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GEOTECHNICAL TESTING REPORT
DUNLOP INACTIVE WASTE SITE CLOSURE
GRAND ISLAND, NEW YORK

Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc., Division

Huntingdon
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October 7, 1993

Mr. John Wokasien
URS CONSULTANTS, INC.
282 Delaware Avenue
Buffalo, New York 14202-1805

SUBJECT: GEOTECHNICAL TESTING
DUNLOP INACTIVE WASTE SITE CLOSURE
GRAND ISLAND, NEW YORK

Dear Mr. Wokasien:

Transmitted herewith are the results of geotechnical laboratory testing performed on thin wall tube samples from the subject project during the months of July, August and September, 1993. The work was executed under the terms of Purchase Order No. BU-93-G0877, dated June 14, 1993. Preliminary test results and advance copies of test reports have been submitted by facsimile transmission as the test results became available.

A total of eighteen (18) permeability tests (ASTM D5084) and one (1) Grain Size Distribution Analysis (ASTM D422) have been completed during this period, and are attached to this report. It should be noted that it was not possible to trim a suitable permeability test specimen from the bottom 6 inches of tubes ST-6A, and DTC-ST-14. The material in this section of the tubes was cracked and crumbling.

For the future we shall be submitting interim reports on a monthly basis. Should you have any questions do not hesitate to contact the undersigned at (716) 735-3400.

Respectfully Submitted,

EMPIRE SOILS INVESTIGATIONS, INC.

Jorgen F. Christiansen, PE
Director, Geotechnical Testing

JFC/las

Enc.

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 8.27
Specimen Diameter (cm): 7.23
Dry Unit Weight (pcf): 101.0
Moisture Before Test (%): 16.4
Moisture After Test (%): 19.5
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.1
Back Pressure (psi): 79.7
Diff. Head (psi): 5.4
Flow Rate (cc/sec): 3.82 x 10^-4
Perm. (cm/sec): 2.07 x 10^-7

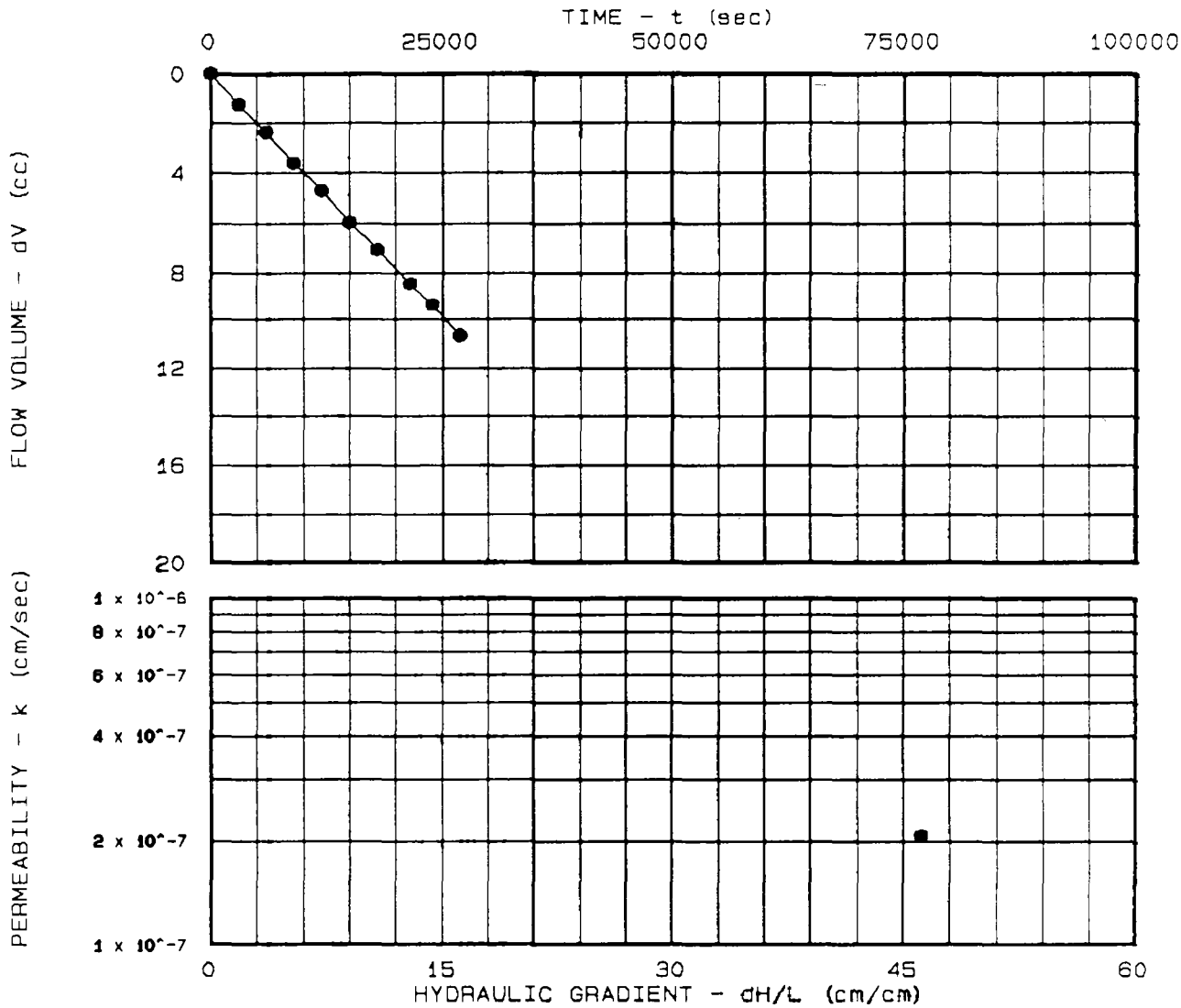
SAMPLE DATA:

Sample Identification: SAMPLE #1

Visual Description: BROWN CLAY, trace gravel
Remarks:.

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: JULY 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1685.001
Tested by: KJC
Checked by: JFC

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
roject Location:	GRAND ISLAND, NEW YORK
roject No.:	
Sample Identification:	SAMPLE #1
ab No.:	1685.001
Description:	BROWN CLAY, trace gravel
ample Type:	UNDISTURBED
ax. Dry Dens.:	
Method (D1557/D698):	
pt. Water Content:	
ate:	JULY 1993
Remarks:	
ermeameter Type:	FLEXIBLE WALL
ested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.815 in	2.873 in		2.789 in	2.757 in	
Middle:	2.839 in	2.843 in		2.786 in	2.786 in	
Bottom:	2.847 in	2.865 in		2.819 in	2.797 in	
Average:	2.85 in	7.23 cm		2.79 in	7.08 cm	
Length:	1	2	3	1	2	3
	3.261 in	3.260 in	3.250 in	3.209 in	3.227 in	3.186 in
Average:	3.26 in	8.27 cm		3.21 in	8.15 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	872.49	889.41
Dry Wt. & Tare:	782.17	782.17
Tare Wt.:	233.08	233.08
Moisture Content:	16.4 %	19.5 %
Dry Unit Weight:	101.0 pcf	106.8 pcf
Porosity:	0.4117	0.3778
Saturation:	64.6 %	88.4 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-32 Panel No.: 3 Positions: 2&1

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	5.40	1.00
Outflow Buret Factor:	5.70	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	7/19/93	7:51	0	85.1	79.9	0.10	24.75	0.00
	7/19/93	8:41	3,000	85.0	79.9	0.30	24.50	1.25
	7/19/93	9:31	6,000	85.0	79.9	0.50	24.30	2.36
	7/19/93	10:21	9,000	85.0	79.9	0.75	24.10	3.61
	7/19/93	11:11	12,000	85.1	80.1	0.95	23.90	4.72
	7/19/93	12: 1	15,000	85.1	80.1	1.20	23.70	5.96
	7/19/93	12:51	18,000	85.1	80.1	1.40	23.50	7.07
	7/19/93	13:51	21,600	85.1	80.0	1.65	23.25	8.46
	7/19/93	14:31	24,000	85.1	80.0	1.85	23.10	9.43
	7/19/93	15:21	27,000	85.1	80.0	2.05	22.85	10.68

Test Pressure = 85.1 psi Differential Head = 5.4 psi, 381.8 cm H2O
radient = 4.615E 01 Flow rate = 3.916E-04 cc/sec R squared = 0.99985
ermeability, K20.0° = 2.068E-07 cm/sec², K20° = 2.068E-07 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 9.15
Specimen Diameter (cm): 7.22
Dry Unit Weight (pcf): 101.1
Moisture Before Test (%): 18.7
Moisture After Test (%): 20.5

Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	
Test Pressure (psi):	84.9	
Back Pressure (psi):	79.6	
Diff. Head (psi):	5.3	
Flow Rate (cc/sec):	1.77 x 10^-5	
Perm. (cm/sec):	1.06 x 10^-8	

SAMPLE DATA:

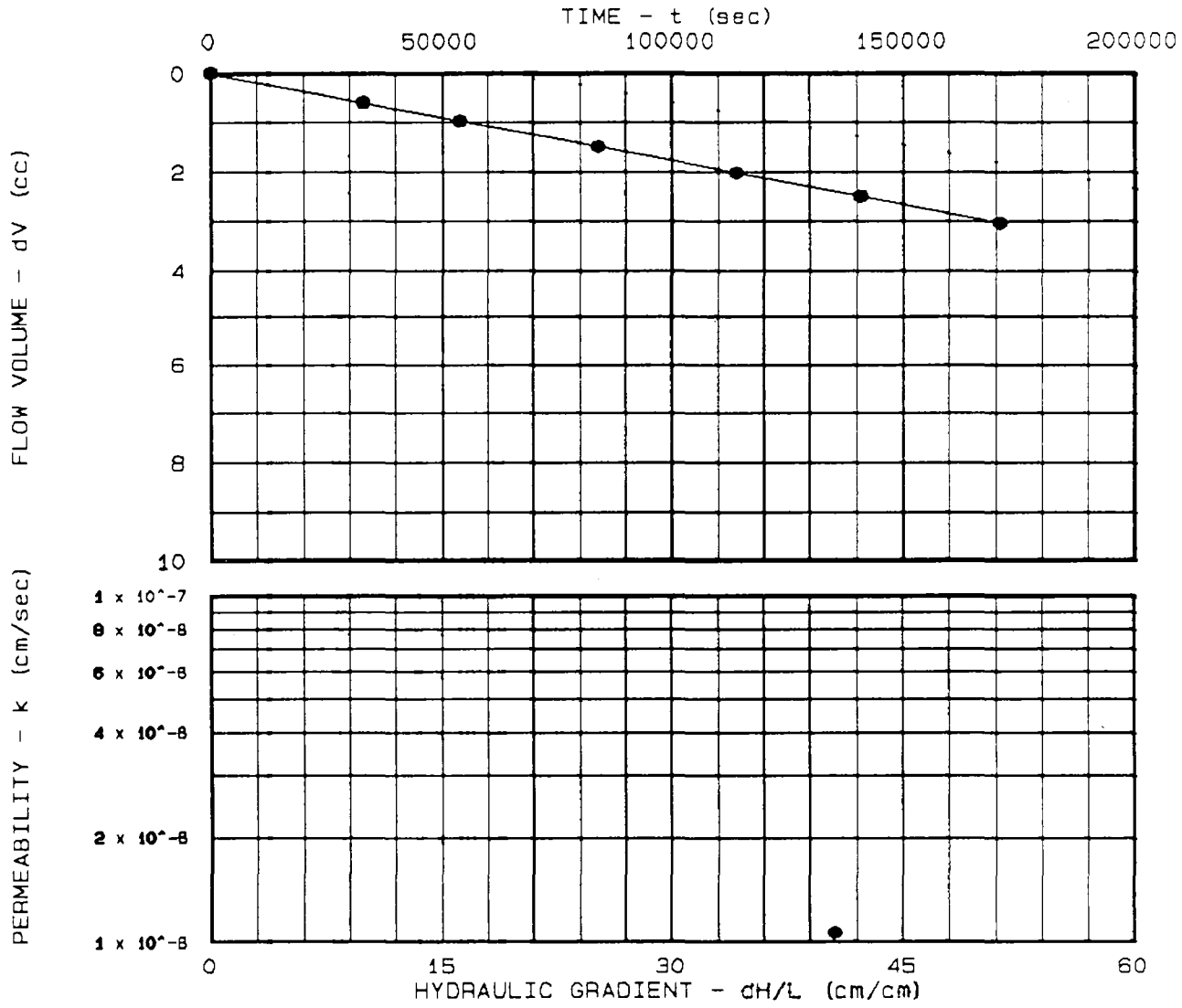
Sample Identification: SAMPLE #2

Visual Description: BROWN CLAY

Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: JULY 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1685.002
Tested by: KJC
Checked by: JFC

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	SAMPLE #2
Lab No.:	1685.002
Description:	BROWN CLAY
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JULY 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.850 in	2.869 in		2.740 in	2.785 in	
Middle:	2.841 in	2.840 in		2.761 in	2.752 in	
Bottom:	2.819 in	2.841 in		2.824 in	2.822 in	
Average:	2.84 in	7.22 cm		2.77 in	7.05 cm	
Length:	1	2	3	1	2	3
	3.606 in	3.601 in	3.611 in	3.572 in	3.576 in	3.574 in
Average:	3.61 in	9.16 cm		3.57 in	9.08 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	945.47	956.12
Dry Wt. & Tare:	831.82	831.82
Tare Wt.:	224.54	224.54
Moisture Content:	18.7 %	20.5 %
Dry Unit Weight:	101.1 pcf	107.1 pcf
Porosity:	0.4112	0.3764
Saturation:	73.7 %	93.3 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-30 Panel No.: 3 Positions: 6&5

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	7/18/93	8:33	0	85.0	80.0	0.00	24.50	0.00
	7/18/93	17:43	33,000	84.9	79.9	0.75	24.05	0.60
	7/18/93	23:33	54,000	84.8	79.9	1.20	23.75	0.98
	7/19/93	7:53	84,000	84.9	79.9	1.80	23.30	1.50
	7/19/93	16:13	114,000	84.9	79.9	2.45	22.90	2.03
	7/19/93	23:43	141,000	85.0	80.1	3.00	22.50	2.50
	7/20/93	8: 3	171,000	85.0	80.1	3.60	22.00	3.05

Test Pressure = 84.9 psi Differential Head = 5.3 psi, 371.8 cm H2O
Gradient = 4.060E 01 Flow rate = 1.769E-05 cc/sec R squared = 0.99994
Permeability, K20.0° = 1.064E-08 cm/sec², K20° = 1.064E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 8.23
Specimen Diameter (cm): 7.20
Dry Unit Weight (pcf): 101.1
Moisture Before Test (%): 16.8
Moisture After Test (%): 20.1

Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	
Test Pressure (psi):	84.8	
Back Pressure (psi):	79.7	
Diff. Head (psi):	5.1	
Flow Rate (cc/sec):	1.97 x 10^-4	
Perm. (cm/sec):	1.12 x 10^-7	

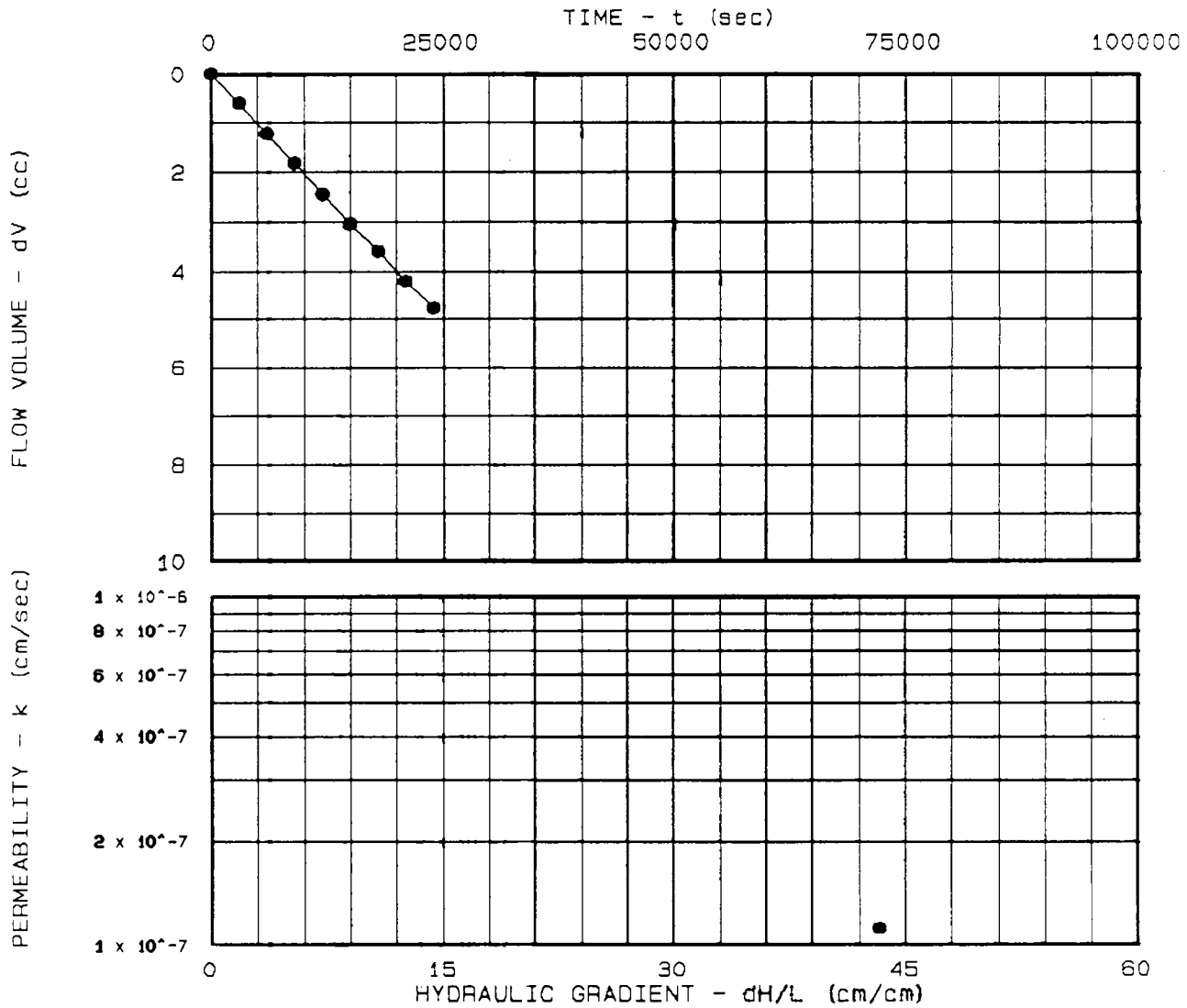
SAMPLE DATA:

Sample Identification: SAMPLE #3

Visual Description: BROWN CLAY, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: JULY 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1691.001
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
roject Location:	GRAND ISLAND, NEW YORK
.roject No.:	
Sample Identification:	SAMPLE #3
ab No.:	1691.001
Description:	BROWN CLAY, trace gravel
ample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
pt. Water Content:	
ate:	JULY 1993
Remarks:	
ermeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.817 in	2.844 in		2.787 in	2.764 in	
Middle:	2.843 in	2.830 in		2.769 in	2.722 in	
Bottom:	2.810 in	2.845 in		2.741 in	2.742 in	
Average:	2.83 in	7.20 cm		2.75 in	6.99 cm	
Length:	1	2	3	1	2	3
	3.245 in	3.229 in	3.248 in	3.263 in	3.216 in	3.224 in
Average:	3.24 in	8.23 cm		3.23 in	8.22 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	859.90	877.76
Dry Wt. & Tare:	768.70	768.70
Tare Wt.:	226.86	226.86
Moisture Content:	16.8 %	20.1 %
Dry Unit Weight:	101.1 pcf	107.3 pcf
Porosity:	0.4113	0.3750
Saturation:	66.3 %	92.2 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-1 TOP Panel No.: 1 Positions: 6&5

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	7/22/93	8:40	0	84.9	80.0	0.30	24.80	0.00
X	7/22/93	9:30	3,000	84.8	80.0	0.90	24.20	0.60
X	7/22/93	10:20	6,000	84.8	79.9	1.55	23.60	1.23
	7/22/93	11:10	9,000	84.8	80.0	2.15	23.00	1.83
	7/22/93	12:00	12,000	84.9	80.0	2.80	22.40	2.45
	7/22/93	12:50	15,000	84.8	80.0	3.40	21.80	3.05
	7/22/93	13:40	18,000	84.9	80.0	4.00	21.30	3.60
	7/22/93	14:30	21,000	84.7	80.0	4.60	20.70	4.20
	7/22/93	15:20	24,000	84.7	80.1	5.20	20.10	4.80

Test Pressure = 84.8 psi Differential Head = 5.1 psi, 356.6 cm H2O
Gradient = 4.332E 01 Flow rate = 1.969E-04 cc/sec R squared = 0.99975
Permeability, K20.0° = 1.118E-07 cm/sec², K20° = 1.118E-07 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 6.98
Specimen Diameter (cm): 7.17
Dry Unit Weight (pcf): 112.5
Moisture Before Test (%): 17.3
Moisture After Test (%): 18.2
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.0
Back Pressure (psi): 81.4
Diff. Head (psi): 3.6
Flow Rate (cc/sec): 2.10 x 10^-5
Perm. (cm/sec): 1.41 x 10^-8

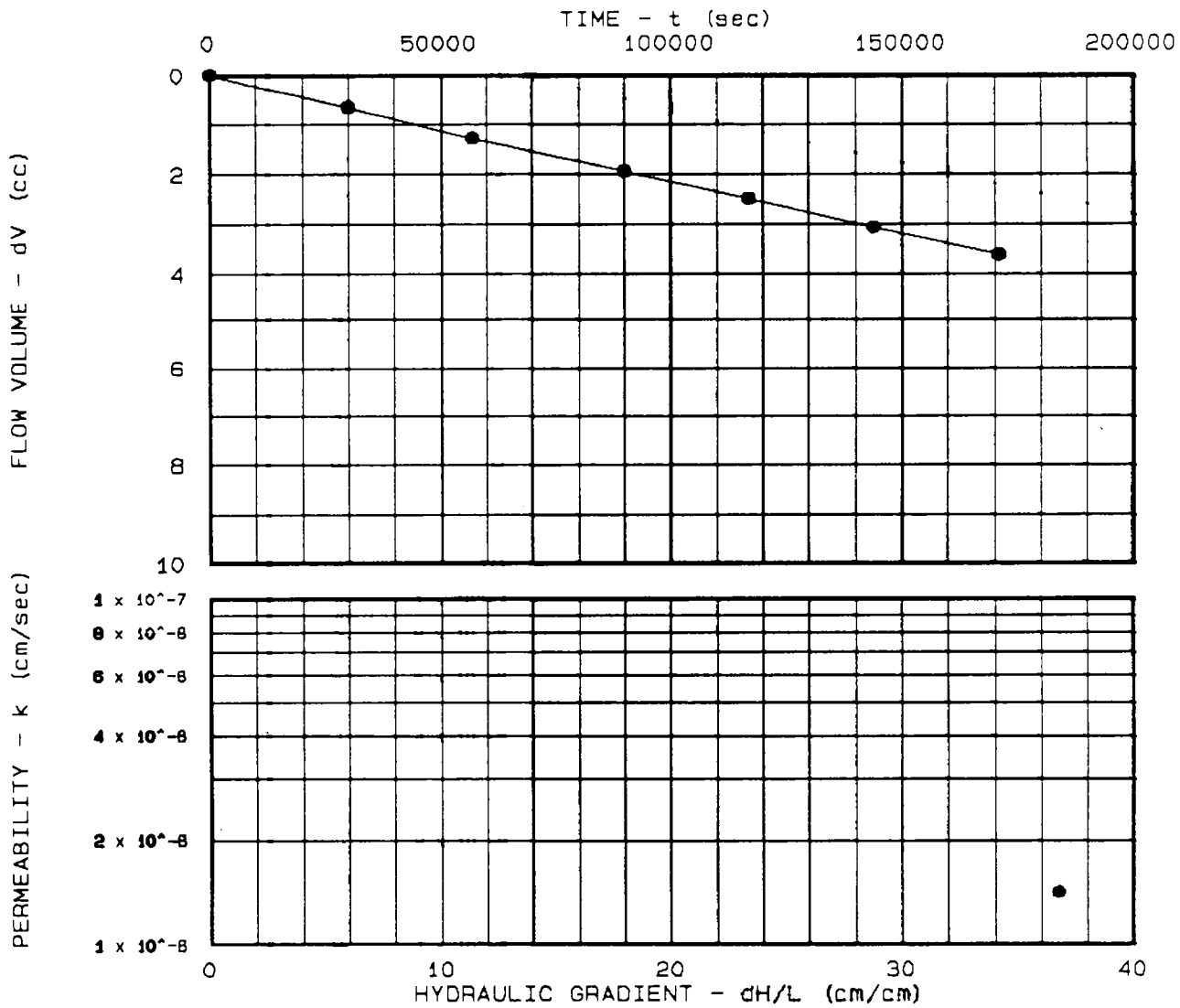
SAMPLE DATA:

Sample Identification: SAMPLE #3B

Visual Description: BROWN CLAY, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: JULY 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1691.001B
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	SAMPLE #3B
Lab No.:	1691.001B
Description:	BROWN CLAY, trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JULY 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.849 in	2.808 in		2.826 in	2.831 in	
Middle:	2.815 in	2.824 in		2.816 in	2.807 in	
Bottom:	2.842 in	2.816 in		2.806 in	2.787 in	
Average:	2.82 in	7.17 cm		2.81 in	7.14 cm	
Length:	1	2	3	1	2	3
	2.758 in	2.729 in	2.752 in	2.736 in	2.716 in	2.707 in
Average:	2.75 in	6.98 cm		2.72 in	6.91 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	822.30	827.06
Dry Wt. & Tare:	734.38	734.38
Tare Wt.:	226.53	226.53
Moisture Content:	17.3 %	18.2 %
Dry Unit Weight:	112.5 pcf	114.5 pcf
Porosity:	0.3449	0.3328
Saturation:	90.4 %	100.6 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-31 Panel No.: 2 Positions: 2

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	7/24/93	7:48	0	85.0	80.0	0.10	24.80	0.00
	7/24/93	16: 8	30,000	84.9	80.0	0.80	24.20	0.65
	7/24/93	23:38	57,000	85.0	79.9	1.45	23.60	1.28
	7/25/93	8:48	90,000	85.0	80.0	2.10	22.90	1.95
	7/25/93	16:18	117,000	84.9	79.9	2.70	22.40	2.50
	7/25/93	23:48	144,000	85.0	80.0	3.30	21.85	3.08
	7/26/93	7:18	171,000	84.9	90.0	3.85	21.30	3.63

Test Pressure = 85.0 psi Differential Head = 3.6 psi, 256.3 cm H2O
Gradient = 3.674E 01 Flow rate = 2.097E-05 cc/sec R squared = 0.99967
Permeability, K20.0° = 1.412E-08 cm/sec², K20° = 1.412E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 4.63
Specimen Diameter (cm): 7.22
Dry Unit Weight (pcf): 121.3
Moisture Before Test (%): 13.4
Moisture After Test (%): 15.5
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.5
Back Pressure (psi): 80.1
Diff. Head (psi): 5.4
Flow Rate (cc/sec): 3.49 x 10^-5
Perm. (cm/sec): 1.02 x 10^-8

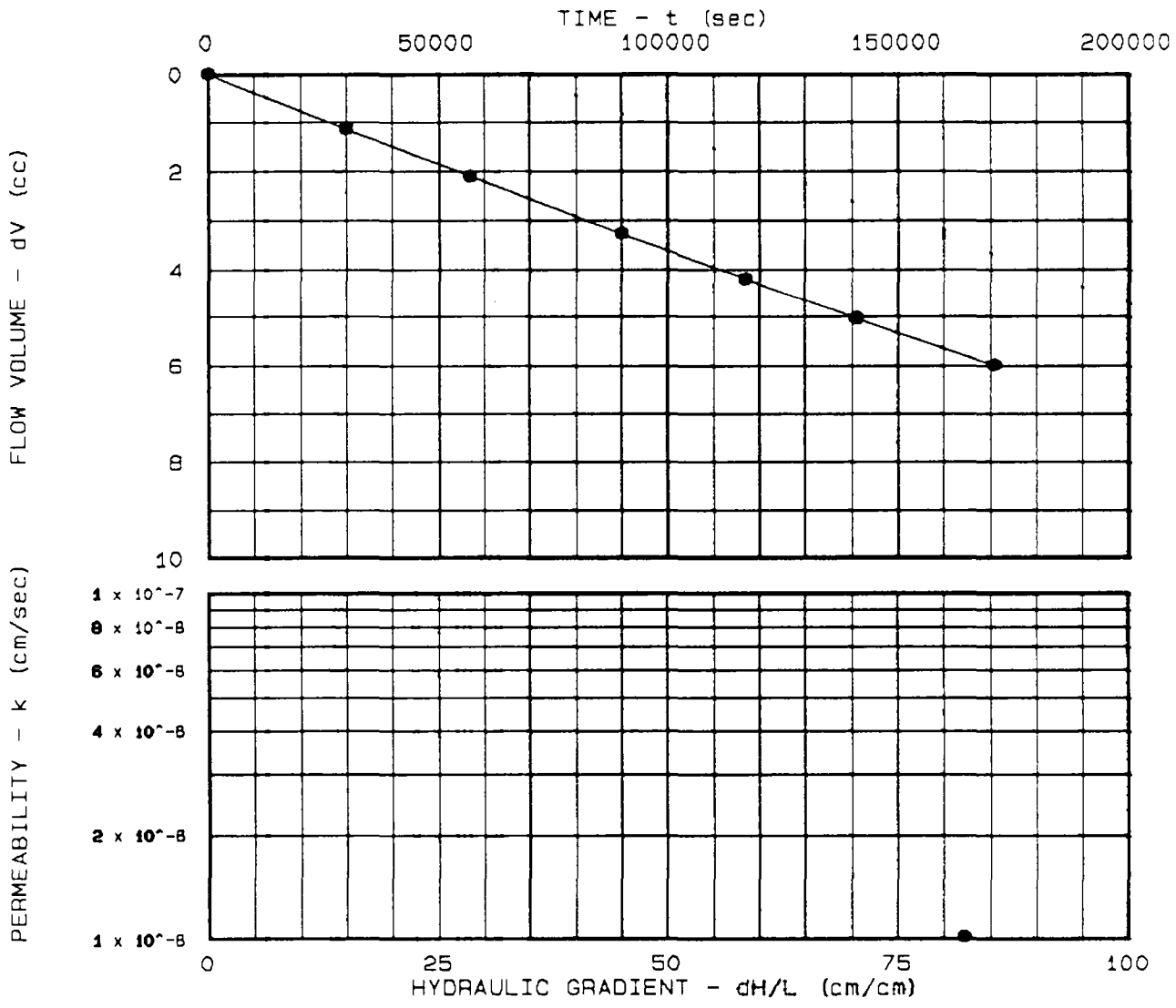
SAMPLE DATA:

Sample Identification: SAMPLE #4

Visual Description: BROWN SILT & CLAY, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: JULY 1993

Project No.:
File No.: G008.014
Lab No.: 1701.001
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	SAMPLE #4
Lab No.:	1701.001
Description:	BROWN SILT & CLAY, trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JULY 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.846 in	2.852 in		2.861 in	2.830 in	
Middle:	2.849 in	2.837 in		2.832 in	2.846 in	
Bottom:	2.845 in	2.836 in		2.818 in	2.775 in	
Average:	2.84 in	7.22 cm		2.83 in	7.19 cm	
Length:	1	2	3	1	2	3
	1.809 in	1.840 in	1.814 in	1.841 in	1.853 in	1.843 in
Average:	1.82 in	4.63 cm		1.85 in	4.69 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	640.44	648.10
Dry Wt. & Tare:	591.08	591.08
Tare Wt.:	222.75	222.75
Moisture Content:	13.4 %	15.5 %
Dry Unit Weight:	121.3 pcf	120.9 pcf
Porosity:	0.2934	0.2960
Saturation:	88.8 %	101.3 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-20 Panel No.: 3 Positions: 4&3

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	7/31/93	8:15	0	85.2	80.1	0.00	24.80	0.00
X	7/31/93	16:35	30,000	85.3	80.2	1.10	23.65	1.13
	8/ 1/93	0: 5	57,000	85.5	80.4	2.10	22.70	2.10
	8/ 1/93	9:15	90,000	85.5	80.3	3.25	21.50	3.28
	8/ 1/93	16:45	117,000	85.6	80.4	4.20	20.60	4.20
	8/ 1/93	23:25	141,000	85.5	80.4	5.05	19.75	5.05
	8/ 2/93	7:45	171,000	85.6	80.5	6.00	18.80	6.00

Test Pressure = 85.5 psi Differential Head = 5.4 psi, 380.2 cm H2O
Gradient = 8.220E 01 Flow rate = 3.433E-05 cc/sec R squared = 0.99953
Permeability, K20.0° = 1.019E-08 cm/sec², K20° = 1.019E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 7.01
Specimen Diameter (cm): 7.24
Dry Unit Weight (pcf): 100.5
Moisture Before Test (%): 15.3
Moisture After Test (%): 18.4
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 84.9
Back Pressure (psi): 79.7
Diff. Head (psi): 5.2
Flow Rate (cc/sec): 3.55 x 10^-4
Perm. (cm/sec): 1.67 x 10^-7

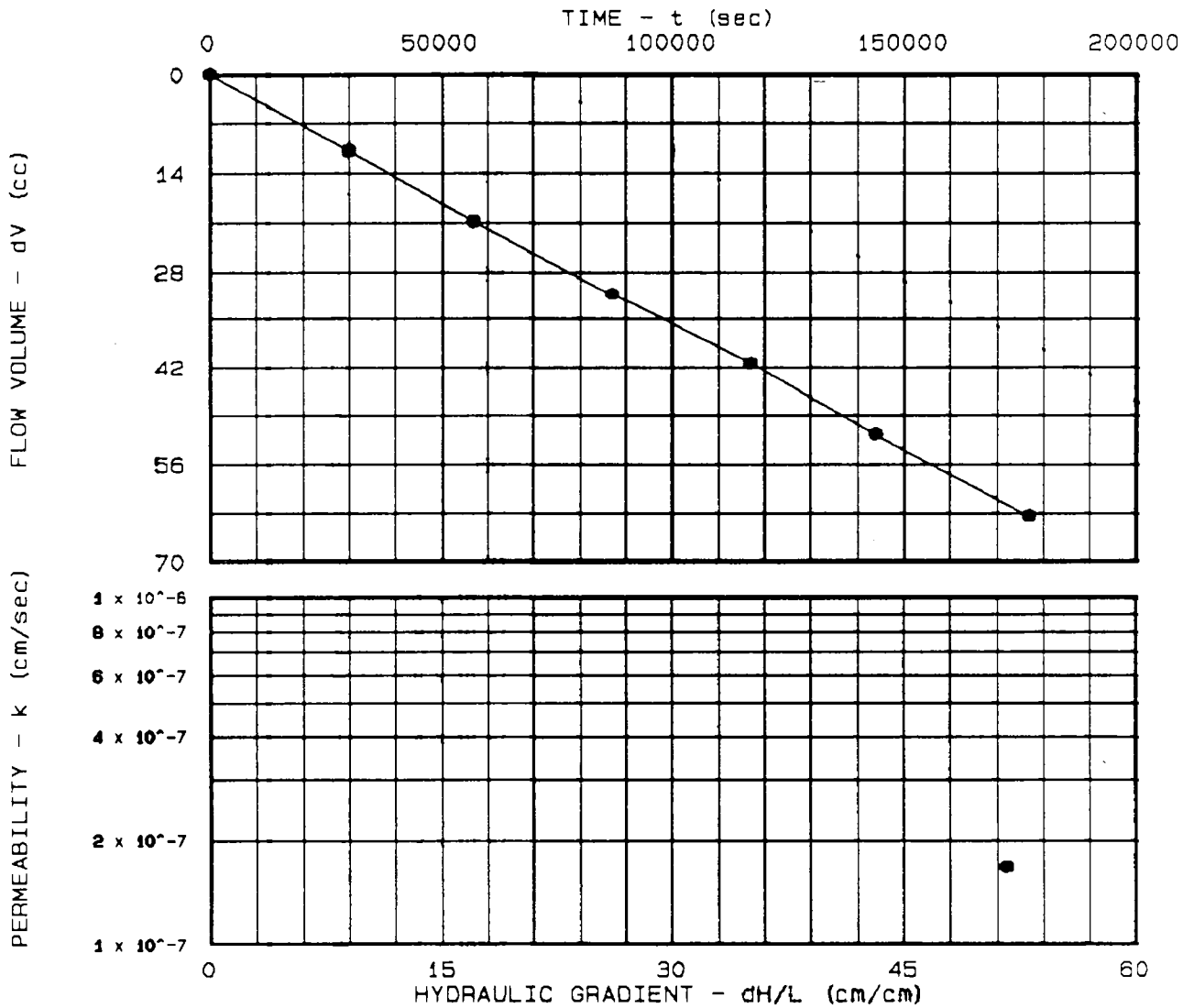
SAMPLE DATA:

Sample Identification: #5A BOTTOM 6"

Visual Description: BROWN CLAY, trace gravel
Remarks:-

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: AUG. 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1714.001
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST DATA

PROJECT DATA

Project Name: DUNLOP INACTIVE WASTE SITE CLOSURE
File No.: G008.014
roject Location: GRAND ISLAND, NEW YORK
.roject No.:
Sample Identification: #5A BOTTOM 6"

ab No.: 1714.001
Description: BROWN CLAY, trace gravel
ample Type: UNDISTURBED
ax. Dry Dens.:
Method (D1557/D698):
pt. Water Content:
ate: AUG. 1993
Remarks:

ermeameter Type: FLEXIBLE WALL
Tested by: KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.843 in	2.844 in		2.751 in	2.679 in	
Middle:	2.845 in	2.859 in		2.770 in	2.724 in	
Bottom:	2.852 in	2.852 in		2.666 in	2.776 in	
Average:	2.85 in	7.24 cm		2.73 in	6.94 cm	
Length:	1	2	3	1	2	3
	2.763 in	2.755 in	2.767 in	2.720 in	2.680 in	2.664 in
Average:	2.76 in	7.01 cm		2.69 in	6.83 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	754.72	769.00
Dry Wt. & Tare:	683.70	683.70
Tare Wt.:	219.14	219.14
Moisture Content:	15.3 %	18.4 %
Dry Unit Weight:	100.5 pcf	112.3 pcf
Porosity:	0.4148	0.3460
Saturation:	59.3 %	95.4 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: fp-2 Panel No.: CU-2 Positions:

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	4.90	1.00
Outflow Buret Factor:	5.10	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc AVERAGE
X	8/ 5/93	7:34	0	85.0	80.0	0.15	24.65	0.00
X	8/ 5/93	15:54	30,000	84.9	80.0	2.40	22.60	10.74
	8/ 5/93	23:24	57,000	84.9	80.0	4.50	20.65	20.86
	8/ 6/93	7:44	87,000	84.9	79.9	6.70	18.65	31.35
	8/ 6/93	16: 4	117,000	84.9	79.9	8.80	16.70	41.47
R	0/ 0/ 0	0:00	0	0.0	0.0	8.80	16.70	0.00
R	0/ 0/ 0	0:00	0	0.0	0.0	0.00	24.60	0.00
	8/ 6/93	23:34	144,000	84.9	80.0	2.10	22.60	51.71
	8/ 7/93	8:44	177,000	84.8	80.0	4.60	20.40	63.45

Test Pressure = 84.9 psi Differential Head = 5.2 psi, 362.4 cm H2O
Gradient = 5.166E 01 Flow rate = 3.553E-04 cc/sec R squared = 0.99969
Permeability, K20.0° = 1.671E-07 cm/sec², K20° = 1.671E-07 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 6.61
Specimen Diameter (cm): 7.23
Dry Unit Weight (pcf): 107.2
Moisture Before Test (%): 14.6
Moisture After Test (%): 18.4
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 83.3
Back Pressure (psi): 79.7
Diff. Head (psi): 3.6
Flow Rate (cc/sec): 3.07 x 10^-4
Perm. (cm/sec): 1.93 x 10^-7

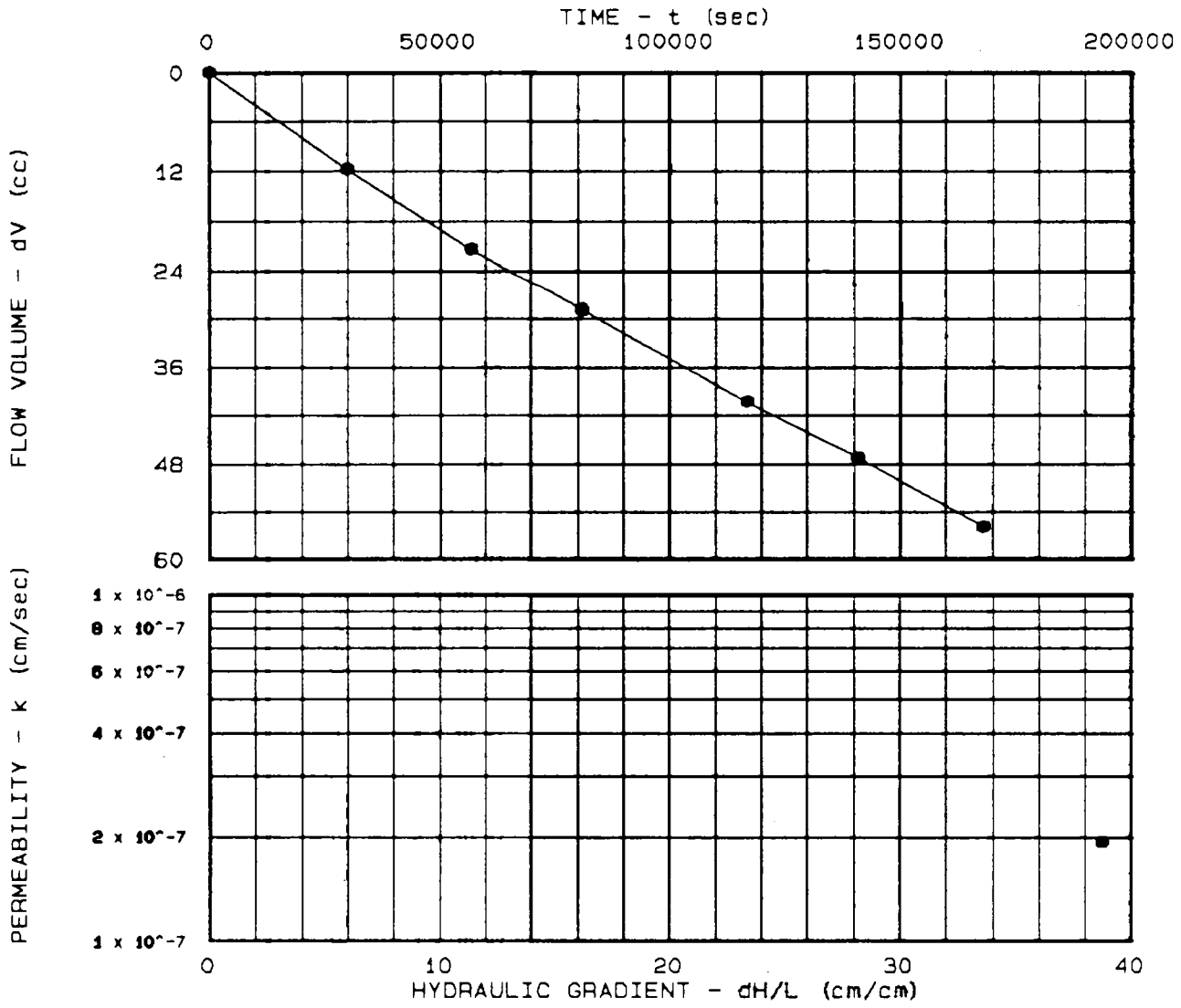
SAMPLE DATA:

Sample Identification: #5 A TOP 12"

Visual Description: BROWN CLAY, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: AUG. 1993

Project No.:
File No.: G008.014
Lab No.: 1714.001A
Tested by: KJC
Checked by: JFC

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

PERMEABILITY TEST DATA

PROJECT DATA

Project Name: DUNLOP INACTIVE WASTE SITE CLOSURE
File No.: G008.014
Project Location: GRAND ISLAND, NEW YORK
Project No.:
Sample Identification: #5 A TOP 12"

Lab No.: 1714.001A
Description: BROWN CLAY, trace gravel
Sample Type: UNDISTURBED
Max. Dry Dens.:
Method (D1557/D698):
Opt. Water Content:
Date: AUG. 1993
Remarks:

Permeameter Type: FLEXIBLE WALL
Tested by: KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.839 in	2.888 in		2.764 in	2.807 in	
Middle:	2.811 in	2.851 in		2.775 in	2.758 in	
Bottom:	2.875 in	2.858 in		2.799 in	2.790 in	
Average:	2.85 in	7.23 cm		2.78 in	7.06 cm	
Length:	1	2	3	1	2	3
	2.596 in	2.613 in	2.595 in	2.576 in	2.551 in	2.591 in
Average:	2.60 in	6.61 cm		2.57 in	6.53 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	764.02	782.00
Dry Wt. & Tare:	696.10	696.10
Tare Wt.:	229.85	229.85
Moisture Content:	14.6 %	18.4 %
Dry Unit Weight:	107.2 pcf	113.9 pcf
Porosity:	0.3757	0.3366
Saturation:	66.6 %	99.9 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-33 TOP Panel No.: CU-1 Positions:

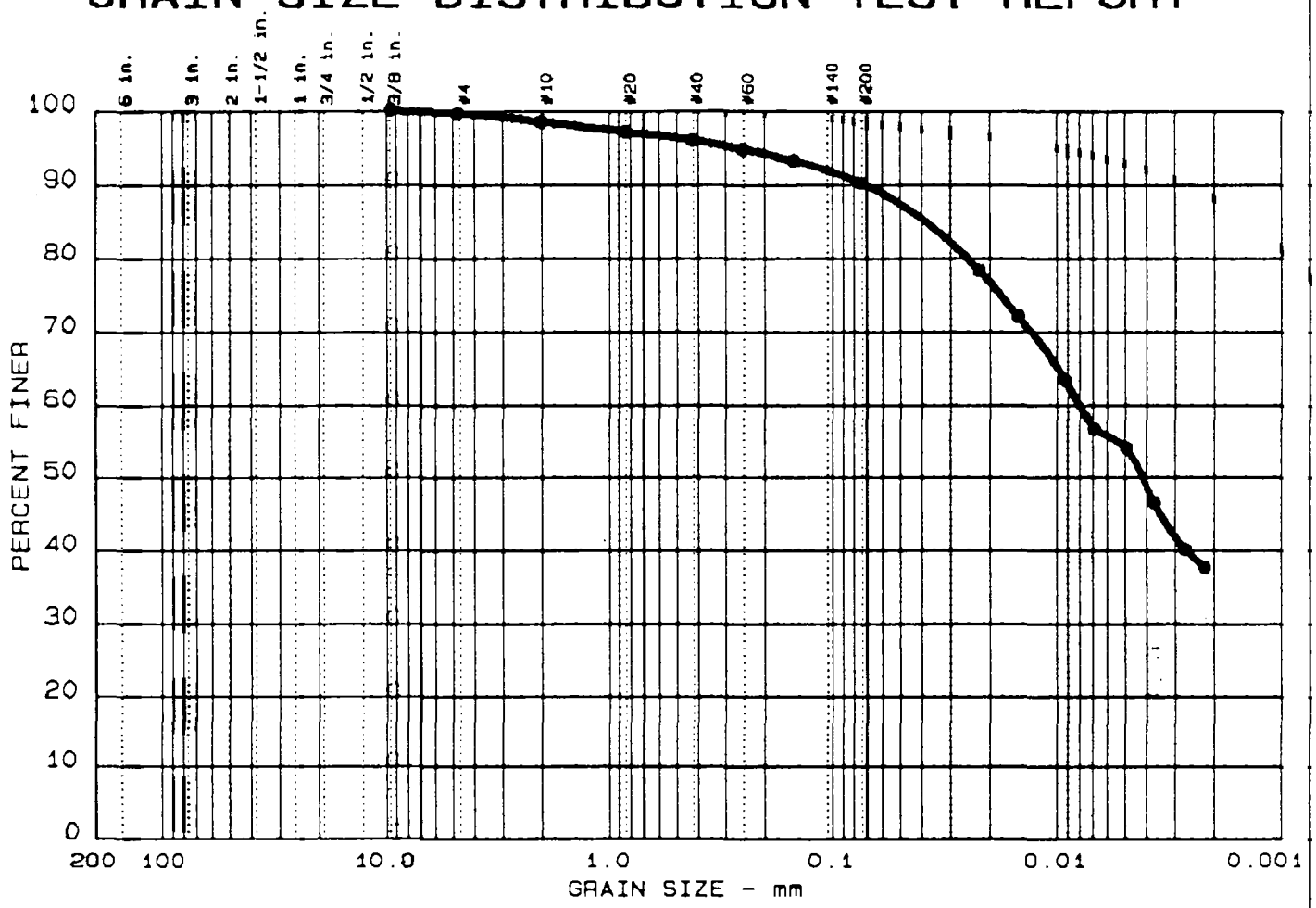
Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	4.90	1.00
Outflow Buret Factor:	4.70	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	8/ 7/93	8:38	0	83.3	80.1	0.00	24.75	0.00
X	8/ 7/93	16:58	30,000	83.0	79.8	2.40	22.25	11.76
X	8/ 8/93	0:28	57,000	83.2	79.7	4.40	20.25	21.36
	8/ 8/93	7: 8	81,000	83.1	79.8	6.00	18.65	29.04
	8/ 8/93	17: 8	117,000	83.5	79.8	8.30	16.25	40.31
	8/ 8/93	23:48	141,000	83.4	80.1	9.75	14.80	47.27
R	0/ 0/ 0	0:00	0	0.0	0.0	9.75	14.80	0.00
R	0/ 0/ 0	0:00	0	0.0	0.0	0.05	24.95	0.00
	8/ 9/93	7:18	168,000	83.0	79.5	1.85	23.15	55.91

Test Pressure = 83.3 psi Differential Head = 3.6 psi, 255.9 cm H2O
Gradient = 3.873E 01 Flow rate = 3.075E-04 cc/sec R squared = 0.99974
Permeability, K20.0° = 1.932E-07 cm/sec², K20° = 1.932E-07 cm/sec²

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.5	9.3	35.9	54.3

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.00					

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN CLAY AND SILT, trace sand & gravel		

Project No.: G008.014
Project: DUNLOP INACTIVE WASTE CLOSURE
● Location: #5A TOP 12" middle portion

Date: AUGUST 12, 1993

Remarks:

CLIENT:

LAB NO. 1714.001A

GRAIN SIZE DISTRIBUTION TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC

Figure No. 1

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 8.21
Specimen Diameter (cm): 7.24
Dry Unit Weight (pcf): 98.2
Moisture Before Test (%): 15.3
Moisture After Test (%): 19.3
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 83.0
Back Pressure (psi): 79.7
Diff. Head (psi): 3.3
Flow Rate (cc/sec): 2.10 x 10^-4
Perm. (cm/sec): 1.82 x 10^-7

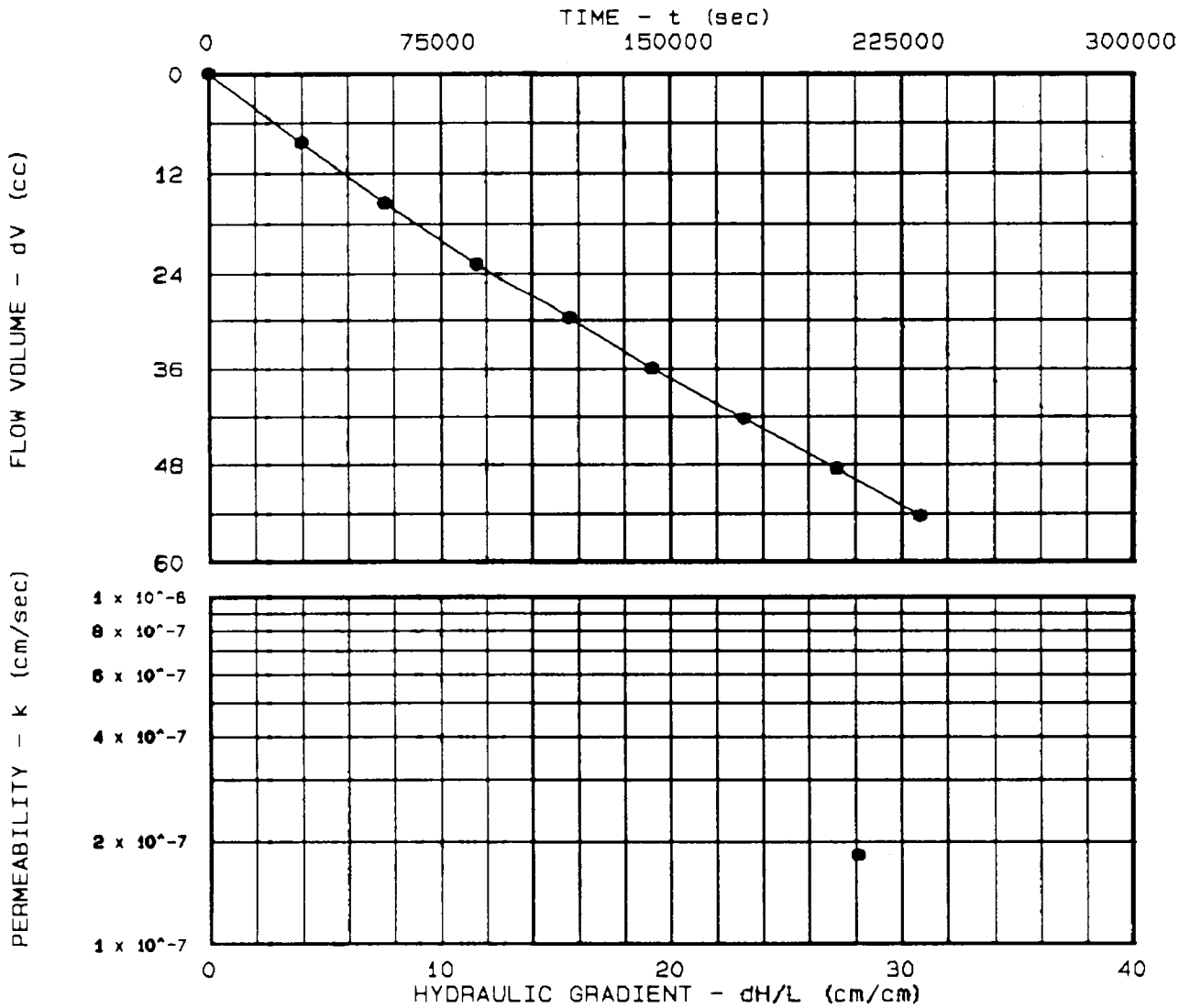
SAMPLE DATA:

Sample Identification: #5B BOTTOM 6"

Visual Description: BROWN CLAY, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: AUG. 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1714.001B
Tested by: KJC
Checked by: JFC

PERMEABILITY TEST DATA

PROJECT DATA

Project Name: DUNLOP INACTIVE WASTE SITE CLOSURE
File No.: G008.014
Project Location: GRAND ISLAND, NEW YORK
Project No.:
Sample Identification: #5B BOTTOM 6"

Lab No.: 1714.001B
Description: BROWN CLAY, trace gravel
Sample Type: UNDISTURBED
Max. Dry Dens.:
Method (D1557/D698):
Opt. Water Content:
Date: AUG. 1993
Remarks:

Permeameter Type: FLEXIBLE WALL
Tested by: KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.861 in	2.863 in		2.742 in	2.815 in	
Middle:	2.847 in	2.836 in		2.581 in	2.737 in	
Bottom:	2.849 in	2.857 in		2.725 in	2.753 in	
Average:	2.85 in	7.24 cm		2.71 in	6.88 cm	
Length:	1	2	3	1	2	3
	3.247 in	3.229 in	3.219 in	3.201 in	3.157 in	3.112 in
Average:	3.23 in	8.21 cm		3.16 in	8.02 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	844.10	865.30
Dry Wt. & Tare:	762.70	762.70
Tare Wt.:	231.20	231.20
Moisture Content:	15.3 %	19.3 %
Dry Unit Weight:	98.2 pcf	111.3 pcf
Porosity:	0.4277	0.3517
Saturation:	56.4 %	97.9 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-19 Panel No.: 3 Positions: 2&1

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	5.40	1.00
Outflow Buret Factor:	5.70	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	8/10/93	7:25	0	82.8	80.0	0.05	24.75	0.00
X	8/10/93	15:45	30,000	82.8	79.9	1.60	23.30	8.32
X	8/10/93	23:15	57,000	82.9	80.0	2.95	22.05	15.53
X	8/11/93	7:35	87,000	83.0	80.1	4.35	20.80	22.87
X	8/11/93	15:55	117,000	82.8	80.0	5.65	19.60	29.80
	8/11/93	23:25	144,000	83.1	80.0	6.80	18.50	36.04
	8/12/93	7:45	174,000	83.0	79.9	8.00	17.45	42.27
	8/12/93	16: 5	204,000	83.1	80.0	9.20	16.40	48.50
R	0/ 0/ 0	0:00	0	0.0	0.0	9.25	16.30	0.00
R	0/ 0/ 0	0:00	0	0.0	0.0	0.05	24.80	0.00
	8/12/93	23:35	231,000	82.8	79.8	1.05	23.85	54.33

Test Pressure = 83.0 psi Differential Head = 3.3 psi, 230.7 cm H2O
Gradient = 2.811E 01 Flow rate = 2.100E-04 cc/sec R squared = 0.99992
Permeability, K20.0° = 1.815E-07 cm/sec², K20° = 1.815E-07 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 9.50
Specimen Diameter (cm): 7.20
Dry Unit Weight (pcf): 116.2
Moisture Before Test (%): 15.1
Moisture After Test (%): 16.8
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.2
Back Pressure (psi): 79.7
Diff. Head (psi): 5.5
Flow Rate (cc/sec): 4.87 x 10^-5
Perm. (cm/sec): 2.92 x 10^-8

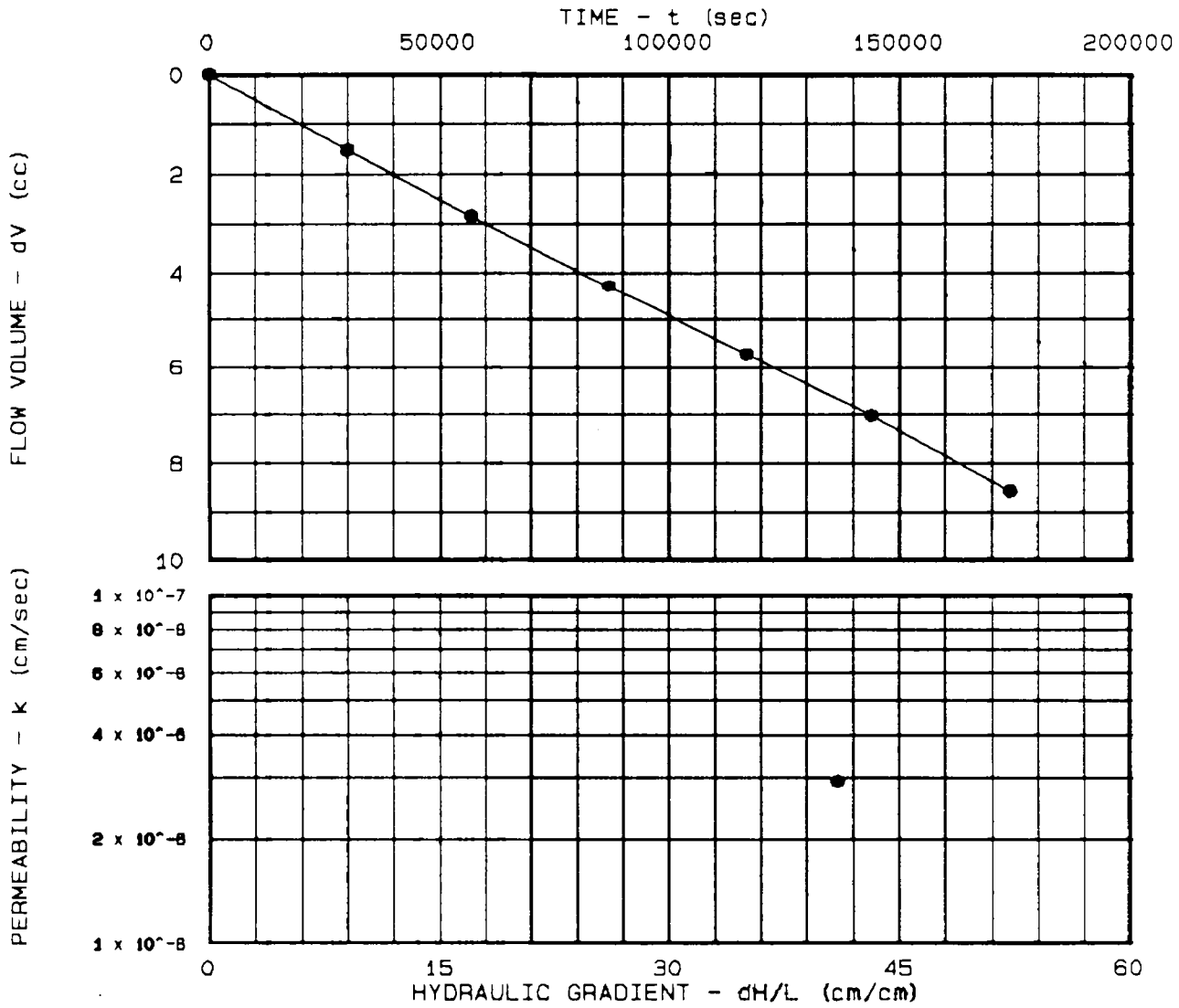
SAMPLE DATA:

Sample Identification: #5B TOP 12"

Visual Description: BROWN CLAY, trace gravel
Remarks:-

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: AUG. 1993

Project No.:
File No.: G008.014
Lab No.: 1714.001B
Tested by: KJC
Checked by: JFC

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	#5B TOP 12"
Lab No.:	1714.001B
Description:	BROWN CLAY, trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	AUG. 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.852 in	2.805 in		2.821 in	2.839 in	
Middle:	2.850 in	2.816 in		2.834 in	2.854 in	
Bottom:	2.859 in	2.838 in		2.825 in	2.852 in	
Average:	2.84 in	7.20 cm		2.84 in	7.21 cm	
Length:	1	2	3	1	2	3
	3.742 in	3.736 in	3.746 in	3.749 in	3.734 in	3.738 in
Average:	3.74 in	9.50 cm		3.74 in	9.50 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	961.02	973.70
Dry Wt. & Tare:	852.30	852.30
Tare Wt.:	131.32	131.32
Moisture Content:	15.1 %	16.8 %
Dry Unit Weight:	116.2 pcf	116.0 pcf
Porosity:	0.3229	0.3244
Saturation:	86.9 %	96.5 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-30 Panel No.: 3 Positions: 4&3

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	8/10/93	7:26	0	85.4	80.0	0.05	24.90	0.00
	8/10/93	15:46	30,000	85.3	79.9	1.60	23.40	1.53
	8/10/93	23:16	57,000	85.2	79.9	3.00	22.15	2.85
	8/11/93	7:36	87,000	85.3	80.0	4.45	20.70	4.30
	8/11/93	15:56	117,000	85.0	79.7	5.95	19.30	5.75
	8/11/93	23:26	144,000	85.1	79.9	7.25	18.05	7.03
	8/12/93	7:46	174,000	85.2	79.9	8.80	16.50	8.58

"est Pressure = 85.2 psi Differential Head = 5.5 psi, 389.5 cm H2O
radient = 4.099E 01 Flow rate = 4.869E-05 cc/sec R squared = 0.99988
Permeability, K20.0° = 2.915E-08 cm/sec², K20° = 2.915E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 6.56
Specimen Diameter (cm): 7.22
Dry Unit Weight (pcf): 114.6
Moisture Before Test (%): 17.4
Moisture After Test (%): 17.7

Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	
Test Pressure (psi):	85.2	
Back Pressure (psi):	79.7	
Diff. Head (psi):	5.5	
Flow Rate (cc/sec):	2.42 x 10^-5	
Perm. (cm/sec):	1.01 x 10^-8	

SAMPLE DATA:

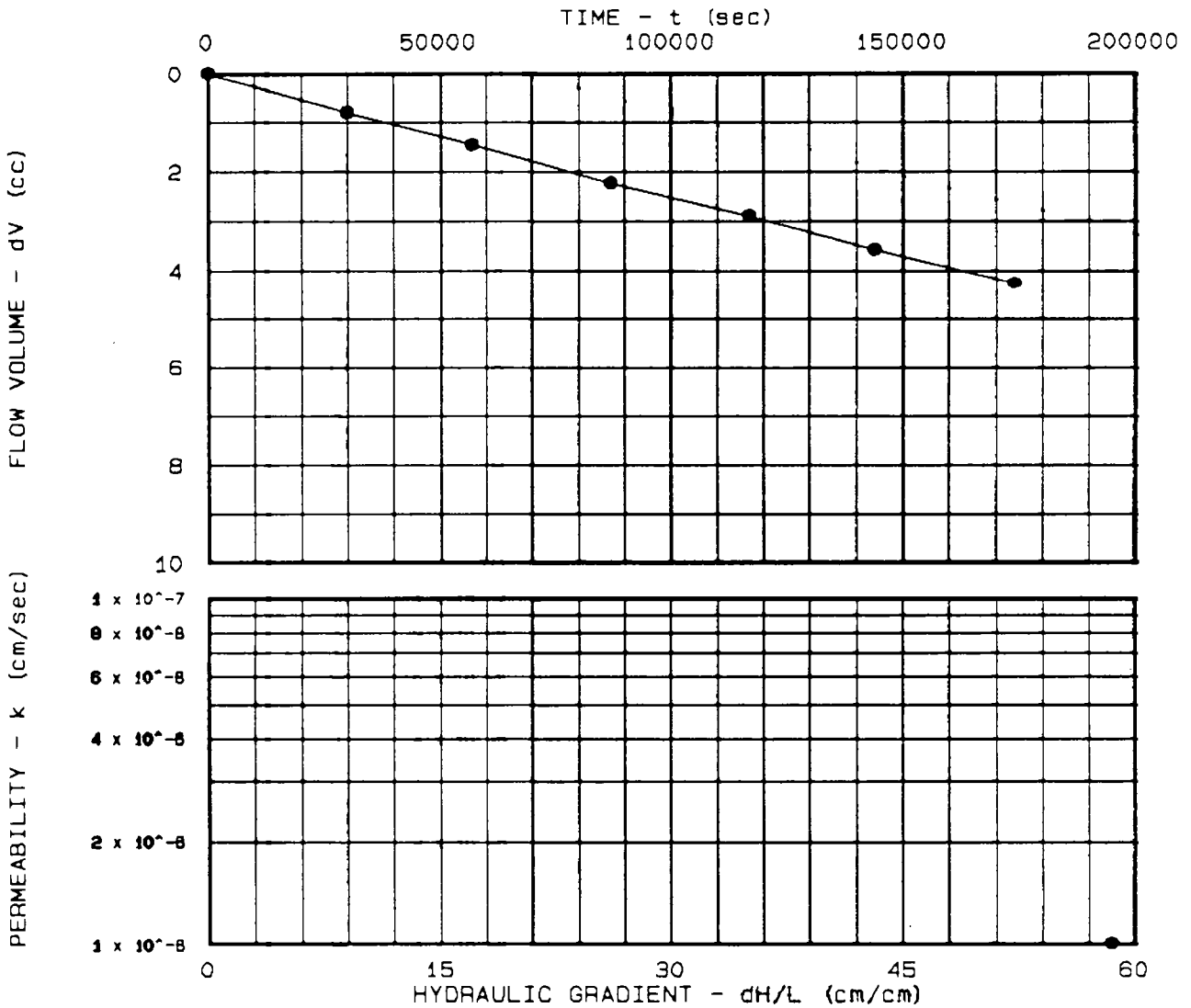
Sample Identification: #6A TOP 12"

Visual Description: BROWN CLAY, trace gravel

Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: AUG. 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1720.001A
Tested by: KJC
Checked by: JFC

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	#6A TOP 12"
Lab No.:	1720.001A
Description:	BROWN CLAY, trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	AUG. 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.790 in	2.851 in		2.805 in	2.842 in	
Middle:	2.825 in	2.852 in		2.819 in	2.843 in	
Bottom:	2.880 in	2.859 in		2.858 in	2.821 in	
Average:	2.84 in	7.22 cm		2.83 in	7.19 cm	
Length:	1	2	3	1	2	3
	2.592 in	2.568 in	2.586 in	2.563 in	2.570 in	2.572 in
Average:	2.58 in	6.56 cm		2.57 in	6.52 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	806.61	808.10
Dry Wt. & Tare:	721.10	721.10
Tare Wt.:	228.39	228.39
Moisture Content:	17.4 %	17.7 %
Dry Unit Weight:	114.6 pcf	116.1 pcf
Porosity:	0.3324	0.3238
Saturation:	95.9 %	101.4 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-8 Panel No.: 3 Positions: 6&5

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	8/10/93	7:27	0	85.3	80.1	0.00	24.80	0.00
	8/10/93	15:47	30,000	85.2	80.0	0.80	24.00	0.80
	8/10/93	23:17	57,000	85.2	80.1	1.50	23.40	1.45
	8/11/93	7:37	87,000	85.3	80.1	2.25	22.60	2.23
	8/11/93	15:57	117,000	85.1	80.0	3.00	22.00	2.90
	8/11/93	23:27	144,000	85.3	80.2	3.65	21.30	3.58
	8/12/93	7:47	174,000	85.2	80.1	4.35	20.60	4.28

Test Pressure = 85.2 psi Differential Head = 5.5 psi, 383.3 cm H2O
Gradient = 5.845E 01 Flow rate = 2.416E-05 cc/sec R squared = 0.99975
Permeability, K20.0° = 1.010E-08 cm/sec², K20° = 1.010E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 5.05
Specimen Diameter (cm): 7.18
Dry Unit Weight (pcf): 110.2
Moisture Before Test (%): 16.4
Moisture After Test (%): 18.9

Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	
Test Pressure (psi):	85.0	
Back Pressure (psi):	79.7	
Diff. Head (psi):	5.3	
Flow Rate (cc/sec):	2.00 x 10^-4	
Perm. (cm/sec):	5.63 x 10^-8	

SAMPLE DATA:

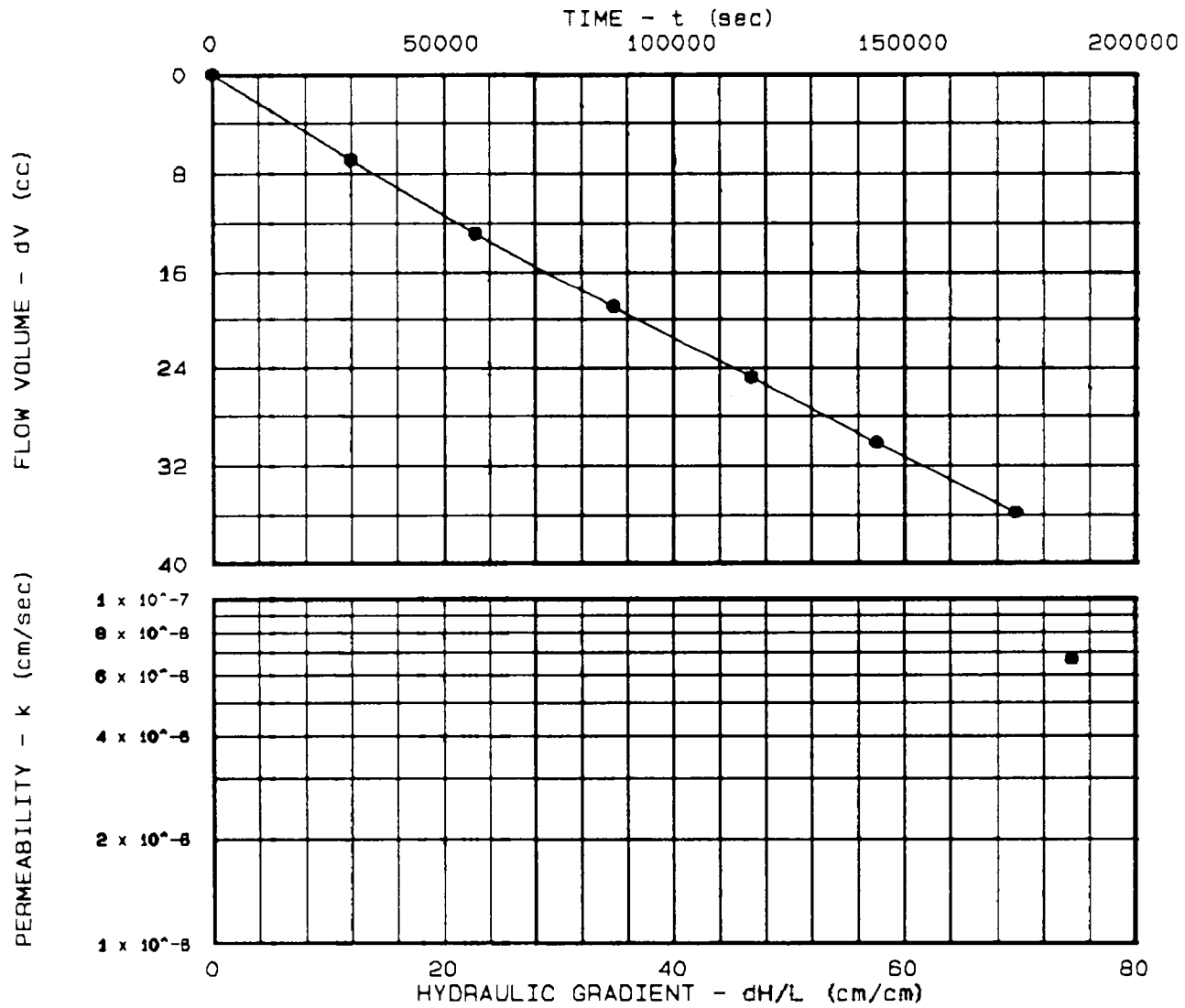
Sample Identification: #7 BOTTOM 6"

Visual Description: BROWN CLAY AND SILT, trace gravel

Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: AUG. 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1725.001
Tested by: KJC
Checked by: JFC

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	#7 BOTTOM 6"
Lab No.:	1725.001
Description:	BROWN CLAY AND SILT, trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	AUG. 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.827 in	2.806 in		2.725 in	2.807 in	
Middle:	2.830 in	2.812 in		2.784 in	2.815 in	
Bottom:	2.861 in	2.836 in		2.817 in	2.842 in	
Average:	2.83 in	7.18 cm		2.80 in	7.11 cm	
Length:	1	2	3	1	2	3
	1.998 in	1.991 in	1.975 in	1.973 in	1.974 in	1.981 in
Average:	1.99 in	5.05 cm		1.98 in	5.02 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	645.58	654.40
Dry Wt. & Tare:	586.32	586.32
Tare Wt.:	225.48	225.48
Moisture Content:	16.4 %	18.9 %
Dry Unit Weight:	110.2 pcf	113.1 pcf
Porosity:	0.3582	0.3413
Saturation:	80.9 %	100.2 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-27 Panel No.: 12 Positions: 4&3

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	4.90	1.00
Outflow Buret Factor:	5.20	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	8/12/93	7:49	0	85.1	80.0	0.05	24.70	0.00
	8/12/93	16: 9	30,000	85.0	79.9	1.45	23.35	6.94
	8/12/93	23:39	57,000	85.1	80.0	2.65	22.20	12.87
	8/13/93	7:59	87,000	85.1	80.0	3.95	21.05	19.05
	8/13/93	16:19	117,000	84.9	79.9	5.15	19.95	24.85
	8/13/93	23:49	144,000	85.0	79.9	6.20	18.90	30.15
	8/14/93	8: 9	174,000	85.0	79.9	7.35	17.80	35.83

Test Pressure = 85.0 psi Differential Head = 5.3 psi, 375.7 cm H2O
Gradient = 7.440E 01 Flow rate = 1.998E-04 cc/sec R squared = 0.99936
Permeability, K20.0° = 6.634E-08 cm/sec², K20° = 6.634E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 9.58
Specimen Diameter (cm): 7.21
Dry Unit Weight (pcf): 113.3
Moisture Before Test (%): 17.6
Moisture After Test (%): 17.8
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 84.6
Back Pressure (psi): 79.6
Diff. Head (psi): 5.0
Flow Rate (cc/sec): 1.77 x 10^-5
Perm. (cm/sec): 1.19 x 10^-8

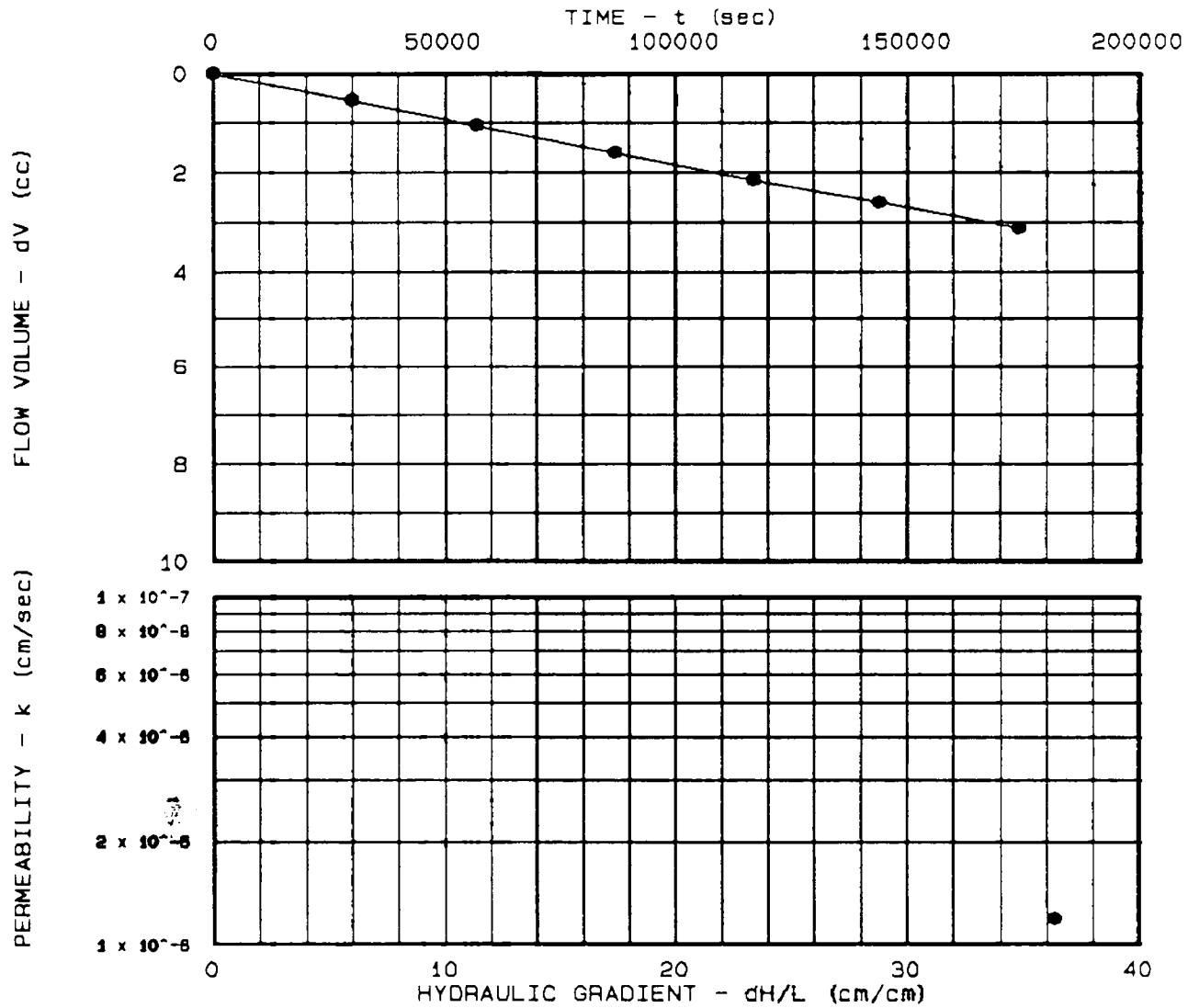
SAMPLE DATA:

Sample Identification: #7 TOP 12"

Visual Description: BROWN CLAY AND SILT, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: AUG. 1993

Project No.:
File No.: G008.014
Lab No.: 1725.001
Tested by: KJC
Checked by: JFC

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
roject Location:	GRAND ISLAND, NEW YORK
roject No.:	
Sample Identification:	#7 TOP 12"
ab No.:	1725.001
Description:	BROWN CLAY AND SILT, trace gravel
ample Type:	UNDISTURBED
ax. Dry Dens.:	
Method (D1557/D698):	
pt. Water Content:	
ate:	AUG. 1993
Remarks:	
ermeameter Type:	FLEXIBLE WALL
ested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.832 in	2.840 in		2.830 in	2.798 in	
Middle:	2.837 in	2.831 in		2.828 in	2.893 in	
Bottom:	2.824 in	2.886 in		2.871 in	2.824 in	
Average:	2.84 in	7.21 cm		2.85 in	7.23 cm	
Length:	1	2	3	1	2	3
	3.780 in	3.761 in	3.778 in	3.726 in	3.701 in	3.717 in
Average:	3.77 in	9.58 cm		3.71 in	9.44 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	1069.62	1070.60
Dry Wt. & Tare:	944.40	944.40
Tare Wt.:	233.52	233.52
Moisture Content:	17.6 %	17.8 %
Dry Unit Weight:	113.3 pcf	114.6 pcf
Porosity:	0.3399	0.3323
Saturation:	94.1 %	98.1 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-26 Panel No.: 11 Positions: 6&5

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	8/12/93	7:51	0	84.7	80.1	0.10	24.85	0.00
X	8/12/93	16:11	30,000	84.6	79.9	0.65	24.30	0.55
	8/12/93	23:41	57,000	84.7	80.0	1.20	23.85	1.05
	8/13/93	8: 1	87,000	84.7	80.1	1.75	23.30	1.60
	8/13/93	16:21	117,000	84.6	79.9	2.30	22.75	2.15
	8/13/93	23:51	144,000	84.5	80.0	2.75	22.30	2.60
	8/14/93	8:11	174,000	84.6	80.0	3.30	21.80	3.13

Test Pressure = 84.6 psi Differential Head = 5.0 psi, 348.2 cm H2O
Gradient = 3.633E 01 Flow rate = 1.770E-05 cc/sec R squared = 0.99966
Permeability, K20.0° = 1.192E-08 cm/sec², K20° = 1.192E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

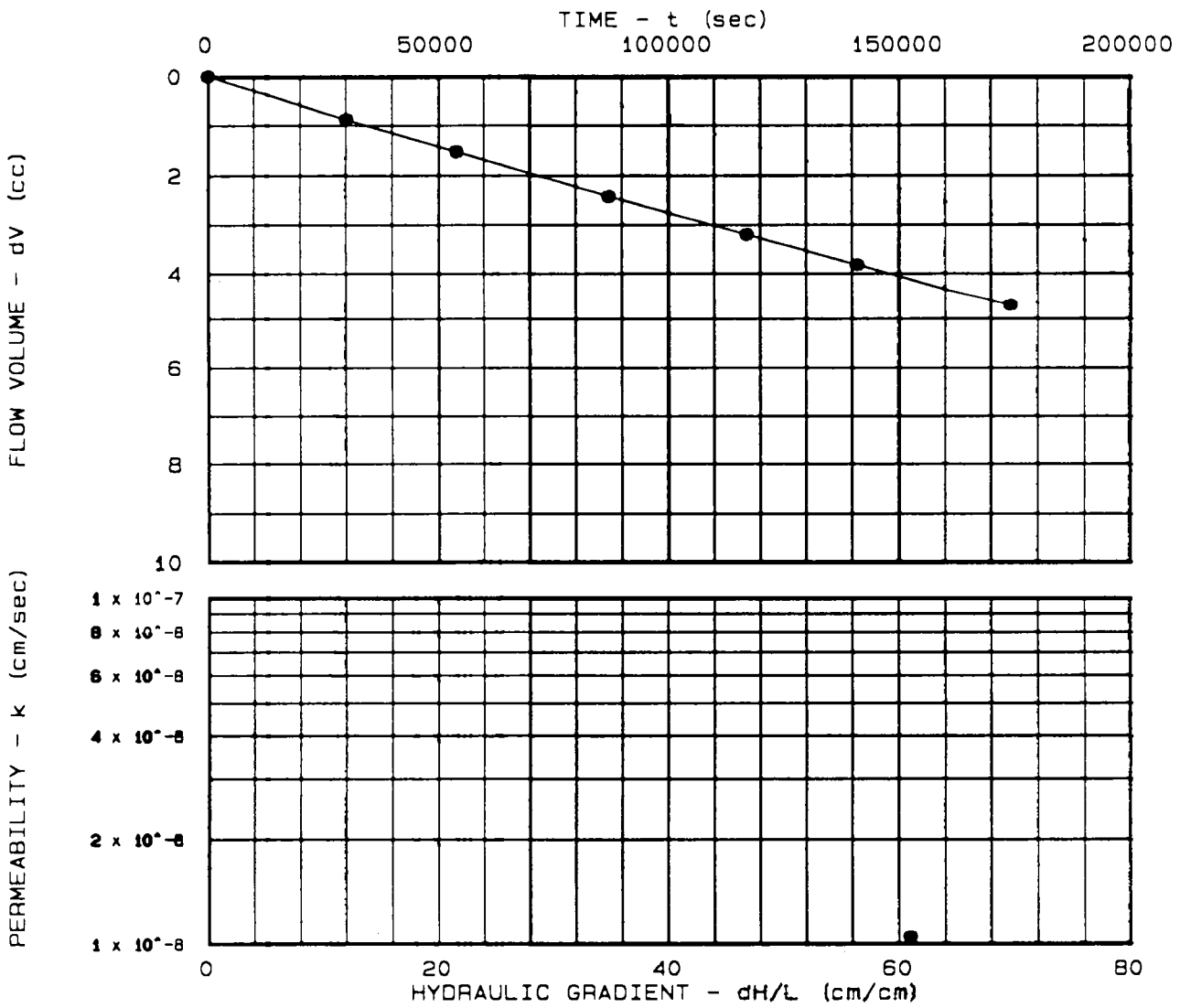
Specimen Height (cm): 5.58
Specimen Diameter (cm): 7.21
Dry Unit Weight (pcf): 113.3
Moisture Before Test (%): 16.8
Moisture After Test (%): 17.5
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 84.8
Back Pressure (psi): 80.0
Diff. Head (psi): 4.8
Flow Rate (cc/sec): 2.61 x 10^-5
Perm. (cm/sec): 1.05 x 10^-8

SAMPLE DATA:

Sample Identification: DTC-ST-8 BOTTOM 6"
Visual Description: BROWN CLAY AND SILT, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: AUG. 1993

Project No.:
File No.: G008.014
Lab No.: 1760.001
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	DTC-ST-8 BOTTOM 6"
Lab No.:	1760.001
Description:	BROWN CLAY AND SILT, trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	AUG. 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.878 in	2.811 in		2.823 in	2.797 in	
Middle:	2.858 in	2.816 in		2.832 in	2.791 in	
Bottom:	2.854 in	2.825 in		2.841 in	2.781 in	
Average:	2.84 in	7.21 cm		2.81 in	7.14 cm	
Length:	1	2	3	1	2	3
	2.178 in	2.207 in	2.206 in	2.163 in	2.167 in	2.231 in
Average:	2.20 in	5.58 cm		2.19 in	5.55 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	711.66	714.50
Dry Wt. & Tare:	642.20	642.20
Tare Wt.:	228.41	228.41
Moisture Content:	16.8 %	17.5 %
Dry Unit Weight:	113.3 pcf	116.1 pcf
Porosity:	0.3400	0.3235
Saturation:	89.6 %	100.5 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-27 Panel No.: 6 Positions: 6&5

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	80.2 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	8/26/93	7:41	0	85.1	80.3	0.10	24.85	0.00
X	8/26/93	16: 1	30,000	84.9	80.1	1.00	24.00	0.88
X	8/26/93	22:41	54,000	84.7	80.2	1.65	23.35	1.53
	8/27/93	7:51	87,000	84.7	80.2	2.55	22.45	2.43
	8/27/93	16:11	117,000	84.5	80.1	3.35	21.70	3.20
	8/27/93	22:51	141,000	85.1	80.2	4.00	21.10	3.83
	8/28/93	8: 1	174,000	84.7	80.3	4.85	20.20	4.70

Test Pressure = 84.8 psi Differential Head = 4.8 psi, 340.0 cm H2O
Gradient = 6.093E 01 Flow rate = 2.615E-05 cc/sec R squared = 0.99996
Permeability, K20.0° = 1.050E-08 cm/sec¹, K20° = 1.050E-08 cm/sec¹

PERMEABILITY TEST REPORT

TEST DATA:

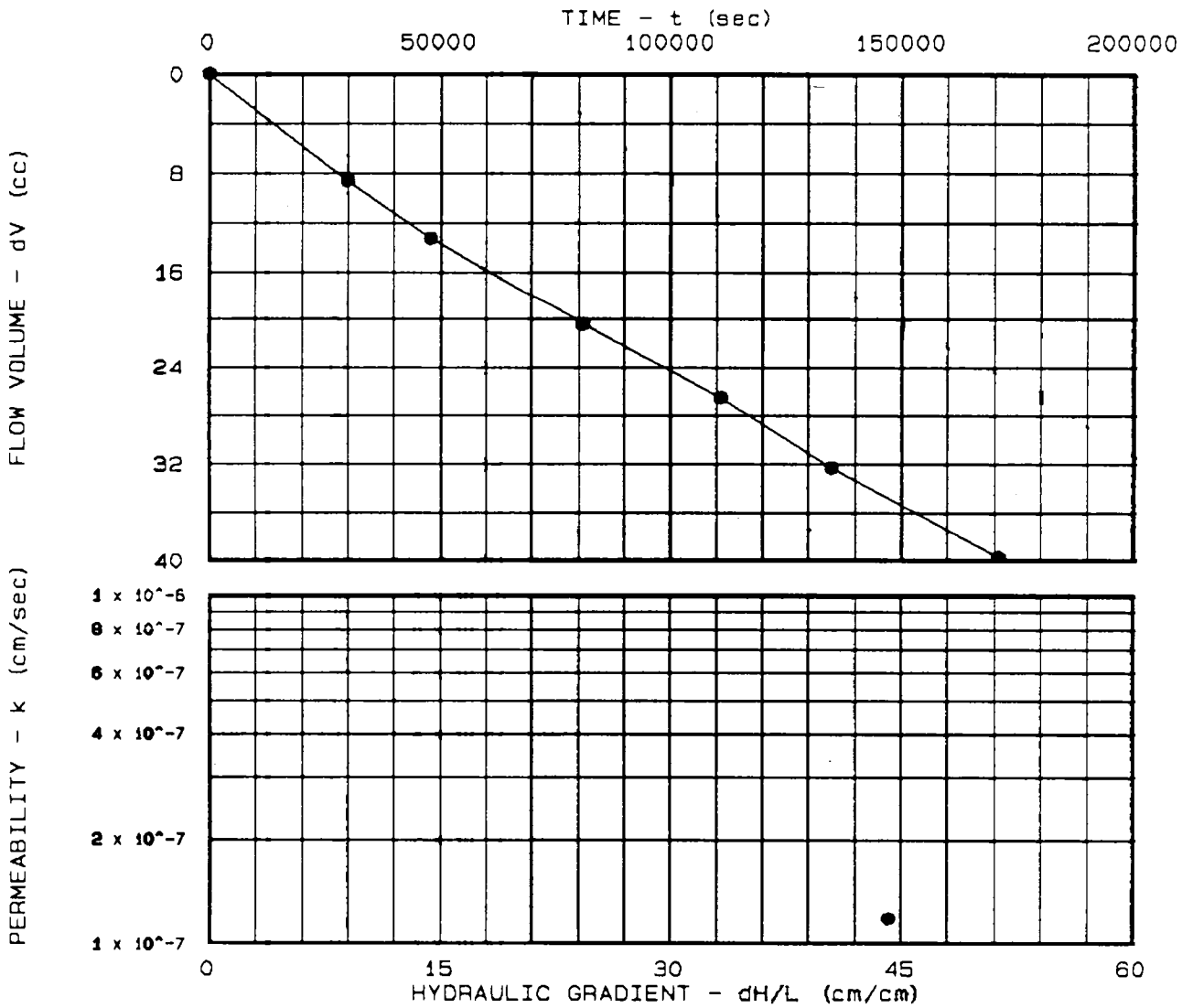
Specimen Height (cm): 6.98
Specimen Diameter (cm): 7.22
Dry Unit Weight (pcf): 104.5
Moisture Before Test (%): 16.0
Moisture After Test (%): 18.8
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 84.2
Back Pressure (psi): 79.8
Diff. Head (psi): 4.4
Flow Rate (cc/sec): 2.15 x 10^-4
Perm. (cm/sec): 1.19 x 10^-7

SAMPLE DATA:

Sample Identification: OTC-ST-9 BOTTOM 6"
Visual Description: BROWN CLAY & SILT, trace sand
Remarks:.

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: SEPT. 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1765.001
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	DTC-ST-9 BOTTOM 6"
Lab No.:	1765.001
Description:	BROWN CLAY & SILT, trace sand
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	SEPT. 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.855 in	2.871 in		2.782 in	2.748 in	
Middle:	2.813 in	2.849 in		2.724 in	2.770 in	
Bottom:	2.850 in	2.849 in		2.739 in	2.760 in	
Average:	2.84 in	7.22 cm		2.75 in	6.99 cm	
Length:	1	2	3	1	2	3
	2.744 in	2.743 in	2.762 in	2.749 in	2.680 in	2.707 in
Average:	2.75 in	6.98 cm		2.71 in	6.89 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	780.86	794.40
Dry Wt. & Tare:	704.30	704.30
Tare Wt.:	225.07	225.07
Moisture Content:	16.0 %	18.8 %
Dry Unit Weight:	104.5 pcf	113.2 pcf
Porosity:	0.3910	0.3408
Saturation:	68.4 %	100.0 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-14 Panel No.: 11 Positions: 6&5

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	80.1 psi	0.0 psi
Inflow Buret Factor:	5.00	1.00
Outflow Buret Factor:	5.30	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	8/29/93	8:57	0	85.0	80.1	0.00	24.45	0.00
X	8/29/93	17:17	30,000	84.7	80.1	1.75	22.85	8.62
	8/29/93	22:17	48,000	84.2	80.1	2.65	21.95	13.25
	8/30/93	7:27	81,000	84.0	80.1	4.10	20.60	20.45
	8/30/93	15:47	111,000	84.8	80.0	5.30	19.45	26.50
	8/30/93	22:27	135,000	84.1	80.1	6.45	18.35	32.29
	8/31/93	8:27	171,000	84.1	80.1	7.95	17.00	39.62

Test Pressure = 84.2 psi Differential Head = 4.4 psi, 308.6 cm H2O
Gradient = 4.419E 01 Flow rate = 2.150E-04 cc/sec R squared = 0.99948
Permeability, K20.0° = 1.188E-07 cm/sec¹, K20° = 1.188E-07 cm/sec¹

PERMEABILITY TEST REPORT

TEST DATA:

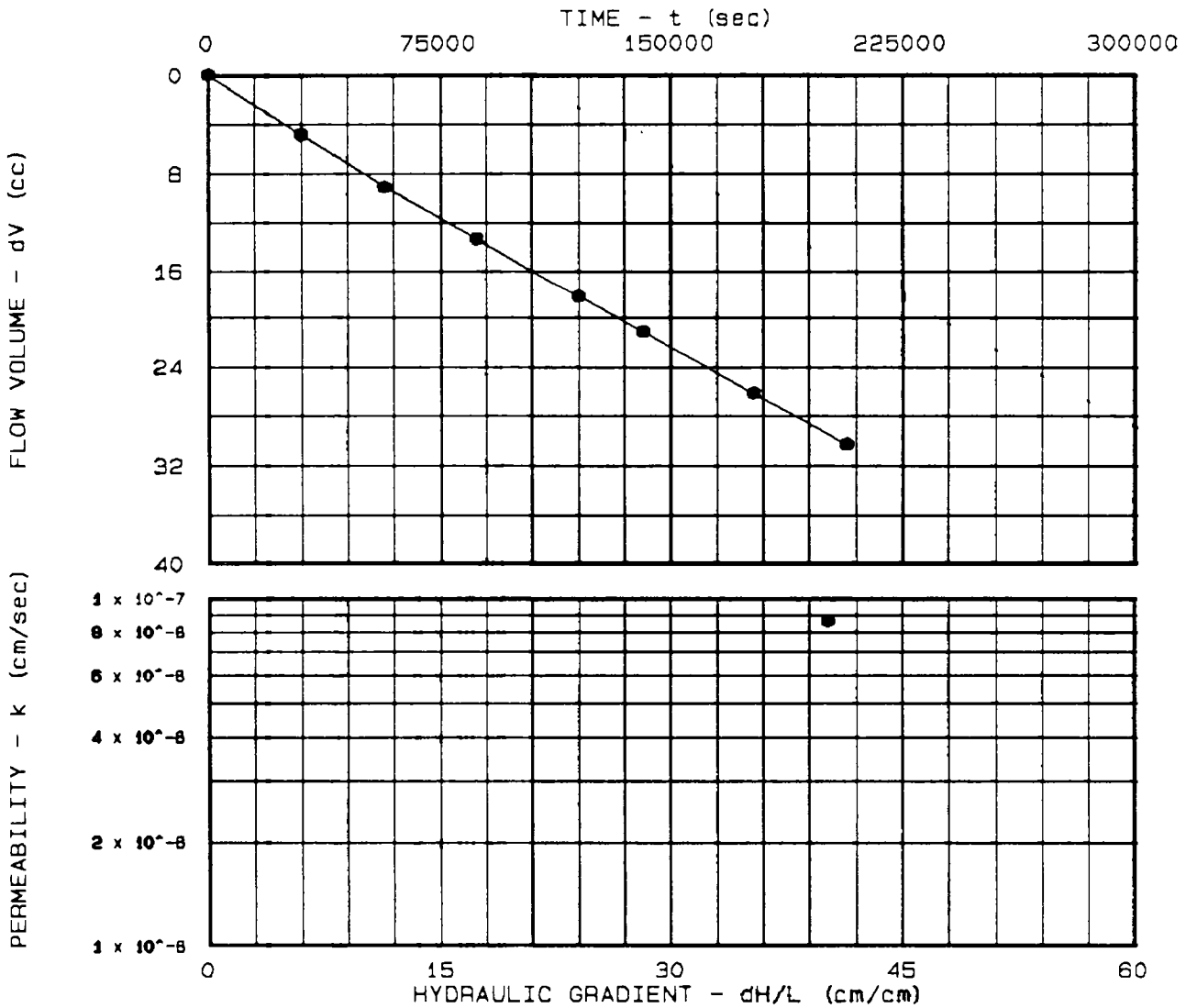
Specimen Height (cm): 9.51
Specimen Diameter (cm): 7.12
Dry Unit Weight (pcf): 113.6
Moisture Before Test (%): 15.7
Moisture After Test (%): 16.9
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.1
Back Pressure (psi): 79.7
Diff. Head (psi): 5.4
Flow Rate (cc/sec): 1.97 x 10^-4
Perm. (cm/sec): 8.99 x 10^-8

SAMPLE DATA:

Sample Identification: DTC-ST-10 BOTTOM 6" CENTRAL AREA "A"
Visual Description: BROWN CLAY AND SILT, Little Gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: SEPT. 1993

Project No.:
File No.: G008.014
Lab No.: 1790.001
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	DTC-ST-10 BOTTOM 6" CENTRAL AREA "A"
Lab No.:	1790.001
Description:	BROWN CLAY AND SILT, Little Gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	SEPT. 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.822 in	2.805 in		2.784 in	2.780 in	
Middle:	2.823 in	2.789 in		2.744 in	2.801 in	
Bottom:	2.826 in	2.761 in		2.739 in	2.738 in	
Average:	2.80 in	7.12 cm		2.77 in	7.03 cm	
Length:	1	2	3	1	2	3
	3.739 in	3.757 in	3.732 in	3.758 in	3.727 in	3.736 in
Average:	3.74 in	9.51 cm		3.74 in	9.50 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	1028.75	1036.90
Dry Wt. & Tare:	920.60	920.60
Tare Wt.:	231.25	231.25
Moisture Content:	15.7 %	16.9 %
Dry Unit Weight:	113.6 pcf	116.8 pcf
Porosity:	0.3385	0.3196
Saturation:	84.3 %	98.8 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-34 Panel No.: 4 Positions: 6&5

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	5.40	1.00
Outflow Buret Factor:	5.60	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	9/10/93	8:23	0	85.1	80.0	0.00	24.50	0.00
X	9/10/93	16:43	30,000	85.0	79.9	0.90	23.65	4.81
X	9/11/93	0:13	57,000	85.2	79.9	1.65	22.85	9.08
X	9/11/93	8:33	87,000	85.2	79.9	2.45	22.10	13.34
	9/11/93	17:43	120,000	85.2	79.9	3.35	21.20	18.29
	9/11/93	23:33	141,000	85.1	80.1	3.85	20.65	21.18
	9/12/93	9:33	177,000	85.1	79.9	4.80	19.80	26.12
	9/12/93	17:53	207,000	85.1	79.9	5.55	19.05	30.25

Test Pressure = 85.1 psi Differential Head = 5.4 psi, 381.8 cm H2O
Gradient = 4.016E 01 Flow rate = 1.375E-04 cc/sec R squared = 1.00000
Permeability, K20.0° = 8.586E-08 cm/sec², K20° = 8.586E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

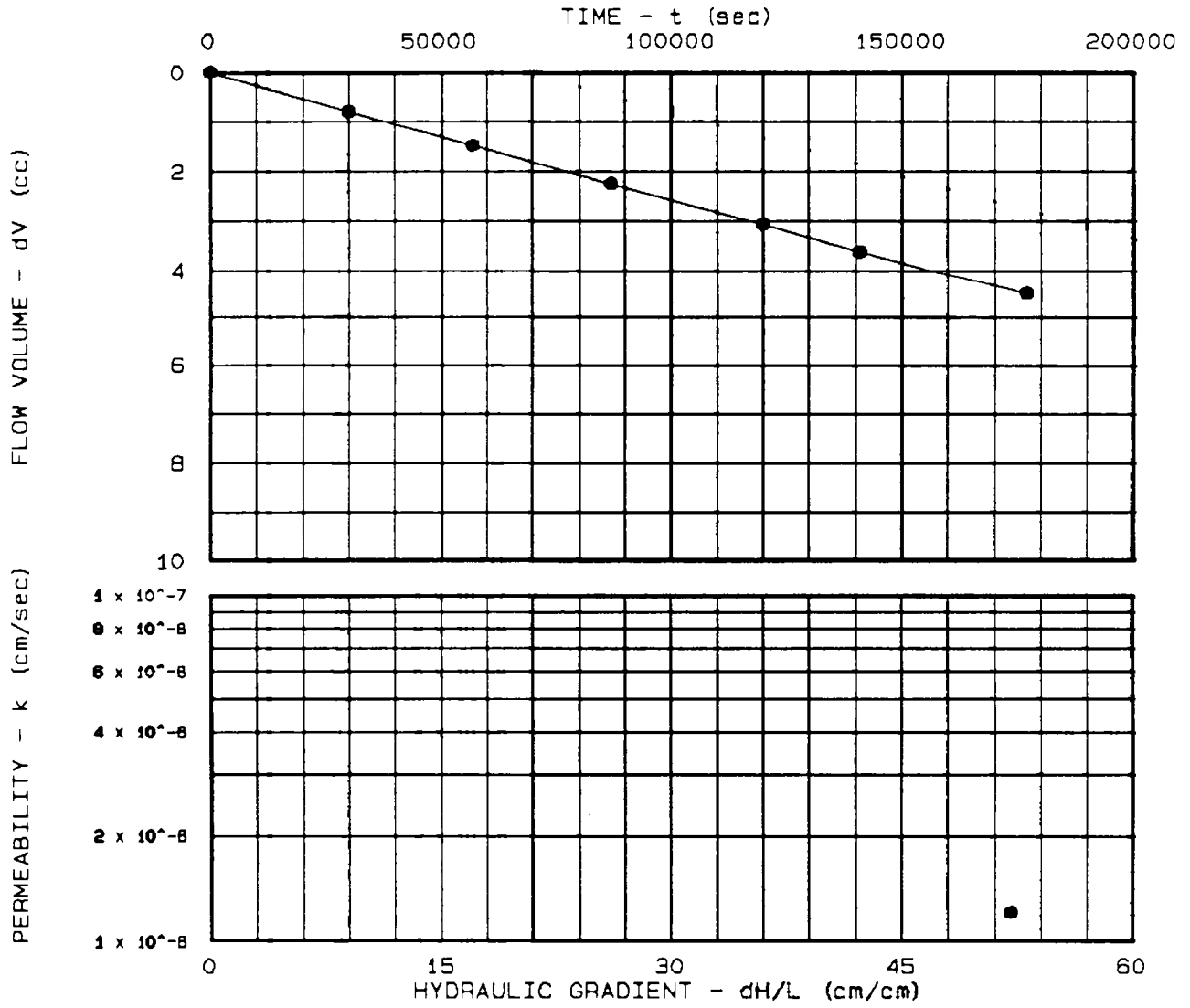
Specimen Height (cm): 7.55
Specimen Diameter (cm): 7.16
Dry Unit Weight (pcf): 111.2
Moisture Before Test (%): 15.1
Moisture After Test (%): 17.1
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.3
Back Pressure (psi): 79.7
Diff. Head (psi): 5.6
Flow Rate (cc/sec): 2.54 x 10^-5
Perm. (cm/sec): 1.21 x 10^-8

SAMPLE DATA:

Sample Identification: DTC-ST-11 BOTTOM 6" CENTRAL AREA "A"
Visual Description: BROWN CLAY AND SILT, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: SEPT. 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G008.014
Lab No.: 1790.002
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	
Sample Identification:	DTC-ST-11 BOTTOM 6" CENTRAL AREA "A"
Lab No.:	1790.002
Description:	BROWN CLAY AND SILT, trace grave
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	SEPT. 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.811 in	2.826 in		2.709 in	2.719 in	
Middle:	2.798 in	2.820 in		2.760 in	2.780 in	
Bottom:	2.846 in	2.832 in		2.836 in	2.832 in	
Average:	2.82 in	7.16 cm		2.77 in	7.04 cm	
Length:	1	2	3	1	2	3
	2.970 in	2.979 in	2.976 in	2.913 in	2.922 in	2.944 in
Average:	2.98 in	7.56 cm		2.93 in	7.43 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	853.58	864.30
Dry Wt. & Tare:	771.60	771.60
Tare Wt.:	229.88	229.88
Moisture Content:	15.1 %	17.1 %
Dry Unit Weight:	111.2 pcf	116.9 pcf
Porosity:	0.3525	0.3193
Saturation:	76.4 %	100.3 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-6 Panel No.: 4 Positions: 4&3

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	0.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	9/10/93	8:24	0	85.2	80.0	0.00	24.60	0.00
	9/10/93	16:44	30,000	85.3	80.0	0.90	23.90	0.80
	9/11/93	0:14	57,000	85.3	79.9	1.60	23.25	1.48
	9/11/93	8:34	87,000	85.3	80.1	2.40	22.50	2.25
	9/11/93	17:44	120,000	85.3	80.0	3.30	21.75	3.08
	9/11/93	23:34	141,000	85.3	80.1	3.90	21.25	3.63
	9/12/93	9:34	177,000	85.3	80.0	4.85	20.40	4.53

Test Pressure = 85.3 psi Differential Head = 5.6 psi, 393.5 cm H2O
Gradient = 5.207E 01 Flow rate = 2.539E-05 cc/sec R squared = 0.99997
Permeability, K20.0° = 1.211E-08 cm/sec², K20° = 1.211E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 6.30
Specimen Diameter (cm): 7.13
Dry Unit Weight (pcf): 111.9
Moisture Before Test (%): 17.2
Moisture After Test (%): 18.2

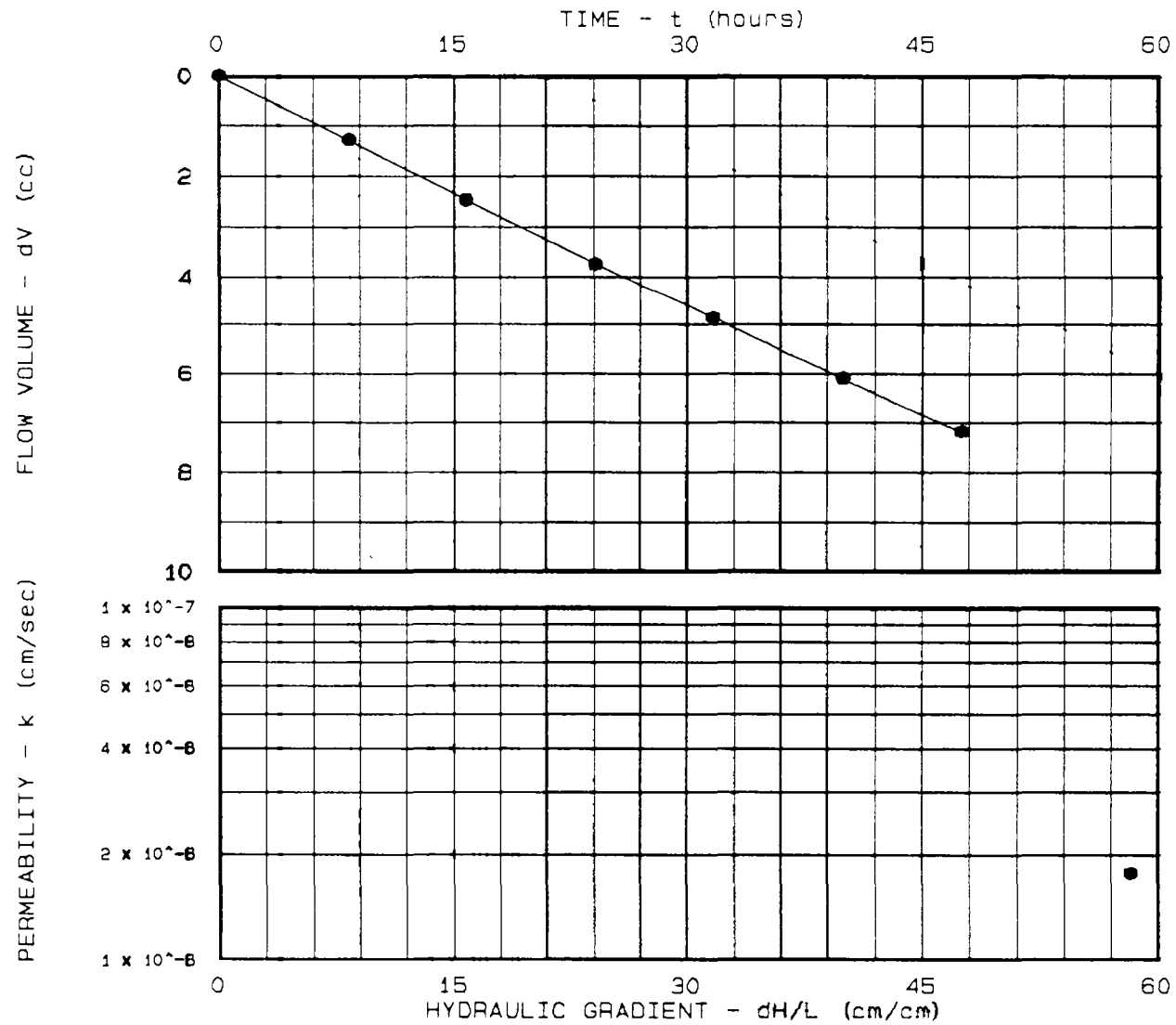
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	
Test Pressure (psi):	85.0	
Back Pressure (psi):	79.8	
Diff. Head (psi):	5.2	
Flow Rate (cc/sec):	4.12 x 10^-5	
Perm. (cm/sec):	1.77 x 10^-8	

SAMPLE DATA:

Sample Identification: DTC-ST-12
BOTTOM 6" , MINOR AREA 'C'
Visual Description: BROWN CLAY AND SILT, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: SEPT, 1993

Project No.: G008.014
File No.: G008.014
Lab No.: 1816.001
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	G008.014
Sample Identification:	DTC-ST-12
	BOTTOM 6" , MINOR AREA 'C'
Lab No.:	1816.001
Description:	BROWN CLAY AND SILT,
	trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	SEPT, 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.805 in	2.799 in		2.773 in	2.804 in	
Middle:	2.815 in	2.796 in		2.722 in	2.795 in	
Bottom:	2.819 in	2.811 in		2.761 in	2.792 in	
Average:	2.81 in	7.13 cm		2.77 in	7.04 cm	
Length:	1	2	3	1	2	3
	2.490 in	2.486 in	2.466 in	2.477 in	2.462 in	2.470 in
Average:	2.48 in	6.30 cm		2.47 in	6.27 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	762.46	767.02
Dry Wt. & Tare:	685.00	685.00
Tare Wt.:	233.99	233.99
Moisture Content:	17.2 %	18.2 %
Dry Unit Weight:	111.9 pcf	115.4 pcf
Porosity:	0.3481	0.3278
Saturation:	88.5 %	102.6 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-33 Panel No.: 1 Positions: 2 & 1

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	80.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (hrs)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	9/21/93	7:50	0.00	85.0	80.1	0.20	24.80	0.00
X	9/21/93	16:10	8.33	84.8	79.8	1.50	23.55	1.28
	9/21/93	23:40	15.83	84.7	79.7	2.75	22.40	2.48
	9/22/93	8:00	24.17	85.1	80.1	4.10	21.20	3.75
	9/22/93	15:30	31.67	85.1	80.0	5.25	20.10	4.88
	9/22/93	23:50	40.00	85.0	80.1	6.55	18.95	6.10
	9/23/93	7:20	47.50	85.0	80.1	7.65	17.90	7.18

Test Pressure = 85.0 psi Differential Head = 5.2 psi, 367.0 cm H2O
Gradient = 5.825E 01 Flow rate = 4.123E-05 cc/sec R squared = 0.99984
Permeability, K20.0° = 1.773E-08 cm/sec², K20° = 1.773E-08 cm/sec²

PERMEABILITY TEST REPORT

TEST DATA:

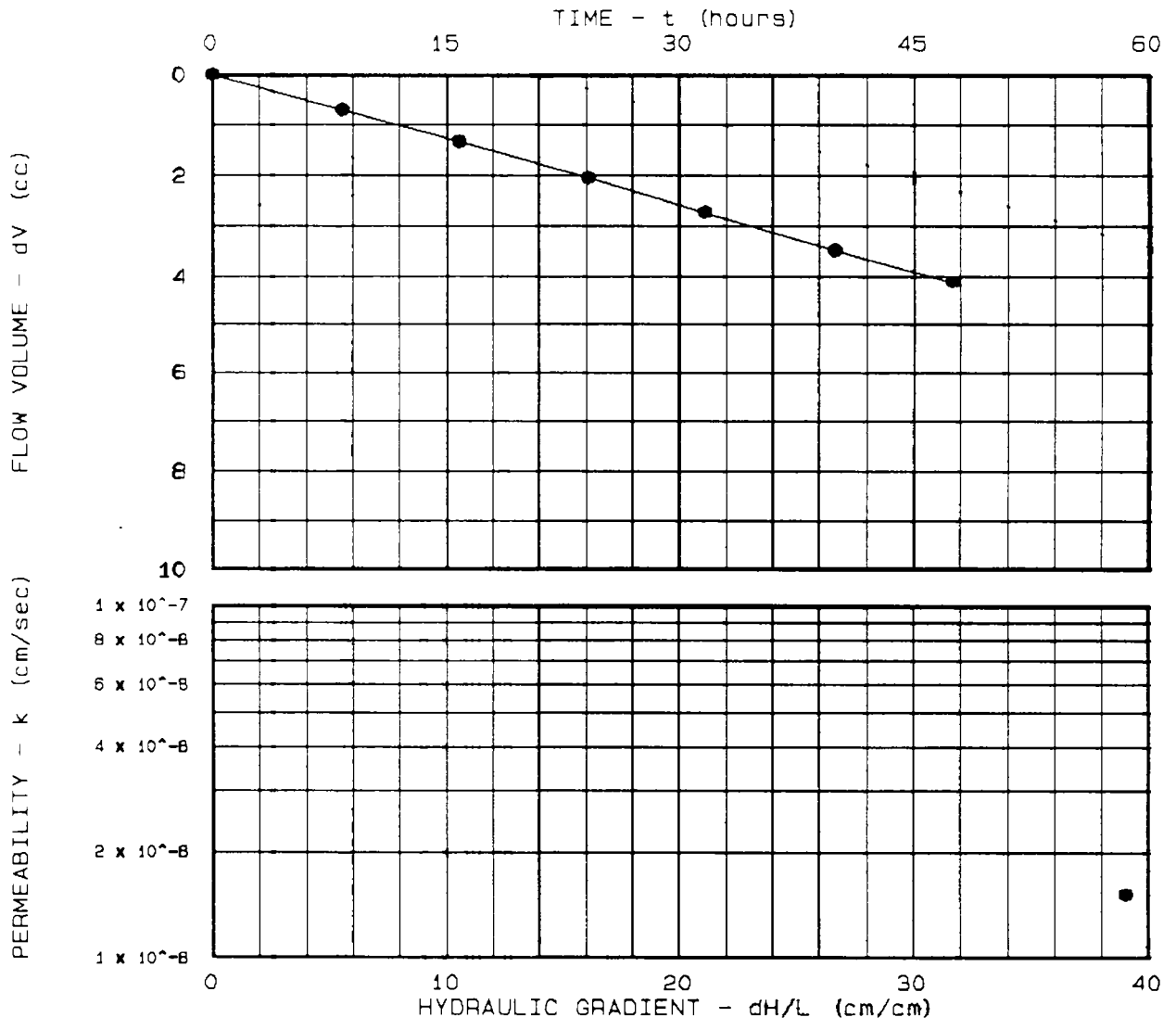
Specimen Height (cm): 8.42
Specimen Diameter (cm): 7.25
Dry Unit Weight (pcf): 109.0
Moisture Before Test (%): 18.1
Moisture After Test (%): 20.0
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.0
Back Pressure (psi): 80.3
Diff. Head (psi): 4.7
Flow Rate (cc/sec): 2.44 x 10^-5
Perm. (cm/sec): 1.52 x 10^-8

SAMPLE DATA:

Sample Identification: DTC-ST-13
BOTTOM 6" , MINOR AREA 'C'
Visual Description: BROWN CLAY AND SILT, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: GRAND ISLAND, NEW YORK
Date: SEPT. 1993

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.: G008.014
File No.: G008.014
Lab No.: 1816.002
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G008.014
Project Location:	GRAND ISLAND, NEW YORK
Project No.:	G008.014
Sample Identification:	DTC-ST-13
	BOTTOM 6" , MINOR AREA 'C'
Lab No.:	1816.002
Description:	BROWN CLAY AND SILT,
	trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	SEPT, 1993
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.857 in	2.881 in		2.874 in	2.859 in	
Middle:	2.812 in	2.879 in		2.840 in	2.824 in	
Bottom:	2.826 in	2.874 in		2.884 in	2.867 in	
Average:	2.85 in	7.25 cm		2.85 in	7.24 cm	
Length:	1	2	3	1	2	3
	3.323 in	3.316 in	3.304 in	3.242 in	3.229 in	3.254 in
Average:	3.31 in	8.42 cm		3.24 in	8.23 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	847.13	858.70
Dry Wt. & Tare:	737.70	737.70
Tare Wt.:	131.64	131.64
Moisture Content:	18.1 %	20.0 %
Dry Unit Weight:	109.0 pcf	111.5 pcf
Porosity:	0.3650	0.3504
Saturation:	86.4 %	101.8 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-17 Panel No.: 1 Positions: 6 & 5

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	80.0 psi	0.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (hrs)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	9/21/93	7:52	0.00	84.8	80.2	0.10	24.90	0.00
	9/21/93	16:12	8.33	83.9	80.1	0.65	24.05	0.70
	9/21/93	23:42	15.83	84.9	80.0	1.25	23.40	1.33
	9/22/93	8: 2	24.17	85.2	81.1	2.00	22.70	2.05
	9/22/93	15:32	31.67	85.2	80.9	2.70	22.05	2.73
	9/22/93	23:52	40.00	85.4	80.9	3.50	21.35	3.48
	9/23/93	7:22	47.50	85.3	80.8	4.15	20.70	4.13

Test Pressure = 85.0 psi Differential Head = 4.7 psi, 328.6 cm H2O
Gradient = 3.903E 01 Flow rate = 2.442E-05 cc/sec R squared = 0.99985
Permeability, K20.0° = 1.518E-08 cm/sec², K20° = 1.518E-08 cm/sec²