume/Outlet Volume Ratio	1.09
Permeation Volume, pore volumes	1.27
Hydraulic Conductivity, cm/sec	5.07 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-4,ST-2,42'-44'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	003.1
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 06/24/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	715	627
Dry Weight, grams	344	407
Diameter, cm	7.22	6.91
Length, cm	11.29	10.64
Volume, cc	462	399
Moisture Content, % dry	107.9	54.3
Wet Unit Weight, pcf	97	98
Dry Unit Weight, pcf	46.4	63.6
Specific Gravity	2.63	2.63
Void Ratio	2.53	1.58
Porosity, %	71.7	61.2
Pore Volume, cc	331	244
Degree of Saturation, %	112.0	90.4

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	43.0
Average Wet Unit Weight, pcf	97
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	8.7
Maximum Differential Pressure, psi	7.7
Maximum Possible Gradient	50.9
Selected Target Gradient	30.0
Target Cell Pressure, psi	78.7
Target Outlet Pressure, psi	70.0
Target Inlet Pressure, psi	74.8

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	78.8
Outlet Pressure, psi	70.0
Inlet Pressure, psi	75.1
Differential Pressure, psi	5.1
Confining Pressure, psi	8.8
Hydraulic Gradient	33.6
Inlet Volume/Outlet Volume Ratio	1.05
Permeation Volume, pore volumes	0.15
Hydraulic Conductivity, cm/sec	3.80 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-4,ST-2,42'-44'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	003.2
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 06/24/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	715	627
Dry Weight, grams	344	407
Diameter, cm	7.22	6.91
Length, cm	11.29	10.64
Volume, cc	462	399
Moisture Content, % dry	107.9	54.3
Wet Unit Weight, pcf	97	98
Dry Unit Weight, pcf	46.4	63.6
Specific Gravity	2.63	2.63
Void Ratio	2.53	1.58
Porosity, %	71.7	61.2
Pore Volume, cc	331	244
Degree of Saturation, %	112.0	90.4

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	43.0
Average Wet Unit Weight, pcf	97
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	30.1
Maximum Differential Pressure, psi	29.1
Maximum Possible Gradient	192.3
Selected Target Gradient	30.0
Target Cell Pressure, psi	100.1
Target Outlet Pressure, psi	70
Target Inlet Pressure, psi	[illegible]

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	100.1
Outlet Pressure, psi	70.0
Inlet Pressure, psi	75.0
Differential Pressure, psi	5.0
Confining Pressure, psi	30.1
Hydraulic Gradient	33.4
Inlet Volume/Outlet Volume Ratio	0.89
Permeation Volume, pore volumes	0.05
Hydraulic Conductivity, cm/sec	1.38 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-4,ST-3,61'-63'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	004.1
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 06/24/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	490	378
Dry Weight, grams	214	239
Diameter, cm	6.66	6.85
Length, cm	10.42	8.51
Volume, cc	363	314
Moisture Content, % dry	129.2	58.3
Wet Unit Weight, pcf	84	75
Dry Unit Weight, pcf	36.7	47.6
Specific Gravity	2.64	2.64
Void Ratio	3.48	2.46
Porosity, %	77.7	71.1
Pore Volume, cc	282	223
Degree of Saturation, %	97.8	62.5

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	62.0
Average Wet Unit Weight, pcf	84
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	11.7
Maximum Differential Pressure, psi	10.7
Maximum Possible Gradient	88.4
Selected Target Gradient	30.0
Target Cell Pressure, psi	81.7
Target Outlet Pressure, psi	70.0
Target Inlet Pressure, psi	74.4

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	81.9
Outlet Pressure, psi	70.0
Inlet Pressure, psi	74.7
Differential Pressure, psi	4.7
Confining Pressure, psi	11.9
Hydraulic Gradient	39.0
Inlet Volume/Outlet Volume Ratio	1.08
Permeation Volume, pore volumes	0.14
Hydraulic Conductivity, cm/sec	2.32 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

F

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA-CHERRY ISLAND	PROJECT SAMPLE I. D.	TB-4,ST-3,61'-63'
W. O. NUMBER	2477-03-01	ETL SAMPLE NUMBER	004.2
JOB NUMBER	9205X006	TEST PERIOD	05/26/92 to 06/24/92

SPECIMEN DESCRIPTION

undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	490	378
Dry Weight, grams	214	239
Diameter, cm	6.66	6.85
Length, cm	10.42	8.51
Volume, cc	363	314
Moisture Content, % dry	129.2	58.3
Wet Unit Weight, pcf	84	75
Dry Unit Weight, pcf	36.7	47.6
Specific Gravity	2.64	2.64
Void Ratio	3.48	2.46
Porosity, %	77.7	71.1
Pore Volume, cc	282	223
Degree of Saturation, %	97.8	62.5

TEST CRITERIA	
Soil Type, USCS Classification	ML
Average Sample Depth, feet	62.0
Average Wet Unit Weight, pcf	84
Effective Stress Envelope, degrees	32
Earth Pressure Coefficent, Ko	0.47
Effective Horizontal Stress, psi	11.7
Maximum Differential Pressure, psi	10.7
Maximum Possible Gradient	88.4
Selected Target Gradient	30.0
Target Cell Pressure, psi	103.1
Target Outlet Pressure, psi	-
Target Inlet Pressure, psi	-

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	103.2
Outlet Pressure, psi	70.0
Inlet Pressure, psi	74.6
Differential Pressure, psi	4.6
Confining Pressure, psi	33.2
Hydraulic Gradient	38.1
Inlet Volume/Outlet Volume Ratio	0.92
Permeation Volume, pore volumes	0.04
Hydraulic Conductivity, cm/sec	1.20 E-08

NOTES

(1) Initial conditions: undisturbed soil specimen collected in a 3" diameter by 30" long brass Shelby tube; specimen is a black-gray sandy silt or clay

(2) Final conditions: estimated conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-12,ST-1,12'-14'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	005.2
W. O. NUMBER	02477-004-001	TEST PERIOD	08/09/93 to 08/13/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	860	852
Dry Weight, grams	472	472
Diameter, cm	7.16	7.12
Length, cm	14.01	13.97
Volume, cc	564	556
Moisture Content, % dry	82.2	80.6
Wet Unit Weight, pcf	95	96
Dry Unit Weight, pcf	52	53
Specific Gravity	2.68	2.68
Void Ratio	2.20	2.16
Porosity, %	68.8	68.3
Pore Volume, cc	388	380
Degree of Saturation, %	100.0	100.0

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	22.8
Average Wet Unit Weight, pcf	95
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	8.7
Maximum Possible Gradient	38.6
Selected Target Gradient	30.0
Target Differential Pressure, psi	6.0
Target Cell Burette Pressure, psi	68.5
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	65.8

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	68.6
Outlet Pressure, psi	60.0
Inlet Pressure, psi	66.1
Differential Pressure, psi	6.1
Confining Pressure, psi	8.6
Hydraulic Gradient	30.8
Inlet Volume/Outlet Volume Ratio	0.96
Permeation Volume, pore volumes	0.11
Hydraulic Conductivity, cm/sec @ 20C	1.08 E-07
Intrinsic Permeability, darcys @ 20C	1.09 E-03

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-12,ST-1,12'-14'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	005.3
W. O. NUMBER	02477-004-001	TEST PERIOD	08/17/93 to 08/26/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	852	833
Dry Weight, grams	472	472
Diameter, cm	7.12	7.00
Length, cm	13.97	13.94
Volume, cc	556	537
Moisture Content, % dry	80.6	76.4
Wet Unit Weight, pcf	96	97
Dry Unit Weight, pcf	53	55
Specific Gravity	2.68	2.68
Void Ratio	2.16	2.05
Porosity, %	68.3	67.2
Pore Volume, cc	380	360
Degree of Saturation, %	100.0	100.0

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	38.5
Average Wet Unit Weight, pcf	96
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	14.8
Maximum Possible Gradient	69.2
Selected Target Gradient	30.0
Target Differential Pressure, psi	6.0
Target Cell Burette Pressure, psi	74.6
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	65.8

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	74.6
Outlet Pressure, psi	60.0
Inlet Pressure, psi	65.8
Differential Pressure, psi	5.8
Confining Pressure, psi	14.6
Hydraulic Gradient	29.5
Inlet Volume/Outlet Volume Ratio	0.95
Permeation Volume, pore volumes	0.17
Hydraulic Conductivity, cm/sec @ 20C	6.28 E-08
Intrinsic Permeability, darcys @ 20C	6.38 E-04

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-11,ST-1,16'-18'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	001
W. O. NUMBER	02477-004-001	TEST PERIOD	07/28/93 to 08/04/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	751	733
Dry Weight, grams	400	401
Diameter, cm	7.15	7.00
Length, cm	12.76	12.60
Volume, cc	512	485
Moisture Content, % dry	87.6	83.0
Wet Unit Weight, pcf	91	94
Dry Unit Weight, pcf	49	52
Specific Gravity	2.63	2.63
Void Ratio	2.36	2.18
Porosity, %	70.3	68.6
Pore Volume, cc	360	333
Degree of Saturation, %	97.4	99.9

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	8.0
Average Wet Unit Weight, pcf	91
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	2.9
Maximum Possible Gradient	10.7
Selected Target Gradient	10.7
Target Differential Pressure, psi	1.9
Target Cell Burette Pressure, psi	62.7
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	61.7

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	63.1
Outlet Pressure, psi	60.0
Inlet Pressure, psi	62.3
Differential Pressure, psi	2.3
Confining Pressure, psi	3.1
Hydraulic Gradient	12.7
Inlet Volume/Outlet Volume Ratio	0.90
Permeation Volume, pore volumes	0.16
Hydraulic Conductivity, cm/sec @ 20C	8.55 E-08
Intrinsic Permeability, darcys @ 20C	8.68 E-04

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters meası fining pressure.

(3) Average of last four me

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ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-11,ST-1,16'-18'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	001
W. O. NUMBER	02477-004-001	TEST PERIOD	08/09/93 to 08/16/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	733	643
Dry Weight, grams	401	403
Diameter, cm	7.00	6.79
Length, cm	12.60	11.80
Volume, cc	485	427
Moisture Content, % dry	83.0	59.7
Wet Unit Weight, pcf	94	94
Dry Unit Weight, pcf	52	59
Specific Gravity	2.63	2.63
Void Ratio	2.18	1.79
Porosity, %	68.6	64.2
Pore Volume, cc	333	274
Degree of Saturation, %	99.9	87.6

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	82.0
Average Wet Unit Weight, pcf	94
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	31.0
Maximum Possible Gradient	167.4
Selected Target Gradient	30.0
Target Differential Pressure, psi	5.0
Target Cell Burette Pressure, psi	90.8
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	64.8

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	90.8
Outlet Pressure, psi	60.0
Inlet Pressure, psi	65.1
Differential Pressure, psi	5.1
Confining Pressure, psi	30.8
Hydraulic Gradient	30.7
Inlet Volume/Outlet Volume Ratio	0.68
Permeation Volume, pore volumes	0.03
Hydraulic Conductivity, cm/sec @ 20C	1.35 E-08
Intrinsic Permeability, darcys @ 20C	1.37 E-04

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-12,ST-1,12'-14'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	005.4
W. O. NUMBER	02477-004-001	TEST PERIOD	09/07/93 to 09/11/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	833	816
Dry Weight, grams	472	472
Diameter, cm	7.00	6.90
Length, cm	13.94	13.89
Volume, cc	537	519
Moisture Content, % dry	76.4	72.8
Wet Unit Weight, pcf	97	98
Dry Unit Weight, pcf	55	57
Specific Gravity	2.68	2.68
Void Ratio	2.05	1.95
Porosity, %	67.2	66.1
Pore Volume, cc	360	343
Degree of Saturation, %	100.0	100.0

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	56.6
Average Wet Unit Weight, pcf	97
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	22.0
Maximum Possible Gradient	105.8
Selected Target Gradient	30.0
Target Differential Pressure, psi	5.9
Target Cell Burette Pressure, psi	81.8
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	65.7

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	80.7
Outlet Pressure, psi	60.0
Inlet Pressure, psi	66.0
Differential Pressure, psi	6.0
Confining Pressure, psi	20.7
Hydraulic Gradient	30.3
Inlet Volume/Outlet Volume Ratio	0.85
Permeation Volume, pore volumes	0.05
Hydraulic Conductivity, cm/sec @ 20C	4.36 E-08
Intrinsic Permeability, darcys @ 20C	4.42 E-04

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-12,ST-1,12'-14'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	005.1
W. O. NUMBER	02477-004-001	TEST PERIOD	07/28/93 to 08/04/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	831	860
Dry Weight, grams	472	472
Diameter, cm	7.17	7.16
Length, cm	14.01	14.01
Volume, cc	565	564
Moisture Content, % dry	76.1	82.2
Wet Unit Weight, pcf	92	95
Dry Unit Weight, pcf	52	52
Specific Gravity	2.68	2.68
Void Ratio	2.21	2.20
Porosity, %	68.9	68.8
Pore Volume, cc	389	388
Degree of Saturation, %	92.3	100.0

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	7.5
Average Wet Unit Weight, pcf	92
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	2.8
Maximum Possible Gradient	8.8
Selected Target Gradient	8.8
Target Differential Pressure, psi	1.8
Target Cell Burette Pressure, psi	62.6
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	61.6

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	62.5
Outlet Pressure, psi	60.0
Inlet Pressure, psi	61.8
Differential Pressure, psi	1.8
Confining Pressure, psi	2.5
Hydraulic Gradient	9.1
Inlet Volume/Outlet Volume Ratio	1.03
Permeation Volume, pore volumes	0.11
Hydraulic Conductivity, cm/sec @ 20C	3.12 E-07
Intrinsic Permeability, darcys @ 20C	3.17 E-03

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-12,ST-1,12'-14'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	005.5
W. O. NUMBER	02477-004-001	TEST PERIOD	09/10/93 to 09/20/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	816	800
Dry Weight, grams	472	472
Diameter, cm	6.90	6.82
Length, cm	13.89	13.80
Volume, cc	519	504
Moisture Content, % dry	72.8	69.6
Wet Unit Weight, pcf	98	99
Dry Unit Weight, pcf	57	58
Specific Gravity	2.68	2.68
Void Ratio	1.95	1.86
Porosity, %	66.1	65.1
Pore Volume, cc	343	328
Degree of Saturation, %	100.0	100.0

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	68.5
Average Wet Unit Weight, pcf	98
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	26.9
Maximum Possible Gradient	131.1
Selected Target Gradient	30.0
Target Differential Pressure, psi	5.9
Target Cell Burette Pressure, psi	86.7
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	65.7

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	86.8
Outlet Pressure, psi	60.0
Inlet Pressure, psi	66.0
Differential Pressure, psi	6.0
Confining Pressure, psi	26.8
Hydraulic Gradient	30.8
Inlet Volume/Outlet Volume Ratio	0.87
Permeation Volume, pore volumes	0.08
Hydraulic Conductivity, cm/sec @ 20C	3.36 E-08
Intrinsic Permeability, darcys @ 20C	3.41 E-04

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-12,ST-2,30'-32'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	002
W. O. NUMBER	02477-004-001	TEST PERIOD	07/28/93 to 08/02/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	682	710
Dry Weight, grams	318	318
Diameter, cm	6.95	6.95
Length, cm	13.56	13.56
Volume, cc	515	514
Moisture Content, % dry	114.7	123.5
Wet Unit Weight, pcf	83	86
Dry Unit Weight, pcf	39	39
Specific Gravity	2.61	2.61
Void Ratio	3.23	3.23
Porosity, %	76.4	76.4
Pore Volume, cc	393	393
Degree of Saturation, %	92.8	99.9

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	14.0
Average Wet Unit Weight, pcf	83
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent. Ko	0.58
Effective Horizontal Stress, psi	4.6
Maximum Possible Gradient	18.9
Selected Target Gradient	18.9
Target Differential Pressure, psi	3.6
Target Cell Burette Pressure, psi	64.4
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	63.4

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	64.7
Outlet Pressure, psi	60.0
Inlet Pressure, psi	63.9
Differential Pressure, psi	3.9
Confining Pressure, psi	4.7
Hydraulic Gradient	20.3
Inlet Volume/Outlet Volume Ratio	0.97
Permeation Volume, pore volumes	0.14
Hydraulic Conductivity, cm/sec @ 20C	1.71 E-07
Intrinsic Permeability, darcys @ 20C	1.73 E-03

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-12,ST-2,30'-32'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	002
W. O. NUMBER	02477-004-001	TEST PERIOD	08/09/93 to 08/16/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	710	532
Dry Weight, grams	318	326
Diameter, cm	6.95	6.93
Length, cm	13.56	10.13
Volume, cc	514	382
Moisture Content, % dry	123.5	63.5
Wet Unit Weight, pcf	86	87
Dry Unit Weight, pcf	39	53
Specific Gravity	2.61	2.61
Void Ratio	3.23	2.06
Porosity, %	76.4	67.4
Pore Volume, cc	393	257
Degree of Saturation, %	99.9	80.4

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	95.8
Average Wet Unit Weight, pcf	86
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	33.1
Maximum Possible Gradient	166.3
Selected Target Gradient	30.0
Target Differential Pressure, psi	4.3
Target Cell Burette Pressure, psi	92.9
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	64.1

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	91.8
Outlet Pressure, psi	60.0
Inlet Pressure, psi	65.9
Differential Pressure, psi	5.9
Confining Pressure, psi	31.8
Hydraulic Gradient	41.3
Inlet Volume/Outlet Volume Ratio	0.87
Permeation Volume, pore volumes	0.08
Hydraulic Conductivity, cm/sec @ 20C	2.28 E-08
Intrinsic Permeability, darcys @ 20C	2.32 E-04

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-13,ST-3,70'-72'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	004
W. O. NUMBER	02477-004-001	TEST PERIOD	07/28/93 to 08/05/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	807	739
Dry Weight, grams	453	453
Diameter, cm	6.88	6.78
Length, cm	12.90	12.69
Volume, cc	479	458
Moisture Content, % dry	78.1	63.0
Wet Unit Weight, pcf	105	101
Dry Unit Weight, pcf	59	62
Specific Gravity	2.63	2.63
Void Ratio	1.78	1.66
Porosity, %	64.0	62.4
Pore Volume, cc	307	286
Degree of Saturation, %	115.4	99.9

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	22.5
Average Wet Unit Weight, pcf	105
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	9.5
Maximum Possible Gradient	46.3
Selected Target Gradient	30.0
Target Differential Pressure, psi	5.4
Target Cell Burette Pressure, psi	69.3
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	65.2

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	69.5
Outlet Pressure, psi	60.0
Inlet Pressure, psi	68.7
Differential Pressure, psi	8.7
Confining Pressure, psi	9.5
Hydraulic Gradient	48.1
Inlet Volume/Outlet Volume Ratio	1.05
Permeation Volume, pore volumes	0.32
Hydraulic Conductivity, cm/sec @ 20C	1.44 E-07
Intrinsic Permeability, darcys @ 20C	1.46 E-03

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-13,ST-3,70'-72'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	004
W. O. NUMBER	02477-004-001	TEST PERIOD	08/12/93 to 08/16/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	739	719
Dry Weight, grams	453	500
Diameter, cm	6.78	6.92
Length, cm	12.69	11.79
Volume, cc	458	444
Moisture Content, % dry	63.0	43.6
Wet Unit Weight, pcf	101	101
Dry Unit Weight, pcf	62	70
Specific Gravity	2.63	2.63
Void Ratio	1.66	1.33
Porosity, %	62.4	57.2
Pore Volume, cc	286	254
Degree of Saturation, %	99.9	86.0

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	87.0
Average Wet Unit Weight, pcf	101
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	35.1
Maximum Possible Gradient	188.9
Selected Target Gradient	30.0
Target Differential Pressure, psi	5.0
Target Cell Burette Pressure, psi	94.9
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	64.8

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	96.5
Outlet Pressure, psi	60.0
Inlet Pressure, psi	65.7
Differential Pressure, psi	5.7
Confining Pressure, psi	36.5
Hydraulic Gradient	34.0
Inlet Volume/Outlet Volume Ratio	0.54
Permeation Volume, pore volumes	0.03
Hydraulic Conductivity, cm/sec @ 20C	2.42 E-08
Intrinsic Permeability, darcys @ 20C	2.46 E-04

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-15,ST-2,50'-52'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	003
W. O. NUMBER	02477-004-001	TEST PERIOD	07/28/93 to 08/04/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	770	772
Dry Weight, grams	462	462
Diameter, cm	7.13	7.13
Length, cm	12.30	12.30
Volume, cc	491	491
Moisture Content, % dry	66.7	67.2
Wet Unit Weight, pcf	98	98
Dry Unit Weight, pcf	59	59
Specific Gravity	2.58	2.58
Void Ratio	1.75	1.75
Porosity, %	63.6	63.6
Pore Volume, cc	312	312
Degree of Saturation, %	98.7	99.3

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	18.0
Average Wet Unit Weight, pcf	98
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	7.1
Maximum Possible Gradient	34.7
Selected Target Gradient	30.0
Target Differential Pressure, psi	5.2
Target Cell Burette Pressure, psi	66.9
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	65.0

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	67.2
Outlet Pressure, psi	60.0
Inlet Pressure, psi	66.3
Differential Pressure, psi	6.3
Confining Pressure, psi	7.2
Hydraulic Gradient	36.0
Inlet Volume/Outlet Volume Ratio	0.99
Permeation Volume, pore volumes	0.23
Hydraulic Conductivity, cm/sec @ 20C	8.22 E-08
Intrinsic Permeability, darcys @ 20C	8.35 E-04

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS
USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	DSWA	PROJECT SAMPLE I. D.	TB-15,ST-2,50'-52'
JOB NUMBER	9307X004	ETL SAMPLE NUMBER	003
W. O. NUMBER	02477-004-001	TEST PERIOD	08/09/93 to 08/16/93

SPECIMEN DESCRIPTION

undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube;
specimen is a gray sludge

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	772	728
Dry Weight, grams	462	471
Diameter, cm	7.13	6.94
Length, cm	12.30	11.81
Volume, cc	491	447
Moisture Content, % dry	67.2	54.6
Wet Unit Weight, pcf	98	102
Dry Unit Weight, pcf	59	66
Specific Gravity	2.58	2.58
Void Ratio	1.75	1.45
Porosity, %	63.6	59.2
Pore Volume, cc	312	264
Degree of Saturation, %	99.3	97.3

TEST CRITERIA	
Soil Type, USCS Classification	MH
Average Sample Depth, feet	87.5
Average Wet Unit Weight, pcf	98
Effective Stress Envelope, degrees	25
Earth Pressure Coefficent, Ko	0.58
Effective Horizontal Stress, psi	34.4
Maximum Possible Gradient	191.0
Selected Target Gradient	30.0
Target Differential Pressure, psi	5.0
Target Cell Burette Pressure, psi	94.2
Target Outlet Burette Pressure, psi	60.0
Target Inlet Burette Pressure, psi	64.8

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	94.2
Outlet Pressure, psi	60.0
Inlet Pressure, psi	65.4
Differential Pressure, psi	5.4
Confining Pressure, psi	34.2
Hydraulic Gradient	32.4
Inlet Volume/Outlet Volume Ratio	0.91
Permeation Volume, pore volumes	0.05
Hydraulic Conductivity, cm/sec @ 20C	1.67 E-08
Intrinsic Permeability, darcys @ 20C	1.70 E-04

NOTES

(1) Initial: parameters measured on undisturbed soil specimen extruded from a 3" diameter by 30" long shelby tube.

(2) Final: parameters measured after saturation and consolidation at reported confining pressure.

(3) Average of last four measurements.

MOISTURE DENSITY RELATIONSHIPS

GANNETT FLEMING GEOTECHNICAL LABORATORY

COMPACTION TEST

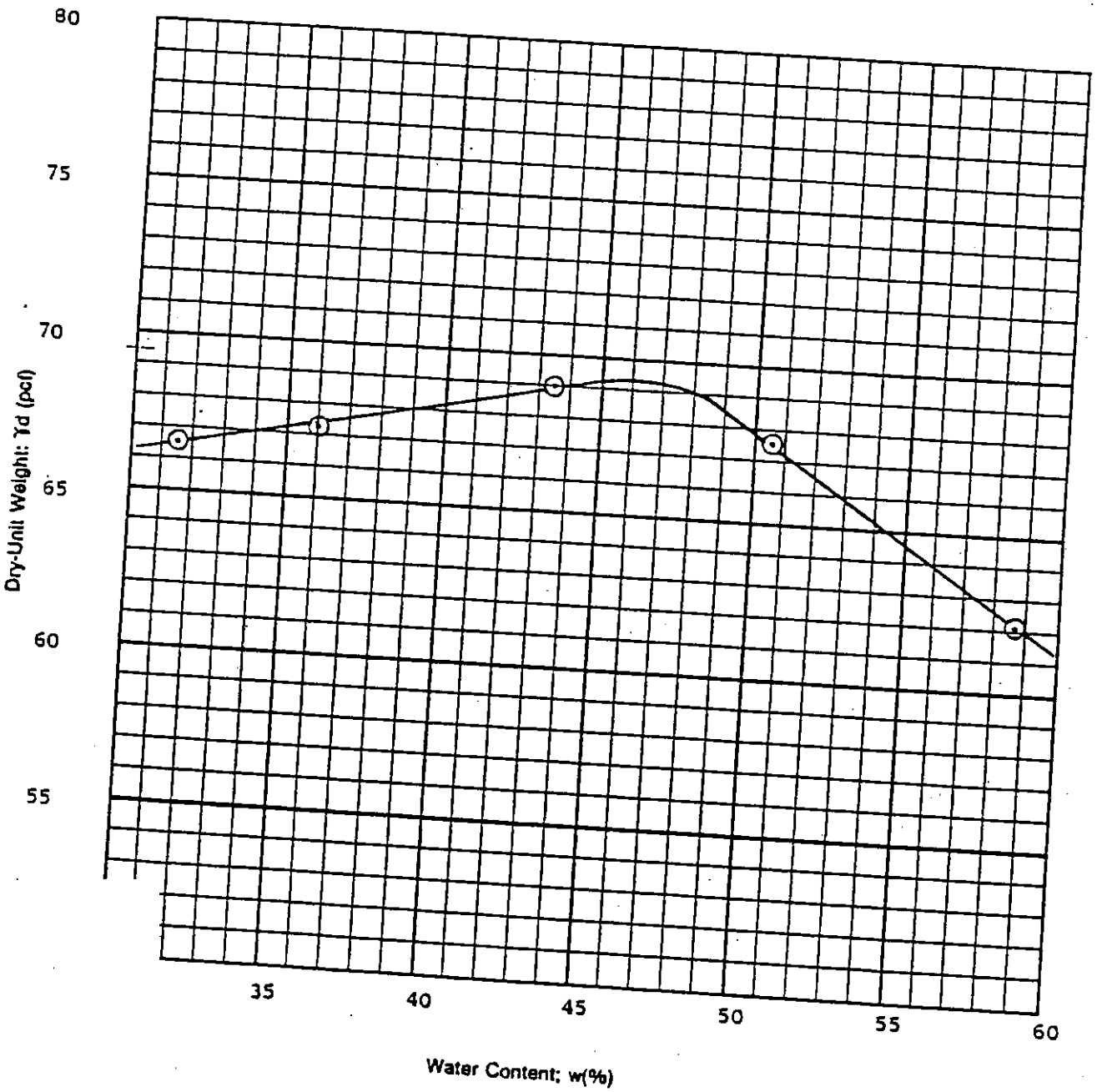
Project DSWA NORTHERN FACILITY-2

Boring No. GF-10 Sample No. Bag Job No.

Description of Soil Gray organic silt Depth 0- 2'

Test Method ASTM D698- Method A

Date of Testing 9/ 86



GANNETT FLEMING GEOTECHNICAL LABORATORY

COMPACTION TEST

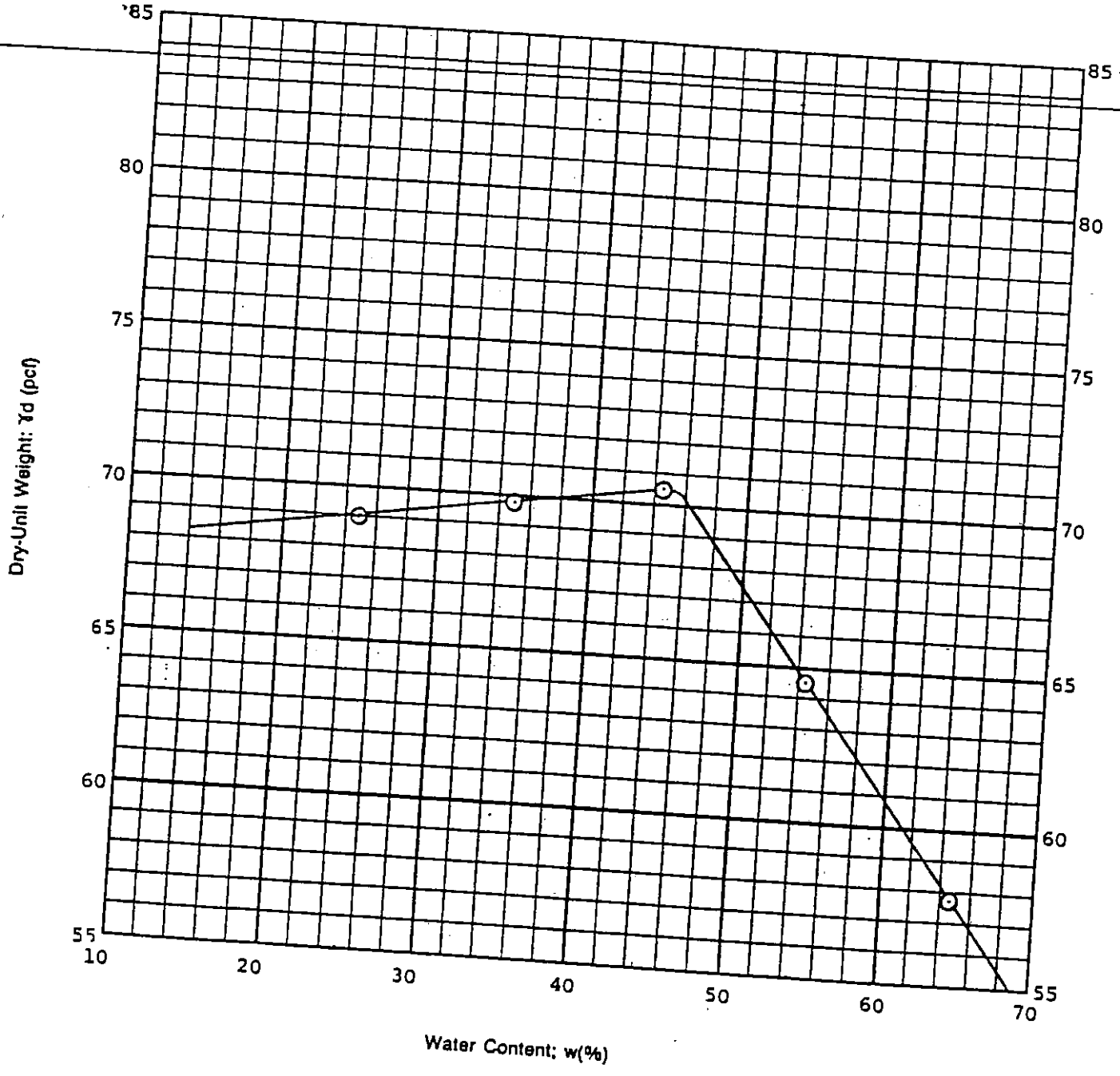
Project DELAWARE SOLID WASTE FACILITY - 2

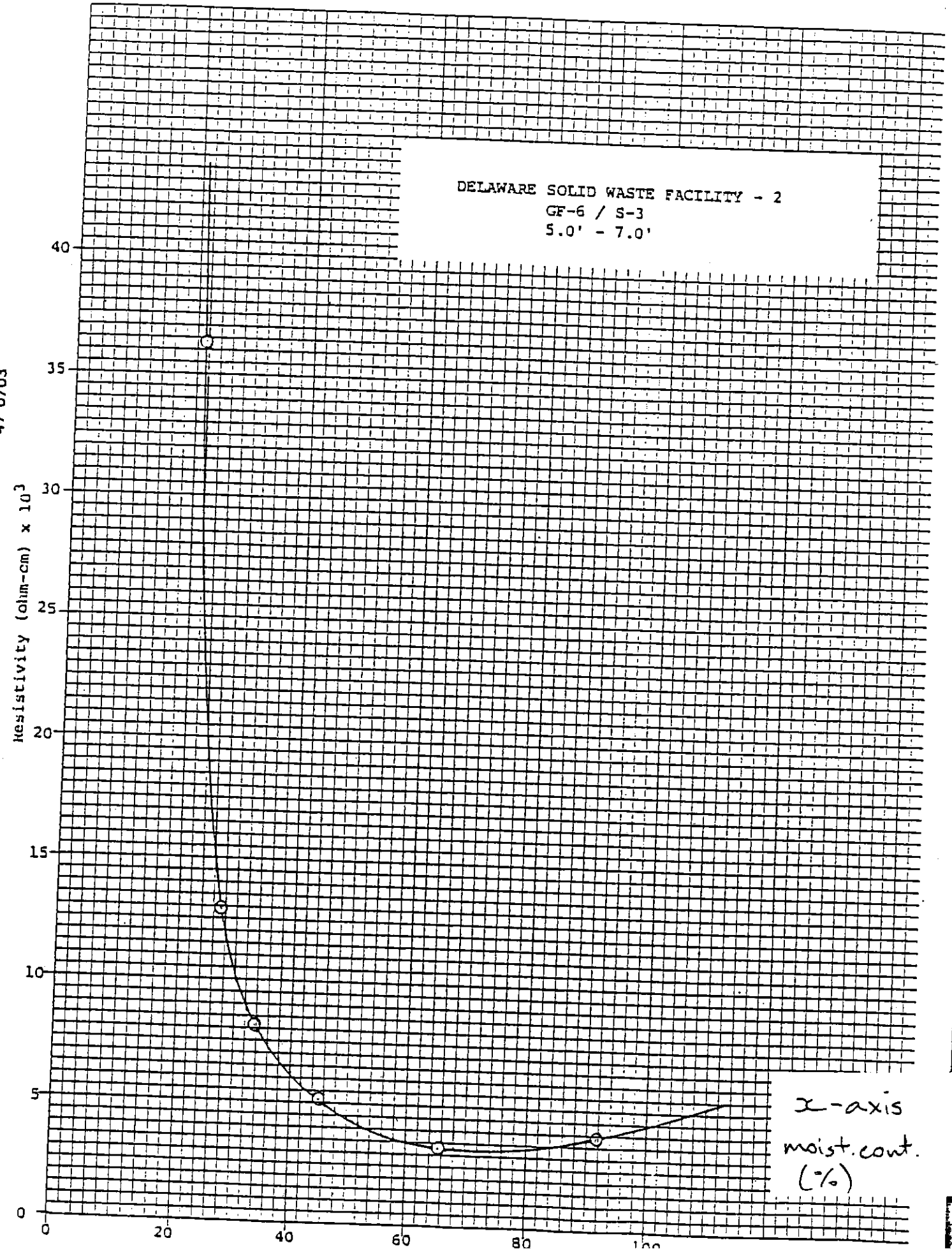
Boring No. GF-11 Sample No. Bulk Job No.

Description of Soil Depth 0.0'- 2.0'

Test Method ASTM - D - 698 Method A

Date of Testing 9/9/86





47 0703

K+E 10 X 10 TO THE INCH 10 X 15 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

GANNETT FLEMING GEOTECHNICAL LABORATORY

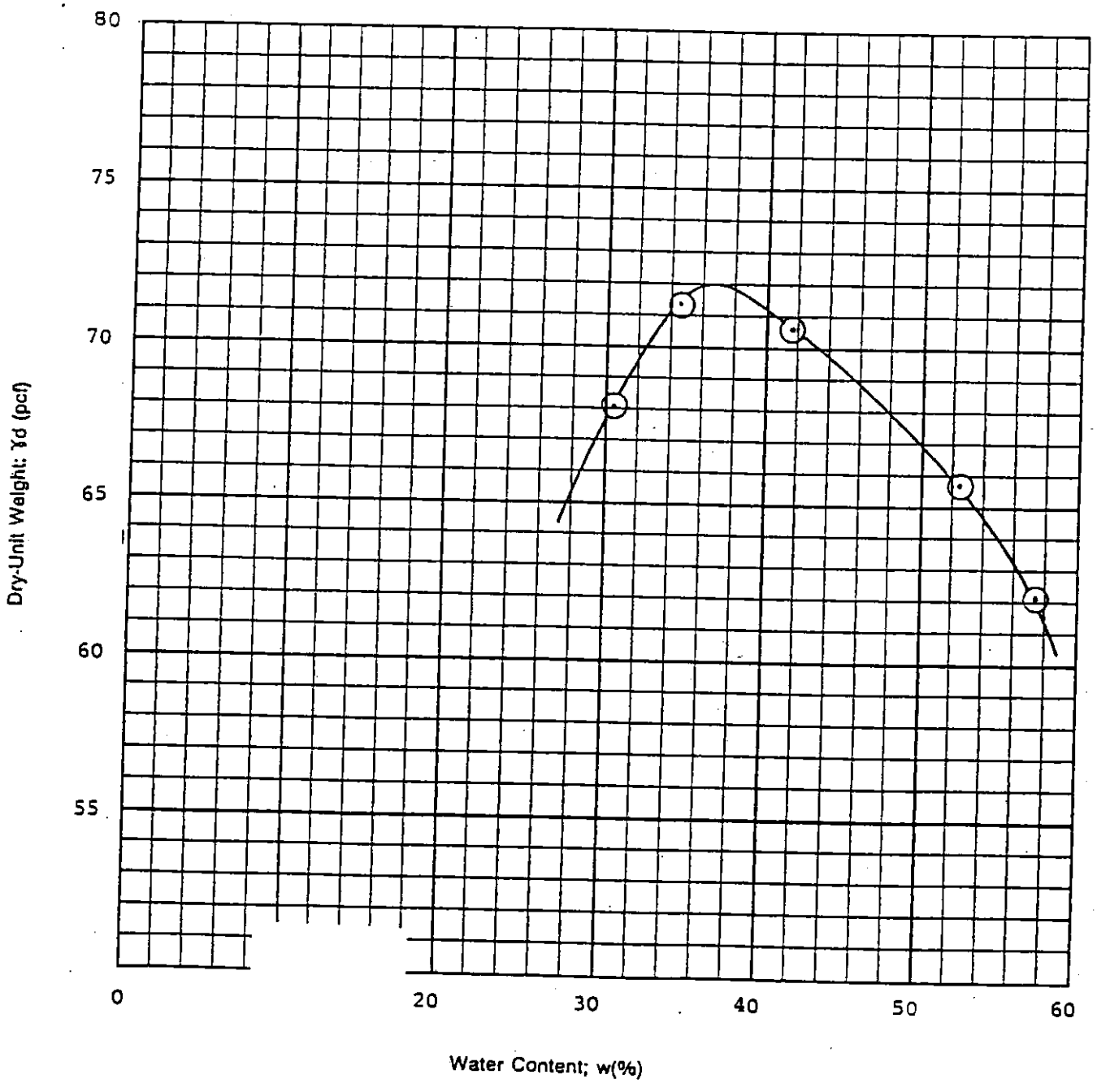
COMPACTION TEST

Project DSWA, NSWF, PHASE III Job No. _____

Boring No. GF-105 Sample No. Bag Depth 0-1'

Description of Soil MH

Test Method ASTM D 698, Method A Date of Testing 2/ 90



GANNETT FLEMING GEOTECHNICAL LABORATORY

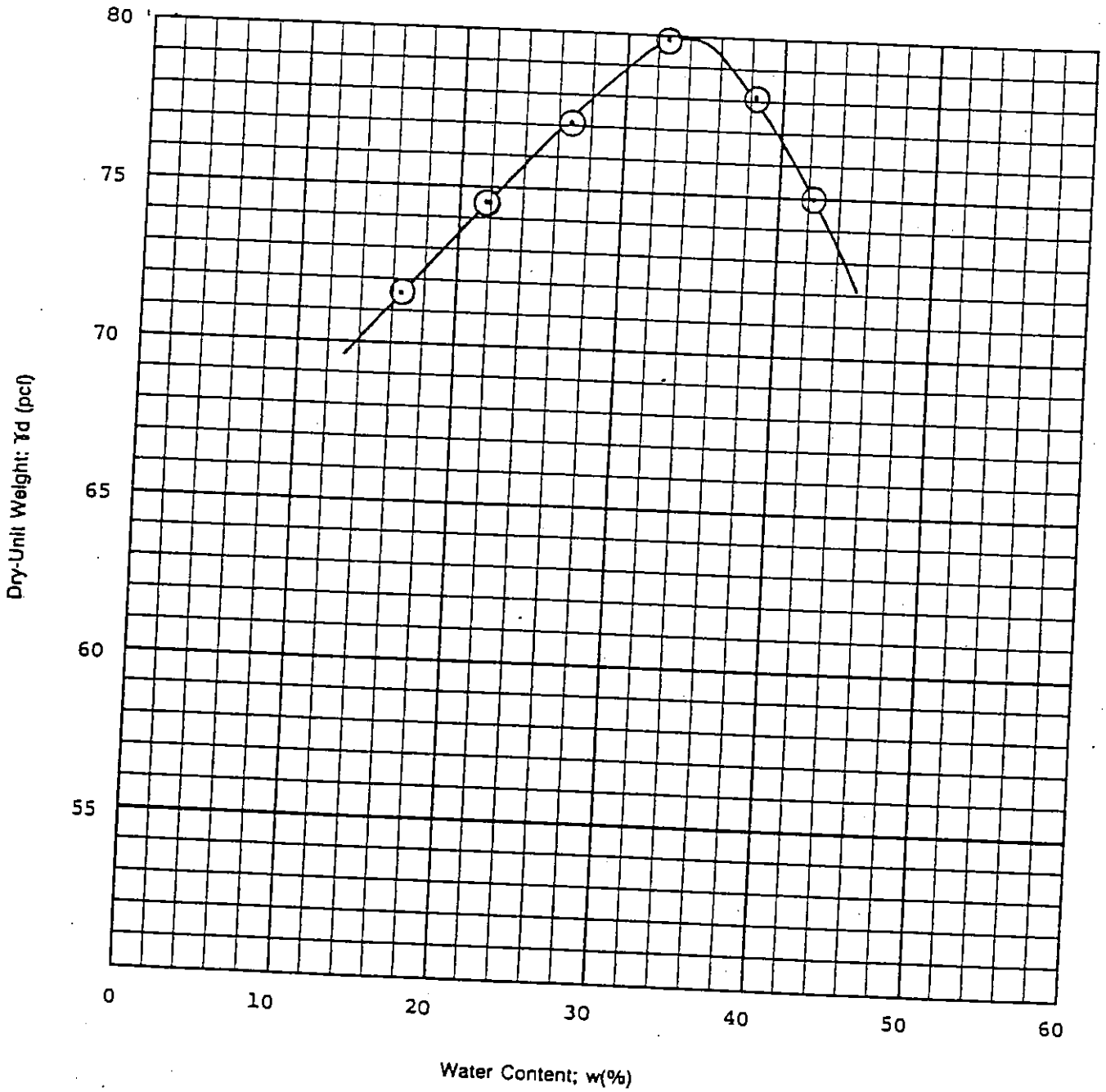
COMPACTION TEST

Project DSWA, NSWF, PHASE III Job No.

Boring No. GF-108 Sample No. Bag Depth 0-1'

Description of Soil MH

Test Method ASTM D 698, Method A Date of Testing 2/90



SOIL COMPACTION TEST DATA AND RESULTS

PROJECT	DSWA	PROJECT SAMPLE ID	Bulk Sample
JOB NUMBER	9205X005	ETL SAMPLE NUMBER	001
W. O. NUMBER	2477-03-01-0004	TEST DATE	6/9/92

SOIL PROPERTIES

Soil Description	USCS Class	Natural Moisture %	Plastic Limit %w	Liquid Limit %w	Specific Gravity (estimated)
	NA	101.5	NA	NA	2.61

COMPACTION PARAMETERS

Test Method	Mold Size			Compaction Method			
				Rammer		# of Layers	# Blows per Layer
	Diameter inches	Height inches	Volume cc	Weight, lb	Drop, inch		
Modified Proctor Method A minimum 4 points	3.984	4.570	933.7	10.0	18	5	25

COMPACTION TEST MEASURED RESULTS

Dry Unit Weight, pcf	83.7	85.2	85.3	85.8	84.5	
Moisture Content, %	22.8	25.9	26.7	29.2	31.1	
Saturated Moisture Content, %	36.2	34.9	34.9	34.5	35.6	
90% Saturated Moisture Content, %	32.6	31.5	31.4	31.0	32.0	

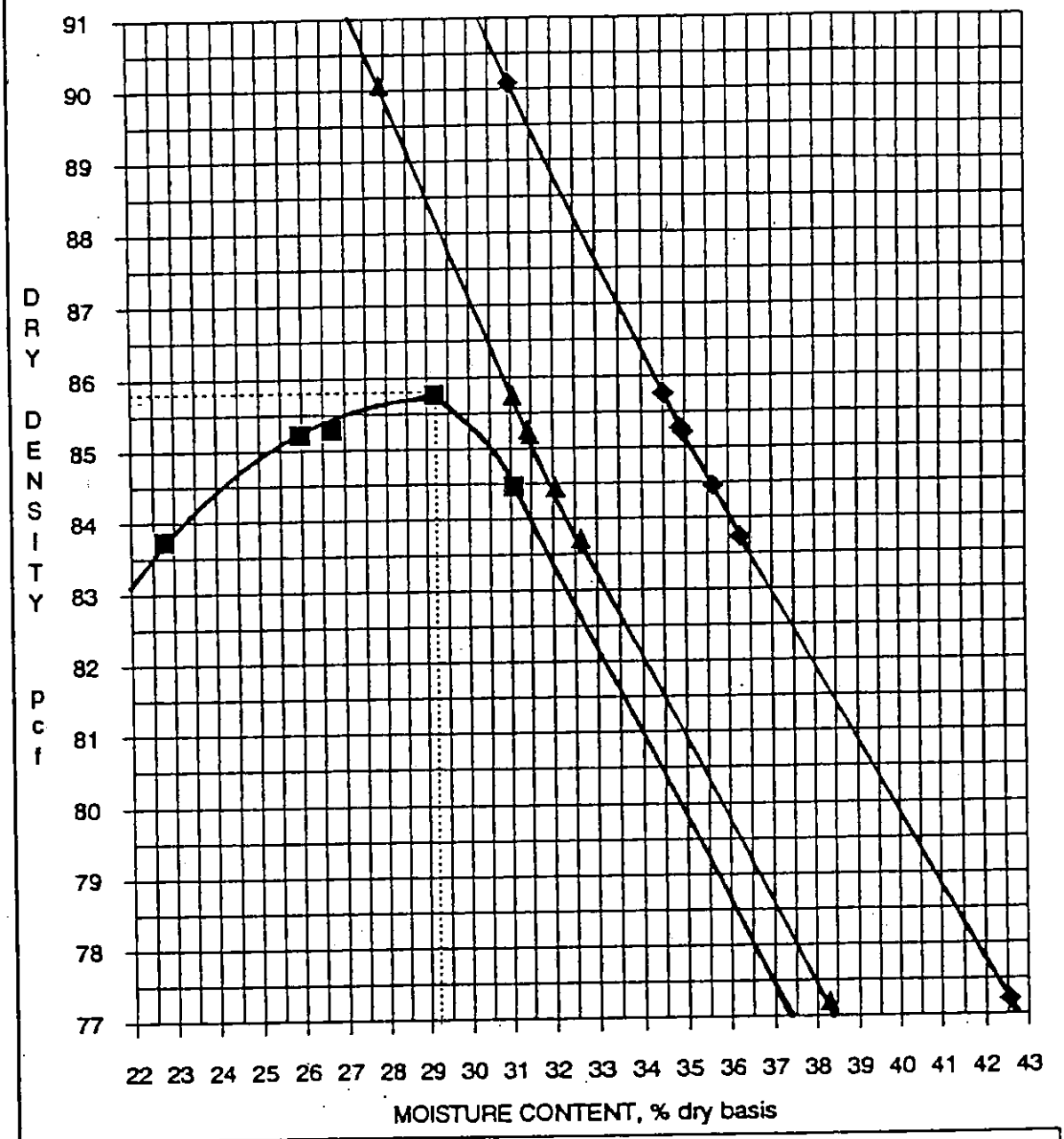
COMPACTION CURVE ANALYSIS/RESULTS

% of Maximum Dry Density	100	95	90			
Dry Density, pcf	85.8	81.5	77.2			
Moisture Content, %	29.2	33.5	37.3			
% Points Wet of Optimum	0.0	4.3	8.1			

NOTES

DSWA PROJECT SAMPLE BULK SAMPLE

COMPACTION TEST RESULTS - MODIFIED PROCTOR (METHOD A)



ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

ASTM D1557 - MOISTURE-DENSITY RELATIONS OF SOILS
MODIFIED PROCTOR METHOD A

PROJECT	DSWA	PROJECT SAMPLE ID	BULK #1
JOB NUMBER	9307X010	ETL SAMPLE NUMBER	001
W. O. NUMBER	02477-004-001	TEST DATE	8/18/93

SOIL PROPERTIES

Soil Description	USCS Class	Natural Moisture % dry basis	Liquid Limit % dry	Plastic Limit % dry	Plasticity Index % dry	Specific Gravity
brown sandy silt of high plasticity 0%>3/4" sieve, 2%>#4 sieve	MH	14.5	NA	NA	NA	2.62

COMPACTION PARAMETERS

Test Method	Mold Size			Compaction Method			
				Rammer			
Modified Proctor Method A minimum 4 points	Diameter inches	Height inches	Volume cc	Weight, lb	Drop, inch	# of Layers	# Blows per Layer
	3.984	4.570	933.7	10.0	18	5	25

COMPACTION TEST RESULTS

Dry Unit Weight, pcf	90.2	92.3	93.9	93.3	92.3	90.0
Moisture Content, %	15.5	17.3	19.6	21.3	22.8	24.6
Saturated Moisture Content, %	31.1	29.5	28.3	28.7	29.5	31.2
95% Saturated Moisture Content, %	29.5	28.0	26.9	27.3	28.0	29.6

COMPACTION CURVE ANALYSIS/RESULTS

% of Maximum Dry Density	100	95	90			
Dry Density, pcf	93.9	89.2	84.5			
Moisture Content, % dry basis	19.6	25.2	28.7			
% Points Wet of Optimum	0.0	5.6	9.1			

NOTES