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Engineered Covers for Waste Containment: Changes in Engineering Properties and Implications for Long-Term Performance Assessment – Appendices

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ABSTRACT

This peer-reviewed study demonstrates that engineering properties of cover soils change while in service and that long-term engineering properties should be used as input to models employed for performance assessments. Recommendations for appropriate input are made based on the data that were collected. Increases in the saturated hydraulic conductivity, saturated volumetric water content, and the air entry suction (as characterized by van Genuchten's α parameter) occurred due to formation of soil structure, regardless of climate, cover design, or service life. Substantial changes in hydraulic conductivity were observed in some geosynthetic clay liners (GCLs) that did not hydrate completely and underwent cation exchange. Changes in geomembranes and geosynthetic drainage layers were modest or small, and computations based on antioxidant depletion rates suggest that the minimum service life of geomembranes is on the order of 50-125 yrs (the actual service life will be longer). The findings indicate that covers should be monitored to ensure that they are functioning as intended. Monitoring using pan lysimeters combined with secondary measurements collected for interpretive purposes is recommended. Future research investments should include an evaluation of remote sensing technologies for cover monitoring and analog studies to estimate properties of earthen and geosynthetic cover materials corresponding to service lives of 100s to 1000s of years.

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EXECUTIVE SUMMARY

In this peer-reviewed study, final covers at test facilities and operating waste containment facilities were exhumed to evaluate how the properties of the cover materials changed 4.0-8.9 yr after installation (6.3 yr on average). Field tests were conducted, samples were collected, laboratory testing was performed, and data analyses were conducted. The findings demonstrate that engineering properties of cover soils change while in service and that long-term engineering properties should be used as input to models employed for performance assessments. Recommendations for appropriate input are made based on the data that were collected.

Changes in hydraulic properties occurred in all cover soils evaluated due to the formation of soil structure, regardless of climate, cover design, or service life. The saturated hydraulic conductivity and the α parameter for the soil water characteristic curve (SWCC) increased, which reflects formation of larger pores due to pedogenic processes such as wet-dry and freeze-thaw cycling. Larger changes were observed for soils with lower as-built saturated hydraulic conductivity and soils with a greater proportion of clay particles in the fines fraction. Hydraulic properties of the cover soils were similar when exhumed, regardless of the as-built condition. Test scale had a significant effect on the hydraulic properties, with conditions near field-scale obtained using 0.3-m test specimens.

Substantial changes were also observed in some geosynthetic clay liners (GCLs). Analysis showed that GCLs have very low saturated hydraulic conductivity ($< 5 \times 10^{-11}$ m/s) when placed on a moist subgrade (water content $> 10\%$) and covered with a geomembrane and cover soil soon after installation. GCLs installed under other conditions can be much more permeable. GCLs that underwent and maintained complete hydration with osmotic swell retained low hydraulic conductivity even when Na was replaced by Ca and Mg provided they did not dehydrate. GCLs that undergo osmotic swell and are covered with a geomembrane surcharged with cover soils are expected to retain low hydraulic conductivity provided the geomembrane remains intact.

Changes in geomembranes and geosynthetic drainage layers were modest or small. Analysis of antioxidants in geomembranes showed that antioxidant depletion was reasonably consistent with expectations based on first-order kinetics and laboratory-measured depletion rates. Based on antioxidant depletion, the minimum service life of geomembranes is on the order of 50-125 yrs. Actual service lives may be longer but are difficult to predict based on the limited information available today.

Because changes in the engineering properties of cover materials are commonplace, and significant in some cases, monitoring of covers should be conducted to ensure they are functioning as intended. Monitoring using pan lysimeters combined with secondary measurements collected for interpretive purposes (water content, temperature, vegetation surveys, etc.) is recommended. Future research investments should explore how remote sensing technologies can be used for cover monitoring.

This study represents a snap shot in the evolution of final covers approximately 5 to 10 yr after construction. Additional research investments are needed to more accurately and completely define very long-term properties of earthen and geosynthetic cover materials corresponding to 100s or 1000s of years. These research investments should include analog studies of natural environments where earthen and natural polymeric materials exist as well as accelerated laboratory experiments that can be used to develop predictive degradation models.

ACKNOWLEDGEMENT

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The research report was peer reviewed by an expert panel consisting of Charles D. Shackelford, John D. McCartney, and George R. Koerner. The authors of the research report considered and incorporated their comments and suggestions when finalizing the report.

ABBREVIATIONS

Acronyms

ACAP	Alternative Cover Assessment Program
BC	bound cations
CEC	cation exchange capacity
CMH	chilled mirror hygrometer
CMP	common midpoint
D	diameter
DW	deionized water
ET	evapotranspiration
GCL	geosynthetic clay liner
GDL	geosynthetic drainage layer
GM	geomembrane
GPR	ground penetrating radar
H	depth of water in outer ring of SDRI
HDPE	high density polyethylene
H _b	height of water in bubbling tube in BH relative to base of borehole
I	infiltration rate
ICP-OES	inductively coupled plasma – optical emissions spectrometry
I _s	ionic strength
K	hydraulic conductivity
L _f	depth of the wetting front
LLDPE	linear low density polyethylene
MARV	minimum average role value
MDR	charge ratio of monovalent to divalent soluble cations
MFI	melt flow index

MSW	municipal solid waste
OIT	oxidation induction time
PET	potential evapotranspiration
Q	volumetric flow rate
RMD	ratio of monovalent to divalent cations in a solution
SC	soluble cations
SDRI	sealed double-ring infiltrometer
SI	swell index
SW	standard water (0.01 M CaCl ₂)
SWCC	soil water characteristic curve
TDR	time domain reflectometry
BH	borehole permeameter
TCM	total soluble cations charge per mass
USCS	Unified Soil Classification System
USEPA	US Environmental Protection Agency

Western Symbols

Ca	calcium
Cl	chlorine
K	potassium
K _F	field-measured saturated hydraulic conductivity
K _s	saturated hydraulic conductivity
K _{sa}	as-built saturated hydraulic conductivity
K _{SDRI}	field-measured hydraulic conductivity with SDRI
K _{si}	in-service saturated hydraulic conductivity
K _{BH}	field-measured hydraulic conductivity with BH permeameter

n	shape parameter in van Genuchten's equation
n_{LS}	shape parameter in van Genuchten's equation from large-scale tests
n_{SS}	shape parameter in van Genuchten's equation from small-scale tests
n_a	shape parameter in van Genuchten's equation from as-built test section
Na	sodium
Mg	magnesium
p	p statistic from t-test
t	t statistic from t-test
X_m	mole fraction of monovalent cations

Greek Symbols

α	shape parameter in van Genuchten's equation
α_a	shape parameter in van Genuchten's equation from as-built test section
α_{LS}	shape parameter in van Genuchten's equation from large-scale tests
α_{SS}	shape parameter in van Genuchten's equation from small-scale tests
γ_{dmax}	maximum dry unit weight on compaction curve
θ	volumetric water content
θ_r	residual volumetric water content
θ_s	saturated volumetric water content
Θ	effective saturation
σ	standard deviation

APPENDIX A – EXHUMATION PHOTO GALLERY



Fig. A.1. Test field prior to decommissioning.



Fig A.3. Constant head TSBs in operation.



Fig A.2. Decommissioning weather station.



Fig A.4. Investigating soil paedogenesis.



Fig A.5. Sampling GDL in section with composite barrier.



Fig A.6. Constructed defect in GM.



Fig A.7. Removing GCL sample from composite barrier.



Fig A.8. Delicately plating GCL to avoid disturbance.



Fig A.9. Removing GCL samples from composite barrier.

APPENDIX A.1 – EXHUMATION OF HELENA, MONTANA SITE



Fig. A.10. Test field prior to decommissioning.



Fig. A.11. Cover soil removed prior to SDRI installation.



Fig. A.12. Cutting trenches for SDRI installation.



Fig. A.13. Adding granular bentonite to seal SDRI.



Fig. A.14. Filling SDRI, inner cap visible.



Fig. A.15. Constant head TSB in operation.



Fig. A.16. Exhumation of block sample.



Fig. A.17. Supervision during block sample exhumation.



Fig. A.18. Removing lysimeter GDL for laboratory analysis.



Fig. A.19. Operating SDRI with constant head inner ring.

APPENDIX A.2 – EXHUMATION OF POLSON, MONTANA SITE



Fig. A.20. Test field (in fence) prior to decommissioning.



Fig. A.21 Digging block sample for laboratory analysis.



Fig. A.22. Macroscopic in-situ flow path.



Fig. A.23. Close-up of macroscopic in-situ flow path.



Fig. A.24 Geophysical investigation prior to excavations.



Fig. A.25. Geophysical investigation prior to excavations.



Fig. A.26. Horizontal plane of roots found during block sampling.



Fig. A.27. Close up of root plane.



Fig. A.28. Installing SDRI under GM into CCL.

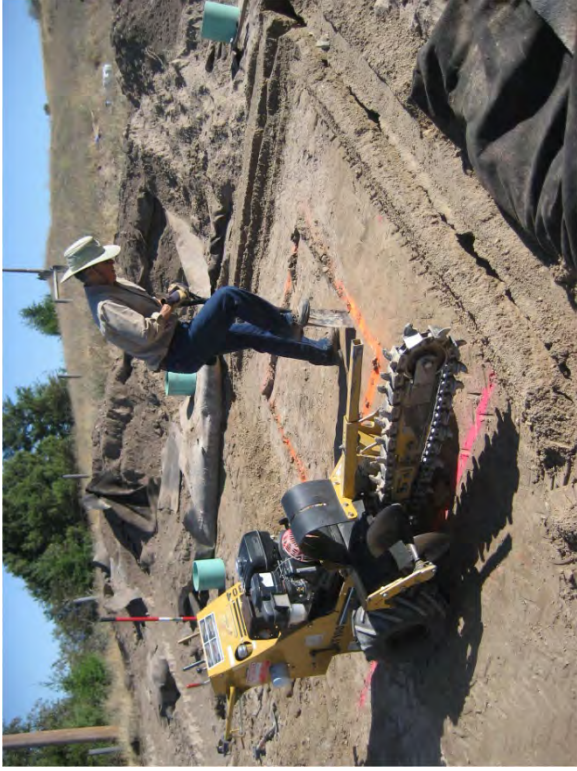


Fig. A.29. Installation of SDRI seating trenches.



Fig. A.30. SDRI inner ring after assembly but prior to filling.



Fig. A.31. Digging subsurface block sample.



Fig. A.32. Vertical root planes.



Fig. A.33. Alternative (ET) cover profile, veg. barrier visible.



Fig. A.34. Sampling ET cover for water content profile.



Fig. A.35. Running SDRI in ET cover.



Fig. A.36. Failure along vertical root planes during trenching.



Fig. A.38. Location of Polson, MT ACAP test section.



Fig. A.37. Water removal from completed SDRI.

APPENDIX A.3 – EXHUMATION OF OMAHA, NEBRASKA SITE



Fig. A.39. ACAP signage.



Fig. A.40 Test field prior to decommissioning.



Fig. A.41. Initial geophysical investigation.



Fig. A.42. Constant head TSBs during operation.



Fig. A.43. Installing TSB, rough bottom to avoid smearing.



Fig. A.44. Grouting TSB with bentonite paste.



Fig. A.45. Installing Mariette bottle for constant head testing.



Fig. A.46. TSB data collection with narrow Mariette bottle.



Fig. A.47. Conventional cover profile (soil above GM).



Fig. A.49. In-situ water content reflectometer.



Fig. A.48. Conventional cover profile (CCL below GM).



Fig. A.50. Soil overlying GM in conventional cover (flipped).



Fig. A.51. Soil underlying GM in conventional cover.



Fig. A.53 Close-up of unintentional hole from installation found via geophysical investigation.



Fig. A.52. Unintentional hole from installation found via geophysical investigation.



Fig. A.54. AO1 (Capillary barrier) cover profile.



Fig. A.55. Close up of capillary barrier in AO1.



Fig. A.57. Close-up of undisturbed roots extending across capillary barrier and into course layer in AO1.



Fig. A.56. Roots extending into course layer in AO1.



Fig. A.58. AO2 (Capillary barrier) cover profile.



Fig. A.59. Close-up of capillary barrier in AO2.



Fig. A.60. Close-up of vegetation barrier in AO2.



Fig. A.61. AO2 (capillary barrier) cover profile.

APPENDIX A.4 – EXHUMATION OF UNDERWOOD, NORTH DAKOTA SITE



Fig. A.62. ACAP signage at Coal Creek Station.



Fig. A.63. Lysimeter and instrumentation trailer.



Fig. A.64. Interior of lysimeters and instrumentation trailer.



Fig. A.65. In situ instrumentation data logger.



Fig. A.66. Test field prior to decommissioning.



Fig. A.68. TSBs in operation, and test pits.



Fig. A.67. Digging block sample for laboratory analysis.



Fig. A.69. Mixing bentonite grout for TSB installation.



Fig. A.70. Thicker (3 ft) CCL profile (desiccated across profile).



Fig. A.72. Roots visible down to veg. barrier in all profiles.



Fig. A.71. Digging block sample in thicker CCL.



Fig. A.73. Root planes visible on ped removed from bottom of desiccated CCL.



Fig. A.74 Discussing observations with regulators.



Fig. A.75. Thicker CCL (5 ft), desiccation and roots visible throughout profile.

APPENDIX A.5 – EXHUMATION OF MONTICELLO, UTAH SITE



Fig. A.76. Repository marker.



Fig. A.77. Test field prior to testing.



Fig. A.78. Vegetation layer removed for SDR1 installation.



Fig. A.79. Preparation of site for SDR1 installation.



Fig. A.80. Measuring in-situ density prior to sampling.



Fig. A.82. Sealing upper TSB section with granular bentonite.



Fig. A.81. Cleaning site for SDR1 installation.



Fig. A.83. Close-up of granular bentonite .



Fig. A.84. Constant head TSBs in operation.



Fig. A.86. Sealing SDRI perimeter with granular bentonite.



Fig. A.85. Setting SDRI in trenches.



Fig. A.87. Installing bentonite grout for inner TSB ring.



Fig. A.88. Installed TSB prior to operation.



Fig. A.90. Block sample ring prior to sampling.



Fig. A.89. Macroscopic flow path visible at bottom of TSB.



Fig. A.91. Removing vegetation prior to sampling.



Fig. A.92. Excavating additional soil during sampling.



Fig. A.93. Continued soil excavation for sampling.



Fig. A.94. Lower block sampling.



Fig. A.95. Trench for examination of soil structure.



Fig. A.96. Analysis of soil structure.



Fig. A.97. Re-compacting soil after sampling.



Fig. A.98. Ensuring re-compaction to initial dry density.

APPENDIX B - SEALED DOUBLE-RING INFILTROMETER (SDRI) DATA

SDRI Test - Altamont - Composite Cover

Date: 4/2/2007
Project: Altamont

Installer: XW
Analyst: CHB

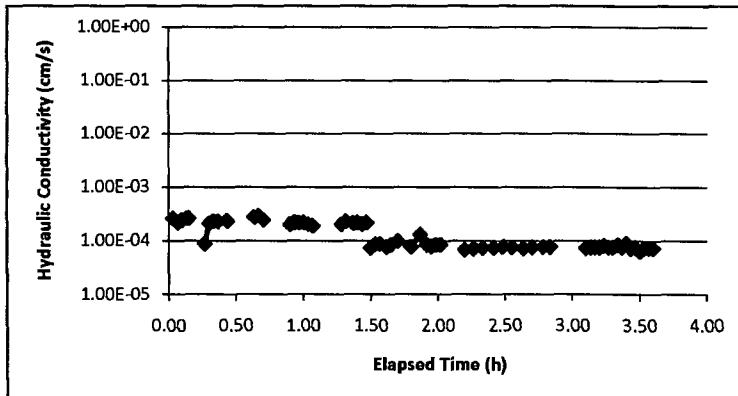
Fixed variables:

L = 150 cm Assume Unit Gradient in Analysis
A = 22500 cm²
a = 77.69 cm²
Dp = 30.48 cm

Temporal Variables:

Time	Reading (cm)	Δ Time (s)	Time (h)	i	I (cm/s)
4/3/07 16:16	56.5				
4/3/07 16:33	54.0	1020	0.28	1.94	4.35E-06
4/3/07 16:52	50.8	1140	0.60	1.94	4.98E-06
4/3/07 17:13	47.3	1260	0.95	1.94	4.93E-06
4/3/07 17:37	43.4	1440	1.35	1.94	4.81E-06
4/3/07 17:57	40.1	1200	1.68	1.94	4.88E-06
4/3/07 18:30	35.4	1980	2.23	1.94	4.21E-06
4/3/07 18:45	33.7	900	2.48	1.94	3.35E-06
4/3/07 19:00	31.6	900	2.73	1.94	4.14E-06
4/3/07 19:15	29.9	900	2.98	1.94	3.35E-06
4/3/07 19:30	28.0	900	3.23	1.94	3.75E-06
4/3/07 19:32	56.5	120	3.27	1.94	
4/4/07 9:50	3.0	51480	17.57	1.94	1.85E-06
4/4/07 9:58	58.0	480	17.70	1.94	
4/4/07 10:32	55.7	2040	18.27	1.94	2.00E-06
4/4/07 11:34	51.0	3720	19.30	1.94	2.24E-06
4/4/07 12:19	46.5	2700	20.05	1.94	2.96E-06
4/4/07 12:37	57.5	1080	20.35	1.94	
4/4/07 13:34	50.7	3420	21.30	1.94	3.53E-06
4/4/07 14:50	42.0	4560	22.57	1.94	3.39E-06
4/4/07 15:50	33.0	3600	23.57	1.94	4.44E-06
4/4/07 16:50	25.0	3600	24.57	1.94	3.95E-06
4/4/07 17:50	18.0	3600	25.57	1.94	3.45E-06
4/4/07 18:50	9.4	3600	26.57	1.94	4.24E-06
4/4/07 19:30	3.0	2400	27.23	1.94	4.73E-06

K (cm/s)
4.1E-06



SDRI Test - Altamont - Store-and-Release Cover

Date: 4/2/2007
Project: Altamont

Installer: XW
Analyst: CHB

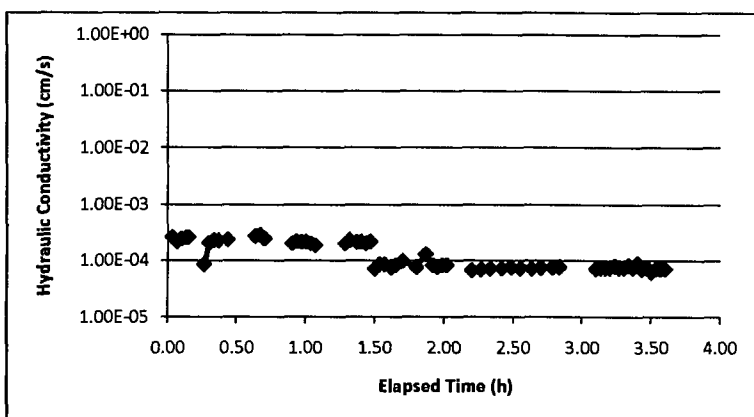
Fixed variables:

L = 150 cm Assume Unit Gradient in Analysis
A = 22500 cm²
a = 77.69 cm²
Dp = 22.86 cm

Temporal Variables:

Time	Reading (cm)	Δ Time (s)	Time (h)	K (cm/s)
15:48	49.0			
15:50	40.0	120	0.03	2.59E-04
15:52	32.5	120	0.07	2.16E-04
15:54	24.0	120	0.10	2.45E-04
15:56	15.0	120	0.13	2.59E-04
15:57	10.5	60	0.15	2.59E-04
16:02	52.0	300	0.23	
16:04	49.0	120	0.27	8.63E-05
16:06	41.8	120	0.30	2.07E-04
16:08	33.8	120	0.33	2.30E-04
16:10	25.8	120	0.37	2.30E-04
16:14	9.5	240	0.43	2.35E-04
16:24	50.0	600	0.60	
16:26	40.5	120	0.63	2.73E-04
16:28	30.5	120	0.67	2.88E-04
16:30	22.0	120	0.70	2.45E-04
16:40	55.0	600	0.87	
16:42	48.0	120	0.90	2.01E-04
16:44	40.4	120	0.93	2.19E-04
16:46	33.0	120	0.97	2.13E-04
16:48	25.5	120	1.00	2.16E-04
16:50	18.5	120	1.03	2.01E-04
16:52	12.0	120	1.07	1.87E-04
17:03	57.0	660	1.25	
17:05	50.0	120	1.28	2.01E-04
17:07	42.0	120	1.32	2.30E-04
17:10	31.0	180	1.37	2.11E-04
17:12	23.5	120	1.40	2.16E-04
17:14	16.5	120	1.43	2.01E-04
17:16	9.0	120	1.47	2.16E-04
9:27	58.5		1.47	
9:29	56.0	120	1.50	7.19E-05
9:31	53.0	120	1.53	8.63E-05
9:33	50.0	120	1.57	8.63E-05
9:36	46.0	180	1.62	7.67E-05
9:38	43.1	120	1.65	8.34E-05
9:41	38.0	180	1.70	9.78E-05
9:47	30.0	360	1.80	7.67E-05
9:51	21.0	240	1.87	1.29E-04
9:54	16.7	180	1.92	8.25E-05
9:56	14.0	120	1.95	7.77E-05
9:58	11.1	120	1.98	8.34E-05
10:00	8.2	120	2.02	8.34E-05
10:08	58.2	480	2.15	
10:11	54.7	180	2.20	6.71E-05
10:15	49.8	240	2.27	7.05E-05
10:19	44.8	240	2.33	7.19E-05
10:24	38.4	300	2.42	7.37E-05
10:28	33.1	240	2.48	7.63E-05

10:32	28.0	240	2.55	7.34E-05	
10:37	21.8	300	2.63	7.14E-05	
10:41	16.6	240	2.70	7.48E-05	
10:46	10.0	300	2.78	7.60E-05	
10:49	6.0	180	2.83	7.67E-05	
11:03	57.2	840	3.07		
11:05	54.7	120	3.10	7.19E-05	
11:07	52.1	120	3.13	7.48E-05	
11:09	49.5	120	3.17	7.48E-05	
11:11	46.9	120	3.20	7.48E-05	
11:13	44.1	120	3.23	8.06E-05	
11:15	41.5	120	3.27	7.48E-05	
11:17	38.9	120	3.30	7.48E-05	
11:19	36.0	120	3.33	8.34E-05	
11:21	33.4	120	3.37	7.48E-05	
11:23	30.3	120	3.40	8.92E-05	
11:25	27.8	120	3.43	7.19E-05	
11:27	25.2	120	3.47	7.48E-05	
11:29	23.0	120	3.50	6.33E-05	K (cm/s)
11:31	20.5	120	3.53	7.19E-05	7.0E-05
11:33	18.0	120	3.57	7.19E-05	
11:35	15.5	120	3.60	7.19E-05	



SDRI Test - Apple Valley - Clay Cover

Date: 3/30/2007
Project: Apple Valley

Installer: XW
Analyst: CHB

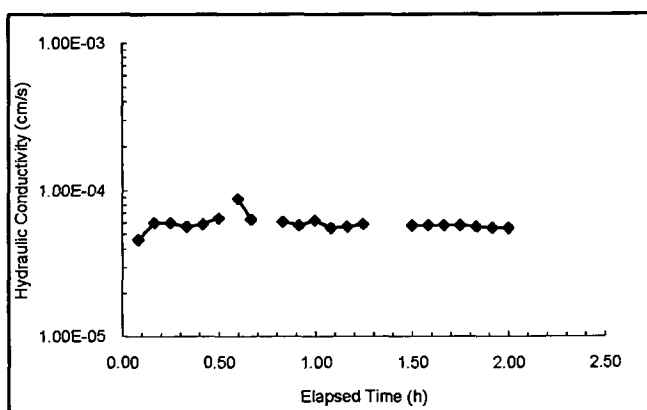
Fixed variables:

L = 150 cm
A = 22500 cm²
a = 77.69 cm²
Dp = 33.02 cm

Temporal Variables:

Time	Reading (cm)	Δ Time (s)	Time (h)	K (cm/s)
10:40	41.0			
10:45	37.0	300	0.08	4.60E-05
10:50	31.8	300	0.17	5.99E-05
10:55	26.6	300	0.25	5.99E-05
11:00	21.7	300	0.33	5.64E-05
11:05	16.6	300	0.42	5.87E-05
11:10	11.0	300	0.50	6.45E-05
11:13	55.0	180	0.55	-8.44E-04
11:16	50.4	180	0.60	8.82E-05
11:20	46.0	240	0.67	6.33E-05
11:25	40.3	300		
11:30	35.0	300	0.83	6.10E-05
11:35	30.0	300	0.91	5.75E-05
11:40	24.6	300	1.00	6.22E-05
11:45	19.8	300	1.08	5.52E-05
11:50	14.9	300	1.16	5.64E-05
11:55	9.8	300	1.25	5.87E-05
12:05	49.5	600		
12:10	44.5	300	1.50	5.75E-05
12:15	39.5	300	1.58	5.75E-05
12:20	34.5	300	1.67	5.75E-05
12:25	29.5	300	1.75	5.75E-05
12:30	24.6	300	1.83	5.64E-05
12:35	19.8	300	1.92	5.52E-05
12:40	15.0	300	2.00	5.52E-05

5.56E-05

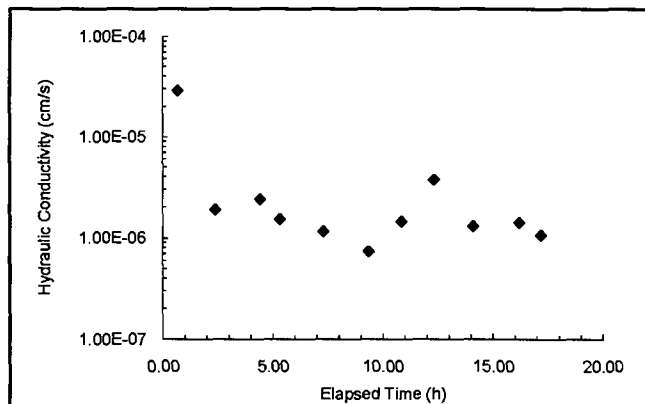


SDRI Test - Cedar Rapids - Clay Cover

L = 610 cm
 A = 372100 cm²
 a = 77.69 cm²
 Dp = 25.4 cm
 i = 1.04

Date	Time	Bag On	Bag Off	Δ Time (s)	Time (h)	I (cm/s)	K (cm/s)
6-Jun-06	15:10	2503.6					
	15:51		828.1	2460	0.68	3.03E-05	2.91E-05
	16:24	2724.4					
7-Jun-06	18:07		2450.1	6180	2.40	1.97E-06	1.89E-06
	8:35	2449.3					
	10:36		2042.2	7260	4.42	2.49E-06	2.39E-06
	10:42	2042.2					
	11:35		1928.3	3180	5.30	1.59E-06	1.53E-06
	11:39	1928.3					
	13:39		1731.3	7200	7.30	1.22E-06	1.17E-06
	13:42	1731.3					
	15:45		1604.3	7380	9.35	7.65E-07	7.34E-07
8-Jun-06	15:51	1604.3					
	17:20		1421.9	5340	10.83	1.52E-06	1.46E-06
	8:29	2448.3					
	9:58		1980.9	5340	12.32	3.89E-06	3.73E-06
	10:04	1980.9					
	11:50		1787.0	6360	14.08	1.35E-06	1.30E-06
	11:52	1787.0					
	13:58		1535.0	7560	16.18	1.48E-06	1.42E-06
	14:05	1535.0					
	15:04		1446.0	3540	17.17	1.12E-06	1.07E-06

Avg K
 1.27E-06

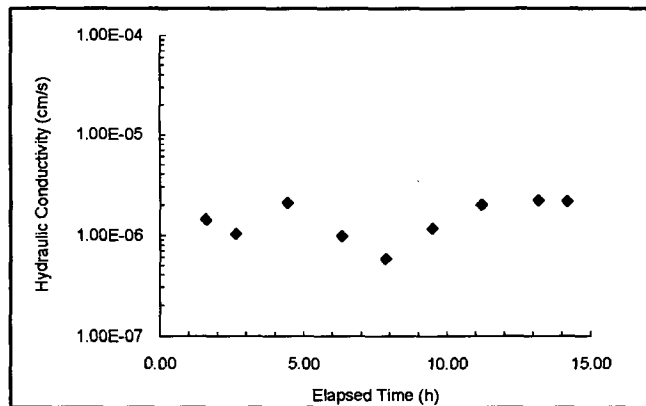


SDRI Test - Cedar Rapids - Composite Cover

$L = 610 \text{ cm}$
 $A = 372100 \text{ cm}^2$
 $a = 77.69 \text{ cm}^2$
 $D_p = 25.4 \text{ cm}$
 $i = 1.04$

Date	Time	Bag On	Bag Off	Δ Time (s)	Time (h)	I (cm/s)	K (cm/s)
7-Jun-06	8:40	2508.6					
	10:16		2315.0	5760	1.60	1.49E-06	1.43E-06
	10:33	2315.0					
	11:35		2224.5	3720	2.63	1.08E-06	1.04E-06
	11:39	2224.5					
	13:27		1906.4	6480	4.43	2.18E-06	2.09E-06
	13:37	1906.4					
	15:31		1746.8	6840	6.33	1.04E-06	9.96E-07
8-Jun-06	15:46	1746.8					
	17:17		1671.9	5460	7.85	6.10E-07	5.85E-07
	8:28	2636.7					
	10:06		2474.0	5880	9.48	1.23E-06	1.18E-06
	10:11	2474.0					
	11:53		2187.0	6120	11.18	2.08E-06	2.00E-06
	11:55	2187.0					
	13:54		1815.0	7140	13.17	2.32E-06	2.22E-06
	14:03	1815.0					
	15:03		1631.0	3600	14.17	2.27E-06	2.18E-06

Avg K
 2.13E-06



SDRI Hydraulic Conductivity - Helena - Store-and-Release Cover

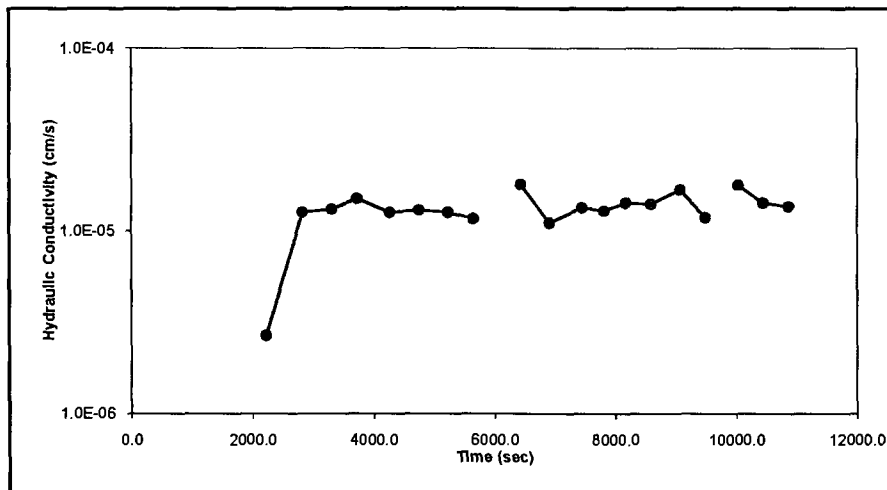
Inner Ring Side Length (ft) 5.00
 Inner Ring Side Length (cm) 152.40
 Inner Ring Area (cm²) 23225.76

Average Head (in) 14.00
 Average Head (cm) 35.56

Standpipe Diameter (cm) 5.00
 Standpipe Area (cm²) 19.63

Date, Time	Inflow Reading (cm)	Inflow (mL)	Δt (sec)	t (sec)	Q (mL/s)	K (cm/s)
9:15	34		0.0			
9:52	41	137.44468	2220.0	2220.0	0.0619	2.7E-06
10:02	50	176.71459	600.0	2820.0	0.2945	1.3E-05
10:10	57.5	147.26216	480.0	3300.0	0.3068	1.3E-05
10:17	65	147.26216	420.0	3720.0	0.3506	1.5E-05
10:26	73.1	159.04313	540.0	4260.0	0.2945	1.3E-05
10:34	80.5	145.29866	480.0	4740.0	0.3027	1.3E-05
10:42	87.7	141.37167	480.0	5220.0	0.2945	1.3E-05
10:49	93.5	113.88273	420.0	5640.0	0.2711	1.2E-05
10:55	40.5	-1040.6526	360.0	6000.0	-2.8907	-1.2E-04
11:02	49.5	176.71459	420.0	6420.0	0.4207	1.8E-05
11:10	55.8	123.70021	480.0	6900.0	0.2577	1.1E-05
11:19	64.4	168.86061	540.0	7440.0	0.3127	1.3E-05
11:25	69.9	107.99225	360.0	7800.0	0.3000	1.3E-05
11:31	76	119.77322	360.0	8160.0	0.3327	1.4E-05
11:38	83.0	137.44468	420.0	8580.0	0.3272	1.4E-05
11:46	92.6	188.49556	480.0	9060.0	0.3927	1.7E-05
11:53	98.5	115.84623	420.0	9480.0	0.2758	1.2E-05
11:58	29.0	-1364.6293	300.0	9780.0	-4.5488	-2.0E-04
12:02	34.1	100.13827	240.0	10020.0	0.4172	1.8E-05
12:09	41.2	139.40817	420.0	10440.0	0.3319	1.4E-05
12:16	48.0	133.51769	420.0	10860.0	0.3179	1.4E-05

Average 1.4E-05



SDRI Test - Monticello - Store-and-Release Cover

Date: 7/24/2007
Project: Monticello

Installer: XW
Analyst: CHB

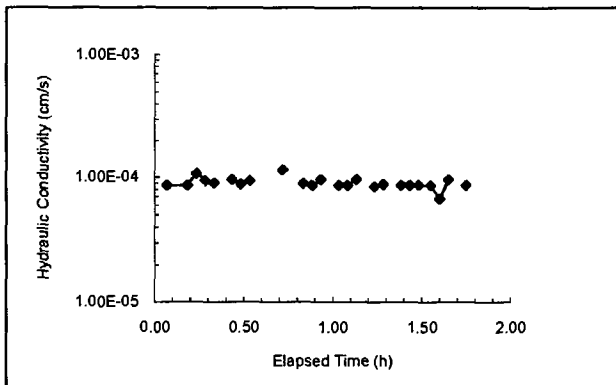
Fixed variables:

L = 150 cm
A = 22500 cm²
a = 77.69 cm²
Dp = 35.56 cm

Temporal Variables:

Time	Reading (cm)	Δ Time (s)	Time (h)	K (cm/s)
10:45	57.0			
10:49	51.0	240	0.07	8.63E-05
10:56	40.5	420	0.18	8.63E-05
10:59	34.9	180	0.23	1.07E-04
11:02	30.0	180	0.28	9.40E-05
11:05	25.3	180	0.33	9.02E-05
11:08	20.8	180	0.38	
11:11	15.8	180	0.43	9.59E-05
11:14	11.2	180	0.48	8.82E-05
11:17	6.3	180	0.53	9.40E-05
11:25	53.5	480	0.67	
11:28	47.5	180	0.72	1.15E-04
11:33	39.6	300	0.80	
11:35	36.5	120	0.83	8.92E-05
11:38	32.0	180	0.88	8.63E-05
11:41	27.0	180	0.93	9.59E-05
11:44	22.5	180	0.98	
11:47	18.0	180	1.03	8.63E-05
11:50	13.5	180	1.08	8.63E-05
11:53	8.5	180	1.13	9.59E-05
11:56	56.2	180	1.18	
11:59	51.8	180	1.23	8.44E-05
12:02	47.2	180	1.28	8.82E-05
12:05	43.0	180	1.33	
12:08	38.5	180	1.38	8.63E-05
12:11	34.0	180	1.43	8.63E-05
12:14	29.5	180	1.48	8.63E-05
12:18	23.5	240	1.55	8.63E-05
12:21	20.0	180	1.60	6.71E-05
12:24	15.0	180	1.65	9.59E-05
12:27	10.5	180	1.70	
12:30	6.0	180	1.75	8.63E-05

Avg K
8.50E-05



Alt. SDRI Hydraulic Conductivity - Polson - Store-and-Release Cover

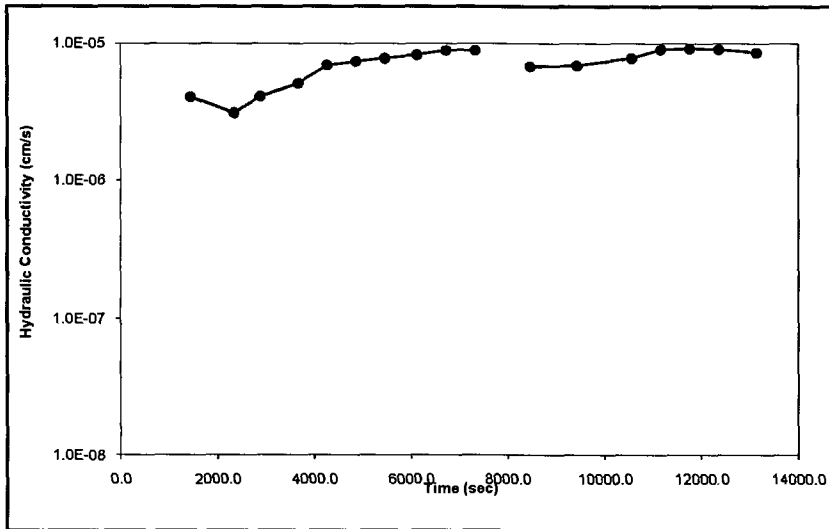
Inner Ring Side Length (ft) 5.00
 Inner Ring Side Length (cm) 152.40
 Inner Ring Area (cm²) 23225.76

Average Head (in) 14.00
 Average Head (cm) 35.56

Standpipe Diameter (cm) 5.00
 Standpipe Area (cm²) 19.63

Date, Time	Inflow Reading (cm)	Inflow (mL)	Dt (sec)	t (sec)	Q (mL/s)	K (cm/s)
9:12	59		0.0			
9:36	52.1	135.48118	1440.0	1440.0	0.0941	4.1E-06
9:51	48.8	64.795348	900.0	2340.0	0.0720	3.1E-06
10:00	46.2	51.050881	540.0	2880.0	0.0945	4.1E-06
10:13	41.5	92.284284	780.0	3660.0	0.1183	5.1E-06
10:23	36.6	96.211275	600.0	4260.0	0.1604	6.9E-06
10:33	31.4	102.10176	600.0	4860.0	0.1702	7.3E-06
10:43	25.9	107.99225	600.0	5460.0	0.1800	7.7E-06
10:54	19.5	125.66371	660.0	6120.0	0.1904	8.2E-06
11:04	13.2	123.70021	600.0	6720.0	0.2062	8.9E-06
11:14	6.9	123.70021	600.0	7320.0	0.2062	8.9E-06
11:23	58.5	-1013.1636	540.0	7860.0	-1.8762	-8.1E-05
11:33	53.7	94.24778	600.0	8460.0	0.1571	6.8E-06
11:49	45.9	153.15264	960.0	9420.0	0.1595	6.9E-06
12:08	35.4	206.16702	1140.0	10560.0	0.1808	7.8E-06
12:18	29.0	125.66371	600.0	11160.0	0.2094	9.0E-06
12:28	22.5	127.6272	600.0	11760.0	0.2127	9.2E-06
12:38	16.1	125.66371	600.0	12360.0	0.2094	9.0E-06
12:51	8.2	155.11614	780.0	13140.0	0.1989	8.6E-06

Average 8.9E-06



Conv. SDRI Hydraulic Conductivity - Polson - Composite Cover

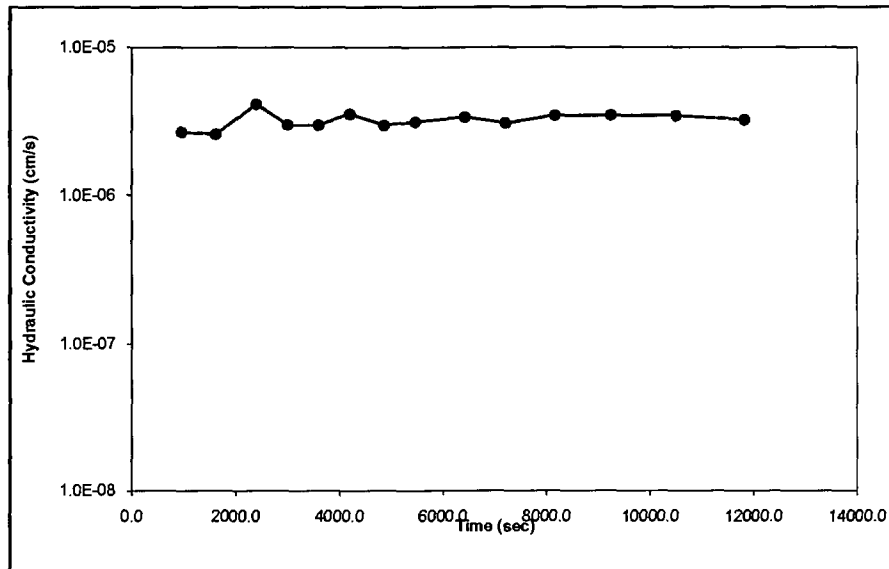
Inner Ring Side Length (ft) 5.00
 Inner Ring Side Length (cm) 152.40
Inner Ring Area (cm²) 23225.76

Average Head (in) 14.00
Average Head (cm) 35.56

Standpipe Diameter (cm) 5.00
Standpipe Area (cm²) 19.63

Date, Time	Inflow Reading (cm)	Inflow (mL)	Dt (sec)	t (sec)	Q (mL/s)	K (cm/s)
9:34	55.5		0.0			
9:50	52.5	58.904862	960.0	960.0	0.0614	2.6E-06
10:01	50.5	39.269908	660.0	1620.0	0.0595	2.6E-06
10:14	46.7	74.612826	780.0	2400.0	0.0957	4.1E-06
10:24	44.6	41.233404	600.0	3000.0	0.0687	3.0E-06
10:34	42.5	41.233404	600.0	3600.0	0.0687	3.0E-06
10:44	40	49.087385	600.0	4200.0	0.0818	3.5E-06
10:55	37.7	45.160394	660.0	4860.0	0.0684	2.9E-06
11:05	35.5	43.196899	600.0	5460.0	0.0720	3.1E-06
11:21	31.7	74.612826	960.0	6420.0	0.0777	3.3E-06
11:34	28.9	54.977871	780.0	7200.0	0.0705	3.0E-06
11:50	25	76.576321	960.0	8160.0	0.0798	3.4E-06
12:08	20.6	86.393798	1080.0	9240.0	0.0800	3.4E-06
12:29	15.5	100.13827	1260.0	10500.0	0.0795	3.4E-06
12:51	10.5	98.17477	1320.0	11820.0	0.0744	3.2E-06

Average 3.4E-06



SDRI Test - Sacramento - Thin Store-and-Release Cover

Date: Installer: XW
Project: Sacramento Analyst: CHB

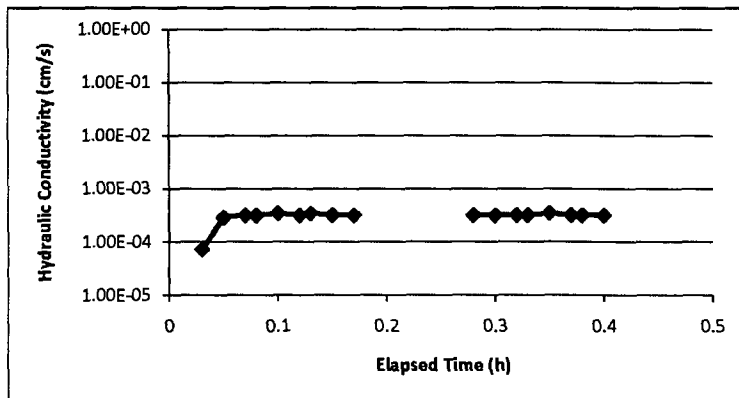
Fixed variables:

L = 150 cm Assume Unit Gradient in Analysis
A = 22500 cm²
a = 77.69 cm²
Dp = cm

Temporal Variables:

Time	Reading (cm)	Δ Time (s)	Time (h)	K (cm/s)
3:50	59			
3:52	56.5	120	0.03	7.19E-05
3:53	51.5	60	0.05	2.88E-04
3:54	46	60	0.07	3.17E-04
3:55	40.5	60	0.08	3.17E-04
3:56	34.5	60	0.1	3.45E-04
3:57	29	60	0.12	3.17E-04
3:58	23	60	0.13	3.45E-04
3:59	17.5	60	0.15	3.17E-04
4:00	12	60	0.17	3.17E-04
4:06	55.5	360	0.27	
4:07	50	60	0.28	3.17E-04
4:08	44.5	60	0.3	3.17E-04
4:09	39	60	0.32	3.17E-04
4:10	33.5	60	0.33	3.17E-04
4:11	27.5	60	0.35	3.45E-04
4:12	22	60	0.37	3.17E-04
4:13	16.5	60	0.38	3.17E-04
4:14	11	60	0.4	3.17E-04

Avg K
3.2E-04



Date:		Installer:	XW
Project:	Sacramento	Analyst:	CHB
Fixed variables:			
L =	150	cm	Assume Unit Gradient in Analysis
A =	22500	cm ²	
a =	77.69	cm ²	
Dp =		cm	

Time	Reading (cm)	Δ Time (s)	Time (h)	K (cm/s)
11:03	56			
11:07	50.7	240	0.07	7.63E-05
11:10	45	180	0.12	1.09E-04
11:13	39	180	0.17	1.15E-04
11:16	33.8	180	0.22	9.98E-05
11:19	28.7	180	0.27	9.78E-05
11:22	23.2	180	0.32	1.06E-04
11:25	18	180	0.37	9.98E-05
11:28	12.6	180	0.42	1.04E-04
11:31	7.4	180	0.47	9.98E-05
11:40	51.5	540	0.62	
11:43	46	180	0.67	1.06E-04
11:46	40.2	180	0.72	1.11E-04
11:49	35	180	0.77	9.98E-05
11:52	29.5	180	0.82	1.06E-04
11:55	25.6	180	0.87	7.48E-05
11:58	19.2	180	0.92	1.23E-04
12:01	14.5	180	0.97	9.02E-05
12:06	53.8	480	1.1	
12:09	49.5	180	1.15	8.25E-05
12:12	44	180	1.2	1.06E-04
12:15	38.9	180	1.25	9.78E-05
12:18	33.8	180	1.3	9.78E-05
12:21	28.6	180	1.35	9.98E-05
12:24	23.4	180	1.4	9.98E-05
12:27	18.2	180	1.45	9.98E-05

Figure 1 is a semi-logarithmic plot showing the relationship between Hydraulic Conductivity (cm/s) on the y-axis and Elapsed Time (h) on the x-axis. The y-axis is logarithmic, with major ticks at 1.00E-05, 1.00E-04, and 1.00E-03. The x-axis is linear, ranging from 0 to 1.6 hours with major ticks every 0.2 hours. The data points, represented by black diamonds, show a relatively stable hydraulic conductivity around 1.00E-04 cm/s, with some minor fluctuations between 0.1 and 1.5 hours.

Elapsed Time (h)	Hydraulic Conductivity (cm/s)
0.10	8.0E-05
0.12	1.0E-04
0.15	1.2E-04
0.18	1.0E-04
0.20	9.0E-05
0.25	1.0E-04
0.30	1.0E-04
0.35	1.0E-04
0.40	1.0E-04
0.45	1.0E-04
0.70	1.0E-04
0.75	1.2E-04
0.80	1.0E-04
0.85	1.1E-04
0.90	7.0E-05
0.95	1.2E-04
1.00	9.0E-05
1.15	8.0E-05
1.20	1.0E-04
1.25	1.0E-04
1.30	1.0E-04
1.35	1.0E-04
1.40	1.0E-04
1.45	1.0E-04

APPENDIX C - TSB DATA

Single-Stage Constant Head Borehole Test - Altamont - Composite Cover

Project: Altamont Decommissioning
Date: 04/03/07
Test ID: TSB-C1

Installer: XW
Analyst: CHB

Fixed Variables:

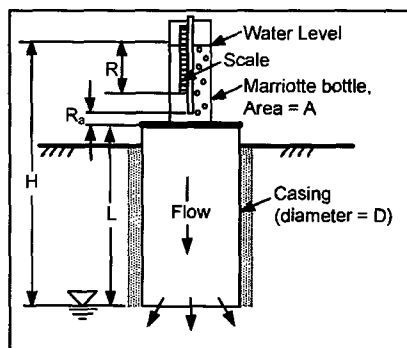
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 30.48

**Analysis using Horslev's isotropic
 constant head solution**

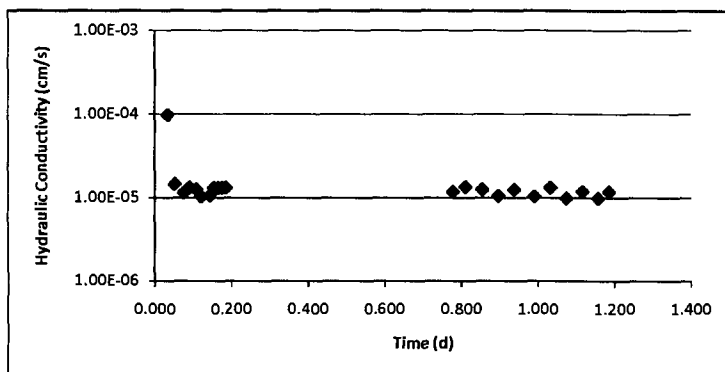
Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
4/3/07 15:03	29.2			
4/3/07 15:51	41.1	3.30E-01	0.033	9.72E-05
4/3/07 16:18	42.1	4.93E-02	0.052	1.45E-05
4/3/07 16:52	43.1	3.91E-02	0.076	1.15E-05
4/3/07 17:13	43.8	4.43E-02	0.090	1.31E-05
4/3/07 17:38	44.6	4.26E-02	0.108	1.25E-05
4/3/07 17:57	45.1	3.50E-02	0.121	1.03E-05
4/3/07 18:30	46.0	3.63E-02	0.144	1.07E-05
4/3/07 18:45	46.5	4.43E-02	0.154	1.31E-05
4/3/07 19:00	47.0	4.43E-02	0.165	1.31E-05
4/3/07 19:15	47.5	4.43E-02	0.175	1.31E-05
4/3/07 19:30	48.0	4.43E-02	0.185	1.31E-05
4/4/07 9:44	73.4	3.96E-02	0.778	1.17E-05
4/4/07 10:31	75.0	4.53E-02	0.811	1.33E-05
4/4/07 11:34	77.0	4.22E-02	0.855	1.24E-05
4/4/07 12:34	78.6	3.55E-02	0.897	1.05E-05
4/4/07 13:34	80.5	4.21E-02	0.938	1.24E-05
4/4/07 14:50	82.5	3.50E-02	0.991	1.03E-05
4/4/07 15:50	84.5	4.43E-02	1.033	1.31E-05
4/4/07 16:50	86.0	3.32E-02	1.074	9.80E-06
4/4/07 17:50	87.8	3.99E-02	1.116	1.18E-05
4/4/07 18:50	89.3	3.33E-02	1.158	9.80E-06
4/4/07 19:30	90.5	3.99E-02	1.185	1.18E-05



K (cm/s)
1.1E-05



Single-Stage Constant Head Borehole Test - Altamont - Composite Cover

Project: Altamont Decommissioning
Date: 03/30/07
Test ID: TSB-C2

Installer: XW
Analyst: CHB

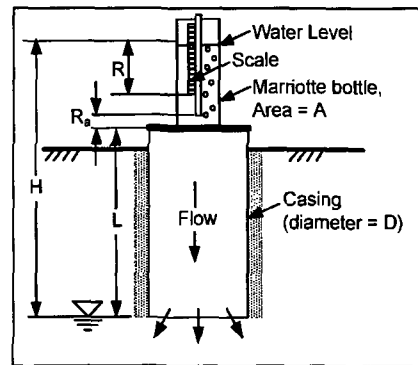
Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 30.48

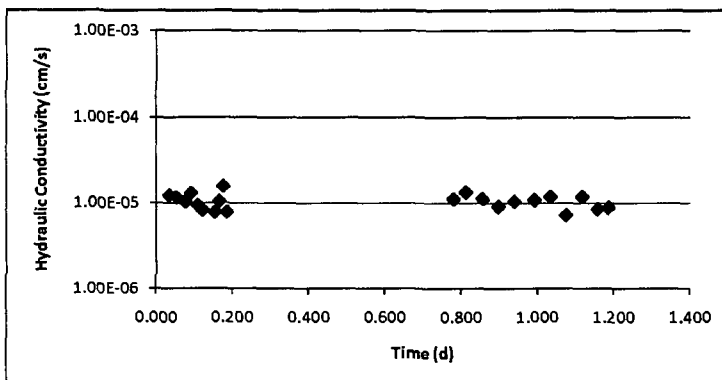
**Analysis using Horslev's isotropic
 constant head solution**

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
4/3/07 15:03	29.5			
4/3/07 15:51	31.0	4.16E-02	0.033	1.22E-05
4/3/07 16:18	31.8	3.94E-02	0.052	1.16E-05
4/3/07 16:52	32.7	3.52E-02	0.076	1.04E-05
4/3/07 17:13	33.4	4.43E-02	0.090	1.31E-05
4/3/07 17:38	34.0	3.19E-02	0.108	9.41E-06
4/3/07 17:57	34.4	2.80E-02	0.121	8.25E-06
4/3/07 18:30	35.4		0.144	
4/3/07 18:45	35.7	2.66E-02	0.154	7.84E-06
4/3/07 19:00	36.1	3.55E-02	0.165	1.05E-05
4/3/07 19:15	36.7	5.32E-02	0.175	1.57E-05
4/3/07 19:30	37.0	2.66E-02	0.185	7.84E-06
4/4/07 9:44	61.2	3.77E-02	0.778	1.11E-05
4/4/07 10:31	62.8	4.53E-02	0.811	1.33E-05
4/4/07 11:34	64.6	3.80E-02	0.855	1.12E-05
4/4/07 12:34	66.0	3.10E-02	0.897	9.15E-06
4/4/07 13:34	67.6	3.55E-02	0.938	1.05E-05
4/4/07 14:50	69.7	3.68E-02	0.991	1.08E-05
4/4/07 15:50	71.5	3.99E-02	1.033	1.18E-05
4/4/07 16:50	72.6	2.44E-02	1.074	7.19E-06
4/4/07 17:50	74.4	3.99E-02	1.116	1.18E-05
4/4/07 18:50	75.7	2.88E-02	1.158	8.49E-06
4/4/07 19:30	76.6	2.99E-02	1.185	8.82E-06



K (cm/s)
9.1E-06



Single-Stage Constant Head Borehole Test - Altamont - Composite Cover

Project: Altamont Decommissioning
Date: 04/03/07
Test ID: TSB-C3

Installer: XW
Analyst: CHB

Fixed Variables:

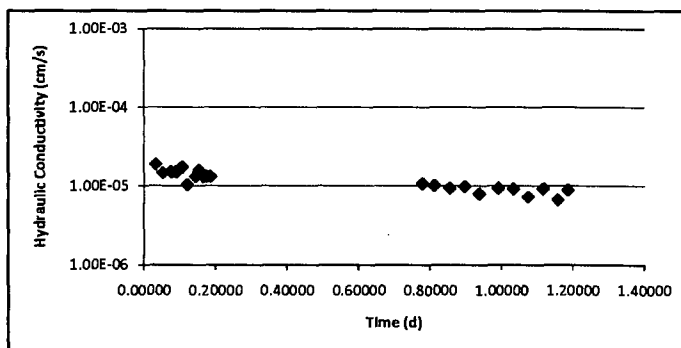
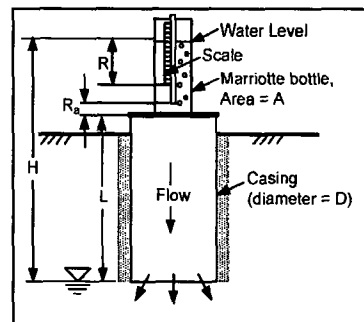
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 30.48

Analysis using Horslev's isotropic
 constant head solution

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
4/3/07 15:03	46.7			
4/3/07 15:51	49.0	6.37E-02	0.03333	1.88E-05
4/3/07 16:18	50.0	4.93E-02	0.05208	1.45E-05
4/3/07 16:52	51.3	5.09E-02	0.07569	1.50E-05
4/3/07 17:13	52.1	5.07E-02	0.09028	1.49E-05
4/3/07 17:38	53.2	5.85E-02	0.10764	1.72E-05
4/3/07 17:57	53.7	3.50E-02	0.12083	1.03E-05
4/3/07 18:30	54.8	4.43E-02	0.14375	1.31E-05
4/3/07 18:45	55.4	5.32E-02	0.15417	1.57E-05
4/3/07 19:00	55.9	4.43E-02	0.16458	1.31E-05
4/3/07 19:15	56.4	4.43E-02	0.17500	1.31E-05
4/3/07 19:30	56.9	4.43E-02	0.18542	1.31E-05
4/4/07 9:44	80.0	3.60E-02	0.77847	1.06E-05
4/4/07 10:31	81.2	3.40E-02	0.81111	1.00E-05
4/4/07 11:34	82.7	3.17E-02	0.85486	9.33E-06
4/4/07 12:34	84.2	3.33E-02	0.89653	9.80E-06
4/4/07 13:34	85.4	2.66E-02	0.93819	7.84E-06
4/4/07 14:50	87.2	3.15E-02	0.99097	9.28E-06
4/4/07 15:50	88.6	3.10E-02	1.03264	9.15E-06
4/4/07 16:50	89.7	2.44E-02	1.07431	7.19E-06
4/4/07 17:50	91.1	3.10E-02	1.11597	9.15E-06
4/4/07 18:50	92.1	2.22E-02	1.15764	6.53E-06
4/4/07 19:30	93.0	2.99E-02	1.18542	8.82E-06

K (cm/s)
 7.9E-06



Single-Stage Constant Head Borehole Test - Altamont - Composite Cover

Project: Altamont Decommissioning
 Date: 04/03/07
 Test ID: TSB-C4

Installer: XW
 Analyst: CHB

Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 30.48

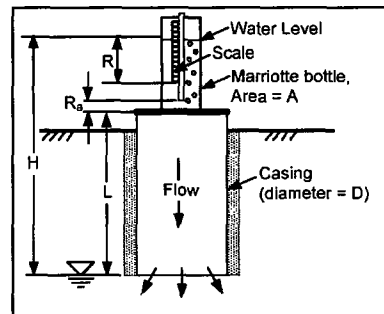
Analysis using Horslev's isotropic
 constant head solution

Temporal Variables:

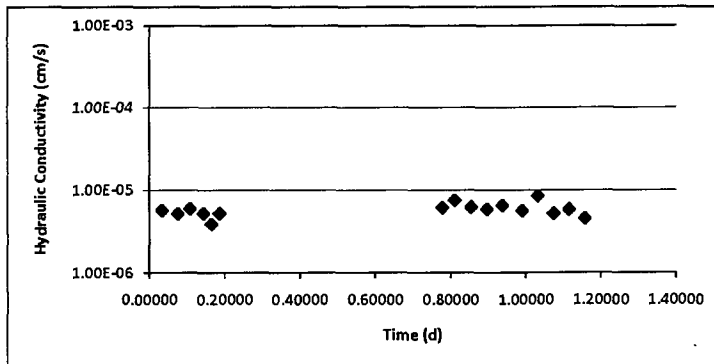
Time	R (cm)
4/3/07 15:03	30.0
4/3/07 15:51	30.7
4/3/07 16:52	31.5
4/3/07 17:38	32.2
4/3/07 18:30	32.9
4/3/07 19:00	33.2
4/3/07 19:30	33.6
4/4/07 9:44	47.0
4/4/07 10:31	47.9
4/4/07 11:34	48.9
4/4/07 12:34	49.8
4/4/07 13:34	50.8
4/4/07 14:50	51.9
4/4/07 15:50	53.2
4/4/07 16:50	54.0
4/4/07 17:50	54.9
4/4/07 18:50	55.6

Computations:

Q (cm ³ /s)	Time (d)	K (cm/s)
1.94E-02	0.03333	5.72E-06
1.74E-02	0.07569	5.14E-06
2.02E-02	0.10764	5.96E-06
1.79E-02	0.14375	5.28E-06
1.33E-02	0.16458	3.92E-06
1.77E-02	0.18542	5.23E-06
2.09E-02	0.77847	6.15E-06
2.55E-02	0.81111	7.51E-06
2.11E-02	0.85486	6.22E-06
2.00E-02	0.89653	5.88E-06
2.22E-02	0.93819	6.53E-06
1.93E-02	0.99097	5.67E-06
2.88E-02	1.03264	8.49E-06
1.77E-02	1.07431	5.23E-06
2.00E-02	1.11597	5.88E-06
1.55E-02	1.15764	4.57E-06



K (cm/s)
 5.2E-06



Single-Stage Constant Head Borehole Test - Altamont - Store-and-Release Cover

Project: Altamont Decommissioning
Date: 04/02/07
Test ID: TSB-A1

Installer: XW
Analyst: CHB

Fixed Variables:

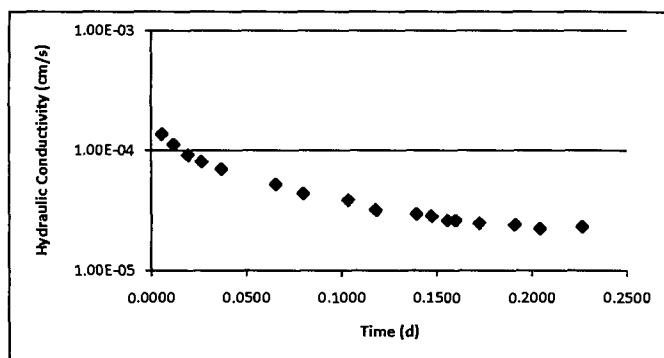
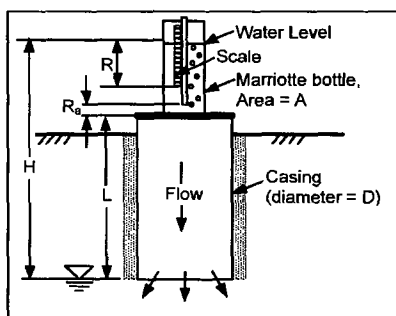
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R₀ (cm): 10
L (cm): 60.96

Analysis using Horslev's isotropic
constant head solution

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
14:03:00	33.3			
14:11:00	38.2	8.15E-01	0.0056	1.37E-04
14:20:00	42.7	6.65E-01	0.0118	1.12E-04
14:31:00	47.2	5.44E-01	0.0194	9.15E-05
14:41:00	50.8	4.79E-01	0.0264	8.05E-05
14:56:00	55.5	4.17E-01	0.0368	7.01E-05
15:37:00	65.1	3.11E-01	0.0653	5.24E-05
15:58:00	69.2	2.60E-01	0.0799	4.37E-05
16:32:00	75.1	2.31E-01	0.1035	3.88E-05
16:53:00	78.1	1.90E-01	0.1181	3.19E-05
17:24:00	82.2	1.76E-01	0.1396	2.96E-05
17:35:00	83.6	1.69E-01	0.1472	2.85E-05
17:47:00	85.0	1.55E-01	0.1556	2.61E-05
17:53:00	85.7	1.55E-01	0.1597	2.61E-05
18:11:00	87.7	1.48E-01	0.1722	2.48E-05
9:34:00	31.0			
10:01:00	33.9	1.43E-01	0.1910	2.40E-05
10:20:00	35.8	1.33E-01	0.2042	2.24E-05
10:52:00	39.1	1.37E-01	0.2264	2.31E-05

K (cm/s)
2.4E-05



Single-Stage Constant Head Borehole Test - Altamont - Store-and-Release Cover

Project: Altamont Decommissioning
 Date: 04/02/07
 Test ID: TSB-A2

Installer: XW
 Analyst: CHB

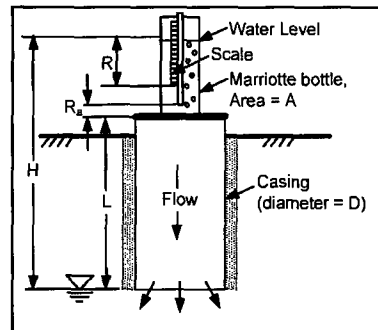
Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 60.96

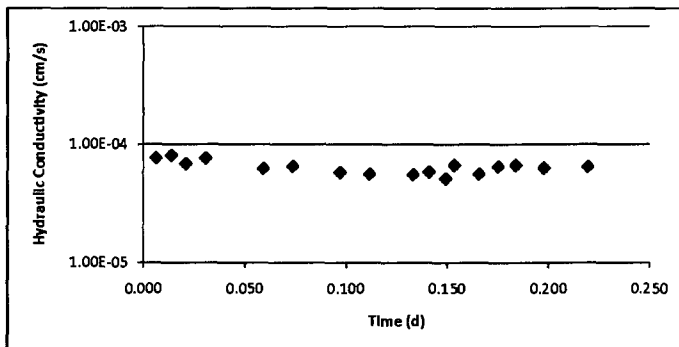
Analysis using Horslev's isotropic
 constant head solution

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
14:12:00	31.0			
14:21:00	34.1	4.58E-01	0.006	7.70E-05
14:32:00	38.1	4.84E-01	0.014	8.13E-05
14:42:00	41.2	4.12E-01	0.021	6.93E-05
14:56:00	46.0	4.56E-01	0.031	7.67E-05
15:37:00	57.5	3.73E-01	0.059	6.27E-05
15:58:00	63.7	3.93E-01	0.074	6.60E-05
16:32:00	72.6	3.48E-01	0.097	5.85E-05
16:53:00	77.9	3.36E-01	0.112	5.64E-05
17:24:00	85.7	3.35E-01	0.133	5.63E-05
17:35:00	88.6	3.51E-01	0.141	5.90E-05
17:47:00	91.4	3.10E-01	0.149	5.22E-05
17:53:00	93.2	3.99E-01	0.153	6.71E-05
18:11:00	97.8	3.40E-01	0.166	5.71E-05
9:35:00	34.0	1.64E-01		2.76E-05
9:48:00	37.8	3.89E-01	0.175	6.54E-05
10:01:00	41.7	3.99E-01	0.184	6.71E-05
10:21:00	47.4	3.79E-01	0.198	6.37E-05
10:52:00	56.4	3.86E-01	0.219	6.49E-05



K (cm/s)
 6.5E-05



Single-Stage Constant Head Borehole Test - Altamont - Store-and-Release Cover

Project: Altamont Decommissioning
Date: 04/02/07
Test ID: TSB-A3

Installer: XW
Analyst: CHB

Fixed Variables:
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

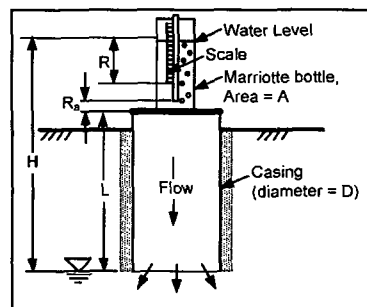
Analysis using Horslev's isotropic
constant head solution

Temporal Variables:

Time	R (cm)
14:25:00	31.5
14:27:00	41.2
14:30:00	56.1
14:33:00	70.1
14:35:00	79.2
14:37:00	88.1
14:39:00	96.7
15:30:55	30.0
15:31:50	32.4
15:33:00	35.4
15:34:40	40.2
15:35:30	42.9
15:38:35	51.4
15:40:15	56.2
15:44:15	67.2
15:46:00	72.1
15:49:15	81.0
15:50:30	84.5
15:51:30	87.2
15:52:30	89.9
15:53:30	93.1
15:54:30	95.4
15:55:30	98.0
15:56:17	100.0
15:27:00	32.0
15:30:00	37.6
15:32:00	45.6
15:34:00	50.9
15:36:00	56.2
15:40:00	66.8
15:42:00	71.8
15:44:00	76.7
15:46:00	81.8
15:48:00	86.8
15:50:00	91.8
15:52:00	96.8

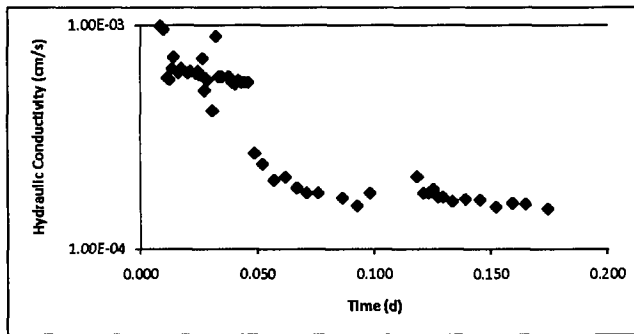
Computations:

Q (cm ³ /s)	Time (d)	K (cm/s)
6.45E+00	0.001	1.08E-03
6.61E+00	0.003	1.11E-03
6.21E+00	0.006	1.04E-03
6.05E+00	0.007	1.02E-03
5.92E+00	0.008	9.95E-04
5.72E+00	0.010	9.62E-04
	0.011	
3.48E+00	0.012	5.85E-04
3.42E+00	0.012	5.75E-04
3.83E+00	0.014	6.44E-04
4.31E+00	0.014	7.24E-04
3.67E+00	0.016	6.16E-04
3.83E+00	0.017	6.44E-04
3.66E+00	0.020	6.15E-04
3.72E+00	0.021	6.26E-04
3.64E+00	0.024	6.12E-04
3.72E+00	0.025	6.26E-04
3.59E+00	0.025	6.04E-04
3.59E+00	0.026	6.04E-04
4.26E+00	0.027	7.16E-04
3.06E+00	0.027	5.14E-04
3.46E+00	0.028	5.81E-04
3.40E+00	0.029	5.71E-04
2.48E+00	0.031	4.17E-04
5.32E+00	0.032	8.94E-04
3.52E+00	0.033	5.93E-04
3.52E+00	0.035	5.93E-04
3.52E+00	0.038	5.93E-04
3.33E+00	0.039	5.59E-04
3.26E+00	0.040	5.48E-04
3.39E+00	0.042	5.70E-04
3.33E+00	0.043	5.59E-04
3.33E+00	0.045	5.59E-04
3.33E+00	0.046	5.59E-04



9:46:00	30.3			
9:50	35.1	1.60E+00	0.049	2.68E-04
9:55	40.5	1.44E+00	0.052	2.41E-04
10:02	46.9	1.22E+00	0.057	2.04E-04
10:09	53.5	1.25E+00	0.062	2.11E-04
10:16	59.4	1.12E+00	0.067	1.88E-04
10:22	64.2	1.06E+00	0.071	1.79E-04
10:29	69.8	1.06E+00	0.076	1.79E-04
10:44	81.2	1.01E+00	0.086	1.70E-04
10:53	87.5	9.31E-01	0.093	1.57E-04
11:01	93.9	1.06E+00	0.098	1.79E-04
11:28	30.0		0.117	
11:30	31.9	1.26E+00	0.118	2.12E-04
11:34	35.1	1.06E+00	0.121	1.79E-04
11:37	37.5	1.06E+00	0.123	1.79E-04
11:40	40.0	1.11E+00	0.125	1.86E-04
11:43	42.3	1.02E+00	0.127	1.71E-04
11:46	44.6	1.02E+00	0.129	1.71E-04
11:52	49.0	9.75E-01	0.133	1.64E-04
12:00	55.0	9.98E-01	0.139	1.68E-04
12:09	61.7	9.90E-01	0.145	1.66E-04
12:19	68.6	9.18E-01	0.152	1.54E-04
12:29	75.8	9.58E-01	0.159	1.61E-04
12:37	81.5	9.48E-01	0.165	1.59E-04
12:51	91.0	9.03E-01	0.174	1.52E-04

K (cm/s)
1.6E-04



Single-Stage Constant Head Borehole Test - Altamont - Store-and-Release Cover

Project: Altamont Decommissioning
Date: 04/02/07
Test ID: TSB-A4

Installer: XW
Analyst: CHB

Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Analysis using Horslev's isotropic
constant head solution

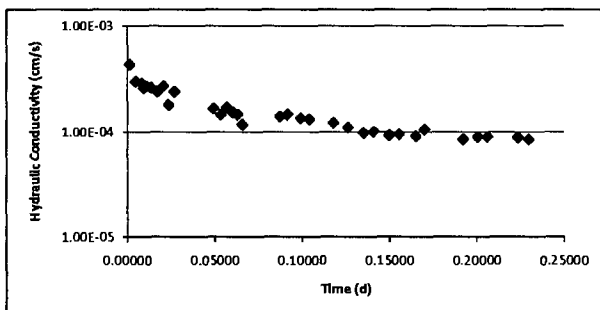
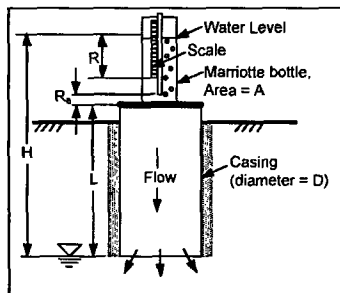
Temporal Variables:

Time	R (cm)
14:22:00	32.7
14:24:00	36.5
14:29:00	43.1
14:34:00	49.4
14:36:00	51.7
14:38:00	54.1
14:42:00	58.7
14:47:00	64.0
14:52:00	70.0
14:56:00	73.2
15:01:00	78.5
15:28:00	35.4
15:33:00	39.1
15:39:00	43.0
15:44:00	46.8
15:49:00	50.2
15:53:00	52.8
15:57:00	54.9
16:28:00	74.2
16:34:00	78.1
16:45:00	84.7
16:52:00	88.8
17:12:00	99.6
9:37:00	31.0
9:49:00	36.9
10:02:00	42.6
10:10:00	46.2
10:23:00	51.6
10:31:00	55.0
10:45:00	60.7
10:52:00	64.0
11:24:00	76.2
11:36:00	81.0
11:44:00	84.2
12:09:00	94.1
12:18:00	97.5

Computations:

Q (cm ³ /s)	Time (d)	K (cm/s)
2.53E+00	0.00139	4.25E-04
1.76E+00	0.00486	2.95E-04
1.68E+00	0.00833	2.82E-04
1.53E+00	0.00972	2.57E-04
1.60E+00	0.01111	2.68E-04
1.53E+00	0.01389	2.57E-04
1.41E+00	0.01736	2.37E-04
1.60E+00	0.02083	2.68E-04
1.06E+00	0.02361	1.79E-04
1.41E+00	0.02708	2.37E-04
9.84E-01	0.049305556	1.65E-04
8.65E-01	0.05347	1.45E-04
1.01E+00	0.05694	1.70E-04
9.04E-01	0.06042	1.52E-04
8.65E-01	0.06319	1.45E-04
6.98E-01	0.06597	1.17E-04
8.28E-01	0.08750	1.39E-04
8.64E-01	0.09167	1.45E-04
7.98E-01	0.09931	1.34E-04
7.79E-01	0.10417	1.31E-04
7.18E-01	0.11806	1.21E-04
6.54E-01	0.12639	1.10E-04
5.83E-01	0.13542	9.80E-05
5.99E-01	0.14097	1.01E-04
5.52E-01	0.15000	9.29E-05
5.65E-01	0.15556	9.50E-05
5.42E-01	0.16528	9.10E-05
6.27E-01	0.17014	1.05E-04
5.07E-01	0.19236	8.53E-05
5.32E-01	0.20069	8.94E-05
5.32E-01	0.20625	8.94E-05
5.27E-01	0.22361	8.85E-05
5.02E-01	0.22986	8.45E-05

K (cm/s)
8.7E-05



Single-Stage Constant Head Borehole Test - Apple Valley - Clay Cover

Project: Apple Valley Decommissioning Installer: XW
 Date: 03/30/07 Analyst: CHB
 Test ID: C-2

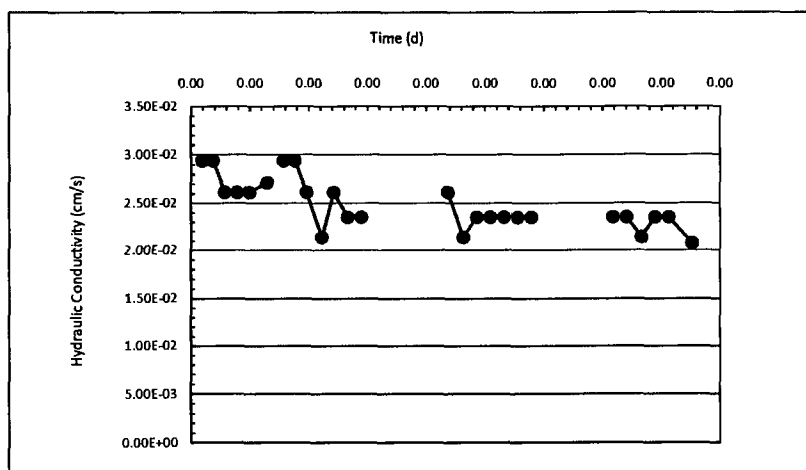
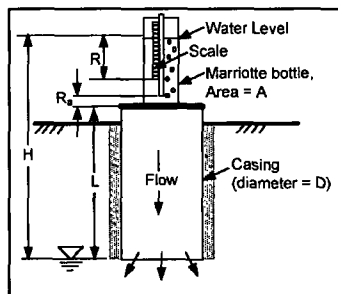
Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 30.48

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
10:00:00	35.0			
10:00:08	45.0	9.98E+01	0.00009	2.94E-02
10:00:16	55.0	9.98E+01	0.00019	2.94E-02
10:00:25	65.0	8.87E+01	0.00029	2.61E-02
10:00:34	75.0	8.87E+01	0.00039	2.61E-02
10:00:43	85.0	8.87E+01	0.00050	2.61E-02
10:00:56	100.0	9.21E+01	0.00065	2.71E-02
10:01:00	30.0		0.00069	
10:01:08	40.0	9.98E+01	0.00079	2.94E-02
10:01:16	50.0	9.97E+01	0.00088	2.94E-02
10:01:25	60.0	8.87E+01	0.00098	2.61E-02
10:01:36	70.0	7.25E+01	0.00111	2.14E-02
10:01:45	80.0	8.87E+01	0.00122	2.61E-02
10:01:55	90.0	7.98E+01	0.00133	2.35E-02
10:02:05	100.0	7.98E+01	0.00145	2.35E-02
10:03:00	30.0		0.00208	
10:03:09	40.0	8.87E+01	0.00219	2.61E-02
10:03:20	50.0	7.25E+01	0.00231	2.14E-02
10:03:30	60.0	7.98E+01	0.00243	2.35E-02
10:03:40	70.0	7.98E+01	0.00255	2.35E-02
10:03:50	80.0	7.98E+01	0.00266	2.35E-02
10:04:00	90.0	7.98E+01	0.00278	2.35E-02
10:04:10	100.0	7.98E+01	0.00289	2.35E-02
10:05:00	35.0		0.00347	
10:05:10	45.0	7.98E+01	0.00359	2.35E-02
10:05:20	55.0	7.98E+01	0.00370	2.35E-02
10:05:31	65.0	7.25E+01	0.00383	2.14E-02
10:05:41	75.0	7.98E+01	0.00395	2.35E-02
10:05:51	85.0	7.98E+01	0.00406	2.35E-02
10:06:08	100.0	7.04E+01	0.00426	2.08E-02

AVG
2.28E-02



Single-Stage Constant Head Borehole Test - Apple Valley - Clay Cover

Project: Apple Valley Decommissioning
 Date: 03/30/07
 Test ID: C-3

Installer: XW
 Analyst: CHB

Fixed Variables:

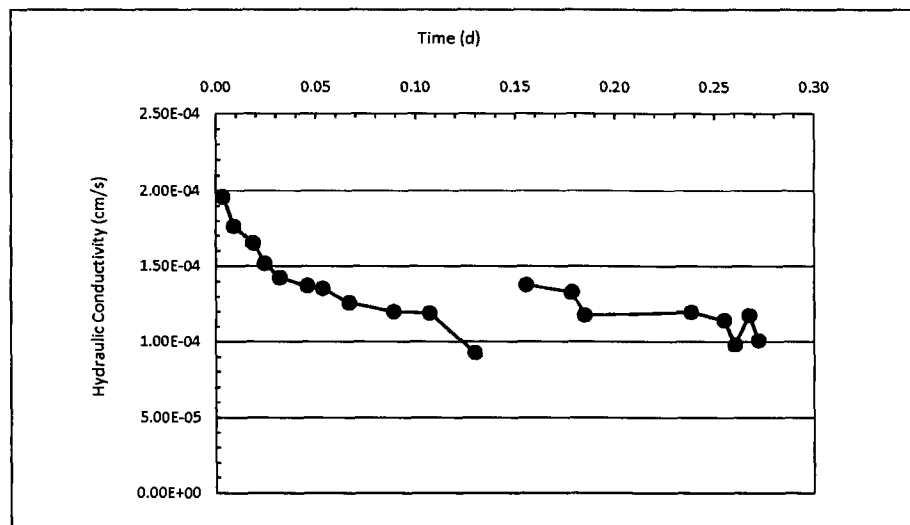
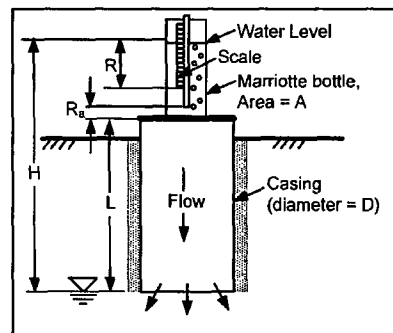
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 30.48

Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
11:00:00	39.5			
11:05:00	42.0	6.65E-01	0.003	1.96E-04
11:13:00	45.6	5.99E-01	0.009	1.76E-04
11:27:00	51.5	5.61E-01	0.019	1.65E-04
11:35:00	54.6	5.15E-01	0.024	1.52E-04
11:46:00	58.6	4.84E-01	0.032	1.43E-04
12:06:00	65.6	4.66E-01	0.046	1.37E-04
12:17:00	69.4	4.59E-01	0.053	1.35E-04
12:36:00	75.5	4.27E-01	0.067	1.26E-04
13:08:00	85.3	4.07E-01	0.089	1.20E-04
13:34:00	93.2	4.04E-01	0.107	1.19E-04
14:07:00	101.0	3.14E-01	0.130	9.26E-05
14:11:00	32.0		0.133	
14:44:00	43.6	4.68E-01	0.156	1.38E-04
15:17:00	54.8	4.51E-01	0.178	1.33E-04
15:26:00	57.5	3.99E-01	0.185	1.18E-04
16:43:00	81.0	4.06E-01	0.238	1.20E-04
17:07:00	88.0	3.88E-01	0.255	1.14E-04
17:15:00	90.0	3.33E-01	0.260	9.80E-05
17:25:00	93.0	3.99E-01	0.267	1.18E-04
17:32:00	94.8	3.42E-01	0.272	1.01E-04

Average
 1.22E-04



Single-Stage Constant Head Borehole Test - Apple Valley - Clay Cover

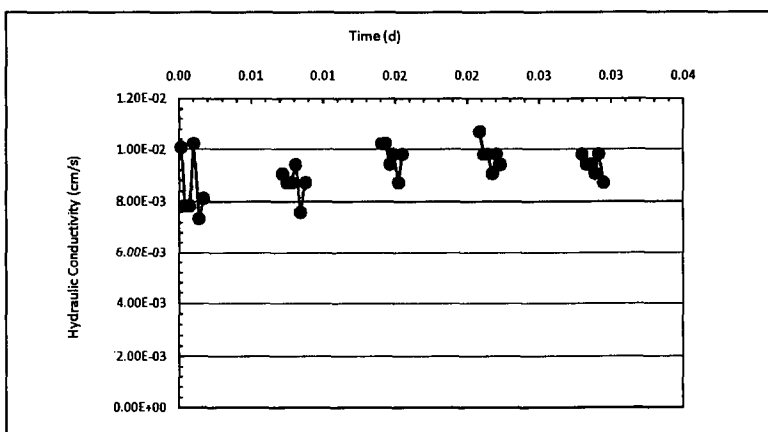
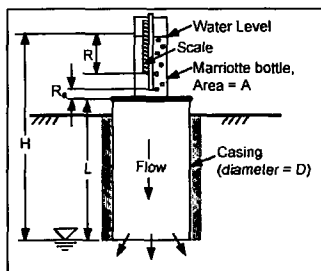
Project: Apple Valley Decommissioning
 Date: 03/30/07
 Test ID: C-4

Installer: XW
 Analyst: CH8

Fixed Variables:
 Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 30.48

Temporal Variables:		Computations:		
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
10:00:07	37.0			
10:00:21	43.0	3.42E+01	0.000	1.01E-02
10:00:42	50.0	2.66E+01	0.000	7.84E-03
10:01:12	60.0	2.66E+01	0.001	7.84E-03
10:01:35	70.0	3.47E+01	0.001	1.02E-02
10:02:07	80.0	2.49E+01	0.001	7.35E-03
10:02:36	90.0	2.75E+01	0.002	8.11E-03
10:10:00	30.0		0.007	
10:10:26	40.0	3.07E+01	0.007	9.05E-03
10:10:53	50.0	2.96E+01	0.007	8.71E-03
10:11:20	60.0	2.96E+01	0.008	8.71E-03
10:11:45	70.0	3.19E+01	0.008	9.41E-03
10:12:16	80.0	2.57E+01	0.008	7.59E-03
10:12:43	90.0	2.96E+01	0.009	8.71E-03
10:20:00	30.0		0.014	
10:20:23	40.0	3.47E+01	0.014	1.02E-02
10:20:46	50.0	3.47E+01	0.014	1.02E-02
10:21:11	60.0	3.19E+01	0.015	9.41E-03
10:21:35	70.0	3.32E+01	0.015	9.80E-03
10:22:02	80.0	2.96E+01	0.015	8.71E-03
10:22:26	90.0	3.33E+01	0.015	9.80E-03
10:30:00	35.0		0.021	
10:30:11	40.0	3.63E+01	0.021	1.07E-02
10:30:35	50.0	3.32E+01	0.021	9.80E-03
10:30:59	60.0	3.33E+01	0.021	9.80E-03
10:31:25	70.0	3.07E+01	0.022	9.05E-03
10:31:49	80.0	3.32E+01	0.022	9.80E-03
10:32:14	90.0	3.19E+01	0.022	9.41E-03
10:40:00	30.0		0.028	
10:40:24	40.0	3.32E+01	0.028	9.80E-03
10:40:49	50.0	3.19E+01	0.028	9.41E-03
10:41:14	60.0	3.19E+01	0.029	9.41E-03
10:41:40	70.0	3.07E+01	0.029	9.05E-03
10:42:04	80.0	3.33E+01	0.029	9.80E-03
10:42:31	90.0	2.96E+01	0.029	8.71E-03

AVG
 9.60E-03



Single-Stage Constant Head Borehole Test - Apple Valley - Clay Cover

Project: Apple Valley Decommissioning Installer: XW
 Date: 03/30/07 Analyst: CHB
 Test ID: C-5

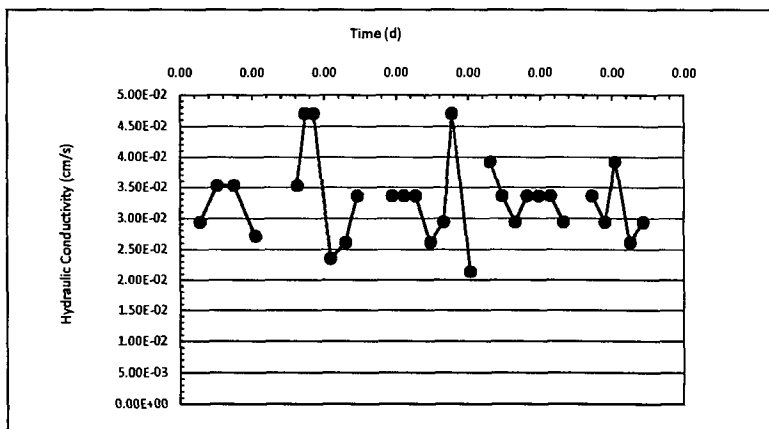
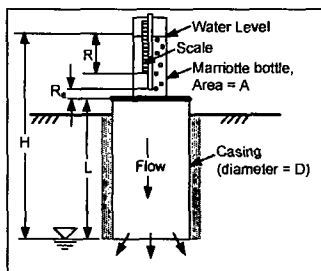
Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 30.48

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
10:00:00	40.0			
10:00:12	55.0	9.97E+01	0.00014	2.94E-02
10:00:22	70.0	1.20E+02	0.00025	3.53E-02
10:00:32	85.0	1.20E+02	0.00037	3.53E-02
10:00:45	100.0	9.21E+01	0.00052	2.71E-02
10:01:00	35.0		0.00069	
10:01:10	50.0	1.20E+02	0.00081	3.53E-02
10:01:15	60.0	1.60E+02	0.00087	4.70E-02
10:01:20	70.0	1.60E+02	0.00093	4.70E-02
10:01:30	80.0	7.98E+01	0.00104	2.35E-02
10:01:39	90.0	8.87E+01	0.00115	2.61E-02
10:01:46	100.0	1.14E+02	0.00123	3.36E-02
10:02:00	30.0		0.00139	
10:02:07	40.0	1.14E+02	0.00147	3.36E-02
10:02:14	50.0	1.14E+02	0.00155	3.36E-02
10:02:21	60.0	1.14E+02	0.00163	3.36E-02
10:02:30	70.0	8.87E+01	0.00174	2.61E-02
10:02:38	80.0	9.97E+01	0.00183	2.94E-02
10:02:43	90.0	1.60E+02	0.00189	4.70E-02
10:02:54	100.0	7.25E+01	0.00201	2.14E-02
10:03:00	30.0		0.00208	
10:03:06	40.0	1.33E+02	0.00215	3.92E-02
10:03:13	50.0	1.14E+02	0.00223	3.36E-02
10:03:21	60.0	9.97E+01	0.00233	2.94E-02
10:03:28	70.0	1.14E+02	0.00241	3.36E-02
10:03:35	80.0	1.14E+02	0.00249	3.36E-02
10:03:42	90.0	1.14E+02	0.00257	3.36E-02
10:03:50	100.0	9.98E+01	0.00266	2.94E-02
10:04:00	30.0		0.00278	
10:04:07	40.0	1.14E+02	0.00286	3.36E-02
10:04:15	50.0	9.98E+01	0.00295	2.94E-02
10:04:21	60.0	1.33E+02	0.00302	3.92E-02
10:04:30	70.0	8.87E+01	0.00312	2.61E-02
10:04:38	80.0	9.97E+01	0.00322	2.94E-02

AVG
 3.15E-02



Single-Stage Constant Head Borehole Test - Apple Valley - Clay Cover

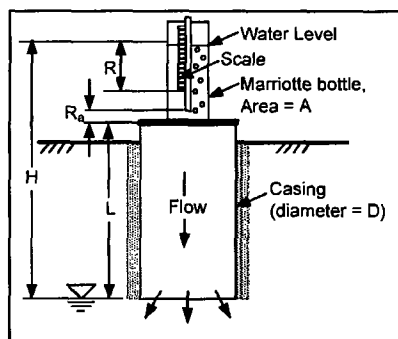
Project: Apple Valley Decommissioning
Date: 03/30/07
Test ID: C-7
Installer: XW
Analyst: CHB

Fixed Variables:

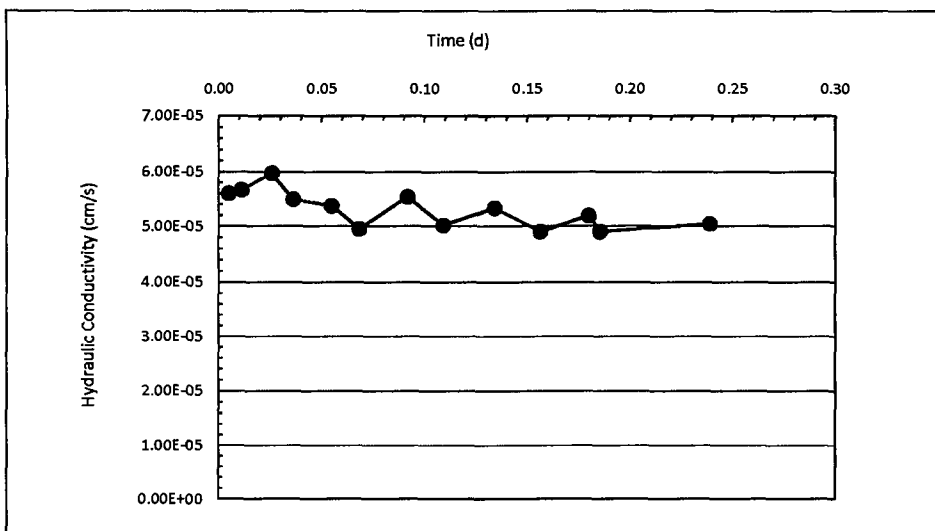
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 30.48

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
10:58:00	35.9			
11:05:00	36.9	1.90E-01	0.005	5.60E-05
11:14:00	38.2	1.92E-01	0.011	5.66E-05
11:35:00	41.4	2.03E-01	0.026	5.97E-05
11:50:00	43.5	1.86E-01	0.036	5.49E-05
12:17:00	47.2	1.82E-01	0.055	5.37E-05
12:36:00	49.6	1.68E-01	0.068	4.95E-05
13:10:00	54.4	1.88E-01	0.092	5.53E-05
13:35:00	57.6	1.70E-01	0.109	5.02E-05
14:11:00	62.5	1.81E-01	0.134	5.34E-05
14:43:00	66.5	1.66E-01	0.156	4.90E-05
15:17:00	71.0	1.76E-01	0.180	5.19E-05
15:25:00	72.0	1.66E-01	0.185	4.90E-05
16:42:00	81.9	1.71E-01	0.239	5.04E-05



AVG
 5.17E-05



Single-Stage Constant Head Borehole Test - Apple Valley - Store-and-Release Cover

Project: Apple Valley Decommissioning Installer: XW
 Date: 03/30/07 Analyst: CHB
 Test ID: ALT-1

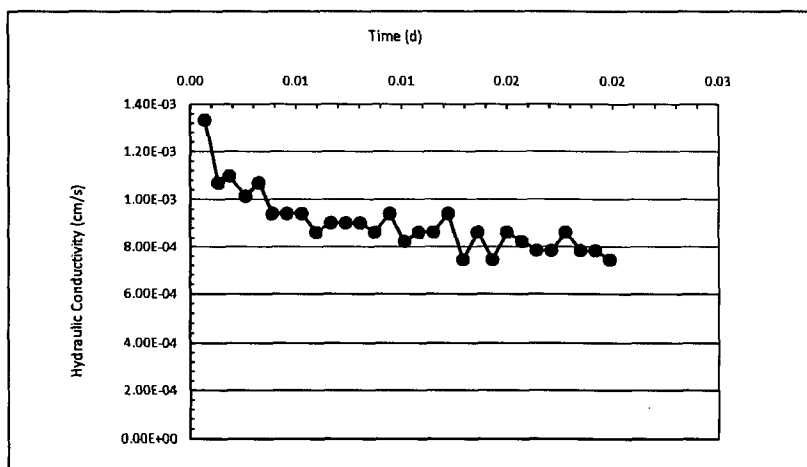
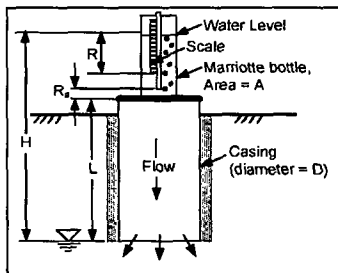
Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 30.48

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
9:29:00	34.0			
9:30:00	37.4	4.52E+00	0.0007	1.33E-03
9:30:55	39.9	3.63E+00	0.0013	1.07E-03
9:31:40	42.0	3.72E+00	0.0019	1.10E-03
9:32:45	44.8	3.44E+00	0.0026	1.01E-03
9:33:40	47.3	3.63E+00	0.0032	1.07E-03
9:34:35	49.5	3.19E+00	0.0039	9.41E-04
9:35:35	51.9	3.19E+00	0.0046	9.41E-04
9:36:35	54.3	3.19E+00	0.0053	9.41E-04
9:37:35	56.5	2.93E+00	0.0060	8.62E-04
9:38:35	58.8	3.06E+00	0.0067	9.02E-04
9:39:35	61.1	3.06E+00	0.0073	9.02E-04
9:40:35	63.4	3.06E+00	0.0080	9.02E-04
9:41:35	65.6	2.93E+00	0.0087	8.62E-04
9:42:35	68.0	3.19E+00	0.0094	9.41E-04
9:43:35	70.1	2.79E+00	0.0101	8.23E-04
9:44:35	72.3	2.93E+00	0.0108	8.62E-04
9:45:35	74.5	2.93E+00	0.0115	8.62E-04
9:46:35	76.9	3.19E+00	0.0122	9.41E-04
9:47:35	78.8	2.53E+00	0.0129	7.45E-04
9:48:35	81.0	2.93E+00	0.0136	8.62E-04
9:49:35	82.9	2.53E+00	0.0143	7.45E-04
9:50:35	85.1	2.93E+00	0.0150	8.62E-04
9:51:35	87.2	2.79E+00	0.0157	8.23E-04
9:52:35	89.2	2.66E+00	0.0164	7.84E-04
9:53:35	91.2	2.66E+00	0.0171	7.84E-04
9:54:35	93.4	2.93E+00	0.0178	8.62E-04
9:55:35	95.4	2.66E+00	0.0185	7.84E-04
9:56:35	97.4	2.66E+00	0.0192	7.84E-04
9:57:35	99.3	2.53E+00	0.0198	7.45E-04

AVG
8.10E-04

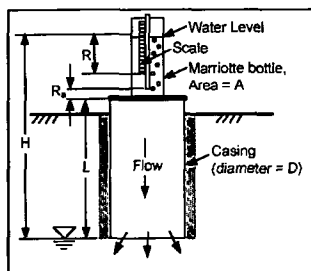


Single-Stage Constant Head Borehole Test - Apple Valley - Store-and-Release Cover

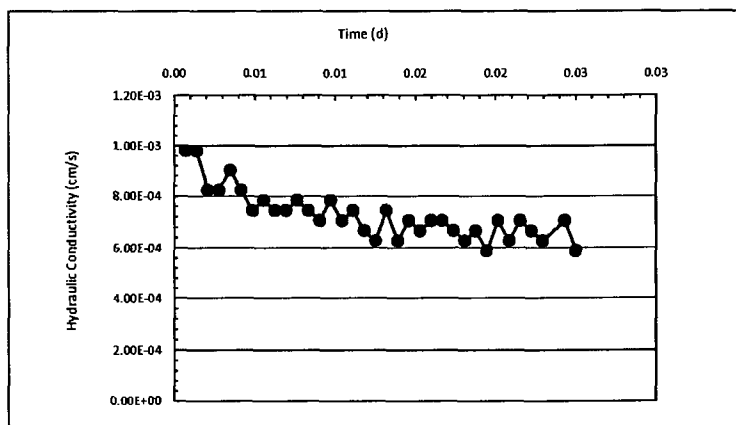
Project: Apple Valley Decommissioning Installer: XW
 Date: 03/30/07 Analyst: CHB
 Test ID: ALT-2

Fixed Variables:
 Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 30.48

Temporal Variables:		Computations:		
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
10:06:00	32.5			
10:07:00	35.0	3.33E+00	0.001	9.80E-04
10:08:00	37.5	3.33E+00	0.001	9.80E-04
10:09:00	39.6	2.79E+00	0.002	8.23E-04
10:10:00	41.7	2.79E+00	0.003	8.23E-04
10:11:00	44.0	3.06E+00	0.003	9.02E-04
10:12:00	46.1	2.79E+00	0.004	8.23E-04
10:13:00	48.0	2.53E+00	0.005	7.45E-04
10:14:00	50.0	2.66E+00	0.006	7.84E-04
10:15:00	51.9	2.53E+00	0.006	7.45E-04
10:16:00	53.8	2.53E+00	0.007	7.45E-04
10:17:00	55.8	2.66E+00	0.008	7.84E-04
10:18:00	57.7	2.53E+00	0.008	7.45E-04
10:19:00	59.5	2.39E+00	0.009	7.06E-04
10:20:00	61.5	2.66E+00	0.010	7.84E-04
10:21:00	63.3	2.39E+00	0.010	7.06E-04
10:22:00	65.2	2.53E+00	0.011	7.45E-04
10:23:00	66.9	2.26E+00	0.012	6.66E-04
10:24:00	68.5	2.13E+00	0.013	6.27E-04
10:25:00	70.4	2.53E+00	0.013	7.45E-04
10:26:00	72.0	2.13E+00	0.014	6.27E-04
10:27:00	73.8	2.39E+00	0.015	7.06E-04
10:28:00	75.5	2.26E+00	0.015	6.66E-04
10:29:00	77.3	2.39E+00	0.016	7.06E-04
10:30:00	79.1	2.39E+00	0.017	7.06E-04
10:31:00	80.8	2.26E+00	0.017	6.66E-04
10:32:00	82.4	2.13E+00	0.018	6.27E-04
10:33:00	84.1	2.26E+00	0.019	6.66E-04
10:34:00	85.6	2.00E+00	0.019	5.88E-04
10:35:00	87.4	2.39E+00	0.020	7.06E-04
10:36:00	89.0	2.13E+00	0.021	6.27E-04
10:37:00	90.8	2.39E+00	0.022	7.06E-04
10:38:00	92.5	2.26E+00	0.022	6.66E-04
10:39:00	94.1	2.13E+00	0.023	6.27E-04
10:41:00	97.7	2.39E+00	0.024	7.06E-04
10:42:00	99.2	2.00E+00	0.025	5.88E-04



AVG
 6.27E-04



Single-Stage Constant Head Borehole Test - Boardman - Thin Store-and-Release Cover

Project: Boardman
Date: 08/20/07
Test ID: TH-1

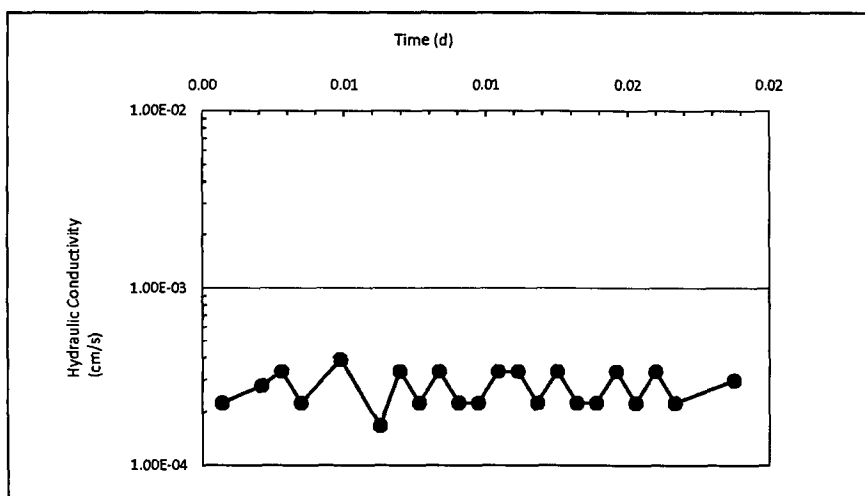
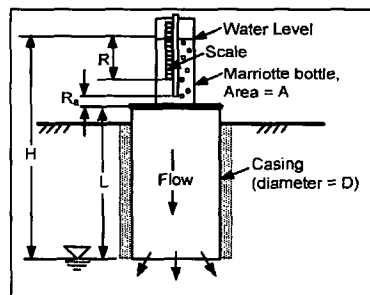
Installer: XW
Analyst: CHB

Fixed Variables:
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
2:49:00	32.0			
2:50:00	33.0	1.33E+00	0.0007	2.24E-04
2:52:00	35.5	1.66E+00	0.0021	2.80E-04
2:53:00	37.0	2.00E+00	0.0028	3.35E-04
2:54:00	38.0	1.33E+00	0.0035	2.24E-04
2:56:00	41.5	2.33E+00	0.0049	3.91E-04
2:58:00	43.0	9.98E-01	0.0063	1.68E-04
2:59:00	44.5	2.00E+00	0.0069	3.35E-04
3:00:00	45.5	1.33E+00	0.0076	2.24E-04
3:01:00	47.0	2.00E+00	0.0083	3.35E-04
3:02:00	48.0	1.33E+00	0.0090	2.24E-04
3:03:00	49.0	1.33E+00	0.0097	2.24E-04
3:04:00	50.5	1.99E+00	0.0104	3.35E-04
3:05:00	52.0	2.00E+00	0.0111	3.35E-04
3:06:00	53.0	1.33E+00	0.0118	2.24E-04
3:07:00	54.5	2.00E+00	0.0125	3.35E-04
3:08:00	55.5	1.33E+00	0.0132	2.24E-04
3:09:00	56.5	1.33E+00	0.0139	2.24E-04
3:10:00	58.0	2.00E+00	0.0146	3.35E-04
3:11:00	59.0	1.33E+00	0.0153	2.24E-04
3:12:00	60.5	2.00E+00	0.0160	3.35E-04
3:13:00	61.5	1.33E+00	0.0167	2.24E-04
3:16:00	65.5	1.77E+00	0.0188	2.98E-04

AVG
2.98E-04



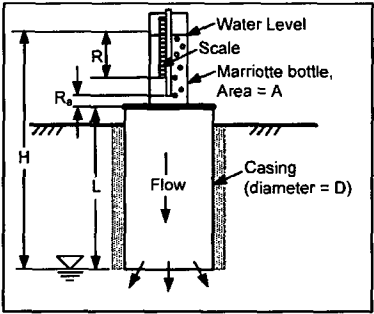
Single-Stage Constant Head Borehole Test - Boardman - Thin Store-and-Release Cover

Project: Boardman
Date: 08/20/07
Test ID: TH-2

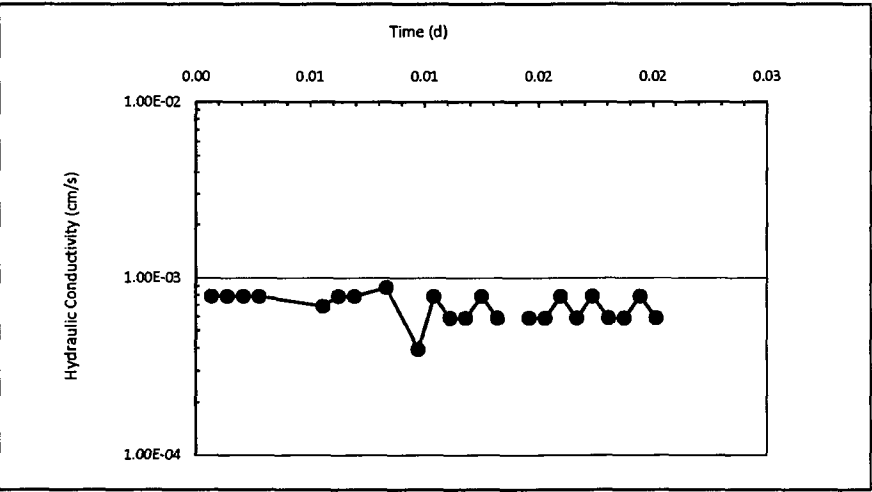
Installer: XW
Analyst: CHB

Fixed Variables:
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 30.48

Temporal Variables:		Computations:		
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
2:44:00	33.0			
2:45:00	35.0	2.66E+00	0.001	7.84E-04
2:46:00	37.0	2.66E+00	0.001	7.84E-04
2:47:00	39.0	2.66E+00	0.002	7.84E-04
2:48:00	41.0	2.66E+00	0.003	7.84E-04
2:52:00	48.0	2.33E+00	0.006	6.86E-04
2:53:00	50.0	2.66E+00	0.006	7.84E-04
2:54:00	52.0	2.66E+00	0.007	7.84E-04
2:56:00	56.5	2.99E+00	0.008	8.82E-04
2:58:00	58.5	1.33E+00	0.010	3.92E-04
2:59:00	60.5	2.66E+00	0.010	7.84E-04
3:00:00	62.0	2.00E+00	0.011	5.88E-04
3:01:00	63.5	2.00E+00	0.012	5.88E-04
3:02:00	65.5	2.66E+00	0.013	7.84E-04
3:03:00	67.0	2.00E+00	0.013	5.88E-04
3:04:00	69.0	2.66E+00	0.014	
3:05:00	70.5	2.00E+00	0.015	5.88E-04
3:06:00	72.0	2.00E+00	0.015	5.88E-04
3:07:00	74.0	2.66E+00	0.016	7.84E-04
3:08:00	75.5	2.00E+00	0.017	5.88E-04
3:09:00	77.5	2.66E+00	0.017	7.84E-04
3:10:00	79.0	2.00E+00	0.018	5.88E-04
3:11:00	80.5	2.00E+00	0.019	5.88E-04
3:12:00	82.5	2.66E+00	0.019	7.84E-04
3:13:00	84.0	2.00E+00	0.020	5.88E-04



AVG
6.53E-04



Single-Stage Constant Head Borehole Test - Boardman - Thin Store-and-Release Cover

Project: Boardman
Date: 08/20/07
Test ID: TH-3

Installer: XW
Analyst: CHB

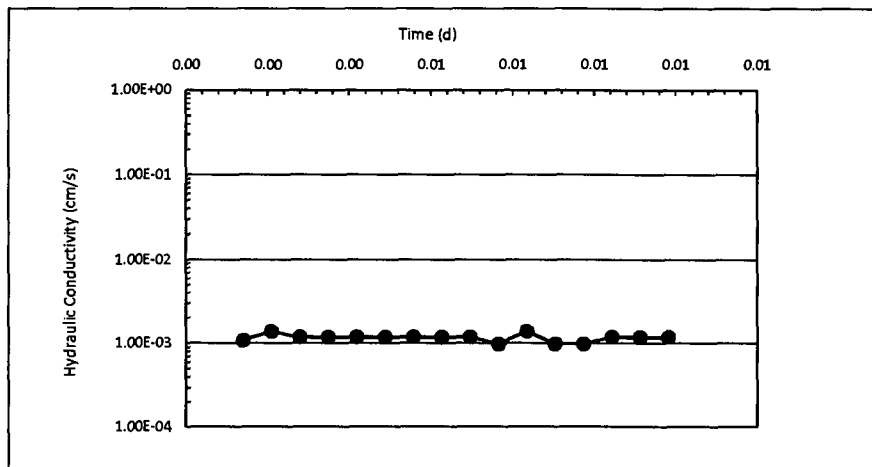
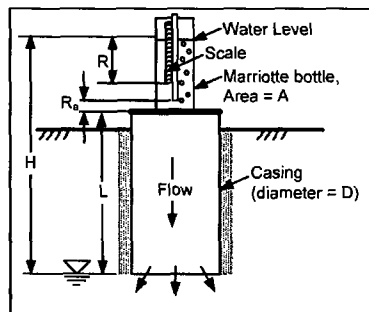
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 30.48

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
2:56:00	34.0			
2:58:00	39.5	3.66E+00	0.001	1.08E-03
2:59:00	43.0	4.66E+00	0.002	1.37E-03
3:00:00	46.0	3.99E+00	0.003	1.18E-03
3:01:00	49.0	3.99E+00	0.003	1.18E-03
3:02:00	52.0	3.99E+00	0.004	1.18E-03
3:03:00	55.0	3.99E+00	0.005	1.18E-03
3:04:00	58.0	3.99E+00	0.006	1.18E-03
3:05:00	61.0	3.99E+00	0.006	1.18E-03
3:06:00	64.0	3.99E+00	0.007	1.18E-03
3:07:00	66.5	3.33E+00	0.008	9.80E-04
3:08:00	70.0	4.66E+00	0.008	1.37E-03
3:09:00	72.5	3.33E+00	0.009	9.80E-04
3:10:00	75.0	3.33E+00	0.010	9.80E-04
3:11:00	78.0	3.99E+00	0.010	1.18E-03
3:12:00	81.0	3.99E+00	0.011	1.18E-03
3:13:00	84.0	3.99E+00	0.012	1.18E-03

AVG
1.18E-03



Single-Stage Constant Head Borehole Test - Boardman - Thin Store-and-Release Cover

Project: Boardman
Date: 08/20/07
Test ID: TH-4

Installer: XW
Analyst: CHB

Fixed Variables:

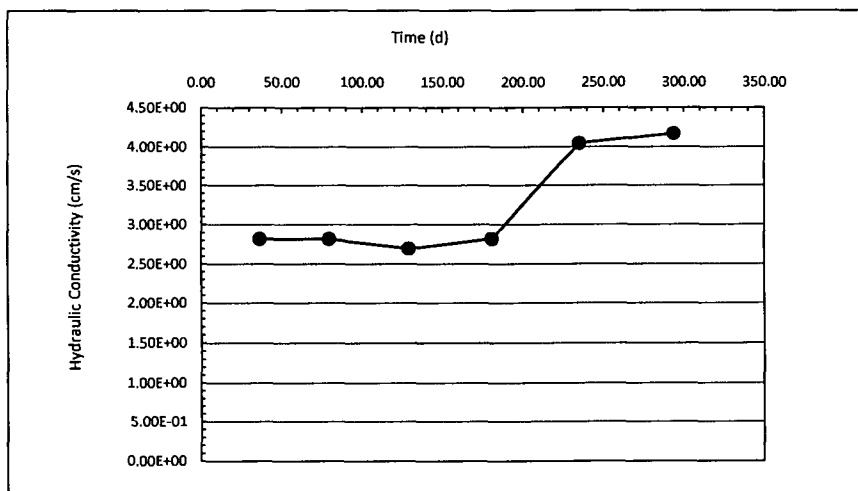
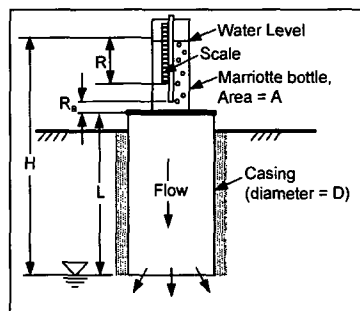
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
14:22:00	32.7			
14:24:00	36.5	1.68E+04	36.5	2.82E+00
14:29:00	43.1	1.68E+04	79.6	2.82E+00
14:34:00	49.4	1.60E+04	129	2.70E+00
14:36:00	51.7	1.68E+04	180.7	2.82E+00
14:38:00	54.1	2.41E+04	234.8	4.05E+00
14:42:00	58.7	2.48E+04	293.5	4.17E+00

Computations:

AVG
2.79E+00



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Boardman - Thick Store-and-Release Cover

TRIAL 1

Test ID: TK-1
Project: Boardman
Installer: XW
Analyst: CHB

FIXED VARIABLES

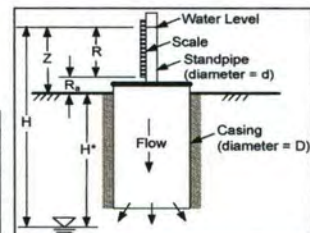
d (cm) = 10.16
D (cm) = 30.48
R_s (cm) = 0
Final Time: 1/1/00 10:58:30

FITTED VARIABLES

a (s⁻¹) = 0.0000839
H* (m) = 0.49
H₀ (m) = 0.82
MSE (m²) = 1.33E-06
Bias (m) = -3.34E-08

SOLUTION - TRIAL 1

K (m/s) = 8.12E-07 8.12E-05
Total Time (d) = 0.07 1.7 hrs



Chiasson Solution:

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
1/1/1900 9:17:17	33
1/1/1900 9:22:30	30.9
1/1/1900 9:27:30	28.9
1/1/1900 9:32:30	26.9
1/1/1900 9:37:30	25
1/1/1900 9:42:30	23.1
1/1/1900 9:47:30	21.2
1/1/1900 9:52:30	19.6
1/1/1900 9:57:30	17.8
1/1/1900 10:02:30	16.2
1/1/1900 10:07:30	14.6
1/1/1900 10:12:30	13.1
1/1/1900 10:18:30	11.2
1/1/1900 10:28:30	8.5
1/1/1900 10:38:30	5.6
1/1/1900 10:48:30	2.7
1/1/1900 10:58:30	0

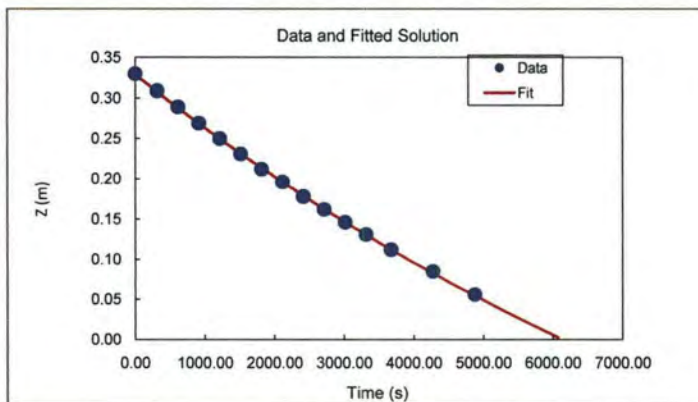
Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	ε (m)	ε' (m)
0.33	0.00	0.329	-9.01E-04	8.11E-07
0.31	313	0.308	-1.11E-03	1.23E-06
0.29	613	0.288	-9.24E-04	8.53E-07
0.27	913	0.269	-2.44E-04	5.94E-08
0.25	1213	0.250	-8.34E-05	6.96E-09
0.23	1513	0.232	5.45E-04	2.98E-07
0.21	1813	0.214	1.63E-03	2.66E-06
0.20	2113	0.196	1.62E-04	2.64E-08
0.18	2413	0.179	1.13E-03	1.27E-06
0.16	2713	0.163	5.17E-04	2.68E-07
0.15	3013	0.146	3.20E-04	1.02E-07
0.13	3313	0.131	-4.75E-04	2.26E-07
0.11	3673	0.112	8.86E-05	7.86E-09
0.09	4273	0.083	-2.43E-03	5.89E-06
0.06	4873	0.055	-1.49E-03	2.23E-06
0.03	5473	0.028	8.20E-04	6.73E-07
0.00	6073	0.002	2.44E-03	5.97E-06

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	0.329
304	0.309
607	0.288
911	0.269
1215	0.250
1518	0.231
1822	0.213
2126	0.195
2429	0.178
2733	0.161
3037	0.145
3340	0.129
3644	0.114
3947	0.098
4251	0.084
4555	0.069
4858	0.055
5162	0.041
5466	0.028
5769	0.015
6073	0.002

Δt (s) = 304



Test ID: TK-2
Project: Boardman

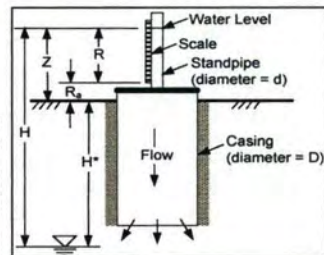
Installer: XW
Analyst: CHB

d (cm) =	10.16
D (cm) =	30.48
R _a (cm) =	0
Final Time:	1/0/00 9:14:37

$a \text{ (s}^{-1}\text{)}$	0.0047384
$H^* \text{ (m)}$	0.92
$H_o \text{ (m)}$	1.50
$\text{MSE (m}^2\text{)}$	7.78E-06
Bias (m)	-6.04E-08

K (m/s) = 4.58E-05

Total Time (d) = 0.00 0.0 hrs



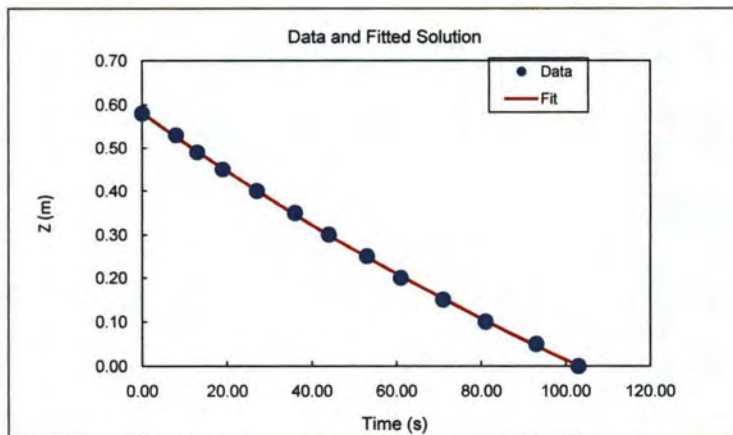
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	0.582
5	0.545
10	0.510
15	0.476
21	0.442
26	0.409
31	0.377
36	0.346
41	0.315
46	0.285
51	0.256
57	0.228
62	0.200
67	0.173
72	0.146
77	0.121
82	0.096
88	0.071
93	0.047
98	0.024
103	0.001

$$\Delta t \text{ (s)} = 5$$


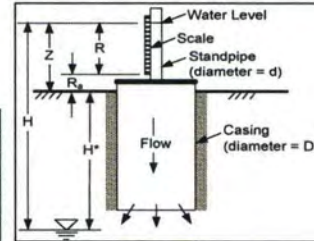
TRIAL 2

FIXED VARIABLES

FITTED VARIABLES

SOLUTION -TRIAL 1

Total Time (d) = 0.00 0.0 hrs



Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_o e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	0.600
4	0.568
7	0.537
11	0.506
15	0.476
19	0.446
22	0.417
26	0.389
30	0.361
34	0.334
37	0.307
41	0.281
45	0.256
49	0.231
52	0.207
56	0.183
60	0.159
64	0.136
67	0.114
71	0.092
75	0.070

Figure 1 is a plot showing the relationship between Z (m) on the vertical axis and Time (s) on the horizontal axis. The vertical axis ranges from 0.00 to 0.70 with increments of 0.10. The horizontal axis ranges from 0 to 80 with increments of 20. The plot displays several data points (black circles) and a fitted curve (red line). The data points show a decreasing trend, and the fitted curve is a smooth curve passing through the data points.

Time (s)	Z (m)
0	0.60
5	0.55
10	0.50
15	0.45
25	0.40
35	0.35
45	0.30
55	0.25
75	0.05

TRIAL 3

Test ID: TK-2

Installer: XW

FIXED VARIABLES

$$d \text{ (cm)} = 30.48$$

FITTED VARIABLES

$$a \text{ (s}^{-1}\text{)} = 0.0012964$$

TEMPORAL VARIABLES

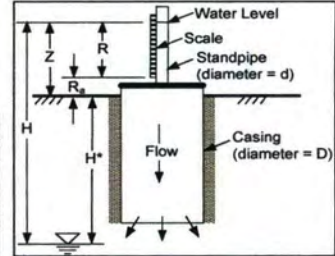
[illegible]

Z-t COMPUTATIONS

[illegible]

SOLUTION -TRIAL 1

K (m/s) = 1.13E-04
Total Time (d) = 0.02 0.4 hrs



Chiasson Solution:

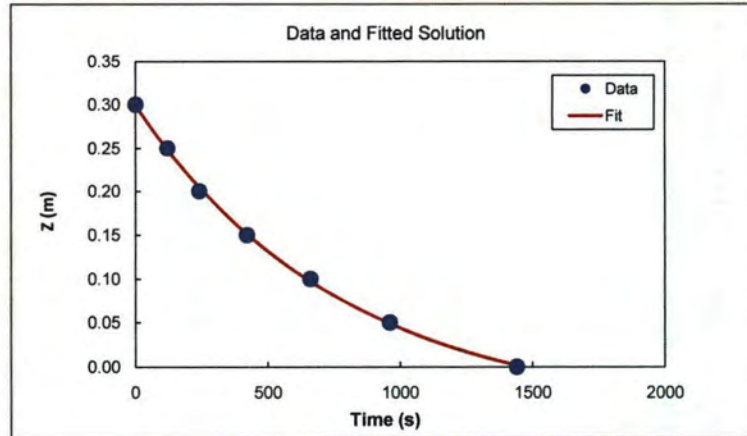
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_o e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	0.299
72	0.268
144	0.239
216	0.213
288	0.189
360	0.168
432	0.148
504	0.130
576	0.114
648	0.099
720	0.086
792	0.073
864	0.062
936	0.052
1008	0.042
1080	0.034
1152	0.026
1224	0.019
1296	0.013
1368	0.007
1440	0.002

$$\Delta t \text{ (s)} = 72$$


Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Boardman - Thick Store-and-Release Cover

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

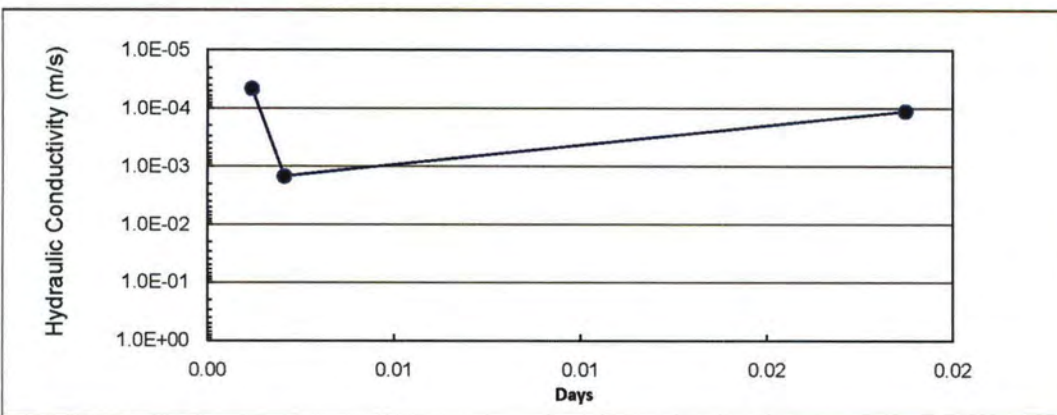
Trial	Time (d)	Total Time (d)	K (m/s)
1	0.001	0.001	4.58E-05
2	0.001	0.002	1.48E-03
3	0.017	0.019	1.13E-04

TK-2

Field Hydraulic Conductivity

5.45E-04 m/s

5.45E-02 cm/s



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis **Boardman - Thick Store-and-Release Cover**

TRIAL 1

Test ID: TK-3 Installer: XW
 Project: Boardman Analyst: CHB

FIXED VARIABLES

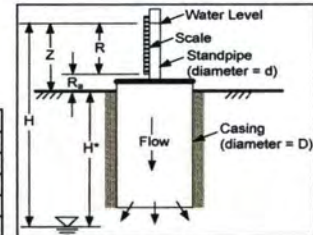
d (cm) = 10.16
 D (cm) = 30.48
 R_s (cm) = 0
 Final Time: 1:58:05

FITTED VARIABLES

a (s⁻¹) = 0.0000208
 H* (m) = 3.50
 H₀ (m) = 4.00
 MSE (m²) = 1.24E-04
 Bias (m) = -1.89E-09

SOLUTION - TRIAL 1

K (m/s) = 2.01E-07 2.01E-05
 Total Time (d) = 0.08 2.0 hrs



Chiasson Solution:

Chiasson, P. (2005). Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
0:00:00	48.5
0:04:18	46.3
0:16:57	40.5
0:22:05	38.1
0:27:05	35.8
0:32:05	33.7
0:37:05	31.6
0:42:05	29.4
0:47:05	27.2
0:52:05	25.2
0:57:05	23.2
1:02:05	21.2
1:07:05	19.2
1:12:05	17.2
1:18:05	14.9
1:28:05	11.1
1:38:05	7.5
1:48:05	3.6
1:58:05	0

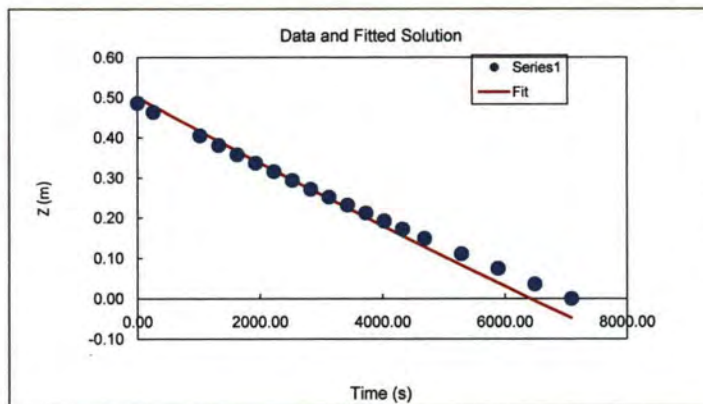
Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	ε (m)	ε ² (m)
0.49	0.00	0.500	1.50E-02	2.25E-04
0.46	258	0.479	1.56E-02	2.43E-04
0.41	1017	0.416	1.13E-02	1.27E-04
0.38	1325	0.391	1.02E-02	1.05E-04
0.36	1625	0.367	9.03E-03	8.16E-05
0.34	1925	0.343	5.97E-03	3.57E-05
0.32	2225	0.319	3.06E-03	9.37E-06
0.29	2525	0.295	1.30E-03	1.69E-06
0.27	2825	0.272	-3.14E-04	9.84E-08
0.25	3125	0.248	-3.78E-03	1.43E-05
0.23	3425	0.225	-7.10E-03	5.04E-05
0.21	3725	0.202	-1.03E-02	1.06E-04
0.19	4025	0.179	-1.33E-02	1.77E-04
0.17	4325	0.156	-1.62E-02	2.62E-04
0.15	4685	0.129	-2.05E-02	4.19E-04
0.11	5285	0.084	-2.75E-02	7.56E-04
0.08	5885	0.039	-3.59E-02	1.29E-03
0.04	6485	-0.005	-4.08E-02	1.67E-03
0.00	7085	-0.048	-4.82E-02	2.32E-03

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	0.500
354	0.471
709	0.441
1063	0.413
1417	0.384
1771	0.355
2126	0.327
2480	0.299
2834	0.271
3188	0.243
3543	0.216
3897	0.189
4251	0.161
4605	0.135
4960	0.108
5314	0.081
5668	0.055
6022	0.029
6377	0.003
6731	-0.023
7085	-0.048

Δt (s) = 354



Test ID: TK-3
Project: Boardman

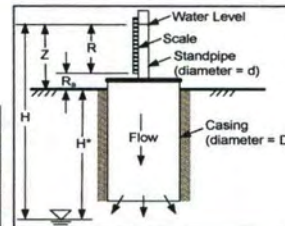
Test ID: TK-3
Project: Boardman

Installer: XW
Analyst: CHB

d (cm) =	10.16
D (cm) =	30.48
R _s (cm) =	0
Final Time:	3:12:30

$a \text{ (s}^{-1}\text{)}$	$= 0.0000477$
$H^* \text{ (m)}$	$= 1.12$
$H_o \text{ (m)}$	$= 1.34$
$\text{MSE (m}^2\text{)}$	$= 2.38\text{E-}06$
Bias (m)	$= 6.37\text{E-}08$

K (m/s) = 4.61E-07 4.61E-05
Total Time (d) = 0.04 1.0 hrs

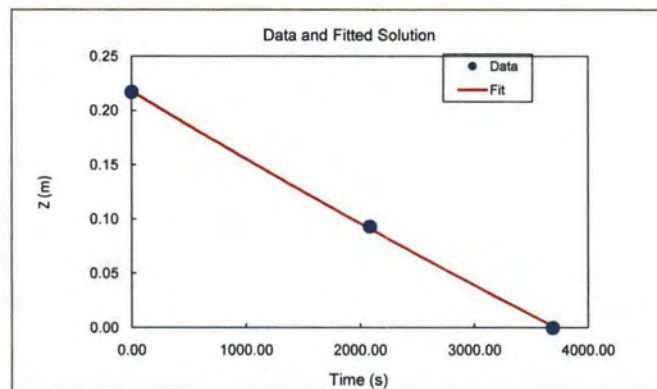
[illegible][illegible]

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	0.218
185	0.206
369	0.194
554	0.183
738	0.171
923	0.160
1107	0.149
1292	0.138
1476	0.127
1661	0.116
1845	0.105
2030	0.094
2214	0.083
2399	0.073
2583	0.062
2768	0.052
2952	0.042
3137	0.031
3321	0.021
3506	0.011
3690	0.001

$$\Delta t \text{ (s)} = 185$$


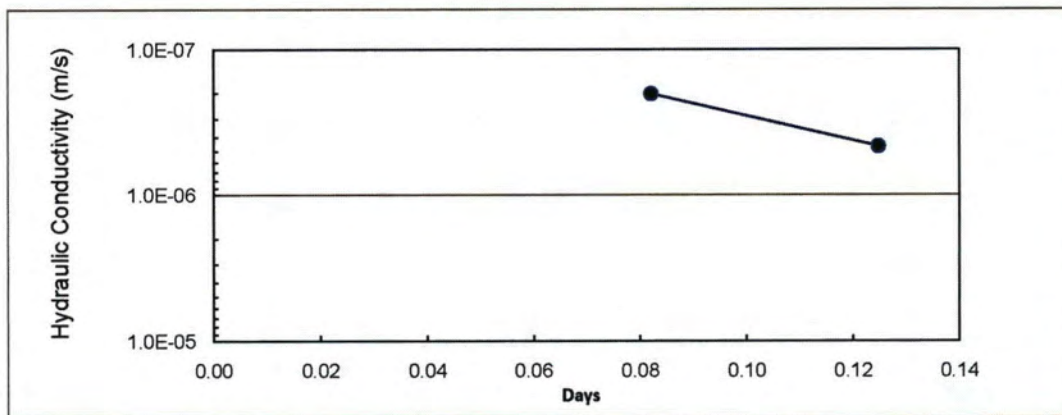
Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis **Boardman - Thick Store-and-Release Cover**

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

Trial	Time (d)	Total Time (d)	K (m/s)	
1	0.082	0.082	2.01E-07	TK-3
2	0.043	0.125	4.61E-07	

Field Hydraulic Conductivity

3.31E-07 m/s
3.31E-05 cm/s



TRIAL 1

FIXED VARIABLES

FITTED VARIABLES

SOLUTION -TRIAL 1

TEMPORAL VARIABLES

[illegible]

Z-t COMPUTATIONS

[illegible]

Chiasson Solution:

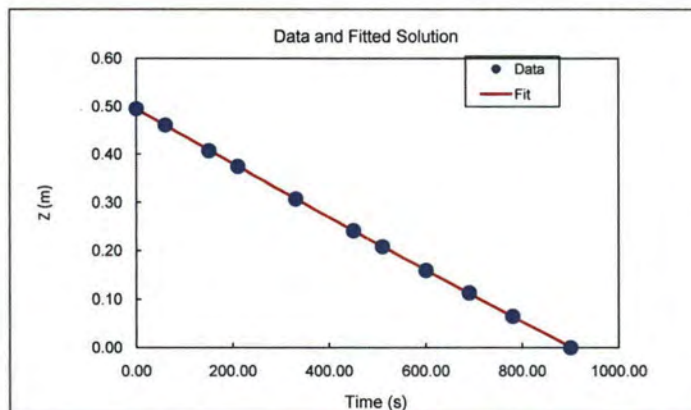
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_o e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	0.495
45	0.469
90	0.443
135	0.417
180	0.391
225	0.366
270	0.341
315	0.316
360	0.291
405	0.266
450	0.241
495	0.216
540	0.192
585	0.168
630	0.143
675	0.119
720	0.096
765	0.072
810	0.048
855	0.025
900	0.001

$$\Delta t \text{ (s)} = 45$$


TRIAL 2

Installer: XW
Analyst: CHB

FIXED VARIABLES

FITTED VARIABLES

$a \text{ (s}^{-1}\text{)}$	0.0001768
$H^* \text{ (m)}$	1.56
$H_o \text{ (m)}$	2.14
$\text{MSE (m}^2\text{)}$	$6.77\text{E-}06$
Bias (m)	$2.50\text{E-}10$

TEMPORAL VARIABLES

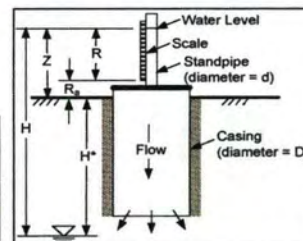
[illegible]

Z-t COMPUTATIONS

[illegible]

SOLUTION -TRIAL 1

K (m/s) = 1.71E-06 1.71E-04
Total Time (d) = 0.02 0.5 hrs



Chiasson Solution:

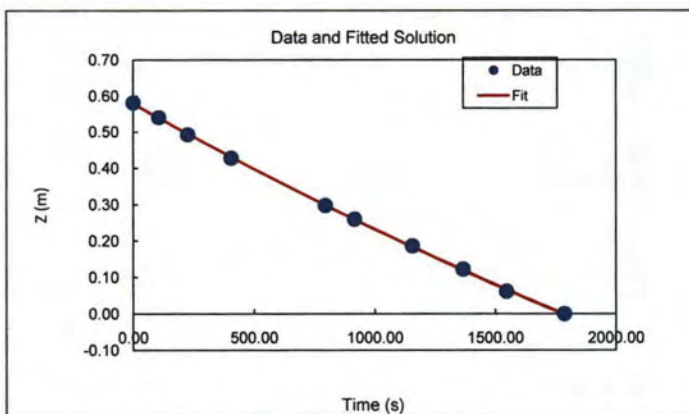
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	0.578
89	0.545
179	0.512
268	0.479
357	0.447
446	0.416
536	0.385
625	0.354
714	0.324
803	0.295
893	0.266
982	0.237
1071	0.209
1160	0.181
1250	0.154
1339	0.127
1428	0.101
1517	0.075
1607	0.049
1696	0.024
1785	-0.001

$$\Delta t \text{ (s)} = 89$$


TRIAL 3

Installer: XW
Analyst: CHB

FITTED VARIABLES

$a \text{ (s}^{-1}\text{)}$	0.0000595
$H^* \text{ (m)}$	4.49
$H_0 \text{ (m)}$	5.13
MSE (m^2)	2.02E-06
Bias (m)	2.40E-09

K (m/s) = 5.75E-07 5.75E-05

The diagram illustrates a standpipe well setup. A vertical pipe, labeled 'Standpipe (diameter = d)', is inserted into a well casing, labeled 'Casing (diameter = D)'. The casing has a downward arrow labeled 'Flow'. The standpipe is open at the top, where a 'Scale' is attached to measure the 'Water Level'. The distance from the ground surface to the water level in the standpipe is labeled 'Z'. The distance from the ground surface to the top of the casing is labeled 'R'. The distance from the top of the casing to the water level in the standpipe is labeled 'R_s'. The total height from the ground surface to the bottom of the casing is labeled 'H'. The height from the bottom of the casing to the water level in the standpipe is labeled 'H*'. The diagram shows the water level in the standpipe is higher than the water level in the casing, indicating a head difference.

Z-t COMPUTATIONS

[illegible]

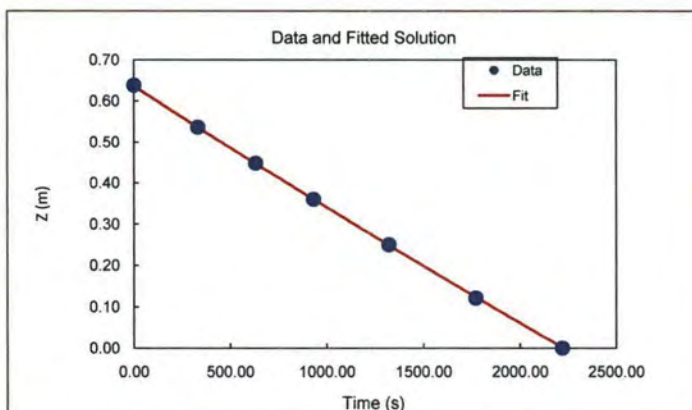
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	0.636
111	0.602
222	0.569
333	0.535
444	0.502
555	0.469
666	0.437
777	0.404
888	0.372
999	0.340
1110	0.308
1221	0.277
1332	0.245
1443	0.214
1554	0.183
1665	0.152
1776	0.122
1887	0.091
1998	0.061
2109	0.031
2220	0.001

At (s) = 111



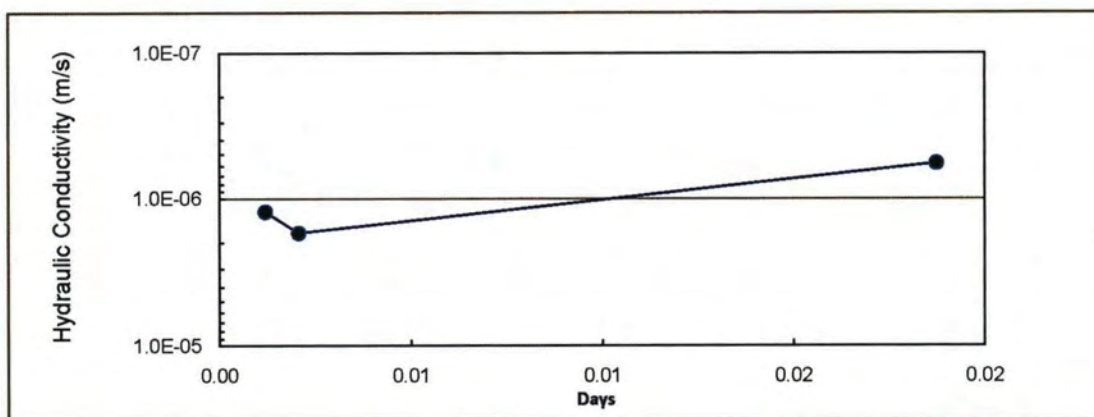
Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis **Boardman - Thick Store-and-Release Cover**

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

Trial	Time (d)	Total Time (d)	K (m/s)	
1	0.001	0.001	1.23E-06	TK-4
2	0.001	0.002	1.71E-06	
3	0.017	0.019	5.75E-07	

Field Hydraulic Conductivity

1.17E-06 m/s
 1.17E-04 cm/s



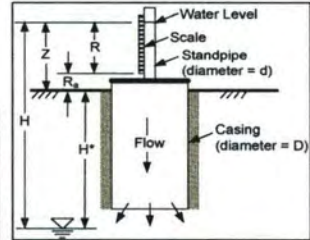
TRIAL 1

Installer: XW
Analyst: CHB

d (cm) =	1.905
D (cm) =	29.845
R _s (cm) =	44.45
Final Time:	16:42:00

$a \text{ (s}^{-1}\text{)}$	0.0000053
$H^* \text{ (m)}$	0.60
$H_0 \text{ (m)}$	1.48
$\text{MSE (m}^2\text{)}$	3.73E-04
Bias (m)	1.29E-09

Total Time (d) = 0.25 6.0 hrs

[illegible][illegible]

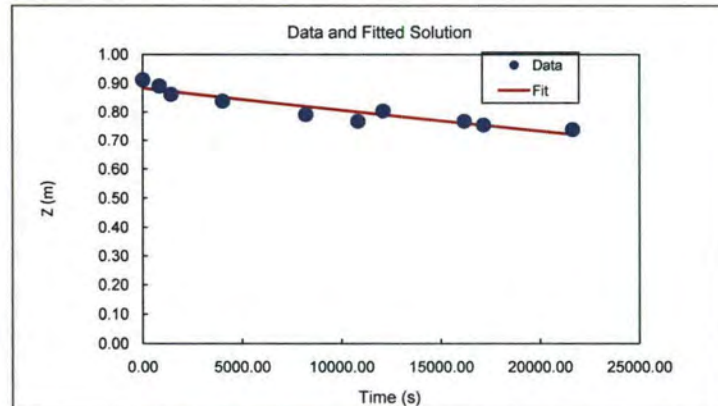
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	0.883
1082	0.875
2163	0.866
3245	0.858
4327	0.849
5409	0.841
6490	0.833
7572	0.824
8654	0.816
9735	0.808
10817	0.800
11899	0.792
12980	0.784
14062	0.776
15144	0.768
16226	0.760
17307	0.752
18389	0.745
19471	0.737
20552	0.729
21634	0.721

$$\Delta t \text{ (s)} = 1082$$


TRIAL 2

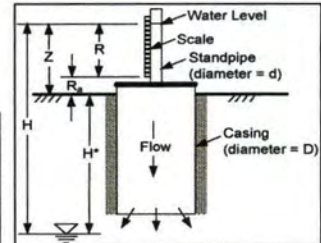
Installer: XW
Analyst: CHB

d (cm) =	1.905
D (cm) =	29.845
R _a (cm) =	44.45
Final Time:	13:46:20

$a \text{ (s}^{-1}\text{)}$	0.0000117
$H^* \text{ (m)}$	0.00
$H_o \text{ (m)}$	1.31
$\text{MSE (m}^2\text{)}$	3.30E-04
Bias (m)	-9.28E-09

[illegible][illegible]

K (m/s) = 4.08E-09
Total Time (d) = 0.19 4.5 hrs

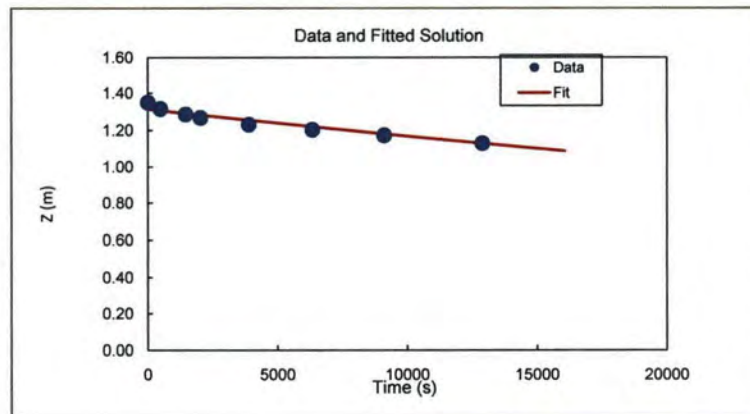


Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	1.313
803	1.301
1606	1.288
2408	1.276
3211	1.264
4014	1.253
4817	1.241
5619	1.229
6422	1.218
7225	1.206
8028	1.195
8830	1.184
9633	1.173
10436	1.162
11239	1.151
12041	1.140
12844	1.129
13647	1.119
14450	1.108
15252	1.098
16055	1.087

$$\Delta t \text{ (s)} = 803$$


Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Cedar Rapids - Clay Cover

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

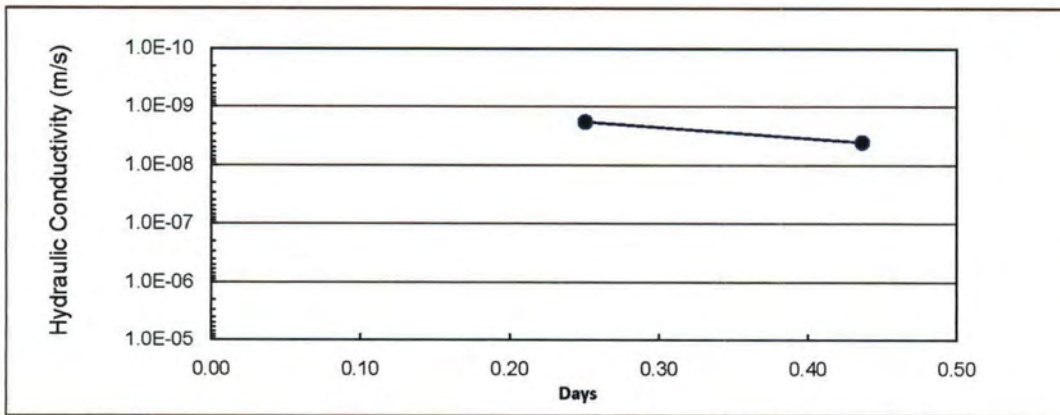
Trial	Time (d)	Total Time (d)	K (m/s)
1	0.250	0.250	1.86E-09
2	0.186	0.436	4.08E-09

Clay1 - NW

Field Hydraulic Conductivity

2.97E-09 m/s

2.97E-07 cm/s



TRIAL 1

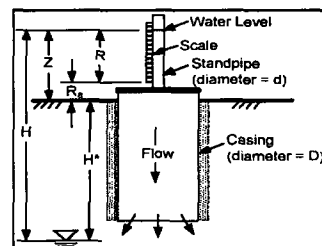
Installer: XW
Analyst: CHB

FITTED VARIABLES

$a \text{ (s}^{-1}\text{)}$	0.0000355
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	1.06
$\text{MSE (m}^2\text{)}$	1.62E-03
Bias (m)	-1.26E-08

K (m/s) = 1.23E-08

Total Time (d) = 0.14



Z-t COMPUTATIONS

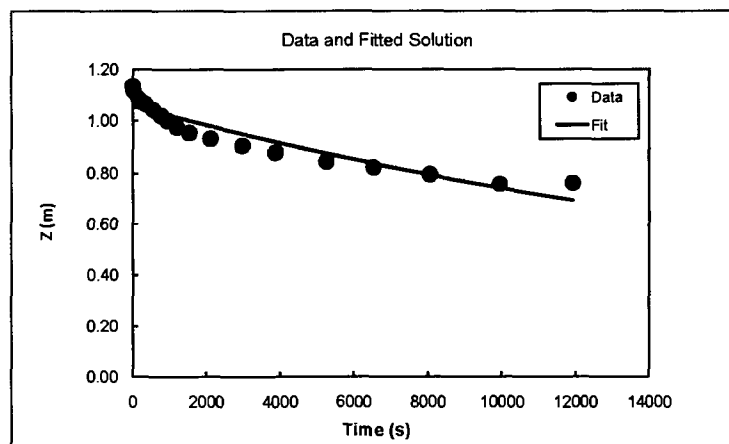
[illegible]

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	1.055
596	1.033
1192	1.012
1788	0.990
2384	0.970
2980	0.949
3576	0.929
4172	0.910
4768	0.891
5364	0.872
5960	0.854
6556	0.836
7152	0.819
7748	0.801
8344	0.785
8940	0.768
9536	0.752
10132	0.736
10728	0.721
11324	0.706
11920	0.691

$$\Delta t \text{ (s)} = 596$$


Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Cedar Rapids - Clay Cover

TRIAL 2

Test ID: Clay2-NE Installer: XW
Project: Cedar Rapids Analyst: CHB

FIXED VARIABLES

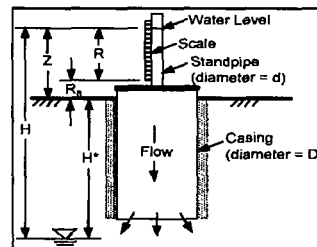
d (cm) = 1.905
D (cm) = 29.845
R_s (cm) = 44.45
Final Time: 9:37:50

FITTED VARIABLES

a (s⁻¹) = 0.0002579
H* (m) = 0.00
H₀ (m) = 1.01
MSE (m²) = 9.78E-04
Bias (m) = 2.80E-07

SOLUTION - TRIAL 1

K (m/s) = 8.96E-08
Total Time (d) = 0.04 1.0 hrs



Chiasson Solution:

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
8:39:40	61.6
8:40:40	59.0
8:41:41	56.0
8:43:06	52.5
8:44:35	49.0
8:45:30	47.0
8:47:52	42.5
8:50:00	39.0
8:53:55	33.0
8:56:30	29.6
8:59:59	25.6
9:02:40	23.0
9:06:20	19.5
9:09:53	16.7
9:15:00	13.6
9:20:36	10.5
9:24:28	8.5
9:30:30	5.4
9:37:50	2.7

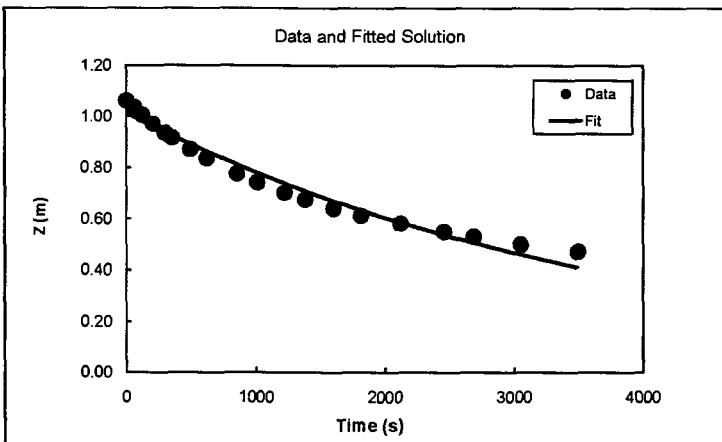
Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	s (m)	s* (m)
1.06	0	1.011	-4.97E-02	2.47E-03
1.03	60	0.995	-3.92E-02	1.54E-03
1.00	121	0.980	-2.48E-02	6.14E-04
0.97	206	0.958	-1.10E-02	1.21E-04
0.93	295	0.937	2.23E-03	4.98E-06
0.91	350	0.924	9.04E-03	8.17E-05
0.87	492	0.890	2.08E-02	4.34E-04
0.83	620	0.861	2.69E-02	7.24E-04
0.77	855	0.811	3.63E-02	1.31E-03
0.74	1010	0.779	3.85E-02	1.48E-03
0.70	1219	0.738	3.76E-02	1.41E-03
0.67	1380	0.708	3.36E-02	1.13E-03
0.64	1600	0.669	2.95E-02	8.71E-04
0.61	1813	0.633	2.18E-02	4.73E-04
0.58	2120	0.585	4.55E-03	2.07E-05
0.55	2456	0.536	-1.30E-02	1.69E-04
0.53	2688	0.505	-2.42E-02	5.84E-04
0.50	3050	0.460	-3.82E-02	1.46E-03
0.47	3490	0.411	-6.06E-02	3.67E-03

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.011
175	0.966
349	0.924
524	0.883
698	0.844
873	0.807
1047	0.772
1222	0.738
1396	0.705
1571	0.674
1745	0.644
1920	0.616
2094	0.589
2269	0.563
2443	0.538
2618	0.515
2792	0.492
2967	0.470
3141	0.450
3316	0.430
3490	0.411

Δt (s) = 175



Test ID:

FIXED VARIABLES

FITTED VARIABLES

SOLUTION -TRIAL 1

Z-1 COMPUTATIONS

[illegible]

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	0.869
99	0.845
197	0.822
296	0.800
395	0.778
493	0.757
592	0.736
691	0.716
790	0.696
888	0.677
987	0.659
1086	0.641
1184	0.623
1283	0.606
1382	0.590
1481	0.573
1579	0.558
1678	0.543
1777	0.528
1875	0.513
1974	0.499

Figure 1 is a line graph titled "Data and Fitted Solution". The vertical axis is labeled "Z (m)" and ranges from 0.00 to 1.00 in increments of 0.10. The horizontal axis is labeled "Time (s)" and ranges from 0 to 2500 in increments of 500. The graph displays nine data points (black dots) and a fitted curve (solid black line). The data points show a decreasing trend, starting at approximately (0, 0.88) and ending at approximately (2000, 0.51). The fitted curve is a smooth, slightly concave-up line that passes through the data points.

Time (s)	Z (m)
0	0.88
100	0.84
200	0.80
300	0.77
400	0.74
700	0.68
1500	0.58
1900	0.52
2000	0.51

Test ID

XVW

CHB

FITTED VARIABLES

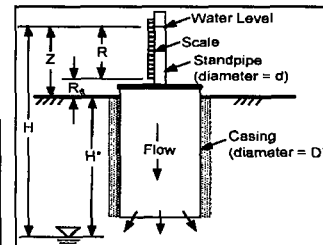
$$a \text{ (s}^{-1}\text{)} = 0.0003852$$
$$H^* (m) = 0.00$$
$$H_g (m) \approx 0.98$$

MSE (m²) = 2.92E-04

Bias (m) = -8.62E-08

K (m/s) = 1.34E-07

0.6 hrs



Z-t COMPUTATIONS

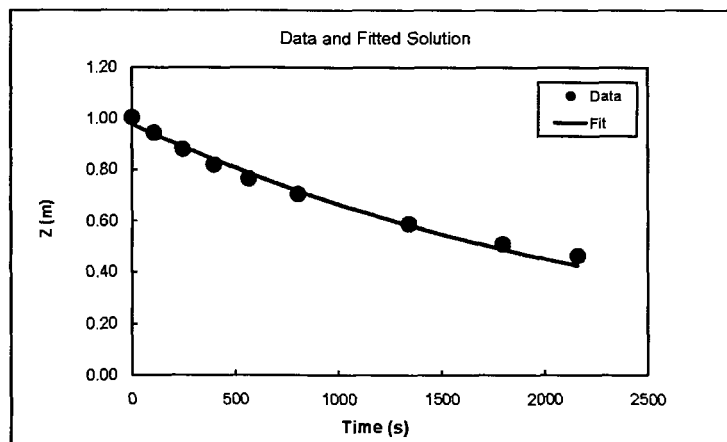
[illegible][illegible]

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	0.977
108	0.937
216	0.899
324	0.862
432	0.827
540	0.793
648	0.761
756	0.730
864	0.700
972	0.672
1080	0.644
1188	0.618
1296	0.593
1404	0.569
1512	0.546
1620	0.523
1728	0.502
1836	0.482
1944	0.462
2052	0.443
2160	0.425

$$\Delta t \text{ (s)} = 108$$


TRIAL 6

FIXED VARIABLES

D (cm) = 29.845

$$R_s \text{ (cm)} = 44.45$$

Final Time: 12:14:24

FITTED VARIABLES

$$a \text{ (s}^{-1}\text{)} = 0.0002001$$
$$H^* \text{ (m)} = 0.00$$
$$H_0 \text{ (m)} = 0.66$$
MSE (m²) = 1.45E-05

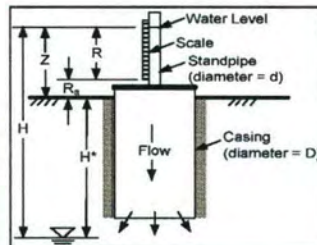
Bias (m) = 8.88E-07

SOLUTION -TRIAL 1

$$K \text{ (m/s)} = 6.95\text{E-}08$$

Total Time (d) = 0.02

0.5 hrs



Chiasson Solution:

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

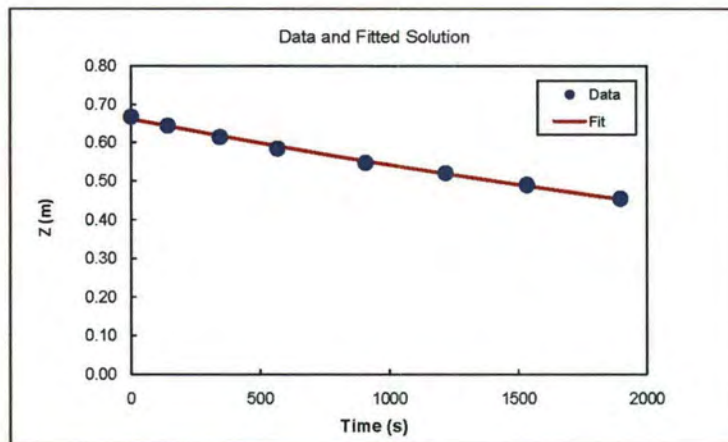
[illegible]

Z-t COMPUTATIONS

[illegible]

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	0.662
95	0.649
190	0.637
284	0.625
379	0.613
474	0.602
569	0.590
664	0.579
758	0.568
853	0.558
948	0.547
1043	0.537
1138	0.527
1232	0.517
1327	0.507
1422	0.498
1517	0.488
1612	0.479
1706	0.470
1801	0.461
1896	0.453

 $\Delta t \text{ (s)} = 95$ 

Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Cedar Rapids - Clay Cover

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

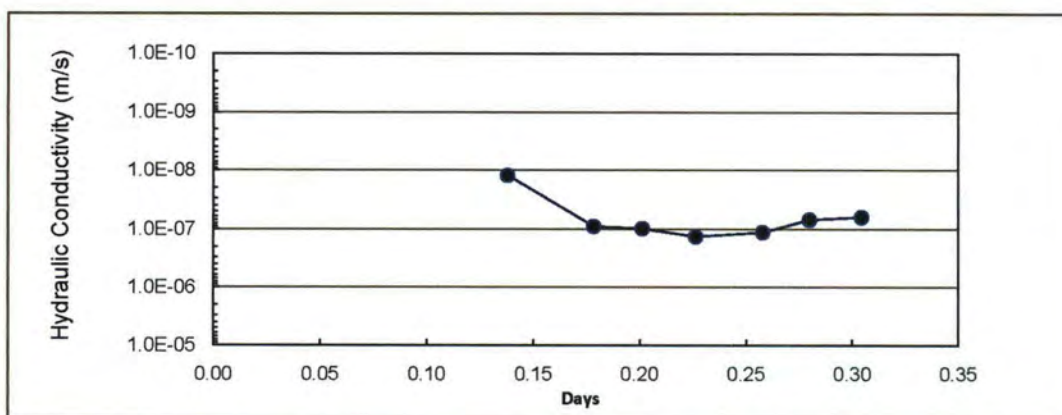
Trial	Time (d)	Total Time (d)	K (m/s)
1	0.138	0.138	1.23E-08
2	0.040	0.178	8.96E-08
3	0.023	0.201	9.76E-08
4	0.025	0.226	1.34E-07
5	0.032	0.258	1.13E-07
6	0.022	0.280	6.95E-08
7	0.025	0.304	6.25E-08

Clay2-NE

Field Hydraulic Conductivity

9.46E-08 m/s

9.46E-06 cm/s



FIXED VARIABLES

FITTED VARIABLES

SOLUTION -TRIAL 1

Diagram illustrating the setup for measuring discharge using a standpipe well. The diagram shows a casing (diameter = D) with flow entering from the bottom. A standpipe (diameter = d) is inserted into the casing. The water level in the standpipe is indicated by a scale. Key vertical distances are labeled: Z (total height from casing bottom to water level), R (height from casing bottom to the top of the standpipe), R_s (height from casing bottom to the water level in the casing), and H^* (height from casing bottom to the water level in the casing).

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	1.292
14	1.266
28	1.241
42	1.216
56	1.192
70	1.168
84	1.144
98	1.121
112	1.099
126	1.077
140	1.055
154	1.034
168	1.014
182	0.993
196	0.973
210	0.954
224	0.935
238	0.916
252	0.898
266	0.880
280	0.862

Figure 1 is a scatter plot with a fitted line. The x-axis is labeled 'Time (s)' and ranges from 0 to 300 with major ticks every 50 units. The y-axis is labeled 'Z (m)' and ranges from 0.00 to 1.40 with major ticks every 0.20 units. There are seven data points represented by blue circles. A solid red line represents the fitted curve, which is a straight line with a negative slope. A legend in the top right corner identifies the blue circles as 'Data' and the red line as 'Fit'.

Time (s)	Z (m)
0	1.30
50	1.20
90	1.15
120	1.10
170	1.00
240	0.90
280	0.85

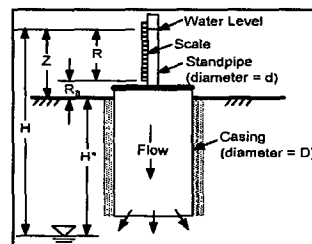
TRIAL 2

Installer: XW
Analyst: CHB

d (cm) = 1.905
D (cm) = 29.845
R_g (cm) = 44.45
Final Time: 16:52:00

$a \text{ (s}^{-1}\text{)}$	0.0014435
$H^* \text{ (m)}$	0.00
$H_o \text{ (m)}$	1.29
$\text{MSE (m}^2\text{)}$	2.62E-05
Bias (m)	-2.30E-07

K (m/s) = 5.01E-07
Total Time (d) = 0.00 0.1 hrs



Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	1.292
14	1.266
28	1.241
42	1.216
56	1.192
70	1.168
84	1.144
98	1.121
112	1.099
126	1.077
140	1.055
154	1.034
168	1.014
182	0.993
196	0.973
210	0.954
224	0.935
238	0.916
252	0.898
266	0.880
280	0.862

Figure 1 is a line graph titled "Data and Fitted Solution". The vertical axis is labeled "Z (m)" and ranges from 0.00 to 1.40 with major ticks every 0.20. The horizontal axis is labeled "Time (s)" and ranges from 0 to 300 with major ticks every 50. The graph shows seven data points (black circles) and a fitted curve (solid line). The data points are approximately: (0, 1.30), (50, 1.20), (90, 1.15), (120, 1.10), (170, 1.00), (240, 0.90), and (280, 0.85). The fitted curve is a smooth, slightly concave-down line passing through these points.

Time (s)	Z (m)
0	1.30
50	1.20
90	1.15
120	1.10
170	1.00
240	0.90
280	0.85

Cedar Rapids - Clay Cover

Installer: XW
Analyst: CHB

$a \text{ (s}^{-1}\text{)}$	0.0000593
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	1.36
$\text{MSE (m}^2\text{)}$	2.03E-04
Bias (m)	-5.85E-07

Diagram illustrating the installation of a standpipe in a casing. The casing has a diameter D and the standpipe has a diameter d . The water level in the standpipe is indicated by a scale. The distance from the ground surface to the top of the casing is Z . The distance from the ground surface to the top of the standpipe is R . The distance from the ground surface to the bottom of the casing is H . The distance from the bottom of the casing to the water level in the standpipe is H^* . The flow is indicated by an arrow pointing down into the casing.

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_o e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	1.357
143	1.345
287	1.334
430	1.322
573	1.311
716	1.300
860	1.289
1003	1.278
1146	1.267
1289	1.257
1433	1.246
1576	1.236
1719	1.225
1862	1.215
2006	1.204
2149	1.194
2292	1.184
2435	1.174
2579	1.164
2722	1.154
2865	1.145

Figure 1 is a plot of Z (m) versus Time (s). The title of the plot is "Data and Fitted Solution". The y-axis, labeled Z (m), ranges from 0.00 to 1.60 with major ticks every 0.20. The x-axis, labeled Time (s), ranges from 0 to 3500 with major ticks every 500. The plot shows several data points (black circles) and a fitted curve (solid line). The data points are approximately at (0, 1.40), (100, 1.38), (200, 1.35), (300, 1.35), (400, 1.32), (900, 1.28), (1300, 1.25), (1900, 1.22), (2200, 1.18), and (2800, 1.18). The fitted curve is a smooth line that starts at $Z \approx 1.40$ at $t = 0$ and decreases to $Z \approx 1.18$ at $t = 2800$.

Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Clay Cover

TRIAL 4

Test ID: Clay2-NE Installer: XW
Project: Cedar Rapids Analyst: CHB

FIXED VARIABLES

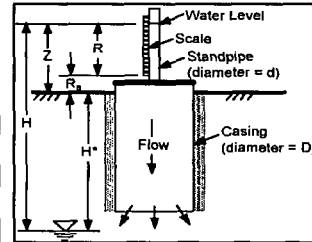
d (cm) = 1.905
D (cm) = 29.845
R_a (cm) = 44.45
Final Time: 16:00:45

FITTED VARIABLES

a (s⁻¹) = 0.0000190
H* (m) = 0.00
H₀ (m) = 1.33
MSE (m²) = 1.43E-03
Bias (m) = 1.21E-07

SOLUTION - TRIAL 1

K (m/s) = 6.59E-09
Total Time (d) = 0.29 7.1 hrs



Chlasson Solution:

Chlasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
8:57:44	97.0
8:58:40	95.0
9:01:14	92.0
9:04:10	90.0
9:08:46	88.0
9:16:30	85.5
9:26:05	83.0
9:33:10	81.2
9:42:25	79.3
9:55:30	76.8
10:22:41	72.3
10:44:08	69.3
11:06:00	66.3
11:31:50	63.2
11:59:27	60.4
12:17:33	58.7
12:54:16	55.2
13:28:46	52.6
14:15:11	49.4
14:51:10	47.2
15:29:10	45.2
16:00:45	43.7

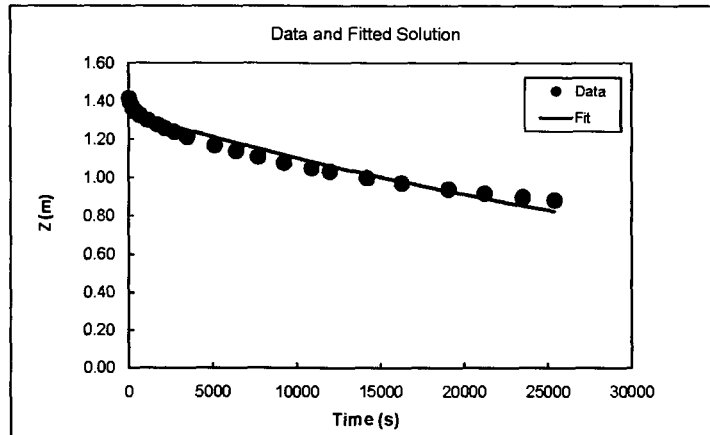
Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	ε (m)	ε ² (m)
1.41	0	1.331	-8.33E-02	6.93E-03
1.39	56	1.330	-6.47E-02	4.18E-03
1.36	210	1.326	-3.86E-02	1.49E-03
1.34	386	1.322	-2.30E-02	5.28E-04
1.32	662	1.315	-9.87E-03	9.74E-05
1.30	1126	1.303	3.61E-03	1.30E-05
1.27	1701	1.289	1.45E-02	2.09E-04
1.26	2126	1.279	2.21E-02	4.89E-04
1.24	2681	1.265	2.77E-02	7.69E-04
1.21	3466	1.247	3.40E-02	1.16E-03
1.17	5097	1.209	4.11E-02	1.69E-03
1.14	6384	1.179	4.19E-02	1.76E-03
1.11	7696	1.150	4.29E-02	1.84E-03
1.08	9246	1.117	4.06E-02	1.65E-03
1.05	10903	1.083	3.40E-02	1.16E-03
1.03	11989	1.060	2.89E-02	8.37E-04
1.00	14192	1.017	2.05E-02	4.22E-04
0.97	16262	0.978	7.37E-03	5.44E-05
0.94	19047	0.928	-1.09E-02	1.20E-04
0.92	21206	0.890	-2.62E-02	6.85E-04
0.90	23486	0.853	-4.39E-02	1.92E-03
0.88	25381	0.823	-5.90E-02	3.48E-03

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.331
1269	1.300
2538	1.269
3807	1.238
5076	1.209
6345	1.180
7614	1.152
8883	1.125
10152	1.098
11421	1.072
12691	1.046
13960	1.022
15229	0.997
16498	0.974
17767	0.950
19036	0.928
20305	0.906
21574	0.884
22843	0.863
24112	0.843
25381	0.823

Δt (s) = 1269



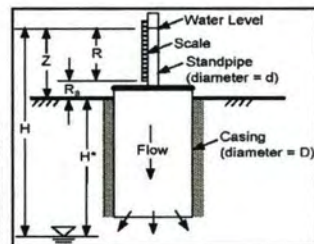
TRIAL 5

Installer: XW
Analyst: CHB

Final Time: 1/1/2005 17:12

$a \text{ (s}^{-1}\text{)}$	0.0000112
$H^* \text{ (m)}$	0.00
$H_o \text{ (m)}$	1.09
$\text{MSE (m}^2\text{)}$	1.39E-03
Bias (m)	-8.74E-08

Total Time (d) = 0.03 0.6 hrs



Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	1.092
108	1.091
216	1.090
324	1.088
432	1.087
540	1.086
648	1.084
756	1.083
864	1.082
972	1.080
1080	1.079
1188	1.078
1296	1.076
1404	1.075
1512	1.074
1620	1.073
1728	1.071
1836	1.070
1944	1.069
2052	1.067
2160	1.066

Time (s)	Z (m)
0	1.145
350	1.115
800	1.085
1500	1.045
2150	1.015

TRIAL 5

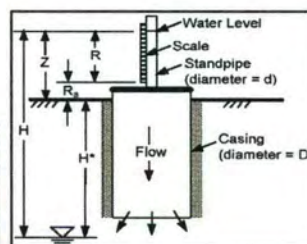
FIXED VARIABLES

FITTED VARIABLES

SOLUTION - TRIAL 1

K (m/s) = 8.45E-08

Total Time (d) = 0.01 0.4 hrs



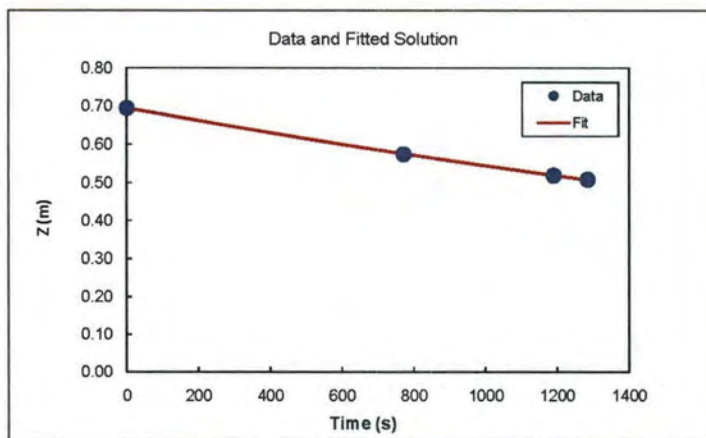
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	0.694
64	0.683
128	0.673
193	0.662
257	0.652
321	0.642
385	0.632
449	0.622
514	0.613
578	0.603
642	0.594
706	0.585
770	0.575
835	0.567
899	0.558
963	0.549
1027	0.541
1091	0.532
1156	0.524
1220	0.516
1284	0.508

 $\Delta t \text{ (s)} = 64$ 

TRIAL 6

Installer: XW
Analyst: CHB

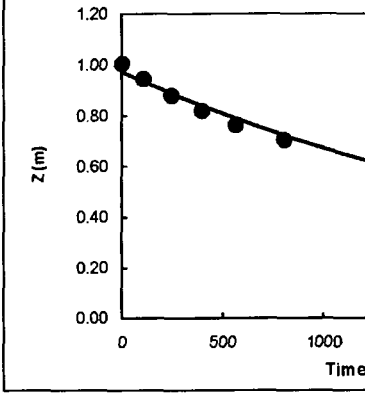
FITTED VARIABLES

$a \text{ (s}^{-1}\text{)}$	0.0003675
$H^* \text{ (m)}$	0.00
$H_o \text{ (m)}$	0.97
$\text{MSE (m}^2\text{)}$	3.74E-04
Bias (m)	-1.87E-07

MSE (m²) = 3.74E-04
Bias (m) = -1.87E-07

Z4 COMPUTATIONS

[illegible]

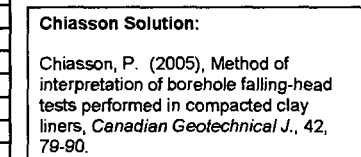


The graph displays the relationship between z (m) and Time (s). The y-axis ranges from 0.00 to 1.20 with increments of 0.20. The x-axis ranges from 0 to 1500 with major ticks at 0, 500, 1000, and 1500. There are 10 data points plotted as solid black circles. A solid black line represents the fitted curve, which shows a decreasing trend.

Time (s)	z (m)
0	1.00
100	0.95
250	0.88
350	0.82
450	0.78
600	0.75
800	0.70
1300	0.60

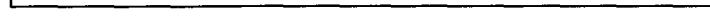
$$K \text{ (m/s)} = 1.28\text{E-}07$$

Total Time (d) = 0.03 0.6 hrs



Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$K = \frac{a \pi d^2}{11 D}$$



TRIAL 7

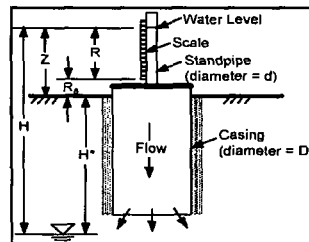
Installer: XW
Analyst: CHB

d (cm) = 1.905
 D (cm) = 29.845
 R_g (cm) = 44.45
 Final Time: 11:41:50

$a \text{ (s}^{-1}\text{)}$	0.0003250
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	1.03
$\text{MSE (m}^2\text{)}$	7.45E-04
Bias (m)	-7.34E-07

[illegible][illegible]

K (m/s) = 1.13E-07
Total Time (d) = 0.03 0.8 hrs

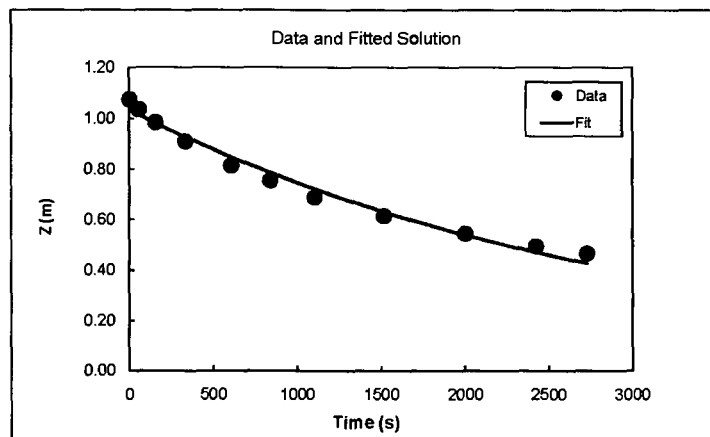


Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	1.033
136	0.988
273	0.945
409	0.904
545	0.865
682	0.828
818	0.792
954	0.757
1091	0.725
1227	0.693
1364	0.663
1500	0.634
1636	0.607
1773	0.581
1909	0.555
2045	0.531
2182	0.508
2318	0.486
2454	0.465
2591	0.445
2727	0.426

$$\Delta t \text{ (s)} = 136$$


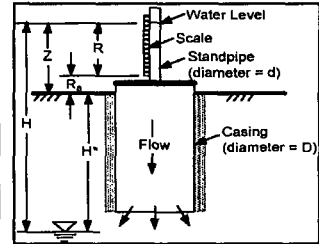
TRIAL 8

Installer: XW
Analyst: CHB

d (cm) = 1.905
 D (cm) = 29.845
 R_a (cm) = 44.45
 Final Time: 12:14:24

$a \text{ (s}^{-1}\text{)}$	0.0002001
$H^* \text{ (m)}$	0.00
$H_o \text{ (m)}$	0.66
$\text{MSE (m}^2\text{)}$	1.45E-05
Bias (m)	9.02E-07

Total Time (d) = 0.02 0.5 hrs

[illegible][illegible]

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_o e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	0.662
95	0.649
190	0.637
284	0.625
379	0.613
474	0.602
569	0.590
664	0.579
758	0.568
853	0.558
948	0.547
1043	0.537
1138	0.527
1232	0.517
1327	0.507
1422	0.498
1517	0.488
1612	0.479
1706	0.470
1801	0.461
1896	0.453

Figure 1 is a line graph titled "Data and Fitted Solution". The x-axis is labeled "Time (s)" and ranges from 0 to 2000 with major ticks every 500 units. The y-axis is labeled "Z (m)" and ranges from 0.00 to 0.80 with major ticks every 0.10 units. The graph displays eight data points (black circles) and a solid black line representing the fitted solution. The data points show a decreasing trend, starting at approximately (0, 0.67) and ending at approximately (1900, 0.45).

Time (s)	Z (m)
0	0.67
150	0.65
350	0.62
550	0.59
900	0.55
1200	0.52
1550	0.49
1900	0.45

TRIAL 9

Installer: XW
Analyst: CHB

FITTED VARIABLES

$a \text{ (s}^{-1}\text{)}$	0.0001799
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	0.67
MSE (m^2)	2.75E-05
Bias (m)	-9.49E-07

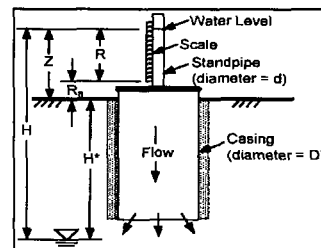
Z-t COMPUTATIONS

[illegible]

t (s)	Z (m)
0	0.672
106	0.659
212	0.646
318	0.634
423	0.622
529	0.611
635	0.599
741	0.588
847	0.577
953	0.566
1059	0.555
1164	0.545
1270	0.534
1376	0.524
1482	0.514
1588	0.505
1694	0.495
1799	0.486
1905	0.477
2011	0.468
2117	0.459

SOLUTION -TRIAL 1
$$K \text{ (m/s)} = 6.25\text{E-}08$$

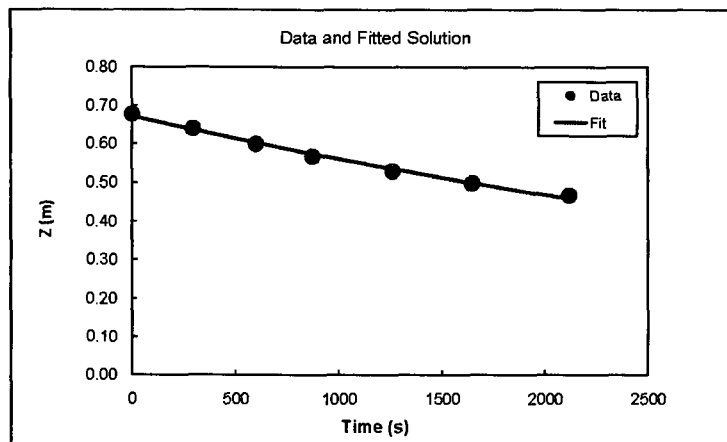
Total Time (d) = 0.02 0.6 hrs



Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Cedar Rapids - Clay Cover

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

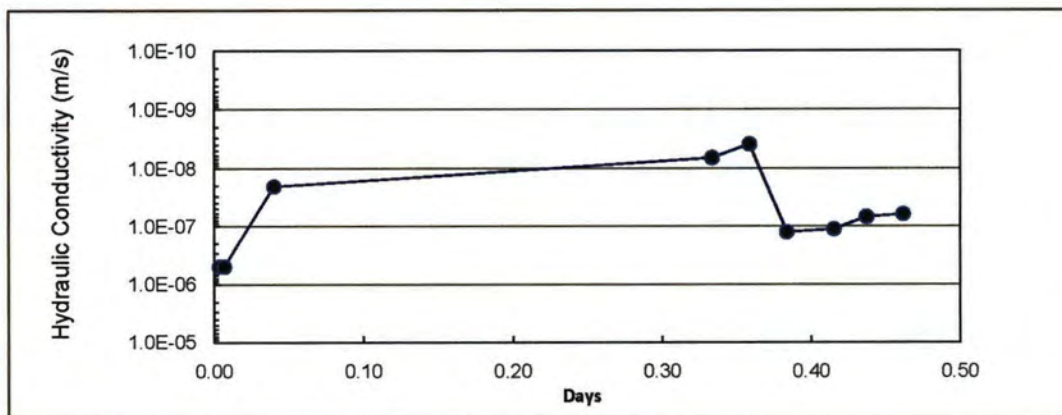
Trial	Time (d)	Total Time (d)	K (m/s)
1	0.003	0.003	5.01E-07
2	0.003	0.006	5.01E-07
3	0.033	0.040	2.06E-08
4	0.294	0.333	6.59E-09
5	0.025	0.358	3.89E-09
6	0.025	0.383	1.28E-07
7	0.032	0.415	1.13E-07
8	0.022	0.437	6.95E-08
9	0.025	0.461	6.25E-08

Clay3-SW

Field Hydraulic Conductivity

9.31E-08 m/s

9.31E-06 cm/s



TRIAL 1

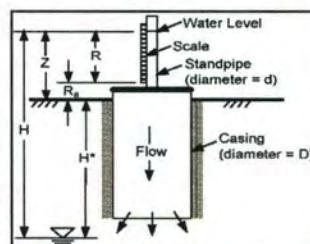
FIXED VARIABLES

FITTED VARIABLES

SOLUTION - TRIAL 1

K (m/s) = 7.93E-08

Total Time (d) = 0.03 0.7 hrs



Chiasson Solution:

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

TEMPORAL VARIABLES

[illegible]

Z-4 COMPUTATIONS

[illegible]

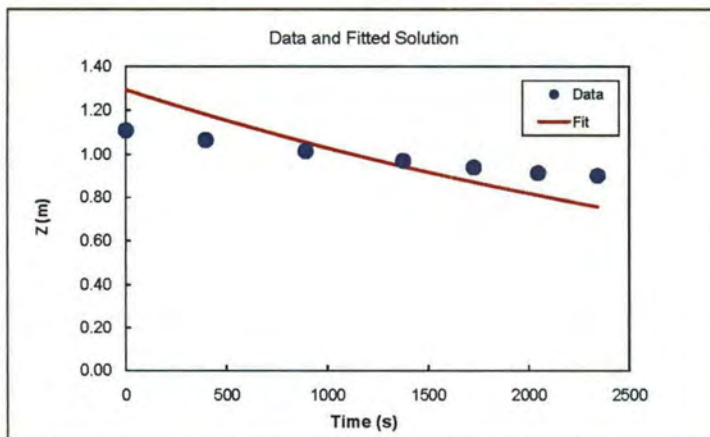
SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.292
117	1.258
234	1.225
351	1.192
468	1.161
585	1.130
702	1.100
819	1.071
936	1.043
1053	1.016
1171	0.989
1288	0.963
1405	0.937
1522	0.913
1639	0.888
1756	0.865
1873	0.842
1990	0.820
2107	0.798
2224	0.777
2341	0.757

$$\Delta t \text{ (s)} = 117$$

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Clay Cover

TRIAL 2

Test ID: Clay4-SE Installer: XW
Project: Cedar Rapids Analyst: CHB

FIXED VARIABLES

d (cm) = 1.905
D (cm) = 29.845
R_s (cm) = 44.45
Final Time: 12:30:45

FITTED VARIABLES

a (s⁻¹) = 0.0000925
H* (m) = 0.00
H₀ (m) = 1.29
MSE (m²) = 3.63E-02
Bias (m) = 1.35E-07

TEMPORAL VARIABLES

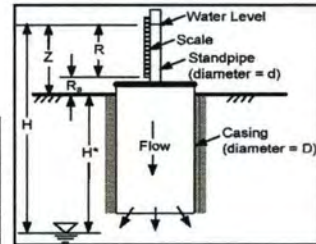
Time (m/d/yr h:m)	R (cm)
8:52:00	67.0
8:52:52	65.0
8:54:35	60.7
8:59:15	58.3
9:07:30	55.3
9:15:50	52.9
9:25:30	50.5
9:32:20	48.7
9:41:50	46.7
9:56:00	44.0
10:22:17	39.7
10:44:40	36.5
11:05:35	33.7
11:32:16	31.4
12:01:21	28.5
12:16:50	27.0
12:30:45	25.5

Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	s (m)	s ² (m)
1.11	0	1.292	1.77E-01	3.14E-02
1.09	52	1.286	1.91E-01	3.65E-02
1.05	155	1.273	2.22E-01	4.93E-02
1.03	435	1.241	2.13E-01	4.55E-02
1.00	930	1.185	1.88E-01	3.53E-02
0.97	1430	1.132	1.58E-01	2.51E-02
0.95	2010	1.073	1.23E-01	1.52E-02
0.93	2420	1.033	1.01E-01	1.03E-02
0.91	2990	0.980	6.82E-02	4.66E-03
0.88	3840	0.906	2.12E-02	4.49E-04
0.84	5417	0.783	-5.87E-02	3.45E-03
0.81	6760	0.691	-1.18E-01	1.40E-02
0.78	8015	0.616	-1.66E-01	2.75E-02
0.76	9616	0.531	-2.28E-01	5.18E-02
0.73	11361	0.452	-2.78E-01	7.71E-02
0.71	12290	0.415	-3.00E-01	9.00E-02
0.70	13125	0.384	-3.16E-01	9.97E-02

SOLUTION - TRIAL 1

K (m/s) = 3.21E-08
Total Time (d) = 0.15 3.6 hrs



Chlasson Solution:

Chlasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

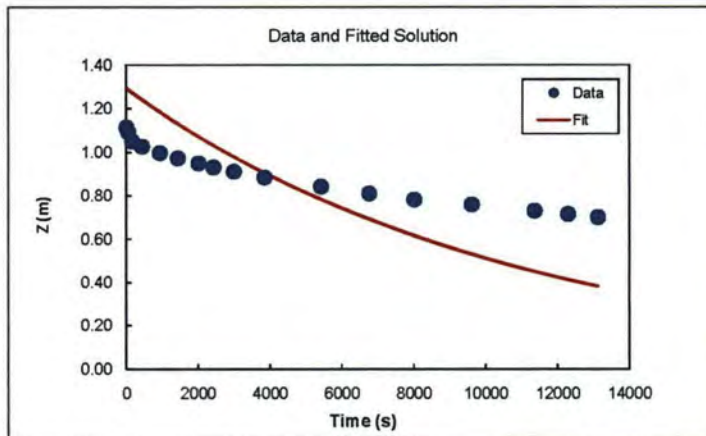
$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.292
656	1.216
1313	1.144
1969	1.077
2625	1.013
3281	0.954
3938	0.898
4594	0.845
5250	0.795
5906	0.748
6563	0.704
7219	0.663
7875	0.624
8531	0.587
9188	0.552
9844	0.520
10500	0.489
11156	0.460
11813	0.433
12469	0.408
13125	0.384

Δt (s) = 656



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Cedar Rapids - Clay Cover

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

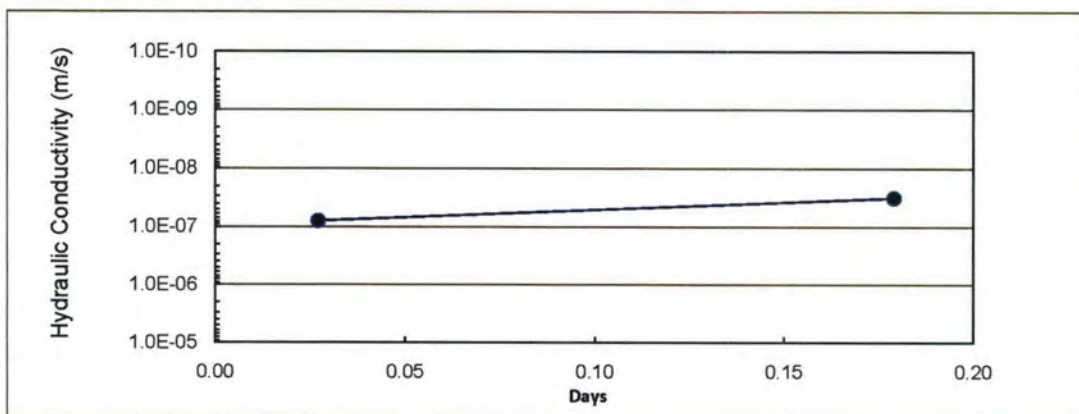
Trial	Time (d)	Total Time (d)	K (m/s)
1	0.027	0.027	7.93E-08
2	0.152	0.179	3.21E-08

Clay4-SE

Field Hydraulic Conductivity

5.57E-08 m/s

5.57E-06 cm/s



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Composite Cover

TRIAL 1

Test ID: CP2-NE Installer: XW
Project: Cedar Rapids Analyst: CHB

FIXED VARIABLES

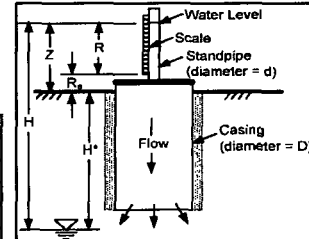
d (cm) = 1.905
D (cm) = 29.845
R_s (cm) = 52.07
Final Time: 13:48:00

FITTED VARIABLES

a (s⁻¹) = 0.0005108
H* (m) = 0.00
H₀ (m) = 1.39
MSE (m²) = 7.33E-04
Bias (m) = -4.43E-08

SOLUTION -TRIAL 1

K (m/s) = 1.77E-07
Total Time (d) = 0.02 0.4 hrs



Chiasson Solution:

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
13:26:12	92.7
13:27:45	82.7
13:28:30	79.0
13:28:50	77.0
13:29:30	73.5
13:30:30	69.0
13:31:15	65.5
13:32:00	62.0
13:33:30	56.5
13:34:47	52.0
13:35:50	48.5
13:37:06	45.0
13:38:14	42.0
13:39:10	39.5
13:41:00	35.5
13:42:40	32.0
13:45:00	28.5
13:47:10	25.5
13:48:00	24.4

Z-t COMPUTATIONS

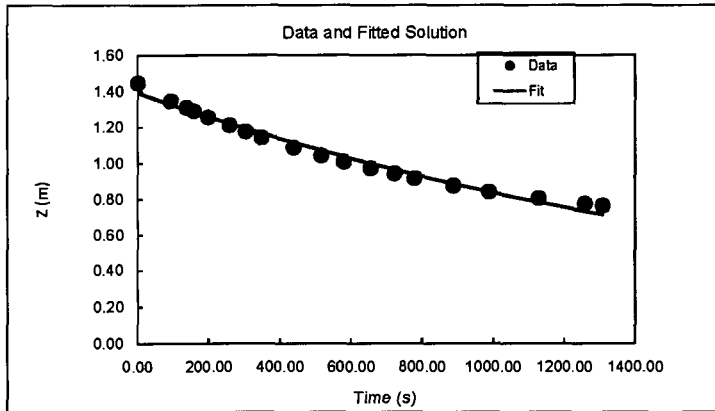
Z (m)	t (s)	Fitted Z (m)	s (m)	s* (m)
1.45	0.00	1.392	-5.59E-02	3.12E-03
1.35	93	1.327	-2.04E-02	4.18E-04
1.31	138	1.297	-1.36E-02	1.85E-04
1.29	158	1.284	-6.79E-03	4.61E-05
1.26	198	1.258	2.25E-03	5.05E-06
1.21	258	1.220	9.28E-03	8.62E-05
1.18	303	1.192	1.66E-02	2.74E-04
1.14	348	1.165	2.45E-02	5.99E-04
1.09	438	1.113	2.71E-02	7.36E-04
1.04	515	1.070	2.92E-02	8.53E-04
1.01	578	1.036	3.03E-02	9.20E-04
0.97	654	0.997	2.59E-02	6.70E-04
0.94	722	0.963	2.19E-02	4.78E-04
0.92	778	0.935	1.97E-02	3.89E-04
0.88	888	0.884	8.62E-03	7.43E-05
0.84	988	0.840	-4.14E-04	1.72E-07
0.81	1128	0.782	-2.34E-02	5.48E-04
0.78	1258	0.732	-4.37E-02	1.91E-03
0.76	1308	0.714	-5.11E-02	2.61E-03

9:16:16

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.392
65	1.346
131	1.302
196	1.259
262	1.218
327	1.178
392	1.139
458	1.102
523	1.065
589	1.030
654	0.997
719	0.964
785	0.932
850	0.902
916	0.872
981	0.843
1046	0.816
1112	0.789
1177	0.763
1243	0.738
1308	0.714

Δt (s) = 65



Test ID: CP2-NE
Project: Cedar Rapids

Installer: XW
Analyst: CHB

d (cm) =	1.905
D (cm) =	29.845
R _s (cm) =	52.07
Run Time:	14:04:19

Final Time: 14:04:19

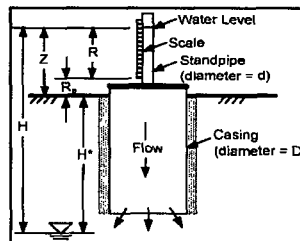
$a \text{ (s}^{-1}\text{)}$	0.0005177
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	1.43
MSE (m^2)	1.65E-04
Bias (m)	8.37E-08

MSE (m²) = 1.65E-04

Bias (m) = 8.37E-08

K (m/s) = 1.80E-07

Total Time (d) = 0.01 0.3 hrs



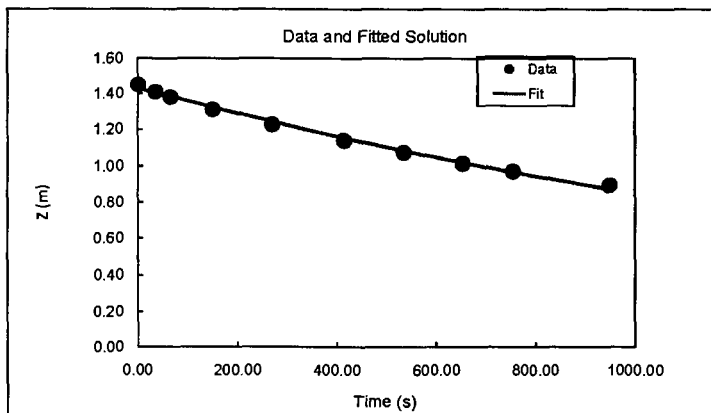
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	1.429
47	1.394
95	1.361
142	1.328
190	1.295
237	1.264
285	1.233
332	1.203
380	1.174
427	1.146
475	1.118
522	1.091
569	1.064
617	1.038
664	1.013
712	0.989
759	0.965
807	0.941
854	0.918
902	0.896
949	0.874

$$\Delta t \text{ (s)} = 47$$


Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Cedar Rapids - Composite Cover

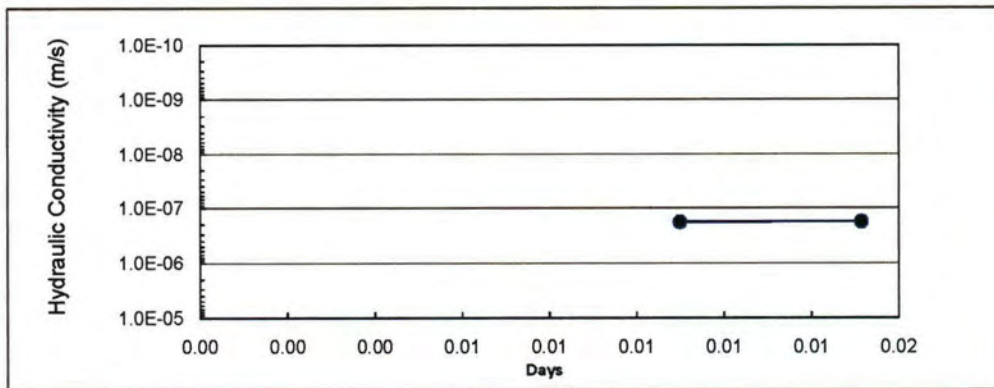
Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

Trial	Time (d)	Total Time (d)	K (m/s)	
1	0.015	0.015	1.77E-07	CP2-NE
2	0.011	0.011	1.80E-07	

Field Hydraulic Conductivity

1.79E-07 m/s

1.79E-05 cm/s



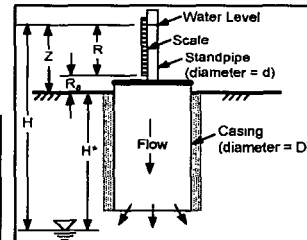
TRIAL 1

Installer: XW
Analyst: CHB

d (cm) = 1.905
 D (cm) = 29.845
 R_3 (cm) = 52.07
 Final Time: 15:09:00

$a \text{ (s}^{-1}\text{)}$	0.0001774
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	1.41
$MSE \text{ (m}^2\text{)}$	1.44E-03
$Bias \text{ (m)}$	-1.06E-08

K (m/s) = 6.16E-08
Total Time (d) = 0.05 1.2 hrs



Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_o e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	1.413
225	1.358
449	1.305
673	1.254
898	1.205
1123	1.158
1347	1.112
1572	1.069
1796	1.027
2021	0.987
2245	0.949
2470	0.912
2694	0.876
2919	0.842
3143	0.809
3368	0.777
3592	0.747
3817	0.718
4041	0.690
4266	0.663
4490	0.637

Figure 1 is a plot titled "Data and Fitted Solution" showing the relationship between Z (m) on the y-axis and Time (s) on the x-axis. The y-axis ranges from 0.00 to 1.60 with increments of 0.20. The x-axis ranges from 0.00 to 5000.00 with increments of 1000.00. The plot displays several data points (black circles) and a fitted curve (solid black line). The data points are clustered at low time values (0 to 1000 s) and follow a decreasing trend. The fitted curve starts at approximately (0, 1.45) and decreases monotonically, passing through the data points and extending to about (4500, 0.65).

Time (s)	Z (m)
0	1.45
100	1.40
200	1.35
300	1.30
400	1.25
500	1.20
600	1.15
700	1.10
4500	0.65

Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Composite Cover

TRIAL 2

Test ID: CP3-SW Installer: XW
Project: Cedar Rapids Analyst: CHB

FIXED VARIABLES

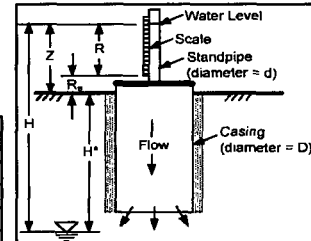
d (cm) = 1.905
D (cm) = 29.845
R_a (cm) = 52.07
Final Time: 16:30:00

FITTED VARIABLES

a (s⁻¹) = 0.0001593
H* (m) = 0.00
H₀ (m) = 1.28
MSE (m²) = 3.01E-03
Bias (m) = 1.14E-09

SOLUTION - TRIAL 1

K (m/s) = 5.53E-08
Total Time (d) = 0.05 1.3 hrs



Chlasson Solution:

Chlasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
15:13:40	89.0
15:15:06	85.5
15:16:14	80.5
15:17:25	74.0
15:18:32	68.0
15:19:56	63.5
15:21:00	62.0
15:23:50	58.5
15:25:07	57.0
15:30:11	51.5
15:36:13	46.0
15:40:20	42.5
15:44:16	39.5
15:49:40	35.7
15:53:10	33.5
15:56:15	31.5
16:00:30	29.0
16:04:10	27.0
16:09:36	24.2
16:17:14	21.6
16:24:25	17.5
16:29:40	15.4
16:30:00	14.9

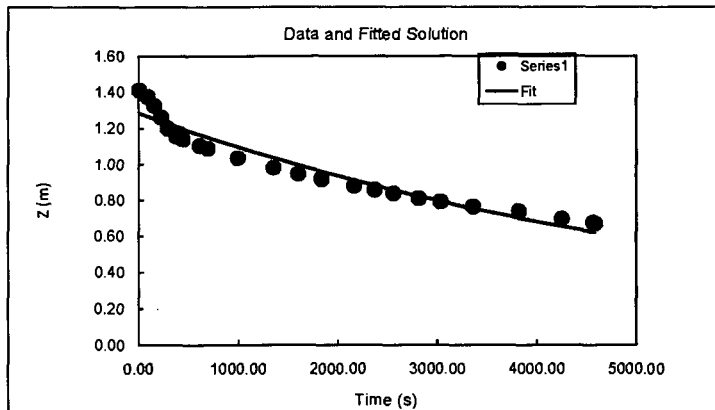
Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	s (m)	s' (m)
1.41	0.00	1.283	-1.28E-01	1.64E-02
1.38	86	1.265	-1.11E-01	1.22E-02
1.33	154	1.252	-7.42E-02	5.50E-03
1.26	225	1.237	-2.32E-02	5.40E-04
1.20	292	1.224	2.36E-02	5.58E-04
1.16	376	1.208	5.24E-02	2.74E-03
1.14	440	1.196	5.51E-02	3.04E-03
1.11	610	1.164	5.82E-02	3.38E-03
1.09	687	1.150	5.90E-02	3.48E-03
1.04	991	1.095	5.96E-02	3.55E-03
0.98	1353	1.034	5.33E-02	2.84E-03
0.95	1600	0.994	4.84E-02	2.34E-03
0.92	1836	0.957	4.17E-02	1.74E-03
0.88	2160	0.909	3.15E-02	9.94E-04
0.86	2370	0.879	2.36E-02	5.58E-04
0.84	2555	0.854	1.81E-02	3.27E-04
0.81	2810	0.820	9.10E-03	8.28E-05
0.79	3030	0.792	8.71E-04	7.58E-07
0.76	3356	0.752	-1.12E-02	1.25E-04
0.74	3814	0.699	-3.81E-02	1.45E-03
0.70	4245	0.652	-4.34E-02	1.88E-03
0.67	4560	0.620	-5.43E-02	2.95E-03
0.67	4580	0.618	-5.13E-02	2.63E-03

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.283
229	1.237
458	1.192
687	1.150
916	1.108
1145	1.069
1374	1.030
1603	0.994
1832	0.958
2061	0.924
2290	0.891
2519	0.859
2748	0.828
2977	0.798
3206	0.770
3435	0.742
3664	0.716
3893	0.690
4122	0.665
4351	0.641
4580	0.618

Δt (s) = 229



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Composite Cover

TRIAL 3

Test ID: CP3-SW Installer: XW
Project: Cedar Rapids Analyst: CHB

FIXED VARIABLES

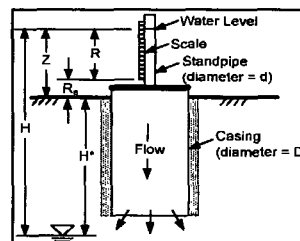
d (cm) = 1.905
D (cm) = 29.845
R₀ (cm) = 52.07
Final Time: 17:58:55

FITTED VARIABLES

a (s⁻¹) = 0.0001403
H* (m) = 0.00
H₀ (m) = 1.42
MSE (m²) = 1.20E-03
Bias (m) = 7.30E-09

SOLUTION - TRIAL 1

K (m/s) = 4.87E-08
Total Time (d) = 0.06 1.5 hrs



Chlasson Solution:

Chlasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

Time (m/d/y h:m)	R (cm)
16:31:48	96.0
16:32:30	94.0
16:34:30	89.0
16:37:00	84.5
16:39:45	79.5
16:44:30	72.5
16:50:25	69.5
16:53:30	61.8
16:58:10	57.2
17:00:35	55.0
17:04:50	51.3
17:11:14	46.5
17:16:00	43.2
17:26:00	37.0
17:30:20	34.6
17:39:40	29.8
17:47:05	26.4
17:53:30	23.2
17:58:55	21.5

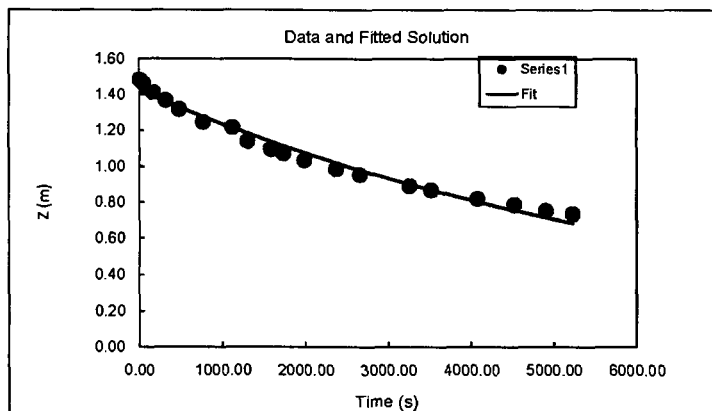
Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	s (m)	s* (m)
1.48	0.00	1.420	-6.11E-02	3.73E-03
1.46	42	1.411	-4.94E-02	2.44E-03
1.41	162	1.388	-2.30E-02	5.27E-04
1.37	312	1.359	-6.87E-03	4.71E-05
1.32	477	1.328	1.20E-02	1.45E-04
1.25	762	1.276	3.00E-02	9.00E-04
1.22	1117	1.214	-1.98E-03	3.92E-06
1.14	1302	1.183	4.39E-02	1.93E-03
1.09	1582	1.137	4.44E-02	1.97E-03
1.07	1727	1.114	4.35E-02	1.89E-03
1.03	1982	1.075	4.13E-02	1.71E-03
0.99	2366	1.019	3.29E-02	1.08E-03
0.95	2652	0.979	2.59E-02	6.69E-04
0.89	3252	0.900	8.87E-03	7.87E-05
0.87	3512	0.867	6.48E-04	4.19E-07
0.82	4072	0.802	-1.69E-02	2.85E-04
0.78	4517	0.753	-3.14E-02	9.87E-04
0.75	4902	0.714	-3.90E-02	1.52E-03
0.74	5227	0.682	-5.38E-02	2.90E-03

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.420
261	1.369
523	1.319
784	1.272
1045	1.226
1307	1.182
1568	1.139
1829	1.098
2091	1.059
2352	1.021
2614	0.984
2875	0.948
3136	0.914
3398	0.881
3659	0.850
3920	0.819
4182	0.790
4443	0.761
4704	0.734
4966	0.707
5227	0.682

Δt (s) = 261



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Composite Cover

TRIAL 4

Test ID: CP3-SW Installer: XW
Project: Cedar Rapids Analyst: CHB

FIXED VARIABLES

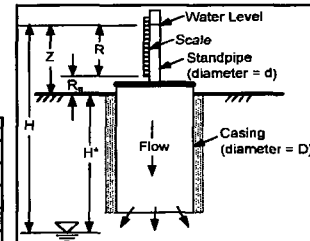
d (cm) = 1.905
D (cm) = 29.845
R_s (cm) = 52.07
Final Time: 10:30:23

FITTED VARIABLES

a (s⁻¹) = 0.0001356
H* (m) = 0.00
H₀ (m) = 1.45
MSE (m²) = 7.84E-04
Bias (m) = -2.08E-11

SOLUTION -TRIAL 1

K (m/s) = 4.71E-08
Total Time (d) = 0.05 1.1 hrs



Chlasson Solution:

Chlasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
9:25:00	100.0
9:26:00	95.5
9:27:00	92.7
9:30:36	86.7
9:32:50	83.2
9:35:10	80.0
9:37:15	77.3
9:39:13	75.0
9:41:13	72.8
9:44	69.6
9:46:35	67.0
9:52:07	62.0
9:54:27	60.0
9:57:43	57.4
10:02:25	53.7
10:10:18	48.5
10:17:24	44.7
10:21:46	42.4
10:30:23	38.1

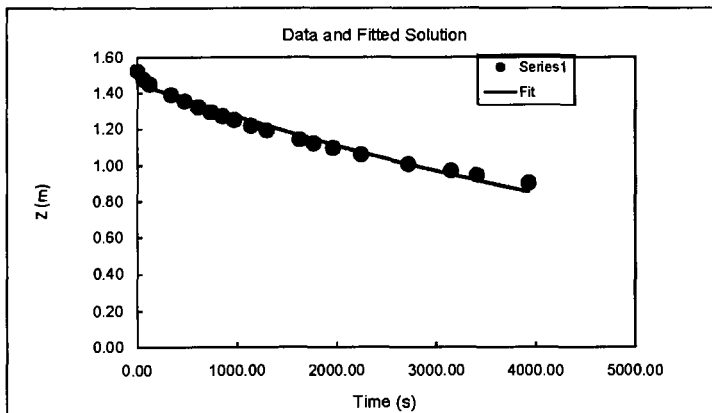
Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	a (m)	a' (m)
1.52	0.00	1.452	-6.87E-02	4.72E-03
1.48	60	1.440	-3.55E-02	1.26E-03
1.45	120	1.429	-1.91E-02	3.66E-04
1.39	336	1.387	-3.90E-04	1.52E-07
1.35	470	1.362	9.62E-03	9.26E-05
1.32	610	1.337	1.60E-02	2.56E-04
1.29	735	1.314	2.05E-02	4.21E-04
1.27	853	1.293	2.27E-02	5.13E-04
1.25	973	1.272	2.38E-02	5.65E-04
1.22	1140	1.244	2.73E-02	7.43E-04
1.19	1295	1.218	2.74E-02	7.50E-04
1.14	1627	1.164	2.37E-02	5.64E-04
1.12	1767	1.143	2.18E-02	4.77E-04
1.09	1963	1.113	1.79E-02	3.19E-04
1.06	2245	1.071	1.31E-02	1.72E-04
1.01	2718	1.004	-1.44E-03	2.07E-06
0.97	3144	0.948	-1.98E-02	3.93E-04
0.94	3406	0.915	-2.99E-02	8.95E-04
0.90	3923	0.853	-4.89E-02	2.39E-03

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.452
196	1.414
392	1.377
588	1.341
785	1.305
981	1.271
1177	1.238
1373	1.205
1569	1.174
1765	1.143
1962	1.113
2158	1.084
2354	1.055
2550	1.027
2746	1.000
2942	0.974
3138	0.949
3335	0.924
3531	0.899
3727	0.876
3923	0.853

Δt (s) = 196



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Cedar Rapids - Composite Cover

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

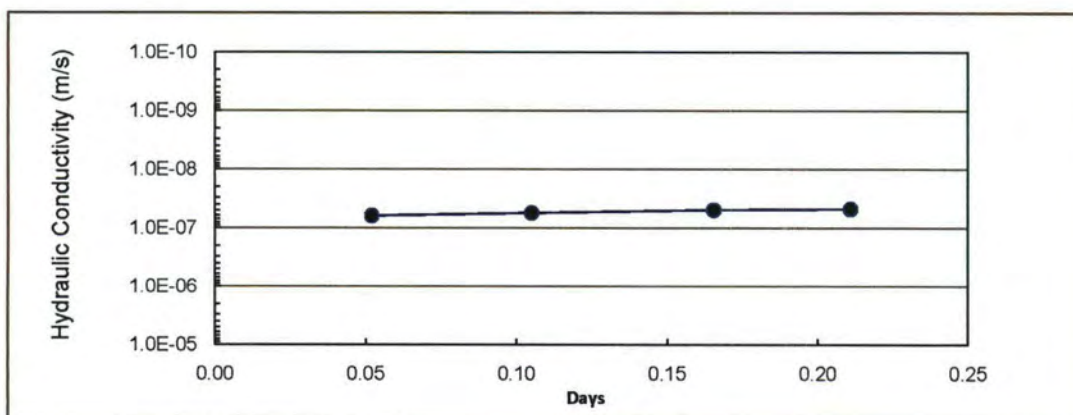
Trial	Time (d)	Total Time (d)	K (m/s)
1	0.052	0.052	6.16E-08
2	0.053	0.105	5.53E-08
3	0.060	0.165	4.87E-08
4	0.045	0.211	4.71E-08

CP3-SW

Field Hydraulic Conductivity

5.32E-08 m/s

5.32E-06 cm/s



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Composite Cover

TRIAL 1

Test ID: CP4-SE
Project: Cedar Rapids

Installer: XW
Analyst: CHB

FIXED VARIABLES

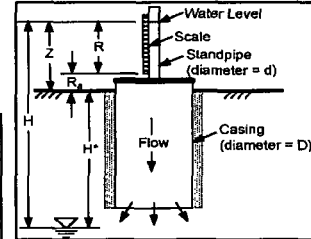
d (cm) = 1.905
D (cm) = 29.845
R₀ (cm) = 52.07
Final Time: 13:48:00

FITTED VARIABLES

a (s⁻¹) = 0.0005108
H* (m) = 0.00
H₀ (m) = 1.39
MSE (m²) = 7.33E-04
Bias (m) = -1.24E-11

SOLUTION -TRIAL 1

K (m/s) = 1.77E-07
Total Time (d) = 0.02 0.4 hrs



Chiaison Solution:

Chiaison, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
13:26:12	92.7
13:27:45	82.7
13:28:30	79.0
13:28:50	77.0
13:29:30	73.5
13:30:30	69.0
13:31:15	65.5
13:32:00	62.0
13:33:30	56.5
13:34:47	52.0
13:35:50	48.5
13:37:06	45.0
13:38:14	42.0
13:39:10	39.5
13:41:00	35.5
13:42:40	32.0
13:45:00	28.5
13:47:10	25.5
13:48:00	24.4

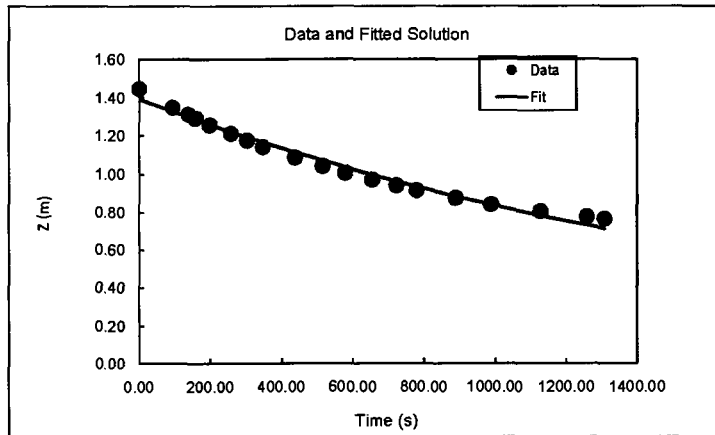
Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	s (m)	s' (m)
1.45	0.00	1.392	-5.59E-02	3.12E-03
1.35	93	1.327	-2.04E-02	4.18E-04
1.31	138	1.297	-1.36E-02	1.85E-04
1.29	158	1.284	-6.79E-03	4.61E-05
1.26	198	1.258	2.25E-03	5.05E-06
1.21	258	1.220	9.28E-03	8.62E-05
1.18	303	1.192	1.66E-02	2.74E-04
1.14	348	1.165	2.45E-02	5.99E-04
1.09	438	1.113	2.71E-02	7.36E-04
1.04	515	1.070	2.92E-02	8.53E-04
1.01	578	1.036	3.03E-02	9.20E-04
0.97	654	0.997	2.59E-02	6.70E-04
0.94	722	0.963	2.19E-02	4.78E-04
0.92	778	0.935	1.97E-02	3.89E-04
0.88	888	0.884	8.62E-03	7.43E-05
0.84	988	0.840	-4.14E-04	1.72E-07
0.81	1128	0.782	-2.34E-02	5.48E-04
0.78	1258	0.732	-4.37E-02	1.91E-03
0.76	1308	0.714	-5.11E-02	2.61E-03

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.392
65	1.346
131	1.302
196	1.259
262	1.218
327	1.178
392	1.139
458	1.102
523	1.065
589	1.030
654	0.997
719	0.964
785	0.932
850	0.902
916	0.872
981	0.843
1046	0.816
1112	0.789
1177	0.763
1243	0.738
1308	0.714

Δt (s) = 65



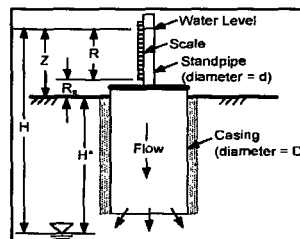
TRIAL 2

Installer: XW
Analyst: CHB

d (cm) =	1.905
D (cm) =	29.845
R _a (cm) =	52.07
Final Time:	14:04:19

$a \text{ (s}^{-1}\text{)}$	0.0005177
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	1.43
$\text{MSE (m}^2\text{)}$	1.65E-04
Bias (m)	-8.32E-09

K (m/s) = 1.80E-07
Total Time (d) = 0.01 0.3 hrs



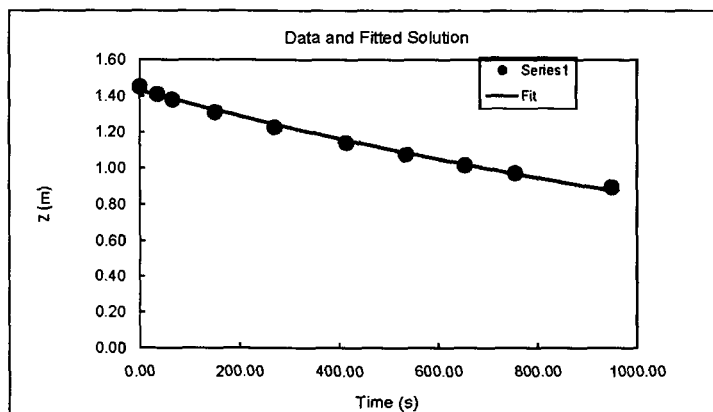
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.* 42, 79-90.

$$Z_t = H_o e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	1.429
47	1.394
95	1.361
142	1.328
190	1.295
237	1.264
285	1.233
332	1.203
380	1.174
427	1.146
475	1.118
522	1.091
569	1.064
617	1.038
664	1.013
712	0.989
759	0.965
807	0.941
854	0.918
902	0.896
949	0.874

$$\Delta t \text{ (s)} = 47$$


Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Composite Cover

TRIAL 3

Test ID: CP4-SE
Project: Cedar Rapids

Installer: XW
Analyst: CHB

FIXED VARIABLES

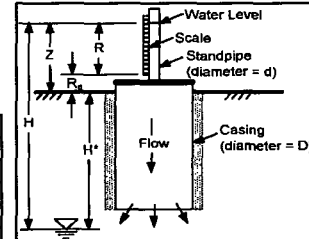
d (cm) = 1.905
D (cm) = 29.845
R_a (cm) = 52.07
Final Time: 15:35:40

FITTED VARIABLES

a (s⁻¹) = 0.0004771
H* (m) = 0.00
H₀ (m) = 1.37
MSE (m⁴) = 1.74E-04
Bias (m) = 4.66E-09

SOLUTION -TRIAL 1

K (m/s) = 1.66E-07
Total Time (d) = 0.02 0.4 hrs



Chiasson Solution:

Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
15:12:10	88.0
15:13:15	82.0
15:14:15	77.5
15:15:35	72.0
15:16:40	68.0
15:18:00	63.0
15:19:10	59.0
15:20:28	55.0
15:21:48	51.0
15:24:20	44.0
15:25:51	40.0
15:29:30	31.5
15:33:40	23.5
15:35:40	20.5

Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	s (m)	s* (m)
1.40	0.00	1.373	-2.74E-02	7.48E-04
1.34	65	1.331	-9.29E-03	8.63E-05
1.30	125	1.294	-1.86E-03	3.46E-06
1.24	205	1.245	4.69E-03	2.20E-05
1.20	270	1.207	6.67E-03	4.44E-05
1.15	350	1.162	1.15E-02	1.31E-04
1.11	420	1.124	1.33E-02	1.77E-04
1.07	498	1.083	1.22E-02	1.50E-04
1.03	578	1.042	1.17E-02	1.36E-04
0.96	730	0.969	8.77E-03	7.69E-05
0.92	821	0.928	7.58E-03	5.75E-05
0.84	1040	0.836	4.91E-04	2.41E-07
0.76	1290	0.742	-1.35E-02	1.83E-04
0.73	1410	0.701	-2.48E-02	6.16E-04

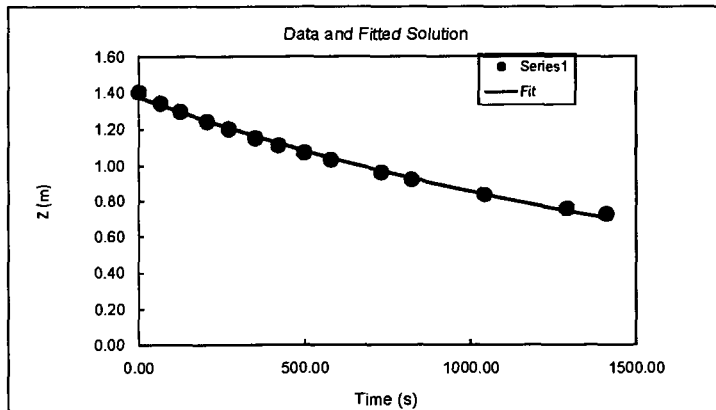
$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.373
71	1.328
141	1.284
212	1.242
282	1.200
353	1.161
423	1.122
494	1.085
564	1.049
635	1.015
705	0.981
776	0.949
846	0.917
917	0.887
987	0.858
1058	0.829
1128	0.802
1199	0.775
1269	0.750
1340	0.725
1410	0.701

Δt (s) = 71



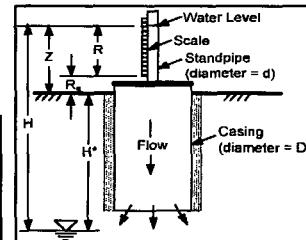
Test ID: CP4-SE
Project: Cedar Rapids

Installer: XW
Analyst: CHB

d (cm) =	1.905
D (cm) =	29.845
R _a (cm) =	52.07
Final Time:	15:57:50

$a \text{ (s}^{-1}\text{)}$	0.0004660
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	1.36
$MSE \text{ (m}^2\text{)}$	7.70E-05
$Bias \text{ (m)}$	-1.16E-09

K (m/s) = 1.62E-07
Total Time (d) = 0.02 0.4 hrs



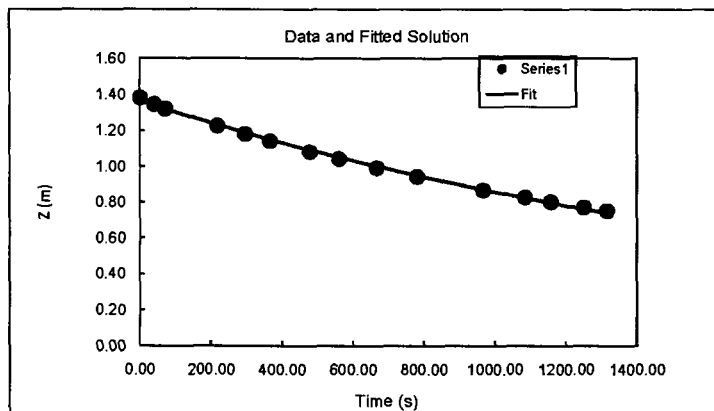
Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

[illegible][illegible]

t (s)	Z (m)
0	1.363
66	1.322
132	1.282
197	1.243
263	1.206
329	1.169
395	1.134
461	1.100
526	1.067
592	1.034
658	1.003
724	0.973
790	0.943
855	0.915
921	0.887
987	0.861
1053	0.835
1119	0.809
1184	0.785
1250	0.761
1316	0.738

$$\Delta t \text{ (s)} = 66$$


Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Composite Cover

TRIAL 5

Test ID: CP4-SE
Project: Cedar Rapids
Installer: XW
Analyst: CHB

FIXED VARIABLES

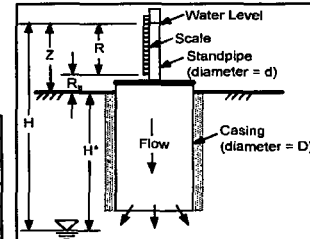
d (cm) = 1.905
D (cm) = 29.845
R_a (cm) = 52.07
Final Time: 9:44:42

FITTED VARIABLES

a (s⁻¹) = 0.0005118
H* (m) = 0.00
H₀ (m) = 1.48
MSE (m²) = 2.21E-04
Bias (m) = 9.04E-09

SOLUTION -TRIAL 1

K (m/s) = 1.78E-07
Total Time (d) = 0.01 0.3 hrs



Chiaison Solution:

Chiaison, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
9:24:00	100.0
9:25:00	90.5
9:27:00	83.5
9:28:00	76.5
9:29:30	71.7
9:31:23	64.7
9:32:00	62.5
9:34:15	55.0
9:35:40	50.6
9:36:30	48.3
9:38:23	43.5
9:39:47	40.0
9:40:30	37.8
9:41:34	35.3
9:43:42	29.8
9:44:42	27.7

Z-t COMPUTATIONS

Z (m)	t (s)	Filt Z (m)	s (m)	s* (m)
1.52	0.00	1.480	-4.10E-02	1.68E-03
1.43	60	1.435	9.29E-03	8.63E-05
1.36	180	1.350	-6.19E-03	3.83E-05
1.29	240	1.309	2.30E-02	5.29E-04
1.24	330	1.250	1.21E-02	1.46E-04
1.17	443	1.180	1.19E-02	1.41E-04
1.15	480	1.157	1.17E-02	1.38E-04
1.07	615	1.080	9.48E-03	8.98E-05
1.03	700	1.034	7.50E-03	5.62E-05
1.00	750	1.008	4.37E-03	1.91E-05
0.96	863	0.951	-4.27E-03	1.83E-05
0.92	947	0.911	-9.31E-03	8.66E-05
0.90	990	0.892	-7.15E-03	5.11E-05
0.87	1054	0.863	-1.09E-02	1.18E-04
0.82	1182	0.808	-1.06E-02	1.12E-04

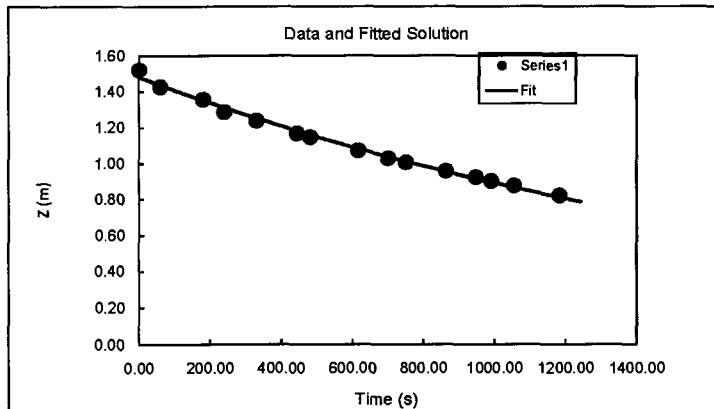
$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.480
62	1.433
124	1.389
186	1.345
248	1.303
310	1.262
373	1.223
435	1.185
497	1.148
559	1.112
621	1.077
683	1.043
745	1.011
807	0.979
869	0.946
931	0.919
994	0.890
1056	0.862
1118	0.835
1180	0.809
1242	0.784

Δt (s) = 62



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Cedar Rapids - Composite Cover

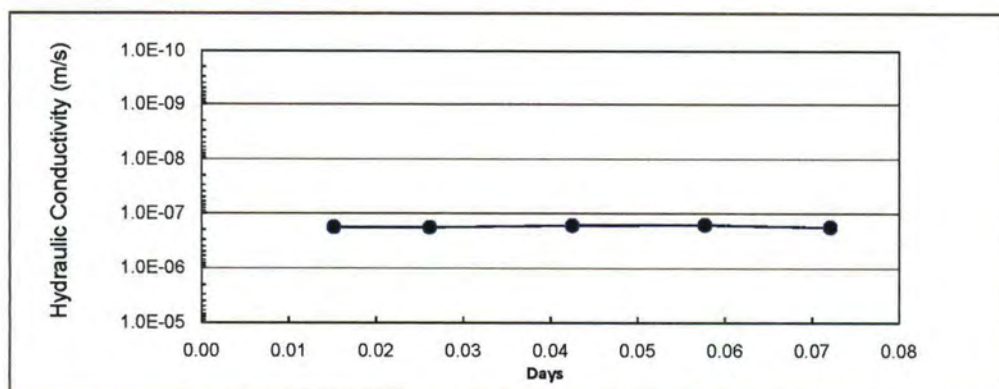
Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

Trial	Time (d)	Total Time (d)	K (m/s)	
1	0.015	0.015	1.77E-07	CP4-SE
2	0.011	0.026	1.80E-07	
3	0.016	0.042	1.66E-07	
4	0.015	0.058	1.62E-07	
5	0.014	0.072	1.78E-07	

Field Hydraulic Conductivity

1.71E-07 m/s

1.71E-05 cm/s



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis

Cedar Rapids - Composite Cover

TRIAL 1

Test ID: CP5-SE Installer: XW
Project: Cedar Rapids Analyst: CHB

FIXED VARIABLES

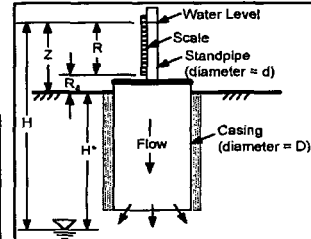
d (cm) = 1.905
D (cm) = 29.845
R_a (cm) = 52.07
Final Time: 11:45:10

FITTED VARIABLES

a (s⁻¹) = 0.0004064
H* (m) = 0.00
H₀ (m) = 1.48
MSE (m²) = 3.40E-04
Bias (m) = 5.38E-08

SOLUTION - TRIAL 1

K (m/s) = 1.41E-07
Total Time (d) = 0.03 0.6 hrs



Chlasson Solution:

Chlasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

TEMPORAL VARIABLES

Time (m/d/yr h:m)	R (cm)
11:06:57	100.0
11:09:02	90.0
11:11:28	80.0
11:14:16	70.0
11:17:30	60.0
11:21:48	49.0
11:25:50	40.0
11:29:21	33.0
11:31:08	30.0
11:32:46	27.0
11:35:00	23.0
11:36:48	20.0
11:40:32	15.0
11:45:10	9.5

Z-t COMPUTATIONS

Z (m)	t (s)	Fit Z (m)	s (m)	s' (m)
1.52	0.00	1.484	-3.72E-02	1.38E-03
1.42	125	1.410	-1.07E-02	1.14E-04
1.32	271	1.329	8.11E-03	6.57E-05
1.22	439	1.241	2.04E-02	4.16E-04
1.12	633	1.147	2.63E-02	6.92E-04
1.01	891	1.033	2.21E-02	4.89E-04
0.92	1133	0.936	1.54E-02	2.36E-04
0.85	1344	0.859	8.44E-03	7.13E-05
0.82	1451	0.823	1.88E-03	3.53E-06
0.79	1549	0.790	-2.40E-04	5.76E-08
0.75	1683	0.749	-2.14E-03	4.57E-06
0.72	1791	0.716	-4.29E-03	1.84E-05
0.67	2015	0.654	-1.66E-02	2.76E-04
0.62	2293	0.584	-3.15E-02	9.93E-04

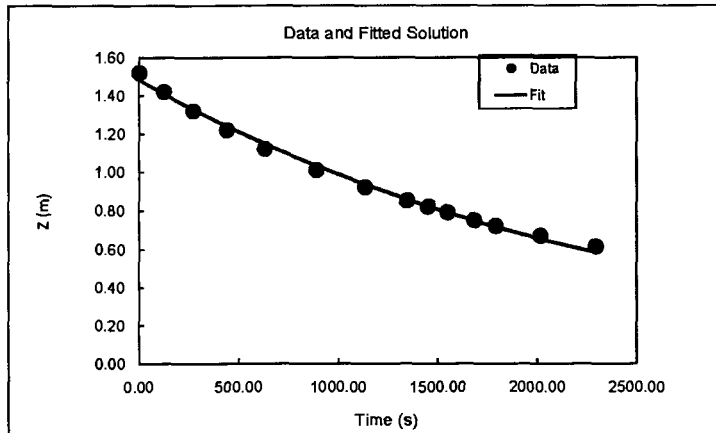
$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

SOLUTION FOR GRAPHING

t (s)	Z (m)
0	1.484
115	1.416
229	1.352
344	1.290
459	1.231
573	1.175
688	1.122
803	1.071
917	1.022
1032	0.975
1147	0.931
1261	0.889
1376	0.848
1490	0.809
1605	0.773
1720	0.737
1834	0.704
1949	0.672
2064	0.641
2178	0.612
2293	0.584

Δt (s) = 115



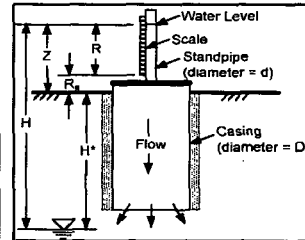
Test ID: CP5-SE
Project: Cedar Rapids

FITTED VARIABLES	
$a \text{ (s}^{-1}\text{)}$	0.0003927
$H^* \text{ (m)}$	0.00
$H_o \text{ (m)}$	1.49
$MSE \text{ (m}^2\text{)}$	3.92E-04
$Bias \text{ (m)}$	-4.07E-08

d (cm) = 1.905
D (cm) = 29.845
R_a (cm) = 52.07
Final Time: 12:24:33

[illegible][illegible]

K (m/s) = 1.36E-07
Total Time (d) = 0.03 0.6 hrs

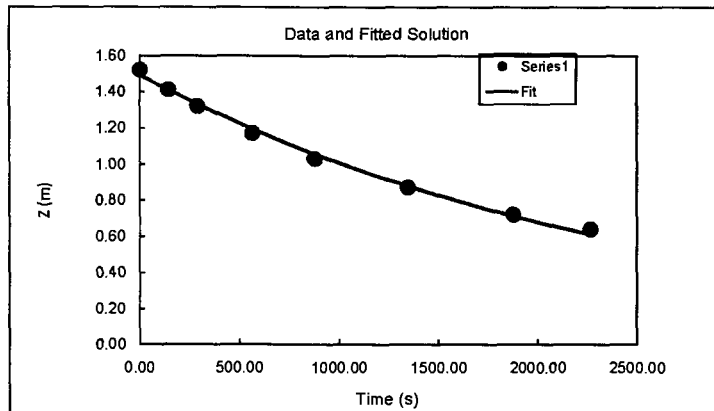


Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_o e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	1.490
113	1.426
226	1.364
340	1.304
453	1.248
566	1.193
679	1.141
792	1.092
906	1.044
1019	0.999
1132	0.955
1245	0.914
1358	0.874
1472	0.836
1585	0.800
1698	0.765
1811	0.732
1924	0.700
2038	0.669
2151	0.640
2264	0.613

$$\Delta t \text{ (s)} = 113$$


Cedar Rapids - Composite Cover

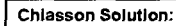
Test ID: CP5-SE
Project: Cedar Rapids

Installer: XW
Analyst: CHB

d (cm) =	1.905
D (cm) =	29.845
R_s (cm) =	52.07
Final Time:	12:46:4

$a \text{ (s}^{-1}\text{)}$	0.0003752
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	1.16
$MSE \text{ (m}^2\text{)}$	4.31E-05
$Bias \text{ (m)}$	7.91E-08

K (m/s) = 1.30E-07
Total Time (d) = 0.02 0.4 hrs

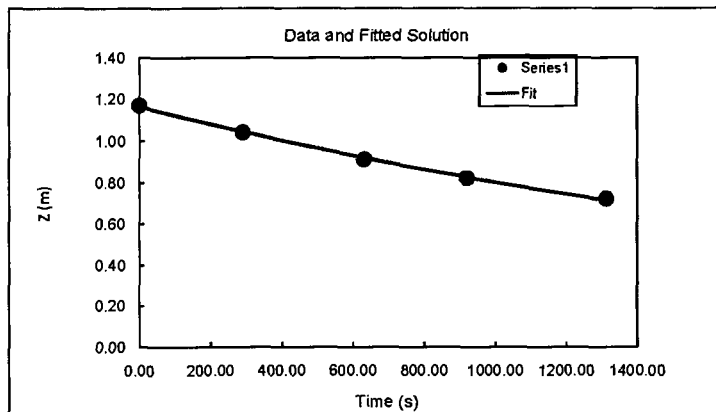


Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

[illegible][illegible]

$$K = \frac{a \pi d^2}{11 D}$$

t (s)	Z (m)
0	1.184
66	1.136
131	1.108
197	1.081
262	1.055
328	1.029
394	1.004
459	0.980
525	0.956
590	0.933
656	0.910
722	0.888
787	0.867
853	0.845
918	0.825
984	0.805
1050	0.785
1115	0.766
1181	0.748
1246	0.729
1312	0.712



$$\Delta t \text{ (s)} \approx 66$$

TRIAL 4

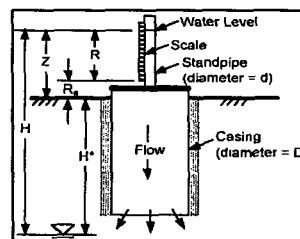
Installer: XW
Analyst: CHB

FITTED VARIABLES

$a \text{ (s}^{-1}\text{)}$	0.0002877
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	0.72
$\text{MSE (m}^2\text{)}$	6.34E-06
Bias (m)	-1.02E-11

K (m/s) = 9.99E-08

Total Time (d) = 0.01 0.3 hrs



Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

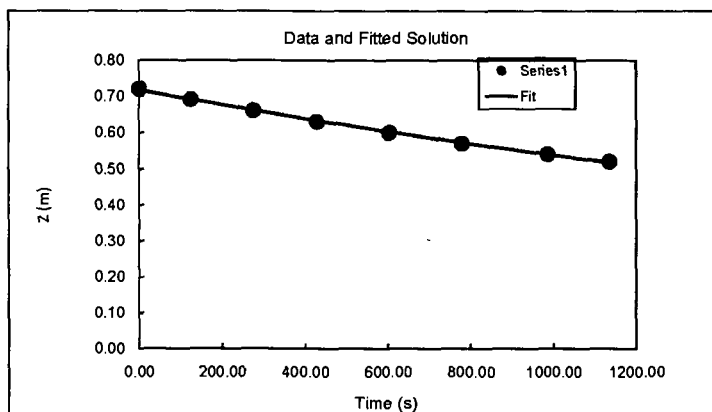
$$Z_t = H_0 e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

Z-t COMPUTATIONS

[illegible][illegible]

t (s)	Z (m)
0	0.717
57	0.705
114	0.694
170	0.682
227	0.671
284	0.660
341	0.650
397	0.639
454	0.629
511	0.619
568	0.609
624	0.599
681	0.589
738	0.580
795	0.570
851	0.561
908	0.552
965	0.543
1022	0.534
1078	0.525
1135	0.517

 $\Delta t \text{ (s)} = 57$ 

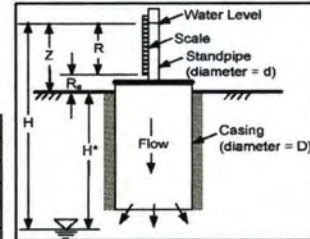
TRIAL 5

Installer: XW
Analyst: CHB

d (cm) =	1.905
D (cm) =	29.845
R _s (cm) =	52.07
Final Time:	14:28:41

$a \text{ (s}^{-1}\text{)}$	0.0003046
$H^* \text{ (m)}$	0.00
$H_0 \text{ (m)}$	0.80
$\text{MSE (m}^2\text{)}$	2.84E-06
Bias (m)	6.95E-11

K (m/s) = 1.06E-07
Total Time (d) = 0.01 0.3 hrs



Chiasson, P. (2005), Method of interpretation of borehole falling-head tests performed in compacted clay liners, *Canadian Geotechnical J.*, 42, 79-90.

$$Z_t = H_o e^{-at} - H^*$$

$$K = \frac{a \pi d^2}{11 D}$$

Time (m/d/yr h:m)	R (cm)
14:10:13	28.0
14:12:09	25.0
14:14:22	22.0
14:15:51	20.0
14:20:54	13.5
14:25:53	8.3
14:28:48	4.7

Z (m)	t (s)	Fit Z (m)	s (m)	s ² (m)
0.80	0.00	0.799	-1.40E-03	1.96E-06
0.77	116	0.772	8.55E-04	7.31E-07
0.74	249	0.741	2.26E-04	5.11E-08
0.72	338	0.721	4.12E-04	1.70E-07
0.66	641	0.658	1.84E-03	3.40E-06
0.60	940	0.600	-3.39E-03	1.15E-05
0.57	1115	0.569	1.45E-03	2.11E-06

t (s)	Z (m)
0	0.799
56	0.786
112	0.773
167	0.760
223	0.747
279	0.734
335	0.722
390	0.710
446	0.698
502	0.686
558	0.674
613	0.663
669	0.652
725	0.641
781	0.630
836	0.620
892	0.609
948	0.599
1004	0.589
1059	0.579
1115	0.569

Figure 1 is a scatter plot with a fitted line. The x-axis is labeled 'Time (s)' and ranges from 0.00 to 1200.00 with major ticks every 200.00 units. The y-axis is labeled 'z (m)' and ranges from 0.00 to 0.90 with major ticks every 0.10 units. There are eight data points represented by blue circles. A red line represents the fitted curve, which is a straight line with a negative slope. The legend in the top right corner identifies the blue circles as 'Series1' and the red line as 'Fit'.

Time (s)	z (m)
0.00	0.80
150.00	0.78
280.00	0.75
350.00	0.73
650.00	0.67
950.00	0.61
1100.00	0.58

Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Cedar Rapids - Composite Cover

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

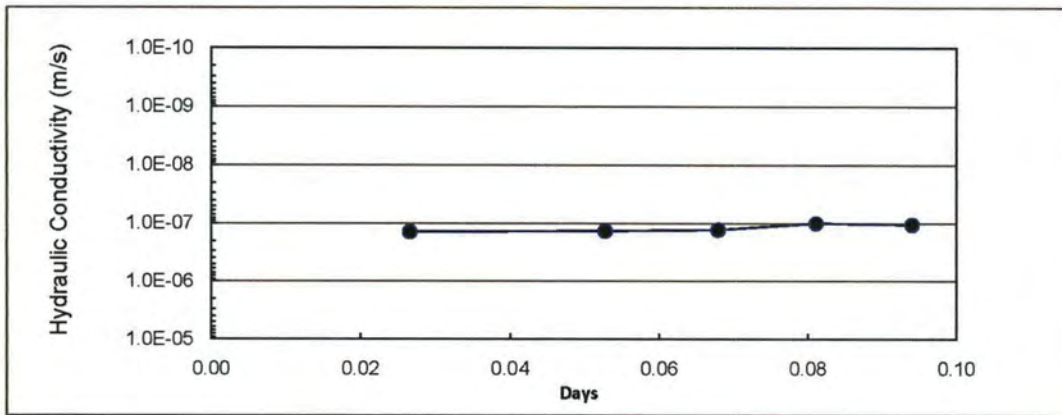
Trial	Time (d)	Total Time (d)	K (m/s)
1	0.027	0.027	1.41E-07
2	0.026	0.053	1.36E-07
3	0.015	0.068	1.30E-07
4	0.013	0.081	9.99E-08
5	0.013	0.094	1.06E-07

CP5-SE

Field Hydraulic Conductivity

1.23E-07 m/s

1.23E-05 cm/s



Single-Stage Constant Head Borehole Test Helena - Store-and-Release Cover

Project: Helena
Date: 08/19/08
Test ID: 1

Installer: XW
Analyst: JS

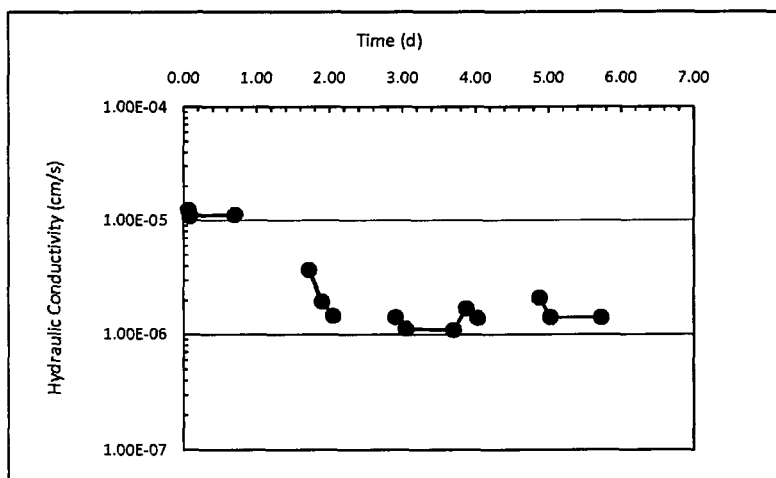
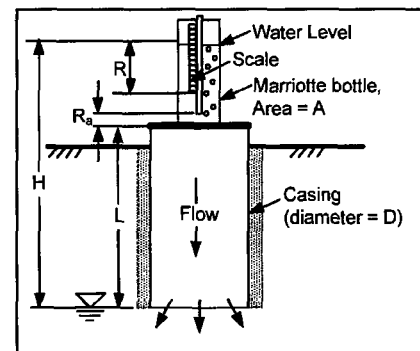
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
8/19/08 15:00	38.5			
8/19/08 16:27	43.3	7.34E-02	0.060	1.23E-05
8/19/08 17:02	45	6.46E-02	0.085	1.09E-05
8/20/08 7:50	89.3	6.64E-02	0.701	1.12E-05
8/20/08 15:00	38.1	-1.58E-01	1.000	
8/21/08 8:05	55	2.19E-02	1.712	3.69E-06
8/21/08 12:30	57.3	1.15E-02	1.896	1.94E-06
8/21/08 16:05	58.7	8.66E-03	2.045	1.46E-06
8/22/08 8:27	40	-2.53E-02	2.727	
8/22/08 12:40	41.6	8.41E-03	2.903	1.41E-06
8/22/08 16:00	42.6	6.65E-03	3.042	1.12E-06
8/23/08 7:46	47.2	6.46E-03	3.699	1.09E-06
8/23/08 11:57	49.1	1.01E-02	3.873	1.69E-06
8/23/08 15:42	50.5	8.29E-03	4.029	1.39E-06
8/24/08 7:55	49	-2.05E-03	4.705	
8/24/08 12:11	51.4	1.25E-02	4.883	2.10E-06
8/24/08 15:37	52.7	8.39E-03	5.026	1.41E-06
8/25/08 8:22	59.0	8.34E-03	5.724	1.40E-06

Average 1.58E-06



Single-Stage Constant Head Borehole Test Helena - Store-and-Release Cover

Project: Helena
Date: 08/19/08
Test ID: 1

Installer: XW
Analyst: JS

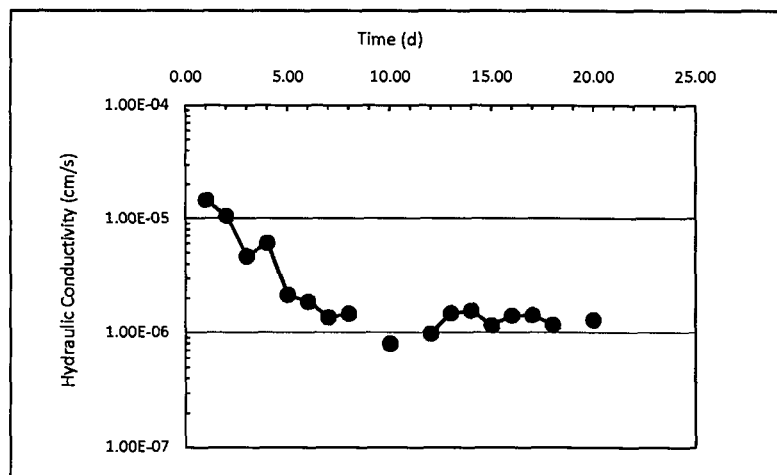
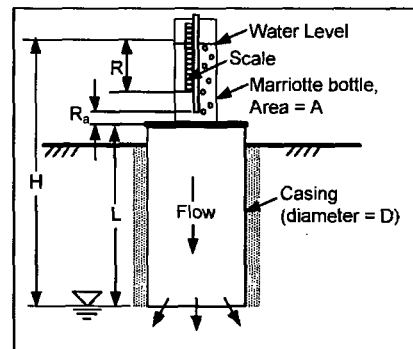
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
8/19/08 14:07	30.5			
8/19/08 15:47	37	8.64E-02	0.069	1.45E-05
8/19/08 17:02	40.5	6.21E-02	0.122	1.04E-05
8/20/08 8:43	60	2.76E-02	0.775	4.63E-06
8/20/08 9:35	61.4	3.58E-02	0.811	6.02E-06
8/20/08 15:00	64.5	1.27E-02	1.037	2.13E-06
8/21/08 8:05	73	1.10E-02	1.749	1.85E-06
8/21/08 12:30	74.6	8.03E-03	1.933	1.35E-06
8/21/08 16:05	76	8.66E-03	2.082	1.46E-06
8/22/08 8:27	40.5	-4.81E-02	2.764	
8/22/08 16:00	42.1	4.70E-03	3.078	7.90E-07
8/22/08 16:00	43	#DIV/0!	3.078	
8/23/08 7:46	47.1	5.76E-03	3.736	9.69E-07
8/23/08 11:57	48.75	8.73E-03	3.910	1.47E-06
8/23/08 15:42	50.3	9.18E-03	4.066	1.54E-06
8/24/08 7:55	55.3	6.83E-03	4.742	1.15E-06
8/24/08 12:11	56.9	8.31E-03	4.920	1.40E-06
8/24/08 15:37	58.2	8.39E-03	5.063	1.41E-06
8/25/08 8:22	63.4	6.88E-03	5.760	1.16E-06

Average 1.28E-06



Single-Stage Constant Head Borehole Test Helena - Store-and-Release Cover

Project: Helena
Date: 08/19/08
Test ID: 1

Installer: XW
Analyst: JS

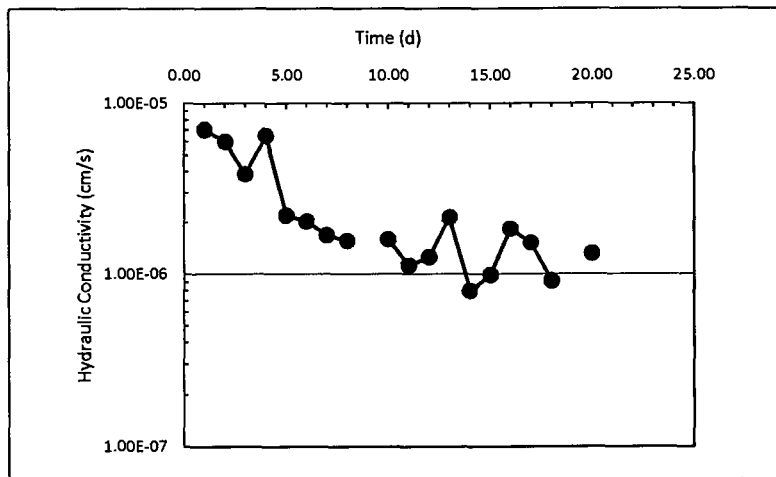
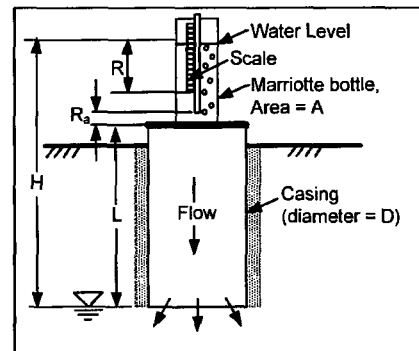
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
 R_a (cm): 10
L (cm): 60.96

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
8/19/08 14:08	45.7			
8/19/08 15:47	48.8	4.16E-02	0.069	7.00E-06
8/19/08 17:02	50.8	3.55E-02	0.121	5.96E-06
8/20/08 8:43	67	2.29E-02	0.774	3.85E-06
8/20/08 9:35	68.5	3.84E-02	0.810	6.45E-06
8/20/08 15:00	71.7	1.31E-02	1.036	2.20E-06
8/21/08 8:05	81	1.21E-02	1.748	2.03E-06
8/21/08 12:30	83	1.00E-02	1.932	1.69E-06
8/21/08 16:05	84.5	9.28E-03	2.081	1.56E-06
8/22/08 8:27	38.9	-6.18E-02	2.763	
8/22/08 12:40	40.7	9.46E-03	2.939	1.59E-06
8/22/08 16:00	41.7	6.65E-03	3.078	1.12E-06
8/23/08 7:46	47	7.45E-03	3.735	1.25E-06
8/23/08 11:57	49.4	1.27E-02	3.909	2.14E-06
8/23/08 15:42	50.2	4.74E-03	4.065	7.97E-07
8/24/08 7:55	54.5	5.88E-03	4.741	9.88E-07
8/24/08 12:11	56.6	1.09E-02	4.919	1.83E-06
8/24/08 15:37	58.0	9.03E-03	5.062	1.52E-06
8/25/08 8:22	62.1	5.43E-03	5.760	9.13E-07

Average 1.31E-06



Single-Stage Constant Head Borehole Test Helena - Store-and-Release Cover

Project: Helena
Date: 08/19/08
Test ID: 1

Installer: XW
Analyst: JS

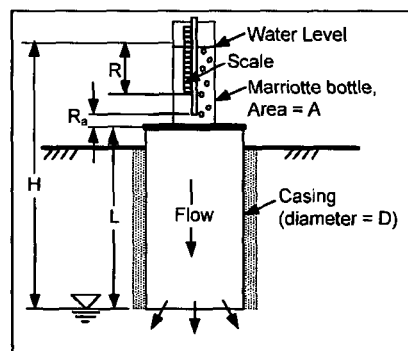
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:

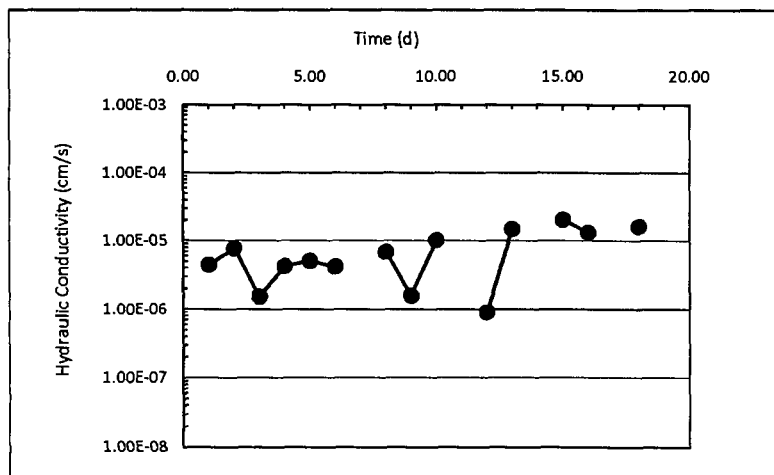
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
8/19/08 17:50	36.5			
8/20/08 8:43	54.2	2.64E-02	0.620	4.43E-06
8/20/08 9:35	56	4.60E-02	0.656	7.74E-06
8/20/08 15:00	58.2	9.00E-03	0.882	1.51E-06
8/21/08 8:05	77.5	2.50E-02	1.594	4.21E-06
8/21/08 12:30	83.5	3.01E-02	1.778	5.06E-06
8/21/08 16:05	87.5	2.47E-02	1.927	4.16E-06
8/22/08 8:35	36.4	-6.86E-02	2.615	
8/22/08 12:40	43.9	4.07E-02	2.785	6.85E-06
8/22/08 16:00	45.3	9.31E-03	2.924	1.57E-06
8/23/08 7:46	88.5	6.07E-02	3.581	1.02E-05
8/23/08 7:47	48.5	-8.63E+01	3.581	
8/23/08 11:57	49.5	5.31E-03	3.755	8.92E-07
8/23/08 15:42	64.5	8.88E-02	3.911	1.49E-05
8/24/08 7:55	51	-1.85E-02	4.587	
8/24/08 12:11	74.5	1.22E-01	4.765	2.05E-05
8/24/08 15:37	86.7	7.87E-02	4.908	1.32E-05

Average 1.62E-05



Bottle leaking from coupler

Still leaking from coupler



Single-Stage Constant Head Borehole Test Monticello - Store-an-Release Cover

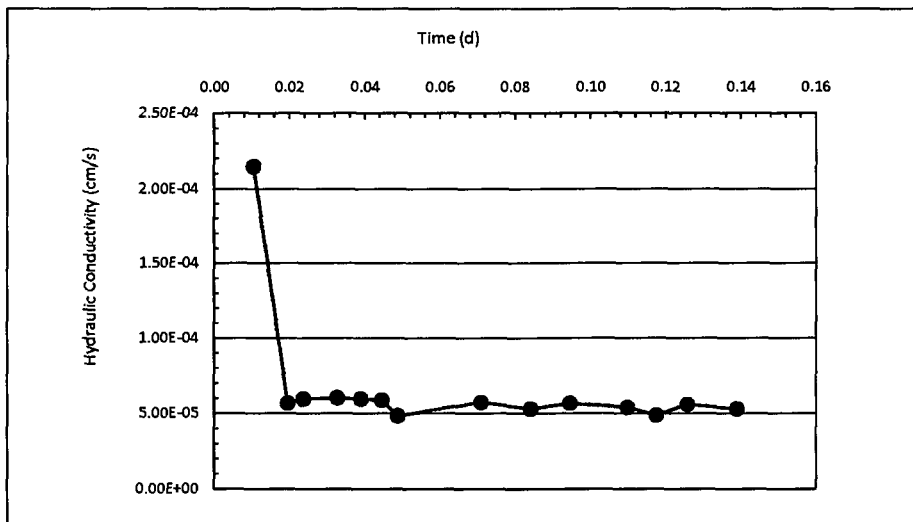
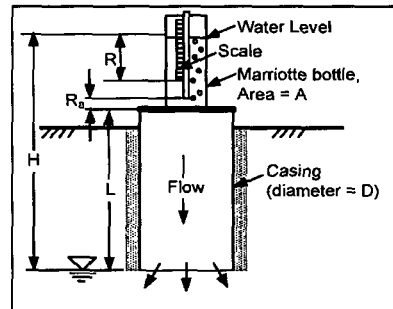
Project: Monticello
Date: 07/23/07
Test ID: MC-1

Installer: XW
Analyst: CHB

Fixed Variables:
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:		Computations:		
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
8:57:00	22.7			
9:12:00	37.1	1.28E+00	0.0104	2.15E-04
9:25:00	40.4	3.38E-01	0.0194	5.68E-05
9:31:00	42.0	3.55E-01	0.0236	5.96E-05
9:44:00	45.5	3.58E-01	0.0326	6.02E-05
9:53:00	47.9	3.55E-01	0.0389	5.96E-05
10:01:00	50.0	3.49E-01	0.0444	5.87E-05
10:07:00	51.3	2.88E-01	0.0486	4.84E-05
10:39:00	59.5	3.41E-01	0.0708	5.73E-05
10:58:00	64.0	3.15E-01	0.0840	5.30E-05
11:13:00	67.8	3.37E-01	0.0944	5.66E-05
11:35:00	73.1	3.20E-01	0.1097	5.39E-05
11:46:00	75.5	2.90E-01	0.1174	4.88E-05
11:58:00	78.5	3.33E-01	0.1257	5.59E-05
12:17:00	83.0	3.15E-01	0.1389	5.30E-05
12:37:00	87.5			

AVG
5.26E-05



Single-Stage Constant Head Borehole Test Monticello - Store-and-Release Cover

Project: Monticello
Date: 07/23/07
Test ID: MC-2

Installer: XW
Analyst: CHB

Fixed Variables:

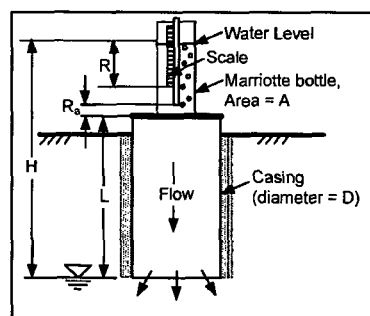
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 30.48

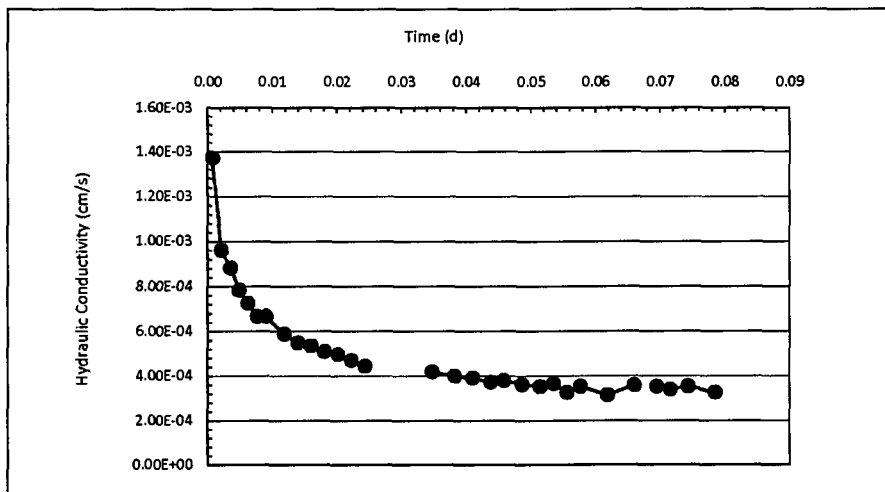
Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
12:59:00	38.0			
13:00:00	41.5	4.66E+00	0.001	1.37E-03
13:02:00	46.4	3.26E+00	0.002	9.60E-04
13:04:00	50.9	2.99E+00	0.003	8.82E-04
13:06:00	54.9	2.66E+00	0.005	7.84E-04
13:08:00	58.6	2.46E+00	0.006	7.25E-04
13:10:00	62.0	2.26E+00	0.008	6.66E-04
13:12:00	65.4	2.26E+00	0.009	6.66E-04
13:16:00	71.4	1.99E+00	0.012	5.88E-04
13:19:00	75.6	1.86E+00	0.014	5.49E-04
13:22:00	79.7	1.82E+00	0.016	5.36E-04
13:25:00	83.6	1.73E+00	0.018	5.10E-04
13:28:00	87.4	1.68E+00	0.020	4.97E-04
13:31:00	91.0	1.60E+00	0.022	4.70E-04
13:34:00	94.4	1.51E+00	0.024	4.44E-04
13:38:00	39.3	-1.83E+01	0.027	
13:40:00	41.6	1.53E+00	0.028	
13:43:00	45.1	1.55E+00	0.031	
13:46:00	48.4	1.46E+00	0.033	
13:49:00	51.6	1.42E+00	0.035	4.18E-04
13:54:00	56.7	1.36E+00	0.038	4.00E-04
13:58:00	60.7	1.33E+00	0.041	3.92E-04
14:02:00	64.5	1.26E+00	0.044	3.72E-04
14:05:00	67.4	1.29E+00	0.046	3.79E-04
14:09:00	71.1	1.23E+00	0.049	3.63E-04
14:13:00	74.7	1.20E+00	0.051	3.53E-04
14:16:00	77.5	1.24E+00	0.053	3.66E-04
14:19:00	80.0	1.11E+00	0.056	3.27E-04
14:22:00	82.7	1.20E+00	0.058	3.53E-04
14:28:00	87.5	1.06E+00	0.062	3.14E-04
14:34:00	93.0	1.22E+00	0.066	3.59E-04
14:37:00	36.0		0.068	
14:39:00	37.8	1.20E+00	0.069	3.53E-04
14:42:00	40.4	1.15E+00	0.072	3.40E-04
14:46:00	44.0	1.20E+00	0.074	3.53E-04
14:52:00	49.0	1.11E+00	0.078	3.27E-04
14:58:00	53.9	1.09E+00	0.083	3.20E-04
15:07:00	61.1	1.06E+00	0.089	3.14E-04
15:21:00	72.3	1.06E+00	0.099	3.14E-04
15:31:00	80.0	1.02E+00	0.106	3.02E-04
15:52:00	95.7	9.94E-01	0.120	2.93E-04

AVG

3.08E-04





Single-Stage Constant Head Borehole Test Monitcello - Store-and-Release Cover

Project: Monticello
Date: 07/24/07
Test ID: MC-3

Installer: XW
Analyst: CHB

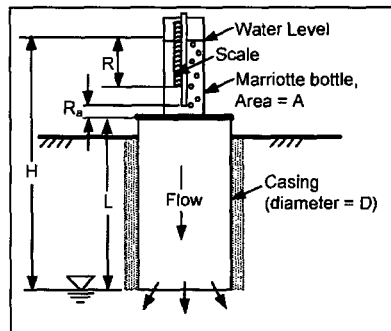
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_a (cm): 10
L (cm): 30.48

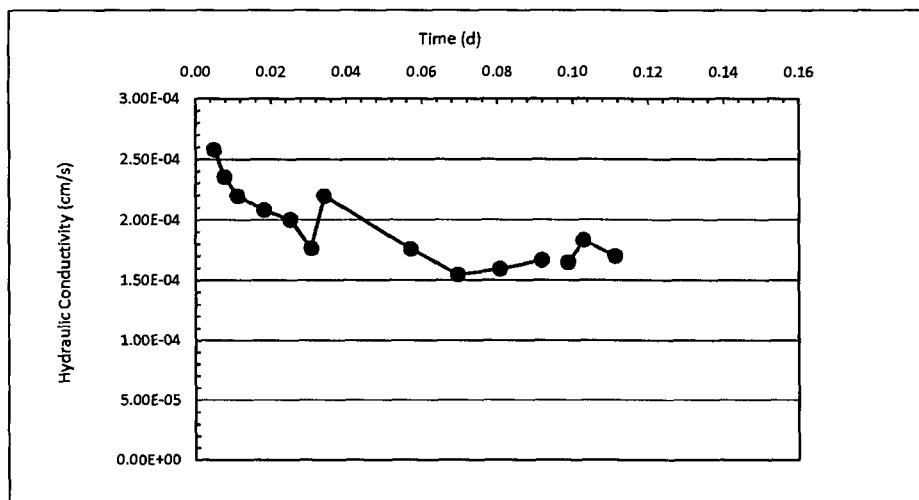
Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
9:17:00	30.0			
9:24:00	34.6	8.74E-01	0.005	2.58E-04
9:28:00	37.0	7.98E-01	0.008	2.35E-04
9:33:00	39.8	7.45E-01	0.011	2.20E-04
9:43:00	45.1	7.05E-01	0.018	2.08E-04
9:53:00	50.2	6.78E-01	0.025	2.00E-04
10:01:00	53.8	5.98E-01	0.031	1.76E-04
10:06:00	56.6	7.45E-01	0.034	2.20E-04
10:39:00	71.4	5.96E-01	0.057	1.76E-04
10:57:00	78.5	5.25E-01	0.069	1.55E-04
11:13:00	85.0	5.40E-01	0.081	1.59E-04
11:29:00	91.8	5.65E-01	0.092	1.67E-04
11:34:00	36.0	-1.48E+01	0.095	
11:39:00	38.1	5.59E-01	0.099	1.65E-04
11:45:00	40.9	6.21E-01	0.103	1.83E-04
11:57:00	46.1	5.76E-01	0.111	1.70E-04
12:03:00	48.7	5.76E-01	0.115	
12:16:00	54.2	5.63E-01	0.124	
12:36:00	62.5	5.52E-01	0.138	



AVG
1.70E-04



Single-Stage Constant Head Borehole Test Monitcello - Store-and-Release Cover

Project: Monticello
Date: 07/25/07
Test ID: MC-5

Installer: XW
Analyst: CHB

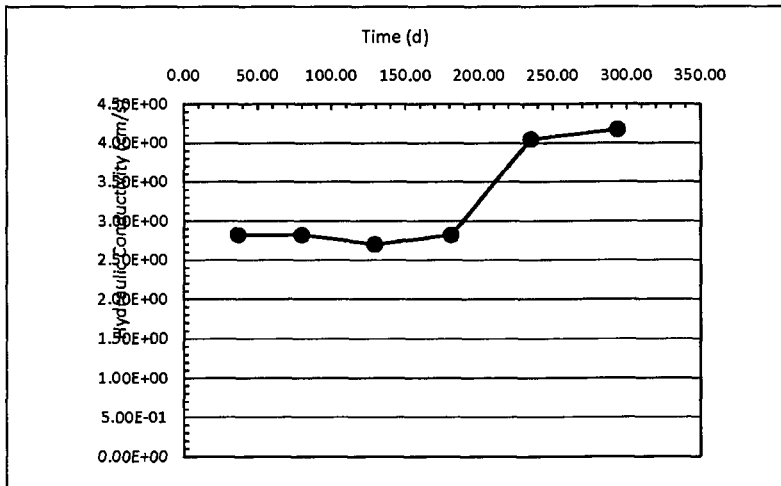
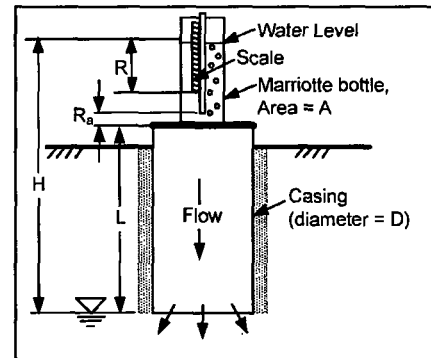
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_a (cm): 10
L (cm): 60.96

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
14:22:00	32.7			
14:24:00	36.5	1.68E+04	36.5	2.82E+00
14:29:00	43.1	1.68E+04	79.6	2.82E+00
14:34:00	49.4	1.60E+04	129	2.70E+00
14:36:00	51.7	1.68E+04	180.7	2.82E+00
14:38:00	54.1	2.41E+04	234.8	4.05E+00
14:42:00	58.7	2.48E+04	293.5	4.17E+00

AVG
2.79E+00



Borehole Hydraulic Conductivity Test Calculator - Isotropic Analysis Monticello - Store-and-Release Cover

Equilibrium Evaluation & Steady Hydraulic Conductivity Determination

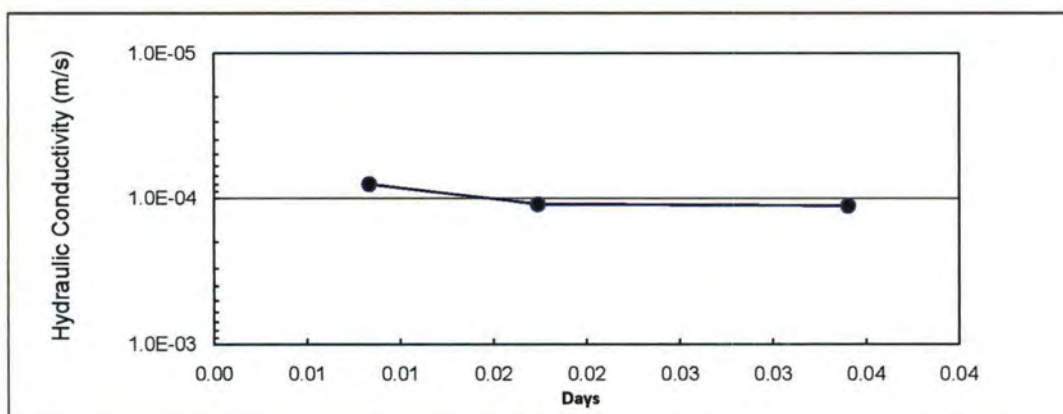
Trial	Time (d)	Total Time (d)	K (m/s)
1	0.008	0.008	7.99E-05
2	0.009	0.017	1.10E-04
3	0.017	0.034	1.13E-04

TSB-4

Field Hydraulic Conductivity

1.13E-04 m/s

1.13E-02 cm/s



Single-Stage Constant Head Borehole Test Omaha - Composite Cover

Project: Omaha
Date: 05/19/08
Test ID: TS81-composite

Installer: XW
Analyst: CHB

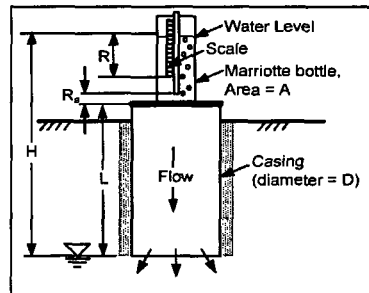
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 19.44 (50 mm standpipe)
 R_s (cm): 10
L (cm): 60.96

Temporal Variables:

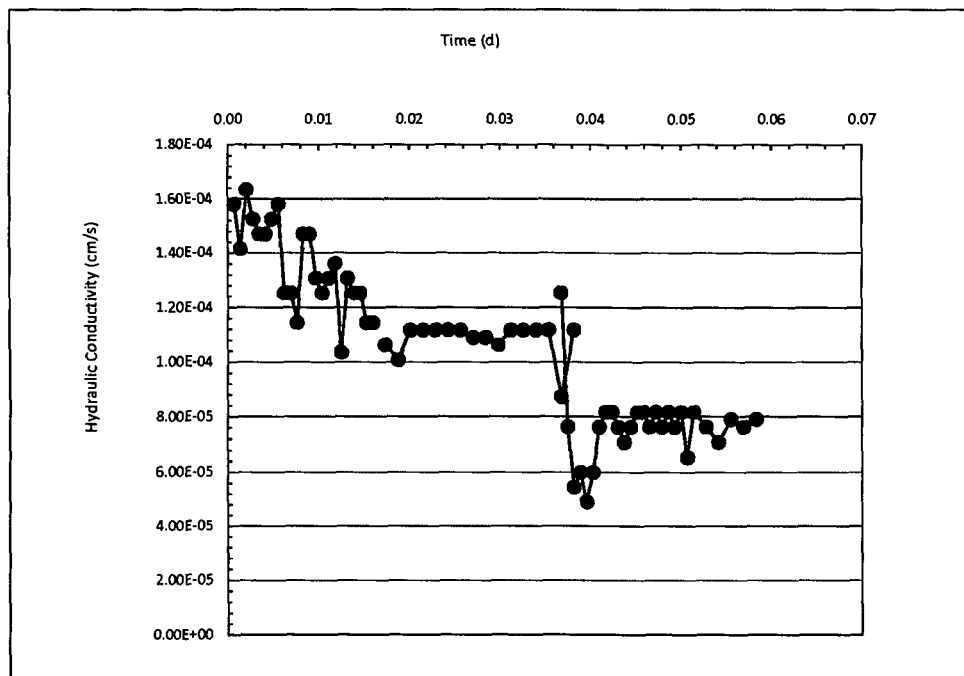
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
4:05:00	35.5			
4:06:00	38.4	9.40E-01	0.0007	1.58E-04
4:07:00	41.0	8.42E-01	0.0014	1.42E-04
4:08:00	44.0	9.72E-01	0.0021	1.63E-04
4:09:00	46.8	9.07E-01	0.0028	1.53E-04
4:10:00	49.5	8.75E-01	0.0035	1.47E-04
4:11:00	52.2	8.75E-01	0.0042	1.47E-04
4:12:00	55.0	9.07E-01	0.0049	1.53E-04
4:13:00	57.9	9.40E-01	0.0056	1.58E-04
4:14:00	60.2	7.45E-01	0.0063	1.25E-04
4:15:00	62.5	7.45E-01	0.0069	1.25E-04
4:16:00	64.6	6.80E-01	0.0076	1.14E-04
4:17:00	67.3	8.75E-01	0.0083	1.47E-04
4:18:00	70.0	8.75E-01	0.0090	1.47E-04
4:19:00	72.4	7.78E-01	0.0097	1.31E-04
4:20:00	74.7	7.45E-01	0.0104	1.25E-04
4:21:00	77.1	7.78E-01	0.0111	1.31E-04
4:22:00	79.6	8.10E-01	0.0118	1.36E-04
4:23:00	81.5	6.16E-01	0.0125	1.03E-04
4:24:00	83.9	7.78E-01	0.0132	1.31E-04
4:25:00	86.2	7.45E-01	0.0139	1.25E-04
4:26:00	88.5	7.45E-01	0.0146	1.25E-04
4:27:00	90.6	6.80E-01	0.0153	1.14E-04
4:28:00	92.7	6.80E-01	0.0160	1.14E-04
9:16:00	31.5			
9:18:00	35.4	6.32E-01	0.0174	1.06E-04
9:20:00	39.1	5.99E-01	0.0188	1.01E-04
9:22:00	43.2	6.64E-01	0.0201	1.12E-04
9:24:00	47.3	6.64E-01	0.0215	1.12E-04
9:26:00	51.4	6.64E-01	0.0229	1.12E-04
9:28:00	55.5	6.64E-01	0.0243	1.12E-04
9:30:00	59.6	6.64E-01	0.0257	1.12E-04
9:32:00	63.6	6.48E-01	0.0271	1.09E-04
9:34:00	67.6	6.48E-01	0.0285	1.09E-04
9:36:00	71.5	6.32E-01	0.0299	1.06E-04
9:38:00	75.6	6.64E-01	0.0313	1.12E-04
9:40:00	79.7	6.64E-01	0.0326	1.12E-04
9:42:00	83.8	6.64E-01	0.0340	1.12E-04
9:44:00	87.9	6.64E-01	0.0354	1.12E-04
9:46:00	91.1	5.18E-01	0.0368	8.72E-05
9:48:00	95.2	6.64E-01	0.0382	1.12E-04

Computations:



10:06:00	30.0			
10:08:00	34.6	7.45E-01	0.0368	1.25E-04
10:09:00	36.0	4.54E-01	0.0375	7.63E-05
10:10:00	37.0	3.24E-01	0.0382	5.45E-05
10:11:00	38.1	3.56E-01	0.0389	5.99E-05
10:12:00	39.0	2.92E-01	0.0396	4.90E-05
10:13:00	40.1	3.56E-01	0.0403	5.99E-05
10:14:00	41.5	4.54E-01	0.0410	7.63E-05
10:15:00	43.0	4.86E-01	0.0417	8.17E-05
10:16:00	44.5	4.86E-01	0.0424	8.17E-05
10:17:00	45.9	4.54E-01	0.0431	7.63E-05
10:18:00	47.2	4.21E-01	0.0438	7.08E-05
10:19:00	48.6	4.54E-01	0.0444	7.63E-05
10:20:00	50.1	4.86E-01	0.0451	8.17E-05
10:21:00	51.6	4.86E-01	0.0458	8.17E-05
10:22:00	53.0	4.54E-01	0.0465	7.63E-05
10:23:00	54.5	4.86E-01	0.0472	8.17E-05
10:24:00	55.9	4.54E-01	0.0479	7.63E-05
10:25:00	57.4	4.86E-01	0.0486	8.17E-05
10:26:00	58.8	4.54E-01	0.0493	7.63E-05
10:27:00	60.3	4.86E-01	0.0500	8.17E-05
10:28:00	61.5	3.89E-01	0.0507	6.54E-05
10:29:00	63.0	4.86E-01	0.0514	8.17E-05
10:31:00	65.8	4.54E-01	0.0528	7.63E-05
10:33:00	68.4	4.21E-01	0.0542	7.08E-05
10:35:00	71.3	4.70E-01	0.0556	7.90E-05
10:37:00	74.1	4.54E-01	0.0569	7.63E-05
10:39:00	77.0	4.70E-01	0.0583	7.90E-05

AVG
7.81E-05



Single-Stage Constant Head Borehole Test Omaha - Composite Cover

Project: Omaha
Date: 05/19/08
Test ID: TSB2-composite

Installer: XW
Analyst: CHB

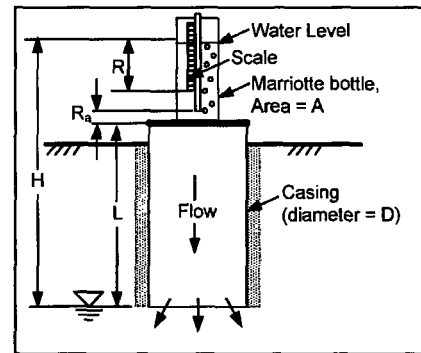
Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 19.44 (50 mm standpipe)
 R_s (cm): 10
 L (cm): 60.96

Temporal Variables:

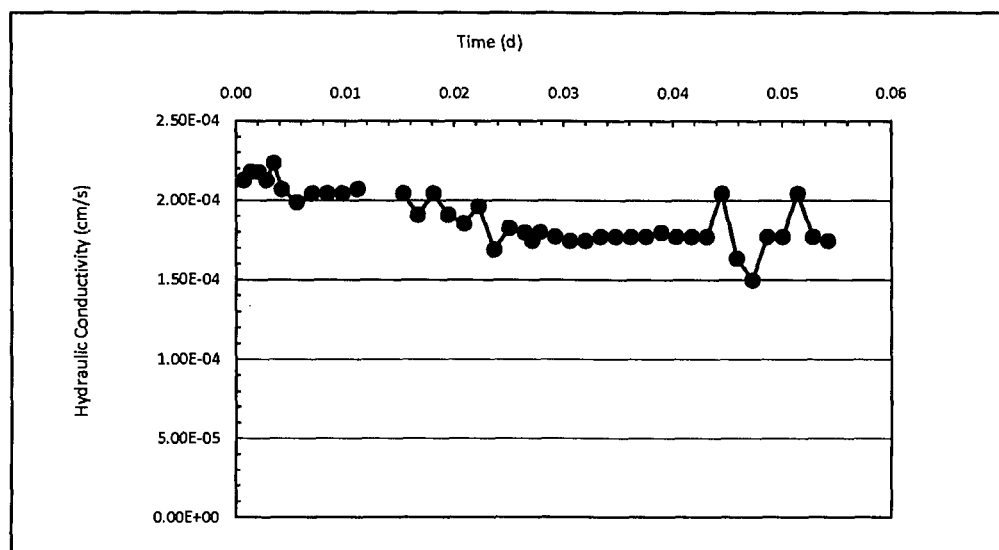
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
3:17:00	32.5			
3:18:00	36.4	1.26E+00	0.001	2.12E-04
3:19:00	40.4	1.30E+00	0.001	2.18E-04
3:20:00	44.4	1.30E+00	0.002	2.18E-04
3:21:00	48.3	1.26E+00	0.003	2.12E-04
3:22:00	52.4	1.33E+00	0.003	2.23E-04
3:23:00	56.2	1.23E+00	0.004	2.07E-04
3:25:00	63.5	1.18E+00	0.006	1.99E-04
3:27:00	71.0	1.21E+00	0.007	2.04E-04
3:29:00	78.5	1.22E+00	0.008	2.04E-04
3:31:00	86.0	1.22E+00	0.010	2.04E-04
3:33:00	93.6	1.23E+00	0.011	2.07E-04
3:37:00	34.5			
3:39:00	42.0	1.22E+00	0.015	2.04E-04
3:41:00	49.0	1.13E+00	0.017	1.91E-04
3:43:00	56.5	1.22E+00	0.018	2.04E-04
3:45:00	63.5	1.13E+00	0.019	1.91E-04
3:47:00	70.3	1.10E+00	0.021	1.85E-04
3:49:00	77.5	1.17E+00	0.022	1.96E-04
3:51:00	83.7	1.00E+00	0.024	1.69E-04
3:53:00	90.4	1.09E+00	0.025	1.82E-04
3:55:00	97.0	1.07E+00	0.026	1.80E-04
9:13:00	31.2			
9:14:00	34.4	1.04E+00	0.027	1.74E-04
9:15:00	37.7	1.07E+00	0.028	1.80E-04
9:17:00	44.2	1.05E+00	0.029	1.77E-04
9:19:00	50.6	1.04E+00	0.031	1.74E-04
9:21:00	57.0	1.04E+00	0.032	1.74E-04
9:23:00	63.5	1.05E+00	0.033	1.77E-04
9:25:00	70.0	1.05E+00	0.035	1.77E-04
9:27:00	76.5	1.05E+00	0.036	1.77E-04
9:29:00	83.0	1.05E+00	0.038	1.77E-04
9:31:00	89.6	1.07E+00	0.039	1.80E-04
9:33:00	96.1	1.05E+00	0.040	1.77E-04

Computations:



9:37:00	31.0			
9:39:00	37.5	1.05E+00	0.042	1.77E-04
9:41:00	44.0	1.05E+00	0.043	1.77E-04
9:43:00	51.5	1.22E+00	0.044	2.04E-04
9:45:00	57.5	9.72E-01	0.046	1.63E-04
9:47:00	63.0	8.91E-01	0.047	1.50E-04
9:49:00	69.5	1.05E+00	0.049	1.77E-04
9:51:00	76.0	1.05E+00	0.050	1.77E-04
9:53:00	83.5	1.22E+00	0.051	2.04E-04
9:55:00	90.0	1.05E+00	0.053	1.77E-04
9:57:00	96.4	1.04E+00	0.054	1.74E-04

AVG
1.77E-04



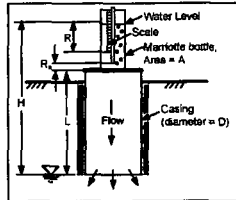
Single-Stage Constant Head Borehole Test Omaha - Composite Cover

Project: Omaha
Date: 05/19/08
Test ID: T503-composite

Installer: XW
Analyst: CHS

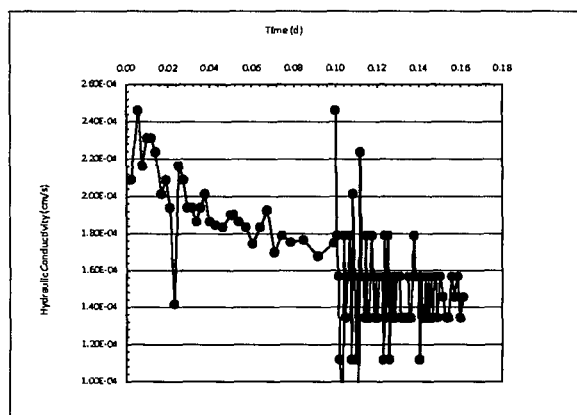
Fixed Variables:
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:		Computations:		
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
1:54	34.0			
1:57	36.8	1.24E+00	0.002	2.09E-04
2:02	42.3	1.46E+00	0.006	2.46E-04
2:05	45.2	1.29E+00	0.008	2.16E-04
2:08	48.3	1.37E+00	0.010	2.31E-04
2:11	51.4	1.37E+00	0.012	2.31E-04
2:14	54.4	1.38E+00	0.014	2.34E-04
2:18	58.0	1.20E+00	0.017	2.01E-04
2:21	60.8	1.24E+00	0.019	2.09E-04
2:24	63.4	1.15E+00	0.021	1.94E-04
2:27	65.3	8.42E-01	0.023	1.42E-04
2:30	68.2	1.29E+00	0.025	2.16E-04
2:33	71.0	1.24E+00	0.027	2.09E-04
2:36	73.6	1.15E+00	0.029	1.94E-04
2:39	76.2	1.15E+00	0.031	1.94E-04
2:42	78.7	1.11E+00	0.033	1.86E-04
2:45	81.3	1.13E+00	0.035	1.94E-04
2:48	84.0	1.20E+00	0.038	2.01E-04
2:51	86.5	1.11E+00	0.040	1.86E-04
2:55	89.8	1.10E+00	0.042	1.84E-04
3:00	93.9	1.09E+00	0.046	1.83E-04
3:06	99.0	1.13E+00	0.050	1.90E-04
3:10:00	33.3			
3:12:00	35.0	1.13E+00	0.051	1.90E-04
3:15:00	37.5	1.11E+00	0.053	1.86E-04
3:20:00	41.6	1.09E+00	0.057	1.83E-04
3:25:00	45.5	1.04E+00	0.060	1.74E-04
3:30:00	49.6	1.09E+00	0.064	1.83E-04
3:35:00	53.9	1.14E+00	0.067	1.92E-04
3:40:00	57.7	1.01E+00	0.071	1.70E-04
3:45:00	61.7	1.08E+00	0.074	1.79E-04
3:51:00	66.4	1.04E+00	0.078	1.75E-04
4:00:00	73.5	1.05E+00	0.085	1.76E-04
4:10:00	81.0	9.97E-01	0.092	1.68E-04
4:21:00	89.6	1.04E+00	0.099	1.75E-04
9:04:00	30.3			
9:05:00	31.4	1.46E+00	0.100	2.46E-04
9:06:00	32.2	1.06E+00	0.101	1.75E-04
9:07:00	32.9	9.31E-01	0.101	1.57E-04
9:08:00	33.4	6.65E-01	0.102	1.12E-04
9:10:00	34.2	5.32E-01	0.103	8.94E-05
9:11:00	35.0	1.06E+00	0.104	1.79E-04
9:12:00	35.6	7.98E-01	0.105	1.34E-04
9:13:00	36.3	9.31E-01	0.106	1.57E-04
9:14:00	37.0	9.31E-01	0.106	1.57E-04
9:15:00	37.8	1.06E+00	0.107	1.79E-04
9:16:00	38.3	6.65E-01	0.108	1.12E-04
9:17:00	39.2	1.20E+00	0.108	2.01E-04
9:18:00	39.9	9.31E-01	0.109	1.57E-04
9:19:00	40.4	6.65E-01	0.110	1.12E-04
9:20:00	41.1	9.31E-01	0.110	1.57E-04
9:21:00	41.5	5.32E-01	0.111	8.94E-05
9:22:00	42.5	1.33E+00	0.112	2.24E-04
9:23:00	43.2	9.31E-01	0.113	1.57E-04
9:24:00	43.9	9.31E-01	0.113	1.57E-04
9:25:00	44.5	7.98E-01	0.114	1.34E-04
9:26:00	45.3	1.06E+00	0.115	1.79E-04
9:27:00	45.9	7.98E-01	0.115	1.34E-04
9:28:00	46.5	7.98E-01	0.116	1.34E-04
9:29:00	47.2	9.31E-01	0.117	1.57E-04
9:30:00	48.0	1.06E+00	0.117	1.79E-04
9:31:00	48.7	9.31E-01	0.118	1.57E-04
9:32:00	49.3	7.98E-01	0.119	1.34E-04
9:33:00	50.0	9.31E-01	0.119	1.57E-04
9:34:00	50.6	7.98E-01	0.120	1.34E-04
9:35:00	51.3	9.31E-01	0.121	1.57E-04
9:36:00	52.0	9.31E-01	0.122	1.57E-04
9:37:00	52.7	9.31E-01	0.122	1.57E-04
9:38:00	53.2	6.65E-01	0.123	1.12E-04
9:39:00	54.0	1.06E+00	0.124	1.79E-04
9:40:00	54.6	7.98E-01	0.124	1.34E-04
9:41:00	55.4	1.06E+00	0.125	1.79E-04
9:42:00	55.9	6.65E-01	0.126	1.12E-04
9:43:00	56.6	9.31E-01	0.126	1.57E-04
9:44:00	57.2	7.98E-01	0.127	1.34E-04
9:45:00	57.9	9.31E-01	0.128	1.57E-04
9:46:00	58.5	7.98E-01	0.128	1.34E-04
9:47:00	59.2	9.31E-01	0.129	1.57E-04
9:48:00	59.9	9.31E-01	0.130	1.57E-04
9:49:00	60.6	9.31E-01	0.131	1.57E-04
9:50:00	61.2	7.98E-01	0.131	1.34E-04
9:51:00	61.8	7.98E-01	0.132	1.34E-04
9:52:00	62.4	7.98E-01	0.133	1.34E-04
9:53:00	63.0	7.98E-01	0.133	1.34E-04
9:54:00	63.6	7.98E-01	0.134	1.34E-04



10:05:00	40.8			
10:06:00	41.5	9.31E-01	0.135	1.57E-04
10:07:00	42.1	7.98E-01	0.135	1.34E-04
10:08:00	42.7	7.98E-01	0.136	1.34E-04
10:09:00	43.4	9.31E-01	0.137	1.57E-04
10:10:00	44.2	1.06E+00	0.138	1.79E-04
10:11:00	44.9	9.31E-01	0.138	1.57E-04
10:12:00	45.6	9.31E-01	0.139	1.57E-04
10:13:00	46.3	9.31E-01	0.140	1.57E-04
10:14:00	46.8	6.65E-01	0.140	1.12E-04
10:15:00	47.5	9.31E-01	0.141	1.57E-04
10:16:00	48.1	7.98E-01	0.142	1.34E-04
10:17:00	48.7	7.98E-01	0.142	1.34E-04
10:18:00	49.4	9.31E-01	0.143	1.57E-04
10:19:00	50.0	7.98E-01	0.144	1.34E-04
10:20:00	50.7	9.31E-01	0.144	1.57E-04
10:21:00	51.3	7.98E-01	0.145	1.34E-04
10:22:00	52.0	9.31E-01	0.146	1.57E-04
10:23:00	52.6	7.98E-01	0.147	1.34E-04
10:24:00	53.3	9.31E-01	0.147	1.57E-04
10:25:00	54.0	9.31E-01	0.148	1.57E-04
10:26:00	54.6	7.98E-01	0.149	1.34E-04
10:28:00	56.0	9.31E-01	0.150	1.57E-04
10:30:00	57.3	8.65E-01	0.151	1.45E-04
10:32:00	58.5	7.98E-01	0.153	1.34E-04
10:34:00	59.7	7.98E-01	0.154	1.34E-04
10:36:00	61.1	9.31E-01	0.156	1.57E-04
10:38:00	62.4	8.65E-01	0.157	1.45E-04
10:40:00	63.8	9.31E-01	0.158	1.57E-04
10:42:00	65.0	7.98E-01	0.160	1.34E-04
10:44:00	66.3	8.65E-01	0.161	1.45E-04

AVG
1.75E-04

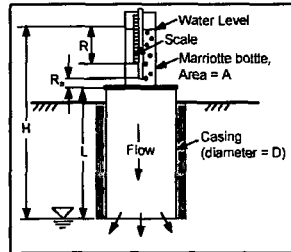


Single-Stage Constant Head Borehole Test Omaha - Composite Cover

Project: Omaha Installer: XW
Date: 05/19/08 Analyst: CHB
Test ID: TSB4-composite

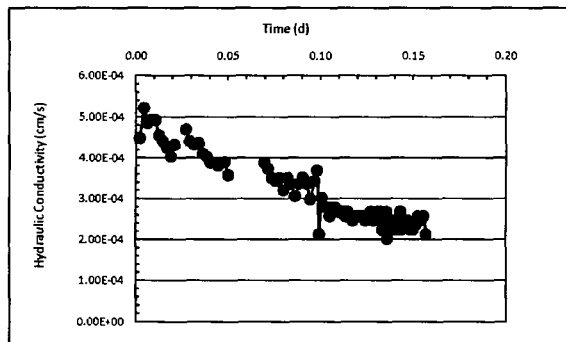
Fixed Variables:
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:		Computations:		
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
1:57:00	30.0			
2:00:00	36.0	2.66E+00	0.002	4.47E-04
2:03:00	43.0	3.10E+00	0.004	5.22E-04
2:06:00	49.5	2.88E+00	0.006	4.84E-04
2:09:00	56.1	2.93E+00	0.008	4.92E-04
2:12:00	62.7	2.93E+00	0.010	4.92E-04
2:15:00	68.8	2.70E+00	0.013	4.55E-04
2:19:00	76.5			
2:22:00	82.4	2.62E+00	0.015	4.40E-04
2:25:00	88.1	2.53E+00	0.017	4.25E-04
2:28:00	93.5	2.39E+00	0.019	4.02E-04
2:31:00	99.3	2.57E+00	0.021	4.32E-04
2:37:00	33.3			
2:40:00	39.6	2.79E+00	0.027	4.70E-04
2:43:00	45.5	2.62E+00	0.029	4.40E-04
2:46:00	51.3	2.57E+00	0.031	4.32E-04
2:50:00	59.1	2.59E+00	0.034	4.36E-04
2:53:00	64.6	2.44E+00	0.036	4.10E-04
2:56:00	70.0	2.39E+00	0.038	4.02E-04
2:59:00	75.2	2.31E+00	0.040	3.88E-04
3:02:00	80.4	2.31E+00	0.042	3.88E-04
3:05:00	85.5	2.26E+00	0.044	3.80E-04
3:10:00	94.2	2.31E+00	0.048	3.89E-04
3:13:00	99.0	2.13E+00	0.050	3.58E-04
3:38:00	32.0			
3:41:00	37.2	2.31E+00	0.069	3.88E-04
3:44:00	42.2	2.22E+00	0.072	3.73E-04
3:47:00	46.9	2.08E+00	0.074	3.50E-04
3:50:00	51.5	2.04E+00	0.076	3.43E-04
3:53:00	56.2	2.08E+00	0.078	3.50E-04
3:56:00	60.5	1.91E+00	0.080	3.21E-04
3:59:00	65.2	2.08E+00	0.082	3.50E-04
4:02:00	69.7	2.00E+00	0.084	3.35E-04
4:05:00	73.8	1.82E+00	0.086	3.06E-04
4:08:00	78.3	1.99E+00	0.088	3.35E-04
4:11:00	83.0	2.08E+00	0.090	3.50E-04
04:14:00	87.5	2.00E+00	0.092	3.35E-04
04:17:00	91.5	1.77E+00	0.094	2.98E-04
04:20:00	96.1	2.04E+00	0.097	3.43E-04
08:57:00	30.3			
08:59:00	33.6	2.19E+00	0.098	3.69E-04
09:01:00	35.5	1.76E+00	0.099	2.12E-04
09:03:00	38.2	1.80E+00	0.101	3.02E-04
09:05:00	40.7	1.66E+00	0.102	2.80E-04
09:07:00	43.2	1.66E+00	0.103	2.80E-04
09:09:00	45.5	1.53E+00	0.105	2.57E-04
09:11:00	48.0	1.66E+00	0.106	2.80E-04
09:13:00	50.5	1.66E+00	0.108	2.80E-04
09:15:00	52.9	1.60E+00	0.109	2.68E-04
09:17:00	55.3	1.60E+00	0.110	2.68E-04
09:19:00	57.7	1.60E+00	0.112	2.68E-04
09:21:00	60.0	1.53E+00	0.113	2.57E-04
09:23:00	62.4	1.60E+00	0.115	2.68E-04
09:25:00	64.7	1.53E+00	0.116	2.57E-04
09:27:00	66.9	1.46E+00	0.117	2.46E-04
09:29:00	69.2	1.53E+00	0.119	2.57E-04
09:31:00	71.5	1.53E+00	0.120	2.57E-04
09:33:00	73.8	1.53E+00	0.122	2.57E-04
09:35:00	76.1	1.53E+00	0.123	2.57E-04
09:37:00	78.3	1.46E+00	0.124	2.46E-04
09:39:00	80.6	1.53E+00	0.126	2.57E-04
09:41:00	83.0	1.60E+00	0.127	2.68E-04
09:43:00	85.2	1.46E+00	0.128	2.46E-04
09:45:00	87.5	1.53E+00	0.130	2.57E-04



10:05:00	42.9			
10:06:00	44.1	1.60E+00	0.131	2.68E-04
10:07:00	45.2	1.46E+00	0.131	2.46E-04
10:08:00	46.3	1.46E+00	0.132	2.46E-04
10:09:00	47.5	1.60E+00	0.133	2.68E-04
10:10:00	48.5	1.33E+00	0.133	2.24E-04
10:11:00	49.6	1.46E+00	0.134	2.46E-04
10:12:00	50.7	1.46E+00	0.135	2.46E-04
10:13:00	51.9	1.60E+00	0.135	2.68E-04
10:14:00	52.8	1.20E+00	0.136	2.01E-04
10:15:00	53.9	1.46E+00	0.137	2.46E-04
10:16:00	54.9	1.33E+00	0.138	2.24E-04
10:17:00	56.0	1.46E+00	0.138	2.46E-04
10:18:00	57.0	1.33E+00	0.139	2.24E-04
10:19:00	58.1	1.46E+00	0.140	2.46E-04
10:20:00	59.1	1.33E+00	0.140	2.24E-04
10:21:00	60.2	1.46E+00	0.141	2.46E-04
10:22:00	61.3	1.46E+00	0.142	2.46E-04
10:23:00	62.3	1.33E+00	0.142	2.24E-04
10:24:00	63.5	1.60E+00	0.143	2.68E-04
10:25:00	64.5	1.33E+00	0.144	2.24E-04
10:26:00	65.6	1.46E+00	0.144	2.46E-04
10:28:00	67.8	1.46E+00	0.146	2.46E-04
10:30:00	70.0	1.46E+00	0.147	2.46E-04
10:32:00	72.0	1.33E+00	0.149	2.24E-04
10:34:00	74.0	1.33E+00	0.150	2.24E-04
10:36:00	76.1	1.40E+00	0.151	2.35E-04
10:38:00	78.4	1.53E+00	0.153	2.57E-04
10:40:00	80.6	1.46E+00	0.154	2.46E-04
10:42:00	82.9	1.53E+00	0.156	2.57E-04
10:44:00	84.8	1.26E+00	0.157	2.12E-04

AVG
3.25E-04



Single-Stage Constant Head Borehole Test - Omaha - Thick Store-and-Release Cover

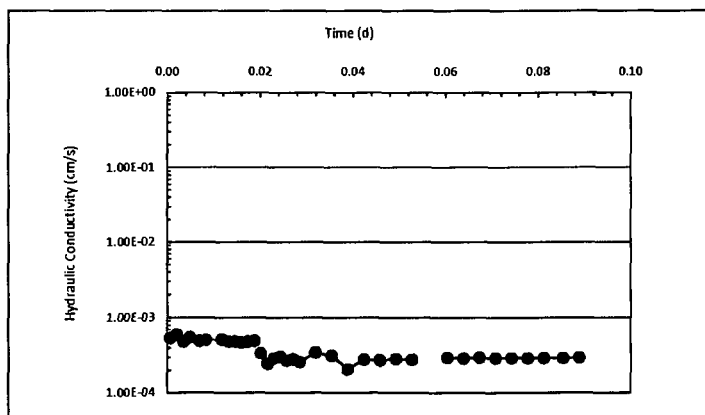
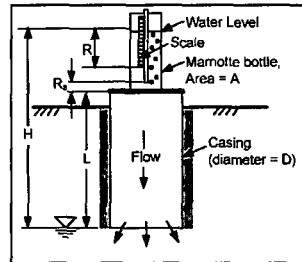
Project: Omaha
 Date: 05/19/08
 Test ID: TSB1-thick-deep

Installer: XW
 Analyst: CHB

Fixed Variables:
 Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 60.96

Temporal Variables:		Computations:		
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
5:22:00	30.0			
5:23:00	32.4	3.19E+00	0.001	5.37E-04
5:25:00	37.7	3.52E+00	0.002	5.93E-04
5:27:00	42.0	2.86E+00	0.003	4.81E-04
5:29:00	46.9	3.26E+00	0.005	5.48E-04
5:32:00	53.5	2.93E+00	0.007	4.92E-04
5:34:00	58.0	2.99E+00	0.008	5.03E-04
5:39:00	69.5	3.06E+00	0.012	5.14E-04
5:41:00	73.8	2.86E+00	0.013	4.81E-04
5:43:00	78.1	2.86E+00	0.015	4.81E-04
5:45:00	82.3	2.79E+00	0.016	4.70E-04
5:47:00	86.6	2.86E+00	0.017	4.81E-04
5:49:00	91.0	2.93E+00	0.019	4.92E-04
9:06:00	30.5			
9:08:00	33.5	2.00E+00	0.020	3.35E-04
9:10:00	35.7	1.46E+00	0.022	2.46E-04
9:12:00	38.3	1.73E+00	0.023	2.91E-04
9:14:00	41.0	1.80E+00	0.024	3.02E-04
9:16:00	43.4	1.60E+00	0.026	2.68E-04
9:18:00	45.9	1.66E+00	0.027	2.80E-04
9:20:00	48.2	1.53E+00	0.028	2.57E-04
9:25:00	55.9	2.05E+00	0.032	3.44E-04
9:30:00	62.9	1.86E+00	0.035	3.13E-04
9:35:00	67.5	1.22E+00	0.039	2.06E-04
9:40:00	73.7	1.65E+00	0.042	2.77E-04
9:45:00	79.8	1.62E+00	0.046	2.73E-04
9:50:00	86.1	1.68E+00	0.049	2.82E-04
9:55:00	92.3	1.65E+00	0.053	2.77E-04
10:00:00	31.0		0.056	
10:06:00	38.9	1.75E+00	0.060	2.94E-04
10:11:00	45.3	1.70E+00	0.064	2.86E-04
10:16:00	51.9	1.76E+00	0.067	2.95E-04
10:21:00	58.4	1.73E+00	0.071	2.91E-04
10:26:00	64.9	1.73E+00	0.074	2.91E-04
10:31:00	71.4	1.73E+00	0.078	2.91E-04
10:36:00	77.9	1.73E+00	0.081	2.91E-04
10:42:00	85.7	1.73E+00	0.085	2.91E-04
10:47:00	92.3	1.76E+00	0.089	2.95E-04

AVG
 2.92E-04



Single-Stage Constant Head Borehole Test - Omaha - Thick Store-and-Release Cover

Project: Omaha Installer: XW
 Date: 05/19/08 Analyst: CHB
 Test ID: TS82-Thick (Shallow Test)

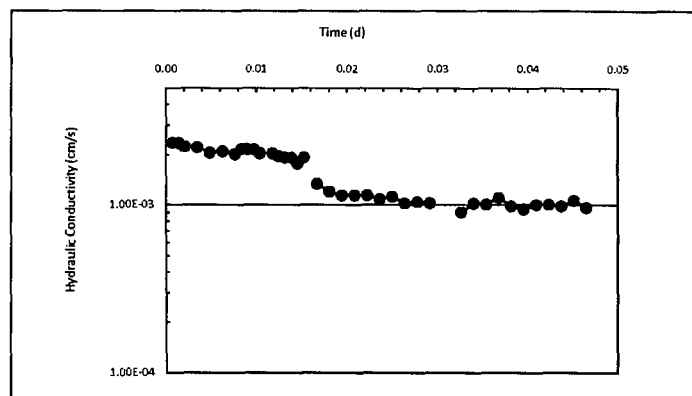
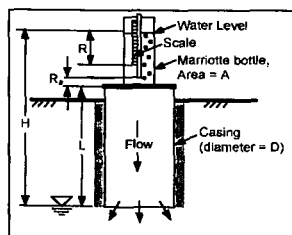
Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R₀ (cm): 10
 L (cm): 30.48

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
1:00:00	35.5			
1:01:00	41.5	7.98E+00	0.0007	2.35E-03
1:02:00	47.5	7.98E+00	0.0014	2.35E-03
1:03:00	53.2	7.58E+00	0.0021	2.23E-03
1:05:00	64.5	7.51E+00	0.0035	2.21E-03
1:07:00	75.0	6.98E+00	0.0049	2.06E-03
1:09:00	85.7	7.12E+00	0.0063	2.10E-03
1:11:00	96.0	6.85E+00	0.0076	2.02E-03
2:00:00	31.5	-1.75E+00	0.0076	
2:01:00	37.0	7.32E+00	0.0083	2.16E-03
2:02:00	42.5	7.32E+00	0.0090	2.16E-03
2:03:00	48.0	7.32E+00	0.0097	2.16E-03
2:04:00	53.2	6.92E+00	0.0104	2.04E-03
2:05:00	58.0	6.38E+00	0.0111	
2:06:00	63.2	6.92E+00	0.0118	2.04E-03
2:07:00	68.2	6.65E+00	0.0125	1.96E-03
2:08:00	73.1	6.52E+00	0.0132	1.92E-03
2:09:00	78.0	6.52E+00	0.0139	1.92E-03
2:10:00	82.5	5.99E+00	0.0146	1.76E-03
2:11:00	87.4	6.52E+00	0.0152	1.92E-03
8:58:00	31.0			
9:00:00	37.8	4.52E+00	0.0166	1.33E-03
9:02:00	43.9	4.06E+00	0.0180	1.20E-03
9:04:00	49.7	3.86E+00	0.0194	1.14E-03
9:06:00	55.5	3.86E+00	0.0208	1.14E-03
9:08:00	61.3	3.86E+00	0.0222	1.14E-03
9:10:00	66.8	3.66E+00	0.0236	1.08E-03
9:12:00	72.5	3.79E+00	0.0250	1.12E-03
9:14:00	77.7	3.46E+00	0.0264	1.02E-03
9:16:00	83.0	3.52E+00	0.0277	1.04E-03
9:18:00	88.2	3.46E+00	0.0291	1.02E-03
9:21:00	34.3		0.0312	
9:23:00	38.9	3.06E+00	0.0326	9.02E-04
9:25:00	44.1	3.46E+00	0.0340	1.02E-03
9:27	49.2	3.39E+00	0.0354	1.00E-03
9:29	54.8	3.72E+00	0.0368	1.10E-03
9:31	59.8	3.31E+00	0.0382	9.80E-04
9:33	64.6	3.19E+00	0.0396	9.41E-04
9:35	69.7	3.39E+00	0.0409	1.00E-03
9:37	74.8	3.39E+00	0.0423	1.00E-03
9:39	79.8	3.33E+00	0.0437	9.80E-04
9:41	85.2	3.59E+00	0.0451	1.06E-03
9:43	90.1	3.26E+00	0.0465	9.60E-04

AVG
1.00E-03



Single-Stage Constant Head Borehole Test - Omaha - Thick Store-and-Release Cover

Project: Omaha
 Date: 05/19/08
 Test ID: TS83-thin-shallow

Installer: XW
 Analyst: CHB

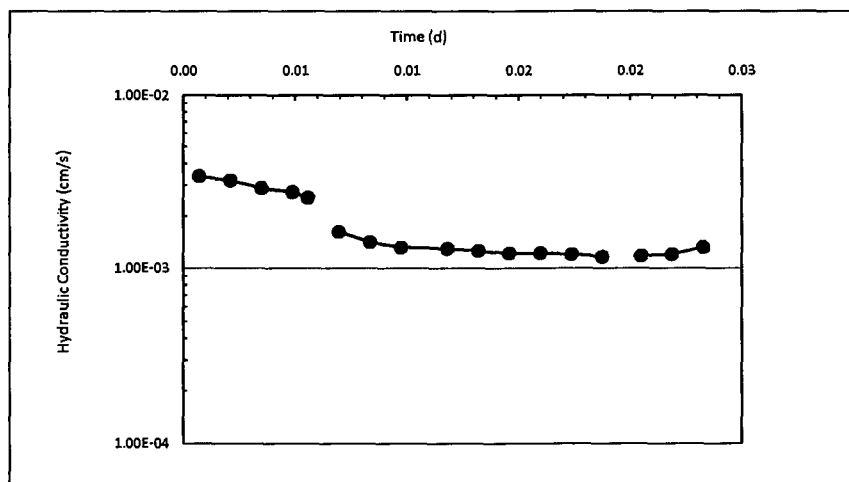
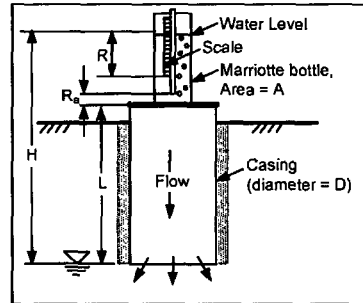
Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_s (cm): 10
 L (cm): 30.48

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
5:30:00	35.4			
5:31:00	44.0	1.14E+01	0.001	3.37E-03
5:33:00	60.3	1.08E+01	0.002	3.19E-03
5:35:00	75.0	9.78E+00	0.003	2.88E-03
5:37:00	89.0	9.31E+00	0.005	2.74E-03
5:38:00	95.5	8.65E+00	0.006	2.55E-03
8:02:00	30.6			
8:04:00	38.9	5.52E+00	0.007	1.63E-03
8:06:00	46.1	4.79E+00	0.008	1.41E-03
8:08:00	52.8	4.46E+00	0.010	1.31E-03
8:11:00	62.7	4.39E+00	0.012	1.29E-03
8:13:00	69.1	4.26E+00	0.013	1.25E-03
8:15:00	75.3	4.12E+00	0.015	1.22E-03
8:17:00	81.5	4.12E+00	0.016	1.22E-03
8:19:00	87.6	4.06E+00	0.017	1.20E-03
8:21:00	93.5	3.92E+00	0.019	1.16E-03
8:59:30	30.5			
9:02:00	38.0	3.99E+00	0.020	1.18E-03
9:04:00	44.1	4.06E+00	0.022	1.20E-03
9:06:00	50.8	4.46E+00	0.023	1.31E-03
9:08:00	57.0	4.12E+00	0.025	1.22E-03
9:10:00	62.7	3.79E+00	0.026	1.12E-03
9:12:00	68.5	3.86E+00	0.027	1.14E-03
9:14:00	74.8	4.19E+00	0.029	1.23E-03
9:16:00	80.5	3.79E+00	0.030	1.12E-03
9:18:00	86.5	3.99E+00	0.032	1.18E-03
9:20:00	92.2	3.79E+00	0.033	1.12E-03
9:22:00	98.3	4.06E+00	0.034	1.20E-03

average
 1.16E-03



Single-Stage Constant Head Borehole Test - Omaha - Thick Store-and-Release Cover

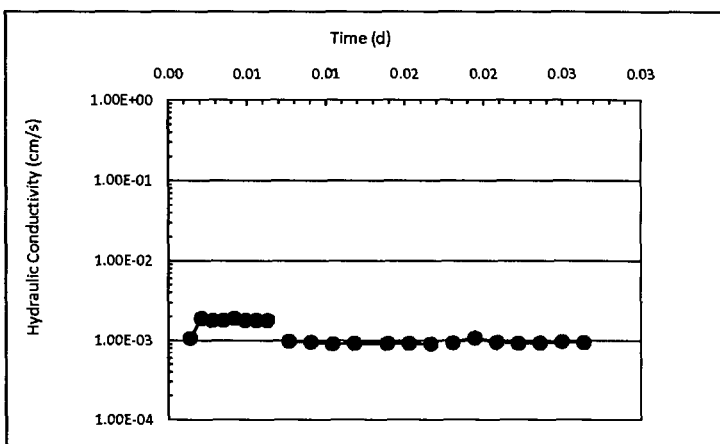
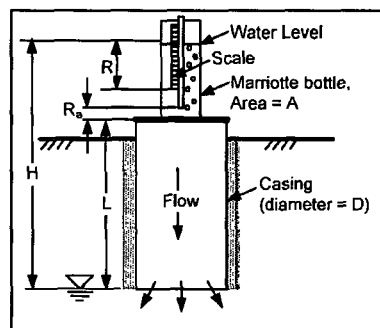
Project: Omaha
Date: 05/19/08
Test ID: TSB4-thin

Installer: XW
Analyst: CHB

Fixed Variables:
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:		Computations:		
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
5:10:00	32.0			
5:12:00	41.5	6.32E+00	0.001	1.06E-03
5:13:00	50.0	1.13E+01	0.002	1.90E-03
5:14:00	58.0	1.06E+01	0.003	1.79E-03
5:15:00	66.0	1.06E+01	0.003	1.79E-03
5:16:00	74.5	1.13E+01	0.004	1.90E-03
5:17:00	82.5	1.06E+01	0.005	1.79E-03
5:18:00	90.5	1.06E+01	0.006	1.79E-03
5:19:00	98.5	1.06E+01	0.006	1.79E-03
8:00	36.0			
8:02:00	44.7	5.79E+00	0.008	9.73E-04
8:04:00	53.2	5.65E+00	0.009	9.50E-04
8:06:00	61.3	5.39E+00	0.010	9.06E-04
8:08:00	69.5	5.45E+00	0.012	9.17E-04
8:11:00	81.8	5.45E+00	0.014	9.17E-04
8:13:00	90.0	5.45E+00	0.015	9.17E-04
8:15:00	98.1	5.39E+00	0.017	9.06E-04
9:03:00	35.1			
9:05:00	43.4	5.52E+00	0.018	9.28E-04
9:07:00	53.0	6.38E+00	0.019	1.07E-03
9:09:00	61.5	5.65E+00	0.021	9.50E-04
9:11:00	69.7	5.45E+00	0.022	9.17E-04
9:13:00	78.0	5.52E+00	0.024	9.28E-04
9:15:00	86.6	5.72E+00	0.025	9.62E-04
9:17:00	95.0	5.59E+00	0.026	9.39E-04

avg
9.43E-04



Single-Stage Constant Head Borehole Test **Omaha - Thin Store-and-Release Cover**

Project: Omaha
Date: 05/19/08
Test ID: TSB1-thin

Installer: XW
Analyst: CHB

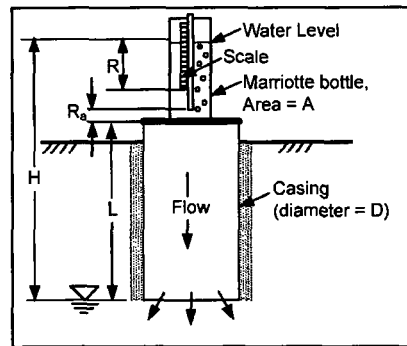
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_a (cm): 10
L (cm): 30.48

Temporal Variables:

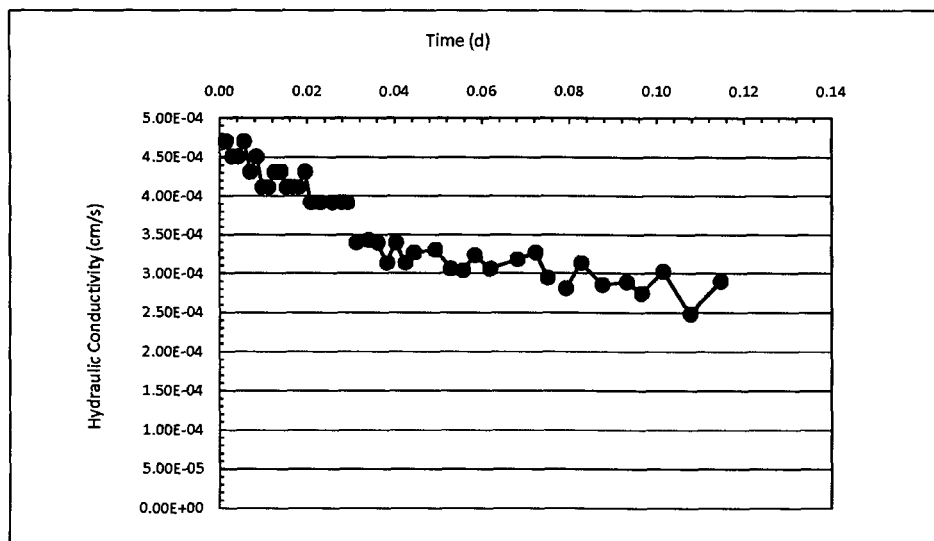
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
3:29:00	34.0			
3:31:00	36.4	1.60E+00	0.001	4.70E-04
3:33:00	38.7	1.53E+00	0.003	4.51E-04
3:35:00	41.0	1.53E+00	0.004	4.51E-04
3:37:00	43.4	1.60E+00	0.006	4.70E-04
3:39:00	45.6	1.46E+00	0.007	4.31E-04
3:41:00	47.9	1.53E+00	0.008	4.51E-04
3:43:00	50.0	1.40E+00	0.010	4.12E-04
3:45:00	52.1	1.40E+00	0.011	4.12E-04
3:47:00	54.3	1.46E+00	0.013	4.31E-04
3:49:00	56.5	1.46E+00	0.014	4.31E-04
3:51:00	58.6	1.40E+00	0.015	4.12E-04
3:53:00	60.7	1.40E+00	0.017	4.12E-04
3:55:00	62.8	1.40E+00	0.018	4.12E-04
3:57:00	65.0	1.46E+00	0.019	4.31E-04
3:59:00	67.0	1.33E+00	0.021	3.92E-04
4:02:00	70.0	1.33E+00	0.023	3.92E-04
4:06:00	74.0	1.33E+00	0.026	3.92E-04
4:09:00	77.0	1.33E+00	0.028	3.92E-04
4:11:00	79.0	1.33E+00	0.029	3.92E-04
8:50:00	30.0			
8:53:00	32.6	1.15E+00	0.031	3.40E-04
8:57:00	36.1	1.16E+00	0.034	3.43E-04
9:00:00	38.7	1.15E+00	0.036	3.40E-04
9:03	41.1	1.06E+00	0.038	3.14E-04
9:06:00	43.7	1.15E+00	0.040	3.40E-04
9:09:00	46.1	1.06E+00	0.042	3.14E-04
9:12:00	48.6	1.11E+00	0.044	3.27E-04
9:19:00	54.5	1.12E+00	0.049	3.30E-04
9:24:00	58.4	1.04E+00	0.053	3.06E-04
9:28:00	61.5	1.03E+00	0.056	3.04E-04
9:32:00	64.8	1.10E+00	0.058	3.23E-04
9:37:00	68.7	1.04E+00	0.062	3.06E-04
9:46:00	76.0	1.08E+00	0.068	3.18E-04
9:52:00	81.0	1.11E+00	0.072	3.27E-04
9:56:00	84.0	9.98E-01	0.075	2.94E-04

Computations:



10:30	50.7			
10:36	55.0	9.53E-01	0.079	2.81E-04
10:41	59.0	1.06E+00	0.083	3.14E-04
10:48	64.1	9.69E-01	0.088	2.86E-04
10:56	70.0	9.81E-01	0.093	2.89E-04
11:01	73.5	9.31E-01	0.097	2.74E-04
11:08	78.9	1.03E+00	0.101	3.02E-04
11:17	84.6	8.42E-01	0.108	2.48E-04
11:27	92.0	9.84E-01	0.115	2.90E-04

AVG
3.13E-04



Single-Stage Constant Head Borehole Test Omaha - Thin Store-and-Release Cover

Project: Omaha
Date: 05/19/08
Test ID: TSB2-Thin

Installer: XW
Analyst: CHB

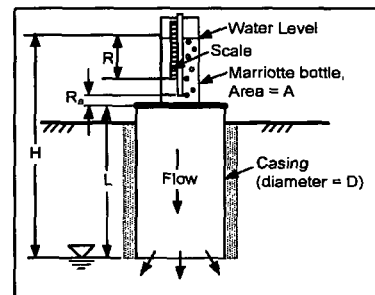
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_a (cm): 10
L (cm): 30.48

Temporal Variables:

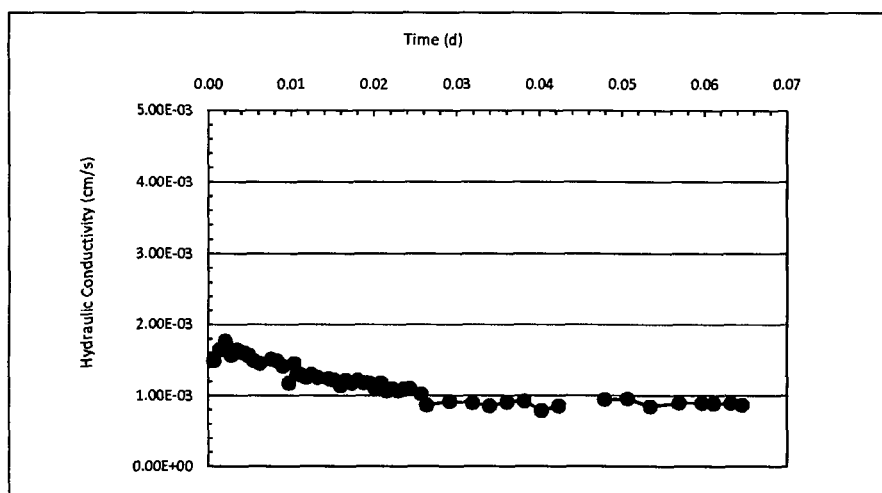
Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
2:34:00	45.0			
2:35:00	48.8	5.05E+00	0.0007	1.49E-03
2:36:00	53.0	5.59E+00	0.0014	1.65E-03
2:37:00	57.5	5.99E+00	0.0021	1.76E-03
2:38:00	61.5	5.32E+00	0.0028	1.57E-03
2:39:00	65.7	5.59E+00	0.0035	1.65E-03
2:40:00	69.8	5.45E+00	0.0042	1.61E-03
2:41:00	73.8	5.32E+00	0.0049	1.57E-03
2:42:00	77.6	5.05E+00	0.0056	1.49E-03
2:43:00	81.3	4.92E+00	0.0063	1.45E-03
2:45:00	89.0	5.12E+00	0.0076	1.51E-03
2:46:00	92.8	5.05E+00	0.0083	1.49E-03
2:47:00	96.4	4.79E+00	0.0090	1.41E-03
3:07:00	32.0			
3:08:00	35.0	3.99E+00	0.0097	1.18E-03
3:09:00	38.7	4.92E+00	0.0104	1.45E-03
3:10:00	42.0	4.39E+00	0.0111	1.29E-03
3:11:00	45.2	4.26E+00	0.0118	1.25E-03
3:12:00	48.5	4.39E+00	0.0125	1.29E-03
3:13:00	51.7	4.26E+00	0.0132	1.25E-03
3:15:00	58.0	4.19E+00	0.0146	1.23E-03
3:16:00	61.1	4.12E+00	0.0153	1.22E-03
3:17:00	64.0	3.86E+00	0.0160	1.14E-03
3:18:00	67.1	4.12E+00	0.0167	1.22E-03
3:19:00	70.1	3.99E+00	0.0174	1.18E-03
3:20:00	73.2	4.12E+00	0.0181	1.22E-03
3:21:00	76.2	3.99E+00	0.0188	1.18E-03
3:22:00	79.2	3.99E+00	0.0194	1.18E-03
3:23:00	82.0	3.72E+00	0.0201	1.10E-03
3:24:00	85.0	3.99E+00	0.0208	1.18E-03
3:25:00	87.7	3.59E+00	0.0215	1.06E-03
3:26:00	90.5	3.72E+00	0.0222	1.10E-03
3:27:00	93.2	3.59E+00	0.0229	1.06E-03
3:28:00	96.0	3.72E+00	0.0236	1.10E-03

Computations:



8:46:00	34.0			
8:47:00	36.8	3.72E+00	0.0243	1.10E-03
8:49:00	42.0	3.46E+00	0.0257	1.02E-03
8:50:00	44.2	2.93E+00	0.0264	8.62E-04
8:54:00	53.5	3.09E+00	0.0292	9.11E-04
8:58:00	62.6	3.03E+00	0.0319	8.92E-04
9:01:00	69.1	2.88E+00	0.0340	8.49E-04
9:04:00	76.0	3.06E+00	0.0361	9.02E-04
9:07:00	83.0	3.10E+00	0.0382	9.15E-04
9:10:00	89.0	2.66E+00	0.0403	7.84E-04
9:13:00	95.5	2.88E+00	0.0424	8.49E-04
9:19:00	31.5	-1.42E+01	0.0465	
9:21:00	36.3	3.19E+00	0.0479	9.41E-04
9:25	46.0	3.23E+00	0.0507	9.51E-04
9:29	54.6	2.86E+00	0.0535	8.43E-04
9:34	66.0	3.03E+00	0.0569	8.94E-04
9:38	75.1	3.03E+00	0.0597	8.92E-04
9:40	79.6	2.99E+00	0.0611	8.82E-04
9:43	86.4	3.01E+00	0.0632	8.88E-04
9:45	90.8	2.93E+00	0.0646	8.62E-04

AVG
1.08E-03



Single-Stage Constant Head Borehole Test Omaha - Thin Store-and-Release Cover

Project: Omaha
Date: 05/19/08
Test ID: TSB3-thin

Installer: XW
Analyst: CHB

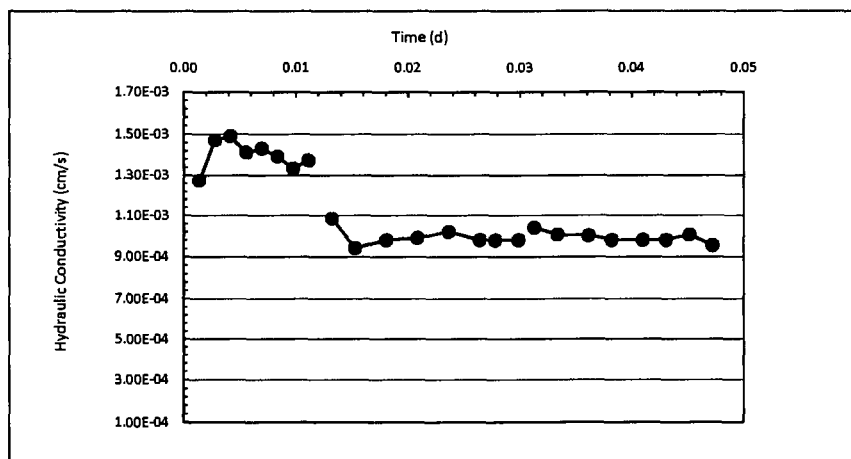
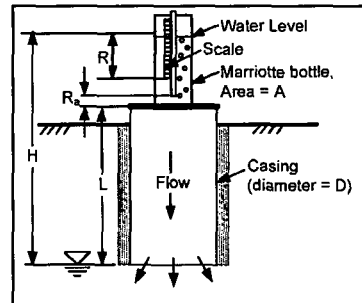
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 30.48

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
5:32:00	37.0			
5:34:00	43.5	4.32E+00	0.001	1.27E-03
5:36:00	51.0	4.99E+00	0.003	1.47E-03
5:38:00	58.6	5.05E+00	0.004	1.49E-03
5:40:00	65.8	4.79E+00	0.006	1.41E-03
5:42:00	73.1	4.85E+00	0.007	1.43E-03
5:44:00	80.2	4.72E+00	0.008	1.39E-03
5:46:00	87.0	4.52E+00	0.010	1.33E-03
5:48:00	94.0	4.66E+00	0.011	1.37E-03
10:17:00	30.5			
10:20:00	38.8	3.68E+00	0.013	1.08E-03
10:23:00	46.0	3.19E+00	0.015	9.41E-04
10:27:00	56.0	3.33E+00	0.018	9.80E-04
10:31:00	66.1	3.36E+00	0.021	9.90E-04
10:35	76.5	3.46E+00	0.024	1.02E-03
10:39	86.5	3.33E+00	0.026	9.80E-04
10:41	91.5	3.33E+00	0.028	9.80E-04
10:44	99.0	3.33E+00	0.030	9.80E-04
11:35	35.8			
11:37	41.1	3.52E+00	0.031	1.04E-03
11:40	48.8	3.41E+00	0.033	1.01E-03
11:44	59.0	3.39E+00	0.036	1.00E-03
11:47	66.5	3.33E+00	0.038	9.80E-04
11:51	76.5	3.33E+00	0.041	9.80E-04
11:54	84.0	3.32E+00	0.043	9.80E-04
11:57	91.7	3.41E+00	0.045	1.01E-03
12:00	99.0	3.24E+00	0.047	9.54E-04

AVG
9.80E-04



Single-Stage Constant Head Borehole Test Omaha - Thin Store-and-Release Cover

Project: Omaha
Date: 05/19/08
Test ID: T5B4-thin

Installer: XW
Analyst: CHB

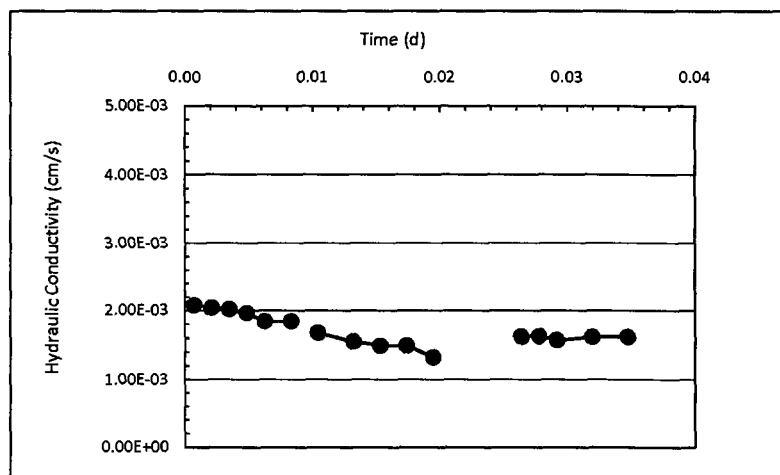
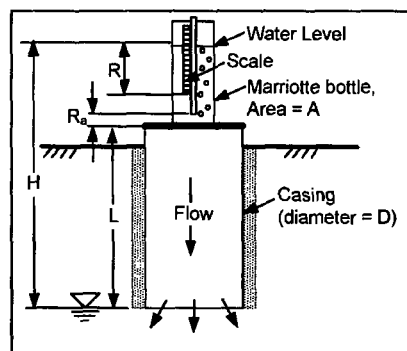
Fixed Variables:

Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_b (cm): 10
L (cm): 30.48

Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
3:53:00	37.0			
3:54:00	42.3	7.05E+00	0.001	2.08E-03
3:56:00	52.7	6.92E+00	0.002	2.04E-03
3:58:00	63.0	6.85E+00	0.003	2.02E-03
4:00:00	73.0	6.65E+00	0.005	1.96E-03
4:02:00	82.4	6.25E+00	0.006	1.84E-03
4:05:00	96.5	6.25E+00	0.008	1.84E-03
8:52:00	30.0			
8:55:00	42.8	5.67E+00	0.010	1.67E-03
8:59:00	58.6	5.25E+00	0.013	1.55E-03
9:02:00	70.0	5.05E+00	0.015	1.49E-03
9:05:00	81.4	5.05E+00	0.017	1.49E-03
9:08:00	91.5	4.48E+00	0.019	1.32E-03
9:15:00	32.8	-1.12E+01	0.024	
9:18:00	45.2	5.50E+00	0.026	1.62E-03
9:20:00	53.5	5.52E+00	0.028	1.63E-03
9:22:00	61.5	5.32E+00	0.029	1.57E-03
9:26:00	78.0	5.49E+00	0.032	1.62E-03
9:30:00	94.5	5.49E+00	0.035	1.62E-03

AVG
1.60E-03



Single-Stage Constant Head Borehole Test - Polson - Composite Cover

Project: Polson
Date: 08/21/08
Test ID: Coventional 1

Installer: XW
Analyst: JS

Fixed Variables:

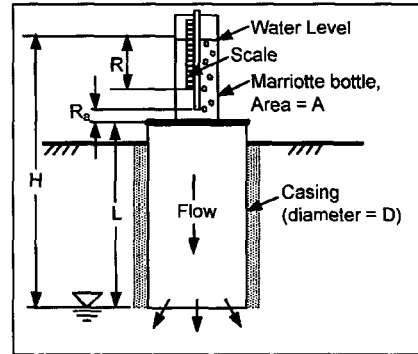
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 60.96

Temporal Variables:

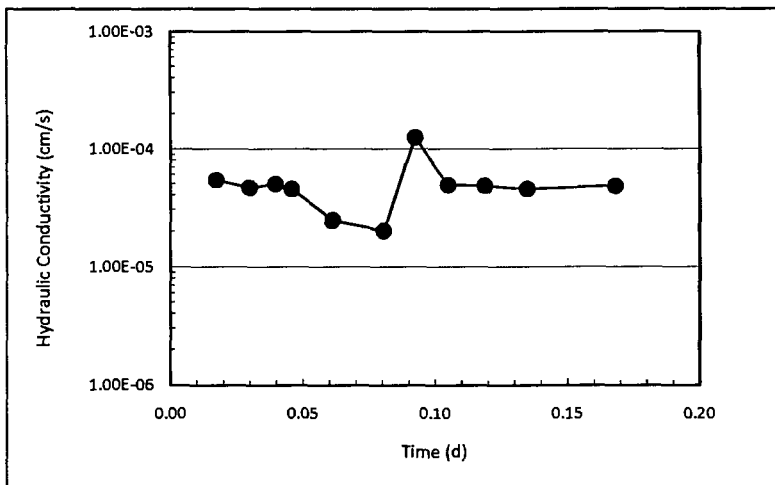
Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
9:38	37			
10:03	43	3.19E-01	0.017	5.37E-05
10:21	46.7	2.73E-01	0.030	4.60E-05
10:35	49.8	2.94E-01	0.040	4.95E-05
10:44	51.6	2.66E-01	0.046	4.47E-05
11:06	54	1.45E-01	0.061	2.44E-05
11:34	56.5	1.19E-01	0.081	2.00E-05
11:51	66	7.43E-01	0.092	1.25E-04
12:09	69.9	2.88E-01	0.105	4.84E-05
12:29	74.2	2.86E-01	0.119	4.81E-05
12:52	78.8	2.66E-01	0.135	4.47E-05
13:40	89	2.83E-01	0.168	4.75E-05

Average 4.72E-05



Allowed to flow without measurements for > 24 hrs



Single-Stage Constant Head Borehole Test - Polson - Composite Cover

Project: Polson
Date: 08/21/08
Test ID: Coventional 2

Installer: XW
Analyst: JS

Fixed Variables:

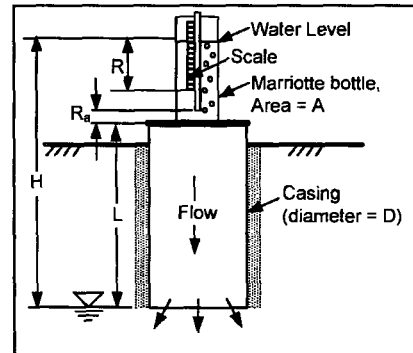
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 60.96

Temporal Variables:

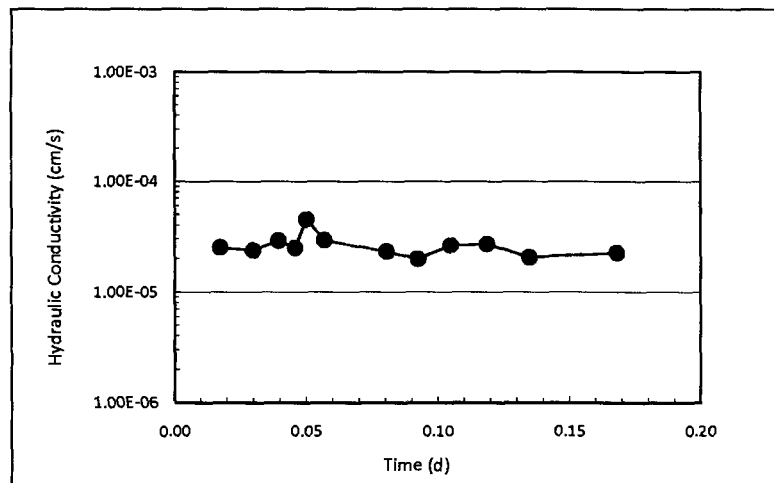
Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
9:38	39			
10:03	41.8	1.49E-01	0.017	2.50E-05
10:21	43.7	1.40E-01	0.030	2.36E-05
10:35	45.5	1.71E-01	0.040	2.87E-05
10:44	46.5	1.48E-01	0.046	2.48E-05
10:50	47.7	2.66E-01	0.050	4.47E-05
11:00	49	1.73E-01	0.057	2.91E-05
11:34	52.5	1.37E-01	0.081	2.30E-05
11:51	54	1.17E-01	0.092	1.97E-05
12:09	56.1	1.55E-01	0.105	2.61E-05
12:29	58.5	1.60E-01	0.119	2.68E-05
12:52	60.6	1.21E-01	0.135	2.04E-05
13:40	65.4	1.33E-01	0.168	2.24E-05

Average 2.39E-05



Allowed to flow without measurements for > 24 hrs



Single-Stage Constant Head Borehole Test - Polson - Composite Cover

Project: Polson
Date: 08/21/08
Test ID: Conventional 3

Installer: XW
Analyst: JS

Fixed Variables:

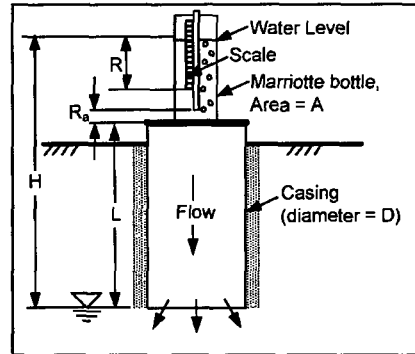
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 60.96

Temporal Variables:

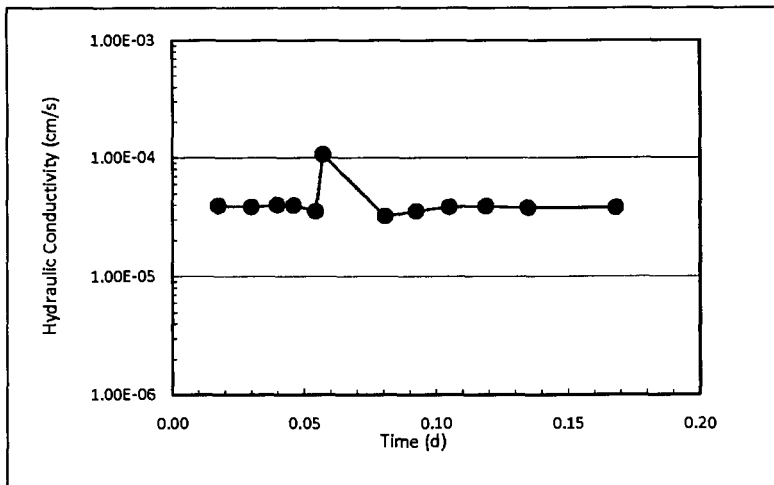
Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
9:38	37.5			
10:03	41.9	2.34E-01	0.017	3.94E-05
10:21	45	2.29E-01	0.030	3.85E-05
10:35	47.5	2.37E-01	0.040	3.99E-05
10:44	49.1	2.36E-01	0.046	3.98E-05
10:56	51	2.11E-01	0.054	3.54E-05
11:00	52.9	6.32E-01	0.057	1.06E-04
11:34	57.8	1.92E-01	0.081	3.22E-05
11:51	60.5	2.11E-01	0.092	3.55E-05
12:09	63.6	2.29E-01	0.105	3.85E-05
12:29	67.1	2.33E-01	0.119	3.91E-05
12:52	71	2.26E-01	0.135	3.79E-05
13:40	79.2	2.27E-01	0.168	3.82E-05

Average 3.84E-05



Allowed to flow without measurements for > 24 hrs



Single-Stage Constant Head Borehole Test - Polson - Composite Cover

Project: Polson
Date: 08/21/08
Test ID: Conventional 4

Installer: XW
Analyst: JS

Fixed Variables:

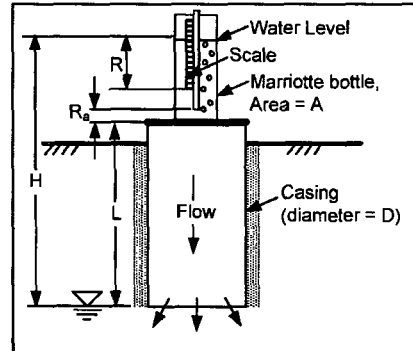
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 60.96

Temporal Variables:

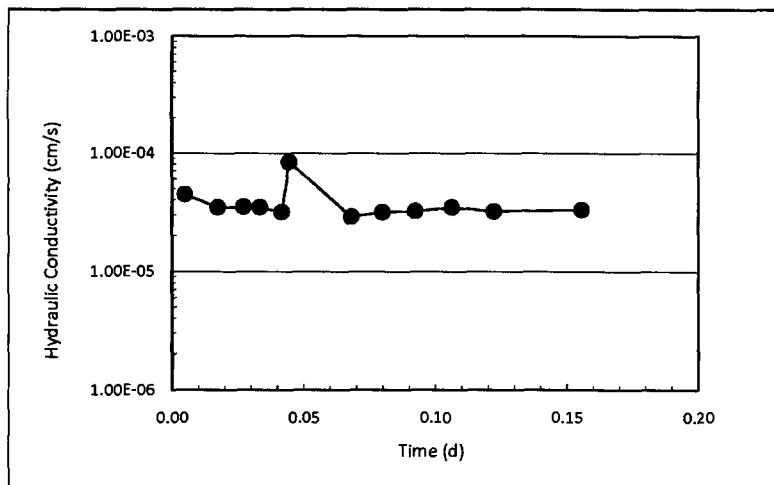
Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
9:56	36.1			
10:03	37.5	2.66E-01	0.005	4.47E-05
10:21	40.3	2.07E-01	0.017	3.48E-05
10:35	42.5	2.09E-01	0.027	3.51E-05
10:44	43.9	2.07E-01	0.033	3.48E-05
10:56	45.6	1.88E-01	0.042	3.17E-05
11:00	47.1	4.99E-01	0.044	8.39E-05
11:34	51.5	1.72E-01	0.068	2.89E-05
11:51	53.9	1.88E-01	0.080	3.16E-05
12:09	56.5	1.92E-01	0.092	3.23E-05
12:29	59.6	2.06E-01	0.106	3.47E-05
12:52	62.9	1.91E-01	0.122	3.21E-05
13:40	70	1.97E-01	0.156	3.31E-05

Average 3.30E-05



Allowed to flow without measurements for > 24 hrs



Single-Stage Constant Head Borehole Test - Polson - Composite Cover

Project: Polson
Date: 08/21/08
Test ID: Conventional 5

Installer: XW
Analyst: JS

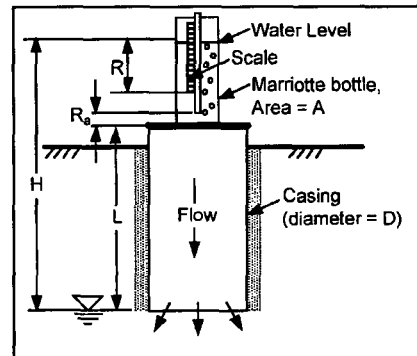
Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 60.96

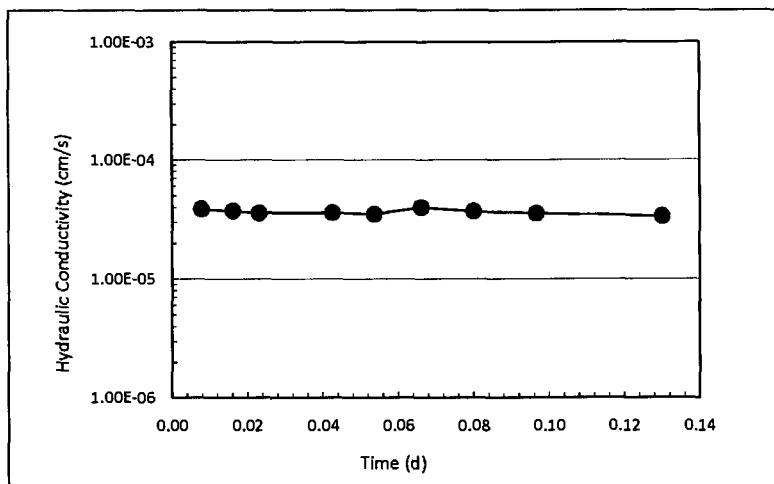
Temporal Variables:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
10:34	38			
10:45	39.9	2.30E-01	0.008	3.86E-05
10:57	41.9	2.22E-01	0.016	3.73E-05
11:07	43.5	2.13E-01	0.023	3.58E-05
11:35	48	2.14E-01	0.042	3.59E-05
11:51	50.5	2.08E-01	0.053	3.49E-05
12:09	53.7	2.36E-01	0.066	3.98E-05
12:29	57	2.19E-01	0.080	3.69E-05
12:53	60.8	2.11E-01	0.097	3.54E-05
13:41	68	2.00E-01	0.130	3.35E-05

Average 3.64E-05



Allowed to flow without measurements for > 24 hrs



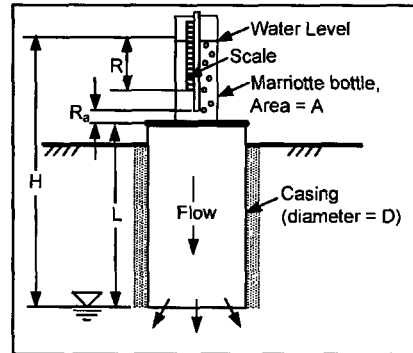
Single-Stage Constant Head Borehole Test - Polson - Store-and-Release Cover

Project: Polson
Date: 08/21/08
Test ID: Alternative 1

Installer: XW
Analyst: JS

Fixed Variables:

Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 60.96



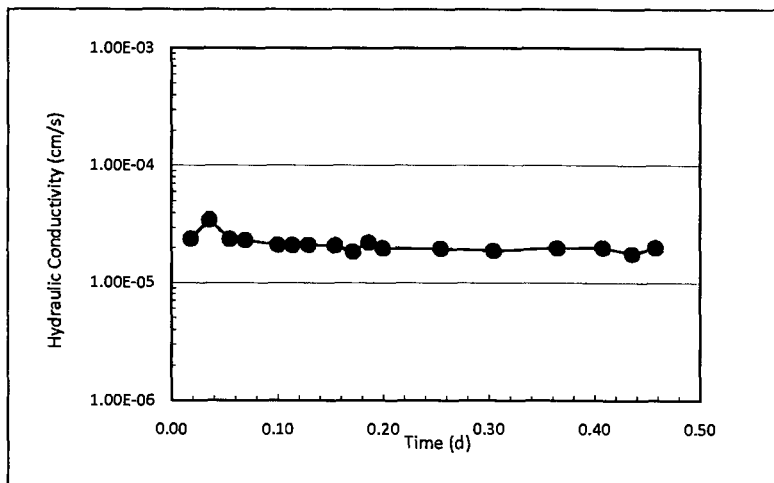
Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
16:30	38.3			
16:56	41.1	1.43E-01	0.018	2.41E-05
17:21	45	2.07E-01	0.035	3.49E-05
17:49	48	1.43E-01	0.055	2.40E-05
9:13	31.2	4.33E-02		
9:34	33.4	1.39E-01	0.069	2.34E-05
10:18	37.6	1.27E-01	0.100	2.13E-05
10:38	39.5	1.26E-01	0.114	2.12E-05
11:00	41.6	1.27E-01	0.129	2.13E-05
11:36	45	1.26E-01	0.154	2.11E-05
12:00	47	1.11E-01	0.171	1.86E-05
12:22	49.2	1.33E-01	0.186	2.24E-05
12:41	50.9	1.19E-01	0.199	2.00E-05
14:00	57.9	1.18E-01	0.254	1.98E-05
15:12	64	1.13E-01	0.304	1.89E-05
16:39	71.8	1.19E-01	0.365	2.00E-05
17:41	77.4	1.20E-01	0.408	2.02E-05
18:21	80.6	1.06E-01	0.435	1.79E-05
18:53	83.5	1.21E-01	0.458	2.03E-05

Allowed to flow without measurements for > 24 hrs

Average 1.96E-05



Single-Stage Constant Head Borehole Test - Polson - Store-and-Release Cover

Project: Polson
Date: 08/21/08
Test ID: Alternative 2

Installer: XW
Analyst: JS

Fixed Variables:

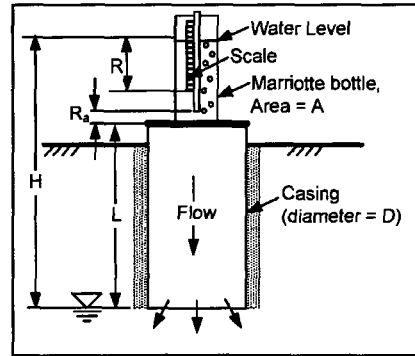
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 60.96

Temporal Variables:

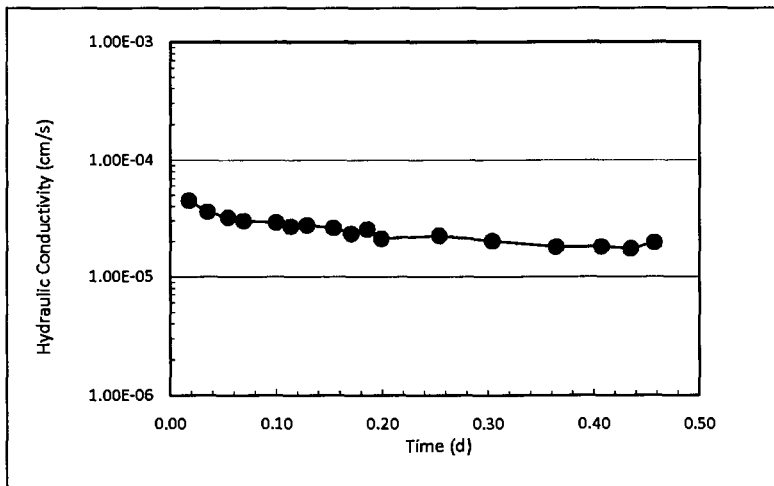
Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
16:31	34.5			
16:56	39.5	2.66E-01	0.017	4.47E-05
17:21	43.5	2.13E-01	0.035	3.58E-05
17:49	47.5	1.90E-01	0.054	3.19E-05
9:13	33.5	3.61E-02		
9:34	36.3	1.77E-01	0.069	2.98E-05
10:18	42	1.72E-01	0.099	2.90E-05
10:38	44.4	1.60E-01	0.113	2.68E-05
11:00	47.1	1.63E-01	0.128	2.74E-05
11:36	51.3	1.55E-01	0.153	2.61E-05
12:00	53.8	1.39E-01	0.170	2.33E-05
12:22	56.3	1.51E-01	0.185	2.54E-05
12:41	58.1	1.26E-01	0.199	2.12E-05
14:00	66	1.33E-01	0.253	2.24E-05
15:12	72.5	1.20E-01	0.303	2.02E-05
16:39	79.5	1.07E-01	0.364	1.80E-05
17:41	84.5	1.07E-01	0.407	1.80E-05
18:21	87.6	1.03E-01	0.435	1.73E-05
18:53	90.4	1.16E-01	0.457	1.96E-05

Average 1.82E-05



Allowed to flow without measurements for > 24 hrs



Single-Stage Constant Head Borehole Test - Polson - Store-and-Release Cover

Project: Polson
Date: 08/21/08
Test ID: Alternative 3

Installer: XW
Analyst: JS

Fixed Variables:

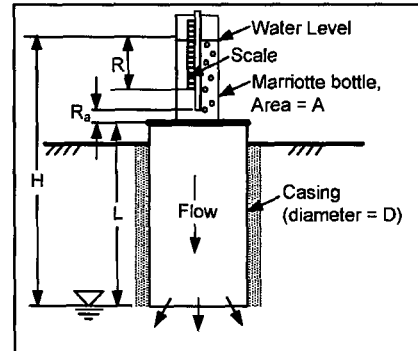
Casing Diameter (cm): 30.48
 Standpipe Area (cm²): 79.8
 R_a (cm): 10
 L (cm): 60.96

Temporal Variables:

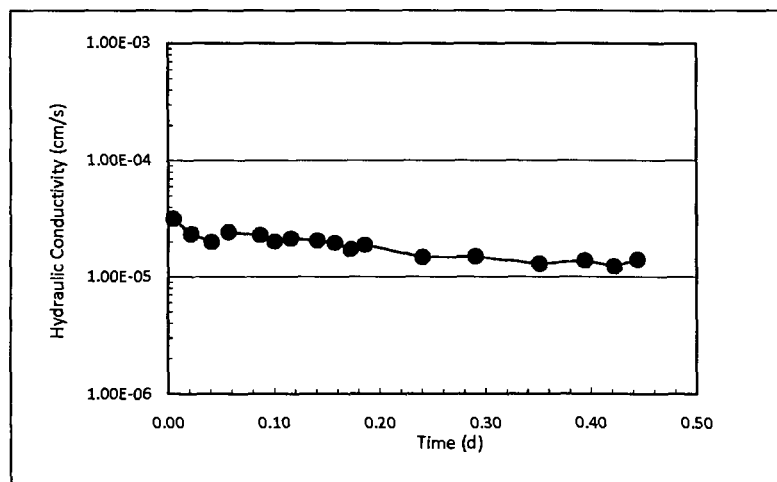
Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
16:50	46			
16:57	47	1.90E-01	0.005	3.19E-05
17:21	49.5	1.39E-01	0.022	2.33E-05
17:49	52	1.19E-01	0.041	2.00E-05
9:12	41.5	2.70E-02		
9:35	44	1.45E-01	0.057	2.43E-05
10:18	48.4	1.36E-01	0.087	2.29E-05
10:38	50.2	1.20E-01	0.101	2.01E-05
11:00	52.3	1.27E-01	0.116	2.13E-05
11:36	55.6	1.22E-01	0.141	2.05E-05
12:00	57.7	1.16E-01	0.158	1.96E-05
12:22	59.4	1.03E-01	0.173	1.73E-05
12:41	61	1.12E-01	0.186	1.88E-05
14:00	66.2	8.75E-02	0.241	1.47E-05
15:12	71	8.87E-02	0.291	1.49E-05
16:39	76.0	7.64E-02	0.351	1.29E-05
17:41	79.8	8.15E-02	0.394	1.37E-05
18:21	82.0	7.32E-02	0.422	1.23E-05
18:53	84.0	8.31E-02	0.444	1.40E-05

Average 1.34E-05



Allowed to flow without measurements for > 24 hrs

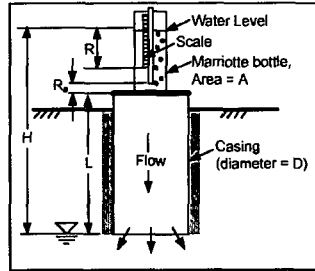


Single-Stage Constant Head Borehole Test - Polson - Store-and-Release Cover

Project: Polson
Date: 08/21/08
Test ID: 1

Installer: XW
Analyst: JS

Fixed Variables:
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96



Temporal Variables:

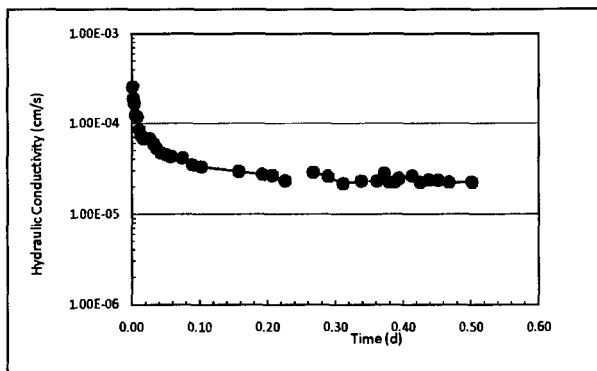
Time	R (cm)
10:13	36.5
10:15	38.8
10:17	40.5
10:19	42
10:21	43.1
10:25	45.2
10:29	46.7
10:33	48
10:37	49.2
10:51	53.4
10:59	55.5
11:05	56.9
11:15	59
11:26	61.2
11:36	63.1
12:00	67.5
12:22	70.9
12:41	73.7
14:00	84.1
14:50	90.2
15:11	92.7
15:38	95.5
15:45	32.0
16:38	38.8
17:09	42.4
17:41	45.5
18:20	49.5
18:53	52.9
10:20	32.5
10:36	34.5
10:46	35.5
10:57	36.6
11:07	37.7
11:35	41.0
11:52	42.7
12:10	44.6
12:30	46.7
12:53	49.0
13:42	53.9

Computations:

Time (d)	Q (cm ³ /s)	K (cm/s)
0.001	1.53E+00	2.57E-04
0.003	1.13E+00	1.90E-04
0.004	9.98E-01	1.68E-04
0.006	7.32E-01	1.23E-04
0.008	6.98E-01	1.17E-04
0.011	4.99E-01	8.39E-05
0.014	4.32E-01	7.27E-05
0.017	3.99E-01	6.71E-05
0.026	3.99E-01	6.71E-05
0.032	3.49E-01	5.87E-05
0.036	3.10E-01	5.22E-05
0.043	2.79E-01	4.70E-05
0.051	2.66E-01	4.47E-05
0.058	2.53E-01	4.25E-05
0.074	2.44E-01	4.10E-05
0.090	2.06E-01	3.46E-05
0.103	1.96E-01	3.30E-05
0.158	1.75E-01	2.94E-05
0.192	1.62E-01	2.73E-05
0.207	1.58E-01	2.66E-05
0.226	1.38E-01	2.32E-05
0.267	-1.21E+01	
0.289	1.71E-01	2.87E-05
0.311	1.54E-01	2.60E-05
0.311	1.29E-01	2.17E-05
0.338	1.36E-01	2.29E-05
0.361	1.37E-01	2.30E-05
0.372	5.29E-02	
0.372	1.66E-01	2.80E-05
0.379	1.33E-01	2.24E-05
0.387	1.33E-01	2.24E-05
0.394	1.46E-01	2.46E-05
0.413	1.57E-01	2.64E-05
0.425	1.33E-01	2.24E-05
0.438	1.40E-01	2.36E-05
0.451	1.40E-01	2.35E-05
0.467	1.33E-01	2.24E-05
0.501	1.33E-01	2.24E-05

Allowed to flow without measurements for > 24 hrs

Average 2.30E-05



Single-Stage Constant Head Borehole Test - Sacramento - Thin Store-and-Release Cover

Project: Sacramento
Date:
Test ID: Thin 1

Installer: XW
Analyst: CB

Fixed Variables:

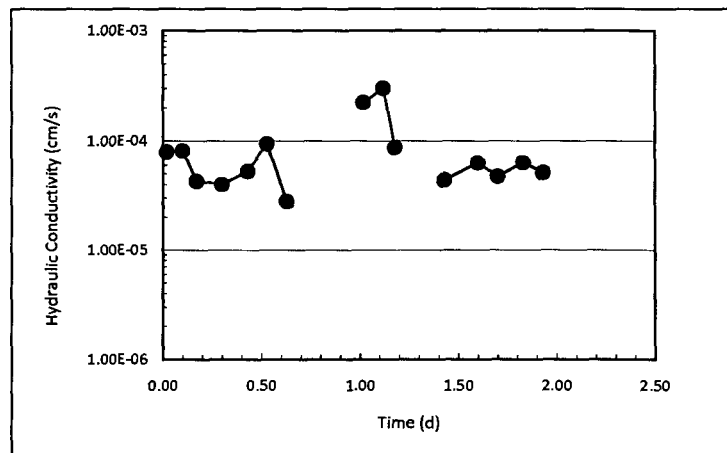
d = 10.16
D = 35.56
Z = 27.94
R = 45.72

Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
12:32	72	145.7		
12:33	68	141.7	60	0.02 3.85E-04
12:38	64	137.7	300	0.1 7.92E-05
12:42	60.8	134.5	240	0.17 8.12E-05
12:50	57.5	131.2	480	0.3 4.29E-05
12:58	54.5	128.2	480	0.43 4.00E-05
13:04	51.6	125.3	360	0.53 5.27E-05
13:10	46.6	120.3	360	0.63 9.38E-05
13:36	40.4	114.1	1560	1.07 2.81E-05
13:33	31.2	104.9	-180	1.02
13:39	21.5	95.2	360	1.12 2.24E-04
13:43	13.5	87.2	240	1.18 3.03E-04
13:52	8.7	82.4	540	1.33 8.70E-05
13:58	83.5	157.2	360	1.43
14:08	78.6	152.3	600	1.6 4.38E-05
14:14	74.5	148.2	360	1.7 6.29E-05
14:22	70.5	144.2	480	1.83 4.73E-05
14:28	66.6	140.3	360	1.93 6.32E-05
14:35	63	136.7	420	2.05 5.13E-05

AVG
5.62E-05



Single-Stage Constant Head Borehole Test - Sacramento - Thin Store-and-Release Cover

Project: Sacramento
Date:
Test ID: Thin 2
Installer: XW
Analyst: CB

Fixed Variables:

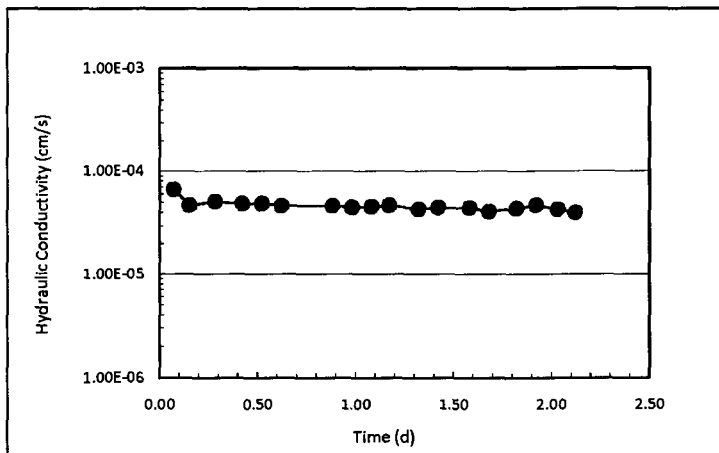
d = 10.16 cm
 D = 35.56 cm
 Z = 33.02 cm
 R = 43.18 cm

Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
12:33	81.6	157.8		
12:37	78.6	154.8	0.070	6.63E-05
12:42	76	152.2	0.150	4.68E-05
12:50	71.6	147.8	0.280	5.07E-05
12:58	67.5	143.7	0.420	4.86E-05
13:04	64.5	140.7	0.520	4.86E-05
13:10	61.7	137.9	0.620	4.63E-05
13:26	54.5	130.7	0.880	4.63E-05
13:32	52	128.2	0.980	4.45E-05
13:38	49.5	125.7	1.080	4.54E-05
13:43	47.4	123.6	1.170	4.66E-05
13:52	44	120.2	1.320	4.28E-05
13:58	41.7	117.9	1.420	4.45E-05
1/0/00 14:08	38	114.2	1.580	4.41E-05
1/0/00 14:14	36	112.2	1.680	4.07E-05
1/0/00 14:22	33.2	109.4	1.820	4.36E-05
1/0/00 14:28	31	107.2	1.920	4.68E-05
1/0/00 14:35	28.7	104.9	2.030	4.28E-05
14:40:00	27.2	103.4	2.120	3.98E-05

AVG
 4.33E-05



Single-Stage Constant Head Borehole Test - Sacramento - Thin Store-and-Release Cover

Project: Sacramento
Date:
Test ID: Thin 3

Installer: XW
Analyst: CB

Fixed Variables:

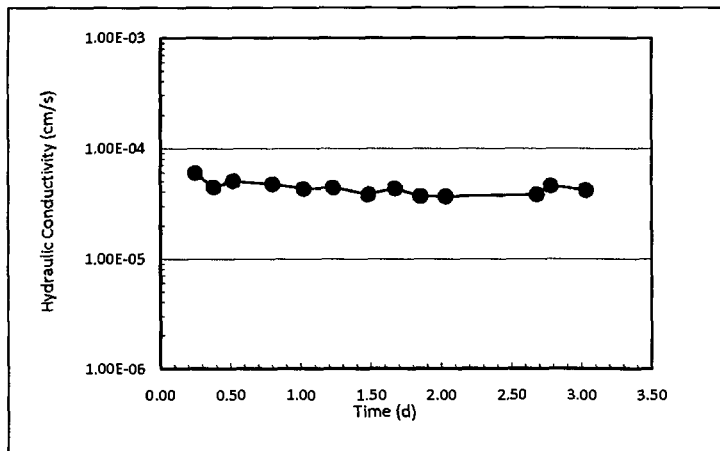
d = 10.16 cm
D = 35.56 cm
Z = 55.88 cm
R = 22.86 cm

Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
10:08	81.5	160.2		
10:23	71.5	150.2	9.00E+02	0.250
10:31	67.7	146.4	4.80E+02	0.380
10:39	63.5	142.2	4.80E+02	0.520
10:56	55.5	134.2	1.02E+03	0.800
11:09	50.2	128.9	7.80E+02	1.020
11:22	45	123.7	7.80E+02	1.230
11:37	40	118.7	9.00E+02	1.480
11:48	36	114.7	6.60E+02	1.670
11:59	32.7	111.4	6.60E+02	1.850
12:10	29.5	108.2	6.60E+02	2.030
12:49	18.5	97.2	2.34E+03	2.680
12:55	16.6	95.3	3.60E+02	2.780
1/0/00 13:10	12.4	91.1	9.00E+02	3.03

AVG
4.04E-05



Single-Stage Constant Head Borehole Test - Sacramento - Thin Store-and-Release Cover

Project: Sacramento
Date:
Test ID: Thin 4
Installer: XW
Analyst: CB

Fixed Variables:

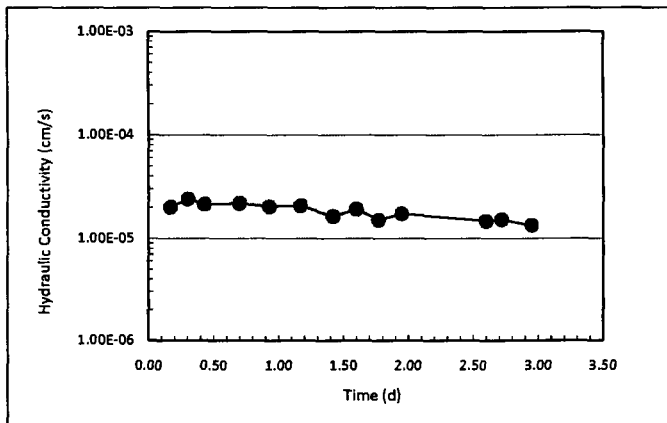
Casing Diameter (cm): 30.48
Standpipe Area (cm²): 79.8
R_s (cm): 10
L (cm): 60.96

Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
10:13	69	145.2		
10:23	67.2	143.4	0.170	2.01E-05
10:31	65.5	141.7	0.300	2.40E-05
10:39	64	140.2	0.430	2.14E-05
10:55	61	137.2	0.700	2.18E-05
11:09	58.6	134.8	0.930	2.03E-05
11:23	56.2	132.4	1.170	2.07E-05
11:38	54.2	130.4	1.420	1.64E-05
11:49	52.5	128.7	1.600	1.92E-05
11:59	51.3	127.5	1.770	1.51E-05
12:10	49.8	126	1.950	1.73E-05
12:49	45.4	121.6	2.600	1.47E-05
12:56	44.6	120.8	2.720	1.52E-05
1/0/00 13:10	43.2	119.4	2.950	1.34E-05

AVG
 1.52E-05



Single-Stage Constant Head Borehole Test - Sacramento - Thick Store-and-Release Cover

Project: Sacramento Installer: XW
 Date: Analyst: CB
 Test ID: Thick 1

Fixed Variables:

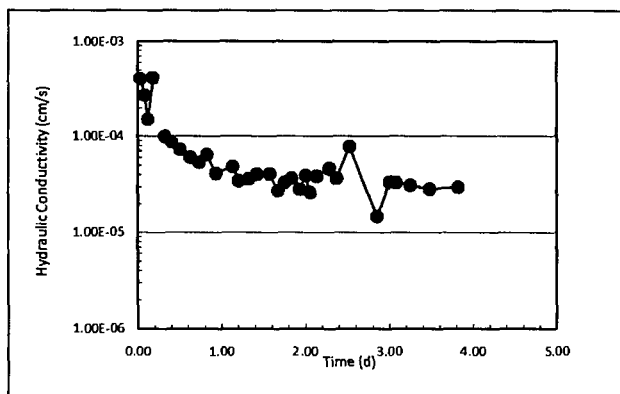
d = 10.16 cm
 Q = 35.56 cm
 Z = 60.96 cm
 R = 14.605 cm

Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
12:16	81	156.6		
12:18	72	147.6	1.20E+02	0.030
12:21	63.5	139.1	1.80E+02	0.080
12:23	60.5	136.1	1.20E+02	0.120
12:27	45	120.6	2.40E+02	0.180
12:30	52	127.6	1.80E+02	0.230
12:35	47.5	123.1	3.00E+02	0.320
12:40	43.7	119.3	3.00E+02	0.400
12:46	40	115.6	3.60E+02	0.500
12:53	36.5	112.1	4.20E+02	0.620
13:00	33.5	109.1	4.20E+02	0.730
13:05	31	106.6	3.00E+02	0.820
13:12	28.8	104.4	4.20E+02	0.930
13:24	24.5	100.1	7.20E+02	1.130
13:28	23.5	99.1	2.40E+02	1.200
13:35	21.7	97.3	4.20E+02	1.320
13:41	20.0	95.6	3.60E+02	1.420
13:50	17.5	93.1	5.40E+02	1.570
13:56	16.4	92	3.60E+02	1.670
14:01:00	15.3	90.9	3.00E+02	1.75
14:06:00	14.1	89.7	3.00E+02	1.830
14:12:00	13.0	88.6	3.60E+02	1.930
14:16:00	12.0	87.6	2.40E+02	2.000
14:19:00	11.5	87.1	1.80E+02	2.050
14:20:00	50.4	126	6.00E+01	2.070
14:24:00	49.0	124.6	2.40E+02	2.130
14:33:00	45.3	120.9	5.40E+02	2.280
14:38:00	43.7	119.3	3.00E+02	2.370
14:47:00	37.8	113.4	5.40E+02	2.520
15:07:00	35.4	111	1.20E+03	2.850
15:16:00	33.0	108.6	5.40E+02	3.000
15:21:00	31.7	107.3	3.00E+02	3.080
15:31:00	29.3	104.9	6.00E+02	3.250
15:45:00	26.3	101.9	8.40E+02	3.480
16:05:00	22.0	97.6	1.20E+03	3.820

AVG
 3.13E-05



Single-Stage Constant Head Borehole Test - Sacramento - Thick Store-and-Release Cover

Project: Sacramento
Date:
Test ID: Thick 2

Installer: XW
Analyst: CB

Fixed Variables:

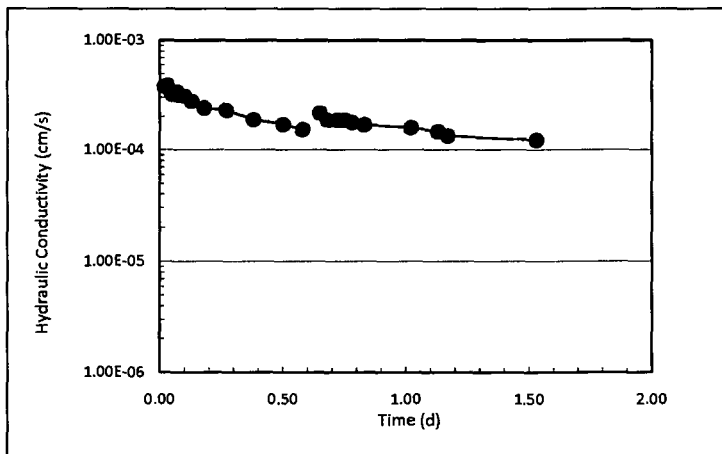
d = 10.16 cm
D = 35.56 cm
Z = 43.18 cm
R = 33.02 cm

Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
1:03	72	148.2		
1:04	68	144.2	0.020	3.78E-04
1:05	64	140.2	0.030	3.89E-04
1:06	60.8	137	0.050	3.19E-04
1:07	57.5	133.7	0.070	3.37E-04
1:08	54.5	130.7	0.080	3.14E-04
1:09	51.6	127.8	0.100	3.10E-04
1:11	46.6	122.8	0.130	2.76E-04
1:14	40.4	116.6	0.180	2.39E-04
1:19	31.2	107.4	0.270	2.27E-04
1:26	21.5	97.7	0.380	1.87E-04
1:33	13.5	89.7	0.500	1.69E-04
1:38	8.7	84.9	0.580	1.52E-04
1:40	83.5	159.7	0.620	
1:42	78.6	154.8	0.650	2.15E-04
1:44	74.5	150.7	0.680	1.85E-04
1:46	70.5	146.7	0.720	1.86E-04
1:48	66.6	142.8	0.750	1.86E-04
1:50	63.0	139.2	0.780	1.76E-04
1:53:00	58.0	134.2	0.83	1.68E-04
2:04:00	42.0	118.2	1.020	1.59E-04
2:11:00	33.6	109.8	1.130	1.46E-04
2:13:00	31.5	107.7	1.170	1.33E-04
2:35:00	12.5	88.7	1.530	1.22E-04

AVG
1.34E-04



Single-Stage Constant Head Borehole Test - Sacramento - Thick Store-and-Release Cover

Project: Sacramento
Date: Thick 3
Test ID:

Installer: XW
Analyst: CB

Fixed Variables:

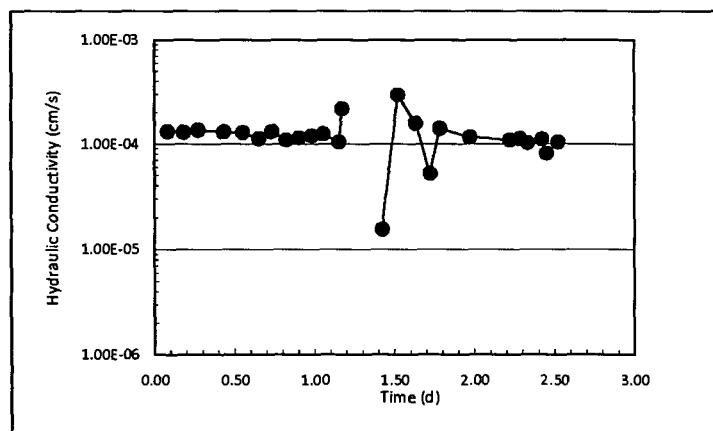
d = 10.16 cm
D = 35.56 cm
Z = 27.94 cm
R = 44.45 cm

Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
10:09	82	154.4		
10:14	74.8	147.2	3.00E+02	0.080
10:20	66.7	139.1	3.60E+02	0.180
10:25	60	132.4	3.00E+02	0.270
10:35	48	120.4	6.00E+02	0.430
10:42	40.4	112.8	4.20E+02	0.550
10:48	35	107.4	3.60E+02	0.650
10:53	30	102.4	3.00E+02	0.730
10:58	26	98.4	3.00E+02	0.820
11:03	22	94.4	3.00E+02	0.900
11:08	18	90.4	3.00E+02	0.980
11:12	14.8	87.2	2.40E+02	1.050
11:18	10.9	83.3	3.60E+02	1.150
11:19	9.6	82	6.00E+01	1.170
11:24	80.4	152.8	3.00E+02	1.250
11:34	78.7	151.1	6.00E+02	1.420
11:40	60.5	132.9	3.60E+02	1.520
11:47	50.3	122.7	4.20E+02	1.630
11:52	48.0	120.4	3.00E+02	1.720
11:56:00	43.2	115.6	2.40E+02	1.78
12:07:00	32.9	105.3	6.60E+02	1.970
12:22:00	21.0	93.4	9.00E+02	2.220
12:26:00	18.0	90.4	2.40E+02	2.280
12:29:00	16.0	88.4	1.80E+02	2.330
12:34:00	12.5	84.9	3.00E+02	2.420
12:36:00	11.5	83.9	1.20E+02	2.450
12:40:00	9.0	81.4	2.40E+02	2.520

AVG
1.00E-04



Single-Stage Constant Head Borehole Test - Sacramento - Thick Store-and-Release Cover

Project: Sacramento
 Date: Thick 4
 Test ID: Thick 4

Installer: XW
 Analyst: CB

Fixed Variables:

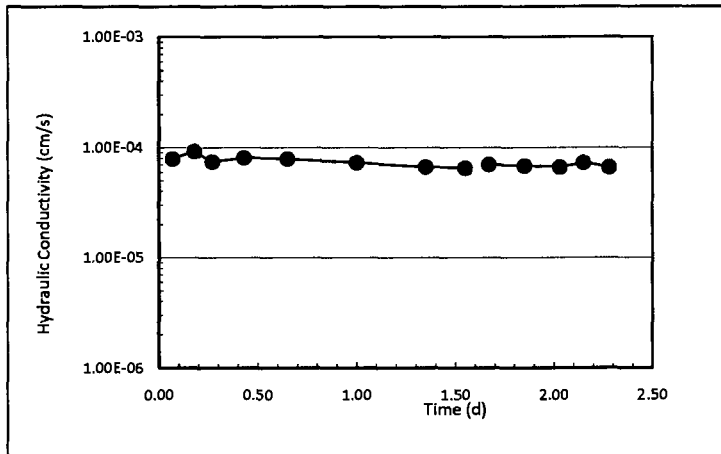
d ≈ 10.16 cm
 D ≈ 35.56 cm
 Z ≈ 60.96 cm
 R ≈ 11.43 cm

Temporal Variables:

Computations:

Time	R (cm)	Q (cm ³ /s)	Time (d)	K (cm/s)
3:05	69	141.4		
3:09	65.8	138.2	0.070	7.91E-05
3:16	59.5	131.9	0.180	9.21E-05
3:21	56	128.4	0.270	7.43E-05
3:31	48.7	121.1	0.430	8.09E-05
3:44	40	112.4	0.650	7.92E-05
4:05	28.2	100.6	1.000	7.30E-05
4:26	18.5	90.9	1.350	6.67E-05
4:38	13.5	85.9	1.550	6.52E-05
4:39	54.3	126.7	1.570	
4:45	50.5	122.9	1.670	7.01E-05
4:56	44	116.4	1.850	6.83E-05
5:07	38	110.4	2.030	6.65E-05
5:14	34	106.4	2.150	7.29E-05
5:22	30	102.4	2.280	6.62E-05

AVG
 6.84E-05



APPENDIX D - LABORATORY HYDRAULIC CONDUCTIVITY DATA

Hydraulic Conductivity Test - Altamont - Store-and-Release

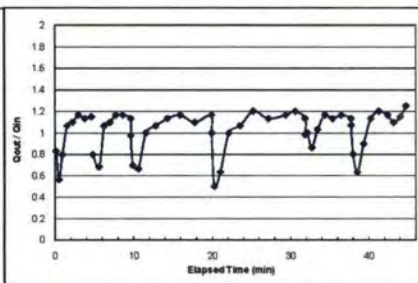
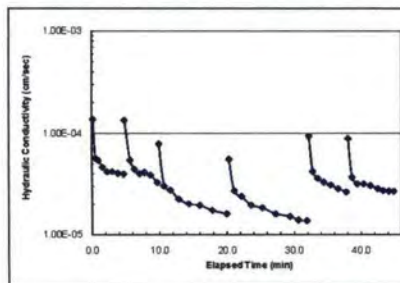
ASTM D 5084 - 00

Sample I.D.	305-mm ALT-DL - 5	Test Date :	1/16/08
Cell Pressure = 42.7 psi	Diameter of Sample, D = 30.5 cm		
Inflow Pressure = 42.4 psi	Length of Sample, L = 17.1 cm		
Outflow Pressure = 40.0 psi	Area of Sample, A = 729.7 cm ²		
Pressure Difference = 2.4 psi	Sample Volume, V = 12510.0 cm ³		
Effective Stress = 1.50 psi	a _{in} = 4 cm ²		
Hydraulic Gradient, i = 9.8	a _{out} = 4 cm ²		
Weight of wet sample = 24580.2 (g)	Sample Water Content = 20.6 (%)		
Wet Density = 2.0 g/cm ³	Dry Density = 1.63 g/cm ³		

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	NA	NA	NA	20.60

Date, Time	Inflow	Outflow	Δt	H	Time	K	Q _{in} / Q _{out}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
1/16/2008 12:00	0.0	24.0	0.0	24.0	0.0				
1/16/2008 12:00	3.0	21.5	10.0	18.5	0.2	1.36E-04	0.8	12	10
1/16/2008 12:00	6.0	19.8	21.0	13.8	0.5	5.69E-05	0.6	12	6.8
1/16/2008 12:00	9.0	17.4	26.0	8.4	1.0	5.43E-05	0.6	12	9.6
1/16/2008 12:01	12.0	14.2	36.0	2.2	1.5	4.85E-05	1.1	12	12.8
1/16/2008 12:02	15.0	10.9	42.0	-4.1	2.3	4.20E-05	1.1	12	13.2
1/16/2008 12:03	18.0	7.4	45.0	-10.6	3.0	4.21E-05	1.2	12	14
1/16/2008 12:03	21.0	4.0	48.0	-17.0	3.8	4.04E-05	1.1	12	13.6
1/16/2008 12:04	24.0	0.5	52.0	-23.5	4.7	3.96E-05	1.2	12	27.6
1/16/2008 12:04	0.0	24.0	0.0	24.0	4.7				
1/16/2008 12:05	3.0	21.6	10.0	18.6	4.8	1.34E-04	0.8	12	9.6
1/16/2008 12:06	6.0	17.5	48.0	6.5	5.6	5.42E-05	0.7	24	16.4
1/16/2008 12:07	12.0	14.3	38.0	2.3	6.3	4.40E-05	1.1	12	12.8
1/16/2008 12:08	15.0	11.0	44.0	-4.0	7.0	4.01E-05	1.1	12	13.2
1/16/2008 12:09	18.0	7.5	46.0	-10.5	7.8	4.11E-05	1.2	12	14
1/16/2008 12:09	21.0	4.0	51.0	-17.0	8.6	3.86E-05	1.2	12	14
1/16/2008 12:04	24.0	0.6	62.0	-23.4	9.7	3.27E-05	1.1	12	13.6
1/16/2008 12:00	0.0	24.0	0.0	24.0	9.7				
1/16/2008 12:00	3.0	21.9	16.0	18.9	9.9	7.87E-05	0.7	12	8.4
1/16/2008 12:00	6.0	19.9	42.0	13.9	10.6	3.02E-05	0.7	12	8
1/16/2008 12:01	9.0	16.9	57.0	7.9	11.6	2.75E-05	1.0	12	12
1/16/2008 12:03	12.0	13.7	75.0	1.7	12.8	2.24E-05	1.1	12	12.8
1/16/2008 12:04	15.0	10.3	90.0	-4.7	14.3	2.00E-05	1.1	12	13.6
1/16/2008 12:05	18.0	6.8	98.0	-11.2	15.9	1.94E-05	1.2	12	14
1/16/2008 12:08	21.0	3.5	111.0	-17.5	17.8	1.73E-05	1.1	12	13.2
1/16/2008 12:10	24.0	0.0	129.0	-24.0	20.0	1.60E-05	1.2	12	14
1/16/2008 12:00	0.0	24.0	0.0	24.0	20.0				
1/16/2008 12:00	3.0	22.5	20.0	19.5	20.3	5.55E-05	0.5	12	6
1/16/2008 12:01	6.0	20.6	46.0	14.6	21.0	2.69E-05	0.6	12	7.6
1/16/2008 12:02	9.0	17.6	66.0	8.6	22.2	2.37E-05	1.0	12	12
1/16/2008 12:03	12.0	14.4	86.0	2.4	23.6	1.94E-05	1.1	12	12.8
1/16/2008 12:05	15.0	10.8	101.0	-4.2	25.3	1.83E-05	1.2	12	14.4
1/16/2008 12:07	18.0	7.4	117.0	-10.6	27.2	1.59E-05	1.1	12	13.6
1/16/2008 12:08	21.0	3.9	131.0	-17.1	29.4	1.51E-05	1.2	12	14
1/16/2008 12:10	22.5	2.1	75.0	-20.4	30.6	1.38E-05	1.2	6	7.2
1/16/2008 12:11	24.0	0.4	75.0	-23.6	31.9	1.37E-05	1.1	6	6.8
1/16/2008 12:00	0.0	24.0	0.0	24.0	31.9				
1/16/2008 12:00	3.0	21.0	16.0	18.0	32.2	9.29E-05	1.0	12	12
1/16/2008 12:00	6.0	18.4	34.0	12.4	32.7	4.21E-05	0.9	12	10.4
1/16/2008 12:01	9.0	15.3	45.0	6.3	33.5	3.58E-05	1.0	12	12.4
1/16/2008 12:02	12.0	11.8	54.0	-0.2	34.4	3.29E-05	1.2	12	14
1/16/2008 12:03	15.0	8.4	59.0	-6.6	35.4	3.08E-05	1.1	12	13.6
1/16/2008 12:04	18.0	4.9	66.0	-13.1	36.5	2.83E-05	1.2	12	14
1/16/2008 12:05	21.0	1.5	75.0	-19.5	37.7	2.63E-05	1.1	12	13.6
1/16/2008 12:00	0.0	24.0	0.0	24.0	37.7				
1/16/2008 12:00	3.0	21.6	15.0	18.6	38.0	8.90E-05	0.8	12	9.6
1/16/2008 12:00	6.0	19.7	34.0	13.7	38.6	3.66E-05	0.6	12	7.6
1/16/2008 12:01	9.0	17.0	47.0	8.0	39.3	3.17E-05	0.9	12	10.8
1/16/2008 12:02	12.0	13.6	55.0	1.6	40.3	3.15E-05	1.1	12	13.6
1/16/2008 12:03	15.0	10.0	61.0	-5.0	41.3	3.04E-05	1.2	12	14.4
1/16/2008 12:04	18.0	6.5	67.0	-11.5	42.4	2.84E-05	1.2	12	14
1/16/2008 12:05	20.0	4.3	47.0	-15.7	43.2	2.71E-05	1.1	8	8.8
1/16/2008 12:06	22.0	2.0	50.0	-20.0	44.0	2.68E-05	1.2	8	9.2
1/16/2008 12:08	23.6	0.0	43.0	-23.6	44.7	2.68E-05	1.3	6.4	8



Hydraulic Conductivity Test - Altamont - Store-and-Release

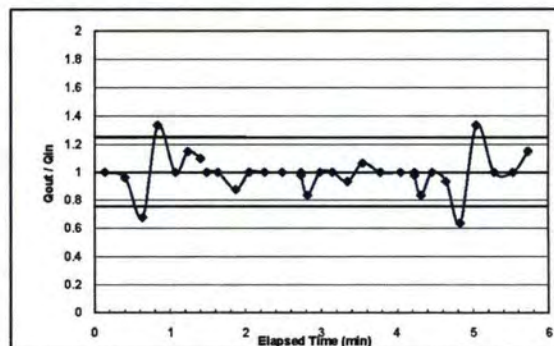
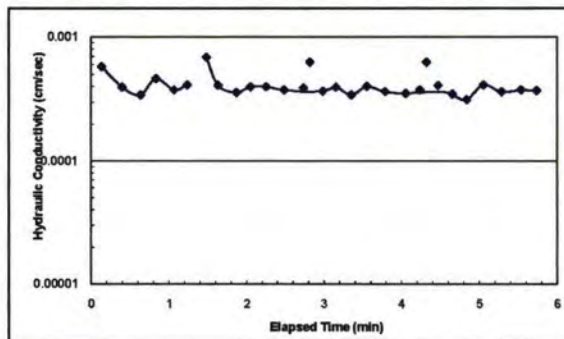
ASTM D 5084 - 00

Sample I.D.	305-mm ALT- ML - 4	Test Date :	12/21/07
Cell Pressure =	42.0 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.0 psi	Length of Sample, L =	15.2 cm
Outflow Pressre =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	1.0 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	4.6	a _{out} =	5 cm ²
Weight of wet sample =	21563.8 (g)	Sample Water Content =	20.9 (%)
Wet Density =	1.9 g/cm ³	Dry Density =	1.60 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	NA	NA	NA	20.87

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
12/21/2007 12:00	0.0	24.0	0.0	24.0	0.0				
12/21/2007 12:00	4.0	20.0	8.0	16.0	0.1	5.78E-04	1.0	20	20
12/21/2007 12:00	9.0	15.2	16.0	6.2	0.4	3.93E-04	1.0	25	24
12/21/2007 12:00	13.0	12.5	14.0	-0.5	0.6	3.42E-04	0.7	20	13.5
12/21/2007 12:00	16.0	8.5	12.0	-7.5	0.8	4.60E-04	1.3	15	20
12/21/2007 12:01	19.0	5.5	14.0	-13.5	1.1	3.74E-04	1.0	15	15
12/21/2007 12:01	21.0	3.2	10.0	-17.8	1.2	4.11E-04	1.2	10	11.5
12/21/2007 12:01	23.0	1.0	10.0	-22.0	1.4	4.35E-04	1.1	10	11
12/21/2007 12:00	0.0	24.0	0.0	24.0	1.4				
12/21/2007 12:00	3.0	21.0	5.0	18.0	1.5	6.86E-04	1.0	15	15
12/21/2007 12:00	6.0	18.0	9.0	12.0	1.6	4.08E-04	1.0	15	15
12/21/2007 12:00	10.0	14.5	14.0	4.5	1.9	3.56E-04	0.9	20	17.5
12/21/2007 12:00	13.0	11.5	11.0	-1.5	2.0	3.97E-04	1.0	15	15
12/21/2007 12:00	16.0	8.5	12.0	-7.5	2.3	3.97E-04	1.0	15	15
12/21/2007 12:01	19.0	5.5	14.0	-13.5	2.5	3.74E-04	1.0	15	15
12/21/2007 12:01	22.0	2.5	15.0	-19.5	2.7	3.88E-04	1.0	15	15
12/21/2007 12:00	0.0	24.0	0.0	24.0	2.7				
12/21/2007 12:00	3.0	21.5	5.0	18.5	2.8	6.27E-04	0.8	15	12.5
12/21/2007 12:00	6.0	18.5	10.0	12.5	3.0	3.65E-04	1.0	15	15
12/21/2007 12:00	9.0	15.5	10.0	6.5	3.2	3.93E-04	1.0	15	15
12/21/2007 12:00	12.0	12.7	12.0	0.7	3.3	3.42E-04	0.9	15	14
12/21/2007 12:00	15.0	9.5	12.0	-5.5	3.6	3.97E-04	1.1	15	16
12/21/2007 12:01	18.0	6.5	14.0	-11.5	3.8	3.62E-04	1.0	15	15
12/21/2007 12:01	21.0	3.5	16.0	-17.5	4.1	3.51E-04	1.0	15	15
12/21/2007 12:01	23.0	1.5	11.0	-21.5	4.2	3.74E-04	1.0	10	10
12/21/2007 12:00	0.0	24.0	0.0	24.0	4.2				
12/21/2007 12:00	3.0	21.5	5.0	18.5	4.3	6.27E-04	0.8	15	12.5
12/21/2007 12:00	6.0	18.5	9.0	12.5	4.5	4.06E-04	1.0	15	15
12/21/2007 12:00	9.0	15.7	11.0	6.7	4.7	3.45E-04	0.9	15	14
12/21/2007 12:00	12.0	13.8	11.0	1.8	4.8	3.12E-04	0.6	15	9.5
12/21/2007 12:00	15.0	9.8	13.0	-5.2	5.1	4.10E-04	1.3	15	20
12/21/2007 12:01	18.0	6.8	14.0	-11.2	5.3	3.60E-04	1.0	15	15
12/21/2007 12:01	21.0	3.8	15.0	-17.2	5.5	3.72E-04	1.0	15	15
12/21/2007 12:01	23.0	1.5	12.0	-21.5	5.7	3.67E-04	1.2	10	11.5



Hydraulic Conductivity Test - Altamont - Store-and-Release

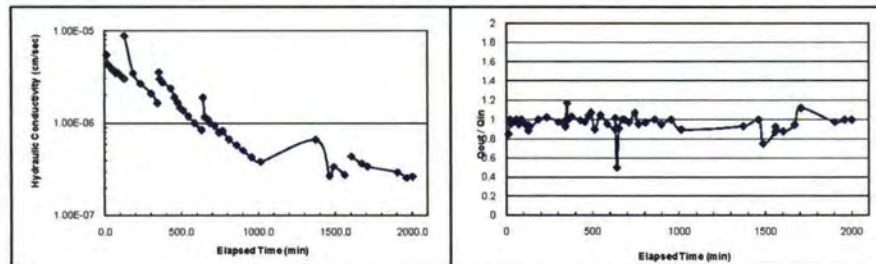
ASTM D 5084 - 00

Sample I.D.	150-mm ALT - ML - 4	Test Date :	2/6/08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	40.8 psi	Length of Sample, L =	8.1 cm
Outflow Pressure =	40.3 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	0.5 psi	Sample Volume, V =	1482.7 cm ³
Effective Stress =	1.50 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	4.6	a _{out} =	1 cm ²
Weight of wet sample =	3447.3 (g)	Sample Water Content =	19.3 (%)
Wet Density =	2.3 g/cm ³	Dry Density =	1.95 g/cm ³

$$K_s = \frac{a_{in} * a_{out} * L}{(a_{in} + a_{out}) * A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content (%)
NA	(g)	(g)	(g)	(%)
NA	NA	NA	NA	19.32

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/6/2008 12:00	0.0	24.0	0.0	24.0	0.0				
2/6/2008 12:12	5.5	19.3	747.0	13.8	12.4	5.43E-06	0.9	5.5	4.7
2/6/2008 12:19	7.5	17.3	424.0	9.8	19.5	4.29E-06	1.0	2	2
2/6/2008 12:29	9.9	15.0	572.0	5.1	29.1	4.10E-06	1.0	2.4	2.3
2/6/2008 12:49	13.9	11.1	1223.0	-2.8	49.4	3.76E-06	1.0	4	3.9
2/6/2008 12:59	15.5	9.5	588.0	-6.0	59.2	3.69E-06	1.0	1.6	1.6
2/6/2008 13:13	17.5	7.6	865.0	-9.9	73.7	3.43E-06	1.0	2	1.9
2/6/2008 13:27	19.1	6.0	807.0	-13.1	87.0	3.46E-06	1.0	1.6	1.6
2/6/2008 13:48	21.2	4.0	1302.0	-17.2	108.7	3.18E-06	1.0	2.1	2
2/6/2008 14:06	22.6	2.7	1078.0	-19.3	126.7	2.99E-06	0.9	1.4	1.3
2/6/2008 12:00	0.0	24.0	0.0	24.0	126.7				
2/6/2008 12:02	1.8	22.4	145.0	20.6	129.1	8.77E-06	0.9	1.8	1.6
2/6/2008 12:58	13.5	10.7	3388.0	-2.8	185.5	3.41E-06	1.0	11.7	11.7
2/6/2008 13:46	18.4	5.7	2845.0	-12.7	233.0	2.65E-06	1.0	4.9	5
2/6/2008 14:55	22.4	1.8	4161.0	-20.6	302.3	2.08E-06	1.0	4	3.9
2/6/2008 15:35	23.8	0.5	2400.0	-23.3	342.3	1.64E-06	0.9	1.4	1.3
2/6/2008 12:00	0.0	24.0	0.0	24.0	342.3				
2/6/2008 12:09	2.4	21.2	564.0	18.8	351.7	3.50E-06	1.2	2.4	2.8
2/6/2008 12:19	3.7	19.9	357.0	16.2	357.7	2.96E-06	1.0	1.3	1.3
2/6/2008 12:39	7.3	16.2	1203.0	8.9	377.7	2.72E-06	1.0	3.6	3.7
2/6/2008 13:26	13.7	9.9	3060.0	-3.9	428.7	2.35E-06	1.0	6.4	6.35
2/6/2008 13:52	15.8	7.8	1563.0	-8.0	454.8	1.89E-06	1.0	2.1	2.05
2/6/2008 14:13	17.1	6.5	1288.0	-10.7	476.2	1.64E-06	1.0	1.3	1.35
2/6/2008 14:28	17.8	5.7	657.0	-12.1	490.5	1.46E-06	1.1	0.7	0.75
2/6/2008 14:49	18.8	4.8	1287.0	-14.0	512.0	1.36E-06	0.9	1	0.9
2/6/2008 15:21	19.9	3.7	1912.0	-16.3	543.8	1.18E-06	1.0	1.1	1.15
2/6/2008 16:01	21.0	2.6	2406.0	-18.4	583.9	9.99E-07	1.0	1.1	1.05
2/6/2008 16:48	22.0	1.7	2795.0	-20.3	630.5	8.46E-07	0.9	1	0.9
2/6/2008 12:00	0.0	24.0	0.0	24.0	630.5				
2/6/2008 12:08	1.8	23.1	537.0	21.3	639.5	1.87E-06	0.5	1.8	0.9
2/6/2008 12:20	2.9	22.1	705.0	19.2	651.2	1.15E-06	0.9	1.1	1
2/6/2008 12:39	4.4	20.6	1115.0	16.2	669.8	1.09E-06	1.0	1.5	1.5
2/6/2008 12:53	5.4	19.6	950.0	14.2	684.0	9.99E-07	1.0	1	1
2/6/2008 13:21	7.2	17.9	1688.0	10.7	712.1	9.43E-07	1.0	1.8	1.75
2/6/2008 13:52	8.7	16.3	1875.0	7.6	743.4	7.95E-07	1.1	1.5	1.6
2/6/2008 14:14	9.8	15.2	1324.0	5.4	765.4	8.27E-07	1.0	1.1	1.05
2/6/2008 14:57	11.4	13.7	2531.0	2.3	807.6	6.75E-07	1.0	1.6	1.55
2/6/2008 15:47	12.9	12.2	3038.0	-0.8	858.2	5.79E-07	1.0	1.5	1.5
2/6/2008 16:27	13.9	11.2	2394.0	-2.7	898.1	5.11E-07	1.0	1	0.95
2/6/2008 17:24	15.0	10.1	3407.0	-4.9	954.9	4.30E-07	1.0	1.1	1.1
2/6/2008 18:22	16.0	9.2	3493.0	-6.8	1013.1	3.86E-07	0.9	1	0.9
2/7/2008 0:22	23.5	2.2	21586.0	-21.3	1372.9	6.67E-07	0.9	7.5	7
2/7/2008 1:51	24.0	1.7	5347.0	-22.3	1462.0	2.69E-07	1.0	0.5	0.5
2/7/2008 2:17	24.2	1.6	1545.0	-22.7	1487.8	3.41E-07	0.8	0.2	0.15
2/7/2008 3:27	24.6	1.2	4233.0	-23.4	1558.3	2.77E-07	0.9	0.4	0.35
2/7/2008 0:00	0.0	24.0	0.0	24.0	1558.3				
2/7/2008 0:45	1.7	22.5	2729.0	20.8	1603.8	4.38E-07	0.9	1.7	1.5
2/7/2008 1:51	3.6	20.7	3977.0	17.1	1670.1	3.69E-07	0.9	1.9	1.8
2/7/2008 2:26	4.5	19.8	2193.0	15.3	1706.6	3.42E-07	1.1	0.85	0.95
2/7/2008 5:44	8.3	16.0	11774.0	7.7	1902.9	2.95E-07	1.0	3.85	3.75
2/7/2008 6:43	9.2	15.1	3541.0	5.9	1961.9	2.57E-07	1.0	0.9	0.9
2/7/2008 7:22	9.8	14.5	2361.0	4.7	2001.2	2.66E-07	1.0	0.6	0.6



Hydraulic Conductivity Test - Altamont - Store-and-Release

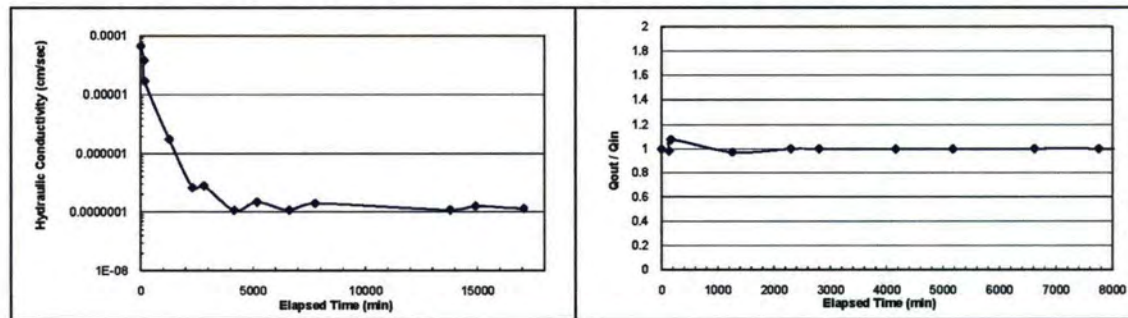
ASTM D 5084 - 00

Sample I.D.	75-mm ALT - ML - 4	Test Date :	3/23/08
Cell Pressure =	42.4 psi	Diameter of Sample, D =	5.6 cm
Inflow Pressure =	41.0 psi	Length of Sample, L =	2.8 cm
Outflow Pressure =	40.8 psi	Area of Sample, A =	24.6 cm ²
Pressure Difference =	0.2 psi	Sample Volume, V =	69.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	5.0	a _{out} =	5 cm ²
Weight of wet sample =	298.8 (g)	Sample Water Content =	19.3 (%)
Wet Density =	4.3 g/cm ³	Dry Density =	3.63 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content (%)
	(g)	(g)	(g)	
NA	NA	NA	NA	19.29

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
3/23/2008 12:00	0.0	24.0	0.0	24.0	0.0				
3/23/2008 12:03	1.0	23.0	230.0	22.0	3.8	6.67E-05	1.0	5	5
3/23/2008 14:20	13.0	11.2	8204.0	-1.8	140.6	3.74E-05	1.0	60	59
3/23/2008 14:53	13.7	10.5	1986.0	-3.2	173.3	1.69E-05	1.1	3.25	3.5
3/24/2008 9:04	15.5	8.7	65463.0	-6.8	1264.4	1.77E-06	1.0	9.25	9
3/25/2008 2:18	15.7	8.5	62050.0	-7.2	2298.6	2.59E-07	1.0	1	1
3/25/2008 10:42	15.8	8.4	30208.0	-7.4	2802.0	2.78E-07	1.0	0.5	0.5
3/26/2008 9:17	15.9	8.3	81350.0	-7.6	4157.9	1.06E-07	1.0	0.5	0.5
3/27/2008 2:13	16.0	8.2	60926.0	-7.8	5173.3	1.47E-07	1.0	0.5	0.5
3/28/2008 2:14	16.1	8.1	86470.0	-8.0	6614.4	1.07E-07	1.0	0.5	0.5
3/28/2008 21:15	16.2	8.0	68459.0	-8.2	7755.4	1.39E-07	1.0	0.5	0.5
4/2/2008 1:40	16.6	7.7	361478.0	-9.0	13780.1	1.08E-07	0.9	2	1.75
4/2/2008 20:28	16.7	7.6	67717.0	-9.1	14908.7	1.25E-07	0.5	0.5	0.25
4/4/2008 8:26	16.9	7.5	129443.0	-9.4	17066.1	1.13E-07	0.7	0.75	0.5



Hydraulic Conductivity Test - Altamont - Store-and-Release

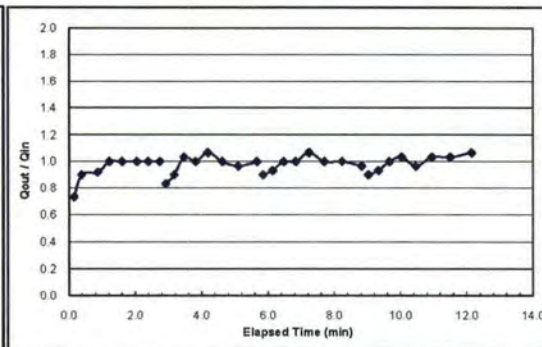
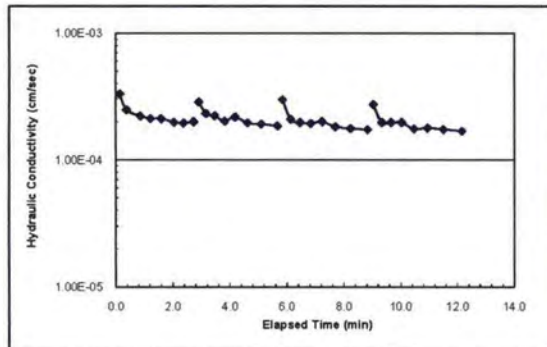
ASTM D 5084 - 00

Sample I.D.	305-mm ALT - ML - 3	Test Date :	12/27/07
Cell Pressure =	42.0 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.0 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	1.0 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	4.6	a _{out} =	5 cm ²
Weight of wet sample =	22402.9 (g)	Sample Water Content =	18.9 (%)
Wet Density =	2.0 g/cm ³	Dry Density =	1.69 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content (%)
NA	(g)	(g)	(g)	(%)
NA	NA	NA	NA	18.90

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
12/27/2007 12:00	0.0	24.0	0.0	24.0	0.0				
12/27/2007 12:00	3.0	21.8	9.0	18.8	0.2	3.29E-04	0.7	15	11
12/27/2007 12:00	6.0	19.1	14.0	13.1	0.4	2.46E-04	0.9	15	13.5
12/27/2007 12:00	11.0	14.5	29.0	3.5	0.9	2.20E-04	0.9	25	23
12/27/2007 12:01	14.0	11.5	21.0	-2.5	1.2	2.11E-04	1.0	15	15
12/27/2007 12:01	17.0	8.5	23.0	-8.5	1.6	2.10E-04	1.0	15	15
12/27/2007 12:02	20.0	5.5	27.0	-14.5	2.0	1.97E-04	1.0	15	15
12/27/2007 12:02	22.0	3.5	20.0	-18.5	2.4	1.94E-04	1.0	10	10
12/27/2007 12:02	24.0	1.5	21.0	-22.5	2.7	2.00E-04	1.0	20	20
12/27/2007 12:00	0.0	24.0	0.0	24.0	2.7				
12/27/2007 12:00	3.0	21.5	11.0	18.5	2.9	2.85E-04	0.8	15	12.5
12/27/2007 12:00	6.0	18.8	15.0	12.8	3.2	2.31E-04	0.9	15	13.5
12/27/2007 12:00	9.0	15.7	18.0	6.7	3.5	2.21E-04	1.0	15	15.5
12/27/2007 12:01	12.0	12.7	21.0	0.7	3.8	2.02E-04	1.0	15	15
12/27/2007 12:01	15.0	9.5	22.0	-5.5	4.2	2.17E-04	1.1	15	16
12/27/2007 12:01	18.0	6.5	26.0	-11.5	4.6	1.95E-04	1.0	15	15
12/27/2007 12:02	21.0	3.6	29.0	-17.4	5.1	1.90E-04	1.0	15	14.5
12/27/2007 12:02	24.0	0.6	34.0	-23.4	5.7	1.85E-04	1.0	15	15
12/27/2007 12:00	0.0	24.0	0.0	24.0	5.7				
12/27/2007 12:00	3.0	21.3	11.0	18.3	5.9	2.96E-04	0.9	15	13.5
12/27/2007 12:00	6.0	18.5	17.0	12.5	6.1	2.08E-04	0.9	15	14
12/27/2007 12:00	9.0	15.5	20.0	6.5	6.5	1.96E-04	1.0	15	15
12/27/2007 12:01	12.0	12.5	22.0	0.5	6.8	1.93E-04	1.0	15	15
12/27/2007 12:01	15.0	9.3	24.0	-5.7	7.2	1.99E-04	1.1	15	16
12/27/2007 12:02	18.0	6.3	28.0	-11.7	7.7	1.82E-04	1.0	15	15
12/27/2007 12:02	21.0	3.3	32.0	-17.7	8.2	1.76E-04	1.0	15	15
12/27/2007 12:03	24.0	0.4	36.0	-23.6	8.8	1.72E-04	1.0	15	14.5
12/27/2007 12:00	0.0	24.0	0.0	24.0	8.8				
12/27/2007 12:00	3.0	21.3	12.0	18.3	9.0	2.71E-04	0.9	15	13.5
12/27/2007 12:00	6.0	18.5	18.0	12.5	9.3	1.96E-04	0.9	15	14
12/27/2007 12:00	9.0	15.5	20.0	6.5	9.7	1.96E-04	1.0	15	15
12/27/2007 12:01	12.0	12.4	22.0	0.4	10.0	1.96E-04	1.0	15	15.5
12/27/2007 12:01	15.0	9.5	26.0	-5.5	10.5	1.75E-04	1.0	15	14.5
12/27/2007 12:02	18.0	6.4	29.0	-11.6	11.0	1.78E-04	1.0	15	15.5
12/27/2007 12:02	21.0	3.3	33.0	-17.7	11.5	1.74E-04	1.0	15	15.5
12/27/2007 12:03	24.0	0.1	39.0	-23.9	12.2	1.68E-04	1.1	15	16



Hydraulic Conductivity Test - Altamont - Composite

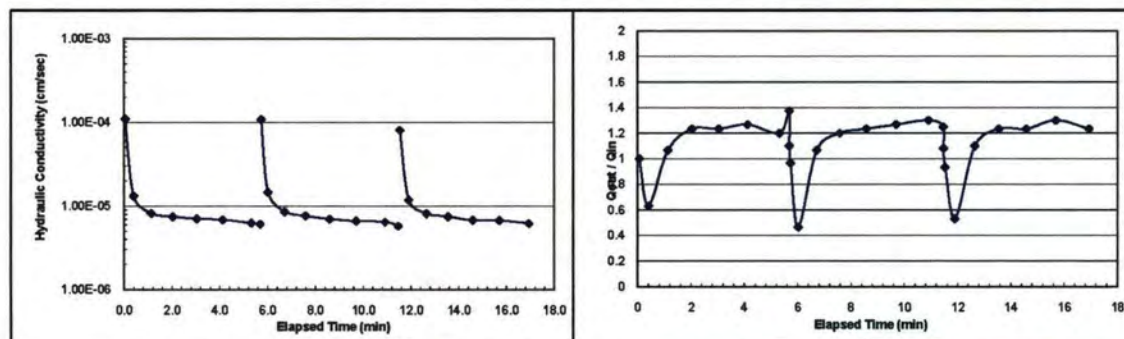
ASTM D 5084 - 00

Sample I.D.	305-mm CMP - SDRI	Test Date :	1/29/07
Cell Pressure = 42.7	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 42.4	psi	Length of Sample, L = 15.2	cm
Outflow Pressure = 40.0	psi	Area of Sample, A = 729.7	cm ²
Pressure Difference = 2.4	psi	Sample Volume, V = 11120.0	cm ³
Effective Stress = 1.50	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 11.1		a _{out} = 1	cm ²
Weight of wet sample = 24539.3	(g)	Sample Water Content = 16.4	(%)
Wet Density = 2.2	g/cm ³	Dry Density = 1.90	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
NA	NA	NA	NA	16.40

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
1/31/2007 12:00	0.0	24.0	0.0	24.0	0.0				
1/31/2007 12:00	3.0	21.0	3.0	18.0	0.1	1.10E-04	1.0	3	3
1/31/2007 12:00	6.0	19.1	21.0	13.1	0.4	1.32E-05	0.6	3	1.9
1/31/2007 12:01	9.0	15.9	44.0	6.9	1.1	8.23E-06	1.1	3	3.2
1/31/2007 12:02	12.0	12.2	54.0	0.2	2.0	7.52E-06	1.2	3	3.7
1/31/2007 12:03	15.0	8.5	60.0	-6.5	3.0	7.04E-06	1.2	3	3.7
1/31/2007 12:04	18.0	4.7	65.0	-13.3	4.1	6.88E-06	1.3	3	3.8
1/31/2007 12:05	21.0	1.1	72.0	-19.9	5.3	6.29E-06	1.2	3	3.6
1/31/2007 12:05	21.8	0.0	22.0	-21.8	5.7	6.10E-06	1.4	0.8	1.1
1/31/2007 12:00	0.0	24.0	0.0	24.0	5.7				
1/31/2007 12:00	3.0	21.1	3.0	18.1	5.7	1.08E-04	1.0	3	2.9
1/31/2007 12:00	6.0	19.7	17.0	13.7	6.0	1.46E-05	0.5	3	1.4
1/31/2007 12:01	9.0	16.5	42.0	7.5	6.7	8.59E-06	1.1	3	3.2
1/31/2007 12:01	12.0	12.9	52.0	0.9	7.6	7.66E-06	1.2	3	3.6
1/31/2007 12:02	15.0	9.2	60.0	-5.8	8.6	7.01E-06	1.2	3	3.7
1/31/2007 12:04	18.0	5.4	67.0	-12.6	9.7	6.64E-06	1.3	3	3.8
1/31/2007 12:05	21.0	1.5	73.0	-19.5	10.9	6.46E-06	1.3	3	3.9
1/31/2007 12:05	22.2	0.0	33.0	-22.2	11.5	5.78E-06	1.3	1.2	1.5
1/31/2007 12:00	0.0	24.0	0.0	24.0	11.5				
1/31/2007 12:00	3.0	21.2	4.0	18.2	11.5	7.97E-05	0.9	3	2.8
1/31/2007 12:00	6.0	19.6	22.0	13.6	11.9	1.18E-05	0.5	3	1.6
1/31/2007 12:01	9.0	16.3	45.0	7.3	12.7	8.16E-06	1.1	3	3.3
1/31/2007 12:02	12.0	12.6	54.0	0.6	13.6	7.50E-06	1.2	3	3.7
1/31/2007 12:03	15.0	8.9	62.0	-6.1	14.6	6.80E-06	1.2	3	3.7
1/31/2007 12:04	18.0	5.0	67.0	-13.0	15.7	6.75E-06	1.3	3	3.9
1/31/2007 12:05	21.0	1.3	74.0	-19.7	16.9	6.20E-06	1.2	3	3.7



Hydraulic Conductivity Test - Altamont - Composite

ASTM D 5084 - 00

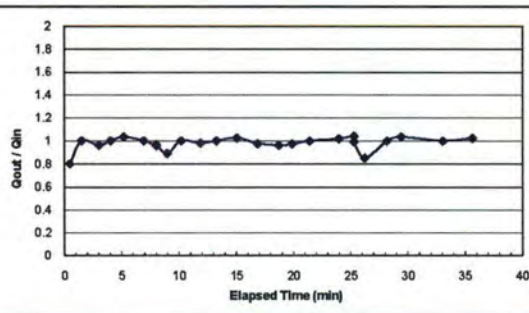
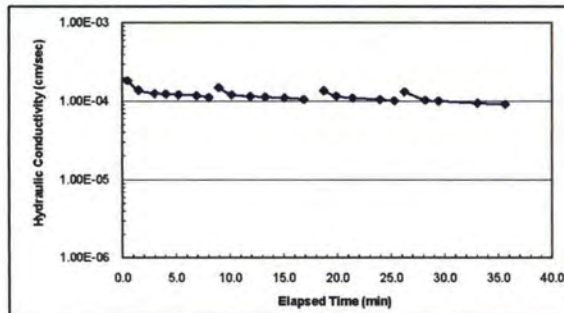
Sample I.D.	150-mm CMP - SDRI	Test Date :	2/20/08
Cell Pressure =	42.1 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	41.2 psi	Length of Sample, L =	7.6 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.2 psi	Sample Volume, V =	1390.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	5 cm ²
Weight of wet sample =	3084.4 (g)	Sample Water Content =	17.3 (%)
Wet Density =	2.2 g/cm ³	Dry Density =	1.89 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
NA	NA	NA	NA	17.33

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/20/2008 12:00	0.0	24.0	0.0	24.0	0.0				
2/20/2008 12:00	3.0	21.6	29.0	18.6	0.5	1.84E-04	0.8	15	12
2/20/2008 12:01	7.0	17.6	61.0	10.6	1.5	1.38E-04	1.0	20	20
2/20/2008 12:03	12.0	12.8	90.0	0.8	3.0	1.26E-04	1.0	25	24
2/20/2008 12:04	15.0	9.8	62.0	-5.2	4.0	1.23E-04	1.0	15	15
2/20/2008 12:05	18.0	6.7	69.0	-11.3	5.2	1.21E-04	1.0	15	15.5
2/20/2008 12:06	22.0	2.7	103.0	-19.3	6.9	1.18E-04	1.0	20	20
2/20/2008 12:08	24.3	0.5	67.0	-23.8	8.0	1.12E-04	1.0	11.5	11
2/20/2008 12:00	0.0	24.0	0.0	24.0	8.0				
2/20/2008 12:00	4.5	20.0	57.0	15.5	9.0	1.50E-04	0.9	22.5	20
2/20/2008 12:02	8.5	16.0	72.0	7.5	10.2	1.21E-04	1.0	20	20
2/20/2008 12:03	13.5	11.1	103.0	-2.4	11.9	1.16E-04	1.0	25	24.5
2/20/2008 12:05	17.0	7.6	83.0	-9.4	13.3	1.12E-04	1.0	17.5	17.5
2/20/2008 12:07	21.0	3.5	108.0	-17.5	15.1	1.11E-04	1.0	20	20.5
2/20/2008 12:08	24.5	0.1	108.0	-24.4	16.9	1.05E-04	1.0	17.5	17
2/20/2008 12:00	0.0	24.0	0.0	24.0	16.9				
2/20/2008 12:01	7.5	16.8	112.0	9.3	18.7	1.36E-04	1.0	37.5	36
2/20/2008 12:03	11.0	13.4	69.0	2.4	19.9	1.16E-04	1.0	17.5	17
2/20/2008 12:04	15.0	9.4	92.0	-5.6	21.4	1.10E-04	1.0	20	20
2/20/2008 12:07	20.5	3.8	152.0	-16.7	24.0	1.04E-04	1.0	27.5	28
2/20/2008 12:08	23.0	1.2	81.0	-21.8	25.3	1.01E-04	1.0	12.5	13
2/20/2008 12:00	0.0	24.0	0.0	24.0	25.3				
2/20/2008 12:00	4.0	20.6	56.0	16.6	26.2	1.32E-04	0.9	20	17
2/20/2008 12:02	9.5	15.1	117.0	5.6	28.2	1.03E-04	1.0	27.5	27.5
2/20/2008 12:04	12.5	12.0	73.0	-0.5	29.4	1.00E-04	1.0	15	15.5
2/20/2008 12:07	20.0	4.5	219.0	-15.5	33.1	9.39E-05	1.0	37.5	37.5
2/20/2008 12:10	24.3	0.1	155.0	-24.2	35.6	9.10E-05	1.0	21.5	22

note: a pre-existing fracture cross cut the diameter of the sample.



Hydraulic Conductivity Test - Altamont - Composite

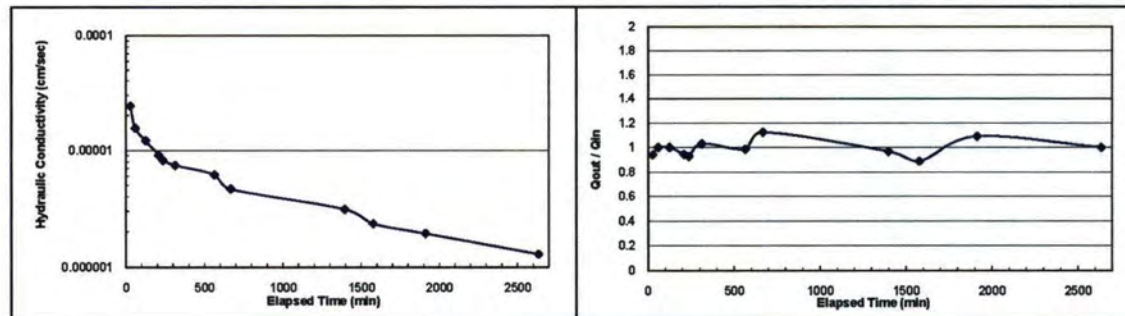
ASTM D 5084 - 00

Sample I.D.	75-mm CMP - SDRI	Test Date :	3/11/08
Cell Pressure = 42.4	psi	Diameter of Sample, D = 5.6	cm
Inflow Pressure = 41.1	psi	Length of Sample, L = 2.8	cm
Outflow Pressure = 40.7	psi	Area of Sample, A = 24.6	cm ²
Pressure Difference = 0.4	psi	Sample Volume, V = 67.7	cm ³
Effective Stress = 1.50	psi	a _{in} = 5	cm ²
Hydraulic Gradient, i = 10.2		a _{out} = 5	cm ²
Weight of wet sample = 314.1	(g)	Sample Water Content = 19.6	(%)
Wet Density = 4.6	g/cm ³	Dry Density = 3.88	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	NA	NA	NA	19.58

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
3/11/2008 12:00	0.0	24.0	0.0	24.0	0.0				
3/11/2008 12:26	3.5	20.7	1612.0	17.2	26.9	2.42E-05	0.9	17.5	16.5
3/11/2008 12:58	5.8	18.4	1916.0	12.6	58.8	1.56E-05	1.0	11.5	11.5
3/11/2008 14:04	9.0	15.2	3938.0	6.2	124.4	1.21E-05	1.0	16	16
3/11/2008 15:28	11.7	12.7	5069.0	1.0	208.9	9.14E-06	0.9	13.5	12.75
3/11/2008 15:55	12.4	12.0	1610.0	-0.4	235.7	8.24E-06	0.9	3.5	3.25
3/11/2008 17:13	14.0	10.4	4659.0	-3.7	313.4	7.47E-06	1.0	8	8.25
3/11/2008 21:24	17.5	6.9	15076.0	-10.6	564.7	6.18E-06	1.0	17.5	17.25
3/11/2008 23:06	18.3	6.0	6121.0	-12.3	666.7	4.65E-06	1.1	4	4.5
3/12/2008 11:16	21.4	3.0	43776.0	-18.4	1396.3	3.10E-06	1.0	15.5	15
3/12/2008 14:18	21.9	2.6	10905.0	-19.3	1578.0	2.34E-06	0.9	2.25	2
3/12/2008 19:52	22.4	2.0	20095.0	-20.4	1913.0	1.93E-06	1.1	2.75	3
3/13/2008 7:55	23.1	1.3	43328.0	-21.8	2635.1	1.29E-06	1.0	3.5	3.5



Hydraulic Conductivity Test - Altamont - Composite

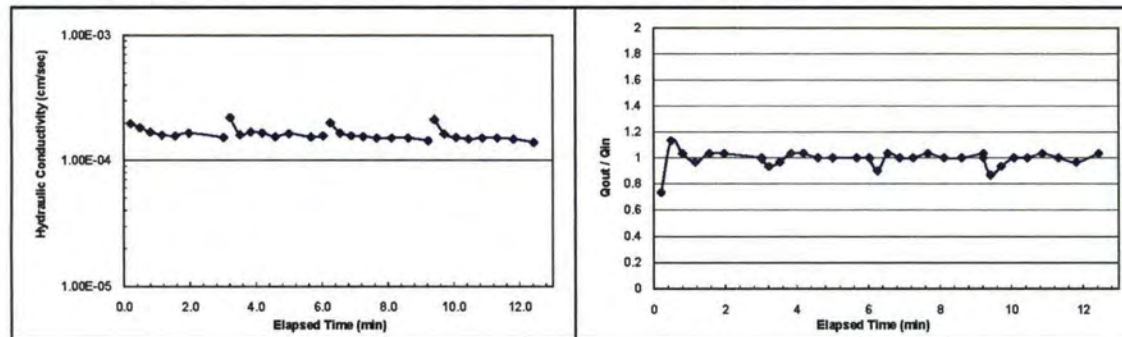
ASTM D 5084 - 00

Sample I.D.	305-mm CMP - CL - 1	Test Date :	12/28/07
Cell Pressure =	42.0 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.0 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	1.0 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	4 cm ²
Hydraulic Gradient, i =	4.6	a _{out} =	4 cm ²
Weight of wet sample =	21994.7 (g)	Sample Water Content =	16.9 (%)
Wet Density =	2.0 g/cm ³	Dry Density =	1.69 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
NA	NA	NA	NA	16.90

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
12/28/2007 12:00	0.0	24.0	0.0	24.0	0.0				
12/28/2007 12:00	3.0	21.8	12.0	18.8	0.2	1.97E-04	0.7	12	8.8
12/28/2007 12:00	6.0	18.4	17.0	12.4	0.5	1.83E-04	1.1	12	13.6
12/28/2007 12:00	9.0	15.3	19.0	6.3	0.8	1.68E-04	1.0	12	12.4
12/28/2007 12:01	12.0	12.4	21.0	0.4	1.1	1.59E-04	1.0	12	11.6
12/28/2007 12:01	15.0	9.3	24.0	-5.7	1.5	1.57E-04	1.0	12	12.4
12/28/2007 12:01	18.0	6.2	25.0	-11.8	2.0	1.66E-04	1.0	12	12.4
12/28/2007 12:03	24.0	0.2	63.0	-23.8	3.0	1.52E-04	1.0	24	24
12/28/2007 12:00	0.0	24.0	0.0	24.0	3.0				
12/28/2007 12:00	3.0	21.2	12.0	18.2	3.2	2.21E-04	0.9	12	11.2
12/28/2007 12:00	6.0	18.3	18.0	12.3	3.5	1.60E-04	1.0	12	11.6
12/28/2007 12:00	9.0	15.2	19.0	6.2	3.8	1.69E-04	1.0	12	12.4
12/28/2007 12:01	12.0	12.1	21.0	0.1	4.2	1.65E-04	1.0	12	12.4
12/28/2007 12:01	15.0	9.1	24.0	-5.9	4.6	1.55E-04	1.0	12	12
12/28/2007 12:01	18.0	6.1	25.0	-11.9	5.0	1.63E-04	1.0	12	12
12/28/2007 12:02	22.0	2.1	40.0	-19.9	5.7	1.54E-04	1.0	16	16
12/28/2007 12:03	24.0	0.1	22.0	-23.9	6.0	1.57E-04	1.0	8	8
12/28/2007 12:00	0.0	24.0	0.0	24.0	6.0				
12/28/2007 12:00	3.0	21.3	13.0	18.3	6.3	2.00E-04	0.9	12	10.8
12/28/2007 12:00	6.0	18.2	18.0	12.2	6.6	1.65E-04	1.0	12	12.4
12/28/2007 12:00	9.0	15.2	20.0	6.2	6.9	1.58E-04	1.0	12	12
12/28/2007 12:01	12.0	12.2	22.0	0.2	7.3	1.55E-04	1.0	12	12
12/28/2007 12:01	15.0	9.1	25.0	-5.9	7.7	1.51E-04	1.0	12	12.4
12/28/2007 12:02	18.0	6.1	27.0	-11.9	8.1	1.51E-04	1.0	12	12
12/28/2007 12:02	21.0	3.1	30.0	-17.9	8.6	1.51E-04	1.0	12	12
12/28/2007 12:03	24.0	0.0	36.0	-24.0	9.2	1.44E-04	1.0	12	12.4
12/28/2007 12:00	0.0	24.0	0.0	24.0	9.2				
12/28/2007 12:00	3.0	21.4	12.0	18.4	9.4	2.13E-04	0.9	12	10.4
12/28/2007 12:00	6.0	18.4	18.0	12.4	9.7	1.62E-04	0.9	24	22.4
12/28/2007 12:00	9.0	15.3	21.0	6.3	10.1	1.52E-04	1.0	12	12.4
12/28/2007 12:01	12.0	12.3	23.0	0.3	10.5	1.48E-04	1.0	12	12
12/28/2007 12:01	15.0	9.2	25.0	-5.8	10.9	1.51E-04	1.0	12	12.4
12/28/2007 12:02	18.0	6.2	27.0	-11.8	11.3	1.51E-04	1.0	12	12
12/28/2007 12:02	21.0	3.3	30.0	-17.7	11.8	1.48E-04	1.0	12	11.6
12/28/2007 12:03	24.0	0.2	37.0	-23.8	12.4	1.39E-04	1.0	12	12.4



Hydraulic Conductivity Test - Altamont - Composite

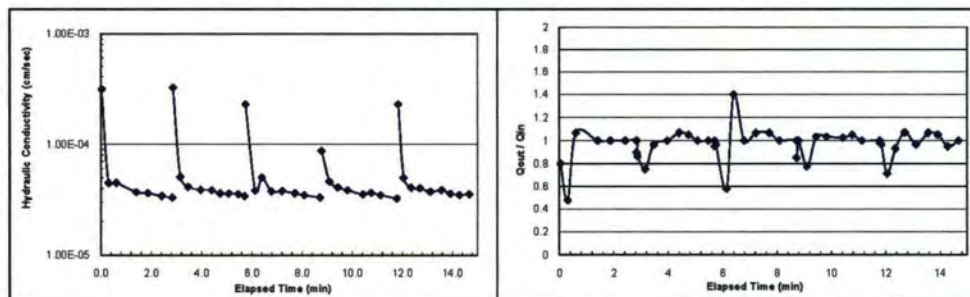
ASTM D 5084 - 00

Sample I.D.	305-mm CMP - CL - 2	Test Date :	12/24/07
Cell Pressure = 42.0	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 41.0	psi	Length of Sample, L = 15.2	cm
Outflow Pressure = 40.0	psi	Area of Sample, A = 729.7	cm ²
Pressure Difference = 1.0	psi	Sample Volume, V = 11120.0	cm ³
Effective Stress = 1.50	psi	a _{in} = 1	cm ⁴
Hydraulic Gradient, i = 4.6		a _{out} = 1	cm ⁴
Weight of wet sample = 25192.5	(g)	Sample Water Content = 16.5	(%)
Wet Density = 2.3	g/cm ³	Dry Density = 1.94	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	NA	NA	NA	16.52

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
12/24/2007 12:00	0.0	24.0	0.0	24.0	0.0				
12/24/2007 12:00	3.0	21.8	2.0	18.6	0.0	3.08E-04	0.8	3	2.4
12/24/2007 12:00	7.0	19.7	18.0	12.7	0.3	4.48E-05	0.5	4	1.9
12/24/2007 12:00	10.0	18.5	18.0	6.5	0.6	4.50E-05	1.1	3	3.2
12/24/2007 12:01	16.0	10.5	48.0	-5.5	1.4	3.69E-05	1.0	6	6
12/24/2007 12:01	19.0	7.5	28.0	-11.5	1.9	3.62E-05	1.0	3	3
12/24/2007 12:02	22.0	4.5	33.0	-17.5	2.4	3.40E-05	1.0	3	3
12/24/2007 12:02	24.0	2.5	25.0	-21.5	2.8	3.29E-05	1.0	2	2
12/24/2007 12:00	0.0	24.0	0.0	24.0	2.8				
12/24/2007 12:00	3.0	21.4	2.0	18.4	2.9	3.20E-04	0.9	3	2.6
12/24/2007 12:00	7.0	18.4	17.0	11.4	3.2	5.05E-05	0.8	4	3
12/24/2007 12:00	10.0	15.5	19.0	5.5	3.5	4.12E-05	1.0	3	2.9
12/24/2007 12:01	14.0	11.5	30.0	-2.5	4.0	3.88E-05	1.0	4	4
12/24/2007 12:01	17.0	8.3	26.0	-8.7	4.4	3.85E-05	1.1	3	3.2
12/24/2007 12:01	19.0	6.2	20.0	-12.8	4.7	3.59E-05	1.1	2	2.1
12/24/2007 12:02	21.0	4.2	21.0	-16.8	5.1	3.58E-05	1.0	2	2
12/24/2007 12:02	23.0	2.2	23.0	-20.8	5.5	3.53E-05	1.0	2	2
12/24/2007 12:02	24.1	1.1	14.0	-23.0	5.7	3.39E-05	1.0	1.1	1.1
12/24/2007 12:00	0.0	24.0	0.0	24.0	5.7				
12/24/2007 12:00	3.0	21.1	3.0	18.1	5.8	2.25E-04	1.0	3	2.9
12/24/2007 12:00	7.5	18.5	23.0	11.0	6.1	3.80E-05	0.6	4.5	2.6
12/24/2007 12:00	10.0	15.0	16.0	5.0	6.4	5.00E-05	1.4	2.5	3.5
12/24/2007 12:01	13.0	12.0	23.0	-1.0	6.8	3.77E-05	1.0	3	3
12/24/2007 12:01	16.0	8.8	26.0	-7.2	7.2	3.76E-05	1.1	3	3.2
12/24/2007 12:02	19.0	5.6	30.0	-13.4	7.7	3.60E-05	1.1	3	3.2
12/24/2007 12:02	21.0	3.6	22.0	-17.4	8.1	3.46E-05	1.0	2	2
12/24/2007 12:03	24.0	0.6	38.0	-23.4	8.7	3.31E-05	1.0	3	3
12/24/2007 12:00	0.0	21.0	0.0	21.0	8.7				
12/24/2007 12:00	3.0	21.0	4.0	18.0	8.8	8.72E-05	1.0	3	0
12/24/2007 12:00	7.0	17.9	19.0	10.9	9.1	4.61E-05	0.8	4	3.1
12/24/2007 12:00	10.0	14.8	20.0	4.8	9.4	4.08E-05	1.0	3	3.1
12/24/2007 12:01	13.0	11.7	23.0	-1.3	9.8	3.84E-05	1.0	3	3.1
12/24/2007 12:01	17.0	7.6	37.0	-9.4	10.4	3.52E-05	1.0	4	4.1
12/24/2007 12:02	19.0	5.5	20.0	-13.5	10.8	3.84E-05	1.1	2	2.1
12/24/2007 12:02	21.0	3.5	22.0	-17.5	11.1	3.46E-05	1.0	2	2
12/24/2007 12:03	24.0	0.5	39.0	-23.5	11.8	3.23E-05	1.0	3	3
12/24/2007 12:00	0.0	24.0	0.0	24.0	11.8				
12/24/2007 12:00	3.0	21.1	3.0	18.1	11.8	2.25E-04	1.0	3	2.9
12/24/2007 12:00	6.1	18.9	13.0	12.8	12.1	4.97E-05	0.7	3.1	2.2
12/24/2007 12:00	9.0	16.2	18.0	7.2	12.4	4.05E-05	0.9	2.9	2.7
12/24/2007 12:00	11.9	13.1	21.0	1.2	12.7	4.01E-05	1.1	2.9	3.1
12/24/2007 12:01	15.0	10.1	25.0	-4.9	13.1	3.72E-05	1.0	3.1	3
12/24/2007 12:01	18.0	6.9	27.0	-11.1	13.6	3.85E-05	1.1	3	3.2
12/24/2007 12:02	20.0	4.8	21.0	-15.2	13.9	3.57E-05	1.1	2	2.1
12/24/2007 12:02	22.0	2.9	22.0	-19.1	14.3	3.48E-05	1.0	2	1.9
12/24/2007 12:02	24.0	0.9	24.0	-23.1	14.7	3.54E-05	1.0	2	2



Hydraulic Conductivity Test - Altamont - Composite

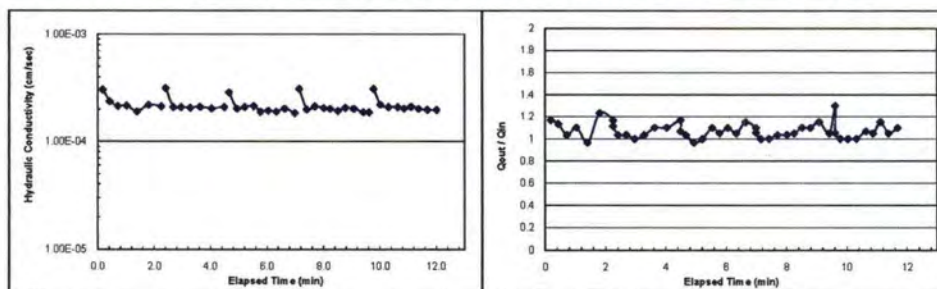
ASTM D 5084 - 00

Sample I.D.	305-mm CMP - CL - 3	Test Date :	12/29/07
Cell Pressure = 42.0	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 41.0	psi	Length of Sample, L = 17.1	cm
Outflow Pressure = 40.0	psi	Area of Sample, A = 729.7	cm ²
Pressure Difference = 1.0	psi	Sample Volume, V = 12510.0	cm ³
Effective Stress = 1.50	psi	a _{in} = 4	cm ²
Hydraulic Gradient, i = 4.1		a _{out} = 4	cm ²
Weight of wet sample = 25442.0	(g)	Sample Water Content = 15.8	(%)
Wet Density = 2.0	g/cm ³	Dry Density = 1.76	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	NA	NA	NA	15.80

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
12/28/2007 12:00	0.0	24.0	0.0	24.0	0.0				
12/28/2007 12:00	3.0	20.5	11.0	17.5	0.2	3.05E-04	1.2	12	14
12/28/2007 12:00	6.0	17.1	15.0	11.1	0.4	2.37E-04	1.1	12	13.6
12/28/2007 12:00	9.0	14.0	17.0	5.0	0.7	2.15E-04	1.0	12	12.4
12/28/2007 12:01	12.0	10.7	19.0	-1.3	1.0	2.16E-04	1.1	12	13.2
12/28/2007 12:01	15.0	7.8	22.0	-7.2	1.4	1.91E-04	1.0	12	11.6
12/28/2007 12:01	18.0	4.1	24.0	-13.9	1.8	2.20E-04	1.2	12	14.8
12/28/2007 12:02	21.0	0.6	27.0	-20.4	2.3	2.13E-04	1.2	12	14
12/28/2007 12:00	0.0	24.0	0.0	24.0	2.3				
12/28/2007 12:00	3.0	20.9	10.0	17.9	2.4	3.14E-04	1.0	12	12.4
12/28/2007 12:00	6.0	17.8	16.0	11.8	2.7	2.10E-04	1.0	12	12.4
12/28/2007 12:00	9.0	14.8	17.0	5.8	3.0	2.10E-04	1.0	12	12
12/28/2007 12:01	12.0	11.7	19.0	-0.3	3.3	2.07E-04	1.0	12	12.4
12/28/2007 12:01	15.0	8.4	21.0	-6.6	3.6	2.11E-04	1.1	12	13.2
12/28/2007 12:01	18.0	5.1	24.0	-12.9	4.0	2.04E-04	1.1	12	13.2
12/28/2007 12:02	21.0	1.6	27.0	-19.4	4.5	2.09E-04	1.2	12	14
12/28/2007 12:00	0.0	24.0	0.0	24.0	4.5				
12/28/2007 12:00	3.0	20.9	11.0	17.9	4.7	2.86E-04	1.0	12	12.4
12/28/2007 12:00	6.0	18.0	16.0	12.0	4.9	2.03E-04	1.0	12	11.6
12/28/2007 12:00	9.0	15.0	17.0	6.0	5.2	2.09E-04	1.0	12	12
12/28/2007 12:01	12.0	11.7	19.0	-0.3	5.5	2.13E-04	1.1	12	13.2
12/28/2007 12:01	14.0	9.6	15.0	-4.4	5.8	1.89E-04	1.1	8	8.4
12/28/2007 12:01	16.0	7.4	16.0	-8.6	6.0	1.93E-04	1.1	8	8.8
12/28/2007 12:01	18.0	5.3	17.0	-12.7	6.3	1.90E-04	1.1	8	8.4
12/28/2007 12:02	20.0	3.0	18.0	-17.0	6.6	2.02E-04	1.2	8	9.2
12/28/2007 12:02	22.0	0.8	21.0	-21.2	7.0	1.84E-04	1.1	8	8.8
12/28/2007 12:00	0.0	24.0	0.0	24.0	7.0				
12/28/2007 12:00	3.0	21.0	10.0	18.0	7.1	3.09E-04	1.0	12	12
12/28/2007 12:00	6.0	18.2	16.0	12.2	7.4	1.99E-04	1.0	12	11.2
12/28/2007 12:00	9.0	15.1	17.0	6.1	7.7	2.12E-04	1.0	12	12.4
12/28/2007 12:01	12.0	12.0	19.0	0.0	8.0	2.06E-04	1.0	12	12.4
12/28/2007 12:01	14.0	9.9	14.0	-4.1	8.3	2.02E-04	1.1	8	8.4
12/28/2007 12:01	16.0	7.7	16.0	-8.3	8.5	1.92E-04	1.1	8	8.8
12/28/2007 12:01	18.0	5.5	16.0	-12.5	8.8	2.06E-04	1.1	8	8.8
12/28/2007 12:02	20.0	3.2	18.0	-16.8	9.1	2.02E-04	1.2	8	9.2
12/28/2007 12:02	22.0	1.1	20.0	-20.9	9.4	1.87E-04	1.1	8	8.4
12/28/2007 12:02	23.0	-0.2	12.0	-23.2	9.6	1.87E-04	1.3	4	5.2
12/28/2007 12:00	0.0	24.0	0.0	24.0	9.6				
12/28/2007 12:00	3.0	21.0	10.0	18.0	9.8	3.09E-04	1.0	12	12
12/28/2007 12:00	6.0	18.0	15.0	12.0	10.0	2.20E-04	1.0	12	12
12/28/2007 12:00	9.0	15.0	17.0	6.0	10.3	2.09E-04	1.0	12	12
12/28/2007 12:01	12.0	11.8	19.0	-0.2	10.6	2.10E-04	1.1	12	12.8
12/28/2007 12:01	14.0	9.7	14.0	-4.3	10.9	2.02E-04	1.1	8	8.4
12/28/2007 12:01	16.0	7.4	15.0	-8.6	11.1	2.11E-04	1.2	8	9.2
12/28/2007 12:01	18.0	5.3	16.0	-12.7	11.4	2.02E-04	1.1	8	8.4
12/28/2007 12:02	20.0	3.1	18.0	-16.9	11.7	1.98E-04	1.1	8	8.8
12/28/2007 12:02	22.0	0.8	20.0	-21.2	12.0	1.97E-04	1.2	8	9.2



Hydraulic Conductivity Test - Altamont - Composite

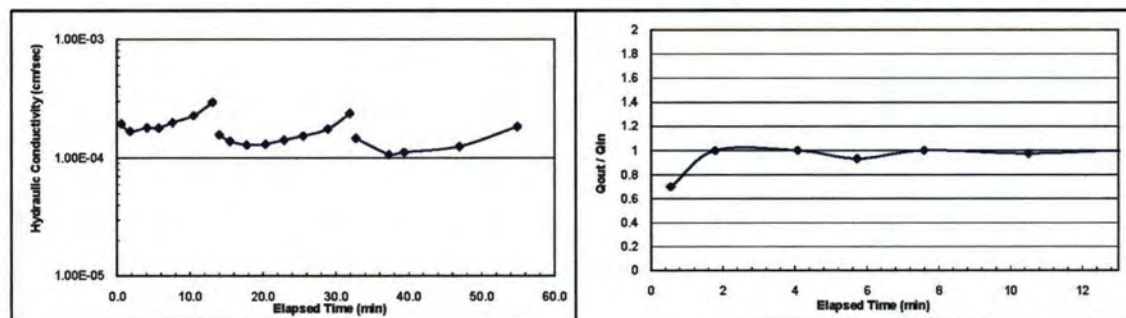
ASTM D 5084 - 00

Sample I.D.	150-mm CMP - CL - 3	Test Date :	2/20/08
Cell Pressure = 42.3	psi	Diameter of Sample, D = 15.2	cm
Inflow Pressure = 41.0	psi	Length of Sample, L = 7.4	cm
Outflow Pressure = 40.6	psi	Area of Sample, A = 182.4	cm ²
Pressure Difference = 0.5	psi	Sample Volume, V = 1343.7	cm ³
Effective Stress = 1.53	psi	a _{in} = 5	cm ²
Hydraulic Gradient, i = 4.3		a _{out} = 5	cm ²
Weight of wet sample = 2313.3	(g)	Sample Water Content = 19.9	(%)
Wet Density = 1.7	g/cm ³	Dry Density = 1.44	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
NA	NA	NA	NA	19.86

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/20/2008 12:00	0.0	24.0	0.0	24.0	0.0				
2/20/2008 12:00	2.0	22.6	33.0	20.6	0.6	1.93E-04	0.7	10	7
2/20/2008 12:01	5.0	19.6	74.0	14.6	1.8	1.66E-04	1.0	15	15
2/20/2008 12:04	10.0	14.6	138.0	4.6	4.1	1.78E-04	1.0	25	25
2/20/2008 12:05	13.0	11.8	99.0	-1.2	5.7	1.78E-04	0.9	15	14
2/20/2008 12:07	16.0	8.8	112.0	-7.2	7.6	1.98E-04	1.0	15	15
2/20/2008 12:10	20.0	4.9	174.0	-15.1	10.5	2.26E-04	1.0	20	19.5
2/20/2008 12:13	23.0	1.9	155.0	-21.1	13.1	2.93E-04	1.0	15	15
2/20/2008 12:00	0.0	24.0	0.0	24.0	13.1				
2/20/2008 12:00	2.5	21.9	56.0	19.4	14.0	1.56E-04	0.8	12.5	10.5
2/20/2008 12:02	5.3	19.0	87.0	13.7	15.5	1.37E-04	1.0	14	14.5
2/20/2008 12:04	9.0	15.4	138.0	6.4	17.8	1.28E-04	1.0	18.5	18
2/20/2008 12:07	12.5	12.0	155.0	-0.5	20.4	1.30E-04	1.0	17.5	17
2/20/2008 12:09	15.5	9.0	153.0	-6.5	22.9	1.41E-04	1.0	15	15
2/20/2008 12:12	18.2	6.4	157.0	-11.8	25.5	1.52E-04	1.0	13.5	13
2/20/2008 12:15	21.2	3.5	204.0	-17.7	28.9	1.75E-04	1.0	15	14.5
2/20/2008 12:18	23.5	1.0	180.0	-22.5	31.9	2.37E-04	1.1	11.5	12.5
2/20/2008 12:00	0.0	24.0	0.0	24.0	31.9				
2/20/2008 12:00	2.0	22.2	49.0	20.2	32.7	1.46E-04	0.9	10	9
2/20/2008 12:05	8.5	15.7	273.0	7.2	37.3	1.07E-04	1.0	32.5	32.5
2/20/2008 12:07	11.0	13.2	125.0	2.2	39.4	1.11E-04	1.0	12.5	12.5
2/20/2008 12:15	18.3	5.9	458.0	-12.4	47.0	1.24E-04	1.0	36.5	36.5
2/20/2008 12:23	24.0	0.5	476.0	-23.5	54.9	1.82E-04	0.9	28.5	27



Hydraulic Conductivity Test - Altamont - Composite

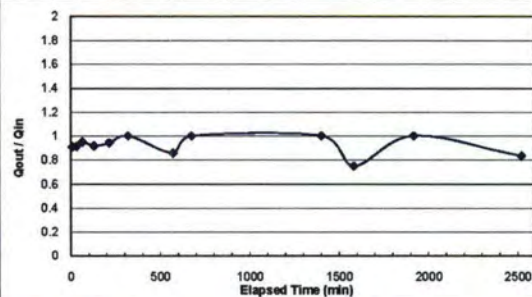
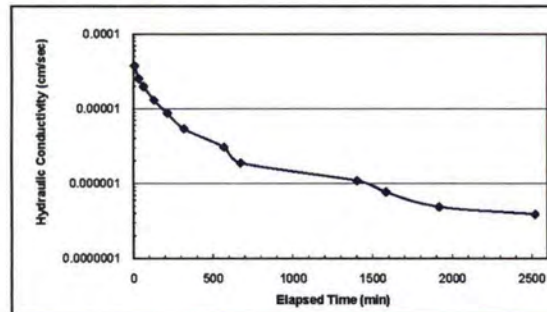
ASTM D 5084 - 00

Sample I.D.	75-mm CMP - CL - 3	Test Date :	3/11/08
Cell Pressure =	42.4 psi	Diameter of Sample, D =	5.6 cm
Inflow Pressure =	41.0 psi	Length of Sample, L =	2.8 cm
Outflow Pressure =	40.8 psi	Area of Sample, A =	24.6 cm ²
Pressure Difference =	0.2 psi	Sample Volume, V =	69.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	5.0	a _{out} =	5 cm ²
Weight of wet sample =	318.3 (g)	Sample Water Content =	20.6 (%)
Wet Density =	4.6 g/cm ³	Dry Density =	3.83 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
NA	NA	NA	NA	20.61

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
3/11/2008 12:00	0.0	24.0	0.0	24.0	0.0				
3/11/2008 12:07	1.1	23.0	432.0	21.9	7.2	3.73E-05	0.9	5.5	5
3/11/2008 12:32	3.4	20.9	1488.0	17.5	32.0	2.49E-05	0.9	11.5	10.5
3/11/2008 13:03	5.4	19.0	1885.0	13.6	63.4	1.99E-05	0.9	10	9.5
3/11/2008 14:09	7.8	16.8	3972.0	9.0	129.6	1.30E-05	0.9	12	11
3/11/2008 15:33	9.5	15.2	5058.0	5.7	213.9	8.68E-06	0.9	8.5	8
3/11/2008 17:18	10.6	14.1	6284.0	3.5	318.7	5.34E-06	1.0	5.5	5.5
3/11/2008 21:29	12.0	12.9	15066.0	0.9	569.7	3.02E-06	0.9	7	6
3/11/2008 23:13	12.3	12.6	6228.0	0.3	673.5	1.87E-06	1.0	1.5	1.5
3/12/2008 11:21	13.4	11.5	43657.0	-1.9	1401.2	1.08E-06	1.0	5.5	5.5
3/12/2008 14:22	13.6	11.4	10873.0	-2.3	1582.4	7.63E-07	0.8	1	0.75
3/12/2008 19:57	13.8	11.2	20135.0	-2.7	1918.0	4.86E-07	1.0	1	1
3/13/2008 6:00	14.1	10.9	36133.0	-3.2	2520.2	3.88E-07	0.8	1.5	1.25



Hydraulic Conductivity Test - Apple Valley - Clay Cover

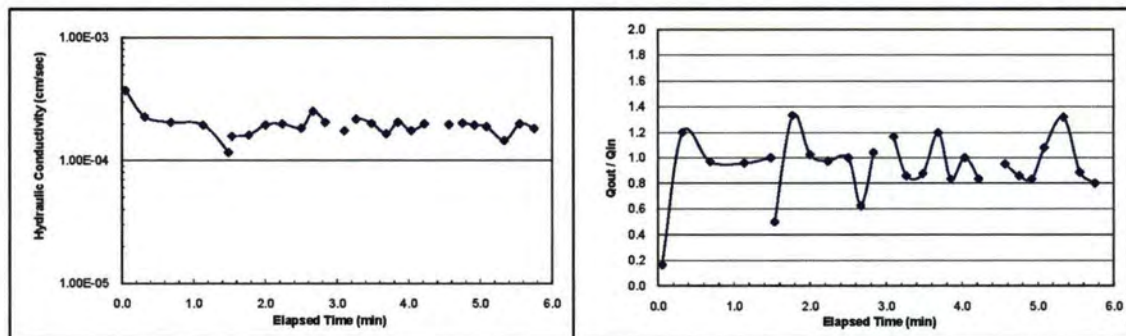
ASTM D 5084 - 00

Sample I.D.	305-mm AV - B - 1 - C	Test Date :	8/21/07
Cell Pressure =	42.7 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	17.8 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.4 psi	Sample Volume, V =	12973.3 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	9.5	a _{out} =	5 cm ²
Weight of wet sample =	26172.3 (g)	Sample Water Content =	19.8 (%)
Wet Density =	2.0 g/cm ³	Dry Density =	1.68 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	NA	NA	NA	19.82

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
8/21/2007 12:00	0.0	24.0	0.0	24.0	0.0				
8/21/2007 12:00	3.0	23.5	3.0	20.5	0.1	3.72E-04	0.2	15	2.5
8/21/2007 12:00	8.0	17.5	16.0	9.5	0.3	2.28E-04	1.2	25	30
8/21/2007 12:00	14.5	11.2	22.0	-3.3	0.7	2.06E-04	1.0	32.5	31.5
8/21/2007 12:01	21.5	4.5	27.0	-17.0	1.1	1.95E-04	1.0	35	33.5
8/21/2007 12:01	24.5	1.5	21.0	-23.0	1.5	1.17E-04	1.0	15	15
8/21/2007 12:00	0.0	24.0	0.0	24.0	1.5				
8/21/2007 12:00	3.0	22.5	3.0	22.5	1.5	1.59E-04	0.5	15	7.5
8/21/2007 12:00	7.0	18.5	14.0	15.5	1.8	1.62E-04	1.3	15	20
8/21/2007 12:00	11.0	14.4	14.0	7.4	2.0	1.96E-04	1.0	20	20.5
8/21/2007 12:00	15.0	10.5	14.0	-0.5	2.2	2.00E-04	1.0	20	19.5
8/21/2007 12:01	19.0	6.5	16.0	-8.5	2.5	1.85E-04	1.0	20	20
8/21/2007 12:01	21.5	4.0	10.0	-15.0	2.7	2.52E-04	0.6	20	12.5
8/21/2007 12:01	23.7	1.4	10.0	-20.1	2.8	2.05E-04	1.0	12.5	13
8/21/2007 12:00	0.0	24.0	0.0	0.3	2.8				
8/21/2007 12:00	3.0	22.5	4.0	22.5	2.9	-1.88E-03			
8/21/2007 12:00	6.5	19.0	12.0	16.0	3.1	1.75E-04	1.2	15	17.5
8/21/2007 12:00	10.5	16.0	10.0	9.5	3.3	2.18E-04	0.9	17.5	15
8/21/2007 12:00	13.0	12.5	13.0	2.0	3.5	2.01E-04	0.9	20	17.5
8/21/2007 12:00	16.0	9.5	12.0	-3.5	3.7	1.66E-04	1.2	12.5	15
8/21/2007 12:01	18.5	7.0	10.0	-9.0	3.8	2.06E-04	0.8	15	12.5
8/21/2007 12:01	21.5	4.5	11.0	-14.0	4.0	1.76E-04	1.0	12.5	12.5
8/21/2007 12:01	23.5	2.0	11.0	-19.5	4.2	2.00E-04	0.8	15	12.5
8/21/2007 12:00	0.0	24.0	0.0	0.5	4.2				
8/21/2007 12:00	4.0	20.8	8.0	20.8	4.4	-8.62E-04			
8/21/2007 12:00	7.5	17.0	13.0	13.0	4.6	1.97E-04	1.0	20	19
8/21/2007 12:00	10.5	14.0	11.0	6.5	4.7	2.02E-04	0.9	17.5	15
8/21/2007 12:00	13.0	11.5	10.0	1.0	4.9	1.94E-04	0.8	15	12.5
8/21/2007 12:00	15.5	8.8	10.0	-4.2	5.1	1.89E-04	1.1	12.5	13.5
8/21/2007 12:01	19.0	5.5	15.0	-10.0	5.3	1.46E-04	1.3	12.5	16.5
8/21/2007 12:01	22.0	2.4	13.0	-16.6	5.5	1.99E-04	0.9	17.5	15.5
8/21/2007 12:01	24.5	0.0	12.0	-22.0	5.8	1.83E-04	0.8	15	12



Hydraulic Conductivity Test - Apple Valley - Clay Cover

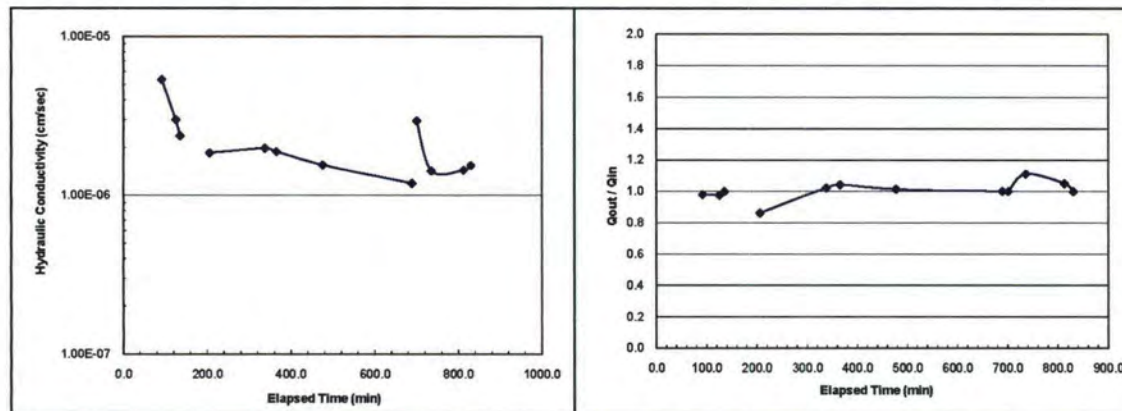
ASTM D 5084 - 00

Sample I.D.	150-mm AV - B - 1 - C	Test Date :	8/21/07
Cell Pressure =	42.7 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	41.7 psi	Length of Sample, L =	7.0 cm
Outflow Pressure =	40.7 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.0 psi	Sample Volume, V =	1274.2 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	10.1	a _{out} =	5 cm ²
Weight of wet sample =	2550.0 (g)	Sample Water Content =	17.7 (%)
Wet Density =	2.0 g/cm ³	Dry Density =	1.70 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} L n \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
BB	30.39	216.06	188.09	17.74

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
5/19/2008 12:00	0.0	24.0	0.0	24.0	0.0				
5/19/2008 13:32	12.7	11.6	5530.0	-1.2	92.2	5.37E-06	1.0	63.5	62.25
5/19/2008 14:04	14.8	9.5	1968.0	-5.3	125.0	3.01E-06	1.0	10.5	10.25
5/19/2008 14:15	15.3	9.0	623.0	-6.3	135.3	2.38E-06	1.0	2.5	2.5
5/19/2008 12:00	0.0	24.0	0.0	24.0	135.3				
5/19/2008 13:10	4.0	20.6	4244.0	16.6	206.1	1.86E-06	0.9	20	17.25
5/19/2008 15:22	10.5	13.9	7930.0	3.4	338.2	1.98E-06	1.0	32.5	33.25
5/19/2008 15:50	11.7	12.7	1640.0	1.1	365.6	1.89E-06	1.0	5.75	6
5/19/2008 17:41	15.3	9.0	6699.0	-6.3	477.2	1.55E-06	1.0	18.25	18.5
5/19/2008 21:14	20.0	4.3	12751.0	-15.7	689.8	1.19E-06	1.0	23.5	23.5
5/19/2008 12:00	0.0	24.0	0.0	24.0	689.8				
5/19/2008 12:11	1.0	23.0	694.0	22.0	701.3	2.96E-06	1.0	5	5
5/19/2008 12:46	2.4	21.5	2102.0	19.2	736.3	1.43E-06	1.1	6.75	7.5
5/19/2008 14:03	5.3	18.4	4636.0	13.1	813.6	1.45E-06	1.1	14.75	15.5
5/19/2008 14:21	6.0	17.7	1047.0	11.7	831.1	1.55E-06	1.0	3.5	3.5



Hydraulic Conductivity Test - Apple Valley - Clay Cover

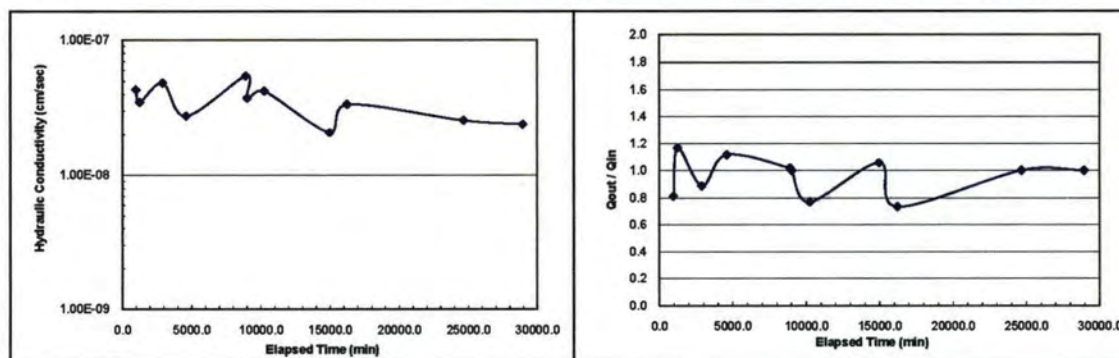
ASTM D 5084 - 00

Sample I.D.	75-mm AV - B - 1 - C	Test Date :	6/2/08
Cell Pressure =	41.8 psi	Diameter of Sample, D =	7.0 cm
Inflow Pressure =	40.5 psi	Length of Sample, L =	3.8 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	38.3 cm ²
Pressure Difference =	0.5 psi	Sample Volume, V =	146.0 cm ³
Effective Stress =	1.53 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	9.5	a _{out} =	1 cm ²
Weight of wet sample =	314.4 (g)	Sample Water Content =	20.1 (%)
Wet Density =	2.2 g/cm ³	Dry Density =	1.79 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
55	30.8	172	148.32	20.15

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
6/3/2008 12:54	1.0	23.4	0.0	22.4	0.0				
6/4/2008 5:03	2.6	22.1	58128.0	19.5	968.8	4.34E-08	0.8	1.6	1.3
6/4/2008 9:41	2.9	21.8	16647.0	18.9	1246.3	3.51E-08	1.2	0.3	0.35
6/5/2008 13:14	5.6	19.4	99227.0	13.8	2900.0	4.87E-08	0.9	2.7	2.4
6/6/2008 17:33	6.9	17.9	101917.0	11.0	4598.6	2.76E-08	1.1	1.3	1.45
6/9/2008 17:19	12.7	12.0	258332.0	-0.7	8904.2	5.48E-08	1.0	5.8	5.9
6/9/2008 19:23	12.8	11.9	7483.0	-0.9	9028.9	3.75E-08	1.0	0.1	0.1
6/10/2008 15:38	14.0	11.0	72886.0	-3.0	10243.7	4.24E-08	0.8	1.2	0.925
6/13/2008 22:27	15.8	9.1	283708.0	-6.7	14972.1	2.07E-08	1.1	1.8	1.9
6/14/2008 19:28	16.7	8.5	75705.0	-8.2	16233.9	3.37E-08	0.7	0.85	0.625
6/20/2008 15:58	19.9	5.3	505800.0	-14.6	24663.9	2.55E-08	1.0	3.2	3.2
6/23/2008 15:14	21.1	4.0	256548.0	-17.1	28939.7	2.38E-08	1.0	1.25	1.25



Hydraulic Conductivity Test - Apple Valley - Clay Cover

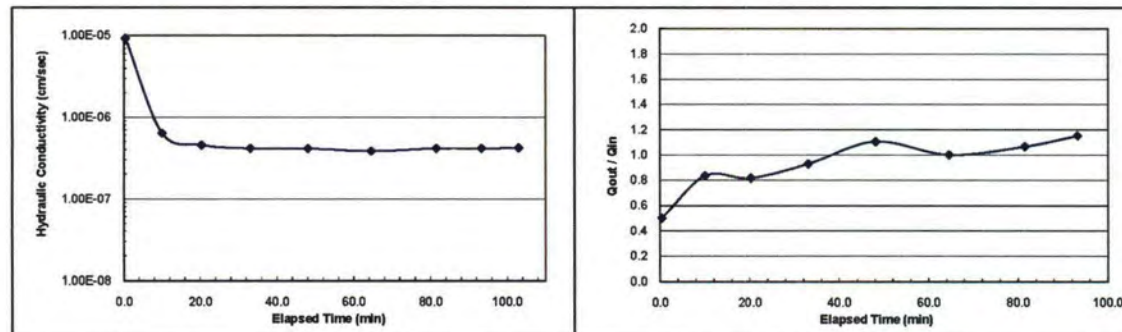
ASTM D 5084 - 00

Sample I.D.	305-mm AV - B - 4 - C	Test Date :	8/20/07
Cell Pressure =	42.7 psi	Diameter of Sample, D =	31.5 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	15.9 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	779.1 cm ²
Pressure Difference =	2.4 psi	Sample Volume, V =	12368.4 cm ³
Effective Stress =	1.50 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	10.6	a _{out} =	1 cm ²
Weight of wet sample =	26149.6 (g)	Sample Water Content =	20.5 (%)
Wet Density =	2.1 g/cm ³	Dry Density =	1.75 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} L n \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
NA	NA	NA	NA	20.52

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
8/20/2007 12:00	0.0	23.0	0.0	23.0	0.0				
8/20/2007 12:00	3.0	21.5	26.0	18.5	0.4	9.30E-06	0.5	3	1.5
8/20/2007 12:10	6.6	18.5	575.0	11.9	10.0	6.36E-07	0.8	3.6	3
8/20/2007 12:20	9.3	16.3	616.0	7.0	20.3	4.55E-07	0.8	2.7	2.2
8/20/2007 12:33	12.1	13.7	768.0	1.6	33.1	4.14E-07	0.9	2.8	2.6
8/20/2007 12:48	15.0	10.5	901.0	-4.5	48.1	4.12E-07	1.1	2.9	3.2
8/20/2007 13:04	18.0	7.5	986.0	-10.5	64.5	3.84E-07	1.0	3	3
8/20/2007 13:21	21.1	4.2	1016.0	-16.9	81.5	4.14E-07	1.1	3.1	3.3
8/20/2007 13:33	23.1	1.9	707.0	-21.2	93.2	4.14E-07	1.2	2	2.3
8/20/2007 13:42	24.7	0.0	582.0	-24.7	102.9	4.20E-07	1.2	1.6	1.9



Hydraulic Conductivity Test - Apple Valley - Clay Cover

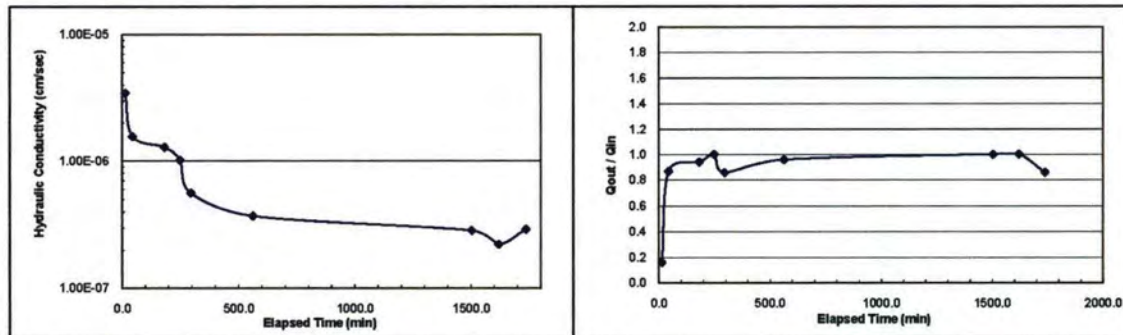
ASTM D 5084 - 00

Sample I.D.	150-mm AV - B - 4 - C	Test Date :	5/27/08
Cell Pressure =	42.7 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	41.7 psi	Length of Sample, L =	7.1 cm
Outflow Pressure =	40.7 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.1 psi	Sample Volume, V =	1297.3 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	10.6	a _{out} =	5 cm ²
Weight of wet sample =	2505.7 (g)	Sample Water Content =	22.9 (%)
Wet Density =	1.9 g/cm ³	Dry Density =	1.57 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
144	30.44	222.54	186.7	22.94

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
5/27/2008 12:00	0.0	24.0	0.0	24.0	0.0				
5/27/2008 12:13	2.5	23.6	833.0	21.1	13.9	3.47E-06	0.2	12.5	2
5/27/2008 12:44	4.0	22.3	1831.0	18.3	44.4	1.57E-06	0.9	7.5	6.5
5/27/2008 15:01	9.0	17.6	8252.0	8.6	181.9	1.29E-06	0.9	25	23.5
5/27/2008 16:07	10.7	15.9	3963.0	5.2	248.0	1.02E-06	1.0	8.5	8.5
5/27/2008 16:54	11.4	15.3	2817.0	3.9	294.9	5.63E-07	0.9	3.5	3
5/27/2008 21:22	13.8	13.0	16027.0	-0.8	562.0	3.72E-07	1.0	12	11.5
5/28/2008 13:03	19.5	7.3	56479.0	-12.2	1503.4	2.86E-07	1.0	28.5	28.5
5/28/2008 14:59	20.0	6.8	6979.0	-13.2	1619.7	2.23E-07	1.0	2.5	2.5
5/28/2008 16:56	20.7	6.2	7024.0	-14.5	1736.7	2.93E-07	0.9	3.5	3



Hydraulic Conductivity Test - Apple Valley - Clay Cover

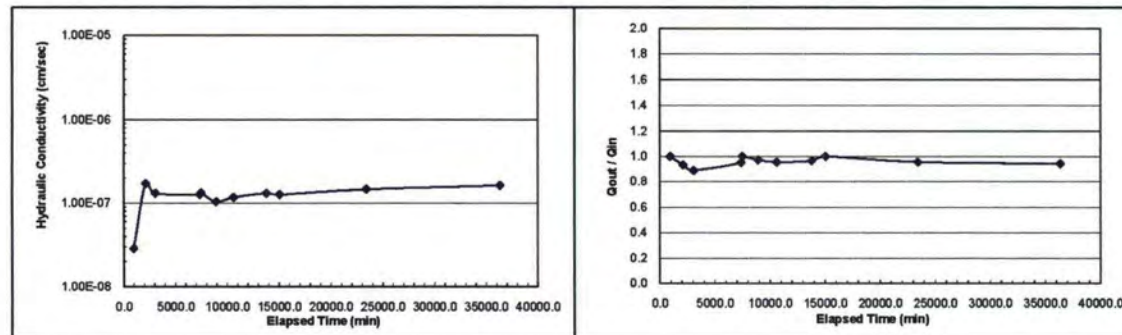
ASTM D 5084 - 00

Sample I.D.	75-mm AV - B - 4 - C	Test Date :	6/4/08
Cell Pressure =	42.7 psi	Diameter of Sample, D =	7.0 cm
Inflow Pressure =	41.5 psi	Length of Sample, L =	3.8 cm
Outflow Pressure =	40.9 psi	Area of Sample, A =	38.3 cm ²
Pressure Difference =	0.6 psi	Sample Volume, V =	146.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	10.6	a _{out} =	5 cm ²
Weight of wet sample =	279.8 (g)	Sample Water Content =	22.1 (%)
Wet Density =	1.9 g/cm ³	Dry Density =	1.57 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
2C	24.64	182.89	154.24	22.11

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
6/4/2008 6:13	1.7	22.9	0.0	21.2	0.0				
6/4/2008 21:50	1.9	22.7	56268.0	20.8	937.8	2.88E-08	1.0	1	1
6/5/2008 17:25	3.4	21.3	70482.0	17.9	2112.5	1.71E-07	0.9	7.5	7
6/6/2008 9:00	4.3	20.5	56065.0	16.2	3046.9	1.31E-07	0.9	4.5	4
6/9/2008 8:44	7.9	17.1	258282.0	9.2	7351.6	1.27E-07	1.0	17.875	17
6/9/2008 10:50	8.0	17.0	7571.0	9.0	7477.8	1.33E-07	1.0	0.5	0.5
6/10/2008 11:01	8.9	16.1	87032.0	7.3	8928.3	1.04E-07	1.0	4.5	4.375
6/11/2008 14:48	10.0	15.1	100040.0	5.1	10595.7	1.17E-07	1.0	5.625	5.375
6/13/2008 19:52	12.2	12.9	191045.0	0.7	13779.8	1.32E-07	1.0	11.125	10.75
6/14/2008 16:53	13.0	12.1	75664.0	-0.9	15040.8	1.26E-07	1.0	3.875	3.875
6/20/2008 12:24	18.2	7.2	502232.0	-11.0	23411.4	1.47E-07	1.0	25.875	24.75
6/29/2008 11:42	24.2	1.5	775086.0	-22.7	36329.5	1.63E-07	0.9	30.125	28.375
7/1/2008 12:40	25.2	0.5	176271.0	-24.8	39267.3	1.74E-07	1.1	5	5.25



Hydraulic Conductivity Test - Apple Valley - Store-and-Release Cover

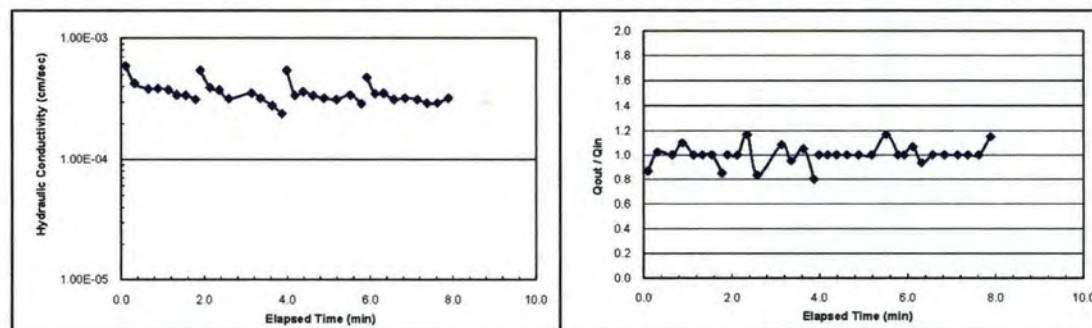
ASTM D 5084 - 00

Sample I.D.	305-mm AV - B - 5 - ALT	Test Date :	8/28/07
Cell Pressure =	42.0 psi	Diameter of Sample, D =	31.9 cm
Inflow Pressure =	41.0 psi	Length of Sample, L =	18.5 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	800.6 cm ²
Pressure Difference =	1.0 psi	Sample Volume, V =	14845.1 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	3.8	a _{out} =	5 cm ²
Weight of wet sample =	26716.6 (g)	Sample Water Content =	8.4 (%)
Wet Density =	1.8 g/cm ³	Dry Density =	1.66 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	NA	NA	NA	8.41

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
8/28/2007 12:00	0.0	24.0	0.0	24.0	0.0				
8/28/2007 12:00	3.0	21.4	6.0	18.4	0.1	5.91E-04	0.9	15	13
8/28/2007 12:00	7.0	17.3	13.0	10.3	0.3	4.26E-04	1.0	20	20.5
8/28/2007 12:00	12.0	12.3	20.0	0.3	0.6	3.83E-04	1.0	25	25
8/28/2007 12:00	15.0	9.0	14.0	-6.0	0.9	3.86E-04	1.1	15	16.5
8/28/2007 12:01	18.0	6.0	15.0	-12.0	1.1	3.78E-04	1.0	15	15
8/28/2007 12:01	20.0	4.0	12.0	-16.0	1.3	3.43E-04	1.0	10	10
8/28/2007 12:01	22.0	2.0	13.0	-20.0	1.5	3.41E-04	1.0	10	10
8/28/2007 12:01	24.0	0.3	14.0	-23.7	1.8	3.16E-04	0.9	10	8.5
8/28/2007 12:00	0.0	24.0	0.0	24.0	1.8				
8/28/2007 12:00	3.0	21.0	7.0	18.0	1.9	5.44E-04	1.0	15	15
8/28/2007 12:00	7.0	17.0	14.0	10.0	2.1	3.93E-04	1.0	20	20
8/28/2007 12:00	10.0	13.5	13.0	3.5	2.3	3.76E-04	1.2	15	17.5
8/28/2007 12:00	13.0	11.0	14.0	-2.0	2.6	3.20E-04	0.8	15	12.5
8/28/2007 12:01	19.0	4.5	33.0	-14.5	3.1	3.54E-04	1.1	30	32.5
8/28/2007 12:01	21.0	2.6	13.0	-18.4	3.3	3.23E-04	1.0	10	9.5
8/28/2007 12:01	23.0	0.5	17.0	-22.5	3.6	2.80E-04	1.1	10	10.5
8/28/2007 12:02	24.5	-0.7	14.0	-25.2	3.9	2.40E-04	0.8	7.5	6
8/28/2007 12:00	0.0	24.0	0.0	24.0	3.9				
8/28/2007 12:00	3.0	21.0	7.0	18.0	4.0	5.44E-04	1.0	15	15
8/28/2007 12:00	6.0	18.0	12.0	12.0	4.2	3.39E-04	1.0	15	15
8/28/2007 12:00	9.0	15.0	12.0	6.0	4.4	3.65E-04	1.0	15	15
8/28/2007 12:00	12.0	12.0	14.0	0.0	4.6	3.39E-04	1.0	15	15
8/28/2007 12:01	15.0	9.0	16.0	-6.0	4.9	3.23E-04	1.0	15	15
8/28/2007 12:01	18.0	6.0	18.0	-12.0	5.2	3.15E-04	1.0	15	15
8/28/2007 12:01	21.0	2.5	20.0	-18.5	5.5	3.42E-04	1.2	15	17.5
8/28/2007 12:01	23.0	0.5	16.0	-22.5	5.8	2.91E-04	1.0	10	10
8/28/2007 12:00	0.0	24.0	0.0	24.0	5.8				
8/28/2007 12:00	3.0	21.0	8.0	18.0	5.9	4.76E-04	1.0	15	15
8/28/2007 12:00	6.0	17.8	12.0	11.8	6.1	3.51E-04	1.1	15	16
8/28/2007 12:00	9.0	15.0	12.0	6.0	6.3	3.53E-04	0.9	15	14
8/28/2007 12:00	12.0	12.0	15.0	0.0	6.6	3.16E-04	1.0	15	15
8/28/2007 12:01	15.0	9.0	16.0	-6.0	6.8	3.23E-04	1.0	15	15
8/28/2007 12:01	18.0	6.0	18.0	-12.0	7.1	3.15E-04	1.0	15	15
8/28/2007 12:01	20.0	4.0	14.0	-16.0	7.4	2.94E-04	1.0	10	10
8/28/2007 12:01	22.0	2.0	15.0	-20.0	7.6	2.95E-04	1.0	10	10
8/28/2007 12:02	24.0	-0.3	16.0	-24.3	7.9	3.23E-04	1.2	10	11.5



Hydraulic Conductivity Test - Boardman - Thin Store-and-Release

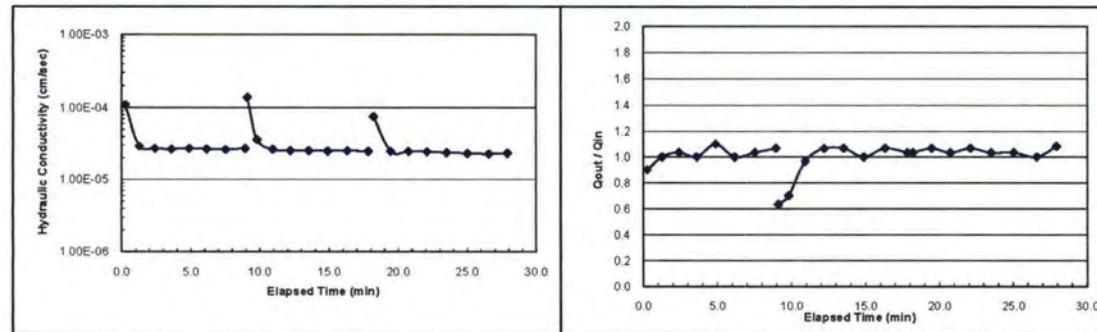
ASTM D 5084 - 00

Sample I.D.	305-mm 4' Cover-Upper Slope-Surface	Test Date :	2/4/08
Cell Pressure = 42.7	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 42.4	psi	Length of Sample, L = 15.9	cm
Outflow Pressure = 40.0	psi	Area of Sample, A = 729.7	cm ²
Pressure Difference = 2.4	psi	Sample Volume, V = 11583.3	cm ³
Effective Stress = 1.50	psi	a _{in} = 5	cm ²
Hydraulic Gradient, i = 10.6		a _{out} = 5	cm ²
Weight of wet sample = 21241.6	(g)	Sample Water Content = 29.6%	(%)
Wet Density = 1.8	g/cm ³	Dry Density = 1.83	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
A3	50.42	418.47	334.31	29.65%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/4/08 12:00 AM	0.0	24.4	0.0	24.4	0.0				
2/4/08 12:00 AM	3.0	21.7	14.9	18.7	0.2	1.09E-04	0.9	15	13.5
2/4/08 12:01 AM	6.0	18.7	60.6	12.7	1.3	2.92E-05	1.0	15	15
2/4/08 12:02 AM	9.0	15.6	68.7	6.6	2.4	2.71E-05	1.0	15	15.5
2/4/08 12:03 AM	12.0	12.6	71.8	0.6	3.6	2.64E-05	1.0	15	15
2/4/08 12:04 AM	15.0	9.3	76.4	-5.7	4.9	2.70E-05	1.1	15	16.5
2/4/08 12:06 AM	18.0	6.3	76.7	-11.7	6.2	2.66E-05	1.0	15	15
2/4/08 12:07 AM	21.0	3.2	82.4	-17.8	7.5	2.61E-05	1.0	15	15.5
2/4/08 12:08 AM	24.0	0.0	84.8	-24.0	8.9	2.69E-05	1.1	15	16
2/4/08 12:00 AM	0.0	24.5	0.0	24.5	8.9				
2/4/08 12:00 AM	3.0	22.6	10.1	19.6	9.1	1.39E-04	0.6	15	9.5
2/4/08 12:00 AM	6.0	20.5	41.5	14.5	9.8	3.60E-05	0.7	15	10.5
2/4/08 12:02 AM	9.0	17.6	68.0	8.6	10.9	2.62E-05	1.0	15	14.5
2/4/08 12:03 AM	12.0	14.4	76.6	2.4	12.2	2.53E-05	1.1	15	16
2/4/08 12:04 AM	15.0	11.2	79.5	-3.8	13.5	2.52E-05	1.1	15	16
2/4/08 12:05 AM	18.0	8.2	81.1	-9.8	14.9	2.48E-05	1.0	15	15
2/4/08 12:07 AM	21.0	5.0	86.5	-16.0	16.3	2.50E-05	1.1	15	16
2/4/08 12:08 AM	24.0	1.9	90.5	-22.1	17.8	2.45E-05	1.0	15	15.5
2/4/08 12:00 AM	0.0	24.4	0.0	24.4	17.8				
2/4/08 12:00 AM	3.0	21.3	23.3	18.3	18.2	7.50E-05	1.0	15	15.5
2/4/08 12:01 AM	6.0	18.1	74.6	12.1	19.5	2.46E-05	1.1	15	16
2/4/08 12:02 AM	9.0	15.0	76.3	6.0	20.7	2.45E-05	1.0	15	15.5
2/4/08 12:04 AM	12.0	11.8	80.9	-0.2	22.1	2.43E-05	1.1	15	16
2/4/08 12:05 AM	15.0	8.7	85.1	-6.3	23.5	2.36E-05	1.0	15	15.5
2/4/08 12:07 AM	18.0	5.6	90.4	-12.4	25.0	2.30E-05	1.0	15	15.5
2/4/08 12:08 AM	21.0	2.6	94.3	-18.4	26.6	2.26E-05	1.0	15	15
2/4/08 12:10 AM	23.4	0.0	79.7	-23.4	27.9	2.31E-05	1.1	12	13



Hydraulic Conductivity Test - Boardman - Thin Store-and-Release

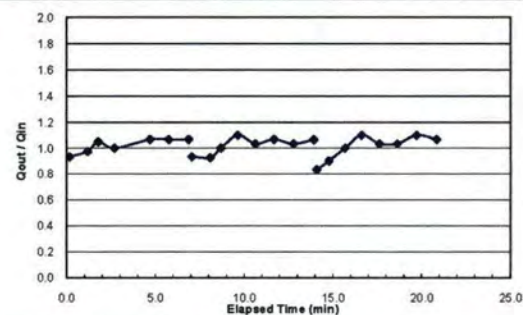
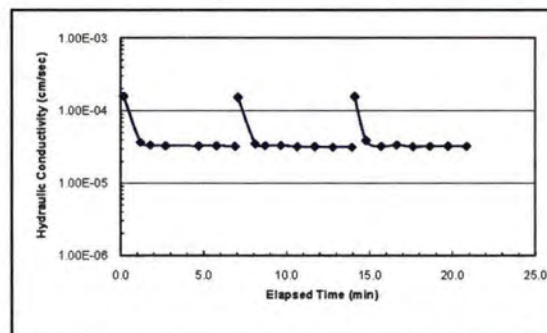
ASTM D 5084 - 00

Sample I.D.	305-mm Oregon Boardman- 4'-Upper Slope- 2'-3'		Test Date :	2/20/08
Cell Pressure =	42.7	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.4	psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.50	psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	5 cm ²
Weight of wet sample =	22000.0	(g)	Sample Water Content =	24.1% (%)
Wet Density =	2.0	g/cm ³	Dry Density =	1.97 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
874	35.34	341.48	282.11	24.06%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/20/08 12:00 AM	0.0	24.8	0.0	24.8	0.0				
2/20/08 12:00 AM	3.0	22.0	10.0	19.0	0.2	1.59E-04	0.9	15	14
2/20/08 12:01 AM	7.0	18.1	60.8	11.1	1.2	3.69E-05	1.0	20	19.5
2/20/08 12:01 AM	9.0	16.0	35.7	7.0	1.8	3.38E-05	1.1	10	10.5
2/20/08 12:02 AM	12.0	13.0	54.9	1.0	2.7	3.30E-05	1.0	15	15
2/20/08 12:04 AM	18.0	6.6	120.5	-11.4	4.7	3.29E-05	1.1	30	32
2/20/08 12:05 AM	21.0	3.4	63.7	-17.6	5.8	3.29E-05	1.1	15	16
2/20/08 12:06 AM	24.0	0.2	67.5	-23.8	6.9	3.24E-05	1.1	15	16
2/20/08 12:00 AM	0.0	24.8	0.0	24.8	6.9				
2/20/08 12:00 AM	3.0	22.0	10.4	19.0	7.1	1.53E-04	0.9	15	14
2/20/08 12:01 AM	7.0	18.3	62.5	11.3	8.1	3.50E-05	0.9	20	18.5
2/20/08 12:01 AM	9.0	16.3	35.6	7.3	8.7	3.29E-05	1.0	10	10
2/20/08 12:02 AM	12.0	13.0	57.1	1.0	9.6	3.33E-05	1.1	15	16.5
2/20/08 12:03 AM	15.0	9.9	59.7	-5.1	10.6	3.20E-05	1.0	15	15.5
2/20/08 12:04 AM	18.0	6.7	63.0	-11.3	11.7	3.20E-05	1.1	15	16
2/20/08 12:05 AM	21.0	3.6	65.5	-17.4	12.8	3.15E-05	1.0	15	15.5
2/20/08 12:07 AM	24.0	0.4	69.2	-23.6	13.9	3.16E-05	1.1	15	16
2/20/08 12:00 AM	0.0	24.9	0.0	24.9	13.9				
2/20/08 12:00 AM	3.0	22.4	9.6	19.4	14.1	1.56E-04	0.8	15	12.5
2/20/08 12:00 AM	6.0	19.7	41.4	13.7	14.8	3.88E-05	0.9	15	13.5
2/20/08 12:01 AM	9.0	16.7	54.0	7.7	15.7	3.23E-05	1.0	15	15
2/20/08 12:02 AM	12.0	13.4	56.4	1.4	16.6	3.36E-05	1.1	15	16.5
2/20/08 12:03 AM	15.0	10.3	59.4	-4.7	17.6	3.21E-05	1.0	15	15.5
2/20/08 12:04 AM	18.0	7.2	61.2	-10.8	18.6	3.23E-05	1.0	15	15.5
2/20/08 12:05 AM	21.0	3.9	65.6	-17.1	19.7	3.24E-05	1.1	15	16.5
2/20/08 12:06 AM	24.0	0.7	67.7	-23.3	20.9	3.22E-05	1.1	15	16



Hydraulic Conductivity Test - Boardman - Thin Store-and-Release

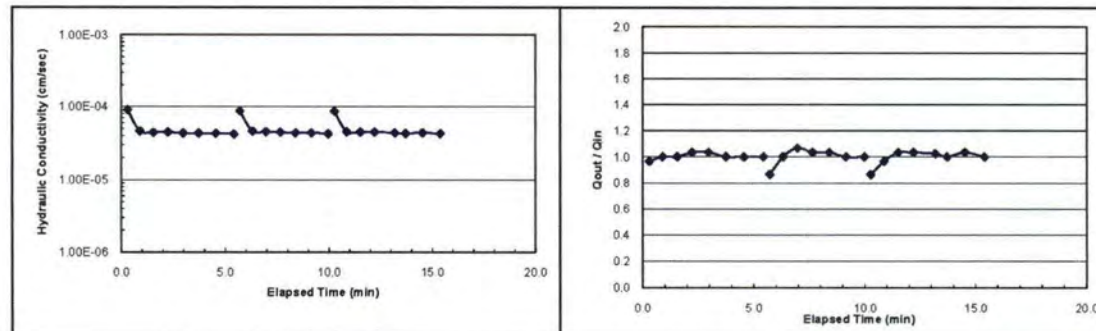
ASTM D 5084 - 00

Sample I.D.	305-mm Oregon Boardman- 4' Cover- Lower Slope-Surface	Test Date :	2/6/08
Cell Pressure =	42.4 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.8 psi	Length of Sample, L =	11.4 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	1.8 psi	Sample Volume, V =	8340.0 cm ³
Effective Stress =	1.50 psi	a_{in} =	5 cm ²
Hydraulic Gradient, i =	11.1	a_{out} =	5 cm ²
Weight of wet sample =	16828.2 (g)	Sample Water Content =	26.2% (%)
Wet Density =	2.0 g/cm ³	Dry Density =	2.01 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
874	35.08	330.07	268.89	26.17%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q_{out} / Q_{in}	Q_{in}	Q_{out}
2/6/08 12:00 AM	0.0	24.7	0.0	24.7	0.0				
2/6/08 12:00 AM	3.0	21.8	17.2	18.8	0.3	9.05E-05	1.0	15	14.5
2/6/08 12:00 AM	6.0	18.8	35.8	12.8	0.9	4.61E-05	1.0	15	15
2/6/08 12:01 AM	9.0	15.8	39.2	6.8	1.5	4.40E-05	1.0	15	15
2/6/08 12:02 AM	12.0	12.7	41.1	0.7	2.2	4.46E-05	1.0	15	15.5
2/6/08 12:02 AM	15.0	9.6	44.5	-5.4	3.0	4.32E-05	1.0	15	15.5
2/6/08 12:03 AM	18.0	6.6	46.0	-11.4	3.7	4.32E-05	1.0	15	15
2/6/08 12:04 AM	21.0	3.6	48.9	-17.4	4.5	4.28E-05	1.0	15	15
2/6/08 12:05 AM	24.0	0.6	52.8	-23.4	5.4	4.19E-05	1.0	15	15
2/6/08 12:00 AM	0.0	24.6	0.0	24.6	5.4				
2/6/08 12:00 AM	3.0	22.0	17.0	19.0	5.7	8.68E-05	0.9	15	13
2/6/08 12:00 AM	6.0	19.0	35.8	13.0	6.3	4.61E-05	1.0	15	15
2/6/08 12:01 AM	9.0	15.8	39.6	6.8	7.0	4.50E-05	1.1	15	16
2/6/08 12:02 AM	12.0	12.7	41.3	0.7	7.7	4.44E-05	1.0	15	15.5
2/6/08 12:02 AM	15.0	9.6	44.2	-5.4	8.4	4.35E-05	1.0	15	15.5
2/6/08 12:03 AM	18.0	6.6	45.6	-11.4	9.1	4.36E-05	1.0	15	15
2/6/08 12:04 AM	21.0	3.6	49.6	-17.4	10.0	4.23E-05	1.0	15	15
2/6/08 12:00 AM	0.0	24.5	0.0	24.5	10.0				
2/6/08 12:00 AM	3.0	21.9	17.2	18.9	10.3	8.59E-05	0.9	15	13
2/6/08 12:00 AM	6.0	19.0	35.8	13.0	10.9	4.53E-05	1.0	15	14.5
2/6/08 12:01 AM	9.0	15.9	39.2	6.9	11.5	4.47E-05	1.0	15	15.5
2/6/08 12:02 AM	12.0	12.8	41.1	0.8	12.2	4.46E-05	1.0	15	15.5
2/6/08 12:03 AM	16.0	8.7	59.2	-7.3	13.2	4.35E-05	1.0	20	20.5
2/6/08 12:03 AM	18.0	6.7	31.3	-11.3	13.7	4.27E-05	1.0	10	10
2/6/08 12:04 AM	21.0	3.6	48.9	-17.4	14.5	4.35E-05	1.0	15	15.5
2/6/08 12:05 AM	24.0	0.6	52.3	-23.4	15.4	4.23E-05	1.0	15	15



Hydraulic Conductivity Test - Boardman - Composite Cover

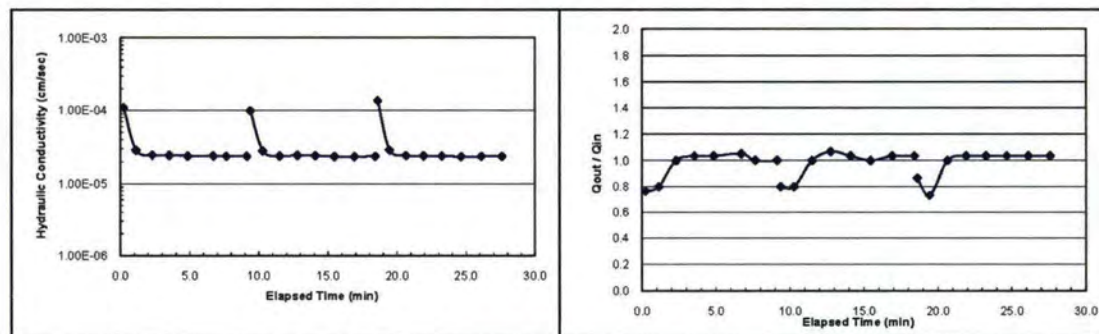
ASTM D 5084 - 00

Sample I.D.	305-mm Oregon Boardman- Q3-Upper	Test Date :	3/7/08
Cell Pressure = 42.7	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 42.4	psi	Length of Sample, L = 15.2	cm
Outflow Pressure = 40.0	psi	Area of Sample, A = 729.7	cm ²
Pressure Difference = 2.4	psi	Sample Volume, V = 11120.0	cm ³
Effective Stress = 1.50	psi	a _{in} = 5	cm ²
Hydraulic Gradient, i = 11.1		a _{out} = 5	cm ²
Weight of wet sample = 21550.0	(g)	Sample Water Content = 25.9%	(%)
Wet Density = 1.9	g/cm ³	Dry Density = 1.93	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
Y	30.96	215.75	177.69	25.94%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
3/7/08 12:00 AM	0.0	24.7	0.0	24.7	0.0				
3/7/08 12:00 AM	3.0	22.4	13.3	19.4	0.2	1.09E-04	0.8	15	11.5
3/7/08 12:01 AM	6.0	20.0	53.1	14.0	1.1	2.86E-05	0.8	15	12
3/7/08 12:02 AM	9.0	17.0	70.7	8.0	2.3	2.47E-05	1.0	15	15
3/7/08 12:03 AM	12.0	13.9	75.0	1.9	3.5	2.44E-05	1.0	15	15.5
3/7/08 12:04 AM	15.0	10.8	79.1	-4.2	4.9	2.40E-05	1.0	15	15.5
3/7/08 12:06 AM	19.0	6.6	111.1	-12.4	6.7	2.40E-05	1.1	20	21
3/7/08 12:07 AM	21.0	4.6	57.0	-16.4	7.7	2.37E-05	1.0	10	10
3/7/08 12:09 AM	24.0	1.6	88.3	-22.4	9.1	2.38E-05	1.0	15	15
3/7/08 12:00 AM	0.0	24.7	0.0	24.7	9.1				
3/7/08 12:00 AM	3.0	22.3	14.9	19.3	9.4	9.94E-05	0.8	15	12
3/7/08 12:01 AM	6.0	19.9	54.4	13.9	10.3	2.80E-05	0.8	15	12
3/7/08 12:02 AM	9.0	16.9	72.7	7.9	11.5	2.40E-05	1.0	15	15
3/7/08 12:03 AM	12.0	13.7	76.6	1.7	12.8	2.43E-05	1.1	15	16
3/7/08 12:04 AM	15.0	10.6	78.6	-4.4	14.1	2.42E-05	1.0	15	15.5
3/7/08 12:06 AM	18.0	7.6	82.4	-10.4	15.5	2.36E-05	1.0	15	15
3/7/08 12:07 AM	21.0	4.5	87.5	-16.5	16.9	2.34E-05	1.0	15	15.5
3/7/08 12:09 AM	24.0	1.4	90.1	-22.6	18.4	2.37E-05	1.0	15	15.5
3/7/08 12:00 AM	0.0	24.6	0.0	24.6	18.4				
3/7/08 12:00 AM	3.0	22.0	11.2	19.0	18.6	1.37E-04	0.9	15	13
3/7/08 12:01 AM	6.0	19.8	51.1	13.8	19.4	2.87E-05	0.7	15	11
3/7/08 12:02 AM	9.0	16.8	71.9	7.8	20.6	2.43E-05	1.0	15	15
3/7/08 12:03 AM	12.0	13.7	76.1	1.7	21.9	2.41E-05	1.0	15	15.5
3/7/08 12:04 AM	15.0	10.6	79.9	-4.4	23.2	2.38E-05	1.0	15	15.5
3/7/08 12:06 AM	18.0	7.5	84.2	-10.5	24.7	2.34E-05	1.0	15	15.5
3/7/08 12:07 AM	21.0	4.4	86.6	-16.6	26.1	2.37E-05	1.0	15	15.5
3/7/08 12:09 AM	24.0	1.3	90.4	-22.7	27.6	2.36E-05	1.0	15	15.5



Hydraulic Conductivity Test - Boardman - Composite Cover

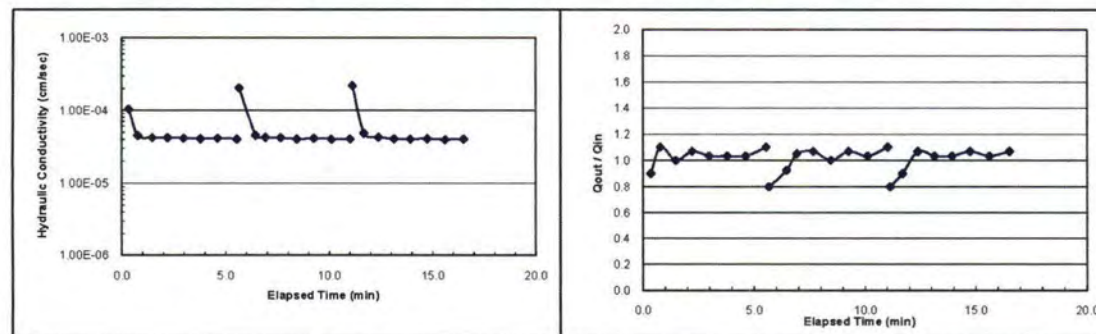
ASTM D 5084 - 00

Sample I.D.	305-mm Oregon Boardman- Q3-Lower	Test Date :	2/8/08
Cell Pressure =	42.7 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.4 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	5 cm ²
Weight of wet sample =	22044.5 (g)	Sample Water Content =	24.1% (%)
Wet Density =	2.0 g/cm ³	Dry Density =	1.98 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
4	50.16	357.96	298.12	24.13%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/8/08 12:00 AM	0.0	24.6	0.0	24.6	0.0				
2/8/08 12:00 AM	4.0	21.0	20.2	17.0	0.3	1.03E-04	0.9	20	18
2/8/08 12:00 AM	6.0	18.8	26.3	12.8	0.8	4.54E-05	1.1	10	11
2/8/08 12:01 AM	9.0	15.8	41.7	6.8	1.5	4.20E-05	1.0	15	15
2/8/08 12:02 AM	12.0	12.6	44.1	0.6	2.2	4.25E-05	1.1	15	16
2/8/08 12:02 AM	15.0	9.5	46.3	-5.5	3.0	4.13E-05	1.0	15	15.5
2/8/08 12:03 AM	18.0	6.4	48.7	-11.6	3.8	4.09E-05	1.0	15	15.5
2/8/08 12:04 AM	21.0	3.3	49.9	-17.7	4.6	4.14E-05	1.0	15	15.5
2/8/08 12:05 AM	24.0	0.0	55.3	-24.0	5.5	4.02E-05	1.1	15	16.5
2/8/08 12:00 AM	0.0	24.7	0.0	24.7	5.5				
2/8/08 12:00 AM	3.0	22.3	7.2	19.3	5.7	2.04E-04	0.8	15	12
2/8/08 12:00 AM	7.0	18.6	47.9	11.6	6.5	4.55E-05	0.9	20	18.5
2/8/08 12:01 AM	9.0	16.5	28.1	7.5	6.9	4.27E-05	1.1	10	10.5
2/8/08 12:02 AM	12.0	13.3	44.5	1.3	7.7	4.20E-05	1.1	15	16
2/8/08 12:02 AM	15.0	10.3	46.5	-4.7	8.4	4.03E-05	1.0	15	15
2/8/08 12:03 AM	18.0	7.1	48.8	-10.9	9.3	4.12E-05	1.1	15	16
2/8/08 12:04 AM	21.0	4.0	51.1	-17.0	10.1	4.03E-05	1.0	15	15.5
2/8/08 12:05 AM	24.0	0.7	54.6	-23.3	11.0	4.06E-05	1.1	15	16.5
2/8/08 12:00 AM	0.0	24.7	0.0	24.7	11.0				
2/8/08 12:00 AM	3.0	22.3	6.7	19.3	11.1	2.21E-04	0.8	15	12
2/8/08 12:00 AM	6.0	19.6	33.0	13.6	11.7	4.86E-05	0.9	15	13.5
2/8/08 12:01 AM	9.0	16.4	42.0	7.4	12.4	4.30E-05	1.1	15	16
2/8/08 12:02 AM	12.0	13.3	45.2	1.3	13.1	4.07E-05	1.0	15	15.5
2/8/08 12:02 AM	15.0	10.2	47.3	-4.8	13.9	4.03E-05	1.0	15	15.5
2/8/08 12:03 AM	18.0	7.0	49.3	-11.0	14.7	4.08E-05	1.1	15	16
2/8/08 12:04 AM	21.0	3.9	52.0	-17.1	15.6	3.96E-05	1.0	15	15.5
2/8/08 12:05 AM	24.0	0.7	54.0	-23.3	16.5	4.03E-05	1.1	15	16



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

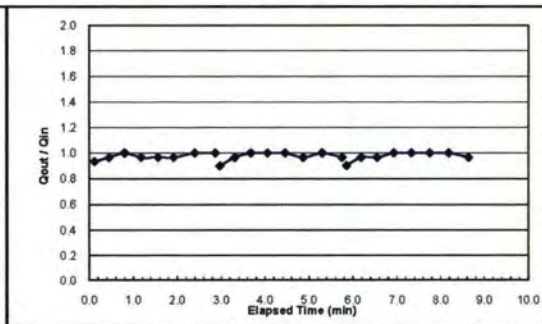
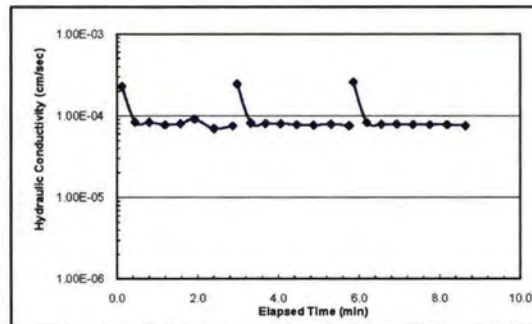
ASTM D 5084 - 00

Sample I.D.		305-mm Oregon Boardman- 6"-Upper Slope- Surface		Test Date :	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	30.5	cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	15.2	cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.7	cm ²
Pressure Difference =	2.4	psi	Sample Volume, V =	11120.0	cm ³
Effective Stress =	1.50	psi	a _{in} =	5	cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	5	cm ²
Weight of wet sample =	21636.2	(g)	Sample Water Content =	25.9%	(%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.94	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
874	35.12	393.89	320.05	25.92%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/13/08 12:00 AM	0.0	24.5	0.0	24.5	0.0				
2/13/08 12:00 AM	3.0	21.7	7.0	18.7	0.1	2.27E-04	0.9	15	14
2/13/08 12:00 AM	6.0	18.8	20.0	12.8	0.5	8.35E-05	1.0	15	14.5
2/13/08 12:00 AM	9.0	15.8	21.0	6.8	0.8	8.35E-05	1.0	15	15
2/13/08 12:01 AM	12.0	12.9	23.0	0.9	1.2	7.76E-05	1.0	15	14.5
2/13/08 12:01 AM	15.0	10.0	23.0	-5.0	1.6	8.03E-05	1.0	15	14.5
2/13/08 12:01 AM	18.0	7.1	21.0	-10.9	1.9	9.12E-05	1.0	15	14.5
2/13/08 12:02 AM	21.0	4.1	29.0	-16.9	2.4	6.98E-05	1.0	15	15
2/13/08 12:02 AM	24.0	1.1	28.0	-22.9	2.9	7.52E-05	1.0	15	15
2/13/08 12:00 AM	0.0	24.7	0.0	24.7	2.9				
2/13/08 12:00 AM	3.0	22.0	6.4	19.0	3.0	2.45E-04	0.9	15	13.5
2/13/08 12:00 AM	6.0	19.1	20.4	13.1	3.3	8.18E-05	1.0	15	14.5
2/13/08 12:00 AM	9.0	16.1	21.8	7.1	3.7	8.05E-05	1.0	15	15
2/13/08 12:01 AM	12.0	13.1	22.7	1.1	4.1	8.00E-05	1.0	15	15
2/13/08 12:01 AM	15.0	10.1	24.1	-4.9	4.5	7.80E-05	1.0	15	15
2/13/08 12:02 AM	18.0	7.2	24.9	-10.8	4.9	7.68E-05	1.0	15	14.5
2/13/08 12:02 AM	21.0	4.2	25.6	-16.8	5.3	7.68E-05	1.0	15	15
2/13/08 12:02 AM	24.0	1.3	27.2	-22.7	5.8	7.59E-05	1.0	15	14.5
2/13/08 12:00 AM	0.0	24.8	0.0	24.8	5.8				
2/13/08 12:00 AM	3.0	22.1	8.1	19.1	5.9	2.58E-04	0.9	15	13.5
2/13/08 12:00 AM	6.0	19.2	20.1	13.2	6.2	8.29E-05	1.0	15	14.5
2/13/08 12:00 AM	9.0	16.3	21.9	7.3	6.6	7.87E-05	1.0	15	14.5
2/13/08 12:01 AM	12.0	13.3	22.8	1.3	6.9	7.92E-05	1.0	15	15
2/13/08 12:01 AM	15.0	10.3	24.0	-4.7	7.3	7.80E-05	1.0	15	15
2/13/08 12:02 AM	18.0	7.3	25.0	-10.7	7.7	7.77E-05	1.0	15	15
2/13/08 12:02 AM	21.0	4.3	25.9	-16.7	8.2	7.80E-05	1.0	15	15
2/13/08 12:02 AM	24.0	1.4	27.3	-22.6	8.6	7.57E-05	1.0	15	14.5



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

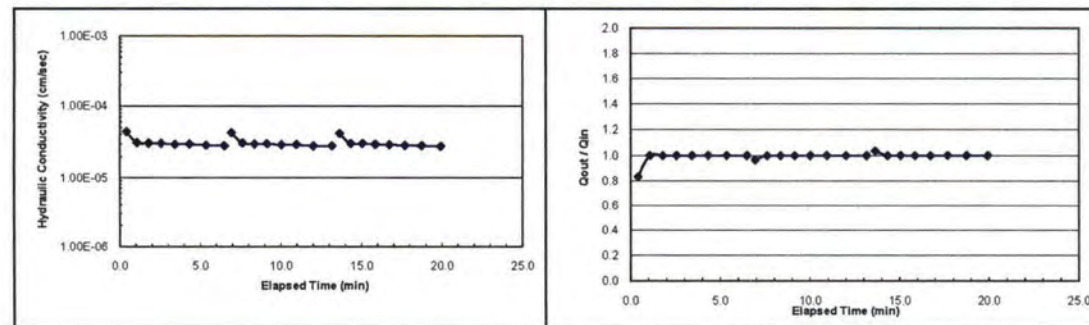
ASTM D 5084 - 00

Sample I.D.	150-mm Oregon Boardman- 6'-Upper	Test Date :	3/14/08
Slope- Surface			
Cell Pressure =	42.7 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	41.8 psi	Length of Sample, L =	7.6 cm
Outflow Pressure =	40.6 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.2 psi	Sample Volume, V =	1390.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	1 cm ²
Weight of wet sample =	2593.1 (g)	Sample Water Content =	25.1% (%)
Wet Density =	1.9 g/cm ³	Dry Density =	1.86 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
2C	24.63	202.94	167.14	25.12%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
3/14/08 00:00:00	0.0	24.7	0.0	24.7	0.0				
3/14/08 00:24.34	3.0	22.2	24.3	19.2	0.4	4.43E-05	0.8	3	2.5
3/14/08 01:04.11	6.0	19.2	39.8	13.2	1.1	3.13E-05	1.0	3	3
3/14/08 01:47.34	9.0	16.2	43.2	7.2	1.8	3.08E-05	1.0	3	3
3/14/08 02:33.45	12.0	13.2	46.1	1.2	2.6	3.08E-05	1.0	3	3
3/14/08 03:24.61	15.0	10.2	51.2	-4.8	3.4	2.96E-05	1.0	3	3
3/14/08 04:19.42	18.0	7.2	54.8	-10.8	4.3	2.98E-05	1.0	3	3
3/14/08 05:20.68	21.0	4.2	61.3	-16.8	5.3	2.89E-05	1.0	3	3
3/14/08 06:28.84	24.0	1.2	68.2	-22.8	6.5	2.84E-05	1.0	3	3
3/14/08 00:00:00	0.0	24.6	0.0	24.6	6.5				
3/14/08 00:27.11	3.0	21.7	27.1	18.7	6.9	4.28E-05	1.0	3	2.9
3/14/08 01:07.65	6.0	18.7	40.5	12.7	7.6	3.08E-05	1.0	3	3
3/14/08 01:52.06	9.0	15.7	44.4	6.7	8.3	2.99E-05	1.0	3	3
3/14/08 02:39.37	12.0	12.7	47.3	0.7	9.1	3.00E-05	1.0	3	3
3/14/08 03:31.55	15.0	9.7	52.2	-5.3	10.0	2.92E-05	1.0	3	3
3/14/08 04:27.56	18.0	6.7	56.0	-11.3	10.9	2.93E-05	1.0	3	3
3/14/08 05:31.42	21.0	3.7	63.9	-17.3	12.0	2.79E-05	1.0	3	3
3/14/08 06:40.68	24.0	0.7	69.3	-23.3	13.2	2.82E-05	1.0	3	3
3/14/08 00:00:00	0.0	24.6	0.0	24.6	13.2				
3/14/08 00:28.73	3.0	21.7	28.7	18.7	13.6	4.17E-05	1.0	3	3.1
3/14/08 01:10.03	6.0	18.7	41.3	12.7	14.3	3.03E-05	1.0	3	3
3/14/08 01:53.73	9.0	15.7	43.7	6.7	15.1	3.04E-05	1.0	3	3
3/14/08 02:41.95	12.0	12.7	48.2	0.7	15.9	2.95E-05	1.0	3	3
3/14/08 03:34.03	15.0	9.7	52.1	-5.3	16.7	2.93E-05	1.0	3	3
3/14/08 04:31.83	18.0	6.7	57.8	-11.3	17.7	2.84E-05	1.0	3	3
3/14/08 05:35.05	21.0	3.7	63.2	-17.3	18.7	2.82E-05	1.0	3	3
3/14/08 06:45.78	24.0	0.7	70.7	-23.3	19.9	2.76E-05	1.0	3	3



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

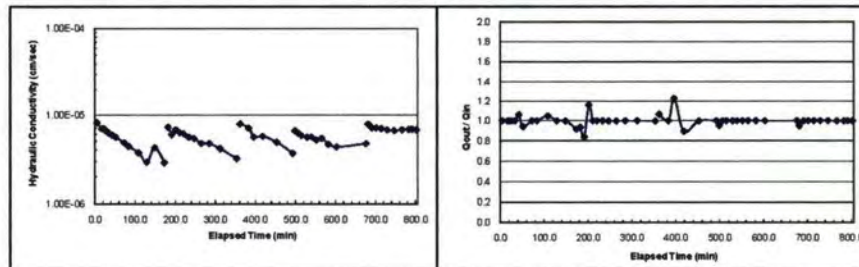
ASTM D 5084 - 00

Sample I.D.		75-mm Oregon Boardman- 6'-Upper Slope- Surface		Test Date :	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	7.6	cm
Inflow Pressure =	41.5	psi	Length of Sample, L =	3.8	cm
Outflow Pressure =	40.9	psi	Area of Sample, A =	45.6	cm ²
Pressure Difference =	0.6	psi	Sample Volume, V =	173.7	cm ³
Effective Stress =	1.50	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	1	cm ²
Weight of wet sample =	294.8	(g)	Sample Water Content = 15.6% (%)		
Wet Density =	1.7	g/cm ³	Dry Density = 1.69 g/cm ³		

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
2	30.8	163.2	145.34	15.69%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
4/23/08 00:00:00	0.0	24.6	0.0	24.6	0.0				
4/23/08 00:05:15	2.0	22.6	315.3	20.6	5.3	8.17E-06	1.0	2	2
4/23/08 00:16:46	5.4	19.2	690.2	13.8	16.8	6.93E-06	1.0	3.4	3.4
4/23/08 00:22:16	6.9	17.7	330.5	10.8	22.3	6.95E-06	1.0	1.5	1.5
4/23/08 00:28:46	8.0	16.6	269.8	8.6	26.8	6.55E-06	1.0	1.1	1.1
4/23/08 00:33:30	9.5	15.1	404.4	5.6	33.5	6.28E-06	1.0	1.5	1.5
4/23/08 00:41:55	11.1	13.4	504.7	2.3	41.9	5.91E-06	1.1	1.6	1.7
4/23/08 00:51:35	12.8	11.8	579.9	-1.0	51.6	5.54E-06	0.9	1.7	1.6
4/23/08 01:12:41	15.6	9.0	1265.9	-6.6	72.7	4.81E-06	1.0	2.8	2.8
4/23/08 01:23:50	16.8	7.8	669.7	-9.0	83.5	4.34E-06	1.0	1.2	1.2
4/23/08 01:48:35	18.8	5.7	1484.1	-13.1	108.6	3.70E-06	1.1	2	2.1
4/23/08 02:09:11	20.0	4.5	1238.5	-15.5	129.2	2.90E-06	1.0	1.2	1.2
4/23/08 02:28:48	21.5	3.0	1176.9	-18.5	148.8	4.22E-06	1.0	1.5	1.5
4/23/08 02:53:38	22.7	1.9	1487.8	-20.8	173.6	2.85E-06	0.9	1.2	1.1
4/23/08 00:00:00	0.0	24.8	0.0	24.8	173.6				
4/23/08 00:08:43	3.0	22.0	522.6	19.0	182.3	7.23E-06	0.9	3	2.8
4/23/08 00:17:50	5.5	19.9	547.4	14.4	191.4	5.95E-06	0.8	2.5	2.1
4/23/08 00:28:08	8.0	17.0	618.3	9.0	201.7	6.78E-06	1.2	2.5	2.9
4/23/08 00:37:08	10.0	15.0	540.1	5.0	210.7	6.28E-06	1.0	2	2
4/23/08 00:47:14	12.0	13.0	606.0	1.0	220.8	6.09E-06	1.0	2	2
4/23/08 01:00:03	14.1	10.9	768.5	-3.2	233.6	5.55E-06	1.0	2.1	2.1
4/23/08 01:13:18	16.0	9.0	794.9	-7.0	246.9	5.37E-06	1.0	1.9	1.9
4/23/08 01:31:05	18.0	7.0	1067.0	-11.0	264.7	4.71E-06	1.0	2	2
4/23/08 01:51:17	20.0	5.0	1212.6	-15.0	284.9	4.71E-06	1.0	2	2
4/23/08 02:18:16	22.0	3.0	1618.9	-19.0	311.9	4.09E-06	1.0	2	2
4/23/08 02:59:21	24.0	1.0	2485.0	-23.0	353.0	3.19E-06	1.0	2	2
4/23/08 00:00:00	0.0	24.9	0.0	24.9	353.0				
4/23/08 00:08:33	3.0	21.7	513.0	18.7	361.5	7.88E-06	1.1	3	3.2
4/23/08 00:30:08	9.0	15.7	1294.6	6.7	383.1	7.07E-06	1.0	6	6
4/23/08 00:43:15	11.2	13.0	787.6	1.8	396.2	5.59E-06	1.2	2.2	2.7
4/23/08 01:05:02	15.0	9.6	1306.9	-5.4	418.0	5.70E-06	0.9	3.8	3.4
4/23/08 01:40:05	19.0	5.6	2105.5	-13.4	453.1	4.85E-06	1.0	4	4
4/23/08 02:19:38	21.7	2.9	2369.9	-18.8	482.6	3.65E-06	1.0	2.7	2.7
4/23/08 00:00:00	0.0	25.0	0.0	25.0	482.6				
4/23/08 00:08:19	2.0	23.1	379.4	21.1	498.9	6.57E-06	0.9	2	1.9
4/23/08 00:13:40	4.0	21.1	440.2	17.1	506.2	6.19E-06	1.0	2	2
4/23/08 00:21:59	8.0	19.1	499.8	13.1	514.6	5.83E-06	1.0	2	2
4/23/08 00:36:28	9.0	16.1	868.5	7.1	529.0	5.51E-06	1.0	3	3
4/23/08 00:48:58	11.0	14.1	629.8	3.1	539.5	5.60E-06	1.0	2	2
4/23/08 00:59:20	13.0	12.1	742.8	-0.9	551.9	5.19E-06	1.0	2	2
4/23/08 01:12:27	15.0	10.1	786.7	-4.9	565.0	5.40E-06	1.0	2	2
4/23/08 01:29:32	17.0	8.1	1024.6	-9.9	582.1	4.61E-06	1.0	2	2
4/23/08 01:50:13	19.0	6.1	1241.6	-12.9	602.8	4.29E-06	1.0	2	2
4/23/08 03:03:17	24.7	0.4	4383.1	-24.3	675.9	4.68E-06	1.0	5.7	5.7
4/23/08 00:00:00	0.0	24.9	0.0	24.9	675.9				
4/23/08 00:05:18	2.0	23.0	318.1	21.0	681.2	7.85E-06	0.9	2	1.9
4/23/08 00:14:59	5.0	20.0	580.7	15.0	690.8	7.17E-06	1.0	3	3
4/23/08 00:25:47	8.0	17.0	647.9	9.0	701.6	7.13E-06	1.0	3	3
4/23/08 00:38:16	11.0	14.0	749.8	3.0	714.1	6.93E-06	1.0	3	3
4/23/08 00:52:59	14.0	11.0	878.7	-3.0	728.8	6.76E-06	1.0	3	3
4/23/08 01:10:19	17.0	8.0	1044.3	-9.0	746.2	6.63E-06	1.0	3	3
4/23/08 01:30:47	20.0	5.0	1227.8	-15.0	766.6	6.76E-06	1.0	3	3
4/23/08 01:46:56	22.0	3.0	968.4	-19.0	782.8	6.84E-06	1.0	2	2
4/23/08 01:56:00	23.0	2.0	544.1	-21.0	791.8	6.89E-06	1.0	1	1
4/23/08 02:06:09	24.0	1.0	809.0	-23.0	802.0	6.77E-06	1.0	1	1



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

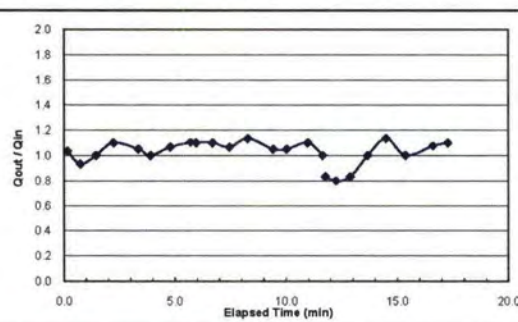
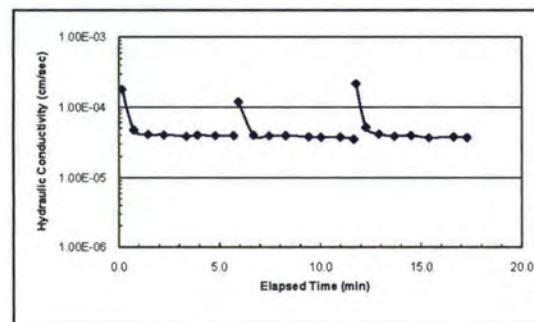
ASTM D 5084 - 00

Sample I.D.	305-mm Oregon Boardman- 6'-Upper	Test Date :	2/11/08
Slope- 3'-4'			
Cell Pressure =	42.7 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.4 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	5 cm ²
Weight of wet sample =	21182.7 (g)	Sample Water Content =	24.0% (%)
Wet Density =	1.9 g/cm ³	Dry Density =	1.90 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
874	35.13	298.29	247.41	23.97%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/11/08 12:00 AM	0.0	24.8	0.0	24.8	0.0				
2/11/08 12:00 AM	3.0	21.7	9.3	18.7	0.2	1.79E-04	1.0	15	15.5
2/11/08 12:00 AM	6.0	18.9	34.7	12.9	0.7	4.73E-05	0.9	15	14
2/11/08 12:01 AM	9.0	15.9	42.7	6.9	1.4	4.11E-05	1.0	15	15
2/11/08 12:02 AM	12.0	12.6	46.9	0.6	2.2	4.07E-05	1.1	15	16.5
2/11/08 12:03 AM	16.0	8.4	67.2	-7.6	3.3	3.85E-05	1.1	20	21
2/11/08 12:03 AM	18.0	6.4	32.7	-11.6	3.9	4.01E-05	1.0	10	10
2/11/08 12:04 AM	21.0	3.2	53.7	-17.8	4.8	3.91E-05	1.1	15	16
2/11/08 12:05 AM	23.9	0.0	54.3	-23.9	5.7	3.96E-05	1.1	14.5	16
2/11/08 12:00 AM	0.0	24.8	0.0	24.8	5.7				
2/11/08 12:00 AM	3.0	21.5	14.6	18.5	5.9	1.19E-04	1.1	15	16.5
2/11/08 12:00 AM	6.0	18.2	44.7	12.2	6.7	4.00E-05	1.1	15	16.5
2/11/08 12:01 AM	9.0	15.0	46.2	6.0	7.4	3.94E-05	1.1	15	16
2/11/08 12:02 AM	12.0	11.6	49.4	-0.4	8.3	3.94E-05	1.1	15	17
2/11/08 12:03 AM	16.0	7.4	68.6	-8.6	9.4	3.80E-05	1.1	20	21
2/11/08 12:04 AM	18.0	5.3	36.1	-12.7	10.0	3.75E-05	1.1	10	10.5
2/11/08 12:05 AM	21.0	2.0	57.3	-19.0	11.0	3.76E-05	1.1	15	16.5
2/11/08 12:05 AM	23.0	0.0	40.2	-23.0	11.6	3.51E-05	1.0	10	10
2/11/08 12:00 AM	0.0	24.8	0.0	24.8	11.6				
2/11/08 12:00 AM	3.0	22.3	6.9	19.3	11.8	2.17E-04	0.8	15	12.5
2/11/08 12:00 AM	6.0	19.9	29.4	13.9	12.2	5.17E-05	0.8	15	12
2/11/08 12:01 AM	9.0	17.4	38.5	8.4	12.9	4.14E-05	0.8	15	12.5
2/11/08 12:02 AM	12.0	14.4	46.4	2.4	13.7	3.88E-05	1.0	15	15
2/11/08 12:02 AM	15.0	11.0	50.1	-4.0	14.5	3.97E-05	1.1	15	17
2/11/08 12:03 AM	18.0	8.0	52.6	-10.0	15.4	3.68E-05	1.0	15	15
2/11/08 12:04 AM	22.0	3.7	73.9	-18.3	16.6	3.79E-05	1.1	20	21.5
2/11/08 12:05 AM	24.0	1.5	40.0	-22.5	17.3	3.70E-05	1.1	10	11



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

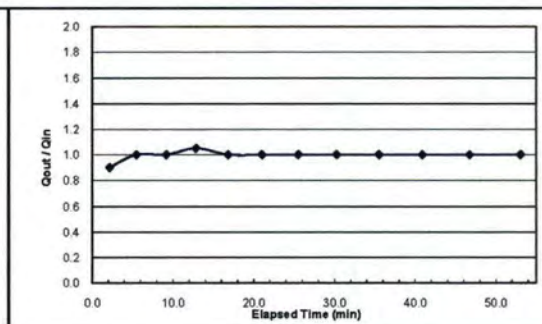
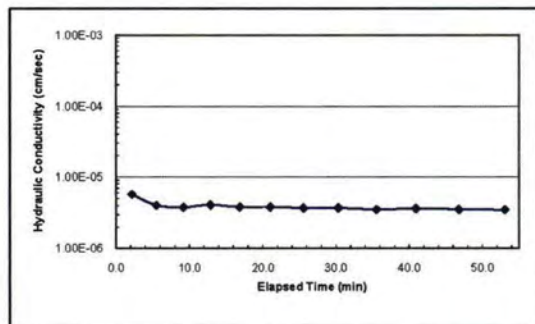
ASTM D 5084 - 00

Sample I.D.		150-mm Oregon Boardman- 6'-Upper Slope- 3'-4'		Test Date :		3/20/08
Cell Pressure =	42.7	psi	Diameter of Sample, D =	15.2	cm	
Inflow Pressure =	41.8	psi	Length of Sample, L =	7.6	cm	
Outflow Pressure =	40.6	psi	Area of Sample, A =	182.4	cm ²	
Pressure Difference =	1.2	psi	Sample Volume, V =	1390.0	cm ³	
Effective Stress =	1.50	psi	a _{in} =	1	cm ²	
Hydraulic Gradient, i =	11.1		a _{out} =	1	cm ²	
Weight of wet sample =	2593.1	(g)	Sample Water Content =	26.7%	(%)	
Wet Density =	1.9	g/cm ³	Dry Density =	1.86	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
2A	31.08	199	163.63	26.68%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
3/20/08 00:00:00	0.0	24.7	0.0	24.7	0.0				
3/20/08 02:09:28	2.0	22.9	129.3	20.9	2.2	5.72E-06	0.9	2	1.8
3/20/08 05:29:21	4.0	20.9	199.9	16.9	5.5	4.04E-06	1.0	2	2
3/20/08 09:11:05	6.0	18.9	221.8	12.9	9.2	3.79E-06	1.0	2	2
3/20/08 12:50:84	8.0	16.8	219.8	8.8	12.8	4.08E-06	1.1	2	2.1
3/20/08 16:50:84	10.0	14.8	240.0	4.8	16.8	3.81E-06	1.0	2	2
3/20/08 21:01:05	12.0	12.8	250.2	0.8	21.0	3.82E-06	1.0	2	2
3/20/08 25:32:21	14.0	10.8	271.2	-3.2	25.5	3.70E-06	1.0	2	2
3/20/08 30:16:75	16.0	8.8	284.5	-7.2	30.3	3.70E-06	1.0	2	2
3/20/08 35:32:21	18.0	6.8	315.5	-11.2	35.5	3.51E-06	1.0	2	2
3/20/08 40:54:34	20.0	4.8	322.1	-15.2	40.9	3.63E-06	1.0	2	2
3/20/08 46:45:42	22.0	2.8	351.1	-19.2	46.8	3.53E-06	1.0	2	2
3/20/08 53:03:42	24.0	0.8	378.0	-23.2	53.1	3.49E-06	1.0	2	2



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

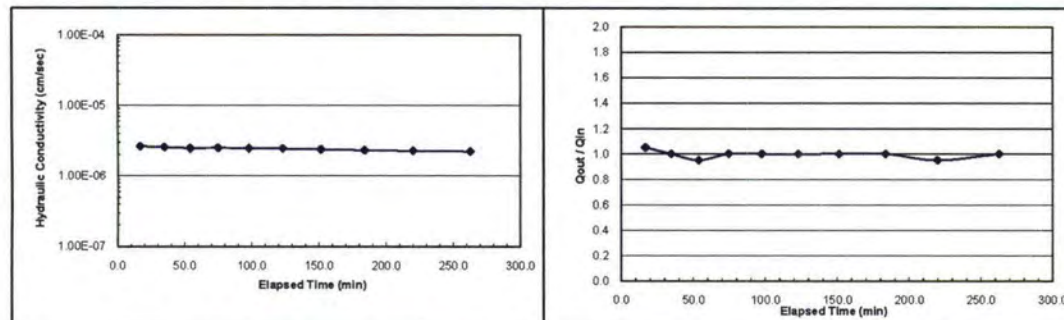
ASTM D 5084 - 00

Sample I.D.		75-mm Oregon Boardman- 6'-Upper Slope- 3'-4'		Test Date :		3/20/08	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	7.6	cm		
Inflow Pressure =	41.5	psi	Length of Sample, L =	3.8	cm		
Outflow Pressure =	40.9	psi	Area of Sample, A =	45.6	cm ²		
Pressure Difference =	0.6	psi	Sample Volume, V =	173.7	cm ³		
Effective Stress =	1.50	psi	a _{in} =	1	cm ²		
Hydraulic Gradient, i =	11.1		a _{out} =	1	cm ²		
Weight of wet sample =	333.2	(g)	Sample Water Content =	11.3%	(%)		
Wet Density =	1.9	g/cm ³	Dry Density =	1.92	g/cm ³		

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
H3	24.4	131.79	120.91	11.27%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
5/2/08 00:00:00	0.0	25.0	0.0	25.0	0.0				
5/2/08 00:18:39	2.0	22.9	999.4	20.9	16.7	2.63E-06	1.1	2	2.1
5/2/08 00:34:30	4.0	20.9	1070.9	16.9	34.5	2.55E-06	1.0	2	2
5/2/08 00:53:44	6.0	19.0	1153.3	13.0	53.7	2.47E-06	0.9	2	1.9
5/2/08 01:14:37	8.0	17.0	1253.4	9.0	74.6	2.51E-06	1.0	2	2
5/2/08 01:37:35	10.0	15.0	1377.8	5.0	97.6	2.47E-06	1.0	2	2
5/2/08 02:02:53	12.0	13.0	1518.0	1.0	122.9	2.44E-06	1.0	2	2
5/2/08 02:31:20	14.0	11.0	1707.2	-3.0	151.3	2.38E-06	1.0	2	2
5/2/08 03:03:48	16.0	9.0	1947.8	-7.0	183.8	2.31E-06	1.0	2	2
5/2/08 03:39:57	18.0	7.1	2168.7	-10.9	219.9	2.26E-06	1.0	2	1.9
5/2/08 04:22:47	20.0	5.1	2570.9	-14.9	262.8	2.22E-06	1.0	2	2



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

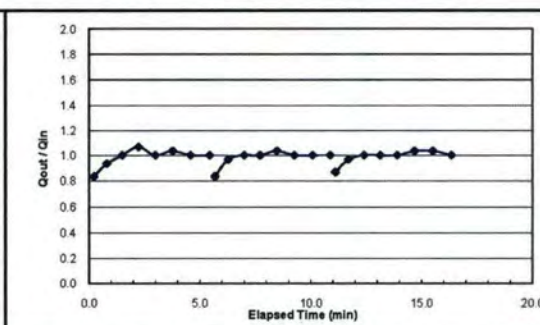
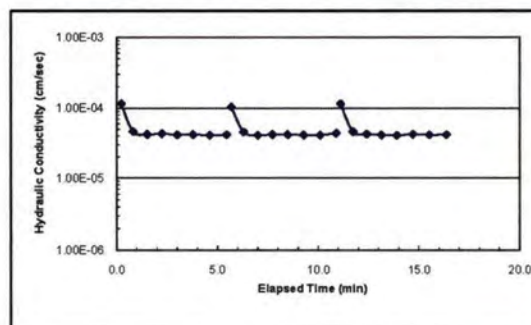
ASTM D 5084 - 00

Sample I.D.	305-mm Oregon Boardman- 6'-Upper Slope- 5'-6'		Test Date :	2/20/08
Cell Pressure =	42.7	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.4	psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.50	psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	5 cm ²
Weight of wet sample =	21450.0	(g)	Sample Water Content =	26.9% (%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.92 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
H2	30.84	234.97	191.66	26.93%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/20/08 12:00 AM	0.0	24.5	0.0	24.5	0.0				
2/20/08 12:00 AM	3.0	22.0	13.1	19.0	0.2	1.16E-04	0.8	15	12.5
2/20/08 12:00 AM	6.0	19.2	35.3	13.2	0.8	4.64E-05	0.9	15	14
2/20/08 12:01 AM	9.0	16.2	41.8	7.2	1.5	4.19E-05	1.0	15	15
2/20/08 12:02 AM	12.0	13.0	43.5	1.0	2.2	4.31E-05	1.1	15	16
2/20/08 12:02 AM	15.0	10.0	45.3	-5.0	3.0	4.15E-05	1.0	15	15
2/20/08 12:03 AM	18.0	6.9	47.3	-11.1	3.8	4.19E-05	1.0	15	15.5
2/20/08 12:04 AM	21.0	3.9	49.4	-17.1	4.6	4.10E-05	1.0	15	15
2/20/08 12:05 AM	24.0	0.9	50.6	-23.1	5.4	4.16E-05	1.0	15	15
2/20/08 12:00 AM	0.0	24.7	0.0	24.7	5.4				
2/20/08 12:00 AM	3.0	22.2	14.5	19.2	5.7	1.04E-04	0.8	15	12.5
2/20/08 12:00 AM	6.0	19.3	36.4	13.3	6.3	4.57E-05	1.0	15	14.5
2/20/08 12:01 AM	9.0	16.3	42.4	7.3	7.0	4.13E-05	1.0	15	15
2/20/08 12:02 AM	12.0	13.3	43.3	1.3	7.7	4.18E-05	1.0	15	15
2/20/08 12:03 AM	15.0	10.2	45.6	-4.8	8.5	4.18E-05	1.0	15	15.5
2/20/08 12:03 AM	18.0	7.2	47.3	-10.8	9.3	4.12E-05	1.0	15	15
2/20/08 12:04 AM	21.0	4.2	49.2	-16.8	10.1	4.11E-05	1.0	15	15
2/20/08 12:05 AM	24.0	1.2	48.0	-22.8	10.9	4.38E-05	1.0	15	15
2/20/08 12:00 AM	0.0	24.7	0.0	24.7	10.9				
2/20/08 12:00 AM	3.0	22.1	13.4	19.1	11.1	1.14E-04	0.9	15	13
2/20/08 12:00 AM	6.0	19.2	36.2	13.2	11.7	4.60E-05	1.0	15	14.5
2/20/08 12:01 AM	9.0	16.2	41.2	7.2	12.4	4.25E-05	1.0	15	15
2/20/08 12:02 AM	12.0	13.2	43.9	1.2	13.1	4.12E-05	1.0	15	15
2/20/08 12:03 AM	15.0	10.2	46.1	-4.8	13.9	4.07E-05	1.0	15	15
2/20/08 12:03 AM	18.0	7.1	46.9	-10.9	14.7	4.22E-05	1.0	15	15.5
2/20/08 12:04 AM	21.0	4.0	49.8	-17.0	15.5	4.13E-05	1.0	15	15.5
2/20/08 12:05 AM	24.0	1.0	50.5	-23.0	16.3	4.17E-05	1.0	15	15



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

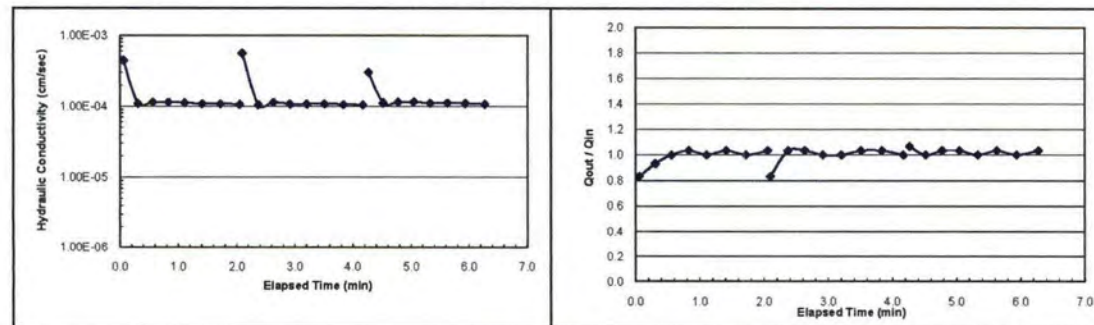
ASTM D 5084 - 00

Sample I.D.	305-mm Oregon Boardman- 6'-Lower Slope- Surface	Test Date :	3/10/08
Cell Pressure = 42.7	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 42.4	psi	Length of Sample, L = 15.2	cm
Outflow Pressure = 40.0	psi	Area of Sample, A = 729.7	cm ²
Pressure Difference = 2.4	psi	Sample Volume, V = 11120.0	cm ³
Effective Stress = 1.50	psi	a _{in} = 5	cm ²
Hydraulic Gradient, i = 11.1		a _{out} = 5	cm ²
Weight of wet sample = 21350.0	(g)	Sample Water Content = 26.5%	(%)
Wet Density = 1.9	g/cm ³	Dry Density = 1.91	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
2C	24.62	235.41	191.25	26.50%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
3/10/08 12:00 AM	0.0	24.8	0.0	24.8	0.0				
3/10/08 12:00 AM	3.0	22.3	3.4	19.3	0.1	4.47E-04	0.8	15	12.5
3/10/08 12:00 AM	6.0	19.5	14.9	13.5	0.3	1.10E-04	0.9	15	14
3/10/08 12:00 AM	9.0	16.5	15.3	7.5	0.6	1.14E-04	1.0	15	15
3/10/08 12:00 AM	12.0	13.4	16.1	1.4	0.8	1.14E-04	1.0	15	15.5
3/10/08 12:01 AM	15.0	10.4	16.7	-4.6	1.1	1.12E-04	1.0	15	15
3/10/08 12:01 AM	18.0	7.3	18.2	-10.7	1.4	1.09E-04	1.0	15	15.5
3/10/08 12:01 AM	21.0	4.3	18.6	-16.7	1.7	1.09E-04	1.0	15	15
3/10/08 12:02 AM	24.0	1.2	20.0	-22.8	2.1	1.07E-04	1.0	15	15.5
3/10/08 12:00 AM	0.0	24.7	0.0	24.7	2.1				
3/10/08 12:00 AM	3.0	22.2	2.7	19.2	2.1	5.62E-04	0.8	15	12.5
3/10/08 12:00 AM	6.0	19.1	16.4	13.1	2.4	1.05E-04	1.0	15	15.5
3/10/08 12:00 AM	9.0	16.0	15.7	7.0	2.6	1.14E-04	1.0	15	15.5
3/10/08 12:00 AM	12.0	13.0	16.9	1.0	2.9	1.08E-04	1.0	15	15
3/10/08 12:01 AM	15.0	10.0	17.5	-5.0	3.2	1.08E-04	1.0	15	15
3/10/08 12:01 AM	18.0	6.9	18.4	-11.1	3.5	1.08E-04	1.0	15	15.5
3/10/08 12:01 AM	21.0	3.8	19.4	-17.2	3.8	1.06E-04	1.0	15	15.5
3/10/08 12:02 AM	24.0	0.8	20.2	-23.2	4.2	1.05E-04	1.0	15	15
3/10/08 12:00 AM	0.0	24.7	0.0	24.7	4.2				
3/10/08 12:00 AM	3.0	21.5	5.6	18.5	4.3	3.02E-04	1.1	15	16
3/10/08 12:00 AM	6.0	18.5	15.2	12.5	4.5	1.12E-04	1.0	15	15
3/10/08 12:00 AM	9.0	15.4	15.6	6.4	4.8	1.15E-04	1.0	15	15.5
3/10/08 12:00 AM	12.0	12.3	16.1	0.3	5.0	1.15E-04	1.0	15	15.5
3/10/08 12:01 AM	15.0	9.3	17.0	-5.7	5.3	1.11E-04	1.0	15	15
3/10/08 12:01 AM	18.0	6.2	17.9	-11.8	5.6	1.11E-04	1.0	15	15.5
3/10/08 12:01 AM	21.0	3.2	18.5	-17.8	5.9	1.10E-04	1.0	15	15
3/10/08 12:02 AM	24.0	0.1	20.2	-23.9	6.3	1.07E-04	1.0	15	15.5



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

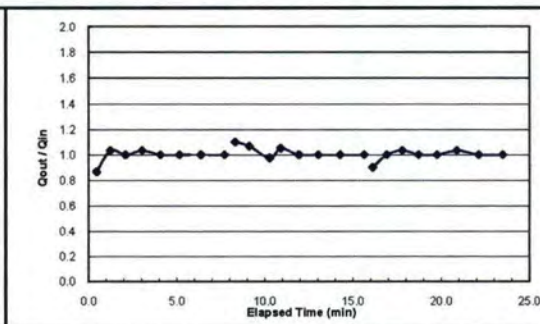
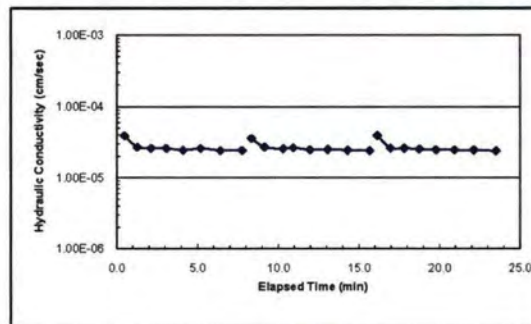
ASTM D 5084 - 00

Sample I.D.	150-mm Oregon Boardman- 6'-Lower	Test Date :	3/31/08
Slope- Surface			
Cell Pressure =	42.7 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	41.8 psi	Length of Sample, L =	7.6 cm
Outflow Pressure =	40.6 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.2 psi	Sample Volume, V =	1390.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	1 cm ²
Weight of wet sample =	2305.6 (g)	Sample Water Content =	24.2% (%)
Wet Density =	1.7 g/cm ³	Dry Density =	1.65 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
H1	30.85	191.54	160.26	24.17%

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
3/31/08 00:00:00	0.0	24.8	0.0	24.8	0.0				
3/31/08 00:28:07	3.0	22.2	28.1	19.2	0.5	3.91E-05	0.9	3	2.6
3/31/08 01:15:35	6.0	19.1	47.3	13.1	1.3	2.68E-05	1.0	3	3.1
3/31/08 02:06:86	9.0	16.1	51.5	7.1	2.1	2.57E-05	1.0	3	3
3/31/08 03:02:83	12.0	13.0	56.0	1.0	3.0	2.57E-05	1.0	3	3.1
3/31/08 04:05:67	15.0	10.0	62.8	-5.0	4.1	2.42E-05	1.0	3	3
3/31/08 05:09:78	18.0	7.0	64.1	-11.0	5.2	2.55E-05	1.0	3	3
3/31/08 06:23:73	21.0	4.0	74.0	-17.0	6.4	2.40E-05	1.0	3	3
3/31/08 07:44:76	24.0	1.0	81.0	-23.0	7.7	2.40E-05	1.0	3	3
3/31/08 00:00:00	0.0	25.0	0.0	25.0	7.7				
3/31/08 00:34:71	3.0	21.7	34.7	18.7	8.3	3.56E-05	1.1	3	3.3
3/31/08 01:22:87	6.0	18.5	48.2	12.5	9.1	2.68E-05	1.1	3	3.2
3/31/08 02:32:71	10.0	14.6	69.8	4.6	10.3	2.54E-05	1.0	4	3.9
3/31/08 03:10:30	12.0	12.5	37.6	0.5	10.9	2.62E-05	1.1	2	2.1
3/31/08 04:12:43	15.0	9.5	62.1	-5.5	12.0	2.46E-05	1.0	3	3
3/31/08 05:18:71	18.0	6.5	66.3	-11.5	13.1	2.49E-05	1.0	3	3
3/31/08 06:32:37	21.0	3.5	73.7	-17.5	14.3	2.43E-05	1.0	3	3
3/31/08 07:54:59	24.0	0.5	82.2	-23.5	15.7	2.38E-05	1.0	3	3
3/31/08 00:00:00	0.0	24.9	0.0	24.9	15.7				
3/31/08 00:28:34	3.0	22.2	28.3	19.2	16.1	3.94E-05	0.9	3	2.7
3/31/08 01:16:31	6.0	19.2	48.0	13.2	16.9	2.59E-05	1.0	3	3
3/31/08 02:08:41	9.0	16.1	52.1	7.1	17.8	2.58E-05	1.0	3	3.1
3/31/08 03:04:57	12.0	13.1	56.2	1.1	18.7	2.52E-05	1.0	3	3
3/31/08 04:06:44	15.0	10.1	61.9	-4.9	19.8	2.45E-05	1.0	3	3
3/31/08 05:14:78	18.0	7.0	68.3	-11.0	20.9	2.43E-05	1.0	3	3.1
3/31/08 06:27:91	21.0	4.0	73.1	-17.0	22.1	2.43E-05	1.0	3	3
3/31/08 07:50:16	24.0	1.0	82.3	-23.0	23.5	2.36E-05	1.0	3	3



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

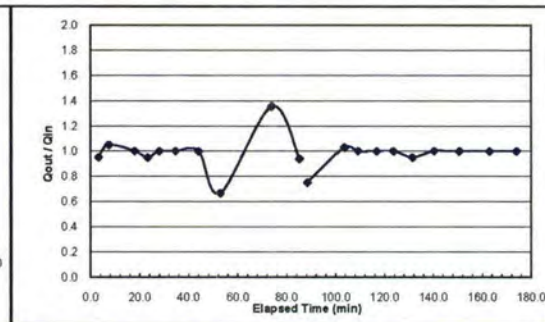
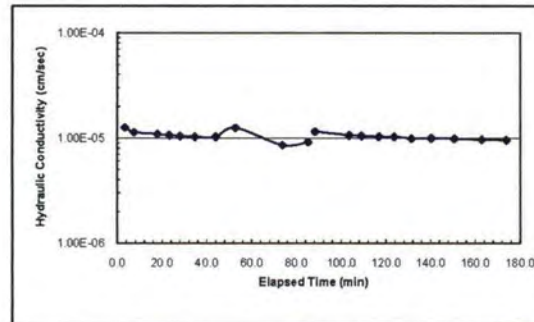
ASTM D 5084 - 00

Sample I.D.		75-mm Oregon Boardman- 6'-Lower Slope- Surface		Test Date :	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	7.6	cm
Inflow Pressure =	41.5	psi	Length of Sample, L =	3.8	cm
Outflow Pressre =	40.9	psi	Area of Sample, A =	45.6	cm ²
Pressure Difference =	0.6	psi	Sample Volume, V =	173.7	cm ³
Effective Stress =	1.50	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	1	cm ²
Weight of wet sample =	279.4	(g)	Sample Water Content =	9.2%	(%)
Wet Density =	1.6	g/cm ³	Dry Density =	1.61	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
2	30.76	162.61	151.48	9.22%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
4/21/08 00:00:00	0.0	24.8	0.0	24.8	0.0				
4/21/08 00:03:18	2.0	22.9	198.1	20.9	3.3	1.26E-05	1.0	2	1.9
4/21/08 00:07:25	4.0	20.8	246.8	16.8	7.4	1.14E-05	1.1	2	2.1
4/21/08 00:17:58	8.5	16.3	632.7	7.8	18.0	1.09E-05	1.0	4.5	4.5
4/21/08 00:23:16	10.5	14.4	318.7	3.9	23.3	1.06E-05	1.0	2	1.9
4/21/08 00:28:04	12.1	12.8	287.8	0.7	28.1	1.04E-05	1.0	1.6	1.6
4/21/08 00:34:40	14.1	10.8	396.3	-3.3	34.7	1.03E-05	1.0	2	2
4/21/08 00:44:00	16.6	8.3	559.5	-8.3	44.0	1.02E-05	1.0	2.5	2.5
4/21/08 00:52:52	19.6	6.3	531.7	-13.3	52.9	1.25E-05	0.7	3	2
4/21/08 01:13:53	22.4	2.5	1261.8	-19.9	73.9	8.55E-06	1.4	2.8	3.8
4/21/08 01:25:13	24.0	1.0	679.2	-23.0	85.2	9.17E-06	0.9	1.6	1.5
4/23/08 00:00:00	0.0	24.8	0.0	24.8	85.2				
4/23/08 00:03:14	2.0	23.3	194.0	21.3	88.4	1.15E-05	0.8	2	1.5
4/23/08 00:18:27	8.5	16.6	912.8	8.1	103.7	1.06E-05	1.0	6.5	6.7
4/23/08 00:23:57	10.5	14.6	329.9	4.1	109.2	1.05E-05	1.0	2	2
4/23/08 00:31:38	13.0	12.1	461.6	-0.9	116.8	1.03E-05	1.0	2.5	2.5
4/23/08 00:38:31	15.0	10.1	412.7	-4.9	123.7	1.03E-05	1.0	2	2
4/23/08 00:46:15	17.0	8.2	463.6	-8.8	131.5	9.93E-06	1.0	2	1.9
4/23/08 00:55:07	19.0	6.2	532.6	-12.8	140.3	9.98E-06	1.0	2	2
4/23/08 01:05:24	21.0	4.2	616.6	-16.8	150.6	9.87E-06	1.0	2	2
4/23/08 01:17:43	23.0	2.2	738.7	-20.8	162.9	9.65E-06	1.0	2	2
4/23/08 01:28:40	24.5	0.7	657.2	-23.8	173.9	9.56E-06	1.0	1.5	1.5



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

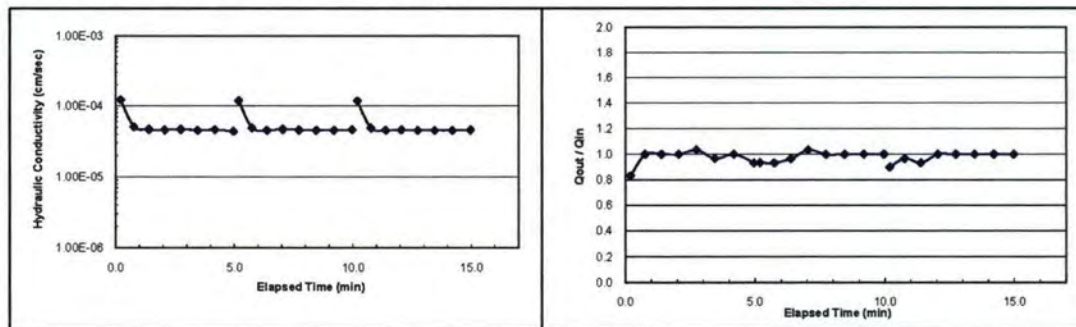
ASTM D 5084 - 00

Sample I.D.	305-mm Oregon Boardman- 6"-Lower Slope- 3'-4'	Test Date :	2/29/08
Cell Pressure =	42.7 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.4 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	5 cm ²
Weight of wet sample =	21100.0 (g)	Sample Water Content =	23.0% (%)
Wet Density =	1.9 g/cm ³	Dry Density =	1.89 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
MC6	31.13	163.44	138.68	23.02%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
2/29/08 12:00 AM	0.0	24.5	0.0	24.5	0.0				
2/29/08 12:00 AM	3.0	22.0	12.4	19.0	0.2	1.21E-04	0.8	15	12.5
2/29/08 12:00 AM	6.0	19.0	33.6	13.0	0.8	5.05E-05	1.0	15	15
2/29/08 12:01 AM	9.0	16.0	37.7	7.0	1.4	4.65E-05	1.0	15	15
2/29/08 12:02 AM	12.0	13.0	39.7	1.0	2.1	4.57E-05	1.0	15	15
2/29/08 12:02 AM	15.0	9.9	41.1	-5.1	2.7	4.65E-05	1.0	15	15.5
2/29/08 12:03 AM	18.0	7.0	42.3	-11.0	3.4	4.53E-05	1.0	15	14.5
2/29/08 12:04 AM	21.0	4.0	44.1	-17.0	4.2	4.59E-05	1.0	15	15
2/29/08 12:04 AM	24.0	1.2	46.5	-22.8	5.0	4.37E-05	0.9	15	14
2/29/08 12:00 AM	0.0	24.5	0.0	24.5	5.0				
2/29/08 12:00 AM	3.0	21.7	13.6	18.7	5.2	1.17E-04	0.9	15	14
2/29/08 12:00 AM	6.0	18.9	33.6	12.9	5.7	4.88E-05	0.9	15	14
2/29/08 12:01 AM	9.0	16.0	38.1	7.0	6.4	4.53E-05	1.0	15	14.5
2/29/08 12:02 AM	12.0	12.9	39.6	0.9	7.0	4.66E-05	1.0	15	15.5
2/29/08 12:02 AM	15.0	9.9	41.3	-5.1	7.7	4.55E-05	1.0	15	15
2/29/08 12:03 AM	18.0	6.9	43.0	-11.1	8.4	4.53E-05	1.0	15	15
2/29/08 12:04 AM	21.0	3.9	44.9	-17.1	9.2	4.51E-05	1.0	15	15
2/29/08 12:05 AM	24.0	0.9	46.0	-23.1	10.0	4.58E-05	1.0	15	15
2/29/08 12:00 AM	0.0	24.6	0.0	24.6	10.0				
2/29/08 12:00 AM	3.0	21.9	13.4	18.9	10.2	1.16E-04	0.9	15	13.5
2/29/08 12:00 AM	6.0	19.0	34.3	13.0	10.8	4.87E-05	1.0	15	14.5
2/29/08 12:01 AM	9.0	16.2	37.6	7.2	11.4	4.51E-05	0.9	15	14
2/29/08 12:02 AM	12.0	13.2	39.5	1.2	12.0	4.59E-05	1.0	15	15
2/29/08 12:02 AM	15.0	10.2	41.6	-4.8	12.7	4.51E-05	1.0	15	15
2/29/08 12:03 AM	18.0	7.2	43.2	-10.8	13.5	4.51E-05	1.0	15	15
2/29/08 12:04 AM	21.0	4.2	44.9	-16.8	14.2	4.51E-05	1.0	15	15
2/29/08 12:05 AM	24.0	1.2	46.1	-22.8	15.0	4.56E-05	1.0	15	15



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

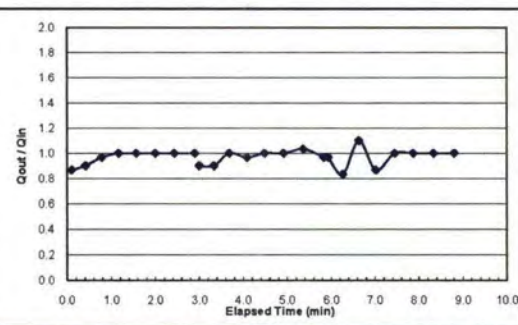
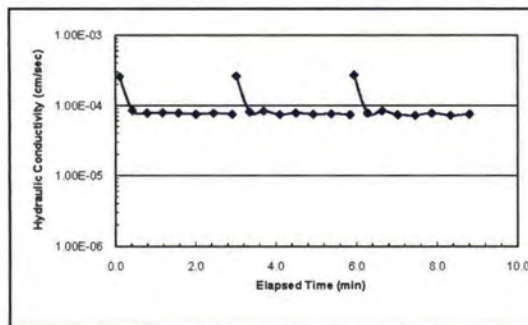
ASTM D 5084 - 00

Sample I.D.		305-mm Oregon Boardman- 6'-Lower		Test Date :	
		Slope- 5'-6'		2/25/08	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	30.5	cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	15.2	cm
Outflow Pressre =	40.0	psi	Area of Sample, A =	729.7	cm ²
Pressure Difference =	2.4	psi	Sample Volume, V =	11120.0	cm ³
Effective Stress =	1.50	psi	a _{in} =	5	cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	5	cm ⁴
Weight of wet sample =	21050.0	(g)	Sample Water Content =	25.3%	(%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.89	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
MC6	31.08	197.58	164.01	25.25%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
2/25/08 12:00 AM	0.0	24.6	0.0	24.6	0.0				
2/25/08 12:00 AM	3.0	22.0	6.0	19.0	0.1	2.56E-04	0.9	15	13
2/25/08 12:00 AM	6.0	19.3	19.0	13.3	0.4	8.47E-05	0.9	15	13.5
2/25/08 12:00 AM	9.0	16.4	22.0	7.4	0.8	7.82E-05	1.0	15	14.5
2/25/08 12:01 AM	12.0	13.4	23.0	1.4	1.2	7.87E-05	1.0	15	15
2/25/08 12:01 AM	15.0	10.4	24.0	-4.6	1.6	7.81E-05	1.0	15	15
2/25/08 12:02 AM	18.0	7.4	26.0	-10.6	2.0	7.48E-05	1.0	15	15
2/25/08 12:02 AM	21.0	4.4	26.0	-16.6	2.4	7.77E-05	1.0	15	15
2/25/08 12:02 AM	24.0	1.4	28.0	-22.6	2.9	7.50E-05	1.0	15	15
2/25/08 12:00 AM	0.0	24.7	0.0	24.7	2.9				
2/25/08 12:00 AM	3.0	22.0	6.0	19.0	3.0	2.60E-04	0.9	15	13.5
2/25/08 12:00 AM	6.0	19.3	20.0	13.3	3.3	8.05E-05	0.9	15	13.5
2/25/08 12:00 AM	9.0	16.3	21.0	7.3	3.7	8.33E-05	1.0	15	15
2/25/08 12:01 AM	12.0	13.4	24.0	1.4	4.1	7.41E-05	1.0	15	14.5
2/25/08 12:01 AM	15.0	10.4	24.0	-4.6	4.5	7.81E-05	1.0	15	15
2/25/08 12:02 AM	18.0	7.4	26.0	-10.6	4.9	7.48E-05	1.0	15	15
2/25/08 12:02 AM	21.0	4.3	27.0	-16.7	5.4	7.60E-05	1.0	15	15.5
2/25/08 12:02 AM	24.0	1.4	28.0	-22.6	5.8	7.38E-05	1.0	15	14.5
2/25/08 12:00 AM	0.0	24.6	0.0	24.6	5.8				
2/25/08 12:00 AM	3.0	21.7	6.0	18.7	5.9	2.70E-04	1.0	15	14.5
2/25/08 12:00 AM	6.0	19.2	20.0	13.2	6.3	7.77E-05	0.8	15	12.5
2/25/08 12:00 AM	9.0	15.9	22.0	6.9	6.6	8.36E-05	1.1	15	16.5
2/25/08 12:01 AM	12.0	13.3	23.0	1.3	7.0	7.35E-05	0.9	15	13
2/25/08 12:01 AM	15.0	10.3	26.0	-4.7	7.5	7.21E-05	1.0	15	15
2/25/08 12:02 AM	18.0	7.3	25.0	-10.7	7.9	7.78E-05	1.0	15	15
2/25/08 12:02 AM	21.0	4.3	28.0	-16.7	8.3	7.22E-05	1.0	15	15
2/25/08 12:02 AM	24.0	1.3	28.0	-22.7	8.8	7.51E-05	1.0	15	15



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

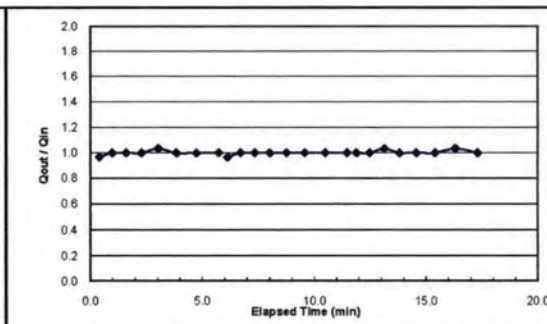
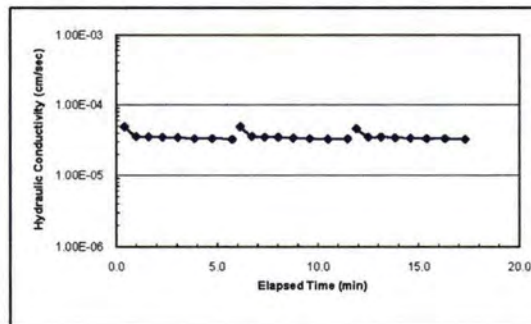
ASTM D 5084 - 00

Sample I.D.		150-mm Oregon Boardman- 6"-Lower		Test Date :	
		Slope- 5'-6'		3/26/08	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	15.2	cm
Inflow Pressure =	41.8	psi	Length of Sample, L =	7.6	cm
Outflow Pressure =	40.6	psi	Area of Sample, A =	182.4	cm ²
Pressure Difference =	1.2	psi	Sample Volume, V =	1390.0	cm ³
Effective Stress =	1.50	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	1	cm ²
Weight of wet sample =	2612.4	(g)	Sample Water Content =	23.8%	(%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.87	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
55	30.91	211.66	176.96	23.76%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
3/26/08 00:00.00	0.0	24.7	0.0	24.7	0.0				
3/26/08 00:23.66	3.0	21.8	23.7	18.8	0.4	4.90E-05	1.0	3	2.9
3/26/08 00:58.58	6.0	18.8	34.9	12.8	1.0	3.58E-05	1.0	3	3
3/26/08 01:36.12	9.0	15.8	37.5	6.8	1.6	3.54E-05	1.0	3	3
3/26/08 02:16.72	12.0	12.8	40.6	0.8	2.3	3.49E-05	1.0	3	3
3/26/08 03:01.64	15.0	9.7	44.9	-5.3	3.0	3.45E-05	1.0	3	3.1
3/26/08 03:50.80	18.0	6.7	49.2	-11.3	3.8	3.34E-05	1.0	3	3
3/26/08 04:43.99	21.0	3.7	53.2	-17.3	4.7	3.35E-05	1.0	3	3
3/26/08 05:43.74	24.0	0.7	59.8	-23.3	5.7	3.27E-05	1.0	3	3
3/26/08 00:00.00	0.0	24.7	0.0	24.7	5.7				
3/26/08 00:23.66	3.0	21.8	23.7	18.8	6.1	4.90E-05	1.0	3	2.9
3/26/08 00:58.58	6.0	18.8	34.7	12.8	6.7	3.60E-05	1.0	3	3
3/26/08 01:36.12	9.0	15.8	37.8	6.8	7.3	3.52E-05	1.0	3	3
3/26/08 02:16.72	12.0	12.8	40.6	0.8	8.0	3.49E-05	1.0	3	3
3/26/08 03:01.64	15.0	9.8	44.9	-5.2	8.8	3.39E-05	1.0	3	3
3/26/08 03:50.80	18.0	6.8	49.2	-11.2	9.6	3.34E-05	1.0	3	3
3/26/08 04:45.00	21.0	3.8	54.2	-17.2	10.5	3.29E-05	1.0	3	3
3/26/08 05:43.74	24.0	0.8	58.7	-23.2	11.5	3.32E-05	1.0	3	3
3/26/08 00:00.00	0.0	24.7	0.0	24.7	11.5				
3/26/08 00:25.56	3.0	21.7	25.6	18.7	11.9	4.61E-05	1.0	3	3
3/26/08 01:01.16	6.0	18.7	35.6	12.7	12.5	3.51E-05	1.0	3	3
3/26/08 01:39.63	9.0	15.6	36.5	6.6	13.1	3.52E-05	1.0	3	3.1
3/26/08 02:21.06	12.0	12.6	41.4	0.6	13.8	3.43E-05	1.0	3	3
3/26/08 03:06.20	15.0	9.6	45.1	-5.4	14.6	3.38E-05	1.0	3	3
3/26/08 03:55.80	18.0	6.6	49.6	-11.4	15.4	3.32E-05	1.0	3	3
3/26/08 04:50.24	21.0	3.5	54.4	-17.5	16.3	3.34E-05	1.0	3	3.1
3/26/08 05:50.56	24.0	0.5	60.3	-23.5	17.3	3.24E-05	1.0	3	3



Hydraulic Conductivity Test - Boardman - Thick Store-and-Release Cover

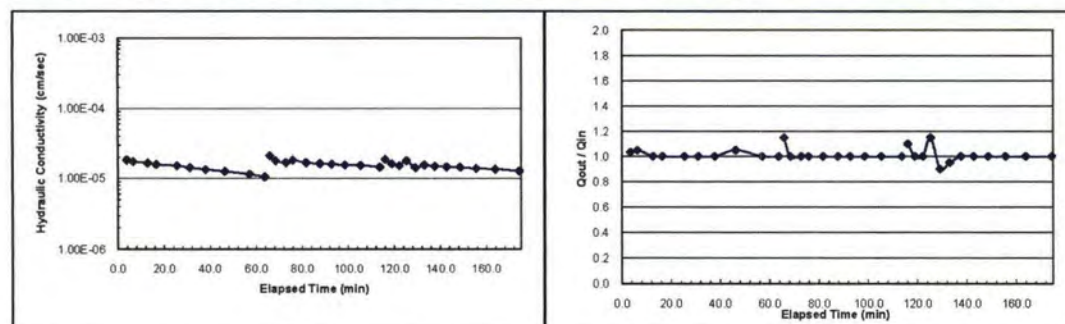
ASTM D 5084 - 00

Sample I.D.	75-mm Oregon Boardman- 6'-Lower	Test Date :	3/26/08
Slope- 5'-6'			
Cell Pressure =	42.7 psi	Diameter of Sample, D =	7.6 cm
Inflow Pressure =	41.5 psi	Length of Sample, L =	3.8 cm
Outflow Pressure =	40.9 psi	Area of Sample, A =	45.6 cm ²
Pressure Difference =	0.6 psi	Sample Volume, V =	173.7 cm ³
Effective Stress =	1.50 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	1 cm ²
Weight of wet sample =	376.2 (g)	Sample Water Content =	14.4% (%)
Wet Density =	2.2 g/cm ³	Dry Density =	2.16 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	50.78	265.61	238.5	14.44%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
5/2/08 00:00:00	0.0	24.9	0.0	24.9	0.0				
5/2/08 00:03:35	3.0	21.8	215.3	18.8	3.6	1.85E-05	1.0	3	3.1
5/2/08 00:06:23	5.0	19.7	167.4	14.7	6.4	1.74E-05	1.1	2	2.1
5/2/08 00:12:43	9.0	15.7	380.7	6.7	12.7	1.66E-05	1.0	4	4
5/2/08 00:16:28	11.0	13.7	224.5	2.7	16.5	1.59E-05	1.0	2	2
5/2/08 00:25:27	15.0	9.7	539.0	-5.3	25.4	1.52E-05	1.0	4	4
5/2/08 00:31:02	17.0	7.7	335.3	-9.3	31.0	1.43E-05	1.0	2	2
5/2/08 00:37:47	19.0	5.7	404.6	-13.3	37.8	1.34E-05	1.0	2	2
5/2/08 00:46:15	21.0	3.6	508.2	-17.4	46.3	1.26E-05	1.1	2	2.1
5/2/08 00:56:58	23.0	1.6	643.2	-21.4	57.0	1.14E-05	1.0	2	2
5/2/08 01:03:39	24.0	0.6	400.5	-23.4	63.6	1.05E-05	1.0	1	1
5/2/08 00:00:00	0.0	25.0	0.0	25.0	63.6				
5/2/08 00:02:11	2.0	22.7	131.4	20.7	65.8	2.10E-05	1.2	2	2.3
5/2/08 00:04:44	4.0	20.7	153.0	16.7	68.4	1.79E-05	1.0	2	2
5/2/08 00:09:11	7.0	17.7	266.3	10.7	72.8	1.69E-05	1.0	3	3
5/2/08 00:12:11	9.0	15.7	180.0	6.7	75.8	1.62E-05	1.0	2	2
5/2/08 00:18:00	12.2	12.5	348.9	0.3	81.6	1.68E-05	1.0	3.2	3.2
5/2/08 00:24:03	15.0	9.7	363.4	-5.3	87.7	1.62E-05	1.0	2.8	2.8
5/2/08 00:29:03	17.0	7.7	300.2	-9.3	92.7	1.60E-05	1.0	2	2
5/2/08 00:34:53	19.0	5.7	349.7	-13.3	98.5	1.55E-05	1.0	2	2
5/2/08 00:41:38	21.0	3.7	404.8	-17.3	105.3	1.54E-05	1.0	2	2
5/2/08 00:50:01	23.0	1.7	503.2	-21.3	113.7	1.45E-05	1.0	2	2
5/2/08 00:00:00	0.0	24.9	0.0	24.9	113.7				
5/2/08 00:02:25	2.0	22.7	145.1	20.7	116.1	1.86E-05	1.1	2	2.2
5/2/08 00:05:15	4.0	20.7	169.5	16.7	118.9	1.62E-05	1.0	2	2
5/2/08 00:08:28	6.0	18.7	193.2	12.7	122.1	1.52E-05	1.0	2	2
5/2/08 00:11:37	8.0	16.4	189.7	8.4	125.3	1.80E-05	1.2	2	2.3
5/2/08 00:15:27	10.0	14.6	229.6	4.6	129.1	1.42E-05	0.9	2	1.8
5/2/08 00:19:21	12.0	12.7	234.0	0.7	133.0	1.55E-05	1.0	2	1.9
5/2/08 00:23:56	14.0	10.7	274.9	-3.3	137.6	1.49E-05	1.0	2	2
5/2/08 00:29:04	16.0	8.7	308.4	-7.3	142.7	1.47E-05	1.0	2	2
5/2/08 00:34:57	18.0	6.7	352.6	-11.3	148.6	1.44E-05	1.0	2	2
5/2/08 00:41:56	20.0	4.7	419.3	-15.3	155.6	1.38E-05	1.0	2	2
5/2/08 00:50:11	22.0	2.7	495.1	-19.3	163.9	1.36E-05	1.0	2	2
5/2/08 01:00:40	24.0	0.7	628.6	-23.3	174.3	1.28E-05	1.0	2	2



Hydraulic Conductivity Test - Cedar Rapids - Clay Cover

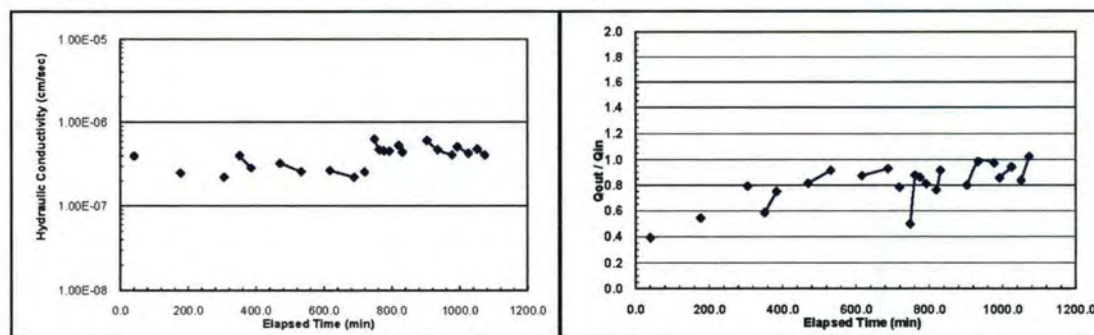
ASTM D 5084 - 00

Sample I.D.	305-mm ICYRU	Test Date :	7/10/06
Cell Pressure =	43.1 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.3 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.3 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	2.0 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	10.6	a _{out} =	1 cm ²
Weight of wet sample =	24222.2 (g)	Sample Water Content =	13.8 (%)
Wet Density =	2.2 g/cm ³	Dry Density =	1.91 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
2	50.1	401.9	359.2	13.81

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/12/2006 11:51	2.5	23.7	0.0	21.2	0.0				
7/12/2006 12:31	14.0	19.2	2400.0	5.2	40.0	3.98E-07	0.4	11.5	4.5
7/12/2006 12:31	1.8	23.9	0.0	22.1	40.0				
7/12/2006 14:48	23.0	12.4	8220.0	-10.6	177.0	2.49E-07	0.5	21.2	11.5
7/12/2006 14:48	1.0	23.0	0.0	22.0	177.0				
7/12/2006 16:56	16.4	10.8	7680.0	-5.6	305.0	2.21E-07	0.8	15.4	12.2
7/14/2006 9:59	7.9	23.0	0.0	15.1	305.0				
7/14/2006 10:45	19.2	16.4	2760.0	-2.8	351.0	4.04E-07	0.6	11.3	6.6
7/14/2006 11:18	24.0	12.8	1980.0	-11.2	384.0	2.86E-07	0.7	4.8	3.6
7/14/2006 11:20	1.5	23.7	0.0	22.2	384.0				
7/14/2006 12:48	16.6	11.4	5160.0	-5.2	470.0	3.26E-07	0.8	15.1	12.3
7/14/2006 13:48	23.8	4.8	3720.0	-19.0	532.0	2.59E-07	0.9	7.2	6.6
7/14/2006 13:49	1.6	23.8	0.0	22.2	532.0				
7/14/2006 15:14	13.6	13.3	5100.0	-0.3	617.0	2.67E-07	0.9	12	10.5
7/14/2006 16:25	20.8	6.6	4260.0	-14.2	688.0	2.21E-07	0.9	7.2	6.7
7/14/2006 16:25	1.6	24.0	0.0	22.4	688.0				
7/14/2006 16:56	6.2	20.4	1860.0	14.2	719.0	2.56E-07	0.8	4.6	3.6
7/20/2006 9:38	1.3	24.3	0.0	23.0	719.0				
7/20/2006 10:07	13.6	18.2	1740.0	4.6	748.0	6.30E-07	0.5	12.3	6.1
7/20/2006 10:21	16.9	15.3	840.0	-1.6	762.0	4.72E-07	0.9	3.3	2.9
7/20/2006 10:34	19.8	12.8	780.0	-7.0	775.0	4.59E-07	0.9	2.9	2.5
7/20/2006 10:51	23.5	9.8	1020.0	-13.7	792.0	4.53E-07	0.8	3.7	3
7/20/2006 10:52	4.0	24.2	0.0	20.2	792.0				
7/20/2006 11:20	12.4	17.8	1680.0	5.4	820.0	5.27E-07	0.8	8.4	6.4
7/20/2006 11:31	14.8	15.6	660.0	0.8	831.0	4.42E-07	0.9	2.4	2.2
7/20/2006 11:52	19.1	11.6	0.0	-7.5	831.0				
7/20/2006 12:48	3.7	23.5	3360.0	19.8	887.0				
7/20/2006 13:04	9.2	19.1	960.0	9.9	903.0	6.10E-07	0.8	5.5	4.4
7/20/2006 13:35	16.2	12.2	1860.0	-4.0	934.0	4.74E-07	1.0	7	6.9
7/20/2006 14:18	23.9	4.7	2580.0	-19.2	977.0	4.10E-07	1.0	7.7	7.5
7/20/2006 14:19	4.0	23.6	0.0	19.6	977.0				
7/20/2006 14:34	8.2	20.0	900.0	11.8	992.0	5.10E-07	0.9	4.2	3.6
7/20/2006 15:07	15.2	13.4	1980.0	-1.8	1025.0	4.30E-07	0.9	7	6.6
7/20/2006 16:17	25.0	1.5	0.0	-23.5	1025.0				
7/20/2006 16:19	4.0	23.8	0.0	19.8	1025.0				
7/20/2006 16:45	10.8	18.1	1560.0	7.3	1051.0	4.78E-07	0.8	6.8	5.7
7/20/2006 17:07	15.0	13.8	1320.0	-1.2	1073.0	4.08E-07	1.0	4.2	4.3



Hydraulic Conductivity Test - Cedar Rapids - Clay Cover

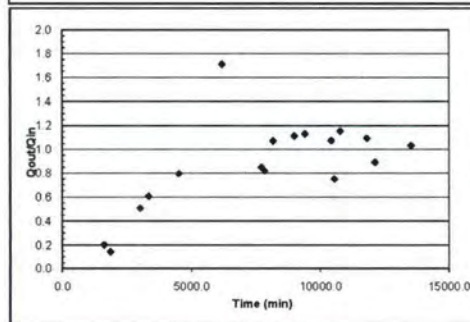
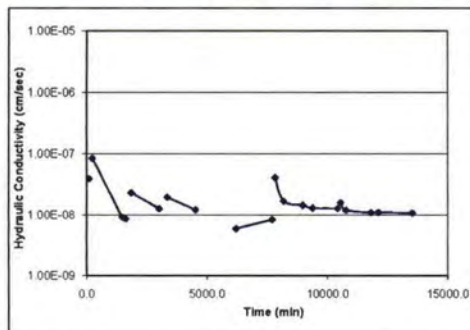
ASTM D 5084 - 00

Sample I.D.	305-mm ICY1L	Test Date :	10/2/06
Cell Pressure =	43.1 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.3 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.3 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	2.0 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	10.6	a _{out} =	1 cm ²
Weight of wet sample =	24131.5 (g)	Sample Water Content =	13.6 (%)
Wet Density =	2.2 g/cm ³	Dry Density =	1.91 g/cm ³

$$K_s = \frac{a_{in} * a_{out} * L}{(a_{in} + a_{out}) * A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Dry Soil (g)	Water Content (%)
CL1	60.36	460.6	411.57	13.57

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{avg} / Q _{in}	Q _{in}	Q _{out}
11/2/2006 12:33	0.5	22.5	0.0	22.0	0.0				
11/2/2006 14:22	6.8	24.3	6600.0	17.5	110.0	3.92E-08	-0.3	6.3	-1.8
11/2/2006 14:23	0.8	20.2	0.0	19.4	110.0				
11/2/2006 15:20	3.3	20.9	3420.0	22.9	167.0				
11/2/2006 16:30	4.8	21.5	4200.0	16.7	237.0	8.49E-08	-0.4	1.5	-0.6
11/3/2006 13:12	18.3	23.6	74520.0	5.3	1479.0	9.25E-09	-0.2	13.5	-2.1
11/3/2006 15:36	19.3	23.4	8640.0	4.1	1623.0	8.71E-09	0.2	1	0.2
11/6/2006 12:22	3.4	22.6	0.0	19.2	1623.0				
11/6/2006 16:14	8.3	21.9	14220.0	13.6	1860.0	2.31E-08	0.1	4.9	0.7
11/7/2006 11:33	17.8	17.1	69240.0	-0.7	3014.0	1.28E-08	0.5	9.5	4.8
11/9/2006 11:50	0.8	23.8	0.0	23.0	3014.0				
11/9/2006 17:29	5.1	21.2	20340.0	16.1	3353.0	1.95E-08	0.6	4.3	2.6
11/10/2006 12:57	12.9	15.0	70080.0	2.1	4521.0	1.22E-08	0.8	7.8	6.2
11/13/2006 12:02	14	23.3	0.0	21.9	4521.0				
11/14/2006 16:01	5.2	16.8	100740.0	11.6	6200.0	5.98E-09	1.7	3.8	6.5
11/15/2006 17:11	11.8	11.2	90600.0	-0.6	7710.0	3.41E-09	0.8	6.8	5.6
11/28/2006 13:42	1.9	21.6	0.0	19.7	7710.0				
11/28/2006 15:43	4.7	19.3	7260.0	14.6	7831.0	4.10E-08	0.8	2.8	2.3
11/28/2006 21:29	7.5	16.3	20520.0	8.8	8173.0	1.70E-08	1.1	2.8	3
11/29/2006 10:58	12.6	10.4	48780.0	-2.4	8986.0	1.45E-08	1.1	5.3	5.9
11/29/2006 17:53	15.1	7.8	24900.0	-7.3	9401.0	1.31E-08	1.1	2.3	2.6
11/30/2006 10:54	20.5	2.0	61260.0	-18.5	10422.0	1.28E-08	1.1	5.4	5.8
11/30/2006 10:59	2.8	24.2	0.0	21.4	10422.0				
11/30/2006 13:04	4	23.3	7500.0	19.3	10547.0	1.61E-08	0.7	1.2	0.9
11/30/2006 16:47	5.3	21.8	13380.0	16.5	10770.0	1.22E-08	1.2	1.3	1.5
12/1/2006 10:06	10.7	15.9	62340.0	5.2	11809.0	1.10E-08	1.1	5.4	5.9
12/1/2006 15:28	12.5	14.3	19320.0	1.8	12131.0	1.11E-08	0.9	1.8	1.6
12/2/2006 14:48	19.2	7.4	84000.0	-11.8	13531.0	1.08E-08	1.0	6.7	6.9



Hydraulic Conductivity Test - Cedar Rapids - Clay Cover

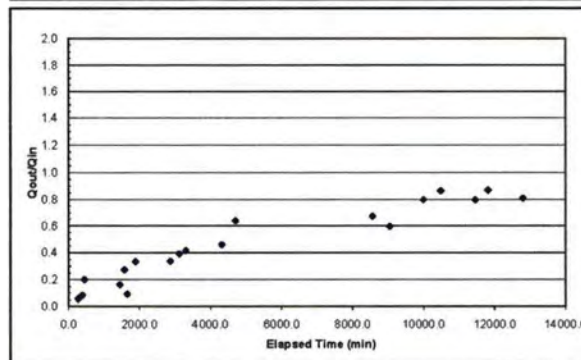
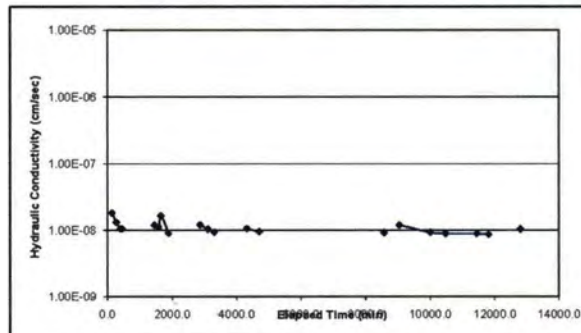
ASTM D 5084 - 00

Sample I.D.		305-mm ICY2L	Test Date :	
Cell Pressure =	43.1	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.3	psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.3	psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	2.0	psi	$a_{in} =$	1 cm ²
Hydraulic Gradient, i =	10.6		$a_{out} =$	1 cm ²
Weight of wet sample =	22362.5	(g)	Sample Water Content =	12.0 (%)
Wet Density =	2.0	g/cm ³	Dry Density =	1.80 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{\Delta H_1}{\Delta H_2} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
44	50.92	525.78	468.57	13.70

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q_{out} / Q_{in}	Q_{in}	Q_{out}
8/1/2006 9:13	4.3	22.6	0.0	18.3	0.0				
8/1/2006 11:33	7.0	22.7	8400.0	15.7	140.0	1.81E-08	0.0	2.7	-0.1
8/1/2006 13:43	8.7	22.6	8100.0	13.9	275.0	1.31E-08	0.1	1.7	0.1
8/1/2006 15:52	9.9	22.5	7440.0	12.8	399.0	1.04E-08	0.1	1.2	0.1
8/1/2006 16:43	10.4	22.4	3420.0	12.0	456.0	1.05E-08	0.2	0.5	0.1
8/1/2006 16:53	1.5	22.6	0.0	21.1	456.0				
8/2/2006 9:23	11.9	20.9	59760.0	9.0	1452.0	1.20E-08	0.2	10.4	1.7
8/2/2006 11:39	13.0	20.8	7800.0	7.8	1582.0	1.10E-08	0.3	1.1	0.3
8/2/2006 12:55	14.1	20.5	4560.0	6.4	1658.0	1.63E-08	0.1	1.1	0.1
8/2/2006 16:45	15.6	20.0	13800.0	4.4	1888.0	9.05E-09	0.3	1.5	0.5
8/2/2006 16:53	2.0	22.4	0.0	20.4	1888.0				
8/3/2006 9:18	10.9	19.4	59100.0	8.5	2873.0	1.19E-08	0.3	8.9	3
8/3/2006 13:26	12.7	18.7	14880.0	6.0	3121.0	1.04E-08	0.4	1.8	0.7
8/3/2006 16:35	13.9	18.2	11340.0	4.3	3310.0	9.38E-09	0.4	1.2	0.5
8/3/2006 16:41	1.8	22.8	0.0	21.0	3310.0				
8/4/2006 9:27	9.2	19.4	60360.0	10.2	4316.0	1.05E-08	0.5	7.4	3.4
8/4/2006 15:51	11.4	18.0	23040.0	6.6	4700.0	9.59E-09	0.6	2.2	1.4
8/4/2006 16:44	1.4	24.6	0.0	23.2	4700.0				
8/7/2006 9:07	21.8	10.9	231780.0	-10.9	8563.0	9.18E-09	0.7	20.4	13.7
8/7/2006 9:09	2.6	23.8	0.0	21.2	8563.0				
8/7/2006 17:08	6.3	21.6	28740.0	15.3	9042.0	1.19E-08	0.6	3.7	2.2
8/8/2006 9:07	11.2	17.7	57540.0	6.5	10001.0	9.25E-09	0.8	4.9	3.9
8/8/2006 17:10	13.4	15.8	28980.0	2.4	10484.0	8.89E-09	0.9	2.2	1.9
8/9/2006 9:18	17.8	12.3	58080.0	-5.5	11452.0	8.87E-09	0.8	4.4	3.5
8/9/2006 15:23	19.3	11.0	21900.0	-8.3	11817.0	8.62E-09	0.9	1.5	1.3
8/9/2006 17:03	4.1	23.3	0.0	19.2	11817.0				
8/10/2006 9:22	9.8	18.7	58920.0	8.9	12799.0	1.04E-08	0.8	5.7	4.6



Hydraulic Conductivity Test - Cedar Rapids - Clay Cover

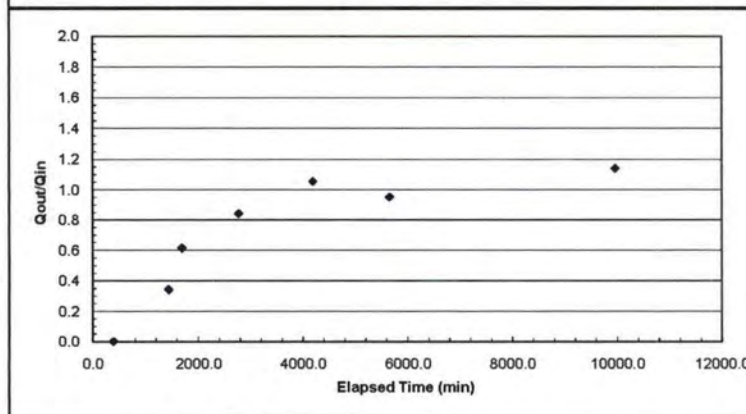
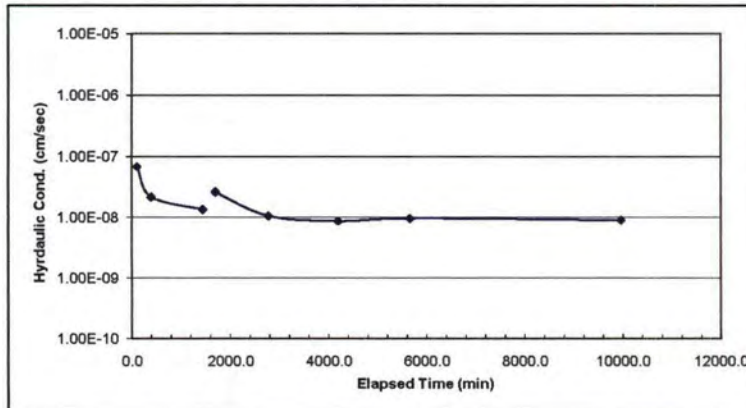
ASTM D 5084 - 00

Sample I.D.	150-mm ICY2L	Test Date :	8/15/06
Cell Pressure =	43.5 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	10.2 cm
Outflow Pressure =	40.6 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.8 psi	Sample Volume, V =	1853.3 cm ³
Effective Stress =	2.0 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	12.5	a _{out} =	1 cm ²
Weight of wet sample =	4082.1 (g)	Sample Water Content =	14.4 (%)
Wet Density =	2.2 g/cm ³	Dry Density =	1.92 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	50.19	508.24	450.46	14.44

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
8/15/2006 10:01	0.8	21.1	0.0	20.3	0.0				
8/15/2006 11:48	3.6	21.6	6420.0	18.0	107.0	6.85E-08	-0.2	2.8	-0.5
8/15/2006 16:31	5.5	21.6	16980.0	16.1	390.0	2.17E-08	0.0	1.9	0
8/16/2006 10:00	8.7	20.5	62940.0	11.8	1439.0	1.35E-08	0.3	3.2	1.1
8/22/2006 11:27	1.8	22.0	0.0	20.2	1439.0				
8/22/2006 15:43	3.1	21.2	15360.0	18.1	1695.0	2.61E-08	0.6	1.3	0.8
8/23/2006 9:40	5.0	19.6	64620.0	14.6	2772.0	1.06E-08	0.8	1.9	1.6
8/24/2006 9:20	6.8	17.7	85200.0	10.9	4192.0	8.68E-09	1.1	1.8	1.9
8/25/2006 9:42	8.9	15.7	87720.0	6.8	5654.0	9.61E-09	1.0	2.1	2
8/28/2006 9:31	13.9	10.0	258540.0	-3.9	9963.0	9.01E-09	1.1	5	5.7



Hydraulic Conductivity Test - Cedar Rapids - Clay Cover

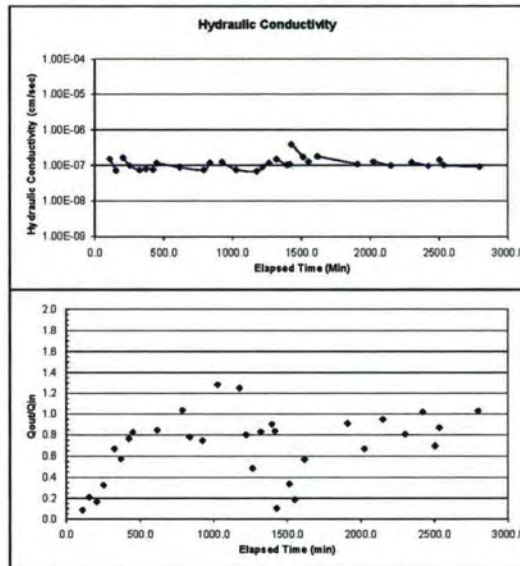
ASTM D 5084 - 00

Sample I.D.		365-mm ICY2U	Test Date :		8/30/06
Cell Pressure =	43.1	psi	Diameter of Sample, D =	30.5	cm
Inflow Pressure =	42.3	psi	Length of Sample, L =	15.2	cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.7	cm ²
Pressure Difference =	2.3	psi	Sample Volume, V =	11120.0	cm ³
Effective Stress =	2.0	psi	a_{in} =	1	cm ²
Hydraulic Gradient, i =	10.6		a_{out} =	1	cm ²
Weight of wet sample =	24630.5	(g)	Sample Water Content =	15.0	(%)
Wet Density =	2.2	g/cm ³	Dry Density =	1.93	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \cdot \frac{L}{\Delta t} \cdot \ln \left(\frac{\Delta H_1}{\Delta H_2} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
9	195.1	930.75	834.65	15.03

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q_{out} / Q_{in}	Q_{in}	Q_{out}
8/30/2006 12:35	5.4	17.5	0.0	12.1	0.0				
8/30/2006 14:24	19.8	16.3	6540.0	-3.3	109.0	1.48E-07	0.1	14.2	1.2
8/30/2006 15:09	22.0	15.9	2700.0	-6.2	154.0	7.14E-08	0.2	2.4	0.5
8/30/2006 12:45	3.5	21.7	0.0	19.2	154.0				
8/30/2006 13:37	10.9	20.5	3120.0	9.7	206.0	1.62E-07	0.2	7.3	1.2
8/30/2006 14:24	14.2	18.4	2820.0	5.2	253.0	8.85E-08	0.3	3.4	1.1
8/30/2006 15:38	17.2	17.4	4320.0	0.2	325.0	7.35E-08	0.7	3	2
8/30/2006 16:21	19.3	18.2	2700.0	-3.1	370.0	7.89E-08	0.8	2.1	1.2
8/30/2006 17:15	21.4	14.8	3240.0	-6.6	424.0	7.61E-08	0.9	2.1	1.8
8/8/2006 8:41	2.1	21.1	0.0	19.0	424.0				
8/8/2006 10:07	3.8	19.7	1560.0	15.9	450.0	1.18E-07	0.8	1.7	1.4
8/8/2006 12:52	11.5	13.2	9900.0	1.7	615.0	8.79E-08	0.8	7.7	6.5
8/8/2006 15:45	17.2	7.3	10380.0	-9.9	789.0	7.41E-08	1.0	5.7	5.9
8/8/2006 18:32	19.8	5.2	2920.0	-14.7	835.0	1.19E-07	0.9	2.7	2.1
8/12/2006 9:24	1.8	18.9	0.0	17.3	835.0				
8/12/2006 10:52	7.8	14.3	5280.0	6.5	823.0	1.23E-07	0.7	6.2	4.6
8/12/2006 12:35	11.0	10.2	6180.0	-0.8	1026.0	7.50E-08	1.3	3.2	4.1
8/12/2006 15:03	15.0	5.2	8980.0	-9.8	1174.0	8.77E-08	1.3	4	5
8/12/2006 15:49	17.0	9.3	2760.0	-13.4	1220.0	9.04E-08	0.9	2	1.9
8/12/2006 16:33	19.9	2.2	2640.0	-17.7	1264.0	1.18E-07	0.5	2.9	1.4
8/8/2006 10:43	1.8	23.3	0.0	21.7	1264.0				
8/8/2006 11:38	6.2	19.5	3300.0	13.3	1319.0	1.48E-07	0.9	4.6	3.8
8/8/2006 12:54	10.2	15.9	4560.0	5.7	1395.0	1.02E-07	0.9	4	3.6
8/8/2006 13:15	11.4	14.9	1260.0	3.5	1418.0	1.10E-07	0.8	1.2	1
8/12/2006 14:27	4.1	22.2	0.0	18.1	1418.0				
8/12/2006 14:38	8.1	21.8	660.0	13.7	1427.0	3.92E-07	0.1	4	0.4
8/12/2006 16:03	18.5	18.3	5100.0	-0.2	1512.0	1.69E-07	0.3	10.4	3.5
8/12/2006 16:16	1.2	21.9	0.0	20.7	1512.0				
8/12/2006 16:55	5.5	21.1	2340.0	15.6	1551.0	1.27E-07	0.2	4.3	0.8
8/13/2006 10:55	1.4	18.5	0.0	17.1	1551.0				
8/13/2006 12:01	8.9	14.3	3960.0	5.5	1617.0	1.77E-07	0.8	7.4	4.2
8/13/2006 16:53	29.1	1.3	17520.0	-21.8	1609.0	1.08E-07	0.9	14.3	13
8/14/2006 11:31	2.7	19.0	0.0	18.3	1609.0				
8/14/2006 13:26	11.1	13.4	6900.0	2.3	2024.0	1.24E-07	0.7	8.4	5.6
8/14/2006 15:31	18.8	9.0	7500.0	-9.8	2149.0	9.75E-08	0.9	5.7	5.4
8/15/2006 12:44	1.3	23.1	0.0	21.9	2149.0				
8/15/2006 15:16	11.8	14.8	8120.0	3.2	2281.0	1.22E-07	0.8	10.3	8.3
8/15/2006 17:18	16.8	9.5	7200.0	-7.3	2421.0	8.54E-08	1.0	5.2	5.3
8/16/2006 10:33	1.4	19.1	0.0	17.7	2421.0				
8/16/2006 11:58	8.5	14.3	4980.0	6.0	2504.0	1.41E-07	0.7	8.9	4.8
8/16/2006 12:25	9.9	13.0	1740.0	3.2	2533.0	1.01E-07	0.9	1.5	1.3
8/16/2006 16:47	20.2	2.3	15720.0	-17.9	2785.0	8.09E-08	1.0	10.4	10.7
8/16/2006 13:49	4.5	17.7	75720.0	13.2	4057.0	-2.70E-08	1.0	-15.7	-15.4



Hydraulic Conductivity Test - Cedar Rapids - Clay Cover

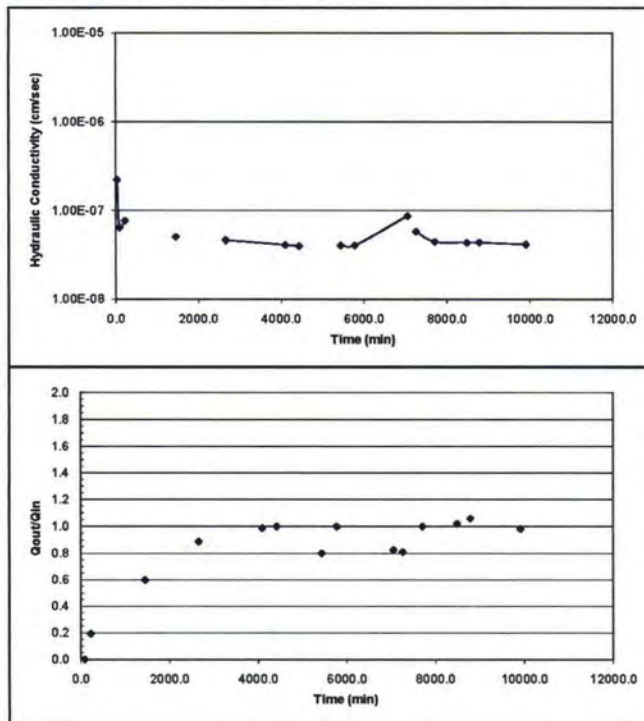
ASTM D 5084 - 00

Sample I.D.	150-mm ICY2U	Test Date : 10/12/06
Cell Pressure = 43.5 psi	Diameter of Sample, D = 15.2 cm	
Inflow Pressure = 42.4 psi	Length of Sample, L = 10.2 cm	
Outflow Pressure = 40.6 psi	Area of Sample, A = 182.4 cm ²	
Pressure Difference = 1.8 psi	Sample Volume, V = 1853.3 cm ³	
Effective Stress = 2.0 psi	a _{in} = 1 cm ²	
Hydraulic Gradient, i = 12.5	a _{out} = 1 cm ²	
Weight of wet sample = 3970.3 (g)	Sample Water Content = 15.0 (%)	
Wet Density = 2.1 g/cm ³	Dry Density = 1.86 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
90	195.1	930.75	834.65	15.03

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
10/12/2006 12:19	2.7	23.6	0.0	20.9	0.0				
10/12/2006 12:49	4.9	23.7	1800.0	18.8	30.0	2.22E-07	0.0	2.2	-0.1
10/12/2006 13:44	6.0	23.7	3300.0	17.7	85.0	6.41E-08	0.0	1.1	0
10/12/2006 15:55	8.6	23.2	7860.0	14.6	216.0	7.69E-08	0.2	2.6	0.5
10/12/2006 16:58	0.8	23.0	0.0	22.2	216.0				
10/13/2006 12:31	12.5	16.0	73980.0	3.5	1449.0	5.06E-08	0.6	11.7	7
10/16/2006 16:01	1.5	23.5	0.0	22.0	1449.0				
10/17/2006 12:03	10.4	15.6	72120.0	5.2	2651.0	4.63E-08	0.9	8.9	7.9
10/18/2006 12:02	18.3	7.8	86340.0	-10.5	4090.0	4.09E-08	1.0	7.9	7.8
10/18/2006 17:29	19.9	6.2	19620.0	-13.7	4417.0	3.97E-08	1.0	1.6	1.6
10/18/2006 18:05	0.5	23.2	0.0	22.7	4417.0				
10/19/2006 10:58	7.5	17.6	60780.0	10.1	5430.0	4.04E-08	0.8	7	5.6
10/19/2006 16:40	9.5	15.6	20520.0	6.1	5772.0	4.03E-08	1.0	2	2
10/20/2006 13:57	25.0	2.8	76620.0	-22.2	7049.0	8.72E-08	0.8	15.5	12.8
10/23/2006 12:11	0.9	21.4	0.0	20.5	7049.0				
10/23/2006 15:41	3.0	19.7	12600.0	16.7	7259.0	5.78E-08	0.8	2.1	1.7
10/23/2006 23:08	6.0	16.7	26820.0	10.7	7706.0	4.44E-08	1.0	3	3
10/24/2006 12:07	10.8	11.8	46740.0	1.0	8485.0	4.37E-08	1.0	4.8	4.9
10/24/2006 17:04	12.5	10.0	17820.0	-2.5	8782.0	4.35E-08	1.1	1.7	1.8
10/25/2006 11:50	18.5	4.1	67560.0	-14.4	9908.0	4.16E-08	1.0	6	5.9



Hydraulic Conductivity Test - Cedar Rapids - Clay Cover

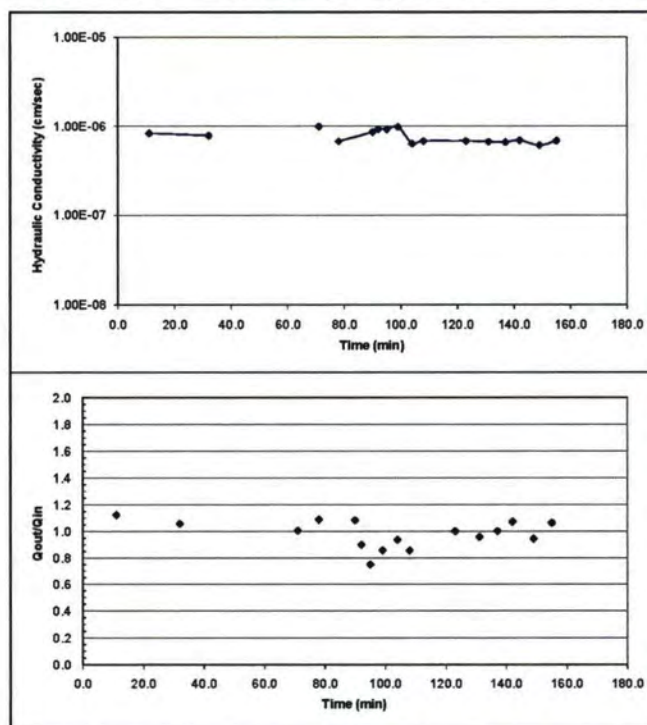
ASTM D 5084 - 00

Sample I.D.	305-mm ICY1U	Test Date :	10/2/06
Cell Pressure =	43.1 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.3 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.3 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	2.0 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	10.6	a _{out} =	1 cm ²
Weight of wet sample =	25265.5 (g)	Sample Water Content =	12.3 (%)
Wet Density =	2.3 g/cm ³	Dry Density =	2.02 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
4	50.09	511.3	460.68	12.33

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
10/2/2006 16:05	11.7	16.3	0.0	4.6	0.0				
10/2/2006 16:16	15.7	11.8	660.0	-3.9	11.0	8.30E-07	1.1	4	4.5
10/2/2006 16:37	22.6	4.5	1260.0	-18.1	32.0	7.81E-07	1.1	6.9	7.3
10/6/2006 14:27	3.3	22.9	0.0	22.9	32.0			-19.3	-18.4
10/6/2006 15:06	19.9	6.2	2340.0	-13.7	71.0	9.86E-07	1.0	16.6	16.7
10/6/2006 15:30	4.3	22.6	0.0	18.3	71.0			-15.6	-16.4
10/6/2006 15:37	6.6	20.1	420.0	13.5	78.0	6.72E-07	1.1	2.3	2.5
10/6/2006 15:49	11.4	14.9	720.0	3.5	90.0	8.52E-07	1.1	4.8	5.2
10/12/2006 12:15	3.0	21.5	0.0	18.5	90.0			-8.4	-6.6
10/12/2006 12:17	4.0	20.6	120.0	16.6	92.0	9.22E-07	0.9	1	0.9
10/12/2006 12:20	5.6	19.4	180.0	13.8	95.0	9.18E-07	0.8	1.6	1.2
10/12/2006 12:24	7.7	17.6	240.0	9.9	99.0	9.78E-07	0.9	2.1	1.8
10/12/2006 12:29	9.3	16.1	300.0	6.8	104.0	6.34E-07	0.9	1.6	1.5
10/12/2006 12:33	10.7	14.9	240.0	4.2	108.0	6.76E-07	0.9	1.4	1.2
10/12/2006 12:48	15.4	10.2	900.0	-5.2	123.0	6.77E-07	1.0	4.7	4.7
10/12/2006 12:56	17.8	7.9	480.0	-9.9	131.0	6.63E-07	1.0	2.4	2.3
10/12/2006 13:02	19.5	6.2	360.0	-13.3	137.0	6.57E-07	1.0	1.7	1.7
10/12/2006 13:07	20.9	4.7	300.0	-16.2	142.0	6.87E-07	1.1	1.4	1.5
10/12/2006 13:14	22.7	3.0	420.0	-19.7	149.0	6.05E-07	0.9	1.9	1.7
10/12/2006 13:20	24.3	1.3	360.0	-23.0	155.0	6.82E-07	1.1	1.6	1.7



Hydraulic Conductivity Test - Cedar Rapids - Clay Cover

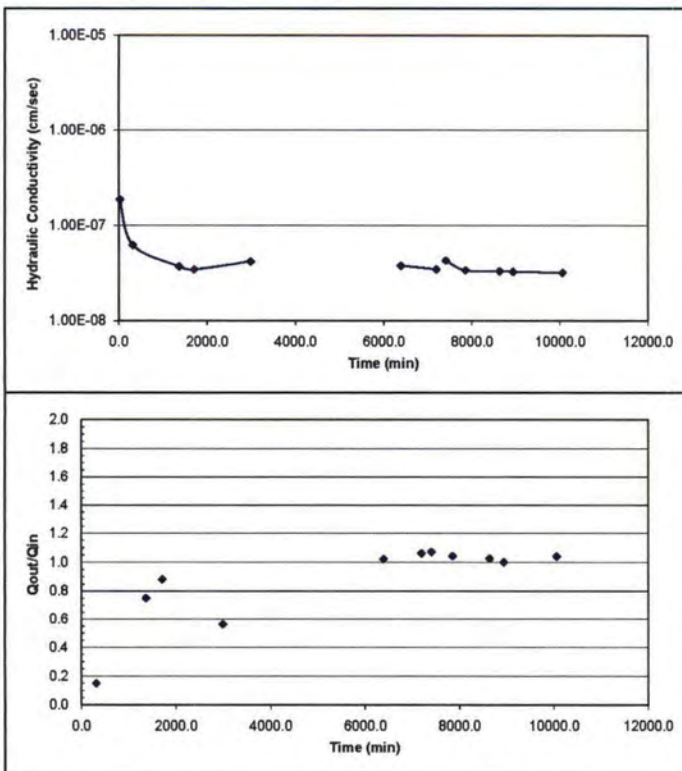
ASTM D 5084 - 00

Sample I.D.			150-mm ICY1U			Test Date :		
Cell Pressure =			43.5			psi		
Inflow Pressure =			42.4			psi		
Outflow Pressure =			40.6			psi		
Pressure Difference =			1.8			psi		
Effective Stress =			2.0			psi		
Hydraulic Gradient, i =			12.5					
Weight of wet sample =			3708.7			(g)		
Wet Density =			2.0			g/cm ³		
Diameter of Sample, D =			15.2			cm		
Length of Sample, L =			10.2			cm		
Area of Sample, A =			182.4			cm ²		
Sample Volume, V =			1853.3			cm ³		
a _{in} =			1			cm ²		
a _{out} =			1			cm ²		
Sample Water Content =			16.4			(%)		
Dry Density =			1.72			g/cm ³		

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	WT of Can + Water Content
	(g)	(g)	(g)	(%)
7	49.43	454.37	397.26	16.42

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
10/18/2006 12:14	1.1	21.3	0.0	20.2	0.0				
10/18/2006 12:43	3.5	22.0	1740.0	18.5	29.0	1.86E-07	-0.3	2.4	-0.7
10/18/2006 17:28	8.2	21.3	17100.0	13.1	314.0	6.18E-08	0.1	4.7	0.7
10/19/2006 10:57	14.6	16.5	62940.0	1.9	1363.0	3.70E-08	0.8	6.4	4.8
10/19/2006 16:38	16.3	15.0	20460.0	-1.3	1704.0	3.43E-08	0.9	1.7	1.5
10/20/2006 13:59	25.0	10.1	76860.0	-14.9	2985.0	4.16E-08	0.6	8.7	4.9
10/20/2006 14:00	1.1	24.7	0.0	23.6	2985.0				
10/22/2006 22:45	19.0	6.4	204300.0	-12.6	6390.0	3.76E-08	1.0	17.9	18.3
10/23/2006 12:06	22.2	3.0	48060.0	-19.2	7191.0	3.46E-08	1.1	3.2	3.4
10/23/2006 12:08	0.3	24.1	0.0	23.8	7191.0				
10/23/2006 15:40	1.7	22.6	12720.0	20.9	7403.0	4.26E-08	1.1	1.4	1.5
10/23/2006 23:07	4.0	20.2	26820.0	16.2	7850.0	3.36E-08	1.0	2.3	2.4
10/24/2006 12:07	7.8	16.3	46800.0	8.5	8630.0	3.30E-08	1.0	3.8	3.9
10/24/2006 17:05	9.2	14.9	17880.0	5.7	8928.0	3.28E-08	1.0	1.4	1.4
10/25/2006 11:49	14.0	9.9	67440.0	-4.1	10052.0	3.18E-08	1.0	4.8	5



Hydraulic Conductivity Test - Cedar Rapids - Clay Cover

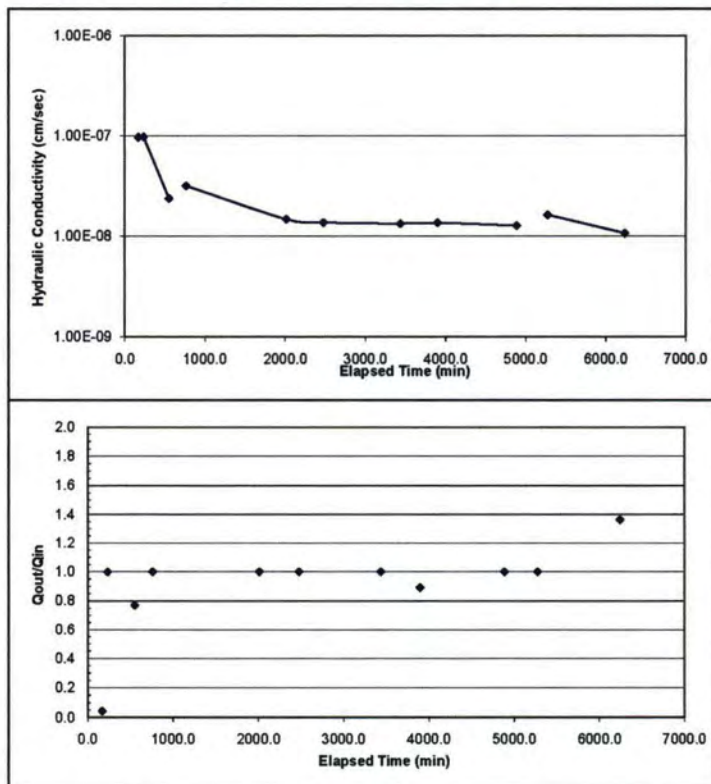
ASTM D 5084 - 00

Sample I.D.			150-mm ICYRL		Test Date :	
Cell Pressure =	43.5	psi			Diameter of Sample, D =	15.2 cm
Inflow Pressure =	42.4	psi			Length of Sample, L =	10.2 cm
Outflow Pressure =	40.6	psi			Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.8	psi			Sample Volume, V =	1853.3 cm ³
Effective Stress =	2.0	psi			a _{in} =	1 cm ²
Hydraulic Gradient, i =					a _{out} =	1 cm ²
Weight of wet sample =	3883.9	(g)			Sample Water Content =	12.9 (%)
Wet Density =	2.1	g/cm ³			Dry Density =	1.86 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
10	50.98	507	454.72	12.95

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/28/2006 9:52	4.0	25.0	0.0	21.0	0.0				
7/28/2006 12:40	8.9	24.8	10080.0	15.9	168.0	9.72E-08	0.0	4.9	0.2
7/31/2006 9:39	1.4	23.6	0.0	22.2	168.0				
7/31/2006 10:43	2.4	22.6	3840.0	20.2	232.0	9.81E-08	1.0	1	1
7/31/2006 16:00	3.7	21.6	19020.0	17.9	549.0	2.31E-08	0.8	1.3	1
8/1/2006 9:08	4.5	20.9	0.0	16.4	549.0				
8/1/2006 12:39	5.5	19.9	12680.0	14.4	780.0	3.10E-08	1.0	1	1
8/2/2006 9:31	8.2	17.2	75120.0	9.0	2012.0	1.45E-08	1.0	2.7	2.7
8/2/2006 17:11	9.1	16.3	27600.0	7.2	2472.0	1.35E-08	1.0	0.9	0.9
8/3/2006 9:16	10.9	14.5	57900.0	3.6	3437.0	1.31E-08	1.0	1.8	1.8
8/3/2006 16:53	11.8	13.7	27420.0	1.9	3894.0	1.33E-08	0.9	0.9	0.8
8/4/2006 9:26	13.5	12.0	59580.0	-1.5	4887.0	1.25E-08	1.0	1.7	1.7
8/8/2006 10:44	15.4	10.0	0.0	-5.4	4887.0				
8/8/2006 17:09	16.2	9.2	23100.0	-7.0	5272.0	1.60E-08	1.0	0.8	0.8
8/9/2006 9:17	17.3	7.7	58080.0	-9.6	6240.0	1.05E-08	1.4	1.1	1.5



Hydraulic Conductivity Test - Cedar Rapids - Composite Cover

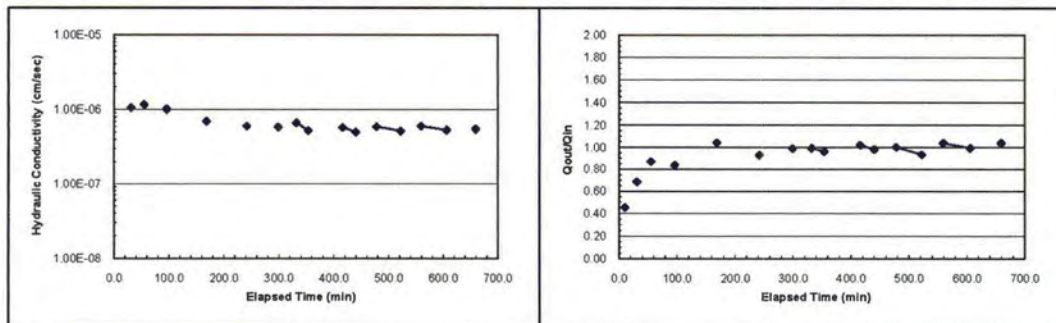
ASTM D 5084 - 00

Sample I.D.	305-mm IOYRL	Test Date :
Cell Pressure =	43.1 psi	Diameter of Sample, D = 30.5 cm
Inflow Pressure =	42.3 psi	Length of Sample, L = 15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A = 729.7 cm ²
Pressure Difference =	2.3 psi	Sample Volume, V = 11120.0 cm ³
Effective Stress =	2.0 psi	a _{in} = 1 cm ²
Hydraulic Gradient, i =	10.6	a _{out} = 1 cm ²
Weight of wet sample =	23269.7 (g)	Sample Water Content = 15.2 (%)
Wet Density =	2.1 g/cm ³	Dry Density = 1.82 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
6	51.3	491.8	433.6	15.22

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/12/06 11:57	1.9	25.0	0.0	23.1	0.0				
7/12/06 12:07	10.9	20.9	800.0	10.0	10.0		0.46	9	4.1
7/12/06 12:07	12.9	20.4	0.0	7.5	10.0			2	0.5
7/12/06 12:28	24.9	12.2	1260.0	-12.7	31.0	1.05E-06	0.68	12	8.2
7/12/06 12:28	3.8	23.0	0.0	19.2	31.0				
7/12/06 12:52	18.1	10.6	1440.0	-7.5	55.0	1.16E-06	0.87	14.3	12.4
7/12/06 12:52	2.9	23.8	0.0	20.9	55.0				
7/12/06 13:33	24.0	6.2	2460.0	-17.8	96.0	1.01E-06	0.83	21.1	17.6
7/12/06 13:33	1.3	28.8	0.0	27.5	96.0				
7/12/06 14:46	24.9	4.3	4380.0	-20.6	169.0	6.99E-07	1.04	23.6	24.5
7/12/06 14:46	3.0	22.7	0.0	19.7	169.0				
7/12/06 15:59	24.0	3.2	4380.0	-20.8	242.0	6.02E-07	0.93	21	19.5
7/12/06 15:59	3.3	23.0	0.0	19.7	242.0			-20.7	-19.8
7/12/06 16:56	19.2	7.3	3420.0	-11.9	299.0	5.84E-07	0.99	15.9	15.7
7/14/06 10:47	8.9	20.7	0.0	11.8	299.0				
7/14/06 11:20	19.3	10.4	1980.0	-8.9	332.0	6.70E-07	0.99	10.4	10.3
7/14/06 11:42	24.3	5.6	1320.0	-18.7	354.0	5.24E-07	0.96	5	4.8
7/14/06 11:44	3.0	23.1	0.0	20.1	354.0			-21.3	-17.5
7/14/06 12:46	19.8	6.0	3720.0	-13.8	416.0	5.79E-07	1.02	16.8	17.1
7/14/2006 13:10	24.8	1.1	1440.0	-23.7	440.0	5.02E-07	0.98	5	4.9
7/14/2006 13:12	2.5	23.6	0.0	21.1	440.0				
7/14/2006 13:50	13.6	12.5	2280.0	-1.1	478.0	5.93E-07	1.00	11.1	11.1
7/14/2006 14:34	23.8	3.0	2640.0	-20.8	522.0	5.17E-07	0.93	10.2	9.5
7/14/2006 14:36	2.4	23.4	0.0	21.0	522.0				
7/14/2006 15:13	13.2	12.2	2220.0	-1.0	559.0	6.03E-07	1.04	10.8	11.2
7/14/2006 16:00	24.0	1.5	2820.0	-22.5	606.0	5.32E-07	0.99	10.8	10.7
7/14/06 16:01	2.5	23.4	0.0	20.9	606.0				
7/14/2006 16:54	16.4	9.0	3180.0	-7.4	659.0	5.53E-07	1.04	13.9	14.4



Hydraulic Conductivity Test - Cedar Rapids - Composite Cover

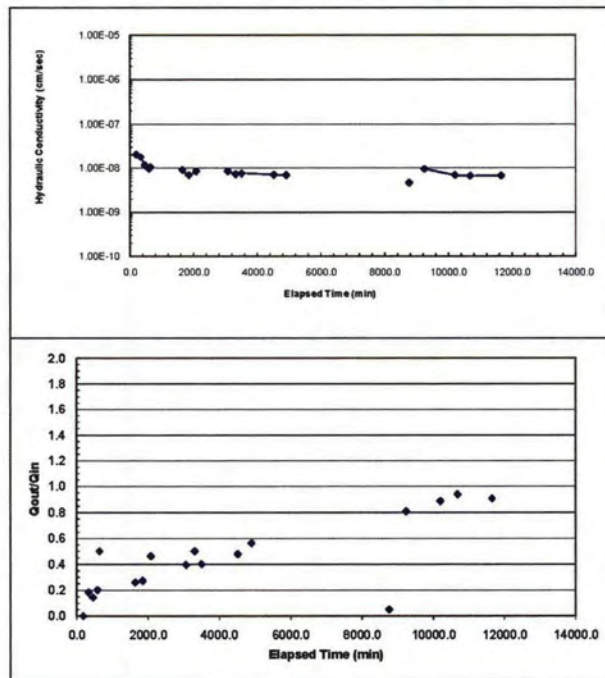
ASTM D 5084 - 00

Sample I.D.		305-mm IOYRU	Test Date :	
Cell Pressure =	43.1	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.3	psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.3	psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	2.0	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	10.6		a _{out} =	1 cm ²
Weight of wet sample =	25310.9	(g)	Sample Water Content =	14.6 (%)
Wet Density =	2.3	g/cm ³	Dry Density =	1.99 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
44	50.92	523.47	463.44	14.55

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/31/06 9:35	7.5	24.5	0.0	17.0	0.0				
7/31/06 10:40	3.5	19.7	0.0	16.2	0.0				
7/31/06 13:45	7.3	19.7	11100.0	12.4	185.0	2.03E-08	0.0	3.8	0
8/1/06 9:11	3.0	22.5	0.0	19.5	185.0				
8/1/06 11:33	5.2	22.1	8520.0	16.9	327.0	1.77E-08	0.2	2.2	0.4
8/1/06 13:47	6.6	21.9	8040.0	15.3	461.0	1.17E-08	0.1	1.4	0.2
8/1/06 15:51	7.6	21.7	7440.0	14.1	585.0	9.55E-09	0.2	1	0.2
8/1/06 16:48	8.0	21.5	3420.0	13.5	642.0	1.04E-08	0.5	0.4	0.2
8/1/06 16:49	1.6	22.2	0.0	20.6	642.0				
8/2/06 9:30	8.9	20.3	60660.0	11.4	1643.0	9.00E-09	0.3	7.3	1.9
8/2/06 12:55	10.0	20.0	12300.0	10.0	1848.0	6.89E-09	0.3	1.1	0.3
8/2/06 16:45	11.3	19.4	13800.0	8.1	2078.0	6.42E-09	0.5	1.3	0.6
8/2/06 16:50	2.1	23.3	0.0	21.2	2078.0				
8/3/06 9:17	8.2	20.9	59220.0	12.7	3065.0	8.39E-09	0.4	6.1	2.4
8/3/06 13:26	9.4	20.3	14940.0	10.9	3314.0	7.25E-09	0.5	1.2	0.6
8/3/06 16:34	10.4	19.9	11280.0	9.5	3602.0	7.54E-09	0.4	1	0.4
8/4/06 9:26	15.0	17.7	60720.0	2.7	4514.0	6.97E-09	0.5	4.6	2.2
8/4/06 15:51	16.6	16.8	23100.0	0.2	4899.0	6.93E-09	0.6	1.6	0.9
8/4/06 16:43	2.7	14.5	0.0	11.8	4899.0				
8/7/06 9:06	18.8	13.7	231780.0	-5.1	8762.0	4.62E-09	0.0	16.1	0.8
8/7/06 9:08	2.1	23.4	0.0	21.3	8762.0				
8/7/06 17:08	4.7	21.3	28800.0	16.6	9242.0	9.43E-09	0.8	2.6	2.1
8/8/06 9:06	8.2	18.2	57480.0	10.0	10200.0	6.85E-09	0.9	3.5	3.1
8/8/06 17:09	9.8	16.7	28980.0	6.9	10683.0	6.56E-09	0.9	1.6	1.5
8/9/06 9:17	13.0	13.8	58080.0	0.8	11651.0	6.62E-09	0.9	3.2	2.9



Hydraulic Conductivity Test - Cedar Rapids - Composite Cover

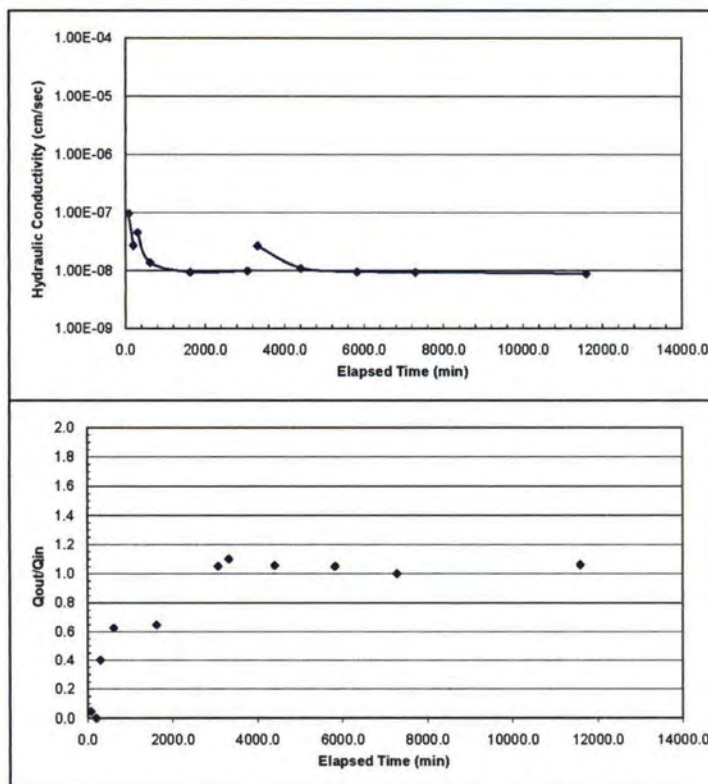
ASTM D 5084 - 00

Sample I.D.	150-mm IOYRU	Test Date :	8/11/06
Cell Pressure = 43.5	psi	Diameter of Sample, D = 15.2	cm
Inflow Pressure = 42.4	psi	Length of Sample, L = 10.2	cm
Outflow Pressure = 40.6	psi	Area of Sample, A = 182.4	cm ²
Pressure Difference = 1.8	psi	Sample Volume, V = 1853.3	cm ³
Effective Stress = 2.0	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 12.5		a _{out} = 1	cm ²
Weight of wet sample = 4105.9	(g)	Sample Water Content = 12.7	(%)
Wet Density = 2.2	g/cm ³	Dry Density = 1.97	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	50.82	520	467.29	12.66

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
8/11/2006 9:42	3.6	23.3	0.0	19.7	0.0				
8/11/2006 10:58	5.8	23.2	4560.0	17.4	76.0	9.68E-08	0.0	2.2	0.1
8/11/2006 12:58	6.8	23.2	7200.0	16.4	196.0	2.70E-08	0.0	1	0
8/14/2006 10:06	8.6	23.0	0.0	14.4	196.0				
8/14/2006 11:50	9.6	22.6	6240.0	13.0	300.0	4.45E-08	0.4	1	0.4
8/14/2006 17:05	10.4	22.1	18900.0	11.7	615.0	1.38E-08	0.6	0.8	0.5
8/15/2006 9:53	12.1	21.0	60480.0	8.9	1623.0	9.42E-09	0.6	1.7	1.1
8/16/2006 9:59	14.1	18.9	86760.0	4.8	3069.0	9.86E-09	1.1	2	2.1
8/22/2006 11:24	1.2	22.6	0.0	21.4	3069.0				
8/22/2006 15:35	2.2	21.5	15060.0	19.3	3320.0	2.64E-08	1.1	1	1.1
8/23/2006 9:38	4.0	19.6	84960.0	15.6	4403.0	1.10E-08	1.1	1.8	1.9
8/24/2006 9:19	6.0	17.5	85260.0	11.5	5824.0	9.56E-09	1.1	2	2.1
8/25/2006 9:41	8.0	15.5	87720.0	7.5	7286.0	9.33E-09	1.0	2	2
8/28/2006 9:30	13.1	10.1	258540.0	-3.0	11595.0	8.78E-09	1.1	5.1	5.4



Hydraulic Conductivity Test - Cedar Rapids - Composite Cover

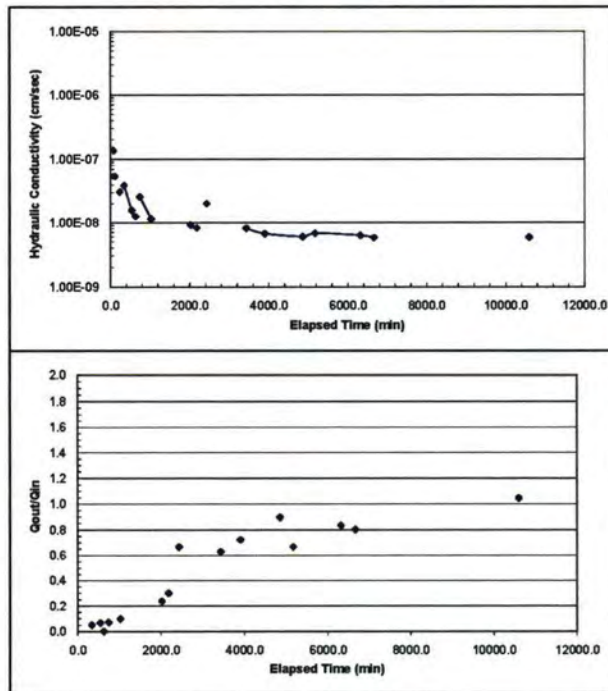
ASTM D 5084 - 00

Sample I.D.		305-mm IOY2U	Test Date : 8/11/06	
Cell Pressure =	43.1	psi	Diameter of Sample, D =	30.5
Inflow Pressure =	42.3	psi	Length of Sample, L =	15.2
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.7
Pressure Difference =	2.3	psi	Sample Volume, V =	11120.0
Effective Stress =	2.0	psi	$a_{in} =$	1
Hydraulic Gradient, i =	10.6		$a_{out} =$	1
Weight of wet sample =	25084.1	(g)	Sample Water Content =	13.4
Wet Density =	2.3	g/cm ³	Dry Density =	1.99
				g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
6	51.3	579.36	516.79	13.44

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q_{out}/Q_{in}	Q_{in}	Q_{out}
8/11/2006 9:48	5.2	21.1	0.0	15.9	0.0				
8/11/2006 10:58	16.0	22.4	4200.0	6.4	70.0	1.37E-07	-0.1	10.8	-1.3
8/11/2006 12:28	3.8	22.7	0.0	18.9	70.0				
8/11/2006 13:00	7.2	24.3	1920.0	17.1	102.0	5.45E-08	-0.5	3.4	-1.6
8/11/2006 13:01	1.4	18.3	0.0	16.9	102.0			-5.8	6
8/11/2006 15:12	6.6	19.4	7860.0	12.8	233.0	3.08E-08	-0.2	5.2	-1.1
8/14/2006 10:05	1.8	21.3	0.0	19.5	233.0				
8/14/2006 11:50	5.8	21.1	6300.0	18.3	338.0	3.89E-08	0.0	4	0.2
8/14/2006 15:12	8.8	20.9	12120.0	12.1	540.0	1.57E-08	0.1	3	0.2
8/14/2006 16:40	9.9	20.9	5280.0	11.0	628.0	1.26E-08	0.0	1.1	0
8/15/2006 9:59	1.6	22.9	0.0	21.3	628.0				
8/15/2006 11:47	4.4	22.7	6720.0	18.3	740.0	2.57E-08	0.1	2.8	0.2
8/15/2006 16:30	7.4	22.4	16980.0	15.0	1023.0	1.14E-08	0.1	3	0.3
8/15/2006 17:22	1.5	22.3	0.0	20.8	1023.0				
8/16/2006 9:58	9.1	20.5	59760.0	11.4	2019.0	9.24E-09	0.2	7.6	1.8
8/16/2006 12:37	10.1	20.2	9540.0	10.1	2178.0	8.25E-09	0.3	1	0.3
8/22/2006 11:25	5.8	19.4	0.0	13.6	2178.0				
8/22/2006 15:36	8.8	17.4	15060.0	8.6	2429.0	2.01E-08	0.7	3	2
8/22/2006 16:56	2.1	23.1	0.0	21.0	2429.0				
8/23/2006 9:38	7.2	19.9	60120.0	12.7	3431.0	8.07E-09	0.6	5.1	3.2
8/23/2006 17:27	9.0	18.6	28140.0	9.6	3900.0	6.65E-09	0.7	1.8	1.3
8/24/2006 9:19	11.9	16.0	57120.0	4.1	4852.0	5.96E-09	0.9	2.9	2.6
8/24/2006 14:32	13.1	15.2	18780.0	2.1	5165.0	6.75E-09	0.7	1.2	0.8
8/25/2006 9:41	16.7	12.2	68940.0	-4.5	6314.0	6.23E-09	0.8	3.6	3
8/25/2006 15:31	17.7	11.4	21000.0	-6.3	6664.0	5.72E-09	0.8	1	0.8
8/25/2006 16:00	1.1	23.4	0.0	22.3	6664.0				
8/28/2006 9:30	12.1	11.9	235800.0	-0.2	10594.0	5.77E-09	1.0	11	11.5



Hydraulic Conductivity Test - Cedar Rapids - Composite Cover

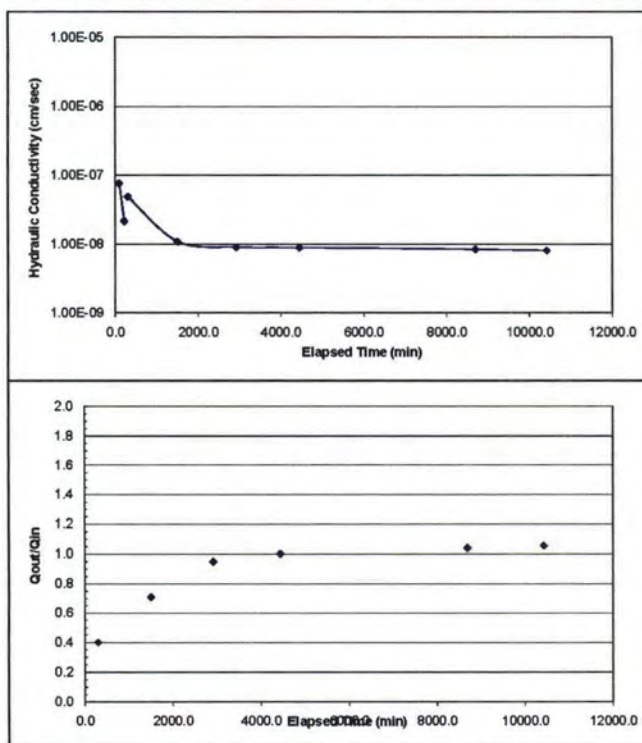
ASTM D 5084 - 00

Sample I.D.			150-mm IOY2U		Test Date :	
Cell Pressure =	43.5	psi	Diameter of Sample, D =		15.2	cm
Inflow Pressure =	42.4	psi	Length of Sample, L =		10.2	cm
Outflow Pressure =	40.6	psi	Area of Sample, A =		182.4	cm ²
Pressure Difference =	1.8	psi	Sample Volume, V =		1853.3	cm ³
Effective Stress =	2.0	psi	a _{in} =		1	cm ²
Hydraulic Gradient, i =	12.5		a _{out} =		1	cm ²
Weight of wet sample =	3997.1	(g)	Sample Water Content =		15.8	(%)
Wet Density =	2.2	g/cm ³	Dry Density =		1.86	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	50.89	550.47	482.24	15.82

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
8/30/2006 11:05	2.8	22.0	0.0	19.2	0.0				
8/30/2006 12:37	5.9	22.9	5520.0	17.0	92.0	7.67E-08	-0.3	3.1	-0.9
8/30/2006 14:36	7.0	23.2	7140.0	16.2	211.0	2.18E-08	-0.3	1.1	-0.3
9/5/2006 12:09	1.2	23.6	0.0	22.4	211.0				
9/5/2006 13:38	2.2	23.2	5340.0	21.0	300.0	4.92E-08	0.4	1	0.4
9/6/2006 9:37	4.6	21.5	71940.0	16.9	1499.0	1.09E-08	0.7	2.4	1.7
9/7/2006 9:20	6.6	19.6	85380.0	13.0	2922.0	8.99E-09	0.9	2	1.9
9/8/2006 10:40	8.6	17.6	91200.0	9.0	4442.0	8.88E-09	1.0	2	2
9/11/2006 9:31	13.5	12.5	255060.0	-1.0	8693.0	8.36E-09	1.0	4.9	5.1
9/12/2006 14:24	15.3	10.6	103980.0	-4.7	10426.0	8.01E-09	1.1	1.8	1.9



Hydraulic Conductivity Test - Cedar Rapids - Composite Cover

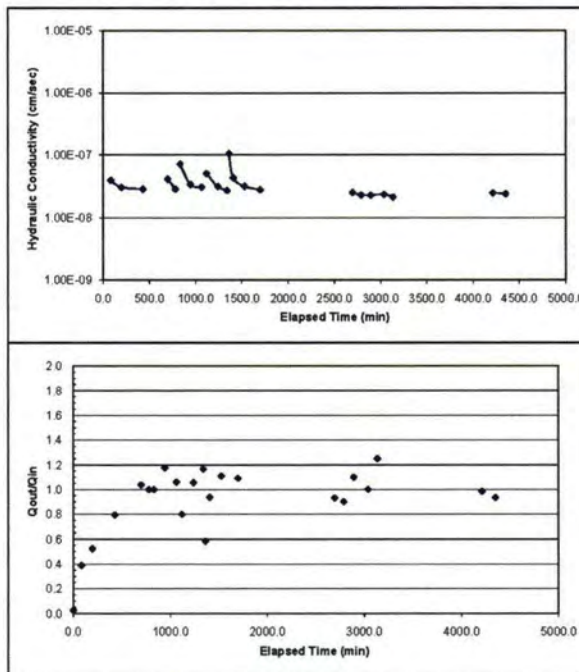
ASTM D 5084 - 00

Sample I.D.	305-mm IOY1U	Test Date :	8/25/06
Cell Pressure =	43.1 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.3 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.7 cm ²
Pressure Difference =	2.3 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	2.0 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	10.6	a _{out} =	1 cm ²
Weight of wet sample =	24539.8 (g)	Sample Water Content =	13.6 (%)
Wet Density =	2.2 g/cm ³	Dry Density =	1.94 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
K9	211.15	1028.2	930.1	13.64

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
8/25/2006 12:57	2.9	19.0	0.0	16.2	0.0				
8/28/2006 10:16	10.6	18.6	0.0	8.2	0.0				
8/28/2006 11:40	12.9	17.9	5040.0	5.0	84.0	3.94E-08	0.4	2.3	0.9
8/28/2006 13:31	15.0	16.6	6600.0	1.6	195.0	3.04E-08	0.5	2.1	1.1
8/28/2006 17:25	18.4	14.1	14040.0	-4.3	429.0	2.83E-08	0.6	3.4	2.7
8/29/2006 11:20	6.4	21.0	0.0	14.6	429.0				
8/29/2006 15:49	11.7	15.5	16140.0	3.8	698.0	4.09E-08	1.0	5.3	5.5
8/29/2006 17:11	12.8	14.4	4920.0	1.6	780.0	2.84E-08	1.0	1.1	1.1
8/30/2006 9:52	6.8	21.3	0.0	14.5	780.0				
8/30/2006 10:43	8.6	19.5	3060.0	10.9	831.0	7.04E-08	1.0	1.8	1.8
8/30/2006 12:36	10.3	17.5	6780.0	7.2	944.0	3.34E-08	1.2	1.7	2
8/30/2006 14:38	12.0	15.7	7200.0	3.7	1064.0	3.04E-08	1.1	1.7	1.8
9/5/2006 12:42	5.2	19.5	0.0	14.3	1064.0				
9/5/2006 13:36	6.7	18.3	3240.0	11.6	1118.0	4.98E-08	0.8	1.5	1.2
9/5/2006 15:37	8.5	16.4	7260.0	7.9	1239.0	3.10E-08	1.1	1.8	1.9
9/5/2006 17:16	9.7	15.0	5940.0	5.3	1338.0	2.72E-08	1.2	1.2	1.4
9/6/2006 9:44	4.0	20.7	0.0	16.7	1338.0				
9/6/2006 10:07	5.5	19.8	1380.0	14.3	1381.0	1.04E-07	0.6	1.54	0.9
9/6/2006 10:50	6.5	18.9	2580.0	12.4	1404.0	4.30E-08	0.9	0.96	0.9
9/6/2006 12:52	8.3	16.9	7320.0	8.6	1526.0	3.15E-08	1.1	1.8	2
9/6/2006 15:44	10.5	14.5	10320.0	4.0	1698.0	2.77E-08	1.1	2.2	2.4
9/6/2006 16:42	2.0	24.1	0.0	22.1	1698.0				
9/7/2006 9:21	14.7	12.3	59940.0	-2.4	2697.0	2.49E-08	0.9	12.7	11.8
9/7/2006 10:53	15.7	11.4	5520.0	-4.3	2769.0	2.27E-08	0.9	1	0.9
9/7/2006 12:36	16.7	10.3	6180.0	-6.4	2892.0	2.27E-08	1.1	1	1.1
9/7/2006 15:02	18.2	8.5	8760.0	-9.4	3038.0	2.32E-08	1.0	1.5	1.5
9/7/2006 16:40	19.0	7.6	5880.0	-11.2	3136.0	2.11E-08	1.3	0.8	1
9/7/2006 16:41	0.6	23.7	0.0	23.1	3136.0				
9/8/2006 10:39	13.8	10.7	64680.0	-3.1	4214.0	2.47E-08	1.0	13.2	13
9/8/2006 12:54	15.3	9.3	8100.0	-6.0	4349.0	2.38E-08	0.9	1.5	1.4



Hydraulic Conductivity Test - Cedar Rapids - Composite Cover

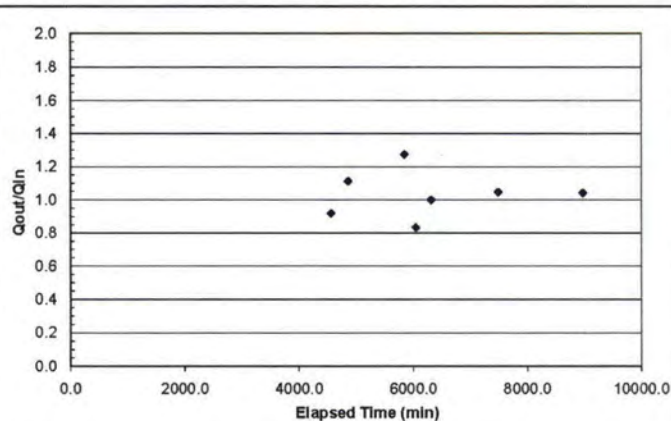
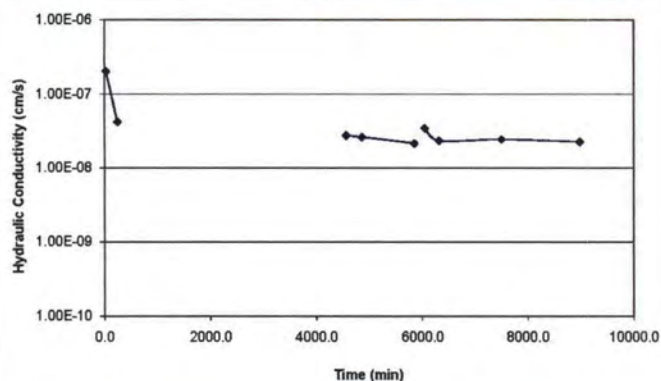
ASTM D 5084 - 00

Sample I.D.	150-mm IOY1U	Test Date :	9/21/06
Cell Pressure =	43.5 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	10.2 cm
Outflow Pressure =	40.6 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.8 psi	Sample Volume, V =	1853.3 cm ³
Effective Stress =	2.0 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	12.5	a _{out} =	1 cm ²
Weight of wet sample =	3852.0 (g)	Sample Water Content =	14.2 (%)
Wet Density =	2.1 g/cm ³	Dry Density =	1.82 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
27	50.19	563.89	499.92	14.22

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
9/21/2006 13:06	0.5	21.4	0.0	20.9	0.0				
9/21/2006 13:33	2.5	21.7	1620.0	19.2	27.0	1.99E-07	-0.2	2	-0.3
9/21/2006 17:06	5.5	21.9	12780.0	16.4	240.0	4.23E-08	-0.1	3	-0.2
9/22/2006 11:57	1.8	21.5	0.0	19.7	240.0				
9/25/2006 11:57	19.1	5.6	259200.0	-13.5	4560.0	2.77E-08	0.9	17.3	15.9
9/25/2006 16:56	20.0	4.6	17940.0	-15.4	4859.0	2.63E-08	1.1	0.9	1
9/26/2006 9:24	22.2	1.8	59280.0	-20.4	5847.0	2.16E-08	1.3	2.2	2.8
9/26/2006 9:25	0.8	24.3	0.0	23.5	5847.0				
9/26/2006 12:44	2.0	23.3	11940.0	21.3	6046.0	3.44E-08	0.8	1.2	1
9/26/2006 17:14	3.0	22.3	16200.0	19.3	6316.0	2.34E-08	1.0	1	1
9/27/2006 12:54	7.3	17.8	70800.0	10.5	7496.0	2.45E-08	1.0	4.3	4.5
9/28/2006 13:37	12.0	12.9	88980.0	0.9	8979.0	2.27E-08	1.0	4.7	4.9



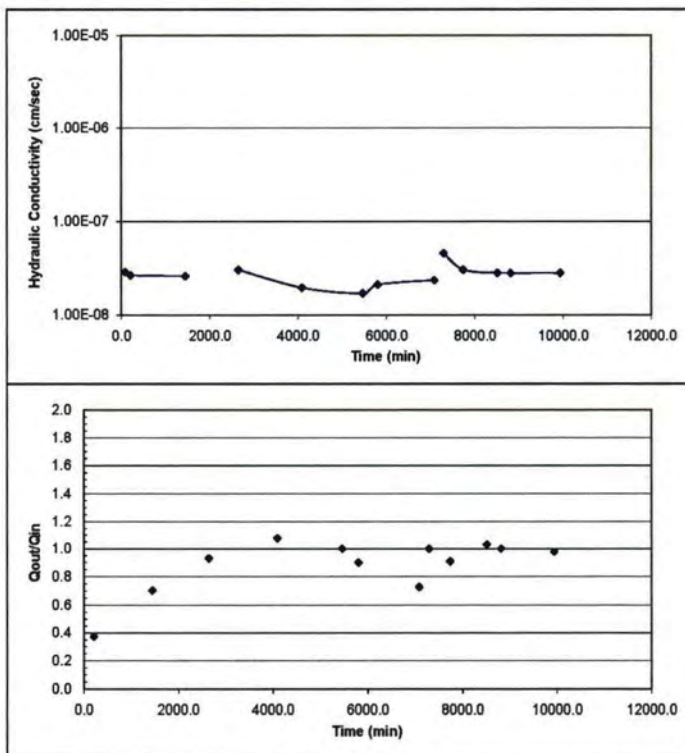
Hydraulic Conductivity Test - Cedar Rapids - Composite Cover

ASTM D 5084 - 00					
Sample I.D.		150-mm IOY2L		Test Date :	
Cell Pressure =	43.5	psi	Diameter of Sample, D =	15.2	cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	10.2	cm
Outflow Pressure =	40.6	psi	Area of Sample, A =	182.4	cm ²
Pressure Difference =	1.8	psi	Sample Volume, V =	1853.3	cm ³
Effective Stress =	2.0	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	12.5		a _{out} =	1	cm ²
Weight of wet sample =	3708.7	(g)	Sample Water Content =	16.4	(%)
Wet Density =	2.0	g/cm ³	Dry Density =	1.72	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	WT of Can + Water Content (%)
7	49.43	454.37	397.26	16.42

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
10/12/2006 12:27	3.2	23.7	0.0	20.5	0.0				
10/12/2006 13:44	4.4	24.2	4620.0	19.8	77.0	2.88E-08	-0.4	1.2	-0.5
10/12/2006 15:56	5.2	23.9	7920.0	18.7	209.0	2.65E-08	0.4	0.8	0.3
10/13/2006 12:32	10.9	19.9	74160.0	9.0	1445.0	2.59E-08	0.7	5.7	4
10/16/2006 16:06	0.8	23.5	0.0	22.7	1445.0			-10.1	-3.6
10/17/2006 12:03	6.8	18.1	71820.0	11.5	2642.0	3.02E-08	0.9	5.8	5.4
10/18/2006 12:02	10.5	13.9	98340.0	3.4	4081.0	1.95E-08	1.1	3.9	4.2
10/19/2006 10:59	13.7	10.7	82620.0	-3.0	5458.0	1.70E-08	1.0	3.2	3.2
10/19/2006 16:40	14.7	9.8	20460.0	-4.9	5799.0	2.11E-08	0.9	1	0.9
10/20/2006 14:01	19.1	6.8	76860.0	-12.5	7080.0	2.34E-08	0.7	4.4	3.2
10/23/2006 12:15	1.3	24.2	0.0	22.9	7080.0			-17.8	-17.6
10/23/2006 15:42	2.8	22.7	12420.0	19.9	7287.0	4.55E-08	1.0	1.5	1.5
10/23/2006 23:09	5.0	20.7	26820.0	15.7	7734.0	3.02E-08	0.9	2.2	2
10/24/2006 12:06	8.2	17.4	46620.0	9.2	8511.0	2.79E-08	1.0	3.2	3.3
10/24/2006 17:03	9.4	16.2	17820.0	6.8	8808.0	2.79E-08	1.0	1.2	1.2
10/25/2006 11:50	13.8	11.9	67620.0	-1.9	9935.0	2.78E-08	1.0	4.4	4.3



Hydraulic Conductivity Test - Cedar Rapids - Composite Cover

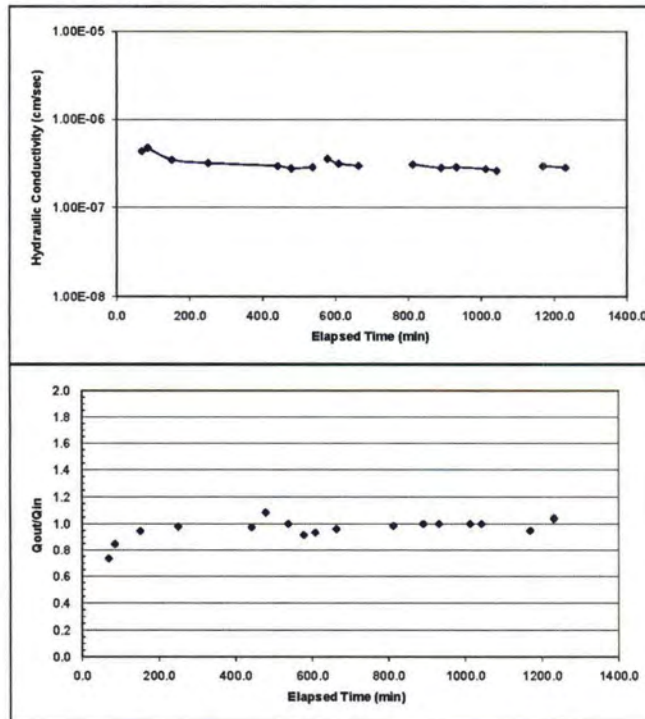
ASTM D 5084 - 00

Sample I.D.	150-mm IOY1L	Test Date :	8/22/06
Cell Pressure = 43.5	psi	Diameter of Sample, D = 15.2	cm
Inflow Pressure = 42.4	psi	Length of Sample, L = 10.2	cm
Outflow Pressure = 40.6	psi	Area of Sample, A = 182.4	cm ²
Pressure Difference = 1.8	psi	Sample Volume, V = 1853.3	cm ³
Effective Stress = 2.0	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 12.5		a _{out} = 1	cm ²
Weight of wet sample = 4037.5	(g)	Sample Water Content = 16.5	(%)
Wet Density = 2.2	g/cm ³	Dry Density = 1.87	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
27	50.11	533.5	465	16.51

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
8/22/2006 15:43	1.1	21.8	0.0	20.7	0.0				
8/22/2006 16:52	6.4	17.9	4140.0	11.5	69.0	4.34E-07	0.7	5.3	3.9
8/23/2006 9:39	1.0	22.8	0.0	21.8	69.0				
8/23/2006 9:55	2.3	21.7	960.0	19.4	85.0	4.73E-07	0.8	1.3	1.1
8/23/2006 11:01	5.9	18.3	3960.0	12.4	151.0	3.46E-07	0.9	3.6	3.4
8/23/2006 12:40	10.5	13.8	5940.0	3.3	250.0	3.17E-07	1.0	4.6	4.5
8/23/2006 15:51	18.0	6.5	11460.0	-11.5	441.0	2.94E-07	1.0	7.5	7.3
8/23/2006 16:28	19.2	5.2	2220.0	-14.0	478.0	2.75E-07	1.1	1.2	1.3
8/23/2006 17:27	21.2	3.2	3540.0	-18.0	537.0	2.85E-07	1.0	2	2
8/24/2006 14:47	0.8	23.5	0.0	22.7	537.0				
8/24/2006 15:28	3.2	21.3	2460.0	18.1	578.0	3.54E-07	0.9	2.4	2.2
8/24/2006 15:58	4.7	19.9	1800.0	15.2	608.0	3.13E-07	0.9	1.5	1.4
8/24/2006 16:53	7.2	17.5	3300.0	10.3	663.0	2.97E-07	1.0	2.5	2.4
8/25/2006 9:43	1.0	23.0	0.0	22.0	663.0				
8/25/2006 12:12	8.0	16.1	8940.0	8.1	812.0	3.06E-07	1.0	7	6.9
8/25/2006 13:30	11.1	13.0	4680.0	1.9	890.0	2.80E-07	1.0	3.1	3.1
8/25/2006 14:11	12.7	11.4	2460.0	-1.3	931.0	2.85E-07	1.0	1.6	1.6
8/25/2006 15:32	15.6	8.5	4860.0	-7.1	1012.0	2.72E-07	1.0	2.9	2.9
8/25/2006 16:02	16.6	7.5	1800.0	-9.1	1042.0	2.61E-07	1.0	1	1
8/28/2006 9:34	0.9	23.2	0.0	22.3	1042.0				
8/28/2006 11:41	6.8	17.6	7620.0	10.8	1169.0	2.94E-07	0.9	5.9	5.6
8/28/2006 12:43	9.3	16.0	3720.0	5.7	1231.0	2.83E-07	1.0	2.5	2.6



Hydraulic Conductivity Test - Helena - Store-and-Release Cover

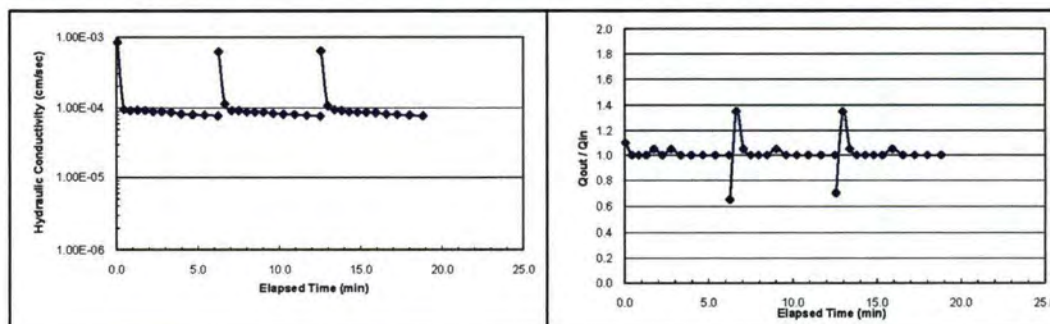
ASTM D 5084 - 00

Sample I.D.		305-mm 3' Top Depth -2		Test Date :		12/19/08
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5	cm	
Inflow Pressure =	41.1	psi	Length of Sample, L =	15.2	cm	
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66	cm ²	
Pressure Difference =	1.1	psi	Sample Volume, V =	11120.0	cm ³	
Effective Stress =	1.5	psi	a _{in} =	5	cm ²	
Hydraulic Gradient, i =	5.0		a _{out} =	5	cm ²	
Weight of wet sample =	20000.0	g	Sample Water Content =	37.5%	(%)	
Wet Density =	1.8	g/cm ³	Dry Density =	1.79	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can Dry Soil	Water Content
	(g)	(g)	(g)	(%)
9C	24.37	163.33	125.45	37.48%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
12/19/2008 00:00.00	0.0	24.8	0.0	24.8	0.0				
12/19/2008 00:02.84	2.0	22.6	2.6	20.6	0.0	8.40E-04	1.1	10	11
12/19/2008 00:25.55	4.0	20.6	22.9	16.6	0.4	9.62E-05	1.0	10	10
12/19/2008 00:50.40	6.0	18.6	24.9	12.6	0.8	9.26E-05	1.0	10	10
12/19/2008 01:16.25	8.0	16.6	25.8	8.6	1.3	9.31E-05	1.0	10	10
12/19/2008 01:44.11	10.0	14.5	27.9	4.5	1.7	9.29E-05	1.1	10	10.5
12/19/2008 02:13.92	12.0	12.5	29.8	0.5	2.2	8.91E-05	1.0	10	10
12/19/2008 02:45.85	14.0	10.4	31.9	-3.6	2.8	8.98E-05	1.1	10	10.5
12/19/2008 03:19.61	16.0	8.4	33.8	-7.6	3.3	8.77E-05	1.0	10	10
12/19/2008 03:57.55	18.0	6.4	37.9	-11.6	4.0	8.27E-05	1.0	10	10
12/19/2008 04:38.74	20.0	4.4	41.2	-15.6	4.6	8.10E-05	1.0	10	10
12/19/2008 05:23.37	22.0	2.4	44.6	-19.6	5.4	7.99E-05	1.0	10	10
12/19/2008 06:12.60	24.0	0.4	49.2	-23.6	6.2	7.77E-05	1.0	10	10
12/19/2008 00:00.00	0.0	24.8	0.0	24.8	6.2				
12/19/2008 00:02.84	2.0	23.3	2.8	21.3	6.3	8.12E-04	0.7	10	6.5
12/19/2008 00:25.55	4.0	20.6	22.7	16.6	6.6	1.14E-04	1.4	10	13.5
12/19/2008 00:51.14	6.0	18.5	25.6	12.5	7.1	9.22E-05	1.1	10	10.5
12/19/2008 01:17.26	8.0	16.5	26.1	8.5	7.5	9.22E-05	1.0	10	10
12/19/2008 01:45.84	10.0	14.5	28.6	4.5	8.0	8.84E-05	1.0	10	10
12/19/2008 02:16.03	12.0	12.5	30.2	0.5	8.5	8.79E-05	1.0	10	10
12/19/2008 02:48.64	14.0	10.4	32.6	-3.6	9.0	8.80E-05	1.1	10	10.5
12/19/2008 03:23.90	16.0	8.4	35.3	-7.6	9.6	8.39E-05	1.0	10	10
12/19/2008 04:02.08	18.0	6.4	38.2	-11.6	10.2	8.22E-05	1.0	10	10
12/19/2008 04:43.36	20.0	4.4	41.3	-15.6	10.9	8.09E-05	1.0	10	10
12/19/2008 05:28.58	22.0	2.4	45.2	-19.6	11.7	7.89E-05	1.0	10	10
12/19/2008 06:18.34	24.0	0.4	49.8	-23.6	12.5	7.69E-05	1.0	10	10
12/19/2008 00:00.00	0.0	24.7	0.0	24.7	12.5				
12/19/2008 00:02.84	2.0	23.3	2.8	21.3	12.6	6.30E-04	0.7	10	7
12/19/2008 00:26.95	4.0	20.6	24.1	16.6	13.0	1.07E-04	1.4	10	13.5
12/19/2008 00:52.03	6.0	18.5	25.1	12.5	13.4	9.41E-05	1.1	10	10.5
12/19/2008 01:18.20	8.0	16.5	26.2	8.5	13.8	9.21E-05	1.0	10	10
12/19/2008 01:46.76	10.0	14.5	28.6	4.5	14.3	8.85E-05	1.0	10	10
12/19/2008 02:17.27	12.0	12.5	30.5	0.5	14.8	8.70E-05	1.0	10	10
12/19/2008 02:49.30	14.0	10.5	32.0	-3.5	15.3	8.73E-05	1.0	10	10
12/19/2008 03:24.53	16.0	8.4	35.2	-7.6	15.9	8.60E-05	1.1	10	10.5
12/19/2008 04:02.65	18.0	6.4	38.1	-11.6	16.6	8.23E-05	1.0	10	10
12/19/2008 04:43.85	20.0	4.4	41.2	-15.6	17.2	8.10E-05	1.0	10	10
12/19/2008 05:28.84	22.0	2.4	45.0	-19.6	18.0	7.93E-05	1.0	10	10
12/19/2008 06:18.27	24.0	0.4	49.4	-23.6	18.8	7.74E-05	1.0	10	10



Hydraulic Conductivity Test - Helena - Store-and-Release Cover

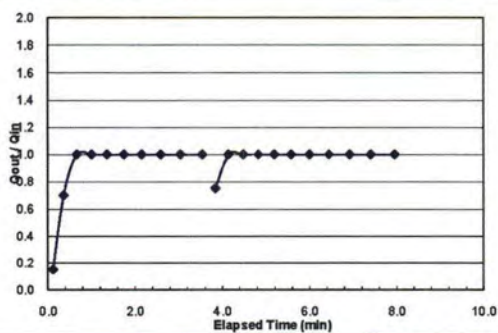
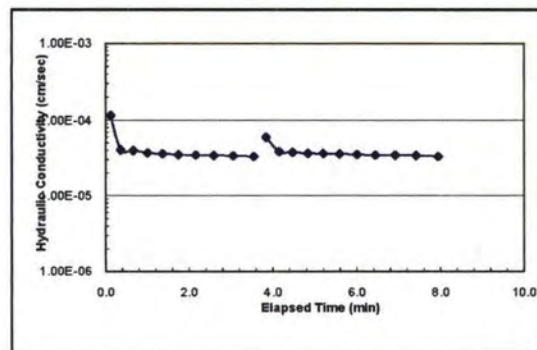
ASTM D 5084 - 00

Sample I.D.	150-mm Helena 3' Top Depth-2	Test Date :	1/14/09
Cell Pressure = 42.0 psi		Diameter of Sample, D = 15.2 cm	
Inflow Pressure = 40.5 psi		Length of Sample, L = 7.0 cm	
Outflow Pressure = 40.0 psi		Area of Sample, A = 182.41 cm ²	
Pressure Difference = 0.5 psi		Sample Volume, V = 1274.2 cm ³	
Effective Stress = 1.8 psi		a _{in} = 1 cm ²	
Hydraulic Gradient, i = 5.0		a _{out} = 1 cm ²	
Weight of wet sample = 2071.8 g		Sample Water Content = 33.9% (%)	
Wet Density = 1.6 g/cm ³		Dry Density = 1.21 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
E	24.11	133.77	105.98	33.94%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	23.0	0.0	23.0	0.0				
0:00:07	2.0	22.7	6.7	20.7	0.1	1.15E-04	0.2	2	0.3
0:00:21	3.0	22.0	14.6	19.0	0.4	4.05E-05	0.7	1	0.7
0:00:39	4.0	21.0	18.1	17.0	0.7	3.98E-05	1.0	1	1
0:01:00	5.0	20.0	20.3	15.0	1.0	3.69E-05	1.0	1	1
0:01:21	6.0	19.0	21.6	13.0	1.4	3.60E-05	1.0	1	1
0:01:45	7.0	18.0	23.3	11.0	1.7	3.49E-05	1.0	1	1
0:02:09	8.0	17.0	24.5	9.0	2.2	3.46E-05	1.0	1	1
0:02:35	9.0	16.0	25.9	7.0	2.6	3.42E-05	1.0	1	1
0:03:03	10.0	15.0	27.6	5.0	3.0	3.37E-05	1.0	1	1
0:03:32	11.0	14.0	29.6	3.0	3.5	3.30E-05	1.0	1	1
0:00:00	0.0	23.0	-212.2	23.0	3.5				
0:00:20	2.0	21.5	20.1	19.5	3.8	5.91E-05	0.8	2	1.5
0:00:39	3.0	20.5	18.6	17.5	4.1	3.84E-05	1.0	1	1
0:00:58	4.0	19.5	19.7	15.5	4.5	3.76E-05	1.0	1	1
0:01:20	5.0	18.5	21.1	13.5	4.8	3.65E-05	1.0	1	1
0:01:42	6.0	17.5	22.2	11.5	5.2	3.62E-05	1.0	1	1
0:02:05	7.0	16.5	23.4	9.5	5.6	3.59E-05	1.0	1	1
0:02:30	8.0	15.5	24.9	7.5	6.0	3.52E-05	1.0	1	1
0:02:57	9.0	14.5	26.7	5.5	6.4	3.45E-05	1.0	1	1
0:03:25	10.0	13.5	28.2	3.5	6.9	3.42E-05	1.0	1	1
0:03:55	11.0	12.5	29.9	1.5	7.4	3.40E-05	1.0	1	1
0:04:27	12.0	11.5	32.5	-0.5	8.0	3.31E-05	1.0	1	1



Hydraulic Conductivity Test - Helena - Store-and-Release Cover

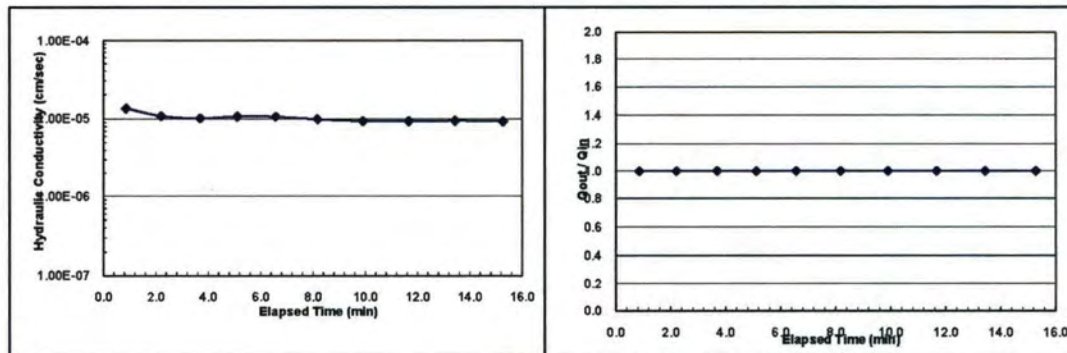
ASTM D 5084 - 00

Sample I.D.			75-mm Helena Top depth-2			Test Date : 1/21/09		
Cell Pressure =	42.0	psi	Diameter of Sample, D =	7.0	cm			
Inflow Pressure =	40.5	psi	Length of Sample, L =	3.8	cm			
Outflow Pressure =	40.0	psi	Area of Sample, A =	38.32	cm ²			
Pressure Difference =	0.5	psi	Sample Volume, V =	146.0	cm ³			
Effective Stress =	1.8	psi	a _{in} =	1	cm ²			
Hydraulic Gradient, i =	9.2		a _{out} =	1	cm ²			
Weight of wet sample =	218.6	g	Sample Water Content =	38.2%	(%)			
Wet Density =	1.5	g/cm ³	Dry Density =	1.08	g/cm ³			

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
15	21.07	93.25	73.3	38.20%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	1.1	24.0	0.0	22.9	0.0				
0:00:51	1.5	23.6	51.2	22.1	0.9	1.35E-05	1.0	0.4	0.4
0:02:13	2.0	23.1	81.3	21.1	2.2	1.08E-05	1.0	0.5	0.5
0:03:41	2.5	22.6	88.5	20.1	3.7	1.01E-05	1.0	0.5	0.5
0:05:06	3.0	22.1	85.4	19.1	5.1	1.06E-05	1.0	0.5	0.5
0:06:34	3.5	21.6	87.6	18.1	6.6	1.06E-05	1.0	0.5	0.5
0:08:10	4.0	21.1	96.2	17.1	8.2	9.79E-06	1.0	0.5	0.5
0:09:54	4.5	20.6	103.5	16.1	9.9	9.28E-06	1.0	0.5	0.5
0:11:40	5.0	20.1	106.2	15.1	11.7	9.22E-06	1.0	0.5	0.5
0:13:26	5.5	19.6	106.0	14.1	13.4	9.42E-06	1.0	0.5	0.5
0:15:17	6.0	19.1	110.7	13.1	15.3	9.21E-06	1.0	0.5	0.5



Hydraulic Conductivity Test - Helena - Store-and-Release Cover

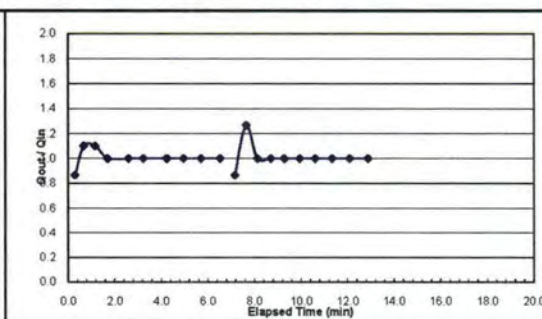
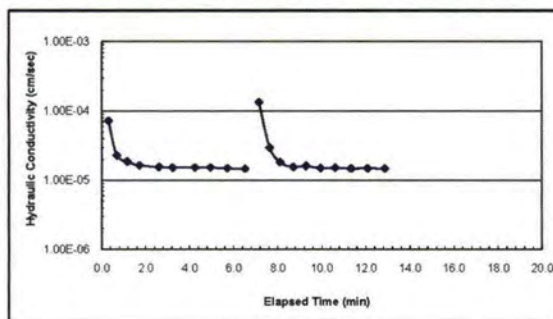
ASTM D 5084 - 00

Sample I.D.			305-mm 3' Top Depth-3		Test Date : 12/30/08			
Cell Pressure = 42.1			psi		Diameter of Sample, D = 30.5		cm	
Inflow Pressure = 41.1			psi		Length of Sample, L = 21.6		cm	
Outflow Pressure = 40.5			psi		Area of Sample, A = 729.66		cm ²	
Pressure Difference = 0.6			psi		Sample Volume, V = 15753.3		cm ³	
Effective Stress = 1.3			psi		a _{in} = 1		cm ²	
Hydraulic Gradient, i = 2.0					a _{out} = 1		cm ²	
Weight of wet sample = 27350.0			g		Sample Water Content = -375.8% (%)			
Wet Density = 1.7			g/cm ³		Dry Density = 1.80			g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
94	31.26	117.47		-375.78%

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:18	3.0	21.4	18.2	18.4	0.3	7.20E-05	0.9	3	2.6
0:00:41	4.0	20.3	22.7	16.3	0.7	2.30E-05	1.1	1	1.1
0:01:10	5.0	19.2	28.9	14.2	1.2	1.87E-05	1.1	1	1.1
0:01:42	6.0	18.2	32.5	12.2	1.7	1.65E-05	1.0	1	1
0:02:36	7.5	16.7	53.4	9.2	2.6	1.57E-05	1.0	1.5	1.5
0:03:14	8.5	15.7	38.2	7.2	3.2	1.54E-05	1.0	1	1
0:04:15	10.0	14.2	60.8	4.2	4.2	1.52E-05	1.0	1.5	1.5
0:04:57	11.0	13.2	42.7	2.2	5.0	1.53E-05	1.0	1	1
0:05:43	12.0	12.2	45.7	0.2	5.7	1.49E-05	1.0	1	1
0:06:32	13.0	11.2	48.5	-1.8	6.5	1.47E-05	1.0	1	1
0:00:00	0.0	24.0	-391.5	24.0	7.0				
0:00:10	3.0	21.4	9.7	18.4	7.2	1.34E-04	0.9	3	2.6
0:00:38	4.5	19.5	28.7	15.0	7.6	2.97E-05	1.3	1.5	1.9
0:01:07	5.5	18.5	28.8	13.0	8.1	1.83E-05	1.0	1	1
0:01:42	6.5	17.5	35.0	11.0	8.7	1.56E-05	1.0	1	1
0:02:17	7.5	16.5	35.1	9.0	9.3	1.62E-05	1.0	1	1
0:02:57	8.5	15.5	39.2	7.0	9.9	1.50E-05	1.0	1	1
0:03:37	9.5	14.5	40.3	5.0	10.6	1.53E-05	1.0	1	1
0:04:20	10.5	13.5	43.2	3.0	11.3	1.48E-05	1.0	1	1
0:05:05	11.5	12.5	44.8	1.0	12.1	1.49E-05	1.0	1	1
0:05:52	12.5	11.5	47.3	-1.0	12.9	1.48E-05	1.0	1	1



Hydraulic Conductivity Test - Helena - Store-and-Release Cover

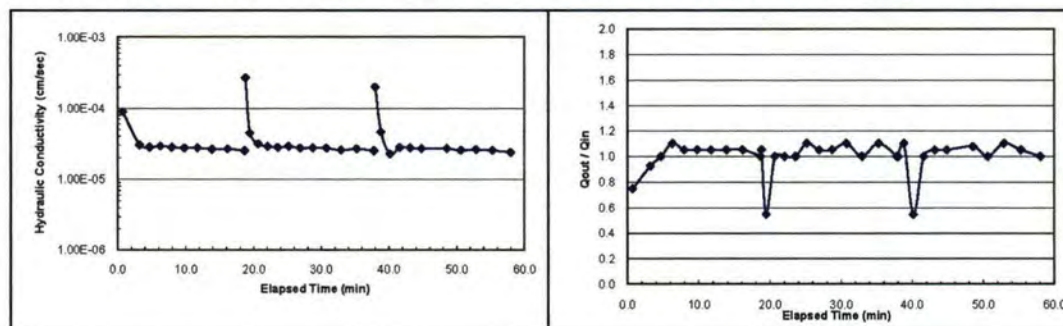
ASTM D 5084 - 00

Sample I.D.		305-mm Mid - 1		Test Date :		1/6/09
Cell Pressure =	42.0	psi		Diameter of Sample, D =	30.5	cm
Inflow Pressure =	41.1	psi		Length of Sample, L =	15.2	cm
Outflow Pressure =	40.0	psi		Area of Sample, A =	729.66	cm ²
Pressure Difference =	1.1	psi		Sample Volume, V =	11120.0	cm ³
Effective Stress =	1.5	psi		a _{in} =	5	cm ²
Hydraulic Gradient, i =	5.0			a _{out} =	5	cm ²
Weight of wet sample =	20050.0	g		Sample Water Content =	34.4%	(%)
Wet Density =	1.8	g/cm ³		Dry Density =	1.80	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can Dry Soil (g)	Water Content (%)
2M	23.99	172.44	134.46	34.38%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
1/6/2009 00:00.00	0.0	24.6	0.0	24.6	0.0				
1/6/2009 00:41.99	4.0	21.6	42.0	17.6	0.7	8.95E-05	0.8	20	15
1/6/2009 03:10.90	8.0	17.9	148.9	9.9	3.2	3.00E-05	0.9	20	18.5
1/6/2009 04:39.65	10.0	15.9	88.8	5.9	4.7	2.80E-05	1.0	10	10
1/6/2009 06:14.40	12.0	13.7	94.7	1.7	6.2	2.89E-05	1.1	10	11
1/6/2009 07:55.80	14.0	11.6	101.4	-2.4	7.9	2.78E-05	1.1	10	10.5
1/6/2009 09:45.72	16.0	9.5	109.9	-6.5	9.8	2.72E-05	1.1	10	10.5
1/6/2009 11:42.12	18.0	7.4	116.4	-10.6	11.7	2.72E-05	1.1	10	10.5
1/6/2009 13:50.72	20.0	5.3	128.6	-14.7	13.8	2.62E-05	1.1	10	10.5
1/6/2009 16:07.74	22.0	3.2	137.0	-18.8	16.1	2.63E-05	1.1	10	10.5
1/6/2009 18:38.95	24.0	1.2	151.2	-22.8	18.6	2.49E-05	1.0	10	10
1/6/2009 00:00.00	0.0	24.8	0.0	24.8	18.6				
1/6/2009 00:07.98	2.0	22.7	8.0	20.7	18.8	2.71E-04	1.1	10	10.5
1/6/2009 00:46.32	4.0	21.8	38.3	17.6	19.4	4.43E-05	0.5	10	5.5
1/6/2009 01:59.79	6.0	19.6	73.5	13.6	20.6	3.10E-05	1.0	10	10
1/6/2009 03:22.92	8.0	17.6	83.1	9.6	22.0	2.86E-05	1.0	10	10
1/6/2009 04:53.05	10.0	15.6	90.1	5.6	23.5	2.77E-05	1.0	10	10
1/6/2009 06:29.41	12.0	13.4	96.4	1.4	25.1	2.86E-05	1.1	10	11
1/6/2009 08:14.26	14.0	11.3	104.9	-2.7	26.9	2.70E-05	1.1	10	10.5
1/6/2009 10:03.77	16.0	9.2	109.5	-6.8	28.7	2.74E-05	1.1	10	10.5
1/6/2009 12:04.16	18.0	7.0	120.4	-11.0	30.7	2.71E-05	1.1	10	11
1/6/2009 14:14.30	20.0	5.0	130.1	-15.0	32.9	2.54E-05	1.0	10	10
1/6/2009 16:34.56	22.0	2.8	140.3	-19.2	35.2	2.65E-05	1.1	10	11
1/6/2009 19:07.90	24.0	0.8	153.3	-23.2	37.8	2.48E-05	1.0	10	10
1/6/2009 00:00.00	0.0	24.6	0.0	24.6	37.8				
1/6/2009 00:10.55	2.0	22.6	10.5	20.6	38.0	2.00E-04	1.0	10	10
1/6/2009 01:01.32	4.0	20.4	50.8	16.4	38.8	4.56E-05	1.1	10	11
1/6/2009 02:20.30	6.0	19.3	79.0	13.3	40.1	2.25E-05	0.5	10	5.5
1/6/2009 03:47.15	8.0	17.3	86.8	9.3	41.6	2.75E-05	1.0	10	10
1/6/2009 05:21.29	10.0	15.2	94.1	5.2	43.1	2.73E-05	1.1	10	10.5
1/6/2009 07:02.35	12.0	13.1	101.1	1.1	44.8	2.67E-05	1.1	10	10.5
1/6/2009 10:45.46	16.0	8.8	223.1	-7.2	48.5	2.66E-05	1.1	20	21.5
1/6/2009 12:49.28	18.0	6.8	123.8	-11.2	50.6	2.52E-05	1.0	10	10
1/6/2009 15:04.63	20.0	4.6	135.4	-15.4	52.9	2.58E-05	1.1	10	11
1/6/2009 17:30.15	22.0	2.5	145.5	-19.5	55.3	2.51E-05	1.1	10	10.5
1/6/2009 20:11.88	24.0	0.5	161.7	-23.5	58.0	2.36E-05	1.0	10	10



Hydraulic Conductivity Test - Helena - Store-and-Release Cover

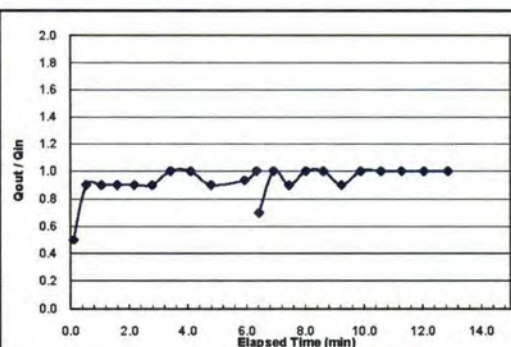
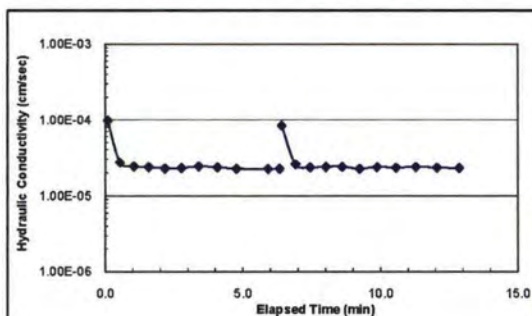
ASTM D 5084 - 00

Sample I.D.	150-mm Helena Mid-1	Test Date :	1/14/09
Cell Pressure = 42.0	psi	Diameter of Sample, D = 15.2	cm
Inflow Pressure = 40.5	psi	Length of Sample, L = 7.6	cm
Outflow Pressure = 40.0	psi	Area of Sample, A = 182.41	cm ²
Pressure Difference = 0.5	psi	Sample Volume, V = 1390.0	cm ³
Effective Stress = 1.8	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 4.6		a _{out} = 1	cm ²
Weight of wet sample = 2458.2	g	Sample Water Content = 33.4%	(%)
Wet Density = 1.8	g/cm ³	Dry Density = 1.33	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
64	30.94	115.31	94.18	33.41%

Date, Time	Inflow	Outflow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	23.0	0.0	23.0	0.0				
0:00:06	1.0	22.5	5.6	21.5	0.1	9.78E-05	0.5	1	0.5
0:00:32	2.0	21.6	26.4	19.6	0.5	2.69E-05	0.9	1	0.9
0:01:03	3.0	20.7	30.7	17.7	1.0	2.40E-05	0.9	1	0.9
0:01:35	4.0	19.8	32.5	15.8	1.6	2.35E-05	0.9	1	0.9
0:02:10	5.0	18.9	35.2	13.9	2.2	2.26E-05	0.9	1	0.9
0:02:47	6.0	18.0	36.2	12.0	2.8	2.28E-05	0.9	1	0.9
0:03:24	7.0	17.0	37.7	10.0	3.4	2.40E-05	1.0	1	1
0:04:05	8.0	16.0	40.7	8.0	4.1	2.32E-05	1.0	1	1
0:04:47	9.0	15.1	42.1	6.1	4.8	2.24E-05	0.9	1	0.9
0:05:56	10.5	13.7	68.7	3.2	5.9	2.21E-05	0.9	1.5	1.4
0:06:20	11.0	13.2	24.6	2.2	6.3	2.24E-05	1.0	0.5	0.5
0:00:00	0.0	23.0	-380.4	23.0	6.3				
0:00:07	1.0	22.3	7.5	21.3	6.4	8.32E-05	0.7	1	0.7
0:00:37	2.0	21.3	29.4	19.3	6.9	2.56E-05	1.0	1	1
0:01:09	3.0	20.4	31.9	17.4	7.4	2.32E-05	0.9	1	0.9
0:01:43	4.0	19.4	34.4	15.4	8.0	2.36E-05	1.0	1	1
0:02:19	5.0	18.4	35.5	13.4	8.6	2.37E-05	1.0	1	1
0:02:56	6.0	17.5	37.4	11.5	9.2	2.23E-05	0.9	1	0.9
0:03:35	7.0	16.5	38.9	9.5	9.9	2.35E-05	1.0	1	1
0:04:17	8.0	15.5	41.6	7.5	10.6	2.30E-05	1.0	1	1
0:04:59	9.0	14.5	42.7	5.5	11.3	2.35E-05	1.0	1	1
0:05:45	10.0	13.5	45.9	3.5	12.1	2.29E-05	1.0	1	1
0:06:34	11.0	12.5	48.7	1.5	12.9	2.28E-05	1.0	1	1



Hydraulic Conductivity Test - Helena - Store-and-Release Cover

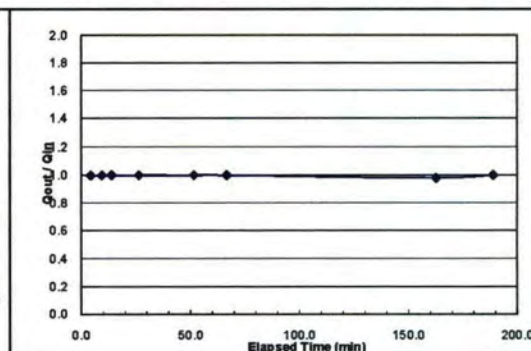
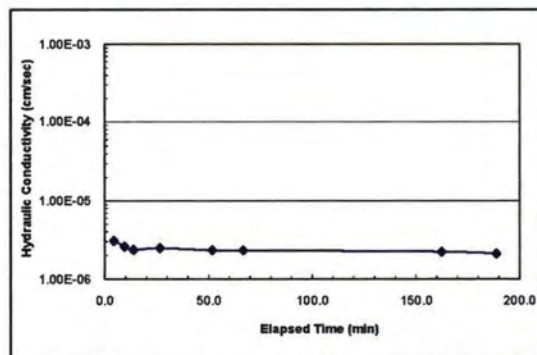
ASTM D 5084 - 00

Sample I.D.	75-mm Helena Mid-1		Test Date :	1/14/09
Cell Pressure =	42.0	psi	Diameter of Sample, D =	7.0 cm
Inflow Pressure =	40.4	psi	Length of Sample, L =	3.8 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	38.32 cm ²
Pressure Difference =	0.4	psi	Sample Volume, V =	146.0 cm ³
Effective Stress =	1.8	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	7.4		a _{out} =	1 cm ²
Weight of wet sample =	239.7	g	Sample Water Content =	36.6% (%)
Wet Density =	1.6	g/cm ³	Dry Density =	1.20 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
#94	31.97	109.86	89.01	36.55%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	1.1	24.0	0.0	22.9	0.0				
0:04:19	1.5	23.6	258.9	22.1	4.3	3.03E-06	1.0	0.4	0.4
0:09:28	1.9	23.2	309.5	21.3	9.5	2.58E-06	1.0	0.4	0.4
0:13:46	2.2	22.9	258.0	20.7	13.8	2.35E-06	1.0	0.3	0.3
0:26:22	3.1	22.0	755.6	18.9	26.4	2.47E-06	1.0	0.9	0.9
0:51:35	4.7	20.4	1512.9	15.7	51.6	2.32E-06	1.0	1.6	1.6
1:06:34	5.6	19.5	899.0	13.9	66.6	2.32E-06	1.0	0.9	0.9
2:42:29	10.4	14.8	5755.0	4.4	162.5	2.21E-06	1.0	4.8	4.7
3:08:45	11.5	13.8	1575.9	2.3	188.7	2.11E-06	1.0	1.05	1.05



Hydraulic Conductivity Test - Helena - Store-and-Release Cover

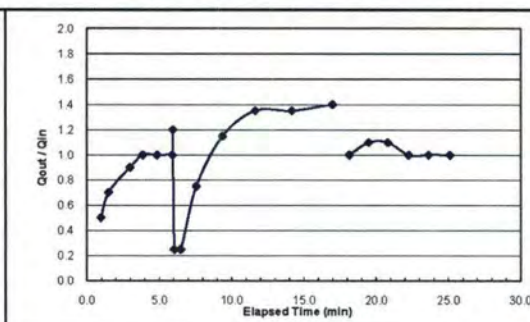
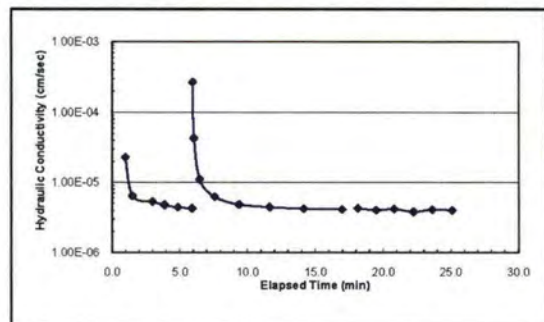
ASTM D 5084 - 00

Sample I.D.	305-mm Mid - 2	Test Date :	12/29/08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.1 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	1.1 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	5.0	a _{out} =	1 cm ²
Weight of wet sample =	20400.0 g	Sample Water Content =	16.7% (%)
Wet Density =	1.8 g/cm ³	Dry Density =	1.83 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
120	31.07	158.32	140.14	16.67%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
1/9/2009 00:00.00	0.0	24.5	0.0	24.5	0.0				
1/9/2009 00:58.51	8.0	20.5	58.5	12.5	1.0	2.26E-06	0.5	8	4
1/9/2009 01:30.27	9.0	19.8	31.8	10.8	1.5	6.36E-06	0.7	1	0.7
1/9/2009 02:58.90	11.0	18.0	88.6	7.0	3.0	5.26E-06	0.9	2	1.8
1/9/2009 03:52.30	12.0	17.0	53.4	5.0	3.9	4.76E-06	1.0	1	1
1/9/2009 04:51.71	13.0	16.0	59.4	3.0	4.9	4.38E-06	1.0	1	1
1/9/2009 05:54.78	14.0	15.0	63.1	1.0	5.9	4.24E-06	1.0	1	1
1/9/2009 00:00.00	0.0	24.9	0.0	24.9	5.9				
1/9/2009 00:01.75	2.0	22.5	1.7	20.5	5.9	2.66E-04	1.2	2	2.4
1/9/2009 00:08.14	4.0	22.0	6.4	18.0	6.0	4.28E-06	0.3	2	0.5
1/9/2009 00:33.84	6.0	21.5	25.7	15.5	6.5	1.09E-06	0.3	2	0.5
1/9/2009 01:39.45	8.0	20.0	65.6	12.0	7.6	6.19E-06	0.8	2	1.5
1/9/2009 03:27.41	10.0	17.7	108.0	7.7	9.4	4.83E-06	1.2	2	2.3
1/9/2009 05:43.09	12.0	15.0	135.7	3.0	11.6	4.44E-06	1.4	2	2.7
1/9/2009 08:15.14	14.0	12.3	152.1	-1.7	14.2	4.20E-06	1.4	2	2.7
1/9/2009 11:03.88	16.0	9.5	168.7	-6.5	17.0	4.12E-06	1.4	2	2.8
1/9/2009 00:00.00	18.0	13.0	0.0	-5.0	17.0				
1/9/2009 01:09.97	19.0	12.0	70.0	-7.0	18.1	4.25E-06	1.0	1	1
1/9/2009 02:30.30	20.0	10.9	80.3	-9.1	19.5	4.01E-06	1.1	1	1.1
1/9/2009 03:50.29	21.0	9.8	80.0	-11.2	20.8	4.15E-06	1.1	1	1.1
1/9/2009 05:16.45	22.0	8.8	86.2	-13.2	22.3	3.79E-06	1.0	1	1
1/9/2009 06:38.97	23.0	7.8	82.5	-15.2	23.6	4.08E-06	1.0	1	1
1/9/2009 08:06.90	24.0	6.8	87.9	-17.2	25.1	3.96E-06	1.0	1	1



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

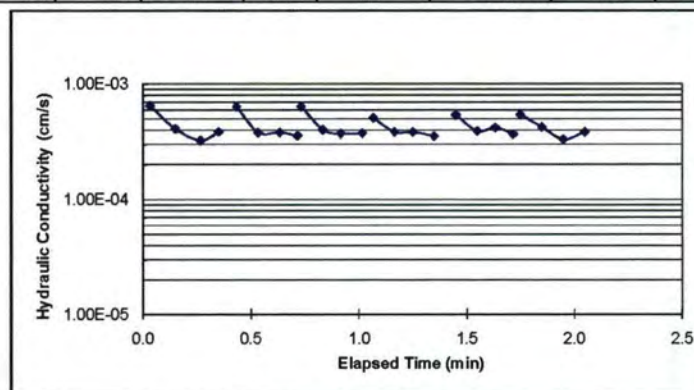
ASTM D 5084 - 00

Sample I.D.			305-mm East Side North Pit 0-30 cm			Test Date :		
Cell Pressure = 42.0 psi			Diameter of Sample, D = 30.5 cm					
Inflow Pressure = 41.0 psi			Length of Sample, L = 17.5 cm					
Outflow Pressre = 40.0 psi			Area of Sample, A = 729.66 cm ²					
Pressure Difference = 1.0 psi			Sample Volume, V = 12741.7 cm ³					
Effective Stress = 1.5 psi			a _{in} = 1 cm ²					
Hydraulic Gradient, i = 4.0			a _{out} = 1 cm ²					
Weight of wet sample = 24584.6 g			Sample Water Content = 16.6% (%)					
Wet Density = 1.9 g/cm ³			Dry Density = 1.93 g/cm ³					

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	50.94	354.14	310.99	16.59%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	23.7	0.0	23.7	0.0				
0:00:02	5.0	19.0	2.0	14.0	0.0	6.51E-04	0.9	5	4.7
0:00:09	14.0	10.0	7.0	-4.0	0.2	4.10E-04	1.0	9	9
0:00:16	20.0	4.5	7.0	-15.5	0.3	3.25E-04	0.9	6	5.5
0:00:21	24.0	0.3	5.0	-23.7	0.4	3.88E-04	1.1	4	4.2
0:00:00	0.0	24.1	-21.0	24.1	0.4				
0:00:02	5.0	19.5	2.0	14.5	0.4	6.41E-04	0.9	5	4.6
0:00:08	12.5	12.2	6.0	-0.3	0.5	3.82E-04	1.0	7.5	7.3
0:00:14	18.5	6.0	6.0	-12.5	0.6	3.82E-04	1.0	6	6.2
0:00:19	22.5	2.0	5.0	-20.5	0.7	3.56E-04	1.0	4	4
0:00:00	0.0	24.1	-19.0	24.1	0.7				
0:00:02	5.0	19.5	2.0	14.5	0.7	6.41E-04	0.9	5	4.6
0:00:08	12.5	11.5	6.0	-1.0	0.8	4.02E-04	1.1	7.5	8
0:00:13	17.5	6.5	5.0	-11.0	0.9	3.73E-04	1.0	5	5
0:00:19	22.5	1.3	6.0	-21.2	1.0	3.76E-04	1.0	5	5.2
0:00:00	0.0	24.4	-19.0	24.4	1.0				
0:00:04	7.5	17.0	4.0	9.5	1.1	5.12E-04	1.0	7.5	7.4
0:00:10	14.5	10.0	6.0	-4.5	1.2	3.85E-04	1.0	7	7
0:00:15	19.5	5.2	5.0	-14.3	1.3	3.86E-04	1.0	5	4.8
0:00:21	24.0	0.6	6.0	-23.4	1.4	3.53E-04	1.0	4.5	4.6
0:00:00	0.0	24.0	-21.0	24.0	1.4				
0:00:03	6.0	18.0	3.0	12.0	1.5	5.43E-04	1.0	6	6
0:00:09	13.5	10.8	6.0	-2.7	1.6	3.92E-04	1.0	7.5	7.2
0:00:14	19.0	5.4	5.0	-13.6	1.6	4.21E-04	1.0	5.5	5.4
0:00:19	23.0	1.3	5.0	-21.7	1.7	3.69E-04	1.0	4	4.1
0:00:00	0.0	24.0	-19.0	24.0	1.7				
0:00:03	6.0	18.0	3.0	12.0	1.8	5.43E-04	1.0	6	6
0:00:09	14.0	10.2	6.0	-3.8	1.9	4.25E-04	1.0	8	7.8
0:00:15	19.0	5.0	6.0	-14.0	2.0	3.32E-04	1.0	5	5.2
0:00:21	24.0	0.1	6.0	-23.9	2.1	3.85E-04	1.0	5	4.9

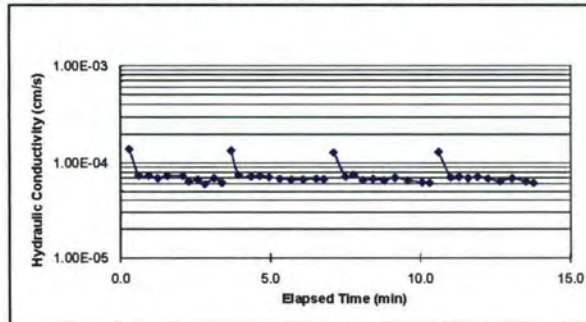


Hydraulic Conductivity Test

ASTM D 5084 - 00

Sample I.D.			East Side North Pit 0-30 cm			Test Date :		
Cell Pressure = 42.0 psi			Diameter of Sample, D = 15.2 cm					
Inflow Pressure = 41.0 psi			Length of Sample, L = 8.3 cm					
Outflow Pressre = 40.0 psi			Area of Sample, A = 182.41 cm ²					
Pressure Difference = 1.0 psi			Sample Volume, V = 1505.8 cm ³					
Effective Stress = 1.5 psi			a _{in} = 1 cm ²					
Hydraulic Gradient, i = 8.5			a _{out} = 1 cm ²					
Weight of wet sample = g			Sample Water Content = -3.8 (%)					
Wet Density = 0.0 g/cm ³			Dry Density = 0.00 g/cm ³					
$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$								
Can #		WT of Can		WT of Can + Wet Soil		WT of Can + Dry Soil		Water Content
		(g)		(g)		(g)		(%)
		30.88		118.21				-3.83

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:17	5.0	19.6	17.0	14.6	0.3	1.40E-04	0.9	5	4.4
0:00:36	7.5	17.0	19.0	9.5	0.6	7.37E-05	1.0	2.5	2.6
0:00:56	10.0	14.5	20.0	4.5	0.9	7.32E-05	1.0	2.5	2.5
0:01:14	12.0	12.5	18.0	0.5	1.2	6.91E-05	1.0	2	2
0:01:33	14.0	10.3	19.0	-3.7	1.6	7.28E-05	1.1	2	2.2
0:02:04	17.0	7.0	31.0	-10.0	2.1	7.25E-05	1.1	3	3.3
0:02:16	18.0	6.0	12.0	-12.0	2.3	6.36E-05	1.0	1	1
0:02:34	19.5	4.5	18.0	-15.0	2.6	6.64E-05	1.0	1.5	1.5
0:02:48	20.5	3.5	14.0	-17.0	2.8	5.95E-05	1.0	1	1
0:03:07	22.0	2.0	19.0	-20.0	3.1	6.90E-05	1.0	1.5	1.5
0:03:22	23.0	1.0	15.0	-22.0	3.4	6.12E-05	1.0	1	1
0:00:00	0.0	24.0	-202.0	24.0	3.4				
0:00:17	5.0	19.9	17.0	14.9	3.7	1.35E-04	0.8	5	4.1
0:00:32	7.0	17.8	15.0	10.8	3.9	7.44E-05	1.1	2	2.1
0:00:57	10.0	14.6	25.0	4.6	4.4	7.20E-05	1.1	3	3.2
0:01:14	12.0	12.6	17.0	0.6	4.6	7.30E-05	1.0	2	2
0:01:33	14.0	10.5	19.0	-3.5	5.0	7.09E-05	1.1	2	2.1
0:01:54	16.0	8.4	21.0	-7.6	5.3	6.82E-05	1.1	2	2.1
0:02:17	18.0	6.3	23.0	-11.7	5.7	6.65E-05	1.1	2	2.1
0:02:41	20.0	4.3	24.0	-15.7	6.1	6.66E-05	1.0	2	2
0:03:07	22.0	2.2	26.0	-19.8	6.5	6.79E-05	1.1	2	2.1
0:03:22	23.0	1.0	15.0	-22.0	6.8	6.71E-05	1.2	1	1.2
0:00:00	0.0	24.0	-202.0	24.0	6.8				
0:00:18	5.0	19.8	18.0	14.8	7.1	1.29E-04	0.8	5	4.2
0:00:42	8.0	16.6	24.0	8.6	7.5	7.13E-05	1.1	3	3.2
0:00:58	10.0	14.5	16.0	4.5	7.8	7.54E-05	1.1	2	2.1
0:01:17	12.0	12.5	19.0	0.5	8.1	6.54E-05	1.0	2	2
0:01:37	14.0	10.4	20.0	-3.6	8.4	6.75E-05	1.1	2	2.1
0:01:58	16.0	8.3	22.0	-7.7	8.8	6.52E-05	1.1	2	2.1
0:02:21	18.0	6.2	22.0	-11.8	9.2	6.96E-05	1.1	2	2.1
0:02:47	20.0	4.0	26.0	-16.0	9.6	6.48E-05	1.1	2	2.2
0:03:15	22.0	2.0	28.0	-20.0	10.1	6.18E-05	1.0	2	2
0:03:30	23.0	1.0	15.0	-22.0	10.3	6.12E-05	1.0	1	1
0:00:00	0.0	24.0	-210.0	24.0	10.3				
0:00:18	5.0	19.7	18.0	14.7	10.6	1.30E-04	0.9	5	4.3
0:00:42	8.0	16.6	24.0	8.6	11.0	7.02E-05	1.0	3	3.1
0:00:58	10.0	14.5	17.0	4.5	11.3	7.10E-05	1.1	2	2.1
0:01:17	12.0	12.5	18.0	0.5	11.6	6.91E-05	1.0	2	2
0:01:36	14.0	10.4	19.0	-3.6	11.9	7.10E-05	1.1	2	2.1
0:01:57	16	8.3	21.0	-7.7	12.3	6.83E-05	1.1	2	2.1
0:02:21	18.0	6.2	24.0	-11.8	12.7	6.38E-05	1.1	2	2.1
0:02:45	20.0	4.1	24.0	-15.9	13.1	6.85E-05	1.1	2	2.1
0:03:13	22.0	2.0	28.0	-20.0	13.5	6.33E-05	1.1	2	2.1
0:03:28	23.0	1.0	15.0	-22.0	13.8	6.12E-05	1.0	1	1



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

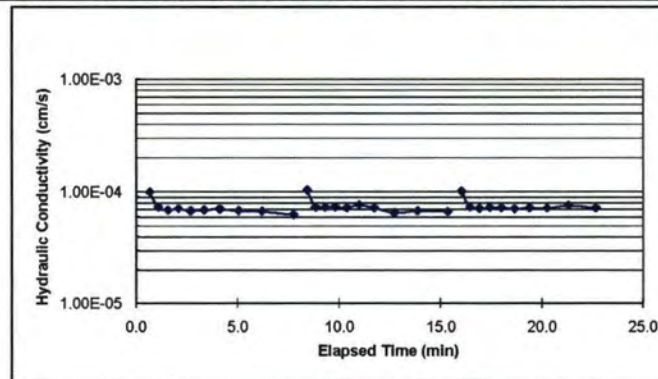
ASTM D 5084 - 00

Sample I.D. 150-mm East Side North Pit 0-30 cm				Test Date :			
Cell Pressure =	41.7	psi		Diameter of Sample, D =	15.6	cm	
Inflow Pressure =	40.5	psi		Length of Sample, L =	8.3	cm	
Outflow Pressure =	40.0	psi		Area of Sample, A =	190.09	cm ²	
Pressure Difference =	0.5	psi		Sample Volume, V =	1569.2	cm ³	
Effective Stress =	1.5	psi		a _{in} =	1	cm ²	
Hydraulic Gradient, i =	4.3			a _{out} =	1	cm ²	
Weight of wet sample =		g		Sample Water Content =	#DIV/0!	(%)	
Wet Density =	0.0	g/cm ³		Dry Density =	#DIV/0!	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
				#DIV/0!

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:39	5.0	19.3	39.0	14.3	0.7	9.97E-05	0.9	5	4.7
0:01:04	7.0	17.3	25.0	10.3	1.1	7.32E-05	1.0	2	2
0:01:33	9.0	15.3	29.0	6.3	1.6	6.90E-05	1.0	2	2
0:02:04	11.0	13.3	31.0	2.3	2.1	7.11E-05	1.0	2	2
0:02:40	13.0	11.3	36.0	-1.7	2.7	6.81E-05	1.0	2	2
0:03:20	15.0	9.3	40.0	-5.7	3.3	6.91E-05	1.0	2	2
0:04:06	17.0	7.2	46.0	-9.8	4.1	7.07E-05	1.1	2	2.1
0:05:02	19.0	5.1	56.0	-13.9	5.0	6.84E-05	1.1	2	2.1
0:06:11	21.0	3.0	69.0	-18.0	6.2	6.74E-05	1.1	2	2.1
0:07:45	23.0	0.9	94.0	-22.1	7.8	6.30E-05	1.1	2	2.1
0:00:00	0.0	24.0	-465.0	24.0	7.8				
0:00:37	5.0	19.4	37.0	14.4	8.4	1.04E-04	0.9	5	4.6
0:01:02	7.0	17.4	25.0	10.4	8.8	7.31E-05	1.0	2	2
0:01:30	9.0	15.3	28.0	6.3	9.3	7.31E-05	1.1	2	2.1
0:02:00	11.0	13.3	30.0	2.3	9.8	7.34E-05	1.0	2	2
0:02:34	13.0	11.3	34.0	-1.7	10.4	7.21E-05	1.0	2	2
0:03:11	15.0	9.2	37.0	-5.8	11.0	7.67E-05	1.1	2	2.1
0:03:55	17.0	7.2	44.0	-9.8	11.7	7.23E-05	1.0	2	2
0:04:55	19.0	5.0	60.0	-14.0	12.7	6.55E-05	1.1	2	2.2
0:06:04	21.0	2.9	69.0	-18.1	13.9	6.78E-05	1.1	2	2.1
0:07:33	23.0	0.8	89.0	-22.2	15.4	6.70E-05	1.1	2	2.1
0:00:00	0.0	24.0	-453.0	24.0	15.4				
0:00:38	5.0	19.4	38.0	14.4	16.0	1.01E-04	0.9	5	4.6
0:01:03	7.0	17.4	25.0	10.4	16.5	7.31E-05	1.0	2	2
0:01:31	9.0	15.4	28.0	6.4	16.9	7.13E-05	1.0	2	2
0:02:02	11.0	13.3	31.0	2.3	17.4	7.27E-05	1.1	2	2.1
0:02:36	13.0	11.3	34.0	-1.7	18.0	7.21E-05	1.0	2	2
0:03:15	15.0	9.3	39.0	-5.7	18.7	7.09E-05	1.0	2	2
0:04:00	17.0	7.2	45.0	-9.8	19.4	7.23E-05	1.1	2	2.1
0:04:52	19.0	5.2	52.0	-13.8	20.3	7.17E-05	1.0	2	2
0:05:55	21.0	3.0	63.0	-18.0	21.3	7.54E-05	1.1	2	2.2
0:07:15	23.0	1.0	80.0	-22.0	22.7	7.20E-05	1.0	2	2

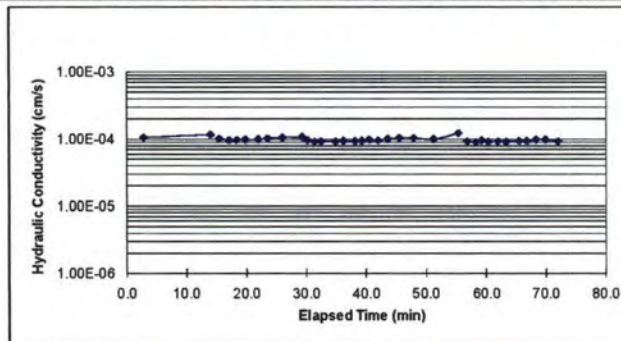


Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

ASTM D 5084 - 00

Sample I.D. 75-mm East Side North Pit 0-30 cm				Test Date :					
Cell Pressure = 42.0 psi				Diameter of Sample, D = 7.0 cm					
Inflow Pressure = 40.7 psi				Length of Sample, L = 4.4 cm					
Outflow Pressre = 40.4 psi				Area of Sample, A = 38.32 cm ²					
Pressure Difference = 0.3 psi				Sample Volume, V = 170.3 cm ³					
Effective Stress = 1.5 psi				a _{in} = 1 cm ²					
Hydraulic Gradient, i = 4.7				a _{out} = 1 cm ²					
Weight of wet sample = 361.2 g				Sample Water Content = 21.94% (%)					
Wet Density = 2.1 g/cm ³				Dry Density = 2.12 g/cm ³					
$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$									
Can #		WT of Can		WT of Can + Wet Soil		WT of Can + Dry Soil		Water Content	
		(g)		(g)		(g)		(%)	
		30.77		143.59		123.29		21.94%	

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:02:48	6.0	18.1	168.0	12.1	2.8	1.06E-04	1.0	6	5.9
0:13:58	18.3	5.8	670.0	-12.5	14.0	1.17E-04	1.0	12.3	12.3
0:00:00	0.0	24.0	-838.0	24.0	14.0				
0:01:23	3.0	20.9	83.0	17.9	15.4	1.02E-04	1.0	2.999039352	3.1
0:03:03	6.0	17.9	100.0	11.9	17.1	9.69E-05	1.0	3	3
0:04:20	8.0	15.9	77.0	7.9	18.3	9.73E-05	1.0	2	2
0:05:47	10.0	13.9	87.0	3.9	19.8	9.89E-05	1.0	2	2
0:07:57	12.5	11.4	130.0	-1.1	22.0	9.96E-05	1.0	2.5	2.5
0:09:29	14.0	9.9	92.0	-4.1	23.5	1.02E-04	1.0	1.5	1.5
0:11:56	16.0	7.9	147.0	-8.1	25.9	1.06E-04	1.0	2	2
0:15:14	18.0	5.9	198.0	-12.1	29.2	1.08E-04	1.0	2	2
0:00:00	0.0	23.9	-914.0	23.9	29.2				
0:00:56	2.0	21.9	56.0	19.9	30.1	9.64E-05	1.0	2	2
0:02:08	4.2	19.7	72.0	15.5	31.3	9.15E-05	1.0	2.2	2.2
0:03:13	6.0	17.9	65.0	11.9	32.4	9.24E-05			
0:05:42	9.5	14.4	149.0	4.9	34.9	9.28E-05	1.0	3.5	3.5
0:06:57	11.0	12.9	75.0	1.9	36.2	9.48E-05	1.0	1.5	1.5
0:08:55	13.0	10.9	118.0	-2.1	38.1	9.39E-05	1.0	2	2
0:10:03	14.0	9.9	68.0	-4.1	39.3	9.49E-05	1.0	1	1
0:11:17	15.0	8.9	74.0	-6.1	40.5	9.81E-05	1.0	1	1
0:12:44	16.0	7.9	87.0	-8.1	41.9	9.54E-05	1.0	1	1
0:14:20	17.0	6.9	96.0	-10.1	43.5	1.01E-04	1.0	1	1
0:16:18	18.0	5.8	118.0	-12.2	45.5	1.04E-04	1.1	1	1.1
0:18:40	19.0	4.8	142.0	-14.2	47.9	1.04E-04	1.0	1	1
0:21:59	20.0	3.8	199.0	-16.2	51.2	9.98E-05	1.0	1	1
0:26:07	21.0	2.8	248.0	-18.2	55.3	1.23E-04	1.0	1	1
0:00:00	0.0	24.0	-1567.0	24.0	55.3				
0:01:29	3.0	21.0	89.0	18.0	56.8	9.30E-05	1.0	3	3
0:02:57	5.5	18.5	88.0	13.0	58.3	9.02E-05	1.0	2.5	2.5
0:03:55	7.0	16.9	58.0	9.9	59.2	9.53E-05	1.1	1.5	1.6
0:05:00	8.5	15.4	65.0	6.9	60.3	9.08E-05	1.0	1.5	1.5
0:06:37	10.5	13.4	97.0	2.9	61.9	9.22E-05	1.0	2	2
0:07:59	12.0	12.0	82.0	0.0	63.3	9.11E-05	0.9	1.5	1.4
0:10:09	14.0	10.0	130.0	-4.0	65.5	9.38E-05	1.0	2	2
0:11:26	15.0	9.0	77.0	-6.0	66.7	9.37E-05	1.0	1	1
0:12:58	16.1	7.9	92.0	-8.2	68.3	9.93E-05	1.0	1.1	1.1
0:14:32	17.0	6.9	94.0	-10.1	69.8	9.83E-05	1.1	0.9	1
0:16:37	18.0	5.9	125.0	-12.1	71.9	9.31E-05	1.0	1	1



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

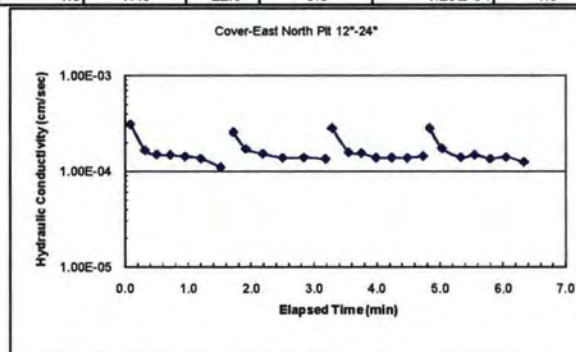
ASTM D 5084 - 00

Sample I.D.	305-mm East Side North Pit 30-60 cm		Test Date :	9/19/07
Cell Pressure =	42.7	psi	Diameter of Sample, D =	30.9 cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	20.3 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	750.1 cm ²
Pressure Difference =	2.4	psi	Sample Volume, V =	15241.4 cm ³
Effective Stress =	1.49	psi	a _{in} =	4 cm ²
Hydraulic Gradient, i =	8.4		a _{out} =	4 cm ²
Weight of wet sample =	24720.8	(g)	Sample Water Content =	6.9 (%)
Wet Density =	1.6	g/cm ³	Dry Density =	1.52 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
NA	NA	NA	NA	6.90

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
9/19/2007 12:00	0.0	24.0	0.0	24.0	0.0				
9/19/2007 12:00	3.0	21.5	5.0	18.5	0.1	3.10E-04	0.8	12	10
9/19/2007 12:00	8.0	18.5	14.0	10.5	0.3	1.67E-04	0.6	20	12
9/19/2007 12:00	11.0	16.0	11.0	5.0	0.5	1.52E-04	0.8	12	10
9/19/2007 12:00	14.0	12.8	13.0	-1.2	0.7	1.50E-04	1.1	12	12.8
9/19/2007 12:00	17.0	9.6	14.0	-7.4	1.0	1.44E-04	1.1	12	12.8
9/19/2007 12:01	20.0	6.5	15.0	-13.5	1.2	1.37E-04	1.0	12	12.4
9/19/2007 12:01	23.0	3.5	19.0	-19.5	1.5	1.11E-04	1.0	12	12
9/19/2007 12:01	24.5	1.0	6.0	-23.5	1.6			6	10
9/19/2007 12:00	0.0	24.0	0.0	24.0	1.6				
9/19/2007 12:00	3.0	21.5	6.0	18.5	1.7	2.58E-04	0.8	12	10
9/19/2007 12:00	7.0	18.4	12.0	11.4	1.9	1.73E-04	0.8	16	12.4
9/19/2007 12:00	11.0	14.3	16.0	3.3	2.2	1.54E-04	1.0	16	16.4
9/19/2007 12:00	15.0	10.0	19.0	-5.0	2.5	1.39E-04	1.1	16	17.2
9/19/2007 12:01	19.0	5.6	20.0	-13.4	2.8	1.41E-04	1.1	16	17.6
9/19/2007 12:01	23.0	1.5	21.0	-21.5	3.2	1.36E-04	1.0	16	16.4
9/19/2007 12:00	0.0	24.0	0.0	24.0	3.2				
9/19/2007 12:00	3.0	21.0	6.0	18.0	3.3	2.82E-04	1.0	12	12
9/19/2007 12:00	8.0	17.3	16.0	9.3	3.6	1.60E-04	0.7	20	14.8
9/19/2007 12:00	11.0	14.2	12.0	3.2	3.7	1.55E-04	1.0	12	12.4
9/19/2007 12:00	14.0	11.0	14.0	-3.0	4.0	1.40E-04	1.1	12	12.8
9/19/2007 12:01	17.0	7.6	15.0	-9.4	4.2	1.40E-04	1.1	12	13.6
9/19/2007 12:01	20.0	4.5	15.0	-15.5	4.5	1.39E-04	1.0	12	12.4
9/19/2007 12:01	23.0	1.4	15.0	-21.6	4.7	1.45E-04	1.0	12	12.4
9/19/2007 12:00	0.0	24.0	0.0	24.0	4.7				
9/19/2007 12:00	3.0	21.0	6.0	18.0	4.8	2.82E-04	1.0	12	12
9/19/2007 12:00	7.0	17.8	12.0	10.8	5.0	1.75E-04	0.8	16	12.8
9/19/2007 12:00	11.0	13.5	18.0	2.5	5.3	1.41E-04	1.1	16	17.2
9/19/2007 12:00	14.0	10.4	13.0	-3.6	5.5	1.49E-04	1.0	12	12.4
9/19/2007 12:01	17.0	7.2	15.0	-9.8	5.8	1.36E-04	1.1	12	12.8
9/19/2007 12:01	20.0	4.0	15.0	-16.0	6.0	1.42E-04	1.1	12	12.8
9/19/2007 12:01	23.0	1.0	17.0	-22.0	6.3	1.26E-04	1.0	12	12



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

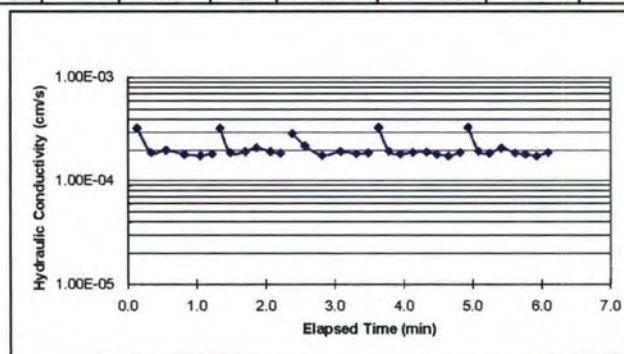
ASTM D 5084 - 00

Sample I.D. 150-mm East Side North Pit 30-60 cm			Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	15.6 cm
Inflow Pressure =	41.0	psi	Length of Sample, L =	9.0 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	190.09 cm ²
Pressure Difference =	1.0	psi	Sample Volume, V =	1714.1 cm ³
Effective Stress =	1.5	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	7.8		a _{out} =	1 cm ²
Weight of wet sample =	3150.2	g	Sample Water Content =	21.24% (%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.83 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	30.79	203.02	172.85	21.24%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:08	5.0	19.2	8.0	14.2	0.1	3.25E-04	1.0	5	4.8
0:00:20	9.0	15.5	12.0	6.5	0.3	1.89E-04	0.9	4	3.7
0:00:33	13.0	11.6	13.0	-1.4	0.6	1.98E-04	1.0	4	3.9
0:00:49	17.0	7.7	16.0	-9.3	0.8	1.80E-04	1.0	4	3.9
0:01:03	20.0	4.7	14.0	-15.3	1.1	1.75E-04	1.0	3	3
0:01:13	22.0	2.6	10.0	-19.4	1.2	1.84E-04	1.1	2	2.1
0:00:00	0.0	24.0	-73.0	24.0	1.2				
0:00:08	5.0	19.2	8.0	14.2	1.3	3.25E-04	1.0	5	4.8
0:00:17	8.0	16.4	9.0	8.4	1.5	1.87E-04	0.9	3	2.8
0:00:30	12.0	12.5	13.0	0.5	1.7	1.93E-04	1.0	4	3.9
0:00:40	15.0	9.5	10.0	-5.5	1.9	2.10E-04	1.0	3	3
0:00:52	18.0	6.5	12.0	-11.5	2.1	1.92E-04	1.0	3	3
0:01:01	20.0	4.5	9.0	-15.5	2.2	1.86E-04	1.0	2	2
0:00:00	0.0	24.0	-61.0	24.0	2.2				
0:00:11	6.0	18.2	11.0	12.2	2.4	2.88E-04	1.0	6	5.8
0:00:22	10.0	14.2	11.0	4.2	2.6	2.20E-04	1.0	4	4
0:00:37	14.0	10.3	15.0	-3.7	2.8	1.77E-04	1.0	4	3.9
0:00:53	18.0	6.2	16.0	-11.8	3.1	1.92E-04	1.0	4	4.1
0:01:07	21.0	3.2	14.0	-17.8	3.3	1.83E-04	1.0	3	3
0:01:17	23.0	1.2	10.0	-21.8	3.5	1.88E-04	1.0	2	2
0:00:00	0.0	24.0	-77.0	24.0	3.5				
0:00:08	5.0	19.0	8.0	14.0	3.6	3.32E-04	1.0	5	5
0:00:17	8.0	16.0	9.0	8.0	3.8	1.94E-04	1.0	3	3
0:00:27	11.0	13.2	10.0	2.2	4.0	1.82E-04	0.9	3	2.8
0:00:38	14.0	10.1	11.0	-3.9	4.1	1.89E-04	1.0	3	3.1
0:00:50	17.0	7.0	12.0	-10.0	4.3	1.90E-04	1.0	3	3.1
0:00:59	19.0	5.0	9.0	-14.0	4.5	1.81E-04	1.0	2	2
0:01:09	21.0	3.0	10.0	-18.0	4.7	1.75E-04	1.0	2	2
0:01:19	23.0	1.0	10.0	-22.0	4.8	1.89E-04	1.0	2	2
0:00:00	0.0	24.0	-79.0	24.0	4.8				
0:00:08	5.0	19.0	8.0	14.0	4.9	3.32E-04	1.0	5	5
0:00:17	8.0	16.0	9.0	8.0	5.1	1.94E-04	1.0	3	3
0:00:27	11.0	13.1	10.0	2.1	5.3	1.86E-04	1.0	3	2.9
0:00:37	14.0	10.0	10.0	-4.0	5.4	2.09E-04	1.0	3	3.1
0:00:49	17.0	7.0	12.0	-10.0	5.6	1.87E-04	1.0	3	3
0:00:58	19.0	5.0	9.0	-14.0	5.8	1.81E-04	1.0	2	2
0:01:08	21.0	3.0	10.0	-18.0	5.9	1.75E-04	1.0	2	2
0:01:18	23.0	1.0	10.0	-22.0	6.1	1.89E-04	1.0	2	2



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

ASTM D 5084 - 00

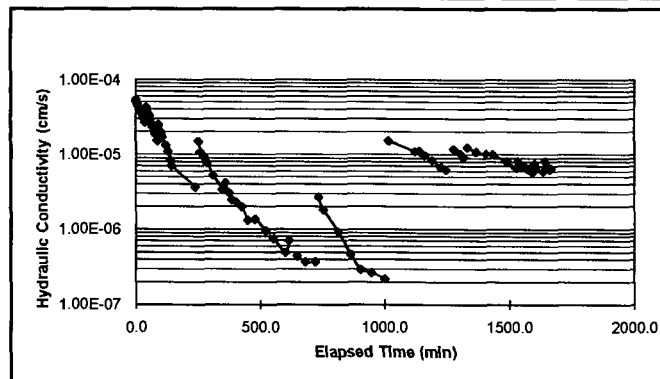
Sample I.D. 75-mm East Side North Pit 30-60 cm			Test Date :	
Cell Pressure =	41.7	psi	Diameter of Sample, D =	7.0 cm
Inflow Pressure =	40.5	psi	Length of Sample, L =	4.6 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	38.32 cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =	175.2 cm ³
Effective Stress =	1.5	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	7.7		a _{out} =	1 cm ²
Weight of wet sample =	319.8	g	Sample Water Content =	23.73% (%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.82 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	30.91	133.8	114.07	23.73%

Date, Time	Inflow	Outflow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:59	1.5	22.4	59.0	20.9	1.0	5.44E-05	1.1	1.5	1.6
0:02:25	3.5	20.4	86.0	16.9	2.4	5.13E-05	1.0	2	2
0:04:01	5.5	18.4	96.0	12.9	4.0	4.97E-05	1.0	2	2
0:06:49	8.5	15.4	168.0	6.9	6.8	4.73E-05	1.0	3	3
0:10:19	11.5	12.4	210.0	0.9	10.3	4.37E-05	1.0	3	3
0:14:48	14.5	9.4	269.0	-5.1	14.8	4.04E-05	1.0	3	3
0:17:35	16.0	7.9	167.0	-8.1	17.6	3.76E-05	1.0	1.5	1.5
0:20:05	17.2	6.7	150.0	-10.5	20.1	3.69E-05	1.0	1.2	1.2
0:26:19	19.6	4.3	374.0	-15.3	26.3	3.45E-05	1.0	2.4	2.4
0:28:11	20.2	3.7	112.0	-16.5	28.2	3.32E-05	1.0	0.6	0.6
0:31:29	21.1	2.8	198.0	-18.3	31.5	3.06E-05	1.0	0.9	0.9
0:35:55	22.2	1.7	266.0	-20.5	35.9	3.13E-05	1.0	1.1	1.1
0:37:28	22.5	1.4	93.0	-21.1	37.5	2.68E-05	1.0	0.3	0.3
0:39:55	23.0	0.9	147.0	-22.1	39.9	2.99E-05	1.0	0.5	0.5
0:00:00	0.0	24.0	-2395.0	24.0	39.9				
0:02:22	3.0	21.3	142.0	18.3	42.3	4.26E-05	0.9	3	2.7
0:05:31	6.0	18.3	189.0	12.3	45.4	3.76E-05	1.0	3	3
0:08:26	8.5	15.8	175.0	7.3	48.3	3.79E-05	1.0	2.5	2.5
0:10:31	10.0	14.3	125.0	4.3	50.4	3.50E-05	1.0	1.5	1.5
0:14:42	12.5	11.7	251.0	-0.8	54.6	3.29E-05	1.0	2.5	2.6
0:18:56	14.5	9.7	254.0	-4.8	58.8	2.91E-05	1.0	2	2
0:22:41	16.0	8.3	225.0	-7.7	62.6	2.66E-05	0.9	1.5	1.4
0:25:43	17.0	7.3	182.0	-9.7	65.6	2.48E-05	1.0	1	1
0:29:16	18.0	6.3	213.0	-11.7	69.2	2.29E-05	1.0	1	1
0:33:29	19.0	5.3	253.0	-13.7	73.4	2.10E-05	1.0	1	1
0:39:47	20.2	4.1	378.0	-16.1	79.7	1.87E-05	1.0	1.2	1.2
0:45:31	21.0	3.3	344.0	-17.7	85.4	1.52E-05	1.0	0.8	0.8
0:00:00	0.0	24.0	-2731.0	24.0	85.4				
0:07:31	5.0	18.8	451.0	13.8	92.9	2.50E-05	1.0	5	5.2
0:11:37	7.0	16.8	246.0	9.8	97.0	2.07E-05	1.0	2	2
0:18:01	9.5	14.3	384.0	4.8	103.4	1.83E-05	1.0	2.5	2.5
0:22:40	11.0	12.7	279.0	1.7	108.1	1.73E-05	1.1	1.5	1.6
0:33:15	13.5	10.3	635.0	-3.2	118.7	1.34E-05	1.0	2.5	2.4
0:43:40	15.2	8.5	625.0	-6.7	129.1	1.11E-05	1.1	1.7	1.8
0:52:43	16.3	7.5	543.0	-8.8	138.1	8.42E-06	0.9	1.1	1
0:57:01	16.7	7.1	258.0	-9.6	142.4	7.12E-06	1.0	0.4	0.4
2:32:41	20.5	3.3	5740.0	-17.2	238.1	3.67E-06	1.0	3.8	3.8
0:00:00	0.0	24.0	-9161.0	24.0	238.1				
0:14:05	5.7	18.3	845.0	12.6	252.2	1.51E-05	1.0	5.7	5.7
0:19:26	7.0	16.9	321.0	9.9	257.5	1.08E-05	1.1	1.3	1.4
0:34:03	9.9	14.0	877.0	4.1	272.2	9.37E-06	1.0	2.9	2.9
0:47:31	11.8	12.0	808.0	0.2	285.6	7.72E-06	1.1	1.9	2
1:12:32	14.0	9.8	1501.0	-4.2	310.6	5.28E-06	1.0	2.2	2.2
1:48:52	15.8	8.0	2180.0	-7.8	347.0	3.38E-06	1.0	1.8	1.8
0:00:00	0.0	24.0	-6532.0	24.0	347.0				
0:11:38	1.3	22.5	698.0	21.2	358.6	4.14E-06	1.2	1.3	1.5
0:26:56	2.6	21.2	918.0	18.6	373.9	3.07E-06	1.0	1.3	1.3
0:39:53	3.5	20.4	777.0	16.9	386.9	2.47E-06	0.9	0.9	0.8
0:54:54	4.4	19.5	901.0	15.1	401.9	2.33E-06	1.0	0.9	0.9
1:19:19	5.6	18.3	1465.0	12.7	426.3	1.99E-06	1.0	1.2	1.2
1:41:57	6.3	17.6	1358.0	11.3	449.0	1.30E-06	1.0	0.7	0.7
2:11:14	7.2	16.7	1757.0	9.5	478.2	1.34E-06	1.0	0.9	0.9

2:54:09	8.1	15.8	2575.0	7.7	521.2	9.53E-07	1.0	0.9	0.9
3:25:16	8.6	15.3	1867.0	6.7	552.3	7.54E-07	1.0	0.5	0.5
4:13:41	9.1	14.8	2905.0	5.7	600.7	4.96E-07	1.0	0.5	0.5
4:27:38	9.3	14.6	837.0	5.3	614.6	7.01E-07	1.0	0.2	0.2
0:00:00	9.0	15.0	-16058.0	6.0	614.6				
0:32:53	9.3	14.7	1973.0	5.4	647.5	4.44E-07	1.0	0.3	0.3
1:06:10	9.6	14.5	1997.0	4.9	680.8	3.70E-07	0.7	0.3	0.2
1:46:24	9.9	14.2	2414.0	4.3	721.0	3.73E-07	1.0	0.3	0.3
0:00:00	0.0	24.0	-6384.0	24.0	721.0				
0:14:02	1.0	22.8	842.0	21.8	735.0	2.68E-06	1.2	1	1.2
0:31:47	1.9	21.9	1065.0	20.0	752.8	1.80E-06	1.0	0.9	0.9
1:32:19	3.4	20.4	3632.0	17.0	813.3	9.18E-07	1.0	1.5	1.5
2:21:36	4.0	19.8	2957.0	15.8	862.6	4.70E-07	1.0	0.6	0.6
3:01:24	4.3	19.5	2388.0	15.2	902.4	2.96E-07	1.0	0.3	0.3
3:45:33	4.6	19.2	2649.0	14.6	946.6	2.70E-07	1.0	0.3	0.3
4:40:05	4.9	18.9	3272.0	14.0	1001.1	2.21E-07	1.0	0.3	0.3
0:00:00	0.0	24.0	-16805.0	24.0	1001.1				
0:12:54	5.3	18.7	774.0	13.4	1014.0	1.52E-05	1.0	5.3	5.3
1:58:50	22.0	1.9	6356.0	-20.1	1119.9	1.10E-05	1.0	16.7	16.8
0:00:00	0.0	24.0	-7130.0	24.0	1119.9				
0:17:20	5.2	18.7	1040.0	13.5	1137.2	1.12E-05	1.0	5.2	5.3
0:38:55	9.8	14.0	1295.0	4.2	1158.8	9.77E-06	1.0	4.6	4.7
1:08:28	14.1	9.7	1773.0	-4.4	1186.4	8.29E-06	1.0	4.3	4.3
1:43:51	17.4	6.4	2123.0	-11.0	1223.8	6.79E-06	1.0	3.3	3.3
2:03:22	17.8	4.0	1171.0	-13.8	1243.3	6.27E-06	6.0	0.4	2.4
0:00:00	0.0	24.0	-7402.0	24.0	1243.3				
0:31:14	9.1	14.8	1874.0	5.7	1274.5	1.18E-05	1.0	9.1	9.2
0:58:02	14.1	9.8	1608.0	-4.3	1301.3	1.04E-05	1.0	5	5
1:11:01	15.8	8.0	779.0	-7.8	1314.3	9.22E-06	1.1	1.7	1.8
0:00:00	0.0	24.0	-4261.0	24.0	1314.3				
0:14:21	4.9	19.1	861.0	14.2	1328.7	1.25E-05	1.0	4.9	4.9
0:50:39	13.0	11.0	2178.0	-2.0	1365.0	1.09E-05	1.0	8.1	8.1
1:29:37	18.5	5.5	2338.0	-13.0	1403.9	1.03E-05	1.0	5.5	5.5
0:00:00	0.0	24.0	-5377.0	24.0	1403.9				
0:27:02	7.0	16.9	1622.0	9.9	1430.9	1.00E-05	1.0	7	7.1
1:24:58	15.4	8.4	3476.0	-7.0	1488.9	8.07E-06	1.0	8.4	8.5
2:02:34	18.5	5.2	2256.0	-13.3	1526.5	6.70E-06	1.0	3.1	3.2
0:00:00	0.0	24.0	-7354.0	24.0	1526.5				
0:06:22	1.5	22.5	382.0	21.0	1532.9	8.13E-06	1.0	1.5	1.5
0:15:25	3.3	20.6	543.0	17.3	1541.9	7.49E-06	1.1	1.8	1.9
0:22:52	4.6	19.3	447.0	14.7	1549.4	6.78E-06	1.0	1.3	1.3
0:30:43	5.9	18.0	471.0	12.1	1557.2	6.78E-06	1.0	1.3	1.3
0:36:20	6.8	17.1	337.0	10.3	1562.8	6.87E-06	1.0	0.9	0.9
0:44:21	8.0	16.0	481.0	8.0	1570.9	6.44E-06	0.9	1.2	1.1
0:54:04	9.3	14.6	583.0	5.3	1580.6	6.61E-06	1.1	1.3	1.4
1:01:46	10.2	13.7	462.0	3.5	1588.3	5.88E-06	1.0	0.9	0.9
1:07:54	10.9	13.0	368.0	2.1	1594.4	5.98E-06	1.0	0.7	0.7
1:12:13	11.5	12.4	259.0	0.9	1598.7	7.54E-06	1.0	0.6	0.6
1:17:17	12.1	11.8	304.0	-0.3	1603.8	6.64E-06	1.0	0.6	0.6
1:48:52	15.1	8.8	1895.0	-6.3	1635.4	5.95E-06	1.0	3	3
0:00:00	0.0	24.0	-6532.0	24.0	1635.4				
0:05:54	1.3	22.5	354.0	21.2	1641.3	8.17E-06	1.2	1.3	1.5
0:16:18	3.3	20.5	624.0	17.2	1651.7	7.04E-06	1.0	2	2
0:24:09	4.6	19.2	471.0	14.6	1659.6	6.45E-06	1.0	1.3	1.3
0:31:01	5.7	18.1	412.0	12.4	1666.4	6.55E-06	1.0	1.1	1.1



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

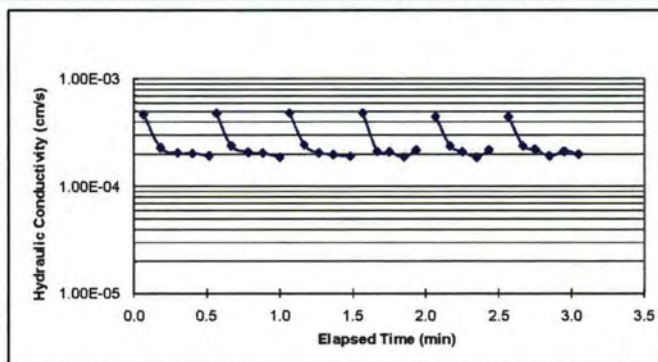
ASTM D 5084 - 00

Sample I.D. 305-mm East Side North Pit 60-90 cm			Test Date :	
Cell Pressure =	42.1	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.0	psi	Length of Sample, L =	17.8 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	1.0	psi	Sample Volume, V =	12973.3 cm ³
Effective Stress =	1.6	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	4.0		a _{out} =	1 cm ²
Weight of wet sample =	23949.6	g	Sample Water Content =	0.0 (%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.85 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	50.25	356.52		

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	23.9	0.0	23.9	0.0				
0:00:04	7.0	17.5	4.0	10.5	0.1	4.67E-04	0.9	7	6.4
0:00:11	12.0	12.5	7.0	0.5	0.2	2.30E-04	1.0	5	5
0:00:18	16.0	8.6	7.0	-7.4	0.3	2.06E-04	1.0	4	3.9
0:00:24	19.0	5.6	6.0	-13.4	0.4	2.03E-04	1.0	3	3
0:00:31	22.0	2.6	7.0	-19.4	0.5	1.94E-04	1.0	3	3
0:00:00	0.0	24.1	-31.0	24.1	0.5				
0:00:04	7.0	17.4	4.0	10.4	0.6	4.77E-04	1.0	7	6.7
0:00:10	11.5	12.9	6.0	1.4	0.7	2.40E-04	1.0	4.5	4.5
0:00:17	15.5	8.8	7.0	-6.7	0.8	2.09E-04	1.0	4	4.1
0:00:23	18.5	5.7	6.0	-12.8	0.9	2.05E-04	1.0	3	3.1
0:00:30	21.5	2.8	7.0	-18.7	1.0	1.88E-04	1.0	3	2.9
0:00:00	0.0	24.1	-30.0	24.1	1.0				
0:00:04	7.0	17.3	4.0	10.3	1.1	4.81E-04	1.0	7	6.8
0:00:10	11.5	12.7	6.0	1.2	1.2	2.43E-04	1.0	4.5	4.6
0:00:16	15.0	9.3	6.0	-5.7	1.3	2.06E-04	1.0	3.5	3.4
0:00:22	18.0	6.3	6.0	-11.7	1.4	1.98E-04	1.0	3	3
0:00:29	21.0	3.2	7.0	-17.8	1.5	1.91E-04	1.0	3	3.1
0:00:00	0.0	24.0	-29.0	24.0	1.5				
0:00:04	7.0	17.2	4.0	10.2	1.6	4.82E-04	1.0	7	6.8
0:00:10	11.0	13.2	6.0	2.2	1.7	2.12E-04	1.0	4	4
0:00:15	14.0	10.2	5.0	-3.8	1.8	2.10E-04	1.0	3	3
0:00:21	17.0	7.3	6.0	-9.7	1.9	1.89E-04	1.0	3	2.9
0:00:26	19.5	4.6	5.0	-14.9	1.9	2.19E-04	1.1	2.5	2.7
0:00:00	0.0	24.0	-26.0	24.0	2.0				
0:00:04	6.5	17.7	4.0	11.2	2.1	4.44E-04	1.0	6.5	6.3
0:00:10	11.0	13.2	6.0	2.2	2.2	2.38E-04	1.0	4.5	4.5
0:00:15	14.0	10.2	5.0	-3.8	2.3	2.10E-04	1.0	3	3
0:00:21	17.0	7.3	6.0	-9.7	2.4	1.89E-04	1.0	3	2.9
0:00:26	19.5	4.6	5.0	-14.9	2.4	2.19E-04	1.1	2.5	2.7
0:00:00	0.0	24.1	-26.0	24.1	2.5				
0:00:04	6.5	17.8	4.0	11.3	2.6	4.44E-04	1.0	6.5	6.3
0:00:10	11.0	13.3	6.0	2.3	2.7	2.37E-04	1.0	4.5	4.5
0:00:15	14.0	10.0	5.0	-4.0	2.8	2.21E-04	1.1	3	3.3
0:00:21	17.0	7.0	6.0	-10.0	2.9	1.93E-04	1.0	3	3
0:00:27	20.0	4.0	6.0	-16.0	3.0	2.13E-04	1.0	3	3
0:00:33	22.5	1.4	6.0	-21.1	3.1	2.00E-04	1.0	2.5	2.6

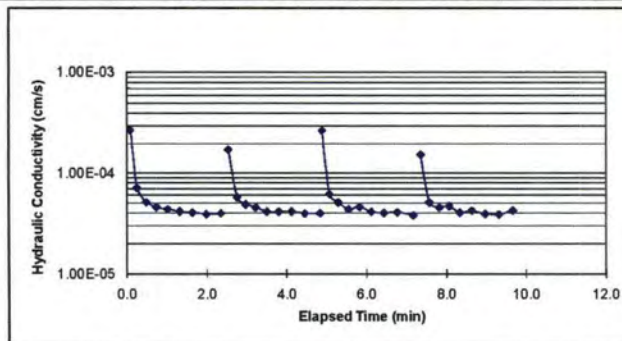


Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

Sample I.D. 305-mm East Side South Pit 0-30 cm					Test Date :				
Cell Pressure = 42.0 psi					Diameter of Sample, D = 30.5 cm				
Inflow Pressure = 41.0 psi					Length of Sample, L = 19.1 cm				
Outflow Pressure = 40.0 psi					Area of Sample, A = 729.66 cm ²				
Pressure Difference = 1.0 psi					Sample Volume, V = 13900.0 cm ³				
Effective Stress = 1.5 psi					a _{in} = 1 cm ²				
Hydraulic Gradient, i = 3.7					a _{out} = 1 cm ²				
Weight of wet sample = 23400.1 g					Sample Water Content = 8.41% (%)				
Wet Density = 1.7 g/cm ³					Dry Density = 1.68 g/cm ³				

$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$					Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
						(g)	(g)	(g)	(%)
						50.36	433.12	403.42	8.41%

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:05	5.3	20.0	5.0	14.7	0.1	2.71E-04	0.8	5.3	4
0:00:15	7.8	18.0	10.0	10.2	0.3	7.10E-05	0.8	2.5	2
0:00:29	10.1	16.0	14.0	5.9	0.5	5.12E-05	0.9	2.3	2
0:00:44	12.0	14.0	15.0	2.0	0.7	4.57E-05	1.1	1.9	2
0:01:01	13.8	11.8	17.0	-2.0	1.0	4.37E-05	1.2	1.8	2.2
0:01:19	15.8	10.0	18.0	-5.8	1.3	4.15E-05	0.9	2	1.8
0:01:38	17.5	8.0	19.0	-9.5	1.6	4.06E-05	1.2	1.7	2
0:01:59	19.2	6.0	21.0	-13.2	2.0	3.90E-05	1.2	1.7	2
0:02:21	20.9	4.0	22.0	-16.9	2.4	3.97E-05	1.2	1.7	2
0:00:00	0.0	24.0	-141.0	24.0	2.4				
0:00:08	5.5	20.0	8.0	14.5	2.5	1.73E-04	0.7	5.5	4
0:00:21	8.0	17.8	13.0	9.8	2.8	5.72E-05	0.9	2.5	2.2
0:00:34	10.0	16.0	13.0	6.0	3.0	4.88E-05	0.9	2	1.8
0:00:49	11.9	14.0	15.0	2.1	3.2	4.56E-05	1.1	1.9	2
0:01:06	13.7	12.0	17.0	-1.7	3.5	4.14E-05	1.1	1.8	2
0:01:24	15.5	10.0	18.0	-5.5	3.8	4.13E-05	1.1	1.8	2
0:01:43	17.3	8.0	19.0	-9.3	4.1	4.15E-05	1.1	1.8	2
0:02:03	18.9	6.0	20.0	-12.9	4.5	3.97E-05	1.3	1.6	2
0:02:26	20.8	4.0	23.0	-16.8	4.8	3.99E-05	1.1	1.9	2
0:00:00	0.0	24.0	-146.0	24.0	4.8				
0:00:05	5.2	20.0	5.0	14.8	4.9	2.68E-04	0.8	5.2	4
0:00:16	7.5	18.0	11.0	10.5	5.1	6.15E-05	0.9	2.3	2
0:00:29	9.5	16.0	13.0	6.5	5.3	5.10E-05	1.0	2	2
0:00:45	11.5	14.0	16.0	2.5	5.6	4.36E-05	1.0	2	2
0:01:01	13.5	12.0	16.0	-1.5	5.8	4.61E-05	1.0	2	2
0:01:19	15.3	10.0	18.0	-5.3	6.1	4.12E-05	1.1	1.8	2
0:01:38	17.0	8.0	19.0	-9.0	6.4	4.02E-05	1.2	1.7	2
0:01:58	18.7	6.0	20.0	-12.7	6.8	4.06E-05	1.2	1.7	2
0:02:22	20.6	4.0	24.0	-16.6	7.2	3.81E-05	1.1	1.9	2
0:00:00	0.0	24.0	-142.0	24.0	7.2				
0:00:09	5.5	20.0	9.0	14.5	7.4	1.54E-04	0.7	5.5	4
0:00:22	7.7	18.0	13.0	10.3	7.6	5.10E-05	0.9	2.2	2
0:00:37	9.8	16.0	15.0	6.2	7.8	4.54E-05	1.0	2.1	2
0:00:52	11.8	14.0	15.0	2.2	8.1	4.67E-05	1.0	2	2
0:01:08	13.3	12.0	16.0	-1.3	8.3	4.04E-05	1.3	1.5	2
0:01:26	15.2	10.0	18.0	-5.2	8.6	4.22E-05	1.1	1.9	2
0:01:46	17.0	8.0	20.0	-9.0	9.0	3.92E-05	1.1	1.8	2
0:02:07	18.7	6.0	21.0	-12.7	9.3	3.87E-05	1.2	1.7	2
0:02:28	20.5	4.0	21.0	-16.5	9.7	4.24E-05	1.1	1.8	2



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

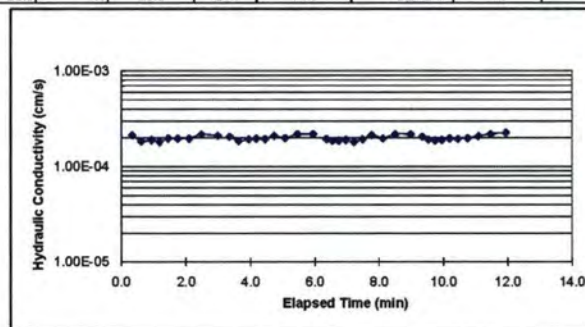
ASTM D 5084 - 00

Sample I.D. 150-mm East Side South Pit 0-30 cm			Test Date :	
Cell Pressure =	41.7	psi	Diameter of Sample, D =	15.6 cm
Inflow Pressure =	40.5	psi	Length of Sample, L =	9.3 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	190.09 cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =	1762.4 cm ³
Effective Stress =	1.5	psi	a_{in} =	1 cm ²
Hydraulic Gradient, i =	3.8		a_{out} =	1 cm ²
Weight of wet sample =	3330.7	g	Sample Water Content =	19.61% (%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.89 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	25.02	157.61	135.87	19.61%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:20	5.0	19.5	20.0	14.5	0.3	2.13E-04	0.9	5	4.5
0:00:37	8.0	16.5	17.0	8.5	0.6	1.85E-04	1.0	3	3
0:00:56	11.0	13.5	19.0	2.5	0.9	1.90E-04	1.0	3	3
0:01:11	13.0	11.5	15.0	-1.5	1.2	1.83E-04	1.0	2	2
0:01:27	15.0	9.4	16.0	-5.6	1.5	1.98E-04	1.1	2	2.1
0:01:45	17.0	7.4	18.0	-9.6	1.8	1.97E-04	1.0	2	2
0:02:06	19.0	5.4	21.0	-13.6	2.1	1.98E-04	1.0	2	2
0:02:29	21.0	3.4	23.0	-17.6	2.5	2.18E-04	1.0	2	2
0:02:59	23.0	1.4	30.0	-21.6	3.0	2.10E-04	1.0	2	2
0:00:00	0.0	24.0	-179.0	24.0	3.0				
0:00:21	5.0	19.4	21.0	14.4	3.4	2.06E-04	0.9	5	4.6
0:00:38	8.0	16.4	17.0	8.4	3.6	1.85E-04	1.0	3	3
0:00:57	11.0	13.3	19.0	2.3	4.0	1.94E-04	1.0	3	3.1
0:01:11	13.0	11.3	14.0	-1.7	4.2	1.97E-04	1.0	2	2
0:01:27	15.0	9.3	16.0	-5.7	4.5	1.94E-04	1.0	2	2
0:01:44	17.0	7.3	17.0	-9.7	4.7	2.09E-04	1.0	2	2
0:02:05	19.0	5.3	21.0	-13.7	5.1	1.98E-04	1.0	2	2
0:02:28	21.0	3.3	23.0	-17.7	5.5	2.19E-04	1.0	2	2
0:02:57	23.0	1.3	29.0	-21.7	6.0	2.19E-04	1.0	2	2
0:00:00	0.0	24.0	-177.0	24.0	6.0				
0:00:22	5.0	19.5	22.0	14.5	6.4	1.94E-04	0.9	5	4.5
0:00:33	7.0	17.5	11.0	10.5	6.6	1.86E-04	1.0	2	2
0:00:45	9.0	15.5	12.0	6.5	6.8	1.86E-04	1.0	2	2
0:00:58	11.0	13.5	13.0	2.5	7.0	1.89E-04	1.0	2	2
0:01:13	13.0	11.5	15.0	-1.5	7.2	1.83E-04	1.0	2	2
0:01:29	15.0	9.5	16.0	-5.5	7.5	1.93E-04	1.0	2	2
0:01:46	17.0	7.4	17.0	-9.6	7.8	2.13E-04	1.1	2	2.1
0:02:07	19.0	5.4	21.0	-13.6	8.1	1.98E-04	1.0	2	2
0:02:30	21.0	3.4	23.0	-17.6	8.5	2.18E-04	1.0	2	2
0:02:59	23.0	1.4	29.0	-21.6	9.0	2.17E-04	1.0	2	2
0:00:00	0.0	24.0	-179.0	24.0	9.0				
0:00:21	5.0	19.4	21.0	14.4	9.4	2.06E-04	0.9	5	4.6
0:00:32	7.0	17.3	11.0	10.3	9.5	1.91E-04	1.1	2	2.1
0:00:44	9.0	15.3	12.0	6.3	9.7	1.87E-04	1.0	2	2
0:00:57	11.0	13.3	13.0	2.3	10.0	1.90E-04	1.0	2	2
0:01:11	13.0	11.3	14.0	-1.7	10.2	1.97E-04	1.0	2	2
0:01:27	15.0	9.3	16.0	-5.7	10.5	1.94E-04	1.0	2	2
0:01:45	17.0	7.3	18.0	-9.7	10.8	1.98E-04	1.0	2	2
0:02:05	19.0	5.3	20.0	-13.7	11.1	2.08E-04	1.0	2	2
0:02:28	21.0	3.3	23.0	-17.7	11.5	2.19E-04	1.0	2	2
0:02:58	23.0	1.3	28.0	-21.7	11.9	2.27E-04	1.0	2	2



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

ASTM D 5084 - 00

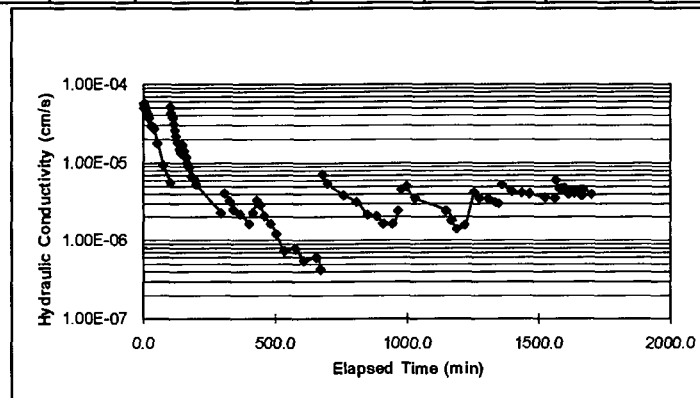
Sample I.D.	75-mm East Side South Pit 0-30 cm	Test Date :
Cell Pressure = 41.8 psi	Diameter of Sample, D = 7.0 cm	
Inflow Pressure = 40.5 psi	Length of Sample, L = 4.4 cm	
Outflow Pressure = 40.2 psi	Area of Sample, A = 38.32 cm ²	
Pressure Difference = 0.3 psi	Sample Volume, V = 170.3 cm ³	
Effective Stress = 1.5 psi	a _{in} = 1 cm ²	
Hydraulic Gradient, i = 4.7	a _{out} = 1 cm ²	
Weight of wet sample = 323.3 g	Sample Water Content = 23.77% (%)	
Wet Density = 1.9 g/cm ³	Dry Density = 1.89 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	30.81	184.46	154.95	23.77%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:03:36	4.3	19.7	216.0	15.4	3.6	5.68E-05	1.0	4.3	4.3
0:04:55	5.5	18.5	79.0	13.0	4.9	4.99E-05	1.0	1.2	1.2
0:06:34	7.0	17.0	99.0	10.0	6.6	5.40E-05	1.0	1.5	1.5
0:09:13	9.0	15.0	159.0	6.0	9.2	5.02E-05	1.0	2	2
0:12:39	11.0	13.0	206.0	2.0	12.7	4.50E-05	1.0	2	2
0:17:02	13.0	11.0	263.0	-2.0	17.0	4.19E-05	1.0	2	2
0:19:53	14.0	10.0	171.0	-4.0	19.9	3.75E-05	1.0	1	1
0:22:48	14.9	9.1	175.0	-5.8	22.8	3.69E-05	1.0	0.9	0.9
0:30:38	16.5	7.5	470.0	-9.0	30.6	2.90E-05	1.0	1.6	1.6
0:36:07	17.4	6.6	329.0	-10.8	36.1	2.84E-05	1.0	0.9	0.9
0:41:22	18.1	5.9	315.0	-12.2	41.4	2.69E-05	1.0	0.7	0.7
0:53:48	19.0	5.0	746.0	-14.0	53.8	1.76E-05	1.0	0.9	0.9
1:16:41	19.7	4.3	1373.0	-15.4	76.7	9.28E-06	1.0	0.7	0.7
1:42:36	20.1	3.9	1555.0	-16.2	102.6	5.64E-06	1.0	0.4	0.4
0:00:00	0.0	24.0	-6156.0	24.0	102.6				
0:02:15	2.5	21.5	135.0	19.0	104.9	5.05E-05	1.0	2.5	2.5
0:04:39	4.5	19.5	144.0	15.0	107.3	4.23E-05	1.0	2	2
0:10:20	8.0	16.0	341.0	8.0	112.9	3.67E-05	1.0	3.5	3.5
0:14:15	9.7	14.3	235.0	4.6	116.9	3.07E-05	1.0	1.7	1.7
0:18:07	11.0	13.1	232.0	2.1	120.7	2.56E-05	0.9	1.3	1.2
0:22:08	12.0	12.1	241.0	0.1	124.7	2.17E-05	1.0	1	1
0:27:25	13.0	11.1	317.0	-1.9	130.0	1.81E-05	1.0	1	1
0:35:02	14.1	10.1	457.0	-4.0	137.6	1.47E-05	0.9	1.1	1
0:42:10	14.9	9.3	428.0	-5.6	144.8	1.33E-05	1.0	0.8	0.8
0:00:00	0.2	23.8	-2530.0	23.6	144.8				
0:05:00	2.0	21.9	300.0	19.9	149.8	1.67E-05	1.1	1.8	1.9
0:10:31	3.6	20.3	331.0	16.7	155.3	1.42E-05	1.0	1.6	1.6
0:16:51	5.0	18.9	380.0	13.9	161.7	1.17E-05	1.0	1.4	1.4
0:22:34	6.0	17.9	343.0	11.9	167.4	9.95E-06	1.0	1	1
0:32:21	7.4	16.5	587.0	9.1	177.2	8.76E-06	1.0	1.4	1.4
0:38:12	8.0	15.9	351.0	7.9	183.0	6.70E-06	1.0	0.6	0.6
0:50:32	9.1	14.8	740.0	5.7	195.3	6.18E-06	1.0	1.1	1.1
0:56:05	9.5	14.4	333.0	4.9	200.9	5.28E-06	1.0	0.4	0.4
2:29:41	12.1	11.9	5616.0	-0.2	294.5	2.26E-06	1.0	2.6	2.5
0:00:00	0.0	24.0	-8981.0	24.0	294.5				
0:13:38	1.2	22.7	818.0	21.5	308.1	4.04E-06	1.1	1.2	1.3
0:33:13	2.5	21.3	1175.0	18.8	327.7	3.23E-06	1.1	1.3	1.4
0:47:10	3.2	20.6	837.0	17.4	341.7	2.48E-06	1.0	0.7	0.7
1:12:04	4.3	19.6	1494.0	15.3	366.6	2.18E-06	0.9	1.1	1
1:49:06	5.4	18.5	2222.0	13.1	403.6	1.63E-06	1.0	1.1	1.1
0:00:00	0.0	24.0	-6546.0	24.0	403.6				
0:12:32	0.7	23.4	752.0	22.7	416.1	2.26E-06	0.9	0.7	0.6
0:27:49	1.8	22.3	917.0	20.5	431.4	3.26E-06	1.0	1.1	1.1
0:41:00	2.6	21.5	791.0	18.9	444.6	2.88E-06	1.0	0.8	0.8
0:55:21	3.2	20.9	861.0	17.7	459.0	2.05E-06	1.0	0.6	0.6
1:20:21	4.0	20.1	1500.0	16.1	484.0	1.63E-06	1.0	0.8	0.8
1:42:23	4.5	19.6	1322.0	15.1	506.0	1.20E-06	1.0	0.5	0.5
2:11:57	4.9	19.2	1774.0	14.3	535.6	7.31E-07	1.0	0.4	0.4

2:54:38	5.5	18.6	2561.0	13.1	578.2	7.81E-07	1.0	0.6	0.6
3:25:45	5.8	18.3	1867.0	12.5	609.4	5.50E-07	1.0	0.3	0.3
4:14:18	6.3	17.8	2913.0	11.5	657.9	6.02E-07	1.0	0.5	0.5
4:28:09	6.4	17.7	831.0	11.3	671.8	4.30E-07	1.0	0.1	0.1
0:00:00	0.0	24.0	-16089.0	24.0	671.8				
0:10:19	1.6	22.3	619.0	20.7	682.1	7.12E-06	1.1	1.6	1.7
0:27:40	3.5	20.3	1041.0	16.8	699.5	5.46E-06	1.1	1.9	2
1:28:15	7.5	16.2	3635.0	8.7	760.1	3.84E-06	1.0	4	4.1
2:17:22	9.7	14.0	2947.0	4.3	809.2	3.14E-06	1.0	2.2	2.2
2:58:23	10.8	12.9	2461.0	2.1	850.2	2.14E-06	1.0	1.1	1.1
3:32:10	11.6	12.1	2027.0	0.5	884.0	2.04E-06	1.0	0.8	0.8
4:00:12	12.1	11.6	1682.0	-0.5	912.0	1.63E-06	1.0	0.5	0.5
4:35:54	12.7	11.0	2142.0	-1.7	947.7	1.63E-06	1.0	0.6	0.6
4:55:00	13.2	10.6	1146.0	-2.6	966.8	2.40E-06	0.8	0.5	0.4
0:00:00	0.0	24	-17700.0	24.0	966.8				
0:12:43	1.3	22.7	763.0	21.4	979.5	4.51E-06	1.0	1.3	1.3
0:00:00	0.0	24.0	-763.0	24.0	979.5				
0:20:04	2.2	21.8	1204.0	19.6	999.6	4.95E-06	1.0	2.2	2.2
0:52:16	4.4	19.5	1932.0	15.1	1031.8	3.52E-06	1.0	2.2	2.3
2:49:45	9.0	14.9	7049.0	5.9	1149.3	2.41E-06	1.0	4.6	4.6
3:09:56	9.5	14.4	1211.0	4.9	1169.4	1.81E-06	1.0	0.5	0.5
3:31:33	9.9	14.0	1297.0	4.1	1191.1	1.40E-06	1.0	0.4	0.4
4:01:27	10.5	13.4	1794.0	2.9	1221.0	1.58E-06	1.0	0.6	0.6
4:36:32	12.2	11.7	2105.0	-0.5	1256.0	4.21E-06	1.0	1.7	1.7
4:55:57	12.9	11.0	1165.0	-1.9	1275.5	3.50E-06	1.0	0.7	0.7
5:29:51	14.0	9.9	2034.0	-4.1	1309.4	3.47E-06	1.0	1.1	1.1
5:56:38	14.7	9.2	1607.0	-5.5	1336.1	3.10E-06	1.0	0.7	0.7
6:09:22	15.0	8.9	764.0	-6.1	1348.9	2.98E-06	1.0	0.3	0.3
0:00:00	0.0	24.0	-22162.0	24.0	1348.9				
0:13:05	1.5	22.4	785.0	20.9	1362.0	5.26E-06	1.1	1.5	1.6
0:49:23	4.7	19.3	2178.0	14.6	1398.3	4.33E-06	1.0	3.2	3.1
1:28:18	7.4	16.5	2335.0	9.1	1437.2	4.16E-06	1.0	2.7	2.8
1:57:04	9.1	14.8	1726.0	5.7	1466.0	4.01E-06	1.0	1.7	1.7
2:55:02	11.7	12.2	3478.0	0.5	1523.9	3.60E-06	1.0	2.6	2.6
3:32:53	13.1	10.8	2271.0	-2.3	1561.8	3.55E-06	1.0	1.4	1.4
0:00:00	0.0	24.0	-12773.0	24.0	1561.8				
0:05:26	0.8	23.3	326.0	22.5	1567.2	6.02E-06	0.9	0.8	0.7
0:17:15	2.0	22.1	709.0	20.1	1579.1	4.63E-06	1.0	1.2	1.2
0:23:48	2.6	21.4	393.0	18.8	1585.6	4.73E-06	1.2	0.6	0.7
0:30:27	3.2	20.8	399.0	17.6	1592.3	4.44E-06	1.0	0.6	0.6
0:00:00	0.0	24.0	-1827.0	24.0	1592.3				
0:05:53	0.7	23.4	353.0	22.7	1598.2	4.81E-06	0.9	0.7	0.6
0:15:10	1.6	22.5	557.0	20.9	1607.5	4.37E-06	1.0	0.9	0.9
0:22:15	2.2	21.9	425.0	19.7	1614.6	3.96E-06	1.0	0.6	0.6
0:30:30	3.0	21.2	495.0	18.2	1622.8	4.39E-06	0.9	0.8	0.7
0:36:13	3.5	20.7	343.0	17.2	1628.5	4.36E-06	1.0	0.5	0.5
0:43:45	4.1	20.1	452.0	16.0	1636.1	4.08E-06	1.0	0.6	0.6
0:55:02	5.0	19.2	677.0	14.2	1647.3	4.26E-06	1.0	0.9	0.9
1:01:44	5.5	18.7	402.0	13.2	1654.0	4.15E-06	1.0	0.5	0.5
1:07:28	5.9	18.2	344.0	12.3	1659.8	4.48E-06	1.3	0.4	0.5
1:12:06	6.2	17.9	278.0	11.7	1664.4	3.78E-06	1.0	0.3	0.3
1:18:42	6.7	17.4	396.0	10.7	1671.0	4.53E-06	1.0	0.5	0.5
1:48:19	8.5	15.6	1777.0	7.1	1700.6	3.92E-06	1.0	1.8	1.8



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

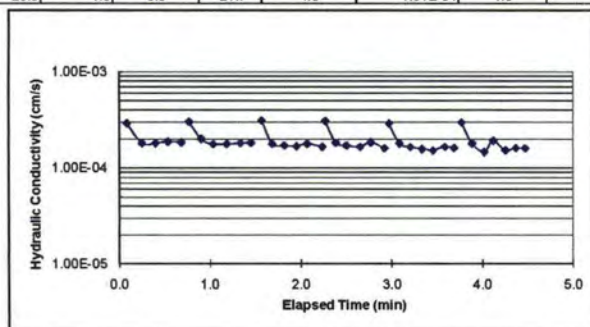
ASTM D 5084 - 00

Sample I.D. 305-mm East Side South Pit 30-60cm			Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.0	psi	Length of Sample, L =	17.8 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	1.0	psi	Sample Volume, V =	12973.3 cm ³
Effective Stress =	1.5	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	4.0		a _{out} =	1 cm ²
Weight of wet sample =	22888.2	g	Sample Water Content =	14.73% (%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.76 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{\Delta H_1}{\Delta H_2} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	35.04	264.2	234.78	14.73%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	23.8	0.0	23.8	0.0				
0:00:05	6.0	19.3	5.0	13.3	0.1	2.88E-04	0.8	6	4.5
0:00:15	11.5	13.3	10.0	1.8	0.3	1.80E-04	1.1	5.5	6
0:00:24	16.0	8.8	9.0	-7.2	0.4	1.80E-04	1.0	4.5	4.5
0:00:32	19.5	5.0	8.0	-14.5	0.5	1.87E-04	1.1	3.5	3.8
0:00:41	23.0	1.4	9.0	-21.6	0.7	1.84E-04	1.0	3.5	3.6
0:00:00	0.0	23.8	-41.0	23.8	0.7				
0:00:04	5.0	20.0	4.0	15.0	0.8	2.99E-04	0.8	5	3.8
0:00:12	10.0	14.5	8.0	4.5	0.9	2.00E-04	1.1	5	5.5
0:00:20	14.0	10.3	8.0	-3.7	1.0	1.77E-04	1.1	4	4.2
0:00:29	18.0	6.1	9.0	-11.9	1.2	1.78E-04	1.1	4	4.2
0:00:38	21.5	2.3	9.0	-19.2	1.3	1.81E-04	1.1	3.5	3.8
0:00:45	24.0	-0.3	7.0	-24.3	1.5	1.83E-04	1.0	2.5	2.6
0:00:00	0.0	24.1	-45.0	24.1	1.5				
0:00:04	5.0	20.0	4.0	15.0	1.6	3.09E-04	0.8	5	4.1
0:00:11	9.0	15.7	7.0	6.7	1.7	1.79E-04	1.1	4	4.3
0:00:19	13.0	11.5	8.0	-1.5	1.8	1.71E-04	1.1	4	4.2
0:00:27	16.5	7.8	8.0	-8.7	2.0	1.68E-04	1.1	3.5	3.7
0:00:34	19.5	4.8	7.0	-14.7	2.1	1.78E-04	1.0	3	3
0:00:44	23.0	1.2	10.0	-21.8	2.2	1.66E-04	1.0	3.5	3.6
0:00:00	0.0	23.9	-44.0	23.9	2.2				
0:00:04	5.0	19.9	4.0	14.9	2.3	3.06E-04	0.8	5	4
0:00:11	9.0	15.4	7.0	6.4	2.4	1.83E-04	1.1	4	4.5
0:00:18	12.5	11.7	7.0	-0.8	2.5	1.72E-04	1.1	3.5	3.7
0:00:27	16.5	7.7	9.0	-8.8	2.7	1.65E-04	1.0	4	4
0:00:34	19.5	4.5	7.0	-15.0	2.8	1.85E-04	1.1	3	3.2
0:00:43	22.5	1.3	9.0	-21.2	2.9	1.61E-04	1.1	3	3.2
0:00:00	0.0	23.9	-43.0	23.9	2.9				
0:00:04	5.0	20.4	4.0	15.4	3.0	2.88E-04	0.7	5	3.5
0:00:11	9.0	16.0	7.0	7.0	3.1	1.79E-04	1.1	4	4.4
0:00:18	12.5	12.5	7.0	0.0	3.2	1.65E-04	1.0	3.5	3.5
0:00:26	16.0	9.1	8.0	-6.9	3.3	1.57E-04	1.0	3.5	3.4
0:00:33	18.5	6.3	7.0	-12.2	3.5	1.52E-04	1.1	2.5	2.8
0:00:41	21.5	3.3	8.0	-18.2	3.6	1.66E-04	1.0	3	3
0:00:47	23.5	1.3	6.0	-22.2	3.7	1.62E-04	1.0	2	2
0:00:00	0.0	24.0	-47.0	24.0	3.7				
0:00:04	5.0	20.3	4.0	15.3	3.8	2.95E-04	0.7	5	3.7
0:00:11	9.0	15.9	7.0	6.9	3.9	1.80E-04	1.1	4	4.4
0:00:19	12.5	12.3	8.0	-0.2	4.0	1.47E-04	1.0	3.5	3.6
0:00:25	15.5	9.0	6.0	-6.5	4.1	1.91E-04	1.1	3	3.3
0:00:33	18.5	5.9	8.0	-12.6	4.3	1.53E-04	1.0	3	3.1
0:00:40	21.0	3.3	7.0	-17.7	4.4	1.61E-04	1.0	2.5	2.6
0:00:46	23.0	1.3	6.0	-21.7	4.5	1.61E-04	1.0	2	2



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

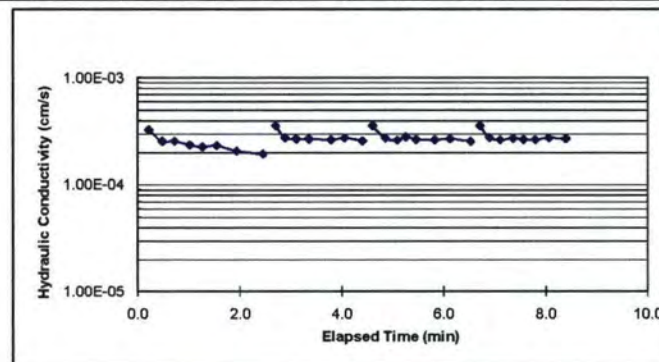
ASTM D 5084 - 00

Sample I.D. 150-mm East Side South Pit 30-60			Test Date :	
Cell Pressure =	41.7	psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	40.5	psi	Length of Sample, L =	8.6 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	182.41 cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =	1563.7 cm ³
Effective Stress =	1.5	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	4.1		a _{out} =	1 cm ²
Weight of wet sample =	2993.3	g	Sample Water Content =	20.66% (%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.91 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	25.06	167.88	143.43	20.66%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:13	5.0	19.2	13.0	14.2	0.2	3.27E-04	1.0	5	4.8
0:00:29	9.0	15.3	16.0	6.3	0.5	2.56E-04	1.0	4	3.9
0:00:43	12.0	12.4	14.0	0.4	0.7	2.58E-04	1.0	3	2.9
0:01:01	15.0	9.5	18.0	-5.5	1.0	2.37E-04	1.0	3	2.9
0:01:16	17.0	7.5	15.0	-9.5	1.3	2.27E-04	1.0	2	2
0:01:33	19.0	5.5	17.0	-13.5	1.6	2.34E-04	1.0	2	2
0:01:56	21.0	3.5	23.0	-17.5	1.9	2.09E-04	1.0	2	2
0:02:27	23.0	1.5	31.0	-21.5	2.5	1.95E-04	1.0	2	2
0:00:00	0.0	24.0	-147.0	24.0	2.5				
0:00:12	5.0	19.1	12.0	14.1	2.7	3.59E-04	1.0	5	4.9
0:00:23	8.0	16.1	11.0	8.1	2.9	2.77E-04	1.0	3	3
0:00:36	11.0	13.1	13.0	2.1	3.1	2.70E-04	1.0	3	3
0:00:51	14.0	10.2	15.0	-3.8	3.4	2.70E-04	1.0	3	2.9
0:01:17	18.0	6.2	26.0	-11.8	3.8	2.66E-04	1.0	4	4
0:01:33	20.0	4.2	16.0	-15.8	4.1	2.76E-04	1.0	2	2
0:01:54	22.0	2.2	21.0	-19.8	4.4	2.59E-04	1.0	2	2
0:00:00	0.0	24.0	-114.0	24.0	4.4				
0:00:12	5.0	19.1	12.0	14.1	4.6	3.59E-04	1.0	5	4.9
0:00:27	9.0	15.2	15.0	6.2	4.9	2.74E-04	1.0	4	3.9
0:00:41	12.0	12.2	14.0	0.2	5.1	2.63E-04	1.0	3	3
0:00:51	14.0	10.2	10.0	-3.8	5.3	2.82E-04	1.0	2	2
0:01:03	16.0	8.2	12.0	-7.8	5.5	2.67E-04	1.0	2	2
0:01:25	19.0	5.2	22.0	-13.8	5.8	2.64E-04	1.0	3	3
0:01:43	21.0	3.2	18.0	-17.8	6.1	2.71E-04	1.0	2	2
0:02:07	23.0	1.2	24.0	-21.8	6.5	2.56E-04	1.0	2	2
0:00:00	0.0	24.0	-127.0	24.0	6.5				
0:00:12	5.0	19.1	12.0	14.1	6.7	3.59E-04	1.0	5	4.9
0:00:23	8.0	16.1	11.0	8.1	6.9	2.77E-04	1.0	3	3
0:00:36	11.0	13.2	13.0	2.2	7.1	2.65E-04	1.0	3	2.9
0:00:51	14.0	10.2	15.0	-3.8	7.4	2.74E-04	1.0	3	3
0:01:03	16.0	8.2	12.0	-7.8	7.6	2.67E-04	1.0	2	2
0:01:17	18.0	6.2	14.0	-11.8	7.8	2.65E-04	1.0	2	2
0:01:33	20.0	4.2	16.0	-15.8	8.1	2.76E-04	1.0	2	2
0:01:53	22.0	2.2	20.0	-19.8	8.4	2.72E-04	1.0	2	2



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

ASTM D 5084 - 00

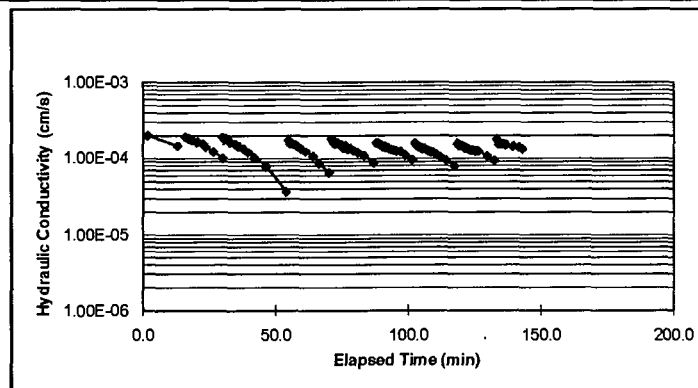
Sample I.D.			75-mm East Side South Pit 30-60 cm			Test Date :		
Cell Pressure = 42.0 psi			Diameter of Sample, D = 7.0 cm					
Inflow Pressure = 40.7 psi			Length of Sample, L = 4.4 cm					
Outflow Pressre = 40.4 psi			Area of Sample, A = 38.32 cm ²					
Pressure Difference = 0.3 psi			Sample Volume, V = 170.3 cm ³					
Effective Stress = 1.5 psi			a _{in} = 1 cm ²					
Hydraulic Gradient, i = 4.7			a _{out} = 1 cm ²					
Weight of wet sample = 335.3 g			Sample Water Content = #DIV/0! (%)					
Wet Density = 2.0 g/cm ³			Dry Density = #DIV/0! g/cm ³					

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
				#DIV/0!

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q_{out} / Q_{in}	Q_{in}	Q_{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:01:44	6.5	17.0	104.0	10.5	1.7	1.98E-04	1.1	6.5	7
0:13:10	19.5	4.0	686.0	-15.5	13.2	1.46E-04	1.0	13	13
0:00:00	0.0	24.0	-790.0	24.0	14.0				
0:01:55	7.0	16.8	115.0	9.8	15.9	1.91E-04	1.0	6.999039352	7.2
0:03:05	10.0	13.7	70.0	3.7	17.1	1.82E-04	1.0	3	3.1
0:04:38	13.0	10.7	93.0	-2.3	18.6	1.73E-04	1.0	3	3
0:06:28	15.5	8.2	110.0	-7.3	20.5	1.63E-04	1.0	2.5	2.5
0:08:37	17.5	6.2	129.0	-11.3	22.6	1.54E-04	1.0	2	2
0:09:40	18.2	5.5	63.0	-12.7	23.7	1.42E-04	1.0	0.7	0.7
0:12:38	19.5	4.2	178.0	-15.3	26.6	1.21E-04	1.0	1.3	1.3
0:16:13	20.4	3.3	215.0	-17.1	30.2	1.00E-04	1.0	0.9	0.9
0:00:00	0.0	23.9	-973.0	23.9	29.2				
0:00:45	3.0	20.8	45.0	17.8	30.0	1.88E-04	1.0	3	3.1
0:01:21	5.0	18.8	36.0	13.8	30.6	1.75E-04	1.0	2	2
0:02:01	7.0	16.7	40.0	9.7	31.2	1.81E-04			
0:03:02	9.5	14.2	61.0	4.7	32.2	1.68E-04	1.0	2.5	2.5
0:03:46	11.0	12.7	44.0	1.7	33.0	1.63E-04	1.0	1.5	1.5
0:05:41	14.0	9.7	115.0	-4.3	34.9	1.54E-04	1.0	3	3
0:07:01	15.5	8.2	80.0	-7.3	36.2	1.43E-04	1.0	1.5	1.5
0:08:47	17.0	6.7	106.0	-10.3	38.0	1.34E-04	1.0	1.5	1.5
0:10:26	18.0	5.7	99.0	-12.3	39.6	1.20E-04	1.0	1	1
0:12:53	19.0	4.7	147.0	-14.3	42.1	1.02E-04	1.0	1	1
0:17:11	20.0	3.7	258.0	-16.3	46.4	7.83E-05	1.0	1	1
0:24:42	20.6	3.1	451.0	-17.5	53.9	3.70E-05	1.0	0.6	0.6
0:00:00	0.0	24.0	-1482.0	24.0	53.9				
0:00:49	3.0	20.9	49.0	17.9	54.7	1.72E-04	1.0	3	3.1
0:01:29	5.0	18.9	40.0	13.9	55.4	1.57E-04	1.0	2	2
0:02:14	7.0	16.9	45.0	9.9	56.1	1.56E-04	1.0	2	2
0:03:07	9.0	14.9	53.0	5.9	57.0	1.51E-04	1.0	2	2
0:04:12	11.0	12.9	65.0	1.9	58.1	1.43E-04	1.0	2	2
0:05:34	13.0	10.9	82.0	-2.1	59.5	1.35E-04	1.0	2	2
0:07:25	15.0	8.9	111.0	-6.1	61.3	1.24E-04	1.0	2	2
0:10:13	17.0	6.9	168.0	-10.1	64.1	1.07E-04	1.0	2	2
0:12:27	18.0	5.9	134.0	-12.1	66.4	8.69E-05	1.0	1	1
0:16:09	19.0	4.9	222.0	-14.1	70.1	6.57E-05	1.0	1	1
0:00:00	0.0	23.9	-969.0	23.9	70.1				
0:00:55	3.5	20.4	55.0	16.9	71.0	1.78E-04	1.0	3.5	3.5
0:01:24	5.0	18.9	29.0	13.9	71.5	1.64E-04	1.0	1.5	1.5
0:02:09	7.0	16.9	45.0	9.9	72.3	1.56E-04	1.0	2	2
0:02:59	9.0	14.9	50.0	5.9	73.1	1.60E-04	1.0	2	2
0:04:00	11.0	12.9	61.0	1.9	74.1	1.52E-04	1.0	2	2
0:04:35	12.0	11.9	35.0	-0.1	74.7	1.51E-04	1.0	1	1
0:05:17	13.0	10.9	42.0	-2.1	75.4	1.38E-04	1.0	1	1
0:06:01	14.0	9.9	44.0	-4.1	76.1	1.47E-04	1.0	1	1
0:06:56	15.0	8.9	55.0	-6.1	77.0	1.32E-04	1.0	1	1
0:07:57	16.0	7.9	61.0	-8.1	78.1	1.36E-04	1.0	1	1
0:09:14	17.0	6.9	77.0	-10.1	79.3	1.26E-04	1.0	1	1
0:10:52	18.0	5.9	98.0	-12.1	81.0	1.19E-04	1.0	1	1
0:13:06	19.0	4.9	134.0	-14.1	83.2	1.09E-04	1.0	1	1
0:16:51	20.0	3.9	225.0	-16.1	87.0	8.67E-05	1.0	1	1

0:00:00	0.0	24.0	-1011.0	24.0	87.0				
0:00:53	3.0	20.9	53.0	17.9	87.9	1.59E-04	1.0	3	3.1
0:01:33	5.0	18.9	40.0	13.9	88.6	1.57E-04	1.0	2	2
0:02:21	7.0	16.8	48.0	9.8	89.4	1.51E-04	1.1	2	2.1
0:03:16	9.0	14.9	55.0	5.9	90.3	1.42E-04	1.0	2	1.9
0:03:47	10.0	13.9	31.0	3.9	90.8	1.44E-04	1.0	1	1
0:04:22	11.0	12.9	35.0	1.9	91.4	1.38E-04	1.0	1	1
0:05:00	12.0	11.9	38.0	-0.1	92.0	1.39E-04	1.0	1	1
0:05:43	13.0	10.9	43.0	-2.1	92.7	1.35E-04	1.0	1	1
0:06:33	14.0	9.9	50.0	-4.1	93.6	1.29E-04	1.0	1	1
0:07:30	15.0	8.9	57.0	-6.1	94.5	1.27E-04	1.0	1	1
0:08:37	16.0	7.9	67.0	-8.1	95.6	1.24E-04	1.0	1	1
0:10:00	17.0	6.8	83.0	-10.2	97.0	1.23E-04	1.1	1	1.1
0:11:47	18.0	5.8	107.0	-12.2	98.8	1.10E-04	1.0	1	1
0:14:22	19.0	4.8	155.0	-14.2	101.4	9.53E-05	1.0	1	1
0:00:00	0.0	24.0	-862.0	24.0	101.4				
0:00:54	3.0	20.8	54.0	17.8	102.3	1.59E-04	1.1	3	3.2
0:01:37	5.0	18.8	43.0	13.8	103.0	1.46E-04	1.0	2	2
0:02:27	7.0	16.8	50.0	9.8	103.9	1.41E-04	1.0	2	2
0:03:26	9.0	14.8	59.0	5.8	104.8	1.36E-04	1.0	2	2
0:04:00	10.0	13.8	34.0	3.8	105.4	1.32E-04	1.0	1	1
0:04:36	11.0	12.8	36.0	1.8	106.0	1.35E-04	1.0	1	1
0:05:17	12.0	11.8	41.0	-0.2	106.7	1.29E-04	1.0	1	1
0:06:04	13.0	10.8	47.0	-2.2	107.5	1.24E-04	1.0	1	1
0:06:58	14.0	9.8	54.0	-4.2	108.4	1.20E-04	1.0	1	1
0:07:59	15.0	8.8	61.0	-6.2	109.4	1.20E-04	1.0	1	1
0:09:14	16.0	7.8	75.0	-8.2	110.6	1.11E-04	1.0	1	1
0:10:49	17.0	6.8	95.0	-10.2	112.2	1.03E-04	1.0	1	1
0:12:55	18.0	5.8	126.0	-12.2	114.3	9.33E-05	1.0	1	1
0:16:01	19.0	4.8	186.0	-14.2	117.4	7.94E-05	1.0	1	1
0:00:00	0.0	24.0	-961.0	24.0	117.4				
0:00:55	3.0	20.8	55.0	17.8	118.3	1.56E-04	1.1	3	3.2
0:01:38	5.0	18.8	43.0	13.8	119.0	1.46E-04	1.0	2	2
0:02:26	7.0	16.8	48.0	9.8	119.8	1.47E-04	1.0	2	2
0:03:23	9.0	14.8	57.0	5.8	120.8	1.41E-04	1.0	2	2
0:03:56	10.0	13.8	33.0	3.8	121.3	1.36E-04	1.0	1	1
0:04:32	11.0	12.8	36.0	1.8	121.9	1.35E-04	1.0	1	1
0:05:12	12.0	11.8	40.0	-0.2	122.6	1.33E-04	1.0	1	1
0:05:58	13.0	10.8	46.0	-2.2	123.4	1.27E-04	1.0	1	1
0:06:49	14.0	9.8	51.0	-4.2	124.2	1.27E-04	1.0	1	1
0:07:48	15.0	8.8	59.0	-6.2	125.2	1.24E-04	1.0	1	1
0:08:55	16.0	7.8	67.0	-8.2	126.3	1.25E-04	1.0	1	1
0:12:18	18.0	5.8	203.0	-12.2	129.7	1.06E-04	1.0	2	2
0:14:57	19.0	4.8	159.0	-14.2	132.4	9.29E-05	1.0	1	1
0:00:00	0.0	24.0	-897.0	24.0	132.4				
0:00:47	3.0	21.0	47.0	18.0	133.2	1.76E-04	1.0	3	3
0:01:28	5.0	19.0	41.0	14.0	133.9	1.53E-04	1.0	2	2
0:02:14	7.0	17.0	46.0	10.0	134.6	1.53E-04	1.0	2	2
0:03:06	9.0	15.0	52.0	6.0	135.5	1.54E-04	1.0	2	2
0:04:08	11.0	13.0	62.0	2.0	136.5	1.49E-04	1.0	2	2
0:07:01	15.0	9.0	173.0	-6.0	139.4	1.43E-04	1.0	4	4
0:09:10	17.0	7.0	129.0	-10.0	141.6	1.38E-04	1.0	2	2
0:10:37	18.0	6.0	87.0	-12.0	143.0	1.32E-04	1.0	1	1



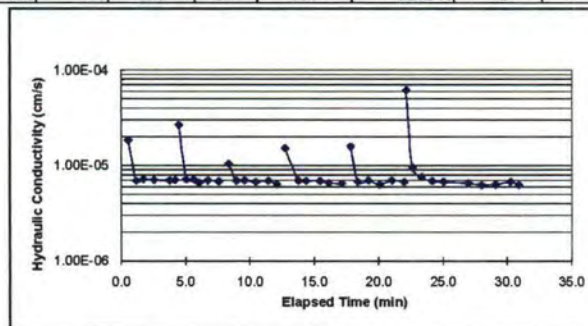
Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

Sample I.D.			305-mm East Side South Pit 60-90 cm			Test Date :		
Cell Pressure = 42.4 psi			Diameter of Sample, D = 30.5 cm			Length of Sample, L = 14.0 cm		
Inflow Pressure = 41.5 psi						Area of Sample, A = 729.66 cm ²		
Outflow Pressre = 40.0 psi			Sample Volume, V = 10193.3 cm ³			a _{in} = 1 cm ²		
Pressure Difference = 1.5 psi			a _{out} = 1 cm ²			Sample Water Content = 22.51% (%)		
Effective Stress = 1.7 psi						Dry Density = 2.02 g/cm ³		
Hydraulic Gradient, i = 7.6								
Weight of wet sample = 20597.5 g								
Wet Density = 2.0 g/cm ³								

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
50	554.13	461.51	22.51%	

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:32	4.0	20.3	32.0	16.3	0.5	1.83E-05	0.9	4	3.7
0:01:10	5.5	18.5	38.0	13.0	1.2	6.92E-06	1.2	1.5	1.8
0:01:43	7.0	17.1	33.0	10.1	1.7	7.19E-06	0.9	1.5	1.4
0:02:33	9.0	14.9	60.0	5.9	2.6	7.09E-06	1.1	2	2.2
0:03:45	12.0	12.2	72.0	0.2	3.8	6.98E-06	0.9	3	2.7
0:04:11	13.0	11.2	26.0	-1.8	4.2	7.03E-06	1.0	1	1
0:00:00	0.0	24.0	-251.0	24.0	4.2				
0:00:16	3.0	21.4	16.0	18.4	4.5	2.65E-05	0.9	3	2.6
0:00:50	4.5	19.8	34.0	15.3	5.0	7.13E-06	1.1	1.5	1.6
0:01:25	6.0	18.2	36.0	12.2	5.6	7.11E-06	1.1	1.5	1.6
0:01:50	7.0	17.2	25.0	10.2	6.0	6.56E-06	1.0	1	1
0:02:31	8.6	15.4	41.0	6.8	6.7	6.96E-06	1.1	1.6	1.8
0:03:22	10.5	13.3	51.0	2.8	7.6	6.81E-06	1.1	1.9	2.1
0:00:00	0.0	24.0	-202.0	24.0	7.6				
0:00:44	3.0	21.0	44.0	18.0	8.3	1.03E-05	1.0	3	3
0:01:20	4.5	19.3	36.0	14.8	8.9	6.98E-06	1.1	1.5	1.7
0:01:57	6.0	17.6	37.0	11.6	9.6	6.98E-06	1.1	1.5	1.7
0:02:49	8.0	15.4	52.0	7.4	10.4	6.72E-06	1.1	2	2.2
0:03:48	10.5	13.2	59.0	2.7	11.4	6.90E-06	0.9	2.5	2.2
0:04:29	12.0	11.8	41.0	-0.2	12.1	6.34E-06	0.9	1.5	1.4
0:00:00	0.0	24.0	-289.0	24.0	12.1				
0:00:37	4.0	20.7	37.0	16.7	12.7	1.50E-05	0.8	4	3.3
0:01:39	6.5	17.8	62.0	11.3	13.8	6.98E-06	1.2	2.5	2.9
0:02:15	8.0	16.3	36.0	8.3	14.4	6.92E-06	1.0	1.5	1.5
0:03:19	10.5	13.7	64.0	3.2	15.4	6.86E-06	1.0	2.5	2.6
0:04:00	12.0	12.2	41.0	0.2	16.1	6.53E-06	1.0	1.5	1.5
0:05:00	14.0	10.0	60.0	-4.0	17.1	6.47E-06	1.1	2	2.2
0:00:00	0.0	24.0	-300.0	24.0	17.1				
0:00:43	4.6	19.8	43.0	15.2	17.8	1.57E-05	0.9	4.6	4.2
0:01:15	6.0	18.5	32.0	12.5	18.4	6.77E-06	0.9	1.4	1.3
0:02:05	8.0	16.3	50.0	8.3	19.2	6.94E-06	1.1	2	2.2
0:02:58	10.0	14.4	53.0	4.4	20.1	6.30E-06	1.0	2	1.9
0:03:54	12.0	12.0	56.0	0.0	21.0	6.99E-06	1.2	2	2.4
0:04:52	14.0	9.8	58.0	-4.2	22.0	6.71E-06	1.1	2	2.2
0:00:00	0.0	24.0	-292.0	24.0	22.0				
0:00:07	3.0	21.3	7.0	18.3	22.1	6.16E-05	0.9	3	2.7
0:00:36	5.0	19.8	29.0	14.8	22.6	9.47E-06	0.8	2	1.5
0:01:18	7.0	17.9	42.0	10.9	23.3	7.51E-06	1.0	2	1.9
0:02:08	9.0	15.8	50.0	6.8	24.1	6.87E-06	1.1	2	2.1
0:03:01	11.0	13.7	53.0	2.7	25.0	6.72E-06	1.1	2	2.1
0:04:57	15.0	9.5	116.0	-5.5	27.0	6.50E-06	1.1	4	4.2
0:05:58	17.0	7.6	61.0	-9.4	28.0	6.24E-06	1.0	2	1.9
0:07:04	19.0	5.5	66.0	-13.5	29.1	6.32E-06	1.1	2	2.1
0:08:14	21.0	3.1	70.0	-17.9	30.2	6.70E-06	1.2	2	2.4
0:08:53	22.0	1.9	39.0	-20.1	30.9	6.24E-06	1.2	1	1.2



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

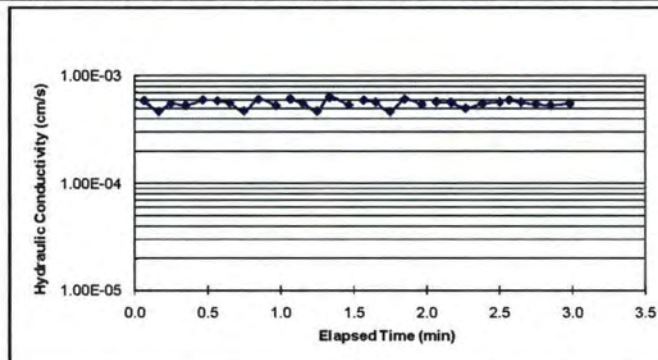
ASTM D 5084 - 00

Sample I.D. 305-mm West Side North Pit 0-30 cm			Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	40.5	psi	Length of Sample, L =	17.8 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =	12973.3 cm ³
Effective Stress =	1.8	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	2.0		a _{out} =	1 cm ²
Weight of wet sample =	24448.5	g	Sample Water Content =	8.10% (%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.88 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	51.12	354.17	331.46	8.10%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	23.8	0.0	23.8	0.0				
0:00:04	5.0	18.5	4.0	13.5	0.1	5.85E-04	1.1	5	5.3
0:00:10	10.0	13.5	6.0	3.5	0.2	4.67E-04	1.0	5	5
0:00:15	14.0	9.7	5.0	-4.3	0.3	5.49E-04	1.0	4	3.8
0:00:21	17.5	6.1	6.0	-11.4	0.4	5.31E-04	1.0	3.5	3.6
0:00:28	21.0	2.7	7.0	-18.3	0.5	5.97E-04	1.0	3.5	3.4
0:00:00	0.0	23.9	-28.0	23.9	0.5				
0:00:04	5.0	18.6	4.0	13.6	0.6	5.84E-04	1.1	5	5.3
0:00:09	10.0	13.6	5.0	3.6	0.7	5.59E-04	1.0	5	5
0:00:15	14.0	9.6	6.0	-4.4	0.8	4.69E-04	1.0	4	4
0:00:21	18.0	5.7	6.0	-12.3	0.9	6.03E-04	1.0	4	3.9
0:00:28	21.0	2.7	7.0	-18.3	1.0	5.30E-04	1.0	3	3
0:00:00	0.0	24.1	-28.0	24.1	1.0				
0:00:04	5.0	18.4	4.0	13.4	1.1	6.06E-04	1.1	5	5.7
0:00:09	10.0	13.5	5.0	3.5	1.2	5.56E-04	1.0	5	4.9
0:00:15	14.0	9.5	6.0	-4.5	1.3	4.71E-04	1.0	4	4
0:00:20	17.5	6.0	5.0	-11.5	1.3	6.31E-04	1.0	3.5	3.5
0:00:28	21.0	2.5	8.0	-18.5	1.5	5.34E-04	1.0	3.5	3.5
0:00:00	0.0	23.9	-28.0	23.9	1.5				
0:00:04	5.0	18.5	4.0	13.5	1.6	5.90E-04	1.1	5	5.4
0:00:09	10.0	13.4	5.0	3.4	1.7	5.67E-04	1.0	5	5.1
0:00:15	14.0	9.5	6.0	-4.5	1.8	4.65E-04	1.0	4	3.9
0:00:21	18.0	5.6	6.0	-12.4	1.9	6.05E-04	1.0	4	3.9
0:00:28	21.0	2.5	7.0	-18.5	2.0	5.43E-04	1.0	3	3.1
0:00:00	0.0	24.0	-28.0	24.0	2.0				
0:00:04	5.0	18.9	4.0	13.9	2.1	5.70E-04	1.0	5	5.1
0:00:10	11.0	13.0	6.0	2.0	2.2	5.64E-04	1.0	6	5.9
0:00:16	15.0	8.9	6.0	-6.1	2.3	4.99E-04	1.0	4	4.1
0:00:23	19.0	5.0	7.0	-14.0	2.4	5.52E-04	1.0	4	3.9
0:00:30	22.0	2.1	7.0	-19.9	2.5	5.69E-04	1.0	3	2.9
0:00:00	0.0	24.0	-30.0	24.0	2.5				
0:00:04	5.0	18.5	4.0	13.5	2.6	5.95E-04	1.1	5	5.5
0:00:09	10.0	13.4	5.0	3.4	2.7	5.67E-04	1.0	5	5.1
0:00:15	14.5	8.8	6.0	-5.7	2.8	5.47E-04	1.0	4.5	4.6
0:00:21	18.0	5.5	6.0	-12.5	2.9	5.33E-04	0.9	3.5	3.3
0:00:29	21.5	2.1	8.0	-19.4	3.0	5.53E-04	1.0	3.5	3.4



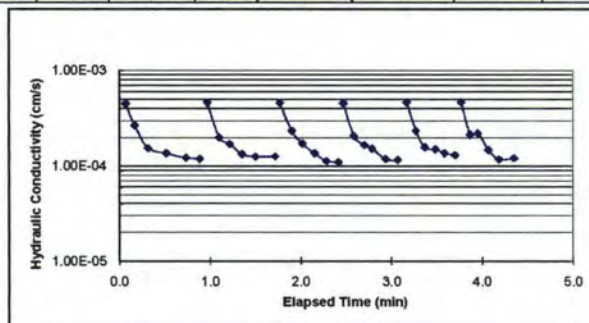
Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

Sample I.D. 305-mm West Side South Pit 0-30 cm		Test Date :	
Cell Pressure =	42.0 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.7 psi	Length of Sample, L =	17.8 cm
Outflow Pressure =	41.0 psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	0.7 psi	Sample Volume, V =	12973.3 cm ³
Effective Stress =	0.6 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	2.8	a _{out} =	1 cm ²
Weight of wet sample =	21912.9 g	Sample Water Content =	6.73% (%)
Wet Density =	1.7 g/cm ³	Dry Density =	1.69 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	50.93	365.08	345.27	6.73%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.1	0.0	24.1	0.0				
0:00:04	5.0	19.0	4.0	14.0	0.1	4.51E-04	1.0	5	5.1
0:00:10	9.0	15.2	6.0	6.2	0.2	2.67E-04	1.0	4	3.8
0:00:19	12.0	12.2	9.0	0.2	0.3	1.55E-04	1.0	3	3
0:00:31	15.0	9.0	12.0	-6.0	0.5	1.36E-04	1.1	3	3.2
0:00:44	17.5	6.2	13.0	-11.3	0.7	1.23E-04	1.1	2.5	2.8
0:00:53	19.0	4.5	9.0	-14.5	0.9	1.19E-04	1.1	1.5	1.7
0:00:00	0.0	24.4	-53.0	24.4	0.9				
0:00:04	5.0	19.0	4.0	14.0	1.0	4.64E-04	1.1	5	5.4
0:00:12	9.0	15.2	6.0	6.2	1.1	2.01E-04	1.0	4	3.8
0:00:19	11.5	12.5	7.0	1.0	1.2	1.71E-04	1.1	2.5	2.7
0:00:27	13.5	10.3	8.0	-3.2	1.4	1.33E-04	1.1	2	2.2
0:00:36	15.5	8.2	9.0	-7.3	1.5	1.26E-04	1.1	2	2.1
0:00:49	18.0	5.4	13.0	-12.6	1.7	1.27E-04	1.1	2.5	2.8
0:00:00	0.0	24.1	-49.0	24.1	1.7				
0:00:04	5.0	18.8	4.0	13.8	1.8	4.61E-04	1.1	5	5.3
0:00:12	9.5	14.3	6.0	4.8	1.9	2.35E-04	1.0	4.5	4.5
0:00:19	12.0	11.7	7.0	-0.3	2.0	1.73E-04	1.0	2.5	2.6
0:00:27	14.0	9.5	8.0	-4.5	2.2	1.37E-04	1.1	2	2.2
0:00:35	15.5	7.8	8.0	-7.7	2.3	1.13E-04	1.1	1.5	1.7
0:00:43	17.0	6.4	8.0	-10.6	2.4	1.10E-04	0.9	1.5	1.4
0:00:00	0.0	24.0	-43.0	24.0	2.4				
0:00:04	5.0	18.8	4.0	13.8	2.5	4.57E-04	1.0	5	5.2
0:00:11	8.5	15.2	7.0	6.7	2.6	2.08E-04	1.0	3.5	3.6
0:00:18	11.0	12.6	7.0	1.6	2.7	1.66E-04	1.0	2.5	2.6
0:00:23	12.5	11.0	5.0	-1.5	2.8	1.53E-04	1.1	1.5	1.6
0:00:32	14.5	9.0	9.0	-5.5	2.9	1.18E-04	1.0	2	2
0:00:40	16.0	7.3	8.0	-8.7	3.1	1.16E-04	1.1	1.5	1.7
0:00:00	0.0	24.1	-40.0	24.1	3.1				
0:00:04	5.0	18.7	4.0	13.7	3.2	4.66E-04	1.1	5	5.4
0:00:10	8.5	15.3	6.0	6.8	3.3	2.36E-04	1.0	3.5	3.4
0:00:16	10.5	13.1	6.0	2.6	3.4	1.58E-04	1.1	2	2.2
0:00:23	12.5	10.8	7.0	-1.7	3.5	1.51E-04	1.2	2	2.3
0:00:29	14.0	9.2	6.0	-4.8	3.6	1.37E-04	1.1	1.5	1.6
0:00:36	15.5	7.5	7.0	-8.0	3.7	1.30E-04	1.1	1.5	1.7
0:00:00	0.0	24.0	-36.0	24.0	3.7				
0:00:04	5.0	18.6	4.0	13.6	3.8	4.67E-04	1.1	5	5.4
0:00:10	8.0	15.3	6.0	7.3	3.9	2.15E-04	1.1	3	3.3
0:00:15	10.5	12.9	5.0	2.4	4.0	2.21E-04	1.0	2.5	2.4
0:00:22	12.5	10.7	7.0	-1.8	4.1	1.48E-04	1.1	2	2.2
0:00:29	14.0	9.1	7.0	-4.9	4.2	1.18E-04	1.1	1.5	1.6
0:00:38	16.0	6.9	10.0	-9.1	4.4	1.21E-04	1.1	2	2.2



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

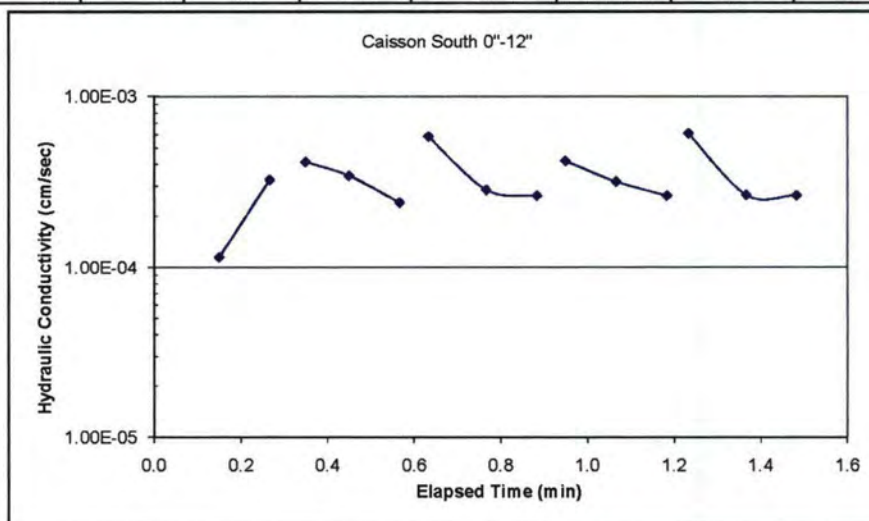
ASTM D 5084 - 00

Sample I.D.			305-mm Cassion South 0-30 cm		Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5	cm	
Inflow Pressure =	41.5	psi	Length of Sample, L =	19.3	cm	
Outflow Pressre =	40.0	psi	Area of Sample, A =	729.66	cm ²	
Pressure Difference =	1.5	psi	Sample Volume, V =	14085.3	cm ³	
Effective Stress =	1.3	psi	a _{in} =	1	cm ²	
Hydraulic Gradient, i =	5.5		a _{out} =	1	cm ²	
Weight of wet sample =	25809.3	g	Sample Water Content =	25.55%	(%)	
Wet Density =	1.8	g/cm ³	Dry Density =	1.83	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	50.93	353.86	292.22	25.55%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.3	0.0	24.3	0.0				
0:00:09	5.0	19.5	9.0	14.5	0.2	1.15E-04	1.0	5	4.8
0:00:16	15.0	10.5	7.0	-4.5	0.3	3.26E-04	0.9	10	9
0:00:00	0.0	23.6	-16.0	23.6	0.3				
0:00:03	6.0	18.0	3.0	12.0	0.4	4.15E-04	0.9	6	5.6
0:00:09	15.0	10.0	6.0	-5.0	0.5	3.45E-04	0.9	9	8
0:00:16	21.0	4.0	7.0	-17.0	0.6	2.40E-04	1.0	6	6
0:00:00	0.0	24.0	-16.0	24.0	0.6				
0:00:02	5.5	18.5	2.0	13.0	0.6	5.87E-04	1.0	5.5	5.5
0:00:10	15.5	9.7	8.0	-5.8	0.8	2.86E-04	0.9	10	8.8
0:00:17	22.0	3.2	7.0	-18.8	0.9	2.64E-04	1.0	6.5	6.5
0:00:00	0.0	24.4	-17.0	24.4	0.9				
0:00:03	6.0	18.6	3.0	12.6	1.0	4.20E-04	1.0	6	5.8
0:00:10	15.5	9.8	7.0	-5.7	1.1	3.18E-04	0.9	9.5	8.8
0:00:17	22.0	3.3	7.0	-18.7	1.2	2.64E-04	1.0	6.5	6.5
0:00:00	0.0	23.7	-17.0	23.7	1.2				
0:00:02	6.0	18.3	2.0	12.3	1.2	6.11E-04	0.9	6	5.4
0:00:10	15.0	9.8	8.0	-5.2	1.4	2.66E-04	0.9	9	8.5
0:00:17	21.5	3.2	7.0	-18.3	1.5	2.65E-04	1.0	6.5	6.6



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

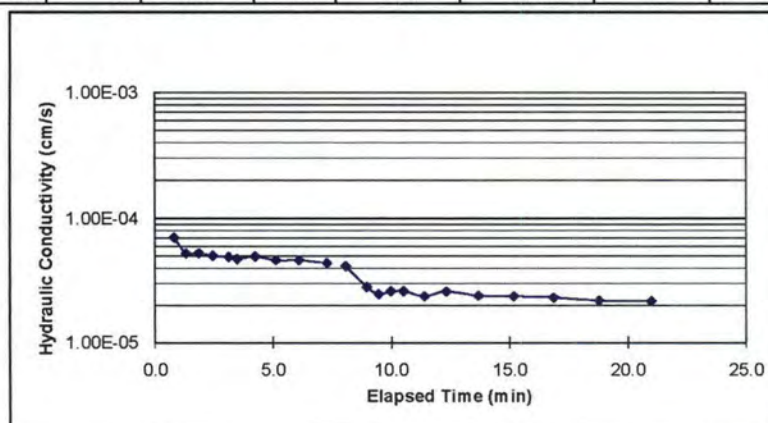
ASTM D 5084 - 00

Sample I.D.		150-mm Caisson South 0-30 cm		Test Date :	
Cell Pressure =	41.6	psi	Diameter of Sample, D =	15.2	cm
Inflow Pressure =	40.7	psi	Length of Sample, L =	8.9	cm
Outflow Pressre =	40.0	psi	Area of Sample, A =	182.41	cm ²
Pressure Difference =	0.7	psi	Sample Volume, V =	1621.7	cm ³
Effective Stress =	1.3	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	5.5		a _{out} =	1	cm ²
Weight of wet sample =	3012.1	g	Sample Water Content =	24.70%	(%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.85	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	30.81	161.79	135.85	24.70%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:48	5.0	19.5	48.0	14.5	0.8	7.05E-05	0.9	5	4.5
0:01:18	7.0	17.5	30.0	10.5	1.3	5.27E-05	1.0	2	2
0:01:50	9.0	15.5	32.0	6.5	1.8	5.28E-05	1.0	2	2
0:02:26	11.0	13.5	36.0	2.5	2.4	5.04E-05	1.0	2	2
0:03:06	13.0	11.5	40.0	-1.5	3.1	4.90E-05	1.0	2	2
0:03:28	14.0	10.5	22.0	-3.5	3.5	4.74E-05	1.0	1	1
0:04:13	16.0	8.5	45.0	-7.5	4.2	4.96E-05	1.0	2	2
0:05:06	18.0	6.5	53.0	-11.5	5.1	4.63E-05	1.0	2	2
0:06:05	20.0	4.5	59.0	-15.5	6.1	4.63E-05	1.0	2	2
0:07:15	22.0	2.5	70.0	-19.5	7.3	4.39E-05	1.0	2	2
0:00:00	0.0	24.0	-435.0	24.0	7.3				
0:00:45	3.0	21.6	45.0	18.6	8.1	4.15E-05	0.8	3	2.4
0:01:38	5.0	19.6	53.0	14.6	8.9	2.79E-05	1.0	2	2
0:02:08	6.0	18.7	30.0	12.7	9.4	2.45E-05	0.9	1	0.9
0:02:39	7.0	17.7	31.0	10.7	10.0	2.58E-05	1.0	1	1
0:03:11	8.0	16.7	32.0	8.7	10.5	2.58E-05	1.0	1	1
0:04:04	9.5	15.3	53.0	5.8	11.4	2.36E-05	0.9	1.5	1.4
0:04:59	11.0	13.7	55.0	2.7	12.3	2.57E-05	1.1	1.5	1.6
0:06:21	13.0	11.7	82.0	-1.3	13.7	2.38E-05	1.0	2	2
0:07:51	15.0	9.7	90.0	-5.3	15.2	2.36E-05	1.0	2	2
0:09:32	17.0	7.7	101.0	-9.3	16.8	2.30E-05	1.0	2	2
0:11:27	19.0	5.8	115.0	-13.2	18.8	2.18E-05	1.0	2	1.9
0:13:40	21.0	3.8	133.0	-17.2	21.0	2.16E-05	1.0	2	2



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

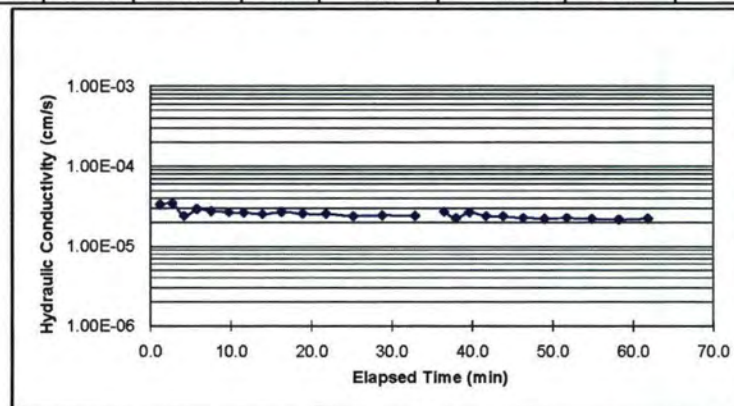
ASTM D 5084 - 00

Sample I.D.		75-mm Caisson South 0 - 30 cm		Test Date :	
Cell Pressure =	41.8	psi	Diameter of Sample, D =	7.0	cm
Inflow Pressure =	40.7	psi	Length of Sample, L =	4.1	cm
Outflow Pressure =	40.4	psi	Area of Sample, A =	38.32	cm ²
Pressure Difference =	0.3	psi	Sample Volume, V =	158.2	cm ³
Effective Stress =	1.3	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	5.1		a _{out} =	1	cm ²
Weight of wet sample =	322.2	g	Sample Water Content =	25.79%	(%)
Wet Density =	2.0	g/cm ³	Dry Density =	2.03	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	25.36	130.36	108.83	25.79%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:01:13	1.0	23.0	73.0	22.0	1.2	3.35E-05	1.0	1	1
0:02:42	2.2	21.8	89.0	19.6	2.7	3.47E-05	1.0	1.2	1.2
0:04:11	3.0	21.0	89.0	18.0	4.2	2.43E-05	1.0	0.8	0.8
0:05:47	4.0	20.0	96.0	16.0	5.8	2.95E-05	1.0	1	1
0:07:34	5.0	19.0	107.0	14.0	7.6	2.79E-05	1.0	1	1
0:09:43	6.1	17.9	129.0	11.8	9.7	2.70E-05	1.0	1.1	1.1
0:11:36	7.0	17.0	113.0	10.0	11.6	2.68E-05	1.0	0.9	0.9
0:13:56	8.0	16.0	140.0	8.0	13.9	2.56E-05	1.0	1	1
0:16:17	9.0	15.0	141.0	6.0	16.3	2.72E-05	1.0	1	1
0:18:56	10.0	14.0	159.0	4.0	18.9	2.60E-05	1.0	1	1
0:21:50	11.0	13.0	174.0	2.0	21.8	2.57E-05	1.0	1	1
0:25:11	12.0	12.0	201.0	0.0	25.2	2.43E-05	1.0	1	1
0:28:49	13.0	11.0	218.0	-2.0	28.8	2.46E-05	1.0	1	1
0:32:53	14.0	10.0	244.0	-4.0	32.9	2.44E-05	1.0	1	1
0:00:00	0.0	24.0	-1973.0	24.0	32.9				
0:03:32	2.3	21.7	212.0	19.4	36.4	2.73E-05	1.0	2.3	2.3
0:05:01	3.0	20.9	89.0	17.9	37.9	2.28E-05	1.1	0.7	0.8
0:06:41	4.0	20.0	100.0	16.0	39.6	2.69E-05	0.9	1	0.9
0:08:44	5.0	19.0	123.0	14.0	41.6	2.43E-05	1.0	1	1
0:10:55	6.0	18.0	131.0	12.0	43.8	2.41E-05	1.0	1	1
0:13:21	7.0	17.0	146.0	10.0	46.3	2.30E-05	1.0	1	1
0:16:00	8.0	16.0	159.0	8.0	48.9	2.25E-05	1.0	1	1
0:18:47	9.0	15.0	167.0	6.0	51.7	2.30E-05	1.0	1	1
0:21:52	10.0	14.0	185.0	4.0	54.8	2.23E-05	1.0	1	1
0:25:16	11.0	13.0	204.0	2.0	58.2	2.19E-05	1.0	1	1
0:28:53	12.0	12.0	217.0	0.0	61.8	2.25E-05	1.0	1	1



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

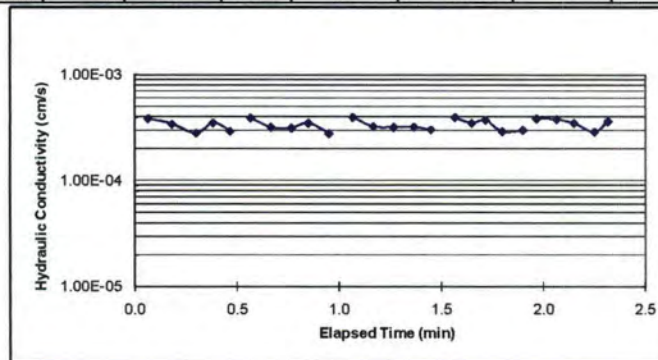
ASTM D 5084 - 00

Sample I.D. 305-mm Caisson South 20-60 cm			Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.0	psi	Length of Sample, L =	18.9 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	1.0	psi	Sample Volume, V =	13807.3 cm ³
Effective Stress =	1.5	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	3.7		a _{out} =	1 cm ²
Weight of wet sample =	19976.1	lb	Sample Water Content =	13.17% (%)
Wet Density =	1.4	g/cm ³	Dry Density =	1.44 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	30.96	161.96	146.71	13.17%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.1	0.0	24.1	0.0				
0:00:04	5.0	18.5	4.0	13.5	0.1	3.86E-04	1.1	5	5.6
0:00:11	12.0	11.4	7.0	-0.6	0.2	3.41E-04	1.0	7	7.1
0:00:18	17.0	6.6	7.0	-10.4	0.3	2.81E-04	1.0	5	4.8
0:00:23	21.0	3.0	5.0	-18.0	0.4	3.52E-04	0.9	4	3.6
0:00:28	24.0	0.4	5.0	-23.6	0.5	2.94E-04	0.9	3	2.6
0:00:00	0.0	24.2	-28.0	24.2	0.5				
0:00:04	5.0	18.5	4.0	13.5	0.6	3.89E-04	1.1	5	5.7
0:00:10	10.5	12.5	6.0	2.0	0.7	3.19E-04	1.1	5.5	6
0:00:16	15.5	7.7	6.0	-7.8	0.8	3.15E-04	1.0	5	4.8
0:00:21	19.5	3.8	5.0	-15.7	0.9	3.50E-04	1.0	4	3.9
0:00:27	23.0	0.7	6.0	-22.3	1.0	2.78E-04	0.9	3.5	3.1
0:00:00	0.0	24.3	-27.0	24.3	1.0				
0:00:04	5.0	18.4	4.0	13.4	1.1	3.97E-04	1.2	5	5.9
0:00:10	10.5	12.2	6.0	1.7	1.2	3.25E-04	1.1	5.5	6.2
0:00:16	15.5	7.3	6.0	-8.2	1.3	3.20E-04	1.0	5	4.9
0:00:22	20.0	3.2	6.0	-16.8	1.4	3.22E-04	0.9	4.5	4.1
0:00:27	23.0	0.3	5.0	-22.7	1.5	3.03E-04	1.0	3	2.9
0:00:00	0.0	24.5	-27.0	24.5	1.5				
0:00:04	5.0	18.6	4.0	13.6	1.6	3.96E-04	1.2	5	5.9
0:00:09	10.0	13.0	5.0	3.0	1.7	3.50E-04	1.1	5	5.6
0:00:13	14.0	9.0	4.0	-5.0	1.7	3.74E-04	1.0	4	4
0:00:18	17.5	5.6	5.0	-11.9	1.8	2.89E-04	1.0	3.5	3.4
0:00:24	21.5	2.0	6.0	-19.5	1.9	3.01E-04	0.9	4	3.6
0:00:00	0.0	24.4	-24.0	24.4	1.9				
0:00:04	5.0	18.8	4.0	13.8	2.0	3.85E-04	1.1	5	5.6
0:00:10	11.5	11.8	6.0	0.3	2.1	3.78E-04	1.1	6.5	7
0:00:15	16.0	7.4	5.0	-8.6	2.2	3.49E-04	1.0	4.5	4.4
0:00:21	20.0	3.7	6.0	-16.3	2.3	2.88E-04	0.9	4	3.7
0:00:25	23.0	1.0	4.0	-22.0	2.3	3.61E-04	0.9	3	2.7
0:00:00	0.0	24.2	-25.0	24.2	2.3				
0:00:04	5.0	18.5	4.0	13.5	2.4	3.89E-04	1.1	5	5.7
0:00:09	10.0	13.0	5.0	3.0	2.5	3.47E-04	1.1	5	5.5
0:00:13	14.0	9.0	4.0	-5.0	2.5	3.74E-04	1.0	4	4
0:00:18	18.0	5.3	5.0	-12.7	2.6	3.25E-04	0.9	4	3.7
0:00:23	21.5	2.0	5.0	-19.5	2.7	3.26E-04	0.9	3.5	3.3



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

ASTM D 5084 - 00

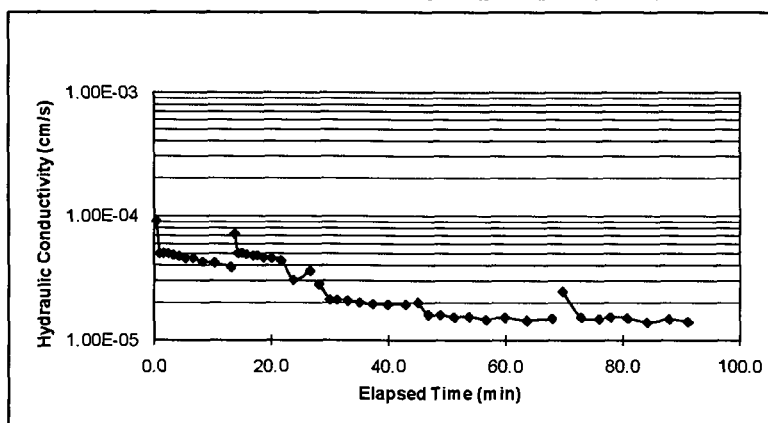
Sample I.D.			150-mm Caisson South 30-60 cm		Test Date :	
Cell Pressure =	41.7	psi	Diameter of Sample, D =		15.2	cm
Inflow Pressure =	40.5	psi	Length of Sample, L =		8.9	cm
Outflow Pressure =	40.0	psi	Area of Sample, A =		182.41	cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =		1621.7	cm ³
Effective Stress =	1.5	psi	a _{in} =		1	cm ²
Hydraulic Gradient, i =	4.0		a _{out} =		1	cm ²
Weight of wet sample =	2821.0	g	Sample Water Content =		27.11%	(%)
Wet Density =	1.7	g/cm ³	Dry Density =		1.73	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	25.09	203.07	165.11	27.11%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:27	3.0	21.3	27.0	18.3	0.5	9.14E-05	0.9	3	2.7
0:01:05	5.0	19.3	38.0	14.3	1.1	4.99E-05	1.0	2	2
0:01:46	7.0	17.3	41.0	10.3	1.8	5.01E-05	1.0	2	2
0:02:32	9.0	15.2	46.0	6.2	2.5	5.01E-05	1.1	2	2.1
0:03:23	11.0	13.2	51.0	2.2	3.4	4.86E-05	1.0	2	2
0:04:21	13.0	11.2	58.0	-1.8	4.4	4.76E-05	1.0	2	2
0:05:29	15.0	9.2	68.0	-5.8	5.5	4.58E-05	1.0	2	2
0:06:47	17.0	7.2	78.0	-9.8	6.8	4.57E-05	1.0	2	2
0:08:25	19.0	5.2	98.0	-13.8	8.4	4.27E-05	1.0	2	2
0:10:26	21.0	3.2	121.0	-17.8	10.4	4.17E-05	1.0	2	2
0:13:11	23.0	1.2	165.0	-21.8	13.2	3.87E-05	1.0	2	2
0:00:00	0.0	24.0	-791.0	24.0	13.2				
0:00:36	3.0	21.0	36.0	18.0	13.8	7.24E-05	1.0	3	3
0:01:14	5.0	19.0	38.0	14.0	14.4	5.02E-05	1.0	2	2
0:01:55	7.0	17.0	41.0	10.0	15.1	5.04E-05	1.0	2	2
0:02:41	9.0	15.0	46.0	6.0	15.9	4.91E-05	1.0	2	2
0:03:48	11.5	12.4	67.0	0.9	17.0	4.81E-05	1.0	2.5	2.6
0:04:32	13.0	10.9	44.0	-2.1	17.7	4.81E-05	1.0	1.5	1.5
0:05:40	15.0	8.9	68.0	-6.1	18.9	4.62E-05	1.0	2	2
0:06:59	17.0	6.9	79.0	-10.1	20.2	4.57E-05	1.0	2	2
0:08:36	19.0	4.9	97.0	-14.1	21.8	4.37E-05	1.0	2	2
0:10:39	21.0	3.9	123.0	-17.1	23.9	3.04E-05	0.5	2	1
0:13:28	23.0	1.9	169.0	-21.1	26.7	3.61E-05	1.0	2	2
0:00:00	0.0	24.0	-808.0	24.0	26.7				
0:01:31	3.0	21.1	91.0	18.1	28.2	2.81E-05	1.0	3	2.9
0:03:22	5.5	18.7	111.0	13.2	30.1	2.12E-05	1.0	2.5	2.4
0:04:36	7.0	17.2	74.0	10.2	31.3	2.11E-05	1.0	1.5	1.5
0:06:24	9.0	15.2	108.0	6.2	33.1	2.08E-05	1.0	2	2
0:08:24	11.0	13.3	120.0	2.3	35.1	2.01E-05	0.9	2	1.9
0:10:41	13.0	11.4	137.0	-1.6	37.4	1.96E-05	1.0	2	1.9
0:13:16	15.0	9.5	155.0	-5.5	40.0	1.94E-05	1.0	2	1.9
0:16:18	17.0	7.5	182.0	-9.5	43.0	1.94E-05	1.0	2	2
0:00:00	0.0	24.0	-978.0	24.0	43.0				
0:02:07	3.1	21.2	127.0	18.1	45.1	2.02E-05	0.9	3.1	2.8
0:03:53	5.0	19.5	106.0	14.5	46.9	1.61E-05	0.9	1.9	1.7
0:05:57	7.0	17.6	124.0	10.6	49.0	1.61E-05	0.9	2	1.9
0:08:15	9.0	15.8	138.0	6.8	51.3	1.53E-05	0.9	2	1.8
0:10:48	11.0	13.9	153.0	2.9	53.8	1.55E-05	1.0	2	1.9
0:13:42	13.0	12.1	174.0	-0.9	56.7	1.47E-05	0.9	2	1.8
0:16:55	15.0	10.2	193.0	-4.8	59.9	1.53E-05	1.0	2	1.9
0:20:40	17.0	8.4	225.0	-8.6	63.7	1.45E-05	0.9	2	1.8
0:24:58	19.0	6.5	258.0	-12.5	68.0	1.50E-05	1.0	2	1.9
0:00:00	0.0	24.0	-1498.0	24.0	68.0				
0:01:46	3.0	21.0	106.0	18.0	69.8	2.46E-05	1.0	3	3

0:04:56	6.0	18.0	190.0	12.0	72.9	1.54E-05	1.0	3	3
0:07:59	8.5	15.5	183.0	7.0	76.0	1.49E-05	1.0	2.5	2.5
0:09:56	10.0	14.0	117.0	4.0	77.9	1.54E-05	1.0	1.5	1.5
0:12:50	12.0	12.0	174.0	0.0	80.8	1.51E-05	1.0	2	2
0:16:09	14.0	10.2	199.0	-3.8	84.2	1.40E-05	0.9	2	1.8
0:19:54	16.0	8.2	225.0	-7.8	87.9	1.48E-05	1.0	2	2
0:23:08	17.5	6.8	194.0	-10.7	91.1	1.41E-05	0.9	1.5	1.4



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

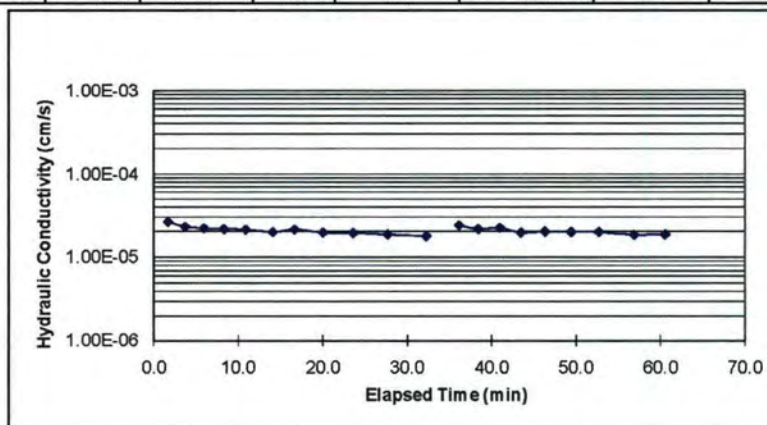
ASTM D 5084 - 00

Sample I.D.			75-mm Caisson South 30-60 cm		Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	7.0	cm	
Inflow Pressure =	40.7	psi	Length of Sample, L =	4.4	cm	
Outflow Pressure =	40.4	psi	Area of Sample, A =	38.32	cm ²	
Pressure Difference =	0.3	psi	Sample Volume, V =	170.3	cm ³	
Effective Stress =	1.5	psi	a _{in} =	1	cm ²	
Hydraulic Gradient, i =	4.7		a _{out} =	1	cm ²	
Weight of wet sample =	325.9	g	Sample Water Content =	25.81%	(%)	
Wet Density =	1.9	g/cm ³	Dry Density =	1.91	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	30.78	142.8	119.82	25.81%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:01:41	1.0	23.0	101.0	22.0	1.7	2.60E-05	1.0	1	1
0:03:42	2.0	22.0	121.0	20.0	3.7	2.28E-05	1.0	1	1
0:05:55	3.0	21.0	133.0	18.0	5.9	2.18E-05	1.0	1	1
0:08:18	4.0	20.0	143.0	16.0	8.3	2.13E-05	1.0	1	1
0:10:51	5.0	19.0	153.0	14.0	10.9	2.10E-05	1.0	1	1
0:14:03	6.1	17.9	192.0	11.8	14.1	1.96E-05	1.0	1.1	1.1
0:16:38	7.0	17.0	155.0	10.0	16.6	2.11E-05	1.0	0.9	0.9
0:19:58	8.0	16.0	200.0	8.0	20.0	1.93E-05	1.0	1	1
0:23:35	9.0	15.0	217.0	6.0	23.6	1.90E-05	1.0	1	1
0:27:38	10.0	14.0	243.0	4.0	27.6	1.83E-05	1.0	1	1
0:32:13	11.0	13.0	275.0	2.0	32.2	1.75E-05	1.0	1	1
0:00:00	0.0	24.0		24.0	32.2				
0:03:54	2.0	21.9	234.0	19.9	36.1	2.36E-05	1.1	2	2.1
0:06:10	3.0	20.9	136.0	17.9	38.4	2.13E-05	1.0	1	1
0:08:43	4.1	19.8	153.0	15.7	40.9	2.20E-05	1.0	1.1	1.1
0:11:14	5.0	18.9	151.0	13.9	43.4	1.93E-05	1.0	0.9	0.9
0:14:05	6.0	17.9	171.0	11.9	46.3	2.00E-05	1.0	1	1
0:17:10	7.0	16.9	185.0	9.9	49.4	1.96E-05	1.0	1	1
0:20:27	8.0	15.9	197.0	7.9	52.7	1.96E-05	1.0	1	1
0:24:40	9.1	14.8	253.0	5.7	56.9	1.81E-05	1.0	1.1	1.1
0:28:19	10.0	13.9	219.0	3.9	60.5	1.84E-05	1.0	0.9	0.9



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

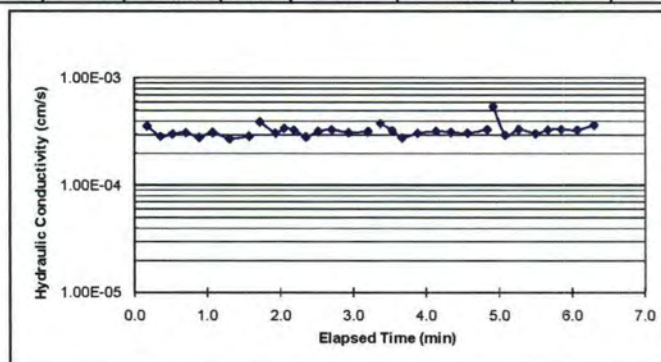
ASTM D 5084 - 00

Sample I.D. 150-mm Caisson South Radon			Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	40.5	psi	Length of Sample, L =	9.5 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	182.41 cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =	1737.5 cm ³
Effective Stress =	1.8	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	3.7		a _{out} =	1 cm ²
Weight of wet sample =	3277.3	g	Sample Water Content =	12.19% (%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.88 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	30.79	142.94	130.75	12.19%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:10	4.0	20.4	10.0	16.4	0.2	3.59E-04	0.9	4	3.6
0:00:21	7.0	17.5	11.0	10.5	0.4	2.88E-04	1.0	3	2.9
0:00:31	9.5	15.0	10.0	5.5	0.5	3.03E-04	1.0	2.5	2.5
0:00:42	12.0	12.5	11.0	0.5	0.7	3.11E-04	1.0	2.5	2.5
0:00:53	14.0	10.5	11.0	-3.5	0.9	2.82E-04	1.0	2	2
0:01:04	16.0	8.6	11.0	-7.4	1.1	3.12E-04	1.0	2	1.9
0:01:18	18.0	6.8	14.0	-11.2	1.3	2.74E-04	0.9	2	1.8
0:01:34	20.0	4.9	16.0	-15.1	1.6	2.90E-04	1.0	2	1.9
0:00:00	0.0	24.0	-94.0	24.0	1.6				
0:00:07	3.0	21.1	7.0	18.1	1.7	3.92E-04	1.0	3	2.9
0:00:20	7.0	17.5	13.0	10.5	1.9	3.09E-04	0.9	4	3.6
0:00:27	9.0	15.5	7.0	6.5	2.1	3.42E-04	1.0	2	2
0:00:35	11.0	13.5	8.0	2.5	2.2	3.29E-04	1.0	2	2
0:00:45	13.0	11.6	10.0	-1.4	2.4	2.85E-04	1.0	2	1.9
0:00:55	15.0	9.7	10.0	-5.3	2.5	3.20E-04	1.0	2	1.9
0:01:06	17.0	7.8	11.0	-9.2	2.7	3.32E-04	1.0	2	1.9
0:01:20	19.0	5.8	14.0	-13.2	2.9	3.12E-04	1.0	2	2
0:01:36	21.0	3.9	16.0	-17.1	3.2	3.19E-04	1.0	2	1.9
0:00:00	0.0	24.0	-96.0	24.0	3.2				
0:00:10	4.0	20.0	10.0	16.0	3.4	3.79E-04	1.0	4	4
0:00:20	7.0	17.0	10.0	10.0	3.5	3.26E-04	1.0	3	3
0:00:28	9.0	15.3	8.0	6.3	3.7	2.79E-04	0.9	2	1.7
0:00:41	12.0	12.4	13.0	0.4	3.9	3.08E-04	1.0	3	2.9
0:00:56	15.0	9.4	15.0	-5.6	4.1	3.22E-04	1.0	3	3
0:01:08	17.0	7.4	12.0	-9.6	4.3	3.16E-04	1.0	2	2
0:01:22	19.0	5.5	14.0	-13.5	4.6	3.09E-04	1.0	2	1.9
0:01:38	21.0	3.5	16.0	-17.5	4.8	3.33E-04	1.0	2	2
0:00:00	0.0	24.0	-98.0	24.0	4.8				
0:00:07	4.0	20.0	7.0	16.0	4.9	5.42E-04	1.0	4	4
0:00:17	7.0	17.5	10.0	10.5	5.1	2.97E-04	0.8	3	2.5
0:00:28	10.0	14.5	11.0	4.5	5.3	3.34E-04	1.0	3	3
0:00:42	13.0	11.5	14.0	-1.5	5.5	3.06E-04	1.0	3	3
0:00:52	15.0	9.5	10.0	-5.5	5.7	3.30E-04	1.0	2	2
0:01:03	17.0	7.6	11.0	-9.4	5.9	3.35E-04	1.0	2	1.9
0:01:16	19.0	5.7	13.0	-13.3	6.1	3.30E-04	1.0	2	1.9
0:01:30	21.0	3.8	14.0	-17.2	6.3	3.66E-04	1.0	2	1.9



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

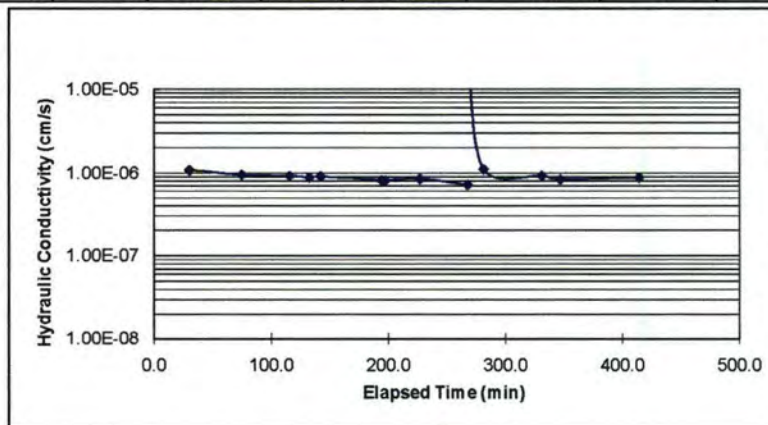
ASTM D 5084 - 00

Sample I.D.			150-mm Caisson South Radon		Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =		15.2	cm
Inflow Pressure =	40.5	psi	Length of Sample, L =		10.2	cm
Outflow Pressure =	40.0	psi	Area of Sample, A =		182.41	cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =		1853.3	cm ³
Effective Stress =	1.8	psi	a _{in} =		1	cm ²
Hydraulic Gradient, i =	3.5		a _{out} =		1	cm ²
Weight of wet sample =	4023.4	g	Sample Water Content =		12.87%	(%)
Wet Density =	2.2	g/cm ³	Dry Density =		2.17	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	25.03	114.9	104.65	12.87%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	2.0	23.3	0.0	21.3	0.0				
0:29:59	3.9	21.4	1799.0	17.5	30.0	1.08E-06	1.0	1.9	1.9
1:14:39	6.2	19.1	2680.0	12.9	74.7	9.50E-07	1.0	2.3	2.3
1:55:15	8.1	17.3	2436.0	9.2	115.3	9.16E-07	0.9	1.9	1.8
2:12:10	8.8	16.6	1015.0	7.8	132.2	8.80E-07	1.0	0.7	0.7
2:21:51	9.2	16.2	581.0	7.0	141.9	9.01E-07	1.0	0.4	0.4
3:14:13	11.1	14.4	3142.0	3.3	194.2	8.14E-07	0.9	1.9	1.8
3:17:13	11.2	14.3	180.0	3.1	197.2	8.07E-07	1.0	0.1	0.1
3:46:43	12.2	13.3	1770.0	1.1	226.7	8.45E-07	1.0	1	1
4:27:22	13.3	12.2	2439.0	-1.1	267.4	7.15E-07	1.0	1.1	1.1
0:00:00	0.0	24.0	-16042.0	24.0	267.4				
0:00:55	1.6	23.4	55.0	21.8	268.3	1.92E-05	0.4	1.6	0.6
0:13:39	2.5	22.6	764.0	20.1	281.1	1.10E-06	0.9	0.9	0.8
1:03:36	5.2	20.1	2997.0	14.9	331.0	9.18E-07	0.9	2.7	2.5
1:19:27	5.9	19.4	951.0	13.5	346.9	8.31E-07	1.0	0.7	0.7
2:26:28	8.8	16.5	4021.0	7.7	413.9	8.79E-07	1.0	2.9	2.9



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

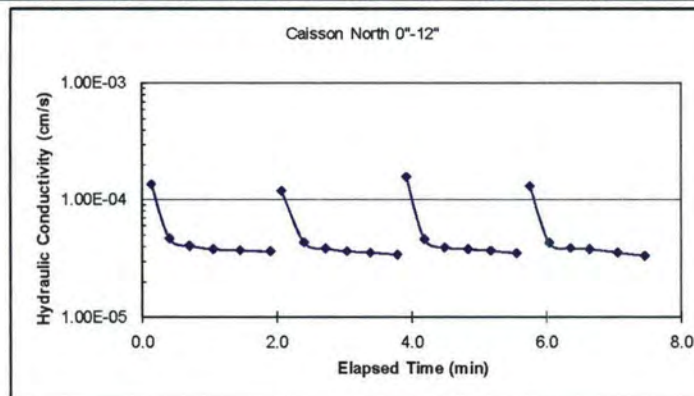
ASTM D 5084 - 00

Sample I.D.	305-mm Caisson North 0-30 cm	Test Date :
Cell Pressure = 42.0 psi	Diameter of Sample, D = 30.5 cm	
Inflow Pressure = 41.5 psi	Length of Sample, L = 19.7 cm	
Outflow Pressure = 40.0 psi	Area of Sample, A = 729.66 cm ²	
Pressure Difference = 1.5 psi	Sample Volume, V = 14363.3 cm ³	
Effective Stress = 1.3 psi	a _{in} = 1 cm ²	
Hydraulic Gradient, i = 5.4	a _{out} = 1 cm ²	
Weight of wet sample = 23056.0 g	Sample Water Content = 12.88% (%)	
Wet Density = 1.6 g/cm ³	Dry Density = 1.60 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
	50.34	336.2	303.59	12.88%

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.5	0.0	24.5	0.0				
0:00:08	5.5	20.0	8.0	14.5	0.1	1.35E-04	0.8	5.5	4.5
0:00:24	9.0	17.0	16.0	8.0	0.4	4.70E-05	0.9	3.5	3
0:00:42	12.0	14.0	18.0	2.0	0.7	4.07E-05	1.0	3	3
0:01:03	15.0	10.8	21.0	-4.2	1.1	3.82E-05	1.1	3	3.2
0:01:27	18.0	7.3	24.0	-10.7	1.5	3.73E-05	1.2	3	3.5
0:01:54	21.0	3.6	27.0	-17.4	1.9	3.66E-05	1.2	3	3.7
0:00:00	0.0	23.9	-114.0	23.9	1.9				
0:00:10	6.0	19.0	10.0	13.0	2.1	1.19E-04	0.8	6	4.9
0:00:30	10.0	15.6	20.0	5.6	2.4	4.35E-05	0.9	4	3.4
0:00:49	13.0	12.7	19.0	-0.3	2.7	3.87E-05	1.0	3	2.9
0:01:08	15.5	9.9	19.0	-5.6	3.0	3.67E-05	1.1	2.5	2.8
0:01:29	18.0	7.0	21.0	-11.0	3.4	3.57E-05	1.2	2.5	2.9
0:01:53	20.5	3.9	24.0	-16.6	3.8	3.43E-05	1.2	2.5	3.1
0:00:00	0.0	24.2	-113.0	24.2	3.8				
0:00:07	5.5	19.6	7.0	14.1	3.9	1.56E-04	0.8	5.5	4.6
0:00:23	9.0	16.7	16.0	7.7	4.2	4.64E-05	0.8	3.5	2.9
0:00:41	12.0	13.9	18.0	1.9	4.5	3.94E-05	0.9	3	2.8
0:01:02	15.0	10.7	21.0	-4.3	4.8	3.82E-05	1.1	3	3.2
0:01:22	17.5	7.8	20.0	-9.7	5.2	3.70E-05	1.2	2.5	2.9
0:01:45	20.0	4.7	23.0	-15.3	5.6	3.53E-05	1.2	2.5	3.1
0:00:00	0.0	24.1	-105.0	24.1	5.6				
0:00:09	6.0	19.3	9.0	13.3	5.8	1.30E-04	0.8	6	4.8
0:00:26	9.5	16.5	17.0	7.0	6.0	4.32E-05	0.8	3.5	2.8
0:00:45	12.5	13.5	19.0	1.0	6.4	3.89E-05	1.0	3	3
0:01:02	15.0	11.0	17.0	-4.0	6.6	3.82E-05	1.0	2.5	2.5
0:01:27	18.0	7.5	25.0	-10.5	7.1	3.57E-05	1.2	3	3.5
0:01:51	20.5	4.5	24.0	-16.0	7.5	3.35E-05	1.2	2.5	3



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

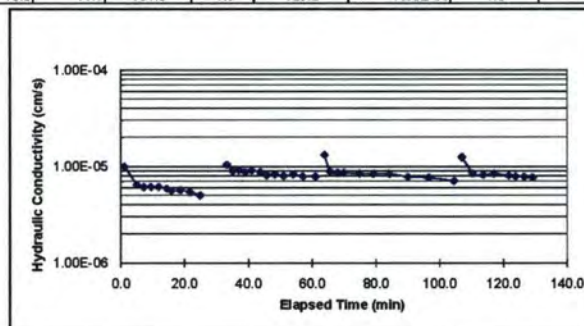
ASTM D 5084 - 00

Sample I.D. 150-mm Caisson North 0-30 cm			Test Date :	
Cell Pressure =	41.7	psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	40.7	psi	Length of Sample, L =	9.3 cm
Outflow Pressure =	40.1	psi	Area of Sample, A =	182.41 cm ²
Pressure Difference =	0.6	psi	Sample Volume, V =	1691.2 cm ³
Effective Stress =	1.3	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	4.6		a _{out} =	1 cm ²
Weight of wet sample =	3157.4	g	Sample Water Content =	25.95% (%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.86 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	30.89	200.1	165.24	25.95%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:01:06	1.0	23.3	66.0	22.3	1.1	1.00E-06	0.7	1	0.7
0:05:06	3.0	21.5	239.0	18.5	5.1	6.46E-06	0.9	2	1.8
0:07:17	4.0	20.6	132.0	16.6	7.3	6.12E-06	0.9	1	0.9
0:09:33	5.0	19.7	136.0	14.7	9.6	6.14E-06	0.9	1	0.9
0:11:54	6.0	18.8	141.0	12.6	11.9	6.12E-06	0.9	1	0.9
0:14:26	7.0	17.9	152.0	10.9	14.4	5.88E-06	0.9	1	0.9
0:15:53	7.5	17.4	87.0	9.9	15.9	5.55E-06	1.0	0.5	0.5
0:18:40	8.5	16.5	167.0	8.0	18.7	5.65E-06	0.9	1	0.9
0:21:41	9.5	15.6	181.0	6.1	21.7	5.42E-06	0.9	1	0.9
0:24:54	10.5	14.8	193.0	4.3	24.9	5.00E-06	0.8	1	0.8
0:24:54					24.9				
0:00:00	0.0	24.0	0.0	24.0	24.9				
0:08:27	6.5	18.0	507.0	11.5	33.4	1.05E-05	0.9	6.5	6
0:10:14	7.5	17.0	107.0	9.5	35.1	9.01E-06	1.0	1	1
0:12:08	8.5	15.9	114.0	7.4	37.0	9.24E-06	1.1	1	1.1
0:14:07	9.5	14.9	119.0	5.4	39.0	8.79E-06	1.0	1	1
0:16:13	10.5	13.8	126.0	3.3	41.1	9.10E-06	1.1	1	1.1
0:18:58	11.7	12.5	165.0	0.8	43.9	8.70E-06	1.1	1.2	1.3
0:20:56	12.5	11.7	118.0	-0.8	45.9	8.17E-06	1.0	0.8	0.8
0:23:27	13.5	10.7	151.0	-2.8	48.4	8.33E-06	1.0	1	1
0:26:12	14.5	9.7	165.0	-4.8	51.1	8.02E-06	1.0	1	1
0:28:09	15.5	8.6	177.0	-6.9	54.1	8.30E-06	1.1	1	1.1
0:32:17	16.5	7.6	188.0	-8.9	57.2	7.88E-06	1.0	1	1
0:36:09	17.6	6.4	232.0	-11.2	61.1	7.84E-06	1.1	1.1	1.2
0:00:00	0.0	24.0	-2169.0	24.0	61.1				
0:02:50	3.0	21.4	170.0	18.4	63.9	1.32E-05	0.9	3	2.6
0:04:26	4.0	20.4	96.0	16.4	65.5	8.88E-06	1.0	1	1
0:07:01	5.5	18.9	155.0	13.4	68.1	8.62E-06	1.0	1.5	1.5
0:08:49	6.5	17.9	108.0	11.4	69.9	8.62E-06	1.0	1	1
0:13:44	9.0	15.4	295.0	6.4	74.8	8.44E-06	1.0	2.5	2.5
0:18:11	11.0	13.3	267.0	2.3	79.3	8.39E-06	1.1	2	2.1
0:23:12	13.0	11.1	301.0	-1.9	84.3	8.37E-06	1.1	2	2.2
0:29:01	15.0	9.0	349.0	-6.0	90.1	7.81E-06	1.1	2	2.1
0:35:30	17.0	7.0	389.0	-10.0	96.6	7.65E-06	1.0	2	2
0:43:28	19.0	5.0	479.0	-14.0	104.6	7.05E-06	1.0	2	2
0:00:00	0.0	24.0	-2608.0	24.0	104.6				
0:02:26	2.5	21.9	146.0	19.4	107.0	1.25E-05	0.8	2.5	2.1
0:05:46	4.5	19.9	200.0	15.4	110.4	8.53E-06	1.0	2	2
0:09:06	6.3	18.1	200.0	11.8	113.7	8.20E-06	1.0	1.8	1.8
0:12:28	8.0	16.3	202.0	8.3	117.1	8.43E-06	1.1	1.7	1.8
0:17:09	10.1	14.1	281.0	4.0	121.8	8.05E-06	1.0	2.1	2.2
0:19:17	11.0	13.2	128.0	2.2	123.9	7.89E-06	1.0	0.9	0.9
0:21:55	12.0	12.1	158.0	0.1	126.5	7.79E-06	1.1	1	1.1
0:24:36	13.0	11.1	161.0	-1.9	129.2	7.65E-06	1.0	1	1



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

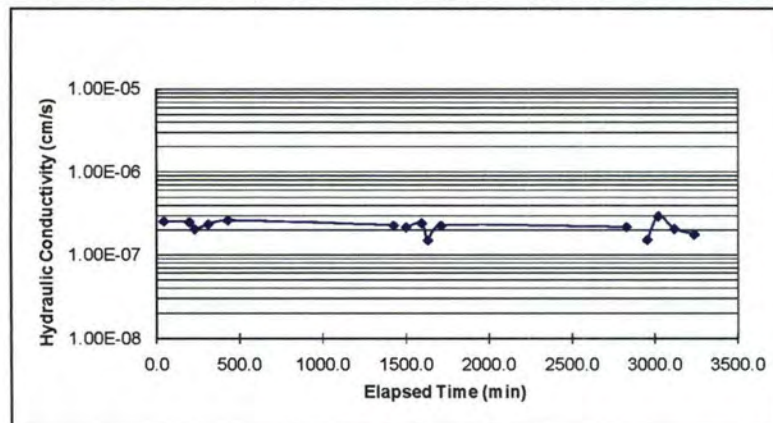
ASTM D 5084 - 00

Sample I.D.			75-mm Caisson North 0-30 cm		Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	7.0	cm	
Inflow Pressure =	40.8	psi	Length of Sample, L =	2.5	cm	
Outflow Pressure =	40.6	psi	Area of Sample, A =	38.32	cm ²	
Pressure Difference =	0.2	psi	Sample Volume, V =	97.3	cm ³	
Effective Stress =	1.3	psi	a _{in} =	1	cm ²	
Hydraulic Gradient, i =	5.5		a _{out} =	1	cm ²	
Weight of wet sample =	210.1	g	Sample Water Content =	26.20%	(%)	
Wet Density =	2.2	g/cm ³	Dry Density =	2.15	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	30.81	157.22	130.98	26.20%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:46:02	0.5	23.7	2762.0	23.2	46.0	2.55E-07	0.6	0.5	0.3
3:19:47	1.8	22.5	9225.0	20.7	199.8	2.49E-07	0.9	1.3	1.2
3:50:47	2.0	22.3	1860.0	20.3	230.8	2.06E-07	1.0	0.2	0.2
5:13:57	2.6	21.7	4990.0	19.1	314.0	2.36E-07	1.0	0.6	0.6
7:11:06	3.5	20.8	7029.0	17.3	431.1	2.63E-07	1.0	0.9	0.9
23:47:34	8.8	15.5	59788.0	6.7	1427.6	2.29E-07	1.0	5.3	5.3
0:00:00	8.9	15.5	-85654.0	6.6	1427.6				
1:15:08	9.2	15.2	4508.0	6.0	1502.7	2.17E-07	1.0	0.3	0.3
2:47:59	9.6	14.8	5571.0	5.2	1595.6	2.42E-07	1.0	0.4	0.4
3:26:13	9.7	14.7	2294.0	5.0	1633.8	1.51E-07	1.0	0.1	0.1
4:44:09	10.0	14.4	4676.0	4.4	1711.8	2.27E-07	1.0	0.3	0.3
23:22:14	13.3	11.1	67085.0	-2.2	2829.8	2.18E-07	1.0	3.3	3.3
0:00:00	13.3	11.1	-84134.0	-2.2	2829.8				
2:04:45	13.5	10.9	7485.0	-2.6	2954.6	1.52E-07	1.0	0.2	0.2
3:11:32	13.7	10.7	4007.0	-3.0	3021.3	2.94E-07	1.0	0.2	0.2
4:49:46	13.9	10.5	5894.0	-3.4	3119.6	2.07E-07	1.0	0.2	0.2
6:48:34	14.1	10.3	7128.0	-3.8	3238.4	1.78E-07	1.0	0.2	0.2



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

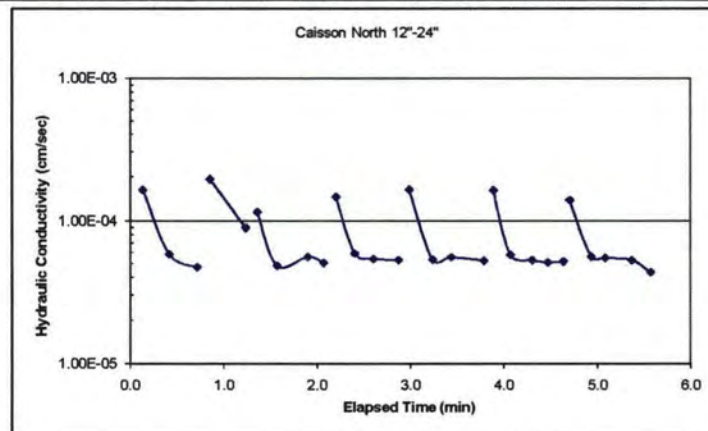
ASTM D 5084 - 00

Sample I.D. 305-mm Caisson North 30-60 cm			Test Date :		
Cell Pressure =	35.0	psi	Diameter of Sample, D =	30.5	cm
Inflow Pressure =	32.5	psi	Length of Sample, L =	20.3	cm
Outflow Pressure =	30.0	psi	Area of Sample, A =	729.66	cm ²
Pressure Difference =	2.5	psi	Sample Volume, V =	14826.7	cm ³
Effective Stress =	3.8	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	8.7		a _{out} =	1	cm ²
Weight of wet sample =	21835.8	g	Sample Water Content =	17.92%	(%)
Wet Density =	1.5	g/cm ³	Dry Density =	1.47	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	50.78	337.5	293.92	17.92%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _n	Q _n	Q _{out}
0:00:00	0.0	24.5	0.0	24.5	0.0				
0:00:08	10.0	16.5	8.0	6.5	0.1	1.64E-04	0.8	10	8
0:00:25	19.0	13.0	17.0	-6.0	0.4	5.82E-05	0.4	9	3.5
0:00:43	25.0	9.0	18.0	-16.0	0.7	4.69E-05	0.7	6	4
0:00:00	0.0	24.0	0.0	24.0	0.7				
0:00:08	10.0	13.0	8.0	3.0	0.9	1.93E-04	1.1	10	11
0:00:31	22.4	0.8	23.0	-21.6	1.2	8.96E-05	1.0	12.4	12.2
0:00:00	0.0	24.1	-31.0	24.1	1.2				
0:00:10	8.0	17.0	9.5	9.0	1.4	1.15E-04	0.9	8	7.1
0:00:22	12.0	13.2	12.5	1.2	1.6	4.80E-05	1.0	4	3.8
0:00:42	19.0	6.6	20.0	-12.4	1.9	5.57E-05	0.9	7	6.6
0:00:52	22.0	3.8	10.0	-18.2	2.1	5.03E-05	0.9	3	2.8
0:00:00	0.0	24.1	-52.0	24.1	2.1				
0:00:06	6.5	18.4	6.0	11.9	2.2	1.46E-04	0.9	6.5	5.7
0:00:18	11.0	13.6	12.0	2.6	2.4	5.90E-05	1.1	4.5	4.8
0:00:30	15.0	9.5	12.0	-5.5	2.6	5.39E-05	1.0	4	4.1
0:00:46	20.0	4.5	16.0	-15.5	2.9	5.27E-05	1.0	5	5
0:00:00	0.0	24.1	-46.0	24.1	2.9				
0:00:05	6.0	18.7	5.0	12.7	3.0	1.64E-04	0.9	6	5.4
0:00:20	11.0	13.2	15.0	2.2	3.2	5.32E-05	1.1	5	5.5
0:00:32	15.0	8.9	12.0	-6.1	3.4	5.54E-05	1.1	4	4.3
0:00:53	21.5	2.5	21.0	-19.0	3.8	5.24E-05	1.0	6.5	6.4
0:00:00	0.0	24.0	-53.0	24.0	3.8				
0:00:05	6.0	18.7	5.0	12.7	3.9	1.62E-04	0.9	6	5.3
0:00:16	10.0	14.3	11.0	4.3	4.1	5.77E-05	1.1	4	4.4
0:00:30	14.5	9.5	14.0	-5.0	4.3	5.27E-05	1.1	4.5	4.8
0:00:40	17.5	6.4	10.0	-11.1	4.5	5.08E-05	1.0	3	3.1
0:00:50	20.5	3.4	10.0	-17.1	4.6	5.17E-05	1.0	3	3
0:00:00	0.0	24.1	-50.0	24.1	4.6				
0:00:06	6.0	18.5	6.0	12.5	4.7	1.39E-04	0.9	6	5.6
0:00:20	11.0	13.2	14.0	2.2	4.9	5.59E-05	1.1	5	5.3
0:00:29	14.0	10.0	9.0	-4.0	5.1	5.48E-05	1.1	3	3.2
0:00:46	19.5	4.8	17.0	-14.7	5.4	5.27E-05	0.9	5.5	5.2
0:00:58	22.5	1.9	12.0	-20.6	5.6	4.33E-05	1.0	3	2.9



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

ASTM D 5084 - 00

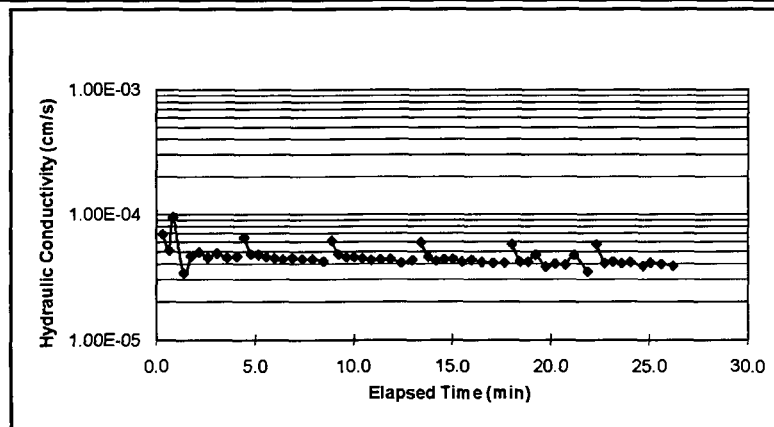
Sample I.D.	150-mm Caisson North 30-60 cm	Test Date :
Cell Pressure = 43.9 psi	Diameter of Sample, D = 15.2 cm	
Inflow Pressure = 40.7 psi	Length of Sample, L = 9.2 cm	
Outflow Pressure = 39.5 psi	Area of Sample, A = 182.41 cm ²	
Pressure Difference = 1.2 psi	Sample Volume, V = 1681.9 cm ³	
Effective Stress = 3.8 psi	a _{in} = 1 cm ²	
Hydraulic Gradient, i = 9.2	a _{out} = 1 cm ²	
Weight of wet sample = 3134.5 g	Sample Water Content = 21.53% (%)	
Wet Density = 1.9 g/cm ³	Dry Density = 1.86 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	25.87	176.58	149.88	21.53%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:20	3.0	21.2	20.0	18.2	0.3	6.95E-05	0.9	3	2.8
0:00:39	5.0	19.3	19.0	14.3	0.7	5.15E-05	0.9	2	1.9
0:00:50	7.0	17.3	11.0	10.3	0.8	9.51E-05	1.0	2	2
0:01:22	9.0	15.3	32.0	6.3	1.4	3.41E-05	1.0	2	2
0:01:46	11.0	13.4	24.0	2.4	1.8	4.63E-05	1.0	2	1.9
0:02:10	13.0	11.4	24.0	-1.6	2.2	4.97E-05	1.0	2	2
0:02:37	15.0	9.5	27.0	-5.5	2.6	4.52E-05	1.0	2	1.9
0:03:04	17.0	7.5	27.0	-9.5	3.1	4.87E-05	1.0	2	2
0:03:34	19.0	5.6	30.0	-13.4	3.6	4.51E-05	1.0	2	1.9
0:04:05	21.0	3.7	31.0	-17.3	4.1	4.61E-05	1.0	2	1.9
					4.1				
0:00:00	0.0	24.0	0.0	24.0	4.1				
0:00:22	3.0	21.0	22.0	18.0	4.5	6.54E-05	1.0	3	3
0:00:43	5.0	19.0	21.0	14.0	4.8	4.80E-05	1.0	2	2
0:01:05	7.0	17.0	22.0	10.0	5.2	4.77E-05	1.0	2	2
0:01:29	9.0	15.0	24.0	6.0	5.6	4.56E-05	1.0	2	2
0:01:54	11.0	13.1	25.0	2.1	6.0	4.46E-05	1.0	2	1.9
0:02:20	13.0	11.3	26.0	-1.7	6.4	4.37E-05	0.9	2	1.8
0:02:48	15.0	9.3	28.0	-5.7	6.9	4.47E-05	1.0	2	2
0:03:18	17.0	7.3	30.0	-9.7	7.4	4.39E-05	1.0	2	2
0:03:49	19.0	5.4	31.0	-13.6	7.9	4.37E-05	1.0	2	1.9
0:04:23	21.0	3.5	34.0	-17.5	8.5	4.21E-05	1.0	2	1.9
0:00:00	0.0	24.0	-263.0	24.0	8.5				
0:00:23	3.0	21.1	23.0	18.1	8.9	6.15E-05	1.0	3	2.9
0:00:44	5.0	19.1	21.0	14.1	9.2	4.79E-05	1.0	2	2
0:01:07	7.0	17.1	23.0	10.1	9.6	4.56E-05	1.0	2	2
0:01:31	9.0	15.1	24.0	6.1	10.0	4.55E-05	1.0	2	2
0:01:56	11.0	13.2	25.0	2.2	10.4	4.45E-05	1.0	2	1.9
0:02:23	13.0	11.3	27.0	-1.7	10.9	4.31E-05	0.9	2	1.9
0:02:51	15.0	9.4	28.0	-5.6	11.4	4.36E-05	1.0	2	1.9
0:03:21	17.0	7.4	30.0	-9.6	11.9	4.39E-05	1.0	2	2
0:03:54	19.0	5.5	33.0	-13.5	12.4	4.10E-05	1.0	2	1.9
0:04:28	21.0	3.5	34.0	-17.5	13.0	4.32E-05	1.0	2	2
0:00:00	0.0	24.0	-268.0	24.0	13.0				
0:00:24	3.0	21.0	24.0	18.0	13.4	6.00E-05	1.0	3	3
0:00:46	5.0	19.0	22.0	14.0	13.8	4.58E-05	1.0	2	2
0:01:10	7.0	17.1	24.0	10.1	14.2	4.26E-05	0.9	2	1.9
0:01:35	9.0	15.1	25.0	6.1	14.6	4.37E-05	1.0	2	2
0:02:01	11.0	13.1	26.0	2.1	15.0	4.39E-05	1.0	2	2
0:02:29	13.0	11.2	28.0	-1.8	15.5	4.16E-05	1.0	2	1.9
0:02:58	15.0	9.2	29.0	-5.8	16.0	4.33E-05	1.0	2	2
0:03:29	17.0	7.3	31.0	-9.7	16.5	4.15E-05	1.0	2	1.9
0:04:03	19.0	5.3	34.0	-13.7	17.1	4.09E-05	1.0	2	2
0:04:38	21.0	3.4	35.0	-17.6	17.6	4.10E-05	1.0	2	1.9

0:00:00	0.0	24.0	-278.0	24.0	17.6				
0:00:25	3.0	21.0	25.0	18.0	18.0	5.76E-05	1.0	3	3
0:00:49	5.0	19.0	24.0	14.0	18.4	4.20E-05	1.0	2	2
0:01:14	7.0	17.0	25.0	10.0	18.8	4.20E-05	1.0	2	2
0:01:37	9.0	15.0	23.0	6.0	19.2	4.76E-05	1.0	2	2
0:02:07	11.0	13.0	30.0	2.0	19.7	3.81E-05	1.0	2	2
0:02:36	13.0	11.1	29.0	-1.9	20.2	4.03E-05	1.0	2	1.9
0:03:07	15.0	9.2	31.0	-5.8	20.7	3.95E-05	1.0	2	1.9
0:03:35	17.0	7.2	28.0	-9.8	21.2	4.71E-05	1.0	2	2
0:04:15	19.0	5.2	40.0	-13.8	21.9	3.48E-05	1.0	2	2
0:00:00	0.0	24.0	-255.0	24.0	21.9				
0:00:25	3.0	21.0	25.0	18.0	22.3	5.76E-05	1.0	3	3
0:00:49	5.0	19.1	24.0	14.1	22.7	4.09E-05	0.9	2	1.9
0:01:14	7.0	17.1	25.0	10.1	23.1	4.19E-05	1.0	2	2
0:01:41	9.0	15.1	27.0	6.1	23.6	4.05E-05	1.0	2	2
0:02:08	11.0	13.2	27.0	2.2	24.0	4.12E-05	1.0	2	1.9
0:02:46	13.5	10.8	38.0	-2.7	24.7	3.87E-05	1.0	2.5	2.4
0:03:09	15.0	9.3	23.0	-5.7	25.1	4.11E-05	1.0	1.5	1.5
0:03:42	17.0	7.3	33.0	-9.7	25.6	4.00E-05	1.0	2	2
0:04:17	19.0	5.4	35.0	-13.6	26.2	3.87E-05	1.0	2	1.9



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

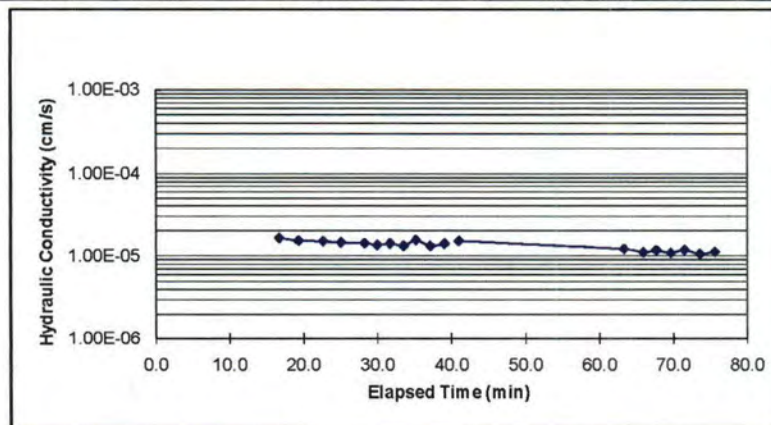
ASTM D 5084 - 00

Sample I.D.	75-mm Caisson North 30-60 cm	Test Date :
Cell Pressure = 44.0 psi	Diameter of Sample, D = 7.0 cm	
Inflow Pressure = 40.5 psi	Length of Sample, L = 4.4 cm	
Outflow Pressure = 39.9 psi	Area of Sample, A = 38.32 cm ²	
Pressure Difference = 0.6 psi	Sample Volume, V = 170.3 cm ³	
Effective Stress = 3.8 psi	a _{in} = 1 cm ²	
Hydraulic Gradient, i = 9.5	a _{out} = 1 cm ²	
Weight of wet sample = 333.8 g	Sample Water Content = 23.89% (%)	
Wet Density = 2.0 g/cm ³	Dry Density = 1.96 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	31.28	148.12	125.59	23.89%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:16:40	8.0	15.9	1000.0	7.9	16.7	1.62E-05	1.0	8	8.1
0:19:17	9.0	14.9	157.0	5.9	19.3	1.51E-05	1.0	1	1
0:22:38	10.2	13.7	201.0	3.5	22.6	1.48E-05	1.0	1.2	1.2
0:25:02	11.0	12.9	144.0	1.9	25.0	1.44E-05	1.0	0.8	0.8
0:28:13	12.0	11.9	191.0	-0.1	28.2	1.41E-05	1.0	1	1
0:29:57	12.5	11.4	104.0	-1.1	30.0	1.34E-05	1.0	0.5	0.5
0:31:39	13.0	10.9	102.0	-2.1	31.7	1.40E-05	1.0	0.5	0.5
0:33:31	13.5	10.4	112.0	-3.1	33.5	1.31E-05	1.0	0.5	0.5
0:35:09	14.0	9.9	98.0	-4.1	35.2	1.53E-05	1.0	0.5	0.5
0:37:07	14.5	9.4	118.0	-5.1	37.1	1.31E-05	1.0	0.5	0.5
0:39:01	15.0	8.9	114.0	-6.1	39.0	1.39E-05	1.0	0.5	0.5
0:00:00	0.0	24.0		24.0	39.0				
0:01:59	1.0	23.0	119.0	22.0	41.0	1.50E-05	1.0	1	1
0:24:20	8.8	15.2	1341.0	6.4	63.3	1.20E-05	1.0	7.8	7.8
0:26:55	9.5	14.5	155.0	5.0	65.9	1.09E-05	1.0	0.7	0.7
0:28:42	10.0	14.0	107.0	4.0	67.7	1.16E-05	1.0	0.5	0.5
0:30:39	10.5	13.5	117.0	3.0	69.7	1.08E-05	1.0	0.5	0.5
0:32:30	11.0	13.0	111.0	2.0	71.5	1.17E-05	1.0	0.5	0.5
0:34:36	11.5	12.5	126.0	1.0	73.6	1.05E-05	1.0	0.5	0.5
0:36:38	12.0	12.0	122.0	0.0	75.6	1.11E-05	1.0	0.5	0.5



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

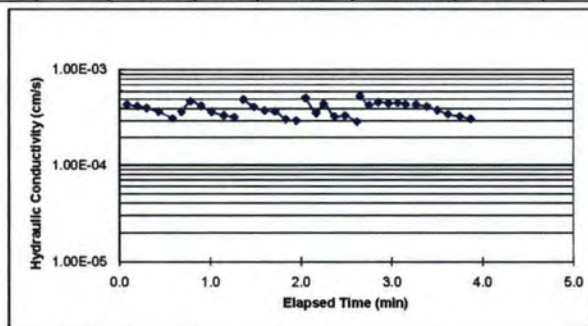
ASTM D 5084 - 00

Sample I.D. 305-mm Caisson North Radon			Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	40.6	psi	Length of Sample, L =	17.5 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	0.6	psi	Sample Volume, V =	12741.7 cm ³
Effective Stress =	1.7	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	2.4		a _{out} =	1 cm ²
Weight of wet sample =	22997.0	g	Sample Water Content =	16.28% (%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.80 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	50.35	328.01	289.14	16.28%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	23.8	0.0	23.8	0.0				
0:00:05	5.0	17.8	5.0	12.8	0.1	4.38E-04	1.2	5	6
0:00:12	11.0	11.8	7.0	0.8	0.2	4.21E-04	1.0	6	6
0:00:18	15.0	7.9	6.0	-7.1	0.3	4.06E-04	1.0	4	3.9
0:00:26	19.0	4.2	8.0	-14.8	0.4	3.70E-04	0.9	4	3.7
0:00:35	22.0	1.4	9.0	-20.6	0.6	3.16E-04	0.9	3	2.9
0:00:00	0.0	24.0	-35.0	24.0	0.6				
0:00:05	4.5	19.0	5.0	14.5	0.7	3.71E-04	1.1	4.5	5
0:00:11	10.5	13.0	6.0	2.5	0.8	4.74E-04	1.0	6	6
0:00:18	15.5	8.2	7.0	-7.3	0.9	4.23E-04	1.0	5	4.8
0:00:25	19.0	4.9	7.0	-14.1	1.0	3.70E-04	0.9	3.5	3.3
0:00:33	22.0	2.2	8.0	-19.8	1.2	3.39E-04	0.9	3	2.7
0:00:40	24.0	0.3	7.0	-23.7	1.3	3.27E-04	1.0	2	1.9
0:00:00	0.0	24.1	-40.0	24.1	1.3				
0:00:04	4.5	18.5	4.0	14.0	1.4	4.94E-04	1.2	4.5	5.6
0:00:11	10.5	12.4	7.0	1.9	1.5	4.14E-04	1.0	6	6.1
0:00:18	15.0	8.1	7.0	-6.9	1.6	3.81E-04	1.0	4.5	4.3
0:00:25	18.5	4.7	7.0	-13.8	1.7	3.72E-04	1.0	3.5	3.4
0:00:32	21.0	2.5	7.0	-18.5	1.8	3.09E-04	0.9	2.5	2.2
0:00:39	23.0	0.7	7.0	-22.3	2.0	2.99E-04	0.9	2	1.8
0:00:00	0.0	24.0	-39.0	24.0	2.0				
0:00:03	3.5	19.5	3.0	16.0	2.1	5.14E-04	1.3	3.5	4.5
0:00:10	9.0	14.0	7.0	5.0	2.2	3.58E-04	1.0	5.5	5.5
0:00:15	13.0	10.0	5.0	-3.0	2.3	4.44E-04	1.0	4	4
0:00:22	16.5	6.6	7.0	-9.9	2.4	3.31E-04	1.0	3.5	3.4
0:00:29	19.5	3.8	7.0	-15.7	2.5	3.38E-04	0.9	3	2.8
0:00:37	22.0	1.6	8.0	-20.4	2.6	2.92E-04	0.9	2.5	2.2
0:00:00	0.0	24.1	-37.0	24.1	2.6				
0:00:03	4.0	19.8	3.0	15.8	2.7	5.33E-04	1.1	4	4.3
0:00:09	9.5	14.0	6.0	4.5	2.8	4.32E-04	1.1	5.5	5.8
0:00:15	14.5	9.3	6.0	-5.2	2.9	4.64E-04	0.9	5	4.7
0:00:22	19.0	5.2	7.0	-13.8	3.0	4.52E-04	0.9	4.5	4.1
0:00:28	22.0	2.4	6.0	-19.6	3.1	4.56E-04	0.9	3	2.8
0:00:33	24.0	0.6	5.0	-23.4	3.2	4.41E-04	0.9	2	1.8
0:00:00	0.0	24.0	-33.0	24.0	3.2				
0:00:04	4.0	19.0	4.0	15.0	3.3	4.37E-04	1.3	4	5
0:00:11	10.0	12.6	7.0	2.6	3.4	4.18E-04	1.1	6	6.4
0:00:18	14.5	8.1	7.0	-6.4	3.5	3.83E-04	1.0	4.5	4.5
0:00:25	18.0	5.0	7.0	-13.0	3.6	3.48E-04	0.9	3.5	3.1
0:00:33	21.0	2.2	8.0	-18.8	3.8	3.31E-04	0.9	3	2.8
0:00:40	23.0	0.3	7.0	-22.7	3.9	3.12E-04	1.0	2	1.9



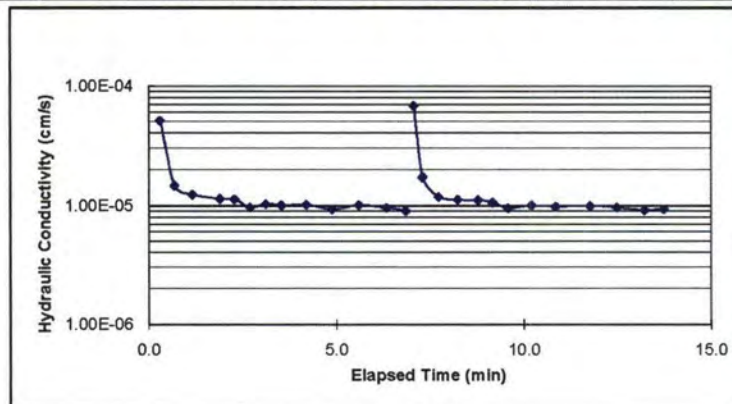
Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

Sample I.D. 305-mm Caisson North Radon				Test Date :			
Cell Pressure =	42.5	psi		Diameter of Sample, D =	30.5	cm	
Inflow Pressure =	41.5	psi		Length of Sample, L =	17.8	cm	
Outflow Pressure =	40.0	psi		Area of Sample, A =	729.66	cm ²	
Pressure Difference =	1.5	psi		Sample Volume, V =	12973.3	cm ³	
Effective Stress =	1.8	psi		a _{in} =	1	cm ²	
Hydraulic Gradient, i =	5.9			a _{out} =	1	cm ²	
Weight of wet sample =	26126.8	lb		Sample Water Content =	15.75%	(%)	
Wet Density =	2.0	g/cm ³		Dry Density =	2.01	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	50.37	360.26	318.09	15.75%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:18	6.0	20.7	18.0	14.7	0.3	5.04E-05	0.6	6	3.3
0:00:41	7.5	18.9	23.0	11.4	0.7	1.47E-05	1.2	1.5	1.8
0:01:10	9.0	17.0	29.0	8.0	1.2	1.24E-05	1.3	1.5	1.9
0:01:54	11.0	14.4	44.0	3.4	1.9	1.15E-05	1.3	2	2.6
0:02:17	12.0	13.1	23.0	1.1	2.3	1.13E-05	1.3	1	1.3
0:02:42	13.0	12.0	25.0	-1.0	2.7	9.70E-06	1.1	1	1.1
0:03:07	14.0	10.8	25.0	-3.2	3.1	1.04E-05	1.2	1	1.2
0:03:32	15.0	9.7	25.0	-5.3	3.5	1.01E-05	1.1	1	1.1
0:04:12	16.5	7.9	40.0	-8.6	4.2	1.02E-05	1.2	1.5	1.8
0:04:53	18.0	6.4	41.0	-11.6	4.9	9.35E-06	1.0	1.5	1.5
0:05:36	19.5	4.6	43.0	-14.9	5.6	1.01E-05	1.2	1.5	1.8
0:06:20	21.0	3.0	44.0	-18.0	6.3	9.64E-06	1.1	1.5	1.6
0:06:51	22.0	2.0	31.0	-20.0	6.9	9.09E-06	1.0	1	1
0:00:00	0.0	24.0	-411.0	24.0	6.9				
0:00:10	5.0	22.0	10.0	17.0	7.1	6.77E-05	0.4	5	2
0:00:24	6.5	21.1	14.0	14.6	7.3	1.72E-05	0.6	1.5	0.9
0:00:50	8.0	19.6	26.0	11.6	7.7	1.19E-05	1.0	1.5	1.5
0:01:20	9.5	17.9	30.0	8.4	8.2	1.13E-05	1.1	1.5	1.7
0:01:53	11.0	16.0	33.0	5.0	8.8	1.12E-05	1.3	1.5	1.9
0:02:16	12.0	14.8	23.0	2.8	9.2	1.07E-05	1.2	1	1.2
0:02:41	13.0	13.7	25.0	0.7	9.6	9.54E-06	1.1	1	1.1
0:03:18	14.5	12.0	37.0	-2.5	10.2	1.01E-05	1.1	1.5	1.7
0:03:57	16.0	10.3	39.0	-5.7	10.9	9.86E-06	1.1	1.5	1.7
0:04:52	18.0	7.9	55.0	-10.1	11.8	9.99E-06	1.2	2	2.4
0:05:35	19.5	6.2	43.0	-13.3	12.5	9.67E-06	1.1	1.5	1.7
0:06:19	21.0	4.7	44.0	-16.3	13.2	9.16E-06	1.0	1.5	1.5
0:06:50	22.0	3.6	31.0	-18.4	13.7	9.36E-06	1.1	1	1.1



Hydraulic Conductivity Test - Monticello - Store-and-Release Cover

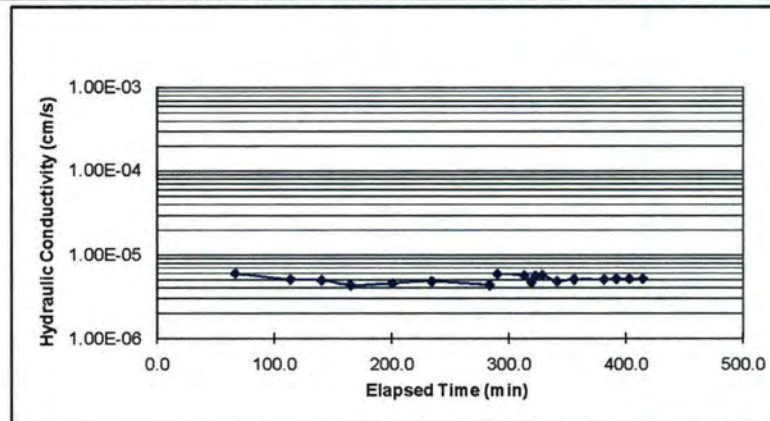
ASTM D 5084 - 00

Sample I.D.			75-mm Caisson North Radon		Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	7.0	cm	
Inflow Pressure =	40.3	psi	Length of Sample, L =	4.4	cm	
Outflow Pressure =	40.1	psi	Area of Sample, A =	38.32	cm ²	
Pressure Difference =	0.2	psi	Sample Volume, V =	170.3	cm ³	
Effective Stress =	1.8	psi	a _{in} =	1	cm ²	
Hydraulic Gradient, i =	3.2		a _{out} =	1	cm ²	
Weight of wet sample =	340.8	g	Sample Water Content =	21.94%	(%)	
Wet Density =	2.0	g/cm ³	Dry Density =	2.00	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
	30.76	128.57	110.97	21.94%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
1:06:39	6.4	17.7	3999.0	11.3	66.7	5.89E-06	1.0	6.4	6.3
1:53:47	9.1	14.9	2828.0	5.8	113.8	5.01E-06	1.0	2.7	2.8
2:20:21	10.4	13.7	1594.0	3.3	140.4	4.89E-06	0.9	1.3	1.2
2:44:56	11.3	12.8	1475.0	1.5	164.9	4.30E-06	1.0	0.9	0.9
3:20:49	12.5	11.6	2153.0	-0.9	200.8	4.51E-06	1.0	1.2	1.2
3:54:21	13.5	10.6	2012.0	-2.9	234.4	4.75E-06	1.0	1	1
4:43:38	14.6	9.5	2957.0	-5.1	283.6	4.30E-06	1.0	1.1	1.1
0:00:00	0.0	24.0	-17018.0	24.0	283.6				
0:06:41	0.8	23.3	401.0	22.5	290.3	5.81E-06	0.9	0.8	0.7
0:29:48	3.1	21.0	1387.0	17.9	313.4	5.62E-06	1.0	2.3	2.3
0:35:48	3.6	20.6	360.0	17.0	319.4	4.60E-06	0.8	0.5	0.4
0:39:13	3.9	20.3	205.0	16.4	322.8	5.52E-06	1.0	0.3	0.3
0:44:58	4.4	19.8	345.0	15.4	328.6	5.61E-06	1.0	0.5	0.5
0:57:45	5.3	18.9	767.0	13.6	341.4	4.77E-06	1.0	0.9	0.9
1:12:09	6.3	17.9	864.0	11.6	355.8	5.04E-06	1.0	1	1
1:37:57	7.9	16.3	1548.0	8.4	381.6	4.99E-06	1.0	1.6	1.6
1:48:22	8.5	15.7	625.0	7.2	392.0	5.09E-06	1.0	0.6	0.6
1:59:26	9.1	15.1	664.0	6.0	403.0	5.07E-06	1.0	0.6	0.6
2:11:09	9.7	14.5	703.0	4.8	414.8	5.09E-06	1.0	0.6	0.6



Hydraulic Conductivity Test - Omaha - Composite Cover

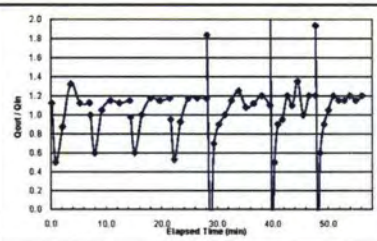
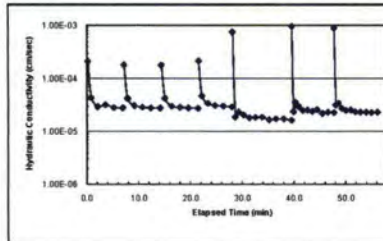
ASTM D 5084 - 00

Sample ID: 305-mm DCRDF C1 Below Membrane		Test Date: 7/3/08	
Cell Pressure = 42.7 psi	Diameter of Sample, D = 30.5 cm		
Inflow Pressure = 42.4 psi	Length of Sample, L = 15.2 cm		
Outflow Pressure = 40.0 psi	Area of Sample, A = 729.66 cm ²		
Pressure Difference = 2.4 psi	Sample Volume, V = 11120.0 cm ³		
Effective Stress = 1.5 psi	$a_{in} = 5$ cm ²		
Hydraulic Gradient, i = 11.1	$a_{out} = 5$ cm ²		
Weight of wet sample = 22150.0 g	Sample Water Content = 24.3% (%)		
Wet Density = 2.0 g/cm ³	Dry Density = 1.99 g/cm ³		

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
GC-2	30.79	119.7	102.32	24.30%

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q_{avg} / Q_m	Q_m	Q_{out}
7/3/2008 00:00:00	0.0	24.8	0.0	24.8	0.0				
7/3/2008 00:11:00	4.0	20.3	11.0	16.3	0.2	2.13E-04	1.1	20	22.5
7/3/2008 00:50:00	8.0	19.3	39.0	10.3	0.8	4.40E-05	0.5	20	10
7/3/2008 02:05:00	12.0	14.8	75.0	2.8	2.1	2.97E-05	0.9	20	17.5
7/3/2008 03:35:00	16.0	9.5	90.0	-8.5	3.6	3.23E-05	1.3	20	26.5
7/3/2008 05:13:00	20.0	5.0	98.0	-15.0	5.2	2.98E-05	1.1	20	22.5
7/3/2008 06:58:00	24.0	0.5	105.0	-23.5	7.0	2.82E-05	1.1	20	22.5
7/3/2008 08:00:00	0.0	24.8	0.0	24.8	7.0				
7/3/2008 08:12:00	4.0	20.8	12.0	16.8	7.2	1.83E-04	1.0	20	20
7/3/2008 08:55:00	8.0	18.4	43.0	10.4	7.9	4.25E-05	0.6	20	12
7/3/2008 09:14:00	12.0	14.2	79.0	2.2	9.2	3.09E-05	1.1	20	21
7/3/2008 09:45:00	16.0	9.8	92.0	-8.4	10.7	2.92E-05	1.2	20	23
7/3/2008 09:55:00	20.0	5.1	100.0	-14.9	12.4	2.82E-05	1.1	20	22.5
7/3/2008 10:13:00	24.0	0.5	107.0	-23.5	14.2	2.80E-05	1.2	20	23
7/3/2008 10:00:00	0.0	24.8	0.0	24.8	14.2				
7/3/2008 10:12:00	4.0	20.9	12.0	16.9	14.4	1.81E-04	1.0	20	19.5
7/3/2008 10:55:00	8.0	18.5	43.0	10.5	15.1	4.25E-05	0.6	20	12
7/3/2008 12:13:00	12.0	14.5	78.0	2.5	16.4	3.09E-05	1.0	20	20
7/3/2008 13:47:00	16.0	9.8	94.0	-8.2	18.0	2.88E-05	1.2	20	23.5
7/3/2008 15:27:00	20.0	5.2	100.0	-14.8	19.6	2.83E-05	1.2	20	23
7/3/2008 17:16:00	24.0	0.5	109.0	-23.5	21.5	2.78E-05	1.2	20	23.5
7/3/2008 18:00:00	0.0	24.8	0.0	24.8	21.5				
7/3/2008 18:10:00	4.0	21.0	10.0	17.0	21.6	2.14E-04	1.0	20	19
7/3/2008 18:47:00	8.0	18.9	37.0	10.9	22.2	4.70E-05	0.5	20	10.5
7/3/2008 19:54:00	12.0	15.2	67.0	3.2	23.4	3.41E-05	0.9	20	18.5
7/3/2008 20:21:00	16.0	10.5	87.0	-5.5	24.8	3.11E-05	1.2	20	23.5
7/3/2008 20:55:00	20.0	5.5	94.0	-14.5	26.4	3.03E-05	1.2	20	23
7/3/2008 20:58:00	24.0	1.1	103.0	-22.9	28.1	2.93E-05	1.2	20	23.5
7/6/2008 00:00:00	0.0	24.4	0.0	24.4	28.1				
7/6/2008 00:03:14	3.0	18.9	3.1	15.9	28.1	7.47E-04	1.8	15	27.5
7/6/2008 00:36:55	6.0	19.7	33.4	13.7	28.7	1.87E-05	-0.3	15	-4
7/6/2008 01:18:68	8.0	18.3	42.1	10.3	29.4	2.33E-05	0.7	10	7
7/6/2008 02:12:78	10.0	16.5	54.1	6.5	30.3	2.07E-05	0.9	10	9
7/6/2008 03:18:58	12.0	14.5	65.8	2.5	31.4	1.83E-05	1.0	10	10
7/6/2008 04:30:23	14.0	12.2	71.7	-1.9	32.6	1.68E-05	1.2	10	11.5
7/6/2008 05:46:24	16.0	9.7	76.0	-6.3	33.9	1.87E-05	1.3	10	12.5
7/6/2008 07:07:06	18.0	7.5	80.8	-10.5	35.2	1.87E-05	1.1	10	10.8
7/6/2008 08:28:33	20.0	5.3	81.3	-14.7	36.6	1.74E-05	1.1	10	11.2
7/6/2008 09:56:02	22.0	2.9	87.7	-19.1	38.0	1.72E-05	1.2	10	12
7/6/2008 11:26:06	24.0	0.7	90.0	-23.3	39.5	1.65E-05	1.1	10	11
7/6/2008 12:00:00	0.0	24.9	0.0	24.9	39.5				
7/6/2008 12:02:18	3.0	18.3	2.3	15.3	39.6	9.53E-04	2.2	15	33
7/6/2008 12:23:02	6.0	19.6	20.3	13.6	39.9	2.39E-05	-0.4	15	-6.5
7/6/2008 12:47:14	8.0	18.6	24.1	10.6	40.3	3.59E-05	0.5	10	5
7/6/2008 13:24:95	10.0	16.8	37.8	6.8	40.9	2.99E-05	0.9	10	9
7/6/2008 14:11:92	12.0	14.9	47.0	2.9	41.7	2.49E-05	1.0	10	9.5
7/6/2008 15:04:61	14.0	12.5	52.7	-1.5	42.6	2.57E-05	1.2	10	12
7/6/2008 15:59:87	16.0	10.3	55.3	-5.7	43.5	2.40E-05	1.1	10	11
7/6/2008 16:58:56	18.0	7.8	58.7	-10.4	44.5	2.02E-05	1.4	10	13.5
7/6/2008 17:59:11	20.0	5.6	60.6	-14.4	45.5	2.50E-05	1.0	10	10
7/6/2008 18:03:65	22.0	3.2	64.5	-18.8	46.6	2.53E-05	1.2	10	12
7/6/2008 18:11:25	24.0	0.8	67.6	-23.2	47.7	2.29E-05	1.2	10	12
7/6/2008 18:00:00	0.0	24.8	0.0	24.8	47.7				
7/6/2008 18:02:73	3.0	19	2.7	16	47.8	8.89E-04	1.9	15	29
7/6/2008 18:24:21	6.0	19.6	21.5	13.6	48.1	3.17E-05	-0.2	15	-3
7/6/2008 18:50:95	8.0	18.4	26.7	10.4	48.6	3.42E-05	0.6	10	6
7/6/2008 19:31:15	10.0	16.6	40.8	9.6	49.2	2.14E-05	0.9	10	9
7/6/2008 20:20:25	12.0	14.5	48.5	9.5	50.0	2.54E-05	1.1	10	10.5
7/6/2008 20:33:33	14.0	12.1	53.1	-1.9	50.9	2.59E-05	1.2	10	12
7/6/2008 20:41:02	16.0	9.8	57.7	-6.2	51.9	2.39E-05	1.2	10	11.5
7/6/2008 20:50:87	18.0	7.5	59.9	-10.5	52.9	2.33E-05	1.2	10	11.5
7/6/2008 20:53:61	20.0	5.1	62.7	-14.9	53.9	2.34E-05	1.2	10	12
7/6/2008 20:57:56	22.0	2.8	64.0	-19.2	55.0	2.31E-05	1.2	10	11.5
7/6/2008 20:58:52	24.0	0.4	67.0	-23.6	56.1	2.32E-05	1.2	10	12



Hydraulic Conductivity Test - Omaha - Thin Store-and-Release Cover

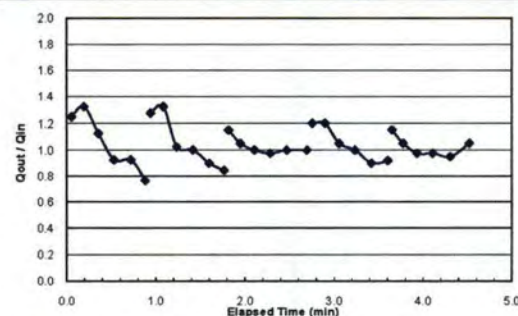
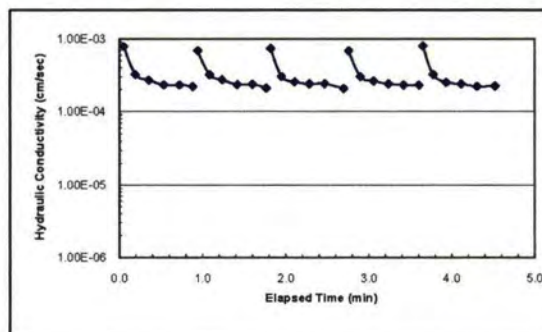
ASTM D 5084 - 00

Sample I.D.	305-mm DCRDF A-1 Shallow	Test Date :	7/9/08
Cell Pressure =	42.7 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	2.4 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	5 cm ²
Weight of wet sample =	21150.0 g	Sample Water Content =	24.7% (%)
Wet Density =	1.9 g/cm ³	Dry Density =	1.90 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left(\frac{\Delta H_1}{\Delta H_2} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
k7	30.8	141.98	119.95	24.71%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/9/2008 00:00:00	0.0	24.8	0.0	24.8	0.0				
7/9/2008 00:03:15	4.0	19.8	3.1	15.8	0.1	7.88E-04	1.3	20	25
7/9/2008 00:11:56	8.0	14.5	8.4	6.5	0.2	3.20E-04	1.3	20	26.5
7/9/2008 00:21:25	12.0	10.0	9.7	-2.0	0.4	2.67E-04	1.1	20	22.5
7/9/2008 00:31:92	16.0	6.3	10.7	-9.7	0.5	2.31E-04	0.9	20	18.5
7/9/2008 00:43:15	20.0	2.6	11.2	-17.4	0.7	2.30E-04	0.9	20	18.5
7/9/2008 00:52:75	23.4	0.0	9.6	-23.4	0.9	2.19E-04	0.8	17	13
7/9/2008 00:00:00	0.0	24.8	0.0	24.8	0.9				
7/9/2008 00:03:65	4.0	19.7	3.6	15.7	0.9	6.87E-04	1.3	20	25.5
7/9/2008 00:12:14	8.0	14.4	8.5	6.4	1.1	3.17E-04	1.3	20	26.5
7/9/2008 00:21:25	12.0	10.3	9.1	-1.7	1.2	2.71E-04	1.0	20	20.5
7/9/2008 00:32:28	16.0	6.3	11.0	-9.7	1.4	2.32E-04	1.0	20	20
7/9/2008 00:43:15	20.0	2.7	10.9	-17.3	1.6	2.35E-04	0.9	20	18
7/9/2008 00:53:06	23.2	0.0	9.9	-23.2	1.8	2.09E-04	0.8	16	13.5
7/9/2008 00:00:00	0.0	24.8	0.0	24.8	1.8				
7/9/2008 00:03:21	4.0	20.2	3.2	16.2	1.8	7.38E-04	1.2	20	23
7/9/2008 00:11:05	8.0	16.0	7.8	8.0	1.9	3.01E-04	1.1	20	21
7/9/2008 00:20:55	12.0	12.0	9.5	0.0	2.1	2.54E-04	1.0	20	20
7/9/2008 00:31:09	16.0	8.1	10.5	-7.9	2.3	2.37E-04	1.0	20	19.5
7/9/2008 00:42:18	20.0	4.1	11.1	-15.9	2.5	2.40E-04	1.0	20	20
7/9/2008 00:55:90	24.0	0.1	13.7	-23.9	2.7	2.04E-04	1.0	20	20
7/9/2008 00:00:00	0.0	24.8	0.0	24.8	2.7				
7/9/2008 00:03:56	4.0	20.0	3.6	16.0	2.8	6.81E-04	1.2	20	24
7/9/2008 00:12:05	8.0	15.2	8.5	7.2	2.9	2.99E-04	1.2	20	24
7/9/2008 00:21:64	12.0	11.0	9.6	-1.0	3.1	2.59E-04	1.1	20	21
7/9/2008 00:32:33	16.0	7.0	10.7	-9.0	3.2	2.38E-04	1.0	20	20
7/9/2008 00:43:46	20.0	3.4	11.1	-16.6	3.4	2.28E-04	0.9	20	18
7/9/2008 00:54:37	23.7	0.0	10.9	-23.7	3.6	2.28E-04	0.9	18.5	17
7/9/2008 00:00:00	0.0	24.8	0.0	24.8	3.6				
7/9/2008 00:02:96	4.0	20.2	3.0	16.2	3.7	8.00E-04	1.2	20	23
7/9/2008 00:10:36	8.0	16.0	7.4	8.0	3.8	3.19E-04	1.1	20	21
7/9/2008 00:19:87	12.0	12.1	9.5	0.1	3.9	2.50E-04	1.0	20	19.5
7/9/2008 00:30:42	16.0	8.2	10.5	-7.8	4.1	2.37E-04	1.0	20	19.5
7/9/2008 00:42:15	20.0	4.4	11.7	-15.6	4.3	2.21E-04	1.0	20	19
7/9/2008 00:55:06	24.0	0.2	12.9	-23.8	4.5	2.22E-04	1.1	20	21



Hydraulic Conductivity Test - Omaha - Thin Store-and-Release Cover

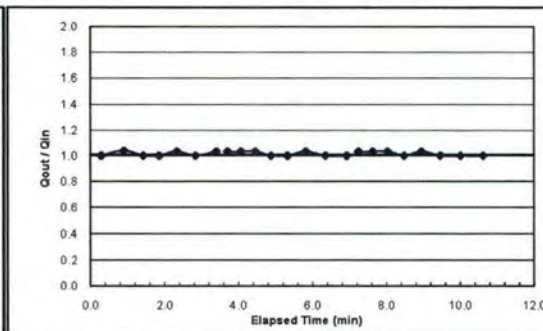
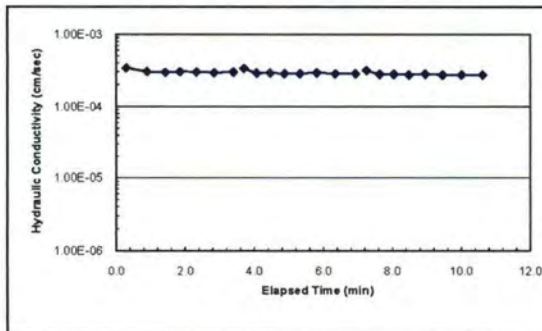
ASTM D 5084 - 00

Sample I.D.	150-mm Omaha DCRDF A1 Shallow 1	Test Date :	7/14/08
Cell Pressure =	42.7 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	41.8 psi	Length of Sample, L =	7.6 cm
Outflow Pressure =	40.6 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.2 psi	Sample Volume, V =	1390.0 cm ³
Effective Stress =	1.50 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	5 cm ²
Weight of wet sample =	2366.8 (g)	Sample Water Content =	28.3% (%)
Wet Density =	1.7 g/cm ³	Dry Density =	1.70 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
B3	30.94	124.91	104.18	28.30%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/14/08 00:00.00	0.0	24.8	0.0	24.8	0.0				
7/14/08 00:17.42	3.0	21.8	17.4	18.8	0.3	3.39E-04	1.0	15	15
7/14/08 00:53.57	8.0	16.6	36.2	8.6	0.9	3.01E-04	1.0	25	26
7/14/08 01:25.55	12.0	12.6	32.0	0.6	1.4	2.94E-04	1.0	20	20
7/14/08 01:51.17	15.0	9.6	25.6	-5.4	1.9	2.98E-04	1.0	15	15
7/14/08 02:19.44	18.0	6.5	28.3	-11.5	2.3	2.97E-04	1.0	15	15.5
7/14/08 02:50.30	21.0	3.5	30.9	-17.5	2.8	2.91E-04	1.0	15	15
7/14/08 03:23.83	24.0	0.4	33.5	-23.6	3.4	2.98E-04	1.0	15	15.5
7/14/08 00:00.00	0.0	24.8	0.0	24.8	3.4				
7/14/08 00:17.99	3.0	21.7	18.0	18.7	3.7	3.34E-04	1.0	15	15.5
7/14/08 00:40.06	6.0	18.6	22.1	12.6	4.1	2.89E-04	1.0	15	15.5
7/14/08 01:03.54	9.0	15.5	23.5	6.5	4.5	2.89E-04	1.0	15	15.5
7/14/08 01:28.84	12.0	12.5	25.3	0.5	4.9	2.82E-04	1.0	15	15
7/14/08 01:55.94	15.0	9.5	27.1	-5.5	5.3	2.82E-04	1.0	15	15
7/14/08 02:25.08	18.0	6.4	29.1	-11.6	5.8	2.88E-04	1.0	15	15.5
7/14/08 02:57.10	21.0	3.4	32.0	-17.6	6.3	2.81E-04	1.0	15	15
7/14/08 03:31.99	24.0	0.4	34.9	-23.6	6.9	2.82E-04	1.0	15	15
7/14/08 00:00.00	0.0	24.8	0.0	24.8	6.9				
7/14/08 00:19.24	3.0	21.7	19.2	18.7	7.3	3.12E-04	1.0	15	15.5
7/14/08 00:42.34	6.0	18.6	23.1	12.6	7.6	2.76E-04	1.0	15	15.5
7/14/08 01:06.82	9.0	15.5	24.5	6.5	8.0	2.77E-04	1.0	15	15.5
7/14/08 01:33.00	12.0	12.5	26.2	0.5	8.5	2.72E-04	1.0	15	15
7/14/08 02:01.10	15.0	9.4	28.1	-5.6	8.9	2.77E-04	1.0	15	15.5
7/14/08 02:31.64	18.0	6.4	30.5	-11.6	9.5	2.71E-04	1.0	15	15
7/14/08 03:04.69	21.0	3.4	33.0	-17.6	10.0	2.72E-04	1.0	15	15
7/14/08 03:41.27	24.0	0.4	36.6	-23.6	10.6	2.69E-04	1.0	15	15



Hydraulic Conductivity Test - Omaha - Thin Store-and-Release Cover

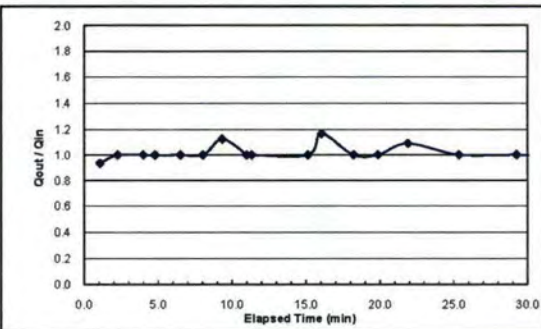
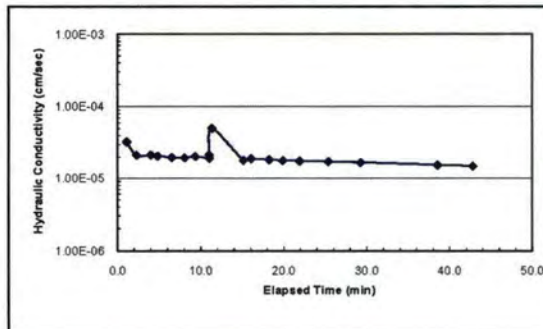
ASTM D 5084 - 00

Sample I.D.	75-mm Omaha DCRDF A1-Shallow 1	Test Date :	7/31/08
Cell Pressure =	38.1 psi	Diameter of Sample, D =	7.6 cm
Inflow Pressure =	37.5 psi	Length of Sample, L =	3.8 cm
Outflow Pressure =	37.0 psi	Area of Sample, A =	45.6 cm ²
Pressure Difference =	0.5 psi	Sample Volume, V =	173.7 cm ³
Effective Stress =	0.85 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	9.2	a _{out} =	1 cm ²
Weight of wet sample =	279.9 (g)	Sample Water Content =	-405.5% (%)
Wet Density =	1.6 g/cm ³	Dry Density =	1.68 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
k7	30.78	124.8		-405.46%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
7/31/08 00:00.00	0.0	24.0	0.0	24.0	0.0				
7/31/08 01:04.56	1.5	22.6	64.6	21.1	1.1	3.25E-05	0.9	1.5	1.4
7/31/08 02:15.84	2.5	21.6	71.3	19.1	2.3	2.12E-05	1.0	1	1
7/31/08 03:59.87	3.9	20.2	104.0	16.3	4.0	2.13E-05	1.0	1.4	1.4
7/31/08 04:47.68	4.5	19.6	47.8	15.1	4.8	2.06E-05	1.0	0.6	0.6
7/31/08 06:31.33	5.7	18.4	103.6	12.7	6.5	1.97E-05	1.0	1.2	1.2
7/31/08 08:02.78	6.7	17.4	91.4	10.7	8.0	1.95E-05	1.0	1	1
7/31/08 09:20.50	7.5	16.5	77.7	9.0	9.3	2.03E-05	1.1	0.8	0.9
7/31/08 11:00.96	8.5	15.5	100.5	7.0	11.0	1.93E-05	1.0	1	1
7/31/08 00:00.00	0.0	24.0	-661.0	24.0	11.0	2.14E-05	1.0	-8.5	-8.5
7/31/08 00:19.95	0.7	23.3	19.9	22.6	11.3	5.01E-05	1.0	0.7	0.7
7/31/08 04:08.15	3.4	20.6	228.2	17.2	15.1	1.80E-05	1.0	2.7	2.7
7/31/08 05:03.65	4.0	19.9	55.5	15.9	16.1	1.89E-05	1.2	0.6	0.7
7/31/08 07:13.46	5.4	18.5	129.8	13.1	18.2	1.81E-05	1.0	1.4	1.4
7/31/08 08:52.55	6.4	17.5	99.1	11.1	19.9	1.78E-05	1.0	1	1
7/31/08 10:53.75	7.5	16.3	121.2	8.8	21.9	1.76E-05	1.1	1.1	1.2
7/31/08 14:21.73	9.3	14.5	208.0	5.2	25.4	1.72E-05	1.0	1.8	1.8
7/31/08 18:15.84	11.1	12.7	234.1	1.6	29.3	1.67E-05	1.0	1.8	1.8
7/31/08 27:31.15	14.5	9.3	555.3	-5.2	38.5	1.54E-05	1.0	3.4	3.4
7/31/08 31:47.83	15.8	8.0	256.7	-7.8	42.8	1.48E-05	1.0	1.3	1.3



Hydraulic Conductivity Test - Omaha - Thin Store-and-Release Cover

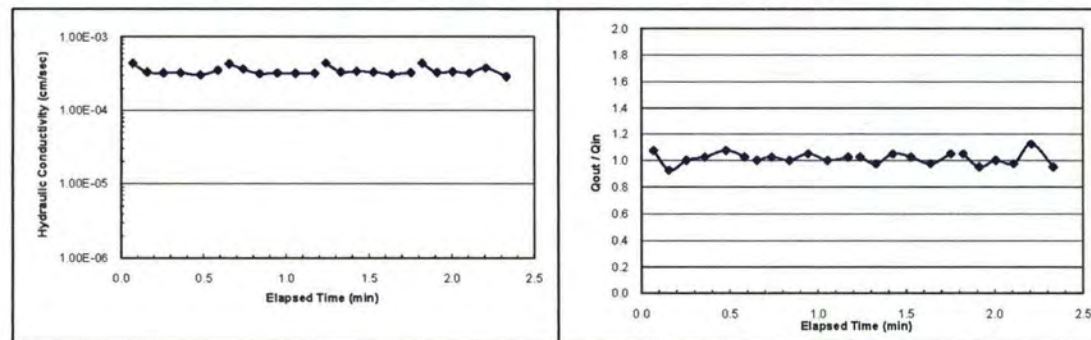
ASTM D 5084 - 00

Sample I.D.	305-mm DCRDF A01-BT2 (Top)	Test Date :	7/9/08
Cell Pressure =	42.7 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	2.4 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5 psi	a _{in} =	4 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	4 cm ²
Weight of wet sample =	20900.0 g	Sample Water Content =	24.8% (%)
Wet Density =	1.9 g/cm ³	Dry Density =	1.87 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
B-3	30.87	165.59	138.85	24.76%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/14/2008 00:00:00	0.0	24.8	0.0	24.8	0.0				
7/14/2008 00:04:14	4.0	20.5	4.1	16.5	0.1	4.41E-04	1.1	16	17.2
7/14/2008 00:09:44	8.0	16.8	5.3	8.8	0.2	3.34E-04	0.9	16	14.8
7/14/2008 00:15:33	12.0	12.8	5.9	0.8	0.3	3.26E-04	1.0	16	16
7/14/2008 00:21:58	16.0	8.7	6.3	-7.3	0.4	3.26E-04	1.0	16	16.4
7/14/2008 00:28:76	20.0	4.4	7.2	-15.6	0.5	3.06E-04	1.1	16	17.2
7/14/2008 00:35:14	24.0	0.3	6.4	-23.7	0.6	3.55E-04	1.0	16	16.4
7/14/2008 00:00:00	0.0	24.8	0.0	24.8	0.6				
7/14/2008 00:04:08	4.0	20.8	4.1	16.8	0.7	4.31E-04	1.0	16	16
7/14/2008 00:09:14	8.0	16.7	5.1	8.7	0.7	3.68E-04	1.0	16	16.4
7/14/2008 00:15:19	12.0	12.7	6.0	0.7	0.8	3.18E-04	1.0	16	16
7/14/2008 00:21:53	16.0	8.5	6.3	-7.5	0.9	3.26E-04	1.1	16	16.8
7/14/2008 00:28:16	20.0	4.5	6.6	-15.5	1.1	3.20E-04	1.0	16	16
7/14/2008 00:35:15	24.0	0.4	7.0	-23.6	1.2	3.24E-04	1.0	16	16.4
7/14/2008 00:00:00	0.0	24.8	0.0	24.8	1.2				
7/14/2008 00:04:02	4.0	20.7	4.0	16.7	1.2	4.43E-04	1.0	16	16.4
7/14/2008 00:09:42	8.0	16.8	5.4	8.8	1.3	3.36E-04	1.0	16	15.6
7/14/2008 00:15:18	12.0	12.6	5.8	0.6	1.4	3.42E-04	1.1	16	16.8
7/14/2008 00:21:29	16.0	8.5	6.1	-7.5	1.5	3.34E-04	1.0	16	16.4
7/14/2008 00:27:98	20.0	4.6	6.7	-15.4	1.6	3.13E-04	1.0	16	15.6
7/14/2008 00:34:92	24.0	0.4	6.9	-23.6	1.8	3.30E-04	1.1	16	16.8
7/14/2008 00:00:00	0.0	24.8	0.0	24.8	1.8				
7/14/2008 00:04:12	4.0	20.6	4.1	16.6	1.8	4.38E-04	1.1	16	16.8
7/14/2008 00:09:54	8.0	16.8	5.4	8.8	1.9	3.31E-04	1.0	16	15.2
7/14/2008 00:15:21	12.0	12.8	5.7	0.8	2.0	3.39E-04	1.0	16	16
7/14/2008 00:21:31	16.0	8.9	6.1	-7.1	2.1	3.26E-04	1.0	16	15.6
7/14/2008 00:27:25	20.0	4.4	5.9	-15.6	2.2	3.79E-04	1.1	16	18
7/14/2008 00:34:79	24.0	0.6	7.5	-23.4	2.3	2.89E-04	1.0	16	15.2



Hydraulic Conductivity Test - Omaha - Thin Store-and-Release Cover

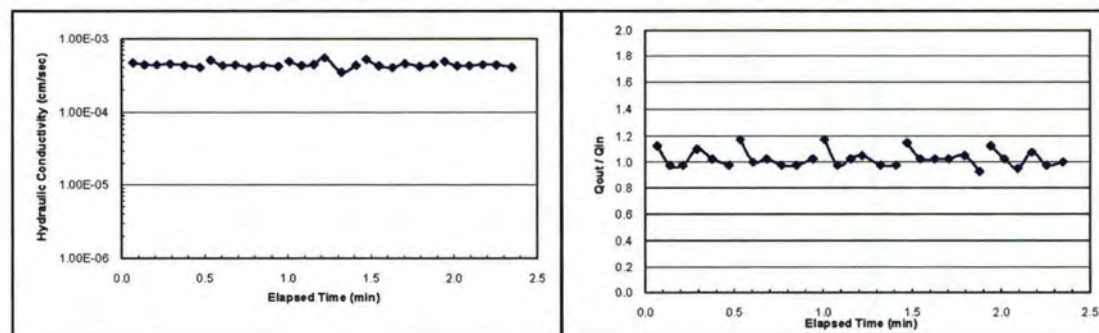
ASTM D 5084 - 00

Sample I.D. 305-mm DCRDF A01- (Top)			Test Date : 7/21/08	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	2.4	psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5	psi	a _{in} =	4 cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	4 cm ²
Weight of wet sample =	19900.0	g	Sample Water Content =	24.2% (%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.79 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
k7	30.85	153	129.17	24.24%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/21/2008 00:00:00	0.0	24.7	0.0	24.7	0.0				
7/21/2008 00:04:08	4.0	20.2	4.1	16.2	0.1	4.59E-04	1.1	16	18
7/21/2008 00:08:29	8.0	16.3	4.2	8.3	0.1	4.32E-04	1.0	16	15.6
7/21/2008 00:12:70	12.0	12.4	4.4	0.4	0.2	4.31E-04	1.0	16	15.6
7/21/2008 00:17:50	16.0	8.0	4.8	-8.0	0.3	4.42E-04	1.1	16	17.6
7/21/2008 00:22:60	20.0	3.9	5.1	-16.1	0.4	4.22E-04	1.0	16	16.4
7/21/2008 00:28:18	24.0	0.0	5.6	-24.0	0.5	3.97E-04	1.0	16	15.6
7/21/2008 00:00:00	0.0	24.8	0.0	24.8	0.5				
7/21/2008 00:03:85	4.0	20.1	3.8	16.1	0.5	4.98E-04	1.2	16	18.8
7/21/2008 00:08:21	8.0	16.1	4.4	8.1	0.6	4.23E-04	1.0	16	16
7/21/2008 00:12:77	12.0	12.0	4.6	0.0	0.7	4.28E-04	1.0	16	16.4
7/21/2008 00:17:79	16.0	8.1	5.0	-7.9	0.8	3.98E-04	1.0	16	15.6
7/21/2008 00:22:76	20.0	4.2	5.0	-15.8	0.8	4.22E-04	1.0	16	15.6
7/21/2008 00:28:31	24.0	0.1	5.5	-23.9	0.9	4.08E-04	1.0	16	16.4
7/21/2008 00:00:00	0.0	24.8	0.0	24.8	0.9				
7/21/2008 00:04:01	4.0	20.1	4.0	16.1	1.0	4.78E-04	1.2	16	18.8
7/21/2008 00:08:36	8.0	16.2	4.3	8.2	1.1	4.18E-04	1.0	16	15.6
7/21/2008 00:12:84	12.0	12.1	4.5	0.1	1.2	4.36E-04	1.0	16	16.4
7/21/2008 00:16:67	16.0	7.9	3.8	-8.1	1.2	5.42E-04	1.1	16	16.8
7/21/2008 00:22:86	20.0	4.0	6.2	-16.0	1.3	3.39E-04	1.0	16	15.6
7/21/2008 00:28:08	24.0	0.1	5.2	-23.9	1.4	4.24E-04	1.0	16	15.6
7/21/2008 00:00:00	0.0	24.8	0.0	24.8	1.4				
7/21/2008 00:03:69	4.0	20.2	3.7	16.2	1.5	5.13E-04	1.2	16	18.4
7/21/2008 00:08:19	8.0	16.1	4.5	8.1	1.5	4.15E-04	1.0	16	16.4
7/21/2008 00:13:15	12.0	12.0	5.0	0.0	1.6	3.94E-04	1.0	16	16.4
7/21/2008 00:17:74	16.0	7.9	4.6	-8.1	1.7	4.47E-04	1.0	16	16.4
7/21/2008 00:23:09	20.0	3.7	5.3	-16.3	1.8	4.08E-04	1.1	16	16.8
7/21/2008 00:28:10	24.0	0.0	5.0	-24.0	1.9	4.31E-04	0.9	16	14.8
7/21/2008 00:00:00	0.0	24.8	0.0	24.8	1.9				
7/21/2008 00:03:91	4.0	20.3	3.9	16.3	1.9	4.79E-04	1.1	16	18
7/21/2008 00:08:41	8.0	16.2	4.5	8.2	2.0	4.15E-04	1.0	16	16.4
7/21/2008 00:12:88	12.0	12.4	4.5	0.4	2.1	4.20E-04	1.0	16	15.2
7/21/2008 00:17:72	16.0	8.1	4.8	-7.9	2.2	4.33E-04	1.1	16	17.2
7/21/2008 00:22:62	20.0	4.2	4.9	-15.8	2.3	4.28E-04	1.0	16	15.6
7/21/2008 00:28:19	24.0	0.2	5.6	-23.8	2.3	4.02E-04	1.0	16	16



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

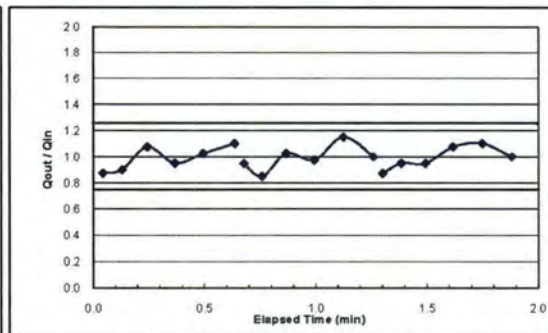
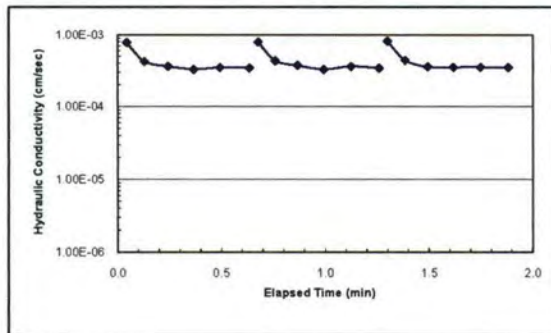
ASTM D 5084 - 00

Sample I.D. 305-mm DCRDF AO2-S1 Deep			Test Date : 5/30/08	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	2.4	psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5	psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	5 cm ²
Weight of wet sample =	19800.0	g	Sample Water Content =	24.9% (%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.78 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
X3	30.4	107.1	91.8	24.92%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
5/30/2008 00:00.00	0.0	24.5	0.0	24.5	0.0				
5/30/2008 00:02.64	4.0	21.0	2.6	17.0	0.0	7.81E-04	0.9	20	17.5
5/30/2008 00:07.78	8.0	17.4	5.1	9.4	0.1	4.23E-04	0.9	20	18
5/30/2008 00:14.64	12.0	13.1	6.9	1.1	0.2	3.62E-04	1.1	20	21.5
5/30/2008 00:22.05	16.0	9.3	7.4	-6.7	0.4	3.30E-04	1.0	20	19
5/30/2008 00:29.68	20.0	5.2	7.6	-14.8	0.5	3.50E-04	1.0	20	20.5
5/30/2008 00:38.14	24.0	0.8	8.5	-23.2	0.6	3.45E-04	1.1	20	22
5/30/2008 00:00.00	0.2	24.6	0.0	24.4	0.6				
5/30/2008 00:02.55	4.0	21.0	2.5	17.0	0.7	7.98E-04	0.9	19	18
5/30/2008 00:07.43	8.0	17.6	4.9	9.6	0.8	4.34E-04	0.9	20	17
5/30/2008 00:13.93	12.0	13.5	6.5	1.5	0.9	3.73E-04	1.0	20	20.5
5/30/2008 00:21.45	16.0	9.6	7.5	-6.4	1.0	3.29E-04	1.0	20	19.5
5/30/2008 00:29.28	20.0	5.0	7.8	-15.0	1.1	3.62E-04	1.2	20	23
5/30/2008 00:37.43	24.0	1.0	8.2	-23.0	1.3	3.41E-04	1.0	20	20
5/30/2008 00:00.00	0.1	24.4	0.0	24.3	1.3				
5/30/2008 00:02.46	4.0	21.0	2.5	17.0	1.3	8.16E-04	0.9	19.5	17
5/30/2008 00:07.52	8.0	17.2	5.1	9.2	1.4	4.42E-04	1.0	20	19
5/30/2008 00:14.06	12.0	13.4	6.5	1.4	1.5	3.57E-04	1.0	20	19
5/30/2008 00:21.46	16.0	9.1	7.4	-6.9	1.6	3.52E-04	1.1	20	21.5
5/30/2008 00:29.33	20.0	4.7	7.9	-15.3	1.7	3.53E-04	1.1	20	22
5/30/2008 00:37.34	24.0	0.7	8.0	-23.3	1.9	3.48E-04	1.0	20	20



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

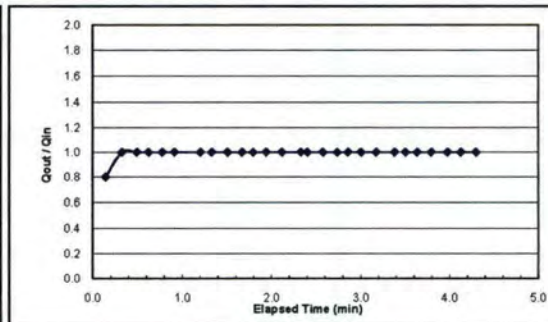
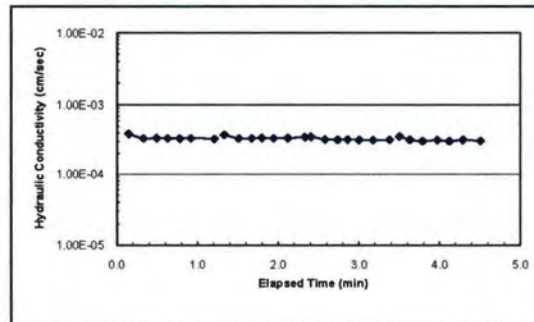
ASTM D 5084 - 00

Sample I.D.	150-mm Omaha DCRDF AO2-S1-Deep	Test Date :	7/15/08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	40.5 psi	Length of Sample, L =	6.4 cm
Outflow Pressure =	40.1 psi	Area of Sample, A =	181.5 cm ²
Pressure Difference =	0.4 psi	Sample Volume, V =	1161.3 cm ³
Effective Stress =	1.70 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	4.4	a _{out} =	1 cm ²
Weight of wet sample =	2126.1 (g)	Sample Water Content =	30.0% (%)
Wet Density =	1.8 g/cm ³	Dry Density =	1.83 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
H1	30.9	139.39	114.35	30.01%

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/22/08 00:00:00	0.0	24.0	0.0	24.0	0.0				
7/22/08 00:08:68	5.0	20.0	8.7	15.0	0.1	3.85E-04	0.8	5	4
7/22/08 00:19:55	9.0	16.0	11.0	7.0	0.3	3.30E-04	1.0	4	4
7/22/08 00:29:56	12.0	13.0	9.9	1.0	0.5	3.33E-04	1.0	3	3
7/22/08 00:37:46	14.0	11.0	7.9	-3.0	0.6	3.30E-04	1.0	2	2
7/22/08 00:46:75	16.0	9.0	9.3	-7.0	0.8	3.29E-04	1.0	2	2
7/22/08 00:54:87	17.5	7.5	8.1	-10.0	0.9	3.33E-04	1.0	1.5	1.5
7/22/08 01:12:37	20.0	5.0	17.5	-15.0	1.2	3.25E-04	1.0	2.5	2.5
7/22/08 00:00:00	0.0	24.0	0.0	24.0	1.2				
7/22/08 00:07:87	4.0	20.0	7.9	16.0	1.3	3.73E-04	1.0	4	4
7/22/08 00:18:56	8.0	16.0	10.7	8.0	1.5	3.30E-04	1.0	4	4
7/22/08 00:28:25	11.0	13.0	9.7	2.0	1.7	3.30E-04	1.0	3	3
7/22/08 00:35:73	13.0	11.0	7.5	-2.0	1.8	3.36E-04	1.0	2	2
7/22/08 00:44:56	15.0	9.0	8.8	-6.0	1.9	3.32E-04	1.0	2	2
7/22/08 00:55:06	17.0	7.0	10.5	-10.0	2.1	3.35E-04	1.0	2	2
7/22/08 01:07:83	19.0	5.0	12.8	-14.0	2.3	3.44E-04	1.0	2	2
7/22/08 00:00:00	0.0	24.0	-67.8	24.0	2.3				
7/22/08 00:06:18	3.0	21.0	6.2	18.0	2.4	3.49E-04	1.0	3	3
7/22/08 00:16:65	7.0	17.0	10.5	10.0	2.6	3.21E-04	1.0	4	4
7/22/08 00:26:21	10.0	14.0	9.6	4.0	2.7	3.16E-04	1.0	3	3
7/22/08 00:33:59	12.0	12.0	7.4	0.0	2.9	3.18E-04	1.0	2	2
7/22/08 00:42:21	14.0	10.0	8.6	-4.0	3.0	3.14E-04	1.0	2	2
7/22/08 00:52:43	16.0	8.0	10.2	-8.0	3.2	3.13E-04	1.0	2	2
7/22/08 01:04:84	18.0	6.0	12.4	-12.0	3.4	3.15E-04	1.0	2	2
7/22/08 00:00:00	0.0	24.0	-64.8	24.0	3.4				
7/22/08 00:06:15	3.0	21.0	6.1	18.0	3.5	3.51E-04	1.0	3	3
7/22/08 00:13:93	6.0	18.0	7.8	12.0	3.6	3.16E-04	1.0	3	3
00:23.4	9.0	15.0	9.5	6.0	3.8	3.02E-04	1.0	3	3
00:34.3	12.0	12.0	10.9	0.0	4.0	3.12E-04	1.0	3	3
00:43.3	14.0	10.0	9.0	-4.0	4.1	3.01E-04	1.0	2	2
00:53.5	16.0	8.0	10.2	-8.0	4.3	3.13E-04	1.0	2	2
01:06.4	18.0	6.0	12.9	-12.0	4.5	3.03E-04	1.0	2	2



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

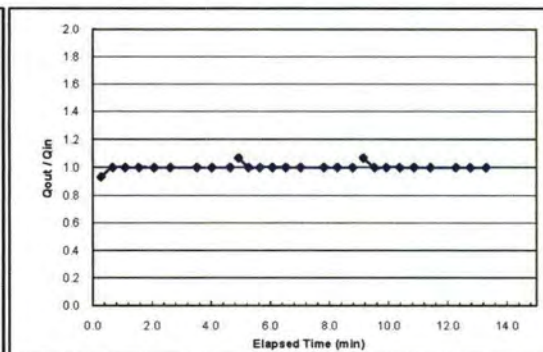
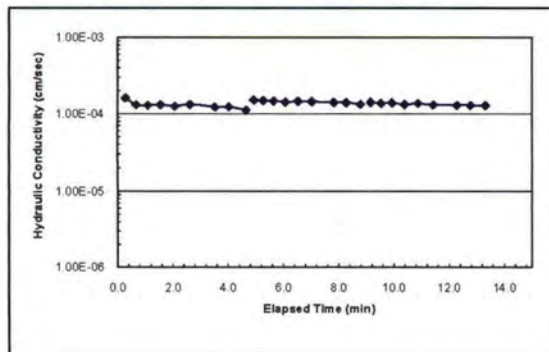
ASTM D 5084 - 00

Sample I.D.	75-mm Omaha DCRDF AO2 S1 Deep	Test Date :	7/15/08
Cell Pressure =	42.1 psi	Diameter of Sample, D =	7.0 cm
Inflow Pressure =	40.3 psi	Length of Sample, L =	3.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	38.3 cm ²
Pressure Difference =	0.3 psi	Sample Volume, V =	121.7 cm ³
Effective Stress =	1.95 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	6.6	a _{out} =	1 cm ²
Weight of wet sample =	198.1 (g)	Sample Water Content =	-466.6% (%)
Wet Density =	1.6 g/cm ³	Dry Density =	1.71 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
h3	24.42	113.94		-466.58%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
8/1/08 00:00:00	0.0	24.0	0.0	24.0	0.0				
8/1/08 00:17:05	1.5	22.6	17.0	21.1	0.3	1.61E-04	0.9	1.5	1.4
8/1/08 00:40:45	3.0	21.1	23.4	18.1	0.7	1.31E-04	1.0	1.5	1.5
8/1/08 01:05:95	4.5	19.6	25.5	15.1	1.1	1.29E-04	1.0	1.5	1.5
8/1/08 01:33:37	6.0	18.1	27.4	12.1	1.6	1.31E-04	1.0	1.5	1.5
8/1/08 02:04:65	7.5	16.6	31.3	9.1	2.1	1.25E-04	1.0	1.5	1.5
8/1/08 02:37:46	9.0	15.1	32.8	6.1	2.6	1.32E-04	1.0	1.5	1.5
8/1/08 03:31:15	11.0	13.1	53.7	2.1	3.5	1.23E-04	1.0	2	2
8/1/08 04:01:65	12.0	12.1	30.5	0.1	4.0	1.22E-04	1.0	1	1
8/1/08 04:38:65	13.0	11.1	37.0	-1.9	4.6	1.11E-04	1.0	1	1
8/1/08 00:00:00	0.0	24.0	-278.6	24.0	4.6				
8/1/08 00:19:46	1.5	22.4	19.5	20.9	4.9	1.52E-04	1.1	1.5	1.6
8/1/08 00:40:27	3.0	20.9	20.8	17.9	5.3	1.48E-04	1.0	1.5	1.5
8/1/08 01:02:90	4.5	19.4	22.6	14.9	5.6	1.47E-04	1.0	1.5	1.5
8/1/08 01:28:28	6.0	17.9	25.4	11.9	6.1	1.42E-04	1.0	1.5	1.5
8/1/08 01:55:46	7.5	16.4	27.2	8.9	6.5	1.45E-04	1.0	1.5	1.5
8/1/08 02:25:73	9.0	14.9	30.3	5.9	7.0	1.44E-04	1.0	1.5	1.5
8/1/08 03:12:95	11.0	12.9	47.2	1.9	7.8	1.41E-04	1.0	2	2
8/1/08 03:39:92	12.0	11.9	27.0	-0.1	8.3	1.40E-04	1.0	1	1
8/1/08 04:11:11	13.0	10.9	31.2	-2.1	8.8	1.33E-04	1.0	1	1
8/1/08 00:00:00	0.0	24.0	-251.1	24.0	8.8				
8/1/08 00:20:95	1.5	22.4	21.0	20.9	9.1	1.41E-04	1.1	1.5	1.6
8/1/08 00:43:42	3.0	20.9	22.5	17.9	9.5	1.37E-04	1.0	1.5	1.5
8/1/08 01:07:40	4.5	19.4	24.0	14.9	9.9	1.38E-04	1.0	1.5	1.5
8/1/08 01:34:65	6.0	17.9	27.2	11.9	10.4	1.32E-04	1.0	1.5	1.5
8/1/08 02:03:65	7.5	16.4	29.0	8.9	10.9	1.36E-04	1.0	1.5	1.5
8/1/08 02:37:18	9.0	14.9	33.5	5.9	11.4	1.30E-04	1.0	1.5	1.5
8/1/08 03:28:68	11.0	12.9	51.5	1.9	12.3	1.29E-04	1.0	2	2
03:57.9	12.0	11.9	29.2	-0.1	12.8	1.29E-04	1.0	1	1
04:30.4	13.0	10.9	32.5	-2.1	13.3	1.27E-04	1.0	1	1



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

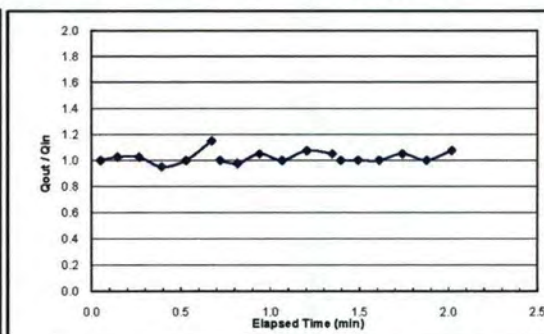
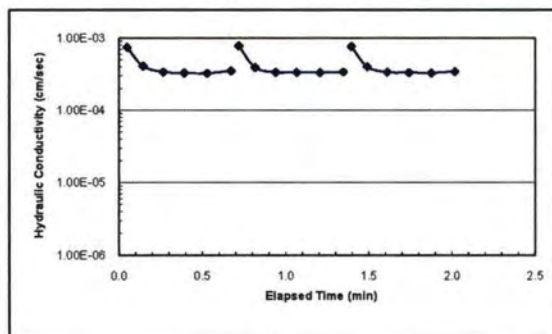
ASTM D 5084 - 00

Sample I.D.		305-mm DCRDF AO2-T2		Test Date : 6/3/08	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	30.5	cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	15.2	cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66	cm ²
Pressure Difference =	2.4	psi	Sample Volume, V =	11120.0	cm ³
Effective Stress =	1.5	psi	a _{in} =	5	cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	5	cm ²
Weight of wet sample =	19000.0	g	Sample Water Content =	25.4%	(%)
Wet Density =	1.7	g/cm ³	Dry Density =	1.70	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
A3	25.14	146.93	122.29	25.36%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
6/3/2008 00:00.00	0.0	24.7	0.0	24.7	0.0				
6/3/2008 00:02.96	4.0	20.7	3.0	16.7	0.0	7.43E-04	1.0	20	20
6/3/2008 00:08.71	8.0	16.6	5.7	8.6	0.1	4.05E-04	1.0	20	20.5
6/3/2008 00:15.95	12.0	12.5	7.2	0.5	0.3	3.36E-04	1.0	20	20.5
6/3/2008 00:23.52	16.0	8.7	7.6	-7.3	0.4	3.25E-04	1.0	20	19
6/3/2008 00:31.73	20.0	4.7	8.2	-15.3	0.5	3.22E-04	1.0	20	20
6/3/2008 00:40.34	24.0	0.1	8.6	-23.9	0.7	3.49E-04	1.2	20	23
6/3/2008 00:00.00	0.0	24.6	0.0	24.6	0.7				
6/3/2008 00:02.83	4.0	20.6	2.8	16.6	0.7	7.78E-04	1.0	20	20
6/3/2008 00:08.65	8.0	16.7	5.8	8.7	0.8	3.90E-04	1.0	20	19.5
6/3/2008 00:16.05	12.0	12.5	7.4	0.5	0.9	3.33E-04	1.1	20	21
6/3/2008 00:23.64	16.0	8.5	7.6	-7.5	1.1	3.32E-04	1.0	20	20
6/3/2008 00:31.95	20.0	4.2	8.3	-15.8	1.2	3.31E-04	1.1	20	21.5
6/3/2008 00:40.45	24.0	0.0	8.5	-24.0	1.3	3.38E-04	1.1	20	21
6/3/2008 00:00.00	0.0	24.7	0.0	24.7	1.3				
6/3/2008 00:02.87	4.0	20.7	2.9	16.7	1.4	7.67E-04	1.0	20	20
6/3/2008 00:08.65	8.0	16.7	5.8	8.7	1.5	3.97E-04	1.0	20	20
6/3/2008 00:15.83	12.0	12.7	7.2	0.7	1.6	3.35E-04	1.0	20	20
6/3/2008 00:23.65	16.0	8.5	7.8	-7.5	1.7	3.30E-04	1.1	20	21
6/3/2008 00:31.75	20.0	4.5	8.1	-15.5	1.9	3.27E-04	1.0	20	20
6/3/2008 00:40.27	24.0	0.2	8.5	-23.8	2.0	3.40E-04	1.1	20	21.5



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

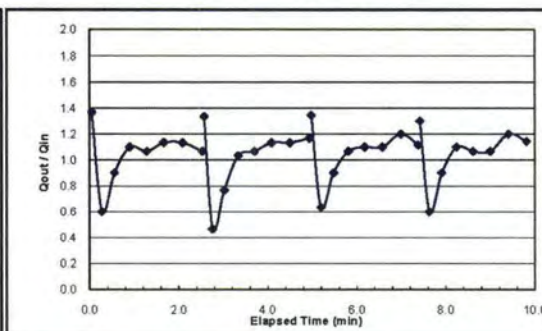
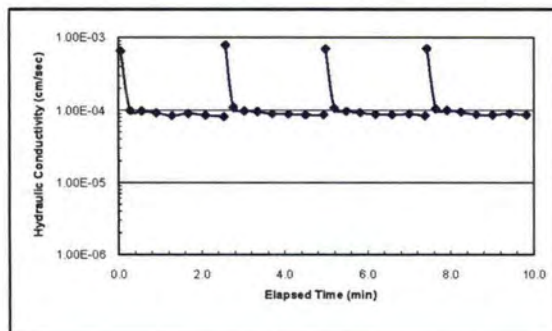
ASTM D 5084 - 00

Sample I.D.	305-mm DCRDF AO2-S2 Shallow	Test Date :	6/12/08
Cell Pressure =	42.7 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	42.4 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	2.4 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	11.1	a _{out} =	5 cm ²
Weight of wet sample =	20000.0 g	Sample Water Content =	26.0% (%)
Wet Density =	1.8 g/cm ³	Dry Density =	1.79 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
RC4-2	24.47	132.74	110.4	26.00%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
6/12/2008 00:00:00	0.0	24.9	0.0	24.9	0.0				
6/12/2008 00:02:06	3.0	20.8	3.0	17.8	0.0	6.58E-04	1.4	15	20.5
6/12/2008 00:16:54	6.0	19.0	13.7	13.0	0.3	9.93E-05	0.6	15	9
6/12/2008 00:33:56	9.0	16.3	16.9	7.3	0.6	9.81E-05	0.9	15	13.5
6/12/2008 00:54:06	12.0	13.0	20.5	1.0	0.9	9.26E-05	1.1	15	16.5
6/12/2008 01:17:02	15.0	9.8	23.0	-5.2	1.3	8.44E-05	1.1	15	16
6/12/2008 01:39:56	18.0	6.4	22.9	-11.6	1.7	9.06E-05	1.1	15	17
6/12/2008 02:05:28	21.0	3.0	25.3	-18.0	2.1	8.55E-05	1.1	15	17
6/12/2008 02:31:84	24.0	-0.2	26.6	-24.2	2.5	8.23E-05	1.1	15	16
6/12/2008 00:00:00	0.0	24.8	0.0	24.8	2.5				
6/12/2008 00:02:42	3.0	20.8	2.4	17.8	2.6	7.93E-04	1.3	15	20
6/12/2008 00:13:75	6.0	19.4	11.3	13.4	2.8	1.10E-04	0.5	15	7
6/12/2008 00:29:40	9.0	17.1	15.6	8.1	3.0	9.83E-05	0.8	15	11.5
6/12/2008 00:48:42	12.0	14.0	19.0	2.0	3.3	9.61E-05	1.0	15	15.5
6/12/2008 01:09:92	15.0	10.8	21.5	-4.2	3.7	8.96E-05	1.1	15	16
6/12/2008 01:33:15	18.0	7.4	23.2	-10.6	4.1	8.89E-05	1.1	15	17
6/12/2008 01:57:90	21.0	4.0	24.7	-17.0	4.5	8.69E-05	1.1	15	17
6/12/2008 02:24:14	24.0	0.5	26.2	-23.5	4.9	8.69E-05	1.2	15	17.5
6/12/2008 00:00:00	0.1	24.8	0.0	24.7	4.9				
6/12/2008 00:02:65	3.0	20.9	2.7	17.9	5.0	7.04E-04	1.3	14.5	19.5
6/12/2008 00:15:55	6.0	19.0	12.9	13.0	5.2	1.07E-04	0.6	15	9.5
6/12/2008 00:32:61	9.0	16.3	17.1	7.3	5.5	9.73E-05	0.9	15	13.5
6/12/2008 00:52:75	12.0	13.1	20.1	1.1	5.8	9.27E-05	1.1	15	16
6/12/2008 01:15:05	15.0	9.8	22.3	-5.2	6.2	8.83E-05	1.1	15	16.5
6/12/2008 01:38:61	18.0	6.5	23.6	-11.5	6.6	8.68E-05	1.1	15	16.5
6/12/2008 02:03:65	21.0	2.9	25.0	-18.1	7.0	8.92E-05	1.2	15	18
6/12/2008 02:26:64	23.6	0.0	23.0	-23.6	7.4	8.42E-05	1.1	13	14.5
6/12/2008 00:00:00	0.0	24.9	0.0	24.9	7.4				
6/12/2008 00:02:67	3.0	21.0	2.7	18.0	7.4	7.08E-04	1.3	15	19.5
6/12/2008 00:15:56	6.0	19.2	12.9	13.2	7.6	1.05E-04	0.6	15	9
6/12/2008 00:32:17	9.0	16.5	16.6	7.5	7.9	9.98E-05	0.9	15	13.5
6/12/2008 00:52:17	12.0	13.2	20.0	1.2	8.2	9.48E-05	1.1	15	16.5
6/12/2008 01:14:25	15.0	10.0	22.1	-5.0	8.6	8.77E-05	1.1	15	16
6/12/2008 01:37:46	18.0	6.8	23.2	-11.2	9.0	8.66E-05	1.1	15	16
6/12/2008 02:02:18	21.0	3.2	24.7	-17.8	9.4	9.02E-05	1.2	15	18
6/12/2008 02:26:55	23.8	0.0	24.4	-23.8	9.8	8.67E-05	1.1	14	16



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

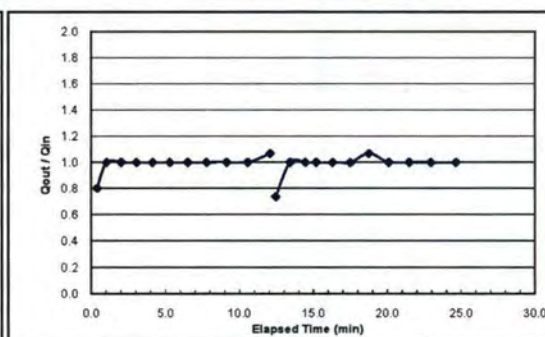
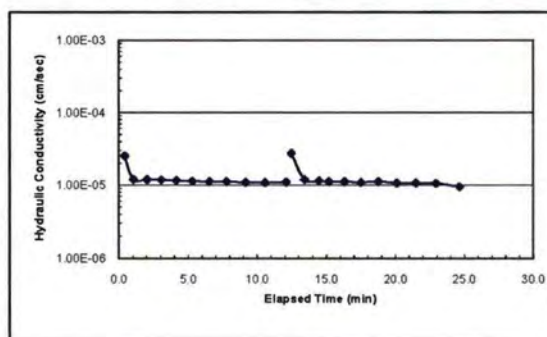
ASTM D 5084 - 00

Sample I.D.	150-mm Omaha DCRDF AO2-S2- Shallow	Test Date :	7/15/08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	40.5 psi	Length of Sample, L =	7.6 cm
Outflow Pressure =	39.5 psi	Area of Sample, A =	182.4 cm ²
Pressure Difference =	1.0 psi	Sample Volume, V =	1390.0 cm ³
Effective Stress =	2.00 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	9.2	a _{out} =	1 cm ²
Weight of wet sample =	2463.2 (g)	Sample Water Content =	29.2% (%)
Wet Density =	1.8 g/cm ³	Dry Density =	1.77 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
K7	30.78	130.37	107.85	29.22%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/18/08 00:00.00	0.0	24.0	0.0	24.0	0.0				
7/18/08 00:23.78	1.5	22.8	23.8	21.3	0.4	2.55E-05	0.8	1.5	1.2
7/18/08 01:02.06	2.5	21.8	38.3	19.3	1.0	1.20E-05	1.0	1	1
7/18/08 02:01.11	4.0	20.3	59.0	16.3	2.0	1.20E-05	1.0	1.5	1.5
7/18/08 03:02.84	5.5	18.8	61.7	13.3	3.0	1.19E-05	1.0	1.5	1.5
7/18/08 04:08.02	7.0	17.3	65.2	10.3	4.1	1.17E-05	1.0	1.5	1.5
7/18/08 05:17.46	8.5	15.8	69.4	7.3	5.3	1.14E-05	1.0	1.5	1.5
7/18/08 06:30.52	10.0	14.3	73.1	4.3	6.5	1.13E-05	1.0	1.5	1.5
7/18/08 07:46.33	11.5	12.8	75.8	1.3	7.8	1.13E-05	1.0	1.5	1.5
7/18/08 09:07.92	13.0	11.3	81.6	-1.7	9.1	1.10E-05	1.0	1.5	1.5
7/18/08 10:33.45	14.5	9.8	85.5	-4.7	10.6	1.09E-05	1.0	1.5	1.5
7/18/08 12:04.55	16.0	8.2	91.1	-7.8	12.1	1.11E-05	1.1	1.5	1.6
7/18/08 00:00.00	0.0	24.0	0.0	24.0	12.1				
7/18/08 00:21.05	1.5	22.9	21.1	21.4	12.5	2.77E-05	0.7	1.5	1.1
7/18/08 01:18.87	3.0	21.4	57.8	18.4	13.4	1.20E-05	1.0	1.5	1.5
7/18/08 02:21.14	4.5	19.9	62.3	15.4	14.5	1.15E-05	1.0	1.5	1.5
7/18/08 03:04.87	5.5	18.9	43.7	13.4	15.2	1.13E-05	1.0	1	1
7/18/08 04:12.18	7.0	17.4	67.3	10.4	16.3	1.13E-05	1.0	1.5	1.5
7/18/08 05:24.15	8.5	15.9	72.0	7.4	17.5	1.10E-05	1.0	1.5	1.5
7/18/08 06:39.37	10.0	14.3	75.2	4.3	18.8	1.13E-05	1.1	1.5	1.6
7/18/08 07:59.25	11.5	12.8	79.9	1.3	20.1	1.07E-05	1.0	1.5	1.5
7/18/08 09:22.96	13.0	11.3	83.7	-1.7	21.5	1.07E-05	1.0	1.5	1.5
7/18/08 10:50.56	14.5	9.8	87.6	-4.7	22.9	1.07E-05	1.0	1.5	1.5
7/18/08 12:33.45	16.0	8.3	102.9	-7.7	24.7	9.50E-06	1.0	1.5	1.5



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

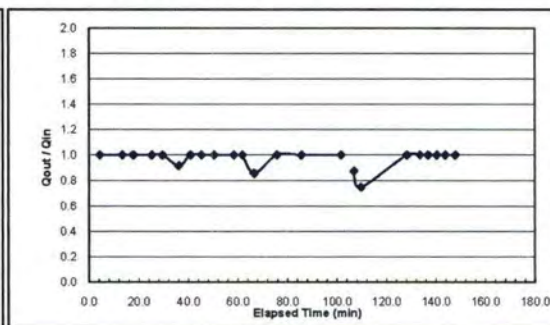
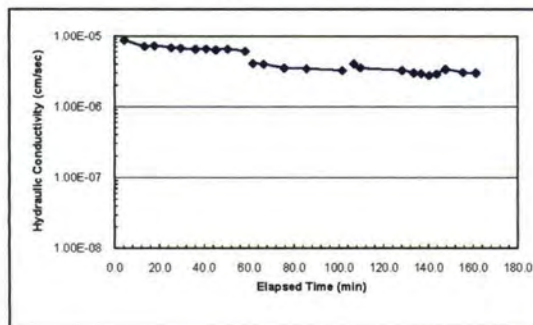
ASTM D 5084 - 00

Sample I.D.	75-mm Omaha DCRDF AO2-S2-Shallow	Test Date :	7/14/08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	7.0 cm
Inflow Pressure =	40.5 psi	Length of Sample, L =	3.8 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	38.3 cm ²
Pressure Difference =	0.5 psi	Sample Volume, V =	146.0 cm ³
Effective Stress =	1.75 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	9.2	a _{out} =	1 cm ²
Weight of wet sample =	242.3 (g)	Sample Water Content =	-506.3% (%)
Wet Density =	1.7 g/cm ³	Dry Density =	1.75 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Water Dry Soil (g)	Water Content (%)
h1	30.84	156.13		-506.26%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/31/08 00:00.00	0.0	24.0	0.0	24.0	0.0				
7/31/08 04:17.50	1.3	22.7	257.5	21.4	4.3	8.68E-06	1.0	1.3	1.3
7/31/08 13:18.42	3.4	20.6	540.9	17.2	13.3	7.09E-06	1.0	2.1	2.1
7/31/08 17:45.60	4.4	19.6	267.2	15.2	17.8	7.25E-06	1.0	1	1
7/31/08 25:13.02	5.9	18.1	447.4	12.2	25.2	6.82E-06	1.0	1.5	1.5
7/31/08 29:28.64	6.7	17.3	255.6	10.6	29.5	6.68E-06	1.0	0.8	0.8
7/31/08 36:03.65	7.9	16.2	395.0	8.3	36.1	6.49E-06	0.9	1.2	1.1
7/31/08 40:50.11	8.7	15.4	286.5	6.7	40.8	6.51E-06	1.0	0.8	0.8
7/31/08 45:16.25	9.4	14.7	266.1	5.3	45.3	6.35E-06	1.0	0.7	0.7
7/31/08 50:24.65	10.2	13.9	308.4	3.7	50.4	6.50E-06	1.0	0.8	0.8
7/31/08 58:21.33	11.3	12.8	476.7	1.5	58.4	6.08E-06	1.0	1.1	1.1
7/31/08 00:00.00	0.0	24.0	-3501.3	24.0	58.4				
7/31/08 03:27.73	0.5	23.5	207.7	23.0	61.9	4.08E-06	1.0	0.5	0.5
7/31/08 08:07.61	1.2	22.9	279.9	21.7	66.5	4.01E-06	0.9	0.7	0.6
7/31/08 17:20.83	2.3	21.8	553.2	19.5	75.7	3.55E-06	1.0	1.1	1.1
7/31/08 27:13.03	3.4	20.7	592.2	17.3	85.6	3.45E-06	1.0	1.1	1.1
7/31/08 43:13.53	5.0	19.1	960.5	14.1	101.6	3.26E-06	1.0	1.6	1.6
7/31/08 00:00.00	0.0	24.0	0.0	24.0	101.6				
7/31/08 05:15.37	0.8	23.3	315.4	22.5	106.9	4.05E-06	0.9	0.8	0.7
7/31/08 08:06.45	1.2	23.0	171.1	21.8	109.7	3.55E-06	0.8	0.4	0.3
7/31/08 26:41.15	3.2	21.0	1114.7	17.8	128.3	3.25E-06	1.0	2	2
7/31/08 31:57.55	3.7	20.5	316.4	16.8	133.6	2.99E-06	1.0	0.5	0.5
7/31/08 35:13.84	4.0	20.2	196.3	16.2	136.8	2.94E-06	1.0	0.3	0.3
7/31/08 38:45.73	4.3	19.9	211.9	15.6	140.4	2.78E-06	1.0	0.3	0.3
7/31/08 42:09.31	4.6	19.6	203.6	15.0	143.8	2.90E-06	1.0	0.3	0.3
7/31/08 46:07.37	5.0	19.2	238.1	14.2	147.7	3.36E-06	1.0	0.4	0.4
53:57.2	5.7	18.5	469.8	12.8	155.6	3.04E-06	1.0	0.7	0.7
59:47.2	6.2	18.0	350.0	11.8	161.4	2.99E-06	1.0	0.5	0.5



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

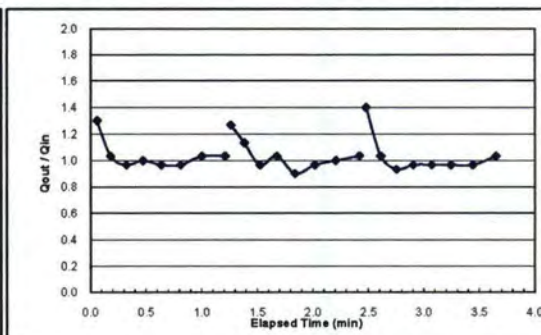
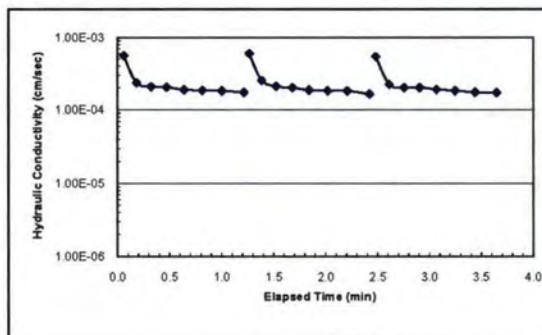
ASTM D 5084 - 00

Sample I.D.		305-mm DCRDF A-2 Top		Test Date : 6/17/08	
Cell Pressure =	42.7	psi	Diameter of Sample, D =	30.5	cm
Inflow Pressure =	42.4	psi	Length of Sample, L =	15.2	cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66	cm ²
Pressure Difference =	2.4	psi	Sample Volume, V =	11120.0	cm ³
Effective Stress =	1.5	psi	a _{in} =	5	cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	5	cm ²
Weight of wet sample =	19700.0	g	Sample Water Content =	22.5%	(%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.77	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
RC4-2	24.47	130.64	111.16	22.47%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
6/17/2008 00:00.00	0.0	24.9	0.0	24.9	0.0				
6/17/2008 00:03.42	3.0	21.0	3.4	18.0	0.1	5.53E-04	1.3	15	19.5
6/17/2008 00:10.84	6.0	17.9	7.4	11.9	0.2	2.33E-04	1.0	15	15.5
6/17/2008 00:19.25	9.0	15.0	8.4	6.0	0.3	2.06E-04	1.0	15	14.5
6/17/2008 00:28.25	12.0	12.0	9.0	0.0	0.5	2.02E-04	1.0	15	15
6/17/2008 00:38.15	15.0	9.1	9.9	-5.9	0.6	1.87E-04	1.0	15	14.5
6/17/2008 00:48.65	18.0	6.2	10.5	-11.8	0.8	1.83E-04	1.0	15	14.5
6/17/2008 01:00.11	21.0	3.1	11.5	-17.9	1.0	1.80E-04	1.0	15	15.5
6/17/2008 01:12.61	24.0	0.0	12.5	-24.0	1.2	1.72E-04	1.0	15	15.5
6/17/2008 00:00.00	0.0	24.8	0.0	24.8	1.2				
6/17/2008 00:03.14	3.0	21.0	3.1	18.0	1.3	5.93E-04	1.3	15	19
6/17/2008 00:10.37	6.0	17.6	7.2	11.6	1.4	2.51E-04	1.1	15	17
6/17/2008 00:18.71	9.0	14.7	8.3	5.7	1.5	2.08E-04	1.0	15	14.5
6/17/2008 00:28.06	12.0	11.6	9.3	-0.4	1.7	1.98E-04	1.0	15	15.5
6/17/2008 00:37.78	15.0	8.9	9.7	-6.1	1.8	1.85E-04	0.9	15	13.5
6/17/2008 00:48.45	18.0	6.0	10.7	-12.0	2.0	1.80E-04	1.0	15	14.5
6/17/2008 00:59.75	21.0	3.0	11.3	-18.0	2.2	1.80E-04	1.0	15	15
6/17/2008 01:12.55	23.9	0.0	12.8	-23.9	2.4	1.62E-04	1.0	14.5	15
6/17/2008 00:00.00	0.0	24.8	0.0	24.8	2.4				
6/17/2008 00:03.68	3.0	20.6	3.7	17.6	2.5	5.37E-04	1.4	15	21
6/17/2008 00:11.55	6.0	17.5	7.9	11.5	2.6	2.20E-04	1.0	15	15.5
6/17/2008 00:20.08	9.0	14.7	8.5	5.7	2.8	2.00E-04	0.9	15	14
6/17/2008 00:29.06	12.0	11.8	9.0	-0.2	2.9	2.00E-04	1.0	15	14.5
6/17/2008 00:38.92	15.0	8.9	9.9	-6.1	3.1	1.88E-04	1.0	15	14.5
6/17/2008 00:49.56	18.0	6.0	10.6	-12.0	3.2	1.81E-04	1.0	15	14.5
6/17/2008 01:01.15	21.0	3.1	11.6	-17.9	3.4	1.72E-04	1.0	15	14.5
6/17/2008 01:13.78	24.0	0.0	12.6	-24.0	3.6	1.70E-04	1.0	15	15.5



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

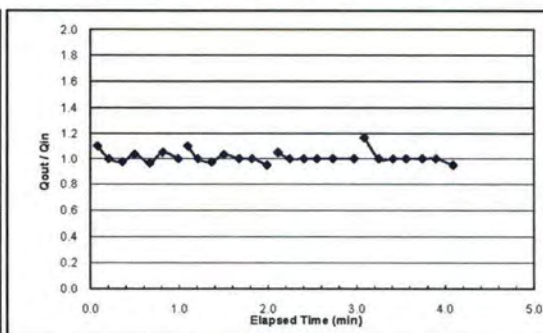
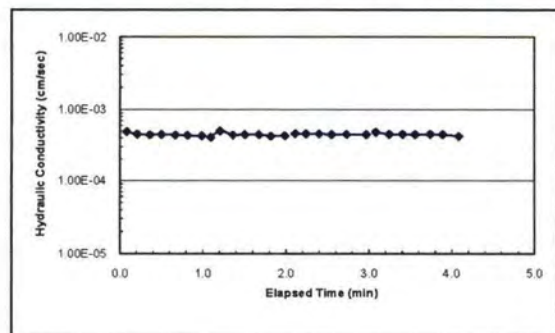
ASTM D 5084 - 00

Sample I.D.	150-mm Omaha DCRDF A2 Top	Test Date :	7/15/08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	40.0 psi	Length of Sample, L =	7.6 cm
Outflow Pressure =	39.5 psi	Area of Sample, A =	181.5 cm ²
Pressure Difference =	0.5 psi	Sample Volume, V =	1379.1 cm ³
Effective Stress =	2.25 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	4.6	a _{out} =	1 cm ²
Weight of wet sample =	2403.2 (g)	Sample Water Content =	28.5% (%)
Wet Density =	1.7 g/cm ³	Dry Density =	1.74 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
A3	25.2	135.8	111.3	28.46%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
7/15/08 00:00.00	0.0	24.0	0.0	24.0	0.0				
7/15/08 00:04.82	3.0	20.7	4.8	17.7	0.1	4.89E-04	1.1	3	3.3
7/15/08 00:12.46	7.0	16.7	7.6	9.7	0.2	4.50E-04	1.0	4	4
7/15/08 00:21.61	11.0	12.8	9.2	1.8	0.4	4.43E-04	1.0	4	3.9
7/15/08 00:30.12	14.0	9.7	8.5	-4.3	0.5	4.44E-04	1.0	3	3.1
7/15/08 00:40.22	17.0	6.8	10.1	-10.2	0.7	4.40E-04	1.0	3	2.9
7/15/08 00:48.87	19.0	4.7	8.7	-14.3	0.8	4.34E-04	1.1	2	2.1
7/15/08 00:59.35	21.0	2.7	10.5	-18.3	1.0	4.25E-04	1.0	2	2
7/15/08 00:00.00	0.0	24.0	0.0	24.0	1.0				
7/15/08 00:05.80	3.0	20.7	5.8	17.7	1.1	4.07E-04	1.1	3	3.3
7/15/08 00:12.68	7.0	16.7	6.9	9.7	1.2	4.99E-04	1.0	4	4
7/15/08 00:21.88	11.0	12.8	9.2	1.8	1.4	4.41E-04	1.0	4	3.9
7/15/08 00:30.38	14.0	9.7	8.5	-4.3	1.5	4.44E-04	1.0	3	3.1
7/15/08 00:40.58	17.0	6.7	10.2	-10.3	1.7	4.44E-04	1.0	3	3
7/15/08 00:49.26	19.0	4.7	8.7	-14.3	1.8	4.23E-04	1.0	2	2
7/15/08 00:59.40	21.0	2.8	10.1	-18.2	2.0	4.27E-04	1.0	2	1.9
7/15/08 00:00.00	0.0	24.0	-59.4	24.0	2.0				
7/15/08 00:06.82	4.0	19.8	6.8	15.8	2.1	4.58E-04	1.1	4	4.2
7/15/08 00:14.68	8.0	15.8	7.9	7.8	2.2	4.55E-04	1.0	4	4
7/15/08 00:24.17	12.0	11.8	9.5	-0.2	2.4	4.55E-04	1.0	4	4
7/15/08 00:33.04	15.0	8.8	8.9	-6.2	2.6	4.44E-04	1.0	3	3
7/15/08 00:43.91	18.0	5.8	10.9	-12.2	2.7	4.47E-04	1.0	3	3
7/15/08 00:58.14	21.0	2.8	14.2	-18.2	3.0	4.46E-04	1.0	3	3
7/15/08 00:00.00	0.0	24.0	-58.1	24.0	3.0				
7/15/08 00:05.08	3.0	20.5	5.1	17.5	3.1	4.80E-04	1.2	3	3.5
7/15/08 00:14.86	8.0	15.5	9.8	7.5	3.2	4.51E-04	1.0	5	5
7/15/08 00:24.57	12.0	11.5	9.7	-0.5	3.4	4.48E-04	1.0	4	4
00:33.5	15.0	8.5	8.9	-6.5	3.6	4.46E-04	1.0	3	3
00:44.5	18.0	5.5	11.0	-12.5	3.7	4.48E-04	1.0	3	3
00:53.6	20.0	3.5	9.1	-16.5	3.9	4.46E-04	1.0	2	2
01:05.3	22.0	1.6	11.7	-20.4	4.1	4.21E-04	1.0	2	1.9



Hydraulic Conductivity Test - Omaha - Thick Store-and-Release Cover

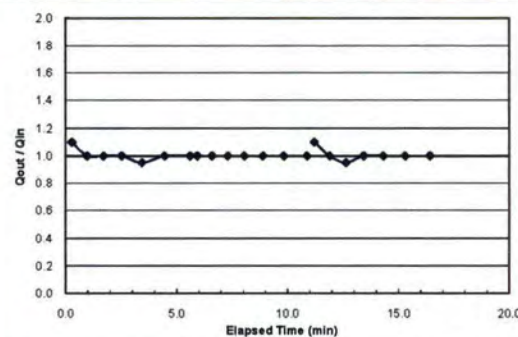
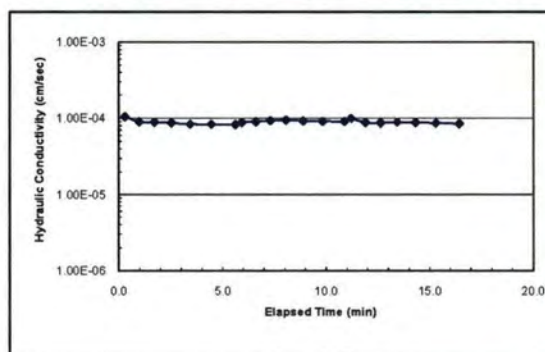
ASTM D 5084 - 00

Sample I.D.	75-mm Omaha DCRDF A2 Top	Test Date :	7/15/08
Cell Pressure = 42.0 psi		Diameter of Sample, D = 7.0 cm	
Inflow Pressure = 40.5 psi		Length of Sample, L = 3.8 cm	
Outflow Pressure = 40.0 psi		Area of Sample, A = 38.3 cm ²	
Pressure Difference = 0.5 psi		Sample Volume, V = 146.0 cm ³	
Effective Stress = 1.75 psi		a _{in} = 1 cm ²	
Hydraulic Gradient, i = 9.2		a _{out} = 1 cm ²	
Weight of wet sample = 252.4 (g)		Sample Water Content = -404.9% (%)	
Wet Density = 1.7 g/cm ³		Dry Density = 1.80 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
6	30.9	125.1		-404.85%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
8/1/08 00:00:00	0.0	24.0	0.0	24.0	0.0				
8/1/08 00:17:23	1.0	22.9	17.2	21.9	0.3	1.04E-04	1.1	1	1.1
00:57.9	3	20.9	40.7	17.9	1.0	8.88E-05	1.0	2	2
8/1/08 01:42:28	5.0	18.9	44.4	13.9	1.7	8.78E-05	1.0	2	2
8/1/08 02:31:55	7.0	16.9	49.3	9.9	2.5	8.58E-05	1.0	2	2
8/1/08 03:25:87	9.0	15.0	54.3	6.0	3.4	8.28E-05	0.9	2	1.9
8/1/08 04:27:25	11.0	13.0	61.4	2.0	4.5	8.28E-05	1.0	2	2
8/1/08 05:36:65	13.0	11.0	69.4	-2.0	5.6	8.16E-05	1.0	2	2
8/1/08 00:00:00	0.0	24.0	-336.7	24.0	5.6				
8/1/08 00:19:45	1.0	23.0	19.5	22.0	5.9	8.79E-05	1.0	1	1
8/1/08 00:59:92	3.0	21.0	40.5	18.0	6.6	8.91E-05	1.0	2	2
8/1/08 01:42:02	5.0	19.0	42.1	14.0	7.3	9.24E-05	1.0	2	2
8/1/08 02:26:95	7.0	17.0	44.9	10.0	8.0	9.39E-05	1.0	2	2
8/1/08 03:17:45	9.0	15.0	50.5	6.0	8.9	9.13E-05	1.0	2	2
8/1/08 04:13:75	11.0	13.0	56.3	2.0	9.8	9.03E-05	1.0	2	2
8/1/08 05:16:56	13.0	11.0	62.8	-2.0	10.9	9.01E-05	1.0	2	2
8/1/08 00:00:00	0.0	24.0	-316.6	24.0	10.9				
8/1/08 00:18:23	1.0	22.9	18.2	21.9	11.2	9.86E-05	1.1	1	1.1
8/1/08 00:59:73	3.0	20.9	41.5	17.9	11.9	8.71E-05	1.0	2	2
8/1/08 01:43:75	5.0	19.0	44.0	14.0	12.6	8.62E-05	0.9	2	1.9
8/1/08 02:31:56	7.0	17.0	47.8	10.0	13.4	8.82E-05	1.0	2	2
8/1/08 03:24:65	9.0	15.0	53.1	6.0	14.3	8.68E-05	1.0	2	2
8/1/08 04:23:73	11.0	13.0	59.1	2.0	15.3	8.60E-05	1.0	2	2
8/1/08 05:31:16	13.0	11.0	67.5	-2.0	16.4	8.39E-05	1.0	2	2



Hydraulic Conductivity Test - Polson - Composite Cover

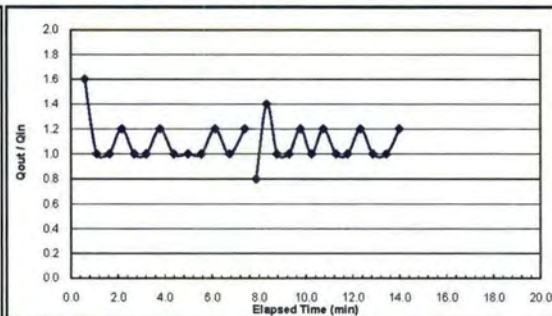
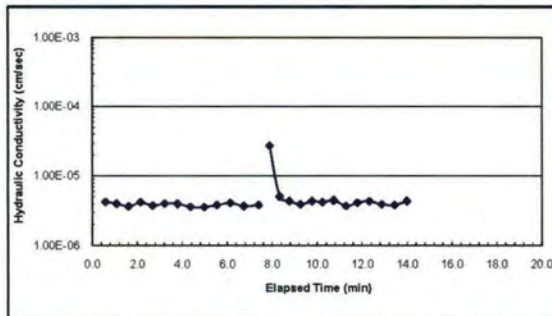
ASTM D 5084 - 00

Sample I.D. 305-mm Polson Conv Below Memebrane-1			Test Date : 11/12/08		
Cell Pressure =	41.8	psi	Diameter of Sample, D =	30.5	cm
Inflow Pressure =	41.0	psi	Length of Sample, L =	14.0	cm
Outflow Pressre =	40.0	psi	Area of Sample, A =	729.66	cm ²
Pressure Difference =	1.0	psi	Sample Volume, V =	10193.3	cm ³
Effective Stress =	1.3	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	5.0		a _{out} =	1	cm ²
Weight of wet sample =	15850.0	g	Sample Water Content =	11.5%	(%)
Wet Density =	1.6	g/cm ³	Dry Density =	1.55	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
k11	30.58	94.89	88.27	11.48%

Date, Time	Inflow	Outflow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	4.0	17.5	0.0	13.5	0.0				
0:00:36	4.5	16.7	35.6	12.2	0.6	4.21E-06	1.6	0.5	0.8
0:01:06	5.0	16.2	29.4	11.2	1.1	3.97E-06	1.0	0.5	0.5
0:01:37	5.5	15.7	32.4	10.2	1.6	3.65E-06	1.0	0.5	0.5
0:02:09	6.0	15.1	31.6	9.1	2.1	4.16E-06	1.2	0.5	0.6
0:02:42	6.5	14.6	32.6	8.1	2.7	3.73E-06	1.0	0.5	0.5
0:03:12	7.0	14.1	30.8	7.1	3.2	3.99E-06	1.0	0.5	0.5
0:03:47	7.5	13.5	34.6	6.0	3.8	3.96E-06	1.2	0.5	0.6
0:04:22	8.0	13.0	35.2	5.0	4.4	3.59E-06	1.0	0.5	0.5
0:04:58	8.5	12.5	36.0	4.0	5.0	3.56E-06	1.0	0.5	0.5
0:05:32	9.0	12.0	34.2	3.0	5.5	3.79E-06	1.0	0.5	0.5
0:06:08	9.5	11.4	35.4	1.9	6.1	4.08E-06	1.2	0.5	0.6
0:06:44	10.0	10.9	36.3	0.9	6.7	3.68E-06	1.0	0.5	0.5
0:07:23	10.5	10.3	39.1	-0.2	7.4	3.81E-06	1.2	0.5	0.6
0:08:00	2.0	24.0	-443.1	22.0	7.4				
0:08:29	6.0	20.8	28.6	14.8	7.9	2.72E-05	0.8	4	3.2
0:08:56	6.5	20.1	27.0	13.6	8.3	5.03E-06	1.4	0.5	0.7
0:09:22	7.0	19.6	26.4	12.6	8.8	4.35E-06	1.0	0.5	0.5
0:09:52	7.5	19.1	29.8	11.6	9.3	3.90E-06	1.0	0.5	0.5
0:10:22	8.0	18.5	29.8	10.5	9.8	4.34E-06	1.2	0.5	0.6
0:10:50	8.5	18.0	28.4	9.5	10.2	4.19E-06	1.0	0.5	0.5
0:11:20	9.0	17.4	29.9	8.4	10.7	4.44E-06	1.2	0.5	0.6
0:11:53	9.5	16.9	33.1	7.4	11.3	3.70E-06	1.0	0.5	0.5
0:12:23	10.0	16.4	30.0	6.4	11.8	4.13E-06	1.0	0.5	0.5
0:12:55	10.5	15.8	32.0	5.3	12.3	4.32E-06	1.2	0.5	0.6
0:13:28	11.0	15.3	32.6	4.3	12.9	3.91E-06	1.0	0.5	0.5
0:14:02	11.5	14.8	34.0	3.3	13.4	3.80E-06	1.0	0.5	0.5
0:14:35	12.0	14.2	33.2	2.2	14.0	4.35E-06	1.2	0.5	0.6



Hydraulic Conductivity Test - Polson - Composite Cover

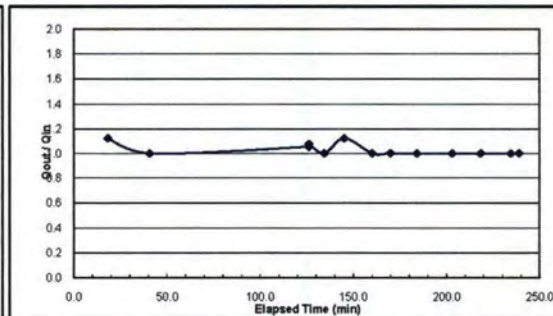
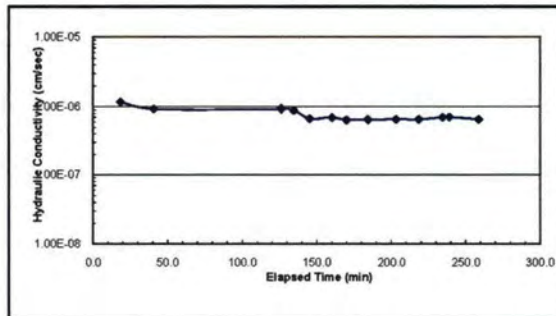
ASTM D 5084 - 00

Sample I.D. 150-mm Polson Conv Below Membrane-1			Test Date : 12/31/08	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	40.7	psi	Length of Sample, L =	6.4 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	182.41 cm ²
Pressure Difference =	0.7	psi	Sample Volume, V =	1158.3 cm ³
Effective Stress =	1.7	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	7.8		a _{out} =	1 cm ²
Weight of wet sample =	2207.7	g	Sample Water Content =	26.1% (%)
Wet Density =	1.91	g/cm ³	Dry Density =	1.51 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
A	31	126.36	106.63	26.09%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	1.0	24.0	0.0	23.0	0.0				
0:18:09	3.4	21.3	1088.7	17.9	18.1	1.17E-06	1.1	2.4	2.7
0:40:34	5.7	19.0	1345.7	13.3	40.6	9.18E-07	1.0	2.3	2.3
2:06:08	12.9	11.4	5133.3	-1.5	126.1	9.16E-07	1.1	7.2	7.6
0:00:00	1.3	23.9	-7567.7	22.6	126.1	9.40E-07	1.1	-11.6	-12.5
0:08:22	2.2	23.0	501.8	20.8	134.5	8.80E-07	1.0	0.9	0.9
0:19:03	3.0	22.1	641.2	19.1	145.1	6.67E-07	1.1	0.8	0.9
0:34:06	4.2	20.9	902.6	16.7	160.2	6.89E-07	1.0	1.2	1.2
0:43:54	4.9	20.2	588.1	15.3	170.0	6.35E-07	1.0	0.7	0.7
0:58:05	5.9	19.2	851.4	13.3	184.2	6.44E-07	1.0	1	1
1:17:01	7.2	17.9	1136.0	10.7	203.1	6.51E-07	1.0	1.3	1.3
1:32:12	8.2	16.9	910.9	8.7	218.3	6.49E-07	1.0	1	1
1:48:24	9.3	15.8	972.0	6.5	234.5	6.93E-07	1.0	1.1	1.1
1:52:53	9.6	15.5	268.8	5.9	239.0	7.01E-07	1.0	0.3	0.3
2:12:45	10.8	14.3	1192.2	3.5	258.9	6.50E-07			



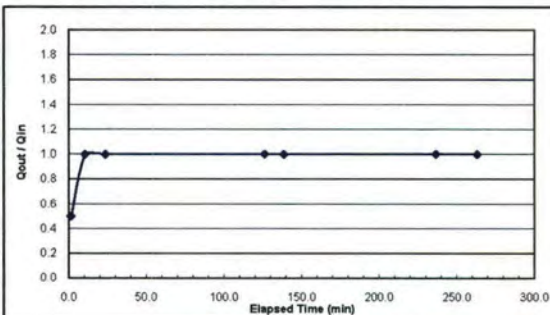
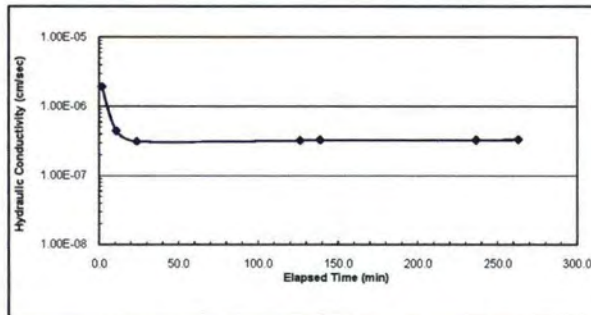
Hydraulic Conductivity Test - Polson - Composite Cover

ASTM D 5084 - 00

Sample I.D. 75-mm Polson Conv Below Membrane-1				Test Date : 12/31/08			
Cell Pressure =	41.8	psi		Diameter of Sample, D =	7.6	cm	
Inflow Pressure =	40.5	psi		Length of Sample, L =	3.2	cm	
Outflow Pressure =	40.0	psi		Area of Sample, A =	45.60	cm ²	
Pressure Difference =	0.5	psi		Sample Volume, V =	144.8	cm ³	
Effective Stress =	1.6	psi		a _{in} =	1	cm ²	
Hydraulic Gradient, i =	11.1			a _{out} =	1	cm ²	
Weight of wet sample =	249.5	g		Sample Water Content =	24.1%	(%)	
Wet Density =	1.72	g/cm ³		Dry Density =	1.39	g/cm ³	

$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$					Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
						(g)	(g)	(g)	(%)
					A	31	134.66	114.55	24.07%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	1.0	24.0	0.0	23.0	0.0				
0:01:33	1.2	23.9	93.0	22.7	1.6	1.93E-06	0.5	0.2	0.1
0:10:38	1.4	23.7	544.8	22.3	10.6	4.43E-07	1.0	0.2	0.2
0:23:34	1.6	23.5	776.5	21.9	23.6	3.13E-07	1.0	0.2	0.2
0:48:59	2.0	23.1	1524.8	21.1	126.1	3.22E-07	1.0	0.4	0.4
1:01:36	2.2	22.9	757.0	20.7	138.7	3.28E-07	1.0	0.2	0.2
2:39:26	3.7	21.4	5870.0	17.7	236.6	3.27E-07	1.0	1.5	1.5
3:05:58	4.1	21.0	1592.0	16.9	263.1	3.33E-07	1.0	0.4	0.4



Hydraulic Conductivity Test - Polson - Composite Cover

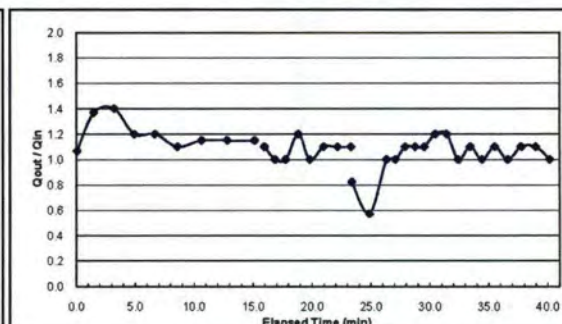
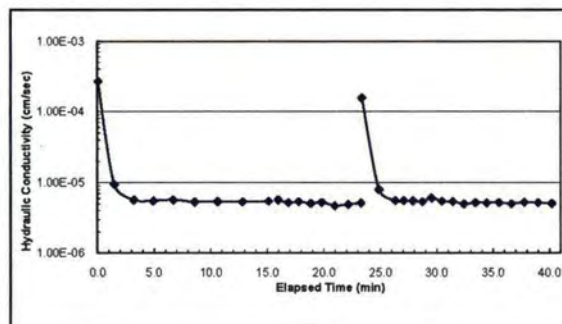
ASTM D 5084 - 00

Sample I.D. 305-mm Conv Below Membrane-4			Test Date : 11/17/08	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.1	psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	1.1	psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	5.1		a _{out} =	1 cm ²
Weight of wet sample =	21800.0	g	Sample Water Content =	21.8% (%)
Wet Density =	2.0	g/cm ³	Dry Density =	1.96 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
BB	30.36	178.34	151.84	21.81%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
12/17/2008 00:00.00	0.0	24.0	0.0	24.0	0.0				
12/17/2008 00:02.46	3.0	20.8	2.5	17.8	0.0	2.68E-04	1.1	3	3.2
12/17/2008 01:28.52	6.0	16.7	86.1	10.7	1.5	9.41E-06	1.4	3	4.1
12/17/2008 03:11.61	8.0	13.9	103.1	5.9	3.2	5.68E-06	1.4	2	2.8
12/17/2008 04:54.56	10.0	11.5	103.0	1.5	4.9	5.51E-06	1.2	2	2.4
12/17/2008 06:39.96	12.0	9.1	105.4	-2.9	6.7	5.69E-06	1.2	2	2.4
12/17/2008 08:34.46	14.0	6.9	114.5	-7.1	8.6	5.30E-06	1.1	2	2.2
12/17/2008 10:37.15	16.0	4.6	122.7	-11.4	10.6	5.38E-06	1.2	2	2.3
12/17/2008 12:48.46	18.0	2.3	131.3	-15.7	12.8	5.36E-06	1.2	2	2.3
12/17/2008 15:07.06	20.0	0.0	138.6	-20.0	15.1	5.45E-06	1.2	2	2.3
12/17/2008 00:00.00	16.0	16.1	0.0	0.1	15.1				
12/17/2008 00:50.56	17.0	15.0	50.6	-2.0	16.0	5.68E-06	1.1	1	1.1
12/17/2008 01:44.61	18.0	14.0	54.1	-4.0	16.9	5.20E-06	1.0	1	1
12/17/2008 02:38.45	19.0	13.0	53.8	-6.0	17.8	5.36E-06	1.0	1	1
12/17/2008 03:42.61	20.0	11.8	64.2	-8.2	18.8	5.10E-06	1.2	1	1.2
12/17/2008 04:41.02	21.0	10.8	58.4	-10.2	19.8	5.25E-06	1.0	1	1
12/17/2008 05:51.52	22.0	9.7	70.5	-12.3	21.0	4.71E-06	1.1	1	1.1
12/17/2008 07:01.37	23.0	8.6	69.9	-14.4	22.1	4.91E-06	1.1	1	1.1
12/17/2008 08:10.05	24.0	7.5	68.7	-16.5	23.3	5.16E-06	1.1	1	1.1
12/17/2008 00:00.00	0.0	24.9	0.0	24.9	23.3				
12/17/2008 00:04.95	4.0	21.6	5.0	17.6	23.4	1.56E-04	0.8	4	3.3
12/17/2008 01:34.95	8.0	19.3	90.0	11.3	24.9	7.97E-06	0.6	4	2.3
12/17/2008 03:01.84	10.0	17.3	86.9	7.3	26.3	5.55E-06	1.0	2	2
12/17/2008 03:46.95	11.0	16.3	45.1	5.3	27.1	5.53E-06	1.0	1	1
12/17/2008 04:35.75	12.0	15.2	46.8	3.2	27.9	5.51E-06	1.1	1	1.1
12/17/2008 05:27.14	13.0	14.1	51.4	1.1	28.7	5.37E-06	1.1	1	1.1
12/17/2008 06:13.64	14.0	13.0	46.5	-1.0	29.5	6.09E-06	1.1	1	1.1
12/17/2008 07:09.78	15.0	11.8	56.1	-3.2	30.4	5.44E-06	1.2	1	1.2
12/17/2008 08:06.05	16.0	10.6	58.3	-5.4	31.4	5.40E-06	1.2	1	1.2
12/17/2008 09:07.15	17.0	9.6	59.1	-7.4	32.4	4.98E-06	1.0	1	1
12/17/2008 10:08.14	18.0	8.5	61.0	-9.5	33.4	5.22E-06	1.1	1	1.1
12/17/2008 11:08.62	19.0	7.5	60.5	-11.5	34.4	5.17E-06	1.0	1	1
12/17/2008 12:13.14	20.0	6.4	64.5	-13.6	35.5	5.24E-06	1.1	1	1.1
12/17/2008 13:19.64	21.0	5.4	66.5	-15.6	36.6	5.00E-06	1.0	1	1
12/17/2008 14:28.18	22.0	4.3	68.5	-17.7	37.8	5.27E-06	1.1	1	1.1
12/17/2008 15:40.62	23.0	3.2	72.4	-19.8	39.0	5.17E-06	1.1	1	1.1
12/17/2008 16:53.52	24.0	2.2	72.9	-21.8	40.2	5.07E-06	1.0	1	1



Hydraulic Conductivity Test - Polson - Store-and-Release Cover

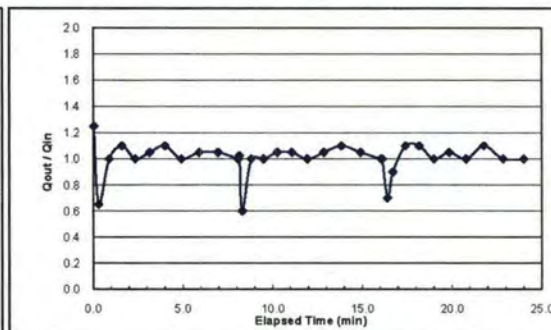
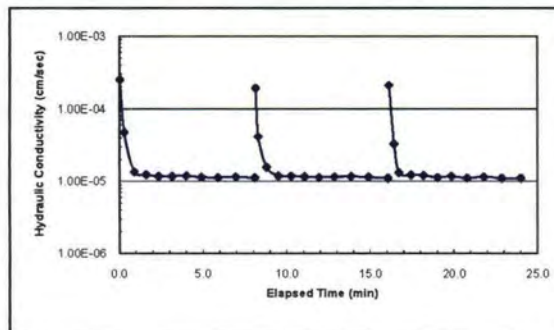
ASTM D 5084 - 00

Sample I.D.	305-mm Alt Upper Silt-2	Test Date :	11/12/08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.1 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	1.1 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	5.0	a _{out} =	1 cm ²
Weight of wet sample =	18000.0 g	Sample Water Content =	4.4% (%)
Wet Density =	1.6 g/cm ³	Dry Density =	1.62 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
CC	30.84	171.15	165.22	4.41%

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
11/12/2008 00:00.00	0.0	24.9	0.0	24.9	0.0				
11/12/2008 00:01.90	2.0	22.4	1.9	20.4	0.0	2.50E-04	1.3	2	2.5
11/12/2008 00:17.62	6.0	19.8	15.7	13.8	0.3	4.70E-05	0.6	4	2.6
11/12/2008 00:53.03	8.0	17.8	35.4	9.8	0.9	1.34E-05	1.0	2	2
11/12/2008 01:35.48	10.0	15.6	42.4	5.6	1.6	1.23E-05	1.1	2	2.2
11/12/2008 02:20.40	12.0	13.6	44.9	1.6	2.3	1.17E-05	1.0	2	2
11/12/2008 03:08.34	14.0	11.5	47.9	-2.5	3.1	1.18E-05	1.1	2	2.1
11/12/2008 03:59.60	16.0	9.3	51.3	-6.7	4.0	1.20E-05	1.1	2	2.2
11/12/2008 04:54.09	18.0	7.3	54.5	-10.7	4.9	1.14E-05	1.0	2	2
11/12/2008 05:53.98	20.0	5.2	59.9	-14.8	5.9	1.13E-05	1.1	2	2.1
11/12/2008 06:56.88	22.0	3.1	62.9	-18.9	6.9	1.15E-05	1.1	2	2.1
11/12/2008 08:04.49	24.0	1.1	67.6	-22.9	8.1	1.12E-05	1.0	2	2
11/12/2008 00:00.00	0.0	24.9	0.0	24.9	8.1				
11/12/2008 00:04.57	4.0	20.8	4.6	16.8	8.2	1.91E-04	1.0	4	4.1
11/12/2008 00:13.40	6.0	19.6	8.8	13.6	8.3	4.14E-05	0.6	2	1.2
11/12/2008 00:43.60	8.0	17.6	30.2	9.6	8.8	1.58E-05	1.0	2	2
11/12/2008 01:25.56	10.0	15.6	42.0	5.6	9.5	1.19E-05	1.0	2	2
11/12/2008 02:11.16	12.0	13.5	45.6	1.5	10.3	1.18E-05	1.1	2	2.1
11/12/2008 02:59.88	14.0	11.4	48.7	-2.6	11.1	1.16E-05	1.1	2	2.1
11/12/2008 03:51.59	16.0	9.4	51.7	-6.6	11.9	1.13E-05	1.0	2	2
11/12/2008 04:46.80	18.0	7.3	55.2	-10.7	12.9	1.15E-05	1.1	2	2.1
11/12/2008 05:46.35	20.0	5.1	59.5	-14.9	13.8	1.16E-05	1.1	2	2.2
11/12/2008 06:49.88	22.0	3.0	63.5	-19.0	14.9	1.14E-05	1.1	2	2.1
11/12/2008 07:58.50	24.0	1.0	68.6	-23.0	16.0	1.10E-05	1.0	2	2
11/12/2008 00:00.00	0.0	24.7	0.0	24.7	16.0				
11/12/2008 00:04.15	4.0	20.7	4.2	16.7	16.1	2.08E-04	1.0	4	4
11/12/2008 00:22.16	7.0	18.6	18.0	11.6	16.4	3.27E-05	0.7	3	2.1
11/12/2008 00:39.48	8.0	17.7	17.3	9.7	16.7	1.32E-05	0.9	1	0.9
11/12/2008 01:22.21	10.0	15.5	42.7	5.5	17.4	1.23E-05	1.1	2	2.2
11/12/2008 02:07.94	12.0	13.3	45.7	1.3	18.2	1.21E-05	1.1	2	2.2
11/12/2008 02:57.01	14.0	11.3	49.1	-2.7	19.0	1.13E-05	1.0	2	2
11/12/2008 03:48.18	16.0	9.2	51.2	-6.8	19.9	1.17E-05	1.1	2	2.1
11/12/2008 04:44.22	18.0	7.2	56.0	-10.8	20.8	1.11E-05	1.0	2	2
11/12/2008 05:44.42	20.0	5.0	60.2	-15.0	21.8	1.15E-05	1.1	2	2.2
11/12/2008 06:48.74	22.0	3.0	64.3	-19.0	22.9	1.10E-05	1.0	2	2
11/12/2008 07:57.56	24.0	1.0	68.8	-23.0	24.0	1.10E-05	1.0	2	2



Hydraulic Conductivity Test - Polson - Store-and-Release Cover

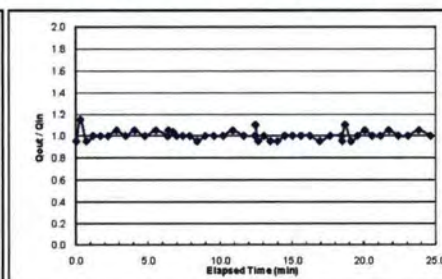
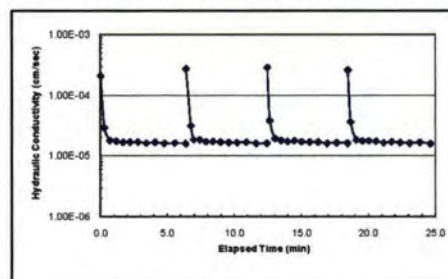
ASTM D 5084 - 00

Sample I.D.		305-mm Alt Upper Silt-3		Test Date : 11/12/08	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5	cm
Inflow Pressure =	41.1	psi	Length of Sample, L =	15.2	cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66	cm ²
Pressure Difference =	1.1	psi	Sample Volume, V =	11120.0	cm ³
Effective Stress =	1.5	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	5.0		a _{out} =	1	cm ²
Weight of wet sample =	18000.0	g	Sample Water Content =	5.8%	(%)
Wet Density =	1.6	g/cm ³	Dry Density =	1.62	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
#1	30.92	142.34	136.26	5.77%

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{avg} / Q _{in}	Q _{in}	Q _{out}
11/12/2008 00:00:00	0.0	24.5	0.0	24.5	0.0				
11/12/2008 00:01:06	2.0	22.6	2.0	20.6	0.0	2.10E-04	0.9	2	1.9
11/12/2008 00:01:37	4.0	20.3	16.4	16.3	0.3	2.89E-05	1.2	2	2.3
11/12/2008 00:03:06	6.0	18.4	25.5	12.4	0.7	1.76E-05	1.0	2	1.9
11/12/2008 01:11:74	8.0	16.4	27.9	8.4	1.2	1.73E-05	1.0	2	2
11/12/2008 01:42:35	10.0	14.4	30.6	4.4	1.7	1.65E-05	1.0	2	2
11/12/2008 02:14:29	12.0	12.4	31.9	0.4	2.2	1.66E-05	1.0	2	2
11/12/2008 02:48:77	14.0	10.3	34.5	-3.7	2.8	1.67E-05	1.1	2	2.1
11/12/2008 03:25:75	16.0	8.3	37.0	-7.7	3.4	1.60E-05	1.0	2	2
11/12/2008 04:04:81	18.0	6.2	39.1	-11.8	4.1	1.65E-05	1.1	2	2.1
11/12/2008 04:47:16	20.0	4.2	42.4	-16.6	4.8	1.58E-05	1.0	2	2
11/12/2008 05:33:05	22.0	2.1	45.9	-19.9	5.6	1.60E-05	1.1	2	2.1
11/12/2008 06:22:12	24.0	0.1	49.1	-23.9	6.4	1.57E-05	1.0	2	2
11/12/2008 00:00:00	0.0	24.9	0.0	24.9	6.4				
11/12/2008 00:01:58	2.0	22.8	1.6	20.8	6.4	2.74E-04	1.1	2	2.1
11/12/2008 00:23:25	5.0	19.7	21.7	14.7	6.8	3.13E-05	1.0	3	3.1
11/12/2008 00:36:95	6.0	18.7	12.7	12.7	7.0	1.63E-05	1.0	1	1
11/12/2008 01:02:30	8.0	16.7	26.4	8.7	7.4	1.62E-05	1.0	2	2
11/12/2008 01:32:10	10.0	14.7	29.5	4.7	7.9	1.69E-05	1.0	2	2
11/12/2008 02:02:55	12.0	12.8	30.4	0.8	8.4	1.69E-05	0.9	2	1.9
11/12/2008 02:35:96	14.0	10.8	33.4	-3.2	9.0	1.67E-05	1.0	2	2
11/12/2008 03:11:85	16.0	8.8	35.9	-7.2	9.6	1.64E-05	1.0	2	2
11/12/2008 03:50:10	18.0	6.8	38.2	-11.2	10.2	1.63E-05	1.0	2	2
11/12/2008 04:31:27	20.0	4.7	41.2	-15.3	10.9	1.65E-05	1.1	2	2.1
11/12/2008 05:16:20	22.0	2.7	44.9	-19.3	11.6	1.58E-05	1.0	2	2
11/12/2008 06:04:08	24.0	0.7	47.9	-23.3	12.4	1.59E-05	1.0	2	2
11/12/2008 00:00:00	0.0	24.9	0.0	24.9	12.4				
11/12/2008 00:01:54	2.0	22.7	1.5	20.7	12.5	2.88E-04	1.1	2	2.2
11/12/2008 00:12:94	4.0	20.8	11.4	16.8	12.7	3.76E-05	0.9	2	1.9
11/12/2008 00:37:11	6.0	18.8	24.2	12.8	13.1	1.90E-05	1.0	2	2
11/12/2008 01:03:64	8.0	16.9	26.5	8.9	13.5	1.76E-05	1.0	2	1.9
11/12/2008 01:32:50	10.0	15.0	28.9	5.0	14.0	1.70E-05	0.9	2	1.9
11/12/2008 02:02:76	12.0	13.0	30.3	1.0	14.5	1.74E-05	1.0	2	2
11/12/2008 02:35:62	14.0	11.0	32.9	-3.0	15.0	1.69E-05	1.0	2	2
11/12/2008 03:11:08	16.0	9.0	35.5	-7.0	15.6	1.66E-05	1.0	2	2
11/12/2008 03:48:59	18.0	7.0	37.5	-11.0	16.2	1.66E-05	1.0	2	2
11/12/2008 04:29:35	20.0	5.1	40.8	-14.9	16.9	1.58E-05	1.0	2	1.9
11/12/2008 05:12:95	22.0	3.1	43.6	-18.9	17.7	1.62E-05	1.0	2	2
11/12/2008 06:00:70	24.0	1.1	47.8	-22.9	18.4	1.58E-05	1.0	2	2
11/12/2008 00:00:00	0.0	24.9	0.0	24.9	18.4				
11/12/2008 00:01:58	2.0	23.0	1.6	21.0	18.5	2.60E-04	0.9	2	1.9
11/12/2008 00:14:49	4.0	20.8	12.9	16.8	18.7	3.57E-05	1.1	2	2.2
11/12/2008 00:39:17	6.0	18.9	24.7	12.9	19.1	1.81E-05	1.0	2	1.9
11/12/2008 01:06:82	8.0	16.9	27.7	8.9	19.6	1.73E-05	1.0	2	2
11/12/2008 01:36:56	10.0	14.8	29.7	4.8	20.1	1.73E-05	1.1	2	2.1
11/12/2008 02:07:43	12.0	12.8	30.9	0.8	20.6	1.71E-05	1.0	2	2
11/12/2008 02:41:86	14.0	10.8	34.4	-3.2	21.1	1.62E-05	1.0	2	2
11/12/2008 03:17:85	16.0	8.7	36.0	-7.3	21.7	1.68E-05	1.1	2	2.1
11/12/2008 03:56:20	18.0	6.7	38.4	-11.3	22.4	1.63E-05	1.0	2	2
11/12/2008 04:37:79	20.0	4.7	41.6	-15.3	23.1	1.60E-05	1.0	2	2
11/12/2008 05:22:22	22.0	2.6	44.4	-19.4	23.8	1.64E-05	1.1	2	2.1
11/12/2008 06:11:20	24.0	0.6	49.0	-23.4	24.6	1.56E-05	1.0	2	2



Hydraulic Conductivity Test - Polson - Store-and-Release Cover

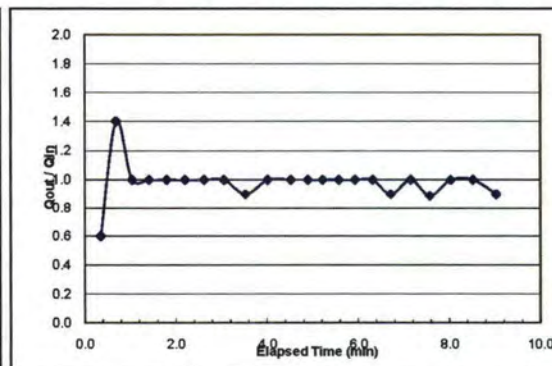
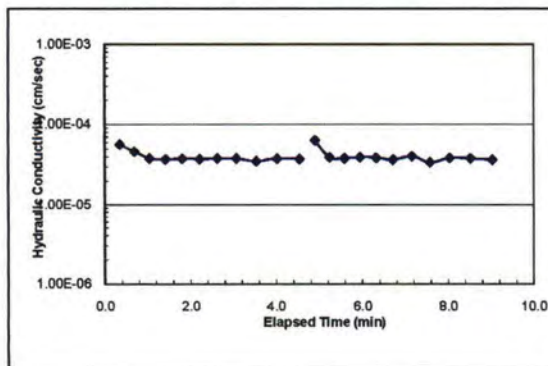
ASTM D 5084 - 00

Sample I.D.	150-mm Polson Alt Upper Silt-3		Test Date :	1/13/09
Cell Pressure =	42.0	psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	40.5	psi	Length of Sample, L =	7.6 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	182.41 cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =	1390.0 cm ³
Effective Stress =	1.8	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	4.6		a _{out} =	1 cm ²
Weight of wet sample =	2504.8	g	Sample Water Content =	28.9% (%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.40 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
A	31.07	122.39	101.93	28.87%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	23.0	0.0	23.0	0.0				
0:00:21	2.0	21.8	20.9	19.8	0.3	5.65E-05	0.6	2	1.2
0:00:41	3.0	20.4	20.1	17.4	0.7	4.63E-05	1.4	1	1.4
0:01:02	4.0	19.4	21.1	15.4	1.0	3.85E-05	1.0	1	1
0:01:25	5.0	18.4	22.6	13.4	1.4	3.73E-05	1.0	1	1
0:01:48	6.0	17.4	23.1	11.4	1.8	3.80E-05	1.0	1	1
0:02:12	7.0	16.4	24.3	9.4	2.2	3.77E-05	1.0	1	1
0:02:37	8.0	15.4	24.9	7.4	2.6	3.85E-05	1.0	1	1
0:03:03	9.0	14.4	26.3	5.4	3.1	3.82E-05	1.0	1	1
0:03:32	10.0	13.5	28.2	3.5	3.5	3.55E-05	0.9	1	0.9
0:04:01	11.0	12.5	29.0	1.5	4.0	3.83E-05	1.0	1	1
0:04:32	12.0	11.5	31.1	-0.5	4.5	3.77E-05	1.0	1	1
0:00:00	0.0	23.0	-271.7	23.0	4.5				
0:00:24	2.0	21.0	23.6	19.0	4.9	6.31E-05	1.0	2	2
0:00:43	3.0	20.0	19.9	17.0	5.2	3.95E-05	1.0	1	1
0:01:05	4.0	19.0	21.3	15.0	5.6	3.83E-05	1.0	1	1
0:01:26	5.0	18.0	21.5	13.0	5.9	3.96E-05	1.0	1	1
0:01:49	6.0	17.0	22.8	11.0	6.3	3.89E-05	1.0	1	1
0:02:13	7.0	16.1	23.8	9.1	6.7	3.69E-05	0.9	1	0.9
0:02:39	8.1	15.0	26.3	6.9	7.2	4.04E-05	1.0	1.1	1.1
0:03:04	9.0	14.2	25.3	5.2	7.6	3.40E-05	0.9	0.9	0.8
0:03:32	10.0	13.2	27.4	3.2	8.0	3.87E-05	1.0	1	1
0:04:01	11.0	12.2	29.4	1.2	8.5	3.80E-05	1.0	1	1
0:04:32	12.0	11.3	30.5	-0.7	9.0	3.68E-05	0.9	1	0.9



Hydraulic Conductivity Test - Polson - Store-and-Release Cover

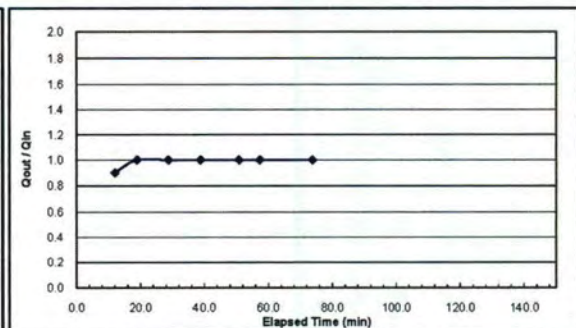
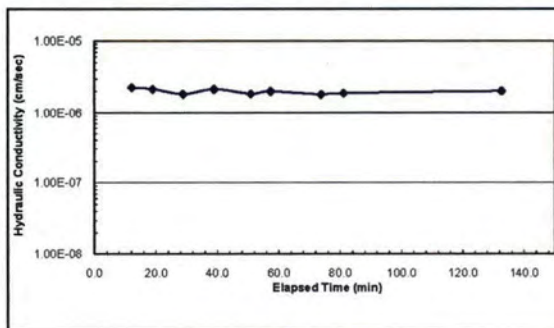
ASTM D 5084 - 00

Sample I.D. 75-mm Polson Alt Upper Silt-3			Test Date : 1/26/09	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	7.0 cm
Inflow Pressure =	40.5	psi	Length of Sample, L =	3.8 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	38.32 cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =	146.0 cm ³
Effective Stress =	1.8	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	9.2		a _{out} =	1 cm ²
Weight of wet sample =	275.2	g	Sample Water Content =	30.5% (%)
Wet Density =	1.88	g/cm ³	Dry Density =	1.44 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
64	30.95	124.12	102.33	30.53%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	1.0	24.0	0.0	23.0	0.0				
0:12:03	2.0	23.1	723.2	21.1	12.1	2.28E-06	0.9	1	0.9
0:18:55	2.5	22.6	412.3	20.1	18.9	2.16E-06	1.0	0.5	0.5
0:28:46	3.1	22.0	590.6	18.9	28.8	1.85E-06	1.0	0.6	0.6
0:38:51	3.8	21.3	605.0	17.5	38.9	2.16E-06	1.0	0.7	0.7
0:50:50	4.5	20.6	719.0	16.1	50.8	1.86E-06	1.0	0.7	0.7
0:57:19	4.9	20.2	389.0	15.3	57.3	2.01E-06	1.0	0.4	0.4
1:13:48	5.8	19.3	989.0	13.5	73.8	1.83E-06	1.0	0.9	0.9
1:21:02	6.2	18.9	434.0	12.7	81.0	1.90E-06	1.0	0.4	0.4
2:12:39	9.1	16.1	3097.0	7.0	132.7	2.04E-06	1.0	2.9	2.8



Hydraulic Conductivity Test - Sacramento - Thin Store-and-Release Cover

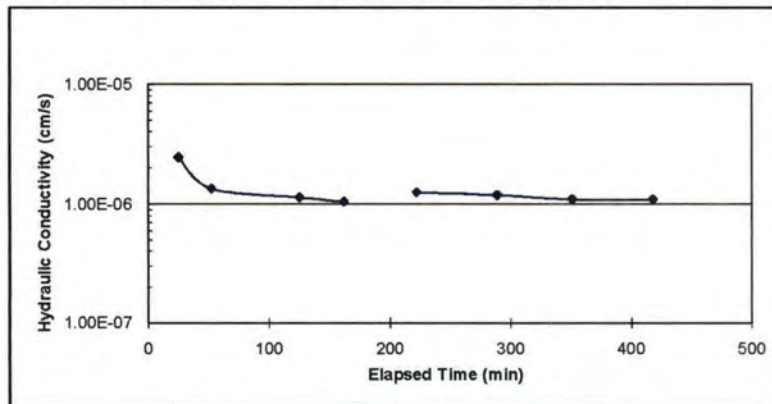
ASTM D 5084 - 00

Sample I.D.	305-mm K#1	Test Date :
Cell Pressure = 20.0 psi		Diameter of Sample, D = 30.5 cm
Inflow Pressure = 17.0 psi		Length of Sample, L = 17.8 cm
Outflow Pressure = 15.0 psi		Area of Sample, A = 730.62 cm ²
Pressure Difference = 2.0 psi		Sample Volume, V = 13005.0 cm ³
Effective Stress = 4.0 psi		a _{in} = 5 cm ²
Hydraulic Gradient, i = 7.9		a _{out} = 5 cm ²
Weight of wet sample = 26308.8 g		Sample Water Content = 27.1 (%)
Wet Density = 2.0 g/cm ³		Dry Density = 1.59 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
7	49.4	383.2	311.96	27.13

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
9:00:00	0.5	22.1	0	21.6	0				
9:25:00	8.1	20.2	1500	12.1	25	2.45E-06	0.3	38	9.5
9:52:00	11.5	18.2	1620	6.7	52	1.35E-06	0.6	17	10
11:05:00	17.9	13	4380	-4.9	125	1.14E-06	0.8	32	26
11:42:00	20.6	10.6	2220	-10	162	1.05E-06	0.9	13.5	12
11:42:00	0.4	23.2	0	22.8	162				
12:42:00	6.8	17.9	3600	11.1	222	1.26E-06	0.8	32	26.5
13:49:00	12.6	12.2	4020	-0.4	289	1.19E-06	1	29	28.5
14:51:00	17.2	7.7	3720	-9.5	351	1.10E-06	1	23	22.5
15:58:00	21.9	3.2	4020	-18.7	418	1.10E-06	1	23.5	22.5



Hydraulic Conductivity Test - Sacramento - Thin Store-and-Release Cover

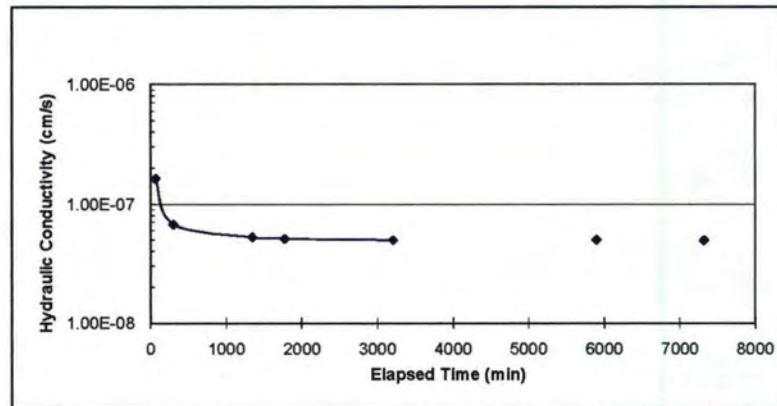
ASTM D 5084 - 00

Sample I.D.		150-mm K#1	Test Date : 12/21/05	
Cell Pressure =	20.0	psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	17.0	psi	Length of Sample, L =	12.5 cm
Outflow Pressure =	15.0	psi	Area of Sample, A =	181.46 cm ²
Pressure Difference =	2.0	psi	Sample Volume, V =	2268.2 cm ³
Effective Stress =	4.0	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	11.3		a _{out} =	1 cm ²
Weight of wet sample =	4776.8	g	Sample Water Content =	17.8 (%)
Wet Density =	2.1	g/cm ³	Dry Density =	1.79 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
4	49.4	441.8	382.64	17.75

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
12/21/2005 11:39	0	24	0	24	0				
12/21/2005 12:45	2.9	23.8	3960	20.9	66	1.64E-07	0.1	14.5	1
12/21/2005 16:40	5.6	22.1	14100	16.5	301	6.71E-08	0.6	13.5	8.5
12/22/2005 10:03	13.4	15.6	62580	2.2	1344	5.22E-08	0.8	39	32.5
12/22/2005 17:09	16.1	13	25560	-3.1	1770	5.07E-08	1	13.5	13
12/23/2005 17:03	24.4	5.3	86040	-19.1	3204	4.92E-08	0.9	41.5	38.5
12/23/2005 17:03	6	23.3	0	17.3	3204				
12/25/2005 13:53	23.2	7.6	161400	-15.6	5894	4.96E-08	0.9	86	78.5
12/25/2005 13:53	9	23.9	0	14.9	5894				
12/26/2005 13:35	18.2	15.2	85320	-3	7316	4.91E-08	0.9	46	43.5
12/27/2005 9:12	24.7	9	70620	-15.7	8493	4.70E-08	1	32.5	31



Hydraulic Conductivity Test - Sacramento - Thin Store-and-Release Cover

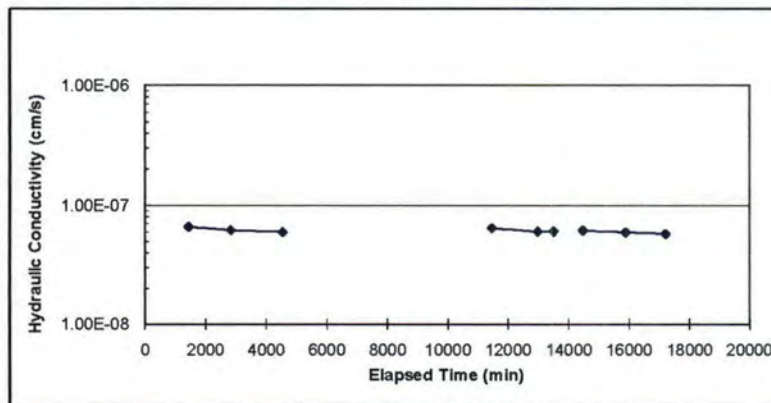
ASTM D 5084 - 00

Sample I.D.	100-mm K#1	Test Date :
Cell Pressure = 20.0 psi	Diameter of Sample, D = 10.2 cm	
Inflow Pressure = 17.0 psi	Length of Sample, L = 10.0 cm	
Outflow Pressure = 15.0 psi	Area of Sample, A = 81.71 cm ²	
Pressure Difference = 2.0 psi	Sample Volume, V = 817.1 cm ³	
Effective Stress = 4.0 psi	a _{in} = 1 cm ²	
Hydraulic Gradient, i = 14.1	a _{out} = 1 cm ²	
Weight of wet sample = 1645.5 g	Sample Water Content = (%)	
Wet Density = 2.0 g/cm ³	Dry Density = 2.01 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
12/28/2005 9:22	0.5	24.1	0	23.6	0.0				
12/29/2005 9:19	8.4	17.5	86220	9.1	1437.0	6.61E-08	0.8	39.5	33
12/30/2005 8:29	14.7	11.8	83400	-2.9	2827.0	6.18E-08	0.9	31.5	28.5
12/31/2005 13:05	21.5	5.5	102960	-16	4543.0	5.99E-08	0.9	34	31.5
1/4/2006 8:45	7	22.4	330000	15.4	10043.0				
1/5/2006 8:17	13.3	15.5	84720	2.2	11455.0	6.43E-08	1.1	31.5	34.5
1/6/2006 9:36	19.5	9.5	91140	-10	12974.0	6.04E-08	1	31	30
1/6/2006 18:23	21.5	7.5	31620	-14	13501.0	6.06E-08	1	10	10
1/6/2006 18:23	7.8	23.8	0	16	13501.0				
1/7/2006 10:27	12.2	19.4	57840	7.2	14465.0	6.16E-08	1	22	22
1/8/2006 10:01	18.1	13.7	84840	-4.4	15879.0	5.94E-08	1	29.5	28.5
1/9/2006 8:05	23.1	8.9	79440	-14.2	17203.0	5.79E-08	1	25	24



Hydraulic Conductivity Test - Sacramento - Thin Store-and-Release Cover

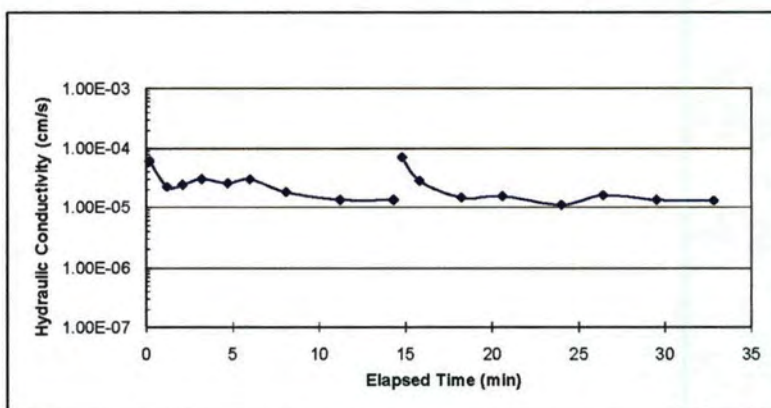
ASTM D 5084 - 00

Sample I.D.		305-mm K#2-L		Test Date :		12/7/05	
Cell Pressure =	20.0	psi		Diameter of Sample, D =	30.5	cm	
Inflow Pressure =	17.0	psi		Length of Sample, L =	15.2	cm	
Outflow Pressure =	15.0	psi		Area of Sample, A =	730.62	cm ²	
Pressure Difference =	2.0	psi		Sample Volume, V =	11105.4	cm ³	
Effective Stress =	4.0	psi		a _{in} =	5	cm ²	
Hydraulic Gradient, i =	9.3			a _{out} =	5	cm ²	
Weight of wet sample =	23768.6	g		Sample Water Content =	24.1	(%)	
Wet Density =	2.1	g/cm ³		Dry Density =	1.72	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
1	50.1	381.1	316.77	24.12

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24	0	24	0				
0:00:10	1.0	23.1	10	22.1	0.2	6.06E-05	0.9	5	4.5
0:01:10	3.0	21	60	18	1.2	2.22E-05	1.05	10	10.5
0:02:04	5.0	19.1	54	14.1	2.1	2.41E-05	0.95	10	9.5
0:03:14	8.0	16	70	8	3.2	3.00E-05	1.03	15	15.5
0:04:40	11.0	12.9	86	1.9	4.7	2.54E-05	1.03	15	15.5
0:05:57	14.0	9.8	77	-4.2	6	2.97E-05	1.03	15	15.5
0:08:05	17.0	6.9	128	-10.1	8.1	1.80E-05	0.97	15	14.5
0:11:10	20.0	3.9	185	-16.1	11.2	1.33E-05	1	15	15
0:14:20	23.0	1	190	-22	14.3	1.33E-05	0.97	15	14.5
0:00:00	0.0	24.5	0	24.5	14.3				
0:00:30	3.0	21	30	18	14.8	6.99E-05	1.17	15	17.5
0:01:30	6.0	19	60	13	15.8	2.79E-05	0.67	15	10
0:03:51	9.0	16.1	141	7.1	18.2	1.45E-05	0.97	15	14.5
0:06:15	12.0	13	144	1	20.6	1.53E-05	1	15	15.5
0:09:38	15.0	10.1	203	-4.9	24	1.09E-05	1	15	14.5
0:12:04	18.0	7.2	146	-10.8	26.4	1.59E-05	1	15	14.5
0:15:07	21.0	4.3	183	-16.7	29.5	1.33E-05	1	15	14.5
0:18:25	24.0	1.4	198	-22.6	32.8	1.29E-05	1	15	14.5



Hydraulic Conductivity Test - Sacramento - Thin Store-and-Release Cover

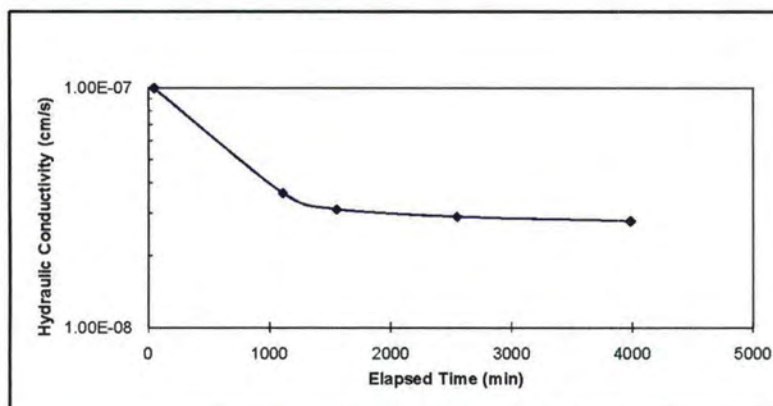
ASTM D 5084 - 00

Sample I.D.	150-mm K#2-L	Test Date :	12/12/05
Cell Pressure = 20.0	psi	Diameter of Sample, D = 15.2	cm
Inflow Pressure = 17.0	psi	Length of Sample, L = 10.0	cm
Outflow Pressure = 15.0	psi	Area of Sample, A = 181.46	cm ²
Pressure Difference = 2.0	psi	Sample Volume, V = 1814.6	cm ³
Effective Stress = 4.0	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 14.1		a _{out} = 1	cm ²
Weight of wet sample = 3800.1	g	Sample Water Content = 13.6	(%)
Wet Density = 2.1	g/cm ³	Dry Density = 1.84	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
874	35.1	379.6	338.47	13.56

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
12/12/2005 14:42	0.2	22.7	0	22.5	0				
12/12/2005 15:30	1	21.8	2880	20.8	48	9.97E-08	1.13	4	4.5
12/13/2005 9:13	7.8	15.6	63780	7.8	1111	3.61E-08	0.91	34	31
12/13/2005 16:37	10.2	13.6	26640	3.4	1555	3.10E-08	0.83	12	10
12/14/2005 9:13	15	9.6	59760	-5.4	2551	2.89E-08	0.83	24	20
12/15/2005 9:10	21	4.3	86220	-16.7	3988	2.77E-08	0.88	30	26.5



Hydraulic Conductivity Test - Sacramento - Thin Store-and-Release Cover

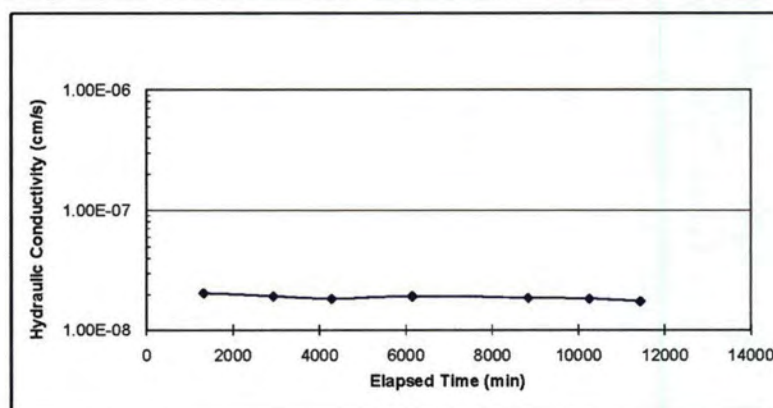
ASTM D 5084 - 00

Sample I.D.	100-mm K#2-L	Test Date :	12/15/05
Cell Pressure = 20.0	psi	Diameter of Sample, D = 10.2	cm
Inflow Pressure = 17.0	psi	Length of Sample, L = 10.0	cm
Outflow Pressure = 15.0	psi	Area of Sample, A = 81.71	cm ²
Pressure Difference = 2.0	psi	Sample Volume, V = 817.1	cm ³
Effective Stress = 4.0	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 14.1		a _{out} = 1	cm ²
Weight of wet sample = 1661.6	g	Sample Water Content = 18.8	(%)
Wet Density = 2.0	g/cm ³	Dry Density = 1.71	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
2	50.2	292.2	253.89	18.81

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
12/19/2005 10:33	1.1	24.2	0	23.1	0.0				
12/20/2005 8:37	3.6	22.4	79440	18.8	1324.0	2.07E-08	0.72	12.5	9
12/21/2005 11:35	6	20	97080	14	2942.0	1.94E-08	1	12	12
12/22/2005 10:03	7.9	18.2	80880	10.3	4290.0	1.85E-08	0.95	9.5	9
12/23/2005 17:04	10.4	15.5	111660	5.1	6151.0	1.94E-08	1.08	12.5	13.5
12/25/2005 13:53	14	12.1	161340	-1.9	8840.0	1.88E-08	0.94	18	17
12/26/2005 13:35	15.7	10.3	85320	-5.4	10262.0	1.85E-08	1.06	8.5	9
12/27/2005 9:11	17	8.9	70560	-8.1	11438.0	1.76E-08	1.08	6.5	7



Hydraulic Conductivity Test - Sacramento - Thin Store-and-Release Cover

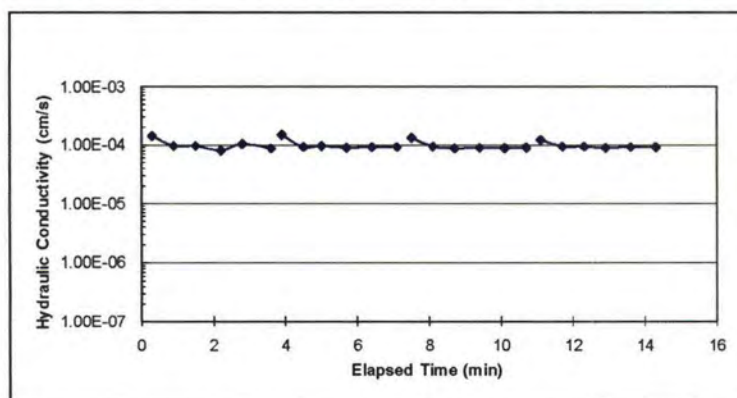
ASTM D 5084 - 00

Sample I.D.	305-mm K#3-L	Test Date :	12/19/05
Cell Pressure = 20.0 psi		Diameter of Sample, D = 30.5 cm	
Inflow Pressure = 17.0 psi		Length of Sample, L = 17.8 cm	
Outflow Pressure = 15.0 psi		Area of Sample, A = 730.62 cm ²	
Pressure Difference = 2.0 psi		Sample Volume, V = 13005.0 cm ³	
Effective Stress = 4.0 psi		a _{in} = 5 cm ²	
Hydraulic Gradient, i = 7.9		a _{out} = 5 cm ²	
Weight of wet sample = 24040.8 g		Sample Water Content = 21.4 (%)	
Wet Density = 1.8 g/cm ³		Dry Density = 1.52 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left[\frac{(\Delta H_1)}{(\Delta H_2)} \right]$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
874	34.8	316	266.48	21.37

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24	0	24	0				
0:00:20	4.0	20.5	20	16.5	0.3	1.42E-04	0.9	20	17.5
0:00:53	8.0	16.5	33	8.5	0.9	9.64E-05	1	20	20
0:01:28	12.0	12.5	35	0.5	1.5	9.59E-05	1	20	20
0:02:11	16.0	8.7	43	-7.3	2.2	8.05E-05	1	20	19
0:02:48	20.0	4.5	37	-15.5	2.8	1.04E-04	1.1	20	21
0:03:34	24.0	0.5	46	-23.5	3.6	8.75E-05	1	20	20
0:00:00	0.0	24.3	0	24.3	3.6				
0:00:20	4.0	20.5	20	16.5	3.9	1.48E-04	1	20	19
0:00:53	8.0	16.8	33	8.8	4.5	9.27E-05	0.9	20	18.5
0:01:28	12.0	12.8	35	0.8	5	9.58E-05	1	20	20
0:02:07	16.0	8.9	39	-7.1	5.7	8.98E-05	1	20	19.5
0:02:49	20.0	4.7	42	-15.3	6.4	9.19E-05	1.1	20	21
0:03:33	24.0	0.6	44	-23.4	7.1	9.25E-05	1	20	20.5
0:00:00	0.0	24.2	0	24.2	7.1				
0:00:25	4.0	19.5	25	15.5	7.5	1.32E-04	1.2	20	23.5
0:00:59	8.0	15.5	34	7.5	8.1	9.42E-05	1	20	20
0:01:35	12.0	12	36	0	8.7	8.79E-05	0.9	20	17.5
0:02:16	16.0	7.8	41	-8.2	9.4	8.92E-05	1.1	20	21
0:02:59	20.0	3.8	43.0	-16.2	10.1	8.83E-05	1.0	20	20
0:03:33	23.0	0.7	34.0	-22.3	10.7	9.00E-05	1.0	15	15.5
0:00:00	0.0	24.0	0.0	24.0	10.7				
0:00:25	4.0	20.0	25.0	16.0	11.1	1.21E-04	1.0	20	20
0:00:59	8.0	16.0	34.0	8.0	11.7	9.39E-05	1.0	20	20
0:01:35	12.0	12.0	36.0	0.0	12.3	9.36E-05	1.0	20	20
0:02:15	16.0	8.0	40.0	-8.0	12.9	8.92E-05	1.0	20	20
0:02:57	20.0	3.8	42.0	-16.2	13.6	9.25E-05	1.1	20	21
0:03:40	24.0	0.0	43.0	-24.0	14.3	9.17E-05	1.0	20	19



Hydraulic Conductivity Test - Sacramento - Thin Store-and-Release Cover

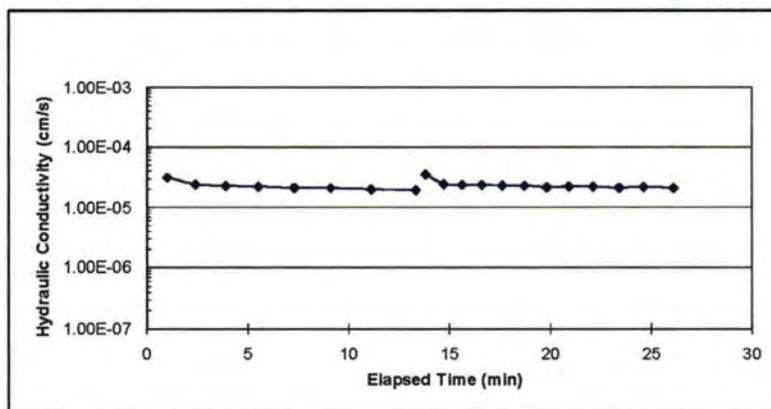
ASTM D 5084 - 00

Sample I.D.	305-mm K#5-L	Test Date :	12/7/05
Cell Pressure = 20.0	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 17.0	psi	Length of Sample, L = 15.2	cm
Outflow Pressure = 15.0	psi	Area of Sample, A = 730.62	cm ²
Pressure Difference = 2.0	psi	Sample Volume, V = 11105.4	cm ³
Effective Stress = 4.0	psi	a _{in} = 5	cm ²
Hydraulic Gradient, i = 9.3		a _{out} = 5	cm ²
Weight of wet sample = 22770.7	g	Sample Water Content = 15.7	(%)
Wet Density = 2.1	g/cm ³	Dry Density = 1.77	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
874	34.9	314.4	276.57	15.65

Date, Time	Inflow	Outflow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24	0	24	0				
0:00:58	3.0	21.4	58	18.4	1	3.12E-05	0.9	15	13
0:02:21	6.0	18.4	83	12.4	2.4	2.42E-05	1	15	15
0:03:51	9.0	15.5	90	6.5	3.9	2.28E-05	1	15	14.5
0:05:29	12.0	12.5	98	0.5	5.5	2.22E-05	1	15	15
0:07:16	15.0	9.5	107	-5.5	7.3	2.12E-05	1	15	15
0:09:07	18.0	6.6	111	-11.4	9.1	2.10E-05	1	15	14.5
0:11:06	21.0	3.8	119	-17.2	11.1	2.01E-05	0.9	15	14
0:13:20	24.0	0.8	134	-23.2	13.3	1.94E-05	1	15	15
0:00:00	0.0	24.5	0	24.5	13.3				
0:00:30	2.0	23.2	30	21.2	13.8	3.51E-05	0.7	10	6.5
0:01:22	4.0	21.3	52	17.3	14.7	2.45E-05	0.9	10	9.5
0:02:18	6.0	19.3	56	13.3	15.6	2.39E-05	1	10	10
0:03:16	8.0	17.3	58	9.3	16.6	2.37E-05	1	10	10
0:04:17	10.0	15.3	61	5.3	17.6	2.31E-05	1	10	10
0:05:20	12.0	13.3	63	1.3	18.7	2.30E-05	1	10	10
0:06:29	14.0	11.3	69	-2.7	19.8	2.16E-05	1	10	10
0:07:36	16.0	9.4	67	-6.6	20.9	2.23E-05	1	10	9.5
0:08:46	18.0	7.5	70	-10.5	22.1	2.20E-05	1	10	9.5
0:10:03	20.0	5.5	77.0	-14.5	23.4	2.12E-05	1.0	10	10
0:11:18	22.0	3.6	75.0	-18.4	24.6	2.19E-05	1.0	10	9.5
0:12:43	24.0	1.5	85.0	-22.5	26.1	2.10E-05	1.1	10	10.5



Hydraulic Conductivity Test - Sacramento - Thick Store-and-Release Cover

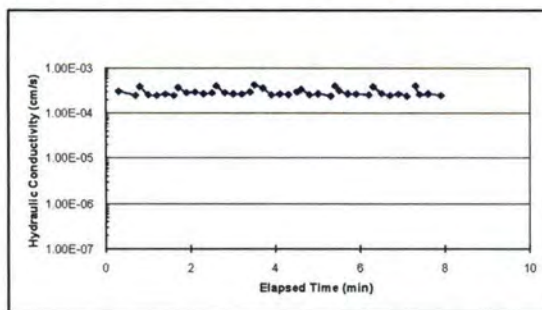
ASTM D 5084 - 00

Sample I.D.	305-mm K#4-L	Test Date :	11/29/05
Cell Pressure = 20.0	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 17.0	psi	Length of Sample, L = 16.5	cm
Outflow Pressure = 15.0	psi	Area of Sample, A = 730.62	cm ²
Pressure Difference = 2.0	psi	Sample Volume, V = 12055.2	cm ³
Effective Stress = 4.0	psi	a _{in} = 4	cm ³
Hydraulic Gradient, i = 8.5		a _{out} = 4	cm ³
Weight of wet sample = 20185.2	g	Sample Water Content = 24.2	(%)
Wet Density = 1.7	g/cm ³	Dry Density = 1.35	g/cm ³

$$K_s = \frac{a_{in} * a_{out} * L}{(a_{in} + a_{out}) * A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
874	34.9	262.3	218.04	24.17

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24	0	24	0				
0:00:15	10.0	18	15	8	0.3	3.08E-04	0.6	40	24
0:00:40	20.0	9	25	-11	0.7	2.48E-04	0.9	40	36
0:00:00	0.0	24.5	0	24.5	0.7				
0:00:08	5.0	18.5	8	13.5	0.8	3.90E-04	1.2	20	24
0:00:18	10.0	15	10	5	1	2.57E-04	0.7	20	14
0:00:31	15.0	10	13	-9	1.2	2.48E-04	1	20	20
0:00:44	20.0	5	13	-19	1.4	2.67E-04	1	20	20
0:00:58	24.0	1	12	-23	1.6	2.48E-04	1	16	16
0:00:00	0.0	24.5	0	24.5	1.6				
0:00:08	5.0	19	8	14	1.7	3.72E-04	1.1	20	22
0:00:18	10.0	14.5	10	4.5	1.9	2.87E-04	0.9	20	18
0:00:29	15.0	9.5	11	-5.5	2.1	2.94E-04	1	20	20
0:00:42	20.0	4.5	13	-15.5	2.3	2.68E-04	1	20	20
0:00:54	24.5	0	12	-24.5	2.5	2.81E-04	1	18	18
0:00:00	0.0	24.5	0	24.5	2.5				
0:00:07	5.0	19.5	7	14.5	2.6	4.04E-04	1	20	20
0:00:17	10.0	15	10	5	2.8	2.89E-04	0.9	20	18
0:00:29	15.0	10	12	-5	3	2.69E-04	1	20	20
0:00:42	20.0	5.0	13.0	-15.0	3.2	2.67E-04	1.0	20	20
0:00:54	24.5	0.0	12.0	-24.5	3.4	2.96E-04	1.1	18	20
0:00:00	0.0	24.5	0	24.5	3.4				
0:00:07	5.0	19.0	7.0	14.0	3.5	4.25E-04	1.1	20	22
0:00:15	10.0	14.5	8.0	4.5	3.7	3.59E-04	0.9	20	18
0:00:27	15.0	10.0	12.0	-5.0	3.9	2.55E-04	0.9	20	18
0:00:40	20.0	5.0	13.0	-15.0	4.1	2.67E-04	1.0	20	20
0:00:53	24.5	0.5	13.0	-24.0	4.3	2.59E-04	1.0	18	18
0:00:00	0.0	24.5	0	24.5	4.3				
0:00:10	5.0	19.0	10.0	14.0	4.5	2.97E-04	1.1	20	22
0:00:19	10.0	14.0	9.0	4.0	4.6	3.38E-04	1.0	20	20
0:00:31	15.0	9.5	12.0	-5.5	4.8	2.56E-04	0.9	20	18
0:00:44	20.0	4.5	13.0	-15.5	5.0	2.68E-04	1.0	20	20
0:00:58	24.5	0.0	14.0	-24.5	5.3	2.41E-04	1.0	18	18
0:00:00	0.0	24.5	0	24.5	5.3				
0:00:07	5.0	19.5	7.0	14.5	5.4	4.04E-04	1.0	20	20
0:00:16	10.0	15.0	9.0	5.0	5.5	3.18E-04	0.9	20	18
0:00:28	15.0	10.0	12.0	-5.0	5.7	2.68E-04	1.0	20	20
0:00:41	20.0	5.0	13.0	-15.0	5.9	2.67E-04	1.0	20	20
0:00:55	24.5	0.0	14.0	-24.5	6.2	2.54E-04	1.1	18	20
0:00:00	0.0	24.5	0	24.5	6.2				
0:00:07	5.0	20.0	7.0	15.0	6.3	3.83E-04	0.9	20	18
0:00:18	10.0	15.0	11.0	5.0	6.5	2.73E-04	1.0	20	20
0:00:31	15.0	10.0	13.0	-5.0	6.7	2.48E-04	1.0	20	20
0:00:44	20.0	5.0	13.0	-15.0	6.9	2.67E-04	1.0	20	20
0:00:58	24.5	0.5	14.0	-24.0	7.1	2.40E-04	1.0	18	18
0:00:00	0.0	24.5	0	24.5	7.1				
0:00:07	5.0	19.5	7.0	14.5	7.3	4.04E-04	1.0	20	20
0:00:18	10.0	15.0	11.0	5.0	7.4	2.60E-04	0.9	20	18
0:00:30	15.0	10.0	12.0	-5.0	7.6	2.68E-04	1.0	20	20
0:00:44	20.0	5.0	14.0	-15.0	7.9	2.48E-04	1.0	20	20



Hydraulic Conductivity Test - Sacramento - Thick Store-and-Release Cover

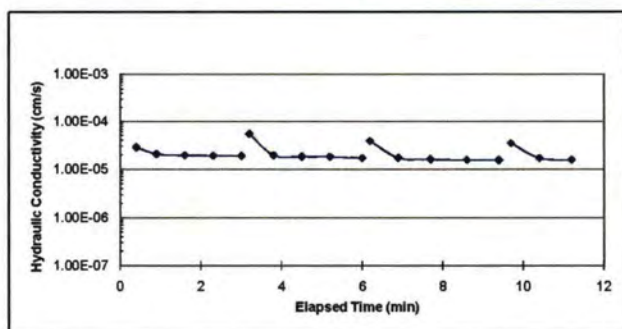
ASTM D 5084 - 00

Sample I.D.	305-mm K#6-L	Test Date :	12/7/05
Cell Pressure = 20.0	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 17.0	psi	Length of Sample, L = 15.2	cm
Outflow Pressure = 15.0	psi	Area of Sample, A = 730.62	cm ²
Pressure Difference = 2.0	psi	Sample Volume, V = 11105.4	cm ³
Effective Stress = 4.0	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 9.3		a _{out} = 1	cm ²
Weight of wet sample = 20729.5	g	Sample Water Content = 32.2	(%)
Wet Density = 1.9	g/cm ³	Dry Density = 1.41	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
874	35	342.7	267.68	32.24

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24	0	24	0				
0:00:22	5.0	19.5	22	14.5	0.4	2.82E-05	0.9	5	4.5
0:00:56	10.0	14.5	34	4.5	0.9	2.05E-05	1	5	5
0:01:35	15.0	9.4	39	-5.6	1.6	1.93E-05	1	5	5.1
0:02:18	20.0	4.3	43	-15.7	2.3	1.89E-05	1	5	5.1
0:02:58	24.3	0	40	-24.3	3	1.88E-05	1	4.3	4.3
0:00:00	0.0	24.5	0	24.5	3				
0:00:12	5.0	19.5	12	14.5	3.2	5.44E-05	1	5	5
0:00:48	10.0	14.5	36	4.5	3.8	1.93E-05	1	5	5
0:01:29	15.0	9.5	41	-5.5	4.5	1.82E-05	1	5	5
0:02:14	20.0	4.5	45	-15.5	5.2	1.78E-05	1	5	5
0:02:59	24.3	0	45	-24.3	6	1.69E-05	1	4.3	4.5
0:00:00	0.0	24.5	0	24.5	6				
0:00:17	5.0	19.5	17	14.5	6.2	3.84E-05	1	5	5
0:00:58	10.0	14.5	41	4.5	6.9	1.70E-05	1	5	5
0:01:45	15.0	9.5	47	-5.5	7.7	1.59E-05	1	5	5
0:02:37	20.0	4.5	52	-15.5	8.6	1.54E-05	1	5	5
0:03:28	24.5	0	51	-24.5	9.4	1.53E-05	1	4.5	4.5
0:00:00	0.0	24.5	0	24.5	9.4				
0:00:19	5.0	19.5	19.0	14.5	9.7	3.43E-05	1.0	5	5
0:01:00	10.0	14.8	41.0	4.6	10.4	1.88E-05	1.0	5	4.9
0:01:48	15.0	9.7	48.0	-5.3	11.2	1.54E-05	1.0	5	4.9
0:02:41	20.0	4.5	53.0	-15.5	12.1	1.54E-05	1.0	5	5.2
0:03:36	24.5	0.0	55.0	-24.5	13.0	1.42E-05	1.0	4.5	4.5
0:00:00	0.0	24.5	0.0	24.5	13.0				
0:00:16	5.0	19.2	16.0	14.2	13.3	4.20E-05	1.1	5	5.3
0:00:58	10.0	14.2	42.0	4.2	14.0	1.66E-05	1.0	5	5
0:01:46	15.0	9.2	48.0	-5.8	14.8	1.56E-05	1.0	5	5
0:02:41	20.0	4.0	55.0	-16.0	15.7	1.49E-05	1.0	5	5.2
0:03:28	24.0	0.0	47.0	-24.0	16.5	1.47E-05	1.0	4	4
0:00:00	0.0	24.5	0.0	24.5	16.5				
0:00:18	5.0	19.7	18.0	14.7	16.8	3.55E-05	1.0	5	4.8
0:01:02	10.0	14.8	44.0	4.8	17.5	1.56E-05	1.0	5	4.9
0:01:53	15.0	9.8	51.0	-5.2	18.4	1.46E-05	1.0	5	5
0:02:49	20.0	4.5	56.0	-15.5	19.3	1.47E-05	1.1	5	5.3
0:03:45	24.5	0.0	56.0	-24.5	20.2	1.39E-05	1.0	4.5	4.5
0:00:00	0.0	24.5	0.0	24.5	20.2				
0:00:17	5	20	17	15	20.5	3.84E-05	0.9	5	4.5
0:01:03	10	15	46	5	21.3	1.51E-05	1	5	5
0:01:55	15	10	52	-5	22.2	1.43E-05	1	5	5
0:02:52	20	5	57	-15	23.1	1.40E-05	1	5	5
0:03:52	25	0	60	-25	24.1	1.44E-05	1	5	5



Hydraulic Conductivity Test - Sacramento - Thick Store-and-Release Cover

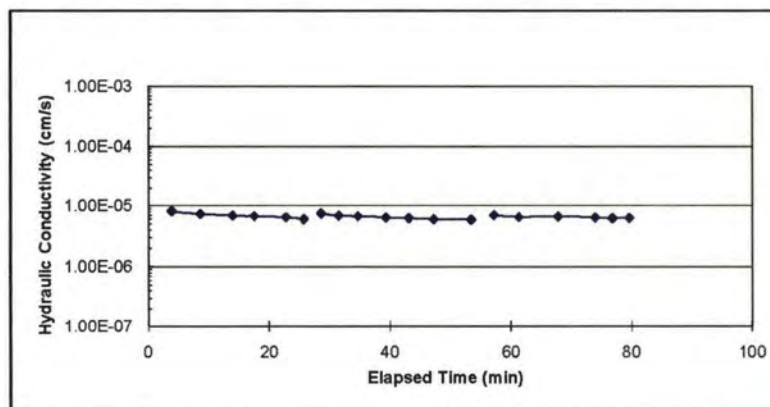
ASTM D 5084 - 00

Sample I.D.	150-mm K#6-L	Test Date :	12/7/05
Cell Pressure = 20.0 psi		Diameter of Sample, D = 15.2 cm	
Inflow Pressure = 17.0 psi		Length of Sample, L = 11.5 cm	
Outflow Pressure = 15.0 psi		Area of Sample, A = 181.46 cm ²	
Pressure Difference = 2.0 psi		Sample Volume, V = 2086.8 cm ³	
Effective Stress = 4.0 psi		a _{in} = 1 cm ²	
Hydraulic Gradient, i = 12.2		a _{out} = 1 cm ²	
Weight of wet sample = 4042.5 g		Sample Water Content = 31.1 (%)	
Wet Density = 1.9 g/cm ³		Dry Density = 1.48 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
10	51	399.95	317.17	31.10

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24	0	24	0				
0:03:47	5.0	19.7	227	14.7	3.8	8.07E-06	0.9	5	4.3
0:08:29	10.0	14.9	282	4.9	8.5	7.28E-06	1	5	4.8
0:13:53	15.0	10	324	-5	13.9	6.85E-06	1	5	4.9
0:17:30	18.0	6.9	217	-11.1	17.5	6.68E-06	1	3	3.1
0:22:49	22.0	2.8	319	-19.2	22.8	6.38E-06	1	4	4.1
0:25:41	24.0	0.9	172	-23.1	25.7	5.98E-06	1	2	1.9
0:00:00	0.8	24.5	0	23.7	25.7				
0:02:52	4.0	21.2	172	17.2	28.6	7.39E-06	1	3.2	3.3
0:05:48	7.0	18.3	176	11.3	31.5	6.82E-06	1	3	2.9
0:08:58	10.0	15.3	190	5.3	34.7	6.68E-06	1	3	3
0:13:37	14.0	11.3	279	-2.7	39.3	6.37E-06	1	4	4
0:17:23	17.0	8.3	226	-8.7	43.1	6.20E-06	1	3	3
0:21:29	20.0	5.3	246	-14.7	47.2	5.96E-06	1	3	3
0:27:45	24.2	1	376	-23.2	53.4	5.86E-06	1	4.2	4.3
0:00:00	0.0	24.5	0	24.5	53.4				
0:03:43	4.0	20.6	223	16.6	57.2	6.93E-06	1	4	3.9
0:07:51	8.0	16.8	248	8.8	61.3	6.47E-06	1	4	3.8
0:14:24	14.0	10.9	393	-3.1	67.8	6.65E-06	1	6	5.9
0:20:36	19.0	6.0	372.0	-13.0	74.0	6.33E-06	1.0	5	4.9
0:23:23	21.0	3.9	167.0	-17.1	76.8	6.16E-06	1.1	2	2.1
0:26:10	23.0	1.9	167.0	-21.1	79.6	6.21E-06	1.0	2	2



Hydraulic Conductivity Test - Sacramento - Thick Store-and-Release Cover

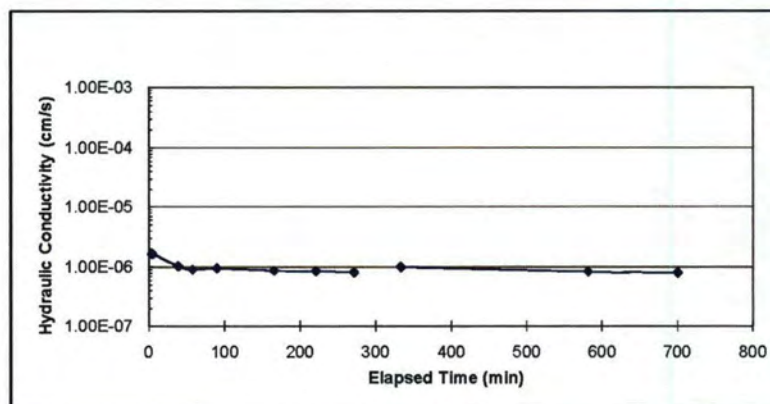
ASTM D 5084 - 00

Sample I.D.	100-mm K#6-L	Test Date :
Cell Pressure = 20.0 psi		Diameter of Sample, D = 10.2 cm
Inflow Pressure = 17.0 psi		Length of Sample, L = 11.5 cm
Outflow Pressure = 15.0 psi		Area of Sample, A = 81.71 cm ²
Pressure Difference = 2.0 psi		Sample Volume, V = 939.7 cm ³
Effective Stress = 4.0 psi		a _{in} = 1 cm ²
Hydraulic Gradient, i = 12.2		a _{out} = 1 cm ²
Weight of wet sample = 1812.6 g		Sample Water Content = (%)
Wet Density = 1.9 g/cm ³		Dry Density = 1.93 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
10	51.1	292.9		

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.2	24.3	0	24.1	0				
0:04:22	1.0	24.1	262	23.1	4.4	1.65E-06	0.2	0.8	0.2
0:38:35	3.8	22.1	2053	18.3	38.6	1.03E-06	0.7	2.8	2
0:57:44	5.0	21	1149	16	57.7	9.00E-07	0.9	1.2	1.1
1:29:59	7.0	19	1935	12	90	9.48E-07	1	2	2
2:45:30	11.2	15	4531	3.8	165.5	8.64E-07	1	4.2	4
3:41:07	14.1	12.2	3337	-1.9	221.1	8.56E-07	1	2.9	2.8
4:31:33	16.5	9.9	3026	-6.6	271.6	8.08E-07	1	2.4	2.3
0:00:00	0.0	24.1	0	24.1	271.6				
1:02:12	4.8	20.5	3732	15.7	333.8	9.94E-07	0.8	4.8	3.6
5:10:22	17.4	8.1	14890	-9.3	581.9	8.30E-07	1	12.6	12.4
7:09:10	22.4	3	7128	-19.4	700.7	7.96E-07	1	5	5.1



Hydraulic Conductivity Test - Sacramento - Thick Store-and-Release Cover

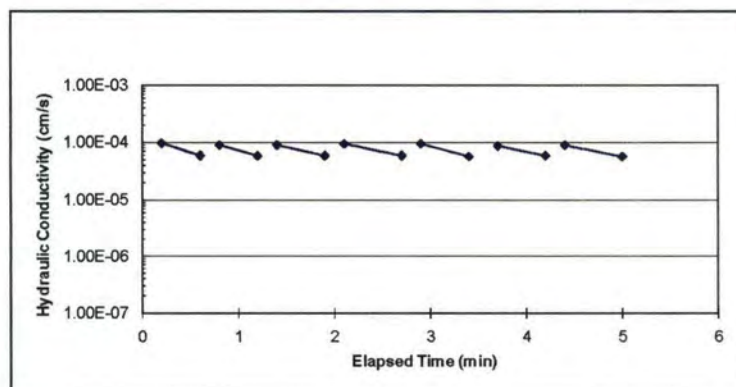
ASTM D 5084 - 00

Sample I.D.	305-mm K#7-L	Test Date :	11/22/05
Cell Pressure = 20.0	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 17.0	psi	Length of Sample, L = 12.7	cm
Outflow Pressure = 15.0	psi	Area of Sample, A = 730.62	cm ²
Pressure Difference = 2.0	psi	Sample Volume, V = 9278.8	cm ³
Effective Stress = 4.0	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 11.1		a _{out} = 1	cm ²
Weight of wet sample = 17690.4	g	Sample Water Content = 27.1	(%)
Wet Density = 1.9	g/cm ³	Dry Density = 1.50	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
10	51.12	480.74	389.15	27.10

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.7	0	24.7	0				
0:00:11	10.0	15.8	11	5.8	0.2	9.60E-05	0.9	10	8.9
0:00:33	20.0	5.5	22	-14.5	0.6	5.90E-05	1	10	10.3
0:00:00	0.0	24.5	0	24.5	0.6				
0:00:14	10.0	12.5	14	2.5	0.8	8.89E-05	1.2	10	12
0:00:37	20.0	2	23	-18	1.2	5.85E-05	1.1	10	10.5
0:00:00	0.0	24.5	0	24.5	1.2				
0:00:13	10.0	14	13	4	1.4	8.87E-05	1.1	10	10.5
0:00:45	24.0	0	32	-24	1.9	5.85E-05	1	14	14
0:00:00	0.0	24.5	0	24.5	1.9				
0:00:12	10.0	14.5	12	4.5	2.1	9.36E-05	1	10	10
0:00:45	24.5	0	33	-24.5	2.7	5.88E-05	1	14.5	14.5
0:00:00	0.0	24.5	0	24.5	2.7				
0:00:12	10.0	14.5	12	4.5	2.9	9.36E-05	1	10	10
0:00:46	24.5	0	34	-24.5	3.4	5.70E-05	1	14.5	14.5
0:00:00	0.0	24.5	0	24.5	3.4				
0:00:13	10.0	14.5	13	4.5	3.7	8.64E-05	1	10	10
0:00:46	24.5	0	33	-24.5	4.2	5.88E-05	1	14.5	14.5
0:00:00	0.0	24.5	0	24.5	4.2				
0:00:13	10.0	14.0	13.0	4.0	4.4	8.87E-05	1.1	10	10.5
0:00:46	24.0	0.0	33.0	-24.0	5.0	5.67E-05	1.0	14	14
0:00:00	0.0	24.5	0.0	24.5	5.0				
0:00:13	10.0	14.5	13.0	4.5	5.2	8.64E-05	1.0	10	10
0:00:47	24.5	0.0	34.0	-24.5	5.8	5.70E-05	1.0	14.5	14.5
0:00:00	0.0	24.5	0.0	24.5	5.8				
0:00:13	10.0	14.0	13.0	4.0	6.0	8.87E-05	1.1	10	10.5
0:00:43	24.0	0.0	30.0	-24.0	6.5	6.24E-05	1.0	14	14
0:00:00	0.0	24.5	0.0	24.5	6.5				
0:00:12	10.0	14.5	12.0	4.5	6.7	9.36E-05	1.0	10	10
0:00:45	24.5	0.0	33.0	-24.5	7.2	5.88E-05	1.0	14.5	14.5



Hydraulic Conductivity Test - Sacramento - Thick Store-and-Release Cover

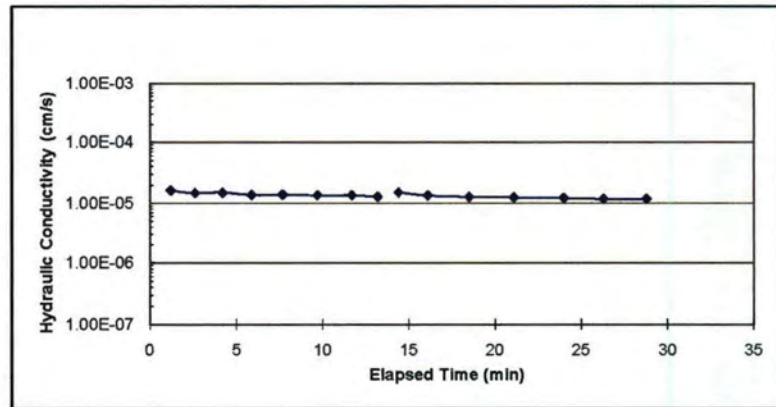
ASTM D 5084 - 00

Sample I.D.		150-mm K#7-L	Test Date :	
Cell Pressure =	20.0	psi	Diameter of Sample, D =	15.2 cm
Inflow Pressure =	17.0	psi	Length of Sample, L =	12.7 cm
Outflow Pressure =	15.0	psi	Area of Sample, A =	181.46 cm ²
Pressure Difference =	2.0	psi	Sample Volume, V =	2304.5 cm ³
Effective Stress =	4.0	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	11.1		a _{out} =	1 cm ²
Weight of wet sample =	4478.6	g	Sample Water Content =	26.9 (%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.53 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
4	50	412.3	335.61	26.85

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	1.0	23.5	0	22.5	0				
0:01:11	4.0	21.2	71	17.2	1.2	1.62E-05	0.8	3	2.3
0:02:38	7.0	18.5	87	11.5	2.6	1.47E-05	0.9	3	2.7
0:04:10	10.0	15.6	92	5.6	4.2	1.50E-05	1	3	2.9
0:05:55	13.0	12.7	105	-0.3	5.9	1.37E-05	1	3	2.9
0:07:43	16.0	9.8	108	-6.2	7.7	1.38E-05	1	3	2.9
0:09:39	19.0	6.9	116	-12.1	9.7	1.35E-05	1	3	2.9
0:11:40	22.0	4	121	-18	11.7	1.35E-05	1	3	2.9
0:13:10	24.0	2	90	-22	13.2	1.28E-05	1	2	2
0:00:00	0.5	24	0	23.5	13.2				
0:01:16	3.0	21.2	76	18.2	14.4	1.50E-05	1.1	2.5	2.8
0:02:56	6.0	18.2	100	12.2	16.1	1.34E-05	1	3	3
0:05:19	10.0	14.4	143	4.4	18.5	1.27E-05	1	4	3.8
0:07:57	14.0	10.4	158	-3.6	21.1	1.25E-05	1	4	4
0:10:48	18.0	6.4	171	-11.6	24	1.22E-05	1	4	4
0:13:08	21.0	3.4	140	-17.6	26.3	1.18E-05	1	3	3
0:15:36	24.0	0.4	148	-23.6	28.8	1.18E-05	1	3	3



Hydraulic Conductivity Test - Sacramento - Thick Store-and-Release Cover

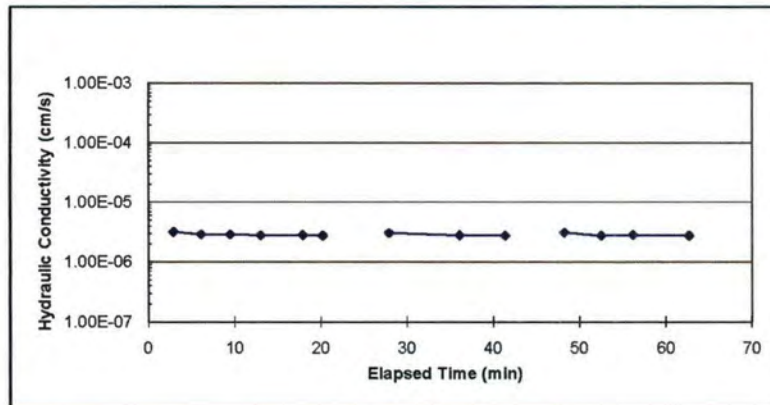
ASTM D 5084 - 00

Sample I.D.	305-mm K#8-L	Test Date :	11/22/05
Cell Pressure = 20.0	psi	Diameter of Sample, D = 30.5	cm
Inflow Pressure = 17.0	psi	Length of Sample, L = 15.2	cm
Outflow Pressure = 15.0	psi	Area of Sample, A = 730.62	cm ²
Pressure Difference = 2.0	psi	Sample Volume, V = 11105.4	cm ³
Effective Stress = 4.0	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 9.3		a _{out} = 1	cm ²
Weight of wet sample = 21319.2	g	Sample Water Content = 30.6	(%)
Wet Density = 1.9	g/cm ³	Dry Density = 1.47	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
	(g)	(g)	(g)	(%)
10	51.12	404.58	321.77	30.60

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	23	0	23	0				
0:02:53	4.0	18.6	173	14.6	2.9	3.18E-06	1.1	4	4.4
0:06:04	8.0	14.6	191	6.6	6.1	2.89E-06	1	4	4
0:09:27	12.0	10.6	203	-1.4	9.5	2.87E-06	1	4	4
0:13:01	16.0	6.9	214	-9.1	13	2.78E-06	0.9	4	3.7
0:17:54	21.0	2	293	-19	17.9	2.79E-06	1	5	4.9
0:20:11	23.3	0	137	-23.3	20.2	2.74E-06	0.9	2.3	2
0:00:00	0.0	24.5	0	24.5	20.2				
0:07:44	10.0	13.6	464	3.6	27.9	3.05E-06	1.1	10	10.9
0:15:53	19.0	4.9	489	-14.1	36.1	2.80E-06	1	9	8.7
0:21:15	24.4	0	322	-24.4	41.4	2.75E-06	0.9	5.4	4.9
0:00:00	0.0	25	0	25	41.4				
0:06:46	9.0	15.2	406	6.2	48.2	3.10E-06	1.1	9	9.8
0:11:05	14.0	10.5	259	-3.5	52.5	2.76E-06	0.9	5	4.7
0:14:45	18.0	6.6	220	-11.4	56.2	2.82E-06	1	4	3.9
0:21:14	24.5	0.5	389	-24	62.7	2.75E-06	0.9	6.5	6.1



Hydraulic Conductivity Test - Underwood - Thick Clay Cover

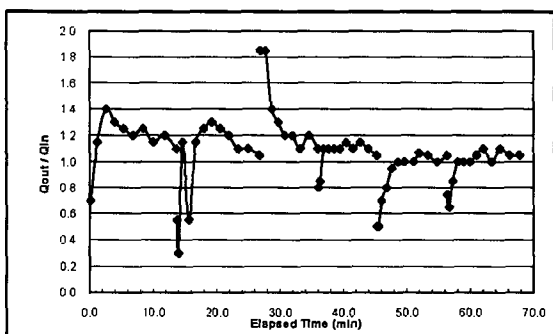
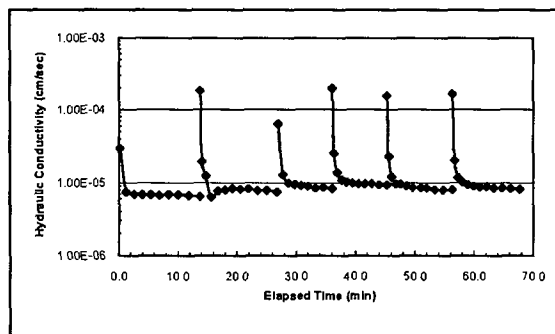
ASTM D 5084 - 00

Sample I.D.				305-mm CC5 - Clay Top 1				Test Date : 9/2/08			
Cell Pressure = 42.0				psi				Diameter of Sample, D = 30.5			
Inflow Pressure = 41.1				psi				cm			
Outflow Pressure = 40.0				psi				Length of Sample, L = 15.2			
Pressure Difference = 1.1				psi				cm ²			
Effective Stress = 1.5				psi				Area of Sample, A = 729.66			
Hydraulic Gradient, i = 5.0								cm ³			
Weight of wet sample = 24750.0				g				Sample Volume, V = 11120.0			
Wet Density = 2.2				g/cm ³				a _{in} = 1			
								cm ²			
								a _{out} = 1			
								cm ²			
								Sample Water Content = 11.6%			
								(%)			
								Dry Density = 2.22			
								g/cm ³			

$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$					Can #	WT of Can	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content
						(g)	(g)	(g)	(%)
					NS-2	24.88	162.34	148	11.65%

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
9/2/2008 00:00.00	0.0	24.9	0.0	24.9	0.0				
9/2/2008 00:11.88	2.0	23.5	11.9	21.5	0.2	3.01E-05	0.7	2	1.4
9/2/2008 01:15.02	4.0	21.2	63.1	17.2	1.3	7.44E-06	1.2	2	2.3
9/2/2008 02:34.58	6.0	18.4	79.6	12.4	2.6	6.93E-06	1.4	2	2.8
9/2/2008 03:56.41	8.0	15.8	81.8	7.8	3.9	6.80E-06	1.3	2	2.6
9/2/2008 05:21.48	10.0	13.3	85.1	3.3	5.4	6.76E-06	1.3	2	2.5
9/2/2008 06:50.30	12.0	10.9	88.8	-1.1	6.8	6.69E-06	1.2	2	2.4
9/2/2008 08:24.52	14.0	8.4	94.2	-5.6	8.4	6.85E-06	1.3	2	2.5
9/2/2008 10:01.48	16.0	6.1	97.0	-9.9	10.0	6.77E-06	1.2	2	2.3
9/2/2008 11:49.42	18.0	3.7	107.9	-14.3	11.8	6.64E-06	1.2	2	2.4
9/2/2008 13:43.77	20.0	1.5	114.4	-18.5	13.7	6.42E-06	1.1	2	2.2
9/2/2008 00:00.00	0.0	24.7	0.0	24.7	13.7				
9/2/2008 00:01.79	2.0	23.6	1.8	21.6	13.8	1.82E-04	0.5	2	1.1
9/2/2008 00:16.03	4.0	23.0	14.2	19.0	14.0	1.98E-05	0.3	2	0.6
9/2/2008 00:55.03	6.0	20.7	39.0	14.7	14.6	1.24E-05	1.2	2	2.3
9/2/2008 01:52.64	8.0	19.6	57.6	11.6	15.6	6.29E-06	0.5	2	1.1
9/2/2008 03:00.55	10.0	17.3	67.9	7.3	16.7	7.72E-06	1.2	2	2.3
9/2/2008 04:13.75	12.0	14.8	73.2	2.8	18.0	7.90E-06	1.3	2	2.5
9/2/2008 05:29.30	14.0	12.2	75.6	-1.8	19.2	8.29E-06	1.3	2	2.6
9/2/2008 06:48.81	16.0	9.7	79.5	-6.3	20.5	8.19E-06	1.3	2	2.5
9/2/2008 08:11.06	18.0	7.3	82.3	-10.7	21.9	8.26E-06	1.2	2	2.4
9/2/2008 09:39.67	20.0	5.1	88.6	-14.9	23.4	7.81E-06	1.1	2	2.2
9/2/2008 11:14.74	22.0	2.9	95.1	-19.1	25.0	7.80E-06	1.1	2	2.2
9/2/2008 12:58.77	24.0	0.8	104.0	-23.2	26.7	7.48E-06	1.1	2	2.1
9/2/2008 00:00.00	0.0	24.9	0.0	24.9	26.7				
9/2/2008 00:09.46	2.0	21.2	9.5	19.2	26.9	6.41E-05	1.9	2	3.7
9/2/2008 00:59.08	4.0	17.5	49.6	13.5	27.7	1.30E-05	1.9	2	3.7
9/2/2008 01:57.00	6.0	14.7	57.9	8.7	28.7	9.92E-06	1.4	2	2.8
9/2/2008 02:58.00	8.0	12.1	61.0	4.1	29.7	9.54E-06	1.3	2	2.6
9/2/2008 04:03.00	10.0	9.7	65.0	-0.3	30.8	9.05E-06	1.2	2	2.4
9/2/2008 05:13.00	12.0	7.3	70.0	-4.7	31.9	8.91E-06	1.2	2	2.4
9/2/2008 06:28.00	14.0	5.1	75.0	-8.9	33.2	8.43E-06	1.1	2	2.2
9/2/2008 07:50.00	16.0	2.7	82.0	-13.3	34.5	8.61E-06	1.2	2	2.4
9/2/2008 09:17.00	18.0	0.5	87.0	-17.5	36.0	8.30E-06	1.1	2	2.2
9/2/2008 00:00.00	0.0	24.9	0.0	24.9	36.0				
9/2/2008 00:01.91	2.0	23.3	1.9	21.3	36.0	1.98E-04	0.8	2	1.6
9/2/2008 00:17.65	4.0	21.6	15.7	17.6	36.3	2.57E-05	0.9	2	1.7
9/2/2008 00:52.24	6.0	19.4	34.6	13.4	36.9	1.38E-05	1.1	2	2.2
9/2/2008 01:37.89	8.0	17.2	45.6	9.2	37.6	1.10E-05	1.1	2	2.2
9/2/2008 02:29.27	10.0	15.0	51.4	5.0	38.5	1.03E-05	1.1	2	2.2
9/2/2008 03:25.39	12.0	12.8	56.1	0.8	39.4	9.88E-06	1.1	2	2.2
9/2/2008 04:27.42	14.0	10.5	62.0	-3.5	40.4	9.67E-06	1.2	2	2.3
9/2/2008 05:31.72	16.0	8.3	64.3	-7.7	41.5	9.67E-06	1.1	2	2.2
9/2/2008 06:40.72	18.0	6.0	69.0	-12.0	42.7	9.81E-06	1.2	2	2.3
9/2/2008 07:55.90	20.0	3.8	75.2	-16.2	43.9	9.40E-06	1.1	2	2.2
9/2/2008 09:15.20	22.0	1.7	79.3	-20.3	45.2	9.32E-06	1.1	2	2.1
9/2/2008 00:00.00	0.0	24.0	0.0	24.0	45.2				
9/2/2008 00:02.03	2.0	23.0	2.0	21.0	45.3	1.56E-04	0.5	2	1
9/2/2008 00:16.16	4.0	22.0	14.1	18.0	45.5	2.32E-05	0.5	2	1
9/2/2008 00:47.75	6.0	20.6	31.6	14.6	46.0	1.22E-05	0.7	2	1.4
9/2/2008 01:31.24	8.0	19.0	43.5	11.0	46.8	9.71E-06	0.8	2	1.6
9/2/2008 02:21.45	10.0	17.1	50.2	7.1	47.6	9.52E-06	0.9	2	1.9
9/2/2008 03:18.31	12.0	15.1	56.9	3.1	48.6	9.04E-06	1.0	2	2
9/2/2008 04:21.31	14.0	13.1	63.0	-0.9	49.6	8.58E-06	1.0	2	2
9/2/2008 05:46.26	16.5	10.6	85.0	-5.9	51.0	8.45E-06	1.0	2.5	2.5
9/2/2008 06:41.95	18.0	9.0	55.7	-9.0	51.9	8.46E-06	1.1	1.5	1.6

9/2/2008 08:04.00	20.0	6.9	82.1	-13.1	53.3	8.01E-06	1.1	2	2.1
9/2/2008 09:30.06	22.0	4.9	86.1	-17.1	54.7	7.95E-06	1.0	2	2
9/2/2008 11:04.16	24.0	2.8	94.1	-21.2	56.3	7.98E-06	1.1	2	2.1
9/3/2008 00:00.00	0.0	24.0	0.0	24.0	56.3				
9/3/2008 00:02.24	2.0	22.5	2.2	20.5	56.4	1.66E-04	0.8	2	1.5
9/3/2008 00:20.03	4.0	21.2	17.8	17.2	56.6	2.04E-05	0.7	2	1.3
9/3/2008 00:55.98	6.0	19.5	36.0	13.5	57.2	1.17E-05	0.9	2	1.7
9/3/2008 01:42.60	8.0	17.5	46.6	9.5	58.0	1.02E-05	1.0	2	2
9/3/2008 02:35.52	10.0	15.5	52.9	5.5	58.9	9.43E-06	1.0	2	2
9/3/2008 03:33.60	12.0	13.5	58.1	1.5	59.9	9.03E-06	1.0	2	2
9/3/2008 04:38.04	14.0	11.4	64.4	-2.6	60.9	8.79E-06	1.1	2	2.1
9/3/2008 05:47.25	16.0	9.2	69.2	-6.8	62.1	8.87E-06	1.1	2	2.2
9/3/2008 07:00.25	18.0	7.2	73.0	-10.8	63.3	8.49E-06	1.0	2	2
9/3/2008 08:21.71	20.0	5.0	81.5	-15.0	64.7	8.51E-06	1.1	2	2.2
9/3/2008 09:49.14	22.0	2.9	87.4	-19.1	66.1	8.28E-06	1.1	2	2.1
9/3/2008 11:24.21	24.0	0.8	95.1	-23.2	67.7	8.19E-06	1.1	2	2.1



Hydraulic Conductivity Test - Underwood - Thick Clay Cover

ASTM D 5084 - 00

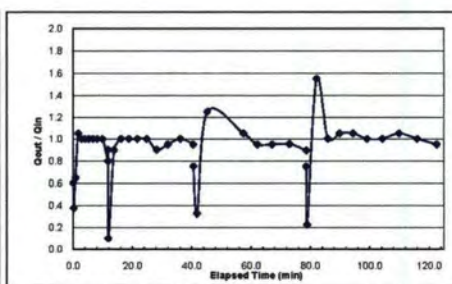
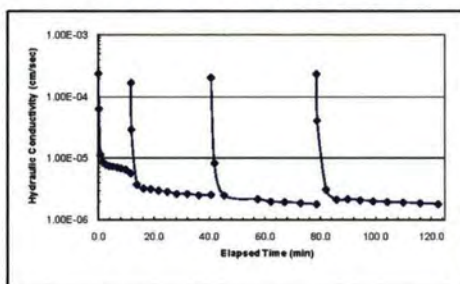
Sample I.D. 305-mm CC5- Clay Top 2		Test Date : 8/21/08	
Cell Pressure = 42.0 psi		Diameter of Sample, D = 30.5 cm	
Inflow Pressure = 41.1 psi		Length of Sample, L = 15.2 cm	
Outflow Pressure = 40.0 psi		Area of Sample, A = 729.66 cm ²	
Pressure Difference = 1.1 psi		Sample Volume, V = 11120.0 cm ³	
Effective Stress = 1.5 psi		a _{in} = 1 cm ²	
Hydraulic Gradient, i = 5.0		a _{out} = 1 cm ²	
Weight of wet sample = 23900.0 g		Sample Water Content = 12.1% (%)	
Wet Density = 2.1 g/cm ³		Dry Density = 2.15 g/cm ³	

$$K_s = \frac{a_m * a_{out}}{(a_m + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
MV-3	50.54	431.49	390.23	12.15%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
8/20/2008 00:00:00	0.0	24.9	0.0	24.9	0.0				
8/20/2008 00:01:40	2.0	23.7	1.4	21.7	0.0	2.40E-04	0.6	2	1.2
8/20/2008 00:10:08	6.0	22.2	9.5	16.2	0.2	6.37E-05	0.4	4	1.5
8/20/2008 00:44:72	8.0	20.9	33.8	12.9	0.7	1.12E-05	0.7	2	1.3
8/20/2008 01:42:32	10.0	18.8	58.2	8.8	1.7	8.45E-06	1.1	2	2.1
8/20/2008 02:47:60	12.0	16.8	64.7	4.8	2.8	7.78E-06	1.0	2	2
8/20/2008 03:58:50	14.0	14.8	70.9	0.8	4.0	7.46E-06	1.0	2	2
8/20/2008 05:14:82	16.0	12.8	76.3	-3.2	5.2	7.30E-06	1.0	2	2
8/20/2008 06:38:04	18.0	10.8	83.2	-7.2	6.6	7.07E-06	1.0	2	2
8/20/2008 08:10:10	20.0	8.8	92.1	-11.2	8.2	6.77E-06	1.0	2	2
8/20/2008 09:51:81	22.0	6.8	101.7	-15.2	9.9	6.52E-06	1.0	2	2
8/20/2008 11:43:32	24.0	5.2	112.1	-18.8	11.7	5.67E-06	0.8	2	1.6
8/21/2008 00:00:00	0.0	24.8	0.0	24.8	11.7				
8/21/2008 00:02:36	2.0	23.0	2.4	21.0	11.8	1.70E-04	0.9	2	1.8
8/21/2008 00:10:60	4.0	22.8	8.2	18.8	11.9	2.90E-05	0.1	2	0.2
8/21/2008 02:04:35	6.0	21.0	113.8	15.0	13.8	3.75E-06	0.9	2	1.8
8/21/2008 04:28:42	8.0	19.0	144.1	11.0	16.2	3.25E-06	1.0	2	2
8/21/2008 07:04:45	10.0	17.0	156.0	7.0	18.8	3.14E-06	1.0	2	2
8/21/2008 09:56:32	12.0	15.0	171.9	3.0	21.7	2.99E-06	1.0	2	2
8/21/2008 13:06:60	14.0	13.0	190.3	-1.0	24.8	2.84E-06	1.0	2	2
8/21/2008 16:31:14	16.0	11.2	204.5	-4.8	28.3	2.65E-06	0.9	2	1.8
8/21/2008 20:14:22	18.0	9.3	223.1	-8.7	32.0	2.63E-06	0.9	2	1.9
8/21/2008 24:28:10	20.0	7.3	253.9	-12.7	36.2	2.51E-06	1.0	2	2
8/21/2008 28:49:32	22.0	5.4	261.2	-16.6	40.6	2.53E-06	1.0	2	1.9
8/21/2008 00:00:00	0.0	24.9	0.0	24.9	40.6				
8/21/2008 00:01:80	2.0	23.4	1.8	21.4	40.6	2.04E-04	0.8	2	1.5
8/21/2008 01:13:18	6.0	22.1	71.4	16.1	41.8	8.17E-06	0.3	4	1.3
8/21/2008 04:41:60	8.0	19.6	208.4	11.6	45.2	2.50E-06	1.3	2	2.5
8/21/2008 16:52:29	14.0	13.3	730.7	-0.7	57.4	2.16E-06	1.1	6	6.3
8/21/2008 21:32:84	16.0	11.4	280.6	-4.6	62.1	1.97E-06	1.0	2	1.9
8/21/2008 26:33:99	18.0	9.5	301.1	-8.5	67.1	1.94E-06	1.0	2	1.9
8/21/2008 32:21:94	20.1	7.5	347.9	-12.6	72.9	1.88E-06	1.0	2.1	2
8/21/2008 38:03:06	22.0	5.8	341.1	-16.2	78.6	1.78E-06	0.9	1.9	1.7
8/21/2008 00:00:00	0.0	24.8	0.0	24.8	78.6				
8/21/2008 00:01:57	2.0	23.3	1.6	21.3	78.6	2.35E-04	0.8	2	1.6
8/21/2008 00:14:75	6.0	22.4	13.2	16.4	78.9	4.09E-05	0.2	4	0.9
8/21/2008 03:26:44	8.0	19.3	191.7	11.3	82.0	3.09E-06	1.6	2	3.1
8/21/2008 07:17:22	10.0	17.3	230.8	7.3	85.9	2.12E-06	1.0	2	2
8/21/2008 11:20:02	12.0	15.2	242.8	3.2	89.9	2.17E-06	1.1	2	2.1
8/21/2008 15:45:36	14.0	13.1	265.3	-0.9	94.4	2.09E-06	1.1	2	2.1
8/21/2008 20:28:18	16.0	11.1	282.8	-4.9	99.1	2.02E-06	1.0	2	2
8/21/2008 25:36:95	18.0	9.1	308.8	-9.9	104.2	1.95E-06	1.0	2	2
8/21/2008 31:18:50	20.0	7.0	341.6	-13.0	109.9	1.92E-06	1.1	2	2.1
8/21/2008 37:23:46	22.0	5.0	365.0	-17.0	116.0	1.87E-06	1.0	2	2
8/21/2008 43:59:60	24.0	3.1	396.1	-20.9	122.6	1.80E-06	1.0	2	1.9

Note:
The highlighted data was recorded prior to a membrane leak.
All other data was recorded following membrane replacement.



Hydraulic Conductivity Test - Underwood - Thick Clay Cover

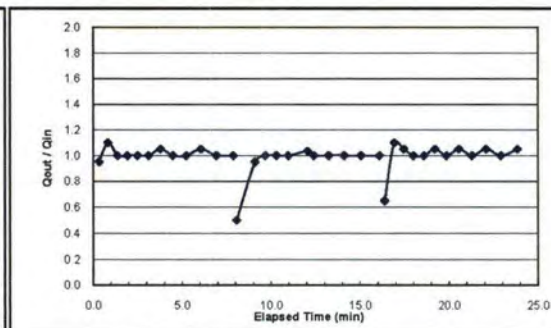
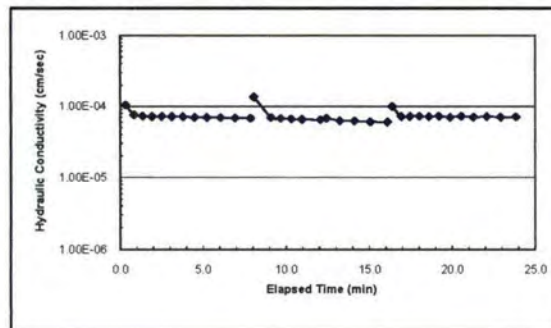
ASTM D 5084 - 00

Sample I.D.	305-mm CC5 - Clay Bottom	Test Date :	10/2/08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.1 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	1.1 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	5.0	a _{out} =	5 cm ²
Weight of wet sample =	22600.0 g	Sample Water Content =	15.3% (%)
Wet Density =	2.0 g/cm ³	Dry Density =	2.03 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
G	30.8	157.28	140.54	15.25%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
10/2/2008 00:00.00	0.0	24.7	0.0	24.7	0.0				
10/2/2008 00:19.73	2.0	22.8	19.7	20.8	0.3	1.04E-04	0.9	10	9.5
10/2/2008 00:50.11	4.0	20.6	30.4	16.6	0.8	7.61E-05	1.1	10	11
10/2/2008 01:21.65	6.0	18.6	31.5	12.6	1.4	7.29E-05	1.0	10	10
10/2/2008 01:55.14	8.0	16.6	33.5	8.6	1.9	7.19E-05	1.0	10	10
10/2/2008 02:30.14	10.0	14.6	35.0	4.6	2.5	7.21E-05	1.0	10	10
10/2/2008 03:06.96	12.0	12.6	36.8	0.6	3.1	7.20E-05	1.0	10	10
10/2/2008 03:47.02	14.0	10.5	40.1	-3.5	3.8	7.15E-05	1.1	10	10.5
10/2/2008 04:29.28	16.0	8.5	42.3	-7.5	4.5	6.99E-05	1.0	10	10
10/2/2008 05:14.18	18.0	6.5	44.9	-11.5	5.2	6.98E-05	1.0	10	10
10/2/2008 06:03.28	20.0	4.4	49.1	-15.6	6.1	6.96E-05	1.1	10	10.5
10/2/2008 06:55.52	22.0	2.4	52.2	-19.6	6.9	6.83E-05	1.0	10	10
10/2/2008 07:51.73	24.0	0.4	56.2	-23.6	7.9	6.81E-05	1.0	10	10
10/2/2008 08:00.00	0.0	24.8	0.0	24.8	7.9				
10/2/2008 08:11.62	2.0	23.8	11.6	21.8	8.1	1.36E-04	0.5	10	5
10/2/2008 01:13.84	6.0	20.0	62.2	14.0	9.1	6.96E-05	1.0	20	19
10/2/2008 01:48.84	8.0	18.0	35.0	10.0	9.7	6.77E-05	1.0	10	10
10/2/2008 02:26.23	10.0	16.0	37.4	6.0	10.3	6.64E-05	1.0	10	10
10/2/2008 03:05.95	12.0	14.0	39.7	2.0	11.0	6.56E-05	1.0	10	10
10/2/2008 04:11.52	15.0	10.9	65.6	-4.1	12.1	6.47E-05	1.0	15	15.5
10/2/2008 04:33.12	16.0	9.9	21.6	-6.1	12.4	6.80E-05	1.0	5	5
10/2/2008 05:22.02	18.0	7.9	48.9	-10.1	13.2	6.27E-05	1.0	10	10
10/2/2008 06:14.42	20.0	5.9	52.4	-14.1	14.1	6.22E-05	1.0	10	10
10/2/2008 07:11.62	22.0	3.9	57.2	-18.1	15.1	6.08E-05	1.0	10	10
10/2/2008 08:13.73	24.0	1.9	62.1	-22.1	16.1	6.00E-05	1.0	10	10
10/2/2008 08:00.00	0.0	24.8	0.0	24.8	16.1				
10/2/2008 00:17.34	2.0	23.5	17.3	21.5	16.4	1.00E-04	0.7	10	6.5
10/2/2008 00:49.25	4.0	21.3	31.9	17.3	16.9	7.19E-05	1.1	10	11
10/2/2008 01:21.61	6.0	19.2	32.4	13.2	17.5	7.24E-05	1.1	10	10.5
10/2/2008 01:54.61	8.0	17.2	33.0	9.2	18.0	7.24E-05	1.0	10	10
10/2/2008 02:29.61	10.0	15.2	35.0	5.2	18.6	7.16E-05	1.0	10	10
10/2/2008 03:06.73	12.0	13.1	37.1	1.1	19.2	7.27E-05	1.1	10	10.5
10/2/2008 03:46.25	14.0	11.1	39.5	-2.9	19.9	7.02E-05	1.0	10	10
10/2/2008 04:27.56	16.0	9.0	41.3	-7.0	20.6	7.28E-05	1.1	10	10.5
10/2/2008 05:11.73	18.0	7.0	44.2	-11.0	21.3	7.04E-05	1.0	10	10
10/2/2008 05:59.05	20.0	4.9	47.3	-15.1	22.1	7.17E-05	1.1	10	10.5
10/2/2008 06:49.34	22.0	2.9	50.3	-19.1	22.9	7.03E-05	1.0	10	10
10/2/2008 07:44.25	24.0	0.8	54.9	-23.2	23.8	7.09E-05	1.1	10	10.5



Hydraulic Conductivity Test - Underwood - Thick Clay Cover

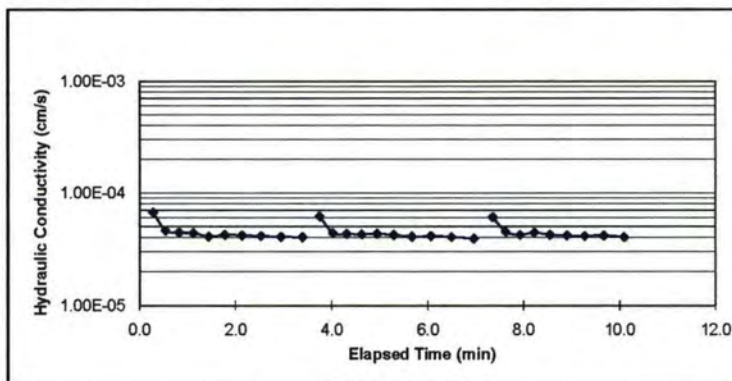
ASTM D 5084 - 00

Sample I.D.		150-mm CC5-Clay-Bottom		Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	15.2	cm
Inflow Pressure =	40.5	psi	Length of Sample, L =	6.1	cm
Outflow Pressre =	40.0	psi	Area of Sample, A =	182.41	cm ²
Pressure Difference =	0.5	psi	Sample Volume, V =	1112.0	cm ³
Effective Stress =	1.8	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	5.8		a _{out} =	1	cm ²
Weight of wet sample =	2041.3	g	Sample Water Content =	18.1	(%)
Wet Density =	1.8	g/cm ³	Dry Density =	1.55	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
62	30.97	125.63	111.1	18.13

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _{in}	Q _{in}	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	8.0	24.0	0.0	16.0	0.0				
0:00:17	10.0	22.7	16.8	12.7	0.3	6.64E-05	0.7	2	1.3
0:00:32	11.0	21.7	15.6	10.7	0.5	4.68E-05	1.0	1	1
0:00:49	12.0	20.7	16.9	8.7	0.8	4.40E-05	1.0	1	1
0:01:07	13.0	19.7	17.9	6.7	1.1	4.36E-05	1.0	1	1
0:01:26	14.0	18.8	19.1	4.8	1.4	4.06E-05	0.9	1	0.9
0:01:47	15.0	17.8	20.3	2.8	1.8	4.22E-05	1.0	1	1
0:02:08	16.0	16.8	21.7	0.8	2.1	4.17E-05	1.0	1	1
0:02:32	17.0	15.8	23.3	-1.2	2.5	4.11E-05	1.0	1	1
0:02:57	18.0	14.8	25.1	-3.2	2.9	4.04E-05	1.0	1	1
0:03:24	19.0	13.8	27.0	-5.2	3.4	4.00E-05	1.0	1	1
0:00:00	8.0	24.0	-203.7	16.0	3.4				
0:00:21	10.0	22.2	21.1	12.2	3.8	6.13E-05	0.9	2	1.8
0:00:38	11.0	21.2	16.5	10.2	4.0	4.36E-05	1.0	1	1
0:00:55	12.0	20.2	17.6	8.2	4.3	4.29E-05	1.0	1	1
0:01:14	13.0	19.2	18.6	6.2	4.6	4.25E-05	1.0	1	1
0:01:33	14.0	18.2	19.2	4.2	4.9	4.30E-05	1.0	1	1
0:01:54	15.0	17.2	20.8	2.2	5.3	4.19E-05	1.0	1	1
0:02:16	16.0	16.2	22.6	0.2	5.7	4.06E-05	1.0	1	1
0:02:40	17.0	15.2	23.7	-1.8	6.1	4.10E-05	1.0	1	1
0:03:06	18.0	14.2	25.6	-3.8	6.5	4.03E-05	1.0	1	1
0:03:34	19.0	13.2	28.2	-5.8	7.0	3.90E-05	1.0	1	1
0:00:00	8.0	24.0	-214.0	16.0	7.0				
0:00:21	10.0	22.2	21.4	12.2	7.4	6.03E-05	0.9	2	1.8
0:00:38	11.0	21.2	16.1	10.2	7.6	4.47E-05	1.0	1	1
0:00:55	12.0	20.2	17.9	8.2	7.9	4.21E-05	1.0	1	1
0:01:13	13.0	19.2	18.0	6.2	8.2	4.39E-05	1.0	1	1
0:01:33	14.0	18.2	19.7	4.2	8.6	4.20E-05	1.0	1	1
0:01:54	15.0	17.2	21.0	2.2	8.9	4.15E-05	1.0	1	1
0:02:16	16.0	16.2	22.4	0.2	9.3	4.11E-05	1.0	1	1
0:02:40	17.0	15.2	23.5	-1.8	9.7	4.15E-05	1.0	1	1
0:03:06	18.0	14.2	25.8	-3.8	10.1	4.01E-05	1.0	1	1



Hydraulic Conductivity Test - Underwood - Thick Clay Cover

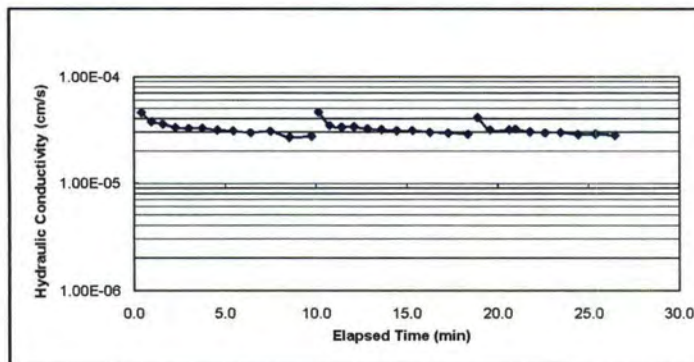
ASTM D 5084 - 00

Sample I.D.	75-mm CC5-Clay Bottom	Test Date :	11.03.08
Cell Pressure = 42.0	psi	Diameter of Sample, D = 7.6	cm
Inflow Pressure = 40.5	psi	Length of Sample, L = 3.2	cm
Outflow Pressure = 40.0	psi	Area of Sample, A = 45.60	cm ²
Pressure Difference = 0.5	psi	Sample Volume, V = 144.8	cm ³
Effective Stress = 1.8	psi	a _{in} = 1	cm ²
Hydraulic Gradient, i = 11.1		a _{out} = 1	cm ²
Weight of wet sample = 233.3	g	Sample Water Content = 21.6	(%)
Wet Density = 1.6	g/cm ³	Dry Density = 1.32	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil	WT of Can + Dry Soil	Water Content (%)
14	30.73	100.58	88.15	21.65

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	1.0	23.8	0.0	22.8	0.0				
0:00:24	2.0	23.0	24.2	21.0	0.4	4.54E-05	0.8	1	0.8
0:00:58	3.0	22.0	33.8	19.0	1.0	3.73E-05	1.0	1	1
0:01:35	4.0	21.0	36.9	17.0	1.6	3.55E-05	1.0	1	1
0:02:16	5.0	20.0	41.2	15.0	2.3	3.30E-05	1.0	1	1
0:03:00	6.0	19.0	43.7	13.0	3.0	3.24E-05	1.0	1	1
0:03:45	7.0	18.0	45.4	11.0	3.8	3.25E-05	1.0	1	1
0:04:35	8.0	17.0	49.6	9.0	4.6	3.11E-05	1.0	1	1
0:05:27	9.0	16.0	52.5	7.0	5.5	3.07E-05	1.0	1	1
0:06:25	10.0	15.0	57.4	5.0	6.4	2.95E-05	1.0	1	1
0:07:29	11.1	13.9	64.7	2.8	7.5	3.03E-05	1.0	1.1	1.1
0:08:33	12.0	13.0	63.3	1.0	8.5	2.67E-05	1.0	0.9	0.9
0:09:45	13.0	12.0	72.3	-1.0	9.7	2.74E-05	1.0	1	1
0:00:00	1.0	24.0	-585.0	23.0	9.7				
0:00:26	2.0	23.0	26.5	21.0	10.1	4.60E-05	1.0	1	1
0:01:03	3.0	22.0	36.7	19.0	10.8	3.44E-05	1.0	1	1
0:01:43	4.0	21.0	39.4	17.0	11.4	3.33E-05	1.0	1	1
0:02:23	5.0	20.0	40.7	15.0	12.1	3.35E-05	1.0	1	1
0:03:07	6.0	19.0	44.2	13.0	12.8	3.20E-05	1.0	1	1
0:03:54	7.0	18.0	46.8	11.0	13.6	3.16E-05	1.0	1	1
0:04:44	8.0	17.0	50.2	9.0	14.4	3.07E-05	1.0	1	1
0:05:37	9.0	16.0	52.3	7.0	15.3	3.09E-05	1.0	1	1
0:06:34	10.0	15.0	56.9	5.0	16.3	2.98E-05	1.0	1	1
0:07:34	11.0	14.0	60.5	3.0	17.3	2.94E-05	1.0	1	1
0:08:39	12.0	13.0	65.4	1.0	18.4	2.86E-05	1.0	1	1
0:00:00	1.0	24.0	-519.5	23.0	18.4				
0:00:30	2.0	23.0	29.8	21.0	18.9	4.09E-05	1.0	1	1
0:01:10	3.0	22.0	40.2	19.0	19.6	3.14E-05	1.0	1	1
0:02:13	4.5	20.5	63.1	16.0	20.6	3.15E-05	1.0	1.5	1.5
0:02:35	5.0	20.0	21.6	15.0	21.0	3.18E-05	1.0	0.5	0.5
0:03:22	6.0	19.0	47.1	13.0	21.8	3.01E-05	1.0	1	1
0:04:12	7.0	18.0	50.2	11.0	22.6	2.94E-05	1.0	1	1
0:05:04	8.0	17.0	51.9	9.0	23.5	2.97E-05	1.0	1	1
0:06:01	9.0	16.0	56.8	7.0	24.4	2.84E-05	1.0	1	1
0:07:00	10.0	15.0	58.9	5.0	25.4	2.87E-05	1.0	1	1
0:08:03	11.0	14.0	63.8	3.0	26.5	2.79E-05	1.0	1	1



Hydraulic Conductivity Test - Underwood - Thin Clay Cover

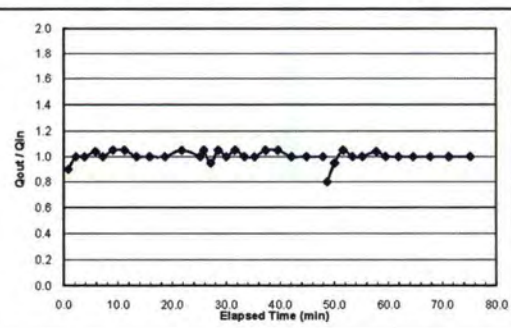
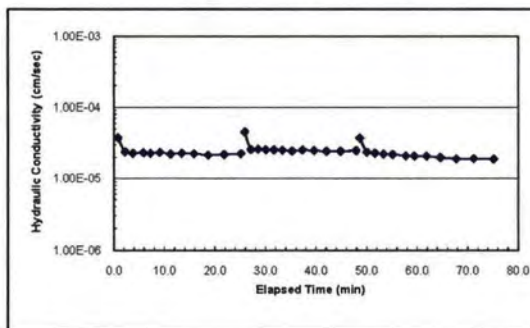
ASTM D 5084 - 00

Sample I.D. 305-mm CC3 - Clay Middle			Test Date : 9/29/08	
Cell Pressure =	41.9	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	40.8	psi	Length of Sample, L =	10.8 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	0.8	psi	Sample Volume, V =	7876.7 cm ³
Effective Stress =	1.5	psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	5.0		a _{out} =	5 cm ²
Weight of wet sample =	15750.0	g	Sample Water Content =	14.0% (%)
Wet Density =	2.0	g/cm ³	Dry Density =	2.00 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can Dry Soil (g)	Water Content (%)
44	30.35	125.33	113.7	13.95%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
9/29/2008 00:00.00	0.0	24.8	0.0	24.8	0.0				
9/29/2008 00:48.53	2.0	23.0	48.5	21.0	0.8	3.77E-05	0.9	10	9
9/29/2008 02:12.61	4.0	21.0	84.1	17.0	2.2	2.41E-05	1.0	10	10
9/29/2008 03:46.15	6.0	19.0	93.5	13.0	3.8	2.29E-05	1.0	10	10
9/29/2008 05:51.53	8.5	16.4	125.4	7.9	5.9	2.34E-05	1.0	12.5	13
9/29/2008 07:11.78	10.0	14.9	80.2	4.9	7.2	2.29E-05	1.0	7.5	7.5
9/29/2008 09:04.84	12.0	12.8	113.1	0.8	9.1	2.36E-05	1.1	10	10.5
9/29/2008 11:12.55	14.0	10.7	127.7	-3.3	11.2	2.25E-05	1.1	10	10.5
9/29/2008 13:25.03	16.0	8.7	132.5	-7.3	13.4	2.30E-05	1.0	10	10
9/29/2008 15:51.53	18.0	6.7	146.5	-11.3	15.9	2.26E-05	1.0	10	10
9/29/2008 18:40.30	20.0	4.7	168.8	-15.3	18.7	2.16E-05	1.0	10	10
9/29/2008 21:47.78	22.0	2.6	187.5	-19.4	21.8	2.21E-05	1.1	10	10.5
9/29/2008 25:08.56	24.0	0.6	200.8	-23.4	25.1	2.27E-05	1.0	10	10
9/29/2008 00:00.00	0.0	24.8	0.0	24.8	25.1				
9/29/2008 00:43.45	2.0	22.7	43.5	20.7	25.9	4.55E-05	1.1	10	10.5
9/29/2008 01:59.75	4.0	20.8	76.3	16.8	27.1	2.60E-05	0.9	10	9.5
9/29/2008 03:23.95	6.0	18.7	84.2	12.7	28.5	2.62E-05	1.1	10	10.5
9/29/2008 04:52.78	8.0	16.7	88.8	8.7	30.0	2.58E-05	1.0	10	10
9/29/2008 06:30.61	10.0	14.6	97.8	4.6	31.7	2.56E-05	1.1	10	10.5
9/29/2008 08:13.87	12.0	12.6	103.3	0.6	33.4	2.53E-05	1.0	10	10
9/29/2008 10:07.61	14.0	10.6	113.7	-3.4	35.3	2.48E-05	1.0	10	10
9/29/2008 12:10.36	16.0	8.5	122.7	-7.5	37.3	2.55E-05	1.1	10	10.5
9/29/2008 14:26.28	18.0	6.4	135.9	-11.6	39.6	2.51E-05	1.1	10	10.5
9/29/2008 16:56.46	20.0	4.4	150.2	-15.6	42.1	2.44E-05	1.0	10	10
9/29/2008 19:42.87	22.0	2.4	166.4	-19.6	44.9	2.45E-05	1.0	10	10
9/29/2008 22:45.95	24.0	0.4	183.1	-23.6	47.9	2.50E-05	1.0	10	10
9/29/2008 00:00.00	0.0	24.9	0.0	24.9	47.9				
9/29/2008 00:46.34	2.0	23.3	46.3	21.3	48.7	3.73E-05	0.8	10	8
9/29/2008 02:09.33	4.0	21.4	83.0	17.4	50.1	2.37E-05	1.0	10	9.5
9/29/2008 03:44.28	6.0	19.3	95.0	13.3	51.6	2.30E-05	1.1	10	10.5
9/29/2008 05:26.23	8.0	17.3	101.9	9.3	53.3	2.22E-05	1.0	10	10
9/29/2008 07:15.34	10.0	15.3	109.1	5.3	55.2	2.21E-05	1.0	10	10
9/29/2008 09:53.11	12.5	12.7	157.8	0.2	57.8	2.11E-05	1.0	12.5	13
9/29/2008 11:33.34	14.0	11.2	100.2	-2.8	59.5	2.10E-05	1.0	7.5	7.5
9/29/2008 13:57.84	16.0	9.2	144.5	-6.8	61.9	2.08E-05	1.0	10	10
9/29/2008 16:42.68	18.0	7.2	164.8	-10.8	64.6	1.99E-05	1.0	10	10
9/29/2008 19:51.56	20.0	5.2	188.9	-14.8	67.8	1.90E-05	1.0	10	10
9/29/2008 23:18.15	22.0	3.2	206.6	-18.8	71.2	1.93E-05	1.0	10	10
9/29/2008 27:13.75	24.0	1.2	235.6	-22.8	75.1	1.90E-05	1.0	10	10



Hydraulic Conductivity Test - Underwood - Thin Clay Cover

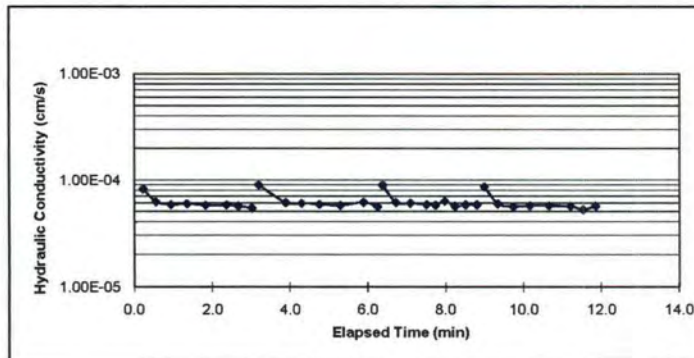
ASTM D 5084 - 00

Sample I.D.	150-mm CC3-Clay-Middle	Test Date :
Cell Pressure = 42.0 psi	Diameter of Sample, D = 15.2 cm	
Inflow Pressure = 40.4 psi	Length of Sample, L = 5.1 cm	
Outflow Pressure = 40.0 psi	Area of Sample, A = 182.41 cm ²	
Pressure Difference = 0.4 psi	Sample Volume, V = 926.7 cm ³	
Effective Stress = 1.8 psi	a _{in} = 1 cm ²	
Hydraulic Gradient, i = 5.5	a _{out} = 1 cm ²	
Weight of wet sample = 1656.2 g	Sample Water Content = 18.7 (%)	
Wet Density = 1.8 g/cm ³	Dry Density = 1.51 g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
MB	30.74	121.2	106.96	18.68

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:14	2.0	22.0	13.6	20.0	0.2	8.15E-05	1.0	2	2
0:00:33	4.0	20.0	19.6	16.0	0.6	6.17E-05	1.0	2	2
0:00:56	6.0	18.0	22.9	12.0	0.9	5.78E-05	1.0	2	2
0:01:21	8.0	16.0	24.9	8.0	1.3	5.88E-05	1.0	2	2
0:01:50	10.0	14.0	28.8	4.0	1.8	5.67E-05	1.0	2	2
0:02:22	12.0	12.0	32.3	0.0	2.4	5.73E-05	1.0	2	2
0:02:40	13.0	11.0	18.3	-2.0	2.7	5.61E-05	1.0	1	1
0:03:01	14.0	10.0	20.6	-4.0	3.0	5.37E-05	1.0	1	1
0:00:00	0.0	24.0	-181.0	24.0	3.0				
0:00:11	2.0	22.3	11.5	20.3	3.2	8.95E-05	0.9	2	1.7
0:00:53	6.0	18.3	41.7	12.3	3.9	6.03E-05	1.0	4	4
0:01:18	8.0	16.3	24.4	8.3	4.3	5.95E-05	1.0	2	2
0:01:45	10.0	14.3	27.8	4.3	4.8	5.82E-05	1.0	2	2
0:02:18	12.0	12.3	32.2	0.3	5.3	5.70E-05	1.0	2	2
0:02:53	14.0	10.2	35.8	-3.8	5.9	6.06E-05	1.1	2	2.1
0:03:15	15.0	9.2	21.6	-5.8	6.2	5.54E-05	1.0	1	1
0:00:00	0.0	24.0	-194.8	24.0	6.2				
0:00:11	2.0	22.5	10.8	20.5	6.4	8.93E-05	0.8	2	1.5
0:00:31	4.0	20.4	20.2	16.4	6.7	6.07E-05	1.1	2	2.1
0:00:54	6.0	18.3	22.5	12.3	7.1	5.97E-05	1.1	2	2.1
0:01:19	8.0	16.3	25.1	8.3	7.5	5.79E-05	1.0	2	2
0:01:32	9.0	15.3	13.7	6.3	7.7	5.73E-05	1.0	1	1
0:01:46	10.0	14.2	14.0	4.2	8.0	6.24E-05	1.1	1	1.1
0:02:02	11.0	13.2	15.9	2.2	8.2	5.60E-05	1.0	1	1
0:02:19	12.0	12.2	16.4	0.2	8.5	5.78E-05	1.0	1	1
0:02:36	13.0	11.2	17.6	-1.8	8.8	5.78E-05	1.0	1	1
0:00:00	0.0	24.0	-156.3	24.0	8.8				
0:00:12	2.0	22.4	11.6	20.4	9.0	8.58E-05	0.8	2	1.6
0:00:32	4.0	20.3	20.9	16.3	9.3	5.89E-05	1.1	2	2.1
0:00:56	6.0	18.3	23.7	12.3	9.7	5.55E-05	1.0	2	2
0:01:22	8.0	16.3	25.6	8.3	10.2	5.66E-05	1.0	2	2
0:01:51	10.0	14.2	29.4	4.2	10.7	5.65E-05	1.1	2	2.1
0:02:24	12.0	12.2	32.9	0.2	11.2	5.59E-05	1.0	2	2
0:02:44	13.0	11.2	19.6	-1.8	11.5	5.20E-05	1.0	1	1
0:03:03	14.0	10.2	19.6	-3.8	11.9	5.62E-05	1.0	1	1



Hydraulic Conductivity Test - Underwood - Thin Clay Cover

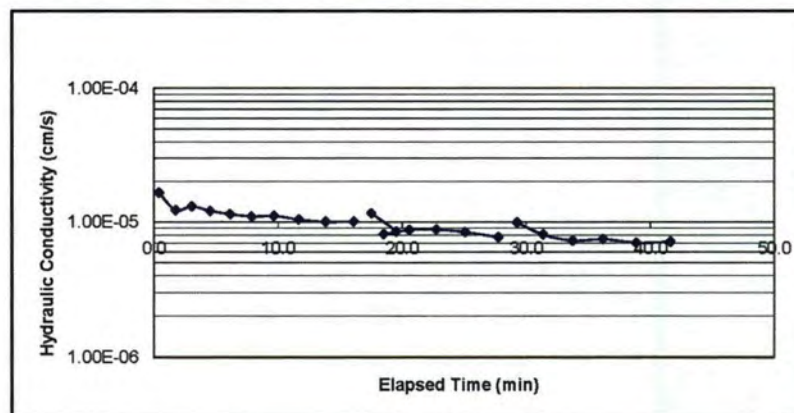
ASTM D 5084 - 00

Sample I.D.	75-mm CC3 Clay-Middle	Test Date :	10.13.08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	7.6 cm
Inflow Pressure =	40.5 psi	Length of Sample, L =	2.5 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	45.60 cm ²
Pressure Difference =	0.5 psi	Sample Volume, V =	115.8 cm ³
Effective Stress =	1.8 psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	13.8	a _{out} =	1 cm ²
Weight of wet sample =	191.4 g	Sample Water Content =	25.4 (%)
Wet Density =	1.7 g/cm ³	Dry Density =	1.32 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta L} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
7	30.38	103.03	88.32	25.39

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.5	23.8	0.0	23.3	0.0				
0:00:23	1.0	23.5	23.3	22.5	0.4	1.65E-05	0.6	0.5	0.3
0:01:44	2.0	22.5	80.8	20.5	1.7	1.22E-05	1.0	1	1
0:03:03	3.0	21.5	78.5	18.5	3.0	1.30E-05	1.0	1	1
0:04:31	4.0	20.5	88.0	16.5	4.5	1.20E-05	1.0	1	1
0:06:07	5.0	19.5	96.3	14.5	6.1	1.14E-05	1.0	1	1
0:07:51	6.0	18.5	104.6	12.5	7.9	1.09E-05	1.0	1	1
0:09:39	7.0	17.5	107.9	10.5	9.7	1.11E-05	1.0	1	1
0:11:39	8.0	16.5	119.7	8.5	11.7	1.04E-05	1.0	1	1
0:13:50	9.0	15.5	130.4	6.5	13.8	1.00E-05	1.0	1	1
0:16:06	10.0	14.5	136.3	4.5	16.1	1.01E-05	1.0	1	1
0:00:00	1.0	24.0	-965.8	23.0	16.1				
0:01:24	2.0	23.0	84.4	21.0	17.5	1.15E-05	1.0	1	1
0:03:24	3.0	22.0	119.3	19.0	19.5	8.46E-06	1.0	1	1
0:05:33	4.0	21.0	129.1	17.0	18.5	8.11E-06	1.0	1	1
0:07:38	5.0	20.0	125.1	15.0	20.6	8.70E-06	1.0	1	1
0:09:47	6.0	19.0	129.1	13.0	22.7	8.78E-06	1.0	1	1
0:12:07	7.0	18.0	140.4	11.0	25.1	8.41E-06	1.0	1	1
0:14:48	8.0	17.0	160.4	9.0	27.7	7.69E-06	1.0	1	1
0:00:00	1.0	24.0	-887.8	23.0	27.7				
0:01:33	2.0	23.1	93.2	21.1	29.3	9.92E-06	0.9	1	0.9
0:03:38	3.0	22.1	125.0	19.1	31.3	8.07E-06	1.0	1	1
0:06:02	4.0	21.1	143.7	17.1	33.7	7.28E-06	1.0	1	1
0:08:28	5.0	20.1	145.9	15.1	36.2	7.45E-06	1.0	1	1
0:11:09	6.0	19.1	160.8	13.1	38.8	7.03E-06	1.0	1	1
0:13:54	7.0	18.1	165.2	11.1	41.6	7.14E-06	1.0	1	1



Hydraulic Conductivity Test - Underwood - Store-and-Release Cover

ASTM D 5084 - 00

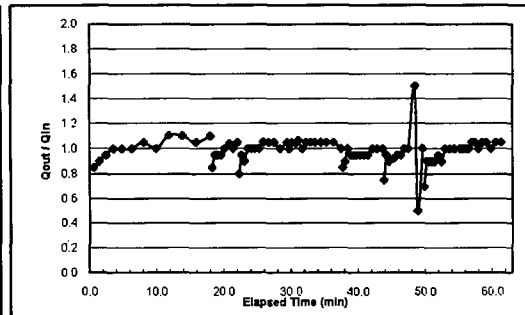
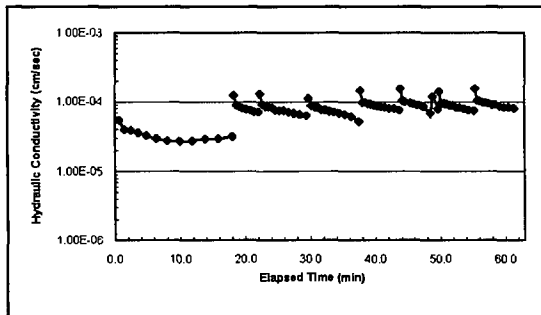
Sample I.D.	305-mm ET-Soil Top 1	Test Date :	10/27/08
Cell Pressure =	42.0 psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.1 psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0 psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	1.1 psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5 psi	a _{in} =	5 cm ²
Hydraulic Gradient, i =	5.0	a _{out} =	5 cm ²
Weight of wet sample =	21650.0 g	Sample Water Content =	12.4% (%)
Wet Density =	1.9 g/cm ³	Dry Density =	1.94 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
X2	30.92	168.15	153.02	12.39%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
10/27/2008 00:00.00	0.0	24.8	0.0	24.8	0.0				
10/27/2008 00:36.09	2.0	23.1	36.1	21.1	0.6	5.40E-05	0.9	10	8.5
10/27/2008 01:28.70	4.0	21.3	52.6	17.3	1.5	3.95E-05	0.9	10	9
10/27/2008 02:26.14	6.0	19.4	57.4	13.4	2.4	3.87E-05	1.0	10	9.5
10/27/2008 03:33.04	8.0	17.4	66.9	9.4	3.6	3.56E-05	1.0	10	10
10/27/2008 04:50.02	10.0	15.4	77.0	5.4	4.8	3.25E-05	1.0	10	10
10/27/2008 06:19.12	12.0	13.4	89.1	1.4	6.3	2.95E-05	1.0	10	10
10/27/2008 08:03.10	14.0	11.3	104.0	-2.7	8.1	2.73E-05	1.1	10	10.5
10/27/2008 09:57.40	16.1	9.2	114.3	-6.9	10.0	2.69E-05	1.0	10.5	10.5
10/27/2008 11:50.19	18.0	7.1	112.8	-10.9	11.8	2.75E-05	1.1	9.5	10.5
10/27/2008 13:50.05	20.0	4.9	119.9	-15.1	13.8	2.90E-05	1.1	10	11
10/27/2008 15:54.20	22.0	2.8	124.1	-19.2	15.9	2.92E-05	1.1	10	10.5
10/27/2008 18:00.36	24.0	0.6	126.2	-23.4	18.0	3.17E-05	1.1	10	11
10/27/2008 00:00.00	0.0	24.9	0.0	24.9	18.0				
10/27/2008 00:15.71	2.0	23.2	15.7	21.2	18.3	1.24E-04	0.9	10	8.5
10/27/2008 00:39.67	4.0	21.3	24.0	17.3	18.7	8.91E-05	0.9	10	9.5
10/27/2008 01:05.91	6.0	19.4	26.2	13.4	19.1	8.48E-05	1.0	10	9.5
10/27/2008 01:34.80	8.0	17.5	28.9	9.5	19.6	8.04E-05	0.9	10	9.5
10/27/2008 02:06.67	10.0	15.5	31.9	5.5	20.1	7.83E-05	1.0	10	10
10/27/2008 02:51.27	12.5	12.9	44.6	0.4	20.9	7.55E-05	1.0	12.5	13
10/27/2008 03:20.47	14.0	11.4	29.2	-2.6	21.3	7.14E-05	1.0	7.5	7.5
10/27/2008 04:02.17	16.0	9.3	41.7	-6.7	22.0	7.18E-05	1.1	10	10.5
10/27/2008 00:00.00	0.0	24.9	0.0	24.9	22.0				
10/27/2008 00:14.61	2.0	23.3	14.6	21.3	22.3	1.30E-04	0.8	10	8
10/27/2008 00:37.92	4.0	21.4	23.3	17.4	22.7	9.14E-05	1.0	10	9.5
10/27/2008 01:03.21	6.0	19.6	25.3	13.6	23.1	8.56E-05	0.9	10	9
10/27/2008 01:31.07	8.0	17.6	27.9	9.6	23.6	8.54E-05	1.0	10	10
10/27/2008 02:02.65	10.1	15.5	31.6	5.4	24.1	8.30E-05	1.0	10.5	10.5
10/27/2008 02:35.38	12.0	13.6	32.7	1.6	24.6	7.61E-05	1.0	9.5	9.5
10/27/2008 03:12.28	14.0	11.6	36.9	-2.4	25.2	7.47E-05	1.0	10	10
10/27/2008 03:52.26	16.0	9.5	40.0	-6.5	25.9	7.47E-05	1.1	10	10.5
10/27/2008 04:37.05	18.0	7.4	44.8	-10.6	26.7	7.07E-05	1.1	10	10.5
10/27/2008 05:26.78	20.0	5.3	49.7	-14.7	27.5	6.78E-05	1.1	10	10.5
10/27/2008 06:20.75	22.0	3.3	54.0	-18.7	28.4	6.51E-05	1.0	10	10
10/27/2008 07:22.05	24.0	1.2	61.3	-22.8	29.4	6.30E-05	1.1	10	10.5
10/27/2008 00:00.00	0.0	24.8	0.0	24.8	29.4				
10/27/2008 00:18.84	2.0	22.8	18.8	20.8	29.7	1.12E-04	1.0	10	10
10/27/2008 00:44.46	4.0	20.7	25.6	16.7	30.2	8.80E-05	1.1	10	10.5
10/27/2008 01:20.10	6.5	18.1	35.6	11.6	30.7	8.27E-05	1.0	12.5	13
10/27/2008 01:42.54	8.0	16.5	22.4	8.5	31.1	8.36E-05	1.1	7.5	8
10/27/2008 02:15.55	10.0	14.5	33.0	4.5	31.7	7.65E-05	1.0	10	10
10/27/2008 02:51.16	12.0	12.4	35.6	0.4	32.3	7.65E-05	1.1	10	10.5
10/27/2008 03:30.60	14.0	10.3	39.4	-3.7	32.9	7.28E-05	1.1	10	10.5
10/27/2008 04:13.66	16.0	8.2	43.1	-7.8	33.6	7.06E-05	1.1	10	10.5
10/27/2008 05:00.94	18.0	6.1	47.3	-11.9	34.4	6.83E-05	1.1	10	10.5
10/27/2008 05:53.45	20.0	4.0	52.5	-16.0	35.3	6.55E-05	1.1	10	10.5
10/27/2008 06:54.08	22.0	1.9	60.6	-20.1	36.3	6.08E-05	1.1	10	10.5
10/27/2008 08:05.35	23.9	0.0	71.3	-23.9	37.5	5.14E-05	1.0	9.5	9.5
10/27/2008 00:00.00	0.0	24.9	0.0	24.9	37.5				
10/27/2008 00:13.30	2.0	23.2	13.3	21.2	37.7	1.46E-04	0.9	10	8.5
10/27/2008 00:34.57	4.0	21.4	21.3	17.4	38.1	9.77E-05	0.9	10	9
10/27/2008 00:57.90	6.0	19.4	23.3	13.4	38.5	9.78E-05	1.0	10	10
10/27/2008 01:22.61	8.0	17.5	24.7	9.5	38.9	9.40E-05	0.9	10	9.5
10/27/2008 01:48.93	10.0	15.6	26.3	5.6	39.3	9.24E-05	1.0	10	9.5
10/27/2008 02:17.60	12.0	13.7	28.7	1.7	39.8	8.90E-05	1.0	10	9.5
10/27/2008 02:48.48	14.0	11.8	30.9	-2.2	40.3	8.69E-05	0.9	10	9.5
10/27/2008 03:21.61	16.0	9.9	33.1	-6.1	40.9	8.53E-05	1.0	10	9.5
10/27/2008 03:57.31	18.0	8.0	35.7	-10.0	41.5	8.37E-05	1.0	10	9.5
10/27/2008 04:37.88	20.0	6.0	40.6	-14.0	42.1	8.02E-05	1.0	10	10
10/27/2008 05:21.25	22.0	4.0	43.4	-18.0	42.9	8.00E-05	1.0	10	10

10/27/2008 08:10.18	24.0	2.0	48.9	-22.0	43.7	7.60E-05	1.0	10	10
10/27/2008 00:00.00	0.0	24.7	0.0	24.7	43.7				
10/27/2008 00:11.91	2.0	23.2	11.9	21.2	43.9	1.55E-04	0.8	10	7.5
10/27/2008 00:32.41	4.0	21.3	20.5	17.3	44.2	1.04E-04	0.9	10	9.5
10/27/2008 00:54.10	6.0	19.5	21.7	13.5	44.6	9.99E-05	0.9	10	9
10/27/2008 01:42.48	10.0	15.8	48.4	5.8	45.4	9.68E-05	0.9	20	18.5
10/27/2008 02:09.78	12.0	13.9	27.3	1.9	45.8	9.32E-05	1.0	10	9.5
10/27/2008 02:39.57	14.0	12.0	29.8	-2.0	46.3	8.98E-05	1.0	10	9.5
10/27/2008 03:12.30	16.0	10.0	32.7	-6.0	46.9	8.84E-05	1.0	10	10
10/27/2008 03:47.87	18.0	8.0	35.6	-10.0	47.5	8.61E-05	1.0	10	10
10/27/2008 04:48.30	20.0	5.0	60.4	-15.0	48.5	6.79E-05	1.5	10	15
10/27/2008 05:10.28	22.0	4.0	22.0	-18.0	48.8	1.18E-04	0.5	10	5
10/27/2008 05:57.54	24.0	2.0	47.3	-22.0	49.6	7.87E-05	1.0	10	10
10/27/2008 00:00.00	0.0	24.6	0.0	24.6	49.6				
10/27/2008 00:12.72	2.0	23.2	12.7	21.2	49.8	1.41E-04	0.7	10	7
10/27/2008 00:34.18	4.0	21.4	21.5	17.4	50.2	9.68E-05	0.9	10	9
10/27/2008 00:57.10	6.0	19.6	22.9	13.6	50.8	9.45E-05	0.9	10	9
10/27/2008 01:21.42	8.0	17.8	24.3	9.8	51.0	9.28E-05	0.9	10	9
10/27/2008 01:47.74	10.0	16.0	26.3	6.0	51.4	8.97E-05	0.9	10	9
10/27/2008 02:16.40	12.0	14.1	28.7	2.1	51.9	8.88E-05	1.0	10	9.5
10/27/2008 02:47.82	14.0	12.3	31.4	-1.7	52.4	8.27E-05	0.9	10	9
10/27/2008 03:22.80	16.0	10.3	35.0	-5.7	53.0	8.24E-05	1.0	10	10
10/27/2008 04:01.52	18.0	8.3	38.7	-9.7	53.7	7.88E-05	1.0	10	10
10/27/2008 04:44.58	20.0	6.3	43.1	-13.7	54.4	7.52E-05	1.0	10	10
10/27/2008 05:31.08	22.0	4.3	46.5	-17.7	55.1	7.43E-05	1.0	10	10
10/27/2008 00:00.00	0.0	24.7	0.0	24.7	55.1				
10/27/2008 00:13.72	2.0	22.7	13.7	20.7	55.4	1.54E-04	1.0	10	10
10/27/2008 00:34.77	4.0	20.7	21.0	16.7	55.7	1.05E-04	1.0	10	10
10/27/2008 00:57.15	6.0	18.7	22.4	12.7	56.1	1.03E-04	1.0	10	10
10/27/2008 01:21.66	8.0	16.7	24.5	8.7	56.5	9.81E-05	1.0	10	10
10/27/2008 01:48.26	10.0	14.6	26.6	4.6	57.0	9.72E-05	1.1	10	10.5
10/27/2008 02:16.88	12.0	12.5	28.6	0.5	57.4	9.50E-05	1.1	10	10.5
10/27/2008 02:47.92	14.0	10.5	31.0	-3.5	57.9	9.01E-05	1.0	10	10
10/27/2008 03:21.25	16.0	8.4	33.3	-7.6	58.5	9.09E-05	1.1	10	10.5
10/27/2008 03:58.34	18.0	6.3	37.1	-11.7	59.1	8.68E-05	1.1	10	10.5
10/27/2008 04:38.62	20.0	4.3	40.3	-15.7	59.8	8.30E-05	1.0	10	10
10/27/2008 05:23.12	22.0	2.2	44.5	-19.8	60.5	8.23E-05	1.1	10	10.5
10/27/2008 06:11.99	24.0	0.1	48.9	-23.9	61.3	8.06E-05	1.1	10	10.5



Hydraulic Conductivity Test - Underwood - Store-and-Release Cover

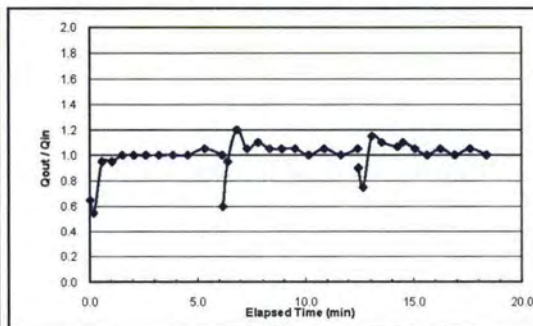
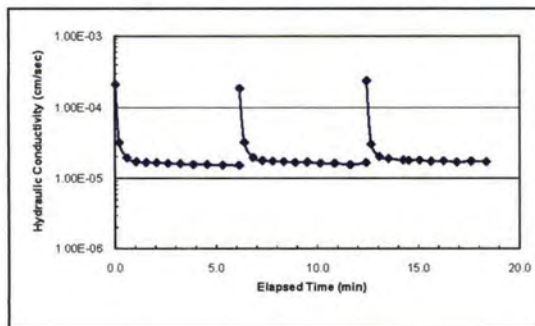
ASTM D 5084 - 00

Sample I.D. 305-mm ET - Soil Top 2			Test Date : 8/18/08	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5 cm
Inflow Pressure =	41.1	psi	Length of Sample, L =	15.2 cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66 cm ²
Pressure Difference =	1.1	psi	Sample Volume, V =	11120.0 cm ³
Effective Stress =	1.5	psi	a _{in} =	1 cm ²
Hydraulic Gradient, i =	5.0		a _{out} =	1 cm ²
Weight of wet sample =	21550.0	g	Sample Water Content =	11.3% (%)
Wet Density =	1.9	g/cm ³	Dry Density =	1.94 g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
MV-3	30.84	182.71	167.28	11.31%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
8/20/2008 00:00.00	0.0	24.9	0.0	24.9	0.0				
8/20/2008 00:01.62	2.0	23.6	1.6	21.6	0.0	2.14E-04	0.8	2	1.3
8/20/2008 00:12.22	4.0	22.5	10.6	18.5	0.2	3.17E-05	0.8	2	1.1
8/20/2008 00:35.02	6.0	20.6	22.8	14.6	0.6	1.93E-05	0.9	2	1.9
8/20/2008 01:01.99	8.0	18.7	27.0	10.7	1.0	1.70E-05	1.0	2	1.9
8/20/2008 01:31.54	10.0	16.7	29.6	6.7	1.5	1.67E-05	1.0	2	2
8/20/2008 02:02.81	12.0	14.7	31.3	2.7	2.0	1.65E-05	1.0	2	2
8/20/2008 02:36.62	14.0	12.7	33.8	-1.3	2.6	1.61E-05	1.0	2	2
8/20/2008 03:12.57	16.0	10.7	35.9	-5.3	3.2	1.59E-05	1.0	2	2
8/20/2008 03:51.72	18.0	8.7	39.2	-9.3	3.9	1.55E-05	1.0	2	2
8/20/2008 04:33.20	20.0	6.7	41.5	-13.3	4.6	1.55E-05	1.0	2	2
8/20/2008 05:19.45	22.0	4.6	46.2	-17.4	5.3	1.52E-05	1.1	2	2.1
8/20/2008 06:08.20	24.0	2.6	48.8	-21.4	6.1	1.51E-05	1.0	2	2
8/20/2008 06:00.00	0.0	24.9	0.0	24.9	6.1				
8/20/2008 00:01.78	2.0	23.7	1.8	21.7	6.2	1.89E-04	0.6	2	1.2
8/20/2008 00:15.18	4.0	21.8	13.4	17.8	6.4	3.17E-05	0.9	2	1.9
8/20/2008 00:41.01	6.0	19.4	25.8	13.4	6.8	1.94E-05	1.2	2	2.4
8/20/2008 01:08.89	8.0	17.3	27.9	9.3	7.3	1.75E-05	1.1	2	2.1
8/20/2008 01:39.48	10.0	15.1	30.6	5.1	7.8	1.72E-05	1.1	2	2.2
8/20/2008 02:11.35	12.0	13.0	31.9	1.0	8.3	1.69E-05	1.1	2	2.1
8/20/2008 02:45.80	14.0	10.9	34.5	-3.1	8.9	1.65E-05	1.1	2	2.1
8/20/2008 03:21.85	16.0	8.8	36.0	-7.2	9.5	1.67E-05	1.1	2	2.1
8/20/2008 04:00.52	18.0	6.8	38.7	-11.2	10.1	1.61E-05	1.0	2	2
8/20/2008 04:42.95	20.0	4.7	42.4	-15.3	10.9	1.60E-05	1.1	2	2.1
8/20/2008 05:29.01	22.0	2.7	46.1	-19.3	11.6	1.54E-05	1.0	2	2
8/20/2008 06:16.81	24.0	0.6	47.6	-23.4	12.4	1.64E-05	1.1	2	2.1
8/20/2008 06:00.00	0.0	24.9	0.0	24.9	12.4				
8/20/2008 00:01.67	2.0	23.1	1.7	21.1	12.4	2.40E-04	0.9	2	1.8
8/20/2008 00:14.48	4.0	21.6	12.8	17.6	12.7	2.99E-05	0.8	2	1.5
8/20/2008 00:38.98	6.0	19.3	24.5	13.3	13.1	2.00E-05	1.2	2	2.3
8/20/2008 01:05.88	8.0	17.1	26.9	9.1	13.5	1.87E-05	1.1	2	2.2
8/20/2008 01:50.10	11.0	13.9	44.2	2.9	14.2	1.78E-05	1.1	3	3.2
8/20/2008 02:05.96	12.0	12.8	15.9	0.8	14.5	1.77E-05	1.1	1	1.1
8/20/2008 02:38.16	14.0	10.7	32.2	-3.3	15.0	1.77E-05	1.1	2	2.1
8/20/2008 03:12.59	16.0	8.7	34.4	-7.3	15.6	1.71E-05	1.0	2	2
8/20/2008 03:49.60	18.0	6.6	37.0	-11.4	16.2	1.73E-05	1.1	2	2.1
8/20/2008 04:29.29	20.0	4.6	39.7	-15.4	16.9	1.68E-05	1.0	2	2
8/20/2008 05:11.74	22.0	2.5	42.5	-19.5	17.6	1.72E-05	1.1	2	2.1
8/20/2008 05:57.09	24.0	0.5	45.3	-23.5	18.4	1.68E-05	1.0	2	2



Hydraulic Conductivity Test - Underwood - Store-and-Release Cover

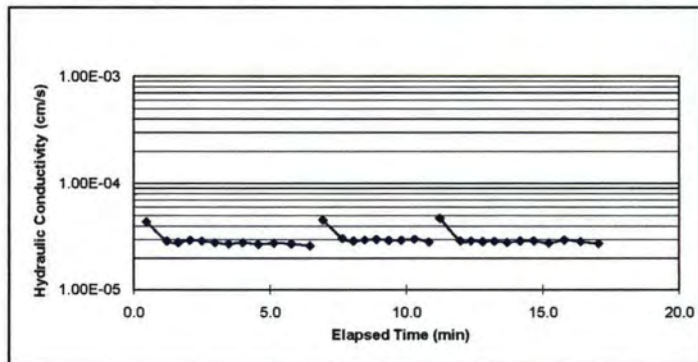
ASTM D 5084 - 00

Sample I.D.			150-mm ET-Soil-Top-2		Test Date :	
Cell Pressure =	42.1	psi	Diameter of Sample, D =	15.2	cm	
Inflow Pressure =	40.5	psi	Length of Sample, L =	6.4	cm	
Outflow Pressure =	40.0	psi	Area of Sample, A =	182.41	cm ²	
Pressure Difference =	0.5	psi	Sample Volume, V =	1158.3	cm ³	
Effective Stress =	1.9	psi	a _{in} =	1	cm ²	
Hydraulic Gradient, i =	5.5		a _{out} =	1	cm ²	
Weight of wet sample =	2066.6	g	Sample Water Content =	25.5	(%)	
Wet Density =	1.8	g/cm ³	Dry Density =	1.42	g/cm ³	

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
62	30.71	139.36	117.3	25.48

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q _{out} / Q _{in}	Q _{in}	Q _{out}
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:28	2.0	22.0	27.8	20.0	0.5	4.38E-05	1.0	2	2
0:01:13	4.0	20.0	45.4	16.0	1.2	2.89E-05	1.0	2	2
0:01:38	5.0	19.0	24.7	14.0	1.6	2.81E-05	1.0	1	1
0:02:04	6.0	17.9	25.7	11.9	2.1	2.96E-05	1.1	1	1.1
0:02:30	7.0	16.9	26.1	9.9	2.5	2.89E-05	1.0	1	1
0:02:58	8.0	15.9	28.4	7.9	3.0	2.79E-05	1.0	1	1
0:03:29	9.0	14.9	30.5	5.9	3.5	2.72E-05	1.0	1	1
0:04:00	10.0	13.9	31.1	3.9	4.0	2.80E-05	1.0	1	1
0:04:34	11.0	12.9	34.0	1.9	4.6	2.69E-05	1.0	1	1
0:05:09	12.0	11.9	35.0	-0.1	5.1	2.76E-05	1.0	1	1
0:05:46	13.0	10.9	37.6	-2.1	5.8	2.72E-05	1.0	1	1
0:06:28	14.0	9.9	41.7	-4.1	6.5	2.61E-05	1.0	1	1
0:00:00	0.0	24.0	-387.9	24.0	6.5				
0:00:26	2.0	22.1	26.2	20.1	6.9	4.54E-05	0.9	2	1.9
0:01:09	4.0	20.1	42.9	16.1	7.7	3.05E-05	1.0	2	2
0:01:33	5.0	19.1	23.9	14.1	8.0	2.90E-05	1.0	1	1
0:01:59	6.0	18.0	25.6	12.0	8.5	2.96E-05	1.1	1	1.1
0:02:24	7.0	17.0	25.2	10.0	8.9	3.00E-05	1.0	1	1
0:02:51	8.0	16.0	26.8	8.0	9.3	2.94E-05	1.0	1	1
0:03:19	9.0	15.0	28.0	6.0	9.8	2.95E-05	1.0	1	1
0:03:47	10.0	14.0	28.8	4.0	10.3	3.01E-05	1.0	1	1
0:04:19	11.0	13.0	32.1	2.0	10.8	2.84E-05	1.0	1	1
0:00:00	0.0	24.0	-259.5	24.0	10.8				
0:00:25	2.0	22.1	25.1	20.1	11.2	4.72E-05	0.9	2	1.9
0:01:10	4.0	20.1	45.0	16.1	12.0	2.90E-05	1.0	2	2
0:01:34	5.0	19.1	24.0	14.1	12.4	2.89E-05	1.0	1	1
0:01:59	6.0	18.1	25.3	12.1	12.8	2.85E-05	1.0	1	1
0:02:26	7.0	17.1	26.1	10.1	13.2	2.88E-05	1.0	1	1
0:02:54	8.0	16.1	28.1	8.1	13.7	2.80E-05	1.0	1	1
0:03:22	9.0	15.1	28.5	6.1	14.2	2.89E-05	1.0	1	1
0:03:52	10.0	14.1	29.8	4.1	14.7	2.90E-05	1.0	1	1
0:04:25	11.0	13.1	33.0	2.1	15.2	2.76E-05	1.0	1	1
0:04:59	12.0	12.0	34.2	0.0	15.8	2.95E-05	1.1	1	1.1
0:05:35	13.0	11.0	35.8	-2.0	16.4	2.85E-05	1.0	1	1
0:06:15	14.0	10.0	39.7	-4.0	17.0	2.73E-05	1.0	1	1



Hydraulic Conductivity Test - Underwood - Store-and-Release Cover

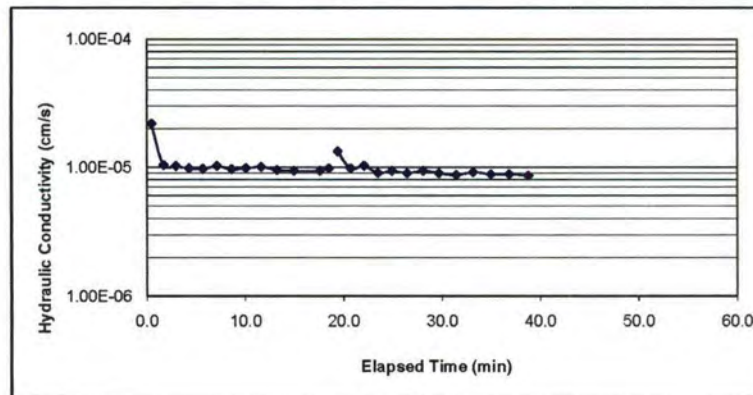
ASTM D 5084 - 00

Sample I.D.		75-mm ET-Soil-Top-2		Test Date :	
Cell Pressure =	42.0	psi	Diameter of Sample, D =	7.6	cm
Inflow Pressure =	41.0	psi	Length of Sample, L =	3.2	cm
Outflow Pressure =	40.0	psi	Area of Sample, A =	45.60	cm ²
Pressure Difference =	1.0	psi	Sample Volume, V =	144.8	cm ³
Effective Stress =	1.5	psi	a _{in} =	1	cm ²
Hydraulic Gradient, i =	22.2		a _{out} =	1	cm ²
Weight of wet sample =	244.2	g	Sample Water Content =	25.1	(%)
Wet Density =	1.7	g/cm ³	Dry Density =	1.35	g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left\{ \frac{(\Delta H_1)}{(\Delta H_2)} \right\}$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
Y	30.96	145.11	122.22	25.08

Date, Time	Inflow	OutFlow	Δt	H	Time	K	Q _{out} / Q _n	Q _n	Q _{out}
			(sec)	(cm)	(min)	(cm/sec)			
0:00:00	0.0	24.0	0.0	24.0	0.0				
0:00:27	1.0	23.4	27.3	22.4	0.5	2.18E-05	0.6	1	0.6
0:01:40	2.0	22.4	72.8	20.4	1.7	1.04E-05	1.0	1	1
0:02:56	3.0	21.4	75.9	18.4	2.9	1.02E-05	1.0	1	1
0:04:17	4.0	20.4	80.9	16.4	4.3	9.81E-06	1.0	1	1
0:05:41	5.0	19.4	83.6	14.4	5.7	9.72E-06	1.0	1	1
0:07:06	6.0	18.3	85.4	12.3	7.1	1.02E-05	1.1	1	1.1
0:08:34	7.0	17.3	88.4	10.3	8.6	9.65E-06	1.0	1	1
0:10:03	8.0	16.3	89.0	8.3	10.1	9.82E-06	1.0	1	1
0:11:37	9.0	15.2	93.5	6.2	11.6	1.01E-05	1.1	1	1.1
0:13:14	10.0	14.2	97.1	4.2	13.2	9.50E-06	1.0	1	1
0:14:55	11.0	13.2	100.9	2.2	14.9	9.38E-06	1.0	1	1
0:17:37	12.5	11.6	162.0	-0.9	17.6	9.39E-06	1.1	1.5	1.6
0:18:28	13.0	11.1	51.6	-1.9	18.5	9.79E-06	1.0	0.5	0.5
0:00:00	0.0	24.0	-1108.3	24.0	18.5				
0:00:53	1.0	23.1	53.2	22.1	19.4	1.33E-05	0.9	1	0.9
0:02:11	2.0	22.1	77.7	20.1	20.7	9.80E-06	1.0	1	1
0:03:34	3.1	21.0	83.5	17.9	22.1	1.03E-05	1.0	1.1	1.1
0:04:58	4.0	20.0	84.0	16.0	23.5	9.02E-06	1.1	0.9	1
0:06:26	5.0	19.0	87.2	14.0	24.9	9.36E-06	1.0	1	1
0:07:58	6.0	18.0	92.8	12.0	26.5	9.00E-06	1.0	1	1
0:09:34	7.0	16.9	95.9	9.9	28.1	9.38E-06	1.1	1	1.1
0:11:12	8.0	15.9	97.7	7.9	29.7	8.99E-06	1.0	1	1
0:12:56	9.0	14.9	103.8	5.9	31.4	8.69E-06	1.0	1	1
0:14:42	10.0	13.8	106.3	3.8	33.2	9.15E-06	1.1	1	1.1
0:16:30	11.0	12.8	108.0	1.8	35.0	8.82E-06	1.0	1	1
0:18:21	12.0	11.8	110.9	-0.2	36.8	8.83E-06	1.0	1	1
0:20:18	13.0	10.8	117.1	-2.2	38.8	8.60E-06	1.0	1	1



Hydraulic Conductivity Test - Underwood - Store-and-Release Cover

ASTM D 5084 - 00

Sample I.D.		305-mm ET-Soil Bottom	Test Date :	10/13/08
Cell Pressure =	42.0	psi	Diameter of Sample, D =	30.5
Inflow Pressure =	41.1	psi	Length of Sample, L =	15.2
Outflow Pressure =	40.0	psi	Area of Sample, A =	729.66
Pressure Difference =	1.1	psi	Sample Volume, V =	11120.0
Effective Stress =	1.5	psi	a_{in} =	5
Hydraulic Gradient, i =	5.0		a_{out} =	5
Weight of wet sample =	22600.0	g	Sample Water Content =	15.3%
Wet Density =	2.0	g/cm ³	Dry Density =	2.03
				g/cm ³

$$K_s = \frac{a_{in} * a_{out}}{(a_{in} + a_{out})} \frac{L}{A * \Delta t} \ln \left(\frac{(\Delta H_1)}{(\Delta H_2)} \right)$$

Can #	WT of Can (g)	WT of Can + Wet Soil (g)	WT of Can + Dry Soil (g)	Water Content (%)
G	30.8	157.28	140.54	15.25%

Date, Time	Inflow	OutFlow	Δt (sec)	H (cm)	Time (min)	K (cm/sec)	Q_{out}/Q_{in}	Q_{in}	Q_{out}
10/13/2008 00:00.00	0.0	24.8	0.0	24.8	0.0				
10/13/2008 00:21.19	2.0	24.1	21.2	22.1	0.4	6.68E-05	0.4	10	3.5
10/13/2008 01:35.12	4.0	22.2	73.9	18.2	1.6	2.86E-05	1.0	10	9.5
10/13/2008 02:57.11	6.0	20.2	82.0	14.2	3.0	2.76E-05	1.0	10	10
10/13/2008 04:20.61	8.0	18.1	83.5	10.1	4.3	2.90E-05	1.1	10	10.5
10/13/2008 05:45.00	10.0	16.1	84.4	6.1	5.8	2.94E-05	1.0	10	10
10/13/2008 07:16.31	12.0	14.0	91.3	2.0	7.3	2.92E-05	1.1	10	10.5
10/13/2008 08:50.68	14.0	12.0	94.4	-2.0	8.8	2.91E-05	1.0	10	10
10/13/2008 10:32.91	16.0	10.0	102.2	-6.0	10.5	2.83E-05	1.0	10	10
10/13/2008 12:19.77	18.0	8.0	106.9	-10.0	12.3	2.87E-05	1.0	10	10
10/13/2008 14:15.60	20.0	5.9	115.8	-14.1	14.3	2.88E-05	1.1	10	10.5
10/13/2008 16:22.87	22.0	3.8	127.3	-18.2	16.4	2.80E-05	1.1	10	10.5
10/13/2008 18:36.03	24.0	1.8	133.2	-22.2	18.6	2.80E-05	1.0	10	10
10/13/2008 00:00.00	0.0	24.7	0.0	24.7	18.6				
10/13/2008 00:16.50	2.0	24.2	16.5	22.2	18.9	7.94E-05	0.3	10	2.5
10/13/2008 01:34.75	4.0	22.7	78.3	18.7	20.2	2.42E-05	0.8	10	7.5
10/13/2008 03:14.24	6.0	20.8	99.5	14.8	21.8	2.20E-05	0.9	10	9.5
10/13/2008 05:00.10	8.0	18.7	105.9	10.7	23.6	2.27E-05	1.1	10	10.5
10/13/2008 06:47.16	10.0	16.7	107.1	6.7	25.4	2.30E-05	1.0	10	10
10/13/2008 08:35.21	12.0	14.4	108.1	2.4	27.2	2.57E-05	1.2	10	11.5
10/13/2008 10:14.20	14.0	12.1	99.0	-1.9	28.8	2.97E-05	1.2	10	11.5
10/13/2008 11:53.16	16.0	10.0	99.0	-6.0	30.5	3.00E-05	1.1	10	10.5
10/13/2008 13:37.21	18.0	8.0	104.1	-10.0	32.2	2.94E-05	1.0	10	10
10/13/2008 15:32.02	20.0	6.0	114.8	-14.0	34.1	2.83E-05	1.0	10	10
10/13/2008 17:32.92	22.0	3.9	120.9	-18.1	36.1	2.95E-05	1.1	10	10.5
10/13/2008 19:48.36	24.0	1.9	135.4	-22.1	38.4	2.75E-05	1.0	10	10
10/13/2008 00:00.00	0.0	24.8	0.0	24.8	38.4				
10/13/2008 00:19.20	2.0	24.2	19.2	22.2	38.7	7.09E-05	0.3	10	3
10/13/2008 01:45.52	4.0	22.5	86.3	18.5	40.2	2.32E-05	0.9	10	8.5
10/13/2008 03:30.29	6.0	20.4	104.8	14.4	41.9	2.21E-05	1.1	10	10.5
10/13/2008 05:15.32	8.0	18.3	105.0	10.3	43.7	2.30E-05	1.1	10	10.5
10/13/2008 07:04.80	10.0	16.3	109.5	6.3	45.5	2.26E-05	1.0	10	10
10/13/2008 08:57.59	12.0	14.2	112.8	2.2	47.4	2.36E-05	1.1	10	10.5
10/13/2008 10:53.45	14.0	12.1	115.9	-1.9	49.3	2.42E-05	1.1	10	10.5
10/13/2008 12:55.82	16.0	10.0	122.4	-6.0	51.3	2.42E-05	1.1	10	10.5
10/13/2008 15:31.21	18.0	7.3	155.4	-11.2	53.9	2.59E-05	1.1	12.5	13.5
10/13/2008 17:08.64	20.0	5.8	97.4	-14.2	55.6	2.53E-05	1.0	7.5	7.5
10/13/2008 19:26.66	22.0	3.7	138.0	-18.3	57.9	2.59E-05	1.1	10	10.5
10/13/2008 21:53.00	24.0	1.6	146.3	-22.4	60.3	2.62E-05	1.1	10	10.5
10/13/2008 00:00.00	0.0	24.8	0.0	24.8	60.3				
10/13/2008 00:29.54	2.0	23.7	29.5	21.7	60.8	5.51E-05	0.6	10	5.5
10/13/2008 01:52.30	4.0	21.6	82.8	17.6	62.2	2.70E-05	1.1	10	10.5
10/13/2008 03:14.51	6.0	19.3	82.2	13.3	63.5	2.98E-05	1.2	10	11.5
10/13/2008 04:34.11	8.0	17.1	79.6	9.1	64.9	3.15E-05	1.1	10	11
10/13/2008 05:56.68	10.0	15.0	82.6	5.0	66.2	3.12E-05	1.1	10	10.5
10/13/2008 07:24.82	12.0	13.0	88.1	1.0	67.7	2.99E-05	1.0	10	10
10/13/2008 08:58.86	14.0	10.9	94.0	-3.1	69.3	3.03E-05	1.1	10	10.5
10/13/2008 10:37.86	16.0	8.8	99.0	-7.2	70.9	3.04E-05	1.1	10	10.5
10/13/2008 12:19.05	18.0	6.8	101.2	-11.2	72.6	3.08E-05	1.0	10	10
10/13/2008 14:10.55	20.0	4.7	111.5	-15.3	74.5	3.05E-05	1.1	10	10.5
10/13/2008 16:10.10	22.0	2.7	119.5	-19.3	76.5	2.97E-05	1.0	10	10
10/13/2008 18:17.55	24.0	0.6	127.5	-23.4	78.6	3.06E-05	1.1	10	10.5

